000695
NSWC WHITE OAK
5090.3a

RESOURCE CONSERVATION AND RECOVERY ACT FACILITY INVESTIGATION SITE 5 AND SITE 13 NSWC WHITE OAK MD

9/1/2002

TETRA TECH

090202/P

RCRA FACILITY INVESTIGATON
for
SITES 5 AND 13

SWH

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 CH32
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 N62467-94-D-0888
CONTRACT TASK ORDER 0839

SEPTEMBER 2002

PREPARED UNDER DIRECTION OF:

RONALD J. KOTUN, Ph.D.
PROJECT MANAGER
TETRA TECH NUS, INC.
PITTSBURGH, PENNSYLVANIA

APPROVED BY:

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

TABLE OF CONTENTS

SECTION			PAGE NO.
ACRONYMS			vi
1.0		INTRODUCTION	1-1
	1.1	PURPOSE OF THE RFI	1-1
	1.2	BASE HISTORY	1-1
	1.3	FACILITY DESCRIPTION	1-2
	1.3.1	Site 5 - Open Burn Areas	1-2
	1.3.2	Site 13 - Oil Sludge Disposal Area	1-3
	1.4	PREVIOUS INVESTIGATIONS	1-3
2.0		SITE INVESTIGATION ACTIVITIES	2-1
	2.1	SCOPE OF WORK	2-1
	2.1.1	SITE 5 – OPEN BURN AREAS	2-1
	2.1.2	SITE 13 – OIL SLUDGE DISPOSAL AREA	2-4
	2.2	INVESTIGATION DERIVED WASTE (IDW) HANDLING	2-5
	2.3	SURVEYING	2-6
	2.4	DATA EVALUATION AND VALIDATION	2-6
	2.4.1	DATA QUALITY	2-6
	2.4.2	Data Quality Objectives	2-6
	2.4.3	Data Validation	2-9
	2.5	CHEMICAL FATE AND TRANSPORT ANALYSIS	2-13
	2.5.1	Chemical and Physical Properties	2-13
	2.5.2	Contaminant Persistence / Fate and Transport	2-16
	2.6	HUMAN HEALTH RISK ASSESSMENT PROCEDURES	2-21
	2.6.1	Data Evaluation	2-21
	2.6.2	Exposure Assessment	2-24
	2.6.3	Toxicity Assessment	2-30
	2.6.4	Risk Characterization	2-32
	2.6.5	Uncertainty Analysis	2-34
	2.6.6	Uncertainty in the Risk Characterization	2-39
	2.7	BASEWIDE ECOLOGICAL RISK ASSESSMENT	2-39
3.0		PHYSICAL CHARACTERISTICS OF THE STUDY AREA	3-1
	3.1	METEOROLOGY AND CLIMATOLOGY	3-1
	3.2	SITE TOPOGRAPHY	3-1
	3.3	REGIONAL GEOLOGY/SOILS	3-1
	3.4	REGIONAL HYDROGEOLOGY	3-2
	3.5	WATER USAGE	3-3
	3.6	LOCAL HYDROGEOLOGY	3-3
4.0		SITE 5 - OPEN BURN AREA	4-1
	4.1	SITE CHARACTERISTICS	4-1
	4.2	NATURE AND EXTENT	4-1
	4.3	CONTAMINANT FATE AND TRANSPORT	4-2
	4.3.1	Volatile Organics	4-3
	4.3.2	Phthalate Esters	4-3
	4.3.3	Polycyclic Aromatic Hydrocarbons	4-3
	4.3.4	Pesticides	4-4
	4.3.5	Polychlorinated Biphenyls	4-4

TABLE OF CONTENTS (Continued)

SECTION		PAGE NO.
4.3.6	Explosives (Nitrogen-Containing Organic Compounds)	4-4
4.3.7	Inorganics (Metals and Cyanide)	4-5
4.4	SITE 5, BASELINE HUMAN HEALTH RISK ASSESSMENT	4-6
4.4.1	Data Evaluation	4-6
4.4.2	Exposure Assessment	4-7
4.4.3	Results of the Risk Characterization	4-7
4.4.4	Uncertainty Analysis	4-8
4.5	SUMMARY AND CONCLUSIONS	4-9
5.0	**SITE 13**	**5-1**
5.1	SITE CHARACTERISTICS	5-1
5.2	NATURE AND EXTENT	5-1
5.3	CONTAMINANT FATE AND TRANSPORT	5-2
5.3.1	Volatile Organics	5-2
5.3.2	Phthalate Esters	5-3
5.3.3	Polycyclic Aromatic Hydrocarbons	5-3
5.3.4	Pesticides	5-3
5.3.5	Polychlorinated Biphenyls	5-4
5.3.6	Inorganics (Metals and Cyanide)	5-4
5.4	SITE 13, BASELINE HUMAN HEALTH RISK ASSESSMENT	5-5
5.4.1	Data Evaluation	5-5
5.4.2	Exposure Assessment	5-6
5.4.3	Results of the Risk Characterization	5-6
5.4.4	Uncertainty Analysis	5-7
5.5	SUMMARY AND CONCLUSIONS	5-8
REFERENCES		**R-1**

APPENDICES

A	**GEOPHYSICAL SURVEY REPORT**
B	**SURVEY LOCATIONS**
C	**DATA VALIDATION MEMORANDA**
D	**ANALYTICAL DATA**
E	**SHAPIRO-WILK ANALYSES**
F	**EXAMPLE CALCULATIONS**
G	**RAGS PART D TABLES (RISK ASSESSMENT SPREADSHEETS)**
H	**WILCOXON RANK-SUM ANALYSES**
I	**FIELD DATA**

TABLES

NUMBER

2-1 Summary of Rejected Results, Site 5
2-2 Summary of Rejected Results, Site 5
2-3 Environmental Fate and Transport Parameters for Organic Chemicals
2-4 Relative Mobilities of Inorganics as a Function of Environmental Conditions (Eh, pH)
2-5 Summary of Exposure Factors - Reasonable Maximum Exposure
2-6 Summary of Exposure Factors - Central Tendency Exposure
2-7 Non-Cancer Toxicity Data - Oral/Dermal
2-8 Cancer Toxicity Data - Oral/Dermal
4-1 Occurrence, Distribution, and Selection of Potential Constituents of Concern, Post-Removal Surface/Subsurface Soil - Site 5 - Open Burn Areas
4-2 Medium-Specific Exposure Point Concentration Summary - Surface/Subsurface Soil, Site 5 - Open Burn Areas
4-3 Cumulative Risk Summary - Reasonable Maximum Exposure to Post-Removal Soil, Site 5 - Chemical Burn Areas
4-4 Cumulative Risk Summary - Central Tendency Exposure to Post-Removal Soil, Site 5 - Chemical Burn Areas
4-5 Comparison of Maximum Detected Concentration to RBCs and Background UCL, Site 5 - Open Burn Areas
5-1 Occurrence, Distribution, and Selection of Potential Constituents of Concern, Post-Removal Surface/Subsurface Soil - Site 13 - Oil Sludge Disposal Area
5-2 Medium-Specific Exposure Point Concentration Summary - Surface/Subsurface Soil, Site 13 - Oil Sludge Disposal Area
5-3 Cumulative Risk Summary - Reasonable Maximum Exposure to Post-Removal Soil, Site 13 - OU1
5-4 Cumulative Risk Summary - Central Tendency Exposure to Post-Removal Soil, Site 13 - OU1
5-5 Comparison of Maximum Detected Concentrton to RBCs and Background UCL, Site 13 - Oil Sludge Disposal Area
5-6 Comparison of UCL to RBCs and Background UCL, Site 13 - Oil Sludge Disposal Area

FIGURES

NUMBER

1-1 Site Vicinity Map
1-2 Site Location Map see notes on fig.
1-3 Sample Location Map
2-1 Geophysical Survey and Test Pit Location Map
2-2 Human Health Conceptual Site Model
3-1 Surficial Geology Map
4-1 Summary of Exceedances of Human Health Criteria, Site 5 - Open Burn Area
5-1 Summary of Exceedances of Human Health Screening Criteria, Site 13 - Oil Sludge Disposal Area

Soil

↑ Soil

ACRONYMS

ALC	Adelphi Laboratory Center
BCF	Bioconcentration factor
bgs	Below ground surface
B&R	Brown and Root Environmental, Inc.
BRAC	Base Realignment and Closure
BTEX	Benzene, ethylbenzene, toluene, and xylenes
CBC	Chillium-Beltsville-Croon soil association
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLEAN	Comprehensive Long-Term Environmental Action Navy
COC	Chemical of concern
COMAR	Code of Maryland Regulations
CRAVE	Carcinogenic Risk Assessment Verification Endeavor
CSF	Cancer Slope Factor
CSM	Conceptual Site Model
CTE	Central Tendency Exposure
CTO	Contract Task Order
DNT	Dinitrotoluene
DQO	Data Quality Objective
EM-31	EM 31 Terrain Conductivity Meter
EPA	United States Environmental Protection Agency
EPC	Exposure point concentration
FID	Flame ionization detector
FSP	Field Sampling Plan
GMC	Gleneig-Manor-Chester soil association
GSA	General Services Administration
HEAST	Health Effects Assessment Summary
HHRA	Human health risk assessment
HI	Hazard Index
HQ	Hazard Quotient
HSWA	Hazardous and Solid Waste Amendments
IAS	Initial Assessment Study
ICLR	Incremental Lifetime Cancer Risk
ICP	Inductively Coupled Plasma
IDW	Investigation-derived waste
IRIS	Integrated Risk Information System

IRP	Installation Restoration Program
NCEA	National Center for Environmental Assessment
NOL	Naval Ordnance Laboratory
NSWC-White Oak	Naval Surface Warfare Center, Dahlgren Division Detachment, White Oak
OPPTS	Office of Prevention, Pesticides, and Toxic Substances
OSWER	Office of Solid waste and Emergency Response
OU	Operable Unit
PAH	Polynuclear aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PCOC	Potential contaminant of concern
PID	Photoionization detector
PPE	Personal protective equipment
QC	Quality control
RBC	Risk-based concentration
RCRA	Resource Conservation and Recovery Act
RfD	Reference Dose
RFI	RCRA Facility Investigation
RI	Remedial Investigation
RME	Reasonable Maximum Exposure
RPD	Relative percent difference
SOP	Standard Operating Procedure
SSL	Soil screening level
SSR	Site Screening Report
SU	Standard Unit
SVOC	Semivolatile organic compound
TAL	Target Analyte List
TCE	Trichloroethene
TCL	Target Compound List
TNT	Trinitrotoluene
TtNUS	Tetra Tech NUS, Inc.
UCL	Upper confidence of the mean
USGS	United States Geological Survey
USNR	United States Naval Reserve
VLF	Very low frequency
VOC	Volatile organic compound

1.0 INTRODUCTION

1.1 PURPOSE OF THE RFI

Tetra Tech NUS (TtNUS) is submitting this Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report for the former Naval Surface Warfare Center, Dahlgren Division Detachment, White Oak (NSWC-White Oak). It has been prepared under Contract Task Order (CTO) 0839 for the Comprehensive Long-Term Environmental Action Navy (CLEAN), Contract Number N62467-94-D-0888. This project is being conducted according to the Resource Conservation and Recovery Act of 1976, as amended by the Hazardous and Solid Waste Amendments (HSWA) of 1984.

The overall goal of this RFI is to characterize environmental conditions at Site 5 (Open Burn Area) and Site 13 (Oil Sludge Disposal Area) of the former NSWC-White Oak to sufficiently determine the extent that these facilities and associated environmental conditions may impact human health and the environment. The RFI Report provides the results of the field study, identifies site contaminants that exceed regulatory standards, and estimates risks from a human health perspective. A basewide ecological risk assessment has already been conducted, and the results of this assessment will be summarized in this RFI.

1.2 BASE HISTORY

NSWC-White Oak was originally established in 1944 as the Naval Ordnance Laboratory (NOL) with a mission to carry out research on military 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 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 General Services Administration (GSA) and to the U.S. Army. GSA is currently investigating plans for the reuse and development of the NSWC-White Oak property. The property transferred to the U.S. Army will be used in conjunction with ongoing activities at the adjacent Adelphi Laboratory Center (ALC).

1.3 FACILITY DESCRIPTION

NSWC-White Oak is a former Navy-owned and -operated laboratory for naval surface warfare research, located approximately 5 miles north of Washington, D.C., off New Hampshire Avenue, in Silver Spring, Maryland (Figure 1-1). NSWC-White Oak covered approximately 712 acres and was located in both Prince George's and Montgomery Counties. Approximately 662 acres were transferred to the GSA in the fall of 1997. The remaining ~~area~~ Acres in the southeastern portion of the facility was transferred to the U.S. Army in February 1998. Of this total area, approximately 617 acres, or 87 percent, is within Montgomery County. NSWC-White Oak is bordered by the U.S. Army's ALC and the United States Naval Reserve (USNR) Training Center along with a mixture of residential, park, industrial, and commercial properties. The facility lies in gently rolling terrain. Local drainage ~~patterns are dominated by~~ surface-water system is comprised of Paint Branch and its tributaries.

This RFI is the continuation of the original effort to remediate these sites and mitigate risk. Other ~~less~~ potentially contaminated sites at NSWC-White Oak are being investigated through other studies. Figure 1-2 shows the location of Sites 5 and 13 in relation to the former Base boundaries, surface water bodies, and other landmarks. The facility boundaries identified on Figures 1-1 and 1-2 are the boundaries that existed prior to the transfer of the property to the GSA and the Army.

1.3.1 Site 5 - Open Burn Areas

Site 5 (Open Burn Areas) was identified in the Initial Assessment Study (IAS) (NEESA, 1984) and the RCRA Facility Assessment (RFA) (SWMU 32). The site is located north of Dahlgren Road in the northeastern corner of NSWC-White Oak and is also southwest of Site 4. Show on fig 1-2.

This site consisted of three adjacent open burn areas that were formed from bermed, compacted soil (Figure 1-3). The first bermed area was used from the late 1940s until 1970 as a burn site for paper, cardboard, wood, and other bulky ignitable materials, as well as small quantities of hazardous materials. In 1969-70, materials were ignited in Berm Area 1 using pyrotechnic devices. It has also been reported that this site may have been used as a fire training area and that explosives may have been tested here. Berm Area 2, located east of Berm Area 1, was reportedly used for research operations. Berm Area 3 is located north of the other two bermed areas and was used to test pyrotechnic devices.

During the Site 3 removal action in the fall of 2000, the burn rings and surface soils across Site 5 were excavated and disposed off site. The excavation extended to the north to the limit of Berm Area 3. The average excavation depth across Site 5 was 3 feet.

the area has recently (2000-2001) been

Site 5 ~~has also been~~ used in support of the closure of Site 3, the Pistol Range Landfill for the storage of ordnance shapes excavated from Site 3.

1.3.2 Site 13 - Oil Sludge Disposal Area

Site 13 (Oil Sludge Disposal Area) is located near the northeastern corner of the Base adjacent to Site 5, + site 3 between Dahlgren Road and the northern boundary patrol road (Figure 1-3). The site occupies approximately 0.7 acre. It is reported that between 1970 and 1978, approximately 6,000 to 10,000 gallons of oily sludge from storage tanks containing No. 6 fuel oil were spread over the surface of Site 13. Site 13 has been used for an equipment storage area during the closure of Site 3.

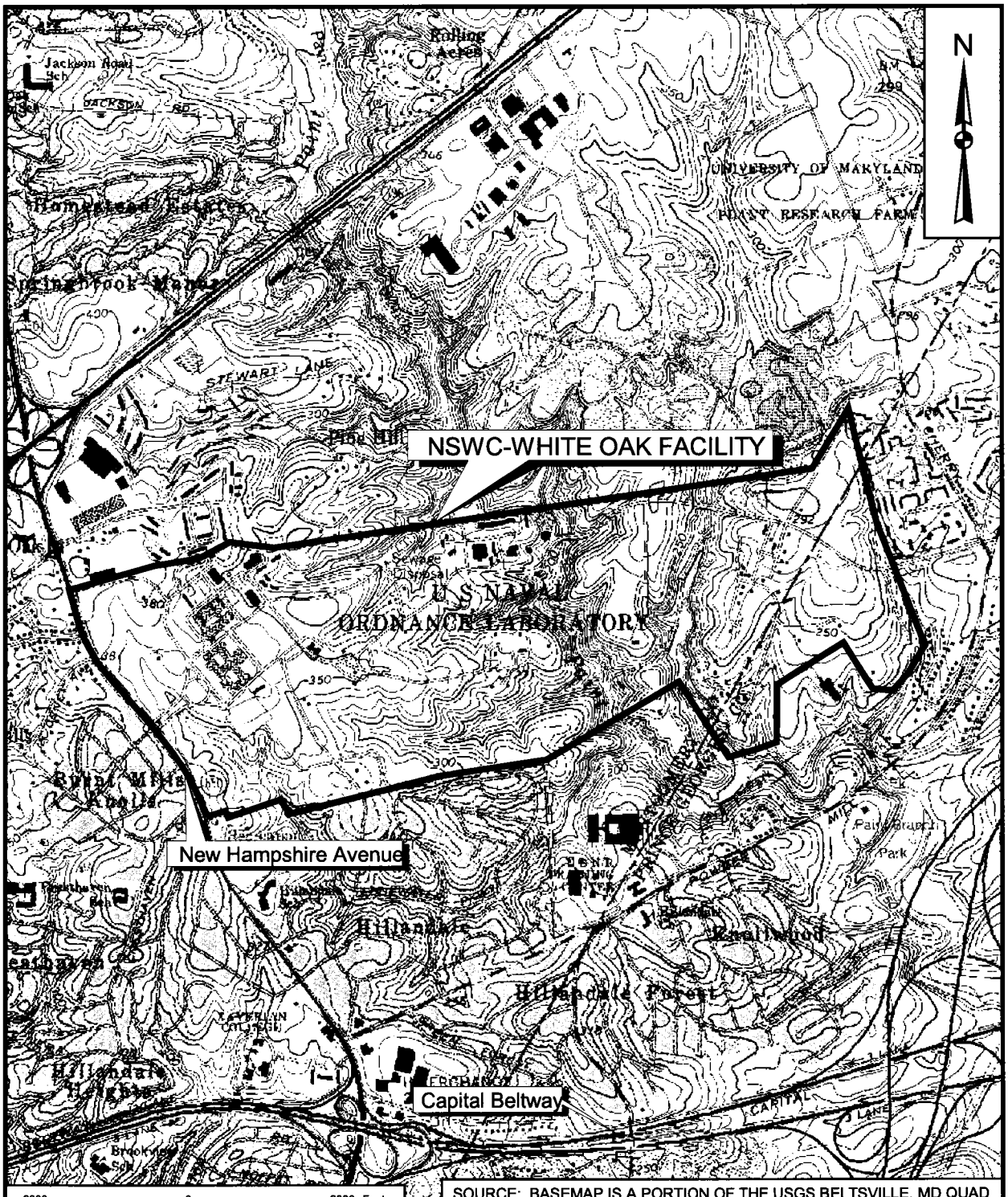
? Was soil removed from site 13 surface? if so Add discuss. here.

1.4 PREVIOUS INVESTIGATIONS

A Site Screening Report (SSR) for Installation Restoration Program (IRP) Sites 1, 5, 6, 12, 13, 28, 29, 31, 32, and 33, EBS AOC 100 (TtNUS, 1998) was conducted. For Site 5, 5 surface and 12 subsurface soil samples were collected and analyzed for Target Compound List (TCL) volatile organic compounds (VOCs), TCL semivolatile organic compounds (SVOCs), TCL pesticides/polychlorinated biphenyls (PCBs), Target Analyte List (TAL) metals, cyanide, and Environmental Protection Agency (EPA) SW846-8330 explosives. For Site 13, 3 surface and 4 subsurface soil samples were collected and analyzed for the same parameters as at Site 5.

Add PP here, general description of soil/ contaminants described above, samples -

Sites 5 and 13 are both located within Operable Unit (OU) 1 at NSWC-White Oak. OU1 is a groundwater and surface water OU in the general area between and including Westfarm Branch on the west and the stream east of Floral Drive (Floral Drive Stream) on the east. The total area of OU1 is approximately 210 acres. The investigation of OU1 has determined that areas of contaminated groundwater at or near Sites 5 and 13 pose an unacceptable risk to human health (CH2M Hill, 2002). In particular, VOCs have been identified at or near sites 5 and 13. Groundwater contamination within Site 13 represents a local hot spot and likely source area to the surrounding aquifer. Sampling performed between 1999 and 2001, as part of the OU1 Remedial Investigation (RI) identified the VOCs 1,1,2,2-tetrachloroethane, trichloroethene (TCE), and cis-1,2-dichloroethene, with lesser concentrations of tetrachloroethene, trans-1,2-dichloroethene, and vinyl chloride. Significant concentrations of chlorinated VOCs were not identified in the vadose zone soil; the greatest concentrations were found in soil near the top of the water table [approximately 14 feet below ground surface (bgs)] (CH2M Hill, 2002).

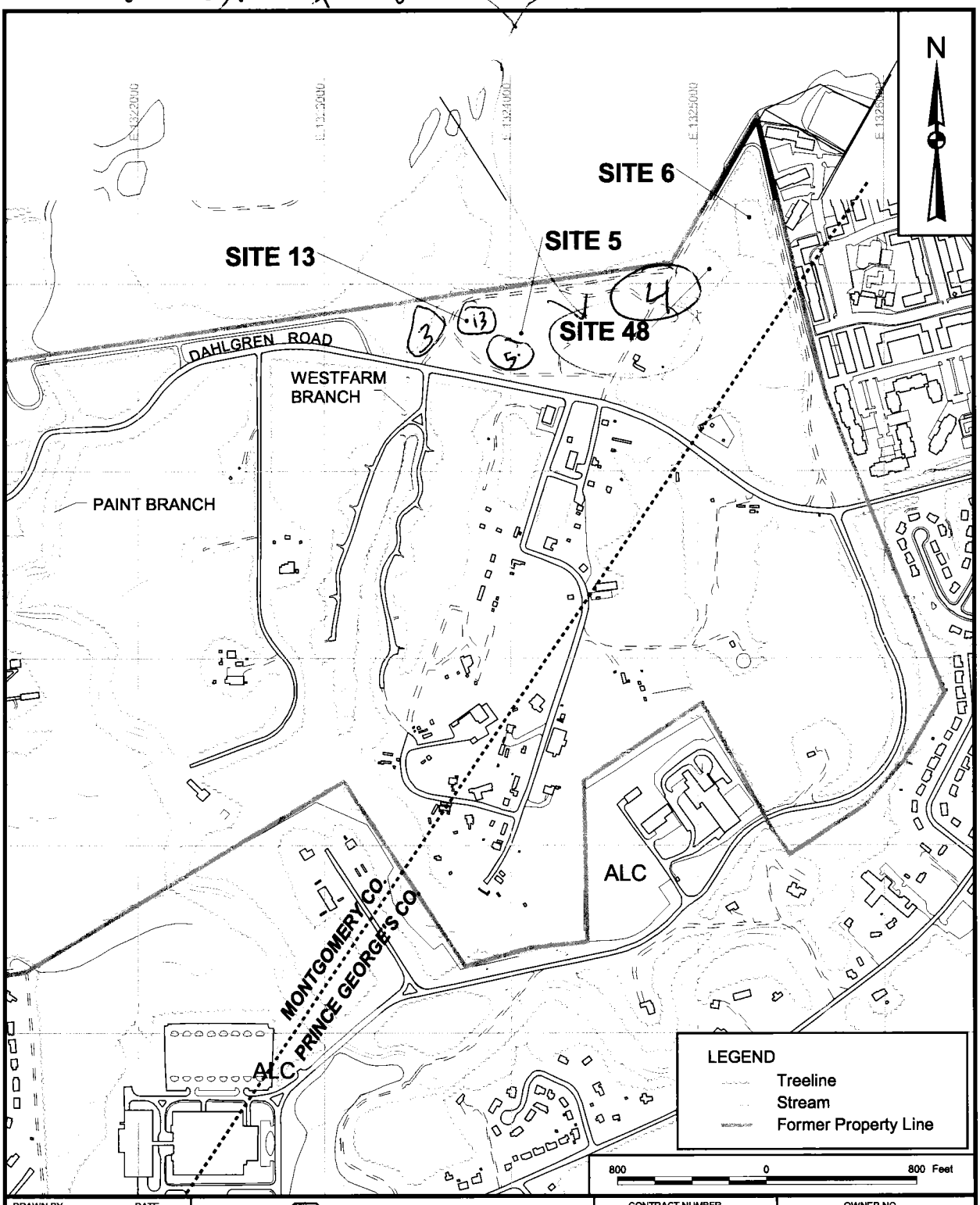


SOURCE: BASEMAP IS A PORTION OF THE USGS BELTSVILLE, MD QUAD (O37035E.TIF, 7.5' SERIES, PHOTOREVISED 1979).

DRAWN BY: J. LAMEY — DATE: 9/7/00	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 4246	OWNER NO.: 0839
CHECKED BY: R. KOTUN — DATE: 9/13/02	SITE VICINITY MAP FORMER NSWC - WHITE OAK SILVER SPRING, MARYLAND	APPROVED BY: — DATE: —	
COST/SCHEDULE-AREA		APPROVED BY: — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE 1-1	REV: 0

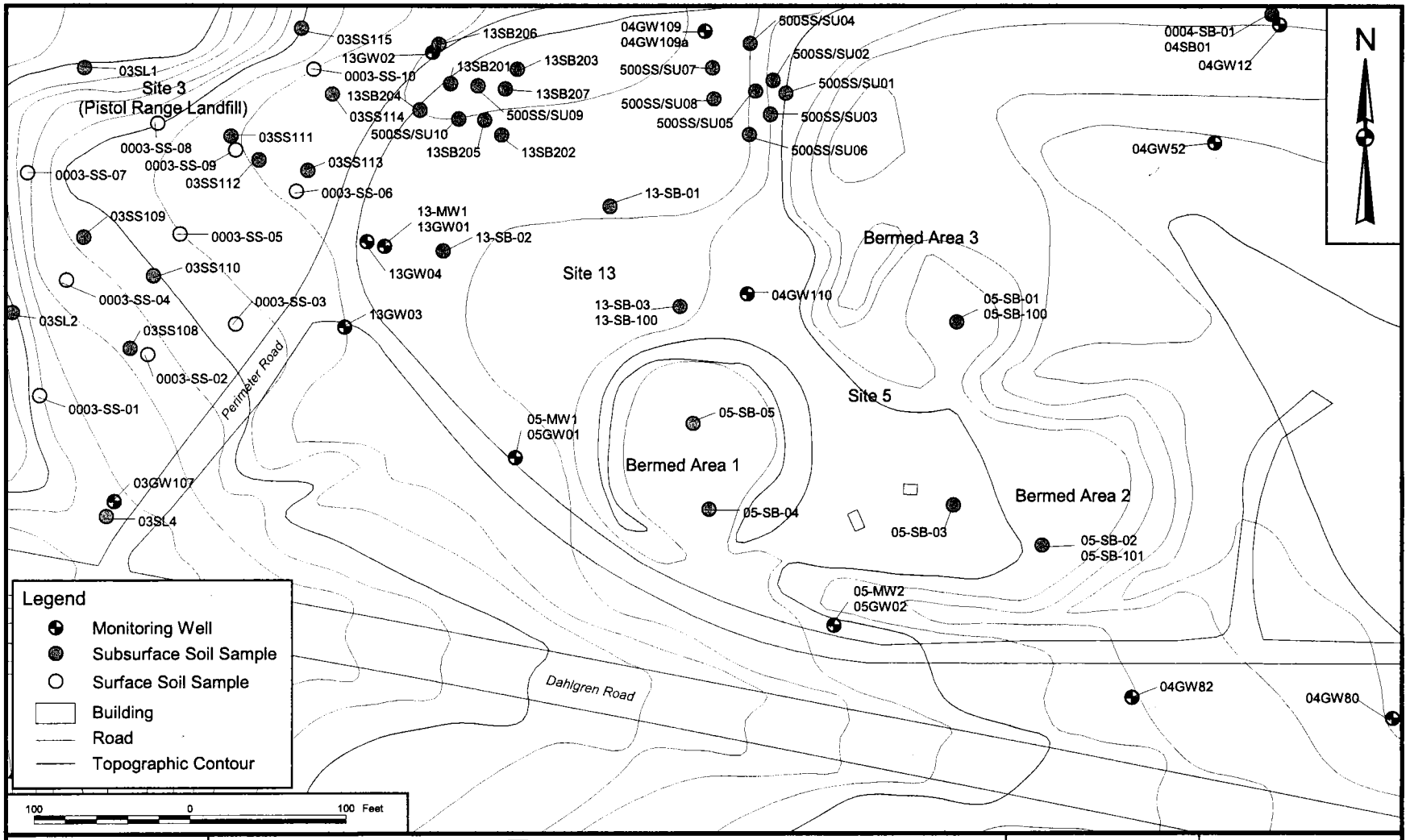
P:\GIS\WHITEOAK\7855_0501.APR SITE VICINITY MAP 9/11/02 AJ

Show areas at this scale
show site 3 + 4 – as discussed in text
48 or 4?



DRAWN BY: J. LAMEY — DATE: 9/7/00	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 4246	OWNER NO.: 0839
CHECKED BY: R. KOTUN — DATE: 9/11/02	SITE LOCATION MAP FORMER NSWC-WHITE OAK SILVER SPRING, MARYLAND	APPROVED BY — DATE: —	
COST/SCHEDULE-AREA		APPROVED BY — DATE: —	
SCALE: AS NOTED		DRAWING NO.: FIGURE 1-2	REV: 0

P:\GIS\WHITEOAK\7855_0501.APR SITE LOCATION MAP 9/11/02 AJ



DRAWN BY: M. JONNET — DATE: 9/23/98	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 4246	OWNER NUMBER: 0839
CHECKED BY: R. KOTUN — DATE: 9/11/02	SAMPLE LOCATION MAP SITE 5 / SWMU 32 - OPEN BURN AREAS AND SITE 13/SWMU 7 - OIL SLUDGE DISPOSAL AREA FORMER 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

P:\GIS\WHITEOAK\7855_0501.APR SAMPLE LOCATION MAP - SITE 5/SWMU 32 & SITE 13/SWMU 7 9/11/02 AJ

Sites 3 + 4 are also shown. Add to caption.

2.0 SITE INVESTIGATION ACTIVITIES

Separate investigations were performed at Sites 5 and 13 to characterize the site and to determine, if necessary, the most appropriate corrective measure for each site. Information from this investigation was used to supplement existing data in order to facilitate an accurate, complete evaluation.

2.1 SCOPE OF WORK

The overall goal of the environmental investigative work at Sites 5 and 13 was to sufficiently determine whether the site and surrounding environmental media pose an unacceptable risk to human health and the environment. This determination is initially made through characterization.

The site characterization process was based on standard guidance for conducting an RFI. The process included identification of Data Quality Objectives (DQOs), development of an RFI Work Plan, performance of field work, data management, and completion of an RFI and other reports.

2.1.1 SITE 5 – OPEN BURN AREAS

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

- A geophysical survey using electromagnetic conductivity to locate anomalies that may be associated with historic activities.

- A soil-gas survey to further define previously identified contaminated soil areas

- Excavation of test pits to determine the nature of the anomalies and the extent of contamination based on visual observations

- Collection of 6 subsurface soil samples from the bottom of the proposed test pits to further delineate the lateral and vertical extent of subsurface soil contamination

- Collection of 6 subsurface waste samples from the test pits to characterize materials for risk analysis and disposal

2.1.1.1 Geophysical Survey

A geophysical survey was conducted at Site 5 using a Geonics EM31 Terrain Conductivity Meter (EM-31) to delineate the disposal area boundaries and to identify potential subsurface anomalies. The survey was conducted in accordance with Section 2.6 of the Master Field Sampling Plan (FSP) (B&R Environmental, 1998) and TtNUS Standard Operating Procedures (SOP) GH-3.1, GH-3.2, and GH-3.4.

Reference grids were installed in the areas hatched on Figure 2-1 using a transit, tape measure, and pin flags, survey stakes, and/or flagging, as appropriate. Grid coordinates were assigned northing and easting locations in feet. Geophysical survey lines were spaced and marked to a maximum of 12.5 feet apart, which is the effective radius of survey based on the fixed coil spacing of the EM-31. Lines were spaced closer in small grid areas where better resolution was desired. Stakes, flagging, and/or pin flags were also placed at regular intervals along the geophysical lines in the direction of the survey at a frequency (typically every 100 to 300 feet) that maintained a line of sight and provided adequate distance references along the lines, depending on the terrain and line length. Terrain conductivity and in-phase responses were measured simultaneously at 1-second intervals (approximately every 3 feet) along these geophysical lines and automatically stored in a digital data logger. All data were collected with the instrument held at waist height (approximately 3 feet), in the vertical dipole mode and oriented parallel to the direction of travel. The depth of investigation using this configuration is approximately 16 feet. The measurements were observed by the instrument operator as the survey was conducted to allow for immediate marking of anomalies in the field, if they were discernible during the survey. Data was collected through the use of a laptop computer and the manufacturer's software, DAT31. The geophysical data were characterized to the extent that they produced recognizable responses when compared with background or surrounding data.

The EM-31 measures and records the quadrature component (ground conductivity) and the in-phase component of the electromagnetic field along the survey lines. The EM-31 measures terrain conductivity by imparting a current to the very low frequency (VLF) transmitter coil. The EM-31 transmits at a frequency of 9.8 kHz. The current passing through this coil produces a magnetic field, which in turn induces small currents in the underlying strata. Currents produced within the underlying strata are sensed by a receiver coil. The ratio of the magnetic field detected by the receiver coil to that field produced by the transmitter coil is directly proportional to terrain conductivity. Terrain conductivity, or apparent ground conductivity, is therefore read directly from the EM-31 in milliSiemens per meter (mS/m). The in-phase response, expressed in parts per thousand (ppt), is significantly more sensitive to buried metal objects. These values represent the average response of the EM-31 over the effective depth of the survey; the effective depth is a function of the distance between the transmitting and receiving coils. The EM-31 has a fixed coil spacing of 12 feet, yielding an effective depth of the survey of approximately 12 to 15 feet, in the absence of features (fences, buildings, etc.) that may interfere with the detection of survey

targets. The results of the geophysical survey were provided to the BRAC Cleanup Team for review prior to the initiation of the test pit investigations.

The geophysical survey identified several anomalous areas within Site 5 that were investigated through the test pit program. The anomalies were identified in the field during test pitting as miscellaneous debris (metal, brick, bottles, etc.) and utility lines; however, no significant signs of soil contamination were identified at any location (Section 2.1.1.3). The geophysical survey report is provided in Appendix A.

2.1.1.2 Soil Gas Survey

To further refine the test pit and soil sampling locations, a soil gas survey was conducted at Site 5 within the area where high concentrations of VOCs were detected during the site screening investigation (Figure 2-1). The soil gas survey included the excavation of shallow test pits and the field monitoring of soil gas in the shallow subsurface using a photoionization detector (PID). The soil gas survey helped to identify potential source areas that may be impacting groundwater quality at the site. The results of the soil gas survey were provided to the BRAC Cleanup Team for review prior to the initiation of the test pit investigations.

The soil gas survey did not identify areas of elevated VOC concentrations in the shallow subsurface soil at Site 5. Little or no organic vapors were measured during this effort. The results of the soil gas survey are provided in Appendix A.

2.1.1.3 Test Pit Investigation

Based on existing data, test pits were excavated to a maximum depth of approximately 5 feet bgs (i.e., the depth of natural soil). The locations of test pits identified on Figure 2-1 were determined from data currently available for the subsurface conditions at Site 5. Six subsurface soil and 6 waste samples were collected during the field investigation. Test pit excavation and sampling were performed in accordance with Section 2.2.2 of the Master FSP and TtNUS SOP SA-1.3.

Test pit soil samples were collected from the base of the excavation within natural soils and beneath the waste materials to determine if residual soil contamination was present. The samples were collected from the bucket of the excavator because personnel were not permitted to enter the test pit.

Waste material samples collected from the test pits were collected half-way between the bottom of the excavation and the ground surface to characterize the waste material for risk analysis and off-site disposal. Visual observations or field screening using a PID/flame ionization detector (FID) were used to select the locations of waste material samples.

2.1.2 SITE 13 – OIL SLUDGE DISPOSAL AREA

Additional information was required at Site 13 to determine the lateral and vertical extent of soil contamination, identify the types and levels of contamination in the subsurface, and determine the subsurface soil conditions to evaluate viable alternatives for time-critical removal action. The following is a summary of the field efforts necessary to obtain this information.

- A geophysical survey using electromagnetic conductivity to locate anomalies that may be associated with historic activities.
- A soil gas survey to further define previously identified contaminated soil areas
- Excavation of test pits to determine the nature of the anomalies and the extent of contamination based on visual observations
- Collection of 4 subsurface soil samples from within the proposed test pits to further delineate the lateral and vertical extent of subsurface soil contamination
- Collection of 4 subsurface waste samples to characterize materials for risk analysis and disposal

2.1.2.1 Geophysical Survey

A geophysical survey was conducted at Site 13 using the Geonics EM31. The survey was conducted to delineate the disposal area boundaries and to identify potential subsurface anomalies. The instrumentation and procedures used at Site 5 were also used at Site 13 (Section 2.1.1.1). The results of the soil gas survey were provided to the BRAC Cleanup Team for review prior to the initiation of the test pit investigations.

The geophysical survey identified several anomalies within Site 13 that were investigated through the test pit program. Little waste or debris was found during the test pit investigation that could be correlated to the geophysical survey, although drums were detected in the subsurface at test pit 13-TP-05 (Figure 2-1). The geophysical survey report is provided in Appendix A.

2.1.2.2 Soil Gas Survey

To further refine the test pit and soil sampling locations, a soil gas survey was conducted at Site 13 within the areas where high concentrations of VOCs were detected in site groundwater and soils during the OU1

RI (Figure 2-1). The soil gas survey included the excavation of shallow test pits and the field monitoring of soil gas in the shallow subsurface using a PID. The results of the soil gas survey were provided to the BRAC Cleanup Team for review prior to the initiation of the test pit investigations.

This soil gas survey did not identify areas of elevated VOC concentrations in the shallow subsurface soil at Site 13. Little or no organic vapors were measured during this effort. The results of the soil gas survey are provided in Appendix A.

2.1.2.3 Test Pit Investigation

Based on existing data, test pits were excavated to natural soil with a maximum depth of 8 to 10 feet bgs (i.e., depth of natural soil). The locations of test pits identified on Figure 2-1 were determined based on data currently available about the subsurface conditions at Site 13. Four subsurface soil and four waste samples were collected during the field investigation. Test pit excavation and sampling were performed in accordance with Section 2.2.2 of the Master FSP (B&R Environmental, 1998) and TtNUS SOP SA-1.3.

Soil samples associated with test pits were collected from the base of the excavation within natural soils and beneath the waste materials to determine if residual soil contamination was present. The samples were collected from the bucket of the excavator because personnel were not permitted to enter the test pits.

Waste material samples collected from the test pits were collected half-way between the bottom of the excavation and the ground surface to characterize the waste material for risk analysis and off-site disposal. Visual observations or field screening using a PID/FID were used to select the locations of waste material samples.

2.2 INVESTIGATION DERIVED WASTE (IDW) HANDLING

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

The types of IDW generated during this field effort were decontamination fluids, field personal protective equipment (PPE), disposable sampling equipment, and other debris. Fluids generated during cleaning of the backhoe bucket were containerized in 55-gallon drums for proper disposal. PPE, disposable sampling equipment, and other debris were collected in garbage bags and disposed of in a trash receptacle.

2.3 SURVEYING

Test pit boundaries and sample locations were surveyed at each site by a registered surveyor. Existing survey monuments within the former NSWC - White Oak were used as reference points. The field survey was performed in accordance with requirements set forth in the Master FSP for NSWC - White Oak (B&R Environmental, 1998). Survey points were measured to the nearest 0.1 foot horizontally and 0.01 foot vertically. The coordinates for surveyed points from this investigation can be found in Appendix B.

2.4 DATA EVALUATION AND VALIDATION

2.4.1 DATA QUALITY

Various data quality control measures were implemented during the RFI performed at Sites 5 and 13. These quality measures were conducted to ensure that the resultant data were suitable for their intended uses (i.e., nature and extent determination, risk assessment, etc.). A brief summary of these measures is provided in this report. Section 2.4.2 contains a summary of the DQOs. Field Quality Control Samples are discussed in Section 2.4.2.5. A summary of the data validation procedures and the results of the data validation process are discussed in Section 2.4.3.

2.4.2 Data Quality Objectives

DQOs established for this project were based upon the systematic approach outlined in the Master FSP (B&R Environmental, 1998). The outlined approach considered existing site information and data, identification of the problem, development of a strategic site plan, specification of control and monitoring criteria, and an evaluation of the data collected during the investigation.

The data obtained during the investigation were evaluated and were used to satisfy and support the decision-making process DQOs. As part of the evaluation process, and in order to provide data of satisfactory quality, all field and laboratory analyses included requirements for precision, accuracy, representativeness, and completeness. These parameters are briefly summarized in this section.

2.4.2.1 Precision

Precision characterizes the amount of variability and bias inherent in a data set. This parameter also describes the reproducibility of measurements of the same parameters for samples under similar conditions. Precision is expressed as a Relative Percent Difference (RPD), which is defined as the relation of the range relative to the mean RPDs. Mean RPDs are typically expressed as percentages, are used to evaluate both field and laboratory duplicate precision, and are calculated as follows:

$$RPD = \frac{|V1 - V2|}{(V1 + V2)/2} \times 100$$

where RPD = relative percent difference
V1, V2 = two results obtained by analyzing duplicate samples

The precision objectives for parameters are specified in the associated analytical protocols. General precision objectives such as ±50 percent for solid matrices and ±30 percent for aqueous matrices were employed for this project.

Field duplicates monitor the consistency with which environmental samples were obtained and analyzed. RPDs were calculated for each set of field and laboratory duplicates generated for the investigation. Analytical data qualifiers, as well as the implication of the data qualifications, are discussed in Section 2.4.3.2.

2.4.2.2 Accuracy

The degree of accuracy of a measurement, which is expressed as a percent recovery, is based on a comparison of the measured value with an accepted reference or true value. Accuracy measurements are determined by the analysis of "spiked" samples (i.e., blank, surrogate, or matrix spikes). These analyses measure the accuracy of the laboratory operations as affected by the sample matrix. Percent recovery is calculated using the following equation:

$$\%R = \frac{Ss - So}{S} \times 100$$

where %R = percent recovery
Ss = result of spiked sample
So = result of non-spiked sample
S = concentration of spiked amount.

In general, a percent recovery range of 75 to 125 defines the accuracy objective for the analytical data. It should be noted however, that the analytical laboratory determines analyte specific percent recoveries. Failures in meeting the accuracy objectives resulted in the qualification (as per data validation protocols) of the associated analytical data. A discussion of the qualification of the analytical data and the implication of the data qualifications is provided in Section 2.4.3.2.

2.4.2.3 Representativeness

Representativeness is defined by the degree to which the data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition. Consideration of geological variability, contaminant concentration variability, collection and preparation variability, and analytical variability are selected variables that attempt to ensure representativeness.

Representativeness with respect to geological and sample collection and preparation variability has been addressed within the FSP. The methods and protocols used to select samples that are representative of a particular sampling site are outlined in the FSP. Collecting a sufficient number of samples of an environmental medium, properly chosen with respect to place and time, ensures representativeness. The precision of a representative set of samples reflects the degree of variability of the sampled medium, as well as the effectiveness of the sampling techniques and laboratory preparation.

Representativeness of contaminant concentration and analytical variability is ensured by the use of both appropriate sampling procedures and analytical methods. Sampling procedures include the collection of field quality control blanks, which are used to assess the potential for field contamination of environmental media. Selection of appropriate analytical methodologies and adherence to analytical requirements provides representative concentrations. Contaminant concentration and analytical variability are assessed and evaluated via data review and validation.

2.4.2.4 Completeness

Completeness is a measure of the amount of valid data obtained from the laboratory analyses in relation to the total amount of data collected. Completeness is typically expressed as a percentage and is determined using the following equation:

$$\%C = \frac{V}{T} \times 100$$

where %C = percent completeness
V = number of results determined to be valid
T = total number of results

Under ideal conditions, the completeness objective would be 100 percent; however, samples can be rendered unusable during shipping and preparation (e.g., bottles broken or extracts accidentally destroyed) or analysis (e.g., loss of instrument sensitivity, strong matrix effects). The calculated percent

completeness for all chemical analytical data collected during the sampling event is 99.3 percent (i.e., 21 chemical results out of a total of 3012 data points were qualified as unusable), indicating that the data completeness objective for the project was achieved.

Tables 2-1 and 2-2 contain a list of those sample results that were determined to be invalid and unusable via data validation. Sections 2.4.3.3 and 2.4.3.4 contain a summary of the data validation results and describe, in general, the rationale behind the rejection of these analytical results.

2.4.2.5 Field Quality Control Samples

The following field quality control (QC) samples were collected for the sampling efforts and analyzed in accordance with DQO requirements, as specified in the FSP:

- Field duplicates were obtained at a frequency of one per every 10 samples (10 percent per matrix). Field duplicates for soil samples are two separate samples collected from the same source. Aqueous sample duplicates are collected simultaneously. Duplicates assess the overall precision of the sampling and analysis program.

- Trip blanks of analyte-free water were generated by the laboratory, taken to the sampling site, and returned to the laboratory with the environmental samples to be analyzed for VOCs. Analytical results for trip blanks are used to determine the level of contamination associated with the transportation of environmental samples. One trip blank was collected per each cooler shipped to the laboratory and analyzed for VOCs.

- Rinsate blanks were obtained by pouring analyte-free water over sample collection equipment (e.g., backhoe bucket, etc.) after decontamination to assess the effectiveness of field decontamination procedures. Samples were obtained at a frequency of one per day per media per analysis.

- Field blanks consisted of source water samples used in steam cleaning and/or decontamination and were used to determine the level of contamination associated with the source water. Field blanks were obtained at a frequency of one per event per decontamination water source.

2.4.3 Data Validation

All samples were subjected to data validation. Data validation is an objective systematic process in which analytical data are reviewed to ascertain the validity of the reported results and to identify for the data user the possible limitation of these results. The data validation review evaluated environmental samples for data completeness, holding time compliance, calibration compliance, laboratory blank contamination,

surrogate spike recovery, matrix spike recovery, blank spike recovery, internal standard response, Inductively Coupled Plasma (ICP) interferences, serial dilution, sample quantitation, and detection limits. This section summarizes the various aspects of the data validation process.

2.4.3.1 General Data Validation Procedures

Validation of data generated for samples collected during the RFI field effort was completed in accordance with the procedures as outlined in Navy guidance (Sampling and Chemical Analysis Quality Assurance Requirements for the Navy Installation Restoration Program, NFESC 20.2-047B). Data validation was performed for all samples analyzed via the SW-846 methods. Data were validated in accordance with the EPA Region III Modifications to the Contract Laboratory Program National Functional Guidelines for Organic and Inorganic Data Review (EPA, September 1994 and EPA, April 1993).

The data completeness evaluation consisted of a review of the hardcopy data deliverables and the electronic data files received from the analytical laboratory. All hardcopy analytical results and electronic data were reviewed for accuracy.

An evaluation of holding time compliance was performed on all environmental samples.

Calibration standards were evaluated to assess compliance to the analytical method. An evaluation of the calibration standards aided in the elimination of false negatives. An assessment of calibration non-compliance also was used to qualify positive and nondetected results.

Evaluation of laboratory blank analyses aided in the elimination of false positive results. Laboratory artifacts and contaminants present in method blanks were used to establish action levels and were correlated to associated environmental samples. Positive results in environmental samples less than the established blank action level for an associated group of environmental samples were considered false positives.

The overall determination of data utility or reliability was based upon laboratory compliance with specified methods and adherence to quality control requirements. Noncompliances observed during the validation process typically resulted in the qualification of the associated analytical data. The qualifiers alert the data user to imprecise or estimated results and, in the worst case, unreliable and unusable data.

The net results of the validation process were summarized in sample delivery group-specific technical reports consisting of a memorandum, a section of qualified analytical results, and a supporting documentation section that provided the rationale for changes and/or qualification of the data. These memoranda provide a detailed explanation of the results of the data validation review (Appendix C).

2.4.3.2 Data Validation Qualifiers

As mentioned previously, the qualification of analytical data during the validation process (i.e., application of U, B, J, UJ, UL, L, K, UR, and R qualifiers) was conducted as required by the EPA Functional Guidelines. The attachment of the data qualifiers to analytical results signifies the occurrence of quality control noncompliances that were noted during the course of data validation. The various data qualifiers are defined as follows:

U - Indicates that the chemical was not detected at the numerical detection limit (sample-specific quantitation limit) noted. Nondetected results from the laboratory are reported in this manner.

B - This qualifier is added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.

L - Indicates that the chemical was detected; however, the associated numerical result is not a precise representation of the amount that is actually present in the sample. The laboratory-reported concentration is considered biased low.

K - Indicates that the chemical was detected; however, the associated numerical result is not a precise representation of the amount that is actually present in the sample. The laboratory-reported concentration is considered biased high.

UJ - Indicates that the chemical was not detected; however, the detection limit (sample-specific quantitation limit) is considered to be estimated based on problems encountered during laboratory analysis. The associated numerical detection limit is regarded as inaccurate or imprecise.

UL - Indicates that the chemical was not detected; however, the detection limit (sample-specific quantitation limit) is considered to be biased low based on problems encountered during laboratory analysis. The associated numerical detection limit is regarded as inaccurate or imprecise.

J - Indicates that the chemical was detected; however, the associated numerical result is not a precise representation of the amount that is actually present in the sample. The laboratory-reported concentration is considered to be an estimated value.

UR - Indicates that the chemical may or may not be present. The nondetected analytical result reported by the laboratory is considered to be unreliable and unusable. This qualifier is applied in cases of gross

technical deficiencies (i.e., holding times missed by a factor of two times the specified time limit, severe calibration noncompliances, and extremely low QC recoveries).

R - Indicates that the chemical may or may not be present. The positive analytical result reported by the laboratory is considered to be unreliable and unusable. This qualifier is applied in cases of gross technical deficiencies.

The preceding data qualifiers may be categorized as indicative of major or minor problems. Major problems are defined as issues that result in the rejection of data, qualified with UR and R data validation qualifiers. These data are considered invalid and are not used for risk assessment and decision making purposes. Minor problems are defined as issues resulting in the estimation of data, qualified with U, J, L, K, UL, and UJ data validation qualifiers. Estimated and directional bias-qualified analytical results are considered to be suitable for risk assessment and decision making purposes.

2.4.3.3 Data Validation Summary for Site 5 Data

A brief summary of the data validation results for the 2002 sampling effort for Site 5 is provided in this section. The percent completeness for Site 5 is 99.2 percent. A total of 1,660 data points were generated with 13 of these points rejected. All rejected analytical results are presented in Table 2-1. The results were rejected due to the percent difference between columns being greater than 100 percent.

Beryllium and acetone were identified as method blank contaminants in all Site 5 samples for the metals and VOC analyses, respectively. Lead and zinc were identified as method blank contaminants in two samples.

In general, analytical results for organic compounds were qualified as estimated because positive results were reported at concentrations less than the reporting limit.

It should be noted that none of the data at Site 5 for the May 2002 sampling event was qualified on the basis of MS/MSD noncompliance or field duplicate imprecision.

2.4.3.4 Data Validation Summary for Site 13 Data

A brief summary of the data validation results for the 2002 sampling effort for Site 13 is provided in this section. The percent completeness for Site 13 is 99.4 percent. A total of 1,352 data points were generated with 8 of these points rejected. All rejected analytical results are presented in Table 2-2. The results were rejected due to the percent difference between columns being greater than 100 percent.

Beryllium and zinc were identified as method blank contaminants in various Site 13 samples. Acetone and acetophenone were identified as method blank contaminants in all Site 13 samples. Methylene chloride was identified as a method blank contaminant in one sample

In general, analytical results for organic compounds were qualified as estimated UJ because of calibration noncompliance and qualified as J because of positive results being reported at concentrations less than the reporting limit.

It should be noted that none of the data at Site 13 for the May 2002 sampling event was qualified on the basis of MS/MSD noncompliance or field duplicate imprecision.

2.5 CHEMICAL FATE AND TRANSPORT ANALYSIS

Various aspects of contaminant fate and transport at NSWC-White Oak are discussed in this section. Properties that affect chemical migration are presented in Section 2.5.1. Section 2.5.2 presents a brief discussion of chemical persistence.

2.5.1 Chemical and Physical Properties

Various chemical and physical properties of all detected site contaminants are presented and discussed in this section. These parameters may be used to estimate the environmental behavior of site chemicals. Physical and chemical properties of the organic and inorganic chemicals found at NSWC-White Oak are presented in Table 2-3.

Literature values of the water solubility, octanol/water partition coefficient, organic carbon partition coefficient, vapor pressure, Henry's Law constant, bioconcentration factor, and specific gravity of site contaminants are presented, when available. A discussion of the environmental significance of each of these parameters follows.

2.5.1.1 Specific Gravity

Specific gravity is the ratio of the weight of a given volume of pure chemical at a specified temperature to the weight of the same volume of water at a given temperature. Its primary use is to determine whether a contaminant will have a tendency to float or sink in water if it is present as a pure compound or at very high concentrations. Contaminants with a specific gravity greater than 1 will tend to sink, whereas contaminants with a specific gravity less than 1 will tend to float. This parameter becomes important in discussions regarding the potential presence of free product or nonaqueous-phase liquids.

Of the detected chemicals at NSWC-White Oak, ketones and some monocyclic aromatics have specific gravities less than 1. The halogenated aliphatics, polycyclic aromatic hydrocarbons (PAHs), PCBs, phthalate esters, and pesticides have specific gravities greater than 1.

2.5.1.2 Vapor Pressure

Vapor pressure provides an indication of the rate at which a chemical volatilizes from both soil and water. It is of primary importance at environmental interfaces, such as surface soil/air and surface water/air. Volatilization is not as important when evaluating contaminated groundwater and subsurface soils that are not exposed to the atmosphere. Vapor pressures for ketones, monocyclic aromatics, halogenated aliphatics, and nitrogen-containing compounds are generally many times higher than vapor pressures for pesticides and PCBs. Chemicals with higher vapor pressures are expected to enter the atmosphere much more readily than chemicals with lower vapor pressures. Volatilization is a significant loss process for volatile organics in surface water or surface soil. Volatilization is not significant for inorganics.

2.5.1.3 Solubility

The rate at which a chemical is leached from a waste deposit by infiltrating precipitation is proportional to its water solubility. More soluble chemicals are more readily leached than less soluble chemicals. The water solubilities presented in Table 2-3 indicate that the VOCs (ketones, monocyclic aromatics, and halogenated aliphatics) and nitrogen-containing compounds are usually several orders of magnitude more water-soluble than pesticides and PCBs. The previous groundwater data collected during the OU1 investigation show that the various types of VOCs are the predominant contaminants.

The solubility of inorganics is strongly influenced by their valence state(s) and forms (hydroxides, oxides, carbonates, etc.). The solubility is also dependent on pH, Eh, and other ionic species in solution (the Debye-Huckel theory). The solubility products reported in the literature vary with the type of complex formed, but generally it can be noted that, for example, cadmium and copper complexes are more soluble than lead and nickel complexes.

2.5.1.4 Octanol/Water Partition Coefficient

The octanol/water partition coefficient (K_{ow}) is a measure of the equilibrium partitioning of chemicals between octanol and water. A linear relationship between the K_{ow} and the uptake of chemicals by fatty tissues of animal and human receptors (the bioconcentration factor) has been determined (Lyman et al., 1990). It is also useful in characterizing the sorption of compounds by organic soils where experimental values are not available. Pesticides and PCBs are several orders of magnitude more likely

to partition to fatty tissues than the more soluble VOCs. The K_{ow} is also used to estimate bioconcentration factors in aquatic organisms.

2.5.1.5 Organic Carbon Partition Coefficient

The organic carbon partition coefficient (K_{oc}) indicates the tendency of a chemical to bind to soil particles containing organic carbon. Chemicals with high K_{oc} values generally have low water solubilities and vice versa. This parameter may be used to infer the relative rates at which the more mobile chemicals (ketones, monocyclic aromatics, and halogenated aliphatics) are transported in groundwater. Pesticides, PAHs, and PCBs are relatively immobile in the soil and are preferentially bound to the soil. These compounds are not subject to groundwater transport to the extent that compounds with higher water solubilities are; however, these immobile chemicals are easily transported by erosional processes when they are present in surface soils.

2.5.1.6 Henry's Law Constant

Both the vapor pressure and the water solubility are of use in determining volatilization rates from surface water bodies and from groundwater. The ratio of these two parameters (the Henry's Law constant) is used to calculated the equilibrium chemical concentrations in the vapor (air) phase versus the liquid (water) phase for the dilute solutions commonly encountered in environmental settings. In general, chemicals having a Henry's Law constant of less than or equal to 1×10^{-5} atm-m^3/mole, such as pesticides and PCBs, should volatilize very little and be present only in minute amounts in the atmosphere or soil gas. For chemicals with a Henry's Law constant greater than 5×10^{-3} atm-m^3/mole, such as many of the halogenated aliphatics, volatilization and diffusion in soil gas could be significant.

2.5.1.7 Bioconcentration Factor

The bioconcentration factor (BCF) represents the ratio of aquatic-animal-tissue concentration to water concentration. The ratio is both contaminant- and species-specific. When site-specific values are not measured, literature values are used or the BCF is derived from the K_{ow}. Many of the pesticides and PCBs will bioconcentrate at levels 3 to 5 orders of magnitude greater than those concentrations found in the water, whereas VOCs and nitrogen-containing compounds are not as readily bioconcentrated.

2.5.1.8 Distribution Coefficient

The distribution coefficient (K_d) is a measure of the equilibrium distribution of a chemical or ion in soil/water systems. The distribution of organic chemicals is a function of both the K_{oc} and the amount of organic carbon in the soil. For ions (e.g., metals), K_d is the ratio of the concentration adsorbed on soil surfaces to the concentration in water. Distribution coefficients for metals vary over several orders of

magnitude because the K_d is dependent on the size and charge of the ion and the soil properties governing exchange sites on soil surfaces. Coulomb's Law predicts that the ion with the smallest hydrated radius and the largest charge will be preferentially accumulated over ions with larger radii and smaller charges. Soil and clay distribution coefficients for inorganics are shown in Table 2-3.

2.5.2 Contaminant Persistence / Fate and Transport

The persistence of various classes of chemicals is discussed in this section. Several transformation mechanisms affect chemical persistence, such as hydrolysis, biodegradation, photolysis, and oxidation/reduction reactions. The following general classes of contaminants detected at Sites 5 and 13 are discussed:

- Ketones
- Monocyclic aromatics
- Halogenated aliphatics
- PAHs
- Phthalate esters
- Pesticides
- PCBs
- Nitrogen-containing compounds
- Metals

2.5.2.1 Ketones

Ketones are highly volatile and soluble, and these two factors dominate the fate of these compounds in the environment. Ketones are not considered to be persistent in the environment, particularly in comparison to chemicals such as PCBs and pesticides. Hydrolysis is generally not a significant fate process for this class of chemicals, nor is bioconcentration significant based on these low K_{ow} values (Howard, 1990).

2.5.2.2 Monocyclic Aromatics

Monocyclic aromatic compounds such as benzene, toluene, chlorobenzene, and xylenes are not considered to be persistent in the environment, particularly in comparison to chemicals such as PCBs and pesticides. Monocyclic aromatics are subject to degradation via the action of both soil and aquatic microorganisms. The biodegradation of these compounds in the soil matrix is dependent on the abundance of microflora, macronutrient availability, soil reaction (pH), temperature, etc.

Although these compounds are amenable to microbial degradation, it is not anticipated that degradation will occur at an appreciable rate, although macronutrient availability is not known. In the event that these compounds discharge to surface water bodies, volatilization and biodegradation may occur relatively rapidly. For example, a reported first-order biodegradation rate constant for benzene is 0.11 day^{-1} in aquatic systems (Lyman et al., 1990). This corresponds to an aquatic half life of approximately 6 days. Other monocyclic aromatics are subject to similar degradation processes in aquatic environments (EPA, December 1982); however, chlorinated monocyclic aromatics such as chlorobenzene are not expected to be as susceptible to microbial degradation. For example, a reported first-order biodegradation rate constant for chlorobenzene is 0.0045 day^{-1} in aquatic systems (Lyman et al., 1990), which corresponds to an aquatic half-life of approximately 150 days.

Benzene in groundwater is significantly reduced by the action of aerobic bacteria. A biodegradation rate of 95 percent per day has been reported. The amount of benzene, toluene, and xylenes in the groundwater was reported to be directly proportional to the availability of dissolved oxygen.

Additional environmental degradation processes, such as hydrolysis and photolysis, are considered to be insignificant fate mechanisms for monocyclic aromatics in aquatic systems (EPA, December 1982). However, some monocyclic aromatics such as benzene and toluene have been shown to undergo clay-, mineral-, and soil-catalyzed oxidation (Dragun, 1988).

2.5.2.3 Halogenated Aliphatics

Halogenated aliphatic hydrocarbons such as tetrachloroethene and TCE are subject to abiotic dehydrohalogenation. This process is an elimination reaction that results in the formation of an ethene from a saturated halogenated compound. Therefore, the presence of dichloroethane in groundwater in association with ethanes may be a result of this process. Research indicates that microbial degradation of highly chlorinated ethanes is a relatively slow process. 1,1,1-Trichloroethane has been shown to break down to 1,1-dichloroethane and chloroethane (Smith and Dragun, 1984), with half-lives reported on the order of 6 to 8 months. Hydrolysis, photolysis, and oxidation are generally not considered to be significant fate processes for the chlorinated ethanes.

While TCE is reportedly susceptible to degradation, the primary end product is reportedly vinyl chloride, which degrades slowly. It does not appear that appreciable degradation of halogenated aliphatics occurs in aerobic aquatic systems (EPA, December 1982) or in unsaturated soils (Lyman et al., 1990).

Photolysis is not considered to be a relevant degradation mechanism for this class of compounds. Limited hydrolysis of saturated aliphatics (i.e., alkanes) may occur, but it does not appear to be a significant degradation mechanism for unsaturated species (i.e., alkenes) (EPA, December 1982).

Under certain conditions, volatilization is a significant fate process for these compounds. Volatilization is only significant at the air-soil or air-water interface. Adsorption should not be considered as an important fate for these types of compounds when compared to more hydrophobic compounds (PCBs for example).

2.5.2.4 Polycyclic Aromatic Hydrocarbons

Polycyclic aromatic hydrocarbons (PAHs) have very low solubilities, vapor pressures, and Henry's Law constants, and high K_{oc}s and K_{ow}s. The low-molecular-weight PAHs (e.g., acenaphthene, anthracene, fluorene, phenanthrene) may volatilize from surface waters, while the high-molecular-weight PAHs [e.g., benzo(a)pyrene, benzo(a)anthracene, chrysene, etc.] are less likely to volatilize. PAHs in soil are much more likely to bind to soil and be transported via mass transport mechanisms than to go into solution. PAHs are subject to degradation via aerobic bacteria but may be relatively persistent in the absence of microbial populations or macronutrients such as phosphorus and nitrogen.

Bioconcentration of PAHs in aquatic organisms is greater for the higher-molecular-weight compounds than the lower-molecular-weight compounds. PAHs can be bioaccumulated from water, sediments, or lower organisms in the food chain.

Landspreading applications have indicated that PAHs are highly amenable to microbial degradation in soil. The rate of degradation is influenced by temperature, pH, oxygen concentrations, initial chemical concentrations, and moisture. Photolysis, hydrolysis, and oxidation are not important fate processes for the degradation of PAHs in soil (ATSDR, 1997).

The most important fate processes of PAHs in water are photo-oxidation, chemical oxidation, and biodegradation. PAHs do not contain functional groups that are susceptible to hydrolytic action, and hydrolysis is considered to be an insignificant degradation mechanism. The rate of photodegradation is influenced by water depth, turbidity, and temperature. Benzo(a)pyrene, chrysene, fluorene, and pyrene are reported to be resistant to photodegradation. PAHs may also be oxidized by chlorination and ozonation and may be metabolized by microbes under oxygenated conditions (ATSDR, 1997).

2.5.2.5 Phthalate Esters

Phthalate esters are considered to be relatively persistent chemicals in the environment. Although numerous studies have demonstrated that phthalate esters undergo biodegradation, it appears that this is a slow process in both soils and surface waters. Certain microorganisms have been shown to excrete products that increase the solubility of phthalate esters and enhance their biodegradation (Gibbons and Alexander, 1989).

Biodegradation of bis(2-ethylhexyl)phthalate and other phthalates in water is an important fate mechanism, with a half-life of 2 to 3 weeks reported for bis(2-ethylhexyl)phthalate (Howard, 1989). Bioaccumulation is also a significant fate process. Hydrolysis of phthalate esters is very slow, with calculated half-lives of 3 years (dimethylphthalate) to 2,000 years (bis(2-ethylhexyl)phthalate) (EPA, December 1979). Similarly, photolysis and volatilization are considered to be insignificant degradation mechanisms (EPA, December 1979; Howard, 1989).

2.5.2.6 Pesticides

Whether pesticides are sprayed, dusted, or applied directly to the soil, the soil is the ultimate sink for these chemicals. Surface soil runoff may carry pesticides to adjacent surface water bodies. Bioconcentration of pesticides in the food chain is another important fate mechanism. Hydrolysis, oxidation, and photolysis are not generally important fate mechanisms for pesticides in soil or water. Hydrolysis half-lives for several pesticides are reported in periods of months to years (EPA, December 1979). Some of the more common pesticides from an historic perspective are discussed below.

- **4,4'-DDT and its metabolites** are considered to be persistent chemicals. They undergo extensive adsorption to soil and are not highly soluble. Biodegradation may occur under both aerobic and anaerobic conditions in the presence of certain soil microorganisms. Under aerobic conditions, 4,4' DDT may be transformed to DDE, while under anaerobic conditions, 4,4' DDD may result. These compounds are, however, somewhat volatile, with a reported half-life of 100 days for 4,4' DDT. These compounds are highly lipophilic and therefore readily bioaccumulate (ATSDR, 1997). 4,4' DDT is no longer in production in the United States.

- **Dieldrin** is an extremely persistent pesticide that is no longer registered for general use. In soil, dieldrin will persist for long periods of time (more than 7 years) and may slowly evaporate. It does not readily leach to groundwater. Once in surface waters (via runoff), dieldrin adsorbs strongly to sediments and bioconcentrates and slowly photodegrades. Biodegradation and hydrolysis are not significant (Howard, 1991).

- The use of **heptachlor** was restricted to underground termite control in 1983. Heptachlor epoxide is formed by the biological transformation of heptachlor in the environment. These compounds sorb strongly to soil. Heptachlor is subject to biodegradation (forming heptachlor epoxide, which is highly resistant to biodegradation) and hydrolysis. Bioconcentration of both compounds is significant, while volatilization and photolysis are very slow (Howard, 1991).

2.5.2.7 Polychlorinated Biphenyls

PCBs are considered to be very persistent organic chemicals. Biodegradation is the only process known to transform PCBs under environmental conditions, and only the lighter compounds are measurably biodegraded (EPA, December 1979). Although some microorganisms (e.g., *Phanaerochaete chrysosporium*) may biodegrade PCBs, such fungi may not exist in local soil. There is experimental evidence to suggest that heavier PCBs (five or more chlorines per molecule) can undergo photolytic degradation, but there are no data to suggest that this process occurs under environmental conditions (EPA, December 1979). Base-, acid-, and neutral-promoted hydrolysis are considered to be inconsequential degradation mechanisms for PCBs (EPA, December 1982).

2.5.2.8 Nitrogen-Containing Compounds

Several nitrogen-containing compounds, namely explosives such as tri- and di-dinitrotoluenes, RDX, HMX, were detected in various media at NSWC-White Oak. Nitrotoluenes, RDX, and HMX are classified as organic compounds.

Nitrogen-containing compounds such as 2,4-dinitrotoluene (2,4-DNT) may be subject to significant biodegradation in both soil and water. In soil, 2,4-DNT will be slightly mobile. Based on aqueous biodegradation tests, 2,4-DNT may biodegrade in both aerobic and anaerobic zones of soil. 2,4-DNT in water will not bioconcentrate significantly and will have a slight tendency to partition to suspended and sediment organic matter. Volatilization of 2,4-DNT from water will not be significant. Photolysis will probably be the most important removal process for 2,4-DNT in water. Aromatic nitro compounds are not susceptible to hydrolysis, and the concentration of 2,4-DNT did not change after 2 weeks incubation in sterile natural water (Howard, 1989).

2.5.2.9 Metals

Metals are highly persistent environmental contaminants. They do not biodegrade, photolyze, hydrolyze, etc. The major fate mechanisms for metals are adsorption to the soil matrix (as compared to being part of the soil structure) and bioaccumulation.

The mobility of metals is influenced primarily by their physical and chemical properties in combination with the physical and chemical characteristics of the soil matrix. Factors that assist in predicting the mobility of inorganic species are the soil/pore water pH, soil/pore water Eh, and cation exchange capacity. The mobility of metals generally increases with decreasing soil pH and cation exchange capacity.

2.6 HUMAN HEALTH RISK ASSESSMENT PROCEDURES

This section describes the general methods used to conduct the site-specific risk assessments for Sites 5 and 13.

The objective of this Human Health Risk Assessment (HHRA) is to determine whether concentrations of chemicals detected at the Sites 5 and 13 pose a significant threat to potential human receptors under current and/or future land use scenarios. The potential risks to human health at the sites are estimated based on the assumption that no actions will be taken to control chemical releases.

An HHRA consists of five components: (1) Data Evaluation; (2) Exposure Assessment; (3) Toxicity Assessment; (4) Risk Characterization, and (5) Uncertainty Analysis. Sections 2.6.1 through 2.6.5 below contain detailed discussions of the methodologies followed for each component of an HHRA.

In order to evaluate potential risks, three major requirements must be fulfilled: (1) contaminants with toxic characteristics must be found in environmental media and must be released by either natural processes or by human action; (2) potential exposure points must exist; and (3) human receptors must be present at the point of exposure. Risk is a function of both toxicity and exposure. If any one of the requirements listed above was absent for a specific site, the exposure route was regarded as incomplete and no potential risks were considered for human receptors.

2.6.1 Data Evaluation

Data evaluation, the first component of an HHRA, is a site-specific task involving the compilation and evaluation of analytical data. The main objective of data evaluation is to develop a media-specific list of potential contaminants of concern (PCOCs) that is used to quantitatively determine potential human health risks.

2.6.1.1 Quantitative vs. Qualitative Use of Analytical Data

The most current site data for soil (collected by TtNUS in May 2002) and data collected for the SSR (TtNUS, 1998) are used to evaluate risks for the Sites 5 and 13. Additional data collected by CH2MHill at Site 13 for the OU1 investigation are also included in this evaluation (CH2MHill, 2002).

All analytical data used in the quantitative estimation of potential risks were subjected to data validation. Only data of adequate quality, current and historical, were used in the quantitative risk assessment. A discussion of data validation protocol followed for data generated for the NSWC-White Oak is provided in

the Master Quality Assurance Project Plan (QAPP) (B&R Environmental, 1998). The analytical data employed in the risk assessment are provided in Appendix D.

2.6.1.2 PCOC Selection

The selection of PCOCs is a qualitative screening process limiting the number of chemicals that are quantitatively evaluated in an HHRA to those site-related constituents that dominate overall potential risks. Screening against EPA Region III Risk-Based Concentrations (RBCs) (EPA, April 2002) and background is employed to focus the risk assessment on appropriate chemicals and exposure routes. Details of the site-specific PCOC selection process are provided in risk assessments for each site.

In general, a chemical was selected as a PCOC and retained for further risk evaluation if the maximum detected concentration in a sampled medium exceeded the RBC, referred to as the PCOC screening level, and the chemical was determined to be present at concentrations above background. Frequency of detection was used to exclude chemicals when data sets of 20 samples or greater are available. Generally, a detection rate of 5 percent or less justified elimination of the chemical from further consideration provided that the concentrations detected were not representative of a "hot spot" area. Chemicals eliminated from further evaluation at this step were assumed to present minimal risks to potential human receptors.

2.6.1.2.1 PCOC Screening Level Development

The risk-based PCOC screening levels corresponded to a systemic Hazard Quotient (HQ) of 0.1 (for noncarcinogens) or a lifetime cancer risk of 1E-6 (for carcinogens). The RBCs were developed using protective default exposure scenarios suggested by EPA (EPA, March 1991) and the most currently available reference doses and cancer slope factors (EPA, September 2002).

Risk-based PCOC screening levels for soil ingestion and site-specific screening levels (SSL) for transfers from soil to air were used to select PCOCs for soil. Soil ingestion screening levels for residential land use were used to ensure that sensitive receptors, such as young children and future residents, are safeguarded in the PCOC selection process. PCOCs for soil were also identified using site-specific SSLs for transfers from soil to air, which have been developed using the Office of Solid Waste and Emergency Response (OSWER) soil screening guidance (EPA, May 1996). The SSLs were used to screen out chemicals detected at insignificant concentrations and to justify the elimination of the inhalation exposure pathway, which is comprised of the generation of fugitive dust and volatile emissions. OSWER SSLs for transfers from soil to groundwater were not used for PCOC selection but are presented to evaluate the potential for migration of contaminants from soil to groundwater. Chemicals with concentrations exceeding the SSLs may potentially migrate from the soil to groundwater in sufficient quantities to pose

concerns about groundwater quality. All potential receptors were assumed to be exposed to surface and subsurface soil simultaneously.

2.6.1.2.2 Lead as a PCOC

RBCs are not calculated for lead because EPA has not derived toxicity values for this constituent. However, guidance from both the Office of Prevention, Pesticides, and Toxic Substances (OPPTS) and OSWER recommends 400 mg/kg as the lowest screening level for lead-contaminated soil in a residential setting where children are frequently present (EPA, July 1994). Based on this recommendation, a value of 400 mg/kg was used as a screening level for soil at sites where a future residential scenario is considered to be a likely potential land use.

2.6.1.2.3 Essential Nutrients and Chemicals without Toxicity Criteria

The essential nutrients calcium, magnesium, potassium, and sodium are not identified as PCOCs because they are naturally abundant in environmental matrices and are only toxic at high doses. In addition, because of the lack of toxicity criteria, risk-based PCOC screening levels were not available for some chemicals. For these constituents [e.g., benzo(g,h,i)perylene, phenanthrene, endosulfan II, endrin ketone, and delta-BHC] surrogate chemicals (that have toxicity criteria) were used for screening purposes. For example, pyrene was used as the surrogate for benzo(g,h,i)perylene and phenanthrene, endosulfan was used as the surrogate for endosulfan II, endrin was used for endrin ketone, and alpha-BHC was used as the surrogate for delta-BHC.

2.6.1.2.4 Determination of Site-Related Chemicals

Metal constituents found at concentrations indicative of background levels were not considered to be site-related contaminants and were not retained as PCOCs. Site-specific background data (TtNUS, December 1998) were used to determine whether detected chemicals were present at naturally occurring levels. The Base-wide background concentrations were compared to constituent concentrations at each site by the Wilcoxon Rank Sum Test at the 80 percent confidence level. If the Wilcoxon test determined that the concentration of a constituent was significantly greater than background and the concentration was greater than its residential RBC, that metal was retained as a PCOC.

The selection of PCOCs for soil are presented in the site-specific risk assessments. A media-specific discussion of the specific criteria used for PCOC selection and the results of the PCOC selection process are provided in the site-specific risk assessments.

2.6.2 Exposure Assessment

This portion of the risk assessment defines and evaluates, quantitatively or qualitatively, the type and magnitude of human exposure to the chemicals present at or migrating from a site. The exposure assessment was designed to depict the physical setting of the site, identify potentially exposed populations and applicable exposure pathways, calculate concentrations of PCOCs to which receptors might be exposed, and estimate chemical intakes under the identified exposure scenarios.

Actual or potential exposures at NSWC-White Oak are based on the most likely pathways of contaminant release and transport, as well as human activity patterns. A complete exposure pathway has three components: a source of chemicals that can be released to the environment, a route of contaminant transport through an environmental medium, and an exposure or contact point for a human receptor. This compilation of likely exposure pathways and receptors is referred to as the Conceptual Site Model (CSM).

2.6.2.1 Conceptual Site Model

The development of a CSM is an essential component of the exposure assessment. The CSM graphically integrates information regarding the physical characteristics of the site, exposed populations, sources of contamination, and contaminant mobility (fate and transport) to identify potential exposure routes and receptors evaluated in the risk assessment. A well-defined CSM allows for a better understanding of the risks at a site and aids risk managers in the identification of the potential need for remediation. The CSM for all identified potential exposure pathways at Sites 5 and 13 is shown in Figure 2-2.

2.6.2.1.1 Exposure Setting

The exposure setting consists of a description of the physical characteristics (climate, meteorology, geology, groundwater hydrology, vegetation, and nearby surface water bodies) of a site, as well as the identification of potentially exposed populations at or near the site. Exposed populations are identified with respect to both current and future land uses.

2.6.2.1.2 Potential Exposure Pathways/Receptors

The course that a chemical takes from the source to the exposed individual is defined as the exposure pathway. The characterization of exposure factors is necessary to allow the evaluation of potentially complete exposure pathways in the risk assessment. This section defines the potential receptors for Sites 5 and 13 and provides details of the exposure pathways evaluated in the risk assessment.

Potential receptors at Sites 5 and 13 were assumed to be exposed to contaminants in soil directly by ingestion or dermal contact or indirectly by inhalation. Exposure via ingestion and dermal contact were quantitatively evaluated using the exposure factors presented in this section. Exposure via inhalation of vapors or fugitive dust was evaluated in a semi-qualitative manner by comparison of maximum site concentrations to SSLs for migration from soil to air.

The following potential receptors were evaluated under current and/or future land use at Sites 5 and 13.

- **Full-time employees who** may be exposed to PCOCs in soil while performing site inspections or daily duties.

- **Maintenance and utility workers** who may be exposed to PCOCs in soil while performing maintenance activities (e.g., mowing, landscaping, digging trenches), site inspections, or daily duties.

- **Construction workers** were evaluated for exposure to surface/subsurface soil assuming that potential future construction or excavation activities will occur at the sites.

- **Adolescent trespassers** from ages 7 to 16 years of age who may come in contact with PCOCs in soil. Small children (6 years or younger) were not included in this receptor group because they were assumed to be supervised by an adult.

- **Adult recreational users** who may use the site for recreational purposes in the future were considered possible receptors for these sites.

- Future **onsite residents** who were assumed to be exposed to PCOCs in soil on a daily basis. However, the future residential scenario is not considered to be likely at NSWC-White Oak.

- **Day care children** from 1 to 6 years of age were evaluated based on the assumption that a Day Care Center would be built in the sites in the future. It was anticipated that children older than age six are in school full time and their time at the day care center would be negligible.

2.6.2.2 CTE vs. RME

Traditionally, exposures evaluated in the HHRA were based on the concept of a Reasonable Maximum Exposure (RME) only, which is defined as " the maximum exposure that is reasonably expected to occur at a site" (EPA, December 1989). However, more recent risk assessment guidance (EPA, February 1992) recommends addressing an average case or Central Tendency Exposure (CTE). Therefore, an

evaluation of both the RME and the CTE scenarios were performed for each site. The CTE evaluation is presented in the Uncertainty Sections of the site-specific risk assessments. The same equations were used to estimate intakes under the CTE scenario; however, exposure input parameters were modified to reflect average case exposures. It should be noted that the available guidance (EPA, May 1993) concerning the evaluation of the CTE is limited and at times vague. Therefore, professional judgment was exercised when defining CTE conditions for a particular receptor at the site.

2.6.2.3 Exposure Point Concentrations

The exposure point concentration (EPC), which was calculated for PCOCs only, is a reasonable maximum estimate of the chemical concentration that is likely to be contacted over time and was used to calculate estimated exposure intakes. The 95 percent upper confidence limit (UCL), which is based on the distribution of a data set, is considered to be the best estimate of the exposure concentration for data sets with 10 or more samples (EPA, May 1992). The 95 percent UCL was used as the exposure concentration to assess RME and CTE risks (EPA, May 1993). For a data set with 10 or more samples with undefined distribution (both the normal and lognormal distributions fail the normality test), the data set was assumed to be log-normally distributed provided the 95 percent UCL did not exceed the maximum concentration. For data sets with less than 10 samples, the UCL was considered to be a poor estimate of the mean, and the exposure concentration was defined as the maximum detection and arithmetic mean (if less than maximum) for RME and CTE scenarios, respectively (EPA, May 1993).

Conventional statistical methods were used to determine the distribution of a particular data set. A number of statistical evaluations may be used to determine which, if either, of the distributions are exhibited by a given data set. As recommended by the EPA, the Shapiro and Wilk "W-test" (for sample sets $\leq$ 50) and the Shapiro-Francia "W-test" (for sample sets>50) were used to determine whether the data were normally or lognormally distributed (EPA, December 1992).

The null hypothesis (H_0) tested is that the population has a normal (or lognormal when the data is log-transformed) distribution. The alternate hypothesis (H_A) is that the population does not have a normal (or lognormal when the data is log-transformed) distribution. The equation for the W statistic is:

$$W = \left[\frac{b}{S_R\sqrt{n-1}}\right]^2$$

where

$$b = \sum_{i=1}^{k} a_i\left(x_{[n+1]} - x\right) = \sum_{i=1}^{k} b_i$$

where: S_R = standard deviation of the sample
n = sample size
a = coefficient dependent on sample size, n

and the coefficients a_i, a_2, a_3, .., a_k are defined in EPA's Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities (EPA, September 1992). Example calculations of the W-test are presented in Appendix E.

A "W" statistic (W_{calc}) was computed for each data set (or a log-transformed data set) and compared to a test statistic (W_{test}). The test statistic was determined at the 5 percent significance level (EPA 1992e). If $W_{calc} > W_{test}$, then the null hypothesis is not rejected (i.e., the data are assumed to be normally distributed or lognormally distributed if log-transformed data are tested). If $W_{calc} < W_{test}$, then the null hypothesis was rejected and the alternative hypothesis was accepted (i.e., the data are not assumed to be normally distributed or log-normally distributed if log transformed data are tested).

EPA (May 1992) defines how the UCL should be calculated. Sample and duplicate analytical results are averaged for statistical use. If the maximum concentration of a constituent occurred in a duplicate pair, the average of the duplicate pair was used as the maximum concentration in the calculation of the UCL and in risk assessment calculations. Nondetected results were utilized; in general, one-half the sample-specific detection limit was used for these analytical results. If the calculated 95 percent UCL exceeded the maximum detected concentration, the maximum is used as the exposure concentration in place of the UCL. Example calculations of the 95 percent UCL are presented in Appendix F.

2.6.2.4 Chemical Intake Estimation

The methodologies and techniques used to estimate exposure intakes are presented in this section. Intakes for the identified potential receptor groups were calculated using current EPA risk assessment guidance (EPA, December 1989 and EPA, February 1992) and presented in risk assessment spreadsheets presented in Appendix G.

Noncarcinogenic intakes were estimated using the concept of an average annual exposure. Carcinogenic intakes were calculated as an incremental lifetime exposure assuming a life expectancy of 70 years. Equations used to calculate estimated intakes are provided below. Assumptions regarding exposure are presented in Tables 2-5 and 2-6 for the RME and CTE scenarios, respectively

2.6.2.4.1 Incidental Ingestion of Soil

Direct physical contact with soil (and sediment) may result in the incidental ingestion of chemicals. Exposure associated with the oral route is estimated in the following manner (EPA, December 1989 and EPA, February 1992):

$$Intake_{si} = (C_{si})(IR_s)(FI)(EF)(ED)(CF) / (BW)(AT)$$

where:	$Intake_{si}$	=	intake of contaminant "i" from soil (mg/kg/day)
	C_{si}	=	concentration of contaminant "i" in soil (mg/kg)
	IR_s	=	ingestion rate (mg/day)
	FI	=	fraction ingested from contaminated source (dimensionless)
	EF	=	exposure frequency (days/yr)
	ED	=	exposure duration (yr)
	CF	=	conversion factor (1E-6 kg/mg)
	BW	=	body weight (kg)
	AT	=	averaging time (days); for noncarcinogens, AT = ED x 365 days/yr for carcinogens, AT = 70 yr x 365 days/yr

The fraction of soil ingested from the source was based on assumed human activity patterns.

2.6.2.4.2 Dermal Contact with Soil

Direct physical contact with soil (and sediment) may result in the dermal absorption of chemicals. Exposure associated with the dermal route is estimated in the following manner (EPA December 1989 and EPA, September 2001):

$$Intake_{si} = (C_{si})(SA)(AF)(ABS)(CF)(EF)(ED) / (BW)(AT)$$

where:	$Intake_{si}$	=	amount of chemical "i" absorbed during contact with soil(mg/kg/day)
	C_{si}	=	concentration of chemical "i" in soil (mg/kg)
	SA	=	skin surface area available for contact (cm^2/day)
	AF	=	skin adherence factor (mg/cm^2)
	ABS	=	absorption factor (dimensionless)
	CF	=	conversion factor (1E-6 kg/mg)
	EF	=	exposure frequency (days/yr)

ED	=	exposure duration (yr)
BW	=	body weight (kg)
AT	=	averaging time (days);
		for noncarcinogens, AT = ED x 365 days/yr
		for carcinogens, AT = 70 yr x 365 days/yr

The same exposure frequencies and durations used in the estimation of incidental ingestion intakes of soil/sediment were used to estimate exposure via dermal contact. Exposed surface areas of the body available for dermal contact were determined on a receptor-specific basis since they correspond with assumed human activities and clothing worn during exposure events. Current guidance (EPA, August 1997 and EPA, September 2001) was used to develop the following default assumptions concerning the amount of skin surface area available for contact for a receptor:

- For full time workers, maintenance/utility workers, and construction workers, the head, hands and forearms (3,300 cm^2) were assumed to be available for soil contact (EPA, September 2001).

- For adolescent trespassers, the forearms, lower legs, and hands (3,263 cm^2) were assumed to be available for surface water and/or sediment contact (EPA, August 1997).

- For adult recreational users, the arms, legs, hands, and feet (9,000 cm^2) were assumed to be available for soil contact (EPA, August 1997).

- For potential future adult residents, the head, hands, forearms, and lower legs (5,700 cm^2) were assumed to be available for soil contact.

- For future child residents and day care children, the head, hands, forearms, lower legs, and feet (2,800 cm^2) were assumed to be available for soil contact (EPA, September 2001).

Values of soil adherence factors and chemical-specific dermal absorption factors provided in RAGS Part E (EPA, 2001) were used to evaluate risks from exposure to soil. The following soil adherence factors were used for the RME and CTE exposure scenarios:

- Full time occupational workers and maintenance/utility workers – 0.2 mg/cm^2 for the RME and 0.02 mg/cm^2 for the CTE (Exhibit 3.5, EPA, September 2001).

- Construction workers – 0.3 mg/cm^2 for the RME and 0.1 mg/cm^2 for the CTE (Exhibit 3.3, EPA, September 2001).

- Adult Recreational Users – 0.08 mg/cm^2 for the RME and 0.01 mg/cm^2 for the CTE. This is based on the assumption of adults playing soccer (Exhibit 3.3, EPA, September 2001).

- Adolescent trespassers – 0.3 mg/cm^2 for the RME and 0.04 mg/cm^2 for the CTE. This is based on the assumption of teens playing in moist conditions (Exhibit 3.3, EPA, September 2001).

- Future adult residents – 0.07 mg/cm^2 for the RME and 0.01 mg/cm^2 for the CTE (Exhibit 3.5, EPA, September 2001).

- Future child residents and day care center children– 0.2 mg/cm^2 for the RME and 0.04 mg/cm^2 for the CTE (Exhibit 3.5, EPA, September 2001).

For the constituents identified as PCOCs in soil, the following dermal absorption factors were used (EPA, September 2001):

- PCBs – 0.14
- PAHs – 0.13
- SVOCs – 0.1
- Inorganics – 0.001. This is a conservative assumption because RAGS Part E does not provide absorption factors for metals other than arsenic and cadmium.

The same exposure frequencies, exposure durations, and body weights previously identified for ingestion of soil/sediment were used to characterize dermal contact with soil. Exposure parameters for the dermal absorption route are summarized in Tables 2-5 and 2-6.

2.6.3 Toxicity Assessment

The objective of the toxicity assessment was to identify the potential adverse health effects in exposed populations. Quantitative estimates of the relationship between the magnitude and type of exposures and the severity or probability of human health effects were defined for the identified PCOCs. Quantitative toxicity values determined during this component of the risk assessment were integrated with outputs of the exposure assessment to characterize the potential for the occurrence of adverse health effects for each receptor group.

The toxicity value used to evaluate noncarcinogenic health effects is the Reference Dose (RfD). The RfD is an estimate of the daily exposure level for the human population that is likely to be without appreciable

risk during a portion or all of a lifetime. It is based on a review of available animal and/or human toxicity data, with adjustments for various uncertainties associated with the data. Carcinogenic effects are quantified using the Cancer Slope Factor (CSF), which is a plausible upper-bound estimate of the probability of development of cancer per unit intake of chemical over a lifetime. It is based on available dose-response data from human and/or animal studies. The RfDs and CSFs for PCOCs identified at NSWC-White Oak are provided in Tables 2-7 and 2-8, respectively.

2.6.3.1 Toxicity Criteria for Oral and Inhalation Exposures

Oral and inhalation RfDs and CSFs used in the site-specific risk assessments for NSWC-White Oak were obtained from the following primary EPA literature sources:

- Integrated Risk Information System (IRIS) (EPA, September 2002)
- Annual Health Effects Assessment Summary Tables (HEAST) (EPA, July 1994)
- National Center for Environmental Assessment (NCEA) Superfund Health Risk Technical Support Center

Although RfDs and CSFs can be found in several toxicological sources, EPA's IRIS on-line database is the preferred source of toxicity values. This database is continuously updated and values presented have been verified by EPA RfD and Carcinogenic Risk Assessment Verification Endeavor (CRAVE) work groups. The most current EPA Region III RBC Table (EPA, April 2002) was also used as a source of toxicity criteria.

2.6.3.2 Toxicity Criteria for Dermal Exposure

RfDs and CSFs found in literature are typically expressed as administered (not absorbed) doses. Therefore, these values are considered to be inappropriate for estimating the risks associated with dermal routes of exposure. Oral dose-response parameters based on administered doses must be adjusted to absorbed doses before the comparison to estimated dermal exposure intakes is made. Because information on administered dermal doses is not always readily available, all oral dose-response parameters were adjusted to provide values for dermal contact.

Oral dose-response parameters were adjusted to an absorbed dose using chemical-specific absorption efficiencies published in current EPA guidance (EPA, September 2001) and the following equations:

$$RfD_{dermal} = (RfD_{oral})(ABS_{GI})$$

$$CSF_{dermal} = (CSF_{oral}) / (ABS_{GI})$$

where: ABS_{GI} = absorption efficiency in the gastrointestinal tract

Absorption efficiencies used in the risk assessment were obtained from the EPA's current dermal assessment guidance (EPA, September 2001).

2.6.3.3 Toxicity Criteria for Chromium

Toxicity criteria are available for two different forms of chromium, the trivalent state and the hexavalent state, the latter of which is considered to be more toxic. The screening of chromium concentrations in soil at Sites 5 and 13 was conducted assuming that 100 percent of the reported total chromium was hexavalent.

2.6.4 Risk Characterization

This section provides the methodologies used for the characterization of the potential human health risks associated with the potential exposure to PCOCs at NSWC-White Oak. Section 2.6.4.1 outlines the methods used to quantitatively estimate the type and magnitude of potential risks for human receptors.

2.6.4.1 Risk Estimation Methods

Quantitative estimates of risk were calculated using intake and toxicity values according to risk assessment methods outlined in current EPA guidance (EPA, December 1989). Lifetime cancer risks were expressed in the form of dimensionless probabilities, referred to as Incremental Lifetime Cancer Risks (ILCRs), which were derived using published CSFs. Noncarcinogenic risk estimates are presented in the form of Hazard Quotients (HQs) that are derived using published RfDs.

ILCR estimates were generated for each PCOC using estimated exposure intakes and published CSFs, as follows:

$$ILCR = (\text{Estimated Exposure Intake})(CSF)$$

If the above equation results in an ILCR greater than 0.01, the following equation is used:

$$ILCR = 1 - [\exp(-\text{Estimated Exposure Intake})(CSF)]$$

The ILCRs for all PCOCs in an exposure scenario were summed to give a cumulative ILCR. An ILCR of 1E-06 indicates that the exposed receptor has a one-in-one-million chance of developing cancer under the defined exposure scenario. Alternatively, such a risk may be interpreted as representing one additional case of cancer in an exposed population of one million persons.

Noncarcinogenic risks were assessed using the concept of HQs and Hazard Indices (HIs). The HQ for a PCOC is the ratio of the estimated intake to the RfD, as follows:

$$HQ = (\text{Estimated Exposure Intake}) / (RfD)$$

An HI was generated by summing the individual HQs for all of the PCOCs. It should be noted that HI is not a mathematical prediction of the severity of toxic effects and therefore is not a true "risk"; it is simply a numerical indicator of the possibility of the occurrence of noncarcinogenic (threshold) effects.

2.6.4.2 Comparison of Quantitative Risk Estimates to Benchmarks

In order to interpret the quantitative risks and to aid risk managers in determining the need for remediation at a site, quantitative risk estimates were compared to typical benchmarks. The EPA has defined the range of 1E-4 to 1E-6 as the ILCR "target range" for most hazardous waste facilities addressed under CERCLA. Cumulative ILCRs greater than 1E-4 generally will indicate that some degree of remediation is required, while ILCRs below 1E-6 normally will not result in remedial efforts. Whenever ILCRs fall between 1E-4 and 1E-6, decisions for remediation are made on a case-specific basis. Individual chemicals contributing significantly to risks above the target range were considered to be chemicals of concern.

An HI exceeding unity (1.0) indicated that there may be potential noncarcinogenic health risks associated with exposure. If an HI exceeded unity, target organ effects from individual PCOCs contributing to the risk were considered. Only those chemicals that impact the same target organ(s) or exhibit similar critical effect(s) were regarded as truly additive. Thus, PCOCs contributing to an HI greater than 1.0 on the basis of a single target organ/effect were considered to be chemicals of concern.

Risk characterizations for Sites 5 and 13 are presented in the site-specific risks assessments, Sections 4.0 and 5.0, respectively.

2.6.5 Uncertainty Analysis

There is uncertainty associated with all aspects of an HHRA. A summary of the uncertainties, including a discussion of how they may affect the results of the risk assessment, is provided in this section. Uncertainties for each site are provided in the site-specific risk assessments, Sections 4.0 and 5.0.

Uncertainty in the selection of PCOCs is related to the current status of the predictive databases, the grouping of samples, and the procedures used to include or exclude constituents as PCOCs. Uncertainty associated with the exposure assessment includes the values used as input variables for a given intake route/scenario, the assumptions made to determine exposure point concentrations, and the predictions regarding future land use and population characteristics. Uncertainty in the toxicity assessment includes the quality of the existing toxicity data needed to support dose-response relationships and the weight-of-evidence used for determining the carcinogenicity of a PCOC. Uncertainty in risk characterization includes uncertainty from exposure to multiple chemicals and the cumulative uncertainty from combining conservative assumptions made in earlier activities.

While there are various sources of uncertainty, as described above, the direction of uncertainty can be influenced by the assumptions made throughout the risk assessment, including selection of PCOCs and selection of values for dose-response relationships. Throughout the entire risk assessment, assumptions that considered safety factors were made so that the final calculated risks were overestimated.

Generally, risk assessments carry two types of uncertainty -- measurement and informational uncertainty. Measurement uncertainty refers to the usual variance that accompanies scientific measurements. For example, this type of uncertainty is associated with analytical data collected for each site. The risk assessment reflects the accumulated variances of the individual values used.

Informational uncertainty stems from inadequate availability of information needed to complete the toxicity and exposure assessments. Often, this gap is significant, such as the absence of information on the effects of human exposure to low doses of a chemical, on the biological mechanism of action of a chemical, or the behavior of a chemical in soil.

Once the risk assessment was complete, the results were reviewed and evaluated to identify the type and magnitude of uncertainty involved. Reliance on results from a risk assessment without consideration of uncertainties, limitations, and assumptions inherent in the process can be misleading. For example, to account for uncertainties in the development of exposure assumptions, conservative estimates were made to ensure that the particular assumptions made were protective of sensitive subpopulations or the maximum exposed individuals. If a number of conservative assumptions were combined in an exposure model, the resulting calculations could have propagated the uncertainties associated with those

assumptions thereby producing a much larger uncertainty for the final results. This uncertainty is biased toward overpredicting both carcinogenic and noncarcinogenic risks. Thus, both the results of the risk assessment and the uncertainties associated with those results must be considered when making risk management decisions.

This interpretation is especially relevant when the risks exceed the point-of-departure for defining "acceptable" risk. For example, when risks calculated using a high degree of uncertainty are below an "acceptable" risk level (i.e., 1E-6), the interpretation of no significant risk is typically straightforward. However, when risks calculated using a high degree of uncertainty are above an "acceptable" risk level (i.e., 1E-4), a conclusion can be difficult unless uncertainty is considered.

2.6.5.1 Uncertainty in Selection of PCOCs

A minor amount of uncertainty associated with the selection of PCOCs that may impact the numerical risk estimates. The most significant issues related to uncertainty in PCOC selection for NSWC-White Oak are (1) the inclusion of chemicals potentially attributable to background and (2) the screening levels used. A brief discussion of each of these issues is provided in the remainder of this section.

2.6.5.2 Chemicals Potentially Attributable to Background

Inorganic constituents in soil were eliminated or included as PCOCs using the Wilcoxon Rank Sum Test at 80-percent confidence. Use of the 80-percent confidence level is more conservative than use of the 95-percent level. With a null hypothesis of background samples being part of the same population as the sample population, the probability of retaining compounds that should be eliminated was increased. Consequently, more constituents were likely to be included in the list of PCOCs. Therefore, the use of the 80-percent confidence level could have lead to the overestimation of potential risks associated with metals. The uncertainty associated with the statistical background tests is further discussed in the site-specific risk assessments.

2.6.5.3 PCOC Screening Levels

The use of predetermined screening values based on conservative land use scenarios (i.e., residential land use for soil and ingestion/inhalation for groundwater) in combination with the use of risk-based screening values corresponding to a 1E-6 ILCR and a 0.1 HI helped ensure that the significant contributors to risk from a site were evaluated. The elimination of chemicals that are present at concentrations that correspond to a less than 1E-6 ILCR and less than 0.1 HI should not have affected the final conclusions of the risk assessment because these chemicals were not expected to cause a potential health concern.

2.6.5.4 Uncertainty in the Exposure Assessment

Uncertainty in the exposure assessment arises because of the methods used to calculate exposure point concentrations, the determination of land use conditions, the selection of receptors and scenarios, and the selection of exposure parameters. Each of these is discussed below.

2.6.5.4.1 Land Use

The current use and planned future use of the sites at NSWC-White Oak have been well established thereby reducing the uncertainty associated with land use assumptions. Land use at the site is currently limited and is expected to be limited in the future. It is possible that the sites could be developed for commercial/industrial uses in the future, but residential development is unlikely to occur. Therefore, the elevated risks presented for future residents are not likely to occur. This exposure scenario is primarily evaluated for informational purposes.

2.6.5.4.2 Exposure Point Concentrations (EPCs)

A significant amount of uncertainty is associated with the values used as EPCs to quantify potential risks. Maximum concentrations were used as EPCs for some constituents because the calculated UCLs exceeded the maximum concentrations. As a result of using the maximum concentration, the estimations of potential risk for the RME scenario were most likely overstated because it is unlikely that potential receptors would be exposed to the maximum concentration over the entire exposure period.

The distribution of some constituents identified as PCOCs could not be defined because the data were neither normally nor lognormally distributed. In this case, the distribution of the data was assumed to be lognormal and the 95 percent UCL of the lognormal distribution was used to estimate potential risks. The use of an assumed distribution produced uncertainty in EPC values for groundwater and risks calculated from these EPCs. In addition, the direction of the uncertainty could not be determined, (i.e., whether it was more or less conservative in regard to the calculated risks).

2.6.5.4.3 Exposure Routes and Receptor Identification

An attempt was made to simplify the various receptor groups and exposure routes of potential concern in this report. However, the uncertainty associated with this approach was minimal because exposure routes and potential receptors are considered to be well-defined, based on the limited land use observed at the site. In addition, exposure routes eliminated from further evaluation were excluded only after a qualitative evaluation of potential exposure.

2.6.5.4.4 Exposure Parameters

Each exposure factor (for RME and CTE scenarios) selected for use in the risk assessment had some associated uncertainty. Generally, exposure factors were based on surveys of physiological and lifestyle profiles across the United States. The attributes and activities studied in these surveys generally had a broad distribution. To avoid underestimation of exposure, the EPA guidelines on the RME receptor were used, which generally consist of the 95th percentile for most parameters. Therefore, the selected values for the RME receptor represented the upper bound of the observed or expected habits of the majority of the population.

Generally, the uncertainty was assessed quantitatively for a number of assumptions made in determining factors for calculating exposures and intakes. Many of these parameters were determined from statistical analyses on human population characteristics. Often the database used to summarize a particular exposure parameter (i.e., body weight) was quite large. Consequently, the values chosen for such variables in the RME scenario had low uncertainty. For many parameters for which limited information exists (i.e., dermal absorption of organic chemicals from soil), there was greater uncertainty. However, there are often sufficient data to estimate values for these parameters.

Many of the quantities used to calculate exposures and risks in this report were selected from a distribution of possible values. For the RME scenario, the value representing the 95th percentile was generally selected for each parameter to ensure that the assessment bounded the actual risks from a postulated exposure. This RME risk estimate was used in risk management decisions but is limited in that it did not indicate what a more average or typical exposure might have been, or what risk range might be expected for individuals in the exposed population.

To address these issues, the EPA (February 1992) suggested the use of the CTE receptor whose intake variables are set at approximately the 50th percentile of the distribution. The risks for this receptor seek to incorporate the range of uncertainty associated with various intake assumptions. Exposure parameters for the CTE scenario are presented in Table 2-6. Some of the parameters were estimated using professional judgment, although EPA provides minimal guidance for the CTE evaluation (EPA, May 1993).

Results of the CTE evaluation for each site are provided in the site-specific risk assessments.

2.6.5.5 Uncertainty in the Toxicological Evaluation

Uncertainties associated with the toxicity assessment (determination of RfDs and CSFs and use of available criteria) are presented in this section.

2.6.5.5.1 Derivation of Toxicity Criteria

Uncertainty in the toxicity assessment was associated with hazard assessment and dose-response evaluations for the PCOCs. The hazard assessment deals with characterizing the nature and strength of the evidence of causation, or the likelihood that a chemical that induces adverse effects in animals will also induce adverse effects in humans. Hazard assessment of carcinogenicity was evaluated as a weight-of-evidence determination, using the EPA methods. Positive animal cancer test data suggest that humans contain tissue(s) that may also manifest a carcinogenic response; however, the animal data cannot necessarily be used to predict the target tissue in humans. In the hazard assessment of noncancer effects, however, positive animal data suggest the nature of the effects (i.e., the target tissues and type of effects) anticipated in humans.

Uncertainty in hazard assessment arose from the nature and quality of the animal and human data. Uncertainty was reduced when similar effects were observed across species, strain, sex, and exposure route; when the magnitude of the response was clearly dose-related; when pharmacokinetic data indicated a similar fate in humans and animals; when postulated mechanisms of toxicity were similar for humans and animals; and when the chemical of concern was structurally similar to other chemicals for which the toxicity was more completely characterized.

Uncertainty in the dose-response evaluation included the determination of a CSF for the carcinogenic assessment and derivation of an RfD for the noncarcinogenic assessment. Uncertainty is introduced from interspecies (animal to human) extrapolation, which, in the absence of quantitative pharmacokinetic or mechanistic data, was usually based on consideration of interspecies differences in basal metabolic rate. Uncertainty also resulted from intraspecies variation. Most toxicity experiments are performed with animals that are very similar in age and genotype so that intragroup biological variation is minimal, but the human population of concern may reflect a great deal of heterogeneity including unusual sensitivity or tolerance to the PCOC. Even toxicity data from human occupational exposure reflect a bias because only those individuals sufficiently healthy to attend work regularly (the "healthy worker effect") and those not unusually sensitive to the chemical are likely to be occupationally exposed. Finally, uncertainty arose from the quality of the key study from which the quantitative estimate was derived and from the database. For cancer effects, the uncertainty associated with dose-response factors was mitigated by assuming the 95 percent upper bound for the slope factor. Another source of uncertainty in the carcinogenic assessment was the method by which data from high doses in animal studies were extrapolated to the dose range expected for environmentally exposed humans. The linearized multistage model, which is used in nearly all quantitative estimations of human risk from animal data, is based on a nonthreshold assumption of carcinogenesis. There is evidence to suggest, however, that epigenetic carcinogens, as well as many genotoxic carcinogens, have a threshold below which they are noncarcinogenic; therefore,

the use of the linearized multistage model was conservative for chemicals that exhibit a threshold for carcinogenicity.

For noncancer effects, additional uncertainty factors may have been applied in the derivation of the RfD or RfC to mitigate poor quality of the key study or gaps in the database. Additional uncertainty for noncancer effects arose from the use of an effect level in the estimation of an RfD because this estimation was predicated on the assumption of a threshold below which adverse effects are not expected. Therefore, an uncertainty factor was usually applied to estimate a no-effect level. Additional uncertainty arose in estimation of an RfD or RfC for chronic exposure from less-than-chronic data. Unless empirical data indicated that effects did not worsen with increasing duration of exposure, an additional uncertainty factor was applied to the no-effect level in the less-than-chronic study. Uncertainty in the derivation of RfDs was mitigated by the use of uncertainty and modifying factors that normally ranged between 3 and 10. The resulting combination of uncertainty and modifying factors may have reached 1,000 or more.

The derivation of dermal RfDs and CSFs from oral values may have caused uncertainty. This is particularly the case when no gastrointestinal absorption rates were available in the literature or when only qualitative statements regarding absorption were available.

2.6.6 Uncertainty in the Risk Characterization

Uncertainty in risk characterization results primarily from assumptions made regarding additivity of effects from exposure to multiple PCOCs from various exposure routes. High uncertainty exists when summing cancer risks for several substances across different exposure pathways. Summing cancer risks assumed that each substance had a similar effect and/or mode of action. Often compounds affect different organs, have different mechanisms of action, and differ in their fate in the body, so additivity may not have been an appropriate assumption. However, the assumption of additivity was made to provide a conservative estimate of risk.

Finally, the risk characterization did not consider antagonistic or synergistic effects. Little or no information was available to determine the potential for antagonism or synergism for the PCOCs. Therefore, this uncertainty cannot be discussed for its impact on the risk assessment because it may either have underestimated or overestimated potential human health risk.

2.7 BASEWIDE ECOLOGICAL RISK ASSESSMENT

A phased Ecological Risk Assessment (ERA) has been conducted at the former NSWC-White Oak to characterize the potential risks to ecological receptors from site-related chemicals at Site 3. A Basewide

Screening-Level Ecological Risk Assessment (SERA) (TtNUS, December 1999) was first completed for all sites at the former NSWC-White Oak. Contaminant concentrations detected in sediment samples from Westfarm Branch were compared to conservative ecological screening criteria during the SERA to determine ecological contaminants of potential concern (COPCs). The SERA, consists of the first two of eight steps required by EPA guidance (EPA, June 1997 and April 1998) and Navy Policy for conducting Ecological Risk Assessments (ERAs). The retained COPCs were further evaluated in Step 3A of the ERA process during the development of the Work Plan for the Basewide ERA (TtNUS, July 2000). The Work Plan was developed as part of Steps 3b through 5 of the ERA process and consisted of a sampling and analysis program to collect site-specific toxicity and bioaccumulation data. This information was collected to evaluate site-specific risks to the ecological receptors and to develop chemical concentrations in the soil and sediment that are not expected to pose an unacceptable risk to the receptors. The sampling program was completed in August 2000. The results of the sampling effort and the final evaluation of the COPCs are summarized in the Baseline ERA (BERA) (TtNUS, March 2001), and constitute Steps 6 and 7 of the ERA process. In summary, the BERA established risk-based levels for several chemicals in the surface soil (Table 7-1 in TtNUS, March 2001).

At Site 5, one surface soil sample was collected for toxicity testing (14-day earthworm test) during the BERA because of elevated levels of PAHs in that sample. The sample was toxic versus the control sample, but still had a high mean survival of 87.5 percent. The surficial soil from Site 5 was removed as part of a remedial action for the site, so the soil from the location of the toxicity test is not longer present. No other surface-soil samples from Site 5 had chemical concentrations that exceeded the risk-based levels developed during the BERA (TtNUS, March 2001) so risks to ecological receptors at Site 5 are expected to be negligible.

No samples were collected from Site 13 for toxicity testing during the BERA (TtNUS, March 2001). However, based on the results from the three surface soil samples collected at the site, all chemical concentrations were below the risk-based levels developed during the BERA (TtNUS, March 2001) so risks to ecological receptors at Site 13 are expected to be negligible.

Add this discussion to summary & conclusions. And put in Ex. Summary.

TABLE 2-1

SUMMARY OF REJECTED RESULTS
SITE 5
NSWC WHITE OAK, SILVER SPRING, MARYLAND

Sample	Compound
05TP01SB0507	4,4'-DDT
05TP01WS0204	4,4'-DDD
	4/4'-DDT
	Endrin
	Endrin Alydehyde
05TP10SB0506	Endrin
	4,4'-DDD
05TP11SB0203	Endrin
	4,4'-DDD
05TP12WS0204	Endrin
	Endosulfan II
	Endosulfan Sulfate
	4,4'-DDT

TABLE 2-2

SUMMARY OF REJECTED RESULTS
SITE 5
NSWC WHITE OAK, SILVER SPRING, MARYLAND

Sample	Compound
13TP05WS0103	4,4'-DDT
	Endosulfan II
	Endrin
FD05160201	4,4'-DDD
	4,4'-DDT
	Endosulfan II
	Endrin
	Endrin Aldehyde

TABLE 2-3

ENVIRONMENTAL FATE AND TRANSPORT PARAMETERS FOR ORGANIC CHEMICALS
SITES 5 AND 13
NSWC WHITE OAK, SILVER SPRING, MARYLAND
PAGE 1 OF 2

Chemical	Specific Gravity (@ 20/4°C)(2)	Vapor Pressure (mm Hg @ 20°C)(2)	Solubility (mg/L @ 20°C)(2)	Octanol/Water Partition Coefficient(2)	Organic Carbon Partition Coefficient(4)	Henry's Law Constant (atm-m3/mole)(2)	Bioconcentration Factor (mg/L/mg/kg)(4)	Mobility Index log((solubility*VP)/K_{oc})
KETONES								
2-Butanone	0.8054	1.0E+2 (25°C)	2.75E+05	1.82E+00	4.44E+0(9)	4.66E-5 (25°C)	9.3E-1(6)	6.79E+00
2-Hexanone	0.8113 (20°C)	1.16E+1 (25°C)	1.64E+04	2.40E+01	1.35E+02	9.3E-5 (25°C)	7.00E+00	3.15E+00
Acetone	0.7899	2.66E+2 (25°C)	Miscible	5.75E-01	7.08E+03 (10)	4.276E-5 (25°C)	3.81E-1(6)	NA
Acetophenone	1.033	4.40E-01	6.13E+03	3.80E+01	2.14E+01	1.07E-5 (25°C)	1.20E+01	2.10E+00
MONOCYCLIC AROMATICS								
1,2-Dichlorobenzene	1.3059	1.36E+00	1.56E+02	2.40E+03	6.17E+02	1.50E-03	90 - 560	-4.64E-01
1,4-Dichlorobenzene	1.2475	1.74E+00	7.60E+01	2.75E+03	6.17E+02	2.70E-03	60 - 720	-4.64E-01
Toluene	0.8669	2.8E+1 (25°C)	5.15E+02	4.90E+02	1.82E+02 (10)	5.92E-3 (25°C)	1.48E+02	1.90E+00
Xylenes (Total)	0.86104-0.8801	1E+1 (27.3-32.1°C)	1.6E+2-1.75E+2(5)	5.89E+2-1.58E+3	3.63E+02-4.07E+02(10)	4.184E-3-6.662E-3 (25°C	7.5E+1-1.59E+2(6)	6.44E-01-6.33E-01
HALOGENATED ALIPHATICS								
1,1,2,2-Tetrachloroethane	1.60 (15/4°C)	6.50E+01	2.77E+02	2.45E+02	9.33E+01	3.45E-04	3.90E+01	2.29E+00
Chloromethane	0.9159	3.80E+03	6.36E+03	8.13E+00	4.30E+00	8.82E-3 (24.8°C)	3.20E+00	6.75E+00
Tetrachloroethene	1.6227	1.9E+1 (25°C)	1.5E+2 (25°C)	3.39E+02	1.55E+02 (10)	2.685E-2 (25°C)	2.52E+02	1.26E+00
Trichloroethene	1.4624	7.10E+01	1.10E+03	5.13E+02	1.66E+02	1.03E-02	9.70E+01	2.67E+00
Trichlorofluoromethane	1.494	8.03E+02	1.10E+03	3.39E+02	1.58E+02	2.39E+00	4.70E+01	3.75E+00
MISCELLANEOUS VOLATILE ORGANICS								
Methyl Acetate	0.9342	2.16E+02	2.44E+05	3.00E+01	1.11E+01	1.02E-04	8.00E-01	6.24E+00
POLYNUCLEAR AROMATIC HYDROCARBONS (PAHs)								
2-Methylnaphthalene	1.0058	1E+1 (105°C)	2.6E+1 (25°C)	7.24E+03	7.27E+2 (9)	4.99E-4 (25°C)	5.1E+2 (6)	-4.47E-01
Acenaphthene	1.07	5.00E-03	4.24E+02	8.32E+03	7.08E+03	1.55E-04	1.10E+03	-3.52E+00
Anthracene	1.283 (25/4°C)	1.95E-4 (25°C)	1.29E+0 (25°C)	2.82E+04	2.95E+04 (10)	8.6E-5 (25°C)	4.70E+03	-8.07E+00
Benzo(a)anthracene	1.274	5.00E-09	1E-2 (24°C)	4.07E+05	3.98E+05 (10)	6.60E-07	5.30E+04	-1.59E+01
Benzo(a)pyrene	1.351	5.00E-09	3.8E-3 (25°C)	9.55E+05	1.02E+06 (10)	4.9E-7 (25°C)	1.40E+05	-1.67E+01
Benzo(b)fluoranthene	NA	5.00E-07	1.2E-3 (25°C)	3.72E+06	1.23E+06 (10)	1.20E-05	1.40E+05	-1.53E+01
Benzo(g,h,i)perylene	1.35	1.00E-10	2.6E-4 (25°C)	1.70E+07	1.60E+06	1.4E-7 (25°C)	3.50E+05	-1.98E+01
Benzo(k)fluoranthene	NA	9.59E-11	5.5E-4 (25°C)	6.92E+06	1.23E+06 (10)	1.04E-03	1.40E+05	-1.94E+01
Carbazole	1.1	1.37E-06	7.48E+00	3.89E+03	3.39E+03	1.53E-08	5.01E+02	-8.52E+00
Chrysene	1.274 (20°C)	6.3E-9 (25°C)	6E-3 (25°C)	4.07E+05	3.98E+05 (10)	1.05E-6 (25°C)	5.30E+04	-1.60E+01
Dibenzo(a,h)anthracene	1.282	1.00E-10	5E-4 (25°C)	9.33E+05	3.80E+06 (10)	7.3E-8 (25°C)	6.90E+05	-1.99E+01
Fluoranthene	1.252	5.0E-6 (25°C)	2.65E-1 (25°C)	2.14E+05	1.07E+05 (10)	6.5E-6 (25°C)	1.20E+04	-1.09E+01
Fluorene	1.202	1.00E+01	1.98E+00	1.62E+04	1.38E+04	6.36E-05	3.80E+03	-2.84E+00
Indeno(1,2,3-cd)pyrene	NA	1E-10 (25°C)	6.20E-02	4.57E+07	3.47E+06 (10)	6.95E-8 (25°C)	3.50E+05	-1.77E+01
Naphthalene	1.162	8.2E-2 (25°C)	3E+1 (25°C)	2.34E+03	2.00E+03 (10)	4.83E-4 (25°C)	4.20E+02	-2.91E+00
Phenanthrene	0.980 (4°C)	1E+0 (118.2°C)	8.16E-1 (21°C)	2.88E+04	1.40E+04	3.93E-5 (25°C)	4.70E+03	-4.23E+00
Pyrene	1.271 (23/4°C)	2.5E+0 (200°C)	1.6E-1 (26°C)	1.51E+05	1.05E+05 (10)	5.1E-6 (25°C)	1.20E+04	-5.42E+00
PHTHALATE ESTERS								
Bis(2-ethylhexyl)phthalate	0.99 (20/20°C)	1.2E+0 (200°C)	4E-1 (25°C)	2.00E+05	1.51E+07 (10)	3.00E-07	2.30E+08	-7.50E+00
Diethylphthalate	1.1175	5E-2 (70°C)	1.08E+3 (25°C)	9.12E+02	2.88E+02 (10)	8.46E-07	1.07E+02	-7.27E-01
Di-n-butylphthalate	1.047 (20/20°C)	1E-1 (115°C)	4E+2 (25°C)	1.58E+05	3.39E+04 (10)	2.8E-7 (25°C)	4.70E+04	-2.93E+00
PESTICIDES								
4,4'-DDD	1.476	1.0E-06 (30°C)	1.6E-1 (24°C)	9.77E+05	1.00E+06 (10)	2.16E-05	1.80E+05	-1.28E+01
4,4'-DDE	NA	6.50E-06	4.00E-02	4.90E+05	4.47E+06 (10)	2.34E-05	8.90E+05	-1.32E+01
4,4'-DDT	1.5 (15/4°C)	1.50E-07	3.1E-3 (25°C)	1.55E+06	2.63E+06 (10)	3.89E-5 (25°C)	8.00E+06	-1.58E+01
alpha-Chlordane (11)	1.61 (25°C)	1E-5 (25°C)	5.60E-02	6.03E+02	1.20E+05	4.79E-05 (25°C)	4.00E+04	-1.13E+01
Dieldrin	1.75	1.8E-7 (25°C)	1.86E-01	1.23E+04	2.14E+04 (10)	5.84E-5 (25°C)	7.10E+02	-1.18E+01
Endosulfan II	1.745 (20/20°C)	2.40E-5 (25°C)	5.1E-01(3)	1.26E+04(3)	2.04E+03(3)	1.12E-05(3)	2.9E+02(5)	-8.22E+00
Endrin ketone	NA	NA	NA	NA	NA	NA	NA	NA
gamma-Chlordane (11)	1.61 (25°C)	1E-5 (25°C)	5.60E-02	6.03E+02	1.20E+05	4.79E-05 (25°C)	4.00E+04	-1.13E+01
Heptachlor	1.57 (9°C)	3E-4 (25°C)	5.6E-2 (25°C)	2.51E+04	1.41E+06 (10)	1.48E-03	4.40E+03	-1.09E+01
Heptachlor epoxide	NA	3.00E-04	3.5E-1(15°C)	5.00E+00	8.32E+04	3.90E-04	7.50E+03	-8.90E+00
PCBs								
Aroclor-1260	1.58 (25°C)(4)	4.05E-5(4)	2.7E-3(4)	1.4E+7(4)	6.70E+06	7.4E-1(4)	1.30E+06	-1.38E+01

TABLE 2-3

ENVIRONMENTAL FATE AND TRANSPORT PARAMETERS FOR ORGANIC CHEMICALS
SITES 5 AND 13
NSWC WHITE OAK, SILVER SPRING, MARYLAND

1 NA - Not Available
2 EPA, September 1992, Handbook of RCRA Groundwater Monitoring Constituents: Chemical and Physical Properties.
3 Lyman et al., 1990; Equation 5-3, Handbook of Chemical Property Estimation Methods.
4 USEPA, December 1982, Aquatic Fate Process Data for Organic Priority Pollutants.
5 ATSDR, October 1989, Toxicity Profile for Xylenes.
6 Lyman et al., 1990, Eq. 5-2
7 Verschueren, 1983, Handbook of Environmental Data of Organic Chemicals.
8 Howard, 1989, Handbook of Environmental Fate and Exposure Data for Organic Chemicals, Volume 1.
9 Lyman et al., 1990; Equation 4-5
10 EPA, July 1996, Soil Screening Guidance.
11 Chlordane data used
12 Endosulfan II data used

TABLE 2-4

RELATIVE MOBILITIES OF INORGANICS AS A FUNCTION OF ENVIRONMENTAL CONDITIONS (Eh,pH)
SITES 5 13
NSWC WHITE OAK, SILVER SPRING, MARYLAND

	Environmental Conditions			
Relative Mobility	Oxidizing	Acidic	Neutral/Alkaline	Reducing
Very High			Se	
High	Se, Zn	Se, Zn, Cu, Ni, Hg,Ag		
Medium	Cu, Ni, Hg, Ag, As, Cd	As, Cd	As, Cd	
Low	Pb, Ba, Se	Pb, Ba, Be	Pb, Ba, Be	
Very Low	Fe, Cr	Cr	Cr, Zn, Cu, Ni, Hg, Ag	Cr, Se, Zn, Cu, Ni, Hg, Pb, Ba, Be, Ag

Notes:

As = Arsenic	Fe = Iron
Ag = Silver	Hg = Mercury
Ba = Barium	Ni = Nickel
Be = Beryllium	Pb = Lead
Cd = Cadmium	Se = Selenium
Cr = Chromium	Zn = Zinc
Cu = Copper	Eh = Standard Redox Potential

Source: Swartzbaugh, et al. Remediating Sites Contaminated with Heavy Metals. Hazardous Materials Control, November/December 1992.

I Walt: as a side note - this table has great relevance to the G-W Cadmium issues @ RRL Fill.

TABLE 2-5

SUMMARY OF EXPOSURE FACTORS - REASONABLE MAXIMUM EXPOSURE
SITES 5 AND 13
NSWC WHITE OAK, SILVER SPRING, MARYLAND

Exposure Route	Full Time Worker	Maintenance/Utility Worker	Construction Worker	Adult Recreational User	Adolescent Trespasser	Day Care Center Child	Future Adult Resident	Future Child Resident
Exposure Concentration - C_{soil} (mg/kg)	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]
Exposure Frequency (EF) (days/year)	250[1]	36[2]	180[2]	16[2]	52[2]	250[1]	350[1]	350[1]
Exposure Duration (ED) (years)	25[1]	25[1]	1[2]	30[1]	10[3]	6[1]	24[1]	6[1]
Body Weight (BW) (kg)	70[4]	70[4]	70[4]	70[4]	43[5]	15[4]	70[4]	15[4]
Noncarcinogenic Averaging Time (AT_n) (days)	9,125[4]	9,125[4]	365[4]	10,950[4]	3,650[4]	2,190[4]	8,760[4]	2,190[4]
Carcinogenic Averaging Time (AT_c) (days)	25,550[4]	25,550[4]	25,550[4]	25,550[4]	25,550[4]	25,550[4]	25,550[4]	25,550[4]
Ingestion Rate (IR) (mg/day)	100[1]	100[1]	480[1]	100[1]	100[1]	200[1]	100[1]	200[1]
Fraction Ingested from Contaminated Source (Fi) (unitless)	1.0[6]	1.0[6]	1.0[6]	1.0[6]	1.0[6]	0.5[6]	1.0[6]	1.0[6]
Skin Surface Area (SA) (cm^2/day)	3,300[6]	3,300[6]	3,300[6]	9,000[5]	3,263[5]	2,800[6]	5,700[6]	2,800[6]
Soil-to-Skin Adherence Factor (AF) (mg/cm^2)	0.2[6]	0.2[6]	0.3[6]	0.08[6]	0.3[6]	0.2[6]	0.07[6]	0.2[6]
Absorption Factor (ABS) (unitless)	chemical-specific[6]	chemical-specific[6]	chemical-specific[6]	chemical-specific[6]	chemical-specific[6]	chemical-specific[6]	chemical-specific[6]	chemical-specific[6]
Conversion Factor (CF) (kg/mg)	1E-06	1E-06	1E-06	1E-06	1E-06	1E-06	1E-06	1E-06

1 USEPA, May 1993
2 Professional Judgement
3 Adolescent, 7 -16 years of age
4 USEPA, December 1989
5 USEPA, August 1997
6 USEPA, September 2001

TABLE 2-6

SUMMARY OF EXPOSURE FACTORS - CENTRAL TENDENCY EXPOSURE
SITES 5 AND 13
NSWC WHITE OAK, SILVER SPRING, MARYLAND

Exposure Route	Full Time Worker	Maintenance/Utility Worker	Construction Worker	Adult Recreational User	Adolescent Trespasser	Day Care Center Child	Future Adult Resident	Future Child Resident
Exposure Concentration - C_{soil} (mg/kg)	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]
Exposure Frequency (EF) (days/year)	219[1]	18[2]	180[2]	8[2]	26[2]	219[1]	234[1]	234[1]
Exposure Duration (ED) (years)	9[1]	9[1]	1[2]	9[1]	10[3]	3[2]	7[1]	2[1]
Body Weight (BW) (kg)	70[4]	70[4]	70[4]	70[4]	43[5]	15[4]	70[4]	15[4]
Noncarcinogenic Averaging Time (AT_n) (days)	3,285[4]	3,285[4]	365[4]	3,285[4]	3,650[4]	1,095[4]	2,555[4]	730[4]
Carcinogenic Averaging Time (AT_c) (days)	25,550[4]	25,550[4]	25,550[4]	25,550[4]	25,550[4]	25,550[4]	25,550[4]	25,550[4]
Ingestion Rate (IR) (mg/day)	50[1]	50[1]	240[1]	50[1]	50[1]	100[1]	50[1]	100[1]
Fraction Ingested from Contaminated Source (Fi) (unitless)	1.0[6]	1.0[6]	1.0[6]	1.0[6]	1.0[6]	0.5[6]	1.0[6]	1.0[6]
Skin Surface Area (SA) (cm^2/day)	3,300[6]	3,300[6]	3,300[6]	9,000[5]	3,263[5]	2,800[6]	5,700[6]	2,800[6]
Soil-to-Skin Adherence Factor (AF) (mg/cm^2)	0.02[6]	0.02[6]	0.1[6]	0.01[6]	0.04[6]	0.04[6]	0.01[6]	0.04[6]
Absorption Factor (ABS) (unitless)	chemical-specific[6]	chemical-specific[6]	chemical-specific[6]	chemical-specific[6]	chemical-specific[6]	chemical-specific[6]	chemical-specific[6]	chemical-specific[6]
Conversion Factor (CF) (kg/mg)	1E-06	1E-06	1E-06	1E-06	1E-06	1E-06	1E-06	1E-06

1 USEPA, May 1993
2 Professional Judgement
3 Adolescent, 7 -16 years of age
4 USEPA, December 1989
5 USEPA, August 1997
6 USEPA, September 2001

TABLE 2-7

NON-CANCER TOXICITY DATA - ORAL/DERMAL
SITES 5 AND 13
NSWC WHITE OAK, SILVER SPRING, MARYLAND

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD	Oral RfD Units	Oral to Dermal Adjustment Factor[1]	Adjusted Dermal RfD[2]	Dermal RfD Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ[3]
Dieldrin	chronic	5.0E-05	mg/kg-day	1	5.00E-05	mg/kg-day	Liver	100	IRIS	04/02/02
2-Amino-4,6-dinitrotoluene	chronic	6.0E-05	mg/kg-day	1	6.00E-05	mg/kg-day			NCEA	04/02/02
RDX	chronic	3.0E-03	mg/kg-day	1	3.00E-03	mg/kg-day	Prostate	100	IRIS	04/02/02
Copper	chronic	4.0E-02	mg/kg-day	1	4.00E-02	mg/kg-day	NA		HEAST	07/97
Selenium	chronic	5.0E-03	mg/kg-day	1	5.00E-03	mg/kg-day	Blood/Skin/CNS	3	IRIS	04/02/02
Thallium	chronic	7.0E-05	mg/kg-day	1	7.00E-05	mg/kg-day	Liver			04/02/02

1 USEPA, September, 2001.
2 RfD dermal = RfDoral x (Oral to Dermal Adjustment Factor)
3 Dates of IRIS, HEAST, or NCEA

Notes: RfD = Reference dose
CNS = Central Nervous System
IRIS = Integrated Risk Information System, on-line database search (USEPA, August 2002)
HEAST = Health Effects Assessment Summary Tables (USEPA, July 1997)
NCEA = USEPA National Center for Environmental Assessment (USEPA RBC Table, April 2, 2002)
NA = Not applicable since an oral RfD is not available for this compound data

TABLE 2-8

CANCER TOXICITY DATA - ORAL/DERMAL
SITES 5 AND 13
NSWC WHITE OAK, SILVER SPRING, MARYLAND

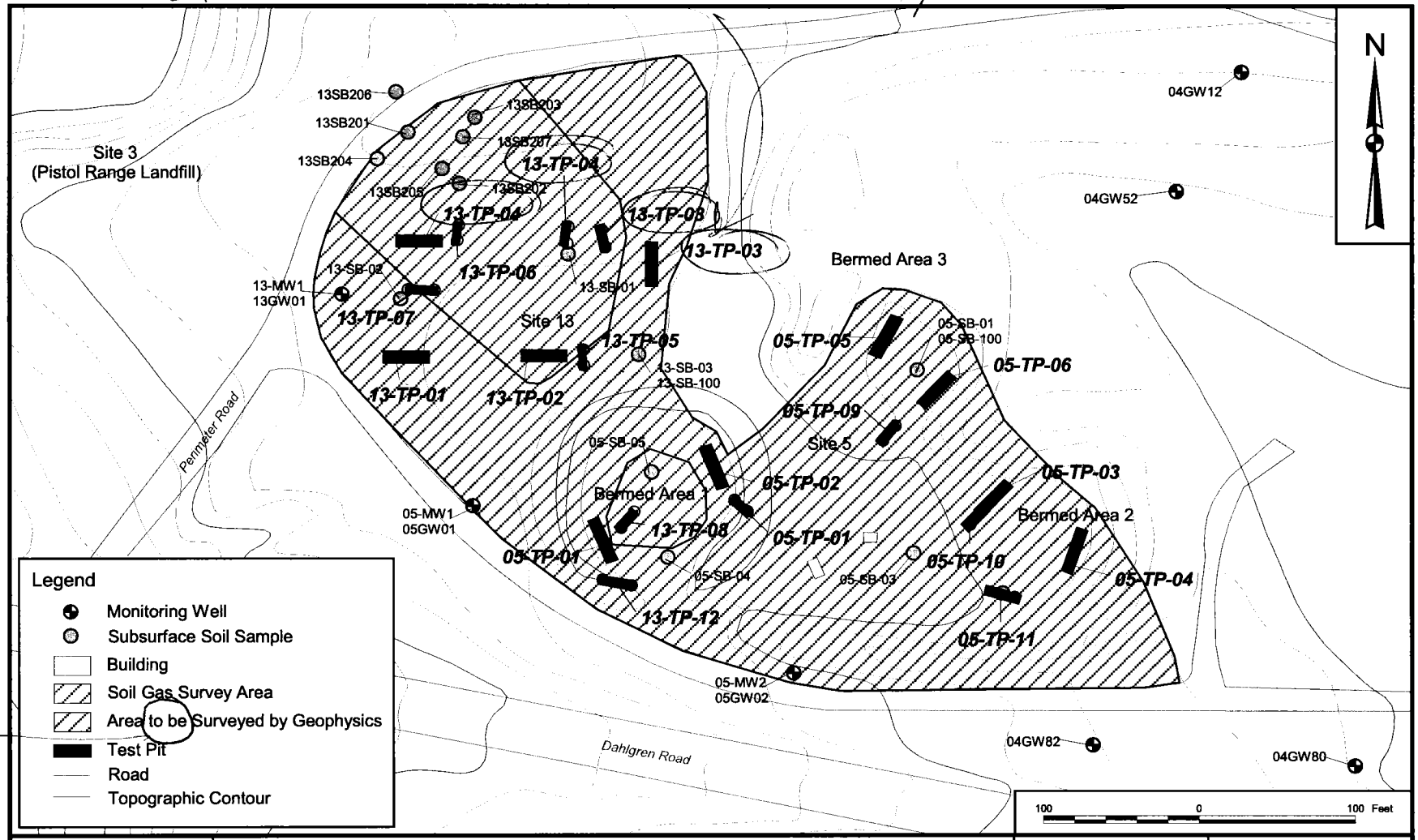
Chemical of Potential Concern	Oral CSF	Oral to Dermal Adjustment Factor[1]	Adjusted Dermal Cancer Slope Factor[2]	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date[3]
Aroclor-1260	2.0E+00	1	2.00E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	7/21/2002
Benzo(a)pyrene	7.3E+00	1	7.30E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	7/21/2002
Dibenzo(a,h)anthracene	7.3E+00	1	7.30E+00	$(mg/kg\text{-}day)^{-1}$	B2	Region 3	4/2/2002
RDX	1.1E-01	1	1.10E-01	(mg/kg-day)-1	C	IRIS	4/2/2002

1 RAGS-PART E (USEPA, September 2001).
2 CSFdermal = CSForal/(Oral to Dermal Adjustment Factor)
3 Date of IRIS

Notes:
CSF = Cancer Slope Factor
IRIS = Integrated Risk Information System, on-line database search (USEPA, July1999)
HEAST = Health Effects Assessment Summary Tables (USEPA, July 1997)
Region 3 - USEPA Region III RBC Table, April 2, 2002

EPA Group:
A - Human carcinogen
B1 - Probable human carcinogen - indicates that limited human data are available
B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen
E - Evidence of noncarcinogenicity

Check labels on Site 13 Test Pits – TP 3+4 – Typos? mislabeled?



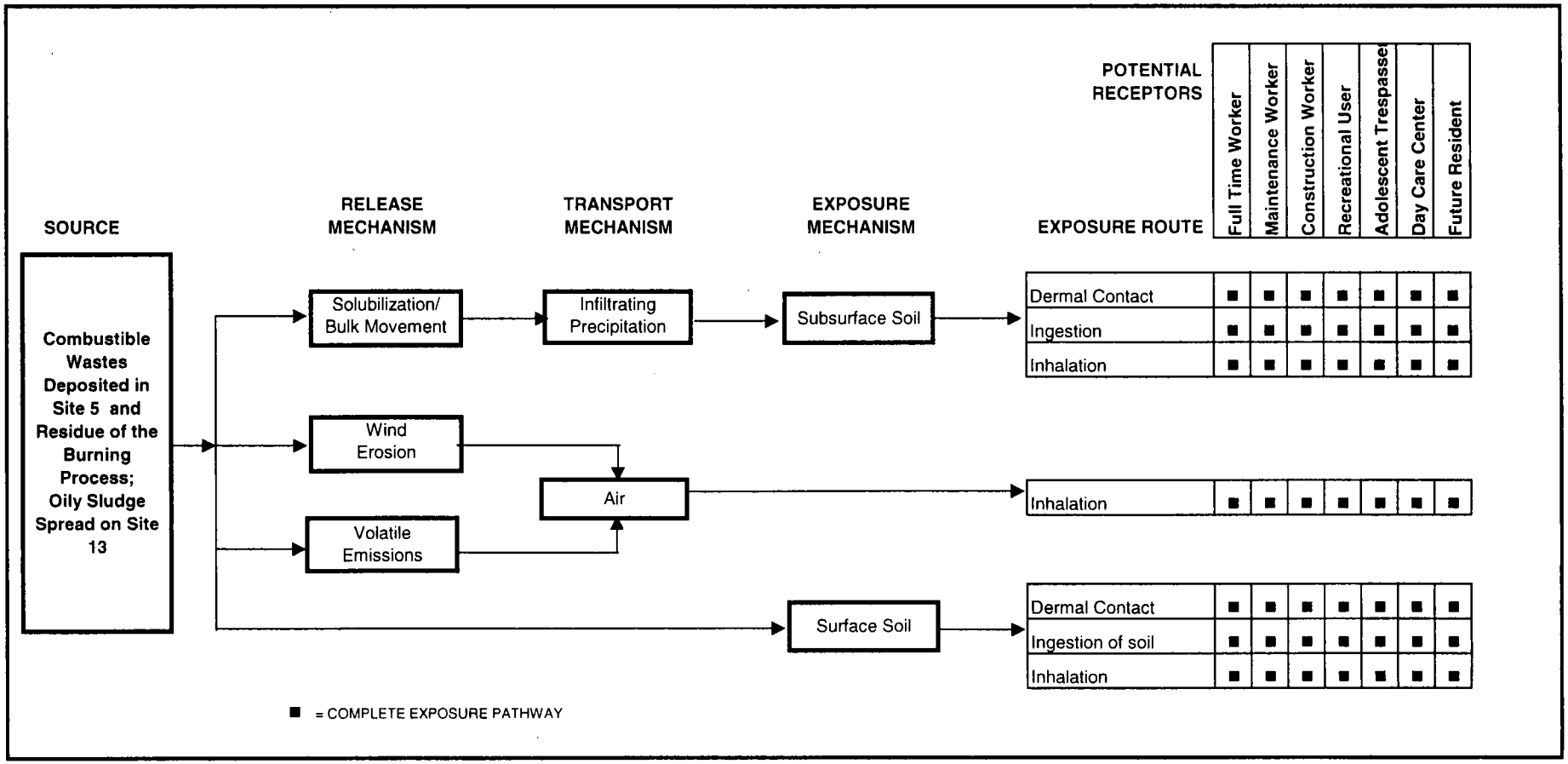
verb Tense?

DRAWN BY J. LAMEY	DATE 9/7/00	Tetra Tech NUS, Inc.	CONTRACT NUMBER 4246 / OWNER NUMBER 0839
CHECKED BY R. KOTUN	DATE 9/11/02	GEOPHYSICAL SURVEY AND TEST PIT LOCATION MAP SITE 5 / SWMU 32 - OPEN BURN AREAS AND SITE 13/SWMU 7 - OIL SLUDGE DISPOSAL AREA FORMER NSWC - WHITE OAK SILVER SPRING, MARYLAND	APPROVED BY / DATE
COST/SCHEDULE-AREA			APPROVED BY / DATE
SCALE AS NOTED			DRAWING NO. FIGURE 2-1 / REV 0

P:\GIS\WHITEOAK\7855_0501.APR GEOPHYSICAL AND TEST PIT - SITE 5/SWMU 32 & SITE 13/SWMU 7 9/11/02 AJ

FIGURE 2-2

HUMAN HEALTH CONCEPTUAL SITE MODEL
SITES 5 AND 13
FORMER NSWC WHITE OAK, SILVER SPRING, MARYLAND



Blank space indicates incomplete exposure pathway or relatively insignificant, or not applicable potential exposure.

3.0 PHYSICAL CHARACTERISTICS OF THE STUDY AREA

3.1 METEOROLOGY AND CLIMATOLOGY

Summers at NSWC-White Oak are warm and humid, and winters are mild. Seasonal temperature variation is about 43°F. The warmest weather occurs in July, with the average daily minimum/maximum temperatures ranging from 69°F to 88°F. The coldest weather occurs in late January and early February, with daily temperatures ranging from 28°F to 44°F. The average annual precipitation is approximately 44 inches. Seasonal variation in precipitation is not pronounced, gradually fluctuating between a typical minimum of 3 inches in February to a typical maximum of 5 inches in August. Snowfall accumulations of more than 10 inches are rare, with the greatest snowfalls occurring in January and February.

The mean annual wind speed varies between 8 miles per hour in August and 11 miles per hour in March. The prevailing direction is from the south most of the year, except for northwesterly winds that occur during December, January, and March.

3.2 SITE TOPOGRAPHY

NSWC-White Oak is located approximately 4 miles northeast of Washington, D.C., near the boundary between the Piedmont and Coastal Plain physiographic provinces. The facility lies in gently rolling terrain. The topographic expression of the area represents the result of a deeply incised, dendritic stream channel pattern. ~~Local drainage patterns are dominated by~~ created by a Paint Branch and its tributaries.

The highest elevation on the site is approximately 398 feet above ~~mean~~ sea level. The lowest elevation is roughly 145 feet above ~~mean low water~~ sea level. The terrain of the western portion of the site slopes generally eastward toward Paint Branch with about 3.5 percent grade. Similar grades are encountered in the eastern portion of the facility, but slopes are more generally southward or are locally influenced by proximity to Paint Branch and its tributary drainages. Near the deeply incised stream channels, ground slopes increase to as much as 65 percent.

3.3 REGIONAL GEOLOGY/SOILS

The boundary between the Piedmont and Coastal Plain physiographic provinces, known as the Fall Line, represents the zone of contact between older Piedmont Plateau crystaline rocks to the west and the younger Atlantic Coastal Plain sedimentary units to the east. In the White Oak area, the Fall Line extends from the southwest to the northeast and roughly parallels the Montgomery-Prince George's County line boundary. ~~The topography of both provinces in the White Oak area is characterized by rolling hills with steeply eroded stream valleys.~~ Delete entire sentence or Repeat the previous sentence. Used above.

OR coastal plain deposits range from a maximum of 100' ft thick at Eastern edge of w/o to Completely removed at Western edge

Underlying NSWC-White Oak, unconsolidated sedimentary ~~units~~ deposits of the Coastal Plain Province overlie fractured metamorphic and igneous rocks of the Piedmont Province. The Coastal Plain ~~sediments~~ deposits include, in ascending order, the Potomac Group, the Upland Sand and Gravel, and undifferentiated Quaternary alluvial deposits. The Potomac Group is of Cretaceous age and consists of a sand, gravel, and silt unit and a clay unit. The Upland Sand and Gravel is of Tertiary age and consists of sand, gravel, and silt with clay lenses. The Coastal Plain ~~sediments~~ deposits are less than a ~~few tens of feet~~ 100' ft thick at the facility.

The Piedmont bedrock extending below the Coastal Plain sediments consists of the Wissahickon Formation, a diamictite gneiss of late Precambrian age. The upper 50 to 70 feet of the Wissahickon Formation has weathered to a saprolite. The saprolite is a clayey, dense, unconsolidated material retaining the parent material structure. The Wissahickon Formation accounts for approximately 50 percent of the surficial geology at NSWC-White Oak. Bedrock outcrops of the Wissahickon Formation occur along Paint Branch and another unnamed tributary in the central portion of the facility due to the erosion of overlying sediments. The surficial geology of NSWC-White Oak is illustrated in Figure 3-1.

Facility soils, except for streambed soils, tend to be moderately to excessively well drained and moderately to severely eroded. The soils generally fall within one of two major associations present in the vicinity: the Gleneig-Manor-Chester (GMC) association and the Chillium-Beltsville-Croom (CBC) association. The GMC association developed in materials weathered from Piedmont metamorphic rocks, and the CBC association is derived from Coastal Plain materials. Soils at the facility tend to be moderately acidic, with a pH ranging from 4 to 6 Standard Units (SUs). This may be due to the presence of hydroxyl, humic, and fulvic acids derived from decaying organic matter.

3.4 REGIONAL HYDROGEOLOGY

NSWC-White Oak lies entirely within the drainage basin of Paint Branch, a 12-mile long tributary to the Northeast Branch of the Anacostia River. Like other streams in the region, Paint Branch is a gaining stream, as it is perennially supported by shallow groundwater discharge from small springs and seeps along its length. Another perennial stream, Westfarm Branch, flows through the eastern portion of the property. It originates approximately 1 mile to the north and joins Paint Branch just south of the property line.

In addition to perennial streams, the facility is traversed by eight intermittent streams, all of which discharge to Paint Branch either on the property or nearby. Several of these streams are very small and are not identified on United States Geological Survey (USGS) topographic maps.

3.5 WATER USAGE

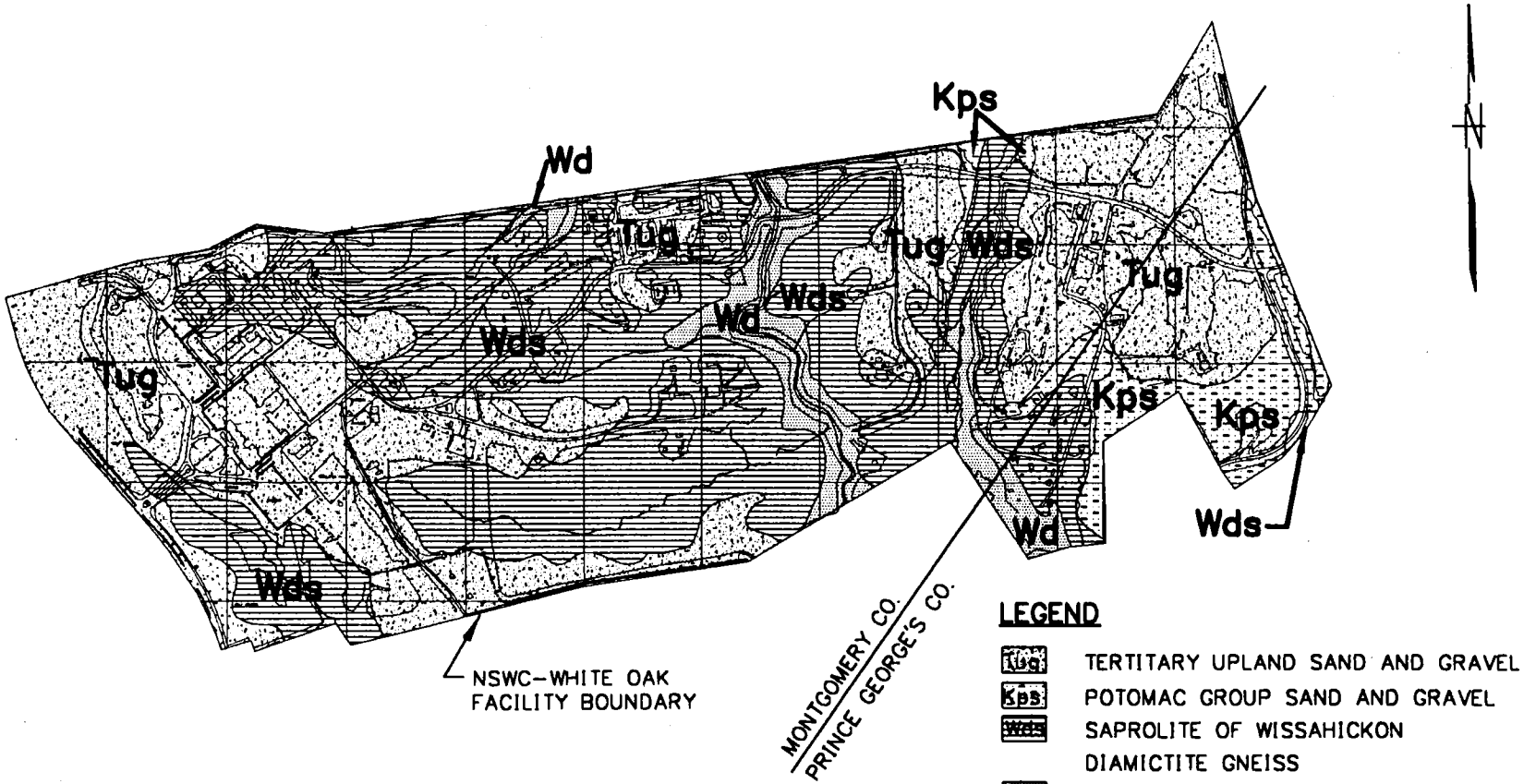
There is no known use of surface water at NSWC-White Oak. Groundwater use in the area is limited to a few residential homes along the southeast perimeter of the site. In the past, groundwater was used for industrial and possibly potable water supplies (Building 367 is a wellhead house) at the site. Use of groundwater at White Oak was discontinued after the facility was connected to the Washington Suburban Sanitary Commission (municipal water supply). in X year.

3.6 LOCAL HYDROGEOLOGY

Groundwater occurs in both unconfined and confined conditions under the facility. Sand and gravel units of the Coastal Plain Province and the uppermost weathered zone of the saprolite of the Wissahickon Formation comprise the unconfined or water table aquifer. The thickness of the saprolite varies with the degree of weathering. Where erosion has removed the overlying Cretaceaous and Tertiary sediments, the saprolite is thicker because of greater exposure to weathering processes. Based on drill logs from field investigations, the "saprolite acts as an aquitard" in places where it has high clay content and unfractured texture. Therefore, the saprolite can limit the water flow between the overlying water table aquifer and the underlying fractured Wissahickon Formation when it has a high clay content. Groundwater flow within the competent bedrock is limited to fractures and occurs under confined conditions in most areas of the facility.

this concept is fallacious at best, it been waved around forever - The OU4 R.I. had same preconceived idea + then concluded that in fact there is a normal amount of connectedness, and possibly some slight infiltration of chemical contaminated groundwater @ most.

ACAD: 7867cm07.dwg 08/31/99 HJP



MODIFIED FROM WITHINGTON AND FROELICH, 1974

DRAWN BY DATE HJP 6/23/97	Tetra Tech NUS, Inc.	CONTRACT NO. 7687	OWNER NO. 0102
CHECKED BY DATE		APPROVED BY	DATE
COST/SCHED-AREA	SURFICIAL GEOLOGY MAP NSWC – WHITE OAK, SILVER SPRING, MARYLAND	APPROVED BY	DATE 8/31/99
SCALE AS NOTED		DRAWING NO. FIGURE 3-1	REV. 0

FORM CADD NO. TtNUS_AH.DWG - REV 0 - 1/22/98

4.0 SITE 5 - OPEN BURN AREA

4.1 SITE CHARACTERISTICS

Post-removal

The ground surface at Site 5 slopes generally to the south, and the maximum difference in elevation is approximately 30 feet. There are no surface water bodies within Site 5. The closest surface water body is a small, southward-flowing tributary (Westfarm Branch) of Paint Branch located approximately 420 feet west of Berm Area 1. During rain events, surface water infiltrates into the surface soil or drains off site towards the nearby stream.

Shallow geologic conditions consist of a surficial veneer of Coastal Plain deposits of the Potomac Group, that contain varying mixtures of gravel, cobbles, silt, and clay to a depth of approximately 20 to 25 feet. The upland Coastal Plain deposits on this site overlie a saprolotic and weathered bedrock layer of varying thickness. The major soils on this site are those of the CBC association. Berm Area 1 subsurface logs for 05-SB-05 indicated that there was a black, cobbly, sandy silt layer with a distinct petroleum odor between 2 feet and 12 feet bgs. Split spoon recovery at this interval was poor, and drill cuttings indicated the presence of fill materials including pieces of rubber automobile tires, burnt wood chips, broken glass, plastic, cardboard, wire, and various metal fragments. A similar lithology was observed in 05-SB-04, except that the depth of the fill material was not observed to exceed 6 feet. No fill materials were discovered in Bermed Area 2 and 3.

4.2 NATURE AND EXTENT

The dataset for post-removal conditions at Site 5 consisted of 10 subsurface soil samples collected during the SSR) for IRP Sites 1, 5, 6, 12, 13, 28, 29, 31, 32, and 33, EBS AOC 100 (TtNUS, 1998) field investigation and eight post-removal subsurface soil samples collected by TtNUS, in May 2002 (Appendix D). This dataset represents conditions at the site after the excavation of all surface soils within Site 5 during the fall of 2000, coincident with the removal action. @ Site 33 Soil sampling locations and any contaminant detections above the human health screening criteria are shown in Figure 4-1. The samples were analyzed for TCL VOCs, TCL SVOCs, TCL Pesticides/PCBs, TAL Metals, Cyanide, and EPA SW846-8330 explosives. The pre-excavation samples collected in 1997 were obtained from five soil borings by collecting split-spoon samples at every 2-foot interval to a maximum depth of 25 feet. The two subsurface soil locations in Berm Area 1 were 05-SB-04 and 05-SB-05; the two locations in Berm Area 2 were 05-SB-02 and 05-SB-03. The only subsurface soil sample location in Berm Area 3 was 05-SB-01. The highest contaminant levels in soil detected in the 1997 investigation were at the location at which, based on aerial photographs, previous disposed activities occurred.

The only two TCL VOCs detected in the combined 1997 and 2002 dataset (acetone and toluene) had concentrations below screening levels. Three types of SVOCs were detected in the post-removal dataset, PAHs, phthalate esters, and acetophenone (detected only in the 2002 sampling event). Of these, only the concentrations of two PAHs [benzo(a)pyrene and dibenzo(a,h)anthracene] exceeded residential screening levels for the protection of human health. The PAHs exceeding screening levels were found only in the samples collected in 1997 primarily at locations 05-SB-02, 05-SB-04, and 05-SB-05. The presence of PAHs at Site 5 is consistent with the burning of waste and waste oils.

One PCB (Aroclor 1260) was detected in 7 of 18 post-removal subsurface soil samples. Concentrations of Aroclor 1260 exceeded the human health screening level in samples collected in 1997 and 2002, with the maximum concentration (1.2 mg/kg) occurring in Sample 05-SB-05 (2 to 4 feet bgs) collected in 1997.

Ten pesticides (DDD, DDE, alpha- and gamma-chlordane, dieldrin, endosulfan II, endrin ketone, heptachlor, heptachlor epoxide, and delta-BHC) were detected at low levels in the both the 1997 and 2002 post-removal subsurface soil samples. Only the concentration of dieldrin (0.053 mg/kg) in one 1997 sample (05-SB-05, 2 to 4 feet bgs) exceeded the human health screening level for residential soil.

Four explosives (2,4,6-trinitrotoluene, 2-amino-4,6-dinitrotoluene, HMX, and RDX) were detected in the samples collected in 1997. Only the concentrations of 2-amino-4,6-dinitrotoluene (1.07 mg/kg) and RDX (30.8 mg/kg) detected in 1 of 18 samples (Sample 05-SB-05, 25-27 feet bgs collected in 1997) exceeded human health screening levels for residential soil.

The following inorganics were detected in excess of screening levels for residential land use: aluminum, antimony, arsenic, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, and thallium. The concentrations of all of these, with the exception of copper, selenium, and thallium, were detected at concentrations within background ranges for surface and subsurface soil at NSWC White-Oak.

4.3 CONTAMINANT FATE AND TRANSPORT

This section presents a brief overview of contaminant fate and transport issues at Site 5. This discussion focuses on some of the major types of contaminants found at the site. Table 2.4 presents the physical and chemical properties of the compounds detected at Site 5. Fate and transport characteristics of the major types of constituents detected at Site 5 are discussed below.

The sources of contamination at Site 5 are materials deposited in the three adjacent open burn areas from the late 1940s until 1970. These include paper, cardboard, wood, other bulky ignitable materials, and small quantities of hazardous materials in the first bermed area. The materials were ignited in Berm Area 1 using pyrotechnic devices. This site may have been used as fire training area and explosives may

also have been tested here. Pyrotechnic devices were tested in Berm Area 3 which is located north of Berm Areas 1 and 2.

4.3.1 Volatile Organics

VOCs are typically considered to be fairly soluble and to have a low capacity for retention by soil organic carbon; therefore, these compounds are most frequently detected in groundwater. These types of chemicals may migrate through the soil column after being released by a spill event or by subsurface waste burial as infiltrating precipitation solubilizes them. Some portion of these chemicals is retained by the soil, but most will continue migrating downward until they reach the water table where migration is primarily lateral with the hydraulic gradient. They may migrate to surface water and sediment, but attenuation and dilution factors such as volatilization may result in their disappearance. Only three VOCs (acetone, acetophenone, and toluene) were detected in Site 5 soil samples. Acetone and toluene were detected in 2 of 18 soil samples at low concentrations. The maximum concentrations of these compounds are well below EPA Region 3 SSLs for the protection of groundwater and, based on the frequency of occurrence and low concentrations, are not expected to impact groundwater. Acetophenone was detected in several soil samples at concentrations exceeding its Region 3 SSL. The literature indicates that acetophenone is expected to biodegrade quickly in groundwater with a half-life of 32 days (TOXNET, September 2002). Acetophenone has not been detected in groundwater samples at NSWC-White Oak.

4.3.2 Phthalate Esters

Several phthalates were detected in soil at Site 5. The maximum concentrations of all phthalates were less than EPA Region 3 SSLs for the protection of groundwater. Phthalate esters are considered to be relatively persistent chemicals in the environment. Although numerous studies have demonstrated that phthalate esters undergo biodegradation, it appears that this is a slow process in both soils and surface waters. Certain microorganisms have been shown to excrete products that increase the solubility of phthalate esters and enhance their biodegradation. Biodegradation of bis(2-ethylhexyl) phthalate and di-n-butyl phthalate in water is an important fate mechanism (Howard, 1989). However, hydrolysis of bis(2-ethylhexyl) phthalate is very slow, with a calculated half-life of 2,000 years. In soil, microorganisms appear to be capable of degrading di-n-butyl phthalate rapidly. Bioaccumulation is also a significant fate process. Photolysis and volatilization are considered to be insignificant degradation mechanisms.

4.3.3 Polycyclic Aromatic Hydrocarbons

PAHs are generally considered to be fairly immobile chemicals in the environment. They are large molecules with high K_{oc} values and low solubilities when compared to VOCs. These compounds, when

found in the soil, generally do not migrate vertically to a great extent. Instead, they are more likely to adhere to soil particles and be removed from the site via surface runoff and erosional processes. PAHs were detected in subsurface soil samples collected at Site 5 but the concentrations of only one PAH (benzo(a)pyrene) exceeded the EPA Region 3 soil screening criteria for the protection of groundwater. Benzo(a)pyrene has not been detected in any groundwater samples at NSWC-White Oak. The absence of PAHs in groundwater is evidence of their immobility.

4.3.4 Pesticides

Pesticides were widely used at NSWC-White Oak. Many of the compounds detected are no longer licensed for general sale and use in the United States. Therefore, it is assumed that much of what was detected at Site 5 is representative of past application for insect control. They were detected in subsurface soil at Site 5.

Like PAHs, pesticides as a class of compounds are not considered to be very mobile in the environment. These chemicals, upon application or disposal, tend to remain affixed to soil particles. Migration of pesticides occurs primarily by erosion via the action of wind or water. Erosion accounts for their presence in sediment. Only one pesticide (dieldrin) was detected at concentrations exceeding migration to groundwater SSLs, but this compound has not been detected in groundwater at NSWC-White Oak. The absence of dieldrin in groundwater is consistent with its tendency to bind to soil and sediment and with its low solubility in water.

4.3.5 Polychlorinated Biphenyls

One PCB (Aroclor 1260) was detected in soil at Site 5 with the concentrations in some samples exceeding Region 3 SSLs for the protection of groundwater. PCBs are considered to be very persistent organic chemicals. Biodegradation is the only process known to transform PCBs under environmental conditions, and only the lighter compounds are measurably biodegraded. As with PAHs and pesticides, PCBs are not considered to be mobile in the environment, and the absence of Aroclor 1260 in groundwater at NSWC-White Oak is consistent with its low water solubility and its tendency to bind to soil particles.

4.3.6 Explosives (Nitrogen-Containing Organic Compounds)

Several nitrogen-containing compounds, namely the explosives, 2-amino-4,6-dinitrotoluene, 2,4,6-trinitrotoluene (TNT), HMX, and RDX were detected in subsurface soil at Site 5. Nitrogen containing compounds such as these have relatively low K_{oc} values and tend to be fairly mobile in the environment. This is evidenced by the fact that explosives have been detected in both soil and

groundwater samples at NSWC-White Oak. These explosives are not expected to bioconcentrate significantly in water and will have only a slight tendency to partition to suspended and sediment organic matter.

4.3.7 Inorganics (Metals and Cyanide)

Twenty-two metals and cyanide were detected in soil samples collected at Site 5. Only the concentrations of arsenic and selenium were greater than SSLs for the protection of groundwater (Note that the concentrations of arsenic were determined to be within background levels at the site). Because inorganics are frequently incorporated into the soil matrix and remain bound to particulate matter, they also migrate from source areas via bulk movement processes (erosion). The larger particles (>0.45 microns, which are removed via the filtration step prior to water analysis) are not generally considered to be mobile in groundwater. The metals detected in unfiltered groundwater samples are likely to be representative of suspended soil material in the samples.

There are some instances, however, where these metals are found at such concentrations or in such form as to be able to migrate in solution. It is possible that industrial activities could saturate all available exchange sites in soil and result in a metal being mobilized. Metals are also more mobile under acidic conditions, which may exist in areas where plating-type activities have occurred. Finally, a metal solution may be utilized in some industrial applications. In these cases, it is possible for metals to migrate vertically through the soil column and reach the groundwater.

The fate and transport properties of cyanide (detected in 2 of 10 samples at Site 5) are different from metals in that it is expected to have very high mobility in soil; however, the maximum concentration of cyanide (0.35 mg/kg) was much less than its SSL for the protection of groundwater (150 mg/kg). Volatilization from moist soil surfaces is expected to be an important fate process based upon published Henry's Law constants. Cyanide may volatilize from dry soil surfaces based upon its vapor pressure. If released into water, cyanide is not expected to adsorb to suspended solids and sediment. Volatilization from water surfaces is expected to be an important fate process based upon this compound's estimated Henry's Law constant. Estimated volatilization half-lives for a model river and model lake are 3 hours and 3 days, respectively (TOXNET, September 2002). An estimated BCF of 3 suggests the potential for bioconcentration in aquatic organisms is low. The general population may be exposed to hydrogen cyanide from automobile exhaust and waste incinerators. Cyanide can be biodegraded by acclimated microbial cultures and sludges.

4.4 SITE 5, BASELINE HUMAN HEALTH RISK ASSESSMENT

This section presents the results of the baseline HHRA for Site 5, the Open Burn Areas. The risk assessment was performed using the general methodologies presented in Section 2.7. Site-specific information on data evaluation (i.e., the selection of PCOCs), identification of exposure scenarios and exposure point concentrations, characterization of potential human health risks, and specific uncertainties associated with the Site 5 risk assessment are contained in Sections 4.4.1 through 4.4.4.

4.4.1 Data Evaluation

A discussion of the chemicals selected as PCOCs for soil at Site 5 is provided in this section.

Identification of PCOCs in Soil

A list of PCOCs was developed for soil collected from depths of 2 to 27 feet bgs. A summary of the PCOC selection process for surface soil is presented in Table 4-1. PCOCs for soil are those chemicals reported at maximum concentrations greater than EPA Region III RBC screening levels for residential soil ingestion, EPA Generic SSLs for inhalation (transfer from soil to air), and base-wide background levels.

The following chemicals were retained as PCOCs for soil at Site 5:

- PAHs - benzo(a)pyrene, dibenzo(a,h,)anthracene
- Aroclor 1260
- Dieldrin
- Energetics – 2-amino-4,6-dintitrotoluene, RDX
- Inorganics – copper, selenium, thallium

No PCOCs exceeded EPA SSLs for inhalation (transfer from soil to air). Consequently, risks from inhalation of vapors and particulates from soil emissions were not quantified in the risk assessment.

The maximum concentrations of a number of constituents (acetophenone, benzo(a)pyrene, Aroclor 1260, dieldrin, arsenic, and selenium) exceeded the EPA Region 3 SSLs for migration to groundwater [Dilution Attenuation Factor (DAF) = 20]. Although the comparison indicates that these chemicals may impact groundwater quality, the actual impact to groundwater may not be significant. Of the inorganic constituents listed above, arsenic was determined to be within background levels (Table 4-1) and selenium has not been detected in filtered groundwater samples collected at NSWC White Oak. Of the organic constituents that exceeded their respective SSLs, the Koc values for benzo(a)pyrene, Aroclor 1260, and dieldrin indicate that these chemicals are not mobile in the environment and are,

therefore, not likely to migrate to groundwater. This is evidenced by the fact that these compounds have not been detected in groundwater samples collected in previous investigations at NSWC-White Oak. Acetophenone was detected in several soil samples collected in May 2002 at concentrations qualified as estimated (less than the sample quantitation limit). However, acetophenone has not been detected in groundwater samples at NSWC-White Oak. In addition, available data (TOXNET, September 2002) indicate that acetophenone is expected to biodegrade quickly in groundwater with a half-life of 32 days. The above information indicates that the actual impact to groundwater may not be as significant as the qualitative comparison suggests, and it is unlikely that the concentrations of the chemicals detected in soil pose any adverse impacts to groundwater.

4.4.2 Exposure Assessment

As identified in Section 2.7.2, several potential human receptors were evaluated for exposure to contaminated soil at Site 5. These include: full time workers, maintenance/utility workers, construction workers, adult recreational users, adolescent trespassers, day care center children, and child and adult residents.

Exposure point concentrations for those chemicals identified as PCOCs for soil are presented in Table 4-2. As indicated in Section 2.7.2, the 95 percent UCL was used as the exposure point concentration for soil at Site 5.

4.4.3 Results of the Risk Characterization

This section contains a summary of the results of the risk characterization for Site 5. Quantitative risk estimates are discussed in the following sections.

4.4.3.1 Quantitative Risk Estimates

Quantitative risk estimates for potential human receptors were developed for those chemicals identified as PCOCs at Site 5. Potential noncarcinogenic and carcinogenic risks for the full time worker, maintenance/utility worker, construction worker, adult recreational user, adolescent trespasser, a child in a day care center, and future residents (adult and child) are summarized in Tables 4-3 and 4-4 for the RME and CTE, respectively. All risk spreadsheets containing the detailed, chemical-specific risks are included in Appendix G. A discussion of the estimated noncarcinogenic and carcinogenic risks is provided in the remainder of this section.

Noncarcinogenic Risks

As indicated in Tables 4-3 and 4-4, cumulative HIs for all receptors were less than unity, indicating that no toxic effects are anticipated for these receptors under the defined exposure conditions.

Carcinogenic Risks

The cumulative ILCRs for maintenance/utility workers, construction workers, adult recreational users, and adolescent trespassers (Table 4-3) under the RME scenario were less than 1E-6.

The ILCRs for full time workers, day care center children and future residents were within the EPA target risk range, 1E-6 to 1E-4. As shown in the RAGS Part D Table 9's presented in Appendix G, the risks exceeding 1E-6 were primarily due to exposure to PAHs (namely, benzo(a)pyrene) and Aroclor 1260. For example, PAHs accounted for approximately 70 percent of the total residential ILCR (8.5E-6), and Aroclor 1260 accounted for approximately 25 percent of the total risk.

4.4.4 Uncertainty Analysis

General uncertainties associated with the risk assessment are discussed in Section 2.7.5. Specific uncertainty issues associated with the risks estimated for Site 5 are addressed in this section.

Some uncertainty associated with the identification of metals as PCOCs still exists. A statistical analysis (Wilcoxon Rank-Sum Test) of site metal concentrations compared to site-specific background concentrations is conducted to determine if site concentrations were significantly greater than the background concentrations. If they were significantly greater than background, and the maximum detected concentrations were greater than the screening level, i.e., one-tenth the RBC for noncarcinogens and the RBC for carcinogens, they were identified as PCOCs. If the site concentration was not significantly greater than the background concentration, the metal was not identified as a PCOC, even if its maximum concentration was greater than the screening level. The statistical analysis accounted for the variability in concentrations; however, at times, a review of the data suggested that certain metals should be identified as PCOCs even when the statistical analysis indicated otherwise.

A review of the Site 5 metals data indicated that copper, lead, nickel, selenium, and thallium had maximum detected concentrations greater than the UCL of the facility background concentrations and greater than their respective screening levels (Table 4-5). Copper, selenium, and thallium were selected as PCOCs and were evaluated in the quantitative risk assessment. Lead and nickel were not selected as PCOCs because they were determined to be within background levels by the Wilcoxon Rank-Sum Test. However, if nickel had been carried through the quantitative risk assessment for the most sensitive

receptor (the future child resident), the HQ for nickel would have been 0.14, and the total HI for the child resident would have increased from 0.45 (Table 4-3) to 0.59. The cumulative HI would still have been less than unity, indicating that no toxic effects would be expected for exposure to soil at the site. If lead would have been evaluated in the quantitative risk assessment, the effects of exposure to lead would have been based on the average lead concentration (96.6 mg/kg), as specified in EPA guidance for lead (EPA, February 1994). This concentration is less than the 400 mg/kg screening level presented in Table 4-1. If lead had been evaluated at this concentration by the adult and child lead models, the predicted blood lead levels and the probability of exceeding the blood lead level of concern (10 µg/dL) would have been acceptable. Therefore, the results and conclusions of the risk assessment would not have changed if lead and nickel had been included in the quantitative risk analysis.

4.5 SUMMARY AND CONCLUSIONS

Need to explicitly state that these are risks relative to post-excavation conditions!

The human health risk assessment for Site 5 was performed to characterize the potential risks to likely human receptors under current and future land use. Potential receptors are full time workers, maintenance/utility workers, construction workers, recreational users, trespassers, day care center children, and hypothetical child and adult residents.

soil remaining @ ~ specify surface/subsurface?

The list of PCOCs for Site 5 includes the following:

- Benzo(a)pyrene, dibenzo(a,h,)anthracene, Aroclor 1260, dieldrin, 2-amino-4,6-dintitrotoluene, RDX, copper, selenium, thallium

Quantitative estimates of noncarcinogenic and carcinogenic risks (HIs and ILCRs, respectively) were developed for these potential human receptors. The results of the quantitative risk analysis indicated minimal risks (i.e., HIs less than unity and ILCRs within the EPA target risk range) for all potential receptors for exposure to soil at Site 5.

remaining

Potential inhalation exposures from soil at Site 5 were semi-quantitatively evaluated in the risk assessment in Table 4-1. Inhalation of volatile emissions from soil and fugitive dust were evaluated by comparing maximum constituent concentrations to EPA SSLs for transfers from soil to air. The SSLs are based on residential land use and lifetime exposure scenarios and are, therefore, conservative values for workers, recreational users, trespassers, and day care center children. As shown in Table 4-1, maximum detected concentrations were less than the inhalation SSLs for all constituents, and potential risks associated with inhalation exposures risks via migration from soil to air are expected to be minimal.

What about ECO Risks, Add AP to summarize!

 See pg 2-40. G-W Risks?

TABLE 4-1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN
POST-REMOVAL SURFACE/SUBSURFACE SOIL - SITE 5 - OPEN BURN AREAS
NSWC WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface / Subsurface Soil
Exposure Point: Entire Site

CAS Numb	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects (1)	Concentration Used for Screening(2)	Site Above Background ? (3)	Risk-Based Residential PCOC Screening Level(4)		Potential ARAR/ TBC Value	Potential ARAR/ TBC Source	PCOC Flag	Rationale for Contaminant Deletion or Selection(5)
Volatile Organics (mg/kg)																	
98-86-2	Acetophenone	0.12	J	0.25	J	mg/kg	05TP12WS0204[Q2]	5/8	0.15 - 0.27	0.25	NA	780	N	0.00022	SSL_MIGR	No	BSL
															SSL_INH		
67-64-1	Acetone	0.086		0.13		mg/kg	05-SB-05-2_OLD	2/18	0.0014 - 0.015	0.13	NA	780	N	2.5	SSL_MIGR	No	BSL
														100000	SSL_INH		
108-88-3	Toluene	0.092		0.092		mg/kg	05-SB-05-2_OLD	1/18	0.011 - 0.015	0.092	NA	1600	N	8.8	SSL_MIGR	No	BSL
														650	SSL_INH		
Semivolatile Organics (mg/kg)																	
83-32-9	Acenaphthene	0.06	J	0.06	J	mg/kg	05TP01SB0507[Q2]	1/18	0.36 - 0.51	0.06	NA	470	N	100	SSL_MIGR	No	BSL
															SSL_INH		
120-12-7	Anthracene	0.056	J	0.14	J	mg/kg	05-SB-05-2_OLD	4/18	0.36 - 0.44	0.14	NA	2300	N	470	SSL_MIGR	No	BSL
															SSL_INH		
56-55-3	Benzo(a)anthracene	0.081	J	0.55	J	mg/kg	05-SB-05-2_OLD	6/18	0.36 - 0.4	0.55	NA	0.87	C	1.5	SSL_MIGR	No	BSL
															SSL_INH		
50-32-8	Benzo(a)pyrene	0.062	J	0.5	J	mg/kg	05-SB-05-2_OLD	8/18	0.36 - 0.4	0.5	NA	0.087	C	0.37	SSL_MIGR	Yes	ASL
															SSL_INH		
205-99-2	Benzo(b)fluoranthene	0.085	J	0.63	J	mg/kg	05-SB-05-2_OLD	6/18	0.36 - 0.4	0.63	NA	0.87	C	4.5	SSL_MIGR	No	BSL
															SSL_INH		
191-24-2	Benzo(g,h,i)perylene	0.061	J	0.55	J	mg/kg	05-SB-02-22_OLD	8/18	0.36 - 0.4	0.55	NA	230(6)	N	680(6)	SSL_MIGR	No	BSL
															SSL_INH		
207-08-9	Benzo(k)fluoranthene	0.073	J	0.29	J	mg/kg	05-SB-05-2_OLD	6/18	0.36 - 0.4	0.29	NA	8.7	C	45	SSL_MIGR	No	BSL
															SSL_INH		
117-81-7	Bis(2-Ethylhexyl)phthalate	0.051	J	0.23	J	mg/kg	05-SB-04-6_OLD	6/18	0.36 - 0.44	0.23	NA	46	C	2900	SSL_MIGR	No	BSL
														31000	SSL_INH		
86-74-8	Carbazole	0.041	J	0.078	J	mg/kg	05-SB-05-2_OLD	2/18	0.36 - 0.51	0.078	NA	32	C	0.47	SSL_MIGR	No	BSL
															SSL_INH		
218-01-9	Chrysene	0.093	J	0.49	J	mg/kg	05-SB-05-2_OLD	6/18	0.36 - 0.4	0.49	NA	87	C	150	SSL_MIGR	No	BSL
															SSL_INH		
84-74-2	Di-n-butyl phthalate	0.039	J	2.7		mg/kg	05TP01WS0204[Q2]	2/18	0.36 - 0.51	2.7	NA	780	N	5000	SSL_MIGR	No	BSL
														2300	SSL_INH		
53-70-3	Dibenzo(a,h)anthracene	0.043	J	0.12	J	mg/kg	05-SB-05-2_OLD	3/18	0.36 - 0.51	0.12	NA	0.087	C	1.4	SSL_MIGR	Yes	ASL
															SSL_INH		
84-66-2	Diethyl Phthalate	0.042	J	0.042	J	mg/kg	05TP12WS0204[Q2]	1/18	0.36 - 0.51	0.042	NA	6300	N	450	SSL_MIGR	No	BSL
														2000	SSL_INH		
206-44-0	Fluoranthene	0.21	J	0.96	J	mg/kg	05-SB-05-2_OLD	6/18	0.36 - 0.4	0.96	NA	310	N	6300	SSL_MIGR	No	BSL
															SSL_INH		
86-73-7	Fluorene	0.066	J	0.066	J	mg/kg	05-SB-05-2_OLD	1/18	0.36 - 0.51	0.066	NA	310	N	140	SSL_MIGR	No	BSL
															SSL_INH		
193-39-5	Indeno(1,2,3-cd)pyrene	0.082	J	0.33	J	mg/kg	05-SB-05-2_OLD	7/18	0.36 - 0.4	0.33	NA	0.87	C	13	SSL_MIGR	No	BSL
															SSL_INH		
91-20-3	Naphthalene	0.055	J	0.097	J	mg/kg	05-SB-05-2_OLD	2/18	0.36 - 0.51	0.097	NA	160	N	0.15	SSL_MIGR	No	BSL
															SSL_INH		
85-01-8	Phenanthrene	0.12	J	0.6	J	mg/kg	05-SB-05-2_OLD	6/18	0.36 - 0.4	0.6	NA	230(6)	N	680(6)	SSL_MIGR	No	BSL
															SSL_INH		
129-00-0	Pyrene	0.16	J	0.88	J	mg/kg	05-SB-05-2_OLD	7/18	0.36 - 0.4	0.88	NA	230	N	680	SSL_MIGR	No	BSL
															SSL_INH		

TABLE 4-1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN
POST-REMOVAL SURFACE/SUBSURFACE SOIL - SITE 5 - OPEN BURN AREAS
NSWC WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface / Subsurface Soil
Exposure Point: Entire Site

CAS Numb	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects (1)	Concentration Used for Screening(2)	Site Above Background ? (3)	Risk-Based Residential PCOC Screening Level(4)		Potential ARAR/ TBC Value	Potential ARAR/ TBC Source	PCOC Flag	Rationale for Contaminant Deletion or Selection(5)
Pesticides/PCBs (mg/kg)																	
72-54-8	4,4'-DDD	0.00065	J	0.005	J	mg/kg	05TP12WS0204[Q2]	2/15	0.0019 - 0.005	0.005	NA	2.7	C	11	SSL_MIGR SSL_INH	No	BSL
72-55-9	4,4'-DDE	0.0003	J	0.022	J	mg/kg	05-SB-05-2_OLD	5/18	0.0019 - 0.005	0.022	NA	1.9	C	35	SSL_MIGR SSL_INH	No	BSL
5103-71-9	alpha-Chlordane	0.00089	J	0.16	J	mg/kg	05-SB-05-2_OLD	4/18	0.0018 - 0.0025	0.16	NA	1.8(7)	C	0.92(7) 20(7)	SSL_MIGR SSL_INH	No	BSL
11096-82-5	Aroclor-1260	0.019	J	1.2	J	mg/kg	05-SB-05-2_OLD	7/18	0.036 - 0.05	1.2	NA	0.32	C	0.41	SSL_MIGR SSL_INH	Yes	ASL
60-57-1	Dieldrin	0.0017	J	0.053	J	mg/kg	05-SB-05-2_OLD	4/18	0.0019 - 0.005	0.053	NA	0.04	C	0.0022 1	SSL_MIGR SSL_INH	Yes	ASL
33213-65-9	Endosulfan II	0.0006	J	0.0081	J	mg/kg	05TP01WS0204[Q2]	5/17	0.0019 - 0.0049	0.0081	NA	47(8)	N	20(8)	SSL_MIGR SSL_INH	No	BSL
53494-70-5	Endrin Ketone	0.0026	J	0.011	J	mg/kg	05-SB-05-2_OLD	2/18	0.0019 - 0.004	0.011	NA	2.3(9)	N	5.4(9)	SSL_MIGR SSL_INH	No	BSL
5103-74-2	gamma-Chlordane	0.1	J	0.14	J	mg/kg	05-SB-05-2_OLD	2/18	0.0018 - 0.0025	0.14	NA	1.8(7)	C	0.92(7) 20(7)	SSL_MIGR SSL_INH	No	BSL
76-44-8	Heptachlor	0.0057	J	0.0057	J	mg/kg	05-SB-04-6_OLD	1/18	0.0018 - 0.0025	0.0057	NA	0.14	C	0.84 4	SSL_MIGR SSL_INH	No	BSL
1024-57-3	Heptachlor Epoxide	0.00017	J	0.00027	J	mg/kg	05-SB-02-10_OLD	3/18	0.0018 - 0.0025	0.00027	NA	0.07	C	0.025 5	SSL_MIGR SSL_INH	No	BSL
319-86-8	delta-BHC	0.00022	J	0.0003	J	mg/kg	05-SB-02-10_OLD	2/18	0.0018 - 0.0025	0.0003	NA	0.1(10)	C	0.00089(10) 0.8(10)	SSL_MIGR SSL_INH	No	BSL
Energetics (mg/kg)																	
118-96-7	2,4,6-Trinitrotoluene	9.82	J	9.82	J	mg/kg	05-SB-05-2_OLD	1/18	0.0356 - 0.25	9.82	NA	21	C	NA	SSL_MIGR SSL_INH	No	BSL
35572-78-2	2-Amino-4,6-dinitrotoluene	1.07	J	1.07	J	mg/kg	05-SB-05-2_OLD	1/18	0.0467 - 0.25	1.07	NA	0.47	N	NA	SSL_MIGR SSL_INH	Yes	ASL
2691-41-0	HMX	0.23	J	5.48	J	mg/kg	05-SB-05-2_OLD	2/18	0.0705 - 0.5	5.48	NA	390	N	NA	SSL_MIGR SSL_INH	No	BSL
121-82-4	RDX	30.8	J	30.8	J	mg/kg	05-SB-05-2_OLD	1/18	0.0509 - 0.5	30.8	NA	5.8	C	NA	SSL_MIGR SSL_INH	Yes	ASL
Inorganics (mg/kg)																	
7429-90-5	Aluminum	507	K	10300		mg/kg	05-SB-05-2_OLD	18/18	---	10300	No	7800	N	NA	SSL_MIGR SSL_INH	No	BKG
7440-36-0	Antimony	0.2	L	3.1	L	mg/kg	05-SB-05-2_OLD	7/18	0.18 - 0.79	3.1	No	3.1	N	13	SSL_MIGR SSL_INH	No	BSL, BKG
7440-38-2	Arsenic	1.1		6.6	J	mg/kg	05-SB-03-12_OLD	14/18	0.71 - 3	6.6	No	0.43	C	0.026 750	SSL_MIGR SSL_INH	No	BKG
7440-39-3	Barium	1.9		312		mg/kg	05-SB-05-2_OLD	18/18	---	312	No	550	N	2100 690000	SSL_MIGR SSL_INH	No	BSL, BKG
7440-43-9	Cadmium	0.43	K	5.6		mg/kg	05TP01WS0204[Q2]	5/18	0.019 - 0.31	5.6	No	7.8(11)	N	55(11) 1800	SSL_MIGR SSL_INH	No	BSL, BKG
7440-70-2	Calcium	37.8		42400		mg/kg	05-SB-05-2_OLD	11/18	40.4 - 154	42400	No	NA		NA	SSL_MIGR SSL_INH	No	NUT, BKG
7440-47-3	Chromium	2.6		40.9		mg/kg	05TP01WS0204[Q2]	18/18	---	40.9	No	23(12)	N	42(12) 270	SSL_MIGR SSL_INH	No	BKG
7440-48-4	Cobalt	0.12		9.5		mg/kg	05TP01WS0204[Q2]	11/18	0.092 - 0.59	9.5	No	160	N	NA	SSL_MIGR SSL_INH	No	BSL, BKG

TABLE 4-1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN
POST-REMOVAL SURFACE/SUBSURFACE SOIL - SITE 5 - OPEN BURN AREAS
NSWC WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface / Subsurface Soil
Exposure Point: Entire Site

CAS Numb	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects (1)	Concentration Used for Screening(2)	Site Above Background ? (3)	Risk-Based Residential PCOC Screening Level(4)		Potential ARAR/ TBC Value	Potential ARAR/ TBC Source	PCOC Flag	Rationale for Contaminant Deletion or Selection(5)
7440-50-8	Copper	2.6		701	J	mg/kg	05TP01WS0204[Q2]	18/18	---	701	Yes	310	N	11000	SSL_MIGR SSL_INH	Yes	ASL
7439-89-6	Iron	1700		24900		mg/kg	05-SB-04-6_OLD	18/18	---	24900	No	2300	N	NA	SSL_MIGR SSL_INH	No	BKG
7439-92-1	Lead	1.3	J	687	K	mg/kg	05-SB-04-6_OLD	17/18	1	687	No	400(13)		NA	SSL_MIGR SSL_INH	No	BKG
7439-95-4	Magnesium	33.9		3340		mg/kg	05TP01WS0204[Q2]	16/18	48.9 - 63.8	3340	No	NA		NA	SSL_MIGR SSL_INH	No	NUT, BKG
7439-96-5	Manganese	1.4		285	J	mg/kg	05TP01WS0204[Q2]	18/18	---	285	No	160(14)	N	950(14)	SSL_MIGR SSL_INH	No	BKG
7439-97-6	Mercury	0.02		2.3		mg/kg	05-SB-04-6_OLD	18/18	---	2.3	Yes	2.3(15)	N	NA	SSL_MIGR SSL_INH	No	BSL
7440-02-0	Nickel	0.2		198	J	mg/kg	05TP01WS0204[Q2]	15/18	0.19 - 1.2	198	No	160	N	NA 13000	SSL_MIGR SSL_INH	No	BKG
7440-09-7	Potassium	32.3		898		mg/kg	05TP01WS0204[Q2]	18/18	---	898	No	NA		NA	SSL_MIGR SSL_INH	No	NUT, BKG
7782-49-2	Selenium	1.1	J	49.6	J	mg/kg	05-SB-02-10_OLD-D	17/18	0.6 - 0.85	49.6	Yes	39	N	19	SSL_MIGR SSL_INH	Yes	ASL
7440-22-4	Silver	0.24		17.8		mg/kg	05-SB-05-2_OLD	6/18	0.067 - 0.21	17.8	No	39	N	31	SSL_MIGR SSL_INH	No	BSL, BKG
7440-23-5	Sodium	364		837	J	mg/kg	05-SB-05-2_OLD	4/18	23.3 - 185	837	No	NA		NA	SSL_MIGR SSL_INH	No	NUT, BKG
7440-28-0	Thallium	0.47		0.95		mg/kg	05TP01SB0507[Q2]	7/18	0.38 - 0.88	0.95	Yes	0.55	N	3.6	SSL_MIGR SSL_INH	Yes	ASL
7440-62-2	Vanadium	5.9		48.5		mg/kg	05-SB-05-2_OLD	18/18	---	48.5	No	55	N	5100	SSL_MIGR SSL_INH	No	BSL, BKG
7440-66-6	Zinc	1.2		1420		mg/kg	05TP01WS0204[Q2]	14/18	1.8 - 2.6	1420	No	2300	N	14000	SSL_MIGR SSL_INH	No	BSL, BKG
57-12-5	Cyanide	0.34		0.35		mg/kg	05-SB-05-2_OLD	2/10	0.19 - 0.28	0.35	NA	160	N	150	SSL_MIGR SSL_INH	No	BSL
Miscellaneous Parameters																	
TTNUS291	Percent Solids	75.5		90.9		mg/kg	05TP11SB0203[Q2]	8/8	---	90.9	NA	NA		NA	SSL_MIGR SSL_INH	No	NTX
TTNUS002	Ph	4.66		8.39		mg/kg	05-SB-05-2_OLD	10/10	---	8.39	NA	NA		NA	SSL_MIGR SSL_INH	No	NTX

Shaded cells indicate that the maximum concentration exceeds the specified criterion or constituent has been selected as a PCOC.

Footnotes:

1 Values presented are sample-specific quantitation limits.
2 The maximum detected concentration is used for screening purposes.
3 To determine whether metal concentrations are within background levels, a comparison of site concentrations with Base-wide background data was made by means of the Wilcoxon Rank Sum Test. If the Wilcoxon Test determined that a constituent concentration was not significanty different from background, that chemical was not selected as a PCOC.

Rationale Codes:
For Selection as a PCOC:
ASL = Above PCOC Screening Level

For Elimination as a PCOC:
BKG = Within background levels
BSL = Below PCOC Screening Level
FREQ = Frequency
NUT = Essential Nutrient

TABLE 4-1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN
POST-REMOVAL SURFACE/SUBSURFACE SOIL - SITE 5 - OPEN BURN AREAS
NSWC WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface / Subsurface Soil
Exposure Point: Entire Site

CAS Numb	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects (1)	Concentration Used for Screening(2)	Site Above Background ? (3)	Risk-Based Residential PCOC Screening Level(4)	Potential ARAR/ TBC Value	Potential ARAR/ TBC Source	PCOC Flag	Rationale for Contaminant Deletion or Selection(5)

4 The risk-based soil COPC screening level for residential land use is presented. The value is based on a target hazard quotient of 0.1 for noncarcinogens (denoted with a "N" flag) or an incremental cancer risk of 1E-6 for carcinogens (denoted with a "C" flag) (USEPA, Region III, April 2002).
5 The chemical is selected as a PCOC if the maximum detected concentration exceeds the risk-based PCOC screening level and facility-wide background levels.
6 Pyrene is used as a surrogate for benzo(g,h,i)perylene and phenanthrene.
7 Value for chlordane is used.
8 Value for endosulfan is used.
9 Value for endrin is used.
10 Value for alpha-BHC is used.
11 Cadmium - Food
12 Chromium as hexavalent chromium.
13 OSWER soil screening level for residential land use (USEPA, July 1994)
14 Manganese-Nonfood.
15 Mercury as Mercuric Chlori

Definitions:
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
J = Estimated Value
K = Value Estimated with a High Bias
L = Value Estimated with a Low Bias
N = Noncarcinogen
NA = Not Applicable/Not Available.
PCOC = Potential Constituent of Concern
SSL-INH = Soil Screening Level for transfers from soil to air (inhalation) (USEPA, May 1996)
SSL-MIGR = Soil Screening Level for transfers from soil to groundwater for a Dilution and Attenuation Factor of 20 (USEPA, Region 3, April 2002)

Associated Samples:

05-SB-01-8_OLD	05-SB-05-25_OLD	05TP12WS0204[Q2]	05TP09SB0506[Q2]
05-SB-02-22_OLD	05TP01SB0507[Q2]	05-SB-02-10_OLD	05TP09SB0506[Q2]-AVG
05-SB-03-12_OLD	05TP01WS0204[Q2]	05-SB-02-10_OLD-AVG	05TP09SB0506[Q2]-D
05-SB-03-25_OLD	05TP08SB0506[Q2]	05-SB-02-10_OLD-D	05TP09SB0506[Q2]-AVG
05-SB-04-20_OLD	05TP10SB0506[Q2]	05-SB-100_OLD	05TP09SB0506[Q2]-D
05-SB-04-6_OLD	05TP11SB0203[Q2]	05-SB-100_OLD-AVG	05TP09SB0506[Q2]-AVG
05-SB-05-2_OLD	05TP12SB0708[Q2]	05-SB-100_OLD-D	05TP09SB0506[Q2]-D

TABLE 4-2

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY - SURFACE / SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface / SubsurfaceSoil
Exposure Point: Surface / Subsurface Soil

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)pyrene	mg/kg	1.93E-01	2.29E-01	5.00E-01	J	mg/kg	2.36E-01	95% UCL-T	W - Test (1)	2.36E-01	95% UCL-T	W - Test (1)
Dibenzo(a,h)anthracene	mg/kg	1.73E-01	1.94E-01	1.20E-01	J	mg/kg	1.20E-01	95% UCL-T	W - Test (1)	1.20E-01	95% UCL-T	W - Test (1)
Aroclor-1260	mg/kg	1.67E-01	2.98E-01	1.20E+00	J	mg/kg	4.46E-01	95% UCL-T	W - Test (1)	4.46E-01	95% UCL-T	W - Test (1)
Dieldrin	mg/kg	4.74E-03	9.71E-03	5.30E-02	J	mg/kg	5.72E-03	95% UCL-T	W - Test (1)	5.72E-03	95% UCL-T	W - Test (1)
2-Amino-4,6-dinitrotoluene	mg/kg	1.27E-01	2.25E-01	1.07E+00	J	mg/kg	2.37E-01	95% UCL-T	W - Test (1)	2.37E-01	95% UCL-T	W - Test (1)
RDX	mg/kg	1.83E+00	4.80E+00	3.08E+01	J	mg/kg	3.24E+00	95% UCL-T	W - Test (1)	3.24E+00	95% UCL-T	W - Test (1)
Copper	mg/kg	1.36E+02	2.32E+02	7.01E+02	J	mg/kg	7.01E+02	Maximum	W - Test (2)	7.01E+02	Maximum	W - Test (2)
Selenium	mg/kg	7.34E+00	1.07E+01	2.56E+01	J	mg/kg	1.56E+01	95% UCL-T	W - Test (3)	1.56E+01	95% UCL-T	W - Test (3)
Thallium	mg/kg	4.50E-01	5.44E-01	9.50E-01		mg/kg	5.67E-01	95% UCL-T	W - Test (3)	5.67E-01	95% UCL-T	W - Test (3)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

1 Shapiro-Wilk W Test is inconclusive. Data are assumed to be log-normally distributed.
2 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration is used for EPC.
3 Shapiro-Wilk W Test indicates data are log-normally distributed.

TABLE 4-3

CUMULATIVE RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE TO POST-REMOVAL SOIL
SITE 5 - CHEMICAL BURN AREAS
NSWC WHITE OAK, SILVER SPRING, MARYLAND

HAZARD INDEX

Exposure Route	Full Time Worker	Maintenance/Utility Worker	Construction Worker	Adult Recreational User	Adolescent Trespasser	Day Care Center Child	Future Adult Resident	Future Child Resident
Incidental Ingestion of Surface/Subsurface Soil	3.3E-02	4.8E-03	1.1E-01	2.1E-03	1.1E-02	1.5E-01	4.6E-02	4.3E-01
Dermal Contact with Surface/Subsurface Soil	3.5E-03	5.0E-04	3.8E-03	2.4E-04	1.8E-03	1.4E-02	3.0E-03	1.9E-02
Total Hazard Index	**3.7E-02**	**5.3E-03**	**1.2E-01**	**2.4E-03**	**1.3E-02**	**1.7E-01**	**4.9E-02**	**4.5E-01**

INCREMENTAL LIFETIME CANCER RISK

Incidental Ingestion of Surface/Subsurface Soil	1.4E-06	2.0E-07	1.9E-07	1.1E-07	1.9E-07	1.5E-06	1.9E-06	4.3E-06
Dermal Contact with Surface/Subsurface Soil	1.2E-06	1.7E-07	5.1E-08	9.8E-08	2.4E-07	1.1E-06	9.5E-07	1.6E-06
Total Cancer Risk	**2.5E-06**	**3.7E-07**	**2.4E-07**	**2.0E-07**	**4.2E-07**	**2.7E-06**	**2.8E-06**	**5.9E-06**

TABLE 4-4

CUMULATIVE RISK SUMMARY - CENTRAL TENDENCY EXPOSURE TO POST-REMOVAL SOIL
SITE 5 - CHEMICAL BURN AREAS
NSWC WHITE OAK, SILVER SPRING, MARYLAND

HAZARD INDEX

Exposure Route	Full Time Worker	Maintenance/Utility Worker	Construction Worker	Adult Recreational User	Adolescent Trespasser	Day Care Center Child	Future Adult Resident	Future Child Resident
Incidental Ingestion of Surface/Subsurface Soil	1.4E-01	1.2E-03	5.7E-02	5.3E-04	2.8E-03	6.8E-02	1.6E-02	1.4E-01
Dermal Contact with Surface/Subsurface Soil	2.6E-03	2.5E-05	1.3E-03	1.5E-05	1.2E-04	2.4E-03	2.8E-04	2.6E-03
Total Hazard Index	**1.5E-01**	**1.2E-03**	**5.9E-02**	**5.5E-04**	**2.9E-03**	**7.0E-02**	**1.6E-02**	**1.5E-01**

INCREMENTAL LIFETIME CANCER RISK

Incidental Ingestion of Surface/Subsurface Soil	4.8E-07	1.8E-08	9.5E-08	7.9E-09	4.7E-08	3.4E-07	1.8E-07	4.8E-07
Dermal Contact with Surface/Subsurface Soil	6.9E-08	3.0E-09	1.7E-08	1.8E-09	1.6E-08	9.8E-08	2.7E-08	6.9E-08
Total Cancer Risk	**5.5E-07**	**2.1E-08**	**1.1E-07**	**9.8E-09**	**6.2E-08**	**4.4E-07**	**2.1E-07**	**5.5E-07**

TABLE 4-5

COMPARISON OF MAXIMUM DETECTED CONCENTRATION TO RBCs AND BACKGROUND UCL
SITE 5 - OPEN BURN AREAS
NSWC WHITE OAK, SILVER SPRING, MARYLAND

Inorganic	Maximum Concentration	Background UCL		Risk-Based PCOC Screening Level(1)	Maximum Greater Than Background (2)	Maximum Greater Than Screening Level	Retained For Further Evaluation? (3)
		Surface Soil	Subsurface Soil				
Aluminum	10300	14953	20961	7800 N	No	Yes	No
Antimony	3.1	ND	0.42	3.1 N	Yes	No	No
Arsenic	6.6	5.11	12.15	0.43 C	No	Yes	No
Barium	312	59.5	40.09	550 N	Yes	No	No
Cadmium	5.6	ND	0.179	7.8 N	Yes	No	No
Calcium	42400	1040	247	NA	Yes	No	No
Chromium(4)	40.9	29.35	41.05	23 N	No	Yes	No
Cobalt	9.5	11.81	16.6	470 N	No	No	No
Copper	701	11.52	21.62	310 N	Yes	Yes	Yes
Iron	24900	18946	28681	2300 N	No	Yes	No
Lead	687	60.2	21.23	400	Yes	Yes	Yes
Magnesium	3340	1183	2987	NA	Yes	No	No
Manganese	285	490	503	160 N	No	Yes	No
Mercury	2.3	0.142	0.051	2.3 N	Yes	No	No
Nickel	198	14.56	13.84	160 N	Yes	Yes	Yes
Potassium	898	845	2792	NA	No	No	No
Selenium	49.6	0.68	2.73	39 N	Yes	Yes	Yes
Silver	17.8	1.15	0.096	39 N	Yes	No	No
Sodium	837	ND	69.4	NA	Yes	No	No
Thallium	0.95	ND	ND	0.55 N	Yes	Yes	Yes
Vanadium	48.5	30.08	44.31	55 N	Yes	No	No
Zinc	1420	30.67	84.2	2300 N	Yes	No	No

Notes:

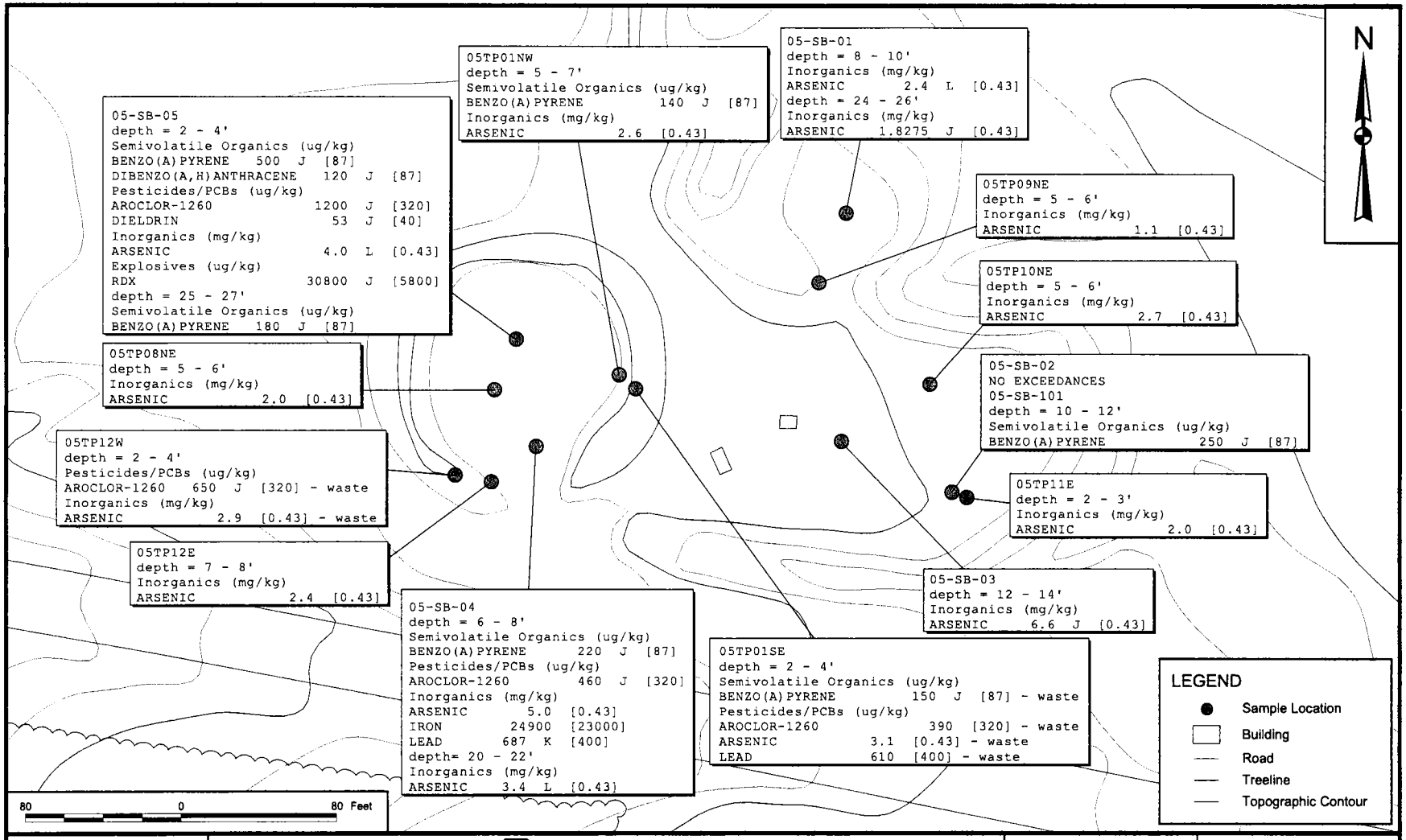
1 USEPA Region 3 RBC Table, April, 2002 (CR = 1E-6, HI = 0.1).

2 The higher of the surface and subsurface soil background concentration is used in comparison.

3 Chemical is retained for further evaluation if the maximum detected concentration exceeded both the background UCL concentration and the RBC.

4 RBC is for hexavalent chromium.

Shading indicates that the maximum detected concentration was greater than the background concentration and/or RBC.



DRAWN BY: A. JANOCHA	DATE: 9/06/02	Tetra Tech NUS, Inc.	CONTRACT NUMBER: 4246 / OWNER NUMBER: 0839
CHECKED BY: R. KOTUN	DATE: 9/09/02	SUMMARY OF EXCEEDANCES OF HUMAN HEALTH CRITERIA in Soil Remaining at SITE 5 - OPEN BURN AREA FORMER NSWC WHITE OAK SILVER SPRING, MARYLAND	APPROVED BY: — / DATE: —
COST/SCHEDULE-AREA			APPROVED BY: — / DATE: —
SCALE: AS NOTED			DRAWING NO.: FIGURE 4 - 1 / REV: 0

P:\GIS\WHITEOAK\4246.APR SWMU 5 - TEST PIT TAGS LAYOUT 9/09/02 AJ

5.0 SITE 13

5.1 SITE CHARACTERISTICS

The ground surface at Site 13 gently slopes to the south and consists of a relatively flat area. The maximum elevation relief across the site is approximately 5 feet, and the elevation of the site is approximately 260 feet. Areas adjacent to Site 13 to the west and southwest decrease to an elevation of 235 feet toward Dahlgren Road. There are no surface water bodies within Site 13. The closest surface water body is a small, southward-flowing tributary (Westfarm Branch) of Paint Branch located approximately 300 feet west of the site. During a rain event, surface water infiltrates into the surface soil or produces minor site runoff towards the tributary.

Shallow geologic conditions consist of a surficial veneer of Coastal Plain deposits of the Potomac Group that contain varying mixtures of gravel, cobbles, silt, and clay to a depth of approximately 20 to 25 feet. The upland Coastal Plain deposits on this site overlie a saprolotic and weathered bedrock layer of varying thickness. The major soils on this site are those of the CBC Association. Boring logs from monitoring well 13-MW-01 indicated a loose, poorly sorted gravel layer in a light brown sandy silt matrix observed in the near-surface soils at 2 feet and continuing to a depth of 10 feet bgs. A brown, grayish soft to medium-soft micaceous silty sand was observed at a depth of approximately 10 to 22 feet bgs. This layer was saprolitic in character with prevalent rust and black stains/striations.

5.2 NATURE AND EXTENT

The dataset for post-removal conditions at Site 13 consisted of three surface soil and three subsurface soil samples (1 to 2 feet bgs) collected during the SSR for IRP Sites 1, 5, 6, 12, 13, 28, 29, 31, 32, and 33, EBS AOC 100 (TtNUS, 1998) field investigation, 13 subsurface soil samples (4 to 14 feet bgs) collected by TtNUS in September 2001, and seven post-removal subsurface soil samples collected by TtNUS in May 2002 (Appendix D). This dataset presents conditions at the site after the excavation of surface soils at Site 13. Soil sampling locations and any contaminant detections above the human health screening criteria are shown in Figure 5-1. The samples were analyzed for TCL VOCs, TCL SVOCs, TCL Pesticides/PCBs, TAL Metals, cyanide, and EPA SW846-8330 explosives. The samples collected in 2001 were analyzed for VOCs only.

Twelve VOCs (primarily chlorinated hydrocarbons, such a 1,1,2,2-tetrachloroethane and TCE) were detected in the combined dataset. However, most of the VOCs were detected in the 2001 sampling event. The most commonly detected chemicals were chloromethane (found in 14 of 27 samples) and 1,1,2,2-tetrachloroethane (7 of 27 samples). The maximum concentrations of all VOCs detected in soil

were less than screening levels for residential land use. The maximum concentrations of 1,1,2,2-tetrachloroethane, TCE, and 1,2-dibromo-3-chloropropane exceeded EPA Region 3 SSLs (DAF 20) for the protection of groundwater.

Two classes of SVOCs were detected in the post-removal dataset, PAHs and phthalate esters. Of these, only the concentrations of two PAHs [benzo(a)pyrene and dibenzo(a,h)anthracene] exceeded residential screening levels for the protection of human health. The PAHs exceeding screening levels were found only in the samples collected in 1997, primarily at locations 13-SB-01 and 13-SB-02. PAHs can be associated with oil disposal or the waste management practices that were conducted at Site 13.

One PCB (Aroclor 1260) and six pesticides (DDT, DDD, DDE, alpha- and gamma-chlordane and dieldrin,) were detected in the both the 1997 and 2002 post-removal subsurface soil samples. The maximum concentrations of all these compounds were less than screening levels for residential land use.

No explosives were detected in the subsurface soil samples collected at Site 13.

The following inorganics were detected in excess of screening levels for residential land use: aluminum, arsenic, chromium, iron, manganese, and thallium. The concentrations of all of these, with the exception of thallium, were detected at concentrations within background ranges for surface and subsurface soil at NSWC White-Oak.

5.3 CONTAMINANT FATE AND TRANSPORT

This section presents a brief overview of contaminant fate and transport issues at Site 13. This discussion focuses on some of the major types of contaminants found at the site. Table 2.4 presents the physical and chemical properties of the compounds detected at Site 13. Fate and transport characteristics of the major types of constituents detected at Site 13 are discussed below.

The sources of contamination at Site 13 are the approximately 6,000 to 10,000 gallons of oily sludge from storage tanks containing No. 6 fuel oil that were spread over the surface of the site between 1970 and 1978.

5.3.1 Volatile Organics

Several types of VOCs were detected in soil at Site 13: chlorinated solvents, such as TCE; ketones, such as 2-butanone; and fuel-related compounds (BTEX), such as toluene and xylenes. Of these, only the maximum concentrations of the chlorinated compounds, 1,1,2,2-tetrachloroethane, TCE, and 1,2-dibromo-3-chloropropane, exceeded EPA Region 3 SSLs for the protection of groundwater (DAF20).

VOCs are typically considered to be fairly soluble and to have a low capacity for retention by soil organic carbon; therefore, these compounds are most frequently detected in groundwater. These types of chemicals may migrate through the soil column after being released by a spill event or by subsurface waste burial as infiltrating precipitation solubilizes them. Some portion of these chemicals is retained by the soil, but most will continue migrating downward until they reach the water table where migration is primarily lateral with the hydraulic gradient. They may migrate to surface water and sediment, but attenuation and dilution factors such as volatilization may result in their disappearance.

5.3.2 Phthalate Esters

Several phthalates were detected in soil at Site 13. The maximum concentrations of all phthalates were less than EPA Region 3 SSLs for the protection of groundwater. Phthalate esters are considered to be relatively persistent chemicals in the environment. Although numerous studies have demonstrated that phthalate esters undergo biodegradation, it appears that this is a slow process in both soils and surface waters. Certain microorganisms have been shown to excrete products that increase the solubility of phthalate esters and enhance their biodegradation. Biodegradation of bis(2-ethylhexyl) phthalate and di-n-butyl phthalate in water is an important fate mechanism. However, hydrolysis of bis(2-ethylhexyl) phthalate is very slow, with a calculated half-life of 2,000 years (TOXNET, September 2002). In soil, microorganisms appear to be capable of degrading di-n-butyl phthalate rapidly. Bioaccumulation is also a significant fate process. Photolysis and volatilization are considered to be insignificant degradation mechanisms.

5.3.3 Polycyclic Aromatic Hydrocarbons

PAHs are generally considered to be fairly immobile chemicals in the environment. They are large molecules with high K_{oc} values and low solubilities when compared to VOCs. These compounds, when found in the soil, generally do not migrate vertically to a great extent. Instead, they are more likely to adhere to soil particles and be removed from the site via surface runoff and erosional processes. PAHs were detected in subsurface soil samples collected at Site 13, but the concentrations of only one PAH (benzo(a)pyrene) exceeded the EPA Region 3 soil screening criteria for the protection of groundwater. Benzo(a)pyrene has not been detected in any groundwater samples at NSWC-White Oak. The absence of PAHs in groundwater is evidence of their immobility.

5.3.4 Pesticides

Pesticides were widely used at NSWC-White Oak. Many of the compounds detected are no longer licensed for general sale and use in the United States. Therefore, it is assumed that much of what was

detected at Site 13 is representative of past application for insect control. They were detected in subsurface soil at Site 13.

Like PAHs, pesticides as a class of compounds are not considered to be very mobile in the environment. These chemicals, upon application or disposal, tend to remain affixed to soil particles. Migration of pesticides occurs primarily by erosion via the action of wind or water. Erosion accounts for their presence in sediment. Only one pesticide (dieldrin) was detected at concentrations exceeding its migration to groundwater SSLs, but this compound has not been detected in groundwater at NSWC-White Oak. The absence of dieldrin in groundwater is consistent with its tendency to bind to soil and sediment and with its low solubility in water.

5.3.5 Polychlorinated Biphenyls

One PCB (Aroclor 1260) was detected in 3 of 13 soil samples at Site 13. The concentrations of Aroclor 1260 in all samples were less than EPA Region 3 SSLs for the protection of groundwater. PCBs are considered to be very persistent organic chemicals. Biodegradation is the only process known to transform PCBs under environmental conditions, and only the lighter compounds are measurably biodegraded. As with PAHs and pesticides, PCBs are not considered to be mobile in the environment, and the absence of Aroclor 1260 in groundwater is consistent with its low water solubility and its tendency to bind to soil particles.

5.3.6 Inorganics (Metals and Cyanide)

Twenty-two metals and cyanide were detected in soil samples collected at Site 13. Only the concentrations of arsenic exceeded the Region 3 SSLs for the protection of groundwater; however, arsenic was determined to be within background levels at the site. Because inorganics are frequently incorporated into the soil matrix and remain bound to particulate matter, they also migrate from source areas via bulk movement processes (erosion). The larger particles (>0.45 microns, which are removed via the filtration step prior to water analysis) are not generally considered to be mobile in groundwater. The metals detected in unfiltered groundwater samples are likely to be representative of suspended soil material in the samples.

There are some instances, however, where these metals are found at such concentrations or in such form as to be able to migrate in solution. It is possible that industrial activities could saturate all available exchange sites in soil and result in a metal being mobilized. Metals are also more mobile under acidic conditions, which may exist in areas where plating-type activities have occurred. Finally, a metal solution may be utilized in some industrial applications. In these cases, it is possible for metals to migrate vertically through the soil column and reach the groundwater.

The fate and transport properties of cyanide (detected in 1 of 6 samples at Site 13) are different from metals in that it is expected to have very high mobility in soil; however, the maximum concentration of cyanide (0.24 mg/kg) was much less that its SSL for the protection of groundwater (150 mg/kg). Volatilization from moist soil surfaces is expected to be an important fate process based upon published Henry's Law constants. Cyanide may volatilize from dry soil surfaces based upon its vapor pressure. If released into water, cyanide is not expected to adsorb to suspended solids and sediment. Volatilization from water surfaces is expected to be an important fate process based upon this compound's estimated Henry's Law constant. Estimated volatilization half-lives for a model river and model lake are 3 hours and 3 days, respectively (TOXNET, September 2002). An estimated BCF of 3 suggests the potential for bioconcentration in aquatic organisms is low. The general population may be exposed to hydrogen cyanide from automobile exhaust and waste incinerators. Cyanide can be biodegraded by acclimated microbial cultures and sludges.

5.4 SITE 13, BASELINE HUMAN HEALTH RISK ASSESSMENT

This section presents the results of the baseline HHRA for Site 13, the Oil Sludge Disposal Area. The risk assessment was performed using the general methodologies presented in Section 2.7. Site-specific information on data evaluation (i.e., the selection of PCOCs), identification of exposure scenarios and exposure point concentrations, characterization of potential human health risks, and specific uncertainties associated with the Site 13 risk assessment are contained in Sections 5.4.1 through 5.4.4.

5.4.1 Data Evaluation

A discussion of the chemicals selected as PCOCs for the surface and subsurface soil remaining at Site 13 is provided in this section.

Identification of PCOCs in Soil

A list of PCOCs was developed for surface/subsurface soil collected from depths of 0 to 14 feet bgs. A summary of the PCOC selection process for surface soil is presented in Table 5-1. PCOCs for soil are those chemicals reported at maximum concentrations greater than EPA Region III RBC screening levels for residential soil ingestion, EPA Generic SSLs for inhalation (transfer from soil to air), and basewide background levels. (SS Levels for GW? see opp. pg.)??

The following chemicals were retained as PCOCs for soil at Site 13:

- PAHs - benzo(a)pyrene, dibenzo(a,h,)anthracene
- Inorganics – thallium

No PCOCs exceeded EPA SSLs for inhalation (transfer from soil to air). Consequently, risks from inhalation of vapors and particulates from soil emissions are not quantified in the risk assessment.

The maximum concentrations of a number of constituents (1,1,2,2-tetrachloroethane, 1,2-dibromo-3-chloropropane, TCE, benzo(a)pyrene, and arsenic) exceeded the EPA Region 3 SSLs for migration to groundwater (DAF20). Although the comparison indicates that these chemicals may impact groundwater quality, the actual impact to groundwater may not be significant. Of the inorganic constituents listed above, arsenic was determined to be within naturally occurring background levels at the site (see Table 5-1). Of the organic constituents which exceeded their respective SSLs, the Koc value for benzo(a)pyrene indicates that this chemical is not mobile in the environment and is not likely to migrate to groundwater. This is evidenced by the fact that benzo(a)pyrene has not been detected in groundwater samples collected in previous investigations at NSWC-White Oak. 1,2-Dibromo-3-chloropropane was detected in only 1 of 21 soil samples at a depth of 8 feet bgs but was not detected in a sample collected from the same boring at a depth of 10 feet bgs. The concentration of 1,2-dibromo-3-chloropropane in the sample was qualified as estimated because the concentration was less than the sample quantitation limit. The information provided in Table 5-1 indicates that that the concentrations of most chemicals detected in soil at Site 13 are not likely to pose any adverse impacts to groundwater. However, the data show that there is some potential for 1,1,2,2-tetrachloroethane and TCE to migrate from soil and impact local groundwater.

Add to Summary & Conclusions

Surface Soil, Subsurface, or Both — specify which

5.4.2 Exposure Assessment

As identified in Section 2.7.2, several potential human receptors are evaluated for exposure to contaminated soil at Site 13. These include: full time workers, maintenance/utility workers, construction workers, adult recreational users, adolescent trespassers, day care center children, and child and adult residents.

Exposure point concentrations for those chemicals identified as PCOCs for soil are presented in Table 5-2. As indicated in Section 2.7.2.3, the 95 percent UCL was used as the exposure point concentration for soil at Site 5.

5.4.3 Results of the Risk Characterization

This section contains a summary of the results of the risk characterization for Site 13. Quantitative risk estimates are discussed in the following sections.

5.4.3.1 Quantitative Risk Estimates

Quantitative risk estimates for potential human receptors are developed for those chemicals identified as PCOCs at Site 13. Potential noncarcinogenic and carcinogenic risks for the full time worker, maintenance/utility worker, construction worker, adult recreational user, adolescent trespasser, a child in a day care center, and future residents (adult and child) are summarized in Tables 5-3 and 5-4 for the RME and CTE, respectively. All risk spreadsheets containing the detailed, chemical-specific risks are included in Appendix G. A discussion of the estimated noncarcinogenic and carcinogenic risks is provided in the remainder of this section.

Noncarcinogenic Risks

As indicated in Tables 5-3 and 5-4, cumulative HIs for all receptors are less than unity, indicating that no toxic effects are anticipated for these receptors under the defined exposure conditions.

Carcinogenic Risks

The cumulative ILCRs for maintenance/utility workers, construction workers, adult recreational users, and adolescent trespassers (Table 5-3) under the RME scenario are less than 1E-6.

The ILCRs for full time workers, day care center children and future residents are within the EPA target risk range, 1E-6 to 1E-4. As shown in the RAGS-Part D Table 9's presented in Appendix G, the risks exceeding 1E-6 are mainly due to exposure to benzo(a)pyrene.

5.4.4 Uncertainty Analysis

General uncertainties associated with the risk assessment are discussed in Section 2.7.5. Specific uncertainty issues associated with the risks estimated for Site 13 are addressed in this section.

Some uncertainty associated with the identification of metals as PCOCs still exists. A statistical analysis (Wilcoxon Rank-Sum Test) of site metal concentrations compared to site-specific background concentrations was conducted to determine if site concentrations were significantly greater than the background concentrations. If they were significantly greater than background, and the maximum detected concentrations were greater than the screening level, i.e., one-tenth the RBC for noncarcinogens and the RBC for carcinogens, they were identified as PCOCs. If the site concentration was not significantly greater than the background concentration, the metal was not identified as a PCOC, even if its maximum concentration was greater than the screening level. The statistical analysis accounts for the variability in concentrations; however, at times, a review of the data suggested that certain metals should be identified as PCOCs even when the statistical analysis indicated otherwise.

A review of the Site 13 metals data indicates that aluminum, iron, manganese, and thallium had maximum detected concentrations greater than the UCL of the facility background concentrations and greater than their respective screening levels (Table 5-5). Thallium was selected as a PCOC and was evaluated in the quantitative risk assessment. Aluminum, iron, manganese were not selected as PCOCs because they were determined to be within background levels by the Wilcoxon Rank-Sum Test. However, only the Site 13 UCL concentration for manganese is greater than the UCL of the site-specific background concentration and its screening levels (Table 5-6). If manganese had been carried through the quantitative risk assessment for the most sensitive receptor (the future child resident), the HQ for manganese would have been 0.14, and the total HI for the child resident would have increased from 0.16 (Table 5-3) to 0.3. The cumulative HI would still be less than unity, indicating that no toxic effects would be expected for exposure to soil at the site. Based on this evaluation, the results and conclusions of the risk assessment would not have changed if aluminum, iron, and manganese had been included quantitative risk analysis.

5.5 SUMMARY AND CONCLUSIONS

The human health risk assessment for Site 13 was performed to characterize the potential risks to likely human receptors under current and future land use. Potential receptors are full time workers, maintenance/utility workers, construction workers, recreational users, trespassers, day care center children, and hypothetical child and adult residents.

Soil remaining @
The list of PCOCs for Site 13 includes the following:

- Benzo(a)pyrene, dibenzo(a,h,)anthracene, thallium

Quantitative estimates of noncarcinogenic and carcinogenic risks (HIs and ILCRs, respectively) were developed for these potential human receptors. The results of the quantitative risk analysis indicated minimal risks (i.e., HIs less than unity and ILCRs within the EPA target risk range) for all potential receptors for exposure to soil at Site 13.
~ either surface or subsurface (pg 5-5)

Potential inhalation exposures from soil at Site 13 were semi-quantitatively evaluated in the risk assessment in Table 5-1. Inhalation of volatile emissions from soil and fugitive dust were evaluated by comparing maximum constituent concentrations to EPA SSLs for transfers from soil to air. The SSLs are based on residential land use and lifetime exposure scenarios and are, therefore, conservative values for workers, recreational users, trespassers, and day care center children. As shown in Table 5-1, maximum detected concentrations were less than the inhalation SSLs for all constituents and potential risks associated with inhalation exposures risks via migration from soil to air are expected to be minimal.

* Add ¶ summarizing ECO Risk, ie absence of!

pg 5-6. * ¶ discussing no risk to G-W from soil contam. remaining?

TABLE 5-1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN
POST-REMOVAL SURFACE/SUBSURFACE SOIL - SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface / Subsurface Soil
Exposure Point: Entire Site

CAS Numb	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects (1)	Concentration Used for Screening(2)	Site Above Background ? (3)	Risk-Based Residential PCOC Screening Level(4)		Potential ARAR/ TBC Value	Potential ARAR/ TBC Source	PCOC Flag	Rationale for Contaminant Deletion or Selection(5)
Volatile Organics (mg/kg)																	
79-34-5	1,1,2,2-Tetrachloroethane	0.0015	J	0.171		mg/kg	13SB207-14	7/27	0.01 - 0.0216	0.171	NA	3.2	C	0.00068 0.6	SSL_MIGR SSL_INH	No	BSL
95-50-1	1,2 Dichlorobenzene	0.0027		0.0027		mg/kg	13SB203-06	1/21	0.00267 - 0.0136	0.0027	NA	700	N	4.6 560	SSL_MIGR SSL_INH	No	BSL, FREQ
96-12-8	1,2-Dibromo-3-chloropropane	0.00598	J	0.00598	J	mg/kg	13SB201-08	1/21	0.00359 - 0.0136	0.00598	NA	0.46	C	0.00087	SSL_MIGR SSL_INH	No	BSL, FREQ
106-46-7	1,4 Dichlorobenzene	0.00247	J	0.0027	J	mg/kg	13SB201-08	2/21	0.00976 - 0.0136	0.0027	NA	27	C	0.0071	SSL_MIGR SSL_INH	No	BSL
78-93-3	2-Butanone	0.0019	J	0.0019	J	mg/kg	13TP04WS0203	1/13	0.01 - 0.014	0.0019	NA	4700	N	7.9	SSL_MIGR SSL_INH	No	BSL
591-78-6	2-Hexanone	0.00775	J	0.0132	J	mg/kg	13SB203-06	2/27	0.00976 - 0.0172	0.0132	NA	310	N	NA	SSL_MIGR SSL_INH	No	BSL
67-64-1	Acetone	0.00335	J	0.00405	J	mg/kg	13SB206-10	2/27	0.0015 - 0.0172	0.00405	NA	780	N	2.5 100000	SSL_MIGR SSL_INH	No	BSL
74-87-3	Chloromethane	0.00192	J	0.00513	J	mg/kg	13SB207-14	14/27	0.01 - 0.014	0.00513	NA	49	C	0.01	SSL_MIGR SSL_INH	No	BSL
79-20-9	Methyl Acetate	0.00215	J	0.0107		mg/kg	13SB206-10	4/19	0.01 - 0.014	0.0107	NA	7800	N	25	SSL_MIGR SSL_INH	No	BSL
127-18-4	Tetrachloroethene	0.001	J	0.00254	J	mg/kg	13SB207-14	4/27	0.01 - 0.0216	0.00254	NA	12	C	0.029 11	SSL_MIGR SSL_INH	No	BSL
1330-20-7	Total Xylenes	0.06		0.06		mg/kg	13TP04WS0203	1/27	0.00976 - 0.0216	0.06	NA	16000	N	170 410	SSL_MIGR SSL_INH	No	BSL, FREQ
79-01-6	Trichloroethene	0.00246	J	0.0162	J	mg/kg	13SB201-08	4/27	0.01 - 0.0216	0.0162	NA	1.6	C	0.00026 5	SSL_MIGR SSL_INH	No	BSL
Semivolatile Organics (mg/kg)																	
91-57-6	2-Methylnaphthalene	0.044	J	0.044	J	mg/kg	13TP04WS0203	1/13	0.35 - 0.47	0.044	NA	160	N	22	SSL_MIGR SSL_INH	No	BSL
83-32-9	Acenaphthene	0.062	J	0.062	J	mg/kg	13-SS-01	1/13	0.35 - 0.47	0.062	NA	470	N	100	SSL_MIGR SSL_INH	No	BSL
120-12-7	Anthracene	0.042	J	0.14	J	mg/kg	13-SS-01	4/13	0.36 - 0.47	0.14	NA	2300	N	470	SSL_MIGR SSL_INH	No	BSL
56-55-3	Benzo(a)anthracene	0.058	J	0.48	J	mg/kg	13-SB-02	5/13	0.36 - 0.47	0.48	NA	0.87	C	1.5	SSL_MIGR SSL_INH	No	BSL
50-32-8	Benzo(a)pyrene	0.041	J	0.39	J	mg/kg	13-SS-01	5/13	0.36 - 0.47	0.39	NA	0.087	C	0.37	SSL_MIGR SSL_INH	Yes	ASL
205-99-2	Benzo(b)fluoranthene	0.095	J	0.78		mg/kg	13-SS-02	4/13	0.36 - 0.47	0.78	NA	0.87	C	4.5	SSL_MIGR SSL_INH	No	BSL
191-24-2	Benzo(g,h,i)perylene	0.2	J	0.29	J	mg/kg	13-SS-01	3/13	0.36 - 0.47	0.29	NA	230(6)	N	680(6)	SSL_MIGR SSL_INH	No	BSL
207-08-9	Benzo(k)fluoranthene	0.19	J	0.25	J	mg/kg	13-SS-01	2/13	0.35 - 0.47	0.25	NA	8.7	C	45	SSL_MIGR SSL_INH	No	BSL
117-81-7	Bis(2-Ethylhexyl)phthalate	0.056	J	0.26	J	mg/kg	13-SB-02	3/13	0.35 - 0.47	0.26	NA	46	C	2900 31000	SSL_MIGR SSL_INH	No	BSL
86-74-8	Carbazole	0.096	J	0.096	J	mg/kg	13-SS-01	1/13	0.35 - 0.47	0.096	NA	32	C	0.47	SSL_MIGR SSL_INH	No	BSL
218-01-9	Chrysene	0.047	J	0.5	J	mg/kg	13-SB-02	5/13	0.36 - 0.47	0.5	NA	87	C	150	SSL_MIGR SSL_INH	No	BSL

TABLE 5-1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN
POST-REMOVAL SURFACE/SUBSURFACE SOIL - SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface / Subsurface Soil
Exposure Point: Entire Site

CAS Numb	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects (1)	Concentration Used for Screening(2)	Site Above Background ? (3)	Risk-Based Residential PCOC Screening Level(4)		Potential ARAR/ TBC Value	Potential ARAR/ TBC Source	PCOC Flag	Rationale for Contaminant Deletion or Selection(5)
53-70-3	Dibenzo(a,h)anthracene	0.088	J	0.14	J	mg/kg	13-SS-01	3/13	0.36 - 0.47	0.14	NA	0.087	C	1.4	SSL_MIGR SSL_INH	Yes	ASL
206-44-0	Fluoranthene	0.037	J	1.1		mg/kg	13-SS-01	6/13	0.36 - 0.47	1.1	NA	310	N	6300	SSL_MIGR SSL_INH	No	BSL
86-73-7	Fluorene	0.058	J	0.064	J	mg/kg	13TP04WS0203	2/13	0.36 - 0.47	0.064	NA	310	N	140	SSL_MIGR SSL_INH	No	BSL
193-39-5	Indeno(1,2,3-cd)pyrene	0.2	J	0.25	J	mg/kg	13-SS-01	3/13	0.36 - 0.47	0.25	NA	0.87	C	13	SSL_MIGR SSL_INH	No	BSL
91-20-3	Naphthalene	0.068	J	0.068	J	mg/kg	13TP04WS0203	1/13	0.36 - 0.47	0.068	NA	160	N	0.15	SSL_MIGR SSL_INH	No	BSL
85-01-8	Phenanthrene	0.073	J	0.59		mg/kg	13-SS-01	5/13	0.36 - 0.47	0.59	NA	230(6)	N	680(6)	SSL_MIGR SSL_INH	No	BSL
129-00-0	Pyrene	0.041	J	0.89	J	mg/kg	13-SB-02	6/13	0.36 - 0.47	0.89	NA	230	N	680	SSL_MIGR SSL_INH	No	BSL
Pesticides/PCBs (mg/kg)																	
72-54-8	4,4'-DDD	0.00061	J	0.017	J	mg/kg	13-SS-01	3/12	0.0019 - 0.0047	0.017	NA	2.7	C	11	SSL_MIGR SSL_INH	No	BSL
72-55-9	4,4'-DDE	0.00049	J	0.071	K	mg/kg	13-SS-01	4/13	0.0019 - 0.0047	0.071	NA	1.9	C	35	SSL_MIGR SSL_INH	No	BSL
50-29-3	4,4'-DDT	0.00071	J	0.039	K	mg/kg	13-SS-01	2/12	0.0019 - 0.0047	0.039	NA	1.9	C	1.2	SSL_MIGR SSL_INH	No	BSL
5103-71-9	alpha-Chlordane	0.0017	J	0.0078	K	mg/kg	13-SS-01	2/13	0.0017 - 0.0024	0.0078	NA	1.8(7)	C	0.92(7) 20(7)	SSL_MIGR SSL_INH	No	BSL
11096-82-5	Aroclor-1260	0.059	J	0.17	J	mg/kg	13-SS-01	3/13	0.036 - 0.047	0.17	NA	0.32	C	0.41	SSL_MIGR SSL_INH	No	BSL
60-57-1	Dieldrin	0.00029	J	0.015	J	mg/kg	13-SS-01	2/13	0.0019 - 0.0047	0.015	NA	0.04	C	0.0022 1	SSL_MIGR SSL_INH	No	BSL
5103-74-2	gamma-Chlordane	0.0016	J	0.0037	K	mg/kg	13-SS-01	2/13	0.0017 - 0.0024	0.0037	NA	1.8(7)	C	0.92(7) 20(7)	SSL_MIGR SSL_INH	No	BSL
Inorganics (mg/kg)																	
7429-90-5	Aluminum	768		21600		mg/kg	13-SB-03	13/13	---	21600	No	7800	N	NA	SSL_MIGR SSL_INH	No	BKG
7440-38-2	Arsenic	0.62		3.9	L	mg/kg	13-SB-03	13/13	---	3.9	No	0.43	C	0.026 750	SSL_MIGR SSL_INH	No	BKG
7440-39-3	Barium	1.8		71.1		mg/kg	13-SS-03	13/13	---	71.1	No	550	N	2100 690000	SSL_MIGR SSL_INH	No	BSL, BKG
7440-41-7	Beryllium	0.08		0.97		mg/kg	13TP05WS0103	3/13	0.02 - 0.76	0.97	Yes	16	N	1200 1300	SSL_MIGR SSL_INH	No	BSL
7440-43-9	Cadmium	0.062	K	0.4		mg/kg	13-SS-01	4/13	0.019 - 0.08	0.4	No	7.8(8)	N	55(8) 1800	SSL_MIGR SSL_INH	No	BSL, BKG
7440-70-2	Calcium	254		20700		mg/kg	13-SS-02	7/13	33.6 - 213	20700	Yes	NA		NA	SSL_MIGR SSL_INH	No	NUT
7440-47-3	Chromium	2.2		28.1	J	mg/kg	13-SB-03	13/13	---	28.1	No	23(9)	N	42(9) 270	SSL_MIGR SSL_INH	No	BKG
7440-48-4	Cobalt	0.16		21.5		mg/kg	13-SS-03	11/13	0.094 - 0.63	21.5	No	160	N	NA	SSL_MIGR SSL_INH	No	BSL, BKG
7440-50-8	Copper	1.3	J	68.4		mg/kg	13-SS-01	13/13	---	68.4	No	310	N	11000	SSL_MIGR SSL_INH	No	BSL, BKG

TABLE 5-1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN
POST-REMOVAL SURFACE/SUBSURFACE SOIL - SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface / Subsurface Soil
Exposure Point: Entire Site

CAS Numb	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects (1)	Concentration Used for Screening(2)	Site Above Background ? (3)	Risk-Based Residential PCOC Screening Level(4)		Potential ARAR/ TBC Value	Potential ARAR/ TBC Source	PCOC Flag	Rationale for Contaminant Deletion or Selection(5)
7439-89-6	Iron	1760		39000	J	mg/kg	13TP05WS0103-D	13/13	---	39000	No	2300	N	NA	SSL_MIGR SSL_INH	No	BKG
7439-92-1	Lead	0.9		40.6		mg/kg	13-SS-01	13/13	---	40.6	No	400(10)		NA	SSL_MIGR SSL_INH	No	BSL, BKG
7439-95-4	Magnesium	35.4		5370		mg/kg	13TP05WS0103-D	13/13	---	5370	No	NA		NA	SSL_MIGR SSL_INH	No	NUT, BKG
7439-96-5	Manganese	3	J	699		mg/kg	13-SS-03	13/13	---	699	No	160(11)	N	950(11)	SSL_MIGR SSL_INH	No	BKG
7439-97-6	Mercury	0.022		0.16		mg/kg	13-SS-01	12/13	0.02	0.16	No	2.3(12)	N	NA	SSL_MIGR SSL_INH	No	BSL, BKG
7440-02-0	Nickel	0.38	J	65.5	J	mg/kg	13TP05WS0103-D	13/13	---	65.5	No	160	N	NA 13000	SSL_MIGR SSL_INH	No	BSL, BKG
7440-09-7	Potassium	26.9		3400		mg/kg	13-SS-03	13/13	---	3400	No	NA		NA	SSL_MIGR SSL_INH	No	NUT, BKG
7782-49-2	Selenium	0.43		3.8	J	mg/kg	13-SB-03	11/12	0.37	3.8	Yes	39	N	19	SSL_MIGR SSL_INH	No	BSL
7440-22-4	Silver	0.073		0.21		mg/kg	13TP05WS0103-D	1/13	0.067 - 0.22	0.21	No	39	N	31	SSL_MIGR SSL_INH	No	BSL, BKG
7440-23-5	Sodium	106		106		mg/kg	13-SS-03	1/13	16.1 - 101	106	No	NA		NA	SSL_MIGR SSL_INH	No	NUT, BKG
7440-28-0	Thallium	0.48		3	K	mg/kg	13TP05WS0103-D	7/13	0.39 - 0.76	3	Yes	0.55	N	3.6	SSL_MIGR SSL_INH	Yes	ASL
7440-62-2	Vanadium	4.1		39.4		mg/kg	13-SB-03	13/13	---	39.4	No	55	N	5100	SSL_MIGR SSL_INH	No	BSL, BKG
7440-66-6	Zinc	6.3	J	70		mg/kg	13-SS-01	8/13	1.4 - 3.8	70	No	2300	N	14000	SSL_MIGR SSL_INH	No	BSL, BKG
57-12-5	Cyanide	0.24		0.24		mg/kg	13-SB-03	1/6	0.18 - 0.32	0.24	NA	160	N	150	SSL_MIGR SSL_INH	No	BSL
Miscellaneous Parameters																	
TTNUS291	Percent Solids (%)	83.8		95.6		mg/kg	13SB202-08	17/17	---	95.6	NA	NA		NA	SSL_MIGR SSL_INH	No	NTX
TTNUS002	Ph (s.u.)	5.65		7.98		mg/kg	13-SB-02	6/6	---	7.98	NA	NA		NA	SSL_MIGR SSL_INH	No	NTX
TTNUS003	Total Organic Carbon	434		434		mg/kg	13SB201-10	1/1	---	434	NA	NA		NA	SSL_MIGR SSL_INH	No	NTX

Shaded cells indicate that the maximum concentration exceeds the specified criterion or constituent has been selected as a PCOC.

Footnotes:

1 Values presented are sample-specific quantitation limits.
2 The maximum detected concentration is used for screening purposes.
3 To determine whether metal concentrations are within background levels, a comparison of site concentrations with Base-wide background data was made by means of the Wilcoxon Rank Sum Test. If the Wilcoxon Test determined that a constituent concentration was not significantly different from background, that chemical was not selected as a PCOC.
4 The risk-based soil COPC screening level for residential land use is presented. The value is based on a target hazard quotient of 0.1 for noncarcinogens (denoted with a "N" flag) or an incremental cancer risk of 1E-6 for carcinogens (denoted with a "C" flag) (USEPA, Region III, April 2002).

Rationale Codes:
For Selection as a PCOC:
ASL = Above PCOC Screening Level

For Elimination as a PCOC:
BKG = Within background levels
BSL = Below PCOC Screening Level
FREQ = Frequency
NUT = Essential Nutrient

TABLE 5-1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN
POST-REMOVAL SURFACE/SUBSURFACE SOIL - SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface / Subsurface Soil
Exposure Point: Entire Site

CAS Numb	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects (1)	Concentration Used for Screening(2)	Site Above Background ? (3)	Risk-Based Residential PCOC Screening Level(4)	Potential ARAR/ TBC Value	Potential ARAR/ TBC Source	PCOC Flag	Rationale for Contaminant Deletion or Selection(5)

5 The chemical is selected as a PCOC if the maximum detected concentration exceeds the risk-based PCOC screening level and facility-wide background levels.
6 Pyrene is used as a surrogate for benzo(g,h,i)perylene and phenanthrene.
7 Value for chlordane is used.
8 Cadmium - Food
9 Chromium as hexavalent chromium.
10 OSWER soil screening level for residential land use (USEPA, July 1994)
11 Manganese-Nonfood.
12 Mercury as Mercuric Chloride.

Definitions:
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
J = Estimated Value
K = Value Estimated with a High Bias
L = Value Estimated with a Low Bias
N = Noncarcinogen
NA = Not Applicable/Not Available.
PCOC = Potential Constituent of Concern
SSL-INH = Soil Screening Level for transfers from soil to air (Inhalation) (USEPA, May 1996)
SSL-MIGR = Soil Screening Level for transfers from soil to groundwater for a Dilution and Attenuation Factor of 20 (USEPA, Region 3, April 2002)

Associated Samples:

13-SB-01	13SB201-08	13SB205-10	13TP04WS0203
13-SB-02	13SB201-10	13SB205-4	13TP05SB0607
13-SB-03	13SB202-08	13SB206-10	13TP05WS0103
13-SB-03-AVG	13SB202-12	13SB206-14	13TP05WS0103-AVG
13-SB-03-D	13SB203-06	13SB207-10	13TP05WS0103-D
13-SS-01	13SB203-12	13SB207-14	13TP06SB0203
13-SS-02	13SB204-10	13TP03SB0405	13TP07SB0304
13-SS-03	13SB204-14	13TP04SB0405	

TABLE 5-2

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY - SURFACE / SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface / SubsurfaceSoil
Exposure Point: Surface / Subsurface Soil

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)pyrene	mg/kg	2.00E-01	2.46E-01	3.90E-01	J	mg/kg	2.46E-01	95% UCL-N	W - Test (1)	2.46E-01	95% UCL-N	W - Test (1)
Dibenzo(a,h)anthracene	mg/kg	1.76E-01	1.94E-01	1.40E-01	J	mg/kg	1.40E-01	Maximum	W - Test (2)	1.40E-01	Maximum	W - Test (2)
Thallium	mg/kg	6.09E-01	8.49E-01	2.10E+00		mg/kg	8.84E-01	95% UCL-T	W - Test (3)	8.84E-01	95% UCL-T	W - Test (3)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

1 Shapiro-Wilk W Test indicates data are normally distributed.
2 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration is used for EPC.
3 Shapiro-Wilk W Test indicates data are log-normally distributed.

TABLE 5-3

CUMULATIVE RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE TO POST-REMOVAL SOIL
SITE 13 - OU1
NSWC WHITE OAK, SILVER SPRING, MARYLAND

HAZARD INDEX

Exposure Route	Full Time Worker	Maintenance/Utility Worker	Construction Worker	Adult Recreational User	Adolescent Trespasser	Day Care Center Child	Future Adult Resident	Future Child Resident
Incidental Ingestion of Surface/Subsurface Soil	1.2E-02	1.8E-03	4.3E-02	7.9E-04	4.2E-03	5.8E-02	1.7E-02	1.6E-01
Dermal Contact with Surface/Subsurface Soil	8.2E-05	1.2E-05	8.8E-05	5.7E-06	4.1E-05	3.2E-04	6.9E-05	4.5E-04
Total Hazard Index	**1.2E-02**	**1.8E-03**	**4.3E-02**	**8.0E-04**	**4.2E-03**	**5.8E-02**	**1.7E-02**	**1.6E-01**

INCREMENTAL LIFETIME CANCER RISK

Incidental Ingestion of Surface/Subsurface Soil	9.9E-07	1.4E-07	1.4E-07	7.6E-08	1.3E-07	1.1E-06	1.3E-06	3.1E-06
Dermal Contact with Surface/Subsurface Soil	8.5E-07	1.2E-07	3.7E-08	7.1E-08	1.7E-07	8.0E-07	6.9E-07	1.1E-06
Total Cancer Risk	**1.8E-06**	**2.6E-07**	**1.7E-07**	**1.5E-07**	**3.0E-07**	**1.9E-06**	**2.0E-06**	**4.2E-06**

TABLE 5-4

CUMULATIVE RISK SUMMARY - CENTRAL TENDENCY EXPOSURE TO POST-REMOVAL SOIL
SITE 13 - OU1
NSWC WHITE OAK, SILVER SPRING, MARYLAND

HAZARD INDEX

Exposure Route	Full Time Worker	Maintenance/Utility Worker	Construction Worker	Adult Recreational User	Adolescent Trespasser	Day Care Center Child	Future Adult Resident	Future Child Resident
Incidental Ingestion of Surface/Subsurface Soil	5.4E-03	4.5E-04	2.1E-02	2.0E-04	1.0E-03	2.5E-02	5.8E-03	5.4E-02
Dermal Contact with Surface/Subsurface Soil	7.1E-06	5.9E-07	2.9E-05	3.6E-07	2.7E-06	5.7E-05	6.6E-06	6.0E-05
Total Hazard Index	**5.4E-03**	**4.5E-04**	**2.1E-02**	**2.0E-04**	**1.0E-03**	**2.5E-02**	**5.8E-03**	**5.4E-02**

INCREMENTAL LIFETIME CANCER RISK

Incidental Ingestion of Surface/Subsurface Soil	1.6E-07	1.3E-08	6.8E-08	5.7E-09	3.3E-08	2.4E-07	1.3E-07	3.4E-07
Dermal Contact with Surface/Subsurface Soil	2.7E-08	2.2E-09	1.2E-08	1.3E-09	1.1E-08	7.0E-08	1.9E-08	5.0E-08
Total Cancer Risk	**1.8E-07**	**1.5E-08**	**8.0E-08**	**7.0E-09**	**4.5E-08**	**3.1E-07**	**1.5E-07**	**3.9E-07**

TABLE 5-5

COMPARISON OF MAXIMUM DETECTED CONCENTRATION TO RBCs AND BACKGROUND UCL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC WHITE OAK, SILVER SPRING, MARYLAND

Inorganic	Maximum Concentration	Background UCL		Risk-Based PCOC Screening Level(1)	Maximum Greater Than Background (2)	Maximum Greater Than Screening Level	Retained For Further Evaluation? (3)
		Surface Soil	Subsurface Soil				
Aluminum	21600	**14953**	**20961**	**7800 N**	Yes	**Yes**	**Yes**
Arsenic	3.9	**5.11**	12.15	**0.43 C**	No	**Yes**	No
Barium	71.1	**59.5**	**40.09**	550 N	Yes	No	No
Beryllium	0.97	**0.19**	2.37	16 N	No	No	No
Calcium	20700	**1040**	**247**	NA	Yes	No	No
Chromium(4)	28.1	29.35	41.05	**23 N**	No	**Yes**	No
Cobalt	21.5	**11.81**	**16.6**	470 N	Yes	No	No
Copper	68.4	**11.52**	**21.62**	310 N	Yes	No	No
Iron	39000	**18946**	**28681**	**2300 N**	Yes	**Yes**	**Yes**
Lead	40.6	60.2	**21.23**	400	No	No	No
Magnesium	5370	**1183**	**2987**	NA	Yes	No	No
Manganese	699	**490**	**503**	**160 N**	Yes	**Yes**	**Yes**
Mercury	0.16	**0.142**	**0.051**	2.3 N	Yes	No	No
Nickel	65.5	**14.56**	**13.84**	160 N	Yes	No	No
Potassium	3400	**845**	**2792**	NA	Yes	No	No
Selenium	3.8	**0.68**	**2.73**	39 N	Yes	No	No
Silver	0.21	1.15	**0.096**	39 N	No	No	No
Sodium	106	ND	**69.4**	NA	Yes	No	No
Thallium	3	**ND**	ND	**0.55 N**	Yes	**Yes**	**Yes**
Vanadium	39.4	**30.08**	**44.31**	55 N	Yes	No	No
Zinc	70	**30.67**	84.2	2300 N	No	No	No

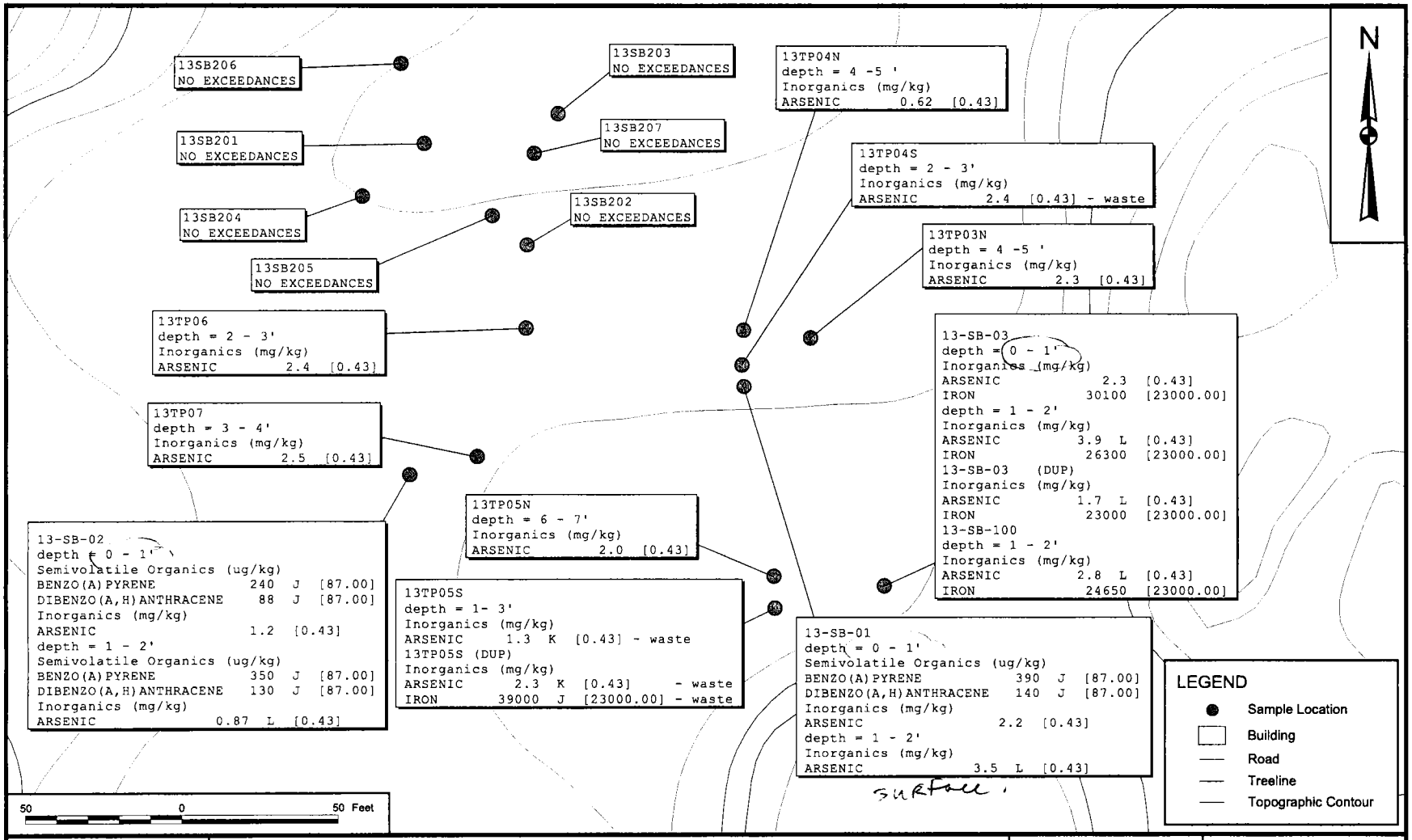
Notes:
1 USEPA Region 3 RBC Table, April, 2002 (CR = 1E-6, HI = 0.1).
2 The higher of the surface and subsurface soil background concentration is used in comparison.
3 Chemical is retained for further evaluation if the maximum detected concentration exceeded both the background UCL concentration and the RBC.
4 RBC is for hexavalent chromium.
Shading indicates that the maximum detected concentration was greater than the background concentration and/or RBC.

TABLE 5-6

COMPARISON OF UCL TO RBCs AND BACKGROUND UCL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC - WHITE OAK, SILVER SPRING, MARYLAND

Inorganic	Maximum Concentration	Background UCL		Risk-Based PCOC Screening Level(1)	Maximum Greater Than Background (2)	Maximum Greater Than Screening Level	Retained For Further Evaluation? (3)
		Surface Soil	Subsurface Soil				
Aluminum	15,661	14953	20961	7800 N	No	Yes	No
Arsenic	2.46	5.11	12.15	0.43 C	No	Yes	No
Barium	71.1	59.5	40.09	550 N	Yes	No	No
Beryllium	0.38	0.19	2.37	16 N	No	No	No
Cadmium	0.38	ND	0.179	7.8 N	Yes	No	No
Calcium	20,700	1040	247	NA	Yes	No	No
Chromium(4)	18.9	29.35	41.05	23 N	No	No	No
Cobalt	21.5	11.81	16.6	470 N	Yes	No	No
Copper	56.0	11.52	21.62	310 N	Yes	No	No
Iron	23,031	18946	28681	2300 N	No	Yes	No
Lead	24.3	60.2	21.23	400	No	No	No
Magnesium	4,060	1183	2987	NA	Yes	No	No
Manganese	699	490	503	160 N	Yes	Yes	Yes
Mercury	0.08	0.142	0.051	2.3 N	No	No	No
Nickel	48.1	14.56	13.84	160 N	Yes	No	No
Potassium	3,400	845	2792	NA	Yes	No	No
Selenium	3.18	0.68	2.73	39 N	Yes	No	No
Silver	0.10	1.15	0.096	39 N	No	No	No
Sodium	51.0	ND	69.4	NA	No	No	No
Thallium	0.88	ND	ND	0.55 N	Yes	Yes	Yes
Vanadium	23.4	30.08	44.31	55 N	Yes	No	No
Zinc	70.0	30.67	84.2	2300 N	No	No	No

Notes:
1 USEPA Region 3 RBC Table, April, 2002 (CR = 1E-6, HI = 0.1).
2 The higher of the surface and subsurface soil background concentration is used in comparison.
3 Chemical is retained for further evaluation if the maximum detected concentration exceeded both the background UCL concentration and the RBC.
4 RBC is for hexavalent chromium.
Shading indicates that the maximum detected concentration was greater than the background concentration and/or RBC.



DRAWN BY	DATE	Tetra Tech NUS, Inc.	CONTRACT NUMBER	OWNER NUMBER
A. JANOCHA	9/06/02		4246	0839
CHECKED BY	DATE	SUMMARY OF EXCEEDANCES OF HUMAN HEALTH SCREENING CRITERIA SITE 13 - OIL SLUDGE DISPOSAL AREA FORMER NSWC WHITE OAK SILVER SPRING, MARYLAND	APPROVED BY	DATE
R. KOTUN	9/09/02		—	—
COST/SCHEDULE-AREA			APPROVED BY	DATE
			—	—
SCALE			DRAWING NO.	REV
AS NOTED			FIGURE 5 - 1	0

P:\GIS\WHITEOAK\4246.APR SWMU 13 - TEST PIT TAGS LAYOUT 9/09/02 AJ

pre or post Excavation —
Both surface & subsurface data shown —

REFERENCES

Agency for Toxic Substances and Disease Registry (ATSDR), 1997. ATSDR Toxicological Profiles on CD-ROM. U.S. Department of Public Health, Atlanta, Georgia.

B&R Environmental, 1998. 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. June.

CH2M HILL, 2002. Final Remedial Investigation of Operable Unit 1, Prepared for Engineering Field Activity Chesapeake, Naval Facilities Engineering Command. Herndon, Virginia.

Dragun, 1988. The Soil Chemistry of Hazardous Materials. Hazardous Material Controls Research Institute, Silver Spring, Maryland.

EPA (U.S. Environmental Protection Agency), 1979. Water-Related Environmental Fate of 129 Priority Pollutants. EPA/440/4-79/029. Washington, D.C. December.

EPA (U.S. Environmental Protection Agency), 1982. Aquatic Fate Process Data for Organic Priority Pollutants. December.

EPA (U.S. Environmental Protection Agency), 1989. Risk Assessment Guidance for Superfund: Volume I, Human Health Evaluation Manual (Part A). EPA 540/1-89/002. Office of Emergency and Remedial Response, Washington, D.C. December.

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

EPA (U.S. Environmental Protection Agency), 1991. Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. Directive 9285.6-03. Office of Solid Waste and Emergency Response, Washington, D.C. March.

EPA (U.S. Environmental Protection Agency), 1992. Memorandum: Guidance on Risk Characterization for Risk Managers and Risk Assessors. Henry Habicht II, Deputy Administrator, Washington, DC. February.

EPA (U.S. Environmental Protection Agency), 1992. Supplemental Guidance to RAGS: Calculating the Concentration Term. 9285.7-081. Office of Solid Waste and Emergency Response, Washington, D.C. May.

EPA (U.S. Environmental Protection Agency), 1992. Handbook of RCRA Groundwater Monitoring Constituents: Chemical and Physical Properties. September.

EPA (U.S. Environmental Protection Agency), 1993. Provisional Guidance for Quantitative Risk Assessment for Polycylic Aromatic Hydrocarbons. EPA/600/R-93/089. Office of Research and Development, Washington, D.C. July.

EPA (U.S. Environmental Protection Agency), 1993. Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure. Office of Solid Waste and Emergency Response, Washington, DC. May.

EPA (U.S. Environmental Protection Agency), Region 3, 1994. Modifications to the Laboratory Program National Functional Guidelines for Inorganic Data Review. EPA-540/R-94/013. Office of Solid Waste and Emergency Response, Washington, DC. February .

EPA (U.S. Environmental Protection Agency), Region 3, 1994. Modifications to the Laboratory Program National Functional Guidelines for Organic Data Review. EPA-540/R-94/012. Office of Solid Waste and Emergency Response, Washington, DC. February.

EPA (U.S. Environmental Protection Agency), 1994. Guidance on Residential Lead-Based Paint, Lead-Contaminated Dust, and Lead-Contaminated Soil. Office of Prevention, Pesticides, and Toxic Substances, Washington, D.C. July.

EPA (U.S. Environmental Protection Agency), 1994. Revised Interim Soil Lead for CERCLA Sites and RCRA Corrective Action Facilities. Directive 9355.4-12. Office of Solid Waste and Emergency Response, Washington, D.C. July.

EPA (U.S. Environmental Protection Agency), 1996. Soil Screening Guidance: Technical Background Document. EPA/540/R-95/128. Office of Solid Waste and Emergency Response, Washington, D.C. May.

EPA (U.S. Environmental Protection Agency), 1997. Health Effects Assessment Summary Table (HEAST). July.

EPA (U.S. Environmental Protection Agency), 1997. Exposure Factors Handbook. EPA/600/P-95/002Ba. National Center for Environmental Assessment, Washington, D.C. August.

EPA (U.S. Environmental Protection Agency), 1998. Risk Assessment Guidance for Superfund: Volume I, Human Health Evaluation Manual, Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments, Publication 9285.7-01D. Office of Emergency and Remedial Response, Washington, D.C. January.

EPA (U.S. Environmental Protection Agency), 2001. Risk Assessment Guidance for Superfund, Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). Interim Guidance. September

EPA (U.S. Environmental Protection Agency), 2002. Risk-Based Concentration Table. EPA Region 3, 841 Chestnut Street, Philadelphia, Pennsylvania 19107. April.

EPA (U.S. Environmental Protection Agency), 2002. Integrated Risk Information System (IRIS) - On-Line Database. September.

Gibbions, J.A. and M. Alexander, 1989. "Microbial degradation of sparingly soluble organic chemicals: Phthalate esters." Environ Toxicol Chem 8(4):283-291.

Gilbert, R.O., 1987. Statistical Methods for Environmental Pollution Monitoring. Van Nostrand Reinhold Company, New York, New York.

Howard, 1989. Handbook of Environmental Fate and Exposure Data for Organic Chemicals, Volume 1.

Howard, 1990. Handbook of Environmental Fate and Exposure Data for Organic Chemicals, Volume 2.

Howard, 1991. Handbook of Environmental Fate and Exposure Data for Organic Chemicals, Volume 3, Pesticides.

Lyman, W.J., W.F. Reehl, and D.H. Rosenblatt, 1990. Handbook of Chemical Property Estimation Methods. American Chemical Society. Washington, D.C.

NEESA (Naval Energy and Environmental Support Activity), 1984. Initial Assessment Study, Naval Surface Warfare Center White Oak, Silver Spring, Maryland, November.

TtNUS (Tetra Tech NUS, Inc.), 1998. Background Investigation Report, Former Naval Surface Warfare Center, White Oak, Silver Spring, Maryland, December.

TtNUS (Tetra Tech NUS, Inc.), 1998 – Site Screening Report for IRP Sites 1, 5, 6, 12, 13, 28, 29, 31, 32, and 33, EBS AOC 100, former Naval Surface Warfare Center White Oak , Silver Spring, Maryland, prepared for the Engineering Field Activity Chesapeake, Naval Facilities Engineering Command. King of Prussia, Pennsylvania, December.

Tetra Tech NUS (TtNUS). 1999. Basewide Screening Level Ecological Risk Assessment, Naval Surface Warfare Center, White Oak, Silver Spring, Maryland prepared for Engineering Facilities Activity, Naval Facilities Engineering Command. Pittsburgh, Pennsylvania. December.

Tetra Tech NUS (TtNUS). 2000. Work Plan for the Basewide Ecological Risk Assessment, Naval Surface Warfare Center, White Oak, Silver Spring, Maryland prepared for Engineering Facilities Activity, Naval Facilities Engineering Command. Pittsburgh, Pennsylvania. July.

Tetra Tech NUS (TtNUS). 2001. Basewide Ecological Risk Assessment, Naval Surface Warfare Center, White Oak, Silver Spring, Maryland prepared for Engineering Facilities Activity, Naval Facilities Engineering Command. Pittsburgh, Pennsylvania. March.

TOXNET , September 2002, Section 4.4.1.

USEPA (U.S. Environmental Protection Agency), 1997. Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments. Interim Final. Environmental Response Team. June 5.

USEPA (U.S. Environmental Protection Agency), 1998. Final Guidelines for Ecological Risk Assessment. Effective April 30.

Verschueren. 1983. Handbook of Environmental Data of Organic Chemicals.

APPENDIX A

GEOPHYSICAL SURVEY REPORT

GEOPHYSICAL SURVEY REPORT
SITES 5 AND 13 RCRA FACILITY INVESTIGATION
SITE 48 SITE SCREENING
FORMER NAVAL SURFACE WARFARE CENTER WHITE OAK
SILVER SPRING, MARYLAND

1.0 INTRODUCTION

Geophysical surveys were performed at three sites at the former Naval Surface Warfare Center (NSWC) White Oak facility, Silver Spring, Maryland. The surveys were performed on April 3 and April 4, 2002 in accordance with the Field Sampling Plan dated January 2002. The three sites have been designated as follows:

- Site 5 – Open Burn Areas
- Site 13 – Oil Sludge Disposal Area
- Site 48 – 500 Area Waste Site

All sites are located in the northeastern portion of the facility. Sites 5 and 13 are contiguous; these sites were therefore surveyed as one area. Site 48 is located nearly 1,000 feet northeast of Sites 5 and 13.

The purpose of the geophysical surveys was to identify anomalous areas that may be associated with historic activities at these Sites. Site 5 consisted of three burn areas that were reportedly used as burn sites, fire training areas, and explosive/pyrotechnic device testing areas. The burn rings and surface soils at Site 5 were excavated and disposed off-site in the fall of 2000. It is reported that at Site 13, immediately adjacent to Site 5 to the west, approximately 6,000 to 10,000 gallons of oily sludge from No. 6 fuel oil storage tanks was spread over the surface from 1970 to 1978. Garbage and rubbish have been observed on the surface and in shallow soils at Site 48.

The geophysical surveys will support the RCRA facility investigation at Sites 5 and 13 and the Site Screening Process for Site 48. The following sections describe geophysical survey field procedures and results.

2.0 GEOPHYSICAL SURVEY METHODS

Reference grids were established at Sites 5/13 and at Site 48 using a transit and tape measures. The grid at Sites 5/13 was referenced to the road that forms the southern boundary of Sites 5 and 13. The grid at

Site 48 was referenced to Perimeter Road, just west of Site 48. The grids consisted of lines spaced 10 feet apart. Grids were marked using pin flags, survey stakes, flagging, and/or marking paint, as appropriate. Grid coordinates were assigned northing and easting coordinates in feet. Pin flags were also placed at regular intervals along the geophysical lines in the direction of the survey at a frequency (typically every 100 to 300 feet) that maintained a line of sight and provided adequate distance references along the lines, depending on the terrain and line length. Data were recorded and observed in real time during the survey; geophysical anomalies detected during the survey, which could not be explained by surface features, were identified and flagged in the field using pin flags.

The geophysical surveys were conducted using a Geonics EM31 Terrain Conductivity meter (EM31). The EM-31 measures and records the quadrature component (ground conductivity) and the inphase component of the electromagnetic field along the survey lines. The EM-31 measures terrain conductivity by imparting a current to the transmitter coil. The current passing through this coil produces a magnetic field, which in turn induces small currents in the underlying strata. Currents produced within the underlying strata are sensed by a receiver coil. The ratio of the magnetic field detected by the receiver coil to that field produced by the transmitter oil is directly proportional to terrain conductivity. Terrain conductivity, or apparent ground conductivity, is therefore read directly from the EM-31 in milliSiemens per meter (mS/m). The inphase response, expressed in parts per thousand, is significantly more sensitive to buried metallic objects. These values will represent the average response of the EM-31 over the effective depth of the survey; the effective depth is a function of the distance between the transmitting and receiving coils. The EM-31 has a fixed coil spacing to twelve feet, yielding an effective depth and radius of survey of approximately twelve to fifteen feet, in the absence of features (fences, buildings, etc.) which may interfere with the detection of survey targets.

Terrain conductivity and inphase responses were measured simultaneously at one-second intervals (approximately every 2.8 feet) along the geophysical lines or traverses and automatically stored in a digital data logger. The measurements were also observed by the instrument operator as the survey was conducted to allow for immediate marking of anomalies in the field, provided they were discernable during the survey and could not be explained by overhead, surface or known subsurface features, such as surface debris or overhead/subsurface utilities. Data stored in the data logger was downloaded to a portable computer at the completion of the survey. A total of 7,452 conductivity and inphase measurements were obtained at Sites 5 and 13; 2,820 conductivity and inphase measurements were obtained at Site 48. Data for Sites 5 and 13 are provided in Attachment A; these data for Site 48 are provided in Attachment B.

Color contour maps using DAT31 Geonics® software and Rockworks® software depicting conductivity and in-phase data for each of the survey areas were prepared from these data and are provided as Figures 1 through 4. The color contour maps allow for an illustration of the locations of anomalies associated with conductive fills, buried metallic material, changes in soil texture, or a change in moisture content.

In general, terrain conductivity anomalies fall into two distinct types. The first type represents a coupling of high and low conductivities. Typically this response is represented by a negative conductivity trough with high conductivity shoulders. This single pulse type response is typical of buried metallic material such as a drum, reinforcement bar, sheet metal, a UST, or other anomalous conductive material. Likewise, buried utilities or pipes provide a similar signature over several adjacent lines. The second type is usually an all high or all low response. Typically this response represents subtle changes in terrain conductivity and covers a large area. These anomalies are typical of sub-surface anomalously conductive soil, fill, and/or changes in moisture content or quality (as in the case of landfill leachate or salt water intrusion). Inphase anomalies are represented by either high or low responses. The character of the inphase response is partially dependent on the orientation of the buried metals relative to the orientation of the EM-31 (i.e. survey direction) during data acquisition. Linear objects which are present parallel to the survey direction generally produce a positive (high) response; linear objects oriented perpendicular to the survey direction generally produce a low (negative) response. Broad areas of buried metals may exhibit high or low inphase responses; the nature of the response is dependent on the surface area and depth of the metallic material.

3.0 GEOPHYSICAL SURVEY RESULTS

3.1 Sites 5 and 13

Figure 1 provides terrain conductivity data; Figure 2 presents the in-phase data. The majority of the surveyed area appears to be representative of background conductivity values within the depth of exploration of the EM-31. These values, indicated by the color green, were generally between 3 and 10 mS/m, typical of sandy soils. Areas exhibiting an inphase response close to zero, represented by the color green, are likely free of buried metals within the depth of investigation of the EM-31.

Six anomalies were marked in the field during the survey. Four of the six anomalies are present in the northern portion of the survey area at Site 13, northeast of the stand of trees trending northwest to southeast that bisects this portion of the survey area. Some surface debris was also observed in this

area. Anomalies were identified at Site 5 in proximity to Berm Area 1; anomalies were not detected in the vicinities of Berm Areas 2 and 3. The six anomalies are described as follows:

Anomaly 1 – Anomaly 1 is a negative conductivity anomaly at W270/N120, and may be representative of a void or anomalously conductive fill. It appears that buried metals are not prevalent at this location, due to the lack of a significant in-phase anomaly. This anomaly is in the approximate area of the northeastern edge of former Berm Area 1 at Site 5.

Anomaly 2 – Anomaly 2 is a significant negative conductivity anomaly along line W280 from N40 to N60. It is similar in signature to Anomaly 1 in that buried metals are not prevalent at this location, due to the lack of a significant in-phase anomaly. This anomaly is near what appears to be a concrete headwall and a standpipe/hydrant. The location of this anomaly corresponds to the southwestern edge of former Berm Area 1 at Site 5.

Anomalies 3/4 – These anomalies represent an area exhibiting a negative conductivity anomaly, at W350/N285 to W370/N307, and may be representative of anomalously conductive fill. Buried metals also appear to be present in the vicinity of W370/N285 and W370/N300 due to a negative in-phase anomaly. re not prevalent at this location, due to the lack of a significant in-phase anomaly.

Anomaly 5 - Anomaly 5 is a negative conductivity anomaly at W370/N220, and may be representative of a void or anomalously conductive fill. It appears that buried metals are not prevalent at this location, due to the lack of a significant in-phase anomaly.

Anomaly 6 - Anomaly 6 is a negative conductivity anomaly at W430/N300, and may be representative of a void or anomalously conductive fill. It appears that buried metals are not prevalent at this location, due to the lack of a significant in-phase anomaly.

3.2 Site 48

Figure 3 presents the terrain conductivity data; Figure 4 presents the in-phase data. The majority of the surveyed area appears to be representative of background conductivity values within the depth of exploration of the EM-31. These values, indicated by the colors yellow and orange, were generally between 3 and 10 mS/m, typical of sandy soils. An area of higher conductivity, indicated by the color red in the east-central portion of the survey area, may indicate a change in soil texture or moisture content. Areas exhibiting an inphase response close to zero, represented by the color green, are likely free of buried metals within the depth of investigation of the EM-31.

Three anomalies were marked in the field during the survey: a small in-phase anomaly was identified as Anomaly 1 at coordinates N120/E165; a negative conductivity anomaly was identified as Anomaly 2 at N140/E96, where surface metal was also observed, and a small conductivity/in-phase anomaly (Anomaly 3) at the edge of the survey area at N180/E190. Areas of surface metal and/or debris were identified at grid coordinates N60/E190, N100/E77, N110/E67, N140/E100, along line N150 at E180 and E155, along lines N180 and N190 from E60 to E85 and E55 to E73, respectively. Shallow, buried metallic material may also be present at these locations. These areas may warrant additional characterization via intrusive methods.

4.0 SUMMARY

The EM-31 surveys performed at NSWC White Oak are a non-intrusive, indirect method of sub-surface exploration. The anomalies described herein have been characterized to the extent that they produce recognizable responses when compared to background data. Additional characterization via intrusive methods is recommended to confirm the nature and extent of anomalies identified during the survey that cannot be explained by visible or other known features.

ATTACHMENT A

GEOPHYSICAL SURVEY DATA – SITES 5 & 13

LINE: W0 Direction: N
Date: 3- 4- 2 Time: 13:44
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 0 Final station: 130

Station	Cond.[mS/m]	Inphase [ppt]
0.000	3.326	-0.069
2.653	3.784	-0.014
5.306	3.388	0.040
7.959	3.112	0.206
10.612	3.052	0.112
13.265	2.900	-0.096
15.918	2.716	0.125
18.571	2.594	0.459
21.224	2.960	0.360
23.878	2.532	0.329
26.531	2.320	0.254
29.184	2.594	0.213
31.837	2.656	0.232
34.490	2.746	0.233
37.143	2.900	0.204
39.796	1.862	0.152
42.449	1.618	0.211
45.102	2.106	0.281
47.755	1.954	0.362
50.408	0.702	-0.175
53.061	0.488	-0.433
55.714	2.258	0.053
58.367	2.442	0.158
61.020	2.380	0.134
63.673	2.778	0.167
66.327	2.808	0.136
68.980	2.594	0.226
71.633	2.716	0.066
74.286	2.442	0.042
76.939	1.770	-0.025
79.592	2.106	0.299
82.245	2.380	0.085
84.898	2.594	0.347
87.551	2.960	0.353
90.204	2.410	-0.021
92.857	2.624	-0.253
95.510	2.472	-0.027
98.163	2.624	0.257
100.816	2.686	0.006
103.469	2.930	-0.196
106.122	2.900	-0.030
108.776	2.960	0.004
111.429	2.532	-0.006
114.082	2.656	0.145
116.735	2.746	-0.027
119.388	2.624	0.040
122.041	2.472	0.059
124.694	2.838	0.016
127.347	2.900	-0.205
130.000	2.624	0.204

---> Comment : N130

LINE: W10 Direction: S
Date: 3- 4- 2 Time: 13:47
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 130 Final station: 0

Station	Cond.[mS/m]	Inphase [ppt]
130.000	2.746	-0.197
127.174	2.288	-0.129

124.348	2.380	-0.061
121.522	2.442	-0.131
118.696	2.350	-0.084
115.870	2.198	-0.052
113.043	2.564	-0.052
110.217	2.686	0.055
107.391	2.746	-0.027
104.565	2.624	0.062
101.739	2.808	0.039
98.913	2.656	-0.196
96.087	2.656	-0.082
93.261	2.746	0.165
90.435	2.746	-0.014
87.609	2.990	-0.148
84.783	3.052	-0.118
81.957	2.930	-0.078
79.130	2.808	-0.118
76.304	2.838	-0.164
73.478	2.624	-0.039
70.652	2.686	-0.041
67.826	2.900	-0.300
65.000	2.686	0.116
62.174	2.868	0.154
59.348	2.838	0.154
56.522	2.778	0.085
53.696	2.778	0.132
50.870	2.778	-0.264
48.043	3.022	-0.306
45.217	2.868	-0.225
42.391	2.930	-0.098
39.565	2.808	-0.041
36.739	2.656	0.077
33.913	2.532	0.061
31.087	2.656	-0.043
28.261	2.960	0.075
25.435	3.266	-0.054
22.609	3.052	0.006
19.783	2.960	0.210
16.957	2.930	0.382
14.130	2.716	0.404
11.304	2.900	0.208
8.478	2.868	0.055
5.652	2.990	0.015
2.826	3.174	0.072
0.000	3.326	-0.017

---> Comment : N0

LINE: W20 Direction: N
Date: 3- 4- 2 Time: 13:49
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 0 Final station: 130

Station	Cond.[mS/m]	Inphase [ppt]
0.000	3.296	-0.379
2.955	3.296	-0.300
5.909	2.808	-0.166
8.864	2.594	-0.265
11.818	2.930	-0.102
14.773	2.716	0.094
17.727	2.808	0.055
20.682	2.532	0.175
23.636	2.716	0.187
26.591	2.442	-0.028
29.545	1.984	0.037
32.500	2.288	-0.203

35.455	2.716	-0.221
38.409	2.868	-0.199
41.364	2.838	0.004
44.318	3.266	0.167
47.273	2.900	0.415
50.227	2.410	0.404
53.182	2.900	0.419
56.136	3.602	0.189
59.091	3.296	0.182
62.045	2.808	-0.047
65.000	2.808	-0.192
67.955	3.144	-0.170
70.909	3.388	-0.080
73.864	2.990	0.079
76.818	3.022	0.173
79.773	3.022	0.143
82.727	2.930	0.118
85.682	2.960	0.184
88.636	2.900	0.217
91.591	3.082	0.167
94.545	3.540	-0.047
97.500	3.296	-0.043
100.455	3.052	-0.100
103.409	3.052	-0.084
106.364	3.112	-0.124
109.318	3.418	-0.098
112.273	3.602	0.259
115.227	3.326	0.202
118.182	3.174	0.213
121.136	3.418	0.044
124.091	3.602	-0.023
127.045	3.602	0.088
130.000	2.930	-0.416

---> Comment : N130

LINE: W30 Direction: S
Date: 3- 4- 2 Time: 13:51
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 130 Final station: 0

Station	Cond.[mS/m]	Inphase [ppt]
130.000	2.716	-0.414
126.829	2.868	-0.444
123.659	2.930	-0.207
120.488	3.022	0.081
117.317	2.990	0.029
114.146	3.082	0.072
110.976	3.204	0.154
107.805	3.052	0.187
104.634	2.990	0.136
101.463	3.112	0.022
98.293	3.204	-0.196
95.122	3.204	-0.140
91.951	3.266	0.292
88.780	3.234	0.171
85.610	3.296	0.141
82.439	3.388	0.127
79.268	2.900	0.046
76.098	3.052	-0.008
72.927	3.022	0.342
69.756	3.418	0.362
66.585	3.326	0.586
63.415	3.052	0.261
60.244	3.052	0.141
57.073	3.204	0.105

53.902	3.204	-0.036
50.732	3.174	0.127
47.561	3.144	0.243
44.390	2.502	0.009
41.220	3.082	0.081
38.049	3.266	0.162
34.878	3.296	0.086
31.707	3.112	0.073
28.537	3.082	-0.332
25.366	2.044	-0.197
22.195	1.800	0.075
19.024	2.166	0.507
15.854	2.472	0.368
12.683	2.808	0.224
9.512	2.930	0.033
6.341	3.052	-0.069
3.171	2.532	-0.100
0.000	3.234	-0.377

---> Comment : N0

LINE: W40 Direction: N

Date: 3- 4- 2 Time: 13:52

Component: Both Dipole mode: Vertical Instrument Orientation: 1

Start station: 0 Final station: 130

Station	Cond.[mS/m]	Inphase [ppt]
0.000	3.570	-0.054
3.333	3.296	0.092
6.667	3.724	-0.133
10.000	3.418	-0.201
13.333	3.602	0.090
16.667	3.112	0.520
20.000	3.022	0.395
23.333	2.502	0.327
26.667	2.410	0.226
30.000	2.868	0.134
33.333	3.632	-0.017
36.667	3.204	-0.212
40.000	2.930	-0.071
43.333	2.930	-0.003
46.667	3.326	-0.085
50.000	3.356	-0.043
53.333	4.058	0.298
56.667	3.540	0.318
60.000	3.052	0.342
63.333	3.112	0.435
66.667	3.112	-0.084
70.000	3.234	-0.104
73.333	3.448	0.226
76.667	3.480	0.121
80.000	3.356	0.072
83.333	3.144	-0.174
86.667	3.022	-0.087
90.000	3.052	-0.065
93.333	3.632	0.116
96.667	3.266	0.123
100.000	2.930	0.079
103.333	3.388	0.028
106.667	3.388	0.175
110.000	3.876	0.110
113.333	3.448	0.171
116.667	3.174	0.202
120.000	3.174	0.287
123.333	3.022	0.217
126.667	3.082	0.336

130.000	3.936	-0.017

---> Comment : N130

LINE: W50 Direction: S
Date: 3- 4- 2 Time: 13:55
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 130 Final station: 0

Station	Cond.[mS/m]	Inphase [ppt]
130.000	3.144	-0.600
126.750	3.052	-0.604
123.500	3.022	-0.616
120.250	2.868	-0.462
117.000	2.930	0.112
113.750	3.510	-0.221
110.500	3.266	-0.541
107.250	3.052	-0.324
104.000	3.082	-0.039
100.750	2.594	-0.139
97.500	2.930	-0.201
94.250	3.388	-0.131
91.000	3.234	-0.186
87.750	3.144	-0.174
84.500	3.144	-0.076
81.250	3.266	0.050
78.000	3.326	0.075
74.750	3.356	0.039
71.500	3.234	-0.387
68.250	3.234	-0.115
65.000	3.480	0.028
61.750	3.326	-0.151
58.500	3.418	-0.183
55.250	3.540	0.083
52.000	3.388	0.158
48.750	3.266	-0.150
45.500	3.296	-0.326
42.250	2.838	-0.324
39.000	2.838	-0.221
35.750	3.112	-0.183
32.500	2.778	-0.317
29.250	2.930	-0.420
26.000	3.112	-0.177
22.750	2.900	-0.129
19.500	3.234	-0.422
16.250	2.990	-0.460
13.000	3.356	-0.559
9.750	3.326	-0.258
6.500	3.174	0.118
3.250	3.266	-0.001
0.000	3.234	-0.389

---> Comment : N0

LINE: W60 Direction: N
Date: 3- 4- 2 Time: 13:56
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 0 Final station: 130

Station	Cond.[mS/m]	Inphase [ppt]
0.000	2.868	0.571
3.171	3.082	-0.216
6.341	2.808	-0.600
9.512	2.990	-0.660
12.683	3.204	-0.403
15.854	3.266	-0.368
19.024	2.990	-0.126
22.195	3.204	-0.278
25.366	3.144	-0.434

28.537	3.418	0.112
31.707	3.388	-0.113
34.878	2.624	-0.273
38.049	2.380	-0.559
41.220	3.174	-0.390
44.390	3.112	-0.150
47.561	3.174	-0.205
50.732	2.838	-0.240
53.902	3.448	-0.367
57.073	2.990	0.070
60.244	3.968	-0.214
63.415	3.540	-0.225
66.585	3.448	-0.245
69.756	3.356	-0.286
72.927	4.242	-0.365
76.098	3.326	0.215
79.268	2.716	0.265
82.439	3.022	-0.050
85.610	2.868	-0.343
88.780	3.112	-0.563
91.951	3.082	-0.469
95.122	3.082	-0.578
98.293	3.052	-0.604
101.463	3.052	0.191
104.634	3.082	0.520
107.805	2.900	-0.030
110.976	3.234	-0.150
114.146	3.082	-0.010
117.317	3.112	0.026
120.488	3.570	-0.251
123.659	2.990	-0.385
126.829	3.052	-0.420
130.000	3.144	-0.350

---> Comment : N130

LINE: W70 Direction: S

Date: 3- 4- 2 Time: 13:58

Component: Both Dipole mode: Vertical Instrument Orientation: 1

Start station: 130 Final station: 0

Station	Cond.[mS/m]	Inphase [ppt]
130.000	3.662	-0.041
126.905	3.724	0.000
123.810	3.754	0.048
120.714	3.602	-0.008
117.619	3.356	-0.133
114.524	3.052	-0.381
111.429	3.082	-0.640
108.333	3.082	-0.727
105.238	3.082	-0.473
102.143	3.296	-0.626
99.048	2.930	-0.694
95.952	3.174	-0.682
92.857	3.662	-0.480
89.762	3.388	-0.488
86.667	2.960	-0.298
83.571	2.990	-0.094
80.476	3.022	-0.115
77.381	3.144	-0.128
74.286	3.448	-0.389
71.190	3.326	-0.462
68.095	3.356	-0.302
65.000	3.418	-0.462
61.905	3.448	-0.694
58.810	3.296	-0.548

55.714	3.388	-0.567
52.619	3.204	-0.670
49.524	3.326	-0.486
46.429	3.418	-0.328
43.333	3.326	-0.060
40.238	3.266	0.022
37.143	3.234	0.020
34.048	3.052	0.116
30.952	3.022	-0.098
27.857	3.448	-0.039
24.762	3.448	-0.008
21.667	3.724	-0.071
18.571	3.356	-0.093
15.476	3.266	-0.515
12.381	3.388	-0.482
9.286	3.418	-0.455
6.190	3.266	-0.471
3.095	3.082	-0.436
0.000	2.960	-0.157

---> Comment : N0

LINE: W80 Direction: N

Date: 3- 4- 2 Time: 14: 0

Component: Both Dipole mode: Vertical Instrument Orientation: 1

Start station: 0 Final station: 130

Station	Cond.[mS/m]	Inphase [ppt]
0.000	3.082	-0.313
3.171	2.930	-0.289
6.341	3.814	-0.453
9.512	3.234	-0.453
12.683	3.356	-0.298
15.854	3.022	-0.526
19.024	3.082	-0.466
22.195	3.022	-0.370
25.366	2.868	-0.339
28.537	3.082	-0.153
31.707	3.204	0.000
34.878	3.052	0.103
38.049	3.692	-0.021
41.220	3.692	0.184
44.390	3.266	-0.139
47.561	3.846	-0.032
50.732	3.112	-0.699
53.902	1.648	-1.842
57.073	1.220	-0.502
60.244	1.586	-0.234
63.415	1.404	-2.316
66.585	2.656	-1.214
69.756	3.448	-0.005
72.927	3.510	-0.028
76.098	2.076	-0.058
79.268	2.960	-0.060
82.439	3.022	-0.515
85.610	2.350	-0.657
88.780	2.930	-0.436
91.951	3.388	-0.289
95.122	3.326	-0.104
98.293	3.906	-0.054
101.463	3.602	-0.438
104.634	3.174	-0.405
107.805	3.296	-0.126
110.976	3.174	0.044
114.146	3.296	0.055
117.317	3.418	-0.126

120.488	3.418	-0.093
123.659	3.326	-0.185
126.829	3.356	-0.394
130.000	3.602	-0.721

---> Comment : N130

LINE: W90 Direction: S
Date: 3- 4- 2 Time: 14: 2
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 130 Final station: 0

Station	Cond.[mS/m]	Inphase [ppt]
130.000	6.684	0.860
126.977	5.554	0.298
123.953	3.936	-0.120
120.930	3.418	-0.534
117.907	3.632	-0.122
114.884	4.120	-0.240
111.860	3.876	-0.181
108.837	3.418	-0.458
105.814	3.326	-0.543
102.791	3.510	-0.539
99.767	3.144	-0.486
96.744	3.112	-0.501
93.721	3.418	-0.038
90.698	3.388	-0.030
87.674	3.448	-0.041
84.651	3.356	0.007
81.628	3.510	-0.253
78.605	3.418	-0.361
75.581	3.234	-0.434
72.558	3.204	-0.376
69.535	3.234	-0.302
66.512	3.266	-0.025
63.488	3.326	-0.210
60.465	3.356	-0.616
57.442	3.234	-0.543
54.419	3.356	-0.390
51.395	3.356	-0.219
48.372	3.266	-0.106
45.349	3.296	-0.122
42.326	3.266	-0.207
39.302	3.326	-0.243
36.279	3.204	-0.451
33.256	3.174	-0.594
30.233	3.388	-0.434
27.209	3.174	-0.490
24.186	3.234	-0.541
21.163	3.418	-0.229
18.140	3.356	-0.146
15.116	3.662	-0.620
12.093	3.540	-0.848
9.070	3.418	-0.826
6.047	3.174	-0.793
3.023	3.144	-0.778

---> Comment : N0

0.000	3.112	-0.716

LINE: W100 Direction: N
Date: 3- 4- 2 Time: 14: 3
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 0 Final station: 130

Station	Cond.[mS/m]	Inphase [ppt]
0.000	3.448	-0.798
3.250	2.930	-0.833
6.500	3.418	-0.791

9.750	3.448	-1.063
13.000	1.862	-0.324
16.250	2.472	0.039
19.500	3.724	-0.170
22.750	3.448	-0.447
26.000	3.418	-0.335
29.250	3.326	-0.212
32.500	3.266	-0.370
35.750	3.326	-0.585
39.000	3.174	-0.385
42.250	3.174	-0.113
45.500	3.204	-0.015
48.750	3.022	-0.179
52.000	3.356	-0.493
55.250	2.990	-0.583
58.500	3.418	-0.550
61.750	3.326	-0.629
65.000	3.266	-0.507
68.250	3.784	-0.411
71.500	3.418	-0.802
74.750	3.144	-0.611
78.000	2.624	0.152
81.250	2.288	-0.140
84.500	2.656	-0.493
87.750	3.724	-0.297
91.000	3.936	-0.245
94.250	3.876	-0.240
97.500	3.174	-0.153
100.750	3.266	-0.212
104.000	3.174	-0.168
107.250	3.814	-0.072
110.500	3.998	-0.207
113.750	4.028	-0.163
117.000	3.876	-0.098
120.250	4.272	-0.525
123.500	4.456	-0.598
126.750	3.632	-0.332
130.000	3.266	-1.366

---> Comment : N130

LINE: W110 Direction: S
Date: 3- 4- 2 Time: 14: 4
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 130 Final station: 0

Station	Cond.[mS/m]	Inphase [ppt]
130.000	3.022	-0.995
126.829	3.296	-0.477
123.659	3.540	-0.646
120.488	4.792	-0.412
117.317	4.944	-0.642
114.146	3.754	-0.455
110.976	3.448	-0.082
107.805	3.540	-0.332
104.634	3.418	-0.581
101.463	3.936	-0.593
98.293	3.998	-0.403
95.122	3.784	-0.414
91.951	3.784	-0.383
88.780	3.570	-0.256
85.610	3.692	-0.620
82.439	3.846	-0.587
79.268	3.662	-0.094
76.098	3.540	-0.429
72.927	3.448	-0.344

69.756	3.266	-0.144
66.585	3.266	-0.175
63.415	3.296	-0.440
60.244	3.296	-0.681
57.073	3.144	-0.525
53.902	3.022	-0.394
50.732	3.144	-0.129
47.561	3.296	-0.069
44.390	3.082	-0.464
41.220	3.388	-0.298
38.049	3.510	-0.098
34.878	3.082	-0.148
31.707	3.418	-0.238
28.537	3.448	-0.276
25.366	3.174	-0.466
22.195	3.356	-0.409
19.024	3.448	-0.447
15.854	3.692	-0.337
12.683	3.998	-0.365
9.512	3.754	-0.453
6.341	3.692	-0.468
3.171	3.510	-0.434
0.000	3.296	-0.502

---> Comment : N0
LINE: W120 Direction: N
Date: 3- 4- 2 Time: 14: 5
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 0 Final station: 130

Station	Cond.[mS/m]	Inphase [ppt]
0.000	3.296	-0.205
3.514	2.594	-0.298
7.027	3.602	-0.330
10.541	3.936	-0.276
14.054	3.692	-0.581
17.568	3.570	-0.675
21.081	3.754	-0.850
24.595	3.540	-0.528
28.108	3.326	-0.488
31.622	3.662	-0.069
35.135	2.990	-0.085
38.649	2.960	-0.071
42.162	3.266	-0.012
45.676	3.418	-0.205
49.189	3.326	-0.151
52.703	3.296	-0.324
56.216	3.234	-0.574
59.730	3.326	-0.286
63.243	2.868	-0.486
66.757	3.174	-0.265
70.270	3.692	-0.096
73.784	3.418	-0.034
77.297	3.204	-0.115
80.811	3.540	-0.120
84.324	3.692	-0.188
87.838	3.510	-0.019
91.351	3.418	-0.113
94.865	3.570	-0.190
98.378	4.302	-0.256
101.892	4.058	-0.164
105.405	3.724	0.035
108.919	3.784	-0.284
112.432	4.150	-0.153
115.946	4.364	0.057

119.459	4.272	-0.258
122.973	4.120	-0.155
126.486	4.852	-0.418
130.000	4.974	-0.513

---> Comment : N130

LINE: W130 Direction: S
Date: 3- 4- 2 Time: 14: 7
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 130 Final station: 0

Station	Cond.[mS/m]	Inphase [ppt]
130.000	3.234	-0.831
126.667	3.144	-0.716
123.333	3.144	-0.497
120.000	2.960	-0.620
116.667	3.754	-0.473
113.333	3.876	-0.355
110.000	4.028	-0.464
106.667	3.998	-0.311
103.333	4.028	-0.032
100.000	3.906	-0.117
96.667	3.602	-0.444
93.333	3.448	-0.425
90.000	4.090	-0.390
86.667	3.968	-0.267
83.333	3.906	-0.289
80.000	3.540	-0.315
76.667	3.356	-0.513
73.333	3.356	-0.455
70.000	3.662	-0.298
66.667	3.662	-0.379
63.333	3.326	-0.355
60.000	3.296	-0.387
56.667	3.448	-0.411
53.333	3.204	-0.640
50.000	2.532	-0.660
46.667	2.320	-0.502
43.333	2.198	-0.107
40.000	3.052	0.015
36.667	3.480	-0.163
33.333	3.510	-0.219
30.000	3.632	-0.352
26.667	2.960	-0.517
23.333	3.266	-0.484
20.000	3.876	-0.456
16.667	3.692	-0.484
13.333	3.936	-0.585
10.000	3.998	-0.587
6.667	3.998	-0.537
3.333	4.120	-0.842
0.000	3.876	-0.789

---> Comment : N0

LINE: W140 Direction: N
Date: 3- 4- 2 Time: 14: 9
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 0 Final station: 130

Station	Cond.[mS/m]	Inphase [ppt]
0.000	3.448	-0.453
3.333	3.936	-0.324
6.667	3.784	-0.111
10.000	3.418	-0.205
13.333	3.510	-0.267
16.667	3.814	-0.330
20.000	3.784	-0.736

23.333	3.602	-0.949
26.667	3.692	-0.662
30.000	4.028	-0.462
33.333	3.356	-0.276
36.667	3.266	-0.267
40.000	3.510	-0.416
43.333	3.968	-0.335
46.667	4.058	-0.365
50.000	3.480	-0.449
53.333	3.510	-0.253
56.667	3.936	-0.190
60.000	3.724	-0.166
63.333	3.936	-0.286
66.667	3.692	-0.317
70.000	2.808	-0.383
73.333	3.662	-0.618
76.667	3.724	-0.734
80.000	3.814	-0.626
83.333	3.846	-0.548
86.667	4.090	-0.163
90.000	3.662	-0.295
93.333	3.480	-0.328
96.667	3.602	-0.512
100.000	4.242	-0.502
103.333	3.814	-0.311
106.667	4.028	-0.282
110.000	4.670	-0.672
113.333	4.426	-0.754
116.667	3.356	-0.253
120.000	3.846	0.085
123.333	3.480	-0.163
126.667	3.418	-0.456
130.000	4.212	-1.010

---> Comment : N130

LINE: W150 Direction: S
Date: 3- 4- 2 Time: 14:11
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 200 Final station: 0

Station	Cond.[mS/m]	Inphase [ppt]
200.000	4.516	-0.348
196.296	4.302	-0.379
192.593	4.058	-0.212
188.889	4.272	-0.253
185.185	4.486	-0.637
181.481	4.212	-0.615
177.778	4.212	-0.201
174.074	4.302	-1.063
170.370	4.822	-0.732
166.667	5.036	-0.135
162.963	4.608	-0.093
159.259	4.760	-0.416
155.556	4.914	-0.280
151.852	4.394	-0.392
148.148	4.242	-0.512
144.444	4.334	-0.585
140.741	4.426	-0.469
137.037	4.426	-0.523
133.333	3.784	-0.547
129.630	3.510	-0.539
125.926	4.058	-0.190
122.222	4.334	-0.464
118.519	4.638	-0.651
114.815	4.456	-0.675

111.111	4.058	-0.567
107.407	3.876	-0.389
103.704	3.906	-0.556
100.000	3.784	-0.567
96.296	3.784	-0.537
92.593	3.510	-0.589
88.889	3.876	-0.234
85.185	4.028	-0.229
81.481	3.724	-0.387
77.778	3.662	-0.346
74.074	3.296	-0.354
70.370	3.082	-0.802
66.667	3.724	-0.322
62.963	3.692	-0.321
59.259	3.510	-0.591
55.556	3.480	-0.466
51.852	3.388	-0.414
48.148	3.266	-0.150
44.444	3.480	-0.091
40.741	3.418	-0.234
37.037	3.754	-0.385
33.333	3.784	-0.769
29.630	3.724	-0.824
25.926	3.814	-0.346
22.222	3.876	-0.657
18.519	3.998	-0.611
14.815	3.876	-0.578
11.111	4.120	-0.456
7.407	4.272	-0.407
3.704	4.212	-0.580
0.000	4.212	-0.774

---> Comment : N0
LINE: W160 Direction: N
Date: 3- 4- 2 Time: 14:13
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 0 Final station: 200

Station	Cond.[mS/m]	Inphase [ppt]
0.000	3.846	-0.672
3.571	3.724	-0.473
7.143	3.692	-0.387
10.714	3.022	-0.155
14.286	4.120	-0.642
17.857	4.058	-0.495
21.429	4.090	-0.300
25.000	3.724	-0.390
28.571	3.814	-0.480
32.143	3.968	-0.561
35.714	4.944	-0.321
39.286	4.090	-0.291
42.857	3.784	-0.372
46.429	3.448	-0.392
50.000	3.662	-0.583
53.571	3.632	-0.400
57.143	3.632	-0.367
60.714	3.754	-0.229
64.286	3.846	-0.376
67.857	3.724	-0.401
71.429	3.602	-0.372
75.000	3.724	-0.418
78.571	3.936	-0.420
82.143	3.632	-0.488
85.714	3.388	-0.547
89.286	3.144	-0.449

92.857	3.754	-0.519
96.429	3.814	-0.400
100.000	3.724	-0.304
103.571	3.998	-0.276
107.143	4.090	-0.368
110.714	4.364	-0.326
114.286	4.822	-0.447
117.857	4.670	-0.390
121.429	4.608	-0.468
125.000	4.516	-0.370
128.571	4.212	-0.295
132.143	4.426	-0.190
135.714	4.548	-0.403
139.286	3.876	-0.727
142.857	4.212	-0.585
146.429	5.158	-0.501
150.000	4.638	-0.365
153.571	4.456	-0.679
157.143	4.180	-0.594
160.714	4.426	-0.620
164.286	4.760	-0.453
167.857	4.792	-0.642
171.429	3.602	-0.684
175.000	3.022	-0.629
178.571	3.112	-0.585
182.143	1.190	-1.653
185.714	2.532	-1.500
189.286	4.272	-0.565
192.857	4.548	-0.269
196.429	3.968	-0.447
200.000	5.126	-0.931

---> Comment : N200

LINE: W170 Direction: S
Date: 3- 4- 2 Time: 14:14
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 200 Final station: 0

Station	Cond.[mS/m]	Inphase [ppt]
200.000	3.906	-0.201
196.610	4.090	-0.082
193.220	4.730	-0.484
189.830	4.456	-0.414
186.441	4.364	-0.271
183.051	4.090	-0.137
179.661	4.426	0.029
176.271	4.120	-0.135
172.881	4.272	-0.418
169.492	4.486	-0.464
166.102	4.670	-0.374
162.712	4.822	-0.330
159.322	4.486	-0.372
155.932	4.456	-0.315
152.542	4.760	-0.556
149.153	4.578	-0.420
145.763	4.914	-0.317
142.373	4.608	-0.357
138.983	4.334	-0.425
135.593	3.906	-0.475
132.203	4.150	-0.060
128.814	4.242	-0.242
125.424	4.426	-0.298
122.034	4.426	-0.231
118.644	4.394	-0.412
115.254	4.516	-0.486

111.864	4.272	-0.550
108.475	3.998	-0.293
105.085	3.724	-0.304
101.695	3.662	-0.519
98.305	3.326	-0.344
94.915	3.112	-0.060
91.525	3.112	-0.113
88.136	3.692	-0.512
84.746	4.150	-0.383
81.356	3.936	-0.438
77.966	3.936	-0.326
74.576	4.120	-0.456
71.186	3.846	-0.078
67.797	3.906	-0.300
64.407	3.876	-0.622
61.017	3.692	-0.646
57.627	3.692	-0.550
54.237	3.632	-0.389
50.847	3.724	-0.319
47.458	3.662	-0.271
44.068	3.936	-0.372
40.678	3.692	-0.502
37.288	3.540	-0.438
33.898	3.754	-0.278
30.508	3.784	-0.245
27.119	3.814	-0.315
23.729	3.846	-0.372
20.339	4.150	-0.668
16.949	3.876	-0.804
13.559	4.058	-0.550
10.169	3.968	-0.416
6.780	3.876	-0.442
3.390	4.090	-0.532
0.000	4.302	-0.513

---> Comment : N0

LINE: W180 Direction: N
Date: 3- 4- 2 Time: 14:16
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 0 Final station: 200

Station	Cond.[mS/m]	Inphase [ppt]
0.000	4.670	-0.587
3.226	4.394	-0.631
6.452	4.150	-0.602
9.677	3.754	-0.499
12.903	4.028	-0.326
16.129	2.686	-0.286
19.355	2.868	-0.286
22.581	3.876	-0.697
25.806	4.302	-0.745
29.032	3.724	-0.418
32.258	3.356	-0.648
35.484	3.692	-0.456
38.710	3.540	-0.567
41.935	2.990	-0.697
45.161	3.388	-0.593
48.387	3.662	-0.585
51.613	3.754	-0.497
54.839	3.570	-0.396
58.065	4.028	-0.429
61.290	3.936	-0.150
64.516	3.784	-0.058
67.742	3.234	-1.252
70.968	2.502	-2.470

74.194	2.320	-2.112
77.419	2.838	-0.844
80.645	3.906	0.037
83.871	4.608	-0.174
87.097	4.090	-0.594
90.323	3.814	-0.598
93.548	3.846	-0.547
96.774	4.272	-0.451
100.000	4.944	-0.368
103.226	4.394	-0.332
106.452	4.242	-0.357
109.677	3.998	-0.423
112.903	4.302	-0.433
116.129	5.462	-0.929
119.355	4.760	-0.679
122.581	4.334	-0.264
125.806	4.426	-0.269
129.032	4.334	-0.288
132.258	4.882	-0.185
135.484	5.280	-0.288
138.710	4.150	-0.565
141.935	4.516	-0.598
145.161	4.914	-0.616
148.387	4.974	-0.488
151.613	4.638	-0.313
154.839	4.456	-0.409
158.065	5.126	-0.513
161.290	5.126	-0.523
164.516	4.822	-0.434
167.742	4.700	-0.532
170.968	4.364	-0.434
174.194	4.670	-0.177
177.419	5.096	-0.203
180.645	4.242	-0.308
183.871	4.760	-0.486
187.097	4.822	-0.519
190.323	4.822	-0.547
193.548	4.944	-0.548
196.774	4.486	-0.677
200.000	4.364	-0.714

---> Comment : N200

LINE: W190 Direction: S
Date: 3- 4- 2 Time: 14:18
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 200 Final station: 0

Station	Cond.[mS/m]	Inphase [ppt]
200.000	4.058	-0.761
196.610	4.364	-0.392
193.220	4.822	-0.554
189.830	4.730	-0.539
186.441	4.394	-0.278
183.051	4.150	-0.102
179.661	4.486	-0.183
176.271	4.578	-0.374
172.881	4.394	-0.381
169.492	4.608	-0.464
166.102	4.578	-0.495
162.712	4.730	-0.374
159.322	5.096	-0.293
155.932	5.250	-0.495
152.542	5.066	-0.469
149.153	5.218	-0.552
145.763	5.280	-0.436

142.373	5.676	-0.541
138.983	5.798	-0.602
135.593	5.768	-0.367
132.203	5.402	-0.543
128.814	5.188	-0.548
125.424	5.004	-0.609
122.034	4.852	-0.468
118.644	4.730	-0.260
115.254	4.730	-0.600
111.864	4.944	-0.357
108.475	4.730	-0.357
105.085	4.456	-0.423
101.695	4.364	-0.515
98.305	4.456	-0.449
94.915	4.212	-0.374
91.525	3.906	-0.282
88.136	4.058	-0.313
84.746	3.936	-0.493
81.356	3.692	-0.519
77.966	3.936	-0.532
74.576	3.906	-0.170
71.186	4.272	-0.174
67.797	4.028	-0.324
64.407	3.936	-0.407
61.017	3.998	-0.298
57.627	3.846	-0.616
54.237	4.028	-0.565
50.847	4.120	-0.504
47.458	4.150	-0.502
44.068	4.180	-0.589
40.678	4.090	-0.517
37.288	3.814	-0.433
33.898	3.846	-0.288
30.508	3.968	-0.422
27.119	3.906	-0.442
23.729	3.724	-0.422
20.339	4.394	-0.433
16.949	4.212	-0.517
13.559	3.906	-0.591
10.169	3.936	-0.446
6.780	3.936	-0.416
3.390	4.548	-0.462
0.000	4.456	-0.507

---> Comment : N0
LINE: W200 Direction: N
Date: 3- 4- 2 Time: 14:19
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 0 Final station: 200

Station	Cond.[mS/m]	Inphase [ppt]
0.000	5.158	-0.576
3.333	5.462	-0.826
6.667	4.974	-0.594
10.000	4.670	-0.442
13.333	3.968	-0.262
16.667	3.814	-0.267
20.000	4.242	-0.556
23.333	3.906	-0.684
26.667	3.846	-0.418
30.000	4.180	-0.401
33.333	4.334	-0.550
36.667	4.180	-0.668
40.000	3.754	-0.728
43.333	3.968	-0.631

46.667	3.204	-0.456
50.000	3.724	-0.556
53.333	3.388	-0.256
56.667	3.754	-0.319
60.000	3.906	-0.332
63.333	3.480	-0.293
66.667	3.784	-0.550
70.000	3.724	-0.458
73.333	3.814	-0.276
76.667	3.724	-0.344
80.000	3.266	-0.574
83.333	3.632	-0.626
86.667	3.876	-0.368
90.000	3.356	-0.179
93.333	3.662	-0.451
96.667	4.242	-0.519
100.000	4.150	-0.488
103.333	4.426	-0.479
106.667	4.272	-0.512
110.000	4.394	-0.567
113.333	4.516	-0.813
116.667	4.548	-0.703
120.000	4.792	-0.486
123.333	4.944	-0.444
126.667	4.638	-0.482
130.000	5.036	-0.513
133.333	5.188	-0.482
136.667	5.188	-0.392
140.000	5.432	-0.321
143.333	5.920	-0.440
146.667	5.432	-0.530
150.000	5.494	-0.554
153.333	5.372	-0.570
156.667	5.524	-0.495
160.000	5.494	-0.449
163.333	5.066	-0.429
166.667	5.340	-0.532
170.000	5.126	-0.436
173.333	4.792	-0.471
176.667	4.882	-0.455
180.000	4.852	-0.525
183.333	4.608	-0.396
186.667	4.516	-0.528
190.000	4.548	-0.710
193.333	4.670	-0.624
196.667	4.516	-0.697
200.000	4.028	-0.765

---> Comment : N200

LINE: W210 Direction: S
Date: 3- 4- 2 Time: 14:21
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 200 Final station: 0

Station	Cond.[mS/m]	Inphase [ppt]
200.000	3.814	-0.502
196.774	3.814	-0.719
193.548	3.144	-0.955
190.323	4.426	-0.242
187.097	4.730	-0.164
183.871	4.792	-0.442
180.645	4.914	-0.368
177.419	5.402	-0.499
174.194	5.584	-0.537
170.968	5.798	-0.502

167.742	4.974	-0.613
164.516	4.914	-0.484
161.290	5.280	-0.383
158.065	5.340	-0.183
154.839	5.706	-0.495
151.613	5.676	-0.589
148.387	5.616	-0.558
145.161	5.646	-0.525
141.935	5.738	-0.648
138.710	5.402	-0.429
135.484	5.676	-0.348
132.258	5.280	-0.458
129.032	5.158	-0.407
125.806	5.250	-0.567
122.581	5.218	-0.499
119.355	4.822	-0.705
116.129	4.700	-0.692
112.903	4.548	-0.526
109.677	4.272	-0.377
106.452	4.608	-0.512
103.226	4.638	-0.507
100.000	4.486	-0.587
96.774	4.456	-0.543
93.548	4.548	-0.519
90.323	4.120	-0.589
87.097	4.090	-0.475
83.871	3.906	-0.396
80.645	4.120	-0.490
77.419	4.456	-0.530
74.194	4.180	-0.506
70.968	4.272	-0.488
67.742	4.150	-0.376
64.516	3.936	-0.504
61.290	4.120	-0.374
58.065	4.272	-0.398
54.839	4.272	-0.412
51.613	4.426	-0.593
48.387	4.150	-0.507
45.161	3.936	-0.475
41.935	3.906	-0.311
38.710	3.876	-0.300
35.484	4.090	-0.484
32.258	3.906	-0.774
29.032	3.632	-0.758
25.806	3.326	-0.672
22.581	3.266	-0.499
19.355	2.532	-0.282
16.129	3.448	-0.164
12.903	4.180	-0.438
9.677	4.120	-0.322
6.452	4.670	-0.434
3.226	5.158	-0.216
0.000	5.126	-0.598

---> Comment : NO
LINE: W220 Direction: N
Date: 3- 4- 2 Time: 14:23
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 0 Final station: 200

Station	Cond.[mS/m]	Inphase [ppt]
0.000	5.432	-0.620
3.125	5.616	-0.664
6.250	6.072	-0.420
9.375	4.914	-0.355

12.500	3.754	-0.333
15.625	4.242	-0.574
18.750	4.212	-0.216
21.875	3.846	-0.537
25.000	3.448	-0.569
28.125	3.998	-0.436
31.250	3.692	-0.491
34.375	3.356	-0.475
37.500	3.388	-0.456
40.625	3.602	-0.412
43.750	3.632	-0.262
46.875	3.876	-0.390
50.000	3.570	-0.390
53.125	3.724	-0.205
56.250	3.754	-0.181
59.375	4.180	-0.231
62.500	4.394	-0.690
65.625	4.212	-0.605
68.750	4.150	-0.344
71.875	4.212	-0.506
75.000	4.180	-0.622
78.125	3.968	-0.528
81.250	4.212	-0.591
84.375	4.028	-0.468
87.500	3.998	-0.506
90.625	4.028	-0.914
93.750	4.394	-0.875
96.875	3.510	-0.690
100.000	3.906	-0.670
103.125	4.364	-0.484
106.250	4.394	-0.539
109.375	4.548	-0.556
112.500	4.486	-0.677
115.625	4.058	-0.611
118.750	4.272	-0.493
121.875	4.548	-0.530
125.000	4.548	-0.626
128.125	4.548	-0.480
131.250	4.760	-0.927
134.375	5.066	-0.969
137.500	5.554	-0.907
140.625	5.004	-0.455
143.750	4.974	-0.390
146.875	4.670	-0.495
150.000	5.462	-0.537
153.125	5.920	-0.387
156.250	5.676	-0.631
159.375	5.524	-0.512
162.500	5.554	-0.552
165.625	5.462	-0.539
168.750	5.616	-0.416
171.875	5.768	-0.442
175.000	5.554	-0.203
178.125	5.950	-0.157
181.250	6.104	-0.721
184.375	5.738	-0.701
187.500	5.188	-0.635
190.625	4.914	-0.657
193.750	4.944	-0.620
196.875	4.516	-0.401
200.000	4.150	-0.717

---> Comment : N200

LINE: W230 Direction: S

SITE5

Date: 3- 4- 2 Time: 14:25
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 200 Final station: 0

Station	Cond.[mS/m]	Inphase [ppt]
200.000	4.670	-0.951
196.610	4.822	-1.005
193.220	5.340	-0.892
189.830	5.188	-0.675
186.441	5.158	-0.451
183.051	5.188	-0.475
179.661	5.524	-0.429
176.271	5.402	-0.488
172.881	5.646	-0.504
169.492	5.798	-0.697
166.102	5.860	-0.611
162.712	5.554	-0.486
159.322	5.768	-0.569
155.932	5.920	-0.548
152.542	6.196	-0.526
149.153	6.440	-0.536
145.763	6.318	-0.602
142.373	5.768	-0.124
138.983	5.768	-0.328
135.593	5.646	-0.412
132.203	5.310	-0.324
128.814	4.944	-0.389
125.424	5.126	-0.471
122.034	5.250	-0.394
118.644	5.188	-0.214
115.254	5.218	-0.488
111.864	5.096	-0.550
108.475	4.882	-0.532
105.085	5.096	-0.583
101.695	4.882	-0.480
98.305	5.036	-0.547
94.915	4.700	-0.367
91.525	4.700	-0.139
88.136	4.882	-0.236
84.746	4.456	-0.311
81.356	4.608	-0.512
77.966	4.730	-0.425
74.576	4.852	-0.427
71.186	5.036	-0.589
67.797	4.822	-0.504
64.407	4.760	-0.253
61.017	4.700	-0.633
57.627	4.334	-0.771
54.237	4.302	-0.418
50.847	4.028	-0.607
47.458	4.058	-0.460
44.068	4.120	-0.209
40.678	4.028	-0.374
37.288	4.212	-0.392
33.898	3.968	-0.253
30.508	4.212	-0.264
27.119	4.852	-0.267
23.729	5.462	-0.256
20.339	6.256	-0.401
16.949	6.286	-0.188
13.559	6.196	-0.313
10.169	6.042	-0.310
6.780	6.348	-0.223
3.390	6.470	-0.253

.000 7.142 -0.545
---> Comment : N0
LINE: W240 Direction: N
Date: 3- 4- 2 Time: 14:27
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 0 Final station: 200

Station	Cond.[mS/m]	Inphase [ppt]
0.000	-19.866	-5.884
3.390	7.690	0.617
6.780	19.042	0.959
10.169	7.080	-2.333
---> Comment : 5GW02		
13.559	5.554	-2.974
16.949	-3.144	-6.131
20.339	22.492	1.044
23.729	15.168	1.341
27.119	5.188	-0.354
30.508	5.340	-0.692
33.898	5.280	-0.859
37.288	4.822	-0.602
40.678	3.936	-0.453
44.068	3.968	-0.416
47.458	4.212	-0.400
50.847	3.998	-0.324
54.237	3.510	0.220
57.627	4.058	0.073
61.017	4.058	-0.295
64.407	4.852	-0.082
67.797	4.670	-0.177
71.186	4.700	-0.076
74.576	4.792	-0.429
77.966	4.700	-0.497
81.356	3.936	-0.705
84.746	4.548	-0.497
88.136	4.792	-0.414
91.525	4.608	-0.365
94.915	4.486	-0.681
98.305	4.730	-0.640
101.695	4.974	-0.615
105.085	4.608	-0.712
108.475	4.760	-0.640
111.864	4.914	-0.543
115.254	4.730	-0.569
118.644	5.280	-0.315
122.034	5.250	-0.833
125.424	4.852	-0.813
128.814	5.096	-0.725
132.203	5.372	-0.477
135.593	5.616	-0.576
138.983	5.218	-0.530
142.373	5.676	-0.519
145.763	5.982	-0.427
149.153	6.072	-0.379
152.542	6.652	-0.515
155.932	6.256	-0.482
159.322	6.072	-0.515
162.712	5.524	-0.558
166.102	5.310	-0.666
169.492	5.890	-0.776
172.881	6.134	-0.769
176.271	5.676	-0.795
179.661	4.822	-0.510
183.051	4.760	-0.446

186.441	5.462	-0.587
189.830	5.310	-0.631
193.220	4.882	-0.650
196.610	5.188	-0.475
200.000	5.310	-0.446

---> Comment : N200

LINE: W250 Direction: S
Date: 3- 4- 2 Time: 14:30
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 200 Final station: 0

Station	Cond.[mS/m]	Inphase [ppt]
200.000	4.822	-0.796
196.774	4.852	-0.739
193.548	4.852	-0.616
190.323	5.126	-0.455
187.097	5.738	-0.420
183.871	6.104	-0.507
180.645	6.318	-0.519
177.419	6.134	-0.525
174.194	6.684	-0.589
170.968	6.774	-0.379
167.742	6.806	-0.558
164.516	6.806	-0.585
161.290	6.806	-0.581
158.065	6.318	-0.668
154.839	5.646	-0.512
151.613	6.042	-0.475
148.387	5.738	-0.763
145.161	5.524	-0.918
141.935	6.774	-0.605
138.710	6.958	-0.304
135.484	6.988	-0.350
132.258	6.958	-0.210
129.032	6.866	-0.600
125.806	7.172	-0.512
122.581	6.896	-0.556
119.355	6.744	-0.580
116.129	7.020	-0.660
112.903	7.232	-0.587
109.677	7.110	-0.521
106.452	6.378	-0.392
103.226	5.646	-0.456
100.000	5.828	-0.504
96.774	5.890	-0.433
93.548	5.890	-0.412
90.323	5.920	-0.214
87.097	5.554	-0.271
83.871	5.462	-0.605
80.645	5.462	-0.479
77.419	5.310	-0.372
74.194	5.706	-0.308
70.968	6.286	-0.047
67.742	7.752	0.344
64.516	8.332	0.643
61.290	13.458	4.425
58.065	13.428	4.678
54.839	10.132	2.861
51.613	6.500	0.797
48.387	5.982	0.630
45.161	6.042	0.630
41.935	6.470	0.445
38.710	6.622	-0.146
35.484	4.974	-0.681

32.258	3.356	-0.745
29.032	3.174	0.160
25.806	1.618	1.420
22.581	6.134	1.385
19.355	9.186	0.873
16.129	10.376	0.825
12.903	11.170	-1.070
9.677	12.786	-0.686
6.452	13.276	0.004
3.226	13.366	0.210
0.000	12.726	0.072

---> Comment : NO

LINE: W260 Direction: N
Date: 3- 4- 2 Time: 14:33
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 0 Final station: 200

Station	Cond.[mS/m]	Inphase [ppt]
0.000	16.358	0.000
3.125	25.756	0.211
6.250	19.562	-0.047
9.375	-7.232	-0.833
12.500	5.768	-0.760
15.625	7.904	-0.122
18.750	11.994	0.252
21.875	5.158	-0.282
25.000	6.684	-0.155
28.125	8.758	0.130
31.250	6.958	-0.705
34.375	7.844	-0.739
37.500	6.196	-2.603
40.625	-10.804	-14.614
43.750	-39.550	-24.768
46.875	-7.019	-8.734

---> Comment :

50.000	-69.122	-24.775

---> Comment : HDWALL

53.125	-53.679	-24.683
56.250	18.586	-4.591
59.375	19.042	3.142
62.500	6.744	0.603
65.625	4.914	-0.732
68.750	6.318	-0.662
71.875	6.530	-0.377
75.000	5.890	-0.330
78.125	5.280	-0.561
81.250	5.432	-0.436
84.375	6.592	-0.539
87.500	6.774	-0.664
90.625	6.836	-0.675
93.750	6.042	-0.541
96.875	4.700	0.020
100.000	3.846	0.162
103.125	5.066	-0.120
106.250	5.616	-0.594
109.375	6.562	-0.447
112.500	8.300	-0.692
115.625	8.576	-0.692
118.750	9.034	-0.664
121.875	8.972	-0.593
125.000	8.636	-0.660
128.125	7.874	-0.434
131.250	7.844	-0.451
134.375	7.812	-0.447

137.500	8.026	-0.567
140.625	7.508	-0.462
143.750	7.264	-0.389
146.875	7.172	-0.469
150.000	6.774	-0.541
153.125	6.684	-0.561
156.250	6.714	-0.605
159.375	6.652	-0.455
162.500	7.110	-0.453
165.625	7.232	-0.455
168.750	7.050	-0.570
171.875	7.324	-0.526
175.000	6.928	-0.383
178.125	6.836	-0.368
181.250	6.500	-0.333
184.375	6.592	-0.330
187.500	6.744	-0.350
190.625	6.134	-0.212
193.750	5.402	-0.310
196.875	5.616	-0.328
200.000	4.760	-0.409

---> Comment : N200

LINE: W270 Direction: S
Date: 3- 4- 2 Time: 14:36
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 200 Final station: 0

Station	Cond.[mS/m]	Inphase [ppt]
200.000	6.072	-0.407
196.970	5.920	-0.433
193.939	5.280	-0.453
190.909	4.700	-0.197
187.879	4.302	-0.067
184.848	4.028	-0.688
181.818	6.318	-0.993
178.788	7.844	-0.377
175.758	7.660	-0.216
172.727	7.508	-0.359
169.697	7.354	-0.210
166.667	7.660	-0.339
163.636	7.966	-0.354
160.606	8.270	-0.517
157.576	8.606	-0.484
154.545	8.820	-0.565
151.515	8.972	-0.504
148.485	8.636	-0.670
145.455	9.186	-0.396
142.424	9.674	-0.396
139.394	9.582	-0.703
136.364	7.660	-1.008
133.333	3.174	-1.155
130.303	-3.052	-1.289
127.273	-8.543	-0.107
124.242	-10.102	2.341
121.212	-11.322	4.838

---> Comment : ANOM1

118.182	-10.406	4.267
115.152	-9.215	2.503
112.121	-3.936	-1.465
109.091	8.942	-0.681
106.061	10.620	-0.387
103.030	10.438	-0.455
100.000	10.162	-0.554
96.970	9.858	-0.480

93.939	9.308	-0.477
90.909	9.124	-0.390
87.879	8.544	-0.407
84.848	8.332	-0.507
81.818	8.210	-0.469
78.788	8.270	-0.434
75.758	7.720	-0.311
72.727	7.844	-0.411
69.697	8.210	-0.436
66.667	8.850	-0.286
63.636	10.132	-0.308
60.606	11.750	-0.163
57.576	14.344	0.220
54.545	17.090	1.779
51.515	14.404	-1.013
48.485	9.216	4.730
45.455	8.362	4.178

---> Comment : MHOLE

42.424	6.134	4.559
39.394	-3.905	-0.767
36.364	-9.064	-7.121
33.333	-2.106	-1.671
30.303	1.586	0.616
27.273	5.798	0.333
24.242	16.694	0.040
21.212	24.598	0.156
18.182	21.912	0.068
15.152	25.176	0.151
12.121	27.496	0.145
9.091	26.702	0.366
6.061	26.000	0.415
3.030	25.512	0.141
0.000	22.858	0.353

---> Comment : NO

LINE: W280 Direction: N
Date: 3- 4- 2 Time: 14:41
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 0 Final station: 200

Station	Cond.[mS/m]	Inphase [ppt]
0.000	14.222	-0.041
3.226	14.526	0.044
6.452	14.924	0.178
9.677	15.716	0.371
12.903	15.838	0.390
16.129	16.572	0.252
19.355	16.296	0.230
22.581	16.174	0.287
25.806	15.624	0.252
29.032	15.380	0.226
32.258	14.740	-0.236
35.484	15.136	0.016
38.710	17.028	-0.089
41.935	-2.746	0.024
45.161	-0.945	0.112
48.387	-25.360	-0.618
51.613	-33.752	-0.653
54.839	-26.428	-0.756

---> Comment : ANOM2

58.065	-23.896	-0.830
61.290	-4.730	-0.725
64.516	15.076	-1.116
67.742	20.416	-0.411
70.968	16.754	-0.330

74.194	13.122	-0.381
77.419	11.506	-0.387
80.645	10.224	-0.049
83.871	8.118	0.028
87.097	6.378	0.472
90.323	5.890	0.527
93.548	7.080	0.254
96.774	8.026	0.162
100.000	6.896	0.169
103.226	7.416	0.178
106.452	9.430	0.044
109.677	10.620	0.002
112.903	10.560	0.013
116.129	9.246	0.204
119.355	5.890	0.652
122.581	5.066	0.683
125.806	5.432	0.489
129.032	6.226	0.781
132.258	5.860	0.869
135.484	6.774	-0.273
138.710	8.300	-1.456
141.935	10.314	-0.684
145.161	10.438	-0.014
148.387	9.460	-0.231
151.613	9.582	-0.504
154.839	9.858	-0.471
158.065	9.614	-0.449
161.290	9.216	-0.163
164.516	9.002	-0.219
167.742	8.850	-0.234
170.968	7.690	-0.392
174.194	7.110	-0.333
177.419	7.172	-0.370
180.645	7.354	-0.333
183.871	6.714	-0.429
187.097	6.196	-0.392
190.323	5.982	-0.047
193.548	5.828	0.055
196.774	5.860	-0.014
200.000	5.372	-0.444

---> Comment : N200

LINE: W290 Direction: S
Date: 3- 4- 2 Time: 14:46
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 200 Final station: 0

Station	Cond.[mS/m]	Inphase [ppt]
200.000	5.616	-2.579
197.561	6.348	-2.682
195.122	6.592	-2.480
192.683	6.440	-2.039
190.244	7.538	0.210
187.805	7.476	1.038
185.366	6.866	0.309
182.927	6.774	-0.201
180.488	7.264	-0.289
178.049	8.728	-0.142
175.610	10.468	-0.194
173.171	10.772	-0.032
170.732	10.406	-0.049
168.293	9.888	-0.078
165.854	9.826	-0.063
163.415	9.888	-0.137
160.976	9.918	-0.297

158.537	9.858	-0.422
156.098	9.980	-0.449
153.659	10.254	-0.321
151.220	10.254	-0.212
148.780	10.192	-0.170
146.341	11.016	-0.135
143.902	11.840	-0.164
141.463	11.902	-0.170
139.024	12.208	-0.201
136.585	12.330	-0.218
134.146	12.390	-0.170
131.707	12.330	-0.157
129.268	11.962	-0.264
126.829	11.810	-0.315
124.390	11.658	-0.357
121.951	11.414	-0.447
119.512	11.414	-0.456
117.073	11.902	-0.339
114.634	11.506	-0.060
112.195	11.016	-0.175
109.756	10.468	-0.025
107.317	9.858	0.020
104.878	8.942	0.206
102.439	8.850	0.165
100.000	8.484	0.298
97.561	8.210	0.393
95.122	7.782	0.869
92.683	7.690	0.790
90.244	8.392	0.360
87.805	9.124	-0.021
85.366	9.704	-0.210
82.927	10.254	-0.385
80.488	10.650	-0.451
78.049	10.986	-0.475
75.610	10.986	-0.455
73.171	10.224	-0.449
70.732	8.942	-0.460
68.293	6.896	-0.512
65.854	2.258	-0.423
63.415	-2.228	-0.471
60.976	-4.852	-0.526
58.537	-4.670	-0.495
56.098	-1.891	-0.411
53.659	4.516	-0.455
51.220	11.292	-0.317
48.780	18.524	-0.109
46.341	22.064	-0.107
43.902	21.882	0.202
41.463	19.866	0.002
39.024	17.028	-0.242
36.585	14.740	-0.210
34.146	13.916	-0.098
31.707	12.330	-0.041
29.268	11.628	-0.122
26.829	11.840	-0.321
24.390	11.628	-0.175
21.951	11.780	-0.060
19.512	12.054	0.015
17.073	11.138	-0.045
14.634	10.528	0.118
12.195	10.834	0.349
9.756	11.230	0.202
7.317	10.620	0.254

4.878	10.834	0.154
2.439	10.620	0.432
0.000	11.932	0.375

---> Comment : N0
LINE: W300 Direction: N
Date: 3- 4- 2 Time: 14:48
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 0 Final station: 400

Station	Cond.[mS/m]	Inphase [ppt]
0.000	10.560	0.702
2.532	10.712	0.899
5.063	10.864	0.717
7.595	10.438	0.412
10.127	10.528	0.299
12.659	11.170	0.279
15.190	11.444	0.327
17.722	11.810	0.263
20.253	11.780	0.085
22.784	11.840	0.204
25.316	11.994	0.059
27.848	11.536	-0.038
30.379	11.474	-0.113
32.911	11.138	-0.201
35.443	11.810	-0.058
37.975	12.878	-0.120
40.506	13.214	-0.115
43.038	13.214	-0.179
45.570	13.610	-0.332
48.101	13.946	-0.295
50.633	14.802	-0.212
53.165	16.846	-0.117
55.696	17.518	-0.253
58.228	15.930	-0.282
60.759	12.452	-0.365
63.291	9.582	-0.392
65.822	6.896	-0.477
68.354	4.272	-0.442
70.886	3.418	-0.501
73.417	3.540	-0.536
75.949	4.792	-0.510
78.481	6.744	-0.826
81.012	7.812	-1.583
83.544	6.836	-0.695
86.076	6.684	0.722
88.608	6.562	0.899
91.139	6.958	1.181
93.671	6.592	1.000
96.203	7.720	-0.006
98.734	9.918	-0.695
101.265	11.200	-0.605
103.797	11.016	-0.517
106.329	10.834	-0.262
108.860	10.192	-0.087
111.392	10.712	-0.039
113.924	11.474	-0.036
116.455	12.604	-0.146
118.987	12.574	-0.159
121.519	12.330	-0.242
124.050	12.360	-0.271
126.582	12.452	-0.466
129.114	11.840	-0.201
131.646	11.506	-0.229
134.177	11.718	-0.243

136.709	12.116	-0.144	
139.241	11.506	-0.717	
141.771	9.736	-2.034	
144.303	9.186	-0.918	
146.835	9.766	0.046	
149.366	9.156	-0.304	
151.898	9.522	-1.000	
154.430	10.284	-0.576	
156.962	10.192	-0.304	
159.493	9.948	-0.196	
162.025	10.010	-0.047	
164.557	9.826	0.007	
167.088	9.552	0.006	
169.620	10.070	-0.196	
172.152	10.010	-0.236	
174.683	8.544	-0.096	
177.215	7.294	-0.181	
179.747	6.500	-0.286	
182.278	6.408	-0.005	
184.809	6.866	0.187	
187.341	7.416	0.248	
189.873	7.568	-0.218	
192.404	7.324	-1.114	
194.936	7.020	-1.577	
197.468	7.294	0.064	
200.000	7.538	0.097	
202.000	6.408	-0.286	New segment
---> Comment : N200			
204.616	6.072	0.029	
207.231	3.846	-1.113	
209.846	1.496	-6.160	
212.462	1.342	-7.964	
215.077	4.730	-2.717	
217.692	6.866	1.400	
220.308	6.652	1.749	
222.924	6.134	1.036	
225.539	5.768	0.338	
228.154	5.950	0.656	
230.770	4.730	-0.140	
233.385	5.646	-0.192	
236.000	5.524	-0.080	
238.616	4.608	-0.166	
241.231	4.914	-0.337	
243.846	5.188	-0.262	
246.462	5.372	-0.368	
249.077	5.126	-0.455	
251.693	3.906	0.073	
254.308	3.570	-0.197	
256.924	3.632	-0.359	
259.539	4.302	-0.330	
262.154	4.334	-0.293	
264.770	4.302	0.066	
267.385	4.364	0.088	
270.000	3.784	-0.190	
272.000	4.852	0.210	New segment
---> Comment : N270			
275.122	5.676	0.009	
278.245	-0.610	-0.280	
281.366	-1.160	-0.593	
284.488	-0.274	-0.534	
287.610	2.564	0.391	
290.731	6.774	0.141	
293.854	8.422	0.252	

296.976	8.636	0.254
300.098	6.470	0.022
303.219	4.272	-0.411
306.342	9.552	-0.267
309.464	8.758	-0.335
312.585	8.210	-0.414
315.707	8.728	-0.451
318.830	8.790	-0.635
321.951	8.544	-0.447
325.073	8.270	-0.471
328.195	6.896	-0.607
331.318	6.408	-0.477
334.439	6.652	-0.411
337.561	6.622	-0.510
340.683	6.104	-0.436
343.805	4.426	-0.216
346.927	5.372	-0.104
350.049	6.104	-0.014
353.170	5.372	-0.288
356.293	5.036	-0.216
359.415	5.402	-0.412
362.537	5.188	-0.490
365.658	4.394	-0.052
368.781	4.364	-0.071
371.903	4.914	0.031
375.024	4.486	0.176
378.146	4.456	0.031
381.269	3.724	-0.126
384.390	4.944	-0.183
387.512	6.104	0.068
390.634	6.500	0.309
393.757	5.890	-0.291

---> Comment : N400

400.000	6.530	0.228

---> Comment : 4GW09

LINE: W310 Direction: S
Date: 3- 4- 2 Time: 14:55
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 400 Final station: 30

Station	Cond.[mS/m]	Inphase [ppt]
400.000	4.364	-0.449
396.969	4.792	-0.471
393.939	4.792	-0.466
390.909	4.944	-0.043
387.879	5.372	-0.387
384.848	5.860	-0.690
381.818	5.646	-0.646
378.787	4.700	-0.258
375.758	4.212	-0.521
372.727	4.882	-0.256
369.697	4.578	0.099
366.666	4.670	-0.269
363.637	6.042	-0.425
360.606	6.256	-0.379
357.576	5.584	-0.741
354.545	5.372	-0.739
351.515	4.822	-0.392
348.485	5.218	-0.425
345.455	4.822	-0.054
342.424	5.432	-0.352
339.394	6.196	-0.526
336.363	5.554	-0.291
333.334	4.822	-0.348

330.303	4.944	-0.414	
327.273	5.494	-0.288	
324.242	5.646	-0.583	
321.213	5.066	-0.997	
318.182	4.822	-1.317	
315.152	4.638	-1.381	
312.121	4.516	-0.870	
309.091	5.340	-0.620	
306.061	5.950	-1.127	
303.031	7.202	-0.574	
300.000	7.812	0.588	
296.969	8.118	0.702	
293.939	9.216	0.369	
290.909	7.354	0.220	
287.879	-0.885	0.006	
284.848	-2.228	-0.225	
281.818	-3.876	-0.955	
278.788	0.794	-0.613	
275.758	9.308	-0.201	
272.727	9.948	0.114	
269.697	5.616	-0.232	
266.666	5.340	-0.190	
263.637	5.584	-0.396	
260.606	3.906	-0.346	
257.576	4.150	-0.468	
254.545	4.212	-0.387	
251.515	4.608	-0.135	
248.485	4.150	-0.183	
245.455	4.548	-0.177	
242.424	4.792	-0.258	
239.394	4.608	-0.295	
236.363	4.394	-0.615	
233.334	4.394	-0.572	
230.303	4.852	-0.218	
227.273	4.700	-0.324	
224.242	4.760	-0.377	
221.213	5.004	-0.058	
218.182	5.004	-0.341	
215.152	5.126	-0.431	
212.121	5.126	-0.304	
209.091	5.372	-0.225	
206.061	4.974	-0.221	
203.031	5.280	-0.163	
200.000	5.584	-0.089	
198.000	6.104	-0.344	New segment
---> Comment : N200			
194.945	6.592	-0.387	
191.891	6.684	-0.122	
188.837	6.318	-0.310	
185.782	6.378	-0.150	
182.727	6.226	0.118	
179.673	6.164	-0.087	
176.619	7.110	-0.449	
173.564	8.118	-0.468	
170.509	9.644	-0.348	
167.454	10.284	-0.166	
164.401	9.980	-0.196	
161.346	9.948	-0.383	
158.291	9.918	-0.721	
155.236	10.346	-0.495	
152.182	11.506	-0.425	
149.128	12.238	-0.231	
146.073	11.994	-0.297	

143.018	12.512	-0.288
139.963	13.062	-0.392
136.910	13.214	-0.390
133.855	13.092	-0.361
130.800	12.940	-0.330
127.745	13.306	-0.288
124.691	13.916	-0.341
121.637	14.556	-0.385
118.582	14.374	-0.278
115.527	14.648	-0.412
112.473	14.222	-0.506
109.418	14.190	-0.657
106.364	13.610	-0.190
103.309	12.878	0.147
100.255	12.176	-0.100
97.200	11.994	-0.278
94.146	11.414	-0.315
91.091	10.590	-0.458
88.037	10.712	-0.405
84.982	10.864	0.015
81.927	11.566	-0.407

---> Comment : STDPIPE

78.873	11.718	-0.210
75.818	12.298	0.075
72.764	12.664	-0.148
69.709	11.750	-0.308
66.654	12.146	-0.319
63.600	12.696	-0.181
60.546	12.664	-0.212
57.491	12.604	-0.306
54.436	12.238	-0.113
51.382	12.330	-0.174
48.328	12.482	-0.436
45.273	11.750	-0.128
42.218	11.352	0.002
39.163	11.596	-0.049
36.110	12.024	-0.063
33.055	12.664	0.224
30.000	12.452	0.463

---> Comment : N30

LINE: W320 Direction: N
Date: 3- 4- 2 Time: 15: 0
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 30 Final station: 400

Station	Cond.[mS/m]	Inphase [ppt]
30.000	13.488	0.575
33.058	14.588	0.154
36.116	15.136	-0.155
39.174	14.466	-0.236
42.231	13.732	-0.300
45.289	12.634	-0.223
48.347	12.634	-0.157
51.405	13.916	-0.311
54.463	13.520	-0.372
57.521	13.366	-0.129
60.579	12.482	-0.069
63.636	11.718	-0.203
66.694	11.536	-0.260
69.752	11.810	-0.186
72.810	11.872	0.020
75.868	11.994	-0.094
78.926	11.414	0.022
81.983	11.078	0.029

85.041	11.108	-0.056
88.099	12.420	-0.469
91.157	12.574	-0.695
94.215	12.360	-0.335
97.273	12.176	-0.089
100.331	12.298	-0.084
103.388	12.482	-0.308
106.446	13.154	-0.251
109.504	14.100	-0.394
112.562	13.764	-0.611
115.620	13.764	-0.385
118.678	13.916	-0.471
121.736	14.984	-0.690
124.793	15.350	-0.868
127.851	14.832	-0.506
130.909	13.154	-0.273
133.967	12.420	-0.420
137.025	13.092	-0.078
140.083	13.336	0.018
143.140	13.428	-0.265
146.198	12.848	-0.510
149.256	11.932	-0.440
152.314	11.932	-0.207
155.372	10.804	-0.181
158.430	10.224	-0.282
161.488	10.406	-0.507
164.545	10.162	-0.203
167.603	9.796	0.013
170.661	9.704	-0.080
173.719	9.400	-0.350
176.777	8.178	-0.104
179.835	7.720	-0.411
182.893	7.050	-0.627
185.950	6.806	-0.773
189.008	6.896	-0.791
192.066	7.264	-0.607
195.124	7.720	-0.574
198.182	6.500	-0.495
201.240	6.530	-0.398
---> Comment : N200		
204.298	6.470	-0.267
207.355	5.524	-0.275
210.413	4.700	-0.163
213.471	5.218	-0.039
216.529	5.218	-0.036
219.587	5.250	-0.100
222.645	5.340	-0.321
225.702	4.670	-0.209
228.760	4.058	-0.102
231.818	4.028	-0.050
234.876	4.302	-0.341
237.934	4.486	-0.335
240.992	4.914	-0.308
244.050	3.784	-0.234
247.107	4.028	-0.148
250.165	3.936	-0.100
253.223	3.784	-0.385
256.281	4.364	-0.469
259.339	3.418	-1.052
262.397	9.918	-1.197
265.455	6.500	-1.265
268.512	-2.716	-1.158
271.570	-3.326	-1.149

274.628	-2.990	-0.831
277.686	0.396	-0.401
280.744	7.202	0.055
283.802	10.620	-0.091
286.859	9.124	-0.242
289.917	6.318	-0.567
292.975	6.012	-0.846
296.033	5.950	-0.605
299.091	6.134	-0.381
302.149	6.500	-0.785
305.207	5.950	-1.092
308.264	5.494	-1.361
311.322	5.432	-1.598
314.380	5.768	-1.304
317.438	4.852	-1.339
320.496	5.462	-1.226
323.554	5.310	-0.995
326.612	4.760	-0.949
329.669	4.638	-1.340
332.727	4.578	-0.975
335.785	5.524	-0.817
338.843	4.760	-0.774
341.901	4.670	-0.416
344.959	5.188	-0.190
348.017	4.578	-0.339
351.074	5.004	-0.289
354.132	5.280	-0.247
357.190	4.974	-0.712
360.248	5.494	-0.554
363.306	5.036	-0.438
366.364	4.670	-0.703
369.421	3.570	-0.844
372.479	4.272	-0.828
375.537	5.738	-0.490
378.595	5.920	-0.699
381.653	5.402	-0.716
384.711	6.196	-0.725
387.769	5.768	-0.741
390.826	5.280	-0.642
393.884	5.340	-0.238
396.942	4.516	-0.734

---> Comment : N400

400.000	5.616	-0.515

LINE: W330 Direction: S
Date: 3- 4- 2 Time: 15: 5
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 400 Final station: 30

Station	Cond.[mS/m]	Inphase [ppt]
400.000	4.700	-1.146
396.296	4.792	-1.008
392.593	7.050	-0.881
388.889	5.158	-1.122
385.185	5.432	-1.056
381.482	6.164	-0.629
377.778	5.494	-0.495
374.074	5.066	-0.414
370.370	4.456	-0.354
366.666	4.914	-0.420
362.963	6.318	-0.232
359.259	5.706	-0.479
355.555	5.004	-0.433
351.852	5.402	-0.513
348.148	6.104	-0.140

344.444	5.706	-0.484	
340.741	5.250	-0.789	
337.037	5.524	-1.201	
333.334	5.250	-1.348	
329.630	4.364	-0.745	
325.925	4.548	-0.752	
322.222	4.914	-0.789	
318.518	5.126	-0.547	
314.814	4.792	-0.556	
311.111	5.036	-0.367	
307.407	5.096	-0.515	
303.703	5.828	-0.615	
300.000	5.584	-0.341	
296.296	5.554	-0.374	
292.593	5.982	-0.201	
288.889	6.562	-0.229	
285.185	7.812	-0.181	
281.482	9.338	-0.021	
277.778	7.142	-0.054	
274.073	2.014	-0.701	
270.370	4.058	-0.763	
266.666	4.212	-0.684	
262.962	3.814	-0.796	
259.259	4.058	-0.804	
255.555	4.058	-0.831	
251.852	4.272	-0.815	
248.148	4.426	-0.695	
244.444	4.700	-0.710	
240.741	4.212	-0.833	
237.037	4.180	-0.844	
233.333	4.364	-0.942	
229.630	4.486	-0.653	
225.925	4.638	-0.752	
222.221	4.486	-0.655	
218.518	4.364	-0.600	
214.814	4.792	-0.578	
211.111	4.852	-0.473	
207.407	5.096	-0.412	
203.703	5.340	-0.497	
200.000	5.402	-0.420	
198.000	5.646	-1.054	New segment
---> Comment : N200			
194.945	6.134	-0.901	
191.891	6.256	-0.660	
188.836	6.318	-0.682	
185.781	6.806	-0.765	
182.727	7.386	-0.773	
179.673	7.264	-0.638	
176.619	7.172	-0.462	
173.564	7.264	-0.284	
170.509	7.752	-0.317	
167.455	8.820	-0.611	
164.400	9.858	-0.664	
161.345	9.980	-0.767	
158.291	10.438	-0.962	
155.236	11.078	-1.122	
152.181	10.772	-0.916	
149.127	10.864	-0.773	
146.073	12.116	-0.868	
143.019	12.146	-0.638	
139.964	12.878	-0.646	
136.909	13.336	-0.754	
133.855	13.946	-0.736	

130.800	14.190	-0.673
127.745	14.526	-0.822
124.691	14.312	-0.754
121.636	13.886	-0.765
118.581	13.916	-0.559
115.527	13.916	-0.593
112.473	14.312	-0.767
109.419	14.344	-0.776
106.364	14.374	-0.901
103.309	14.282	-0.800
100.255	14.160	-0.624
97.200	13.824	-0.550
94.145	13.642	-0.638
91.091	14.068	-0.761
88.036	14.466	-0.646
84.981	14.770	-0.420
81.927	14.924	-0.333
78.873	13.886	-0.517
75.819	12.482	-0.662
72.764	13.764	-0.802
69.709	16.418	-0.894
66.655	17.944	-0.896
63.600	16.296	-0.796
60.545	12.878	-0.672
57.491	10.498	-0.771
54.436	11.322	-0.672
51.381	11.902	-0.791
48.327	13.306	-0.776
45.273	15.228	-0.585
42.219	16.662	-0.471
39.164	16.266	-0.769
36.109	14.160	-0.431
33.055	12.420	0.015
30.000	12.116	-0.008

---> Comment : N30

LINE: W340 Direction: N
Date: 3- 4- 2 Time: 15: 9
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 30 Final station: 400

Station	Cond.[mS/m]	Inphase [ppt]
30.000	11.108	0.197
33.190	10.132	0.094
36.379	10.804	0.118
39.569	12.238	-0.420
42.759	14.618	-0.541
45.948	15.716	-0.559
49.138	15.380	-0.969
52.328	12.390	-0.988
55.517	7.232	-0.853
58.707	5.554	-0.545
61.897	12.268	-0.519
65.086	19.012	-1.169
68.276	17.182	-1.340
71.466	13.366	-0.401
74.655	11.048	0.208
77.845	9.216	-1.105
81.034	13.062	-1.434
84.224	14.130	-0.666
87.414	13.306	-0.418
90.603	13.610	-0.558
93.793	13.978	-0.747
96.983	14.862	-0.670
100.172	14.556	-0.530

103.362	14.068	-0.539
106.552	13.672	-0.490
109.741	13.916	-0.864
112.931	14.130	-0.925
116.121	13.550	-1.004
119.310	13.672	-0.456
122.500	13.336	-0.311
125.690	13.916	-0.539
128.879	13.854	-0.682
132.069	13.916	-0.756
135.259	13.154	-0.525
138.448	11.932	-0.464
141.638	11.474	-0.377
144.828	10.894	-0.447
148.017	10.894	-0.616
151.207	10.742	-0.745
154.397	9.918	-0.624
157.586	10.346	-0.210
160.776	10.192	-0.084
163.966	9.490	-0.144
167.155	9.034	-0.256
170.345	8.026	-0.405
173.534	7.782	-0.245
176.724	7.720	-0.490
179.914	7.264	-0.600
183.103	7.050	-0.532
186.293	6.896	-0.468
189.483	6.562	-0.425
192.672	6.226	-0.631
195.862	6.164	-0.530
199.052	4.914	-0.969
---> Comment : N200		
202.241	5.372	-0.574
205.431	5.340	-0.333
208.621	4.822	-0.475
211.810	4.974	-0.368
215.000	5.340	-0.218
218.190	5.066	-0.447
221.379	4.974	-0.385
224.569	4.608	-0.418
227.759	4.822	-0.466
230.948	4.974	-0.368
234.138	4.334	-1.096
237.328	4.670	-0.574
240.517	4.638	-0.363
243.707	4.212	-0.431
246.897	4.120	-0.444
250.086	3.876	-0.686
253.276	4.548	-0.486
256.466	4.456	-0.585
259.655	4.760	-0.629
262.845	4.486	-0.425
266.034	3.968	-0.447
269.224	3.662	-0.434
272.414	3.510	-0.324
275.603	3.662	-0.253
278.793	4.028	-0.480
281.983	3.480	-0.390
285.172	10.346	-0.681
288.362	12.084	-0.852
291.552	-3.052	-0.455
294.741	-4.486	-0.251
297.931	-0.794	0.184

301.121	7.934	-0.181
304.310	11.048	-0.063
307.500	8.544	-0.089
310.690	7.020	-0.157
313.879	6.440	-0.012
317.069	6.988	-0.881
320.259	6.836	-1.107
323.448	6.012	-1.294
326.638	5.524	-1.158
329.828	5.706	-1.192
333.017	6.592	-0.706
336.207	5.218	-0.545
339.397	4.486	-0.716
342.586	5.860	-0.513
345.776	6.042	-0.067
348.965	5.188	-0.841
352.155	4.852	-0.607
355.345	5.218	-0.501
358.534	4.302	-0.925
361.724	4.944	-0.383
364.914	4.914	-0.256
368.103	3.968	-0.728
371.293	4.944	-1.298
374.483	5.860	-1.609
377.672	6.164	-1.225
380.862	5.310	-0.773
384.052	6.318	-0.839
387.241	6.530	-0.818
390.431	6.164	-0.806
393.621	5.768	-0.106
396.810	5.828	-0.460
400.000	6.592	-0.449

---> Comment : N400

LINE: W350 Direction: N
Date: 4- 4- 2 Time: 8:36
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 30 Final station: 400

Station	Cond.[mS/m]	Inphase [ppt]
30.000	10.040	2.309
33.426	10.070	2.293
36.852	10.804	2.232
40.278	11.384	2.328
43.704	11.718	1.672
47.130	11.596	1.198
50.556	11.108	1.324
53.981	9.034	0.679
57.407	4.180	-0.259
60.833	3.570	1.069
64.259	6.896	2.302
67.685	11.260	2.383
71.111	14.496	2.285
74.537	15.014	2.388
77.963	14.802	1.773
81.389	14.556	1.398
84.815	14.038	1.661
88.241	13.916	1.925
91.667	14.038	1.923
95.093	14.404	1.857
98.519	13.580	1.793
101.944	12.970	1.697
105.370	12.390	1.910
108.796	11.962	1.995
112.222	12.360	1.729

115.648	12.970	1.626
119.074	12.908	1.679
122.500	12.390	2.125
125.926	12.268	2.276
129.352	12.146	1.570
132.778	12.146	1.383
136.204	11.872	1.923
139.630	10.926	2.048
143.056	10.682	1.672
146.481	10.712	1.920
149.907	11.108	1.824
153.333	10.712	1.839
156.759	10.192	2.313
160.185	9.216	2.265
163.611	9.064	2.125
167.037	8.698	2.024
170.463	7.720	2.274
173.889	7.264	1.967
177.315	6.896	1.923
180.741	6.530	1.879
184.167	6.562	1.756
187.593	6.196	1.800
191.019	5.950	1.697
194.444	5.402	1.870
197.870	5.096	1.975
---> Comment : N200		
201.296	4.914	2.019
204.722	4.670	2.197
208.148	4.364	2.271
211.574	4.150	2.313
215.000	3.662	2.335
218.426	3.936	2.243
221.852	4.212	2.024
225.278	4.272	2.087
228.704	5.036	1.975
232.130	4.700	1.883
235.556	3.968	1.863
238.981	3.540	1.699
242.407	3.448	1.932
245.833	3.814	1.876
249.259	4.242	1.853
252.685	3.814	1.940
256.111	3.174	2.221
259.537	-1.342	2.090
262.963	-1.892	2.037
266.389	-1.678	1.824
269.815	-1.618	1.962
273.241	-1.252	2.140
276.667	1.984	1.782
280.093	-4.302	2.118
283.519	-9.826	2.149
286.944	-8.636	2.269
290.370	-2.106	2.081
293.796	6.072	1.966
297.222	5.372	2.199
300.648	5.706	2.313
---> Comment : ANOM3		
304.074	4.608	2.407
307.500	2.930	2.339
310.926	1.556	2.061
314.352	1.068	1.940
317.778	1.038	1.863
321.204	0.916	2.010

324.630	1.160	1.920
328.056	0.824	1.899
331.481	0.518	1.694
334.907	0.000	1.927
338.333	0.274	1.986
341.759	0.428	1.896
345.185	0.672	1.835
348.611	1.098	1.865
352.037	1.008	1.774
355.463	0.762	1.995
358.889	0.610	2.144
362.315	0.092	2.195
365.741	-0.732	2.177
369.167	0.184	2.111
372.593	-0.122	2.037
376.019	0.428	2.250
379.444	-0.062	2.083
382.870	0.122	1.819
386.296	-0.886	1.580
389.722	0.672	1.719
393.148	1.678	1.894
396.574	0.274	1.843
400.000	-1.130	1.789

---> Comment : N400

LINE: W360 Direction: S
Date: 4- 4- 2 Time: 8:42
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 400 Final station: 30

Station	Cond.[mS/m]	Inphase [ppt]
400.000	0.916	1.427
396.429	-0.030	1.727
392.857	1.068	2.148
389.286	1.740	2.136
385.715	0.610	1.690
382.143	0.184	1.673
378.571	0.702	1.839
375.000	0.458	2.307
371.428	-0.030	2.554
367.857	-1.648	2.982
364.286	-1.954	2.827
360.714	-0.702	2.636
357.143	0.274	2.552
353.572	0.336	2.634
350.000	-0.306	2.357
346.429	-0.062	2.087
342.858	0.184	2.366
339.285	0.092	2.342
335.714	-0.244	2.234
332.143	-0.702	2.381
328.571	0.000	2.326
325.000	1.098	2.219
321.429	1.648	2.227
317.857	1.130	2.219
314.286	1.160	2.328
310.715	1.160	2.574
307.143	1.892	2.697
303.572	2.746	0.319
300.001	-1.678	-12.386
296.428	-6.744	-12.366
292.857	-7.904	4.312
289.286	-8.026	-2.307

---> Comment : ANOM4

285.714	-4.608	11.660

282.143	-18.798	-24.478	
278.572	10.132	14.653	
275.000	-0.794	1.874	
271.429	-0.824	1.730	
267.858	-0.702	1.697	
264.286	-0.886	1.914	
260.715	-0.794	2.100	
257.143	-0.732	2.333	
253.571	-0.762	1.797	
250.000	-0.518	1.435	
246.429	-0.458	1.949	
242.857	-0.244	2.072	
239.286	0.092	2.103	
235.715	0.000	2.063	
232.143	0.366	2.006	
228.572	0.640	1.927	
225.001	0.550	1.613	
221.429	-0.640	1.451	
217.857	-2.532	1.986	
214.286	-1.374	2.414	
210.714	-0.396	2.129	
207.143	1.160	2.508	
203.572	1.892	2.866	
200.000	1.252	2.506	
198.000	0.976	2.100	New segment
---> Comment : N200			
194.889	1.160	1.951	
191.777	1.220	2.048	
188.667	1.618	1.938	
185.556	1.954	1.730	
182.444	1.954	1.683	
179.333	2.106	1.754	
176.223	1.832	1.800	
173.111	1.678	1.955	
170.000	1.984	1.894	
166.889	2.686	1.824	
163.777	3.602	1.846	
160.667	4.242	1.967	
157.556	4.670	1.896	
154.444	5.310	2.015	
151.333	5.706	1.859	
148.223	5.920	1.929	
145.111	5.768	1.863	
142.000	6.012	1.749	
138.889	5.462	1.846	
135.777	5.646	1.890	
132.667	6.012	1.830	
129.556	5.920	1.811	
126.444	6.042	1.828	
123.333	6.012	1.782	
120.223	5.982	1.905	
117.111	6.684	1.585	
114.000	6.928	1.446	
110.889	6.592	1.633	
107.777	6.286	1.582	
104.667	6.226	1.602	
101.556	6.408	1.725	
98.444	7.630	2.030	
95.333	8.422	1.956	
92.223	8.299	1.903	
89.111	8.088	2.050	
86.000	7.752	2.170	
82.889	7.966	2.056	

79.777	7.386	1.646
76.667	7.568	1.528
73.556	8.118	1.925
70.444	8.270	2.449
67.333	6.562	2.300
64.223	2.166	0.959
61.111	-1.008	-1.054
58.000	1.068	-0.356
54.889	5.126	1.754
51.777	7.020	2.497
48.667	6.714	2.351
45.556	5.982	2.135
42.444	5.646	1.596
39.333	5.310	1.894
36.223	4.914	2.315
33.111	4.058	2.192
30.000	2.960	1.918

---> Comment : N30

LINE: W370 Direction: N

Date: 4- 4- 2 Time: 8:46

Component: Both Dipole mode: Vertical Instrument Orientation: 1

Start station: 30 Final station: 400

Station	Cond.[mS/m]	Inphase [ppt]
30.000	3.296	2.206
33.304	3.356	2.206
36.607	3.174	2.346
39.911	3.052	2.471
43.214	3.968	2.113
46.518	5.372	1.945
49.821	5.982	1.640
53.125	5.676	1.673
56.429	5.036	2.438
59.732	4.700	2.917
63.036	4.760	2.910
66.339	5.158	2.215
69.643	6.104	2.263
72.946	6.470	2.486
76.250	6.500	2.379
79.554	7.020	2.105
82.857	6.988	1.923
86.161	6.348	2.037
89.464	7.232	2.311
92.768	6.714	1.503
96.071	5.646	0.608
99.375	6.408	1.436
102.679	6.196	2.078
105.982	5.798	1.971
109.286	6.500	1.938
112.589	7.324	1.982
115.893	7.080	1.885
119.196	6.164	1.876
122.500	5.584	1.833
125.804	5.126	1.809
129.107	5.798	1.844
132.411	6.134	1.830
135.714	5.798	1.910
139.018	6.530	1.811
142.321	6.286	1.848
145.625	6.072	1.865
148.929	5.280	1.846
152.232	5.250	2.032
155.536	5.004	1.997
158.839	5.004	1.859

162.143	4.852	1.809
165.446	4.150	1.701
168.750	3.356	1.732
172.054	2.686	1.609
175.357	2.778	1.697
178.661	2.716	1.824
181.964	2.656	1.802
185.268	2.198	1.798
188.571	2.106	1.730
191.875	1.832	1.907
195.179	1.770	2.116
198.482	1.800	2.447
201.786	1.800	2.493
---> Comment : N200		
205.089	1.862	2.385
208.393	0.336	0.417
211.696	-7.110	-4.858
215.000	-17.670	-6.078
218.304	-19.806	-0.556
221.607	-19.532	1.582
224.911	-14.100	-0.501
---> Comment : ANOM5		
228.214	0.580	0.558
231.518	1.740	1.809
234.821	1.740	2.502
238.125	0.550	2.274
241.429	0.030	1.966
244.732	0.152	1.819
248.036	-0.184	1.754
251.339	-0.244	1.876
254.643	-0.336	1.736
257.946	-0.396	1.694
261.250	-0.640	1.672
264.554	-1.008	1.769
267.857	-1.008	1.758
271.161	-0.672	1.653
274.464	-0.702	1.605
277.768	-0.518	1.561
281.071	-0.640	1.769
284.375	-59.082	-24.485
287.679	-54.810	-24.485
290.982	-29.938	-21.112
294.286	-19.990	10.409
---> Comment : ANOM4		
297.589	-23.742	-6.379
300.893	-31.952	-24.489
304.196	-18.218	-24.487
307.500	3.632	-12.549
310.804	4.548	4.295
314.107	2.198	2.824
317.411	1.464	2.158
320.714	1.160	1.967
324.018	0.550	1.927
327.321	0.428	1.982
330.625	0.306	1.991
333.929	0.794	2.026
337.232	0.274	1.999
340.536	0.092	2.011
343.839	0.336	1.951
347.143	0.336	1.923
350.446	0.030	1.859
353.750	0.184	1.887
357.054	0.366	1.855

360.357	0.062	1.866
363.661	0.274	2.102
366.964	0.244	2.148
370.268	-0.244	2.056
373.571	-0.702	2.094
376.875	0.458	1.988
380.179	0.702	1.870
383.482	0.946	1.964
386.786	1.130	2.023
390.089	1.342	2.179
393.393	1.160	2.129
396.696	1.252	1.800
400.000	0.886	1.409

---> Comment : N400

LINE: W380 Direction: S
Date: 4- 4- 2 Time: 8:53
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 400 Final station: 30

Station	Cond.[mS/m]	Inphase [ppt]
400.000	0.214	1.857
396.337	0.854	1.999
392.673	1.648	1.986
389.010	-0.244	1.958
385.347	-0.428	1.808
381.683	0.030	1.894
378.020	0.122	2.090
374.356	0.366	2.054
370.693	0.092	2.155
367.030	0.366	2.131
363.366	0.794	1.973
359.703	0.886	1.839
356.040	1.160	1.944
352.376	0.702	1.824
348.713	0.794	1.752
345.049	1.648	1.859
341.386	1.312	1.874
337.723	-0.030	1.914
334.059	0.428	1.831
330.396	0.946	1.679
326.733	1.008	1.841
323.069	1.038	2.120
319.406	0.794	2.081
315.743	1.220	2.054
312.079	1.282	2.383
308.416	1.038	2.465
304.752	1.678	2.585
301.089	2.014	2.660
297.426	1.526	3.068
293.762	1.282	3.215
290.099	1.190	3.342
286.436	1.954	3.386
282.772	-0.732	1.918
279.109	-0.458	1.729
275.446	-0.428	1.565
271.782	-0.366	1.629
268.119	-0.122	1.989
264.455	0.244	0.253
260.792	0.886	2.170
257.129	0.580	2.144
253.465	0.550	2.263
249.802	0.366	2.419
246.139	0.580	2.214
242.475	1.008	2.236

238.812	0.794	2.351
235.149	0.916	2.752
231.485	0.824	2.983
227.822	0.824	3.022
224.158	1.404	3.189
220.495	1.832	2.958
216.832	2.410	2.993
213.168	2.624	3.206
209.505	2.410	2.936
205.842	1.892	2.814

---> Comment : N200

202.178	1.770	2.612
198.515	2.166	2.158
194.851	1.984	2.136
191.188	1.586	2.050
187.525	1.954	2.021
183.861	2.228	2.019
180.198	2.594	1.820
176.535	2.960	1.668
172.871	2.960	1.620
169.208	3.480	1.721
165.545	4.058	1.758
161.881	4.852	1.806
158.218	5.494	1.782
154.554	5.158	1.712
150.891	4.944	1.872
147.228	5.126	1.868
143.564	5.310	1.655
139.901	5.036	1.082
136.238	4.302	1.550
132.574	4.302	1.723
128.911	3.724	0.490
125.248	5.494	1.405
121.584	6.592	2.033
117.921	6.592	1.988
114.257	6.500	2.050
110.594	5.920	1.848
106.931	5.860	1.905
103.267	5.462	1.951
99.604	5.372	2.184
95.941	6.042	2.528
92.277	6.226	2.379
88.614	6.592	2.407
84.950	6.378	2.348
81.287	6.042	2.283
77.624	4.944	2.324
73.960	5.890	2.131
70.297	6.226	2.081
66.634	5.768	1.980
62.970	4.608	2.100
59.307	3.724	2.401
55.644	3.906	2.203
51.980	4.302	2.045
48.317	4.852	2.017
44.653	4.516	2.151
40.990	3.448	2.063
37.327	2.960	2.208
33.663	3.266	2.427
30.000	2.900	2.408

---> Comment : N30

LINE: W390 Direction: N
Date: 4- 4- 2 Time: 8:57
Component: Both Dipole mode: Vertical Instrument Orientation: 1

SITE5

Start station: 30 Final station: 400

Station	Cond.[mS/m]	Inphase [ppt]	
30.000	2.380	2.199	
33.208	3.204	2.326	
36.415	3.052	2.366	
39.623	3.112	2.283	
42.830	3.356	2.151	
46.038	3.174	1.670	
49.246	3.052	1.872	
52.453	3.602	2.002	
55.661	4.486	2.067	
58.867	5.250	2.212	
62.075	5.462	2.179	
65.283	5.066	2.100	
68.490	5.280	1.923	
71.698	5.706	2.006	
74.905	5.584	1.960	
78.113	5.494	2.096	
81.321	5.554	2.306	
84.528	6.072	2.377	
87.736	6.500	2.236	
90.943	6.226	2.294	
94.151	6.072	2.232	
97.359	5.828	2.006	
100.566	5.738	2.004	
103.774	5.890	1.931	
106.981	5.982	1.843	
110.189	6.348	1.800	
113.397	5.920	1.837	
116.603	5.950	1.894	
119.811	5.706	1.931	
123.019	5.402	2.054	
126.226	5.524	1.786	
129.434	5.616	1.558	
132.641	5.646	1.846	
135.849	5.646	1.686	
139.057	5.158	1.424	
142.264	4.760	1.644	
145.472	4.212	1.695	
148.679	4.242	1.587	
151.887	4.578	1.811	
155.095	5.036	1.855	
158.302	4.914	1.681	
161.510	4.486	1.681	
164.717	3.754	1.762	
167.925	2.960	1.837	
171.133	3.204	1.786	
174.339	3.174	1.784	
177.547	3.082	1.747	
180.754	2.624	1.999	
183.962	2.442	2.247	
187.170	2.044	2.574	
190.377	1.526	2.728	
193.585	1.800	2.811	
196.792	1.618	2.961	
200.000	1.282	2.884	
202.000	1.220	2.798	New segment
---> Comment : N200			
205.736	1.130	2.914	
209.472	1.008	3.009	
213.208	1.220	3.158	
216.944	0.854	2.928	
220.680	0.824	3.138	

224.415	0.396	3.395
228.151	0.702	3.248
231.887	0.732	3.020
235.622	0.946	2.811
239.358	0.916	2.328
243.094	0.306	2.157
246.830	0.396	2.342
250.566	0.336	1.883
254.302	0.336	1.817
258.038	0.092	1.718
261.773	-0.092	1.407
265.509	0.122	1.337
269.245	0.336	1.394
272.981	0.366	1.673
276.717	-0.244	1.547
280.453	-1.130	1.447
284.189	-1.220	1.727
287.925	-3.814	2.092
291.661	-3.632	1.872
295.397	-3.814	1.771
299.132	-3.784	1.795
302.867	-2.656	1.659
306.603	3.204	1.311
310.339	2.502	1.166
314.075	1.038	1.238
317.811	-0.062	1.065
321.547	-0.030	1.258
325.283	1.068	2.013
329.019	1.220	2.116
332.755	1.130	1.956
336.491	1.282	1.843
340.227	1.252	1.649
343.962	0.854	1.727
347.698	0.946	1.830
351.434	0.946	1.903
355.170	1.282	1.714
358.906	1.312	1.820
362.642	0.824	1.958
366.377	-0.336	2.203
370.113	0.000	2.001
373.849	0.886	1.942
377.585	0.518	2.092
381.320	0.336	2.107
385.056	1.556	1.991
388.792	1.252	2.001
392.528	1.220	2.114
396.264	0.306	2.293
400.000	2.624	1.865

---> Comment : N400

LINE: W400 Direction: S
Date: 4- 4- 2 Time: 9: 1
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 400 Final station: 70

Station	Cond.[mS/m]	Inphase [ppt]
400.000	1.800	1.481
396.796	1.984	1.797
393.592	3.692	2.243
390.388	2.930	2.002
387.184	0.672	2.109
383.981	1.648	1.925
380.777	-0.092	2.033
377.573	1.404	1.883
374.369	1.862	1.644

371.165	1.586	1.706
367.961	0.580	1.841
364.757	1.068	1.947
361.553	0.976	1.927
358.350	1.160	1.786
355.146	1.434	1.813
351.942	1.618	1.727
348.738	1.586	1.743
345.534	1.130	1.752
342.330	0.946	1.923
339.126	0.976	1.929
335.922	1.496	1.831
332.718	1.832	1.666
329.515	2.350	1.806
326.311	3.204	1.833
323.107	3.936	1.730
319.903	4.364	1.475
316.699	5.402	1.569
313.495	5.554	1.795
310.291	-0.640	1.870
307.087	-6.530	2.002
303.883	-7.752	1.980
300.680	-5.676	1.932
297.476	2.166	1.815
294.272	10.254	1.651
291.068	7.904	1.642
287.864	5.188	1.740
284.660	3.052	1.624
281.456	0.396	1.822
278.252	0.518	1.982
275.049	0.336	1.813
271.845	0.122	1.763
268.641	0.000	1.712
265.437	0.062	1.771
262.233	0.062	1.923
259.029	0.092	1.918
255.825	0.488	1.809
252.621	0.854	1.949
249.417	1.068	2.056
246.214	1.130	2.204
243.010	1.098	2.487
239.806	-0.062	2.272
236.602	0.062	2.206
233.398	1.434	2.236
230.194	0.976	2.383
226.990	0.610	2.594
223.786	0.580	2.678
220.583	0.976	2.757
217.379	1.190	2.791
214.175	1.008	2.416
210.971	1.008	2.210
207.767	0.976	2.208
204.563	0.886	2.239
201.359	1.008	2.074
---> Comment : N200		
198.155	1.130	2.078
194.951	1.098	2.142
191.748	1.038	2.302
188.544	1.434	2.309
185.340	1.954	2.225
182.136	2.258	2.146
178.932	2.502	2.206
175.728	3.052	1.988

172.524	3.082	1.626
169.320	2.868	1.512
166.117	2.838	1.583
162.913	2.656	1.570
159.709	3.602	1.780
156.505	4.242	1.714
153.301	3.784	1.758
150.097	3.602	1.745
146.893	4.150	1.881
143.689	4.944	1.863
140.485	5.432	1.745
137.282	5.706	1.808
134.078	5.646	1.740
130.874	5.402	1.673
127.670	5.494	1.837
124.466	5.554	1.964
121.262	5.524	2.032
118.058	4.852	1.903
114.854	4.700	1.848
111.650	5.676	1.881
108.447	5.340	2.028
105.243	5.616	1.925
102.039	5.584	1.809
98.835	5.828	1.718
95.631	6.378	1.776
92.427	6.348	1.894
89.223	6.378	1.912
86.019	6.012	1.966
82.816	5.616	1.815
79.612	5.676	1.964
76.408	6.072	1.670
73.204	5.706	1.918
70.000	4.944	2.129

---> Comment : N70

LINE: W410 Direction: N

Date: 4- 4- 2 Time: 9: 4

Component: Both Dipole mode: Vertical Instrument Orientation: 1

Start station: 70 Final station: 400

Station	Cond.[mS/m]	Inphase [ppt]
70.000	5.004	1.934
73.514	5.524	2.054
77.027	6.684	1.989
80.541	6.836	1.918
84.054	6.286	1.991
87.568	5.494	2.068
91.081	5.218	1.857
94.595	6.226	1.879
98.109	6.164	1.923
101.622	6.104	1.831
105.136	5.982	1.708
108.649	5.432	1.988
112.162	4.944	2.032
115.675	5.036	1.949
119.189	5.462	1.642
122.703	5.462	1.677
126.216	5.402	1.984
129.730	5.126	2.050
133.243	5.310	2.089
136.757	4.700	2.204
140.270	4.548	2.004
143.784	4.882	1.923
147.297	4.394	1.923
150.811	4.120	2.035

154.325	3.754	1.852	
157.838	3.784	1.892	
161.352	3.510	1.883	
164.865	3.388	1.787	
168.379	3.602	1.824	
171.892	3.480	1.874	
175.406	3.174	1.831	
178.920	2.808	1.923	
182.433	2.808	1.870	
185.947	2.410	1.743	
189.460	1.892	2.041	
192.973	1.832	1.846	
196.486	1.740	1.841	
200.000	1.922	1.765	
202.000	2.106	1.679	New segment
---> Comment : N200			
205.667	2.166	1.646	
209.333	2.076	1.789	
213.000	1.648	1.819	
216.667	0.854	1.773	
220.334	1.098	1.881	
224.000	1.098	2.048	
227.667	0.854	2.089	
231.334	0.488	2.021	
235.000	0.550	2.033	
238.667	1.008	2.320	
242.334	1.282	2.550	
246.000	1.098	2.438	
249.667	1.312	2.296	
253.334	1.130	2.019	
257.001	0.976	1.686	
260.667	0.610	1.220	
264.334	0.518	1.378	
268.001	0.122	1.304	
271.666	0.458	1.400	
275.333	9.094	1.431	
279.000	8.850	1.444	
282.667	6.622	1.591	
286.333	-7.202	2.171	
290.000	-12.542	2.028	
293.667	-9.918	1.791	
297.333	-4.516	1.969	
301.000	5.982	1.787	
304.667	9.582	1.357	
308.333	7.630	1.174	
312.000	5.706	1.324	
315.667	3.724	1.453	
319.334	2.228	1.449	
323.000	2.838	1.528	
326.667	1.832	1.537	
330.334	1.618	1.481	
334.000	1.586	1.565	
337.667	1.190	1.708	
341.334	1.832	1.960	
345.000	1.740	1.833	
348.667	1.586	1.692	
352.334	0.794	1.681	
356.000	1.312	1.681	
359.666	1.374	1.883	
363.333	0.976	1.971	
367.000	1.984	1.830	
370.666	2.044	1.572	
374.333	1.648	1.622	

378.000	2.198	1.653
381.666	1.708	1.655
385.333	2.380	1.686
389.000	1.892	1.648
392.667	2.258	1.462
396.333	0.732	1.820
400.000	1.312	1.695

---> Comment : N400

LINE: W420 Direction: S
Date: 4- 4- 2 Time: 9: 7
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 400 Final station: 70

Station	Cond.[mS/m]	Inphase [ppt]
400.000	3.876	3.470
396.364	1.892	3.165
392.727	2.288	2.223
389.091	2.778	1.769
385.455	2.136	1.683
381.818	1.282	1.675
378.182	2.410	1.627
374.546	2.076	1.611
370.908	2.198	1.824
367.272	1.984	1.769
363.636	1.496	1.644
360.000	2.258	1.627
356.363	2.044	1.852
352.727	1.618	1.863
349.091	2.106	1.600
345.454	2.076	1.615
341.818	1.800	1.659
338.182	2.228	1.469
334.545	3.144	1.534
330.909	3.144	1.482
327.273	3.296	1.596
323.637	4.272	1.716
320.000	6.744	1.703
316.364	9.430	1.639
312.728	5.340	1.752
309.090	-3.448	1.653
305.454	-10.102	1.390
301.818	-12.420	1.793
298.181	-10.528	1.859
294.545	8.850	1.780

---> Comment : FGLASSTK

290.909	21.882	1.326
287.272	19.990	0.937
283.636	10.376	1.148
280.000	6.836	1.260
276.363	4.882	1.190
272.727	2.808	1.205
269.091	1.922	1.400
265.455	-1.740	2.039
261.818	0.000	1.934
258.182	-0.062	0.854
254.545	0.458	2.136
250.908	0.794	-3.786
247.272	1.098	-3.171
243.636	1.648	2.875
239.999	1.190	2.217
236.363	0.122	-5.826
232.727	1.130	-0.361
229.090	1.496	2.732
225.454	1.098	2.473

221.818	0.640	1.953	
218.182	0.396	1.826	
214.545	1.190	1.787	
210.909	1.190	1.804	
207.273	1.130	1.760	
203.636	2.198	1.822	
200.000	2.288	1.966	
198.000	1.556	1.690	New segment

---> Comment : N200

194.877	1.038	1.808
191.755	1.556	1.852
188.633	1.220	1.883
185.512	1.282	2.048
182.390	1.832	2.063
179.268	2.258	2.015
176.146	2.564	2.085
173.024	2.442	2.162
169.902	3.082	1.910
166.780	3.204	1.778
163.658	2.960	1.868
160.536	2.656	1.809
157.415	2.838	1.791
154.293	3.174	2.081
151.171	3.388	2.083
148.049	4.212	1.918
144.926	4.456	1.912
141.804	4.578	1.716
138.682	4.302	1.901
135.560	3.998	1.918
132.439	4.090	1.991
129.317	4.578	2.061
126.195	4.730	1.909
123.073	4.516	1.828
119.951	4.302	1.936
116.829	4.334	2.125
113.707	4.792	1.916
110.585	5.554	1.778
107.464	6.470	1.721
104.342	6.440	1.861
101.220	5.340	1.725
98.098	3.754	1.883
94.975	3.296	1.868
91.853	3.876	2.006
88.731	5.584	1.894
85.609	7.171	1.806
82.488	7.782	1.804
79.366	7.386	2.006
76.244	5.676	2.028
73.122	4.180	1.938
70.000	4.028	1.931

---> Comment : N70

LINE: W430 Direction: N
Date: 4- 4- 2 Time: 9:10
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 70 Final station: 400

Station	Cond.[mS/m]	Inphase [ppt]
70.000	4.120	1.912
73.250	4.700	2.019
76.500	4.760	2.203
79.750	5.218	2.103
83.000	5.890	1.934
86.250	6.348	1.809
89.500	6.562	1.797

92.750	6.226	1.980	
96.000	5.402	1.859	
99.251	6.622	1.694	
102.500	6.988	1.666	
---> Comment : GRAVDEP			
105.750	6.958	1.754	
109.000	6.744	1.861	
112.250	6.072	1.758	
115.500	4.578	1.887	
118.750	3.448	2.162	
122.000	2.868	2.344	
125.250	2.624	2.342	
128.500	3.204	2.285	
131.750	3.388	2.181	
135.000	3.388	1.988	
138.250	3.784	1.830	
141.500	4.150	1.811	
144.750	4.120	1.837	
148.000	4.212	1.956	
151.251	3.876	2.247	
154.501	4.028	2.535	
157.751	3.968	2.868	
161.001	3.876	2.943	
164.251	3.326	2.737	
167.500	2.900	2.348	
170.750	2.228	2.096	
174.000	2.014	2.195	
177.250	2.106	2.421	
180.500	2.532	2.247	
183.750	2.838	1.879	
187.000	2.716	1.809	
190.250	2.410	1.831	
193.500	2.076	1.896	
196.750	1.800	1.833	
200.000	2.320	1.853	
202.000	1.862	1.672	New segment
---> Comment : N200			
205.536	2.198	1.734	
209.071	2.076	1.695	
212.607	2.106	1.684	
216.143	1.740	1.642	
219.678	1.342	1.692	
223.214	1.770	1.828	
226.750	1.954	1.491	
230.285	1.892	1.611	
233.821	1.954	1.763	
237.357	2.044	1.723	
240.892	2.258	2.074	
244.428	2.410	2.910	
247.964	2.442	2.484	
251.499	1.862	2.026	
255.035	0.854	1.866	
258.572	-0.030	0.334	
262.107	0.396	1.427	
265.643	1.740	2.759	
269.179	2.410	2.835	
272.714	1.740	2.357	
276.250	2.044	2.138	
279.785	2.288	2.177	
283.321	2.930	2.158	
286.857	3.632	2.416	
290.393	3.204	1.556	
293.928	7.416	1.570	

297.464	-10.926	1.815
300.999	-13.154	2.316
304.535	-12.512	2.502
308.071	-10.162	1.863
311.606	-8.362	1.714
315.143	9.490	1.519

---> Comment : ANOM6

318.679	9.246	1.600
322.214	7.690	1.892
325.750	5.340	1.791
329.286	3.448	1.497
332.821	2.686	1.458
336.357	2.746	1.367
339.893	2.656	1.582
343.428	2.838	1.618
346.964	1.984	1.631
350.500	2.198	1.646
354.035	2.014	1.718
357.571	2.136	1.646
361.107	1.922	1.736
364.642	1.984	1.820
368.178	2.594	1.692
371.714	2.716	1.809
375.250	2.320	1.910
378.786	2.442	1.640
382.322	2.076	1.615
385.857	2.228	1.565
389.393	2.350	1.583
392.929	1.800	1.765
396.464	2.014	1.789
400.000	1.220	1.863

---> Comment : N400

LINE: W440 Direction: S
Date: 4- 4- 2 Time: 9:16
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 400 Final station: 70.00001

Station	Cond.[mS/m]	Inphase [ppt]
400.000	2.532	1.560
396.000	2.502	1.637
392.000	4.090	1.681
388.000	2.594	1.795
383.999	1.618	1.754
380.000	2.380	1.506
376.000	2.320	1.620
372.000	2.532	1.672
368.000	2.228	1.782
363.999	2.228	1.989
360.000	2.228	1.734
356.000	2.502	1.780
352.000	3.022	1.776
348.000	2.686	1.857
344.000	2.166	1.767
340.000	2.808	1.745
336.000	3.234	1.815
331.999	3.144	2.028
328.000	4.120	1.989
324.000	3.204	1.734
320.000	6.622	1.962
316.000	6.012	1.962
311.999	0.458	1.831
308.000	-7.874	1.905
304.000	-14.710	2.056
299.999	-11.596	2.017

296.000	2.258	3.085	
292.000	3.632	3.489	
288.000	4.120	2.649	
284.000	2.288	1.649	
279.999	2.076	1.955	
276.000	2.106	2.627	
272.000	2.532	3.024	
268.000	1.464	2.351	
264.000	-1.312	0.510	
259.999	-2.778	-0.598	
256.000	-2.656	-0.292	
252.000	-2.532	0.523	
247.999	0.550	2.427	
244.000	2.564	3.608	
240.000	2.624	3.594	
236.000	2.258	2.901	
232.000	1.648	2.236	
227.999	2.136	2.214	
224.000	2.136	2.280	
220.000	2.350	2.427	
215.999	2.502	2.449	
212.000	2.166	2.237	
207.999	1.954	2.090	
204.000	2.044	1.978	
200.000	2.502	1.877	
198.000	2.838	1.600	New segment
---> Comment : N200			
194.953	2.990	1.620	
191.905	2.990	1.809	
188.857	3.296	2.032	
185.810	3.112	1.853	
182.762	2.502	1.892	
179.715	2.624	1.885	
176.667	2.716	1.905	
173.619	3.052	2.158	
170.572	3.112	2.491	
167.524	3.326	2.862	
164.476	3.448	3.070	
161.429	3.418	3.031	
158.381	3.112	2.814	
155.334	3.388	2.822	
152.285	4.272	3.197	
149.238	4.486	3.502	
146.191	3.876	2.996	
143.143	3.082	2.441	
140.095	3.082	2.142	
137.048	2.716	2.050	
134.000	2.320	2.219	
130.953	3.052	2.401	
127.905	3.296	1.824	
124.857	4.120	1.677	
121.810	5.096	1.945	
118.762	4.670	2.287	
115.715	4.516	1.056	
112.666	5.004	1.653	
109.619	5.584	2.594	
106.572	5.494	2.526	
103.524	5.004	2.280	
100.476	4.730	2.054	
97.428	4.608	1.978	
94.381	4.486	2.078	
91.334	3.906	2.111	
88.285	3.724	2.190	

85.238	4.302	2.109
82.191	4.760	1.813
79.143	4.364	1.741
76.095	3.876	2.153
73.047	3.296	2.179
70.000	2.136	1.644

---> Comment : N70

LINE: W450 Direction: N
Date: 4- 4- 2 Time: 9:20
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 110 Final station: 400

Station	Cond.[mS/m]	Inphase [ppt]	
110.000	5.280	2.010	
113.462	6.470	2.302	

---> Comment : 5GW01

116.923	4.792	1.144	
120.385	6.684	2.267	
123.846	8.636	3.158	
127.308	6.348	3.075	
130.770	4.090	2.362	
134.230	3.296	2.072	
137.692	3.448	2.021	
141.153	3.876	1.995	
144.615	3.968	1.914	
148.077	3.570	2.050	
151.538	3.022	2.109	
155.000	3.296	2.109	
158.461	3.754	2.131	
161.923	3.632	2.403	
165.385	3.388	2.487	
168.846	3.724	2.508	
172.308	3.754	2.410	
175.769	3.692	2.127	
179.230	3.296	2.061	
182.692	2.656	2.030	
186.153	2.014	2.002	
189.615	2.350	2.199	
193.076	2.258	2.333	
196.538	2.564	2.098	
200.000	3.112	1.806	
202.000	3.754	1.637	New segment

---> Comment : N200

206.305	3.326	1.659	
210.608	3.144	1.778	
214.913	3.052	2.090	
219.218	2.900	2.133	
223.522	2.410	2.419	
227.826	2.656	2.649	
232.130	2.564	2.904	
236.435	2.320	3.004	
240.740	1.892	3.085	
245.043	1.708	3.173	
249.348	2.258	3.344	
253.653	2.532	3.537	
257.957	2.624	3.426	
262.261	2.960	2.230	
266.565	3.326	1.618	
270.870	2.778	2.576	
275.175	3.052	3.202	
279.478	3.174	1.576	
283.783	3.510	0.951	
288.087	3.692	1.561	
292.392	42.328	1.422	

296.696	32.380	1.945
301.000	0.030	2.135
305.305	-15.046	2.041
309.608	-14.008	1.923
313.913	-6.408	1.872
318.218	4.394	2.151
322.522	8.941	2.181
326.826	6.866	1.804
331.130	5.584	1.736
335.435	4.334	2.182
339.740	3.234	1.953
344.043	2.746	1.773
348.348	2.594	1.444
352.652	2.746	1.587
356.957	3.234	1.982
361.261	2.228	2.441
365.565	1.374	1.916
369.870	2.472	2.063
374.174	2.564	1.940
378.478	3.082	1.694
382.783	2.258	1.940
387.087	1.954	2.004
391.392	2.746	1.949
395.695	2.594	2.035
400.000	2.198	1.655

---> Comment : N400

LINE: W460 Direction: S
Date: 4- 4- 2 Time: 9:25
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 400 Final station: 120

Station	Cond.[mS/m]	Inphase [ppt]
400.000	3.052	1.653
396.543	2.686	1.449
393.086	2.532	1.885
389.630	2.502	1.697
386.173	1.618	2.114
382.716	1.282	1.653
379.259	2.808	1.780
375.802	3.052	1.774
372.346	2.564	1.830
368.889	3.144	1.714
365.432	2.624	1.637
361.975	2.838	1.727
358.519	3.296	1.751
355.062	3.632	1.545
351.605	3.510	1.661
348.148	2.778	1.526
344.691	2.838	1.541
341.235	2.838	1.493
337.778	3.480	1.569
334.321	3.754	1.554
330.864	4.302	1.605
327.407	4.822	1.464
323.951	5.462	1.604
320.494	5.310	1.537
317.037	2.198	1.844
313.580	-6.652	1.892
310.123	-12.482	1.855
306.667	13.642	1.256

---> Comment : CONC

303.210	24.170	1.220
299.753	24.688	1.291
296.296	15.350	1.425

292.839	9.246	1.593
289.383	5.920	2.019
285.926	5.004	1.892
282.469	3.846	1.914
279.012	3.082	2.227
275.556	3.418	2.113
272.099	3.326	2.013
268.642	2.990	2.245
265.185	2.838	2.133
261.728	3.388	2.195
258.272	3.112	2.407
254.815	2.564	2.315
251.358	2.228	2.201
247.901	2.166	2.219
244.444	2.320	2.460
240.988	2.564	2.243
237.531	3.356	2.072
234.074	3.296	1.940
230.617	2.838	1.980
227.160	2.686	1.944
223.704	2.778	1.789
220.247	2.960	1.811
216.790	2.778	2.043
213.333	2.808	2.212
209.877	2.442	2.186
206.420	3.082	1.958
202.963	3.326	1.975
199.506	3.204	2.111
196.049	3.234	1.958
192.593	3.356	1.958
189.136	3.510	2.061
185.679	3.632	1.813
182.222	3.754	1.830
178.765	3.662	1.817
175.309	3.448	1.912
171.852	3.814	1.798
168.395	3.724	1.865
164.938	3.510	1.945
161.481	3.388	1.899
158.025	3.326	1.793
154.568	3.418	1.907
151.111	3.326	2.013
147.654	3.144	2.023
144.198	3.296	1.738
140.741	3.662	1.883
137.284	3.480	1.966
133.827	3.602	2.131
130.370	4.120	1.578
126.914	4.394	1.944
123.457	4.700	2.763
120.000	5.310	3.860

---> Comment : ROAD

LINE: W470 Direction: N
Date: 4- 4- 2 Time: 9:28
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 120 Final station: 400

Station	Cond.[mS/m]	Inphase [ppt]
120.000	4.242	2.522
123.478	4.272	2.304
126.957	4.028	2.037
130.435	3.814	1.971
133.913	3.480	1.876
137.392	3.052	1.673

140.869	3.234	1.956	
144.347	3.234	2.050	
147.826	3.052	1.980	
151.304	2.594	2.127	
154.782	2.716	2.197	
158.261	2.900	2.124	
161.739	3.296	2.100	
165.217	3.632	2.113	
168.696	3.632	1.964	
172.174	3.418	1.793	
175.652	3.266	1.800	
179.131	3.326	1.872	
182.608	2.716	2.028	
186.086	2.930	1.980	
189.565	2.990	2.113	
193.043	2.960	2.170	
196.521	2.594	2.103	
200.000	2.838	2.206	
202.000	3.266	1.901	New segment
---> Comment : N200			
205.882	3.266	1.833	
209.765	3.418	1.828	
213.647	3.784	1.883	
217.529	3.814	1.747	
221.412	3.876	1.670	
225.294	3.814	1.574	
229.176	3.540	1.646	
233.059	3.204	1.661	
236.941	3.234	1.532	
240.823	3.266	2.030	
244.706	2.502	2.399	
248.588	2.044	2.636	
252.470	1.984	2.923	
256.353	3.266	2.752	
260.235	3.876	2.603	
264.117	3.998	2.282	
268.000	3.876	2.359	
271.882	4.090	2.157	
275.764	4.486	1.999	
279.647	4.914	2.113	
283.529	5.646	2.081	
287.411	7.110	1.874	
291.294	7.996	2.056	
295.176	9.156	1.927	
299.059	1.922	2.019	
302.942	-12.604	2.287	
306.824	-12.664	2.171	
310.706	6.562	1.407	
314.589	11.384	1.236	
318.471	7.568	1.541	
322.353	8.514	1.491	
---> Comment : OHEADWRE			
326.236	7.660	1.534	
330.118	5.738	1.583	
334.000	4.486	1.609	
337.883	3.754	1.583	
341.765	2.960	1.712	
345.647	2.930	1.789	
349.530	3.570	1.692	
353.412	3.632	1.673	
357.294	3.174	1.973	
361.177	2.900	1.997	
365.059	2.778	1.927	

368.941	3.356	2.019
372.824	3.204	2.287
376.706	2.900	2.304
380.588	3.356	2.552
384.471	3.388	3.046
388.353	3.022	3.254
392.235	3.082	2.835
396.118	2.960	3.160
400.000	3.418	2.577

---> Comment : N400

LINE: W480 Direction: S
Date: 4- 4- 2 Time: 9:32
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 400 Final station: 130

Station	Cond.[mS/m]	Inphase [ppt]
400.000	3.814	3.983
395.970	5.004	4.689
391.940	2.442	4.529
387.910	2.808	4.639
383.881	2.288	0.352
379.851	1.984	-2.930
375.821	3.570	1.221
371.791	3.480	2.825
367.761	2.380	2.158
363.731	2.350	1.793
359.701	2.320	1.863
355.672	3.448	1.802
351.642	3.754	1.679
347.612	3.570	1.651
343.582	3.082	1.629
339.552	2.900	1.769
335.522	3.876	1.525
331.493	3.876	1.227
327.463	4.608	1.148
323.433	5.066	1.255
319.403	5.798	1.176
315.373	7.660	1.330
311.343	9.156	1.622
307.313	11.048	1.627
303.284	5.890	1.486
299.254	-0.428	1.547
295.224	-4.852	1.648
291.194	-3.570	1.784
287.164	2.320	1.944
283.134	4.700	1.830
279.104	4.944	2.070
275.075	4.608	2.219
271.045	3.784	2.135
267.015	3.570	1.969
262.985	3.448	1.802
258.955	3.480	2.201
254.925	3.632	2.967
250.896	3.174	2.357
246.866	2.990	1.102
242.836	3.326	1.616
238.806	3.174	2.142
234.776	2.900	2.164
230.746	2.930	2.199
226.716	3.388	2.227
222.687	3.662	1.914
218.657	3.754	1.813
214.627	3.448	1.966
210.597	3.388	1.982

206.567	3.266	1.833

---> Comment : N200

202.537	3.356	1.896
198.507	3.296	2.054
194.478	3.052	2.032
190.448	2.960	2.081
186.418	3.234	2.263
182.388	3.724	2.419
178.358	3.968	2.408
174.328	3.662	2.465
170.298	3.846	2.170
166.269	3.144	1.888
162.239	3.388	1.916
158.209	3.418	2.050
154.179	3.480	2.059
150.149	3.510	1.859
146.119	4.028	1.602
142.090	4.302	1.468
138.060	4.670	1.859
134.030	5.310	1.918
130.000	4.882	1.730

---> Comment : ROAD

LINE: W490 Direction: N
Date: 4- 4- 2 Time: 9:34
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 130 Final station: 400

Station	Cond.[mS/m]	Inphase [ppt]
130.000	5.554	0.972
134.576	5.554	1.074
139.153	5.432	1.183
143.729	4.914	1.400
148.305	3.876	2.074
152.881	3.602	2.089
157.458	3.692	2.186
162.034	3.876	2.328
166.610	3.846	2.291
171.186	4.242	2.381
175.763	4.212	2.254
180.339	3.570	2.192
184.915	3.480	2.328
189.492	3.174	2.243
194.068	3.052	2.153
198.644	3.540	2.186

---> Comment : N200

203.220	3.602	2.217
207.797	3.570	2.475
212.373	3.326	2.443
216.949	3.296	2.199
221.525	3.326	1.942
226.102	2.990	2.181
230.678	2.838	2.563
235.254	2.166	1.819
239.830	2.960	1.703
244.407	3.662	2.655
248.983	3.602	2.794
253.559	3.356	2.706
258.136	3.418	2.579
262.712	2.990	2.589
267.288	3.480	2.033
271.864	4.120	1.817
276.441	4.150	1.909
281.017	3.632	1.909
285.593	1.464	1.966

290.169	-0.092	2.182
294.746	-0.640	2.037
299.322	5.494	2.041
303.898	6.744	1.572
308.475	7.294	1.510
313.051	6.774	1.820
317.627	5.280	1.971
322.203	3.906	1.808
326.780	3.144	1.690
331.356	2.656	1.822
335.932	3.204	1.947
340.508	3.174	1.929
345.085	2.320	1.831
349.661	2.258	1.912
354.237	2.502	1.932
358.814	2.838	2.094
363.390	2.686	2.445
367.966	2.410	2.399
372.542	2.350	2.148
377.119	2.350	1.977
381.695	2.960	1.881
386.271	2.808	2.033
390.847	2.472	2.109
395.424	2.624	2.179
400.000	1.832	2.219

---> Comment : N400

LINE: W500 Direction: S
Date: 4- 4- 2 Time: 9:36
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 400 Final station: 200

Station	Cond.[mS/m]	Inphase [ppt]
400.000	1.342	1.787
395.455	1.434	1.809
390.909	1.556	1.879
386.364	1.160	1.811
381.818	0.152	2.006
377.273	0.824	1.953
372.727	1.374	1.975
368.182	1.190	2.269
363.636	0.794	2.283
359.091	1.282	2.181
354.545	0.916	2.006
350.000	0.672	2.021
345.455	1.892	1.791
340.909	2.228	1.831
336.364	2.380	1.747
331.818	2.350	1.677
327.273	2.044	1.789
322.727	2.502	1.637
318.182	2.594	1.662
313.636	3.998	2.467
309.091	3.632	2.443
304.545	2.288	2.061
300.000	1.892	2.294
295.455	2.350	2.010
290.909	2.472	1.690
286.364	2.716	1.817
281.818	2.808	1.951
277.273	2.778	1.789
272.727	2.502	1.644
268.182	2.472	1.859
263.636	2.532	2.249
259.091	2.106	2.146

254.545	2.258	2.067
250.000	2.502	2.024
245.455	2.686	1.956
240.909	3.052	1.938
236.364	3.266	2.032
231.818	3.022	1.817
227.273	2.900	1.747
222.727	3.204	2.057
218.182	3.204	2.138
213.636	3.234	2.127
209.091	3.052	2.127
204.545	2.960	2.203
200.000	3.602	1.958

---> Comment : N200

LINE: W510 Direction: N
Date: 4- 4- 2 Time: 9:37
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 200 Final station: 400

Station	Cond.[mS/m]	Inphase [ppt]
200.000	3.082	1.710
204.762	3.144	1.741
209.524	3.082	1.846
214.286	2.716	1.991
219.048	3.082	1.944
223.810	3.144	1.765
228.571	3.234	1.822
233.333	2.868	2.010
238.095	2.716	1.927
242.857	2.778	1.922
247.619	2.502	1.988
252.381	2.624	2.243
257.143	2.686	2.227
261.905	2.746	2.184
266.667	3.234	2.181
271.429	3.204	2.070
276.190	3.174	2.182
280.952	3.388	2.381
285.714	2.808	2.489
290.476	2.258	2.151
295.238	2.136	2.057
300.000	1.648	1.789
304.762	1.984	1.839
309.524	2.564	2.063
314.286	2.198	2.083
319.048	1.252	2.052
323.809	1.098	2.008
328.571	1.954	1.824
333.333	1.496	2.090
338.095	0.702	2.131
342.857	0.824	2.151
347.619	1.160	2.149
352.381	1.098	1.870
357.143	1.342	1.874
361.905	0.732	2.254
366.667	0.244	2.359
371.429	0.122	2.432
376.190	0.824	2.148
380.952	1.312	2.067
385.714	0.886	1.885
390.476	-0.092	1.526
395.238	-0.092	2.021
400.000	0.366	1.633

---> Comment : N400

SITE5

LINE: W520 Direction: S
Date: 4- 4- 2 Time: 9:39
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 400 Final station: 200

Station	Cond.[mS/m]	Inphase [ppt]
400.000	-1.434	2.085
395.349	-0.610	2.212
390.698	-0.610	2.074
386.046	-1.130	1.920
381.395	-0.306	1.666
376.744	0.000	1.622
372.093	0.152	1.811
367.442	-0.214	1.940
362.791	-0.244	1.710
358.140	-0.122	1.701
353.488	0.214	1.918
348.837	0.306	1.978
344.186	0.152	1.991
339.535	0.184	2.026
334.884	0.396	2.010
330.233	1.098	1.980
325.581	1.618	1.936
320.930	1.892	1.899
316.279	1.708	1.721
311.628	2.014	1.918
306.977	2.044	2.092
302.326	1.954	2.011
297.674	1.954	2.300
293.023	2.716	2.614
288.372	2.960	1.710
283.721	1.892	-0.935
279.070	1.068	2.168
---> Comment : BETWELLS		
274.419	1.618	2.638
269.767	2.624	3.052
265.116	1.404	1.396
260.465	2.746	1.631
255.814	3.326	2.203
251.163	3.602	2.010
246.512	3.692	1.852
241.860	3.570	1.945
237.209	2.990	1.971
232.558	2.778	1.984
227.907	2.990	2.015
223.256	2.900	2.033
218.605	3.174	2.061
213.953	3.266	2.140
209.302	3.204	1.909
204.651	3.602	2.283
200.000	3.480	1.688
---> Comment : N200		

ATTACHMENT B

GEOPHYSICAL SURVEY DATA – SITE 48

Why is this Site included - What is site 48?

SITE48

LINE: N0 Direction: E
Date: 4- 4- 2 Time: 10:35
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 0 Final station: 190

Station	Cond.[mS/m]	Inphase [ppt]
0.000	4.914	1.894
2.879	4.760	1.442
5.758	4.852	1.104
8.636	4.700	0.881
11.515	4.944	0.595
14.394	4.638	0.398
17.273	4.426	0.490
20.152	5.066	0.295
23.030	4.516	-0.946
25.909	2.532	-0.694
28.788	2.656	0.628
31.667	2.044	0.439
34.545	-0.458	-0.966
37.424	-0.732	0.178
40.303	-0.244	0.692
43.182	-0.092	0.139
46.061	2.014	0.082
48.939	5.126	0.209
51.818	5.524	0.229
54.697	4.730	0.457
57.576	4.334	0.543
60.455	4.364	0.328
63.333	4.516	0.216
66.212	4.638	-0.531
69.091	4.548	-0.395
71.970	3.906	-0.259
74.848	4.302	-0.380
77.727	3.998	-0.435
80.606	3.906	-0.282
83.485	4.120	-0.273
86.364	4.486	-0.317
89.242	5.036	-0.293
92.121	5.372	-0.226
95.000	5.402	-0.218
97.879	4.944	-0.273
100.758	5.432	-0.121
103.636	5.372	0.023
106.515	5.340	0.165
109.394	5.004	-0.047
112.273	4.608	-0.308
115.152	5.004	-0.328
118.030	5.372	-0.442
120.909	5.402	-0.527
123.788	5.188	-0.514
126.667	5.188	-0.444
129.545	5.950	-0.455
132.424	6.440	-1.058
135.303	5.646	-1.100
138.182	4.974	-0.453
141.061	5.280	-0.172
143.939	6.408	-0.420
146.818	7.354	-0.576
149.697	7.232	-0.558
152.576	6.896	-0.428
155.455	7.232	-0.262
158.333	7.171	-0.305
161.212	6.592	-0.606
164.091	5.372	-0.670

166.970	4.364	-0.869
169.848	3.814	-1.120
172.727	4.334	-0.815
175.606	5.096	-0.334
178.485	4.974	-0.198
181.364	5.036	-0.202
184.242	4.792	-0.169
187.121	3.876	0.029
190.000	3.724	-0.437

---> Comment : E190
LINE: N10 Direction: W
Date: 4- 4- 2 Time: 10:37
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 190 Final station: 0

Station	Cond.[mS/m]	Inphase [ppt]
190.000	3.846	-0.861
186.724	4.058	-0.745
183.448	4.792	-0.301
180.172	4.302	-0.608
176.897	5.004	-0.933
173.621	5.584	-0.795
170.345	5.860	-0.536
167.069	7.171	-0.589
163.793	7.232	-0.773
160.517	6.684	-0.560
157.241	7.294	-0.323
153.966	7.782	-0.464
150.690	8.698	-0.288
147.414	8.880	-0.198
144.138	8.240	-0.187
140.862	7.690	-0.338
137.586	7.568	-0.382
134.310	6.684	-0.308
131.034	6.286	-0.510
127.759	6.440	-0.391
124.483	7.171	-0.165
121.207	6.928	-0.259
117.931	6.592	-0.202
114.655	6.440	-1.613
111.379	5.982	-2.780
108.103	6.012	-0.705
104.828	5.828	-0.977
101.552	4.792	-4.527
98.276	4.516	-2.434
95.000	3.998	-0.633
91.724	4.334	-0.808
88.448	4.760	-0.718
85.172	5.372	-0.262
81.897	5.126	-0.722
78.621	5.004	-0.227
75.345	4.944	-0.150
72.069	4.882	0.020
68.793	4.608	-0.771
65.517	4.944	-0.731
62.241	4.822	-0.540
58.966	4.394	-0.689
55.690	4.456	-0.310
52.414	4.638	-0.246
49.138	4.548	-0.332
45.862	4.760	-0.176
42.586	4.456	-0.244
39.310	3.692	-0.075
36.034	2.166	0.073

32.759	1.800	0.363
29.483	1.404	0.578
26.207	1.862	0.826
22.931	2.044	1.280
19.655	1.800	0.461
16.379	2.198	0.073
13.103	4.548	-0.167
9.828	5.158	-0.676
6.552	4.792	-0.277
3.276	4.882	0.113
0.000	4.670	0.352

LINE: N20 Direction: E
Date: 4- 4- 2 Time: 10:39
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 0 Final station: 190

Station	Cond.[mS/m]	Inphase [ppt]
0.000	4.394	0.497
3.167	4.394	0.626
6.333	3.936	0.387
9.500	4.578	-0.327
12.667	4.578	-0.509
15.833	4.670	-0.404
19.000	4.456	-0.435
22.167	4.670	-0.251
25.333	3.906	0.268
28.500	2.656	-0.108
31.667	1.618	-0.547
34.833	1.678	0.016
38.000	2.044	-0.167
41.167	2.778	-0.332
44.333	3.356	-0.564
47.500	4.150	-0.406
50.667	4.456	-0.444
53.833	4.578	-0.110
57.000	4.486	-0.220
60.167	4.242	-0.264
63.333	4.090	-0.453
66.500	4.212	-1.644
69.667	4.180	-2.963
72.833	5.218	-0.556
76.000	5.676	-0.038
79.167	5.554	-1.392
82.333	4.212	-1.207
85.500	4.792	-0.564
88.667	5.402	-0.203
91.833	5.494	-0.295
95.000	5.890	-0.488
98.167	6.012	-0.264
101.333	6.164	-0.363
104.500	6.378	-0.440
107.667	6.408	-0.422
110.833	6.408	-0.279
114.000	6.318	-0.444
117.167	6.408	-0.486
120.333	6.562	-0.382
123.500	6.592	-0.426
126.667	6.714	-0.464
129.833	7.476	-0.685
133.000	7.812	-0.856
136.167	8.514	-1.089
139.333	8.544	-0.869
142.500	8.392	-0.793
145.667	8.178	-1.201

148.833	8.422	-1.231
152.000	8.422	-1.098
155.167	8.088	-1.107
158.333	7.720	-0.812
161.500	7.782	-0.725
164.667	7.202	-1.030
167.833	6.928	-0.249
171.000	7.324	-0.192
174.167	6.622	-0.676
177.333	6.714	-1.317
180.500	6.774	-1.578
183.667	5.280	-2.592
186.833	2.838	-3.210
190.000	1.252	-1.515

LINE: N30 Direction: W
Date: 4- 4- 2 Time: 10:40
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 190 Final station: 0

Station	Cond.[mS/m]	Inphase [ppt]
190.000	4.334	-0.358
186.724	4.608	-0.435
183.448	6.104	-0.113
180.172	7.508	0.016
176.897	8.422	-0.165
173.621	8.728	-0.082
170.345	8.972	0.115
167.069	9.522	-0.525
163.793	8.820	-1.769
160.517	8.332	-0.935
157.241	8.880	-0.323
153.966	8.972	-1.819
150.690	10.040	-1.622
147.414	10.986	-0.516
144.138	10.772	-0.389
140.862	10.010	-0.382
137.586	9.582	-0.264
134.310	8.912	-0.033
131.034	9.460	-0.163
127.759	9.796	-0.299
124.483	8.790	-0.481
121.207	8.728	-0.549
117.931	8.514	-0.439
114.655	8.178	-0.402
111.379	7.934	-0.531
108.103	8.270	-0.396
104.828	8.026	-0.461
101.552	8.240	-0.113
98.276	7.752	-0.299
95.000	7.324	-0.371
91.724	6.866	-0.745
88.448	6.440	-0.681
85.172	6.196	-0.091
81.897	5.828	-0.095
78.621	5.280	-0.549
75.345	3.936	-0.975
72.069	4.272	-0.663
68.793	3.662	-0.830
65.517	3.784	-0.303
62.241	4.578	-0.268
58.966	4.058	-0.301
55.690	4.242	-0.905
52.414	4.180	-0.426
49.138	4.150	-0.202

45.862	4.670	-0.330
42.586	3.052	-1.249
39.310	0.946	-2.260
36.034	0.488	-1.405
32.759	0.886	-1.752
29.483	0.274	-2.441
26.207	3.602	-0.733
22.931	4.638	-0.257
19.655	4.150	-0.106
16.379	4.150	-0.222
13.103	4.120	-0.134
9.828	4.578	-0.047
6.552	4.272	-0.093
3.276	4.578	0.058
0.000	4.456	0.181

LINE: N40 Direction: E
Date: 4- 4- 2 Time: 10:42
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 0 Final station: 190

Station	Cond.[mS/m]	Inphase [ppt]
0.000	4.120	0.077
3.220	4.180	0.115
6.441	3.846	-0.290
9.661	3.356	-0.718
12.881	3.082	-0.740
16.102	3.846	-0.589
19.322	4.120	-0.900
22.542	4.486	-0.874
25.763	4.180	-0.801
28.983	4.334	-0.422
32.203	4.426	0.123
35.424	2.686	0.446
38.644	1.832	0.586
41.864	2.014	0.361
45.085	2.472	0.738
48.305	3.876	0.033
51.525	4.852	-0.281
54.746	4.730	-0.404
57.966	4.302	-0.821
61.186	4.364	-0.806
64.407	4.334	-0.723
67.627	4.548	-0.575
70.847	3.662	-0.519
74.068	3.662	-0.356
77.288	3.968	-0.310
80.508	5.676	-0.426
83.729	5.250	-0.271
86.949	5.554	-0.407
90.169	6.164	-0.347
93.390	6.164	0.132
96.610	6.988	0.044
99.831	7.934	0.236
103.051	7.934	1.144
106.271	8.026	0.856
109.492	8.728	-0.347
112.712	9.186	-0.502
115.932	8.850	-0.170
119.153	9.246	-0.334
122.373	10.192	-0.446
125.593	10.468	-1.383
128.814	10.956	-1.124
132.034	10.834	-0.780
135.254	10.590	-0.797

138.475	11.170	-0.981
141.695	11.932	-0.830
144.915	12.512	-0.801
148.136	12.054	-0.876
151.356	12.330	-0.646
154.576	12.756	-0.095
157.797	12.298	-0.259
161.017	11.444	-0.464
164.237	10.620	-0.529
167.458	9.613	-0.338
170.678	9.368	-0.306
173.898	9.064	-0.411
177.119	8.665	0.060
180.339	7.812	-0.384
183.559	6.562	-0.501
186.780	5.616	-0.332
190.000	5.768	-0.106

LINE: N50 Direction: W
Date: 4- 4- 2 Time: 10:44
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 190 Final station: 0

Station	Cond.[mS/m]	Inphase [ppt]
190.000	5.096	-0.229
187.031	3.936	0.192
184.062	4.944	-0.369
181.094	5.646	-0.916
178.125	7.324	-0.644
175.156	8.299	-0.189
172.187	8.299	-0.113
169.219	8.820	-0.005
166.250	9.644	0.055
163.281	10.192	-0.180
160.312	11.230	-0.358
157.344	12.176	-0.532
154.375	12.452	-0.444
151.406	12.176	-0.531
148.437	12.146	-0.336
145.469	11.962	-0.293
142.500	11.902	-0.433
139.531	12.298	-0.117
136.562	12.390	0.027
133.594	12.604	-0.448
130.625	12.542	-0.510
127.656	11.048	-0.407
124.687	10.376	-0.360
121.719	10.560	-0.378
118.750	10.224	-0.279
115.781	9.736	-0.519
112.812	8.880	-0.679
109.844	8.088	-0.648
106.875	7.264	-1.015
103.906	7.080	-1.111
100.937	7.508	-1.618
97.969	6.408	-0.055
95.000	7.080	0.101
92.031	6.500	0.170
89.062	6.164	-0.308
86.094	5.554	-0.474
83.125	5.250	-0.496
80.156	4.180	-0.554
77.187	4.334	-0.617
74.219	5.372	-0.475
71.250	4.638	-0.588

68.281	4.730	-0.510
65.312	4.608	-0.297
62.344	4.822	-0.189
59.375	3.998	-0.562
56.406	4.882	-0.542
53.437	4.456	-0.589
50.469	5.126	-0.698
47.500	4.792	-0.481
44.531	4.578	-0.373
41.562	4.334	-0.229
38.594	3.204	0.349
35.625	2.502	0.749
32.656	2.410	0.745
29.687	3.174	1.021
26.719	2.838	0.762
23.750	3.846	0.529
20.781	4.426	0.659
17.812	4.242	0.185
14.844	3.540	-0.268
11.875	3.846	-0.598
8.906	4.180	-0.521
5.937	3.814	-0.468
2.969	3.540	-0.343
0.000	4.578	-0.633

LINE: N60 Direction: E
Date: 4- 4- 2 Time: 10:46
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 0 Final station: 190

Station	Cond.[mS/m]	Inphase [ppt]
0.000	4.638	-0.580
3.167	4.150	-0.474
6.333	3.388	-0.413
9.500	2.564	-0.169
12.667	3.784	-0.670
15.833	3.388	-0.624
19.000	4.180	-0.384
22.167	4.426	0.036
25.333	4.302	1.106
28.500	2.990	0.949
31.667	2.228	0.102
34.833	2.228	0.378
38.000	2.624	0.472
41.167	1.464	0.444
44.333	2.044	0.200
47.500	3.418	-0.290
50.667	5.096	-0.349
53.833	5.372	-0.178
57.000	4.792	-0.633
60.167	4.882	-0.880
63.333	3.754	-1.289
66.500	3.724	-0.942
69.667	3.388	-0.334
72.833	2.686	-0.316
76.000	2.442	-1.207
79.167	2.930	-1.969
82.333	4.212	-1.115
85.500	4.670	-0.718
88.667	4.272	-0.716
91.833	4.334	-1.218
95.000	5.066	-1.743
98.167	4.486	-0.995
101.333	4.578	-0.764
104.500	5.432	-0.576

107.667	5.798	-0.667
110.833	5.462	-0.957
114.000	8.210	-0.703
117.167	10.224	-0.564
120.333	10.590	-0.540
123.500	10.742	-0.635
126.667	11.566	-0.745
129.833	11.596	-0.891
133.000	11.292	-1.593
136.167	8.514	-3.018
139.333	6.226	-3.250
142.500	7.294	-2.302
145.667	4.272	-5.113
148.833	2.900	-5.688
152.000	8.912	-1.749
155.167	13.092	-1.150
158.333	9.430	-6.535
161.500	6.470	-4.200
164.667	5.646	-0.863
167.833	3.022	-2.232
171.000	-2.960	-13.995
174.167	1.068	-10.499
177.333	1.130	-9.918
180.500	-0.854	-9.955
183.667	1.648	-2.364
186.833	2.746	2.221
190.000	-52.674	-24.904

---> Comment : SURFMTL
LINE: N70 Direction: W
Date: 4- 4- 2 Time: 10:49
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 190 Final station: 0

Station	Cond.[mS/m]	Inphase [ppt]
190.000	6.286	0.374
186.545	6.562	-0.093
183.091	6.866	-0.940
179.636	7.508	-1.107
176.182	8.299	-0.292
172.727	8.912	0.137
169.273	8.665	0.042
165.818	8.972	-0.253
162.364	9.704	-0.496
158.909	10.224	-0.549
155.455	11.048	-0.624
152.000	11.718	-0.363
148.545	13.184	-0.545
145.091	13.642	-0.560
141.636	12.054	-1.280
138.182	11.292	-1.282
134.727	12.238	-1.390
131.273	12.390	-0.841
127.818	11.658	-0.459
124.364	11.016	-0.479
120.909	10.804	-0.027
117.455	10.498	-0.273
114.000	6.134	-0.316
110.545	5.462	-0.415
107.091	5.554	-0.299
103.636	5.158	-0.286
100.182	4.882	-0.270
96.727	4.822	-0.633
93.273	4.364	-0.676
89.818	5.096	-0.654

86.364	5.218	-0.275
82.909	4.670	-0.203
79.455	3.144	-0.448
76.000	2.502	-0.310
72.545	4.272	-1.457
69.091	3.632	-1.194
65.636	4.516	-1.008
62.182	4.486	-0.731
58.727	4.334	-0.903
55.273	4.700	-0.994
51.818	3.602	-0.117
48.364	2.838	-0.185
44.909	1.862	-1.148
41.455	1.038	-1.539
38.000	2.564	-0.821
34.545	3.082	-0.720
31.091	3.112	-1.030
27.636	2.288	-0.266
24.182	2.442	-0.259
20.727	3.388	-0.973
17.273	4.212	-0.953
13.818	4.272	-0.486
10.364	4.426	-0.628
6.909	4.426	-0.582
3.455	3.692	-0.385
0.000	4.974	-0.492

LINE: N80 Direction: E
Date: 4- 4- 2 Time: 10:51
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 0 Final station: 190

Station	Cond.[mS/m]	Inphase [ppt]
0.000	3.540	-0.514
3.878	3.082	-0.396
7.755	3.234	-0.270
11.633	3.144	-0.216
15.510	2.472	-0.349
19.388	3.356	-0.339
23.265	2.990	-0.187
27.143	2.778	-0.474
31.020	3.296	-0.310
34.898	2.564	-0.113
38.776	2.502	0.137
42.653	2.778	-0.108
46.531	3.480	-0.393
50.408	2.778	-0.626
54.286	2.350	-0.878
58.163	1.678	-0.938
62.041	1.678	-0.804
65.918	2.656	-0.801
69.796	2.778	-0.661
73.673	3.112	-0.233
77.551	4.456	-0.406
81.429	4.212	-0.446
85.306	3.998	-0.780
89.184	4.486	-0.852
93.061	5.432	-0.670
96.939	6.042	-0.415
100.816	5.432	-0.452
104.694	4.974	-0.453
108.571	5.340	-0.413
112.449	5.950	-0.604
116.327	11.078	-0.608
120.204	11.536	-0.779

124.082	11.414	-0.779
127.959	11.260	-0.902
131.837	11.840	-1.078
135.714	12.634	-1.225
139.592	13.336	-1.567
143.469	13.306	-1.460
147.347	12.878	-1.409
151.224	13.154	-1.013
155.102	12.452	-1.152
158.980	11.230	-0.999
162.857	10.498	-0.839
166.735	9.704	-0.707
170.612	8.636	-0.747
174.490	7.171	-0.894
178.367	6.774	-1.315
182.245	5.554	-1.986
186.122	5.280	-2.748
190.000	3.846	-3.711

LINE: N90 Direction: W
Date: 4- 4- 2 Time: 10:53
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 190 Final station: 0

Station	Cond.[mS/m]	Inphase [ppt]
190.000	1.312	-1.653
186.667	-0.366	-1.898
183.333	-0.366	-2.034
180.000	2.472	-2.671
176.667	5.890	-2.522
173.333	9.796	-1.273
170.000	9.980	-0.806
166.667	9.736	-0.940
163.333	10.102	-0.922
160.000	11.078	-0.621
156.667	11.628	-0.861
153.333	12.664	-0.797
150.000	12.726	-0.701
146.667	12.512	-0.722
143.333	12.084	-0.442
140.000	11.688	-1.414
136.667	11.260	-1.624
133.333	11.566	-1.383
130.000	10.956	-1.273
126.667	9.796	-1.126
123.333	8.056	-0.836
120.000	7.294	-0.793
116.667	7.598	-0.648
113.333	6.530	-0.641
110.000	6.134	-0.422
106.667	5.158	-0.502
103.333	5.340	-0.521
100.000	5.890	-0.742
96.667	6.072	-0.764
93.333	5.554	-0.883
90.000	3.326	-2.311
86.667	-0.854	-3.605
83.333	0.152	-2.877
80.000	0.184	-2.833
76.667	-0.152	-3.129
73.333	4.944	-0.430
70.000	3.052	-0.499
66.667	3.570	-0.690
63.333	1.098	-1.286

---> Comment : GASCYL

60.000	0.458	-1.076
56.667	1.984	-0.893
53.333	3.510	-1.302
50.000	3.082	-0.791
46.667	1.160	-0.260
43.333	2.198	-1.052
40.000	3.510	-0.804
36.667	4.882	-0.617
33.333	2.320	-0.202
30.000	1.586	-0.367
26.667	3.448	-0.284
23.333	1.984	-0.297
20.000	2.656	-0.655
16.667	3.754	-0.856
13.333	4.058	-0.676
10.000	3.936	-0.033
6.667	3.234	-0.203
3.333	2.900	-0.847
0.000	2.594	-0.839

LINE: N100 Direction: E
Date: 4- 4- 2 Time: 10:56
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 0 Final station: 190

Station	Cond.[mS/m]	Inphase [ppt]
0.000	2.624	-0.758
2.969	2.746	-0.659
5.937	3.906	-0.630
8.906	2.716	-0.628
11.875	1.954	-0.598
14.844	2.320	-0.198
17.812	3.814	-0.148
20.781	3.144	-0.624
23.750	2.778	-0.543
26.719	2.472	-0.277
29.687	3.174	-0.632
32.656	2.746	-0.735
35.625	2.532	-0.764
38.594	2.502	-0.815
41.562	3.112	-0.411
44.531	1.922	-1.109
47.500	1.098	-1.258
50.469	3.692	-0.924
53.437	2.746	-2.914
56.406	0.702	-3.729
59.375	-4.914	-3.145
62.344	-8.087	-4.580

---> Comment : TUBES

65.312	-5.126	-3.300
68.281	2.380	-1.085
71.250	2.930	-1.089
74.219	2.808	-0.668
77.187	-38.482	-11.605
80.156	7.630	-0.598
83.125	4.670	-1.098
86.094	3.510	-0.935
89.062	3.570	-0.540
92.031	3.784	-0.488
95.000	4.394	-0.525
97.969	4.638	-0.762
100.937	4.944	-0.694
103.906	5.188	-0.687
106.875	5.126	-0.808
109.844	5.432	-0.953

112.812	4.822	-1.005
115.781	4.882	-0.481
118.750	6.470	-0.589
121.719	7.294	-0.966
124.687	7.294	-1.096
127.656	7.874	-0.821
130.625	9.094	-0.446
133.594	9.430	-0.676
136.562	9.430	-0.830
139.531	10.284	-1.062
142.500	11.566	-1.005
145.469	10.894	-1.032
148.437	10.682	-1.271
151.406	11.170	-1.223
154.375	11.810	-1.556
157.344	12.634	-1.356
160.312	13.244	-0.760
163.281	13.550	-0.817
166.250	13.032	-0.975
169.219	12.482	-0.850
172.187	12.054	-0.729
175.156	11.170	-0.687
178.125	9.796	-1.107
181.094	7.598	-1.962
184.062	5.524	-2.307
187.031	4.974	-1.521
190.000	5.890	-0.630

LINE: N110 Direction: W
Date: 4- 4- 2 Time: 10:58
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 190 Final station: 0

Station	Cond.[mS/m]	Inphase [ppt]
190.000	4.272	-1.534
187.206	3.814	-1.863
184.412	3.692	-2.120
181.618	6.256	-1.651
178.824	8.392	-1.901
176.029	9.186	-1.784
173.235	10.010	-1.411
170.441	10.682	-1.155
167.647	11.688	-0.920
164.853	12.482	-1.339
162.059	12.208	-1.558
159.265	11.872	-1.490
156.471	11.444	-1.905
153.676	10.894	-2.320
150.882	9.064	-2.680
148.088	6.988	-2.033
145.294	7.080	-1.315
142.500	7.690	-1.106
139.706	8.820	-1.218
136.912	10.864	-1.074
134.118	10.620	-0.898
131.324	9.186	-0.795
128.529	8.698	-1.027
125.735	6.896	-0.867
122.941	5.828	-0.749
120.147	5.494	-0.865
117.353	6.196	-0.894
114.559	6.592	-0.716
111.765	4.700	-0.718
108.971	4.090	-1.135
106.176	3.814	-0.982

103.382	3.692	-0.152
100.588	3.846	-0.325
97.794	4.456	-0.582
95.000	5.036	-0.867
92.206	3.876	-0.889
89.412	3.632	-0.828
86.618	2.624	-0.889
83.824	4.180	-0.815
81.029	3.602	-0.358
78.235	3.480	-0.619
75.441	4.394	-0.319
72.647	2.258	-0.606
69.853	2.228	-7.833
67.059	-30.364	-17.858
64.265	-15.472	-9.598
61.471	6.256	1.227

---> Comment : MNDCONC

58.676	2.228	1.324
55.882	-3.480	-1.356
53.088	-39.276	-20.059
50.294	-20.508	-8.996
47.500	1.770	1.787
44.706	2.076	1.896
41.912	2.716	1.464
39.118	2.868	-0.005
36.324	3.296	-0.571
33.529	2.198	-0.812
30.735	1.954	-0.694
27.941	2.656	-0.446
25.147	3.784	-0.319
22.353	4.364	-0.913
19.559	3.204	-0.323
16.765	2.472	-0.157
13.971	2.442	-0.751
11.176	3.418	-1.231
8.382	2.472	-1.159
5.588	2.686	-0.858
2.794	3.998	-0.854
0.000	2.594	-0.867

LINE: N120 Direction: E
Date: 4- 4- 2 Time: 11: 0
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 0 Final station: 190

Station	Cond.[mS/m]	Inphase [ppt]
0.000	3.784	-0.477
2.794	4.028	-0.257
5.588	3.326	-0.290
8.382	2.868	-0.453
11.176	2.410	-0.797
13.971	2.472	-0.861
16.765	2.076	-0.797
19.559	2.380	-0.801
22.353	2.532	-0.576
25.147	3.540	-0.576
27.941	3.632	-0.883
30.735	2.106	-0.635
33.529	1.648	-0.417
36.324	1.800	-0.339
39.118	1.648	-0.771
41.912	2.136	-1.447
44.706	3.692	-1.344
47.500	3.022	-0.170
50.294	1.648	-0.071

53.088	-1.648	-2.377
55.882	-2.746	-2.658
58.676	1.374	-0.404
61.471	2.930	-0.841
64.265	-2.990	-4.218
67.059	0.214	-2.079
69.853	4.394	-0.147
72.647	4.426	-0.286
75.441	4.700	-0.959
78.235	2.076	-0.927
81.029	2.686	-0.795
83.824	4.334	-0.705
86.618	4.272	-0.863
89.412	3.418	-0.929
92.206	3.632	-0.718
95.000	2.930	-0.766
97.794	3.876	-0.757
100.588	2.960	-0.600
103.382	4.150	-1.030
106.176	3.570	-0.837
108.971	7.020	-1.124
111.765	5.950	-1.383
114.559	5.646	-0.975
117.353	6.592	-0.496
120.147	9.002	-0.657
122.941	9.278	-1.074
125.735	9.400	-1.615
128.529	10.314	-1.356
131.324	9.034	-0.865
134.118	8.912	-0.927
136.912	9.430	-0.848
139.706	8.728	-1.025
142.500	10.314	-0.922
145.294	10.376	-0.977
148.088	11.078	-0.826
150.882	11.688	-0.646
153.676	12.360	-0.903
156.471	11.078	-3.064
159.265	7.690	-9.038
162.059	3.326	-13.091
164.853	1.618	-9.361
167.647	2.778	-4.558
170.441	-1.434	-11.614
173.235	1.342	-6.374
176.029	3.144	-2.625
178.824	-0.366	-8.163
181.618	1.892	-8.470
184.412	6.562	-3.410
187.206	6.684	-1.172
---> Comment : ANOM1		
190.000	6.378	-0.657

LINE: N130 Direction: W
Date: 4- 4- 2 Time: 11: 4
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 190 Final station: 0

Station	Cond.[mS/m]	Inphase [ppt]
190.000	2.320	-3.085
187.246	2.198	-2.890
184.493	2.258	-1.793
181.739	3.632	-1.218
178.985	3.480	-1.508
176.232	3.724	-1.740
173.478	5.218	-1.872

170.725	6.774	-1.719
167.971	8.056	-1.670
165.217	8.544	-1.852
162.464	8.912	-1.809
159.710	9.490	-1.073
156.957	9.156	-0.832
154.203	8.880	-0.769
151.449	8.362	-0.676
148.696	9.552	-0.727
145.942	9.460	-1.089
143.188	7.996	-1.493
140.435	7.690	-1.473
137.681	7.752	-1.438
134.928	8.026	-1.190
132.174	8.606	-0.957
129.420	8.210	-1.049
126.667	7.966	-1.164
123.913	6.408	-1.107
121.159	6.348	-0.707
118.406	4.822	-0.690
115.652	4.700	-0.994
112.899	4.608	-0.701
110.145	4.272	-0.913
107.391	4.426	-1.299
104.638	4.578	-0.900
101.884	4.394	-0.382
99.130	4.394	-0.209
96.377	4.730	-0.169
93.623	5.310	-0.273
90.870	4.364	-0.413
88.116	2.136	-0.773
85.362	1.800	-1.152
82.609	2.778	-1.027
79.855	3.022	-1.049
77.101	3.814	-0.788
74.348	3.602	-0.518
71.594	1.740	-0.064
68.841	-0.580	-0.086
66.087	2.198	0.903
63.333	3.266	1.223
60.580	2.198	0.543
57.826	2.410	-0.885
55.072	3.540	-0.608
52.319	2.900	-0.661
49.565	3.112	-0.608
46.812	2.410	-0.648
44.058	1.648	-0.525
41.304	1.740	-0.523
38.551	2.990	-0.654
35.797	3.082	-0.764
33.043	2.044	-0.650
30.290	2.106	-0.933
27.536	1.892	-0.893
24.783	2.320	-0.760
22.029	2.198	-0.672
19.275	2.014	-0.700
16.522	2.014	-0.784
13.768	2.746	-0.876
11.014	2.320	-0.729
8.261	2.686	-0.536
5.507	2.716	-0.244
2.754	2.594	-0.481
0.000	1.252	-0.439

LINE: N140 Direction: E
Date: 4- 4- 2 Time: 11: 6
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 0 Final station: 190

Station	Cond.[mS/m]	Inphase [ppt]
0.000	2.656	-0.762
2.533	2.380	-0.742
5.067	1.832	-0.799
7.600	3.540	-0.418
10.133	3.326	-0.411
12.667	2.656	-0.742
15.200	2.532	-0.257
17.733	2.930	-0.319
20.267	2.868	-0.637
22.800	2.380	-0.211
25.333	2.564	-0.556
27.867	2.442	-0.700
30.400	2.502	-0.731
32.933	2.258	-0.863
35.467	2.044	-0.663
38.000	2.808	-0.815
40.533	2.320	-0.795
43.067	2.044	-0.773
45.600	2.044	-0.760
48.133	2.106	-0.424
50.667	3.692	-0.814
53.200	2.686	-0.540
55.733	0.824	-0.769
58.267	2.014	-1.015
60.800	1.678	-0.582
63.333	1.800	-0.619
65.867	2.106	-0.600
68.400	2.532	-0.312
70.933	2.532	-0.418
73.467	2.686	-0.468
76.000	2.808	-0.422
78.533	3.876	-0.475
81.067	2.564	-1.139
83.600	-1.434	-2.921
86.133	-5.340	-1.694
88.667	-5.950	-2.587
91.200	-8.880	-1.563
93.733	-8.972	-1.043
96.267	-6.134	-3.950
---> Comment : ANOM2		
98.800	-7.324	-5.075
---> Comment : SURFMTL		
101.333	-20.690	-24.788
103.867	-44.464	-24.787
106.400	-10.192	21.597
108.933	-0.580	22.811
111.467	-7.598	-12.950
114.000	-11.444	-24.778
116.533	-9.430	-24.778
119.067	2.044	-14.028
121.600	7.752	1.495
124.133	5.798	1.374
126.667	4.944	-0.191
129.200	5.768	-0.667
131.733	6.378	-0.637
134.267	6.042	-1.085
136.800	5.920	-2.796
139.333	5.402	-2.655

141.867	5.554	-2.014
144.400	4.914	-1.155
146.933	5.676	-1.245
149.467	5.920	-1.390
152.000	7.110	-1.374
154.533	7.476	-1.449
157.067	7.752	-1.021
159.600	8.880	-0.924
162.133	8.850	-0.964
164.667	8.606	-0.948
167.200	7.171	-0.639
169.733	7.171	-0.735
172.267	7.386	-1.045
174.800	4.944	-2.098
177.333	5.250	-2.065
179.867	6.042	-1.034
182.400	5.066	-1.275
184.933	0.672	-3.105
187.467	4.272	-2.517
190.000	5.616	-1.605

LINE: N150 Direction: W
Date: 4- 4- 2 Time: 11: 9
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 190 Final station: 0

Station	Cond.[mS/m]	Inphase [ppt]
190.000	5.402	-5.501
187.164	6.774	-2.506
184.328	9.064	-0.523
---> Comment : SURFMTL		
181.493	7.630	-0.685
178.657	7.020	-0.979
175.821	6.928	-1.346
172.985	7.324	-2.261
170.149	5.706	-4.016
167.313	2.716	-3.665
164.478	-0.274	-1.508
161.642	0.030	-0.981
158.806	-3.510	-5.481
155.970	-11.078	-11.370
153.134	-6.134	-6.515
150.298	3.174	-3.384
---> Comment : COOP		
147.463	3.936	-2.726
144.627	3.388	-2.350
141.791	4.364	-2.320
138.955	4.028	-0.784
136.119	8.576	-0.334
133.284	7.416	-1.039
130.448	5.432	-0.887
127.612	4.150	-0.913
124.776	5.188	-0.854
121.940	5.066	-0.321
119.104	3.906	-0.712
116.269	4.578	-1.569
113.433	4.608	-1.653
110.597	2.594	-1.025
107.761	3.052	-0.588
104.925	3.448	-1.493
102.090	3.296	-2.734
99.254	1.404	-2.129
96.418	-0.062	-0.286
93.582	1.252	-0.249
90.746	2.198	-0.979

87.910	1.526	-1.920
85.075	3.480	-1.214
82.239	4.058	-0.529
79.403	2.624	-0.611
76.567	2.716	-0.516
73.731	3.022	-0.650
70.896	2.288	-0.611
68.060	1.984	-0.321
65.224	1.618	-0.474
62.388	2.686	-0.762
59.552	1.282	-0.711
56.716	2.502	-0.949
53.881	1.892	-0.817
51.045	1.832	-0.696
48.209	1.220	-0.611
45.373	1.374	-0.676
42.537	2.228	-0.769
39.701	1.586	-0.611
36.866	1.832	-0.670
34.030	2.044	-0.527
31.194	1.770	-0.277
28.358	4.272	-0.376
25.522	2.746	-0.654
22.687	1.678	-0.883
19.851	2.624	-0.663
17.015	3.022	-0.457
14.179	1.892	-1.102
11.343	0.886	-0.893
8.507	2.716	-0.689
5.672	0.946	-0.551
2.836	2.136	-0.738
0.000	3.266	-0.356

LINE: N160 Direction: E
Date: 4- 4- 2 Time: 11:12
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 0 Final station: 190

Station	Cond.[mS/m]	Inphase [ppt]
0.000	3.204	-0.834
3.455	2.778	-0.646
6.909	2.990	-0.676
10.364	3.174	-0.937
13.818	2.258	-0.806
17.273	2.502	-1.015
20.727	2.258	-0.744
24.182	2.472	-0.641
27.636	2.136	-0.667
31.091	1.618	-0.545
34.545	1.954	-0.598
38.000	2.502	-0.788
41.455	2.564	-0.881
44.909	2.594	-0.615
48.364	3.692	-0.551
51.818	3.602	-0.521
55.273	2.716	-0.740
58.727	1.008	-0.716
62.182	0.762	-0.720
65.636	2.350	-0.689
69.091	2.106	-0.545
72.545	3.234	-0.839
76.000	2.778	-0.703
79.455	2.930	-0.718
82.909	4.058	-0.358
86.364	3.174	-0.266

89.818	2.380	-0.676
93.273	1.922	-0.802
96.727	5.004	-0.589
100.182	5.250	-0.203
103.636	4.700	-0.459
107.091	4.486	-0.718
110.545	5.310	-0.745
114.000	4.882	-0.762
117.455	3.632	-0.858
120.909	3.570	-0.777
124.364	4.578	-0.506
127.818	5.524	-0.621
131.273	6.196	-0.679
134.727	5.950	-0.428
138.182	5.950	-0.736
141.636	4.426	-0.771
145.091	5.096	-0.758
148.545	3.388	-0.646
152.000	3.480	-0.339
155.455	3.876	-0.891
158.909	4.486	-1.424
162.364	4.914	-1.613
165.818	5.798	-2.734
169.273	6.744	-2.184
172.727	7.110	-0.775
176.182	6.042	-0.799
179.636	5.494	-2.611
183.091	6.714	-2.328
186.545	8.056	-1.732
190.000	7.476	-1.649

LINE: N170 Direction: W
Date: 4- 4- 2 Time: 11:15
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 190 Final station: 0

Station	Cond.[mS/m]	Inphase [ppt]
190.000	6.134	-0.788
186.833	4.822	-1.367
183.667	3.144	-1.876
180.500	2.778	-1.642
177.333	2.960	-1.310
174.167	2.258	-1.379
171.000	1.008	-1.784
167.833	3.602	-1.326
164.667	5.310	-0.964
161.500	6.318	-1.062
158.333	5.982	-1.120
155.167	4.822	-1.291
152.000	5.828	-1.311
148.833	6.562	-0.784
145.667	5.462	-0.677
142.500	3.876	-1.049
139.333	3.968	-1.183
136.167	3.448	-1.109
133.000	2.960	-1.008
129.833	3.570	-1.015
126.667	3.082	-0.937
123.500	2.778	-0.745
120.333	3.540	-0.657
117.167	3.296	-0.580
114.000	3.296	-0.793
110.833	4.394	-0.312
107.667	4.090	-0.733
104.500	3.510	-0.903

101.333	3.724	-0.108
98.167	2.532	-0.760
95.000	2.808	-1.054
91.833	2.868	-1.041
88.667	2.288	-1.036
85.500	3.662	-1.280
82.333	2.594	-0.874
79.167	1.404	-0.799
76.000	3.480	-1.120
72.833	2.564	-0.856
69.667	3.632	-0.236
66.500	2.320	-0.509
63.333	2.320	-0.132
60.167	1.618	-0.483
57.000	2.808	-0.554
53.833	4.792	-0.391
50.667	2.716	-0.903
47.500	1.282	-0.981
44.333	0.732	-0.108
41.167	3.662	-0.303
38.000	3.602	-0.984
34.833	1.832	-1.253
31.667	1.648	-0.428
28.500	2.686	-0.848
25.333	0.702	-0.824
22.167	1.800	-0.900
19.000	2.198	-0.588
15.833	2.380	-1.225
12.667	1.068	-1.273
9.500	1.068	-0.435
6.333	3.204	-0.749
3.167	2.624	-1.594
0.000	2.900	-1.449

LINE: N180 Direction: E
Date: 4- 4- 2 Time: 11:17
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 0 Final station: 190

Station	Cond.[mS/m]	Inphase [ppt]
0.000	3.082	-0.880
2.794	4.028	-0.944
5.588	2.746	-0.968
8.382	1.586	-0.777
11.176	2.106	-1.010
13.971	1.800	-0.861
16.765	2.106	-0.740
19.559	2.014	-0.676
22.353	2.258	-0.834
25.147	1.586	-0.896
27.941	2.106	-0.725
30.735	1.312	-0.677
33.529	2.076	-0.652
36.324	2.808	-0.720
39.118	2.686	-0.738
41.912	3.266	-0.681
44.706	1.374	-0.505
47.500	2.410	-0.470
50.294	1.404	-0.260
53.088	3.356	-0.279
55.882	4.058	1.321
58.676	8.820	3.542
61.471	-1.160	-7.693
64.265	-26.642	-24.743
67.059	-56.274	-24.768

69.853	-48.890	-24.741

---> Comment : SURFMTL

72.647	-38.086	-20.722
75.441	-21.362	-9.547
78.235	-47.546	-24.765
81.029	-34.240	-20.891
83.824	-19.226	-11.599
86.618	0.824	-1.833
89.412	2.686	-0.663
92.206	2.868	-0.841
95.000	2.960	-0.847
97.794	3.052	-0.529
100.588	3.234	-0.646
103.382	2.532	-0.817
106.176	3.144	-1.036
108.971	1.954	-0.916
111.765	1.404	-1.005
114.559	2.838	-1.085
117.353	3.448	-0.907
120.147	3.480	-0.824
122.941	3.448	-0.924
125.735	2.778	-0.745
128.529	1.862	-0.506
131.324	3.814	-0.893
134.118	3.906	-0.538
136.912	3.876	-0.801
139.706	3.968	-0.815
142.500	4.120	-0.701
145.294	3.754	-0.760
148.088	4.638	-0.872
150.882	5.096	-0.933
153.676	4.150	-1.051
156.471	4.578	-0.955
159.265	5.218	-0.907
162.059	5.158	-1.091
164.853	5.004	-0.788
167.647	4.670	-1.176
170.441	3.112	-2.013
173.235	2.564	-2.311
176.029	0.396	-3.156
178.824	-0.824	-3.808
181.618	-2.410	-4.321
184.412	-2.076	-3.843
187.206	-0.152	-3.263
190.000	-4.700	-5.519

---> Comment : ANOM3TINY

LINE: N190 Direction: W
Date: 4- 4- 2 Time: 11:22
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 190 Final station: 0

Station	Cond.[mS/m]	Inphase [ppt]
190.000	5.280	-1.334
187.361	5.676	-1.403
184.722	4.914	-1.931
182.083	4.028	-3.788
179.444	5.126	-2.576
176.806	6.042	0.293
174.167	6.836	-0.595
171.528	6.408	-0.955
168.889	6.622	-1.218
166.250	5.372	-1.245
163.611	5.494	-1.317
160.972	4.212	-1.368

158.333	5.340	-1.100
155.694	4.670	-1.462
153.056	3.936	-1.236
150.417	4.638	-1.128
147.778	5.188	-0.824
145.139	4.730	-0.843
142.500	4.120	-1.550
139.861	3.296	-1.291
137.222	5.920	-0.701
134.583	4.852	-0.683
131.944	4.456	-1.065
129.306	5.036	-0.959
126.667	4.638	-0.986
124.028	4.578	-0.865
121.389	3.144	-0.815
118.750	2.930	-0.547
116.111	2.136	-0.545
113.472	2.532	-0.966
110.833	5.036	-1.286
108.194	5.218	-0.755
105.556	3.234	-1.117
102.917	2.320	-1.378
100.278	2.686	-1.119
97.639	2.990	-1.034
95.000	2.442	-0.883
92.361	2.808	-0.870
89.722	3.052	-0.632
87.083	1.892	-0.720
84.444	2.442	-0.700
81.806	3.540	-0.213
79.167	2.960	-0.075
76.528	3.784	-0.319
73.889	3.692	-2.894
71.250	-0.886	-13.779
68.611	-4.700	-16.277
65.972	3.480	7.215
---> Comment : SURFMTL		
63.333	1.160	6.901
60.694	-6.896	-24.783
58.056	-13.764	-24.798
55.417	4.914	-7.421
52.778	4.486	0.600
50.139	4.058	0.236
47.500	3.570	-0.497
44.861	2.624	-0.848
42.222	2.472	-0.661
39.583	2.564	-0.837
36.944	1.678	-0.909
34.306	2.166	-0.799
31.667	1.984	-0.619
29.028	1.984	-0.779
26.389	2.380	-1.047
23.750	4.364	-0.907
21.111	2.716	-0.935
18.472	2.076	-0.852
15.833	2.960	-1.051
13.194	2.076	-0.979
10.556	2.350	-0.869
7.917	2.288	-0.812
5.278	2.106	-0.795
2.639	2.198	-0.661
0.000	2.044	-0.828

LINE: N200 Direction: E

SITE48

Date: 4- 4- 2 Time: 11:24
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 0 Final station: 190

Station	Cond.[mS/m]	Inphase [ppt]
0.000	2.838	-1.017
2.923	2.532	-1.063
5.846	2.746	-0.850
8.769	2.656	-0.869
11.692	2.472	-0.984
14.615	2.808	-1.047
17.538	2.442	-1.058
20.462	2.350	-0.893
23.385	1.892	-0.837
26.308	2.442	-0.843
29.231	2.624	-0.834
32.154	1.984	-0.780
35.077	2.044	-1.073
38.000	3.234	-0.810
40.923	2.106	-0.918
43.846	2.564	-0.845
46.769	3.052	-0.775
49.692	2.320	-0.657
52.615	2.166	-0.543
55.538	3.662	-0.709
58.462	4.212	-0.711
61.385	3.112	-0.496
64.308	0.916	-0.655
67.231	1.800	-0.569
70.154	3.632	-1.084
73.077	3.754	-1.073
76.000	2.258	-0.101
78.923	2.320	-0.597
81.846	3.022	-0.556
84.769	2.778	-0.893
87.692	4.638	-0.440
90.615	3.692	-0.424
93.538	2.960	-0.354
96.462	2.960	-0.628
99.385	3.632	-0.598
102.308	3.846	-0.349
105.231	3.968	-0.371
108.154	2.808	-1.069
111.077	1.526	-1.282
114.000	0.824	-0.927
116.923	0.946	-0.604
119.846	0.030	-0.644
122.769	0.854	-1.264
125.692	3.814	-1.383
128.615	3.814	-1.754
131.538	3.418	-1.067
134.462	3.602	-0.951
137.385	4.058	-0.624
140.308	3.326	-1.015
143.231	3.174	-0.819
146.154	5.280	-0.475
149.077	4.426	-0.407
152.000	3.082	-0.744
154.923	3.906	-0.635
157.846	3.968	-0.598
160.769	3.510	-0.898
163.692	3.570	-1.106
166.615	3.266	-0.646
169.538	3.326	-0.891

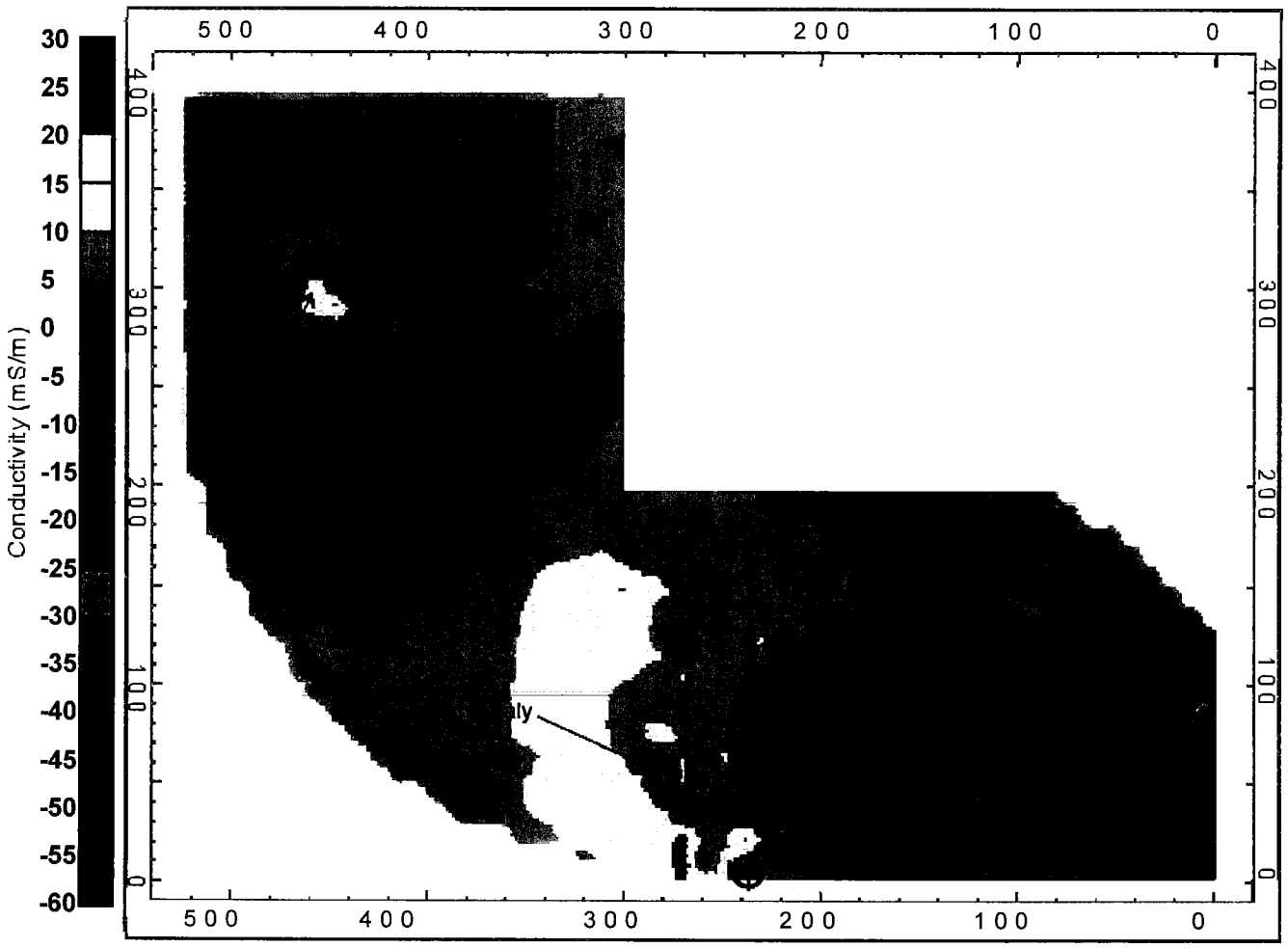
172.462	0.916	-1.729
175.385	0.610	-1.299
178.308	4.120	-0.999
181.231	4.914	-0.731
184.154	4.058	-0.903
187.077	3.144	-1.532
190.000	3.968	-2.193

LINE: N210 Direction: W
Date: 4- 4- 2 Time: 11:25
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 190 Final station: 0

Station	Cond.[mS/m]	Inphase [ppt]
190.000	5.524	-0.602
187.324	4.730	-0.339
184.648	6.012	-0.687
181.972	6.226	-0.729
179.296	5.982	-0.586
176.620	3.998	-0.624
173.944	2.472	-0.606
171.268	2.410	-0.893
168.592	2.990	-0.876
165.915	5.706	-1.444
163.239	5.218	-0.619
160.563	4.548	-0.198
157.887	1.770	-0.674
155.211	4.578	-1.304
152.535	5.402	-0.758
149.859	5.004	0.077
147.183	3.754	0.233
144.507	3.448	0.012
141.831	3.022	-0.463
139.155	3.234	-0.865
136.479	2.746	-1.304
133.803	1.526	-1.401
131.127	1.342	-1.264
128.451	1.922	-1.255
125.775	2.166	-1.052
123.099	2.350	-1.091
120.423	2.258	-1.104
117.746	1.678	-0.384
115.070	1.922	-0.534
112.394	1.526	-0.578
109.718	3.112	-0.876
107.042	2.746	-0.558
104.366	4.548	-0.635
101.690	3.570	-1.005
99.014	4.150	-1.218
96.338	3.540	-0.683
93.662	3.266	-0.598
90.986	2.900	-0.521
88.310	3.418	-0.604
85.634	2.228	-0.801
82.958	2.198	-0.867
80.282	2.410	-1.018
77.606	2.014	-0.920
74.930	2.014	-0.828
72.254	3.234	-0.736
69.577	3.234	-1.438
66.901	3.022	-1.464
64.225	2.564	-0.898
61.549	2.564	-0.711
58.873	2.838	-0.858
56.197	2.502	-0.745

SITE48

53.521	2.014	-0.957
50.845	1.160	-0.845
48.169	2.044	-0.764
45.493	2.320	-0.946
42.817	2.838	-1.038
40.141	2.532	-1.547
37.465	2.442	-1.639
34.789	2.624	-1.030
32.113	1.678	-0.893
29.437	1.922	-1.045
26.761	2.380	-0.698
24.085	1.954	-0.643
21.408	2.136	-0.858
18.732	2.716	-0.962
16.056	2.076	-0.898
13.380	1.556	-0.834
10.704	2.808	-0.887
8.028	2.410	-0.859
5.352	2.594	-0.869
2.676	1.740	-0.920
0.000	0.000	0.000

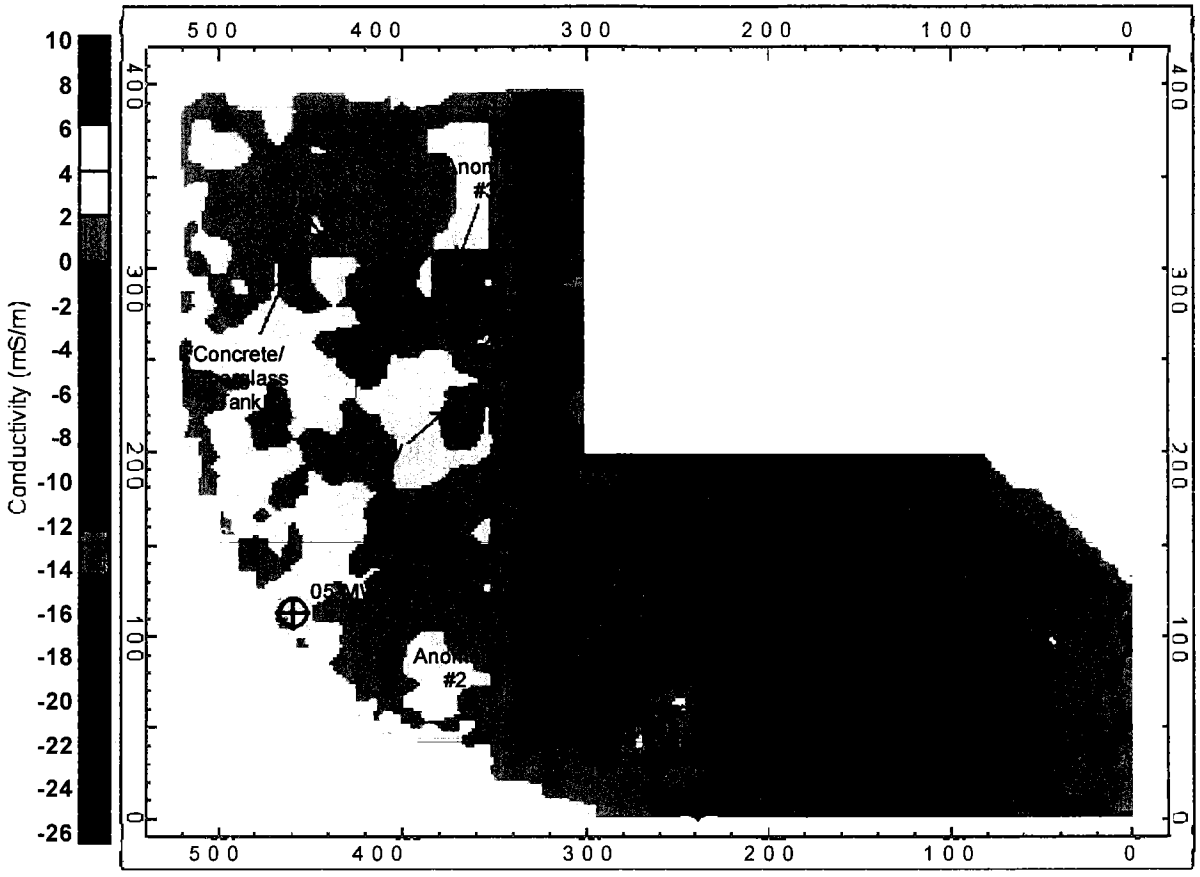


⊕ Monitoring Well Location

0 100 200 feet

DRAWN BY: LR — DATE: 4/18/02	Tetra Tech NUS, Inc.	CONTRACT NO: N62467-94-D-0888	OWNER NO: CTO 839
CHECKED BY: MC — DATE: 4/18/02	Geophysical Survey Results Terrain Conductivity Site 5 & 13 NSWC White Oak Silver Spring, Maryland	APPROVED BY — DATE	
COST/SCHED-AREA		APPROVED BY — DATE	
SCALE: AS SHOWN		DRAWING NO.: Figure 1	REV.: 0

k:/graphics/whiteoak\sites5_13_cond.cdr

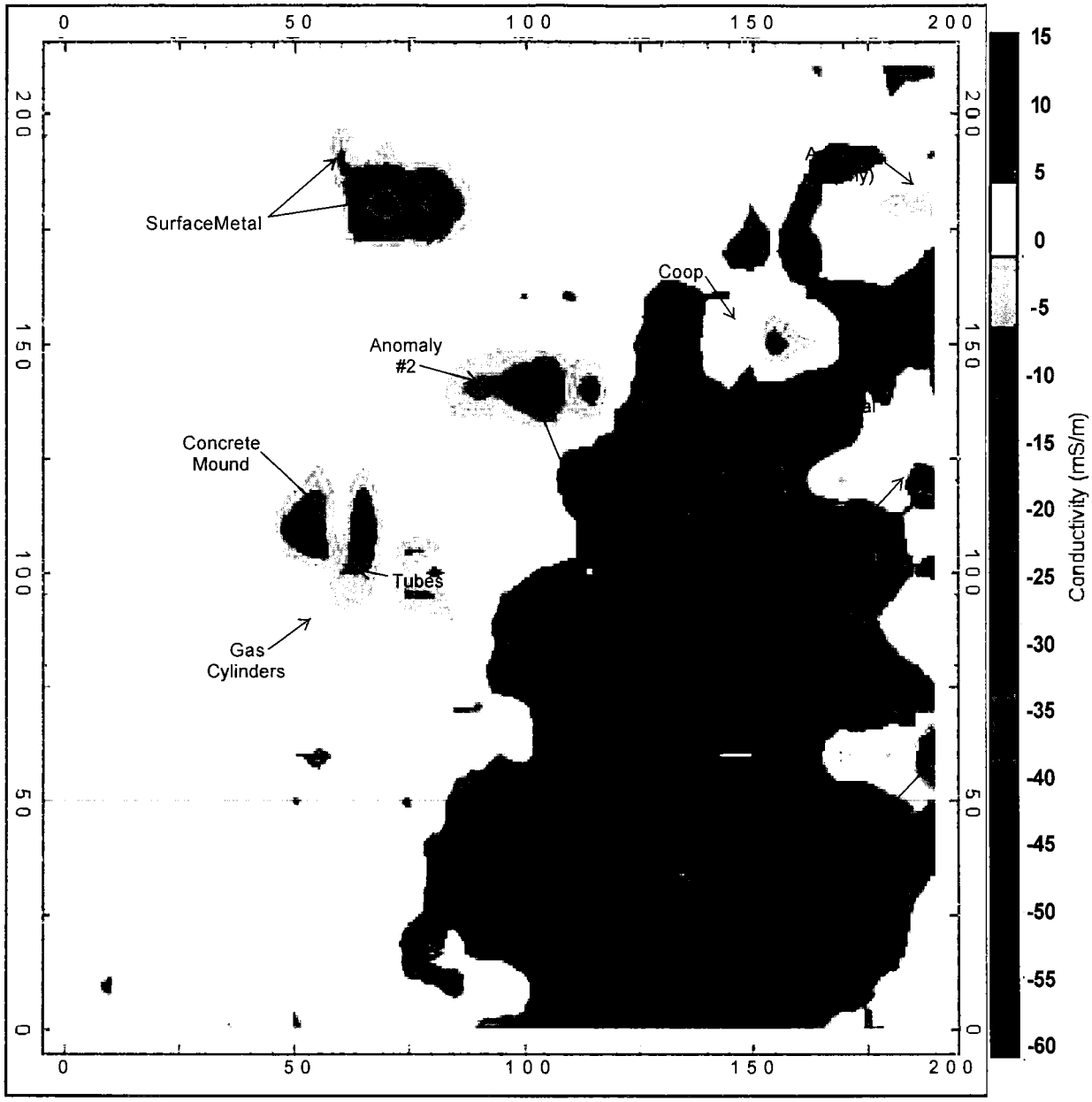


MonitoringWellLocation

0 100 200 feet

DRAWN BY: LR	DATE: 4/18/02	Tetra Tech NUS, Inc.	CONTRACT NO: N62467-94-D-0888	OWNER NO: CTO 839
CHECKED BY: MC	DATE: 4/18/02	Geophysical Survey Results In-Phase Data Site 5 & 13 NSWC White Oak Silver Spring, Maryland	APPROVED BY	DATE
COST/SCHED AREA			APPROVED BY	DATE
SCALE: AS SHOWN			DRAWING NO.: Figure 2	REV.: 0

k:/graphics/whiteoak\sites5_13_inphase.cdr

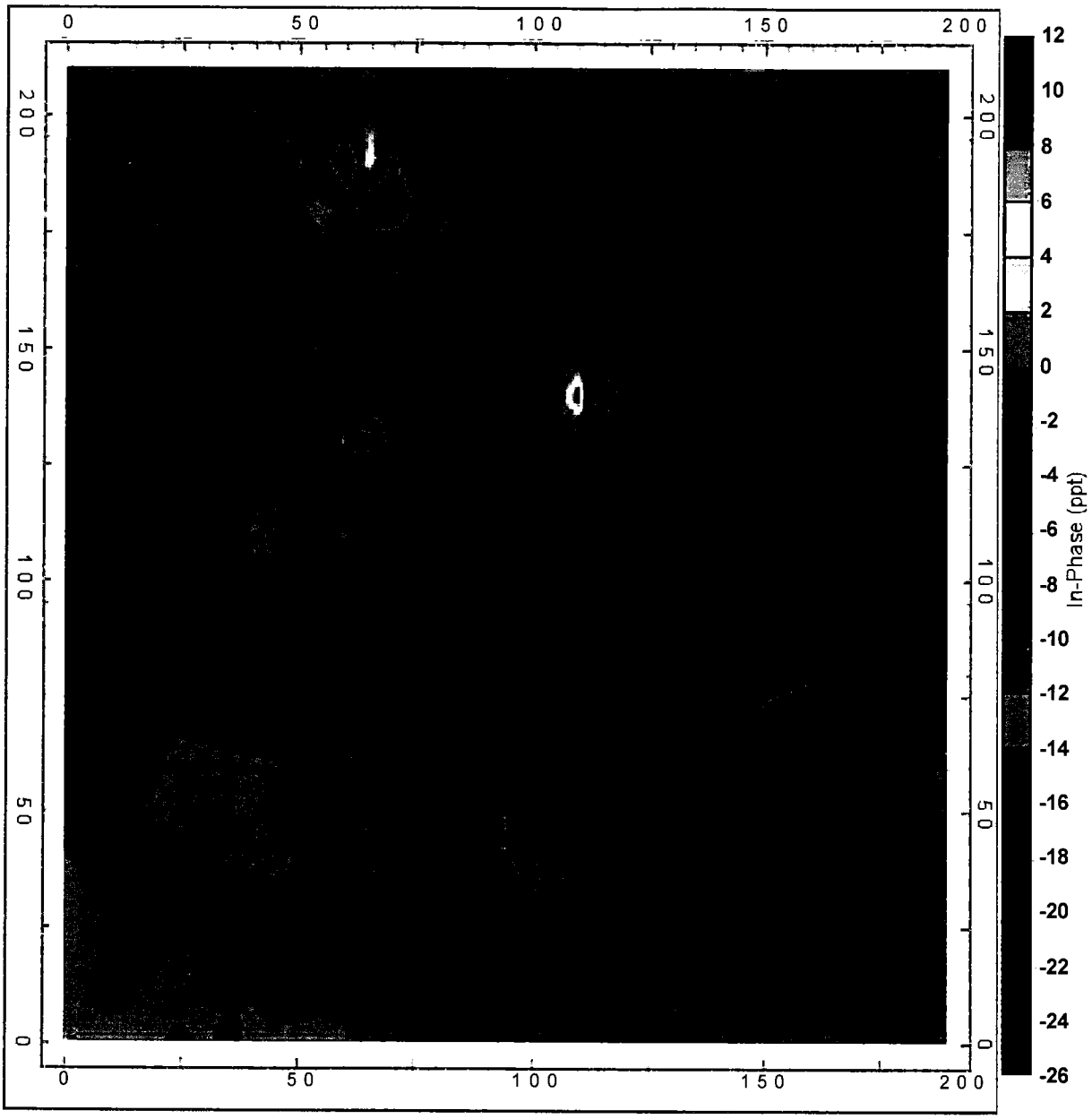


0 25 50 feet

DRAWN BY: LR — DATE: 4/18/02	Tetra Tech NUS, Inc.	CONTRACT NO: N62467-94-D-0888	OWNER NO: CTO 839
CHECKED BY: MC — DATE: 4/18/02	Geophysical Survey Results Terrain Conductivity Site 48 NSWC White Oak Silver Spring, Maryland	APPROVED BY — DATE	
COST/SCHED AREA		APPROVED BY — DATE	
SCALE: AS SHOWN		DRAWING NO.: Figure 3	REV.: 0

k:/graphics/whiteoak\site48inphase.cdr

Label ?



DRAWN BY: LR	DATE: 4/18/02	Tetra Tech NUS, Inc.	CONTRACT NO: N62467-94-D-0888	OWNER NO: CTO 839
CHECKED BY: MC	DATE: 4/18/02	Geophysical Survey Results In-Phase Data Site 48 NSWC White Oak Silver Spring, Maryland	APPROVED BY	DATE
COST/SCHED AREA			APPROVED BY	DATE
SCALE: AS SHOWN			DRAWING NO.: Figure 4	REV.: 0

k:/graphics/whiteoak\site48inphase.cdr

APPENDIX B

SURVEY DATA

	Northing	Easting	Elevation	Location
3	500346.9460	1324452.1700	290.59	MON
16	499619.9530	1324060.8700	273.42	NAIL
58	500772.7920	1323660.2100	257.17	9 NAIL
84	499923.4700	1319294.7000	294.67	BCS
99	498538.8086	1317633.8676	366.82	PK
160	499865.3115	1324466.8028	292.02	BCS
162	499493.4600	1324315.9200	259.34	NAIL
164	498675.9000	1324227.8900	217.80	MAG
165	498714.9600	1323942.5300	251.31	MAG
166	498185.4020	1324060.6400	199.35	MAG
292	498451.6360	1321152.7700	261.61	BCS
310	498828.0100	1317451.3700	367.04	MAG
322	498813.3790	1317400.7400	368.51	11GW110
400	500989.2909	1324442.6125	276.14	BCS
480	501016.8333	1324873.3303	293.27	SPIKE
481	501036.2872	1325075.7814	295.27	BCS
500	500778.7154	1323672.2704	258.38	PK
561	500722.2810	1324676.5100	301.23	NAIL
582	500962.1240	1323990.9400	270.49	BCF
1000	498519.1022	1317468.5831	368.74	11SB10
1001	500008.8966	1319464.4264	293.22	47SS15
1002	500020.3159	1319517.8497	292.90	47SS18
1003	500048.5390	1319516.4800	293.26	47SS16
1004	500051.4610	1319565.1744	292.37	47SS19
1005	500078.0862	1319546.4947	293.61	47SS17
1006	500100.1830	1319523.7177	294.17	47SS14
1007	500119.4825	1319497.8971	293.77	47SS11
1008	500092.2868	1319468.9287	294.31	47SS10
1009	500044.3182	1319468.1859	293.91	47SS13
1010	500062.1267	1319438.1660	294.67	47SS09
1011	500005.9128	1319413.4176	293.85	47SS12
1012	498684.0102	1321077.7995	256.67	52SS01
1013	498670.3000	1321079.9331	256.55	52SS02
1014	498657.2428	1321083.4426	256.37	52SS03
1015	498398.2978	1322325.2112	169.94	GR 08
1016	498399.0170	1322324.2966	173.57	87TP08
1017	498328.9763	1322291.7897	169.57	87TP06 GR
1018	498330.0067	1322291.7071	171.89	87TP06
1019	498290.6607	1322276.1287	168.99	87TP05 GR
1020	498291.1261	1322275.8010	171.64	87TP05
1021	498295.0297	1324275.0304	192.63	41SB01
1022	498248.7139	1324268.9153	193.06	41SB02
1023	500862.4060	1324527.6523	281.05	04SB306
1024	500894.3775	1324618.1120	281.90	04SB305
1025	500941.8299	1324596.8647	279.83	04TW02 GR
1026	500941.0456	1324596.1685	282.42	04TW02
1027	500907.8409	1324570.1912	280.47	04MW301 CONC
1028	500908.0288	1324570.7279	282.59	04MW301
1029	500965.0069	1324526.5977	277.53	04TW03 GR
1030	500965.3577	1324525.1923	280.17	04TW03
1031	500927.0350	1324494.0594	278.33	04TW04 GR
1032	500928.8524	1324492.4965	280.49	04TW04

1033	500966.8847	1323989.9173	269.87	582 BC
1034	500962.0995	1323990.8909	270.54	0582 BCF
1035	500823.3596	1323779.0897	258.95	13TP06
1036	500813.5581	1323778.1433	258.45	13TP06A
1037	500822.6082	1323849.3248	259.28	13TP04
1038	500811.5296	1323848.8034	258.91	13TP04A
1039	500808.7098	1323873.4345	258.82	13TP03A
1040	500820.1796	1323871.0500	259.39	13TP03
1041	500919.0091	1323903.3610	258.71	W300 N400
1042	500877.7886	1323739.1035	257.67	W470 N400
1043	500778.7056	1323672.2802	258.36	PK 500
1044	500730.5070	1323711.9881	260.23	W520 N200
1045	500778.1781	1323746.6744	261.58	W520 N200
1046	500782.0321	1323746.5624	261.58	13TP07
1047	500781.6751	1323763.5265	261.97	13TP07
1048	500732.7685	1323859.4481	266.24	13TP05
1049	500742.9980	1323859.1699	266.00	13TP05A
1050	500712.7376	1323918.8012	267.30	05TP13
1051	500711.8168	1323929.5295	267.82	05TP13
1052	500693.7873	1324060.1091	272.01	05TP09
1053	500684.6668	1324052.2431	271.30	05TP09
1054	500641.2397	1324117.7005	273.31	05TP10
1055	500630.2452	1324108.2838	273.03	05TP10
1056	500583.0842	1324136.6778	273.63	05TP11
1057	500587.1128	1324120.2147	273.33	05TP11
1058	500659.9509	1324229.4781	292.79	W000 N130
1059	500533.0714	1324233.3066	287.91	W000 N000
1060	500585.7437	1323945.0677	266.91	ANOMALIE 2
1061	500573.3924	1323954.7622	268.03	ANOMALIE 2W
1062	500638.7796	1323964.8936	267.88	05TP01
1063	500646.0869	1323956.3710	267.64	05TP01A
1064	500638.4555	1323891.8522	264.99	05TP08
1065	500628.2549	1323883.4430	264.24	05TP08
1066	500591.0350	1323890.1427	263.96	05TP12
1067	500594.7030	1323871.5982	263.48	05TP12
1068	500525.4748	1323934.4919	265.25	W300 N000
1069	500726.6245	1324031.2827	273.21	W200 N200
1070	500725.4868	1323931.8189	268.23	W300 N200
1071	500726.5634	1323678.3882	262.85	13GW03
1072	501050.3309	1324899.4691	293.40	N50 E00
1073	501188.7491	1324977.2222	294.05	N210 E00
1074	501146.9895	1325003.7129	295.31	48TP05
1075	501137.5649	1324988.8645	295.64	48TP05
1076	501186.7289	1325010.1826	295.91	48TP05
1077	501122.4770	1325065.6660	293.14	48TP04
1078	501133.0452	1325070.4621	292.40	48TP04
1079	501073.8728	1325032.8701	293.40	48TP02
1080	501050.8470	1325055.2579	293.63	48TP02
1081	501041.6010	1325085.9401	294.68	48TP10
1082	501027.0591	1325101.4308	294.08	48TP10
1083	501027.3226	1325088.8982	295.40	48TP01
1084	500923.2371	1325043.5298	293.66	48TP09
1085	500877.8530	1324760.5816	296.27	48TP09

1086	500904.9918	1325034.7356	291.65	N00 E190
1087	500948.3495	1324995.1230	294.58	48TP08
1088	500930.5868	1324978.0887	291.34	48TP08
1089	500999.0606	1324910.4070	292.09	48TP06
1090	501015.6841	1324885.0501	291.23	48TP06
1091	501108.6291	1324934.8243	294.14	48TP07
1092	501094.3168	1324952.5154	293.30	48TP07
1093	501008.9347	1324990.8342	295.26	48TP13
1094	501023.0909	1325001.2676	295.41	48TP13
1095	501064.0737	1325116.6417	290.69	48TP03
1096	501088.7246	1325137.5978	289.75	N210 E190
1097	501026.3986	1325089.3255	295.49	48TP01
1098	501011.6596	1325080.5010	295.89	48TP01
1099	501040.8917	1325085.7256	294.74	48TP10
1100	501027.1913	1325102.3108	293.85	48TP10
1101	498671.9440	1321238.2800	263.26	NAIL-291
1102	501013.0114	1325115.2602	292.10	48TP11
1103	498721.9940	1321156.7900	259.48	CB-201
1104	501000.1430	1325123.8334	290.50	48TP11
1105	501001.8006	1325031.7774	295.93	48TP12
1106	500991.5964	1325025.5851	296.69	48TP12
1107	499488.4511	1324059.6868	270.26	29SS05
1108	499464.9601	1324055.1122	266.51	29SS06
1109	499493.4449	1324315.9139	258.76	162
1110	499780.3514	1324404.7678	283.07	40WP03 GR
1111	499781.2366	1324404.8418	284.21	40WP03
1112	499748.7776	1324461.0884	283.40	40WP04
1113	499748.4244	1324462.1982	282.56	40WP04 GR
1114	499765.0480	1324542.8116	285.08	40WP05 GR
1115	499766.1487	1324543.0724	287.98	40WP05
1116	499856.5875	1324471.8635	295.05	40WP02
1117	499856.6774	1324472.7980	291.61	40WP02 GR
1118	499888.1695	1324515.6694	291.27	CB-345
1119	499899.5113	1324511.8252	291.27	CB-345
1120	499883.1824	1324532.3919	291.23	CB-345
1121	499921.3783	1324518.3366	291.32	CB-345
1153	499856.3560	1319265.9400	296.95	CB-104
1183	498369.6470	1322292.2200	170.11	CB-611
1300	500870.6156	1323816.8347	258.40	BCS
5817	498434.6230	1322264.8200	173.35	NAIL RESET

APPENDIX C

DATA VALIDATION MEMORANDA

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO: **R. KOTUN** **DATE:** **JULY 22, 2002**

FROM: **BERNARD F SPADA III** **COPIES:** **DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION- VOA/SVOA/PEST/PCB/EXP/HERB**
CTO 839, NSWC WHITE OAK
SDG WO094

SAMPLES: 3/Aqueous

04GW301	04TW03	TB05170201

6/Soil

05TP09SB0506	05TP10SB0506	05TP11SB0203
05TP12SB0708	05TP12WS0204	FD05170201

1/TCLP

05TP12WS0204

Overview

The sample set for CTO 839 NSWC White Oak, SDG WO094 consists of two (2) environmental aqueous samples, five (5) environmental soil samples, one (1) trip blank, and one (1) field duplicate. The soil sample (05TP12WS0204) was also analyzed after having TCLP performed on it. All aqueous samples were analyzed for volatile organic compounds (VOC) by CLP Method OLC02.1. All soil samples were analyzed for VOC, semivolatile organic compounds (SVOC), pesticides (PEST), polychlorinated biphenyls (PCB), explosives (EXP) by CLP Method OLM04.2 (VOC and SVOC), SW-846 Methods 8081, 8082, and 8330 respectively. The TCLP extract was analyzed for VOC, SVOC, PEST, PCB, and Herbicides (HERB) by SW-846 Methods 8260B, 8270C, 8081A, 8082, and 8151A respectively. The field duplicate pair included in this SDG is FD05170201 and 05TP09SB0506.

The samples were collected by Tetra Tech NUS on May 17, 2002 and analyzed by Severn Trent Laboratories Pittsburgh. All analyses were conducted in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria using CLP OLC02.1 and OLM04.2 and SW-846 Methods 8260B, 8270C, 8081A, 8082, 8330 and 8151A analytical and reporting protocols.

The data contained in this SDG were validated with regard to the following parameters: data completeness, holding times, GCMS tuning, initial/continuing calibrations, laboratory method blank results, surrogate spike recoveries, blank spike/blank spike duplicate results, internal standard recoveries, chromatographic resolution, compound identification, compound quantitation, field duplicate precision, and detection limits. Areas of concern are listed below.

Major

- The aqueous volatile initial calibration was below the 0.05 relative response factor (RRF) quality control criteria for acetone, 2-butanone, and 1,2-dibromo-3-chloropropane. All non-detected

results for the aforementioned compounds were rejected (UR). Acetone was not qualified for calibration non-compliance because it was already qualified for method blank contamination.

- The aqueous volatile continuing calibration analyzed on May 20 at 06:25 was below the 0.05 RRF quality control criteria for acetone, 2-butanone, and 1,2-dibromo-3-chloropropane. All non-detected results for the aforementioned compounds were rejected (UR). Acetone was not qualified for calibration non-compliance because it was already qualified for method blank contamination.

- The percent difference between analytical columns exceeded the 100% quality control criteria for the following compounds.

Sample	Compound	% Difference	Qualification
05TP10SB0506	Endrin	610.7	R
	4,4-DDD	190.4	R
05TP11SB0203	Endrin	915.6	R
	4,4-DDD	167.6	R
05TP12WS0204	Endrin	636.0	R
	Endosulfan II	602.2	R
	Endosulfan sulfate	532.3	R
	4,4-DDT	999.9	R

Minor

- The following compounds were detected in the aqueous method blank:

Compound	Maximum Concentration	Blank Action Level
Acetone	2.3 ug/L	23 ug/L
Methylene chloride	0.91 ug/L	9.1 ug/L

Sample aliquot, and dilution factors were taken into consideration when applying the blank action levels. Positive results for the aforementioned compounds below the blank action level were qualified as non-detected, (B).

- The following compounds were detected in the aqueous method blank:

Compound	Maximum Concentration	Blank Action Level
Acetone	1.6 ug/kg	16 ug/kg
Methylene chloride	1.2 ug/kg	12 ug/kg

Sample aliquot, percent solids, and dilution factors were taken into consideration when applying the blank action levels. Positive results for the aforementioned compounds below the blank action level were qualified as non-detected, (B). The trip blank sample was not qualified for method blank contamination.

- The aqueous volatile initial calibration exceeded the 30% relative standard deviation (RSD) quality control criteria for acetone. The result for acetone in the trip blank was qualified as estimated (J).

- The volatile initial calibration analyzed on 2/19/02 exceeded the 50% RSD quality control criteria for chloroethane. All non-detected results for chloroethane were qualified as estimated (UJ).

- The soil volatile continuing calibration analyzed on May 19 at 07:52 exceeded the 25 %D (and was >50%) quality control criteria for acetone, 2-butanone, 4-methyl-2-pentanone, 2-hexanone, dichlorodifluoromethane, and trichlorofluoromethane. All non-detected results for the aforementioned compounds were qualified as estimated (UJ) in all soil samples except sample 05TP09SB0506. Acetone was not qualified for calibration non-compliance because it was already qualified for method blank contamination.

- The soil volatile continuing calibration analyzed on May 22 at 15:34 exceeded the 25 %D (and was >50%) quality control criteria for chloroethane, dichlorodifluoromethane, and trichlorofluoromethane. All non-detected results for the aforementioned compounds were qualified as estimated (UJ).

- The percent difference between analytical columns exceeded the 25% quality control criteria for the following compounds.

Sample	Compound	% Difference	Qualification
05TP10SB0506	Endosulfan II	86.6	J
05TP11SB0203	Endosulfan II	64.0	J
	4,4-DDE	62.2	J
05TP12WS0204	4,4-DDE	30.8	J

- The PCB surrogate decachlorobiphenyl exceeded the quality control criteria in sample 05TP12WS0204. Positive results were qualified as estimated (J).

Notes

The aqueous volatile surrogate recovery form was not included in the data package. The laboratory provided the form once contacted.

The volatile continuing calibrations exceeded the 25% D (but was <50%) quality control criteria for chloromethane, bromoform, methylene chloride, and 1,2,4-trichlorobenzene. No qualifications were made based on this.

The soil semivolatile initial calibration exceeded the 30 %RSD (but was <50%) quality control criteria for benzaldehyde. No qualifications were made based on this because the all results for benzaldehyde were non-detected.

The soil semivolatile continuing calibration exceeded the 25 %D (but was <50%) quality control criteria for benzaldehyde and hexachlorocyclopentadiene. No qualifications were made based on this because the all results for benzaldehyde and hexachlorocyclopentadiene were non-detected.

Pesticide surrogates missing on column #2 for samples 05TP09SB0506, 05TP12SB0708, and FD05170201. No action was taken based on this, but the lab reported all surrogates in 3 other samples.

The % recovery for methoxychlor was high in the TCLP blank spike. No action was taken because the sample results were non-detected.

Nitrobenzene, 2,6-dinitrotoluene, and 2,4-dinitrotoluene were reported in both the SVOC and EXP fractions. The results from the EXP fraction were used for validation because the RLs were lower.

Executive Summary

Laboratory Performance: Qualifications were made based on calibration non-compliances and method blank contamination.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to U.S. EPA National Functional Guidelines for Data Validation as modified by EPA Region III (9/94) and the NFESC guidelines entitled Navy IRCDQM (Sept. 1999). The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Tetra Tech NUS
Bernard F Spada III
Chemist/Data Validator

Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO: **R. KOTUN** **DATE:** **JULY 22, 2002**

FROM: **BERNARD F SPADA III** **COPIES:** **DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION- VOA/SVOA/PEST/PCB/EXP/HERB**
CTO 839, NSWC WHITE OAK
SDG WO093

SAMPLES: 2/Aqueous

04WP02	TB05160201	

15/Soil

05TP01SB0507*&	05TP01WS0204*&	05TP08SB0506*&
13TP03SB0405*&	13TP04SB0405*&	13TP04WS0203*&
13TP05SB0607*&	13TP05WS0103*&	13TP06SB0203*&
13TP07SB0304*&	FD05160201*	41SB010204
41SS010002	41SS020002	41SB020204

4/TCLP

05TP01WS0204	13TP04WS0203	13TP05WS0103
FD05160201		

Overview

The sample set for CTO 839 NSWC White Oak, SDG WO093 consists of one (1) environmental aqueous sample, fourteen (14) environmental soil samples, one (1) trip blank, and one (1) field duplicate. Three soil samples and the field duplicate (05TP01WS0204, 13TP04WS0203, 13TP05WS0103 and FD05160201) were also analyzed after having TCLP performed on them. Both aqueous samples were analyzed for volatile organic compounds (VOC) by CLP Method OLC02.1. All soil samples were analyzed for explosives (EXP) by SW-846 Method 8330. The samples denoted with an asterisk (*) were analyzed for semivolatile organic compounds (SVOC), pesticides (PEST), and polychlorinated biphenyls (PCB) by CLP Method OLM04.2 and SW-846 Methods 8181A and 8082 respectively. The samples denoted with an ampersand (&) were analyzed for volatile organic compounds (VOC) by CLP Method OLM04.2. The TCLP extracts were analyzed for VOC, SVOC, PEST, PCB, and HERB by SW-846 Methods 8260B, 8270C, 8081A, 8082, and 8151A respectively. The field duplicate pair included in this SDG is FD05160201 and 13TP05WS0103.

The samples were collected by Tetra Tech NUS on May 15 and 16, 2002 and analyzed by Severn Trent Laboratories Pittsburgh. All analyses were conducted in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria using CLP OLC02.1 and OLM04.2 and SW-846 Methods 8260B, 8270C, 8081A, 8082, 8330 and 8151A analytical and reporting protocols.

The data contained in this SDG were validated with regard to the following parameters: data completeness, holding times, GCMS tuning, initial/continuing calibrations, laboratory method blank results, surrogate spike

recoveries, blank spike/blank spike duplicate results, internal standard recoveries, chromatographic resolution, compound identification, compound quantitation and detection limits. Areas of concern are listed below.

Major

- The aqueous volatile initial calibration was below the 0.05 relative response factor (RRF) quality control criteria for acetone, 2-butanone, and 1,2-dibromo-3-chloropropane. All non-detected results for the aforementioned compounds were rejected (UR). Acetone was not qualified for calibration non-compliance in the environmental sample because it was already qualified for method blank contamination. The positive result for acetone in the trip blank was qualified as low biased (L) because the trip blank does not get qualified for method blank contamination.

- The aqueous volatile continuing calibration analyzed on May 20 at 06:25 was below the 0.05 RRF quality control criteria for acetone, 2-butanone, and 1,2-dibromo-3-chloropropane. All non-detected results for the aforementioned compounds were rejected (UR). Acetone was not qualified for calibration non-compliance in the environmental sample because it was already qualified for method blank contamination. The positive result for acetone in the trip blank was qualified as low biased (L) because the trip blank does not get qualified for method blank contamination.

- The following table defines the pesticide %D between column non-compliances.

Sample	Compound	% Difference	Concentrations	Qualification
05TP01SB0507	4,4'-DDD	94.0	(1.077, 0.555)	J
	4,4'-DDT	663.8	(1.530, 0.2003)	R
	Endosulfan II	49.8	(0.571, 0.855)	J
05TP01WS0204	4,4'-DDD	475.0	(3.012, 17.32)	R
	4,4'-DDE	57.1	(1.215, 1.909)	J
	4,4'-DDT	999.9	(18.84, 1.614)	R
	Endosulfan II	91.1	(6.123, 11.7)	J
	Endrin	630.8	(15.56, 2.129)	R
	Endrin Aldehyde	111.9	(9.887, 4.666)	R
13TP01WS0103	4,4'-DDE	43.6	(0.442, 0.634)	J
	4,4'-DDT	999.9	(5.887, 0.306)	R
	Dieldrin	55.6	(0.2626, 0.4085)	J
	Endosulfan II	181.0	(1.506, 4.232)	R
	Endrin	583.8	(4.60, 0.673)	R
FD05160201	4,4'-DDD	713.6	(0.7576, 6.164)	R
	4,4'-DDT	999.9	(6.449, 0.374)	R
	Dieldrin	32.3	(0.341, 0.451)	J
	Endosulfan II	131.5	(2.094, 4.847)	R
	Endrin	644.8	(5.249, 0.705)	R
	Endrin Aldehyde	113.7	(3.227, 1.510)	R

The criteria for pesticides in the above table are 25-100%D = J and >100%D = R. PCBs were present in each of the above samples which may have resulted in false positives.

Minor

- The following compounds were detected in the aqueous method blank:

Compound	Maximum Concentration	Blank Action Level
Acetone	2.3 ug/L	23 ug/L
Methylene chloride	0.91 ug/L	9.1 ug/L

Sample aliquot, and dilution factors were taken into consideration when applying the blank action levels. Positive results for the aforementioned compounds below the blank action level were qualified as non-detected, (B).

- The following compounds were detected in the soil method blank:

Compound	Maximum Concentration	Blank Action Level
Acetone	1.6 ug/kg	16 ug/kg
Methylene chloride	1.2 ug/kg	12 ug/kg
Acetophenone	89 ug/kg	445 ug/kg
Phenol	37 ug/kg	185 ug/kg

Sample aliquot, percent solids, and dilution factors were taken into consideration when applying the blank action levels. Positive results for the aforementioned compounds below the blank action level were qualified as non-detected, (B). The trip blank sample was not qualified for method blank contamination.

- The soil volatile initial calibration exceeded the 30% (and was >50%) relative standard deviation (RSD) quality control criteria for chloroethane. All results for chloroethane in soil samples were qualified as estimated (UJ).

- The soil volatile continuing calibration analyzed on May 19 at 07:52 exceeded the 25 %D (and was >50%) quality control criteria for acetone, 2-butanone, 4-methyl-2-pentanone, 2-hexanone, dichlorodifluoromethane, and trichlorofluoromethane. All non-detected results for the aforementioned compounds except acetone were qualified as estimated (UJ) in all soil samples. Acetone was not qualified for calibration non-compliance because it was already qualified for method blank contamination.

- The soil volatile continuing calibration analyzed on May 22 at 15:34 exceeded the 25 %D (and was >50%) quality control criteria for chloroethane, dichlorodifluoromethane, trichlorofluoromethane. All non-detected results for the aforementioned compounds were qualified as estimated (UJ).

- The soil semivolatile continuing calibration analyzed on May 31 at 11:40 exceeded the 25 %D (and was >50%) quality control criteria for benzaldehyde and hexachlorocyclopentadiene. The results for benzaldehyde and hexachlorocyclopentadiene were qualified as estimated (UJ) in the re-extracted sample 13TP05WS0103.

Notes

The chain of custody stated that the field duplicate (FD05160201) was supposed to be analyzed for VOCs. The laboratory did not receive encores for this sample, so it could not be analyzed for VOCs.

The soil volatile initial calibration exceeded the 30% (but was <50%) RSD quality control criteria for acetone. The positive results for acetone were not qualified for calibration non-compliance because they were already

qualified for method blank contamination.

The soil volatile continuing calibration analyzed on May 19 at 07:52 exceeded the 25 %D (but was <50%) quality control criteria for chloromethane. No qualifications were made based on this because all results were non-detected.

The soil volatile continuing calibration analyzed on May 22 at 15:34 exceeded the 25 %D (but was <50%) quality control criteria for chloromethane, methylene chloride, bromoform, and 1,2,4-trichlorobenzene. No qualifications were made based on this because all results were non-detected, or already qualified for method blank contamination.

The soil semivolatile initial calibration exceeded the 30 %RSD (but was <50%) quality control criteria for benzaldehyde. No qualifications were made based on this because the all results for benzaldehyde were non-detected.

The soil semivolatile continuing calibration analyzed on May 28 at 12:18 exceeded the 25 %D (but was <50%) quality control criteria for benzaldehyde and hexachlorocyclopentadiene. No qualifications were made based on this because the all results for benzaldehyde and hexachlorocyclopentadiene were non-detected.

The surrogate recovery in the semivolatile fraction of sample 13TP05WS0103 was below the quality control criteria for surrogates 2-fluorophenol and 2,4,6-tribromophenol (TBP). TBP was <10% recovered. The sample was re-extracted and re-analyzed within holding time with acceptable results. The re-extracted sample was used for validation.

Pesticide surrogates were not reported on column #2 for several samples.

Nitrobenzene, 2,6-dinitrotoluene, and 2,4-dinitrotoluene were reported in both the SVOC and EXP fractions. The results from the EXP fraction were used for validation because the RLs were lower.

Executive Summary

Laboratory Performance: Qualifications were made based on calibration non-compliances, percent difference between analytical columns non-compliances, and method blank contamination.

Other Factors Affecting Data Quality: PCBs in several samples may have resulted in pesticide false positives.

The data for these analyses were reviewed with reference to U.S. EPA National Functional Guidelines for Data Validation as modified by EPA Region III (9/94) and the NFESC guidelines entitled Navy IRCDQM (Sept. 1999). The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Tetra Tech NUS
Bernard F Spada III
Chemist/Data Validator

Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:
Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**R. KOTUN**	**DATE:**	**JULY 22, 2002**
FROM:	**ETHAN G. LEE**	**COPIES:**	**DV FILE**

SUBJECT: **INORGANIC DATA VALIDATION – TAL METALS**
NSWC WHITE OAK - CTO-839
SAMPLE DELIVERY GROUP (SDG) – WO094

SAMPLES: 6/SOIL/

05TP09SB0506	05TP10SB0506	05TP11SB0203
05TP12SB0708	05TP12WS0204	FD05170201

Overview

The sample set for CTO 839, NSWC White Oak, SDG WO094, consists of six (6) soil environmental samples. One (1) field duplicate pair (FD05170201 / 05TP09SB0506) is included in this SDG.

The samples were analyzed for TAL metals. Sample 05TP12WS0204 was analyzed for TCLP metals. The samples were collected by Tetra Tech NUS May 17, 2002 and analyzed by Severn Trent Laboratories, Inc. under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. Metals analyses except mercury were conducted using method SW846 6010B. Mercury soil analyses were conducted using method SW846 7471A. Mercury aqueous analyses were conducted using method SW 846 7470A.

Summary

All analytes were successfully analyzed. The findings offered in this report are based upon a general review of all available data. The data review was based on data completeness, holding times, calibration data, laboratory method/preparation blanks, interference check sample (ICS) results, matrix spike results, matrix spike duplicate results, laboratory control sample (LCS) results, ICP serial dilution results, field duplicate results, detection limits, and analyte quantitation.

Metals analyses except mercury were conducted using Inductively Coupled Plasma (ICP) methodologies. Mercury analyses were conducted using Cold Vapor Atomic Absorption (CVAA).

Minor Problems

- The following contaminants were detected in the laboratory method/preparation blanks at the following maximum concentrations:

Analyte	Maximum Concentration	Action Level
Aluminum	53.5 ug/L	26.75 mg/kg
Arsenic[(1)]	0.17 mg/L	0.85 mg/L
Barium	2.1 ug/L	1.05 mg/kg
Barium	2.1 ug/L	0.0105 mg/L
Beryllium	1.1 ug/L	0.55 mg/kg
Calcium[(2)]	3.2 mg/kg	16.0 mg/kg
Iron[(2)]	2.6 mg/kg	13.0 mg/kg
Lead[(2)]	0.19 mg/kg	0.95 mg/kg
Magnesium[(2)]	2.0 mg/kg	10.0 mg/kg
Manganese	0.2 ug/L	0.10 mg/kg
Potassium	45.4 ug/L	22.7 mg/kg
Sodium[(2)]	38.0 mg/kg	190.0 mg/kg
Zinc	0.8 ug/L	0.4 mg/kg

[(1)] Maximum concentration present in TCLP preparation blank.
[(2)] Maximum concentration present in soil preparation blank.

An action level of 5X the maximum concentration was used to evaluate the sample data for blank contamination. Sample aliquot, percent solids, and dilution factors, if applicable, were taken into consideration when evaluating for blank contamination. Positive results less than the action level for beryllium, lead, and sodium were qualified (B) as a result of blank contamination for soil. The positive result less than the action level for arsenic was qualified (B) as a result of blank contamination for the TCLP sample. The remaining analytes were not qualified because either the sample values were greater than the action level or they were nondetects.

- The interfering analyte iron was present in soil sample 05TP12WS0204 at a concentration comparable to the concentration in the interference check sample (ICS) solution. Several analytes, namely arsenic, barium, beryllium, cadmium, chromium, copper, lead, manganese, potassium, thallium, vanadium, and zinc were present in the ICS solution at concentrations that exceeded the absolute value of the instrument detection limit (IDL). Interference effects existed for beryllium, cadmium, and thallium in the affected sample. Positive results for cadmium and thallium were qualified as biased high (K). Beryllium was not qualified because it was already qualified for blank contamination.

- The soil matrix spike and matrix spike duplicate percent recoveries for antimony were below the control limit of 75-125%. Positive results were qualified as biased low (L). Nondetects were qualified as biased low (UL).

- The soil matrix spike and matrix spike duplicate percent recoveries for aluminum were above the control limit of 75-125%. Positive results were qualified as biased high (K).

Notes

Reporting limits on Form 1s and EDD did not agree. The reviewer amended the database for several analytes and percent solids.

The chain of custody (COC) incorrectly requests cyanide analysis. The statement of work does not require cyanide analyses and the laboratory did not perform cyanide analysis.

The continuing calibration verification percent recoveries on 5/23/02 at 15:28 and 16:33 for potassium and sodium were reported incorrectly by the lab. Veronica Bortot was contacted and the corrected Form 2's were submitted.

Executive Summary

Laboratory Performance: Several analytes were present in the laboratory method/preparation blanks. Several analytes were qualified due to ICP interference. Several analytes were qualified due to matrix spike noncompliance.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Review", April 1993 and the NFESC document entitled "Navy IRCDQM" (September 1999).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Tetra Tech NUS
Ethan G. Lee
Environmental Scientist

Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

Data Qualifier Key:

U	-	Value is a nondetect as reported by the laboratory.
B	-	Positive result is considered to be an artifact of blank contamination and should not be considered present.
UL	-	Nondetected result is considered biased low as a result of technical noncompliance.
L	-	Positive result is considered biased low as a result of technical noncompliance.
K	-	Positive result is considered biased high as a result of technical noncompliance.

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO: R. KOTUN **DATE:** JULY 22, 2002

FROM: ETHAN G. LEE **COPIES:** DV FILE

SUBJECT: **INORGANIC DATA VALIDATION – TAL METALS AND PERCHLORATE**
NSWC WHITE OAK - CTO-839
SAMPLE DELIVERY GROUP (SDG) – WO093

SAMPLES: 13/SOIL/

05TP01SB0507	05TP01WS0204	05TP08SB0506
13TP03SB0405	13TP04SB0405	13TP04WS0203
13TP05SB0607	13TP05WS0103	13TP06SB0203
13TP07SB0304	FD05160201	11SB100910
11SB101112		

Overview

The sample set for CTO 839, NSWC White Oak, SDG WO093, consists of thirteen (13) soil environmental samples. One (1) field duplicate pair (FD05160201 / 13TP05WS0103) is included in this SDG.

All samples were analyzed for TAL metals. Samples 05TP01WS0204, 13TP04WS0203, 13TP05WS0103, and FD05160201 were analyzed for TCLP metals. Samples 11SB100910 and 11SB101112 were analyzed for perchlorate. The samples were collected by Tetra Tech NUS May 15-16, 2002 and analyzed by Severn Trent Laboratories, Inc. under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. Metals analyses except mercury were conducted using method SW846 6010B. Mercury soil analyses were conducted using method SW846 7471A. Mercury aqueous analyses were conducted using method SW 846 7470A. Perchlorate analyses were conducted using method EPA 314.0.

Summary

All analytes were successfully analyzed. The findings offered in this report are based upon a general review of all available data. The data review was based on data completeness, holding times, calibration data, laboratory method/preparation blanks, interference check sample (ICS) results, matrix spike results, matrix spike duplicate results, laboratory control sample (LCS) results, ICP serial dilution results, field duplicate results, detection limits, and analyte quantitation.

Metals analyses except mercury were conducted using Inductively Coupled Plasma (ICP) methodologies. Mercury analyses were conducted using Cold Vapor Atomic Absorption (CVAA).

Minor Problems

- The following contaminants were detected in the laboratory method/preparation blanks at the following maximum concentrations:

Analyte	Maximum Concentration	Action Level
Aluminum	86.0 ug/L	43.0 mg/kg
Arsenic[(1)]	0.17 mg/L	0.85 mg/L
Barium	2.1 ug/L	1.05 mg/kg
Barium	2.1 ug/L	0.0105 mg/L
Beryllium	1.4 ug/L	0.7 mg/kg
Calcium[(2)]	44.9 mg/kg	224.5 mg/kg
Chromium[(2)]	0.15 mg/kg	0.75 mg/kg
Iron[(2)]	2.4 mg/kg	12.0 mg/kg
Manganese[(2)]	0.048 mg/kg	0.24 mg/kg
Potassium	45.4 ug/L	22.7 mg/kg
Sodium[(2)]	52.6 mg/kg	263.0 mg/kg
Zinc[(2)]	1.1 mg/kg	5.5 mg/kg

[(1)] Maximum concentration present in TCLP preparation blank.
[(2)] Maximum concentration present in soil preparation blank.

An action level of 5X the maximum concentration was used to evaluate the sample data for blank contamination. Sample aliquot, percent solids, and dilution factors, if applicable, were taken into consideration when evaluating for blank contamination. Positive results less than the action level for arsenic, beryllium, calcium, sodium, and zinc were qualified (B) as a result of blank contamination for soil. Positive results less than the action level for arsenic were qualified (B) as a result of blank contamination for the TCLP samples. The remaining analytes were not qualified because either the sample values were greater than the action level or they were nondetects.

- The interfering analyte calcium was present in soil sample 05TP01WS0204 at a concentration comparable to the concentration in the interference check sample (ICS) solution. Several analytes, namely arsenic, barium, beryllium, cadmium, chromium, copper, lead, manganese, potassium, thallium, vanadium, and zinc were present in the ICS solution at concentrations that exceeded the absolute value of the instrument detection limit (IDL). Interference effects existed for thallium in the affected sample. The positive result for thallium was qualified as biased high (K).

- The interfering analyte iron was present in soil sample 05TP01WS0204 at a concentration comparable to the concentration in the ICS solution. Several analytes, namely arsenic, barium, beryllium, cadmium, chromium, copper, lead, manganese, potassium, thallium, vanadium, and zinc were present in the ICS solution at concentrations that exceeded the absolute value of the IDL. Interference effects existed for beryllium and thallium in the affected sample. The positive result for thallium was qualified as biased high (K). Beryllium was not qualified because it was already qualified for blank contamination.

- The interfering analyte iron was present in soil sample 13TP05WS0103 at a concentration comparable to the concentration in the ICS solution. Several analytes, namely arsenic, barium, beryllium, cadmium, chromium, copper, lead, manganese, potassium, thallium, vanadium, and zinc were present in the ICS solution at concentrations that exceeded the absolute value of the IDL. Interference effects existed for arsenic and thallium in the affected sample. Positive results for arsenic and thallium were qualified as biased high (K).

- The interfering analyte iron was present in soil sample FD05160201 at a concentration comparable to the concentration in the ICS solution. Several analytes, namely arsenic, barium, beryllium, cadmium, chromium, copper, lead, manganese, potassium, thallium, vanadium, and zinc were present in the ICS solution at concentrations that exceeded the absolute value of the IDL. Interference effects existed for arsenic, beryllium, cadmium, and thallium in the affected sample. Positive results for arsenic, cadmium, and thallium were qualified as biased high (K). Beryllium was not qualified because it was already qualified for blank contamination.

- The soil matrix spike and matrix spike duplicate percent recoveries for antimony were below the control limit of 75-125%. Positive results were qualified as biased low (L). Nondetects were qualified as biased low (UL).

- The TCLP matrix spike percent recovery for silver was below the control limit of 75-125%. Nondetects were qualified as biased low (UL).

- The soil serial dilution percent difference (%D) for copper was above the 10% control limit and the original sample concentration was >50X IDL. Positive results were qualified as estimated (J).

- The Relative Percent Differences (RPDs) between the field duplicate pair samples (FD05160201 / 13TP05WS0103) for copper, iron, manganese, and nickel were above 50% and both sample values were >5X CRDL. Positive results for the affected analytes were qualified as estimated (J) in all samples.

Notes

Reporting limits and percent solids on Form 1s and EDD did not agree. The reviewer amended the database for several analytes and percent solids.

The chain of custody (COC) incorrectly requests cyanide analysis. The statement of work does not require cyanide analyses and the laboratory did not perform the test.

A dilution was made for zinc in sample 05TP01WS0204 because it was above the instrument's linear range.

Executive Summary

Laboratory Performance: Several analytes were present in the laboratory method/preparation blanks.

Other Factors Affecting Data Quality: Several analytes were qualified due to ICP interference. Several analytes were qualified due to matrix spike noncompliance. Copper was qualified due to serial dilution noncompliance. Several analytes were qualified due to field duplicate noncompliance.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Review", April 1993 and the NFESC document entitled "Navy IRCDQM" (September 1999).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Tetra Tech NUS
Ethan G. Lee
Environmental Scientist

Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

Data Qualifier Key:

U - Value is a nondetect as reported by the laboratory.

B - Positive result is considered to be an artifact of blank contamination and should not be considered present.

UL - Nondetected result is considered biased low as a result of technical noncompliance.

L - Positive result is considered biased low as a result of technical noncompliance.

K - Positive result is considered biased high as a result of technical noncompliance.

J - Positive result is considered estimated as a result of technical noncompliance.

APPENDIX D

ANALYTICAL DATA

SITE 5

POSITIVE HITS
ANALYTICAL DATA

site5_resp -
summary of positive hits

order	001	002	003	004	005	006	007	008	009	010	011	012
site	005	005	005	005	005	005	005	005	005	005	005	005
location	05-SB-01	05-SB-02	05-SB-02	05-SB-101	05-SB-02	05-SB-03	05-SB-03	05-SB-04	05-SB-04	05-SB-05	05-SB-05	05-SB-100
nsample	05-SB-01-8_OLD	05-SB-02-10_OLD	05-SB-02-10_OLD-AVG	05-SB-02-10_OLD-D	05-SB-02-22_OLD	05-SB-03-12_OLD	05-SB-03-25_OLD	05-SB-04-20_OLD	05-SB-04-6_OLD	05-SB-05-25_OLD	05-SB-05-2_OLD	05-SB-100_OLD
sample	05-SB-01(8)	05-SB-02(10)	05-SB-02-10_OLD-AVG	05-SB-101	05-SB-02(22)	05-SB-03(12)	05-SB-03(25)	05-SB-04(20)	05-SB-04(6)	05-SB-05(25)	05-SB-05(2)	05-SB-100
matrix	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
sacode	NORMAL	DUP	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP
depth_rang	8 - 10	10 - 12	10 - 12	10 - 12	22 - 24	12 - 14	25 - 27	20 - 22	6 - 8	25 - 27	2 - 4	24 - 26
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	10/21/97	10/22/97	10/22/97	10/22/97	10/22/97	10/21/97	10/22/97	10/21/97	10/21/97	10/22/97	10/20/97	10/21/97
validated	T	T	T	T	T	T	T	T	T	T	T	T
cto_proj	273	273	273	273	273	273	273	273	273	273	273	273
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S
sort	**c_001**	**c_002**	**c_003**	**c_004**	**c_005**	**c_006**	**c_007**	**c_008**	**c_009**	**c_010**	**c_011**	**c_012**
Volatile Organics (ug/kg)												
ACETONE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	86	15 U	130	13 U
TOLUENE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 UJ	15 U	92	13 U
Semivolatile Organics (ug/kg)												
ACENAPHTHENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ	380 UJ
ACETOPHENONE												
ANTHRACENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	68 J	56 J	140 J	380 UJ
BENZO(A)ANTHRACENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	240 J	230 J	550 J	380 UJ
BENZO(A)PYRENE	370 UJ	370 UJ	250 J	250 J	62 J	390 UJ	370 UJ	400 UJ	220 J	180 J	500 J	380 UJ
BENZO(B)FLUORANTHENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	290 J	220 J	630 J	380 UJ
BENZO(G,H,I)PERYLENE	370 UJ	370 UJ	347.5 J	510 J	550 J	390 UJ	370 UJ	400 UJ	140 J	100 J	300 J	380 UJ
BENZO(K)FLUORANTHENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	120 J	130 J	290 J	380 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	370 UJ	51 J	51 J	51 J	380 UJ	58 J	370 UJ	400 UJ	230 J	210 J	190 J	380 UJ
CARBAZOLE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	78 J	380 UJ
CHRYSENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	210 J	200 J	490 J	380 UJ
DI-N-BUTYL PHTHALATE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	39 J	510 UJ	490 UJ	380 UJ
DIBENZO(A,H)ANTHRACENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	43 J	510 UJ	120 J	380 UJ
DIETHYL PHTHALATE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ	380 UJ
FLUORANTHENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	350 J	370 J	960 J	380 UJ
FLUORENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	66 J	380 UJ
INDENO(1,2,3-CD)PYRENE	370 UJ	370 UJ	140 J	140 J	380 UJ	390 UJ	370 UJ	400 UJ	140 J	110 J	330 J	380 UJ
NAPHTHALENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	55 J	510 UJ	97 J	380 UJ
PHENANTHRENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	280 J	270 J	600 J	380 UJ
PYRENE	370 UJ	370 UJ	160 J	160 J	380 UJ	390 UJ	370 UJ	400 UJ	350 J	400 J	880 J	380 UJ
Pesticides/PCBs (ug/kg)												
4,4'-DDD	3.7 UJ	3.7 UJ	3.75 UJ	3.8 UJ	3.8 UJ	3.9 UJ	3.7 UJ	4 UJ	3.9 UJ	5 UJ	4.9 UJ	3.8 UJ
4,4'-DDE	3.7 UJ	3.7 UJ	3.75 UJ	3.8 UJ	3.8 UJ	3.9 UJ	3.7 UJ	4 UJ	4.2 J	5 UJ	22 J	3.8 UJ
ALPHA-CHLORDANE	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.8 UJ	2 UJ	94 J	2.5 UJ	160 J	1.9 UJ
AROCLOR-1260	37 UJ	37 UJ	37.5 UJ	38 UJ	38 UJ	39 UJ	37 UJ	40 UJ	460 J	50 UJ	1200 J	38 UJ
DELTA-BHC	1.8 UJ	0.3 J	0.3 J	1.9 UJ	0.22 J	1.9 UJ	1.8 UJ	2 UJ	1.9 UJ	2.5 UJ	2.5 UJ	1.9 UJ
DIELDRIN	3.7 UJ	3.7 UJ	3.75 UJ	3.8 UJ	3.8 UJ	3.9 UJ	3.7 UJ	4 UJ	6.8 J	5 UJ	53 J	3.8 UJ
ENDOSULFAN II	3.7 UJ	3.7 UJ	3.75 UJ	3.8 UJ	3.8 UJ	3.9 UJ	3.7 UJ	4 UJ	3.9 UJ	0.86 J	4.9 UJ	3.8 UJ
ENDRIN KETONE	3.7 UJ	3.7 UJ	3.75 UJ	3.8 UJ	3.8 UJ	3.9 UJ	3.7 UJ	4 UJ	3.9 UJ	2.6 J	11 J	3.8 UJ
GAMMA-CHLORDANE	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.8 UJ	2 UJ	100 J	2.5 UJ	140 J	1.9 UJ
HEPTACHLOR	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.8 UJ	2 UJ	5.7 J	2.5 UJ	2.5 UJ	1.9 UJ
HEPTACHLOR EPOXIDE	1.8 UJ	0.27 J	0.25 J	0.23 J	0.25 J	1.9 UJ	0.17 J	2 UJ	1.9 UJ	2.5 UJ	2.5 UJ	1.9 UJ
Explosives (ug/kg)												
2,4,6-TRINITROTOLUENE	35.6 U	35.6 U	35.6 U	35.6 U	35.6 U	35.6 U	35.6 U	35.6 U	35.6 UJ	92 U	9820 J	35.6 U
2-AMINO-4,6-DINITROTOLUENE	46.7 U	46.7 U	46.7 U	46.7 U	46.7 U	46.7 U	46.7 U	46.7 U	46.7 UJ	46.7 U	1070 J	46.7 U
HMX	73 U	70.5 U	70.5 U	70.5 U	70.5 U	70.5 U	70.5 U	73 U	73 UJ	73 U	5480 J	73 U
RDX	50.9 U	50.9 U	50.9 U	50.9 U	50.9 U	50.9 U	50.9 U	50.9 U	50.9 UJ	50.9 U	30800 J	50.9 U
Inorganics (mg/kg)												
ALUMINUM	2070	3490 J	3925 J	4360 J	2160 J	8410 J	3060 J	8370	9990	2380	10300	2920
ANTIMONY	0.57 UL	0.62 UL	0.625 UL	0.63 UL	0.63 UL	0.65 UL	0.6 UL	2.3 L	2.5 L	0.79 UL	3.1 L	0.59 UL
ARSENIC	2.4 L	1.2 U	2.1 U	3.0 U	2.0 U	6.6 J	0.81 U	3.4 L	5.0	1.0 U	4.0 L	3.3 L
BARIUM	5.2	5.4	5.95	6.5	4.2	57.2	3.2	253	119	30.6	312	6.0

from site5_samp.dbf
from site5_resp.dbf
from site5_resp.xls
from q:\sql_server\white_oak\upload

site5_resp -
summary of positive hits

order	001	002	003	004	005	006	007	008	009	010	011	012
site	005	005	005	005	005	005	005	005	005	005	005	005
location	05-SB-01	05-SB-02	05-SB-02	05-SB-101	05-SB-02	05-SB-03	05-SB-03	05-SB-04	05-SB-04	05-SB-05	05-SB-05	05-SB-100
nsample	05-SB-01-8_OLD	05-SB-02-10_OLD	05-SB-02-10_OLD-AVG	05-SB-02-10_OLD-D	05-SB-02-22_OLD	05-SB-03-12_OLD	05-SB-03-25_OLD	05-SB-04-20_OLD	05-SB-04-6_OLD	05-SB-05-25_OLD	05-SB-05-2_OLD	05-SB-100_OLD
sample	05-SB-01(8)	05-SB-02(10)	05-SB-02-10_OLD-AVG	05-SB-101	05-SB-02(22)	05-SB-03(12)	05-SB-03(25)	05-SB-04(20)	05-SB-04(6)	05-SB-05(25)	05-SB-05(2)	05-SB-100
matrix	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
sacode	NORMAL	DUP	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP
depth_rang	8 - 10	10 - 12	10 - 12	10 - 12	22 - 24	12 - 14	25 - 27	20 - 22	6 - 8	25 - 27	2 - 4	24 - 26
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	10/21/97	10/22/97	10/22/97	10/22/97	10/22/97	10/21/97	10/22/97	10/21/97	10/21/97	10/22/97	10/20/97	10/21/97
validated	T	T	T	T	T	T	T	T	T	T	T	T
cto_proj	273	273	273	273	273	273	273	273	273	273	273	273
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S
sort	**c_001**	**c_002**	**c_003**	**c_004**	**c_005**	**c_006**	**c_007**	**c_008**	**c_009**	**c_010**	**c_011**	**c_012**
CADMIUM	0.07 U	0.07 U	0.07 U	0.07 U	0.08 U	0.07 U	0.06 U	2.0 K	3.2 K	0.31 U	2.5 K	0.07 U
CALCIUM	40.4 U	51.2 U	48.1 U	45.0 U	63.0 U	92.4 U	41.2 U	34400	12000	1150 K	42400	48.5 U
CHROMIUM	13.1 J	5.7 J	8.05 J	10.4 J	9.9 J	35.0 J	4.6 J	29.1 J	37.3 J	14.3 J	35.7 J	12.4 J
COBALT	0.1 U	0.26 U	0.28 U	0.3 U	0.14 UJ	0.59 U	0.13 U	3.4 J	5.5 J	0.12	4.3 J	0.26 U
COPPER	28.5	4.3	28.1	51.9	31.4	29.9	3.8	511	313	46.7	630	20.2
IRON	5580	3450 J	6500 J	9550 J	6140 J	16300 J	2610 J	18000	24900	12400	22200	6980
LEAD	3.1 K	1.7 J	2.2 J	2.7 J	2.5 J	5.3 J	1.3 J	147 K	687 K	16.6 K	181 K	3.2 K
MAGNESIUM	58.2 U	101 K	112 K	123 K	63.8 U	192 K	72.4 K	2440 J	3190 J	250 J	3010 J	93.7 J
MANGANESE	4.3 J	3.7 J	4.4 J	5.1 J	3.6 J	12.6 J	3.7 J	186 J	253 J	32.9 J	229 J	6.0 J
MERCURY	0.06	0.1	0.075	0.05	0.07	0.07	0.03	0.02	2.3	0.03	1.8	0.1
NICKEL	0.42 K	0.87 U	1.035 U	1.2 U	0.28 U	2.1 K	0.4 U	24.6	52.0	1.6 K	30.0	0.87 K
POTASSIUM	160	171	174.5	178	138	328	91.7	556	599	316	689	166
SELENIUM	18.2 J	1.1 J	25.35 J	49.6 J	25.6 J	17.5 J	1.4 J	4.2 J	2.9 J	0.85 UJ	4.5 J	15.1 J
SILVER	0.18 U	0.2 U	0.2 U	0.2 U	0.2 U	0.21 U	0.19 U	14.2	7.6	0.24	17.8	0.18 U
SODIUM	43.9 UJ	44.4 U	36.7 UL	29.0 UL	48.2 U	61.3 U	27.8 UL	666 J	787 J	159 U	837 J	45.1 UJ
THALLIUM	0.64 U	0.51 U	0.51 U	0.51 U	0.52 U	0.53 U	0.49 U	0.68 UL	0.66 UL	0.88 U	0.84 UL	0.65 U
VANADIUM	28.2	9.3	13.65	18.0	15.0	44.8	7.4	39.1	17.1	13.4	48.5	37.0
ZINC	1.8 U	2.0 J	2.45 J	2.9 J	1.7 J	5.6 J	1.7 J	519 J	509 J	11.6 J	641 J	2.3 U
Miscellaneous Parameters (mg/kg)												
CYANIDE	0.19 U	0.22 U	0.23 U	0.24 U	0.28 U	0.21 U	0.22 U	0.24 U	0.24 U	0.34	0.35	0.24 U
PERCENT SOLIDS												
PH	4.66	5.08	5.115	5.15	5.49	5.35	4.99	7.85	7.87	8.36	8.39	4.73

from site5_samp.dbf
from site5_resp.dbf
from site5_resp.xls
from q:\sql_s white_oak\upload

site5_resp -
summary of positive hits

order	013	014	015	016	017	018	019	020	021	022
site	005	005					.NULL.			
location	05-SB-100	05-SB-01	05TP01	05TP01	05TP08	05TP09	05TP09	05TP09	05TP10	05TP11
nsample	05-SB-100_OLD-AVG	05-SB-100_OLD-D	05TP01SB0507[Q2]	05TP01WS0204[Q2]	05TP08SB0506[Q2]	05TP09SB0506[Q2]	05TP09SB0506[Q2]-AVG	05TP09SB0506[Q2]-D	05TP10SB0506[Q2]	05TP11SB0203[Q2]
sample	05-SB-100_OLD-AVG	05-SB-01(24)	05TP01SB0507	05TP01WS0204	05TP08SB0506	05TP09SB0506	05TP09SB0506[Q2]-AVG	FD05170201	05TP10SB0506	05TP11SB0203
matrix	SB	SB	SO	SO	SO	SO	SO	SO	SO	SO
sacode	AVG	DUP	NORMAL	NORMAL	NORMAL	DUP	AVG	DUP	NORMAL	NORMAL
depth_rang	24 - 26	24 - 26					.NULL.			
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	10/21/97	10/21/97	05/16/02	05/16/02	05/16/02	05/17/02	05/17/02	05/17/02	05/17/02	05/17/02
validated	T	T	Y	Y	Y	Y	Y	Y	Y	Y
cto_proj	273	273	839	839	839	839	839	839	839	839
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S
sort	**c_013**	**c_014**	**c_015**	**c_016**	**c_017**	**c_018**	**c_019**	**c_020**	**c_021**	**c_022**
Volatile Organics (ug/kg)										
ACETONE	12 U	11 U	2.2 U	2.1 U	1.6 U	5.3 U	3.75 U	2.2 U	1.4 U	1.7 U
TOLUENE	12 U	11 U	12 U	13 U	11 U	12 U	12 U	12 U	11 U	11 U
Semivolatile Organics (ug/kg)										
ACENAPHTHENE	370 UJ	360 UJ	60 J	440 U	380 U	370 U	370 U	370 U	370 U	360 U
ACETOPHENONE			200 U	270 U	150 U	140 J	135 J	130 J	120 J	120 J
ANTHRACENE	370 UJ	360 UJ	72 J	440 U	380 U	370 U	370 U	370 U	370 U	360 U
BENZO(A)ANTHRACENE	370 UJ	360 UJ	150 J	120 J	380 U	370 U	370 U	370 U	370 U	360 U
BENZO(A)PYRENE	370 UJ	360 UJ	140 J	150 J	380 U	370 U	370 U	370 U	370 U	360 U
BENZO(B)FLUORANTHENE	370 UJ	360 UJ	110 J	140 J	380 U	370 U	370 U	370 U	370 U	360 U
BENZO(G,H,I)PERYLENE	370 UJ	360 UJ	90 J	150 J	380 U	370 U	370 U	370 U	370 U	360 U
BENZO(K)FLUORANTHENE	370 UJ	360 UJ	120 J	120 J	380 U	370 U	370 U	370 U	370 U	360 U
BIS(2-ETHYLHEXYL)PHTHALATE	59 J	59 J	390 U	440 U	380 U	370 U	370 U	370 U	370 U	360 U
CARBAZOLE	370 UJ	360 UJ	41 J	440 U	380 U	370 U	370 U	370 U	370 U	360 U
CHRYSENE	370 UJ	360 UJ	150 J	140 J	380 U	370 U	370 U	370 U	370 U	360 U
DI-N-BUTYL PHTHALATE	370 UJ	360 UJ	390 U	2700	380 U	370 U	370 U	370 U	370 U	360 U
DIBENZO(A,H)ANTHRACENE	370 UJ	360 UJ	390 U	59 J	380 U	370 U	370 U	370 U	370 U	360 U
DIETHYL PHTHALATE	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U	360 U
FLUORANTHENE	370 UJ	360 UJ	320 J	210 J	380 U	370 U	370 U	370 U	370 U	360 U
FLUORENE	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U	360 U
INDENO(1,2,3-CD)PYRENE	370 UJ	360 UJ	120 J	190 J	380 U	370 U	370 U	370 U	370 U	360 U
NAPHTHALENE	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U	360 U
PHENANTHRENE	370 UJ	360 UJ	270 J	120 J	380 U	370 U	370 U	370 U	370 U	360 U
PYRENE	370 UJ	360 UJ	260 J	170 J	380 U	370 U	370 U	370 U	370 U	360 U
Pesticides/PCBs (ug/kg)										
4,4'-DDD	3.7 UJ	3.6 UJ	0.65 J	4 R	2 U	1.9 U	1.9 U	1.9 U	0.82 R	0.72 R
4,4'-DDE	3.7 UJ	3.6 UJ	2 U	1.6 J	2 U	1.9 U	1.9 U	1.9 U	1.9 U	0.3 J
ALPHA-CHLORDANE	1.85 UJ	1.8 UJ	2 U	1.2 J	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
AROCLOR-1260	37 UJ	36 UJ	19 J	390	38 U	37 U	37 U	37 U	46	32 J
DELTA-BHC	1.85 UJ	1.8 UJ	2 U	2.3 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
DIELDRIN	3.7 UJ	3.6 UJ	2 U	2.2 J	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
ENDOSULFAN II	3.7 UJ	3.6 UJ	0.67 J	8.1 J	2 U	1.9 U	1.9 U	1.9 U	0.66 J	0.6 J
ENDRIN KETONE	3.7 UJ	3.6 UJ	2 U	2.3 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
GAMMA-CHLORDANE	1.85 UJ	1.8 UJ	2 U	2.3 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
HEPTACHLOR	1.85 UJ	1.8 UJ	2 U	2.3 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
HEPTACHLOR EPOXIDE	1.85 UJ	1.8 UJ	2 U	2.3 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Explosives (ug/kg)										
2,4,6-TRINITROTOLUENE	35.6 U	35.6 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
2-AMINO-4,6-DINITROTOLUENE	46.7 U	46.7 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
HMX	73 U	73 U	500 U	230 J	500 U	500 U	500 U	500 U	500 U	500 U
RDX	50.9 U	50.9 U	500 U	500 U	500 U	500 U	500 U	500 U	500 U	500 U
Inorganics (mg/kg)										
ALUMINUM	2330	1740	2590	6200	2340	507 K	555.5 K	604 K	5000 K	2740 K
ANTIMONY	0.575 UL	0.56 UL	0.19 UL	2.6 L	0.2 L	0.18 UL	0.18 UL	0.18 UL	0.24 L	0.18 UL
ARSENIC	1.8275 J	0.71 UL	2.6	3.1	2.0	1.1	1.1	1.1	2.7	2.0
BARIUM	6.05	6.1	3.9	173	4.0	1.9	2.15	2.4	8.3	7.8

from site5_samp.dbf
from site5_resp.dbf
from site5_resp.xls
from q:\sql_server\white_oak\upload

site5_resp -
summary of positive hits

order	013	014	015	016	017	018	019	020	021	022
site	005	005					.NULL.			
location	05-SB-100	05-SB-01	05TP01	05TP01	05TP08	05TP09	05TP09	05TP09	05TP10	05TP11
nsample	05-SB-100_OLD-AVG	05-SB-100_OLD-D	05TP01SB0507[Q2]	05TP01WS0204[Q2]	05TP08SB0506[Q2]	05TP09SB0506[Q2]	05TP09SB0506[Q2]-AVG	05TP09SB0506[Q2]-D	05TP10SB0506[Q2]	05TP11SB0203[Q2]
sample	05-SB-100_OLD-AVG	05-SB-01(24)	05TP01SB0507	05TP01WS0204	05TP08SB0506	05TP09SB0506	05TP09SB0506[Q2]-AVG	FD05170201	05TP10SB0506	05TP11SB0203
matrix	SB	SB	SO	SO	SO	SO	SO	SO	SO	SO
sacode	AVG	DUP	NORMAL	NORMAL	NORMAL	DUP	AVG	DUP	NORMAL	NORMAL
depth_rang	24 - 26	24 - 26					.NULL.			
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	10/21/97	10/21/97	05/16/02	05/16/02	05/16/02	05/17/02	05/17/02	05/17/02	05/17/02	05/17/02
validated	T	T	Y	Y	Y	Y	Y	Y	Y	Y
cto_proj	273	273	839	839	839	839	839	839	839	839
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S
sort	**c_013**	**c_014**	**c_015**	**c_016**	**c_017**	**c_018**	**c_019**	**c_020**	**c_021**	**c_022**
CADMIUM	0.07 U	0.07 U	0.02 U	5.6	0.02 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U
CALCIUM	48.05 U	47.6 U	277	20800	154 U	49.3	46.45	43.6	37.8	62.0
CHROMIUM	8.7 J	5.0 J	6.2	40.9	5.6	2.6	2.8	3.0	9.5	5.6
COBALT	0.2 U	0.14 U	0.22	9.5	0.2	0.092 U	0.092 U	0.092 U	0.48	0.41
COPPER	11.4	2.6	10.3 J	701 J	5.6 J	4.8	5.05	5.3	9.1	7.1
IRON	4555	2130	6160	15900	5230	1700	1795	1890	7690	4780
LEAD	2.55 K	1.9 K	1.9	610	1.7	1.0 U	1.0 U	1.0 U	3.2	2.5
MAGNESIUM	59.075 J	48.9 U	161	3340	63.8	33.9	34.2	34.5	87.5	103
MANGANESE	5.25 J	4.5 J	4.7 J	285 J	3.3 J	1.4	1.5	1.6	7.5	7.2
MERCURY	0.06	0.02	0.038	0.22	0.035	0.063	0.0665	0.07	0.093	0.049
NICKEL	0.82 K	0.77 K	0.47 J	198 J	0.42 J	0.2	0.1475	0.19 U	0.91	0.84
POTASSIUM	150.5	135	107	898	130	32.3	33.0	33.7	78.4	76.8
SELENIUM	7.7 J	0.6 UJ	4.8	2.5	1.9	2.2	2.3	2.4	3.7	2.7
SILVER	0.175 U	0.17 U	0.072 U	1.1	0.071 U	0.068 U	0.068 U	0.068 U	0.069 U	0.067 U
SODIUM	55.6 UJ	66.1 U	26.4 U	364	185 U	43.6 U	39.25 U	34.9 U	23.3 U	39.1 U
THALLIUM	0.635 U	0.62 U	0.95	0.78 K	0.4 U	0.48	0.335	0.38 U	0.75	0.47
VANADIUM	21.5	6.0	16.2	12.6	12.1	5.9	6.35	6.8	17.9	12.5
ZINC	2.15 U	2.0 U	2.6 U	1420	2.0 U	1.2	1.25	1.3	3.3	2.9
Miscellaneous Parameters (mg/kg)										
CYANIDE	0.235 U	0.23 U								
PERCENT SOLIDS			84.8	75.5	86.1	89.4	89.35	89.3	88.9	90.9
PH	4.855	4.98								

from site5_samp.dbf
from site5_resp.dbf
from site5_resp.xls
from q:\sql_ white_oak\upload

site5_resp -
summary of positive hits

order	023	024	
site			
location	05TP12	05TP12	
nsample	05TP12SB0708[Q2]	05TP12WS0204[Q2]	
sample	05TP12SB0708	05TP12WS0204	
matrix	SO	SO	
sacode	NORMAL	NORMAL	
depth_rang			
status	NORMAL	NORMAL	
sample_dat	05/17/02	05/17/02	
validated	Y	Y	
cto_proj	839	839	
proj_manag	NESBIT,S	NESBIT,S	
sort	**c_023**	**c_024**	**count**
Volatile Organics (ug/kg)			
ACETONE	2.9 U	15 U	24
TOLUENE	11 U	12 U	24
Semivolatile Organics (ug/kg)			
ACENAPHTHENE	380 U	390 U	24
ACETOPHENONE	150 J	250 J	10
ANTHRACENE	380 U	390 U	24
BENZO(A)ANTHRACENE	380 U	81 J	24
BENZO(A)PYRENE	380 U	86 J	24
BENZO(B)FLUORANTHENE	380 U	85 J	24
BENZO(G,H,I)PERYLENE	380 U	61 J	24
BENZO(K)FLUORANTHENE	380 U	73 J	24
BIS(2-ETHYLHEXYL)PHTHALATE	380 U	390 U	24
CARBAZOLE	380 U	390 U	24
CHRYSENE	380 U	93 J	24
DI-N-BUTYL PHTHALATE	380 U	390 U	24
DIBENZO(A,H)ANTHRACENE	380 U	390 U	24
DIETHYL PHTHALATE	380 U	42 J	24
FLUORANTHENE	380 U	210 J	24
FLUORENE	380 U	390 U	24
INDENO(1,2,3-CD)PYRENE	380 U	82 J	24
NAPHTHALENE	380 U	390 U	24
PHENANTHRENE	380 U	160 J	24
PYRENE	380 U	160 J	24
Pesticides/PCBs (ug/kg)			
4,4'-DDD	2 U	5 J	24
4,4'-DDE	2 U	2 J	24
ALPHA-CHLORDANE	2 U	0.89 J	24
AROCLOR-1260	38 U	650 J	24
DELTA-BHC	2 U	2 U	24
DIELDRIN	2 U	1.7 J	24
ENDOSULFAN II	2 U	6.4 R	24
ENDRIN KETONE	2 U	2 U	24
GAMMA-CHLORDANE	2 U	2 U	24
HEPTACHLOR	2 U	2 U	24
HEPTACHLOR EPOXIDE	2 U	2 U	24
Explosives (ug/kg)			
2,4,6-TRINITROTOLUENE	250 U	250 U	24
2-AMINO-4,6-DINITROTOLUENE	250 U	250 U	24
HMX	500 U	500 U	24
RDX	500 U	500 U	24
Inorganics (mg/kg)			
ALUMINUM	1770 K	4780 K	24
ANTIMONY	0.19 UL	0.69 L	24
ARSENIC	2.4	2.9	24
BARIUM	3.6	46.8	24

from site5_samp.dbf
from site5_resp.dbf
from site5_resp.xls
from q:\sql_server\white_oak\upload

site5_resp -
summary of positive hits

order	023	024	
site			
location	05TP12	05TP12	
nsample	05TP12SB0708[Q2]	05TP12WS0204[Q2]	
sample	05TP12SB0708	05TP12WS0204	
matrix	SO	SO	
sacode	NORMAL	NORMAL	
depth_rang			
status	NORMAL	NORMAL	
sample_dat	05/17/02	05/17/02	
validated	Y	Y	
cto_proj	839	839	
proj_manag	NESBIT,S	NESBIT,S	
sort	**c_023**	**c_024**	**count**
CADMIUM	0.02 U	0.43 K	24
CALCIUM	210	2510	24
CHROMIUM	5.9	20.0	24
COBALT	0.12	2.3	24
COPPER	8.2	70.3	24
IRON	5950	12600	24
LEAD	1.5	69.3	24
MAGNESIUM	55.8	486	24
MANGANESE	4.3	96.2	24
MERCURY	0.03	0.23	24
NICKEL	0.38	8.3	24
POTASSIUM	59.1	296	24
SELENIUM	4.0	2.4	24
SILVER	0.071 U	1.9	24
SODIUM	63.3 U	61.0 U	24
THALLIUM	0.64	0.79 K	24
VANADIUM	12.4	23.2	24
ZINC	2.3	181	24
Miscellaneous Parameters (mg/kg)			
CYANIDE			14
PERCENT SOLIDS	85.9	84.4	10
PH			14

from site5_samp.dbf
from site5_resp.dbf
from site5_resp.xls
from q:\sql_s white_oak\upload

SITE 13

POSITIVE HITS
ANALYTICAL DATA

site13_resp -
summary of positive detections

order	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016
site	013	013	013	013	013	013	013	013	013	013	013	013	013	013	013	013
location	13-SB-01	13-SB-02	13-SB-03	13-SB-03	13-SB-03	13-SB-01	13-SB-02	13-SB-03	13SB201	13SB201	13SB202	13SB202	13SB203	13SB203	13SB204	13SB204
nsample	13-SB-01	13-SB-02	13-SB-03	13-SB-03-AVG	13-SB-03-D	13-SS-01	13-SS-02	13-SS-03	13SB201-08	13SB201-10	13SB202-08	13SB202-12	13SB203-06	13SB203-12	13SB204-10	13SB204-14
sample	13-SB-01	13-SB-02	13-SB-03	13-SB-03-AVG	13-SB-03-DX	13-SS-01	13-SS-02	13-SS-03	13SB201-08	13SB201-10	13SB202-08	13SB202-12	13SB203-06	13SB203-12	13SB204-10	13SB204-14
sacode	NORMAL	NORMAL	DUP	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
depth_rang	1 - 2	1 - 2	1 - 2	1 - 2	1 - 2	0 - 1	0 - 1	0 - 1								
sample_dat	10/20/97	10/20/97	10/20/97	10/20/97	10/20/97	10/06/97	10/06/97	10/06/97	09/07/01	09/07/01	09/07/01	09/07/01	09/07/01	09/07/01	09/07/01	09/07/01
validated	T	T	T	T	T	T	T	T	Y	Y	Y	Y	Y	Y	Y	Y
cto_proj	273	273	273	273	273	273	273	273	839	839	839	839	839	839	839	839
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S
sort	**c_001**	**c_002**	**c_003**	**c_004**	**c_005**	**c_006**	**c_007**	**c_008**	**c_009**	**c_010**	**c_011**	**c_012**	**c_013**	**c_014**	**c_015**	**c_016**
Volatile Organics (ug/kg)																
1,1,2,2-TETRACHLOROETHANE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U	17.2 U	8.59 J	10.6 U	79.3	21.6 U	18.5	1.5 J	12.3 U
1,2-DIBROMO-3-CHLOROPROPANE									5.98 J	10.9 U	10.6 U	9.76 U	3.59 UJ	11.6 U	13.6 U	12.3 U
1,2-DICHLOROBENZENE									2.67 UJ	10.9 U	10.6 U	9.76 U	2.7	11.6 U	13.6 U	12.3 U
1,4-DICHLOROBENZENE									2.7 J	10.9 U	10.6 U	9.76 U	2.47 J	11.6 U	13.6 U	12.3 U
2-BUTANONE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U								
2-HEXANONE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U	17.2 U	10.9 U	10.6 U	9.76 U	13.2 J	7.75 J	13.6 U	12.3 U
ACETONE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U	17.2 U	10.9 U	10.6 U	9.76 U	3.35 J	11.6 U	13.6 U	12.3 U
CHLOROMETHANE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U	4.63 J	3.61 J	2.31 J	2.83	4.87 J	2.83 J	4.02 J	2.79 J
METHYL ACETATE									4.29 J	10.9 U	10.6 U	9.76 U			13.6 U	12.3 U
TETRACHLOROETHENE	13 U	13 U	1 J	1 J	14 U	12 UJ	10 U	11 U	2.07 J	10.9 U	10.6 U	1.81 J	21.6 U	11.6 U	13.6 U	12.3 U
TOTAL XYLENES	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U	17.2 U	10.9 U	10.6 U	9.76 U	21.6 U	11.6 U	13.6 U	12.3 U
TRICHLOROETHENE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U	16.2 J	10.9 U	10.6 U	5.73 J	21.6 U	11.6 U	13.6 U	12.3 U
Semivolatile Organics (ug/kg)																
2-METHYLNAPHTHALENE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
ACENAPHTHENE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	62 J	350 U	360 U								
ANTHRACENE	440 UJ	82 J	420 UJ	445 UJ	470 UJ	140 J	42 J	360 U								
BENZO(A)ANTHRACENE	67 J	480 J	420 UJ	445 UJ	470 UJ	430	310 J	360 U								
BENZO(A)PYRENE	65 J	350 J	420 UJ	445 UJ	470 UJ	390 J	240 J	360 U								
BENZO(B)FLUORANTHENE	95 J	560 J	420 UJ	445 UJ	470 UJ	380 J	780	360 U								
BENZO(G,H,I)PERYLENE	440 UJ	200 J	420 UJ	445 UJ	470 UJ	290 J	210 J	360 U								
BENZO(K)FLUORANTHENE	440 UJ	190 J	420 UJ	445 UJ	470 UJ	250 J	350 U	360 U								
BIS(2-ETHYLHEXYL)PHTHALATE	56 J	260 J	130 J	103.5 J	77 J	400 U	350 U	360 U								
CARBAZOLE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	96 J	350 U	360 U								
CHRYSENE	47 J	500 J	420 UJ	445 UJ	470 UJ	430	350	360 U								
DIBENZO(A,H)ANTHRACENE	440 UJ	130 J	420 UJ	445 UJ	470 UJ	140 J	88 J	360 U								
FLUORANTHENE	110 J	1000 J	420 UJ	445 UJ	470 UJ	1100	640	360 U								
FLUORENE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	58 J	350 U	360 U								
INDENO(1,2,3-CD)PYRENE	440 UJ	200 J	420 UJ	445 UJ	470 UJ	250 J	200 J	360 U								
NAPHTHALENE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
PHENANTHRENE	73 J	410 J	420 UJ	445 UJ	470 UJ	590	190 J	360 U								
PYRENE	110 J	890 J	420 UJ	445 UJ	470 UJ	570	570	360 U								
Pesticides/PCBs (ug/kg)																
4,4'-DDD	0.65 R	2 J	4.2 UJ	4.45 UJ	4.7 UJ	17 J	3.5 U	3.6 U								
4,4'-DDE	0.91 J	0.65 J	4.2 UJ	4.45 UJ	4.7 UJ	71 K	3.5 U	3.6 U								
4,4'-DDT	0.71 J	4.2 U	4.2 UJ	4.45 UJ	4.7 UJ	39 K	3.5 U	3.6 U								
ALPHA-CHLORDANE	2.2 UJ	1.7 J	2.1 UJ	2.25 UJ	2.4 UJ	7.8 K	1.7 U	1.8 U								
AROCLOR-1260	44 UJ	42 UJ	42 UJ	44.5 UJ	47 UJ	170 J	59 J	36 U								
DIELDRIN	4.4 UJ	4.2 UJ	4.2 UJ	4.45 UJ	4.7 UJ	15 J	3.5 U	3.6 U								
GAMMA-CHLORDANE	2.2 UJ	1.6 J	2.1 UJ	2.25 UJ	2.4 UJ	3.7 K	1.7 U	1.8 U								
Inorganics (mg/kg)																
ALUMINUM	10800	3380	21600	18900	16200	11100	4280	20000								
ARSENIC	3.5 L	0.87 L	3.9 L	2.8 L	1.7 L	2.2	1.2	2.3								
BARIUM	41.9	8.8	59.1	53.7	48.3	53.0	17.3	71.1								
BERYLLIUM	0.03 U	0.03 U	0.14 K	0.0775	0.03 U	0.02 U	0.02 U	0.08								

from site13_samp.dbf
from site13_resp.dbf
from site13_resp.xls
from q:\sql_server\white_oak\upload

site13_resp -
summary of positive detections

order	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016
site	013	013	013	013	013	013	013	013	013	013	013	013	013	013	013	013
location	13-SB-01	13-SB-02	13-SB-03	13-SB-03	13-SB-03	13-SB-01	13-SB-02	13-SB-03	13SB201	13SB201	13SB202	13SB202	13SB203	13SB203	13SB204	13SB204
nsample	13-SB-01	13-SB-02	13-SB-03	13-SB-03-AVG	13-SB-03-D	13-SS-01	13-SS-02	13-SS-03	13SB201-08	13SB201-10	13SB202-08	13SB202-12	13SB203-06	13SB203-12	13SB204-10	13SB204-14
sample	13-SB-01	13-SB-02	13-SB-03	13-SB-03-AVG	13-SB-03-DX	13-SS-01	13-SS-02	13-SS-03	13SB201-08	13SB201-10	13SB202-08	13SB202-12	13SB203-06	13SB203-12	13SB204-10	13SB204-14
sacode	NORMAL	NORMAL	DUP	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
depth_rang	1 - 2	1 - 2	1 - 2	1 - 2	1 - 2	0 - 1	0 - 1	0 - 1								
sample_dat	10/20/97	10/20/97	10/20/97	10/20/97	10/20/97	10/06/97	10/06/97	10/06/97	09/07/01	09/07/01	09/07/01	09/07/01	09/07/01	09/07/01	09/07/01	09/07/01
validated	T	T	T	T	T	T	T	T	Y	Y	Y	Y	Y	Y	Y	Y
cto_proj	273	273	273	273	273	273	273	273	839	839	839	839	839	839	839	839
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S
sort	**c_001**	**c_002**	**c_003**	**c_004**	**c_005**	**c_006**	**c_007**	**c_008**	**c_009**	**c_010**	**c_011**	**c_012**	**c_013**	**c_014**	**c_015**	**c_016**
CADMIUM	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.4	0.21	0.3 K								
CALCIUM	1990 K	1640 K	208 U	199 U	190 U	4970	20700	254								
CHROMIUM	19.1 J	8.6 J	28.1 J	22.75 J	17.4 J	17.8	10.8	19.9 K								
COBALT	3.7 J	0.63 U	11.0 J	11.45 J	11.9 J	6.8	2.4	21.5								
COPPER	16.1	6.3	29.8	28.45	27.1	68.4	9.0	40.9								
IRON	14000	4260	26300	24650	23000	15100	6080	30100								
LEAD	9.6 K	5.3 K	9.9 K	8.85 K	7.8 K	40.6	14.8	10.3								
MAGNESIUM	1280 J	596 J	2550 J	2650 J	2750 J	1850	3620	4060								
MANGANESE	124 J	17.9 J	375 J	381.5 J	388 J	292	82.1	699								
MERCURY	0.05	0.03	0.05	0.045	0.04	0.16	0.05	0.02 U								
NICKEL	7.0 K	4.0 K	15.1 K	15.05 K	15.0 K	19.8 K	17.2 K	24.5 K								
POTASSIUM	724	252	2180	2280	2380	995	696	3400								
SELENIUM	3.2 J	2.0 J	3.8 J	2.8 J	1.8 J	0.76 L	1.4 L	0.6 UR								
SILVER	0.21 U	0.2 U	0.2 U	0.21 U	0.22 U	0.19 U	0.16 U	0.17 U								
SODIUM	66.6 U	50.8 U	95.9 U	83.95 U	72.0 U	47.9 U	40.7 U	106								
THALLIUM	0.76 U	0.74 U	0.73 UL	0.5825	0.8	0.7 U	0.59 U	0.62 UL								
VANADIUM	28.0	11.1	39.4	31.3	23.2	21.7	11.5	25.4								
ZINC	20.1 J	6.3 J	32.2 J	33.2 J	34.2 J	70.0	18.8	54.3								
Miscellaneous Parameters (mg/kg)																
CYANIDE	0.28 U	0.26 U	0.24	0.24	0.32 U	0.26 U	0.18 U	0.23 U								
PERCENT SOLIDS (%)									95.2	90.6	95.6	86.5	93.2	89.4	89.5	91.2
PH (s.u.)	7.22	7.98	5.72	5.685	5.65	6.33	7.89	5.74								
TOTAL ORGANIC CARBON (%)										434						

from site13_samp.dbf
from site13_resp.dbf
from site13_resp.xls
from q:\sql r\white_oak\upload

site13_resp -
summary of positive detections

order	017	018	019	020	021	022	023	024	025	027	028	029	030
site	013	013	013	013	013	013	013	013	013	013	013	013	013
location	13SB205	13SB205	13SB206	13SB206	13SB207	13SB207	13TP03	13TP04	13TP04	13TP05	13TP05	13TP05	13TP05
nsample	13SB205-10	13SB205-4	13SB206-10	13SB206-14	13SB207-10	13SB207-14	13TP03SB0405	13TP04SB0405	13TP04WS0203	13TP05SB0607	13TP05WS0103	13TP05WS0103-AVG	13TP05WS0103-D
sample	13SB205-10	13SB205-4	13SB206-10	13SB206-14	13SB207-10	13SB207-14	13TP03SB0405	13TP04SB0405	13TP04WS0203	13TP05SB0607	13TP05WS0103	13TP05WS0103-AVG	FD05160201
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	AVG	DUP
depth_rang							4 - 5	4 - 5	2 - 3	6 - 7	1 - 3	1 - 3	1 - 3
sample_dat	09/07/01	09/07/01	09/20/01	09/20/01	09/20/01	09/20/01	05/16/02	05/16/02	05/16/02	05/16/02	05/16/02	05/16/02	05/16/02
validated	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
cto_proj	839	839	839	839	839	839	839	839	839	839	839	839	839
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S
sort	**c_017**	**c_018**	**c_019**	**c_020**	**c_021**	**c_022**	**c_023**	**c_024**	**c_025**	**c_027**	**c_028**	**c_029**	**c_030**
Volatile Organics (ug/kg)													
1,1,2,2-TETRACHLOROETHANE	2.79 J	12.3 U	10.1 U	17.9	10.2 U	171	11 U	11 U	12 U	13 U	11 U	11 U	
1,2-DIBROMO-3-CHLOROPROPANE	11.7 U	12.3 U	10.1 U	10.1 U	10.2 U	12.3 U	11 U	11 U	12 U	13 U	11 U	11 U	
1,2-DICHLOROBENZENE	11.7 U	12.3 U	10.1 U	10.1 U	10.2 U	12.3 U	11 U	11 U	12 U	13 U	11 U	11 U	
1,4-DICHLOROBENZENE	11.7 U	12.3 U	10.1 U	10.1 U	10.2 U	12.3 U	11 U	11 U	12 U	13 U	11 U	11 U	
2-BUTANONE							11 UJ	11 UJ	1.9 J	13 UJ	11 UJ	11 UJ	
2-HEXANONE	11.7 U	12.3 U	10.1 U	10.1 U	10.2 U	12.3 U	11 UJ	11 UJ	12 UJ	13 UJ	11 UJ	11 UJ	
ACETONE	11.7 U	12.3 U	4.05 J	10.1 U	10.2 U	12.3 U	1.7 U	3 U	10 U	2.3 U	1.5 U	1.5 U	
CHLOROMETHANE	3.15 J	2.97 J	2.97 J	3.33 J	1.92 J	5.13 J	11 U	11 U	12 U	13 U	11 U	11 U	
METHYL ACETATE	11.7 U	12.3 U	10.7	2.15 J	8.34 J	12.3 U	11 U	11 U	12 U	13 U	11 U	11 U	
TETRACHLOROETHENE	11.7 U	12.3 U	10.1 U	10.1 U	10.2 U	2.54 J	11 U	11 U	12 U	13 U	11 U	11 U	
TOTAL XYLENES	11.7 U	12.3 U	10.1 U	10.1 U	10.2 U	12.3 U	11 U	11 U	60	13 U	11 U	11 U	
TRICHLOROETHENE	2.46 J	12.3 U	10.1 U	10.1 U	10.2 U	9.85 J	11 U	11 U	12 U	13 U	11 U	11 U	
Semivolatile Organics (ug/kg)													
2-METHYLNAPHTHALENE							360 U	380 U	44 J	360 U	360 U	365 U	370 U
ACENAPHTHENE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
ANTHRACENE							360 U	380 U	58 J	360 U	360 U	365 U	370 U
BENZO(A)ANTHRACENE							360 U	380 U	58 J	360 U	360 U	365 U	370 U
BENZO(A)PYRENE							360 U	380 U	41 J	360 U	360 U	365 U	370 U
BENZO(B)FLUORANTHENE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
BENZO(G,H,I)PERYLENE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
BENZO(K)FLUORANTHENE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
BIS(2-ETHYLHEXYL)PHTHALATE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
CARBAZOLE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
CHRYSENE							360 U	380 U	71 J	360 U	360 U	365 U	370 U
DIBENZO(A,H)ANTHRACENE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
FLUORANTHENE							360 U	380 U	210 J	360 U	37 J	42 J	47 J
FLUORENE							360 U	380 U	64 J	360 U	360 U	365 U	370 U
INDENO(1,2,3-CD)PYRENE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
NAPHTHALENE							360 U	380 U	68 J	360 U	360 U	365 U	370 U
PHENANTHRENE							360 U	380 U	430	360 U	360 U	365 U	370 U
PYRENE							360 U	380 U	240 J	360 U	360 U	41 J	41 J
Pesticides/PCBs (ug/kg)													
4,4'-DDD							1.9 U	2 U	0.61 J	1.9 U	1.9 U	1.9 U	0.85 R
4,4'-DDE							1.9 U	2 U	2 U	1.9 U	0.49 J	0.59 J	0.69 J
4,4'-DDT							1.9 U	2 U	2 U	1.9 U	0.34 R	0.38 R	0.42 R
ALPHA-CHLORDANE							1.9 U	2 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U
AROCLOR-1260							36 U	38 U	39 U	36 U	100	105	110
DIELDRIN							1.9 U	2 U	2 U	1.9 U	0.29 J	0.335 J	0.38 J
GAMMA-CHLORDANE							1.9 U	2 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U
Inorganics (mg/kg)													
ALUMINUM							2180	768	4740	4430	5640	6675	7710
ARSENIC							2.3	0.62	2.4	2.0	1.3 K	1.8 K	2.3 K
BARIUM							2.4	1.8	15.8	6.4	24.3	29.3	34.3
BERYLLIUM							0.17 U	0.13 U	0.36 U	0.18 U	0.97	0.675	0.76 U

from site13_samp.dbf
from site13_resp.dbf
from site13_resp.xls
from q:\sql_server\white_oak\upload

site13_resp -
summary of positive detections

order	017	018	019	020	021	022	023	024	025	027	028	029	030
site	013	013	013	013	013	013	013	013	013	013	013	013	013
location	13SB205	13SB205	13SB206	13SB206	13SB207	13SB207	13TP03	13TP04	13TP04	13TP05	13TP05	13TP05	13TP05
nsample	13SB205-10	13SB205-4	13SB206-10	13SB206-14	13SB207-10	13SB207-14	13TP03SB0405	13TP04SB0405	13TP04WS0203	13TP05SB0607	13TP05WS0103	13TP05WS0103-AVG	13TP05WS0103-D
sample	13SB205-10	13SB205-4	13SB206-10	13SB206-14	13SB207-10	13SB207-14	13TP03SB0405	13TP04SB0405	13TP04WS0203	13TP05SB0607	13TP05WS0103	13TP05WS0103-AVG	FD05160201
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	AVG	DUP
depth_rang							4 - 5	4 - 5	2 - 3	6 - 7	1 - 3	1 - 3	1 - 3
sample_dat	09/07/01	09/07/01	09/20/01	09/20/01	09/20/01	09/20/01	05/16/02	05/16/02	05/16/02	05/16/02	05/16/02	05/16/02	05/16/02
validated	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
cto_proj	839	839	839	839	839	839	839	839	839	839	839	839	839
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S
sort	**c_017**	**c_018**	**c_019**	**c_020**	**c_021**	**c_022**	**c_023**	**c_024**	**c_025**	**c_027**	**c_028**	**c_029**	**c_030**
CADMIUM							0.019 U	0.02 U	0.02 U	0.019 U	0.019 U	0.0358 K	0.062 K
CALCIUM							75.8 U	105 U	553	60.2 U	722	886	1050
CHROMIUM							4.2	2.2	8.3	7.1	11.5	14.2	16.9
COBALT							0.2	0.094 U	3.1	0.31	6.3	8.45	10.6
COPPER							2.2 J	1.3 J	11.9 J	4.1 J	17.4 J	23.9 J	30.4 J
IRON							4230	1760	6540	5890	15200 J	27100 J	39000 J
LEAD							0.9	1.3	7.3	2.2	7.5	8.55	9.6
MAGNESIUM							35.4	39.5	279	95.5	1890	3630	5370
MANGANESE							3.0 J	3.9 J	28.0 J	5.6 J	213 J	291 J	369 J
MERCURY							0.039	0.037	0.022	0.037	0.13	0.12	0.11
NICKEL							0.38 J	0.38 J	2.5 J	0.87 J	30.7 J	48.1 J	65.5 J
POTASSIUM							38.1	26.9	161	61.8	912	1171	1430
SELENIUM							0.37 U	0.43	2.9	0.88	1.2	1.55	1.9
SILVER							0.067 U	0.07 U	0.073 U	0.067 U	0.073	0.1415	0.21
SODIUM							16.1 U	59.7 U	17.5 U	40.4 U	22.7 U	20.9 U	19.1 U
THALLIUM							0.64	0.39 U	0.7	0.77	1.2 K	2.1 K	3.0 K
VANADIUM							8.4	4.1	16.3	12.9	11.5	13.25	15.0
ZINC							1.6 U	1.4 U	11.1	2.8 U	22.1	29.2	36.3
Miscellaneous Parameters (mg/kg)													
CYANIDE													
PERCENT SOLIDS (%)	93.3	95					91.2	87.1	83.8	91.2	90.7	89.65	88.6
PH (s.u.)													
TOTAL ORGANIC CARBON (%)													

from site13_samp.dbf
from site13_resp.dbf
from site13_resp.xls
from q:\sql\white_oak\upload

site13_resp -
summary of positive detections

order	034	035
site	013	013
location	13TP06	13TP07
nsample	13TP06SB0203	13TP07SB0304
sample	13TP06SB0203	13TP07SB0304
sacode	NORMAL	NORMAL
depth_rang	2 - 3	3 - 4
sample_dat	05/16/02	05/16/02
validated	Y	Y
cto_proj	839	839
proj_manag	NESBIT,S	NESBIT,S
sort	**c_034**	**c_035**
Volatile Organics (ug/kg)		
1,1,2,2-TETRACHLOROETHANE	12 U	12 U
1,2-DIBROMO-3-CHLOROPROPANE	12 U	12 U
1,2-DICHLOROBENZENE	12 U	12 U
1,4-DICHLOROBENZENE	12 U	12 U
2-BUTANONE	12 U	12 UJ
2-HEXANONE	12 U	12 UJ
ACETONE	5.6 U	1.8 U
CHLOROMETHANE	12 U	12 U
METHYL ACETATE	12 U	12 U
TETRACHLOROETHENE	12 U	12 U
TOTAL XYLENES	12 U	12 U
TRICHLOROETHENE	12 U	12 U
Semivolatile Organics (ug/kg)		
2-METHYLNAPHTHALENE	380 U	370 U
ACENAPHTHENE	380 U	370 U
ANTHRACENE	380 U	370 U
BENZO(A)ANTHRACENE	380 U	370 U
BENZO(A)PYRENE	380 U	370 U
BENZO(B)FLUORANTHENE	380 U	370 U
BENZO(G,H,I)PERYLENE	380 U	370 U
BENZO(K)FLUORANTHENE	380 U	370 U
BIS(2-ETHYLHEXYL)PHTHALATE	380 U	370 U
CARBAZOLE	380 U	370 U
CHRYSENE	380 U	370 U
DIBENZO(A,H)ANTHRACENE	380 U	370 U
FLUORANTHENE	380 U	370 U
FLUORENE	380 U	370 U
INDENO(1,2,3-CD)PYRENE	380 U	370 U
NAPHTHALENE	380 U	370 U
PHENANTHRENE	380 U	370 U
PYRENE	380 U	370 U
Pesticides/PCBs (ug/kg)		
4,4'-DDD	1.9 U	1.9 U
4,4'-DDE	1.9 U	1.9 U
4,4'-DDT	1.9 U	1.9 U
ALPHA-CHLORDANE	1.9 U	1.9 U
AROCLOR-1260	38 U	37 U
DIELDRIN	1.9 U	1.9 U
GAMMA-CHLORDANE	1.9 U	1.9 U
Inorganics (mg/kg)		
ALUMINUM	4690	2810
ARSENIC	2.4	2.5
BARIUM	5.3	5.0
BERYLLIUM	0.16 U	0.19 U

from site13_samp.dbf
from site13_resp.dbf
from site13_resp.xls
from q:\sql_server\white_oak\upload

site13_resp -
summary of positive detections

order	034	035
site	013	013
location	13TP06	13TP07
nsample	13TP06SB0203	13TP07SB0304
sample	13TP06SB0203	13TP07SB0304
sacode	NORMAL	NORMAL
depth_rang	2 - 3	3 - 4
sample_dat	05/16/02	05/16/02
validated	Y	Y
cto_proj	839	839
proj_manag	NESBIT,S	NESBIT,S
sort	**c_034**	**c_035**
CADMIUM	0.019 U	0.019 U
CALCIUM	213 U	33.6 U
CHROMIUM	7.4	6.7
COBALT	0.37	0.16
COPPER	5.1 J	3.5 J
IRON	6140	6480
LEAD	2.1	2.0
MAGNESIUM	107	45.5
MANGANESE	5.9 J	5.4 J
MERCURY	0.036	0.042
NICKEL	0.85 J	0.42 J
POTASSIUM	97.6	52.0
SELENIUM	0.69	0.63
SILVER	0.07 U	0.069 U
SODIUM	38.1 U	101 U
THALLIUM	0.74	0.48
VANADIUM	13.1	13.7
ZINC	3.8 U	2.0 U
Miscellaneous Parameters (mg/kg)		
CYANIDE		
PERCENT SOLIDS (%)	87.7	88
PH (s.u.)		
TOTAL ORGANIC CARBON (%)		

from site13_samp.dbf
from site13_resp.dbf
from site13_resp.xls
from q:\sql \white_oak\upload

SITE 5

ANALYTICAL DATA

order	001	002	003	004	005	006	007	008	009	010	011
site	005	005	005	005	005	005	005	005	005	005	005
location	05-SB-01	05-SB-02	05-SB-02	05-SB-101	05-SB-02	05-SB-03	05-SB-03	05-SB-04	05-SB-04	05-SB-05	05-SB-05
nsample	05-SB-01-8_OLD	05-SB-02-10_OLD	05-SB-02-10_OLD-AVG	05-SB-02-10_OLD-D	05-SB-02-22_OLD	05-SB-03-12_OLD	05-SB-03-25_OLD	05-SB-04-20_OLD	05-SB-04-6_OLD	05-SB-05-25_OLD	05-SB-05-2_OLD
sample	05-SB-01(8)	05-SB-02(10)	05-SB-02-10_OLD-AVG	05-SB-101	05-SB-02(22)	05-SB-03(12)	05-SB-03(25)	05-SB-04(20)	05-SB-04(6)	05-SB-05(25)	05-SB-05(2)
matrix	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
sacode	NORMAL	DUP	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
depth_rang	8 - 10	10 - 12	10 - 12	10 - 12	22 - 24	12 - 14	25 - 27	20 - 22	6 - 8	25 - 27	2 - 4
sample_dat	10/21/97	10/22/97	10/22/97	10/22/97	10/22/97	10/21/97	10/22/97	10/21/97	10/21/97	10/22/97	10/20/97
validated	T	T	T	T	T	T	T	T	T	T	T
cto_proj	273	273	273	273	273	273	273	273	273	273	273
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S
sort	c_001	c_002	c_003	c_004	c_005	c_006	c_007	c_008	c_009	c_010	c_011
Volatile Organics (ug/kg)											
1,1,1-TRICHLOROETHANE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 U	15 U	74 U
1,1,2,2-TETRACHLOROETHANE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 UJ	15 U	74 U
1,1,2-TRICHLOROETHANE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 U	15 U	74 U
1,1,2-TRICHLOROTRIFLUOROETHANE											
1,1-DICHLOROETHANE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 U	15 U	74 U
1,1-DICHLOROETHENE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 U	15 U	74 U
1,2 DICHLOROBENZENE											
1,2,4 TRICHLOROBENZENE											
1,2-DIBROMO-3-CHLOROPROPANE											
1,2-DIBROMOETHANE											
1,2-DICHLOROETHANE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 U	15 U	74 U
1,2-DICHLOROPROPANE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 U	15 U	74 U
1,3 DICHLOROBENZENE											
1,4 DICHLOROBENZENE											
2-BUTANONE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 UJ	15 U	74 U
2-HEXANONE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 UJ	15 U	74 U
4-METHYL-2-PENTANONE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 U	15 U	74 U
ACETONE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	86	15 U	130
BENZENE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 U	15 U	74 U
BROMODICHLOROMETHANE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 U	15 U	74 U
BROMOFORM	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 U	15 U	74 U
BROMOMETHANE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 U	15 U	74 U
CARBON DISULFIDE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 U	15 UJ	74 U
CARBON TETRACHLORIDE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 U	15 U	74 U
CHLOROBENZENE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 UJ	15 U	74 U
CHLORODIBROMOMETHANE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 U	15 U	74 U
CHLOROETHANE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 U	15 U	74 U
CHLOROFORM	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 U	15 U	74 U
CHLOROMETHANE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 U	15 U	74 U
CIS-1,2-DICHLOROETHENE											
CIS-1,3-DICHLOROPROPENE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 U	15 U	74 U
CYCLOHEXANE											
DICHLORODIFLUOROMETHANE											
ETHYLBENZENE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 UJ	15 U	74 U
ISOPROPYLBENZENE											
METHYL ACETATE											
METHYL CYCLOHEXANE											
METHYL TERT-BUTYL ETHER											
METHYLENE CHLORIDE	7 U	11 U	8.5 U	6 U	7 U	6 U	6 U	7 U	12 U	8 U	37 U
STYRENE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 UJ	15 U	74 U
TETRACHLOROETHENE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 UJ	15 U	74 U
TOLUENE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 UJ	15 U	92
TOTAL 1,2-DICHLOROETHENE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 U	15 U	74 U
TOTAL XYLENES	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 UJ	15 U	74 U
TRANS-1,2-DICHLOROETHENE											
TRANS-1,3-DICHLOROPROPENE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 U	15 U	74 U

from site5_sam.dbf
from site5_res.dbf
from site5_res.xls
from q:\sql_server\white_oak\upload

site5_res -
full appendix results

order	001	002	003	004	005	006	007	008	009	010	011
site	005	005	005	005	005	005	005	005	005	005	005
location	05-SB-01	05-SB-02	05-SB-02	05-SB-101	05-SB-02	05-SB-03	05-SB-03	05-SB-04	05-SB-04	05-SB-05	05-SB-05
nsample	05-SB-01-8_OLD	05-SB-02-10_OLD	05-SB-02-10_OLD-AVG	05-SB-02-10_OLD-D	05-SB-02-22_OLD	05-SB-03-12_OLD	05-SB-03-25_OLD	05-SB-04-20_OLD	05-SB-04-6_OLD	05-SB-05-25_OLD	05-SB-05-2_OLD
sample	05-SB-01(8)	05-SB-02(10)	05-SB-02-10_OLD-AVG	05-SB-101	05-SB-02(22)	05-SB-03(12)	05-SB-03(25)	05-SB-04(20)	05-SB-04(6)	05-SB-05(25)	05-SB-05(2)
matrix	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
sacode	NORMAL	DUP	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
depth_rang	8 - 10	10 - 12	10 - 12	10 - 12	22 - 24	12 - 14	25 - 27	20 - 22	6 - 8	25 - 27	2 - 4
sample_dat	10/21/97	10/22/97	10/22/97	10/22/97	10/22/97	10/21/97	10/22/97	10/21/97	10/21/97	10/22/97	10/20/97
validated	T	T	T	T	T	T	T	T	T	T	T
cto_proj	273	273	273	273	273	273	273	273	273	273	273
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S
sort	**c_001**	**c_002**	**c_003**	**c_004**	**c_005**	**c_006**	**c_007**	**c_008**	**c_009**	**c_010**	**c_011**
TRICHLOROETHENE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 U	15 U	74 U
TRICHLOROFLUOROMETHANE											
VINYL CHLORIDE	11 U	11 U	11 U	11 U	11 U	12 U	11 U	12 U	12 U	15 U	74 U
Semivolatile Organics (ug/kg)											
1,1-BIPHENYL											
1,2,4-TRICHLOROBENZENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
1,2-DICHLOROBENZENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
1,3-DICHLOROBENZENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
1,4-DICHLOROBENZENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
2,2'-OXYBIS(1-CHLOROPROPANE)	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
2,4 DINITROTOLUENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
2,4,5-TRICHLOROPHENOL	930 UJ	930 UJ	935 UJ	940 UJ	950 UJ	970 UJ	920 UJ	990 UJ	970 UJ	1300 UJ	1200 UJ
2,4,6-TRICHLOROPHENOL	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
2,4-DICHLOROPHENOL	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
2,4-DIMETHYLPHENOL	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
2,4-DINITROPHENOL	930 UJ	930 UJ	935 UJ	940 UJ	950 UJ	970 UJ	920 UJ	990 UJ	970 UJ	1300 UJ	1200 UJ
2,6 DINITROTOLUENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
2-CHLORONAPHTHALENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
2-CHLOROPHENOL	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
2-METHYLNAPHTHALENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
2-METHYLPHENOL	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
2-NITROANILINE	930 UJ	930 UJ	935 UJ	940 UJ	950 UJ	970 UJ	920 UJ	990 UJ	970 UJ	1300 UJ	1200 UJ
2-NITROPHENOL	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
3,3'-DICHLOROBENZIDINE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
3-NITROANILINE	930 UJ	930 UJ	935 UJ	940 UJ	950 UJ	970 UJ	920 UJ	990 UJ	970 UJ	1300 UJ	1200 UJ
4,6-DINITRO-2-METHYLPHENOL	930 UJ	930 UJ	935 UJ	940 UJ	950 UJ	970 UJ	920 UJ	990 UJ	970 UJ	1300 UJ	1200 UJ
4-BROMOPHENYL PHENYL ETHER	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
4-CHLORO-3-METHYLPHENOL	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
4-CHLOROANILINE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
4-CHLOROPHENYL PHENYL ETHER	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
4-METHYLPHENOL	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
4-NITROANILINE	930 UJ	930 UJ	935 UJ	940 UJ	950 UJ	970 UJ	920 UJ	990 UJ	970 UJ	1300 UJ	1200 UJ
4-NITROPHENOL	930 UJ	930 UJ	935 UJ	940 UJ	950 UJ	970 UJ	920 UJ	990 UJ	970 UJ	1300 UJ	1200 UJ
ACENAPHTHENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
ACENAPHTHYLENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
ACETOPHENONE											
ANTHRACENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	68 J	56 J	140 J
ATRAZINE											
BENZALDEHYDE											
BENZO(A)ANTHRACENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	240 J	230 J	550 J
BENZO(A)PYRENE	370 UJ	370 UJ	250 J	250 J	62 J	390 UJ	370 UJ	400 UJ	220 J	180 J	500 J
BENZO(B)FLUORANTHENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	290 J	220 J	630 J
BENZO(G,H,I)PERYLENE	370 UJ	370 UJ	347.5 J	510 J	550 J	390 UJ	370 UJ	400 UJ	140 J	100 J	300 J
BENZO(K)FLUORANTHENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	120 J	130 J	290 J
BIS(2-CHLOROETHOXY)METHANE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
BIS(2-CHLOROETHYL)ETHER	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	370 UJ	51 J	51 J	51 J	380 UJ	58 J	370 UJ	400 UJ	230 J	210 J	190 J

from site5_sam.dbf
from site5_res.dbf
from site5_res.dbs
from q:\sql_____white_oak\upload

order	001	002	003	004	005	006	007	008	009	010	011
site	005	005	005	005	005	005	005	005	005	005	005
location	05-SB-01	05-SB-02	05-SB-02	05-SB-101	05-SB-02	05-SB-03	05-SB-03	05-SB-04	05-SB-04	05-SB-05	05-SB-05
nsample	05-SB-01-8_OLD	05-SB-02-10_OLD	05-SB-02-10_OLD-AVG	05-SB-02-10_OLD-D	05-SB-02-22_OLD	05-SB-03-12_OLD	05-SB-03-25_OLD	05-SB-04-20_OLD	05-SB-04-6_OLD	05-SB-05-25_OLD	05-SB-05-2_OLD
sample	05-SB-01(8)	05-SB-02(10)	05-SB-02-10_OLD-AVG	05-SB-101	05-SB-02(22)	05-SB-03(12)	05-SB-03(25)	05-SB-04(20)	05-SB-04(6)	05-SB-05(25)	05-SB-05(2)
matrix	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
sacode	NORMAL	DUP	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
depth_rang	8 - 10	10 - 12	10 - 12	10 - 12	22 - 24	12 - 14	25 - 27	20 - 22	6 - 8	25 - 27	2 - 4
sample_dat	10/21/97	10/22/97	10/22/97	10/22/97	10/22/97	10/21/97	10/22/97	10/21/97	10/21/97	10/22/97	10/20/97
validated	T	T	T	T	T	T	T	T	T	T	T
cto_proj	273	273	273	273	273	273	273	273	273	273	273
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S
sort	**c_001**	**c_002**	**c_003**	**c_004**	**c_005**	**c_006**	**c_007**	**c_008**	**c_009**	**c_010**	**c_011**
BUTYL BENZYL PHTHALATE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
CAPROLACTAM											
CARBAZOLE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	78 J
CHRYSENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	210 J	200 J	490 J
DI-N-BUTYL PHTHALATE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	39 J	510 UJ	490 UJ
DI-N-OCTYL PHTHALATE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
DIBENZO(A,H)ANTHRACENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	43 J	510 UJ	120 J
DIBENZOFURAN	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
DIETHYL PHTHALATE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
DIMETHYL PHTHALATE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
FLUORANTHENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	350 J	370 J	960 J
FLUORENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	66 J
HEXACHLOROBENZENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
HEXACHLOROBUTADIENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
HEXACHLOROCYCLOPENTADIENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
HEXACHLOROETHANE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
INDENO(1,2,3-CD)PYRENE	370 UJ	370 UJ	140 J	140 J	380 UJ	390 UJ	370 UJ	400 UJ	140 J	110 J	330 J
ISOPHORONE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
N-NITROSO-DI-N-PROPYLAMINE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
N-NITROSODIPHENYLAMINE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
NAPHTHALENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	55 J	510 UJ	97 J
NITROBENZENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
PENTACHLOROPHENOL	930 UJ	930 UJ	935 UJ	940 UJ	950 UJ	970 UJ	920 UJ	990 UJ	970 UJ	1300 UJ	1200 UJ
PHENANTHRENE	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	280 J	270 J	600 J
PHENOL	370 UJ	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	370 UJ	400 UJ	390 UJ	510 UJ	490 UJ
PYRENE	370 UJ	370 UJ	160 J	160 J	380 UJ	390 UJ	370 UJ	400 UJ	350 J	400 J	880 J
Pesticides/PCBs (ug/kg)											
4,4'-DDD	3.7 UJ	3.7 UJ	3.75 UJ	3.8 UJ	3.8 UJ	3.9 UJ	3.7 UJ	4 UJ	3.9 UJ	5 UJ	4.9 UJ
4,4'-DDE	3.7 UJ	3.7 UJ	3.75 UJ	3.8 UJ	3.8 UJ	3.9 UJ	3.7 UJ	4 UJ	4.2 J	5 UJ	22 J
4,4'-DDT	3.7 UJ	3.7 UJ	3.75 UJ	3.8 UJ	3.8 UJ	3.9 UJ	3.7 UJ	4 UJ	3.9 UJ	5 UJ	4.9 U
ALDRIN	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.8 UJ	2 UJ	1.9 UJ	2.5 UJ	2.5 UJ
ALPHA-BHC	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.8 UJ	2 UJ	1.9 UJ	2.5 UJ	2.5 UJ
ALPHA-CHLORDANE	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.8 UJ	2 UJ	94 J	2.5 UJ	160 J
AROCLOR-1016	37 UJ	37 UJ	37.5 UJ	38 UJ	38 UJ	39 UJ	37 UJ	40 UJ	39 UJ	50 UJ	49 UJ
AROCLOR-1221	74 UJ	74 UJ	74.5 UJ	75 UJ	76 UJ	77 UJ	73 UJ	79 UJ	78 UJ	100 UJ	99 UJ
AROCLOR-1232	37 UJ	37 UJ	37.5 UJ	38 UJ	38 UJ	39 UJ	37 UJ	40 UJ	39 UJ	50 UJ	49 UJ
AROCLOR-1242	37 UJ	37 UJ	37.5 UJ	38 UJ	38 UJ	39 UJ	37 UJ	40 UJ	39 UJ	50 UJ	49 UJ
AROCLOR-1248	37 UJ	37 UJ	37.5 UJ	38 UJ	38 UJ	39 UJ	37 UJ	40 UJ	39 UJ	50 UJ	49 UJ
AROCLOR-1254	37 UJ	37 UJ	37.5 UJ	38 UJ	38 UJ	39 UJ	37 UJ	40 UJ	39 UJ	50 UJ	49 UJ
AROCLOR-1260	37 UJ	37 UJ	37.5 UJ	38 UJ	38 UJ	39 UJ	37 UJ	40 UJ	460 J	50 UJ	1200 J
BETA-BHC	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.8 UJ	2 UJ	1.9 UJ	2.5 UJ	2.5 UJ
DELTA-BHC	1.8 UJ	0.3 J	0.3 J	1.9 UJ	0.22 J	1.9 UJ	1.8 UJ	2 UJ	1.9 UJ	2.5 UJ	2.5 UJ
DIELDRIN	3.7 UJ	3.7 UJ	3.75 UJ	3.8 UJ	3.8 UJ	3.9 UJ	3.7 UJ	4 UJ	6.8 J	5 UJ	53 J
ENDOSULFAN I	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.8 UJ	2 UJ	1.9 UJ	2.5 UJ	2.5 UJ
ENDOSULFAN II	3.7 UJ	3.7 UJ	3.75 UJ	3.8 UJ	3.8 UJ	3.9 UJ	3.7 UJ	4 UJ	3.9 UJ	0.86 J	4.9 UJ
ENDOSULFAN SULFATE	3.7 UJ	3.7 UJ	3.75 UJ	3.8 UJ	3.8 UJ	3.9 UJ	3.7 UJ	4 UJ	3.9 UJ	5 UJ	4.9 UJ
ENDRIN	3.7 UJ	3.7 UJ	3.75 UJ	3.8 UJ	3.8 UJ	3.9 UJ	3.7 UJ	4 UJ	3.9 UJ	5 UR	4.9 UR

from site5_sam.dbf
from site5_res.dbf
from site5_res.xls
from q:\sql_server\white_oak\upload

site5_res -
full appendix results

order	001	002	003	004	005	006	007	008	009	010	011
site	005	005	005	005	005	005	005	005	005	005	005
location	05-SB-01	05-SB-02	05-SB-02	05-SB-101	05-SB-02	05-SB-03	05-SB-03	05-SB-04	05-SB-04	05-SB-05	05-SB-05
nsample	05-SB-01-8_OLD	05-SB-02-10_OLD	05-SB-02-10_OLD-AVG	05-SB-02-10_OLD-D	05-SB-02-22_OLD	05-SB-03-12_OLD	05-SB-03-25_OLD	05-SB-04-20_OLD	05-SB-04-6_OLD	05-SB-05-25_OLD	05-SB-05-2_OLD
sample	05-SB-01(8)	05-SB-02(10)	05-SB-02-10_OLD-AVG	05-SB-101	05-SB-02(22)	05-SB-03(12)	05-SB-03(25)	05-SB-04(20)	05-SB-04(6)	05-SB-05(25)	05-SB-05(2)
matrix	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
sacode	NORMAL	DUP	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
depth_rang	8 - 10	10 - 12	10 - 12	10 - 12	22 - 24	12 - 14	25 - 27	20 - 22	6 - 8	25 - 27	2 - 4
sample_dat	10/21/97	10/22/97	10/22/97	10/22/97	10/22/97	10/21/97	10/22/97	10/21/97	10/21/97	10/22/97	10/20/97
validated	T	T	T	T	T	T	T	T	T	T	T
cto_proj	273	273	273	273	273	273	273	273	273	273	273
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S
sort	**c_001**	**c_002**	**c_003**	**c_004**	**c_005**	**c_006**	**c_007**	**c_008**	**c_009**	**c_010**	**c_011**
ENDRIN ALDEHYDE	3.7 UJ	3.7 UJ	3.75 UJ	3.8 UJ	3.8 UJ	3.9 UJ	3.7 UJ	4 UJ	3.9 UJ	5 UJ	4.9 UJ
ENDRIN KETONE	3.7 UJ	3.7 UJ	3.75 UJ	3.8 UJ	3.8 UJ	3.9 UJ	3.7 UJ	4 UJ	3.9 UJ	2.6 J	11 J
GAMMA-BHC (LINDANE)	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.8 UJ	2 UJ	1.9 UJ	2.5 UJ	2.5 UJ
GAMMA-CHLORDANE	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.8 UJ	2 UJ	100 J	2.5 UJ	140 J
HEPTACHLOR	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.8 UJ	2 UJ	5.7 J	2.5 UJ	2.5 UJ
HEPTACHLOR EPOXIDE	1.8 UJ	0.27 J	0.25 J	0.23 J	0.25 J	1.9 UJ	0.17 J	2 UJ	1.9 UJ	2.5 UJ	2.5 UJ
METHOXYCHLOR	18 UJ	19 UJ	19 UJ	19 UJ	19 UJ	19 UJ	18 UJ	20 UJ	19 UJ	25 UJ	25 UJ
TOXAPHENE	180 UJ	190 UJ	190 UJ	190 UJ	190 UJ	190 UJ	180 UJ	200 UJ	190 UJ	250 UJ	250 UJ
Explosives (ug/kg)											
1,3,5-TRINITROBENZENE	40.2 U	40.2 U	40.2 U	40.2 U	40.2 U	40.2 U	40.2 U	40.2 U	40.2 UJ	40.2 U	40.2 UJ
1,3-DINITROBENZENE	37.2 U	37.2 U	37.2 U	37.2 U	37.2 U	37.2 U	37.2 U	37.2 U	37.2 UJ	37.2 U	37.2 UJ
2,4,6-TRINITROTOLUENE	35.6 U	35.6 U	35.6 U	35.6 U	35.6 U	35.6 U	35.6 U	35.6 U	35.6 UJ	92 U	9820 J
2,4-DINITROTOLUENE	51.6 U	51.6 U	51.6 U	51.6 U	51.6 U	51.6 U	51.6 U	51.6 U	51.6 UJ	51.6 U	51.6 UJ
2,6-DINITROTOLUENE	47.6 U	47.6 U	47.6 U	47.6 U	47.6 U	47.6 U	47.6 U	47.6 U	47.6 UJ	47.6 U	47.6 UJ
2-AMINO-4,6-DINITROTOLUENE	46.7 U	46.7 U	46.7 U	46.7 U	46.7 U	46.7 U	46.7 U	46.7 U	46.7 UJ	46.7 U	1070 J
2-NITROTOLUENE	81.4 U	81.4 U	81.4 U	81.4 U	81.4 U	81.4 U	81.4 U	81.4 U	81.4 UJ	81.4 U	81.4 UJ
3-NITROTOLUENE	81.8 U	81.8 U	81.8 U	81.8 U	81.8 U	81.8 U	81.8 U	81.8 U	81.8 UJ	81.8 U	81.8 UJ
4-AMINO-2,6-DINITROTOLUENE	40.9 U	40.9 U	40.9 U	40.9 U	40.9 U	40.9 U	40.9 U	40.9 U	40.9 UJ	40.9 U	40.9 UJ
4-NITROTOLUENE	87.2 U	87.2 U	87.2 U	87.2 U	87.2 U	87.2 U	87.2 U	87.2 U	87.2 UJ	87.2 U	87.2 UJ
HMX	73 U	70.5 U	70.5 U	70.5 U	70.5 U	70.5 U	70.5 U	73 U	73 UJ	73 U	5480 J
NITRO-BENZENE	35.2 U	35.2 U	35.2 U	35.2 U	35.2 U	35.2 U	35.2 U	35.2 U	35.2 UJ	35.2 U	35.2 UJ
RDX	50.9 U	50.9 U	50.9 U	50.9 U	50.9 U	50.9 U	50.9 U	50.9 U	50.9 UJ	50.9 U	30800 J
TETRYL	163 U	163 UJ	163 UJ	163 UJ	163 UJ	163 UJ	163 UJ	163 U	163 UJ	163 U	163 UJ
Inorganics (mg/kg)											
ALUMINUM	2070	3490 J	3925 J	4360 J	2160 J	8410 J	3060 J	8370	9990	2380	10300
ANTIMONY	0.57 UL	0.62 UL	0.625 UL	0.63 UL	0.63 UL	0.65 UL	0.6 UL	2.3 L	2.5 L	0.79 UL	3.1 L
ARSENIC	2.4 L	1.2 U	2.1 U	3.0 U	2.0 U	6.6 J	0.81 U	3.4 L	5	1.0 U	4.0 L
BARIUM	5.2	5.4	5.95	6.5	4.2	57.2	3.2	253	119	30.6	312
BERYLLIUM	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.03 U	0.03 U
CADMIUM	0.07 U	0.07 U	0.07 U	0.07 U	0.08 U	0.07 U	0.06 U	2.0 K	3.2 K	0.31 U	2.5 K
CALCIUM	40.4 U	51.2 U	48.1 U	45.0 U	63.0 U	92.4 U	41.2 U	34400	12000	1150 K	42400
CHROMIUM	13.1 J	5.7 J	8.05 J	10.4 J	9.9 J	35.0 J	4.6 J	29.1 J	37.3 J	14.3 J	35.7 J
COBALT	0.1 U	0.26 U	0.28 U	0.3 U	0.14 UJ	0.59 U	0.13 U	3.4 J	5.5 J	0.12	4.3 J
COPPER	28.5	4.3	28.1	51.9	31.4	29.9	3.8	511	313	46.7	630
IRON	5580	3450 J	6500 J	9550 J	6140 J	16300 J	2610 J	18000	24900	12400	22200
LEAD	3.1 K	1.7 J	2.2 J	2.7 J	2.5 J	5.3 J	1.3 J	147 K	687 K	16.6 K	181 K
MAGNESIUM	58.2 U	101 K	112 K	123 K	63.8 U	192 K	72.4 K	2440 J	3190 J	250 J	3010 J
MANGANESE	4.3 J	3.7 J	4.4 J	5.1 J	3.6 J	12.6 J	3.7 J	186 J	253 J	32.9 J	229 J
MERCURY	0.06	0.1	0.075	0.05	0.07	0.07	0.03	0.02	2.3	0.03	1.8
NICKEL	0.42 K	0.87 U	1.035 U	1.2 U	0.28 U	2.1 K	0.4 U	24.6	52	1.6 K	30
POTASSIUM	160	171	174.5	178	138	328	91.7	556	599	316	689
SELENIUM	18.2 J	1.1 J	25.35 J	49.6 J	25.6 J	17.5 J	1.4 J	4.2 J	2.9 J	0.85 UJ	4.5 J
SILVER	0.18 U	0.2 U	0.2 U	0.2 U	0.2 U	0.21 U	0.19 U	14.2	7.6	0.24	17.8
SODIUM	43.9 UJ	44.4 U	36.7 UL	29.0 UL	48.2 U	61.3 U	27.8 UL	666 J	787 J	159 U	837 J
THALLIUM	0.64 U	0.51 U	0.51 U	0.51 U	0.52 U	0.53 U	0.49 U	0.68 UL	0.66 UL	0.88 U	0.84 UL
VANADIUM	28.2	9.3	13.65	18	15	44.8	7.4	39.1	17.1	13.4	48.5
ZINC	1.8 U	2.0 J	2.45 J	2.9 J	1.7 J	5.6 J	1.7 J	519 J	509 J	11.6 J	641 J

from site5_sam.dbf
from site5_res.dbf
from site5_re[illegible]
from q:\sql white_oak\upload

order	001	002	003	004	005	006	007	008	009	010	011
site	005	005	005	005	005	005	005	005	005	005	005
location	05-SB-01	05-SB-02	05-SB-02	05-SB-101	05-SB-02	05-SB-03	05-SB-03	05-SB-04	05-SB-04	05-SB-05	05-SB-05
nsample	05-SB-01-8_OLD	05-SB-02-10_OLD	05-SB-02-10_OLD-AVG	05-SB-02-10_OLD-D	05-SB-02-22_OLD	05-SB-03-12_OLD	05-SB-03-25_OLD	05-SB-04-20_OLD	05-SB-04-6_OLD	05-SB-05-25_OLD	05-SB-05-2_OLD
sample	05-SB-01(8)	05-SB-02(10)	05-SB-02-10_OLD-AVG	05-SB-101	05-SB-02(22)	05-SB-03(12)	05-SB-03(25)	05-SB-04(20)	05-SB-04(6)	05-SB-05(25)	05-SB-05(2)
matrix	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
sacode	NORMAL	DUP	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
depth_rang	8 - 10	10 - 12	10 - 12	10 - 12	22 - 24	12 - 14	25 - 27	20 - 22	6 - 8	25 - 27	2 - 4
sample_dat	10/21/97	10/22/97	10/22/97	10/22/97	10/22/97	10/21/97	10/22/97	10/21/97	10/21/97	10/22/97	10/20/97
validated	T	T	T	T	T	T	T	T	T	T	T
cto_proj	273	273	273	273	273	273	273	273	273	273	273
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S
sort	c_001	c_002	c_003	c_004	c_005	c_006	c_007	c_008	c_009	c_010	c_011
Miscellaneous Parameters (mg/kg)											
CYANIDE	0.19 U	0.22 U	0.23 U	0.24 U	0.28 U	0.21 U	0.22 U	0.24 U	0.24 U	0.34	0.35
PERCENT SOLIDS (%)											
PH (S.U.)	4.66 S.U.	5.08 S.U.	5.115 S.U.	5.15 S.U.	5.49 S.U.	5.35 S.U.	4.99 S.U.	7.85 S.U.	7.87 S.U.	8.36 S.U.	8.39 S.U.

from site5_sam.dbf
from site5_res.dbf
from site5_res.xls
from q:\sql_server\white_oak\upload

site5_res -
full appendix results

order	012	013	014	015	016	017	018	019	020	021
site	005	005	005					.NULL.		
location	05-SB-100	05-SB-100	05-SB-01	05TP01	05TP01	05TP08	05TP09	05TP09	05TP09	05TP10
nsample	05-SB-100_OLD	05-SB-100_OLD-AVG	05-SB-100_OLD-D	05TP01SB0507[Q2]	05TP01WS0204[Q2]	05TP08SB0506[Q2]	05TP09SB0506[Q2]	05TP09SB0506[Q2]-AVG	05TP09SB0506[Q2]-D	05TP10SB0506[Q2]
sample	05-SB-100	05-SB-100_OLD-AVG	05-SB-01(24)	05TP01SB0507	05TP01WS0204	05TP08SB0506	05TP09SB0506	05TP09SB0506[Q2]-AVG	FD05170201	05TP10SB0506
matrix	SB	SB	SB	SO	SO	SO	SO	SO	SO	SO
sacode	DUP	AVG	DUP	NORMAL	NORMAL	NORMAL	DUP	AVG	DUP	NORMAL
depth_rang	24 - 26	24 - 26	24 - 26					.NULL.		
sample_dat	10/21/97	10/21/97	10/21/97	05/16/02	05/16/02	05/16/02	05/17/02	05/17/02	05/17/02	05/17/02
validated	T	T	T	Y	Y	Y	Y	Y	Y	Y
cto_proj	273	273	273	839	839	839	839	839	839	839
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S
sort	**c_012**	**c_013**	**c_014**	**c_015**	**c_016**	**c_017**	**c_018**	**c_019**	**c_020**	**c_021**
Volatile Organics (ug/kg)										
1,1,1-TRICHLOROETHANE	13 U	12 U	11 U	12 U	13 U	11 U	12 U	12 U	12 U	11 U
1,1,2,2-TETRACHLOROETHANE	13 U	12 U	11 U	12 U	13 U	11 U	12 U	12 U	12 U	11 U
1,1,2-TRICHLOROETHANE	13 U	12 U	11 U	12 U	13 U	11 U	12 U	12 U	12 U	11 U
1,1,2-TRICHLOROTRIFLUOROETHANE				12 U	13 U	11 U	12 U	12 U	12 U	11 U
1,1-DICHLOROETHANE	13 U	12 U	11 U	12 U	13 U	11 U	12 U	12 U	12 U	11 U
1,1-DICHLOROETHENE	13 U	12 U	11 U	12 U	13 U	11 U	12 U	12 U	12 U	11 U
1,2 DICHLOROBENZENE				12 U	13 U	11 U	12 U	12 U	12 U	11 U
1,2,4 TRICHLOROBENZENE				12 U	13 U	11 U	12 U	12 U	12 U	11 U
1,2-DIBROMO-3-CHLOROPROPANE				12 U	13 U	11 U	12 U	12 U	12 U	11 U
1,2-DIBROMOETHANE				12 U	13 U	11 U	12 U	12 U	12 U	11 U
1,2-DICHLOROETHANE	13 U	12 U	11 U	12 U	13 U	11 U	12 U	12 U	12 U	11 U
1,2-DICHLOROPROPANE	13 U	12 U	11 U	12 U	13 U	11 U	12 U	12 U	12 U	11 U
1,3 DICHLOROBENZENE				12 U	13 U	11 U	12 U	12 U	12 U	11 U
1,4 DICHLOROBENZENE				12 U	13 U	11 U	12 U	12 U	12 U	11 U
2-BUTANONE	13 U	12 U	11 U	12 UJ	13 UJ	11 UJ	12 U	12 UJ	12 UJ	11 UJ
2-HEXANONE	13 U	12 U	11 U	12 UJ	13 UJ	11 UJ	12 U	12 UJ	12 UJ	11 UJ
4-METHYL-2-PENTANONE	13 U	12 U	11 U	12 UJ	13 UJ	11 UJ	12 U	12 UJ	12 UJ	11 UJ
ACETONE	13 U	12 U	11 U	2.2 U	2.1 U	1.6 U	5.3 U	3.75 U	2.2 U	1.4 U
BENZENE	13 U	12 U	11 U	12 U	13 U	11 U	12 U	12 U	12 U	11 U
BROMODICHLOROMETHANE	13 U	12 U	11 U	12 U	13 U	11 U	12 U	12 U	12 U	11 U
BROMOFORM	13 U	12 U	11 U	12 U	13 U	11 U	12 U	12 U	12 U	11 U
BROMOMETHANE	13 U	12 U	11 U	12 U	13 U	11 U	12 U	12 U	12 U	11 U
CARBON DISULFIDE	13 U	12 U	11 U	12 U	13 U	11 U	12 U	12 U	12 U	11 U
CARBON TETRACHLORIDE	13 U	12 U	11 U	12 U	13 U	11 U	12 U	12 U	12 U	11 U
CHLOROBENZENE	13 U	12 U	11 U	12 U	13 U	11 U	12 U	12 U	12 U	11 U
CHLORODIBROMOMETHANE	13 U	12 U	11 U	12 U	13 U	11 U	12 U	12 U	12 U	11 U
CHLOROETHANE	13 U	12 U	11 U	12 UJ	13 UJ	11 UJ	12 UJ	12 UJ	12 UJ	11 UJ
CHLOROFORM	13 U	12 U	11 U	12 U	13 U	11 U	12 U	12 U	12 U	11 U
CHLOROMETHANE	13 U	12 U	11 U	12 U	13 U	11 U	12 U	12 U	12 U	11 U
CIS-1,2-DICHLOROETHENE				12 U	13 U	11 U	12 U	12 U	12 U	11 U
CIS-1,3-DICHLOROPROPENE	13 U	12 U	11 U	12 U	13 U	11 U	12 U	12 U	12 U	11 U
CYCLOHEXANE				12 U	13 U	11 U	12 U	12 U	12 U	11 U
DICHLORODIFLUOROMETHANE				12 UJ	13 UJ	11 UJ	12 UJ	12 UJ	12 UJ	11 UJ
ETHYLBENZENE	13 U	12 U	11 U	12 U	13 U	11 U	12 U	12 U	12 U	11 U
ISOPROPYLBENZENE				12 U	13 U	11 U	12 U	12 U	12 U	11 U
METHYL ACETATE				12 U	13 U	11 U	12 U	12 U	12 U	11 U
METHYL CYCLOHEXANE				12 U	13 U	11 U	12 U	12 U	12 U	11 U
METHYL TERT-BUTYL ETHER				12 U	13 U	11 U	12 U	12 U	12 U	11 U
METHYLENE CHLORIDE	11 U	9.5 U	8 U	12 U	13 U	11 U	12 U	12 U	12 U	11 U
STYRENE	13 U	12 U	11 U	12 U	13 U	11 U	12 U	12 U	12 U	11 U
TETRACHLOROETHENE	13 U	12 U	11 U	12 U	13 U	11 U	12 U	12 U	12 U	11 U
TOLUENE	13 U	12 U	11 U	12 U	13 U	11 U	12 U	12 U	12 U	11 U
TOTAL 1,2-DICHLOROETHENE	13 U	12 U	11 U							
TOTAL XYLENES	13 U	12 U	11 U	12 U	13 U	11 U	12 U	12 U	12 U	11 U
TRANS-1,2-DICHLOROETHENE				12 U	13 U	11 U	12 U	12 U	12 U	11 U
TRANS-1,3-DICHLOROPROPENE	13 U	12 U	11 U	12 U	13 U	11 U	12 U	12 U	12 U	11 U

from site5_sam.dbf
from site5_res.dbf
from site5_re~ ~
from q:\sql white_oak\upload

order	012	013	014	015	016	017	018	019	020	021
site	005	005	005					.NULL.		
location	05-SB-100	05-SB-100	05-SB-01	05TP01	05TP01	05TP08	05TP09	05TP09	05TP09	05TP10
nsample	05-SB-100_OLD	05-SB-100_OLD-AVG	05-SB-100_OLD-D	05TP01SB0507[Q2]	05TP01WS0204[Q2]	05TP08SB0506[Q2]	05TP09SB0506[Q2]	05TP09SB0506[Q2]-AVG	05TP09SB0506[Q2]-D	05TP10SB0506[Q2]
sample	05-SB-100	05-SB-100_OLD-AVG	05-SB-01(24)	05TP01SB0507	05TP01WS0204	05TP08SB0506	05TP09SB0506	05TP09SB0506[Q2]-AVG	FD05170201	05TP10SB0506
matrix	SB	SB	SB	SO	SO	SO	SO	SO	SO	SO
sacode	DUP	AVG	DUP	NORMAL	NORMAL	NORMAL	DUP	AVG	DUP	NORMAL
depth_rang	24 - 26	24 - 26	24 - 26					.NULL.		
sample_dat	10/21/97	10/21/97	10/21/97	05/16/02	05/16/02	05/16/02	05/17/02	05/17/02	05/17/02	05/17/02
validated	T	T	T	Y	Y	Y	Y	Y	Y	Y
cto_proj	273	273	273	839	839	839	839	839	839	839
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S
sort	**c_012**	**c_013**	**c_014**	**c_015**	**c_016**	**c_017**	**c_018**	**c_019**	**c_020**	**c_021**
TRICHLOROETHENE	13 U	12 U	11 U	12 U	13 U	11 U	12 U	12 U	12 U	11 U
TRICHLOROFLUOROMETHANE				12 UJ	13 UJ	11 UJ	12 UJ	12 UJ	12 UJ	11 UJ
VINYL CHLORIDE	13 U	12 U	11 U	12 U	13 U	11 U	12 U	12 U	12 U	11 U
Semivolatile Organics (ug/kg)										
1,1-BIPHENYL				390 U	440 U	380 U	370 U	370 U	370 U	370 U
1,2,4-TRICHLOROBENZENE	380 UJ	370 UJ	360 UJ							
1,2-DICHLOROBENZENE	380 UJ	370 UJ	360 UJ							
1,3-DICHLOROBENZENE	380 UJ	370 UJ	360 UJ							
1,4-DICHLOROBENZENE	380 UJ	370 UJ	360 UJ							
2,2'-OXYBIS(1-CHLOROPROPANE)	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
2,4 DINITROTOLUENE	380 UJ	370 UJ	360 UJ							
2,4,5-TRICHLOROPHENOL	950 UJ	930 UJ	910 UJ	980 U	1100 U	960 U	930 U	930 U	930 U	930 U
2,4,6-TRICHLOROPHENOL	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
2,4-DICHLOROPHENOL	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
2,4-DIMETHYLPHENOL	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
2,4-DINITROPHENOL	950 UJ	930 UJ	910 UJ	980 U	1100 U	960 U	930 U	930 U	930 U	930 U
2,6 DINITROTOLUENE	380 UJ	370 UJ	360 UJ							
2-CHLORONAPHTHALENE	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
2-CHLOROPHENOL	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
2-METHYLNAPHTHALENE	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
2-METHYLPHENOL	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
2-NITROANILINE	950 UJ	930 UJ	910 UJ	980 U	1100 U	960 U	930 U	930 U	930 U	930 U
2-NITROPHENOL	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
3,3'-DICHLOROBENZIDINE	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
3-NITROANILINE	950 UJ	930 UJ	910 UJ	980 U	1100 U	960 U	930 U	930 U	930 U	930 U
4,6-DINITRO-2-METHYLPHENOL	950 UJ	930 UJ	910 UJ	980 U	1100 U	960 U	930 U	930 U	930 U	930 U
4-BROMOPHENYL PHENYL ETHER	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
4-CHLORO-3-METHYLPHENOL	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
4-CHLOROANILINE	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
4-CHLOROPHENYL PHENYL ETHER	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
4-METHYLPHENOL	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
4-NITROANILINE	950 UJ	930 UJ	910 UJ	980 U	1100 U	960 U	930 U	930 U	930 U	930 U
4-NITROPHENOL	950 UJ	930 UJ	910 UJ	980 U	1100 U	960 U	930 U	930 U	930 U	930 U
ACENAPHTHENE	380 UJ	370 UJ	360 UJ	60 J	440 U	380 U	370 U	370 U	370 U	370 U
ACENAPHTHYLENE	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
ACETOPHENONE				200 U	270 U	150 U	140 J	135 J	130 J	120 J
ANTHRACENE	380 UJ	370 UJ	360 UJ	72 J	440 U	380 U	370 U	370 U	370 U	370 U
ATRAZINE				390 U	440 U	380 U	370 U	370 U	370 U	370 U
BENZALDEHYDE				390 U	440 U	380 U	370 U	370 U	370 U	370 U
BENZO(A)ANTHRACENE	380 UJ	370 UJ	360 UJ	150 J	120 J	380 U	370 U	370 U	370 U	370 U
BENZO(A)PYRENE	380 UJ	370 UJ	360 UJ	140 J	150 J	380 U	370 U	370 U	370 U	370 U
BENZO(B)FLUORANTHENE	380 UJ	370 UJ	360 UJ	110 J	140 J	380 U	370 U	370 U	370 U	370 U
BENZO(G,H,I)PERYLENE	380 UJ	370 UJ	360 UJ	90 J	150 J	380 U	370 U	370 U	370 U	370 U
BENZO(K)FLUORANTHENE	380 UJ	370 UJ	360 UJ	120 J	120 J	380 U	370 U	370 U	370 U	370 U
BIS(2-CHLOROETHOXY)METHANE	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
BIS(2-CHLOROETHYL)ETHER	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
BIS(2-ETHYLHEXYL)PHTHALATE	380 UJ	59 J	59 J	390 U	440 U	380 U	370 U	370 U	370 U	370 U

from site5_sam.dbf
from site5_res.dbf
from site5_res.xls
from q:\sql_server\white_oak\upload

order	012	013	014	015	016	017	018	019	020	021
site	005	005	005					.NULL.		
location	05-SB-100	05-SB-100	05-SB-01	05TP01	05TP01	05TP08	05TP09	05TP09	05TP09	05TP10
nsample	05-SB-100_OLD	05-SB-100_OLD-AVG	05-SB-100_OLD-D	05TP01SB0507[Q2]	05TP01WS0204[Q2]	05TP08SB0506[Q2]	05TP09SB0506[Q2]	05TP09SB0506[Q2]-AVG	05TP09SB0506[Q2]-D	05TP10SB0506[Q2]
sample	05-SB-100	05-SB-100_OLD-AVG	05-SB-01(24)	05TP01SB0507	05TP01WS0204	05TP08SB0506	05TP09SB0506	05TP09SB0506[Q2]-AVG	FD05170201	05TP10SB0506
matrix	SB	SB	SB	SO	SO	SO	SO	SO	SO	SO
sacode	DUP	AVG	DUP	NORMAL	NORMAL	NORMAL	DUP	AVG	DUP	NORMAL
depth_rang	24 - 26	24 - 26	24 - 26					.NULL.		
sample_dat	10/21/97	10/21/97	10/21/97	05/16/02	05/16/02	05/16/02	05/17/02	05/17/02	05/17/02	05/17/02
validated	T	T	T	Y	Y	Y	Y	Y	Y	Y
cto_proj	273	273	273	839	839	839	839	839	839	839
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S
sort	**c_012**	**c_013**	**c_014**	**c_015**	**c_016**	**c_017**	**c_018**	**c_019**	**c_020**	**c_021**
BUTYL BENZYL PHTHALATE	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
CAPROLACTAM				390 U	440 U	380 U	370 U	370 U	370 U	370 U
CARBAZOLE	380 UJ	370 UJ	360 UJ	41 J	440 U	380 U	370 U	370 U	370 U	370 U
CHRYSENE	380 UJ	370 UJ	360 UJ	150 J	140 J	380 U	370 U	370 U	370 U	370 U
DI-N-BUTYL PHTHALATE	380 UJ	370 UJ	360 UJ	390 U	2700	380 U	370 U	370 U	370 U	370 U
DI-N-OCTYL PHTHALATE	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
DIBENZO(A,H)ANTHRACENE	380 UJ	370 UJ	360 UJ	390 U	59 J	380 U	370 U	370 U	370 U	370 U
DIBENZOFURAN	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
DIETHYL PHTHALATE	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
DIMETHYL PHTHALATE	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
FLUORANTHENE	380 UJ	370 UJ	360 UJ	320 J	210 J	380 U	370 U	370 U	370 U	370 U
FLUORENE	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
HEXACHLOROBENZENE	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
HEXACHLOROBUTADIENE	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
HEXACHLOROCYCLOPENTADIENE	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
HEXACHLOROETHANE	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
INDENO(1,2,3-CD)PYRENE	380 UJ	370 UJ	360 UJ	120 J	190 J	380 U	370 U	370 U	370 U	370 U
ISOPHORONE	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
N-NITROSO-DI-N-PROPYLAMINE	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
N-NITROSODIPHENYLAMINE	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
NAPHTHALENE	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
NITROBENZENE	380 UJ	370 UJ	360 UJ							
PENTACHLOROPHENOL	950 UJ	930 UJ	910 UJ	980 U	1100 U	960 U	930 U	930 U	930 U	930 U
PHENANTHRENE	380 UJ	370 UJ	360 UJ	270 J	120 J	380 U	370 U	370 U	370 U	370 U
PHENOL	380 UJ	370 UJ	360 UJ	390 U	440 U	380 U	370 U	370 U	370 U	370 U
PYRENE	380 UJ	370 UJ	360 UJ	260 J	170 J	380 U	370 U	370 U	370 U	370 U
Pesticides/PCBs (ug/kg)										
4,4'-DDD	3.8 UJ	3.7 UJ	3.6 UJ	0.65 J	4 R	2 U	1.9 U	1.9 U	1.9 U	0.82 R
4,4'-DDE	3.8 UJ	3.7 UJ	3.6 UJ	2 U	1.6 J	2 U	1.9 U	1.9 U	1.9 U	1.9 U
4,4'-DDT	3.8 UJ	3.7 UJ	3.6 UJ	0.24 R	2.1 R	2 U	1.9 U	1.9 U	1.9 U	1.9 U
ALDRIN	1.9 UJ	1.85 UJ	1.8 UJ	2 U	2.3 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U
ALPHA-BHC	1.9 UJ	1.85 UJ	1.8 UJ	2 U	2.3 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U
ALPHA-CHLORDANE	1.9 UJ	1.85 UJ	1.8 UJ	2 U	1.2 J	2 U	1.9 U	1.9 U	1.9 U	1.9 U
AROCLOR-1016	38 UJ	37 UJ	36 UJ	39 U	44 U	38 U	37 U	37 U	37 U	37 U
AROCLOR-1221	76 UJ	74 UJ	72 UJ	39 U	44 U	38 U	37 U	37 U	37 U	37 U
AROCLOR-1232	38 UJ	37 UJ	36 UJ	39 U	44 U	38 U	37 U	37 U	37 U	37 U
AROCLOR-1242	38 UJ	37 UJ	36 UJ	39 U	44 U	38 U	37 U	37 U	37 U	37 U
AROCLOR-1248	38 UJ	37 UJ	36 UJ	39 U	44 U	38 U	37 U	37 U	37 U	37 U
AROCLOR-1254	38 UJ	37 UJ	36 UJ	39 U	44 U	38 U	37 U	37 U	37 U	37 U
AROCLOR-1260	38 UJ	37 UJ	36 UJ	19 J	390	38 U	37 U	37 U	37 U	46
BETA-BHC	1.9 UJ	1.85 UJ	1.8 UJ	2 U	2.3 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U
DELTA-BHC	1.9 UJ	1.85 UJ	1.8 UJ	2 U	2.3 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U
DIELDRIN	3.8 UJ	3.7 UJ	3.6 UJ	2 U	2.2 J	2 U	1.9 U	1.9 U	1.9 U	1.9 U
ENDOSULFAN I	1.9 UJ	1.85 UJ	1.8 UJ	2 U	2.3 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U
ENDOSULFAN II	3.8 UJ	3.7 UJ	3.6 UJ	0.67 J	8.1 J	2 U	1.9 U	1.9 U	1.9 U	0.66 J
ENDOSULFAN SULFATE	3.8 UJ	3.7 UJ	3.6 UJ	2 U	2.3 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U
ENDRIN	3.8 UJ	3.7 UJ	3.6 UJ	2 U	2.8 R	2 U	1.9 U	1.9 U	1.9 U	0.39 R

from site5_sam.dbf
from site5_res.dbf
from site5_res.xls
from q:\sql\ white_oak\upload

order	012	013	014	015	016	017	018	019	020	021
site	005	005	005					.NULL.		
location	05-SB-100	05-SB-100	05-SB-01	05TP01	05TP01	05TP08	05TP09	05TP09	05TP09	05TP10
nsample	05-SB-100_OLD	05-SB-100_OLD-AVG	05-SB-100_OLD-D	05TP01SB0507[Q2]	05TP01WS0204[Q2]	05TP08SB0506[Q2]	05TP09SB0506[Q2]	05TP09SB0506[Q2]-AVG	05TP09SB0506[Q2]-D	05TP10SB0506[Q2]
sample	05-SB-100	05-SB-100_OLD-AVG	05-SB-01(24)	05TP01SB0507	05TP01WS0204	05TP08SB0506	05TP09SB0506	05TP09SB0506[Q2]-AVG	FD05170201	05TP10SB0506
matrix	SB	SB	SB	SO	SO	SO	SO	SO	SO	SO
sacode	DUP	AVG	DUP	NORMAL	NORMAL	NORMAL	DUP	AVG	DUP	NORMAL
depth_rang	24 - 26	24 - 26	24 - 26					.NULL.		
sample_dat	10/21/97	10/21/97	10/21/97	05/16/02	05/16/02	05/16/02	05/17/02	05/17/02	05/17/02	05/17/02
validated	T	T	T	Y	Y	Y	Y	Y	Y	Y
cto_proj	273	273	273	839	839	839	839	839	839	839
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S
sort	**c_012**	**c_013**	**c_014**	**c_015**	**c_016**	**c_017**	**c_018**	**c_019**	**c_020**	**c_021**
ENDRIN ALDEHYDE	3.8 UJ	3.7 UJ	3.6 UJ	2 U	6.2 R	2 U	1.9 U	1.9 U	1.9 U	1.9 U
ENDRIN KETONE	3.8 UJ	3.7 UJ	3.6 UJ	2 U	2.3 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U
GAMMA-BHC (LINDANE)	1.9 UJ	1.85 UJ	1.8 UJ	2 U	2.3 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U
GAMMA-CHLORDANE	1.9 UJ	1.85 UJ	1.8 UJ	2 U	2.3 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U
HEPTACHLOR	1.9 UJ	1.85 UJ	1.8 UJ	2 U	2.3 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U
HEPTACHLOR EPOXIDE	1.9 UJ	1.85 UJ	1.8 UJ	2 U	2.3 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U
METHOXYCHLOR	19 UJ	18.5 UJ	18 UJ	3.9 U	4.4 U	3.8 U	3.7 U	3.7 U	3.7 U	3.7 U
TOXAPHENE	190 UJ	185 UJ	180 UJ	79 U	89 U	78 U	75 U	75 U	75 U	75 U
Explosives (ug/kg)										
1,3,5-TRINITROBENZENE	40.2 U	40.2 U	40.2 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
1,3-DINITROBENZENE	37.2 U	37.2 U	37.2 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
2,4,6-TRINITROTOLUENE	35.6 U	35.6 U	35.6 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
2,4-DINITROTOLUENE	51.6 U	51.6 U	51.6 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
2,6-DINITROTOLUENE	47.6 U	47.6 U	47.6 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
2-AMINO-4,6-DINITROTOLUENE	46.7 U	46.7 U	46.7 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
2-NITROTOLUENE	81.4 U	81.4 U	81.4 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
3-NITROTOLUENE	81.8 U	81.8 U	81.8 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
4-AMINO-2,6-DINITROTOLUENE	40.9 U	40.9 U	40.9 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
4-NITROTOLUENE	87.2 U	87.2 U	87.2 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
HMX	73 U	73 U	73 U	500 U	230 J	500 U	500 U	500 U	500 U	500 U
NITRO-BENZENE	35.2 U	35.2 U	35.2 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
RDX	50.9 U	50.9 U	50.9 U	500 U	500 U	500 U	500 U	500 U	500 U	500 U
TETRYL	163 U	163 U	163 U	650 U	650 U	650 U	650 U	650 U	650 U	650 U
Inorganics (mg/kg)										
ALUMINUM	2920	2330	1740	2590	6200	2340	507 K	555.5 K	604 K	5000 K
ANTIMONY	0.59 UL	0.575 UL	0.56 UL	0.19 UL	2.6 L	0.2 L	0.18 UL	0.18 UL	0.18 UL	0.24 L
ARSENIC	3.3 L	1.8275 J	0.71 UL	2.6	3.1	2	1.1	1.1	1.1	2.7
BARIUM	6	6.05	6.1	3.9	173	4	1.9	2.15	2.4	8.3
BERYLLIUM	0.02 U	0.02 U	0.02 U	0.17 U	0.32 U	0.19 U	0.069 U	0.072 U	0.075 U	0.14 U
CADMIUM	0.07 U	0.07 U	0.07 U	0.02 U	5.6	0.02 U	0.019 U	0.019 U	0.019 U	0.019 U
CALCIUM	48.5 U	48.05 U	47.6 U	277	20800	154 U	49.3	46.45	43.6	37.8
CHROMIUM	12.4 J	8.7 J	5.0 J	6.2	40.9	5.6	2.6	2.8	3	9.5
COBALT	0.26 U	0.2 U	0.14 U	0.22	9.5	0.2	0.092 U	0.092 U	0.092 U	0.48
COPPER	20.2	11.4	2.6	10.3 J	701 J	5.6 J	4.8	5.05	5.3	9.1
IRON	6980	4555	2130	6160	15900	5230	1700	1795	1890	7690
LEAD	3.2 K	2.55 K	1.9 K	1.9	610	1.7	1.0 U	1.0 U	1.0 U	3.2
MAGNESIUM	93.7 J	59.075 J	48.9 U	161	3340	63.8	33.9	34.2	34.5	87.5
MANGANESE	6.0 J	5.25 J	4.5 J	4.7 J	285 J	3.3 J	1.4	1.5	1.6	7.5
MERCURY	0.1	0.06	0.02	0.038	0.22	0.035	0.063	0.0665	0.07	0.093
NICKEL	0.87 K	0.82 K	0.77 K	0.47 J	198 J	0.42 J	0.2	0.1475	0.19 U	0.91
POTASSIUM	166	150.5	135	107	898	130	32.3	33	33.7	78.4
SELENIUM	15.1 J	7.7 J	0.6 UJ	4.8	2.5	1.9	2.2	2.3	2.4	3.7
SILVER	0.18 U	0.175 U	0.17 U	0.072 U	1.1	0.071 U	0.068 U	0.068 U	0.068 U	0.069 U
SODIUM	45.1 UJ	55.6 UJ	66.1 U	26.4 U	364	185 U	43.6 U	39.25 U	34.9 U	23.3 U
THALLIUM	0.65 U	0.635 U	0.62 U	0.95	0.78 K	0.4 U	0.48	0.335	0.38 U	0.75
VANADIUM	37	21.5	6	16.2	12.6	12.1	5.9	6.35	6.8	17.9
ZINC	2.3 U	2.15 U	2.0 U	2.6 U	1420	2.0 U	1.2	1.25	1.3	3.3

from site5_sam.dbf
from site5_res.dbf
from site5_res.xls
from q:\sql_server\white_oak\upload

site5_res -
full appendix results

order	012	013	014	015	016	017	018	019	020	021
site	005	005	005					.NULL.		
location	05-SB-100	05-SB-100	05-SB-01	05TP01	05TP01	05TP08	05TP09	05TP09	05TP09	05TP10
nsample	05-SB-100_OLD	05-SB-100_OLD-AVG	05-SB-100_OLD-D	05TP01SB0507[Q2]	05TP01WS0204[Q2]	05TP08SB0506[Q2]	05TP09SB0506[Q2]	05TP09SB0506[Q2]-AVG	05TP09SB0506[Q2]-D	05TP10SB0506[Q2]
sample	05-SB-100	05-SB-100_OLD-AVG	05-SB-01(24)	05TP01SB0507	05TP01WS0204	05TP08SB0506	05TP09SB0506	05TP09SB0506[Q2]-AVG	FD05170201	05TP10SB0506
matrix	SB	SB	SB	SO	SO	SO	SO	SO	SO	SO
sacode	DUP	AVG	DUP	NORMAL	NORMAL	NORMAL	DUP	AVG	DUP	NORMAL
depth_rang	24 - 26	24 - 26	24 - 26					.NULL.		
sample_dat	10/21/97	10/21/97	10/21/97	05/16/02	05/16/02	05/16/02	05/17/02	05/17/02	05/17/02	05/17/02
validated	T	T	T	Y	Y	Y	Y	Y	Y	Y
cto_proj	273	273	273	839	839	839	839	839	839	839
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S
sort	**c_012**	**c_013**	**c_014**	**c_015**	**c_016**	**c_017**	**c_018**	**c_019**	**c_020**	**c_021**
Miscellaneous Parameters (mg/kg)										
CYANIDE	0.24 U	0.235 U	0.23 U							
PERCENT SOLIDS (%)				84.8 %	75.5 %	86.1 %	89.4 %	89.35 %	89.3 %	88.9 %
PH (S.U.)	4.73 S.U.	4.855 S.U.	4.98 S.U.							

from site5_sam.dbf
from site5_res.dbf
from site5_re[illegible]
from q:\sql white_oak\upload

order	022	023	024	
site				
location	05TP11	05TP12	05TP12	
nsample	05TP11SB0203[Q2]	05TP12SB0708[Q2]	05TP12WS0204[Q2]	
sample	05TP11SB0203	05TP12SB0708	05TP12WS0204	
matrix	SO	SO	SO	
sacode	NORMAL	NORMAL	NORMAL	
depth_rang				
sample_dat	05/17/02	05/17/02	05/17/02	
validated	Y	Y	Y	
cto_proj	839	839	839	
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	
sort	c_022	c_023	c_024	count
Volatile Organics (ug/kg)				
1,1,1-TRICHLOROETHANE	11 U	11 U	12 U	24
1,1,2,2-TETRACHLOROETHANE	11 U	11 U	12 U	24
1,1,2-TRICHLOROETHANE	11 U	11 U	12 U	24
1,1,2-TRICHLOROTRIFLUOROETHANE	11 U	11 U	12 U	10
1,1-DICHLOROETHANE	11 U	11 U	12 U	24
1,1-DICHLOROETHENE	11 U	11 U	12 U	24
1,2 DICHLOROBENZENE	11 U	11 U	12 U	10
1,2,4 TRICHLOROBENZENE	11 U	11 U	12 U	10
1,2-DIBROMO-3-CHLOROPROPANE	11 U	11 U	12 U	10
1,2-DIBROMOETHANE	11 U	11 U	12 U	10
1,2-DICHLOROETHANE	11 U	11 U	12 U	24
1,2-DICHLOROPROPANE	11 U	11 U	12 U	24
1,3 DICHLOROBENZENE	11 U	11 U	12 U	10
1,4 DICHLOROBENZENE	11 U	11 U	12 U	10
2-BUTANONE	11 UJ	11 UJ	12 UJ	24
2-HEXANONE	11 UJ	11 UJ	12 UJ	24
4-METHYL-2-PENTANONE	11 UJ	11 UJ	12 UJ	24
ACETONE	1.7 U	2.9 U	15 U	24
BENZENE	11 U	11 U	12 U	24
BROMODICHLOROMETHANE	11 U	11 U	12 U	24
BROMOFORM	11 U	11 U	12 U	24
BROMOMETHANE	11 U	11 U	12 U	24
CARBON DISULFIDE	11 U	11 U	12 U	24
CARBON TETRACHLORIDE	11 U	11 U	12 U	24
CHLOROBENZENE	11 U	11 U	12 U	24
CHLORODIBROMOMETHANE	11 U	11 U	12 U	24
CHLOROETHANE	11 UJ	11 UJ	12 UJ	24
CHLOROFORM	11 U	11 U	12 U	24
CHLOROMETHANE	11 U	11 U	12 U	24
CIS-1,2-DICHLOROETHENE	11 U	11 U	12 U	10
CIS-1,3-DICHLOROPROPENE	11 U	11 U	12 U	24
CYCLOHEXANE	11 U	11 U	12 U	10
DICHLORODIFLUOROMETHANE	11 UJ	11 UJ	12 UJ	10
ETHYLBENZENE	11 U	11 U	12 U	24
ISOPROPYLBENZENE	11 U	11 U	12 U	10
METHYL ACETATE	11 U	11 U	12 U	10
METHYL CYCLOHEXANE	11 U	11 U	12 U	10
METHYL TERT-BUTYL ETHER	11 U	11 U	12 U	10
METHYLENE CHLORIDE	11 U	11 U	12 U	24
STYRENE	11 U	11 U	12 U	24
TETRACHLOROETHENE	11 U	11 U	12 U	24
TOLUENE	11 U	11 U	12 U	24
TOTAL 1,2-DICHLOROETHENE				14
TOTAL XYLENES	11 U	11 U	12 U	24
TRANS-1,2-DICHLOROETHENE	11 U	11 U	12 U	10
TRANS-1,3-DICHLOROPROPENE	11 U	11 U	12 U	24

from site5_sam.dbf
from site5_res.dbf
from site5_res.xls
from q:\sql_server\white_oak\upload

order	022	023	024	
site				
location	05TP11	05TP12	05TP12	
nsample	05TP11SB0203[Q2]	05TP12SB0708[Q2]	05TP12WS0204[Q2]	
sample	05TP11SB0203	05TP12SB0708	05TP12WS0204	
matrix	SO	SO	SO	
sacode	NORMAL	NORMAL	NORMAL	
depth_rang				
sample_dat	05/17/02	05/17/02	05/17/02	
validated	Y	Y	Y	
cto_proj	839	839	839	
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	
sort	**c_022**	**c_023**	**c_024**	**count**
TRICHLOROETHENE	11 U	11 U	12 U	24
TRICHLOROFLUOROMETHANE	11 UJ	11 UJ	12 UJ	10
VINYL CHLORIDE	11 U	11 U	12 U	24
Semivolatile Organics (ug/kg)				
1,1-BIPHENYL	360 U	380 U	390 U	10
1,2,4-TRICHLOROBENZENE				14
1,2-DICHLOROBENZENE				14
1,3-DICHLOROBENZENE				14
1,4-DICHLOROBENZENE				14
2,2'-OXYBIS(1-CHLOROPROPANE)	360 U	380 U	390 U	24
2,4 DINITROTOLUENE				14
2,4,5-TRICHLOROPHENOL	910 U	970 U	980 U	24
2,4,6-TRICHLOROPHENOL	360 U	380 U	390 U	24
2,4-DICHLOROPHENOL	360 U	380 U	390 U	24
2,4-DIMETHYLPHENOL	360 U	380 U	390 U	24
2,4-DINITROPHENOL	910 U	970 U	980 U	24
2,6 DINITROTOLUENE				14
2-CHLORONAPHTHALENE	360 U	380 U	390 U	24
2-CHLOROPHENOL	360 U	380 U	390 U	24
2-METHYLNAPHTHALENE	360 U	380 U	390 U	24
2-METHYLPHENOL	360 U	380 U	390 U	24
2-NITROANILINE	910 U	970 U	980 U	24
2-NITROPHENOL	360 U	380 U	390 U	24
3,3'-DICHLOROBENZIDINE	360 U	380 U	390 U	24
3-NITROANILINE	910 U	970 U	980 U	24
4,6-DINITRO-2-METHYLPHENOL	910 U	970 U	980 U	24
4-BROMOPHENYL PHENYL ETHER	360 U	380 U	390 U	24
4-CHLORO-3-METHYLPHENOL	360 U	380 U	390 U	24
4-CHLOROANILINE	360 U	380 U	390 U	24
4-CHLOROPHENYL PHENYL ETHER	360 U	380 U	390 U	24
4-METHYLPHENOL	360 U	380 U	390 U	24
4-NITROANILINE	910 U	970 U	980 U	24
4-NITROPHENOL	910 U	970 U	980 U	24
ACENAPHTHENE	360 U	380 U	390 U	24
ACENAPHTHYLENE	360 U	380 U	390 U	24
ACETOPHENONE	120 J	150 J	250 J	10
ANTHRACENE	360 U	380 U	390 U	24
ATRAZINE	360 U	380 U	390 U	10
BENZALDEHYDE	360 U	380 U	390 U	10
BENZO(A)ANTHRACENE	360 U	380 U	81 J	24
BENZO(A)PYRENE	360 U	380 U	86 J	24
BENZO(B)FLUORANTHENE	360 U	380 U	85 J	24
BENZO(G,H,I)PERYLENE	360 U	380 U	61 J	24
BENZO(K)FLUORANTHENE	360 U	380 U	73 J	24
BIS(2-CHLOROETHOXY)METHANE	360 U	380 U	390 U	24
BIS(2-CHLOROETHYL)ETHER	360 U	380 U	390 U	24
BIS(2-ETHYLHEXYL)PHTHALATE	360 U	380 U	390 U	24

from site5_sam.dbf
from site5_res.dbf
from site5_r
from q:\sql white_oak\upload

order	022	023	024	
site				
location	05TP11	05TP12	05TP12	
nsample	05TP11SB0203[Q2]	05TP12SB0708[Q2]	05TP12WS0204[Q2]	
sample	05TP11SB0203	05TP12SB0708	05TP12WS0204	
matrix	SO	SO	SO	
sacode	NORMAL	NORMAL	NORMAL	
depth_rang				
sample_dat	05/17/02	05/17/02	05/17/02	
validated	Y	Y	Y	
cto_proj	839	839	839	
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	
sort	**c_022**	**c_023**	**c_024**	**count**
BUTYL BENZYL PHTHALATE	360 U	380 U	390 U	24
CAPROLACTAM	360 U	380 U	390 U	10
CARBAZOLE	360 U	380 U	390 U	24
CHRYSENE	360 U	380 U	93 J	24
DI-N-BUTYL PHTHALATE	360 U	380 U	390 U	24
DI-N-OCTYL PHTHALATE	360 U	380 U	390 U	24
DIBENZO(A,H)ANTHRACENE	360 U	380 U	390 U	24
DIBENZOFURAN	360 U	380 U	390 U	24
DIETHYL PHTHALATE	360 U	380 U	42 J	24
DIMETHYL PHTHALATE	360 U	380 U	390 U	24
FLUORANTHENE	360 U	380 U	210 J	24
FLUORENE	360 U	380 U	390 U	24
HEXACHLOROBENZENE	360 U	380 U	390 U	24
HEXACHLOROBUTADIENE	360 U	380 U	390 U	24
HEXACHLOROCYCLOPENTADIENE	360 U	380 U	390 U	24
HEXACHLOROETHANE	360 U	380 U	390 U	24
INDENO(1,2,3-CD)PYRENE	360 U	380 U	82 J	24
ISOPHORONE	360 U	380 U	390 U	24
N-NITROSO-DI-N-PROPYLAMINE	360 U	380 U	390 U	24
N-NITROSODIPHENYLAMINE	360 U	380 U	390 U	24
NAPHTHALENE	360 U	380 U	390 U	24
NITROBENZENE				14
PENTACHLOROPHENOL	910 U	970 U	980 U	24
PHENANTHRENE	360 U	380 U	160 J	24
PHENOL	360 U	380 U	390 U	24
PYRENE	360 U	380 U	160 J	24
Pesticides/PCBs (ug/kg)				
4,4'-DDD	0.72 R	2 U	5 J	24
4,4'-DDE	0.3 J	2 U	2 J	24
4,4'-DDT	1.9 U	2 U	2.5 R	24
ALDRIN	1.9 U	2 U	2 U	24
ALPHA-BHC	1.9 U	2 U	2 U	24
ALPHA-CHLORDANE	1.9 U	2 U	0.89 J	24
AROCLOR-1016	36 U	38 U	39 U	24
AROCLOR-1221	36 U	38 U	39 U	24
AROCLOR-1232	36 U	38 U	39 U	24
AROCLOR-1242	36 U	38 U	39 U	24
AROCLOR-1248	36 U	38 U	39 U	24
AROCLOR-1254	36 U	38 U	39 U	24
AROCLOR-1260	32 J	38 U	650 J	24
BETA-BHC	1.9 U	2 U	2 U	24
DELTA-BHC	1.9 U	2 U	2 U	24
DIELDRIN	1.9 U	2 U	1.7 J	24
ENDOSULFAN I	1.9 U	2 U	2 U	24
ENDOSULFAN II	0.6 J	2 U	6.4 R	24
ENDOSULFAN SULFATE	1.9 U	2 U	1.8 R	24
ENDRIN	0.18 R	2 U	2.4 R	24

from site5_sam.dbf
from site5_res.dbf
from site5_res.xls
from q:\sql_server\white_oak\upload

order	022	023	024	
site				
location	05TP11	05TP12	05TP12	
nsample	05TP11SB0203[Q2]	05TP12SB0708[Q2]	05TP12WS0204[Q2]	
sample	05TP11SB0203	05TP12SB0708	05TP12WS0204	
matrix	SO	SO	SO	
sacode	NORMAL	NORMAL	NORMAL	
depth_rang				
sample_dat	05/17/02	05/17/02	05/17/02	
validated	Y	Y	Y	
cto_proj	839	839	839	
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	
sort	**c_022**	**c_023**	**c_024**	**count**
ENDRIN ALDEHYDE	1.9 U	2 U	2 U	24
ENDRIN KETONE	1.9 U	2 U	2 U	24
GAMMA-BHC (LINDANE)	1.9 U	2 U	2 U	24
GAMMA-CHLORDANE	1.9 U	2 U	2 U	24
HEPTACHLOR	1.9 U	2 U	2 U	24
HEPTACHLOR EPOXIDE	1.9 U	2 U	2 U	24
METHOXYCHLOR	3.6 U	3.8 U	3.9 U	24
TOXAPHENE	74 U	78 U	79 U	24
Explosives (ug/kg)				
1,3,5-TRINITROBENZENE	250 U	250 U	250 U	24
1,3-DINITROBENZENE	250 U	250 U	250 U	24
2,4,6-TRINITROTOLUENE	250 U	250 U	250 U	24
2,4-DINITROTOLUENE	250 U	250 U	250 U	24
2,6-DINITROTOLUENE	250 U	250 U	250 U	24
2-AMINO-4,6-DINITROTOLUENE	250 U	250 U	250 U	24
2-NITROTOLUENE	250 U	250 U	250 U	24
3-NITROTOLUENE	250 U	250 U	250 U	24
4-AMINO-2,6-DINITROTOLUENE	250 U	250 U	250 U	24
4-NITROTOLUENE	250 U	250 U	250 U	24
HMX	500 U	500 U	500 U	24
NITRO-BENZENE	250 U	250 U	250 U	24
RDX	500 U	500 U	500 U	24
TETRYL	650 U	650 U	650 U	24
Inorganics (mg/kg)				
ALUMINUM	2740 K	1770 K	4780 K	24
ANTIMONY	0.18 UL	0.19 UL	0.69 L	24
ARSENIC	2	2.4	2.9	24
BARIUM	7.8	3.6	46.8	24
BERYLLIUM	0.12 U	0.099 U	0.34 U	24
CADMIUM	0.019 U	0.02 U	0.43 K	24
CALCIUM	62	210	2510	24
CHROMIUM	5.6	5.9	20	24
COBALT	0.41	0.12	2.3	24
COPPER	7.1	8.2	70.3	24
IRON	4780	5950	12600	24
LEAD	2.5	1.5	69.3	24
MAGNESIUM	103	55.8	486	24
MANGANESE	7.2	4.3	96.2	24
MERCURY	0.049	0.03	0.23	24
NICKEL	0.84	0.38	8.3	24
POTASSIUM	76.8	59.1	296	24
SELENIUM	2.7	4	2.4	24
SILVER	0.067 U	0.071 U	1.9	24
SODIUM	39.1 U	63.3 U	61.0 U	24
THALLIUM	0.47	0.64	0.79 K	24
VANADIUM	12.5	12.4	23.2	24
ZINC	2.9	2.3	181	24

from site5_sam.dbf
from site5_res.dbf
from site5_res.vls
from q:\sql white_oak\upload

order	022	023	024	
site				
location	05TP11	05TP12	05TP12	
nsample	05TP11SB0203[Q2]	05TP12SB0708[Q2]	05TP12WS0204[Q2]	
sample	05TP11SB0203	05TP12SB0708	05TP12WS0204	
matrix	SO	SO	SO	
sacode	NORMAL	NORMAL	NORMAL	
depth_rang				
sample_dat	05/17/02	05/17/02	05/17/02	
validated	Y	Y	Y	
cto_proj	839	839	839	
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	
sort	**c_022**	**c_023**	**c_024**	**count**
Miscellaneous Parameters (mg/kg)				
CYANIDE				14
PERCENT SOLIDS (%)	90.9 %	85.9 %	84.4 %	10
PH (S.U.)				14

from site5_sam.dbf
from site5_res.dbf
from site5_res.xls
from q:\sql_server\white_oak\upload

SITE 13

ANALYTICAL DATA

order	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016
site	013	013	013	013	013	013	013	013	013	013	013	013	013	013	013	013
location	13-SB-01	13-SB-02	13-SB-03	13-SB-03	13-SB-03	13-SB-01	13-SB-02	13-SB-03	13SB201	13SB201	13SB202	13SB202	13SB203	13SB203	13SB204	13SB204
nsample	13-SB-01	13-SB-02	13-SB-03	13-SB-03-AVG	13-SB-03-D	13-SS-01	13-SS-02	13-SS-03	13SB201-08	13SB201-10	13SB202-08	13SB202-12	13SB203-06	13SB203-12	13SB204-10	13SB204-14
sample	13-SB-01	13-SB-02	13-SB-03	13-SB-03-AVG	13-SB-03-DX	13-SS-01	13-SS-02	13-SS-03	13SB201-08	13SB201-10	13SB202-08	13SB202-12	13SB203-06	13SB203-12	13SB204-10	13SB204-14
sacode	NORMAL	NORMAL	DUP	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
matrix	SB	SB	SB	SB	SB	SS	SS	SS	SB	SB	SB	SB	SB	SB	SB	SB
depth_rang	1 - 2	1 - 2	1 - 2	1 - 2	1 - 2	0 - 1	0 - 1	0 - 1								
sample_dat	10/20/97	10/20/97	10/20/97	10/20/97	10/20/97	10/06/97	10/06/97	10/06/97	09/07/01	09/07/01	09/07/01	09/07/01	09/07/01	09/07/01	09/07/01	09/07/01
validated	T	T	T	T	T	T	T	T	Y	Y	Y	Y	Y	Y	Y	Y
cto_proj	273	273	273	273	273	273	273	273	839	839	839	839	839	839	839	839
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S
sort	**c_001**	**c_002**	**c_003**	**c_004**	**c_005**	**c_006**	**c_007**	**c_008**	**c_009**	**c_010**	**c_011**	**c_012**	**c_013**	**c_014**	**c_015**	**c_016**
Volatile Organics (ug/kg)																
1,1,1-TRICHLOROETHANE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U	17.2 U	10.9 U	10.6 U	9.76 U	21.6 U	11.6 U	13.6 U	12.3 U
1,1,2,2-TETRACHLOROETHANE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U	17.2 U	8.59 J	10.6 U	79.3	21.6 U	18.5	1.5 J	12.3 U
1,1,2-TRICHLOROETHANE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U								
1,1,2-TRICHLOROTRIFLUOROETHANE																
1,1-DICHLOROETHANE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U								
1,1-DICHLOROETHENE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U								
1,2,4-TRICHLOROBENZENE									5.53 UJ	10.9 U	10.6 U	9.76 U	4.09 UJ	11.6 U	13.6 U	12.3 U
1,2-DIBROMO-3-CHLOROPROPANE									5.98 J	10.9 U	10.6 U	9.76 U	3.59 UJ	11.6 U	13.6 U	12.3 U
1,2-DIBROMOETHANE																
1,2-DICHLOROBENZENE									2.67 UJ	10.9 U	10.6 U	9.76 U	2.7	11.6 U	13.6 U	12.3 U
1,2-DICHLOROETHANE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U	17.2 U	10.9 U	10.6 U	9.76 U	21.6 U	11.6 U	13.6 U	12.3 U
1,2-DICHLOROPROPANE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U								
1,3-DICHLOROBENZENE																
1,4-DICHLOROBENZENE									2.7 J	10.9 U	10.6 U	9.76 U	2.47 J	11.6 U	13.6 U	12.3 U
2-BUTANONE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U								
2-HEXANONE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U	17.2 U	10.9 U	10.6 U	9.76 U	13.2 J	7.75 J	13.6 U	12.3 U
4-METHYL-2-PENTANONE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U								
ACETONE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U	17.2 U	10.9 U	10.6 U	9.76 U	3.35 J	11.6 U	13.6 U	12.3 U
BENZENE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U								
BROMODICHLOROMETHANE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U								
BROMOFORM	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U								
BROMOMETHANE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U								
CARBON DISULFIDE	13 UJ	13 UJ	13 UJ	13.5 UJ	14 UJ	12 UJ	10 U	11 U	17.2 U	10.9 U	10.6 U	9.76 U	21.6 U	11.6 U	13.6 U	12.3 U
CARBON TETRACHLORIDE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U	17.2 U	10.9 U	10.6 U	9.76 U	21.6 U	11.6 U	13.6 U	12.3 U
CHLOROBENZENE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U	17.2 U	10.9 U	10.6 U	9.76 U	21.6 U	11.6 U	13.6 U	12.3 U
CHLORODIBROMOMETHANE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U								
CHLOROETHANE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U								
CHLOROFORM	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U								
CHLOROMETHANE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U	4.63 J	3.61 J	2.31 J	2.83	4.87 J	2.83 J	4.02 J	2.79 J
CIS-1,2-DICHLOROETHENE									17.2 U	10.9 U	10.6 U	9.76 U	21.6 U	11.6 U	13.6 U	12.3 U
CIS-1,3-DICHLOROPROPENE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U								
CYCLOHEXANE									17.2 U	10.9 U	10.6 U	9.76 U			13.6 U	12.3 U
DICHLORODIFLUOROMETHANE																
ETHYLBENZENE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U	17.2 U	10.9 U	10.6 U	9.76 U	21.6 U	11.6 U	13.6 U	12.3 U
ISOPROPYLBENZENE									17.2 U	10.9 U	10.6 U	9.76 U	21.6 U	11.6 U	13.6 U	12.3 U
METHYL ACETATE									4.29 J	10.9 U	10.6 U	9.76 U			13.6 U	12.3 U
METHYL CYCLOHEXANE									17.2 U	10.9 U	10.6 U	9.76 U			13.6 U	12.3 U
METHYL TERT-BUTYL ETHER																
METHYLENE CHLORIDE	9 U	7 U	13 U	12 U	11 U	6 U	2 U	2 U								
STYRENE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U	17.2 U	10.9 U	10.6 U	9.76 U	21.6 U	11.6 U	13.6 U	12.3 U
TETRACHLOROETHENE	13 U	13 U	1 J	1 J	14 U	12 UJ	10 U	11 U	2.07 J	10.9 U	10.6 U	1.81 J	21.6 U	11.6 U	13.6 U	12.3 U
TOLUENE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U								
TOTAL 1,2-DICHLOROETHENE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U								

from site13_sam.dbf
from site13_res.dbf
from site13_res.xls
from q:\sql_server\white_oak\upload

site13_res -
full appendix results

order	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016
site	013	013	013	013	013	013	013	013	013	013	013	013	013	013	013	013
location	13-SB-01	13-SB-02	13-SB-03	13-SB-03	13-SB-03	13-SB-01	13-SB-02	13-SB-03	13SB201	13SB201	13SB202	13SB202	13SB203	13SB203	13SB204	13SB204
nsample	13-SB-01	13-SB-02	13-SB-03	13-SB-03-AVG	13-SB-03-D	13-SS-01	13-SS-02	13-SS-03	13SB201-08	13SB201-10	13SB202-08	13SB202-12	13SB203-06	13SB203-12	13SB204-10	13SB204-14
sample	13-SB-01	13-SB-02	13-SB-03	13-SB-03-AVG	13-SB-03-DX	13-SS-01	13-SS-02	13-SS-03	13SB201-08	13SB201-10	13SB202-08	13SB202-12	13SB203-06	13SB203-12	13SB204-10	13SB204-14
sacode	NORMAL	NORMAL	DUP	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
matrix	SB	SB	SB	SB	SB	SS	SS	SS	SB	SB	SB	SB	SB	SB	SB	SB
depth_rang	1 - 2	1 - 2	1 - 2	1 - 2	1 - 2	0 - 1	0 - 1	0 - 1								
sample_dat	10/20/97	10/20/97	10/20/97	10/20/97	10/20/97	10/06/97	10/06/97	10/06/97	09/07/01	09/07/01	09/07/01	09/07/01	09/07/01	09/07/01	09/07/01	09/07/01
validated	T	T	T	T	T	T	T	T	Y	Y	Y	Y	Y	Y	Y	Y
cto_proj	273	273	273	273	273	273	273	273	839	839	839	839	839	839	839	839
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S
sort	**c_001**	**c_002**	**c_003**	**c_004**	**c_005**	**c_006**	**c_007**	**c_008**	**c_009**	**c_010**	**c_011**	**c_012**	**c_013**	**c_014**	**c_015**	**c_016**
TOTAL XYLENES	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U	17.2 U	10.9 U	10.6 U	9.76 U	21.6 U	11.6 U	13.6 U	12.3 U
TRANS-1,2-DICHLOROETHENE																
TRANS-1,3-DICHLOROPROPENE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U								
TRICHLOROETHENE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U	16.2 J	10.9 U	10.6 U	5.73 J	21.6 U	11.6 U	13.6 U	12.3 U
TRICHLOROFLUOROMETHANE																
VINYL CHLORIDE	13 U	13 U	13 U	13.5 U	14 U	12 UJ	10 U	11 U								
Semivolatile Organics (ug/kg)																
1,1-BIPHENYL																
1,2,4-TRICHLOROBENZENE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
1,2-DICHLOROBENZENE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
1,3-DICHLOROBENZENE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
1,4-DICHLOROBENZENE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
2,2'-OXYBIS(1-CHLOROPROPANE)	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
2,4 DINITROTOLUENE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
2,4,5-TRICHLOROPHENOL	1100 UJ	1100 UJ	1100 UJ	1150 UJ	1200 UJ	1000 U	870 U	910 U								
2,4,6-TRICHLOROPHENOL	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
2,4-DICHLOROPHENOL	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
2,4-DIMETHYLPHENOL	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
2,4-DINITROPHENOL	1100 UJ	1100 UJ	1100 UJ	1150 UJ	1200 UJ	1000 U	870 U	910 U								
2,6 DINITROTOLUENE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
2-CHLORONAPHTHALENE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
2-CHLOROPHENOL	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
2-METHYLNAPHTHALENE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
2-METHYLPHENOL	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
2-NITROANILINE	1100 UJ	1100 UJ	1100 UJ	1150 UJ	1200 UJ	1000 U	870 U	910 U								
2-NITROPHENOL	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
3,3'-DICHLOROBENZIDINE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
3-NITROANILINE	1100 UJ	1100 UJ	1100 UJ	1150 UJ	1200 UJ	1000 U	870 U	910 U								
4,6-DINITRO-2-METHYLPHENOL	1100 UJ	1100 UJ	1100 UJ	1150 UJ	1200 UJ	1000 U	870 U	910 U								
4-BROMOPHENYL PHENYL ETHER	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
4-CHLORO-3-METHYLPHENOL	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
4-CHLOROANILINE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
4-CHLOROPHENYL PHENYL ETHER	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
4-METHYLPHENOL	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
4-NITROANILINE	1100 UJ	1100 UJ	1100 UJ	1150 UJ	1200 UJ	1000 U	870 U	910 U								
4-NITROPHENOL	1100 UJ	1100 UJ	1100 UJ	1150 UJ	1200 UJ	1000 U	870 U	910 U								
ACENAPHTHENE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	62 J	350 U	360 U								
ACENAPHTHYLENE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
ACETOPHENONE																
ANTHRACENE	440 UJ	82 J	420 UJ	445 UJ	470 UJ	140 J	42 J	360 U								
ATRAZINE																
BENZALDEHYDE																
BENZO(A)ANTHRACENE	67 J	480 J	420 UJ	445 UJ	470 UJ	430	310 J	360 U								
BENZO(A)PYRENE	65 J	350 J	420 UJ	445 UJ	470 UJ	390 J	240 J	360 U								

from site13_sam.dbf
from site13_res.dbf
from site13_res.xls
from q:\sql_[illegible]er\white_oak\upload

order	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016
site	013	013	013	013	013	013	013	013	013	013	013	013	013	013	013	013
location	13-SB-01	13-SB-02	13-SB-03	13-SB-03	13-SB-03	13-SB-01	13-SB-02	13-SB-03	13SB201	13SB201	13SB202	13SB202	13SB203	13SB203	13SB204	13SB204
nsample	13-SB-01	13-SB-02	13-SB-03	13-SB-03-AVG	13-SB-03-D	13-SS-01	13-SS-02	13-SS-03	13SB201-08	13SB201-10	13SB202-08	13SB202-12	13SB203-06	13SB203-12	13SB204-10	13SB204-14
sample	13-SB-01	13-SB-02	13-SB-03	13-SB-03-AVG	13-SB-03-DX	13-SS-01	13-SS-02	13-SS-03	13SB201-08	13SB201-10	13SB202-08	13SB202-12	13SB203-06	13SB203-12	13SB204-10	13SB204-14
sacode	NORMAL	NORMAL	DUP	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
matrix	SB	SB	SB	SB	SB	SS	SS	SS	SB	SB	SB	SB	SB	SB	SB	SB
depth_rang	1 - 2	1 - 2	1 - 2	1 - 2	1 - 2	0 - 1	0 - 1	0 - 1								
sample_dat	10/20/97	10/20/97	10/20/97	10/20/97	10/20/97	10/06/97	10/06/97	10/06/97	09/07/01	09/07/01	09/07/01	09/07/01	09/07/01	09/07/01	09/07/01	09/07/01
validated	T	T	T	T	T	T	T	T	Y	Y	Y	Y	Y	Y	Y	Y
cto_proj	273	273	273	273	273	273	273	273	839	839	839	839	839	839	839	839
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S
sort	**c_001**	**c_002**	**c_003**	**c_004**	**c_005**	**c_006**	**c_007**	**c_008**	**c_009**	**c_010**	**c_011**	**c_012**	**c_013**	**c_014**	**c_015**	**c_016**
BENZO(B)FLUORANTHENE	95 J	560 J	420 UJ	445 UJ	470 UJ	380 J	780	360 U								
BENZO(G,H,I)PERYLENE	440 UJ	200 J	420 UJ	445 UJ	470 UJ	290 J	210 J	360 U								
BENZO(K)FLUORANTHENE	440 UJ	190 J	420 UJ	445 UJ	470 UJ	250 J	350 U	360 U								
BIS(2-CHLOROETHOXY)METHANE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
BIS(2-CHLOROETHYL)ETHER	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
BIS(2-ETHYLHEXYL)PHTHALATE	56 J	260 J	130 J	103.5 J	77 J	400 U	350 U	360 U								
BUTYL BENZYL PHTHALATE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
CAPROLACTAM																
CARBAZOLE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	96 J	350 U	360 U								
CHRYSENE	47 J	500 J	420 UJ	445 UJ	470 UJ	430	350	360 U								
DI-N-BUTYL PHTHALATE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
DI-N-OCTYL PHTHALATE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
DIBENZO(A,H)ANTHRACENE	440 UJ	130 J	420 UJ	445 UJ	470 UJ	140 J	88 J	360 U								
DIBENZOFURAN	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
DIETHYL PHTHALATE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
DIMETHYL PHTHALATE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
FLUORANTHENE	110 J	1000 J	420 UJ	445 UJ	470 UJ	1100	640	360 U								
FLUORENE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	58 J	350 U	360 U								
HEXACHLOROBENZENE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
HEXACHLOROBUTADIENE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
HEXACHLOROCYCLOPENTADIENE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 UJ	360 U								
HEXACHLOROETHANE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
INDENO(1,2,3-CD)PYRENE	440 UJ	200 J	420 UJ	445 UJ	470 UJ	250 J	200 J	360 U								
ISOPHORONE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
N-NITROSO-DI-N-PROPYLAMINE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
N-NITROSODIPHENYLAMINE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
NAPHTHALENE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
NITROBENZENE	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
PENTACHLOROPHENOL	1100 UJ	1100 UJ	1100 UJ	1150 UJ	1200 UJ	1000 U	870 U	910 U								
PHENANTHRENE	73 J	410 J	420 UJ	445 UJ	470 UJ	590	190 J	360 U								
PHENOL	440 UJ	420 UJ	420 UJ	445 UJ	470 UJ	400 U	350 U	360 U								
PYRENE	110 J	890 J	420 UJ	445 UJ	470 UJ	570	570	360 U								
Pesticides/PCBs (ug/kg)																
4,4'-DDD	0.65 R	2 J	4.2 UJ	4.45 UJ	4.7 UJ	17 J	3.5 U	3.6 U								
4,4'-DDE	0.91 J	0.65 J	4.2 UJ	4.45 UJ	4.7 UJ	71 K	3.5 U	3.6 U								
4,4'-DDT	0.71 J	4.2 U	4.2 UJ	4.45 UJ	4.7 UJ	39 K	3.5 U	3.6 U								
ALDRIN	2.2 UJ	2.1 UJ	2.1 UJ	2.25 UJ	2.4 UJ	2 U	1.7 U	1.8 U								
ALPHA-BHC	2.2 UJ	2.1 UJ	2.1 UJ	2.25 UJ	2.4 UJ	2 U	1.7 U	1.8 U								
ALPHA-CHLORDANE	2.2 UJ	1.7 J	2.1 UJ	2.25 UJ	2.4 UJ	7.8 K	1.7 U	1.8 U								
AROCLOR-1016	44 UJ	42 UJ	42 UJ	44.5 UJ	47 UJ	40 U	35 U	36 U								
AROCLOR-1221	89 UJ	85 UJ	84 UJ	89 UJ	94 UJ	81 U	69 U	73 U								
AROCLOR-1232	44 UJ	42 UJ	42 UJ	44.5 UJ	47 UJ	40 U	35 U	36 U								
AROCLOR-1242	44 UJ	42 UJ	42 UJ	44.5 UJ	47 UJ	40 U	35 U	36 U								
AROCLOR-1248	44 UJ	42 UJ	42 UJ	44.5 UJ	47 UJ	40 U	35 U	36 U								

from site13_sam.dbf
from site13_res.dbf
from site13_res.xls
from q:\sql_server\white_oak\upload

site13_res -
full appendix results

order	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016
site	013	013	013	013	013	013	013	013	013	013	013	013	013	013	013	013
location	13-SB-01	13-SB-02	13-SB-03	13-SB-03	13-SB-03	13-SB-01	13-SB-02	13-SB-03	13SB201	13SB201	13SB202	13SB202	13SB203	13SB203	13SB204	13SB204
nsample	13-SB-01	13-SB-02	13-SB-03	13-SB-03-AVG	13-SB-03-D	13-SS-01	13-SS-02	13-SS-03	13SB201-08	13SB201-10	13SB202-08	13SB202-12	13SB203-06	13SB203-12	13SB204-10	13SB204-14
sample	13-SB-01	13-SB-02	13-SB-03	13-SB-03-AVG	13-SB-03-DX	13-SS-01	13-SS-02	13-SS-03	13SB201-08	13SB201-10	13SB202-08	13SB202-12	13SB203-06	13SB203-12	13SB204-10	13SB204-14
sacode	NORMAL	NORMAL	DUP	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
matrix	SB	SB	SB	SB	SB	SS	SS	SS	SB	SB	SB	SB	SB	SB	SB	SB
depth_rang	1 - 2	1 - 2	1 - 2	1 - 2	1 - 2	0 - 1	0 - 1	0 - 1								
sample_dat	10/20/97	10/20/97	10/20/97	10/20/97	10/20/97	10/06/97	10/06/97	10/06/97	09/07/01	09/07/01	09/07/01	09/07/01	09/07/01	09/07/01	09/07/01	09/07/01
validated	T	T	T	T	T	T	T	T	Y	Y	Y	Y	Y	Y	Y	Y
cto_proj	273	273	273	273	273	273	273	273	839	839	839	839	839	839	839	839
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S
sort	**c_001**	**c_002**	**c_003**	**c_004**	**c_005**	**c_006**	**c_007**	**c_008**	**c_009**	**c_010**	**c_011**	**c_012**	**c_013**	**c_014**	**c_015**	**c_016**
AROCLOR-1254	44 UJ	42 UJ	42 UJ	44.5 UJ	47 UJ	40 U	35 U	36 U								
AROCLOR-1260	44 UJ	42 UJ	42 UJ	44.5 UJ	47 UJ	170 J	59 J	36 U								
BETA-BHC	2.2 UJ	2.1 UJ	2.1 UJ	2.25 UJ	2.4 UJ	2 U	1.7 U	1.8 U								
DELTA-BHC	2.2 UJ	2.1 UJ	2.1 UJ	2.25 UJ	2.4 UJ	2 U	1.7 U	1.8 U								
DIELDRIN	4.4 UJ	4.2 UJ	4.2 UJ	4.45 UJ	4.7 UJ	15 J	3.5 U	3.6 U								
ENDOSULFAN I	2.2 UJ	2.1 UJ	2.1 UJ	2.25 UJ	2.4 UJ	2 U	1.7 U	1.8 U								
ENDOSULFAN II	4.4 UJ	4.2 UJ	4.2 UJ	4.45 UJ	4.7 UJ	4 U	3.5 U	3.6 U								
ENDOSULFAN SULFATE	4.4 UJ	4.2 UJ	4.2 UJ	4.45 UJ	4.7 UJ	4 U	3.5 U	3.6 U								
ENDRIN	4.4 UJ	4.2 UJ	4.2 UJ	4.45 UJ	4.7 UJ	4 U	3.5 U	3.6 U								
ENDRIN ALDEHYDE	4.4 UJ	4.2 UJ	4.2 UJ	4.45 UJ	4.7 UJ	4 U	3.5 U	3.6 U								
ENDRIN KETONE	4.4 UJ	4.2 UJ	4.2 UJ	4.45 UJ	4.7 UJ	4 U	3.5 U	3.6 U								
GAMMA-BHC (LINDANE)	2.2 UJ	2.1 UJ	2.1 UJ	2.25 UJ	2.4 UJ	2 U	1.7 U	1.8 U								
GAMMA-CHLORDANE	2.2 UJ	1.6 J	2.1 UJ	2.25 UJ	2.4 UJ	3.7 K	1.7 U	1.8 U								
HEPTACHLOR	2.2 UJ	2.1 UJ	2.1 UJ	2.25 UJ	2.4 UJ	2 U	1.7 U	1.8 U								
HEPTACHLOR EPOXIDE	2.2 UJ	2.1 UJ	2.1 UJ	2.25 UJ	2.4 UJ	2 U	1.7 U	1.8 U								
METHOXYCHLOR	22 UJ	21 UJ	21 UJ	22.5 UJ	24 UJ	20 U	17 U	18 U								
TOXAPHENE	220 UJ	210 UJ	210 UJ	225 UJ	240 UJ	200 U	170 U	180 U								
Explosives (ug/kg)																
1,3,5-TRINITROBENZENE	40.2 U	40.2 U	40.2 U	40.2 U	40.2 U											
1,3-DINITROBENZENE	37.2 U	37.2 U	37.2 U	37.2 U	37.2 U											
2,4,6-TRINITROTOLUENE	92 U	92 U	92 U	92 U	92 U											
2,4-DINITROTOLUENE	51.6 U	51.6 U	51.6 U	51.6 U	51.6 U											
2,6-DINITROTOLUENE	47.6 U	47.6 U	47.6 U	47.6 U	47.6 U											
2-AMINO-4,6-DINITROTOLUENE	46.7 U	46.7 U	46.7 U	46.7 U	46.7 U											
2-NITROTOLUENE	81.4 U	81.4 U	81.4 U	81.4 U	81.4 U											
3-NITROTOLUENE	81.8 U	81.8 U	81.8 U	81.8 U	81.8 U											
4-AMINO-2,6-DINITROTOLUENE	40.9 U	40.9 U	40.9 U	40.9 U	40.9 U											
4-NITROTOLUENE	87.2 U	87.2 U	87.2 U	87.2 U	87.2 U											
HMX	73 U	73 U	73 U	73 U	73 U											
NITRO-BENZENE	35.2 U	35.2 U	35.2 U	35.2 U	35.2 U											
RDX	50.9 U	50.9 U	50.9 U	50.9 U	50.9 U											
TETRYL	163 U	163 U	163 U	163 U	163 U											

from site13_sam.dbf
from site13_res.dbf
from site13_res.xls
from q:\sql_server\white_oak\upload

order	017	018	019	020	021	022	023	024	025	027	028	029	030
site	013	013	013	013	013	013	013	013	013	013	013	013	013
location	13SB205	13SB205	13SB206	13SB206	13SB207	13SB207	13TP03	13TP04	13TP04	13TP05	13TP05	13TP05	13TP05
nsample	13SB205-10	13SB205-4	13SB206-10	13SB206-14	13SB207-10	13SB207-14	13TP03SB0405	13TP04SB0405	13TP04WS0203	13TP05SB0607	13TP05WS0103	13TP05WS0103-AVG	13TP05WS0103-D
sample	13SB205-10	13SB205-4	13SB206-10	13SB206-14	13SB207-10	13SB207-14	13TP03SB0405	13TP04SB0405	13TP04WS0203	13TP05SB0607	13TP05WS0103	13TP05WS0103-AVG	FD05160201
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	AVG	DUP
matrix	SB	SB	SB	SB	SB	SB	SO	SO	SO	SO	SO	SO	SO
depth_rang							4 - 5	4 - 5	2 - 3	6 - 7	1 - 3	1 - 3	1 - 3
sample_dat	09/07/01	09/07/01	09/20/01	09/20/01	09/20/01	09/20/01	05/16/02	05/16/02	05/16/02	05/16/02	05/16/02	05/16/02	05/16/02
validated	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
cto_proj	839	839	839	839	839	839	839	839	839	839	839	839	839
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S
sort	**c_017**	**c_018**	**c_019**	**c_020**	**c_021**	**c_022**	**c_023**	**c_024**	**c_025**	**c_027**	**c_028**	**c_029**	**c_030**
Volatile Organics (ug/kg)													
1,1,1-TRICHLOROETHANE	11.7 U	12.3 U	10.1 U	10.1 U	10.2 U	12.3 U	11 U	11 U	12 U	13 U	11 U	11 U	
1,1,2,2-TETRACHLOROETHANE	2.79 J	12.3 U	10.1 U	17.9	10.2 U	171	11 U	11 U	12 U	13 U	11 U	11 U	
1,1,2-TRICHLOROETHANE							11 U	11 U	12 U	13 U	11 U	11 U	
1,1,2-TRICHLOROTRIFLUOROETHANE							11 U	11 U	12 U	13 U	11 U	11 U	
1,1-DICHLOROETHANE							11 U	11 U	12 U	13 U	11 U	11 U	
1,1-DICHLOROETHENE							11 U	11 U	12 U	13 U	11 U	11 U	
1,2,4-TRICHLOROBENZENE	11.7 U	12.3 U	10.1 U	10.1 U	10.2 U	12.3 U	11 U	11 U	12 U	13 U	11 U	11 U	
1,2-DIBROMO-3-CHLOROPROPANE	11.7 U	12.3 U	10.1 U	10.1 U	10.2 U	12.3 U	11 U	11 U	12 U	13 U	11 U	11 U	
1,2-DIBROMOETHANE							11 U	11 U	12 U	13 U	11 U	11 U	
1,2-DICHLOROBENZENE	11.7 U	12.3 U	10.1 U	10.1 U	10.2 U	12.3 U	11 U	11 U	12 U	13 U	11 U	11 U	
1,2-DICHLOROETHANE	11.7 U	12.3 U	10.1 U	10.1 U	10.2 U	12.3 U	11 U	11 U	12 U	13 U	11 U	11 U	
1,2-DICHLOROPROPANE							11 U	11 U	12 U	13 U	11 U	11 U	
1,3-DICHLOROBENZENE							11 U	11 U	12 U	13 U	11 U	11 U	
1,4-DICHLOROBENZENE	11.7 U	12.3 U	10.1 U	10.1 U	10.2 U	12.3 U	11 U	11 U	12 U	13 U	11 U	11 U	
2-BUTANONE							11 UJ	11 UJ	1.9 J	13 UJ	11 UJ	11 UJ	
2-HEXANONE	11.7 U	12.3 U	10.1 U	10.1 U	10.2 U	12.3 U	11 UJ	11 UJ	12 UJ	13 UJ	11 UJ	11 UJ	
4-METHYL-2-PENTANONE							11 UJ	11 UJ	12 UJ	13 UJ	11 UJ	11 UJ	
ACETONE	11.7 U	12.3 U	4.05 J	10.1 U	10.2 U	12.3 U	1.7 U	3 U	10 U	2.3 U	1.5 U	1.5 U	
BENZENE							11 U	11 U	12 U	13 U	11 U	11 U	
BROMODICHLOROMETHANE							11 U	11 U	12 U	13 U	11 U	11 U	
BROMOFORM							11 U	11 U	12 U	13 U	11 U	11 U	
BROMOMETHANE							11 U	11 U	12 U	13 U	11 U	11 U	
CARBON DISULFIDE	11.7 U	12.3 U	10.1 U	10.1 U	10.2 U	12.3 U	11 U	11 U	12 U	13 U	11 U	11 U	
CARBON TETRACHLORIDE	11.7 U	12.3 U	10.1 U	10.1 U	10.2 U	12.3 U	11 U	11 U	12 U	13 U	11 U	11 U	
CHLOROBENZENE	11.7 U	12.3 U	10.1 U	10.1 U	10.2 U	12.3 U	11 U	11 U	12 U	13 U	11 U	11 U	
CHLORODIBROMOMETHANE							11 U	11 U	12 U	13 U	11 U	11 U	
CHLOROETHANE							11 UJ	11 UJ	12 UJ	13 UJ	11 UJ	11 UJ	
CHLOROFORM							11 U	11 U	12 U	13 U	11 U	11 U	
CHLOROMETHANE	3.15 J	2.97 J	2.97 J	3.33 J	1.92 J	5.13 J	11 U	11 U	12 U	13 U	11 U	11 U	
CIS-1,2-DICHLOROETHENE	11.7 U	12.3 U	10.1 U	10.1 U	10.2 U	12.3 U	11 U	11 U	12 U	13 U	11 U	11 U	
CIS-1,3-DICHLOROPROPENE							11 U	11 U	12 U	13 U	11 U	11 U	
CYCLOHEXANE	11.7 U	12.3 U	10.1 U	10.1 U	10.2 U	12.3 U	11 U	11 U	12 U	13 U	11 U	11 U	
DICHLORODIFLUOROMETHANE							11 UJ	11 UJ	12 UJ	13 UJ	11 UJ	11 UJ	
ETHYLBENZENE	11.7 U	12.3 U	10.1 U	10.1 U	10.2 U	12.3 U	11 U	11 U	12 U	13 U	11 U	11 U	
ISOPROPYLBENZENE	11.7 U	12.3 U	10.1 U	10.1 U	10.2 U	12.3 U	11 U	11 U	12 U	13 U	11 U	11 U	
METHYL ACETATE	11.7 U	12.3 U	10.7	2.15 J	8.34 J	12.3 U	11 U	11 U	12 U	13 U	11 U	11 U	
METHYL CYCLOHEXANE	11.7 U	12.3 U	10.1 U	10.1 U	10.2 U	12.3 U	11 U	11 U	12 U	13 U	11 U	11 U	
METHYL TERT-BUTYL ETHER							11 U	11 U	12 U	13 U	11 U	11 U	
METHYLENE CHLORIDE							11 U	11 U	12 U	13 U	11 U	11 U	
STYRENE	11.7 U	12.3 U	10.1 U	10.1 U	10.2 U	12.3 U	11 U	11 U	12 U	13 U	11 U	11 U	
TETRACHLOROETHENE	11.7 U	12.3 U	10.1 U	10.1 U	10.2 U	2.54 J	11 U	11 U	12 U	13 U	11 U	11 U	
TOLUENE							11 U	11 U	12 U	13 U	11 U	11 U	
TOTAL 1,2-DICHLOROETHENE													

from site13_sam.dbf
from site13_res.dbf
from site13_res.xls
from q:\sql_server\white_oak\upload

order	017	018	019	020	021	022	023	024	025	027	028	029	030
site	013	013	013	013	013	013	013	013	013	013	013	013	013
location	13SB205	13SB205	13SB206	13SB206	13SB207	13SB207	13TP03	13TP04	13TP04	13TP05	13TP05	13TP05	13TP05
nsample	13SB205-10	13SB205-4	13SB206-10	13SB206-14	13SB207-10	13SB207-14	13TP03SB0405	13TP04SB0405	13TP04WS0203	13TP05SB0607	13TP05WS0103	13TP05WS0103-AVG	13TP05WS0103-D
sample	13SB205-10	13SB205-4	13SB206-10	13SB206-14	13SB207-10	13SB207-14	13TP03SB0405	13TP04SB0405	13TP04WS0203	13TP05SB0607	13TP05WS0103	13TP05WS0103-AVG	FD05160201
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	AVG	DUP
matrix	SB	SB	SB	SB	SB	SB	SO	SO	SO	SO	SO	SO	SO
depth_rang							4 - 5	4 - 5	2 - 3	6 - 7	1 - 3	1 - 3	1 - 3
sample_dat	09/07/01	09/07/01	09/20/01	09/20/01	09/20/01	09/20/01	05/16/02	05/16/02	05/16/02	05/16/02	05/16/02	05/16/02	05/16/02
validated	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
cto_proj	839	839	839	839	839	839	839	839	839	839	839	839	839
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S
sort	**c_017**	**c_018**	**c_019**	**c_020**	**c_021**	**c_022**	**c_023**	**c_024**	**c_025**	**c_027**	**c_028**	**c_029**	**c_030**
TOTAL XYLENES	11.7 U %	12.3 U	10.1 U	10.1 U	10.2 U	12.3 U	11 U	11 U	60	13 U	11 U	11 U	
TRANS-1,2-DICHLOROETHENE							11 U	11 U	12 U	13 U	11 U	11 U	
TRANS-1,3-DICHLOROPROPENE							11 U	11 U	12 U	13 U	11 U	11 U	
TRICHLOROETHENE	2.46 J	12.3 U	10.1 U	10.1 U	10.2 U	9.85 J	11 U	11 U	12 U	13 U	11 U	11 U	
TRICHLOROFLUOROMETHANE							11 UJ	11 UJ	12 UJ	13 UJ	11 UJ	11 UJ	
VINYL CHLORIDE							11 U	11 U	12 U	13 U	11 U	11 U	
Semivolatile Organics (ug/kg)													
1,1-BIPHENYL							360 U	380 U	390 U	360 U	360 U	365 U	370 U
1,2,4-TRICHLOROBENZENE													
1,2-DICHLOROBENZENE													
1,3-DICHLOROBENZENE													
1,4-DICHLOROBENZENE													
2,2'-OXYBIS(1-CHLOROPROPANE)							360 U	380 U	390 U	360 U	360 U	365 U	370 U
2,4 DINITROTOLUENE													
2,4,5-TRICHLOROPHENOL							910 U	950 U	990 U	910 U	920 U	930 U	940 U
2,4,6-TRICHLOROPHENOL							360 U	380 U	390 U	360 U	360 U	365 U	370 U
2,4-DICHLOROPHENOL							360 U	380 U	390 U	360 U	360 U	365 U	370 U
2,4-DIMETHYLPHENOL							360 U	380 U	390 U	360 U	360 U	365 U	370 U
2,4-DINITROPHENOL							910 U	950 U	990 U	910 U	920 U	930 U	940 U
2,6 DINITROTOLUENE													
2-CHLORONAPHTHALENE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
2-CHLOROPHENOL							360 U	380 U	390 U	360 U	360 U	365 U	370 U
2-METHYLNAPHTHALENE							360 U	380 U	44 J	360 U	360 U	365 U	370 U
2-METHYLPHENOL							360 U	380 U	390 U	360 U	360 U	365 U	370 U
2-NITROANILINE							910 U	950 U	990 U	910 U	920 U	930 U	940 U
2-NITROPHENOL							360 U	380 U	390 U	360 U	360 U	365 U	370 U
3,3'-DICHLOROBENZIDINE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
3-NITROANILINE							910 U	950 U	990 U	910 U	920 U	930 U	940 U
4,6-DINITRO-2-METHYLPHENOL							910 U	950 U	990 U	910 U	920 U	930 U	940 U
4-BROMOPHENYL PHENYL ETHER							360 U	380 U	390 U	360 U	360 U	365 U	370 U
4-CHLORO-3-METHYLPHENOL							360 U	380 U	390 U	360 U	360 U	365 U	370 U
4-CHLOROANILINE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
4-CHLOROPHENYL PHENYL ETHER							360 U	380 U	390 U	360 U	360 U	365 U	370 U
4-METHYLPHENOL							360 U	380 U	390 U	360 U	360 U	365 U	370 U
4-NITROANILINE							910 U	950 U	990 U	910 U	920 U	930 U	940 U
4-NITROPHENOL							910 U	950 U	990 U	910 U	920 U	930 U	940 U
ACENAPHTHENE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
ACENAPHTHYLENE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
ACETOPHENONE							150 U	180 U	280 U	140 U	94 U	84 U	74 U
ANTHRACENE							360 U	380 U	58 J	360 U	360 U	365 U	370 U
ATRAZINE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
BENZALDEHYDE							360 U	380 U	390 U	360 U	360 UJ	365 UJ	370 U
BENZO(A)ANTHRACENE							360 U	380 U	58 J	360 U	360 U	365 U	370 U
BENZO(A)PYRENE							360 U	380 U	41 J	360 U	360 U	365 U	370 U

from site13_sam.dbf
from site13_res.dbf
from site13_res.xls
from q:\sql_server\white_oak\upload

order	017	018	019	020	021	022	023	024	025	027	028	029	030
site	013	013	013	013	013	013	013	013	013	013	013	013	013
location	13SB205	13SB205	13SB206	13SB206	13SB207	13SB207	13TP03	13TP04	13TP04	13TP05	13TP05	13TP05	13TP05
nsample	13SB205-10	13SB205-4	13SB206-10	13SB206-14	13SB207-10	13SB207-14	13TP03SB0405	13TP04SB0405	13TP04WS0203	13TP05SB0607	13TP05WS0103	13TP05WS0103-AVG	13TP05WS0103-D
sample	13SB205-10	13SB205-4	13SB206-10	13SB206-14	13SB207-10	13SB207-14	13TP03SB0405	13TP04SB0405	13TP04WS0203	13TP05SB0607	13TP05WS0103	13TP05WS0103-AVG	FD05160201
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	AVG	DUP
matrix	SB	SB	SB	SB	SB	SB	SO	SO	SO	SO	SO	SO	SO
depth_rang							4 - 5	4 - 5	2 - 3	6 - 7	1 - 3	1 - 3	1 - 3
sample_dat	09/07/01	09/07/01	09/20/01	09/20/01	09/20/01	09/20/01	05/16/02	05/16/02	05/16/02	05/16/02	05/16/02	05/16/02	05/16/02
validated	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
cto_proj	839	839	839	839	839	839	839	839	839	839	839	839	839
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S
sort	**c_017**	**c_018**	**c_019**	**c_020**	**c_021**	**c_022**	**c_023**	**c_024**	**c_025**	**c_027**	**c_028**	**c_029**	**c_030**
BENZO(B)FLUORANTHENE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
BENZO(G,H,I)PERYLENE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
BENZO(K)FLUORANTHENE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
BIS(2-CHLOROETHOXY)METHANE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
BIS(2-CHLOROETHYL)ETHER							360 U	380 U	390 U	360 U	360 U	365 U	370 U
BIS(2-ETHYLHEXYL)PHTHALATE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
BUTYL BENZYL PHTHALATE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
CAPROLACTAM							360 U	380 U	390 U	360 U	360 U	365 U	370 U
CARBAZOLE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
CHRYSENE							360 U	380 U	71 J	360 U	360 U	365 U	370 U
DI-N-BUTYL PHTHALATE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
DI-N-OCTYL PHTHALATE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
DIBENZO(A,H)ANTHRACENE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
DIBENZOFURAN							360 U	380 U	390 U	360 U	360 U	365 U	370 U
DIETHYL PHTHALATE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
DIMETHYL PHTHALATE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
FLUORANTHENE							360 U	380 U	210 J	360 U	37 J	42 J	47 J
FLUORENE							360 U	380 U	64 J	360 U	360 U	365 U	370 U
HEXACHLOROBENZENE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
HEXACHLOROBUTADIENE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
HEXACHLOROCYCLOPENTADIENE							360 U	380 U	390 U	360 U	360 UJ	365 U	370 U
HEXACHLOROETHANE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
INDENO(1,2,3-CD)PYRENE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
ISOPHORONE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
N-NITROSO-DI-N-PROPYLAMINE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
N-NITROSODIPHENYLAMINE							360 U	380 U	390 U	360 U	360 U	365 U	370 U
NAPHTHALENE							360 U	380 U	68 J	360 U	360 U	365 U	370 U
NITROBENZENE													
PENTACHLOROPHENOL							910 U	950 U	990 U	910 U	920 U	930 U	940 U
PHENANTHRENE							360 U	380 U	430	360 U	360 U	365 U	370 U
PHENOL							360 U	380 U	390 U	360 U	360 U	365 U	370 U
PYRENE							360 U	380 U	240 J	360 U	360 U	41 J	41 J
Pesticides/PCBs (ug/kg)													
4,4'-DDD							1.9 U	2 U	0.61 J	1.9 U	1.9 U	1.9 U	0.85 R
4,4'-DDE							1.9 U	2 U	2 U	1.9 U	0.49 J	0.59 J	0.69 J
4,4'-DDT							1.9 U	2 U	2 U	1.9 U	0.34 R	0.38 R	0.42 R
ALDRIN							1.9 U	2 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U
ALPHA-BHC							1.9 U	2 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U
ALPHA-CHLORDANE							1.9 U	2 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U
AROCLOR-1016							36 U	38 U	39 U	36 U	36 U	36.5 U	37 U
AROCLOR-1221							36 U	38 U	39 U	36 U	36 U	36.5 U	37 U
AROCLOR-1232							36 U	38 U	39 U	36 U	36 U	36.5 U	37 U
AROCLOR-1242							36 U	38 U	39 U	36 U	36 U	36.5 U	37 U
AROCLOR-1248							36 U	38 U	39 U	36 U	36 U	36.5 U	37 U

from site13_sam.dbf
from site13_res.dbf
from site13_res.xls
from q:\sql_server\white_oak\upload

order	017	018	019	020	021	022	023	024	025	027	028	029	030
site	013	013	013	013	013	013	013	013	013	013	013	013	013
location	13SB205	13SB205	13SB206	13SB206	13SB207	13SB207	13TP03	13TP04	13TP04	13TP05	13TP05	13TP05	13TP05
nsample	13SB205-10	13SB205-4	13SB206-10	13SB206-14	13SB207-10	13SB207-14	13TP03SB0405	13TP04SB0405	13TP04WS0203	13TP05SB0607	13TP05WS0103	13TP05WS0103-AVG	13TP05WS0103-D
sample	13SB205-10	13SB205-4	13SB206-10	13SB206-14	13SB207-10	13SB207-14	13TP03SB0405	13TP04SB0405	13TP04WS0203	13TP05SB0607	13TP05WS0103	13TP05WS0103-AVG	FD05160201
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	AVG	DUP
matrix	SB	SB	SB	SB	SB	SB	SO	SO	SO	SO	SO	SO	SO
depth_rang							4 - 5	4 - 5	2 - 3	6 - 7	1 - 3	1 - 3	1 - 3
sample_dat	09/07/01	09/07/01	09/20/01	09/20/01	09/20/01	09/20/01	05/16/02	05/16/02	05/16/02	05/16/02	05/16/02	05/16/02	05/16/02
validated	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
cto_proj	839	839	839	839	839	839	839	839	839	839	839	839	839
proj_manag	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S	NESBIT,S
sort	**c_017**	**c_018**	**c_019**	**c_020**	**c_021**	**c_022**	**c_023**	**c_024**	**c_025**	**c_027**	**c_028**	**c_029**	**c_030**
AROCLOR-1254							36 U	38 U	39 U	36 U	36 U	36.5 U	37 U
AROCLOR-1260							36 U	38 U	39 U	36 U	100	105	110
BETA-BHC							1.9 U	2 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U
DELTA-BHC							1.9 U	2 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U
DIELDRIN							1.9 U	2 U	2 U	1.9 U	0.29 J	0.335 J	0.38 J
ENDOSULFAN I							1.9 U	2 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U
ENDOSULFAN II							1.9 U	2 U	2 U	1.9 U	1.7 R	2.05 R	2.4 R
ENDOSULFAN SULFATE							1.9 U	2 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U
ENDRIN							1.9 U	2 U	2 U	1.9 U	0.74 R	0.077 R	0.8 R
ENDRIN ALDEHYDE							1.9 U	2 U	2 U	1.9 U	1.9 U	1.9 U	1.7 R
ENDRIN KETONE							1.9 U	2 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U
GAMMA-BHC (LINDANE)							1.9 U	2 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U
GAMMA-CHLORDANE							1.9 U	2 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U
HEPTACHLOR							1.9 U	2 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U
HEPTACHLOR EPOXIDE							1.9 U	2 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U
METHOXYCHLOR							3.6 U	3.8 U	3.9 U	3.6 U	3.6 U	3.65 U	3.7 U
TOXAPHENE							73 U	77 U	80 U	73 U	74 U	75 U	76 U
Explosives (ug/kg)													
1,3,5-TRINITROBENZENE							250 U	250 U	250 U	250 U	250 U	250 U	250 U
1,3-DINITROBENZENE							250 U	250 U	250 U	250 U	250 U	250 U	250 U
2,4,6-TRINITROTOLUENE							250 U	250 U	250 U	250 U	250 U	250 U	250 U
2,4-DINITROTOLUENE							250 U	250 U	250 U	250 U	250 U	250 U	250 U
2,6-DINITROTOLUENE							250 U	250 U	250 U	250 U	250 U	250 U	250 U
2-AMINO-4,6-DINITROTOLUENE							250 U	250 U	250 U	250 U	250 U	250 U	250 U
2-NITROTOLUENE							250 U	250 U	250 U	250 U	250 U	250 U	250 U
3-NITROTOLUENE							250 U	250 U	250 U	250 U	250 U	250 U	250 U
4-AMINO-2,6-DINITROTOLUENE							250 U	250 U	250 U	250 U	250 U	250 U	250 U
4-NITROTOLUENE							250 U	250 U	250 U	250 U	250 U	250 U	250 U
HMX							500 U	500 U	500 U	500 U	500 U	500 U	500 U
NITRO-BENZENE							250 U	250 U	250 U	250 U	250 U	250 U	250 U
RDX							500 U	500 U	500 U	500 U	500 U	500 U	500 U
TETRYL							650 U	650 U	650 U	650 U	650 U	650 U	650 U

from site13_sam.dbf
from site13_res.dbf
from site13_res.xls
from q:\sql_server\white_oak\upload

order	**034**	**035**
site	013	013
location	13TP06	13TP07
nsample	13TP06SB0203	13TP07SB0304
sample	13TP06SB0203	13TP07SB0304
sacode	NORMAL	NORMAL
matrix	SO	SO
depth_rang	2 - 3	3 - 4
sample_dat	05/16/02	05/16/02
validated	Y	Y
cto_proj	839	839
proj_manag	NESBIT,S	NESBIT,S
sort	**c_034**	**c_035**
Volatile Organics (ug/kg)		
1,1,1-TRICHLOROETHANE	12 U	12 U
1,1,2,2-TETRACHLOROETHANE	12 U	12 U
1,1,2-TRICHLOROETHANE	12 U	12 U
1,1,2-TRICHLOROTRIFLUOROETHANE	12 U	12 U
1,1-DICHLOROETHANE	12 U	12 U
1,1-DICHLOROETHENE	12 U	12 U
1,2,4-TRICHLOROBENZENE	12 U	12 U
1,2-DIBROMO-3-CHLOROPROPANE	12 U	12 U
1,2-DIBROMOETHANE	12 U	12 U
1,2-DICHLOROBENZENE	12 U	12 U
1,2-DICHLOROETHANE	12 U	12 U
1,2-DICHLOROPROPANE	12 U	12 U
1,3-DICHLOROBENZENE	12 U	12 U
1,4-DICHLOROBENZENE	12 U	12 U
2-BUTANONE	12 U	12 UJ
2-HEXANONE	12 U	12 UJ
4-METHYL-2-PENTANONE	12 U	12 UJ
ACETONE	5.6 U	1.8 U
BENZENE	12 U	12 U
BROMODICHLOROMETHANE	12 U	12 U
BROMOFORM	12 U	12 U
BROMOMETHANE	12 U	12 U
CARBON DISULFIDE	12 U	12 U
CARBON TETRACHLORIDE	12 U	12 U
CHLOROBENZENE	12 U	12 U
CHLORODIBROMOMETHANE	12 U	12 U
CHLOROETHANE	12 UJ	12 UJ
CHLOROFORM	12 U	12 U
CHLOROMETHANE	12 U	12 U
CIS-1,2-DICHLOROETHENE	12 U	12 U
CIS-1,3-DICHLOROPROPENE	12 U	12 U
CYCLOHEXANE	12 U	12 U
DICHLORODIFLUOROMETHANE	12 UJ	12 UJ
ETHYLBENZENE	12 U	12 U
ISOPROPYLBENZENE	12 U	12 U
METHYL ACETATE	12 U	12 U
METHYL CYCLOHEXANE	12 U	12 U
METHYL TERT-BUTYL ETHER	12 U	12 U
METHYLENE CHLORIDE	1.5 U	12 U
STYRENE	12 U	12 U
TETRACHLOROETHENE	12 U	12 U
TOLUENE	12 U	12 U
TOTAL 1,2-DICHLOROETHENE		

from site13_sam.dbf
from site13_res.dbf
from site13_res.xls
from q:\sql_server\white_oak\upload

order	034	035
site	013	013
location	13TP06	13TP07
nsample	13TP06SB0203	13TP07SB0304
sample	13TP06SB0203	13TP07SB0304
sacode	NORMAL	NORMAL
matrix	SO	SO
depth_rang	2 - 3	3 - 4
sample_dat	05/16/02	05/16/02
validated	Y	Y
cto_proj	839	839
proj_manag	NESBIT,S	NESBIT,S
sort	**c_034**	**c_035**
TOTAL XYLENES	12 U	12 U
TRANS-1,2-DICHLOROETHENE	12 U	12 U
TRANS-1,3-DICHLOROPROPENE	12 U	12 U
TRICHLOROETHENE	12 U	12 U
TRICHLOROFLUOROMETHANE	12 UJ	12 UJ
VINYL CHLORIDE	12 U	12 U
Semivolatile Organics (ug/kg)		
1,1-BIPHENYL	380 U	370 U
1,2,4-TRICHLOROBENZENE		
1,2-DICHLOROBENZENE		
1,3-DICHLOROBENZENE		
1,4-DICHLOROBENZENE		
2,2'-OXYBIS(1-CHLOROPROPANE)	380 U	370 U
2,4 DINITROTOLUENE		
2,4,5-TRICHLOROPHENOL	950 U	940 U
2,4,6-TRICHLOROPHENOL	380 U	370 U
2,4-DICHLOROPHENOL	380 U	370 U
2,4-DIMETHYLPHENOL	380 U	370 U
2,4-DINITROPHENOL	950 U	940 U
2,6 DINITROTOLUENE		
2-CHLORONAPHTHALENE	380 U	370 U
2-CHLOROPHENOL	380 U	370 U
2-METHYLNAPHTHALENE	380 U	370 U
2-METHYLPHENOL	380 U	370 U
2-NITROANILINE	950 U	940 U
2-NITROPHENOL	380 U	370 U
3,3'-DICHLOROBENZIDINE	380 U	370 U
3-NITROANILINE	950 U	940 U
4,6-DINITRO-2-METHYLPHENOL	950 U	940 U
4-BROMOPHENYL PHENYL ETHER	380 U	370 U
4-CHLORO-3-METHYLPHENOL	380 U	370 U
4-CHLOROANILINE	380 U	370 U
4-CHLOROPHENYL PHENYL ETHER	380 U	370 U
4-METHYLPHENOL	380 U	370 U
4-NITROANILINE	950 U	940 U
4-NITROPHENOL	950 U	940 U
ACENAPHTHENE	380 U	370 U
ACENAPHTHYLENE	380 U	370 U
ACETOPHENONE	160 U	160 U
ANTHRACENE	380 U	370 U
ATRAZINE	380 U	370 U
BENZALDEHYDE	380 U	370 U
BENZO(A)ANTHRACENE	380 U	370 U
BENZO(A)PYRENE	380 U	370 U

from site13_sam.dbf
from site13_res.dbf
from site13_res.xls
from q:\sql_server\white_oak\upload

order	034	035
site	013	013
location	13TP06	13TP07
nsample	13TP06SB0203	13TP07SB0304
sample	13TP06SB0203	13TP07SB0304
sacode	NORMAL	NORMAL
matrix	SO	SO
depth_rang	2 - 3	3 - 4
sample_dat	05/16/02	05/16/02
validated	Y	Y
cto_proj	839	839
proj_manag	NESBIT,S	NESBIT,S
sort	**c_034**	**c_035**
BENZO(B)FLUORANTHENE	380 U	370 U
BENZO(G,H,I)PERYLENE	380 U	370 U
BENZO(K)FLUORANTHENE	380 U	370 U
BIS(2-CHLOROETHOXY)METHANE	380 U	370 U
BIS(2-CHLOROETHYL)ETHER	380 U	370 U
BIS(2-ETHYLHEXYL)PHTHALATE	380 U	370 U
BUTYL BENZYL PHTHALATE	380 U	370 U
CAPROLACTAM	380 U	370 U
CARBAZOLE	380 U	370 U
CHRYSENE	380 U	370 U
DI-N-BUTYL PHTHALATE	380 U	370 U
DI-N-OCTYL PHTHALATE	380 U	370 U
DIBENZO(A,H)ANTHRACENE	380 U	370 U
DIBENZOFURAN	380 U	370 U
DIETHYL PHTHALATE	380 U	370 U
DIMETHYL PHTHALATE	380 U	370 U
FLUORANTHENE	380 U	370 U
FLUORENE	380 U	370 U
HEXACHLOROBENZENE	380 U	370 U
HEXACHLOROBUTADIENE	380 U	370 U
HEXACHLOROCYCLOPENTADIENE	380 U	370 U
HEXACHLOROETHANE	380 U	370 U
INDENO(1,2,3-CD)PYRENE	380 U	370 U
ISOPHORONE	380 U	370 U
N-NITROSO-DI-N-PROPYLAMINE	380 U	370 U
N-NITROSODIPHENYLAMINE	380 U	370 U
NAPHTHALENE	380 U	370 U
NITROBENZENE		
PENTACHLOROPHENOL	950 U	940 U
PHENANTHRENE	380 U	370 U
PHENOL	380 U	370 U
PYRENE	380 U	370 U
Pesticides/PCBs (ug/kg)		
4,4'-DDD	1.9 U	1.9 U
4,4'-DDE	1.9 U	1.9 U
4,4'-DDT	1.9 U	1.9 U
ALDRIN	1.9 U	1.9 U
ALPHA-BHC	1.9 U	1.9 U
ALPHA-CHLORDANE	1.9 U	1.9 U
AROCLOR-1016	38 U	37 U
AROCLOR-1221	38 U	37 U
AROCLOR-1232	38 U	37 U
AROCLOR-1242	38 U	37 U
AROCLOR-1248	38 U	37 U

from site13_sam.dbf
from site13_res.dbf
from site13_res.xls
from q:\sql_server\white_oak\upload

order	034	035
site	013	013
location	13TP06	13TP07
nsample	13TP06SB0203	13TP07SB0304
sample	13TP06SB0203	13TP07SB0304
sacode	NORMAL	NORMAL
matrix	SO	SO
depth_rang	2 - 3	3 - 4
sample_dat	05/16/02	05/16/02
validated	Y	Y
cto_proj	839	839
proj_manag	NESBIT,S	NESBIT,S
sort	**c_034**	**c_035**
AROCLOR-1254	38 U	37 U
AROCLOR-1260	38 U	37 U
BETA-BHC	1.9 U	1.9 U
DELTA-BHC	1.9 U	1.9 U
DIELDRIN	1.9 U	1.9 U
ENDOSULFAN I	1.9 U	1.9 U
ENDOSULFAN II	1.9 U	1.9 U
ENDOSULFAN SULFATE	1.9 U	1.9 U
ENDRIN	1.9 U	1.9 U
ENDRIN ALDEHYDE	1.9 U	1.9 U
ENDRIN KETONE	1.9 U	1.9 U
GAMMA-BHC (LINDANE)	1.9 U	1.9 U
GAMMA-CHLORDANE	1.9 U	1.9 U
HEPTACHLOR	1.9 U	1.9 U
HEPTACHLOR EPOXIDE	1.9 U	1.9 U
METHOXYCHLOR	3.8 U	3.7 U
TOXAPHENE	76 U	76 U
Explosives (ug/kg)		
1,3,5-TRINITROBENZENE	250 U	250 U
1,3-DINITROBENZENE	250 U	250 U
2,4,6-TRINITROTOLUENE	250 U	250 U
2,4-DINITROTOLUENE	250 U	250 U
2,6-DINITROTOLUENE	250 U	250 U
2-AMINO-4,6-DINITROTOLUENE	250 U	250 U
2-NITROTOLUENE	250 U	250 U
3-NITROTOLUENE	250 U	250 U
4-AMINO-2,6-DINITROTOLUENE	250 U	250 U
4-NITROTOLUENE	250 U	250 U
HMX	500 U	500 U
NITRO-BENZENE	250 U	250 U
RDX	500 U	500 U
TETRYL	650 U	650 U

from site13_sam.dbf
from site13_res.dbf
from site13_res.xls
from q:\sql_server\white_oak\upload

APPENDIX E

SHAPIRO-WILK ANALYSIS

NORMAL AND LOGNORMAL UCLS FOR COPCS
SITE 5 - OPEN BURN AREAS
FORMER NSWC, WHITE OAK, SILVER SPRING, MARYLAND

PARAMETER	# DETECTS	CNT	AVG	STD DEV	W NORM	W LOG	W TEST	SAMP UCL NORM	SAMP UCL LOG	MAX DETECT	DIST	REP CONC
Benzo(a)pyrene	8.0000	18.0000	0.1926667	0.0881916	0.6894	0.8153	0.8970	0.228836	0.23643	0.5	U	0.23643
Dibenzo(a,h)anthracene	3.0000	18.0000	0.1734444	0.0505187	0.7018	0.5921	0.8970	0.1941633	0.2217261	0.12	U	0.12
Aroclor-1260	7.0000	18.0000	0.1672917	0.3190199	0.5519	0.6451	0.8970	0.2981287	0.4464795	1.2	U	0.4464795
Dieldrin	4.0000	18.0000	0.0047403	0.0121162	0.3201	0.6677	0.8970	0.0097094	0.0057209	0.053	U	0.0057209
2-Amino-4,6-dinitrotoluene	1.0000	18.0000	0.126675	0.2408281	0.4083	0.7379	0.8970	0.2254439	0.2366045	1.07	U	0.2366045
RDX	1.0000	18.0000	1.8349472	7.229593	0.2637	0.6898	0.8970	4.7999619	3.2416523	30.8	U	3.2416523
Copper	18.0000	18.0000	136.1361	233.2518	0.6115	0.8826	0.8970	231.7978	731.1108	701	U	701
Selenium	17.0000	18.0000	7.3375	8.2428	0.7117	0.9326	0.8970	10.718	15.6229	25.6	L	15.6229
Thallium	7.0000	18.0000	0.4504	0.2287	0.8503	0.9217	0.8970	0.5442	0.5672	0.95	L	0.5672

NORMAL AND LOGNORMAL UCLS FOR COPCS
SITE 13 - OIL SUDGE DISPOSAL AREA
FORMER NSWC, WHITE OAK, SILVER SPRING, MARYLAND

PARAMETER	# DETECTS	CNT	AVG	STD DEV	W NORM	W LOG	W TEST	SAMP UCL NORM	SAMP UCL LOG	MAX DETECT	DIST	REP CONC
Benzo(a)pyrene	5.0000	13.0000	0.1996923	0.0940489	0.8765	0.8061	0.8660	0.2461748	0.3099672	0.39	N	N
Dibenzo(a,h)anthracene	3.0000	13.0000	0.1756154	0.0367158	0.8658	0.7908	0.8660	0.1937617	0.2021173	0.14	N	N
Thallium	7.0000	13.0000	0.6087	0.4855	0.676	0.9373	0.866	0.8486	0.8844	2.1	N	N

APPENDIX F

SAMPLE CALCULATIONS

CLIENT	JOB NUMBER
WHITE OAK	N4246
SUBJECT: SAMPLE CALCULATION OF STATISTICAL ANALYSIS	
BASED ON: SITE 5 CHROMIUM SOIL RESULTS	DRAWING NUMBER
BY: TSK / CHECKED BY: BEL	APPROVED BY / DATE: 9/09/02

THE DATA USED FOR THE FOLLOWING SAMPLE CALCULATIONS ARE THE CHROMIUM RESULTS COLLECTED FROM SOILS AT SITE 5.

NSAMPLE	PARAMETER	RESULT	QUALIFIER	VALUE	SAMPLE DATE
05-SB-01-8_OLD	CHROMIUM	13.1	J	13.1	10/21/97
05-SB-02-10_OLD-AVG	CHROMIUM	8.05	J	8.05	10/22/97
05-SB-02-22_OLD	CHROMIUM	9.9	J	9.9	10/22/97
05-SB-03-12_OLD	CHROMIUM	35	J	35	10/21/97
05-SB-03-25_OLD	CHROMIUM	4.6	J	4.6	10/22/97
05-SB-04-20_OLD	CHROMIUM	29.1	J	29.1	10/21/97
05-SB-04-6_OLD	CHROMIUM	37.3	J	37.3	10/21/97
05-SB-05-25_OLD	CHROMIUM	14.3	J	14.3	10/22/97
05-SB-05-2_OLD	CHROMIUM	35.7	J	35.7	10/20/97
05-SB-100_OLD_AVG	CHROMIUM	8.7	J	8.7	10/21/97
05TP01SB0507[QZ]	CHROMIUM	6.2		6.2	5/16/02
05TP01WS0204[QZ]	CHROMIUM	40.9		40.9	5/16/02
05TP08SB0506[QZ]	CHROMIUM	5.6		5.6	5/16/02
05TP09SB0506[QZ]-AVG	CHROMIUM	2.8		2.8	5/17/02
05TP10SB0506[QZ]	CHROMIUM	9.5		9.5	5/17/02
05TP11SB0203[QZ]	CHROMIUM	5.6		5.6	5/17/02
05TP12SB0708[QZ]	CHROMIUM	5.9		5.9	5/17/02
05TP12WS0204[QZ]	CHROMIUM	20		20	5/17/02

* VALUE = RESULT/2 FOR NON-DETECTS (NO NON-DETECTS IN THIS CASE)

① CALCULATE THE ARITHMETIC MEAN ($\bar{x}$):

$$\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n}$$

$$\sum_{i=1}^{18} = 13.1 + 8.05 + 9.9 + 35 + 4.6 + 29.1 + 37.3 + 14.3 + 35.7 + 8.7 + 6.2 + 40.9 + 5.6 + 2.8 + 9.5 + 5.6 + 5.9 + 20$$

CLIENT	JOB NUMBER
WHITE OAK	NH246
SUBJECT: SAMPLE CALCULATION OF STATISTICAL ANALYSIS	
BASED ON: SITE 5 CHROMIUM SOIL RESULTS	DRAWING NUMBER
BY: TSK / CHECKED BY: BEL	APPROVED BY / DATE: 9/09/02

$$\sum_{i=1}^{18} = 292.25 \qquad \bar{X} = \frac{292.25}{18} = 16.236$$

② CALCULATE THE STANDARD DEVIATION (S_x):

$$S_x = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n-1}}$$

$$\sum_{i=1}^{18} (x_i - \bar{x})^2 = (13.1-16.236)^2 + (8.05-16.236)^2 + (9.9-16.236)^2 + (35-16.236)^2 + (4.6-16.236)^2$$
$$+ (29.1-16.236)^2 + (37.3-16.236)^2 + (14.3-16.236)^2 + (35.7-16.236)^2 + (8.7-16.236)^2$$
$$+ (6.2-16.236)^2 + (40.9-16.236)^2 + (5.6-16.236)^2 + (2.8-16.236)^2 + (9.5-16.236)^2$$
$$+ (5.6-16.236)^2 + (5.9-16.236)^2 + (20-16.236)^2$$

$$= (-3.136)^2 + (-8.186)^2 + (-6.336)^2 + (18.763)^2 + (-11.636)^2$$
$$+ (12.863)^2 + (21.063)^2 + (-1.936)^2 + (19.463)^2 + (-7.536)^2$$
$$+ (-10.036)^2 + (24.663)^2 + (-10.636)^2 + (-13436)^2 + (-6.736)^2$$
$$+ (-10.636)^2 + (-10.336)^2 + (3.763)^2$$

$$= (9.8352) + (67.012) + (40.146) + (352.08) + (135.4)$$
$$+ (165.48) + (443.69) + (3.7485) + (378.84) + (56.793)$$
$$+ (100.72) + (608.31) + (113.13) + (180.53) + (45.375)$$
$$+ (113.13) + (106.84) + (14.167)$$

$$\sum_{i=1}^{18} (x_i - \bar{x})^2 = 2935.2$$

$$S_x = \sqrt{\frac{\sum_{i=1}^{18} (x_i - \bar{x})^2}{n-1}} = \sqrt{\frac{2935.2}{18-1}} = \sqrt{172.66}$$

$$S_x = 13.14$$

CLIENT	JOB NUMBER	
White Oak	N4246	
SUBJECT Sample Calculation of Statistical Analysis		
BASED ON Site 5 Chromium Soil Results	DRAWING NUMBER	
BY TSK	CHECKED BY BEL	APPROVED BY DATE 9/09/02

(3) Calculate the Shapiro Wilk W-Statistic (W_{CALC}):

$$W_{CALC} = \left(\frac{b}{S_x \sqrt{n-1}} \right)^2$$

Calculate b by creating the following table:

Column 1: Value ordered from smallest to largest (R_i)
Column 2: Value ordered from largest to smallest (R_{n-i+1})
Column 3: Column 2 - Column 1 ($R_{n-i+1} - R_i$)
Column 4: Coefficient a_i found in Table 1
Column 5: Column 3 x Column 4 = $b_i = a_i (R_{n-i+1} - R_i)$

$$b = \sum_{i=1}^{K} b_i$$

* Where K is the greatest integer less than or equal to $n/2$

$$K = n/2 = 18/2 = 9$$

CLIENT: White Oak	JOB NUMBER: N4246
SUBJECT: Sample Calculation of Statistical Analysis	
BASED ON: Site 5 Chromium Soil Results	DRAWING NUMBER:
BY: TSK / CHECKED BY: BEL	APPROVED BY: / DATE: 9/09/02

R_i	R_{n-i+1}	$R_{n-i+1} - R_i$	a_i	b_i	i
2.8	40.9	38.1	0.4886	18.61566	1
4.6	37.3	32.7	0.3253	10.63731	2
5.6	35.7	30.1	0.2553	7.68453	3
5.6	35	29.4	0.2027	5.95938	4
5.9	29.1	23.2	0.1587	3.68184	5
6.2	20	13.8	0.1197	1.65186	6
8.05	14.3	6.25	0.0837	0.523125	7
8.7	13.1	4.4	0.0496	0.21824	8
9.5	9.9	0.4	0.0163	0.00652	9
9.9	9.5				10
13.1	8.7				11
14.3	8.05				12
20	6.2				13
29.1	5.9				14
35	5.6				15
35.7	5.6				16
37.3	4.6				17
40.9	2.8			+	18
				$b = 48.978465$	

$$W_{CALC} = \left(\frac{b}{S_x\sqrt{n-1}}\right)^2$$

$$= \left(\frac{48.978465}{13.14\left(\sqrt{17}\right)}\right)^2 = \left(\frac{48.978465}{54.17761}\right)^2 = (0.904)^2 = 0.817$$

- Determine W_{TEST} at a 5% level of significance from Table 2.
- Compare W_{TEST} to W_{CALC}

$$W_{TEST} = 0.897 > 0.817 = W_{CALC}$$

Since $W_{CALC} < W_{TEST}$ we reject the Null Hypothesis that the data set has a Normal Distribution

CLIENT	JOB NUMBER
WHITE OAK	N4246
SUBJECT: SAMPLE CALCULATION OF STATISTICAL ANALYSIS	
BASED ON: SITE 5 CHROMIUM SOIL RESULTS	DRAWING NUMBER
BY: TSK / CHECKED BY: BEL	APPROVED BY / DATE: 9/09/02

AFTER FURTHER INVESTIGATION, RUNNING THE SHAPIRO WILK TEST ON LOG-TRANSFORMED DATA, THE DATA SET IS BEST REPRESENTED AS A LOGNORMAL DISTRIBUTION.

$$W_{\substack{CALC \\ LOG}} = 0.9298 > 0.897 = W_{TEST}$$

(4) CALCULATE THE 95% UPPER CONFIDENCE LIMIT ($UCL_{0.95}$):

$$UCL_{0.95} = \bar{x} + t_{0.95,n-1}\left(S_x/\sqrt{n}\right)$$

* DETERMINE $t_{0.95,n-1}$ FROM TABLE 3

$$t_{0.95,17} = 1.740$$

$$UCL_{0.95} = 16.236 + 1.740\left[\frac{13.14}{\sqrt{18}}\right]$$

$$= 16.236 + 5.3890$$

$$UCL_{0.95} = 21.625$$

(5) CALCULATE THE 95% UPPER CONFIDENCE LIMIT FOR LOGNORMAL VALUES:

* FIRST, FIND $\bar{y}$ & S_y USING LOG-TRANSFORMED VALUES OF THE ORIGINAL DATA BY THE SAME PROCEDURES ON PAGES 1 & 2 FOR $\bar{x}$ & S_x.

$$\bar{y} = 2.4696 \qquad S_y = 0.8295$$

$$UCL_{0.95} = e^{\left[\bar{y} + 0.5(S_y)^2 + \frac{S_y(H_{0.95,n})}{\sqrt{n-1}}\right]}$$

CLIENT	JOB NUMBER
White Oak	NH246
SUBJECT: Sample Calculation of Statistical Analysis	
BASED ON: Site 5 Chromium Soil Results	DRAWING NUMBER
BY: TSK / CHECKED BY: BEL	APPROVED BY / DATE: 9/09/02

* Find $H_{0.95,n}$ from Table H by interpolation.

$$y - y_1 = \frac{y_2 - y_1}{x_2 - x_1}(X - X_1)$$

where: $x = S_y$ for $n = 15$

$x_1 = S_y < 0.8295 = 0.80$ (From Table H)

$x_2 = S_y > 0.8295 = 0.90$ (From Table H)

$y = H_{0.95,n}$

y_1 = Respective $H_{0.95}$ value from Table H (at X_1)

y_2 = Respective $H_{0.95}$ value from Table H (at X_2)

$$y - 2.443 = \frac{2.589 - 2.443}{0.90 - 0.80}(0.8295 - 0.80)$$

$$y = 1.46(0.0295) + 2.443$$

$$y = 2.48607$$

Complete interpolation between values for $n = 21$ and then for new values $15 \rightarrow 21$

$H_{0.95,18} = 2.4149$

$$UCL_{0.95} = e^{\left[2.4696 + (0.5)(0.8295)^2 + \left(\frac{0.8295(2.4149)}{\sqrt{18-1}}\right)\right]}$$

$$= e^{\left[2.4696 + 0.344 + 0.485854\right.}$$

$$= e^{[3.29945)}$$

$$UCL_{0.95} = 27.0978$$

Sample Calculations Table 1
COEFFICIENTS A_i FOR W TEST OF NORMALITY FOR N=2 to 50

i/n	2	3	4	5	6	7	8	9	10
1	0.7071	0.7071	0.6872	0.6646	0.6431	0.6233	0.6052	0.5888	0.5739
2			0.1677	0.2413	0.2806	0.3031	0.3164	0.3244	0.3291
3					0.0875	0.1401	0.1743	0.1976	0.2141
4							0.0561	0.0947	0.1224
5									0.0399

i/n	11	12	13	14	15	16	17	18	19	20
1	0.5601	0.5475	0.5359	0.5251	0.5150	0.5056	0.4968	0.4886	0.4808	0.4734
2	0.3315	0.3325	0.3325	0.3318	0.3306	0.3290	0.3273	0.3253	0.3232	0.3211
3	0.2260	0.2347	0.2412	0.2460	0.2495	0.2521	0.2540	0.2553	0.2561	0.2565
4	0.1429	0.1586	0.1707	0.1802	0.1878	0.1939	0.1988	0.2027	0.2059	0.2085
5	0.0695	0.0922	0.1099	0.1240	0.1353	0.1447	0.1524	0.1587	0.1641	0.1686
6		0.0303	0.0539	0.0727	0.0880	0.1005	0.1109	0.1197	0.1271	0.1334
7				0.0240	0.0433	0.0593	0.0725	0.0837	0.0932	0.1013
8						0.0196	0.0359	0.0496	0.0612	0.0711
9								0.0163	0.0303	0.0422
10										0.0140

i/n	21	22	23	24	25	26	27	28	29	30
1	0.4643	0.4590	0.4542	0.4493	0.4450	0.4407	0.4366	0.4328	0.4291	0.4254
2	0.3185	0.3156	0.3126	0.3098	0.3069	0.3043	0.3018	0.2992	0.2968	0.2944
3	0.2578	0.2571	0.2563	0.2554	0.2543	0.2533	0.2522	0.2510	0.2499	0.2487
4	0.2119	0.2131	0.2139	0.2145	0.2148	0.2151	0.2152	0.2151	0.2150	0.2148
5	0.1736	0.1764	0.1787	0.1807	0.1822	0.1836	0.1848	0.1857	0.1864	0.1870
6	0.1399	0.1443	0.1480	0.1512	0.1539	0.1563	0.1584	0.1601	0.1616	0.1630
7	0.1092	0.1150	0.1201	0.1245	0.1283	0.1316	0.1346	0.1372	0.1395	0.1415
8	0.0804	0.0878	0.0941	0.0997	0.1046	0.1089	0.1128	0.1162	0.1192	0.1219
9	0.0530	0.0618	0.0696	0.0764	0.0823	0.0876	0.0923	0.0965	0.1002	0.1036
10	0.0263	0.0368	0.0459	0.0539	0.0610	0.0672	0.0728	0.0778	0.0822	0.0862
11		0.0122	0.0228	0.0321	0.0403	0.0476	0.0540	0.0598	0.0650	0.0697
12				0.0107	0.0200	0.0284	0.0358	0.0424	0.0483	0.0537
13						0.0094	0.0178	0.0253	0.0320	0.0381
14								0.0084	0.0159	0.0227
15										0.0076

i/n	31	32	33	34	35	36	37	38	39	40
1	0.4220	0.4188	0.4156	0.4127	0.4096	0.4068	0.4040	0.4015	0.9689	0.3964
2	0.2921	0.2898	0.2876	0.2854	0.2834	0.2813	0.2794	0.2774	0.2755	0.2737
3	0.2475	0.2463	0.2451	0.2439	0.2427	0.2415	0.2403	0.2391	0.2380	0.2368
4	0.2145	0.2141	0.2137	0.2132	0.2127	0.2121	0.2116	0.2110	0.2104	0.2098
5	0.1874	0.1878	0.1880	0.1882	0.1883	0.1883	0.1883	0.1881	0.1880	0.1878
6	0.1641	0.1651	0.1660	0.1667	0.1673	0.1678	0.1683	0.1686	0.1689	0.1691
7	0.1433	0.1449	0.1463	0.1475	0.1487	0.1496	0.1503	0.1513	0.1520	0.1526
8	0.1243	0.1265	0.1284	0.1301	0.1317	0.1331	0.1344	0.1356	0.1366	0.1376
9	0.1066	0.1093	0.1118	0.1140	0.1160	0.1179	0.1196	0.1211	0.1225	0.1237
10	0.0899	0.0931	0.0961	0.0988	0.1013	0.1036	0.1056	0.1075	0.1092	0.1108
11	0.0739	0.0777	0.0821	0.0844	0.0873	0.0900	0.0924	0.0947	0.0967	0.0986
12	0.0585	0.0629	0.0669	0.0706	0.0739	0.0770	0.0798	0.0824	0.0848	0.0870
13	0.0435	0.0485	0.0530	0.0572	0.0610	0.0645	0.0677	0.0706	0.0733	0.0759
14	0.0289	0.0344	0.0395	0.0441	0.0484	0.0523	0.0559	0.0592	0.0622	0.0651
15	0.0144	0.0206	0.0262	0.0314	0.0361	0.0404	0.0444	0.0481	0.0515	0.0546
16		0.0068	0.0131	0.0187	0.0239	0.0287	0.0331	0.0372	0.0409	0.0444
17				0.0062	0.0119	0.0172	0.0220	0.0264	0.0305	0.0343
18						0.0057	0.0110	0.0158	0.0203	0.0244
19								0.0053	0.0101	0.0146
20										0.0049

i/n	41	42	43	44	45	46	47	48	49	50
1	0.3940	0.3917	0.3894	0.3872	0.3850	0.3830	0.3808	0.3789	0.3770	0.3751
2	0.2719	0.2701	0.2684	0.2667	0.2651	0.2635	0.2620	0.2604	0.2589	0.2574
3	0.2357	0.2345	0.2334	0.2323	0.2313	0.2302	0.2291	0.2281	0.2271	0.2260
4	0.2091	0.2085	0.2078	0.2072	0.2065	0.2058	0.2052	0.2045	0.2038	0.2032
5	0.1876	0.1874	0.1871	0.1868	0.1865	0.1862	0.1859	0.1855	0.1851	0.1847
6	0.1693	0.1694	0.1695	0.1695	0.1695	0.1695	0.1695	0.1693	0.1692	0.1691
7	0.1531	0.1535	0.1539	0.1542	0.1545	0.1548	0.1550	0.1551	0.1553	0.1554
8	0.1384	0.1392	0.1398	0.1405	0.1410	0.1415	0.1420	0.1423	0.1427	0.1430
9	0.1249	0.1259	0.1269	0.1278	0.1286	0.1293	0.1300	0.1306	0.1312	0.1317
10	0.1123	0.1136	0.1149	0.1160	0.1170	0.1180	0.1189	0.1197	0.1205	0.1212
11	0.1004	0.1020	0.1035	0.1049	0.1062	0.1073	0.1085	0.1095	0.1105	0.1113
12	0.0891	0.0909	0.0927	0.0943	0.0959	0.0972	0.0986	0.0998	0.1010	0.1020
13	0.0782	0.0804	0.0824	0.0842	0.0860	0.0876	0.0892	0.0906	0.0919	0.0932
14	0.0677	0.0701	0.0724	0.0745	0.0775	0.0785	0.0801	0.0817	0.0832	0.0846
15	0.0575	0.0602	0.0628	0.0651	0.0673	0.0694	0.0713	0.0731	0.0748	0.0764
16	0.0476	0.0506	0.0534	0.0560	0.0584	0.0607	0.0628	0.0648	0.0667	0.0685
17	0.0379	0.0411	0.0442	0.0471	0.0497	0.0522	0.0546	0.0568	0.0588	0.0608
18	0.0283	0.0318	0.0352	0.0383	0.0412	0.0439	0.0465	0.0489	0.0511	0.0532
19	0.0188	0.0227	0.0263	0.0296	0.0328	0.0357	0.0385	0.0411	0.0436	0.0459
20	0.0094	0.0136	0.0175	0.0211	0.0245	0.0277	0.0307	0.0335	0.0361	0.0386
21		0.0045	0.0087	0.0126	0.0163	0.0197	0.0229	0.0259	0.0288	0.0314
22				0.0042	0.0081	0.0188	0.0153	0.0185	0.0215	0.0244
23						0.0039	0.0076	0.0111	0.0143	0.0174
24								0.0037	0.0071	0.0104
25										0.0350

TABLE 2
PERCENTAGE POINTS OF THE W TEST FOR N=3 to 50

n	0.01	0.05
3	0.753	0.767
4	0.687	0.748
5	0.686	0.762
6	0.713	0.788
7	0.730	0.803
8	0.749	0.818
9	0.764	0.829
10	0.781	0.842
11	0.792	0.850
12	0.805	0.859
13	0.814	0.866
14	0.825	0.874
15	0.835	0.881
16	0.844	0.887
17	0.851	0.892
18	0.858	0.897
19	0.863	0.901
20	0.868	0.905
21	0.873	0.908
22	0.878	0.911
23	0.881	0.914
24	0.884	0.916
25	0.888	0.918
26	0.891	0.920
27	0.894	0.923
28	0.896	0.924
29	0.898	0.926
30	0.900	0.927

n	0.01	0.05
31	0.902	0.929
32	0.904	0.930
33	0.906	0.931
34	0.908	0.933
35	0.910	0.934
36	0.912	0.935
37	0.914	0.936
38	0.916	0.938
39	0.917	0.939
40	0.919	0.940
41	0.920	0.941
42	0.922	0.942
43	0.923	0.943
44	0.924	0.944
45	0.926	0.945
46	0.927	0.945
47	0.928	0.946
48	0.929	0.947
49	0.929	0.947
50	0.930	0.947

Sample Calculations Table 3
PERCENTILES OF STUDENT's t-DISTRIBUTION WITH n DEGREES OF FREEDOM

n\F	0.60	0.75	0.90	0.95	0.975	0.99	0.995	0.9995
1	0.325	1.000	3.078	6.314	12.706	31.821	63.656	636.578
2	0.289	0.816	1.886	2.920	4.303	6.965	9.925	31.600
3	0.277	0.765	1.638	2.353	3.182	4.541	5.841	12.924
4	0.271	0.741	1.533	2.132	2.776	3.747	4.604	8.610
5	0.267	0.727	1.476	2.015	2.571	3.365	4.032	6.869
6	0.265	0.718	1.440	1.943	2.447	3.143	3.707	5.959
7	0.263	0.711	1.415	1.895	2.365	2.998	3.499	5.408
8	0.262	0.706	1.397	1.860	2.306	2.896	3.355	5.041
9	0.261	0.703	1.383	1.833	2.262	2.821	3.250	4.781
10	0.260	0.700	1.372	1.812	2.228	2.764	3.169	4.587
11	0.260	0.697	1.363	1.796	2.201	2.718	3.106	4.437
12	0.259	0.695	1.356	1.782	2.179	2.681	3.055	4.318
13	0.259	0.694	1.350	1.771	2.160	2.650	3.012	4.221
14	0.258	0.692	1.345	1.761	2.145	2.624	2.977	4.140
15	0.258	0.691	1.341	1.753	2.131	2.602	2.947	4.073
16	0.258	0.690	1.337	1.746	2.120	2.583	2.921	4.015
17	0.257	0.689	1.333	1.740	2.110	2.567	2.898	3.965
18	0.257	0.688	1.330	1.734	2.101	2.552	2.878	3.922
19	0.257	0.688	1.328	1.729	2.093	2.539	2.861	3.883
20	0.257	0.687	1.325	1.725	2.086	2.528	2.845	3.850
21	0.257	0.686	1.323	1.721	2.080	2.518	2.831	3.819
22	0.256	0.686	1.321	1.717	2.074	2.508	2.819	3.792
23	0.256	0.685	1.319	1.714	2.069	2.500	2.807	3.768
24	0.256	0.685	1.318	1.711	2.064	2.492	2.797	3.745
25	0.256	0.684	1.316	1.708	2.060	2.485	2.787	3.725
26	0.256	0.684	1.315	1.706	2.056	2.479	2.779	3.707
27	0.256	0.684	1.314	1.703	2.052	2.473	2.771	3.689
28	0.256	0.683	1.313	1.701	2.048	2.467	2.763	3.674
29	0.256	0.683	1.311	1.699	2.045	2.462	2.756	3.660
30	0.256	0.683	1.310	1.697	2.042	2.457	2.750	3.646
40	0.255	0.681	1.303	1.684	2.021	2.423	2.704	3.551
60	0.254	0.679	1.296	1.671	2.000	2.390	2.660	3.460
65	0.254	0.679	1.295	1.670	1.998	2.387	2.656	3.453
120	0.254	0.677	1.289	1.658	1.980	2.358	2.617	3.373
1,000,000	0.253	0.674	1.282	1.645	1.960	2.326	2.576	3.290

$F = 1 - \alpha$

Sample calculation Table 4
VALUES OF $H_{0.95}$ FOR COMPUTING A ONE-SIDED UPPER 95% CONFIDENCE LIMIT ON A LOGNORMAL MEAN

Sy\n	3	5	7	10	12	15	21	31	51	101	201
0.10	2.750	2.035	1.886	1.802	1.775	1.749	1.722	1.701	1.684	1.670	1.652
0.20	3.295	2.198	1.992	1.881	1.843	1.809	1.771	1.742	1.718	1.697	1.676
0.30	4.109	2.402	2.125	1.977	1.927	1.882	1.833	1.793	1.761	1.733	1.705
0.40	5.220	2.651	2.282	2.089	2.026	1.968	1.905	1.856	1.813	1.777	1.727
0.50	6.495	2.947	2.465	2.220	2.141	2.068	1.989	1.928	1.876	1.830	1.784
0.60	7.807	3.287	2.673	2.368	2.271	2.181	2.085	2.010	1.946	1.891	1.836
0.70	9.120	3.662	2.904	2.532	2.414	2.306	2.191	2.102	2.025	1.960	1.895
0.80	10.43	4.062	3.155	2.710	2.570	2.443	2.307	2.202	2.112	2.035	1.958
0.90	11.74	4.478	3.420	2.902	2.738	2.589	2.432	2.310	2.206	2.117	2.028
1.00	13.05	4.905	3.698	3.103	2.915	2.744	2.564	2.423	2.306	2.205	2.104
1.25	16.33	6.001	4.426	3.639	3.389	3.163	2.923	2.737	2.580	2.447	2.314
1.50	19.6	7.120	5.184	4.207	3.896	3.612	3.311	3.077	2.881	2.713	2.545
1.75	22.87	8.250	5.960	4.795	4.422	4.081	3.719	3.437	3.200	2.997	2.794
2.00	26.14	9.387	6.747	5.396	4.962	4.564	4.141	3.812	3.533	3.295	3.057
2.50	32.69	11.67	8.339	6.621	6.067	5.557	5.013	4.588	4.228	3.92	3.612
3.00	39.23	13.97	9.945	7.864	7.191	6.57	5.907	5.388	4.947	4.569	4.191
3.50	45.77	16.27	11.56	9.118	8.326	7.596	6.815	6.201	5.681	5.233	4.758
4.00	52.31	18.58	13.18	10.38	9.469	8.63	7.731	7.024	6.424	5.908	5.392
4.50	58.85	20.88	14.8	11.64	10.62	9.669	8.652	7.854	7.174	6.59	6.006
5.00	65.39	23.19	16.43	12.91	11.77	10.71	9.579	8.688	7.929	7.277	6.625
6.00	78.47	27.81	19.68	15.45	14.08	12.81	11.44	10.36	9.449	8.661	7.873
7.00	91.55	32.43	22.94	18.00	16.39	14.9	13.31	12.05	10.98	10.05	9.12
8.00	104.6	37.06	26.2	20.55	18.71	17.01	15.18	13.74	12.51	11.45	10.39
9.00	117.7	41.68	29.46	23.1	21.03	19.11	17.05	15.43	14.05	12.85	11.65
10.00	130.8	46.31	32.73	25.66	23.35	21.22	18.93	17.13	15.59	14.26	12.93

CALCULATION WORKSHEET

CLIENT: NSWC, SILVER SPRING, MARYLAND		**JOB NUMBER:** 4246
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SOIL - SITE 5 FUTURE ADULT RESIDENTS		
BASED ON: USEPA, DEC. 1989		
BY: T. JACKMAN	**CHECKED BY:**	**DATE:** 08/19/02

PURPOSE: To estimate intake, carcinogenic and noncarcinogenic risks from incidental ingestion of soil by future adult resdents for the Reasonable Maximum Exposure (RME).

EQUATION:

$$IEX = \frac{Cs \times IR \times EF \times ED \times FI \times CF}{BW \times AT}$$

Where:

IEX	=	estimated exposure intake (mg/kg/day)
Cs	=	exposure point concentration in soil (mg/kg)
IR	=	incidental soil ingestion rate (mg/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
FI	=	fraction ingested from contaminated source (unitless)
CF	=	conversion factor (1.0E-6 kg/mg)
BW	=	body weight (kg)
AT	=	averaging time (days)
CSFo	=	oral carcinogenic slope factor ((mg/kg/day)$^{-1}$)
RfDo	=	oral noncarcinogenic reference dose (mg/kg/day)

RISKS:

ICLR (Carcinogens) = Intake (mg/kg/day) x CSFo (mg/kg/day)$^{-1}$
HQ (Noncarcinogens) = Intake (mg/kg/day) / RFDo (mg/kg/day)

ASSUMPTIONS:

Cs	=	3.24	mg/kg	RDX
IR	=	100	mg/day	
EF	=	350	days/year	
ED	=	24	years	
FI	=	1		
CF	=	1.0E-06	kg/mg	
BW	=	70	kg	
ATc	=	25550	days	
ATnc	=	8760	days	
CSFo	=	0.11	(mg/kg/day)$^{-1}$	
RfDo	=	3.00E-03	(mg/kg/day)	

CLIENT: NSWC, SILVER SPRING, MARYLAND		**JOB NUMBER:** 4246
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SOIL - SITE 5 FUTURE ADULT RESIDENTS		
BASED ON: USEPA, DEC. 1989		
BY: T. JACKMAN	**CHECKED BY:**	**DATE:** 08/19/02

EXAMPLE CARCINOGENIC CALCULATION

$$IEXc = \frac{3.24\ mg/kg \times 100\ mg/day \times 350\ days/year \times 24\ years \times 0.000001\ kg/mg}{70\ kg \times 25550\ days}$$

IEXc = 1.52E-06 mg/kg/day

ICLR = 1.52E-06 mg/kg/day x 0.11 (mg/kg/day)-1 = Incremental Lifetime Cancer Risk

ICLR = 1.7E-07

EXAMPLE CARCINOGENIC CALCULATION

$$IEXnc = \frac{3.24\ mg/kg \times 100\ mg/day \times 350\ days/year \times 24\ years \times 0.000001\ kg/mg}{70\ kg \times 8760\ days}$$

IEXnc = 4.44E-06 mg/kg/day

HQ = 4.44E-06 mg/kg/day / 0.003 (mg/kg/day) = Hazard Quotient

HQ = 1.5E-03

CALCULATION WORKSHEET

CLIENT: NSWC, SILVER SPRING, MARYLAND		**JOB NUMBER:** 4246
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SOIL - SITE 5 FUTURE ADULT RESIDENTS		
BASED ON: USEPA, DEC. 1998		
BY: T. JACKMAN	**CHECKED BY:**	**DATE:** 08/19/02

PURPOSE: To estimate intake, carcinogenic and noncarcinogenic risks from dermal contact with soil by future adult resdents for the Reasonable Maximum Exposure (RME).

EQUATION:

$$DEX = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where:

DEX	=	estimated exposure intake (mg/kg/day)
Cs	=	exposure point concentration in soil (mg/kg)
CF	=	conversion factor (1.0E-6 kg/mg)
SA	=	skin surface available for contact (cm^2/day)
ABS	=	absorption factor (unitless)
AF	=	adherence factor (mg/cm^2)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
BW	=	body weight (kg)
AT	=	averaging time (days)
CSFd	=	dermal carcinogenic slope factor ($(mg/kg/day)^{-1}$)
RfDd	=	dermal noncarcinogenic reference dose (mg/kg/day)

RISKS:

ICLR (Carcinogens) = Intake (mg/kg/day) x CSFd $(mg/kg/day)^{-1}$
HQ (Noncarcinogens) = Intake (mg/kg/day) / RFDd (mg/kg/day)

ASSUMPTIONS:

Cs	=	3.24	mg/kg	RDX
CF	=	1.0E-06	kg/mg	
SA	=	5,700	cm^2/day	
AF	=	0.07	mg/cm^2	
ABS	=	0.1		
EF	=	350	days/year	
ED	=	24	years	
BW	=	70	kg	
ATc	=	25550	days	
ATnc	=	8760	days	
CSFd	=	0.11	$(mg/kg/day)^{-1}$	
RfDd	=	3.00E-03	(mg/kg/day)	

CALCULATION WORKSHEET

CLIENT: NSWC, SILVER SPRING, MARYLAND		**JOB NUMBER:** 4246
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SOIL - SITE 5 FUTURE ADULT RESIDENTS		
BASED ON: USEPA, DEC. 1998		
BY: T. JACKMAN	**CHECKED BY:**	**DATE:** 08/19/02

EXAMPLE CARCINOGENIC CALCULATION

$$DEXc = \frac{3.24\ mg/kg \times 0.000001\ kg/mg \times 5700cm2/day \times 0.07mg/cm2 \times 0.1 \times 350\ days/year \times 24\ years}{70\ kg \times 25550\ days}$$

DEXc = 6.07E-07 mg/kg/day

ICLR = 6.07E-07 mg/kg/day x 0.11 (mg/kg/day)-1 = Incremental Lifetime Cancer Risk

ICLR = 6.7E-08

EXAMPLE NONCARCINOGENIC CALCULATION

$$DEXnc = \frac{3.24\ mg/kg \times 0.000001\ kg/mg \times 5700cm2/day \times 0.07mg/cm2 \times 0.1 \times 350\ days/year \times 24\ years}{70\ kg \times 8760\ days}$$

DEXnc = 1.77E-06 mg/kg/day

HQ = 1.77E-06 mg/kg/day / 0.003 (mg/kg/day) = Hazard Quotient

HQ = 5.9E-04

CALCULATION WORKSHEET

CLIENT: NSWC, SILVER SPRING, MARYLAND		**JOB NUMBER:** 4246
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SOIL - SITE 13 FUTURE ADULT RESIDENTS		
BASED ON: USEPA, DEC. 1998		
BY: T. JACKMAN	**CHECKED BY:**	**DATE:** 08/19/02

PURPOSE: To estimate intake, carcinogenic and noncarcinogenic risks from dermal contact with soil by future adult resdents for the Reasonable Maximum Exposure (RME).

EQUATION:

$$DEX = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where:

DEX	=	estimated exposure intake (mg/kg/day)
Cs	=	exposure point concentration in soil (mg/kg)
CF	=	conversion factor (1.0E-6 kg/mg)
SA	=	skin surface available for contact (cm^2/day)
ABS	=	absorption factor (unitless)
AF	=	adherence factor (mg/cm^2)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
BW	=	body weight (kg)
AT	=	averaging time (days)
CSFd	=	dermal carcinogenic slope factor ($(mg/kg/day)^{-1}$)
RfDd	=	dermal noncarcinogenic reference dose (mg/kg/day)

RISKS:

ICLR (Carcinogens) = Intake (mg/kg/day) x CSFd $(mg/kg/day)^{-1}$

HQ (Noncarcinogens) = Intake (mg/kg/day) / RFDd (mg/kg/day)

ASSUMPTIONS:

Cs	=	0.246	mg/kg	Benzo(a)pyrene
CF	=	1.0E-06	kg/mg	
SA	=	5,700	cm^2/day	
AF	=	0.07	mg/cm^2	
ABS	=	0.13		
EF	=	350	days/year	
ED	=	24	years	
BW	=	70	kg	
ATc	=	25550	days	
ATnc	=	8760	days	
CSFd	=	7.3	$(mg/kg/day)^{-1}$	
RfDd	=	NA	(mg/kg/day)	

CLIENT: NSWC, SILVER SPRING, MARYLAND		**JOB NUMBER:** 4246
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SOIL - SITE 13 FUTURE ADULT RESIDENTS		
BASED ON: USEPA, DEC. 1998		
BY: T. JACKMAN	**CHECKED BY:**	**DATE:** 08/19/02

EXAMPLE CARCINOGENIC CALCULATION

$$DEXc = \frac{0.246\ mg/kg \times 0.000001\ kg/mg \times 5700cm2/day \times 0.07mg/cm2 \times 0.13 \times 350\ days/year \times 24\ years}{70\ kg \times 25550\ days}$$

DEXc = 5.99E-08 mg/kg/day

ICLR = 5.99E-08 mg/kg/day x 7.3 (mg/kg/day)-1 = Incremental Lifetime Cancer Risk

ICLR = 4.4E-07

EXAMPLE NONCARCINOGENIC CALCULATION

$$DEXnc = \frac{0.246\ mg/kg \times 0.000001\ kg/mg \times 5700cm2/day \times 0.07mg/cm2 \times 0.13 \times 350\ days/year \times 24\ years}{70\ kg \times 8760\ days}$$

DEXnc = 1.75E-07 mg/kg/day

HQ = NA

HQ = NA

CALCULATION WORKSHEET

CLIENT: NSWC, SILVER SPRING, MARYLAND		**JOB NUMBER:** 4246
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SOIL - SITE 13 FUTURE ADULT RESIDENTS		
BASED ON: USEPA, DEC. 1989		
BY: T. JACKMAN	**CHECKED BY:**	**DATE:** 08/19/02

PURPOSE: To estimate intake, carcinogenic and noncarcinogenic risks from incidental ingestion of soil by future adult resdents for the Reasonable Maximum Exposure (RME).

EQUATION:

$$IEX = \frac{Cs \times IR \times EF \times ED \times FI \times CF}{BW \times AT}$$

Where:

IEX	=	estimated exposure intake (mg/kg/day)
Cs	=	exposure point concentration in soil (mg/kg)
IR	=	incidental soil ingestion rate (mg/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
FI	=	fraction ingested from contaminated source (unitless)
CF	=	conversion factor (1.0E-6 kg/mg)
BW	=	body weight (kg)
AT	=	averaging time (days)
CSFo	=	oral carcinogenic slope factor ($(mg/kg/day)^{-1}$)
RfDo	=	oral noncarcinogenic reference dose (mg/kg/day)

RISKS:

ICLR (Carcinogens) = Intake (mg/kg/day) x CSFo $(mg/kg/day)^{-1}$
HQ (Noncarcinogens) = Intake (mg/kg/day) / RFDo (mg/kg/day)

ASSUMPTIONS:

Cs	=	0.246	mg/kg	Benzo(a)pyrene
IR	=	100	mg/day	
EF	=	350	days/year	
ED	=	24	years	
FI	=	1		
CF	=	1.0E-06	kg/mg	
BW	=	70	kg	
ATc	=	25550	days	
ATnc	=	8760	days	
CSFo	=	7.3	$(mg/kg/day)^{-1}$	
RfDo	=	NA	(mg/kg/day)	

CLIENT: NSWC, SILVER SPRING, MARYLAND		**JOB NUMBER:** 4246
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SOIL - SITE 13 FUTURE ADULT RESIDENTS		
BASED ON: USEPA, DEC. 1989		
BY: T. JACKMAN	**CHECKED BY:**	**DATE:** 08/19/02

EXAMPLE CARCINOGENIC CALCULATION

$$IEXc = \frac{0.246\ mg/kg \times 100\ mg/day \times 350\ days/year \times 24\ years \times 0.000001\ kg/mg}{70\ kg \times 25550\ days}$$

IEXc = 1.16E-07 mg/kg/day

ICLR = 1.16E-07 mg/kg/day x 7.3 (mg/kg/day)-1 = Incremental Lifetime Cancer Risk

ICLR = 8.4E-07

EXAMPLE CARCINOGENIC CALCULATION

$$IEXnc = \frac{0.246\ mg/kg \times 100\ mg/day \times 350\ days/year \times 24\ years \times 0.000001\ kg/mg}{70\ kg \times 8760\ days}$$

IEXnc = 3.37E-07 mg/kg/day

HQ = NA

HQ = NA

APPENDIX G

RISK ASSESSMENT SPREADSHEETS

(RAGS D TABLES)

SITE 5

TABLE 1

SELECTION OF EXPOSURE PATHWAYS
SITES 5 13
NSWC-WHITE OAK, SILVER SPRING, MARYLAND
PAGE 1 OF 1

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Surface and Subsurface Soil	Surface and Subsurface Soil	Entire Site	All Potential Receptors, i.e., Workers, Recreational Users, Trespassers, Day Care Center Children, and Future Residents	Adult, Child, Adolescent	Ingestion	On-site	Quant(1)	Exposure to surface soil may occur if potential receptors are exposed during typical receptor-related activities, such as digging and playing.
						Dermal	On-site	Quant(1)	
		Air	Vapors and Particulates in Air - Entire Site	All Potential Receptors, i.e., Workers, Recreational Users, Trespassers, Day Care Center Children, and Future Residents	Adult, Child, Adolescent	Inhalation	On-site	Qual(2)	Exposure is evaluated qualitatively by a comparison of site data to USEPA Generic SSLs (3)for transfers from soil to air.

Footnotes:

1 Quantitative.

2 Qualitative.

3 Soil Screening Levels (USEPA, May 1996).

TABLE 2.1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN
POST-REMOVAL SURFACE/SUBSURFACE SOIL - SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface / Subsurface Soil
Exposure Point: Entire Site

CAS Numb	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects (1)	Concentration Used for Screening(2)	Site Above Background ? (3)	Risk-Based Residential PCOC Screening Level(4)		Potential ARAR/ TBC Value	Potential ARAR/ TBC Source	PCOC Flag	Rationale for Contaminant Deletion or Selection(5)
Volatile Organics (mg/kg)																	
98-86-2	Acetophenone	0.12	J	0.25	J	mg/kg	05TP12WS0204[Q2]	5/8	0.15 - 0.27	0.25	NA	780	N	**0.00022**	SSL_MIGR SSL_INH	No	BSL
67-64-1	Acetone	0.086		0.13		mg/kg	05-SB-05-2_OLD	2/18	0.0014 - 0.015	0.13	NA	780	N	2.5 100000	SSL_MIGR SSL_INH	No	BSL
108-88-3	Toluene	0.092		0.092		mg/kg	05-SB-05-2_OLD	1/18	0.011 - 0.015	0.092	NA	1600	N	8.8 650	SSL_MIGR SSL_INH	No	BSL
Semivolatile Organics (mg/kg)																	
83-32-9	Acenaphthene	0.06	J	0.06	J	mg/kg	05TP01SB0507[Q2]	1/18	0.36 - 0.51	0.06	NA	470	N	100	SSL_MIGR SSL_INH	No	BSL
120-12-7	Anthracene	0.056	J	0.14	J	mg/kg	05-SB-05-2_OLD	4/18	0.36 - 0.44	0.14	NA	2300	N	470	SSL_MIGR SSL_INH	No	BSL
56-55-3	Benzo(a)anthracene	0.081	J	0.55	J	mg/kg	05-SB-05-2_OLD	6/18	0.36 - 0.4	0.55	NA	0.87	C	1.5	SSL_MIGR SSL_INH	No	BSL
50-32-8	**Benzo(a)pyrene**	0.062	J	0.5	J	mg/kg	05-SB-05-2_OLD	8/18	0.36 - 0.4	0.5	NA	**0.087**	C	**0.37**	SSL_MIGR SSL_INH	**Yes**	**ASL**
205-99-2	Benzo(b)fluoranthene	0.085	J	0.63	J	mg/kg	05-SB-05-2_OLD	6/18	0.36 - 0.4	0.63	NA	0.87	C	4.5	SSL_MIGR SSL_INH	No	BSL
191-24-2	Benzo(g,h,i)perylene	0.061	J	0.55	J	mg/kg	05-SB-02-22_OLD	8/18	0.36 - 0.4	0.55	NA	230(6)	N	680(6)	SSL_MIGR SSL_INH	No	BSL
207-08-9	Benzo(k)fluoranthene	0.073	J	0.29	J	mg/kg	05-SB-05-2_OLD	6/18	0.36 - 0.4	0.29	NA	8.7	C	45	SSL_MIGR SSL_INH	No	BSL
117-81-7	Bis(2-Ethylhexyl)phthalate	0.051	J	0.23	J	mg/kg	05-SB-04-6_OLD	6/18	0.36 - 0.44	0.23	NA	46	C	2900 31000	SSL_MIGR SSL_INH	No	BSL
86-74-8	Carbazole	0.041	J	0.078	J	mg/kg	05-SB-05-2_OLD	2/18	0.36 - 0.51	0.078	NA	32	C	0.47	SSL_MIGR SSL_INH	No	BSL
218-01-9	Chrysene	0.093	J	0.49	J	mg/kg	05-SB-05-2_OLD	6/18	0.36 - 0.4	0.49	NA	87	C	150	SSL_MIGR SSL_INH	No	BSL
84-74-2	Di-n-butyl phthalate	0.039	J	2.7		mg/kg	05TP01WS0204[Q2]	2/18	0.36 - 0.51	2.7	NA	780	N	5000 2300	SSL_MIGR SSL_INH	No	BSL
53-70-3	**Dibenzo(a,h)anthracene**	0.043	J	0.12	J	mg/kg	05-SB-05-2_OLD	3/18	0.36 - 0.51	0.12	NA	**0.087**	C	1.4	SSL_MIGR SSL_INH	**Yes**	**ASL**
84-66-2	Diethyl Phthalate	0.042	J	0.042	J	mg/kg	05TP12WS0204[Q2]	1/18	0.36 - 0.51	0.042	NA	6300	N	450 2000	SSL_MIGR SSL_INH	No	BSL
206-44-0	Fluoranthene	0.21	J	0.96	J	mg/kg	05-SB-05-2_OLD	6/18	0.36 - 0.4	0.96	NA	310	N	6300	SSL_MIGR SSL_INH	No	BSL
86-73-7	Fluorene	0.066	J	0.066	J	mg/kg	05-SB-05-2_OLD	1/18	0.36 - 0.51	0.066	NA	310	N	140	SSL_MIGR SSL_INH	No	BSL
193-39-5	Indeno(1,2,3-cd)pyrene	0.082	J	0.33	J	mg/kg	05-SB-05-2_OLD	7/18	0.36 - 0.4	0.33	NA	0.87	C	13	SSL_MIGR SSL_INH	No	BSL
91-20-3	Naphthalene	0.055	J	0.097	J	mg/kg	05-SB-05-2_OLD	2/18	0.36 - 0.51	0.097	NA	160	N	0.15	SSL_MIGR SSL_INH	No	BSL
85-01-8	Phenanthrene	0.12	J	0.6	J	mg/kg	05-SB-05-2_OLD	6/18	0.36 - 0.4	0.6	NA	230(6)	N	680(6)	SSL_MIGR SSL_INH	No	BSL
129-00-0	Pyrene	0.16	J	0.88	J	mg/kg	05-SB-05-2_OLD	7/18	0.36 - 0.4	0.88	NA	230	N	680	SSL_MIGR SSL_INH	No	BSL

TABLE 2.1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN
POST-REMOVAL SURFACE/SUBSURFACE SOIL - SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface / Subsurface Soil
Exposure Point: Entire Site

CAS Numb	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects (1)	Concentration Used for Screening(2)	Site Above Background ? (3)	Risk-Based Residential PCOC Screening Level(4)		Potential ARAR/ TBC Value	Potential ARAR/ TBC Source	PCOC Flag	Rationale for Contaminant Deletion or Selection(5)
Pesticides/PCBs (mg/kg)																	
72-54-8	4,4'-DDD	0.00065	J	0.005	J	mg/kg	05TP12WS0204[Q2]	2/15	0.0019 - 0.005	0.005	NA	2.7	C	11	SSL_MIGR SSL_INH	No	BSL
72-55-9	4,4'-DDE	0.0003	J	0.022	J	mg/kg	05-SB-05-2_OLD	5/18	0.0019 - 0.005	0.022	NA	1.9	C	35	SSL_MIGR SSL_INH	No	BSL
5103-71-9	alpha-Chlordane	0.00089	J	0.16	J	mg/kg	05-SB-05-2_OLD	4/18	0.0018 - 0.0025	0.16	NA	1.8(7)	C	0.92(7) 20(7)	SSL_MIGR SSL_INH	No	BSL
11096-82-5	Aroclor-1260	0.019	J	1.2	J	mg/kg	05-SB-05-2_OLD	7/18	0.036 - 0.05	1.2	NA	0.32	C	0.41	SSL_MIGR SSL_INH	Yes	ASL
60-57-1	Dieldrin	0.0017	J	0.053	J	mg/kg	05-SB-05-2_OLD	4/18	0.0019 - 0.005	0.053	NA	0.04	C	0.0022 1	SSL_MIGR SSL_INH	Yes	ASL
33213-65-9	Endosulfan II	0.0006	J	0.0081	J	mg/kg	05TP01WS0204[Q2]	5/17	0.0019 - 0.0049	0.0081	NA	47(8)	N	20(8)	SSL_MIGR SSL_INH	No	BSL
53494-70-5	Endrin Ketone	0.0026	J	0.011	J	mg/kg	05-SB-05-2_OLD	2/18	0.0019 - 0.004	0.011	NA	2.3(9)	N	5.4(9)	SSL_MIGR SSL_INH	No	BSL
5103-74-2	gamma-Chlordane	0.1	J	0.14	J	mg/kg	05-SB-05-2_OLD	2/18	0.0018 - 0.0025	0.14	NA	1.8(7)	C	0.92(7) 20(7)	SSL_MIGR SSL_INH	No	BSL
76-44-8	Heptachlor	0.0057	J	0.0057	J	mg/kg	05-SB-04-6_OLD	1/18	0.0018 - 0.0025	0.0057	NA	0.14	C	0.84 4	SSL_MIGR SSL_INH	No	BSL
1024-57-3	Heptachlor Epoxide	0.00017	J	0.00027	J	mg/kg	05-SB-02-10_OLD	3/18	0.0018 - 0.0025	0.00027	NA	0.07	C	0.025 5	SSL_MIGR SSL_INH	No	BSL
319-86-8	delta-BHC	0.00022	J	0.0003	J	mg/kg	05-SB-02-10_OLD	2/18	0.0018 - 0.0025	0.0003	NA	0.1(10)	C	0.00089(10) 0.8(10)	SSL_MIGR SSL_INH	No	BSL
Energetics (mg/kg)																	
118-96-7	2,4,6-Trinitrotoluene	9.82	J	9.82	J	mg/kg	05-SB-05-2_OLD	1/18	0.0356 - 0.25	9.82	NA	21	C	NA	SSL_MIGR SSL_INH	No	BSL
35572-78-2	2-Amino-4,6-dinitrotoluene	1.07	J	1.07	J	mg/kg	05-SB-05-2_OLD	1/18	0.0467 - 0.25	1.07	NA	0.47	N	NA	SSL_MIGR SSL_INH	Yes	ASL
2691-41-0	HMX	0.23	J	5.48	J	mg/kg	05-SB-05-2_OLD	2/18	0.0705 - 0.5	5.48	NA	390	N	NA	SSL_MIGR SSL_INH	No	BSL
121-82-4	RDX	30.8	J	30.8	J	mg/kg	05-SB-05-2_OLD	1/18	0.0509 - 0.5	30.8	NA	5.8	C	NA	SSL_MIGR SSL_INH	Yes	ASL
Inorganics (mg/kg)																	
7429-90-5	Aluminum	507	K	10300		mg/kg	05-SB-05-2_OLD	18/18	---	10300	No	7800	N	NA	SSL_MIGR SSL_INH	No	BKG
7440-36-0	Antimony	0.2	L	3.1	L	mg/kg	05-SB-05-2_OLD	7/18	0.18 - 0.79	3.1	No	3.1	N	13	SSL_MIGR SSL_INH	No	BSL, BKG
7440-38-2	Arsenic	1.1		6.6	J	mg/kg	05-SB-03-12_OLD	14/18	0.71 - 3	6.6	No	0.43	C	0.026 750	SSL_MIGR SSL_INH	No	BKG
7440-39-3	Barium	1.9		312		mg/kg	05-SB-05-2_OLD	18/18	---	312	No	550	N	2100 690000	SSL_MIGR SSL_INH	No	BSL, BKG
7440-43-9	Cadmium	0.43	K	5.6		mg/kg	05TP01WS0204[Q2]	5/18	0.019 - 0.31	5.6	No	7.8(11)	N	55(11) 1800	SSL_MIGR SSL_INH	No	BSL, BKG
7440-70-2	Calcium	37.8		42400		mg/kg	05-SB-05-2_OLD	11/18	40.4 - 154	42400	No	NA		NA	SSL_MIGR SSL_INH	No	NUT, BKG
7440-47-3	Chromium	2.6		40.9		mg/kg	05TP01WS0204[Q2]	18/18	---	40.9	No	23(12)	N	42(12) 270	SSL_MIGR SSL_INH	No	BKG
7440-48-4	Cobalt	0.12		9.5		mg/kg	05TP01WS0204[Q2]	11/18	0.092 - 0.59	9.5	No	160	N	NA	SSL_MIGR SSL_INH	No	BSL, BKG

TABLE 2.1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN
POST-REMOVAL SURFACE/SUBSURFACE SOIL - SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface / Subsurface Soil
Exposure Point: Entire Site

CAS Numb	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects (1)	Concentration Used for Screening(2)	Site Above Background ? (3)	Risk-Based Residential PCOC Screening Level(4)		Potential ARAR/ TBC Value	Potential ARAR/ TBC Source	PCOC Flag	Rationale for Contaminant Deletion or Selection(5)
7440-50-8	Copper	2.6		701	J	mg/kg	05TP01WS0204[Q2]	18/18	---	701	Yes	310	N	11000	SSL_MIGR SSL_INH	Yes	ASL
7439-89-6	Iron	1700		24900		mg/kg	05-SB-04-6_OLD	18/18	---	24900	No	2300	N	NA	SSL_MIGR SSL_INH	No	BKG
7439-92-1	Lead	1.3	J	687	K	mg/kg	05-SB-04-6_OLD	17/18	1	687	No	400(13)		NA	SSL_MIGR SSL_INH	No	BKG
7439-95-4	Magnesium	33.9		3340		mg/kg	05TP01WS0204[Q2]	16/18	48.9 - 63.8	3340	No	NA		NA	SSL_MIGR SSL_INH	No	NUT, BKG
7439-96-5	Manganese	1.4		285	J	mg/kg	05TP01WS0204[Q2]	18/18	---	285	No	160(14)	N	950(14)	SSL_MIGR SSL_INH	No	BKG
7439-97-6	Mercury	0.02		2.3		mg/kg	05-SB-04-6_OLD	18/18	---	2.3	Yes	2.3(15)	N	NA	SSL_MIGR SSL_INH	No	BSL
7440-02-0	Nickel	0.2		198	J	mg/kg	05TP01WS0204[Q2]	15/18	0.19 - 1.2	198	No	160	N	NA 13000	SSL_MIGR SSL_INH	No	BKG
7440-09-7	Potassium	32.3		898		mg/kg	05TP01WS0204[Q2]	18/18	---	898	No	NA		NA	SSL_MIGR SSL_INH	No	NUT, BKG
7782-49-2	Selenium	1.1	J	49.6	J	mg/kg	05-SB-02-10_OLD-D	17/18	0.6 - 0.85	49.6	Yes	39	N	19	SSL_MIGR SSL_INH	Yes	ASL
7440-22-4	Silver	0.24		17.8		mg/kg	05-SB-05-2_OLD	6/18	0.067 - 0.21	17.8	No	39	N	31	SSL_MIGR SSL_INH	No	BSL, BKG
7440-23-5	Sodium	364		837	J	mg/kg	05-SB-05-2_OLD	4/18	23.3 - 185	837	No	NA		NA	SSL_MIGR SSL_INH	No	NUT, BKG
7440-28-0	Thallium	0.47		0.95		mg/kg	05TP01SB0507[Q2]	7/18	0.38 - 0.88	0.95	Yes	0.55	N	3.6	SSL_MIGR SSL_INH	Yes	ASL
7440-62-2	Vanadium	5.9		48.5		mg/kg	05-SB-05-2_OLD	18/18	---	48.5	No	55	N	5100	SSL_MIGR SSL_INH	No	BSL, BKG
7440-66-6	Zinc	1.2		1420		mg/kg	05TP01WS0204[Q2]	14/18	1.8 - 2.6	1420	No	2300	N	14000	SSL_MIGR SSL_INH	No	BSL, BKG
57-12-5	Cyanide	0.34		0.35		mg/kg	05-SB-05-2_OLD	2/10	0.19 - 0.28	0.35	NA	160	N	150	SSL_MIGR SSL_INH	No	BSL
Miscellaneous Parameters																	
TTNUS291	Percent Solids	75.5		90.9		mg/kg	05TP11SB0203[Q2]	8/8	---	90.9	NA	NA		NA	SSL_MIGR SSL_INH	No	NTX
TTNUS002	Ph	4.66		8.39		mg/kg	05-SB-05-2_OLD	10/10	---	8.39	NA	NA		NA	SSL_MIGR SSL_INH	No	NTX

Shaded cells indicate that the maximum concentration exceeds the specified criterion or constituent has been selected as a PCOC.

Footnotes:

1 Values presented are sample-specific quantitation limits.
2 The maximum detected concentration is used for screening purposes.
3 To determine whether metal concentrations are within background levels, a comparison of site concentrations with Base-wide background data was made by means of the Wilcoxon Rank Sum Test. If the Wilcoxon Test determined that a constituent concentration was not significantly different from background, that chemical was not selected as a PCOC.

Rationale Codes:
For Selection as a PCOC:
ASL = Above PCOC Screening Level

For Elimination as a PCOC:
BKG = Within background levels
BSL = Below PCOC Screening Level
FREQ = Frequency
NUT = Essential Nutrient

TABLE 2.1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN
POST-REMOVAL SURFACE/SUBSURFACE SOIL - SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface / Subsurface Soil
Exposure Point: Entire Site

CAS Numb	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects (1)	Concentration Used for Screening(2)	Site Above Background ? (3)	Risk-Based Residential PCOC Screening Level(4)	Potential ARAR/ TBC Value	Potential ARAR/ TBC Source	PCOC Flag	Rationale for Contaminant Deletion or Selection(5)

4 The risk-based soil COPC screening level for residential land use is presented. The value is based on a target hazard quotient of 0.1 for noncarcinogens (denoted with a "N" flag) or an incremental cancer risk of 1E-6 for carcinogens (denoted with a "C" flag) (USEPA, Region III, April 2002).
5 The chemical is selected as a PCOC if the maximum detected concentration exceeds the risk based PCOC screening level and facility-wide background levels.
6 Pyrene is used as a surrogate for benzo(g,h,i)perylene and phenanthrene.
7 Value for chlordane is used.
8 Value for endosulfan is used.
9 Value for endrin is used.
10 Value for alpha-BHC is used.
11 Cadmium - Food
12 Chromium as hexavalent chromium.
13 OSWER soil screening level for residential land use (USEPA, July 1994)
14 Manganese-Nonfood.
15 Mercury as Mercuric Chlori

Definitions:
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
J = Estimated Value
K = Value Estimated with a High Bias
L = Value Estimated with a Low Bias
N = Noncarcinogen
NA = Not Applicable/Not Available.
PCOC = Potential Constituent of Concern
SSL-INH = Soil Screening Level for transfers from soil to air (Inhalation) (USEPA, May 1996)
SSL-MIGR = Soil Screening Level for transfers from soil to groundwater for a Dilution and Attenuation Factor of 20 (USEPA, Region 3, April 2002)

Associated Samples:

05-SB-01-8_OLD	05-SB-05-25_OLD	05TP12WS0204[Q2]	05TP09SB0506[Q2]
05-SB-02-22_OLD	05TP01SB0507[Q2]	05-SB-02-10_OLD	05TP09SB0506[Q2]-AVG
05-SB-03-12_OLD	05TP01WS0204[Q2]	05-SB-02-10_OLD-AVG	05TP09SB0506[Q2]-D
05-SB-03-25_OLD	05TP08SB0506[Q2]	05-SB-02-10_OLD-D	05TP09SB0506[Q2]-AVG
05-SB-04-20_OLD	05TP10SB0506[Q2]	05-SB-100_OLD	05TP09SB0506[Q2]-D
05-SB-04-6_OLD	05TP11SB0203[Q2]	05-SB-100_OLD-AVG	05TP09SB0506[Q2]-AVG
05-SB-05-2_OLD	05TP12SB0708[Q2]	05-SB-100_OLD-D	05TP09SB0506[Q2]-D

TABLE 3.1

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY - SURFACE / SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface / SubsurfaceSoil
Exposure Point: Surface / Subsurface Soil

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)pyrene	mg/kg	1.93E-01	2.29E-01	5.00E-01	J	mg/kg	2.36E-01	95% UCL-T	W - Test (1)	2.36E-01	95% UCL-T	W - Test (1)
Dibenzo(a,h)anthracene	mg/kg	1.73E-01	1.94E-01	1.20E-01	J	mg/kg	1.20E-01	95% UCL-T	W - Test (1)	1.20E-01	95% UCL-T	W - Test (1)
Aroclor-1260	mg/kg	1.67E-01	2.98E-01	1.20E+00	J	mg/kg	4.46E-01	95% UCL-T	W - Test (1)	4.46E-01	95% UCL-T	W - Test (1)
Dieldrin	mg/kg	4.74E-03	9.71E-03	5.30E-02	J	mg/kg	5.72E-03	95% UCL-T	W - Test (1)	5.72E-03	95% UCL-T	W - Test (1)
2-Amino-4,6-dinitrotoluene	mg/kg	1.27E-01	2.25E-01	1.07E+00	J	mg/kg	2.37E-01	95% UCL-T	W - Test (1)	2.37E-01	95% UCL-T	W - Test (1)
RDX	mg/kg	1.83E+00	4.80E+00	3.08E+01	J	mg/kg	3.24E+00	95% UCL-T	W - Test (1)	3.24E+00	95% UCL-T	W - Test (1)
Copper	mg/kg	1.36E+02	2.32E+02	7.01E+02	J	mg/kg	7.01E+02	Maximum	W - Test (2)	7.01E+02	Maximum	W - Test (2)
Selenium	mg/kg	7.34E+00	1.07E+01	2.56E+01	J	mg/kg	1.56E+01	95% UCL-T	W - Test (3)	1.56E+01	95% UCL-T	W - Test (3)
Thallium	mg/kg	4.50E-01	5.44E-01	9.50E-01		mg/kg	5.67E-01	95% UCL-T	W - Test (3)	5.67E-01	95% UCL-T	W - Test (3)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

(1) Shapiro-Wilk W Test is inconclusive. Data are assumed to be log-normally distributed.
(2) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration is used for EPC.
(3) Shapiro-Wilk W Test indicates data are log-normally distributed.

TABLE 5.1

NON-CANCER TOXICITY DATA -- ORAL/DERMAL
SITES 5 & 13
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD	Oral RfD Units	Oral to Dermal Adjustment Factor[1]	Adjusted Dermal RfD[2]	Dermal RfD Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ[3]
Dieldrin	chronic	5.0E-05	mg/kg-day	1	5.00E-05	mg/kg-day	Liver	100	IRIS	04/02/02
2-Amino-4,6-dinitrotoluene	chronic	6.0E-05	mg/kg-day	1	6.00E-05	mg/kg-day			NCEA	04/02/02
RDX	chronic	3.0E-03	mg/kg-day	1	3.00E-03	mg/kg-day	Prostate	100	IRIS	04/02/02
Copper	chronic	4.0E-02	mg/kg-day	1	4.00E-02	mg/kg-day	NA		HEAST	07/97
Selenium	chronic	5.0E-03	mg/kg-day	1	5.00E-03	mg/kg-day	Blood/Skin/CNS	3	IRIS	04/02/02
Thallium	chronic	7.0E-05	mg/kg-day	1	7.00E-05	mg/kg-day	Liver			04/02/02

(1) USEPA, September, 2001.
(2) RfD dermal = RfDoral x (Oral to Dermal Adjustment Factor)
(3) Dates of IRIS, HEAST, or NCEA

Notes: RfD = Reference dose
CNS = Central Nervous System
IRIS = Integrated Risk Information System, on-line database search (USEPA, August 2002)
HEAST = Health Effects Assessment Summary Tables (USEPA, July 1997)
NCEA = USEPA National Center for Environmental Assessment (USEPA RBC Table, April 2, 2002)
NA = Not applicable since an oral RfD is not available for this compound data

TABLE 6.1

CANCER TOXICITY DATA -- ORAL/DERMAL
SITES 5 & 13
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Chemical of Potential Concern	Oral CSF	Oral to Dermal Adjustment Factor[1]	Adjusted Dermal Cancer Slope Factor[2]	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date[3]
Aroclor-1260	2.0E+00	1	2.00E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	7/21/2002
Benzo(a)pyrene	7.3E+00	1	7.30E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	7/21/2002
Dibenzo(a,h)anthracene	7.3E+00	1	7.30E+00	$(mg/kg\text{-}day)^{-1}$	B2	Region 3	4/2/2002
RDX	1.1E-01	1	1.10E-01	(mg/kg-day)-1	C	IRIS	4/2/2002

(1) RAGS-PART E (USEPA, September 2001).
(2) CSFdermal = CSForal/(Oral to Dermal Adjustment Factor)
(3) Date of IRIS

Notes:
CSF = Cancer Slope Factor
IRIS = Integrated Risk Information System, on-line database search (USEPA, July1999)
HEAST = Health Effects Assessment Summary Tables (USEPA, July 1997)
Region 3 - USEPA Region III RBC Table, April 2, 2002

EPA Group:
A - Human carcinogen
B1 - Probable human carcinogen - indicates that limited human data are available
B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen
E - Evidence of noncarcinogenicity

TABLE 4.1

VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FULL TIME WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Full Time Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cs	Chemical Concentration in Soil	(mg/kg)	95% UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	IRs	Ingestion Rate of Soil	(mg/day)	100	USEPA, May 1993	50	USEPA, May 1993	Cs x IRs x EF x ED / BW x AT x CF
	EF	Exposure Frequency	(days/year)	250	USEPA, May 1993	219	USEPA, May 1993	
	FI	Fraction Ingested	(unitless)	1	Professional Judgement	1	Professional Judgement	
	ED	Exposure Duration	(years)	25	USEPA, May 1993	9	USEPA, May 1993	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	70	USEPA December 1989	70	USEPA December 1989	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	9,125	USEPA December 1989	3,285	USEPA December 1989	
Dermal	Cs	Chemical Concentration in Soil	(mg/kg)	95%UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	AF	Soil to Skin Adherence Factor	(mg/cm^2)	0.2	USEPA, September 2001	0.02	USEPA, September 2001	Cs x SA x ABS x AF x EF x ED / BW x AT x CF
	SA	Skin Surface Area	(cm^2)	3,300	USEPA, September 2001	3,300	USEPA, September 2001	
	ABS	Absorption Factor	(unitless)	chemical-specific	USEPA, September 2001	chemical-specific	USEPA, September 2001	
	EF	Exposure Frequency	(days/year)	250	USEPA, May 1993	219	USEPA, May 1993	
	ED	Exposure Duration	(years)	25	USEPA, May 1993	9	USEPA, May 1993	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	70	USEPA December 1989	70	USEPA December 1989	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	9,125	USEPA December 1989	3,285	USEPA December 1989	

Daily Intake Calculations
Ingestion Intake = (IR x Fi x EF x ED x CF) / (BW x AT)
Dermal Intake = (CF x SA x AF x ABS x EF x ED) / (BW x AT)

Cancer Ingestion Intake - RME = 3.49E-07
Noncancer Ingestion Intake - RME = 9.78E-07

Cancer Ingestion Intake - CTE = 5.51E-08
Noncancer Ingestion Intake - CTE = 4.29E-07

Cancer Dermal Intake - RME = 2.31E-06
Noncancer Dermal Intake - RME = 6.46E-06

Cancer Dermal Intake - CTE = 7.27E-08
Noncancer Dermal Intake - CTE = 5.66E-07

TABLE 7.1 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FULL TIME WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Full Time Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	2.3E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	1.2E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	4.4E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	5.6E-09	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	1.1E-04
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	2.3E-07	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	3.9E-03
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	3.2E-06	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	1.1E-03
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	6.9E-04	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	1.7E-02
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	1.5E-05	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	3.1E-03
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	5.5E-07	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	7.9E-03
	(total)												**3.3E-02**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	2.0E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	1.0E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	4.0E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	3.7E-09	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	7.4E-05
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	1.5E-07	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	2.5E-03
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	2.1E-06	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	7.0E-04
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	4.5E-06	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	1.1E-04
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	1.0E-07	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	2.0E-05
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	3.7E-09	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	5.2E-05
	(total)												**3.5E-03**
										Total Hazard Index Across All Exposure Routes/Pathways			**3.7E-02**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 8.1 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FULL TIME WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Full Time Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	8.3E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	6.03E-07
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	4.2E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.06E-07
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	1.6E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	3.12E-07
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	2.0E-09	mg/kg-day	1.60E+01	(mg/kg-day)-1	3.20E-08
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	8.3E-08	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.1E-06	mg/kg-day	1.10E-01	(mg/kg-day)-1	1.25E-07
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	2.4E-04	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	5.5E-06	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	2.0E-07	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.4E-06**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	7.1E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	5.2E-07
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	3.6E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.6E-07
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	1.4E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	2.9E-07
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	1.3E-09	mg/kg-day	1.60E+01	(mg/kg-day)-1	2.1E-08
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	5.5E-08	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	7.5E-07	mg/kg-day	1.10E-01	(mg/kg-day)-1	8.2E-08
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	1.6E-06	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	3.6E-08	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	1.3E-09	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.2E-06**
										Total Risk Across All Exposure Routes/Pathways	**2.5E-06**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 7.1a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FULL TIME WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Full Time Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	1.0E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	5.1E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	1.9E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	2.4E-08	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	4.9E-04
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	1.0E-06	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	1.7E-02
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.4E-05	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	4.6E-03
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	3.0E-03	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	7.5E-02
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	6.7E-05	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	1.3E-02
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	2.4E-06	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	3.5E-02
	(total)												**1.4E-01**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	1.5E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	7.5E-08	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	3.0E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	2.7E-09	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	5.5E-05
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	1.1E-07	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	1.9E-03
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.6E-06	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	5.2E-04
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	3.4E-06	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	8.4E-05
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	7.5E-08	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	1.5E-05
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	2.7E-09	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	3.9E-05
	(total)												**2.6E-03**
										Total Hazard Index Across All Exposure Routes/Pathways			**1.5E-01**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 8.1a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FULL TIME WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Full Time Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	2.9E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.11E-07
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	1.5E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.07E-07
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	5.5E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	1.09E-07
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	7.0E-10	mg/kg-day	1.60E+01	(mg/kg-day)-1	1.12E-08
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	2.9E-08	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	4.0E-07	mg/kg-day	1.10E-01	(mg/kg-day)-1	4.35E-08
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	8.6E-05	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	1.9E-06	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	6.9E-08	mg/kg-day		(mg/kg-day)-1	
	(total)										**4.8E-07**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	4.2E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.1E-08
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	2.1E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.6E-08
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	8.5E-09	mg/kg-day	2.00E+00	(mg/kg-day)-1	1.7E-08
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	7.8E-11	mg/kg-day	1.60E+01	(mg/kg-day)-1	1.3E-09
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	3.2E-09	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	4.4E-08	mg/kg-day	1.10E-01	(mg/kg-day)-1	4.9E-09
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	9.6E-08	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	2.1E-09	mg/kg-day		(mg/kg-day)-1	
	Thalllum	5.67E-01	mg/kg	5.67E-01	mg/kg	M	7.8E-11	mg/kg-day		(mg/kg-day)-1	
	(total)										**6.9E-08**
										Total Risk Across All Exposure Routes/Pathways	**5.5E-07**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 4.2

VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF MAINTENANCE/UTILITY WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cs	Chemical Concentration in Soil	(mg/kg)	95% UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	IRs	Ingestion Rate of Soil	(mg/day)	100	USEPA, May 1993	50	USEPA, May 1993	$\frac{Cs \times IRs \times EF \times ED}{BW \times AT \times CF}$
	EF	Exposure Frequency	(days/year)	36	Professional Judgement	18	Professional Judgement	
	FI	Fraction Ingested	(unitless)	1	Professional Judgement	1	Professional Judgement	
	ED	Exposure Duration	(years)	25	USEPA, May 1993	9	USEPA, May 1993	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	70	USEPA December 1989	70	USEPA December 1989	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	9,125	USEPA December 1989	3,285	USEPA December 1989	
Dermal	Cs	Chemical Concentration in Soil	(mg/kg)	95%UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	AF	Soil to Skin Adherence Factor	(mg/cm^2)	0.2	USEPA, September 2001	0.02	USEPA, September 2001	$\frac{Cs \times SA \times ABS \times AF \times EF \times ED}{BW \times AT \times CF}$
	SA	Skin Surface Area	(cm^2)	3,300	USEPA, September 2001	3,300	USEPA, September 2001	
	ABS	Absorption Factor	(unitless)	chemical-specific	USEPA, September 2001	chemical-specific	USEPA, September 2001	
	EF	Exposure Frequency	(days/year)	36	Professional Judgement	18	Professional Judgement	
	ED	Exposure Duration	(years)	25	USEPA, May 1993	9	USEPA, May 1993	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	70	USEPA December 1989	70	USEPA December 1989	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	9,125	USEPA December 1989	3,285	USEPA December 1989	

Daily Intake Calculations

Ingestion Intake = (IR x Fi x EF x ED x CF) / (BW x AT)
Dermal Intake = (CF x SA x AF x ABS x EF x ED) / (BW x AT)

Cancer Ingestion Intake - RME = 5.03E-08
Noncancer Ingestion Intake - RME = 1.41E-07

Cancer Ingestion Intake - CTE = 4.53E-09
Noncancer Ingestion Intake - CTE = 3.52E-08

Cancer Dermal Intake - RME = 3.32E-07
Noncancer Dermal Intake - RME = 9.30E-07

Cancer Dermal Intake - CTE = 5.98E-09
Noncancer Dermal Intake - CTE = 4.65E-08

TABLE 7.2 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF MAINTENANCE/UTILITY WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	3.3E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	1.7E-08	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	6.3E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	8.1E-10	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	1.6E-05
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	3.3E-08	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	5.6E-04
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	4.6E-07	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	1.5E-04
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	9.9E-05	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	2.5E-03
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	2.2E-06	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	4.4E-04
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	8.0E-08	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	1.1E-03
	(total)												**4.8E-03**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	2.9E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	1.5E-08	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	5.8E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	5.3E-10	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	1.1E-05
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	2.2E-08	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	3.7E-04
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	3.0E-07	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	1.0E-04
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	6.5E-07	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	1.6E-05
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	1.5E-08	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	2.9E-06
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	5.3E-10	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	7.5E-06
	(total)												**5.0E-04**
										Total Hazard Index Across All Exposure Routes/Pathways			**5.3E-03**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 8.2 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF MAINTENANCE/UTILITY WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	1.2E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	8.69E-08
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	6.0E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.41E-08
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	2.2E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	4.49E-08
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	2.9E-10	mg/kg-day	1.60E+01	(mg/kg-day)-1	4.61E-09
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	1.2E-08	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.6E-07	mg/kg-day	1.10E-01	(mg/kg-day)-1	1.79E-08
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	3.5E-05	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	7.9E-07	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	2.9E-08	mg/kg-day		(mg/kg-day)-1	
	(total)										**2.0E-07**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	1.0E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	7.5E-08
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	5.2E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.8E-08
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	2.1E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	4.2E-08
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	1.9E-10	mg/kg-day	1.60E+01	(mg/kg-day)-1	3.0E-09
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	7.9E-09	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.1E-07	mg/kg-day	1.10E-01	(mg/kg-day)-1	1.2E-08
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	2.3E-07	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	5.2E-09	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	1.9E-10	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.7E-07**
										Total Risk Across All Exposure Routes/Pathways	**3.7E-07**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 7.2a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF MAINTENANCE/UTILITY WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	8.3E-09	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	4.2E-09	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	1.6E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	2.0E-10	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	4.0E-06
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	8.3E-09	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	1.4E-04
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.1E-07	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	3.8E-05
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	2.5E-05	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	6.2E-04
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	5.5E-07	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	1.1E-04
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	2.0E-08	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	2.9E-04
	(total)												**1.2E-03**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	1.4E-09	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	7.3E-10	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	2.9E-09	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	2.7E-11	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	5.3E-07
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	1.1E-09	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	1.8E-05
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.5E-08	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	5.0E-06
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	3.3E-08	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	8.1E-07
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	7.3E-10	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	1.5E-07
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	2.6E-11	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	3.8E-07
	(total)												**2.5E-05**
										Total Hazard Index Across All Exposure Routes/Pathways			**1.2E-03**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 8.2a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF MAINTENANCE/UTILITY WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	1.1E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	7.82E-09
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	5.4E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.97E-09
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	2.0E-09	mg/kg-day	2.00E+00	(mg/kg-day)-1	4.04E-09
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	2.6E-11	mg/kg-day	1.60E+01	(mg/kg-day)-1	4.15E-10
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	1.1E-09	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.5E-08	mg/kg-day	1.10E-01	(mg/kg-day)-1	1.61E-09
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	3.2E-06	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	7.1E-08	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	2.6E-09	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.8E-08**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	1.8E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.3E-09
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	9.3E-11	mg/kg-day	7.30E+00	(mg/kg-day)-1	6.8E-10
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	3.7E-10	mg/kg-day	2.00E+00	(mg/kg-day)-1	7.5E-10
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	3.4E-12	mg/kg-day	1.60E+01	(mg/kg-day)-1	5.5E-11
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	1.4E-10	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.9E-09	mg/kg-day	1.10E-01	(mg/kg-day)-1	2.1E-10
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	4.2E-09	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	9.3E-11	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	3.4E-12	mg/kg-day		(mg/kg-day)-1	
	(total)										**3.0E-09**
										Total Risk Across All Exposure Routes/Pathways	**2.1E-08**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 4.3

VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF CONSTRUCTION WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cs	Chemical Concentration in Soil	(mg/kg)	95% UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	IRs	Ingestion Rate of Soil	(mg/day)	480	USEPA, May 1993	240	USEPA, May 1993	$\frac{Cs \times IRs \times EF \times ED}{BW \times AT \times CF}$
	EF	Exposure Frequency	(days/year)	180	Professional Judgement	180	Professional Judgement	
	FI	Fraction Ingested	(unitless)	1	Professional Judgement	1	Professional Judgement	
	ED	Exposure Duration	(years)	1	Professional Judgement	1	Professional Judgement	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	70	USEPA December 1989	70	USEPA December 1989	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	365	USEPA December 1989	365	USEPA December 1989	
Dermal	Cs	Chemical Concentration in Soil	(mg/kg)	95%UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg^2/kg-day) =
	AF	Soil to Skin Adherence Factor	(mg/cm^2)	0.3	USEPA, September 2001	0.1	USEPA, September 2001	$\frac{Cs \times SA \times ABS \times AF \times EF \times ED}{BW \times AT \times CF}$
	SA	Skin Surface Area	(cm^2)	3,300	USEPA, September 2001	3,300	USEPA, September 2001	
	ABS	Absorption Factor	(unitless)	chemical-specific	USEPA, September 2001	chemical-specific	USEPA, September 2001	
	EF	Exposure Frequency	(days/year)	180	Professional Judgement	180	Professional Judgement	
	ED	Exposure Duration	(years)	1	Professional Judgement	1	Professional Judgement	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	70	USEPA December 1989	70	USEPA December 1989	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	365	USEPA December 1989	365	USEPA December 1989	

Daily Intake Calculations

Ingestion Intake = (IR x Fi x EF x ED x CF) / (BW x AT)
Dermal Intake = (CF x SA x AF x ABS x EF x ED) / (BW x AT)

Cancer Ingestion Intake - RME = 4.83E-08
Noncancer Ingestion Intake - RME = 3.38E-06

Cancer Ingestion Intake - CTE = 2.42E-08
Noncancer Ingestion Intake - CTE = 1.69E-06

Cancer Dermal Intake - RME = 9.96E-08
Noncancer Dermal Intake - RME = 6.97E-06

Cancer Dermal Intake - CTE = 3.32E-08
Noncancer Dermal Intake - CTE = 2.32E-06

TABLE 7.3 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF CONSTRUCTION WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	8.0E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	4.1E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	1.5E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	1.9E-08	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	3.9E-04
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	8.0E-07	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	1.3E-02
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.1E-05	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	3.7E-03
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	2.4E-03	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	5.9E-02
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	5.3E-05	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	1.1E-02
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	1.9E-06	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	2.7E-02
	(total)												**1.1E-01**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	2.1E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	1.1E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	4.4E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	4.0E-09	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	8.0E-05
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	1.7E-07	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	2.8E-03
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	2.3E-06	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	7.5E-04
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	4.9E-06	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	1.2E-04
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	1.1E-07	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	2.2E-05
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	4.0E-09	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	5.7E-05
	(total)												**3.8E-03**
										Total Hazard Index Across All Exposure Routes/Pathways			**1.2E-01**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 8.3 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF CONSTRUCTION WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	1.1E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	8.34E-08
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	5.8E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.23E-08
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	2.2E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	4.31E-08
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	2.8E-10	mg/kg-day	1.60E+01	(mg/kg-day)-1	4.42E-09
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	1.1E-08	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.6E-07	mg/kg-day	1.10E-01	(mg/kg-day)-1	1.72E-08
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	3.4E-05	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	7.5E-07	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	2.7E-08	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.9E-07**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	3.1E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.2E-08
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	1.6E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.1E-08
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	6.2E-09	mg/kg-day	2.00E+00	(mg/kg-day)-1	1.2E-08
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	5.7E-11	mg/kg-day	1.60E+01	(mg/kg-day)-1	9.1E-10
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	2.4E-09	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	3.2E-08	mg/kg-day	1.10E-01	(mg/kg-day)-1	3.6E-09
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	7.0E-08	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	1.6E-09	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	5.7E-11	mg/kg-day		(mg/kg-day)-1	
	(total)										**5.1E-08**
										Total Risk Across All Exposure Routes/Pathways	**2.4E-07**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 7.3a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF CONSTRUCTION WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	4.0E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	2.0E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	7.5E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	9.7E-09	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	1.9E-04
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	4.0E-07	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	6.7E-03
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	5.5E-06	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	1.8E-03
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	1.2E-03	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	3.0E-02
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	2.6E-05	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	5.3E-03
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	9.6E-07	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	1.4E-02
	(total)												**5.7E-02**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	7.1E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	3.6E-08	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	1.5E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	1.3E-09	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	2.7E-05
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	5.5E-08	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	9.2E-04
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	7.5E-07	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	2.5E-04
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	1.6E-06	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	4.1E-05
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	3.6E-08	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	7.3E-06
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	1.3E-09	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	1.9E-05
	(total)												**1.3E-03**
										Total Hazard Index Across All Exposure Routes/Pathways			**5.9E-02**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 8.3a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF CONSTRUCTION WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	5.7E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.17E-08
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	2.9E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.12E-08
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	1.1E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	2.16E-08
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	1.4E-10	mg/kg-day	1.60E+01	(mg/kg-day)-1	2.21E-09
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	5.7E-09	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	7.8E-08	mg/kg-day	1.10E-01	(mg/kg-day)-1	8.61E-09
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	1.7E-05	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	3.8E-07	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	1.4E-08	mg/kg-day		(mg/kg-day)-1	
	(total)										**9.5E-08**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	1.0E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	7.5E-09
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	5.2E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.8E-09
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	2.1E-09	mg/kg-day	2.00E+00	(mg/kg-day)-1	4.2E-09
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	1.9E-11	mg/kg-day	1.60E+01	(mg/kg-day)-1	3.0E-10
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	7.9E-10	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.1E-08	mg/kg-day	1.10E-01	(mg/kg-day)-1	1.2E-09
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	2.3E-08	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	5.2E-10	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	1.9E-11	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.7E-08**
										Total Risk Across All Exposure Routes/Pathways	**1.1E-07**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 4.4

VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADULT RECREATIONAL USERS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Adult Recreational User
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cs	Chemical Concentration in Soil	(mg/kg)	95% UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	IRs	Ingestion Rate of Soil	(mg/day)	100	USEPA, May 1993	50	USEPA, May 1993	$\frac{Cs \times IRs \times EF \times ED}{BW \times AT \times CF}$
	EF	Exposure Frequency	(days/year)	16	Professional Judgement	8	Professional Judgement	
	FI	Fraction Ingested	(unitless)	1	Professional Judgement	1	Professional Judgement	
	ED	Exposure Duration	(years)	30	USEPA, May 1993	9	USEPA, May 1993	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	70	USEPA December 1989	70	USEPA December 1989	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	10,950	USEPA December 1989	3,285	USEPA December 1989	
Dermal	Cs	Chemical Concentration in Soil	(mg/kg)	95%UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	AF	Soil to Skin Adherence Factor	(mg/cm^2)	0.08	USEPA, September 2001	0.01	USEPA, September 2001	$\frac{Cs \times SA \times ABS \times AF \times EF \times ED}{BW \times AT \times CF}$
	SA	Skin Surface Area	(cm^2)	9,000	USEPA, August 1997	9,000	USEPA, August 1997	
	ABS	Absorption Factor	(unitless)	chemical-specific	USEPA, September 2001	chemical-specific	USEPA, September 2001	
	EF	Exposure Frequency	(days/year)	16	Professional Judgement	8	Professional Judgement	
	ED	Exposure Duration	(years)	30	USEPA, May 1993	9	USEPA, May 1993	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	70	USEPA December 1989	70	USEPA December 1989	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	10,950	USEPA December 1989	3,285	USEPA December 1989	

Daily Intake Calculations

Ingestion Intake = (IR x Fi x EF x ED x CF) / (BW x AT)
Dermal Intake = (CF x SA x AF x ABS x EF x ED) / (BW x AT)

Cancer Ingestion Intake - RME = 2.68E-08
Noncancer Ingestion Intake - RME = 6.26E-08

Cancer Ingestion Intake - CTE = 2.01E-09
Noncancer Ingestion Intake - CTE = 1.57E-08

Cancer Dermal Intake - RME = 1.93E-07
Noncancer Dermal Intake - RME = 4.51E-07

Cancer Dermal Intake - CTE = 3.62E-09
Noncancer Dermal Intake - CTE = 2.82E-08

TABLE 7.4 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADULT RECREATIONAL USERS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Adult Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	1.5E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	7.5E-09	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	2.8E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	3.6E-10	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	7.2E-06
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	1.5E-08	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	2.5E-04
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	2.0E-07	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	6.8E-05
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	4.4E-05	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	1.1E-03
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	9.8E-07	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	2.0E-04
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	3.6E-08	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	5.1E-04
	(total)												**2.1E-03**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	1.4E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	7.0E-09	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	2.8E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	2.6E-10	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	5.2E-06
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	1.1E-08	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	1.8E-04
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.5E-07	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	4.9E-05
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	3.2E-07	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	7.9E-06
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	7.0E-09	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	1.4E-06
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	2.6E-10	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	3.7E-06
	(total)												**2.4E-04**
										Total Hazard Index Across All Exposure Routes/Pathways			**2.4E-03**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 8 4 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADULT RECREATIONAL USERS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Adult Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	6.3E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.63E-08
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	3.2E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.35E-08
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	1.2E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	2.40E-08
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	1.5E-10	mg/kg-day	1.60E+01	(mg/kg-day)-1	2.46E-09
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	6.4E-09	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	8.7E-08	mg/kg-day	1.10E-01	(mg/kg-day)-1	9.57E-09
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	1.9E-05	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	4.2E-07	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	1.5E-08	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.1E-07**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	5.9E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.3E-08
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	3.0E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.2E-08
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	1.2E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	2.4E-08
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	1.1E-10	mg/kg-day	1.60E+01	(mg/kg-day)-1	1.8E-09
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	4.6E-09	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	6.3E-08	mg/kg-day	1.10E-01	(mg/kg-day)-1	6.9E-09
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	1.4E-07	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	3.0E-09	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	1.1E-10	mg/kg-day		(mg/kg-day)-1	
	(total)										**9.8E-08**
										Total Risk Across All Exposure Routes/Pathways	**2.0E-07**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 7.4a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADULT RECREATIONAL USERS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Adult Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	3.7E-09	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	1.9E-09	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	7.0E-09	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	9.0E-11	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	1.8E-06
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	3.7E-09	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	6.2E-05
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	5.1E-08	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	1.7E-05
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	1.1E-05	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	2.7E-04
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	2.4E-07	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	4.9E-05
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	8.9E-09	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	1.3E-04
	(total)												**5.3E-04**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	8.7E-10	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	4.4E-10	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	1.8E-09	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	1.6E-11	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	3.2E-07
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	6.7E-10	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	1.1E-05
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	9.1E-09	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	3.0E-06
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	2.0E-08	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	4.9E-07
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	4.4E-10	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	8.8E-08
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	1.6E-11	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	2.3E-07
	(total)												**1.5E-05**
										Total Hazard Index Across All Exposure Routes/Pathways			**5.5E-04**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 8.4a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADULT RECREATIONAL USERS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Adult Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	4.8E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.47E-09
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	2.4E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.76E-09
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	9.0E-10	mg/kg-day	2.00E+00	(mg/kg-day)-1	1.80E-09
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	1.2E-11	mg/kg-day	1.60E+01	(mg/kg-day)-1	1.84E-10
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	4.8E-10	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	6.5E-09	mg/kg-day	1.10E-01	(mg/kg-day)-1	7.18E-10
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	1.4E-06	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	3.1E-08	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	1.1E-09	mg/kg-day		(mg/kg-day)-1	
	(total)										**7.9E-09**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	1.1E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	8.1E-10
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	5.7E-11	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.1E-10
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	2.3E-10	mg/kg-day	2.00E+00	(mg/kg-day)-1	4.5E-10
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	2.1E-12	mg/kg-day	1.60E+01	(mg/kg-day)-1	3.3E-11
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	8.6E-11	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.2E-09	mg/kg-day	1.10E-01	(mg/kg-day)-1	1.3E-10
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	2.5E-09	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	5.7E-11	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	2.1E-12	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.8E-09**
										Total Risk Across All Exposure Routes/Pathways	**9.8E-09**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 4.5

VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADOLESCENT TRESPASSERS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Adolescent Trespasser
Receptor Age: Adolescent

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cs	Chemical Concentration in Soil	(mg/kg)	95% UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	IRs	Ingestion Rate of Soil	(mg/day)	100	USEPA, May 1993	50	USEPA, May 1993	$\frac{Cs \times IRs \times EF \times ED}{BW \times AT \times CF}$
	EF	Exposure Frequency	(days/year)	52	Professional Judgement	26	Professional Judgement	
	FI	Fraction Ingested	(unitless)	1	Professional Judgement	1	Professional Judgement	
	ED	Exposure Duration	(years)	10	Professional Judgement	10	Professional Judgement	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	43	USEPA, August 1997	43	USEPA, August 1997	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	3,650	USEPA December 1989	3,650	USEPA December 1989	
Dermal	Cs	Chemical Concentration in Soil	(mg/kg)	95%UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	AF	Soil to Skin Adherence Factor	(mg/cm^2)	0.3	USEPA, September 2001	0.04	USEPA, September 2001	$\frac{Cs \times SA \times ABS \times AF \times EF \times ED}{BW \times AT \times CF}$
	SA	Skin Surface Area	(cm^2)	3,263	USEPA, August 1997	3,263	USEPA, August 1997	
	ABS	Absorption Factor	(unitless)	chemical-specific	USEPA, September 2001	chemical-specific	USEPA, September 2001	
	EF	Exposure Frequency	(days/year)	52	Professional Judgement	26	Professional Judgement	
	ED	Exposure Duration	(years)	10	Professional Judgement	10	Professional Judgement	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	43	USEPA, August 1997	43	USEPA, August 1997	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	3,650	USEPA December 1989	3,650	USEPA December 1989	

Daily Intake Calculations

Ingestion Intake = (IR x Fi x EF x ED x CF) / (BW x AT)
Dermal Intake = (CF x SA x AF x ABS x EF x ED) / (BW x AT)

Cancer Ingestion Intake - RME = 4.73E-08
Noncancer Ingestion Intake - RME = 3.31E-07

Cancer Ingestion Intake - CTE = 1.18E-08
Noncancer Ingestion Intake - CTE = 8.28E-08

Cancer Dermal Intake - RME = 4.63E-07
Noncancer Dermal Intake - RME = 3.24E-06

Cancer Dermal Intake - CTE = 3.09E-08
Noncancer Dermal Intake - CTE = 2.16E-07

TABLE 7.5 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADOLESCENT TRESPASSERS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Adolescent Trespasser
Receptor Age: Adolescent

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	7.8E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	4.0E-08	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	1.5E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	1.9E-09	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	3.8E-05
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	7.8E-08	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	1.3E-03
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.1E-06	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	3.6E-04
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	2.3E-04	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	5.8E-03
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	5.2E-06	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	1.0E-03
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	1.9E-07	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	2.7E-03
	(total)												**1.1E-02**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	1.0E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	5.1E-08	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	2.0E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	1.9E-09	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	3.7E-05
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	7.7E-08	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	1.3E-03
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.1E-06	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	3.5E-04
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	2.3E-06	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	5.7E-05
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	5.1E-08	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	1.0E-05
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	1.8E-09	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	2.6E-05
	(total)												**1.8E-03**
												Total Hazard Index Across All Exposure Routes/Pathways	**1.3E-02**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 8.5 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADOLESCENT TRESPASSERS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Adolescent Trespasser
Receptor Age: Adolescent

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	1.1E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	8.17E-08
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	5.7E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.15E-08
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	2.1E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	4.23E-08
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	2.7E-10	mg/kg-day	1.60E+01	(mg/kg-day)-1	4.33E-09
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	1.1E-08	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.5E-07	mg/kg-day	1.10E-01	(mg/kg-day)-1	1.69E-08
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	3.3E-05	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	7.4E-07	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	2.7E-08	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.9E-07**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	1.4E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.0E-07
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	7.2E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	5.3E-08
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	2.9E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	5.8E-08
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	2.7E-10	mg/kg-day	1.60E+01	(mg/kg-day)-1	4.2E-09
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	1.1E-08	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.5E-07	mg/kg-day	1.10E-01	(mg/kg-day)-1	1.7E-08
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	3.2E-07	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	7.2E-09	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	2.6E-10	mg/kg-day		(mg/kg-day)-1	
	(total)										**2.4E-07**
										Total Risk Across All Exposure Routes/Pathways	**4.2E-07**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 7.5a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADOLESCENT TRESPASSERS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Adolescent Trespasser
Receptor Age: Adolescent

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	2.0E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	9.9E-09	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	3.7E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	4.7E-10	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	9.5E-06
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	2.0E-08	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	3.3E-04
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	2.7E-07	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	9.0E-05
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	5.8E-05	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	1.5E-03
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	1.3E-06	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	2.6E-04
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	4.7E-08	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	6.7E-04
	(total)												**2.8E-03**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	6.6E-09	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	3.4E-09	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	1.4E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	1.2E-10	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	2.5E-06
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	5.1E-09	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	8.5E-05
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	7.0E-08	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	2.3E-05
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	1.5E-07	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	3.8E-06
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	3.4E-09	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	6.8E-07
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	1.2E-10	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	1.8E-06
	(total)												**1.2E-04**
												Total Hazard Index Across All Exposure Routes/Pathways	**2.9E-03**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 8.5a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADOLESCENT TRESPASSERS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Adolescent Trespasser
Receptor Age: Adolescent

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	2.8E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.04E-08
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	1.4E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.04E-08
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	5.3E-09	mg/kg-day	2.00E+00	(mg/kg-day)-1	1.06E-08
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	6.8E-11	mg/kg-day	1.60E+01	(mg/kg-day)-1	1.08E-09
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	2.8E-09	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	3.8E-08	mg/kg-day	1.10E-01	(mg/kg-day)-1	4.22E-09
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	8.3E-06	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	1.8E-07	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	6.7E-09	mg/kg-day		(mg/kg-day)-1	
	(total)										**4.7E-08**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	9.5E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	6.9E-09
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	4.8E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.5E-09
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	1.9E-09	mg/kg-day	2.00E+00	(mg/kg-day)-1	3.9E-09
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	1.8E-11	mg/kg-day	1.60E+01	(mg/kg-day)-1	2.8E-10
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	7.3E-10	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.0E-08	mg/kg-day	1.10E-01	(mg/kg-day)-1	1.1E-09
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	2.2E-08	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	4.8E-10	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	1.8E-11	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.6E-08**
										Total Risk Across All Exposure Routes/Pathways	**6.2E-08**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 4.6

VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF DAY CARE CENTER CHILDREN TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Day Care Child
Receptor Age: Child (0-6 Years)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cs	Chemical Concentration in Soil	(mg/kg)	95% UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	IRs	Ingestion Rate of Soil	(mg/day)	200	USEPA, May 1993	100	USEPA, May 1993	Cs x IRs x EF x ED / BW x AT x CF
	EF	Exposure Frequency	(days/year)	250	USEPA, May 1993	219	USEPA, May 1993	
	FI	Fraction Ingested	(unitless)	0.5	Professional Judgement	0.5	Professional Judgement	
	ED	Exposure Duration	(years)	6	Professional Judgement	3	Professional Judgement	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	15	USEPA December 1989	15	USEPA December 1989	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	2,190	USEPA December 1989	1,095	USEPA December 1989	
Dermal	Cs	Chemical Concentration in Soil	(mg/kg)	95%UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	AF	Soil to Skin Adherence Factor	(mg/cm^2)	0.2	USEPA, September 2001	0.04	USEPA, September 2001	Cs x SA x ABS x AF x EF x ED / BW x AT x CF
	SA	Skin Surface Area	(cm^2)	2,800	USEPA, September 2001	2,800	USEPA, September 2001	
	ABS	Absorption Factor	(unitless)	chemical-specific	USEPA, September 2001	chemical-specific	USEPA, September 2001	
	EF	Exposure Frequency	(days/year)	250	USEPA, May 1993	219	USEPA, May 1993	
	ED	Exposure Duration	(years)	6	Professional Judgement	3	Professional Judgement	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	15	USEPA December 1989	15	USEPA December 1989	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	2,190	USEPA December 1989	1,095	USEPA December 1989	

Daily Intake Calculations
Ingestion Intake = (IR x Fi x EF x ED x CF) / (BW x AT)
Dermal Intake = (CF x SA x AF x ABS x EF x ED) / (BW x AT)

Cancer Ingestion Intake - RME = 3.91E-07
Noncancer Ingestion Intake - RME = 4.57E-06

Cancer Ingestion Intake - CTE = 8.57E-08
Noncancer Ingestion Intake - CTE = 2.00E-06

Cancer Dermal Intake - RME = 2.19E-06
Noncancer Dermal Intake - RME = 2.56E-05

Cancer Dermal Intake - CTE = 1.92E-07
Noncancer Dermal Intake - CTE = 4.48E-06

TABLE 7.6a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF DAY CARE CENTER CHILDREN TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Day Care Child
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	4.7E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	2.4E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	8.9E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	1.1E-08	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	2.3E-04
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	4.7E-07	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	7.9E-03
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	6.5E-06	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	2.2E-03
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	1.4E-03	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	3.5E-02
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	3.1E-05	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	6.2E-03
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	1.1E-06	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	1.6E-02
	(total)												**6.8E-02**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	1.4E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	7.0E-08	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	2.8E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	2.6E-09	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	5.1E-05
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	1.1E-07	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	1.8E-03
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.5E-06	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	4.8E-04
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	3.1E-06	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	7.9E-05
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	7.0E-08	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	1.4E-05
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	2.5E-09	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	3.6E-05
	(total)												**2.4E-03**
										Total Hazard Index Across All Exposure Routes/Pathways			**7.0E-02**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 8.6a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF DAY CARE CENTER CHILDREN TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Day Care Child
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	2.0E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.48E-07
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	1.0E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	7.51E-08
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	3.8E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	7.65E-08
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	4.9E-10	mg/kg-day	1.60E+01	(mg/kg-day)-1	7.85E-09
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	2.0E-08	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	2.8E-07	mg/kg-day	1.10E-01	(mg/kg-day)-1	3.06E-08
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	6.0E-05	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	1.3E-06	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	4.9E-08	mg/kg-day		(mg/kg-day)-1	
	(total)										**3.4E-07**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	5.9E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.3E-08
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	3.0E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.2E-08
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	1.2E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	2.4E-08
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	1.1E-10	mg/kg-day	1.60E+01	(mg/kg-day)-1	1.8E-09
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	4.5E-09	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	6.2E-08	mg/kg-day	1.10E-01	(mg/kg-day)-1	6.8E-09
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	1.3E-07	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	3.0E-09	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	1.1E-10	mg/kg-day		(mg/kg-day)-1	
	(total)										**9.8E-08**
										Total Risk Across All Exposure Routes/Pathways	**4.4E-07**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 7.6 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF DAY CARE CENTER CHILDREN TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Day Care Child
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	1.1E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	5.5E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	2.0E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	2.6E-08	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	5.2E-04
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	1.1E-06	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	1.8E-02
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.5E-05	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	4.9E-03
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	3.2E-03	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	8.0E-02
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	7.1E-05	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	1.4E-02
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	2.6E-06	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	3.7E-02
	(total)												**1.5E-01**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	7.9E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	4.0E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	1.6E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	1.5E-08	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	2.9E-04
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	6.1E-07	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	1.0E-02
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	8.3E-06	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	2.8E-03
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	1.8E-05	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	4.5E-04
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	4.0E-07	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	8.0E-05
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	1.5E-08	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	2.1E-04
	(total)												**1.4E-02**
										Total Hazard Index Across All Exposure Routes/Pathways			**1.7E-01**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 8.6 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF DAY CARE CENTER CHILDREN TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Day Care Child
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	9.3E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	6.76E-07
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	4.7E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.43E-07
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	1.7E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	3.49E-07
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	2.2E-09	mg/kg-day	1.60E+01	(mg/kg-day)-1	3.58E-08
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	9.3E-08	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.3E-06	mg/kg-day	1.10E-01	(mg/kg-day)-1	1.40E-07
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	2.7E-04	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	6.1E-06	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	2.2E-07	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.5E-06**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	6.7E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.9E-07
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	3.4E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.5E-07
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	1.4E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	2.7E-07
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	1.3E-09	mg/kg-day	1.60E+01	(mg/kg-day)-1	2.0E-08
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	5.2E-08	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	7.1E-07	mg/kg-day	1.10E-01	(mg/kg-day)-1	7.8E-08
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	1.5E-06	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	3.4E-08	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	1.2E-09	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.1E-06**
										Total Risk Across All Exposure Routes/Pathways	**2.7E-06**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 4.7

VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE ADULT RESIDENTS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cs	Chemical Concentration in Soil	(mg/kg)	95% UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	IRs	Ingestion Rate of Soil	(mg/day)	100	USEPA, May 1993	50	USEPA, May 1993	Cs x IRs x EF x ED / BW x AT x CF
	EF	Exposure Frequency	(days/year)	350	USEPA, May 1993	234	USEPA, May 1993	
	FI	Fraction Ingested	(unitless)	1	Professional Judgement	1	Professional Judgement	
	ED	Exposure Duration	(years)	24	USEPA, May 1993	7	USEPA, May 1993	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	70	USEPA December 1989	70	USEPA December 1989	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	8,760	USEPA December 1989	2,555	USEPA December 1989	
Dermal	Cs	Chemical Concentration in Soil	(mg/kg)	95%UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	AF	Soil to Skin Adherence Factor	(mg/cm^2)	0.07	USEPA, September 2001	0.01	USEPA, September 2001	Cs x SA x ABS x AF x EF x ED / BW x AT x CF
	SA	Skin Surface Area	(cm^2)	5,700	USEPA, September 2001	5,700	USEPA, September 2001	
	ABS	Absorption Factor	(unitless)	chemical-specific	USEPA, September 2001	chemical-specific	USEPA, September 2001	
	EF	Exposure Frequency	(days/year)	350	USEPA, May 1993	234	USEPA, May 1993	
	ED	Exposure Duration	(years)	24	USEPA, May 1993	7	USEPA, May 1993	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	70	USEPA December 1989	70	USEPA December 1989	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	8,760	USEPA December 1989	2,555	USEPA December 1989	

Daily Intake Calculations

Ingestion Intake = (IR x Fi x EF x ED x CF) / (BW x AT)
Dermal Intake = (CF x SA x AF x ABS x EF x ED) / (BW x AT)

Cancer Ingestion Intake - RME = 4.70E-07
Noncancer Ingestion Intake - RME = 1.37E-06

Cancer Ingestion Intake - CTE = 4.58E-08
Noncancer Ingestion Intake - CTE = 4.58E-07

Cancer Dermal Intake - RME = 1.87E-06
Noncancer Dermal Intake - RME = 5.47E-06

Cancer Dermal Intake - CTE = 5.22E-08
Noncancer Dermal Intake - CTE = 5.22E-07

TABLE 7.7 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE ADULT RESIDENTS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	3.2E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	1.6E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	6.1E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	7.8E-09	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	1.6E-04
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	3.2E-07	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	5.4E-03
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	4.4E-06	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	1.5E-03
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	9.6E-04	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	2.4E-02
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	2.1E-05	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	4.3E-03
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	7.8E-07	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	1.1E-02
	(total)												**4.6E-02**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	1.7E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	8.5E-08	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	3.4E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	3.1E-09	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	6.3E-05
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	1.3E-07	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	2.2E-03
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.8E-06	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	5.9E-04
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	3.8E-06	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	9.6E-05
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	8.5E-08	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	1.7E-05
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	3.1E-09	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	4.4E-05
	(total)												**3.0E-03**
												Total Hazard Index Across All Exposure Routes/Pathways	**4.9E-02**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 8.7 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE ADULT RESIDENTS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	1.1E-07	mg/kg-day	7.30E+00	(mg/kg-day)-1	8.11E-07
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	5.6E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.11E-07
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	2.1E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	4.19E-07
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	2.7E-09	mg/kg-day	1.60E+01	(mg/kg-day)-1	4.30E-08
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	1.1E-07	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.5E-06	mg/kg-day	1.10E-01	(mg/kg-day)-1	1.67E-07
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	3.3E-04	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	7.3E-06	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	2.7E-07	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.9E-06**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	5.8E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.2E-07
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	2.9E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.1E-07
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	1.2E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	2.3E-07
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	1.1E-09	mg/kg-day	1.60E+01	(mg/kg-day)-1	1.7E-08
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	4.4E-08	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	6.1E-07	mg/kg-day	1.10E-01	(mg/kg-day)-1	6.7E-08
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	1.3E-06	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	2.9E-08	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	1.1E-09	mg/kg-day		(mg/kg-day)-1	
	(total)										**9.5E-07**
										Total Risk Across All Exposure Routes/Pathways	**2.8E-06**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 7 7a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE ADULT RESIDENTS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	1.1E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	5.5E-08	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	2.0E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	2.6E-09	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	5.2E-05
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	1.1E-07	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	1.8E-03
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.5E-06	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	4.9E-04
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	3.2E-04	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	8.0E-03
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	7.2E-06	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	1.4E-03
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	2.6E-07	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	3.7E-03
	(total)												**1.6E-02**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	1.6E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	8.1E-09	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	3.3E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	3.0E-10	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	6.0E-06
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	1.2E-08	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	2.1E-04
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.7E-07	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	5.6E-05
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	3.7E-07	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	9.1E-06
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	8.2E-09	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	1.6E-06
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	3.0E-10	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	4.2E-06
	(total)												**2.8E-04**
												Total Hazard Index Across All Exposure Routes/Pathways	**1.6E-02**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 8.7a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE ADULT RESIDENTS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	1.1E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	7.90E-08
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	5.5E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.01E-08
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	2.0E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	4.09E-08
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	2.6E-10	mg/kg-day	1.60E+01	(mg/kg-day)-1	4.19E-09
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	1.1E-08	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.5E-07	mg/kg-day	1.10E-01	(mg/kg-day)-1	1.63E-08
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	3.2E-05	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	7.2E-07	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	2.6E-08	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.8E-07**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	1.6E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.2E-08
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	8.1E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	5.9E-09
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	3.3E-09	mg/kg-day	2.00E+00	(mg/kg-day)-1	6.5E-09
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	3.0E-11	mg/kg-day	1.60E+01	(mg/kg-day)-1	4.8E-10
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	1.2E-09	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.7E-08	mg/kg-day	1.10E-01	(mg/kg-day)-1	1.9E-09
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	3.7E-08	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	8.2E-10	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	3.0E-11	mg/kg-day		(mg/kg-day)-1	
	(total)										**2.7E-06**
										Total Risk Across All Exposure Routes/Pathways	**2.1E-07**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 4.8

VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE CHILD RESIDENTS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Child (0-6 Years)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cs	Chemical Concentration in Soil	(mg/kg)	95% UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	IRs	Ingestion Rate of Soil	(mg/day)	200	USEPA, May 1993	100	USEPA, May 1993	Cs x IRs x EF x ED / BW x AT x CF
	EF	Exposure Frequency	(days/year)	350	USEPA, May 1993	234	USEPA, May 1993	
	FI	Fraction Ingested	(unitless)	1	Professional Judgement	1	Professional Judgement	
	ED	Exposure Duration	(years)	6	USEPA, May 1993	2	USEPA, May 1993	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	15	USEPA December 1989	15	USEPA December 1989	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	2,190	USEPA December 1989	730	USEPA December 1989	
Dermal	Cs	Chemical Concentration in Soil	(mg/kg)	95%UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	AF	Soil to Skin Adherence Factor	(mg/cm^2)	0.2	USEPA, September 2001	0.04	USEPA, September 2001	Cs x SA x ABS x AF x EF x ED / BW x AT x CF
	SA	Skin Surface Area	(cm^2)	2,800	USEPA, September 2001	2,800	USEPA, September 2001	
	ABS	Absorption Factor	(unitless)	chemical-specific	USEPA, September 2001	chemical-specific	USEPA, September 2001	
	EF	Exposure Frequency	(days/year)	350	USEPA, May 1993	234	USEPA, May 1993	
	ED	Exposure Duration	(years)	6	USEPA, May 1993	2	USEPA, May 1993	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	15	USEPA December 1989	15	USEPA December 1989	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	2,190	USEPA December 1989	730	USEPA December 1989	

Daily Intake Calculations

Ingestion Intake = (IR x Fi x EF x ED x CF) / (BW x AT)
Dermal Intake = (CF x SA x AF x ABS x EF x ED) / (BW x AT)

Cancer Ingestion Intake - RME = 1.10E-06
Noncancer Ingestion Intake - RME = 1.28E-05

Cancer Ingestion Intake - CTE = 1.22E-07
Noncancer Ingestion Intake - CTE = 4.27E-06

Cancer Dermal Intake - RME = 3.07E-06
Noncancer Dermal Intake - RME = 3.58E-05

Cancer Dermal Intake - CTE = 1.37E-07
Noncancer Dermal Intake - CTE = 4.79E-06

TABLE 7.8 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE CHILD RESIDENTS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	3.0E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	1.5E-06	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	5.7E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	7.3E-08	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	1.5E-03
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	3.0E-06	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	5.0E-02
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	4.1E-05	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	1.4E-02
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	9.0E-03	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	2.2E-01
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	2.0E-04	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	4.0E-02
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	7.3E-06	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	1.0E-01
	(total)												**4.3E-01**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	1.1E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	5.6E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	2.2E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	2.0E-08	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	4.1E-04
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	8.5E-07	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	1.4E-02
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.2E-05	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	3.9E-03
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	2.5E-05	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	6.3E-04
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	5.6E-07	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	1.1E-04
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	2.0E-08	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	2.9E-04
	(total)												**1.9E-02**
										Total Hazard Index Across All Exposure Routes/Pathways			**4.5E-01**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 8.8 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE CHILD RESIDENTS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	2.6E-07	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.89E-06
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	1.3E-07	mg/kg-day	7.30E+00	(mg/kg-day)-1	9.60E-07
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	4.9E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	9.79E-07
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	6.3E-09	mg/kg-day	1.60E+01	(mg/kg-day)-1	1.00E-07
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	2.6E-07	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	3.6E-06	mg/kg-day	1.10E-01	(mg/kg-day)-1	3.91E-07
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	7.7E-04	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	1.7E-05	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	6.2E-07	mg/kg-day		(mg/kg-day)-1	
	(total)										**4.3E-06**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	9.4E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	6.9E-07
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	4.8E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.5E-07
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	1.9E-07	mg/kg-day	2.00E+00	(mg/kg-day)-1	3.8E-07
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	1.8E-09	mg/kg-day	1.60E+01	(mg/kg-day)-1	2.8E-08
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	7.3E-08	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	9.9E-07	mg/kg-day	1.10E-01	(mg/kg-day)-1	1.1E-07
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	2.2E-06	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	4.8E-08	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	1.7E-09	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.6E-06**
										Total Risk Across All Exposure Routes/Pathways	**5.9E-06**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 7.8a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE CHILD RESIDENTS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	1.0E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	5.1E-07	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	1.9E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	2.4E-08	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	4.9E-04
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	1.0E-06	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	1.7E-02
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.4E-05	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	4.6E-03
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	3.0E-03	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	7.5E-02
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	6.7E-05	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	1.3E-02
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	2.4E-06	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	3.5E-02
	(total)												**1.4E-01**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	1.5E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	7.5E-08	mg/kg-day		mg/kg-day	NA	NA	
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	3.0E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	2.7E-09	mg/kg-day	5.00E-05	mg/kg-day	NA	NA	5.5E-05
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	1.1E-07	mg/kg-day	6.00E-05	mg/kg-day	NA	NA	1.9E-03
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	1.6E-06	mg/kg-day	3.00E-03	mg/kg-day	NA	NA	5.2E-04
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	3.4E-06	mg/kg-day	4.00E-02	mg/kg-day	NA	NA	8.4E-05
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	7.5E-08	mg/kg-day	5.00E-03	mg/kg-day	NA	NA	1.5E-05
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	2.7E-09	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	3.9E-05
	(total)												**2.6E-03**
										Total Hazard Index Across All Exposure Routes/Pathways			**1.5E-01**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

TABLE 8.8a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE CHILD RESIDENTS TO SURFACE/SUBSURFACE SOIL
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	2.9E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.11E-07
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	1.5E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.07E-07
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	5.5E-08	mg/kg-day	2.00E+00	(mg/kg-day)-1	1.09E-07
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	7.0E-10	mg/kg-day	1.60E+01	(mg/kg-day)-1	1.12E-08
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	2.9E-08	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	4.0E-07	mg/kg-day	1.10E-01	(mg/kg-day)-1	4.35E-08
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	8.6E-05	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	1.9E-06	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	6.9E-08	mg/kg-day		(mg/kg-day)-1	
	(total)										**4.8E-07**
Dermal	Benzo(a)pyrene	2.36E-01	mg/kg	2.36E-01	mg/kg	M	4.2E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.1E-08
	Dibenzo(a,h)anthracene	1.20E-01	mg/kg	1.20E-01	mg/kg	M	2.1E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.6E-08
	Aroclor-1260	4.46E-01	mg/kg	4.46E-01	mg/kg	M	8.5E-09	mg/kg-day	2.00E+00	(mg/kg-day)-1	1.7E-08
	Dieldrin	5.72E-03	mg/kg	5.72E-03	mg/kg	M	7.8E-11	mg/kg-day	1.60E+01	(mg/kg-day)-1	1.3E-09
	2-Amino-4,6-dinitrotoluene	2.37E-01	mg/kg	2.37E-01	mg/kg	M	3.2E-09	mg/kg-day		(mg/kg-day)-1	
	RDX	3.24E+00	mg/kg	3.24E+00	mg/kg	M	4.4E-08	mg/kg-day	1.10E-01	(mg/kg-day)-1	4.9E-09
	Copper	7.01E+02	mg/kg	7.01E+02	mg/kg	M	9.6E-08	mg/kg-day		(mg/kg-day)-1	
	Selenium	1.56E+01	mg/kg	1.56E+01	mg/kg	M	2.1E-09	mg/kg-day		(mg/kg-day)-1	
	Thallium	5.67E-01	mg/kg	5.67E-01	mg/kg	M	7.8E-11	mg/kg-day		(mg/kg-day)-1	
	(total)										**6.9E-08**
										Total Risk Across All Exposure Routes/Pathways	**5.5E-07**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PCBs - 0.14
PAHs - 0.13 Semivolatiles - 0.1

. TABLE 9.1 - REASONABLE MAXIMUM EXPOSURE (RME)

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - FULL TIME WORKER

SITE 5 - OPEN BURN AREAS

NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Full Time Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	6.0E-07		5.2E-07	1.1E-06	Benzo(a)pyrene					
			Dibenzo(a,h)anthracene	3.1E-07		2.6E-07	5.7E-07	Dibenzo(a,h)anthracene					
			Aroclor-1260	3.1E-07		2.9E-07	6.0E-07	Aroclor-1260					
			Dieldrin	3.2E-08		2.1E-08	5.3E-08	Dieldrin	Liver	1.1E-04		7.4E-05	1.9E-04
			2-Amino-4,6-dinitrotoluene					2-Amino-4,6-dinitrotoluene	Liver	3.9E-03		2.5E-03	6.4E-03
			RDX	1.2E-07		8.2E-08	2.1E-07	RDX	Prostate	1.1E-03		7.0E-04	1.8E-03
			Copper					Copper		1.7E-02		1.1E-04	1.7E-02
			Selenium					Selenium	Blood/Skin/CNS	3.1E-03		2.0E-05	3.1E-03
			Thallium					Thallium	Liver	7.9E-03		5.2E-05	8.0E-03
							Total Risk Across Surface Soil	2.5E-06					Total Hazard Index Across All Media and All Exposure Routes	3.7E-02

Total Risk Across All Media and All Exposure Routes 2.5E-06

Total Liver HI =	1.5E-02
Total Blood HI =	3.1E-03
Total CNS HI =	3.1E-03
Total Prostrate HI =	1.8E-03
Total Skin HI =	3.1E-03

TABLE 9.2 - REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - MAINTENANCE / UTILITY WORKER
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	8.7E-08		7.5E-08	1.6E-07	Benzo(a)pyrene					
			Dibenzo(a,h)anthracene	4.4E-08		3.8E-08	8.2E-08	Dibenzo(a,h)anthracene					
			Aroclor-1260	4.5E-08		4.2E-08	8.6E-08	Aroclor-1260					
			Dieldrin	4.6E-09		3.0E-09	7.6E-09	Dieldrin	Liver	1.6E-05		1.1E-05	2.7E-05
			2-Amino-4,6-dinitrotoluene					2-Amino-4,6-dinitrotoluene	Liver	5.6E-04		3.7E-04	9.2E-04
			RDX	1.8E-08		1.2E-08	3.0E-08	RDX	Prostate	1.5E-04		1.0E-04	2.5E-04
			Copper					Copper		2.5E-03		1.6E-05	2.5E-03
			Selenium					Selenium	Blood/Skin/CNS	4.4E-04		2.9E-06	4.4E-04
			Thallium					Thallium	Liver	1.1E-03		7.5E-06	1.1E-03

TABLE 9.3 - REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CONSTRUCTION WORKER
SITE 5 - OPEN BURN AREAS
NSWC WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	8.3E-08		2.2E-08	1.1E-07	Benzo(a)pyrene					
			Dibenzo(a,h)anthracene	4.2E-08		1.1E-08	5.4E-08	Dibenzo(a,h)anthracene					
			Aroclor-1260	4.3E-08		1.2E-08	5.6E-08	Aroclor-1260					
			Dieldrin	4.4E-09		9.1E-10	5.3E-09	Dieldrin	Liver	3.9E-04		8.0E-05	4.7E-04
			2-Amino-4,6-dinitrotoluene					2-Amino-4,6-dinitrotoluene	Liver	1.3E-02		2.8E-03	1.6E-02
			RDX	1.7E-08		3.6E-09	2.1E-08	RDX	Prostate	3.7E-03		7.5E-04	4.4E-03
			Copper					Copper		5.9E-02		1.2E-04	5.9E-02
			Selenium					Selenium	Blood/Skin/CNS	1.1E-02		2.2E-05	1.1E-02
			Thallium					Thallium	Liver	2.7E-02		5.7E-05	2.7E-02
							Total Risk Across Surface Soil	2.4E-07					Total Hazard Index Across All Media and All Exposure Routes	1.2E-01

Total Risk Across All Media and All Exposure Routes	2.4E-07

Total Liver HI =	4.4E-02
Total Blood HI =	1.1E-02
Total CNS HI =	1.1E-02
Total Prostrate HI =	4.4E-03
Total Skin HI =	1.1E-02

TABLE 9.4 - REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADULT RECREATIONAL USER
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	4.6E-08		4.3E-08	9.0E-08	Benzo(a)pyrene					
			Dibenzo(a,h)anthracene	2.4E-08		2.2E-08	4.6E-08	Dibenzo(a,h)anthracene					
			Aroclor-1260	2.4E-08		2.4E-08	4.8E-08	Aroclor-1260					
			Dieldrin	2.5E-09		1.8E-09	4.2E-09	Dieldrin	Liver	7.2E-06		5.2E-06	1.2E-05
			2-Amino-4,6-dinitrotoluene					2-Amino-4,6-dinitrotoluene	Liver	2.5E-04		1.8E-04	4.2E-04
			RDX	9.6E-09		6.9E-09	1.6E-08	RDX	Prostate	6.8E-05		4.9E-05	1.2E-04
			Copper					Copper		1.1E-03		7.9E-06	1.1E-03
			Selenium					Selenium	Blood/Skin/CNS	2.0E-04		1.4E-06	2.0E-04
			Thallium					Thallium	Liver	5.1E-04		3.7E-06	5.1E-04
							Total Risk Across Surface Soil	2.0E-07					Total Hazard Index Across All Media and All Exposure Routes	2.4E-03

Total Risk Across All Media and All Exposure Routes: 2.0E-07

Total Liver HI = 9.5E-04
Total Blood HI = 2.0E-04
Total CNS HI = 2.0E-04

TABLE 9.5 - REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADOLESCENT TRESPASSER
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	8.2E-08		1.0E-07	1.9E-07	Benzo(a)pyrene					
			Dibenzo(a,h)anthracene	4.1E-08		5.3E-08	9.4E-08	Dibenzo(a,h)anthracene					
			Aroclor-1260	4.2E-08		5.8E-08	1.0E-07	Aroclor-1260					
			Dieldrin	4.3E-09		4.2E-09	8.6E-09	Dieldrin	Liver	3.8E-05		3.7E-05	7.5E-05
			2-Amino-4,6-dinitrotoluene					2-Amino-4,6-dinitrotoluene	Liver	1.3E-03		1.3E-03	2.6E-03
			RDX	1.7E-08		1.7E-08	3.3E-08	RDX	Prostate	3.6E-04		3.5E-04	7.1E-04
			Copper					Copper		5.8E-03		5.7E-05	5.9E-03
			Selenium					Selenium	Blood/Skin/CNS	1.0E-03		1.0E-05	1.0E-03
			Thallium					Thallium	Liver	2.7E-03		2.6E-05	2.7E-03
						Total Risk Across Surface Soil	4.2E-07					Total Hazard Index Across All Media and All Exposure Routes	1.3E-02

Total Risk Across All Media and All Exposure Routes: 4.2E-07

Total Liver HI = 5.4E-03
Total Blood HI = 1.0E-03

TABLE 9.6 - REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - DAY CARE CENTER CHILD
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Day Care Center Child
Receptor Age: Child (0-6 Years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	6.8E-07		4.9E-07	1.2E-06	Benzo(a)pyrene		0.0E+00		0.0E+00	0.0E+00
			Dibenzo(a,h)ant	3.4E-07		2.5E-07	5.9E-07	Dibenzo(a,h)anthracene		0.0E+00		0.0E+00	0.0E+00
			Aroclor-1260	3.5E-07		2.7E-07	6.2E-07	Aroclor-1260		0.0E+00		0.0E+00	0.0E+00
			Dieldrin	3.6E-08		2.0E-08	5.6E-08	Dieldrin	Liver	5.2E-04		2.9E-04	8.2E-04
			2-Amino-4,6-din					2-Amino-4,6-din	Liver	1.8E-02		1.0E-02	2.8E-02
			RDX	1.4E-07		7.8E-08	2.2E-07	RDX	Prostate	4.9E-03		2.8E-03	7.7E-03
			Copper					Copper		8.0E-02		4.5E-04	8.0E-02
			Selenium					Selenium	Blood/Skin/CNS	1.4E-02		8.0E-05	1.4E-02
			Thallium					Thallium	Liver	3.7E-02		2.1E-04	3.7E-02
						Total Risk Across Surface Soil	2.7E-06					Total Hazard Index Across All Media and All Exposure Routes	1.7E-01

Total Risk Across All Media and All Exposure Routes	2.7E-06

Total Liver HI =	6.6E-02
Total Blood HI =	1.4E-02
Total CNS HI =	1.4E-02
Total Prostrate HI =	7.7E-03
Total Skin HI =	1.4E-02

TABLE 9.7 - REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - FUTURE ADULT RESIDENT
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	8.1E-07		4.2E-07	1.2E-06	Benzo(a)pyrene					
			Dibenzo(a,h)anthracene	4.1E-07		2.1E-07	6.2E-07	Dibenzo(a,h)anthracene					
			Aroclor-1260	4.2E-07		2.3E-07	6.5E-07	Aroclor-1260					
			Dieldrin	4.3E-08		1.7E-08	6.0E-08	Dieldrin	Liver	1.6E-04		6.3E-05	2.2E-04
			2-Amino-4,6-dinitrotoluene					2-Amino-4,6-dinitrotoluene	Liver	5.4E-03		2.2E-03	7.6E-03
			RDX	1.7E-07		6.7E-08	2.3E-07	RDX	Prostate	1.5E-03		5.9E-04	2.1E-03
			Copper					Copper		2.4E-02		9.6E-05	2.4E-02
			Selenium					Selenium	Blood/Skin/CNS	4.3E-03		1.7E-05	4.3E-03
			Thallium					Thallium	Liver	1.1E-02		4.4E-05	1.1E-02
							Total Risk Across Surface Soil	2.8E-06					Total Hazard Index Across All Media and All Exposure Routes 4.9E-02

Total Risk Across All Media and All Exposure Routes 2.8E-06

Total Liver HI =	1.9E-02
Total Blood HI =	4.3E-03
Total CNS HI =	4.3E-03
Total Prostrate HI =	2.1E-03
Total Skin HI =	4.3E-03

TABLE 9.8 - REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - FUTURE CHILD RESIDENT
SITE 5 - OPEN BURN AREAS
NSWC WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child (0 - 6 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	1.9E-06		6.9E-07	2.6E-06	Benzo(a)pyrene					
			Dibenzo(a,h)anthracene	9.6E-07		3.5E-07	1.3E-06	Dibenzo(a,h)anthracene					
			Aroclor-1260	9.8E-07		3.8E-07	1.4E-06	Aroclor-1260					
			Dieldrin	1.0E-07		2.8E-08	1.3E-07	Dieldrin	Liver	1.5E-03		4.1E-04	1.9E-03
			2-Amino-4,6-dinitrotoluene					2-Amino-4,6-dinitrotoluene	Liver	5.0E-02		1.4E-02	6.5E-02
			RDX	3.9E-07		1.1E-07	5.0E-07	RDX	Prostate	1.4E-02		3.9E-03	1.8E-02
			Copper					Copper		2.2E-01		6.3E-04	2.2E-01
			Selenium					Selenium	Blood/Skin/CNS	4.0E-02		1.1E-04	4.0E-02
			Thallium					Thallium	Liver	1.0E-01		2.9E-04	1.0E-01
							Total Risk Across Surface Soil	5.9E-06					Total Hazard Index Across All Media and All Exposure Routes	4.5E-01

Total Risk Across All Media and All Exposure Routes: 5.9E-06

Total Liver HI =	1.7E-01
Total Blood HI =	4.0E-02
Total CNS HI =	4.0E-02
Total Prostrate HI =	1.8E-02
Total Skin HI =	4.0E-02

Total Vascular HI =	1.8E-02
Total GI Tract HI =	4.0E-02
Total Skin HI =	1.8E-02
Total Blood HI =	4.0E-02
Total CNS HI =	5.2E-01
Total Immune System HI =	4.0E-02
Total Body Weight HI =	
Total Cerebellum HI =	
Total Developmental HI =	

TABLE 9.1a - CENTRAL TENDENCY EXPOSURE (CTE)

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - FULL TIME WORKER

SITE 5 - OPEN BURN AREAS

NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Full Time Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	2.1E-07		3.1E-08	2.4E-07	Benzo(a)pyrene					
			Dibenzo(a,h)anthracene	1.1E-07		1.6E-08	1.2E-07	Dibenzo(a,h)anthracene					
			Aroclor-1260	1.1E-07		1.7E-08	1.3E-07	Aroclor-1260					
			Dieldrin	1.1E-08		1.3E-09	1.2E-08	Dieldrin	Liver	4.9E-04		5.5E-05	5.4E-04
			2-Amino-4,6-dinitrotoluene					2-Amino-4,6-dinitrotoluene	Liver	1.7E-02		1.9E-03	1.9E-02
			RDX	4.4E-08		4.9E-09	4.8E-08	RDX	Prostate	4.6E-03		5.2E-04	5.1E-03
			Copper					Copper		7.5E-02		8.4E-05	7.5E-02
			Selenium					Selenium	Blood/Skin/CNS	1.3E-02		1.5E-05	1.3E-02
			Thallium					Thallium	Liver	3.5E-02		3.9E-05	3.5E-02
							Total Risk Across Surface Soil	5.5E-07					Total Hazard Index Across All Media and All Exposure Routes	1.5E-01

Total Risk Across All Media and All Exposure Routes	5.5E-07

Total Liver HI =	5.4E-02
Total Blood HI =	1.3E-02
Total CNS HI =	1.3E-02
Total Prostrate HI =	5.1E-03
Total Skin HI =	1.3E-02

TABLE 9.2a - CENTRAL TENDENCY EXPOSURE (CTE)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - MAINTENANCE / UTILITY WORKER
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	7.8E-09		1.3E-09	9.2E-09	Benzo(a)pyrene					
			Dibenzo(a,h)anthracene	4.0E-09		6.8E-10	4.6E-09	Dibenzo(a,h)anthracene					
			Aroclor-1260	4.0E-09		7.5E-10	4.8E-09	Aroclor-1260					
			Dieldrin	4.1E-10		5.5E-11	4.7E-10	Dieldnn	Liver	4.0E-06		5.3E-07	4.6E-06
			2-Amino-4,6-dinitrotoluene					2-Amino-4,6-dinitrotoluene	Liver	1.4E-04		1.8E-05	1.6E-04
			RDX	1.6E-09		2.1E-10	1.8E-09	RDX	Prostate	3.8E-05		5.0E-06	4.3E-05
			Copper					Copper		6.2E-04		8.1E-07	6.2E-04
			Selenium					Selenium	Blood/Skin/CNS	1.1E-04		1.5E-07	1.1E-04
			Thallium					Thallium	Liver	2.9E-04		3.8E-07	2.9E-04

TABLE 9.3a - CENTRAL TENDENCY EXPOSURE (CTE)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CONSTRUCTION WORKER
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	4.2E-08		7.5E-09	4.9E-08	Benzo(a)pyrene					
			Dibenzo(a,h)anthracene	2.1E-08		3.8E-09	2.5E-08	Dibenzo(a,h)anthracene					
			Aroclor-1260	2.2E-08		4.2E-09	2.6E-08	Aroclor-1260					
			Dieldrin	2.2E-09		3.0E-10	2.5E-09	Dieldrin	Liver	1.9E-04		2.7E-05	2.2E-04
			2-Amino-4,6-dinitrotoluene					2-Amino-4,6-dinitrotoluene	Liver	6.7E-03		9.2E-04	7.6E-03
			RDX	8.6E-09		1.2E-09	9.8E-09	RDX	Prostate	1.8E-03		2.5E-04	2.1E-03
			Copper					Copper		3.0E-02		4.1E-05	3.0E-02
			Selenium					Selenium	Blood/Skin/CNS	5.3E-03		7.3E-06	5.3E-03
			Thallium					Thallium	Liver	1.4E-02		1.9E-05	1.4E-02
						Total Risk Across Surface Soil	1.1E-07					Total Hazard Index Across All Media and All Exposure Routes	5.9E-02

Total Risk Across All Media and All Exposure Routes	1.1E-07

Total Liver HI =	2.2E-02
Total Blood HI =	5.3E-03
Total CNS HI =	5.3E-03
Total Prostrate HI =	2.1E-03
Total Skin HI =	5.3E-03

TABLE 9.4a - CENTRAL TENDENCY EXPOSURE (CTE)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADULT RECREATIONAL USER
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	3.5E-09		8.1E-10	4.3E-09	Benzo(a)pyrene					
			Dibenzo(a,h)anthracene	1.8E-09		4.1E-10	2.2E-09	Dibenzo(a,h)anthracene					
			Aroclor-1260	1.8E-09		4.5E-10	2.3E-09	Aroclor-1260					
			Dieldrin	1.8E-10		3.3E-11	2.2E-10	Dieldrin	Liver	1.8E-06		3.2E-07	2.1E-06
			2-Amino-4,6-dinitrotoluene					2-Amino-4,6-dinitrotoluene	Liver	6.2E-05		1.1E-05	7.3E-05
			RDX	7.2E-10		1.3E-10	8.5E-10	RDX	Prostate	1.7E-05		3.0E-06	2.0E-05
			Copper					Copper		2.7E-04		4.9E-07	2.7E-04
			Selenium					Selenium	Blood/Skin/CNS	4.9E-05		8.8E-08	4.9E-05
			Thallium					Thallium	Liver	1.3E-04		2.3E-07	1.3E-04
							Total Risk Across Surface Soil	9.8E-09					Total Hazard Index Across All Media and All Exposure Routes	5.5E-04

Total Risk Across All Media and All Exposure Routes	9.8E-09

Total Liver HI =	2.0E-04
Total Blood HI =	4.9E-05
Total CNS HI =	4.9E-05

TABLE 9.5a - CENTRAL TENDENCY EXPOSURE (CTE)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADOLESCENT TRESPASSER
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	2.0E-08		6.9E-09	2.7E-08	Benzo(a)pyrene					
			Dibenzo(a,h)anthracene	1.0E-08		3.5E-09	1.4E-08	Dibenzo(a,h)anthracene					
			Aroclor-1260	1.1E-08		3.9E-09	1.4E-08	Aroclor-1260					
			Dieldrin	1.1E-09		2.8E-10	1.4E-09	Dieldrin	Liver	9.5E-06		2.5E-06	1.2E-05
			2-Amino-4,6-dinitrotoluene					2-Amino-4,6-dinitrotoluene	Liver	3.3E-04		8.5E-05	4.1E-04
			RDX	4.2E-09		1.1E-09	5.3E-09	RDX	Prostate	9.0E-05		2.3E-05	1.1E-04
			Copper					Copper		1.5E-03		3.8E-06	1.5E-03
			Selenium					Selenium	Blood/Skin/CNS	2.6E-04		6.8E-07	2.6E-04
			Thallium					Thallium	Liver	6.7E-04		1.8E-06	6.7E-04
						Total Risk Across Surface Soil	6.2E-08					Total Hazard Index Across All Media and All Exposure Routes	2.9E-03

Total Risk Across All Media and All Exposure Routes: 6.2E-08

Total Liver HI = 1.1E-03
Total Blood HI = 2.6E-04

TABLE 9.6a - CENTRAL TENDENCY EXPOSURE (CTE)

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - DAY CARE CENTER CHILD

SITE 5 - OPEN BURN AREAS

NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Day Care Center Child
Receptor Age: Child (0-6 Years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	1.5E-07		4.3E-08	1.9E-07	Benzo(a)pyrene		0.0E+00		0.0E+00	0.0E+00
			Dibenzo(a,h)ant	7.5E-08		2.2E-08	9.7E-08	Dibenzo(a,h)anthracene		0.0E+00		0.0E+00	0.0E+00
			Aroclor-1260	7.7E-08		2.4E-08	1.0E-07	Aroclor-1260		0.0E+00		0.0E+00	0.0E+00
			Dieldrin	7.8E-09		1.8E-09	9.6E-09	Dieldrin	Liver	2.3E-04		5.1E-05	2.8E-04
			2-Amino-4,6-din					2-Amino-4,6-din	Liver	7.9E-03		1.8E-03	9.7E-03
			RDX	3.1E-08		6.8E-09	3.7E-08	RDX	Prostate	2.2E-03		4.8E-04	2.6E-03
			Copper					Copper		3.5E-02		7.9E-05	3.5E-02
			Selenium					Selenium	Blood/Skin/CNS	6.2E-03		1.4E-05	6.3E-03
			Thallium					Thallium	Liver	1.6E-02		3.6E-05	1.6E-02
						Total Risk Across Surface Soil	4.4E-07			Total Hazard Index Across All Media and All Exposure Routes			7.0E-02

Total Risk Across All Media and All Exposure Routes	4.4E-07

Total Liver HI =	2.6E-02
Total Blood HI =	6.3E-03
Total CNS HI =	6.3E-03
Total Prostrate HI =	2.6E-03
Total Skin HI =	6.3E-03

TABLE 9.7a - CENTRAL TENDENCY EXPOSURE (CTE)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - FUTURE ADULT RESIDENT
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	7.9E-08		1.2E-08	9.1E-08	Benzo(a)pyrene					
			Dibenzo(a,h)anthracene	4.0E-08		5.9E-09	4.6E-08	Dibenzo(a,h)anthracene					
			Aroclor-1260	4.1E-08		6.5E-09	4.7E-08	Aroclor-1260					
			Dieldrin	4.2E-09		4.8E-10	4.7E-09	Dieldrin	Liver	5.2E-05		6.0E-06	5.8E-05
			2-Amino-4,6-dinitrotoluene					2-Amino-4,6-dinitrotoluene	Liver	1.8E-03		2.1E-04	2.0E-03
			RDX	1.6E-08		1.9E-09	1.8E-08	RDX	Prostate	4.9E-04		5.6E-05	5.5E-04
			Copper					Copper		8.0E-03		9.1E-06	8.0E-03
			Selenium					Selenium	Blood/Skin/CNS	1.4E-03		1.6E-06	1.4E-03
			Thallium					Thallium	Liver	3.7E-03		4.2E-06	3.7E-03
							Total Risk Across Surface Soil	2.1E-07				Total Hazard Index Across All Media and All Exposure Routes	1.6E-02

Total Risk Across All Media and All Exposure Routes	2.1E-07

Total Liver HI =	5.8E-03
Total Blood HI =	1.4E-03
Total CNS HI =	1.4E-03
Total Prostrate HI =	5.5E-04
Total Skin HI =	1.4E-03

TABLE 9.8a - CENTRAL TENDENCY EXPOSURE (CTE)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - FUTURE CHILD RESIDENT
SITE 5 - OPEN BURN AREAS
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child (0 - 6 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	2.1E-07		3.1E-08	2.4E-07	Benzo(a)pyrene					
			Dibenzo(a,h)anthracene	1.1E-07		1.6E-08	1.2E-07	Dibenzo(a,h)anthracene					
			Aroclor-1260	1.1E-07		1.7E-08	1.3E-07	Aroclor-1260					
			Dieldrin	1.1E-08		1.3E-09	1.2E-08	Dieldrin	Liver	4.9E-04		5.5E-05	5.4E-04
			2-Amino-4,6-dinitrotoluene					2-Amino-4,6-dinitrotoluene	Liver	1.7E-02		1.9E-03	1.9E-02
			RDX	4.4E-08		4.9E-09	4.8E-08	RDX	Prostate	4.6E-03		5.2E-04	5.1E-03
			Copper					Copper		7.5E-02		8.4E-05	7.5E-02
			Selenium					Selenium	Blood/Skin/CNS	1.3E-02		1.5E-05	1.3E-02
			Thallium					Thallium	Liver	3.5E-02		3.9E-05	3.5E-02
						Total Risk Across Surface Soil	5.5E-07					Total Hazard Index Across All Media and All Exposure Routes	1.5E-01

Total Risk Across All Media and All Exposure Routes	5.5E-07

Total Liver HI =	5.4E-02
Total Blood HI =	1.3E-02
Total CNS HI =	1.3E-02
Total Prostrate HI =	5.1E-03
Total Skin HI =	1.3E-02

Total Vascular HI =	5.1E-03
Total GI Tract HI =	1.3E-02
Total Skin HI =	5.1E-03
Total Blood HI =	1.3E-02
Total CNS HI =	1.7E-01
Total Immune System HI =	1.3E-02
Total Body Weight HI =	
Total Cerebellum HI =	
Total Developmental HI =	

SITE 13

TABLE 1

SELECTION OF EXPOSURE PATHWAYS
SITES 5 13
NSWC-WHITE OAK, SILVER SPRING, MARYLAND
PAGE 1 OF 1

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Surface and Subsurface Soil	Surface and Subsurface Soil	Entire Site	All Potential Receptors, i.e., Workers, Recreational Users, Trespassers, Day Care Center Children, and Future Residents	Adult, Child, Adolescent	Ingestion	On-site	Quant(1)	Exposure to surface soil may occur if potential receptors are exposed during typical receptor-related activities, such as digging and playing.
						Dermal	On-site	Quant(1)	
		Air	Vapors and Particulates in Air - Entire Site	All Potential Receptors, i.e., Workers, Recreational Users, Trespassers, Day Care Center Children, and Future Residents	Adult, Child, Adolescent	Inhalation	On-site	Qual(2)	Exposure is evaluated qualitatively by a comparison of site data to USEPA Generic SSLs (3)for transfers from soil to air.

Footnotes:

1 Quantitative.

2 Qualitative.

3 Soil Screening Levels (USEPA, May 1996).

TABLE 2.1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN
POST-REMOVAL SURFACE/SUBSURFACE SOIL - SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface / Subsurface Soil
Exposure Point: Entire Site

CAS Numb	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects (1)	Concentration Used for Screening(2)	Site Above Background ? (3)	Risk-Based Residential PCOC Screening Level(4)		Potential ARAR/ TBC Value	Potential ARAR/ TBC Source	PCOC Flag	Rationale for Contaminant Deletion or Selection(5)
Volatile Organics (mg/kg)																	
79-34-5	1,1,2,2-Tetrachloroethane	0.0015	J	0.171		mg/kg	13SB207-14	7/27	0.01 - 0.0216	0.171	NA	3.2	C	0.00068 0.6	SSL_MIGR SSL_INH	No	BSL
95-50-1	1,2 Dichlorobenzene	0.0027		0.0027		mg/kg	13SB203-06	1/21	0.00267 - 0.0136	0.0027	NA	700	N	4.6 560	SSL_MIGR SSL_INH	No	BSL, FREQ
96-12-8	1,2-Dibromo-3-chloropropane	0.00598	J	0.00598	J	mg/kg	13SB201-08	1/21	0.00359 - 0.0136	0.00598	NA	0.46	C	0.00087	SSL_MIGR SSL_INH	No	BSL, FREQ
106-46-7	1,4 Dichlorobenzene	0.00247	J	0.0027	J	mg/kg	13SB201-08	2/21	0.00976 - 0.0136	0.0027	NA	27	C	0.0071	SSL_MIGR SSL_INH	No	BSL
78-93-3	2-Butanone	0.0019	J	0.0019	J	mg/kg	13TP04WS0203	1/13	0.01 - 0.014	0.0019	NA	4700	N	7.9	SSL_MIGR SSL_INH	No	BSL
591-78-6	2-Hexanone	0.00775	J	0.0132	J	mg/kg	13SB203-06	2/27	0.00976 - 0.0172	0.0132	NA	310	N	NA	SSL_MIGR SSL_INH	No	BSL
67-64-1	Acetone	0.00335	J	0.00405	J	mg/kg	13SB206-10	2/27	0.0015 - 0.0172	0.00405	NA	780	N	2.5 100000	SSL_MIGR SSL_INH	No	BSL
74-87-3	Chloromethane	0.00192	J	0.00513	J	mg/kg	13SB207-14	14/27	0.01 - 0.014	0.00513	NA	49	C	0.01	SSL_MIGR SSL_INH	No	BSL
79-20-9	Methyl Acetate	0.00215	J	0.0107		mg/kg	13SB206-10	4/19	0.01 - 0.014	0.0107	NA	7800	N	25	SSL_MIGR SSL_INH	No	BSL
127-18-4	Tetrachloroethene	0.001	J	0.00254	J	mg/kg	13SB207-14	4/27	0.01 - 0.0216	0.00254	NA	12	C	0.029 11	SSL_MIGR SSL_INH	No	BSL
1330-20-7	Total Xylenes	0.06		0.06		mg/kg	13TP04WS0203	1/27	0.00976 - 0.0216	0.06	NA	16000	N	170 410	SSL_MIGR SSL_INH	No	BSL, FREQ
79-01-6	Trichloroethene	0.00246	J	0.0162	J	mg/kg	13SB201-08	4/27	0.01 - 0.0216	0.0162	NA	1.6	C	0.00026 5	SSL_MIGR SSL_INH	No	BSL
Semivolatile Organics (mg/kg)																	
91-57-6	2-Methylnaphthalene	0.044	J	0.044	J	mg/kg	13TP04WS0203	1/13	0.35 - 0.47	0.044	NA	160	N	22	SSL_MIGR SSL_INH	No	BSL
83-32-9	Acenaphthene	0.062	J	0.062	J	mg/kg	13-SS-01	1/13	0.35 - 0.47	0.062	NA	470	N	100	SSL_MIGR SSL_INH	No	BSL
120-12-7	Anthracene	0.042	J	0.14	J	mg/kg	13-SS-01	4/13	0.36 - 0.47	0.14	NA	2300	N	470	SSL_MIGR SSL_INH	No	BSL
56-55-3	Benzo(a)anthracene	0.058	J	0.48	J	mg/kg	13-SB-02	5/13	0.36 - 0.47	0.48	NA	0.87	C	1.5	SSL_MIGR SSL_INH	No	BSL
50-32-8	Benzo(a)pyrene	0.041	J	0.39	J	mg/kg	13-SS-01	5/13	0.36 - 0.47	0.39	NA	0.087	C	0.37	SSL_MIGR SSL_INH	Yes	ASL
205-99-2	Benzo(b)fluoranthene	0.095	J	0.78		mg/kg	13-SS-02	4/13	0.36 - 0.47	0.78	NA	0.87	C	4.5	SSL_MIGR SSL_INH	No	BSL
191-24-2	Benzo(g,h,i)perylene	0.2	J	0.29	J	mg/kg	13-SS-01	3/13	0.36 - 0.47	0.29	NA	230(6)	N	680(6)	SSL_MIGR SSL_INH	No	BSL
207-08-9	Benzo(k)fluoranthene	0.19	J	0.25	J	mg/kg	13-SS-01	2/13	0.35 - 0.47	0.25	NA	8.7	C	45	SSL_MIGR SSL_INH	No	BSL
117-81-7	Bis(2-Ethylhexyl)phthalate	0.056	J	0.26	J	mg/kg	13-SB-02	3/13	0.35 - 0.47	0.26	NA	46	C	2900 31000	SSL_MIGR SSL_INH	No	BSL
86-74-8	Carbazole	0.096	J	0.096	J	mg/kg	13-SS-01	1/13	0.35 - 0.47	0.096	NA	32	C	0.47	SSL_MIGR SSL_INH	No	BSL
218-01-9	Chrysene	0.047	J	0.5	J	mg/kg	13-SB-02	5/13	0.36 - 0.47	0.5	NA	87	C	150	SSL_MIGR SSL_INH	No	BSL

TABLE 2.1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN
POST-REMOVAL SURFACE/SUBSURFACE SOIL - SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface / Subsurface Soil
Exposure Point: Entire Site

CAS Numb	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects (1)	Concentration Used for Screening(2)	Site Above Background ? (3)	Risk-Based Residential PCOC Screening Level(4)		Potential ARAR/ TBC Value	Potential ARAR/ TBC Source	PCOC Flag	Rationale for Contaminant Deletion or Selection(5)
53-70-3	Dibenzo(a,h)anthracene	0.088	J	0.14	J	mg/kg	13-SS-01	3/13	0.36 - 0.47	0.14	NA	0.087	C	1.4	SSL_MIGR SSL_INH	Yes	ASL
206-44-0	Fluoranthene	0.037	J	1.1		mg/kg	13-SS-01	6/13	0.36 - 0.47	1.1	NA	310	N	6300	SSL_MIGR SSL_INH	No	BSL
86-73-7	Fluorene	0.058	J	0.064	J	mg/kg	13TP04WS0203	2/13	0.36 - 0.47	0.064	NA	310	N	140	SSL_MIGR SSL_INH	No	BSL
193-39-5	Indeno(1,2,3-cd)pyrene	0.2	J	0.25	J	mg/kg	13-SS-01	3/13	0.36 - 0.47	0.25	NA	0.87	C	13	SSL_MIGR SSL_INH	No	BSL
91-20-3	Naphthalene	0.068	J	0.068	J	mg/kg	13TP04WS0203	1/13	0.36 - 0.47	0.068	NA	160	N	0.15	SSL_MIGR SSL_INH	No	BSL
85-01-8	Phenanthrene	0.073	J	0.59		mg/kg	13-SS-01	5/13	0.36 - 0.47	0.59	NA	230(6)	N	680(6)	SSL_MIGR SSL_INH	No	BSL
129-00-0	Pyrene	0.041	J	0.89	J	mg/kg	13-SB-02	6/13	0.36 - 0.47	0.89	NA	230	N	680	SSL_MIGR SSL_INH	No	BSL
Pesticides/PCBs (mg/kg)																	
72-54-8	4,4'-DDD	0.00061	J	0.017	J	mg/kg	13-SS-01	3/12	0.0019 - 0.0047	0.017	NA	2.7	C	11	SSL_MIGR SSL_INH	No	BSL
72-55-9	4,4'-DDE	0.00049	J	0.071	K	mg/kg	13-SS-01	4/13	0.0019 - 0.0047	0.071	NA	1.9	C	35	SSL_MIGR SSL_INH	No	BSL
50-29-3	4,4'-DDT	0.00071	J	0.039	K	mg/kg	13-SS-01	2/12	0.0019 - 0.0047	0.039	NA	1.9	C	1.2	SSL_MIGR SSL_INH	No	BSL
5103-71-9	alpha-Chlordane	0.0017	J	0.0078	K	mg/kg	13-SS-01	2/13	0.0017 - 0.0024	0.0078	NA	1.8(7)	C	0.92(7) 20(7)	SSL_MIGR SSL_INH	No	BSL
11096-82-5	Aroclor-1260	0.059	J	0.17	J	mg/kg	13-SS-01	3/13	0.036 - 0.047	0.17	NA	0.32	C	0.41	SSL_MIGR SSL_INH	No	BSL
60-57-1	Dieldrin	0.00029	J	0.015	J	mg/kg	13-SS-01	2/13	0.0019 - 0.0047	0.015	NA	0.04	C	0.0022 1	SSL_MIGR SSL_INH	No	BSL
5103-74-2	gamma-Chlordane	0.0016	J	0.0037	K	mg/kg	13-SS-01	2/13	0.0017 - 0.0024	0.0037	NA	1.8(7)	C	0.92(7) 20(7)	SSL_MIGR SSL_INH	No	BSL
Inorganics (mg/kg)																	
7429-90-5	Aluminum	768		21600		mg/kg	13-SB-03	13/13	---	21600	No	7800	N	NA	SSL_MIGR SSL_INH	No	BKG
7440-38-2	Arsenic	0.62		3.9	L	mg/kg	13-SB-03	13/13	---	3.9	No	0.43	C	0.026 750	SSL_MIGR SSL_INH	No	BKG
7440-39-3	Barium	1.8		71.1		mg/kg	13-SS-03	13/13	---	71.1	No	550	N	2100 690000	SSL_MIGR SSL_INH	No	BSL, BKG
7440-41-7	Beryllium	0.08		0.97		mg/kg	13TP05WS0103	3/13	0.02 - 0.76	0.97	Yes	16	N	1200 1300	SSL_MIGR SSL_INH	No	BSL
7440-43-9	Cadmium	0.062	K	0.4		mg/kg	13-SS-01	4/13	0.019 - 0.08	0.4	No	7.8(8)	N	55(8) 1800	SSL_MIGR SSL_INH	No	BSL, BKG
7440-70-2	Calcium	254		20700		mg/kg	13-SS-02	7/13	33.6 - 213	20700	Yes	NA		NA	SSL_MIGR SSL_INH	No	NUT
7440-47-3	Chromium	2.2		28.1	J	mg/kg	13-SB-03	13/13	---	28.1	No	23(9)	N	42(9) 270	SSL_MIGR SSL_INH	No	BKG
7440-48-4	Cobalt	0.16		21.5		mg/kg	13-SS-03	11/13	0.094 - 0.63	21.5	No	160	N	NA	SSL_MIGR SSL_INH	No	BSL, BKG
7440-50-8	Copper	1.3	J	68.4		mg/kg	13-SS-01	13/13	---	68.4	No	310	N	11000	SSL_MIGR SSL_INH	No	BSL, BKG

TABLE 2.1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN
POST-REMOVAL SURFACE/SUBSURFACE SOIL - SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface / Subsurface Soil
Exposure Point: Entire Site

CAS Numb	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects (1)	Concentration Used for Screening(2)	Site Above Background ? (3)	Risk-Based Residential PCOC Screening Level(4)		Potential ARAR/ TBC Value	Potential ARAR/ TBC Source	PCOC Flag	Rationale for Contaminant Deletion or Selection(5)
7439-89-6	Iron	1760		39000	J	mg/kg	13TP05WS0103-D	13/13	---	39000	No	2300	N	NA	SSL_MIGR SSL_INH	No	BKG
7439-92-1	Lead	0.9		40.6		mg/kg	13-SS-01	13/13	----	40.6	No	400(10)		NA	SSL_MIGR SSL_INH	No	BSL, BKG
7439-95-4	Magnesium	35.4		5370		mg/kg	13TP05WS0103-D	13/13	---	5370	No	NA		NA	SSL_MIGR SSL_INH	No	NUT, BKG
7439-96-5	Manganese	3	J	699		mg/kg	13-SS-03	13/13	---	699	No	160(11)	N	950(11)	SSL_MIGR SSL_INH	No	BKG
7439-97-6	Mercury	0.022		0.16		mg/kg	13-SS-01	12/13	0.02	0.16	No	2.3(12)	N	NA	SSL_MIGR SSL_INH	No	BSL, BKG
7440-02-0	Nickel	0.38	J	65.5	J	mg/kg	13TP05WS0103-D	13/13	---	65.5	No	160	N	NA 13000	SSL_MIGR SSL_INH	No	BSL, BKG
7440-09-7	Potassium	26.9		3400		mg/kg	13-SS-03	13/13	---	3400	No	NA		NA	SSL_MIGR SSL_INH	No	NUT, BKG
7782-49-2	Selenium	0.43		3.8	J	mg/kg	13-SB-03	11/12	0.37	3.8	Yes	39	N	19	SSL_MIGR SSL_INH	No	BSL
7440-22-4	Silver	0.073		0.21		mg/kg	13TP05WS0103-D	1/13	0.067 - 0.22	0.21	No	39	N	31	SSL_MIGR SSL_INH	No	BSL, BKG
7440-23-5	Sodium	106		106		mg/kg	13-SS-03	1/13	16.1 - 101	106	No	NA		NA	SSL_MIGR SSL_INH	No	NUT, BKG
7440-28-0	Thallium	0.48		3	K	mg/kg	13TP05WS0103-D	7/13	0.39 - 0.76	3	Yes	0.55	N	3.6	SSL_MIGR SSL_INH	Yes	ASL
7440-62-2	Vanadium	4.1		39.4		mg/kg	13-SB-03	13/13	---	39.4	No	55	N	5100	SSL_MIGR SSL_INH	No	BSL, BKG
7440-66-6	Zinc	6.3	J	70		mg/kg	13-SS-01	8/13	1.4 - 3.8	70	No	2300	N	14000	SSL_MIGR SSL_INH	No	BSL, BKG
57-12-5	Cyanide	0.24		0.24		mg/kg	13-SB-03	1/6	0.18 - 0.32	0.24	NA	160	N	150	SSL_MIGR SSL_INH	No	BSL
Miscellaneous Parameters																	
TTNUS291	Percent Solids (%)	83.8		95.6		mg/kg	13SB202-08	17/17	---	95.6	NA	NA		NA	SSL_MIGR SSL_INH	No	NTX
TTNUS002	Ph (s.u.)	5.65		7.98		mg/kg	13-SB-02	6/6	---	7.98	NA	NA		NA	SSL_MIGR SSL_INH	No	NTX
TTNUS003	Total Organic Carbon	434		434		mg/kg	13SB201-10	1/1	---	434	NA	NA		NA	SSL_MIGR SSL_INH	No	NTX

Shaded cells indicate that the maximum concentration exceeds the specified criterion or constituent has been selected as a PCOC.

Footnotes:

1 Values presented are sample-specific quantitation limits.
2 The maximum detected concentration is used for screening purposes.
3 To determine whether metal concentrations are within background levels, a comparison of site concentrations with Base-wide background data was made by means of the Wilcoxon Rank Sum Test. If the Wilcoxon Test determined that a constituent concentration was not significanty different from background, that chemical was not selected as a PCOC.
4 The risk-based soil COPC screening level for residential land use is presented. The value is based on a target hazard quotient of 0.1 for noncarcinogens (denoted with a "N" flag) or an incremental cancer risk of 1E-6 for carcinogens (denoted with a "C" flag) (USEPA, Region III, April 2002).

Rationale Codes:
For Selection as a PCOC:
ASL = Above PCOC Screening Level

For Elimination as a PCOC:
BKG = Within background levels
BSL = Below PCOC Screening Level
FREQ = Frequency
NUT = Essential Nutrient

TABLE 2.1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN
POST-REMOVAL SURFACE/SUBSURFACE SOIL - SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface / Subsurface Soil
Exposure Point: Entire Site

CAS Numb	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects (1)	Concentration Used for Screening(2)	Site Above Background ? (3)	Risk-Based Residential PCOC Screening Level(4)	Potential ARAR/ TBC Value	Potential ARAR/ TBC Source	PCOC Flag	Rationale for Contaminant Deletion or Selection(5)

5 The chemical is selected as a PCOC if the maximum detected concentration exceeds the risk-based PCOC screening level and facility-wide background levels.
6 Pyrene is used as a surrogate for benzo(g,h,i)perylene and phenanthrene.
7 Value for chlordane is used.
8 Cadmium - Food
9 Chromium as hexavalent chromium.
10 OSWER soil screening level for residential land use (USEPA, July 1994)
11 Manganese-Nonfood.
12 Mercury as Mercuric Chloride.

Definitions:
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
J = Estimated Value
K = Value Estimated with a High Bias
L = Value Estimated with a Low Bias
N = Noncarcinogen
NA = Not Applicable/Not Available.
PCOC = Potential Constituent of Concern
SSL-INH = Soil Screening Level for transfers from soil to air (Inhalation) (USEPA, May 1996)
SSL-MIGR = Soil Screening Level for transfers from soil to groundwater for a Dilution and Attenuation Factor of 20 (USEPA, Region 3, April 2002)

Associated Samples:

13-SB-01	13SB201-08	13SB205-10	13TP04WS0203
13-SB-02	13SB201-10	13SB205-4	13TP05SB0607
13-SB-03	13SB202-08	13SB206-10	13TP05WS0103
13-SB-03-AVG	13SB202-12	13SB206-14	13TP05WS0103-AVG
13-SB-03-D	13SB203-06	13SB207-10	13TP05WS0103-D
13-SS-01	13SB203-12	13SB207-14	13TP06SB0203
13-SS-02	13SB204-10	13TP03SB0405	13TP07SB0304
13-SS-03	13SB204-14	13TP04SB0405	

TABLE 3.1

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY - SURFACE / SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface / SubsurfaceSoil
Exposure Point: Surface / Subsurface Soil

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)pyrene	mg/kg	2.00E-01	2.46E-01	3.90E-01	J	mg/kg	2.46E-01	95% UCL-N	W - Test (1)	2.46E-01	95% UCL-N	W - Test (1)
Dibenzo(a,h)anthracene	mg/kg	1.76E-01	1.94E-01	1.40E-01	J	mg/kg	1.40E-01	Maximum	W - Test (2)	1.40E-01	Maximum	W - Test (2)
Thallium	mg/kg	6.09E-01	8.49E-01	2.10E+00		mg/kg	8.84E-01	95% UCL-T	W - Test (3)	8.84E-01	95% UCL-T	W - Test (3)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

(1) Shapiro-Wilk W Test indicates data are normally distributed.
(2) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration is used for EPC.
(3) Shapiro-Wilk W Test indicates data are log-normally distributed.

TABLE 5.1

NON-CANCER TOXICITY DATA -- ORAL/DERMAL
SITES 5 & 13
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD	Oral RfD Units	Oral to Dermal Adjustment Factor[1]	Adjusted Dermal RfD[2]	Dermal RfD Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ[3]
Dieldrin	chronic	5.0E-05	mg/kg-day	1	5.00E-05	mg/kg-day	Liver	100	IRIS	04/02/02
2-Amino-4,6-dinitrotoluene	chronic	6.0E-05	mg/kg-day	1	6.00E-05	mg/kg-day			NCEA	04/02/02
RDX	chronic	3.0E-03	mg/kg-day	1	3.00E-03	mg/kg-day	Prostate	100	IRIS	04/02/02
Copper	chronic	4.0E-02	mg/kg-day	1	4.00E-02	mg/kg-day	NA		HEAST	07/97
Selenium	chronic	5.0E-03	mg/kg-day	1	5.00E-03	mg/kg-day	Blood/Skin/CNS	3	IRIS	04/02/02
Thalllum	chronic	7.0E-05	mg/kg-day	1	7.00E-05	mg/kg-day	Liver			04/02/02

(1) USEPA, September, 2001.
(2) RfD dermal = RfDoral x (Oral to Dermal Adjustment Factor)
(3) Dates of IRIS, HEAST, or NCEA

Notes: RfD = Reference dose
CNS = Central Nervous System
IRIS = Integrated Risk Information System, on-line database search (USEPA, August 2002)
HEAST = Health Effects Assessment Summary Tables (USEPA, July 1997)
NCEA = USEPA National Center for Environmental Assessment (USEPA RBC Table, April 2, 2002)
NA = Not applicable since an oral RfD is not available for this compound data

TABLE 6.1

CANCER TOXICITY DATA -- ORAL/DERMAL
SITES 5 & 13
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Chemical of Potential Concern	Oral CSF	Oral to Dermal Adjustment Factor[1]	Adjusted Dermal Cancer Slope Factor[2]	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date[3]
Aroclor-1260	2.0E+00	1	2.00E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	7/21/2002
Benzo(a)pyrene	7.3E+00	1	7.30E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	7/21/2002
Dibenzo(a,h)anthracene	7.3E+00	1	7.30E+00	$(mg/kg\text{-}day)^{-1}$	B2	Region 3	4/2/2002
RDX	1.1E-01	1	1.10E-01	(mg/kg-day)-1	C	IRIS	4/2/2002

(1) RAGS-PART E (USEPA, September 2001).
(2) CSFdermal = CSForal/(Oral to Dermal Adjustment Factor)
(3) Date of IRIS

Notes:
CSF = Cancer Slope Factor
IRIS = Integrated Risk Information System, on-line database search (USEPA, July1999)
HEAST = Health Effects Assessment Summary Tables (USEPA, July 1997)
Region 3 - USEPA Region III RBC Table, April 2, 2002

EPA Group:
A - Human carcinogen
B1 - Probable human carcinogen - indicates that limited human data are available
B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen
E - Evidence of noncarcinogenicity

TABLE 4.1

VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FULL TIME WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Full Time Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cs	Chemical Concentration in Soil	(mg/kg)	95% UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	IRs	Ingestion Rate of Soil	(mg/day)	100	USEPA, May 1993	50	USEPA, May 1993	Cs x IRs x EF x ED / BW x AT x CF
	EF	Exposure Frequency	(days/year)	250	USEPA, May 1993	219	USEPA, May 1993	
	FI	Fraction Ingested	(unitless)	1	Professional Judgement	1	Professional Judgement	
	ED	Exposure Duration	(years)	25	USEPA, May 1993	9	USEPA, May 1993	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	70	USEPA December 1989	70	USEPA December 1989	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	9,125	USEPA December 1989	3,285	USEPA December 1989	
Dermal	Cs	Chemical Concentration in Soil	(mg/kg)	95%UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	AF	Soil to Skin Adherence Factor	(mg/cm^2)	0.2	USEPA, September 2001	0.02	USEPA, September 2001	Cs x SA x ABS x AF x EF x ED / BW x AT x CF
	SA	Skin Surface Area	(cm^2)	3,300	USEPA, September 2001	3,300	USEPA, September 2001	
	ABS	Absorption Factor	(unitless)	chemical-specific	USEPA, September 2001	chemical-specific	USEPA, September 2001	
	EF	Exposure Frequency	(days/year)	250	USEPA, May 1993	219	USEPA, May 1993	
	ED	Exposure Duration	(years)	25	USEPA, May 1993	9	USEPA, May 1993	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	70	USEPA December 1989	70	USEPA December 1989	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	9,125	USEPA December 1989	3,285	USEPA December 1989	

Daily Intake Calculations
Ingestion Intake = (IR x Fi x EF x ED x CF) / (BW x AT)
Dermal Intake = (CF x SA x AF x ABS x EF x ED) / (BW x AT)

Cancer Ingestion Intake - RME = 3.49E-07
Noncancer Ingestion Intake - RME = 9.78E-07

Cancer Ingestion Intake - CTE = 5.51E-08
Noncancer Ingestion Intake - CTE = 4.29E-07

Cancer Dermal Intake - RME = 2.31E-06
Noncancer Dermal Intake - RME = 6.46E-06

Cancer Dermal Intake - CTE = 7.27E-08
Noncancer Dermal Intake - CTE = 5.66E-07

TABLE 7.1 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FULL TIME WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Full Time Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	2.4E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	1.4E-07	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	8.7E-07	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	1.2E-02
	(total)												**1.2E-02**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	2.1E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	1.2E-07	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	5.7E-09	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	8.2E-05
	(total)												**8.2E-05**
										Total Hazard Index Across All Exposure Routes/Pathways			**1.2E-02**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 8.1 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FULL TIME WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Full Time Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	8.6E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	6.28E-07
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	4.9E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.57E-07
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	3.1E-07	mg/kg-day		(mg/kg-day)-1	
	(total)										**9.9E-07**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	7.4E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	5.4E-07
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	4.2E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.1E-07
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	2.0E-09	mg/kg-day		(mg/kg-day)-1	
	(total)										**8.5E-07**
								Total Risk Across All Exposure Routes/Pathways			**1.8E-06**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 7.1a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FULL TIME WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Full Time Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	1.1E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	6.0E-08	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	3.8E-07	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	5.4E-03
	(total)												**5.4E-03**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	1.8E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	1.0E-08	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	5.0E-10	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	7.1E-06
	(total)												**7.1E-06**
										Total Hazard Index Across All Exposure Routes/Pathways			**5.4E-03**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 8.1a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FULL TIME WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Full Time Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	1.4E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	9.90E-08
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	7.7E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	5.63E-08
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	4.9E-08	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.6E-07**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	2.3E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.7E-08
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	1.3E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	9.7E-09
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	6.4E-11	mg/kg-day		(mg/kg-day)-1	
	(total)										**2.7E-08**
										Total Risk Across All Exposure Routes/Pathways	**1.8E-07**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 4.2

VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF MAINTENANCE/UTILITY WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cs	Chemical Concentration in Soil	(mg/kg)	95% UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	IRs	Ingestion Rate of Soil	(mg/day)	100	USEPA, May 1993	50	USEPA, May 1993	$\frac{Cs \times IRs \times EF \times ED}{BW \times AT \times CF}$
	EF	Exposure Frequency	(days/year)	36	Professional Judgement	18	Professional Judgement	
	FI	Fraction Ingested	(unitless)	1	Professional Judgement	1	Professional Judgement	
	ED	Exposure Duration	(years)	25	USEPA, May 1993	9	USEPA, May 1993	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	70	USEPA December 1989	70	USEPA December 1989	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	9,125	USEPA December 1989	3,285	USEPA December 1989	
Dermal	Cs	Chemical Concentration in Soil	(mg/kg)	95%UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	AF	Soil to Skin Adherence Factor	(mg/cm^2)	0.2	USEPA, September 2001	0.02	USEPA, September 2001	$\frac{Cs \times SA \times ABS \times AF \times EF \times ED}{BW \times AT \times CF}$
	SA	Skin Surface Area	(cm^2)	3,300	USEPA, September 2001	3,300	USEPA, September 2001	
	ABS	Absorption Factor	(unitless)	chemical-specific	USEPA, September 2001	chemical-specific	USEPA, September 2001	
	EF	Exposure Frequency	(days/year)	36	Professional Judgement	18	Professional Judgement	
	ED	Exposure Duration	(years)	25	USEPA, May 1993	9	USEPA, May 1993	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	70	USEPA December 1989	70	USEPA December 1989	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	9,125	USEPA December 1989	3,285	USEPA December 1989	

Daily Intake Calculations

Ingestion Intake = (IR x Fi x EF x ED x CF) / (BW x AT)
Dermal Intake = (CF x SA x AF x ABS x EF x ED) / (BW x AT)

Cancer Ingestion Intake - RME = 5.03E-08
Noncancer Ingestion Intake - RME = 1.41E-07

Cancer Ingestion Intake - CTE = 4.53E-09
Noncancer Ingestion Intake - CTE = 3.52E-08

Cancer Dermal Intake - RME = 3.32E-07
Noncancer Dermal Intake - RME = 9.30E-07

Cancer Dermal Intake - CTE = 5.98E-09
Noncancer Dermal Intake - CTE = 4.65E-08

TABLE 7.2 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF MAINTENANCE/UTILITY WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	3.5E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	2.0E-08	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	1.2E-07	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	1.8E-03
	(total)												**1.8E-03**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	3.0E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	1.7E-08	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	8.2E-10	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	1.2E-05
	(total)												**1.2E-05**
												Total Hazard Index Across All Exposure Routes/Pathways	**1.8E-03**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 8.2 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF MAINTENANCE/UTILITY WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	1.2E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	9.04E-08
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	7.0E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	5.14E-08
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	4.5E-08	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.4E-07**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	1.1E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	7.8E-08
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	6.0E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.4E-08
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	2.9E-10	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.2E-07**
										Total Risk Across All Exposure Routes/Pathways	**2.6E-07**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 7.2a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF MAINTENANCE/UTILITY WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	8.7E-09	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	4.9E-09	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	3.1E-08	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	4.5E-04
	(total)												**4.5E-04**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	1.5E-09	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	8.5E-10	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	4.1E-11	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	5.9E-07
	(total)												**5.9E-07**
										Total Hazard Index Across All Exposure Routes/Pathways			**4.5E-04**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 8.2a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF MAINTENANCE/UTILITY WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	1.1E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	8.14E-09
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	6.3E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.63E-09
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	4.0E-09	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.3E-08**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	1.9E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.4E-09
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	1.1E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	7.9E-10
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	5.3E-12	mg/kg-day		(mg/kg-day)-1	
	(total)										**2.2E-09**
										Total Risk Across All Exposure Routes/Pathways	**1.5E-08**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 4.3

VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF CONSTRUCTION WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cs	Chemical Concentration in Soil	(mg/kg)	95% UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	IRs	Ingestion Rate of Soil	(mg/day)	480	USEPA, May 1993	240	USEPA, May 1993	Cs x IRs x EF x ED / BW x AT x CF
	EF	Exposure Frequency	(days/year)	180	Professional Judgement	180	Professional Judgement	
	FI	Fraction Ingested	(unitless)	1	Professional Judgement	1	Professional Judgement	
	ED	Exposure Duration	(years)	1	Professional Judgement	1	Professional Judgement	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	70	USEPA December 1989	70	USEPA December 1989	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	365	USEPA December 1989	365	USEPA December 1989	
Dermal	Cs	Chemical Concentration in Soil	(mg/kg)	95%UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	AF	Soil to Skin Adherence Factor	(mg/cm^2)	0.3	USEPA, September 2001	0.1	USEPA, September 2001	Cs x SA x ABS x AF x EF x ED / BW x AT x CF
	SA	Skin Surface Area	(cm^2)	3,300	USEPA, September 2001	3,300	USEPA, September 2001	
	ABS	Absorption Factor	(unitless)	chemical-specific	USEPA, September 2001	chemical-specific	USEPA, September 2001	
	EF	Exposure Frequency	(days/year)	180	Professional Judgement	180	Professional Judgement	
	ED	Exposure Duration	(years)	1	Professional Judgement	1	Professional Judgement	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	70	USEPA December 1989	70	USEPA December 1989	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	365	USEPA December 1989	365	USEPA December 1989	

Daily Intake Calculations

Ingestion Intake = (IR x Fi x EF x ED x CF) / (BW x AT)
Dermal Intake = (CF x SA x AF x ABS x EF x ED) / (BW x AT)

Cancer Ingestion Intake - RME = 4.83E-08
Noncancer Ingestion Intake - RME = 3.38E-06

Cancer Ingestion Intake - CTE = 2.42E-08
Noncancer Ingestion Intake - CTE = 1.69E-06

Cancer Dermal Intake - RME = 9.96E-08
Noncancer Dermal Intake - RME = 6.97E-06

Cancer Dermal Intake - CTE = 3.32E-08
Noncancer Dermal Intake - CTE = 2.32E-06

TABLE 7.3 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF CONSTRUCTION WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	8.3E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	4.7E-07	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	3.0E-06	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	4.3E-02
	(total)												**4.3E-02**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	2.2E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	1.3E-07	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	6.2E-09	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	8.8E-05
	(total)												**8.8E-05**
										Total Hazard Index Across All Exposure Routes/Pathways			**4.3E-02**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 8.3 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF CONSTRUCTION WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	1.2E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	8.68E-08
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	6.8E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.94E-08
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	4.3E-08	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.4E-07**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	3.2E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.3E-08
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	1.8E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.3E-08
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	8.8E-11	mg/kg-day		(mg/kg-day)-1	
	(total)										**3.7E-08**
										Total Risk Across All Exposure Routes/Pathways	**1.7E-07**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 8.3a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF CONSTRUCTION WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	5.9E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.34E-08
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	3.4E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.47E-08
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	2.1E-08	mg/kg-day		(mg/kg-day)-1	
	(total)										**6.8E-08**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	1.1E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	7.8E-09
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	6.0E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.4E-09
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	2.9E-11	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.2E-08**
										Total Risk Across All Exposure Routes/Pathways	**8.0E-08**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 7.3a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF CONSTRUCTION WORKERS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	4.2E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	2.4E-07	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	1.5E-06	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	2.1E-02
	(total)												**2.1E-02**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	7.4E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	4.2E-08	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	2.1E-09	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	2.9E-05
	(total)												**2.9E-05**
										Total Hazard Index Across All Exposure Routes/Pathways			**2.1E-02**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 4.4

VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADULT RECREATIONAL USERS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Adult Recreational User
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cs	Chemical Concentration in Soil	(mg/kg)	95% UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	IRs	Ingestion Rate of Soil	(mg/day)	100	USEPA, May 1993	50	USEPA, May 1993	Cs x IRs x EF x ED / BW x AT x CF
	EF	Exposure Frequency	(days/year)	16	Professional Judgement	8	Professional Judgement	
	FI	Fraction Ingested	(unitless)	1	Professional Judgement	1	Professional Judgement	
	ED	Exposure Duration	(years)	30	USEPA, May 1993	9	USEPA, May 1993	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	70	USEPA December 1989	70	USEPA December 1989	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	10,950	USEPA December 1989	3,285	USEPA December 1989	
Dermal	Cs	Chemical Concentration in Soil	(mg/kg)	95%UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	AF	Soil to Skin Adherence Factor	(mg/cm^2)	0.08	USEPA, September 2001	0.01	USEPA, September 2001	Cs x SA x ABS x AF x EF x ED / BW x AT x CF
	SA	Skin Surface Area	(cm^2)	9,000	USEPA, August 1997	9,000	USEPA, August 1997	
	ABS	Absorption Factor	(unitless)	chemical-specific	USEPA, September 2001	chemical-specific	USEPA, September 2001	
	EF	Exposure Frequency	(days/year)	16	Professional Judgement	8	Professional Judgement	
	ED	Exposure Duration	(years)	30	USEPA, May 1993	9	USEPA, May 1993	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	70	USEPA December 1989	70	USEPA December 1989	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	10,950	USEPA December 1989	3,285	USEPA December 1989	

Daily Intake Calculations
Ingestion Intake = (IR x Fi x EF x ED x CF) / (BW x AT)
Dermal Intake = (CF x SA x AF x ABS x EF x ED) / (BW x AT)

Cancer Ingestion Intake - RME = 2.68E-08
Noncancer Ingestion Intake - RME = 6.26E-08

Cancer Ingestion Intake - CTE = 2.01E-09
Noncancer Ingestion Intake - CTE = 1.57E-08

Cancer Dermal Intake - RME = 1.93E-07
Noncancer Dermal Intake - RME = 4.51E-07

Cancer Dermal Intake - CTE = 3.62E-09
Noncancer Dermal Intake - CTE = 2.82E-08

TABLE 7.4 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADULT RECREATIONAL USERS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Adult Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	1.5E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	8.8E-09	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	5.5E-08	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	7.9E-04
	(total)												**7.9E-04**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	1.4E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	8.2E-09	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	4.0E-10	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	5.7E-06
	(total)												**5.7E-06**
										Total Hazard Index Across All Exposure Routes/Pathways			**8.0E-04**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 8.4 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADULT RECREATIONAL USERS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Adult Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	6.6E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.82E-08
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	3.8E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.74E-08
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	2.4E-08	mg/kg-day		(mg/kg-day)-1	
	(total)										**7.6E-08**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	6.2E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.5E-08
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	3.5E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.6E-08
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	1.7E-10	mg/kg-day		(mg/kg-day)-1	
	(total)										**7.1E-08**
										Total Risk Across All Exposure Routes/Pathways	**1.5E-07**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 7.4a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADULT RECREATIONAL USERS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Adult Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	3.9E-09	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	2.2E-09	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	1.4E-08	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	2.0E-04
	(total)												**2.0E-04**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	9.0E-10	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	5.1E-10	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	2.5E-11	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	3.6E-07
	(total)												**3.6E-07**
										Total Hazard Index Across All Exposure Routes/Pathways			**2.0E-04**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 8.4a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADULT RECREATIONAL USERS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Adult Recreational User
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	5.0E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.62E-09
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	2.8E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.06E-09
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	1.8E-09	mg/kg-day		(mg/kg-day)-1	
	(total)										**5.7E-09**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	1.2E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	8.5E-10
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	6.6E-11	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.8E-10
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	3.2E-12	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.3E-09**
										Total Risk Across All Exposure Routes/Pathways	**7.0E-09**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 4.5

VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADOLESCENT TRESPASSERS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Adolescent Trespasser
Receptor Age: Adolescent

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cs	Chemical Concentration in Soil	(mg/kg)	95% UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	IRs	Ingestion Rate of Soil	(mg/day)	100	USEPA, May 1993	50	USEPA, May 1993	$\frac{Cs \times IRs \times EF \times ED}{BW \times AT \times CF}$
	EF	Exposure Frequency	(days/year)	52	Professional Judgement	26	Professional Judgement	
	FI	Fraction Ingested	(unitless)	1	Professional Judgement	1	Professional Judgement	
	ED	Exposure Duration	(years)	10	Professional Judgement	10	Professional Judgement	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	43	USEPA, August 1997	43	USEPA, August 1997	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	3,650	USEPA December 1989	3,650	USEPA December 1989	
Dermal	Cs	Chemical Concentration in Soil	(mg/kg)	95%UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	AF	Soil to Skin Adherence Factor	(mg/cm^2)	0.3	USEPA, September 2001	0.04	USEPA, September 2001	$\frac{Cs \times SA \times ABS \times AF \times EF \times ED}{BW \times AT \times CF}$
	SA	Skin Surface Area	(cm^2)	3,263	USEPA, August 1997	3,263	USEPA, August 1997	
	ABS	Absorption Factor	(unitless)	chemical-specific	USEPA, September 2001	chemical-specific	USEPA, September 2001	
	EF	Exposure Frequency	(days/year)	52	Professional Judgement	26	Professional Judgement	
	ED	Exposure Duration	(years)	10	Professional Judgement	10	Professional Judgement	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	43	USEPA, August 1997	43	USEPA, August 1997	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	3,650	USEPA December 1989	3,650	USEPA December 1989	

Daily Intake Calculations

Ingestion Intake = (IR x Fi x EF x ED x CF) / (BW x AT)
Dermal Intake = (CF x SA x AF x ABS x EF x ED) / (BW x AT)

Cancer Ingestion Intake - RME = 4.73E-08
Noncancer Ingestion Intake - RME = 3.31E-07

Cancer Ingestion Intake - CTE = 1.18E-08
Noncancer Ingestion Intake - CTE = 8.28E-08

Cancer Dermal Intake - RME = 4.63E-07
Noncancer Dermal Intake - RME = 3.24E-06

Cancer Dermal Intake - CTE = 3.09E-08
Noncancer Dermal Intake - CTE = 2.16E-07

TABLE 7.5 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADOLESCENT TRESPASSERS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Adolescent Trespasser
Receptor Age: Adolescent

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	8.2E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	4.6E-08	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	2.9E-07	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	4.2E-03
	(total)												**4.2E-03**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	1.0E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	5.9E-08	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	2.9E-09	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	4.1E-05
	(total)												**4.1E-05**
										Total Hazard Index Across All Exposure Routes/Pathways			**4.2E-03**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 8.5 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADOLESCENT TRESPASSERS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Adolescent Trespasser
Receptor Age: Adolescent

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	1.2E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	8.51E-08
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	6.6E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.84E-08
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	4.2E-08	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.3E-07**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	1.5E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.1E-07
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	8.4E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	6.2E-08
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	4.1E-10	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.7E-07**
										Total Risk Across All Exposure Routes/Pathways	**3.0E-07**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 7.5a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADOLESCENT TRESPASSERS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Adolescent Trespasser
Receptor Age: Adolescent

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	2.0E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	1.2E-08	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	7.3E-08	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	1.0E-03
	(total)												**1.0E-03**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	6.9E-09	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	3.9E-09	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	1.9E-10	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	2.7E-06
	(total)												**2.7E-06**
										Total Hazard Index Across All Exposure Routes/Pathways			**1.0E-03**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 8.5a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF ADOLESCENT TRESPASSERS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Adolescent Trespasser
Receptor Age: Adolescent

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	2.9E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.13E-08
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	1.7E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.21E-08
	Thalllium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	1.0E-08	mg/kg-day		(mg/kg-day)-1	
	(total)										**3.3E-08**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	9.9E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	7.2E-09
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	5.6E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.1E-09
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	2.7E-11	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.1E-08**
										Total Risk Across All Exposure Routes/Pathways	**4.5E-08**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 4.6

VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF DAY CARE CENTER CHILDREN TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Day Care Child
Receptor Age: Child (0-6 Years)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cs	Chemical Concentration in Soil	(mg/kg)	95% UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	IRs	Ingestion Rate of Soil	(mg/day)	200	USEPA, May 1993	100	USEPA, May 1993	$\frac{Cs \times IRs \times EF \times ED}{BW \times AT \times CF}$
	EF	Exposure Frequency	(days/year)	250	USEPA, May 1993	219	USEPA, May 1993	
	FI	Fraction Ingested	(unitless)	0.5	Professional Judgement	0.5	Professional Judgement	
	ED	Exposure Duration	(years)	6	Professional Judgement	3	Professional Judgement	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	15	USEPA December 1989	15	USEPA December 1989	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	2,190	USEPA December 1989	1,095	USEPA December 1989	
Dermal	Cs	Chemical Concentration in Soil	(mg/kg)	95%UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	AF	Soil to Skin Adherence Factor	(mg/cm^2)	0.2	USEPA, September 2001	0.04	USEPA, September 2001	$\frac{Cs \times SA \times ABS \times AF \times EF \times ED}{BW \times AT \times CF}$
	SA	Skin Surface Area	(cm^2)	2,800	USEPA, September 2001	2,800	USEPA, September 2001	
	ABS	Absorption Factor	(unitless)	chemical-specific	USEPA, September 2001	chemical-specific	USEPA, September 2001	
	EF	Exposure Frequency	(days/year)	250	USEPA, May 1993	219	USEPA, May 1993	
	ED	Exposure Duration	(years)	6	Professional Judgement	3	Professional Judgement	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	15	USEPA December 1989	15	USEPA December 1989	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	2,190	USEPA December 1989	1,095	USEPA December 1989	

Daily Intake Calculations

Ingestion Intake = (IR x Fi x EF x ED x CF) / (BW x AT)
Dermal Intake = (CF x SA x AF x ABS x EF x ED) / (BW x AT)

Cancer Ingestion Intake - RME = 3.91E-07
Noncancer Ingestion Intake - RME = 4.57E-06

Cancer Ingestion Intake - CTE = 8.57E-08
Noncancer Ingestion Intake - CTE = 2.00E-06

Cancer Dermal Intake - RME = 2.19E-06
Noncancer Dermal Intake - RME = 2.56E-05

Cancer Dermal Intake - CTE = 1.92E-07
Noncancer Dermal Intake - CTE = 4.48E-06

TABLE 7.6 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF DAY CARE CENTER CHILDREN TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Day Care Child
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	1.1E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	6.4E-07	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	4.0E-06	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	5.8E-02
	(total)												**5.8E-02**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	8.2E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	4.7E-07	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	2.3E-08	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	3.2E-04
	(total)												**3.2E-04**
										Total Hazard Index Across All Exposure Routes/Pathways			**5.8E-02**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 8.6 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF DAY CARE CENTER CHILDREN TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Day Care Child
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	9.6E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	7.03E-07
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	5.5E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.00E-07
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	3.5E-07	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.1E-06**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	7.0E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	5.1E-07
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	4.0E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.9E-07
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	1.9E-09	mg/kg-day		(mg/kg-day)-1	
	(total)										**8.0E-07**
										Total Risk Across All Exposure Routes/Pathways	**1.9E-06**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 7.6a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF DAY CARE CENTER CHILDREN TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Day Care Child
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	4.9E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	2.8E-07	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	1.8E-06	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	2.5E-02
	(total)												**2.5E-02**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	1.4E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	8.2E-08	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	4.0E-09	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	5.7E-05
	(total)												**5.7E-05**
												Total Hazard Index Across All Exposure Routes/Pathways	**2.5E-02**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 8.6a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF DAY CARE CENTER CHILDREN TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Day Care Child
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	2.1E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.54E-07
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	1.2E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	8.76E-08
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	7.6E-08	mg/kg-day		(mg/kg-day)-1	
	(total)										**2.4E-07**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	6.1E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.5E-08
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	3.5E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.6E-08
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	1.7E-10	mg/kg-day		(mg/kg-day)-1	
	(total)										**7.0E-08**
										Total Risk Across All Exposure Routes/Pathways	**3.1E-07**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 4.7

VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE ADULT RESIDENTS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cs	Chemical Concentration in Soil	(mg/kg)	95% UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	IRs	Ingestion Rate of Soil	(mg/day)	100	USEPA, May 1993	50	USEPA, May 1993	$\frac{Cs \times IRs \times EF \times ED}{BW \times AT \times CF}$
	EF	Exposure Frequency	(days/year)	350	USEPA, May 1993	234	USEPA, May 1993	
	FI	Fraction Ingested	(unitless)	1	Professional Judgement	1	Professional Judgement	
	ED	Exposure Duration	(years)	24	USEPA, May 1993	7	USEPA, May 1993	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	70	USEPA December 1989	70	USEPA December 1989	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	8,760	USEPA December 1989	2,555	USEPA December 1989	
Dermal	Cs	Chemical Concentration in Soil	(mg/kg)	95%UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	AF	Soil to Skin Adherence Factor	(mg/cm^2)	0.07	USEPA, September 2001	0.01	USEPA, September 2001	$\frac{Cs \times SA \times ABS \times AF \times EF \times ED}{BW \times AT \times CF}$
	SA	Skin Surface Area	(cm^2)	5,700	USEPA, September 2001	5,700	USEPA, September 2001	
	ABS	Absorption Factor	(unitless)	chemical-specific	USEPA, September 2001	chemical-specific	USEPA, September 2001	
	EF	Exposure Frequency	(days/year)	350	USEPA, May 1993	234	USEPA, May 1993	
	ED	Exposure Duration	(years)	24	USEPA, May 1993	7	USEPA, May 1993	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	70	USEPA December 1989	70	USEPA December 1989	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	8,760	USEPA December 1989	2,555	USEPA December 1989	

Daily Intake Calculations

Ingestion Intake = (IR x Fi x EF x ED x CF) / (BW x AT)
Dermal Intake = (CF x SA x AF x ABS x EF x ED) / (BW x AT)

Cancer Ingestion Intake - RME = 4.70E-07
Noncancer Ingestion Intake - RME = 1.37E-06

Cancer Ingestion Intake - CTE = 4.58E-08
Noncancer Ingestion Intake - CTE = 4.58E-07

Cancer Dermal Intake - RME = 1.87E-06
Noncancer Dermal Intake - RME = 5.47E-06

Cancer Dermal Intake - CTE = 5.22E-08
Noncancer Dermal Intake - CTE = 5.22E-07

TABLE 7.7a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE ADULT RESIDENTS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	1.1E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	6.4E-08	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	4.0E-07	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	5.8E-03
	(total)												**5.8E-03**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	1.7E-08	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	9.5E-09	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	4.6E-10	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	6.6E-06
	(total)												**6.6E-06**
										Total Hazard Index Across All Exposure Routes/Pathways			**5.8E-03**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 8.7a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE ADULT RESIDENTS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	1.1E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	8.23E-08
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	6.4E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.68E-08
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	4.0E-08	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.3E-07**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	1.7E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.2E-08
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	9.5E-10	mg/kg-day	7.30E+00	(mg/kg-day)-1	6.9E-09
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	4.6E-11	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.9E-08**
										Total Risk Across All Exposure Routes/Pathways	**1.5E-07**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 7.7 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE ADULT RESIDENTS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	3.4E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	1.9E-07	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	1.2E-06	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	1.7E-02
	(total)												**1.7E-02**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	1.7E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	9.9E-08	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	4.8E-09	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	6.9E-05
	(total)												**6.9E-05**
										Total Hazard Index Across All Exposure Routes/Pathways			**1.7E-02**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 8.7 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE ADULT RESIDENTS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	1.2E-07	mg/kg-day	7.30E+00	(mg/kg-day)-1	8.44E-07
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	6.6E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.80E-07
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	4.2E-07	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.3E-06**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	6.0E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.4E-07
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	3.4E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.5E-07
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	1.7E-09	mg/kg-day		(mg/kg-day)-1	
	(total)										**6.9E-07**
										Total Risk Across All Exposure Routes/Pathways	**2.0E-06**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 4.8

VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE CHILD RESIDENTS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Child (0-6 Years)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cs	Chemical Concentration in Soil	(mg/kg)	95% UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	IRs	Ingestion Rate of Soil	(mg/day)	200	USEPA, May 1993	100	USEPA, May 1993	Cs x IRs x EF x ED / BW x AT x CF
	EF	Exposure Frequency	(days/year)	350	USEPA, May 1993	234	USEPA, May 1993	
	FI	Fraction Ingested	(unitless)	1	Professional Judgement	1	Professional Judgement	
	ED	Exposure Duration	(years)	6	USEPA, May 1993	2	USEPA, May 1993	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	15	USEPA December 1989	15	USEPA December 1989	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	2,190	USEPA December 1989	730	USEPA December 1989	
Dermal	Cs	Chemical Concentration in Soil	(mg/kg)	95%UCL	USEPA, May 1993	95%UCL	USEPA, May 1993	Chronic Daily Intake (CDI) (mg/kg-day) =
	AF	Soil to Skin Adherence Factor	(mg/cm^2)	0.2	USEPA, September 2001	0.04	USEPA, September 2001	Cs x SA x ABS x AF x EF x ED / BW x AT x CF
	SA	Skin Surface Area	(cm^2)	2,800	USEPA, September 2001	2,800	USEPA, September 2001	
	ABS	Absorption Factor	(unitless)	chemical-specific	USEPA, September 2001	chemical-specific	USEPA, September 2001	
	EF	Exposure Frequency	(days/year)	350	USEPA, May 1993	234	USEPA, May 1993	
	ED	Exposure Duration	(years)	6	USEPA, May 1993	2	USEPA, May 1993	
	CF	Conversion Factor	(mg/kg)	1.00E-06	USEPA December 1989	1.00E-06	USEPA December 1989	
	BW	Body Weight	(kg)	15	USEPA December 1989	15	USEPA December 1989	
	AT-C	Averaging Time (Cancer)	(days)	25,550	USEPA December 1989	25,550	USEPA December 1989	
	AT-N	Averaging Time (Noncancer)	(days)	2,190	USEPA December 1989	730	USEPA December 1989	

Daily Intake Calculations
Ingestion Intake = (IR x Fi x EF x ED x CF) / (BW x AT)
Dermal Intake = (CF x SA x AF x ABS x EF x ED) / (BW x AT)

Cancer Ingestion Intake - RME = 1.10E-06
Noncancer Ingestion Intake - RME = 1.28E-05

Cancer Ingestion Intake - CTE = 1.22E-07
Noncancer Ingestion Intake - CTE = 4.27E-06

Cancer Dermal Intake - RME = 3.07E-06
Noncancer Dermal Intake - RME = 3.58E-05

Cancer Dermal Intake - CTE = 1.37E-07
Noncancer Dermal Intake - CTE = 4.79E-06

TABLE 7.8 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE CHILD RESIDENTS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	3.1E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	1.8E-06	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	1.1E-05	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	1.6E-01
	(total)												**1.6E-01**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	1.1E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	6.5E-07	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	3.2E-08	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	4.5E-04
	(total)												**4.5E-04**
										Total Hazard Index Across All Exposure Routes/Pathways			**1.6E-01**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 8.8 - REASONABLE MAXIMUM EXPOSURE (RME)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE CHILD RESIDENTS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	2.7E-07	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.97E-06
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	1.5E-07	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.12E-06
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	9.7E-07	mg/kg-day		(mg/kg-day)-1	
	(total)										**3.1E-06**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	9.8E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	7.2E-07
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	5.6E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	4.1E-07
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	2.7E-09	mg/kg-day		(mg/kg-day)-1	
	(total)										**1.1E-06**
										Total Risk Across All Exposure Routes/Pathways	**4.2E-06**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 7.8a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF NON-CANCER HAZARDS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE CHILD RESIDENTS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	1.1E-06	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	6.0E-07	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	3.8E-06	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	5.4E-02
	(total)												**5.4E-02**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	1.5E-07	mg/kg-day		mg/kg-day	NA	NA	
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	8.7E-08	mg/kg-day		mg/kg-day	NA	NA	
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	4.2E-09	mg/kg-day	7.00E-05	mg/kg-day	NA	NA	6.0E-05
	(total)												**6.0E-05**
										Total Hazard Index Across All Exposure Routes/Pathways			**5.4E-02**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 8.8a - CENTRAL TENDENCY EXPOSURE (CTE)
CALCULATION OF CANCER RISKS FROM EXPOSURE OF VALUES USED FOR DAILY INTAKE CALCULATIONS
EXPOSURE OF FUTURE CHILD RESIDENTS TO SURFACE/SUBSURFACE SOIL
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Entire Site
Receptor Population: Residents
Receptor Age: Child (0-6 Years)

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	3.0E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	2.19E-07
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	1.7E-08	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.25E-07
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	1.1E-07	mg/kg-day		(mg/kg-day)-1	
	(total)										**3.4E-07**
Dermal	Benzo(a)pyrene	2.46E-01	mg/kg	2.46E-01	mg/kg	M	4.4E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	3.2E-08
	Dibenzo(a,h)anthracene	1.40E-01	mg/kg	1.40E-01	mg/kg	M	2.5E-09	mg/kg-day	7.30E+00	(mg/kg-day)-1	1.8E-08
	Thallium	8.84E-01	mg/kg	8.84E-01	mg/kg	M	1.2E-10	mg/kg-day		(mg/kg-day)-1	
	(total)										**5.0E-08**
										Total Risk Across All Exposure Routes/Pathways	**3.9E-07**

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for risk calculation.

Dermal Absorption Fraction from Soil(ABS) (USEPA 2001):

Metals - 0.001 PAHs - 0.13

TABLE 9.1 - REASONABLE MAXIMUM EXPOSURE (RME)

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - FULL TIME WORKER

SITE 13 - OIL SLUDGE DISPOSAL AREA

NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Full Time Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	6.3E-07		5.4E-07	1.2E-06	Benzo(a)pyrene					
			Dibenzo(a,h)anthracene	3.6E-07		3.1E-07	6.6E-07	Dibenzo(a,h)anthracene					
			Thallium					Thallium	Liver	1.2E-02		8.2E-05	1.2E-02
						Total Risk Across Surface Soil	1.8E-06					Total Hazard Index Across All Media and All Exposure Routes	1.2E-02

Total Risk Across All Media and All Exposure Routes: 1.8E-06

Total Liver HI = 1.2E-02

TABLE 9 2 - REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - MAINTENANCE / UTILITY WORKER
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	9.0E-08		7.8E-08	1.7E-07	Benzo(a)pyrene					
			Dibenzo(a,h)anthracene	5.1E-08		4.4E-08	9.6E-08	Dibenzo(a,h)anthracene					
			Thallium					Thallium	Liver	1.8E-03		1.2E-05	1.8E-03
						Total Risk Across Surface Soil	2.6E-07		Total Hazard Index Across All Media and All Exposure Routes				1.8E-03

Total Risk Across All Media and All Exposure Routes 2.6E-07

Total Liver HI = 1.8E-03

TABLE 9.3 - REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CONSTRUCTION WORKER
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	8.7E-08		2.3E-08	1.1E-07	Benzo(a)pyrene					
			Dibenzo(a,h)anthracene	4.9E-08		1.3E-08	6.3E-08	Dibenzo(a,h)anthracene					
			Thallium					Thallium	Liver	4.3E-02		8.8E-05	4.3E-02
							Total Risk Across Surface Soil	1.7E-07					Total Hazard Index Across All Media and All Exposure Routes 4.3E-02

Total Risk Across All Media and All Exposure Routes 1.7E-07

Total Liver HI = 4.3E-02

TABLE 9.4 - REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADULT RECREATIONAL USER
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	4.8E-08		4.5E-08	9.3E-08	Benzo(a)pyrene					
			Dibenzo(a,h)anthracene	2.7E-08		2.6E-08	5.3E-08	Dibenzo(a,h)anthracene					
			Thallium					Thallium	Liver	7.9E-04		5.7E-06	8.0E-04
						Total Risk Across Surface Soil	1.5E-07					Total Hazard Index Across All Media and All Exposure Routes	8.0E-04

Total Risk Across All Media and All Exposure Routes 1.5E-07

Total Liver HI = 8.0E-04

TABLE 9.5 - REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADOLESCENT TRESPASSER
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	8.5E-08		1.1E-07	1.9E-07	Benzo(a)pyrene					
			Dibenzo(a,h)anthracene	4.8E-08		6.2E-08	1.1E-07	Dibenzo(a,h)anthracene					
			Thallium					Thallium	Liver	4.2E-03		4.1E-05	4.2E-03
							Total Risk Across Surface Soil	3.0E-07					Total Hazard Index Across All Media and All Exposure Routes	4.2E-03

Total Risk Across All Media and All Exposure Routes 3.0E-07

Total Liver HI = 4.2E-03

TABLE 9.6 - REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - DAY CARE CENTER CHILD
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Day Care Center Child
Receptor Age: Child (0-6 Years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	7.0E-07		5.1E-07	1.2E-06	Benzo(a)pyrene					
			Dibenzo(a,h)anthracene	4.0E-07		2.9E-07	6.9E-07	Dibenzo(a,h)anthracene					
			Thallium					Thallium	Liver	5.8E-02		3.2E-04	5.8E-02
							Total Risk Across Surface Soil	1.9E-06					Total Hazard Index Across All Media and All Exposure Routes 5.8E-02

Total Risk Across All Media and All Exposure Routes 1.9E-06

Total Liver HI = 5.8E-02

TABLE 9.7 - REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - FUTURE ADULT RESIDENT
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	8.4E-07		4.4E-07	1.3E-06	Benzo(a)pyrene					
			Dibenzo(a,h)anthracene	4.8E-07		2.5E-07	7.3E-07	Dibenzo(a,h)anthracene					
			Thallium					Thallium	Liver	1.7E-02		6.9E-05	1.7E-02
						Total Risk Across Surface Soil	2.0E-06					Total Hazard Index Across All Media and All Exposure Routes	1.7E-02

Total Risk Across All Media and All Exposure Routes 2.0E-06

Total Liver HI = 1.7E-02

TABLE 9.8 - REASONABLE MAXIMUM EXPOSURE (RME)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - FUTURE CHILD RESIDENT
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child (0 - 6 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	2.0E-06		7.2E-07	2.7E-06	Benzo(a)pyrene					
			Dibenzo(a,h)anthracene	1.1E-06		4.1E-07	1.5E-06	Dibenzo(a,h)anthracene					
			Thallium					Thallium	Liver	1.6E-01		4.5E-04	1.6E-01
						.Total Risk Across Surface Soil	4.2E-06					Total Hazard Index Across All Media and All Exposure Routes	1.6E-01

Total Risk Across All Media and All Exposure Routes 4.2E-06

Total Liver HI = 1.6E-01

TABLE 9.1a. CENTRAL TENDENCY EXPOSURE (CTE)

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - FULL TIME WORKER

SITE 13 - OIL SLUDGE DISPOSAL AREA

NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Full Time Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	9.9E-08		1.7E-08	1.2E-07	Benzo(a)pyrene					
			Dibenzo(a,h)anthracene	5.6E-08		9.7E-09	6.6E-08	Dibenzo(a,h)anthracene					
			Thallium					Thallium	Liver	5.4E-03		7.1E-06	5.4E-03
						Total Risk Across Surface Soil	1.8E-07					Total Hazard Index Across All Media and All Exposure Routes	5.4E-03

Total Risk Across All Media and All Exposure Routes 1.8E-07

Total Liver HI = 5.4E-03

TABLE 9.2a. CENTRAL TENDENCY EXPOSURE (CTE)

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - MAINTENANCE / UTILITY WORKER

SITE 13 - OIL SLUDGE DISPOSAL AREA

NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	8.1E-09		1.4E-09	9.5E-09	Benzo(a)pyrene					
			Dibenzo(a,h)anthracene	4.6E-09		7.9E-10	5.4E-09	Dibenzo(a,h)anthracene					
			Thallium					Thallium	Liver	4.5E-04		5.9E-07	4.5E-04
						Total Risk Across Surface Soil	1.5E-08		Total Hazard Index Across All Media and All Exposure Routes				4.5E-04

Total Risk Across All Media and All Exposure Routes 1.5E-08

Total Liver HI = 4.5E-04

TABLE 9.3a. CENTRAL TENDENCY EXPOSURE (CTE)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CONSTRUCTION WORKER
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	4.3E-08		7.8E-09	5.1E-08	Benzo(a)pyrene					
			Dibenzo(a,h)anthracene	2.5E-08		4.4E-09	2.9E-08	Dibenzo(a,h)anthracene					
			Thallium					Thallium	Liver	2.1E-02		2.9E-05	2.1E-02
						Total Risk Across Surface Soil	8.0E-08		Total Hazard Index Across All Media and All Exposure Routes				2.1E-02
						Total Risk Across All Media and All Exposure Routes	8.0E-08					Total Liver HI =	2.1E-02

TABLE 9.4a. CENTRAL TENDENCY EXPOSURE (CTE)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADULT RECREATIONAL USER
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinoganic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	3.6E-09		8.5E-10	4.5E-09	Benzo(a)pyrene					
			Dibenzo(a,h)anthracene	2.1E-09		4.8E-10	2.5E-09	Dibenzo(a,h)anthracene					
			Thallium					Thallium	Liver	2.0E-04		3.6E-07	2.0E-04
						Total Risk Across Surface Soil	7.0E-09					Total Hazard Index Across All Media and All Exposure Routes	2.0E-04
						Total Risk Across All Media and All Exposure Routes	7.0E-09					Total Liver HI =	2.0E-04

TABLE 9.5a. CENTRAL TENDENCY EXPOSURE (CTE)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADOLESCENT TRESPASSER
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	2.1E-08		7.2E-09	2.8E-08	Benzo(a)pyrene					
			Dibenzo(a,h)anthracene	1.2E-08		4.1E-09	1.6E-08	Dibenzo(a,h)anthracene					
			Thallium					Thallium	Liver	1.0E-03		2.7E-06	1.0E-03
						Total Risk Across Surface Soil	4.5E-08					Total Hazard Index Across All Media and All Exposure Routes	1.0E-03

Total Risk Across All Media and All Exposure Routes 4.5E-08

Total Liver HI = 1.0E-03

TABLE 9.6a. CENTRAL TENDENCY EXPOSURE (CTE)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - DAY CARE CENTER CHILD
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Day Care Center Child
Receptor Age: Child (0-6 Years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	1.5E-07		4.5E-08	2.0E-07	Benzo(a)pyrene					
			Dibenzo(a,h)anthracene	8.8E-08		2.6E-08	1.1E-07	Dibenzo(a,h)anthracene					
			Thallium					Thallium	Liver	2.5E-02		5.7E-05	2.5E-02
						Total Risk Across Surface Soil	3.1E-07					Total Hazard Index Across All Media and All Exposure Routes	2.5E-02

Total Risk Across All Media and All Exposure Routes 3.1E-07

Total Liver HI = 2.5E-02

TABLE 9.7a. CENTRAL TENDENCY EXPOSURE (CTE)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - FUTURE ADULT RESIDENT
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	8.2E-08		1.2E-08	9.4E-08	Benzo(a)pyrene					
			Dibenzo(a,h)anthracene	4.7E-08		6.9E-09	5.4E-08	Dibenzo(a,h)anthracene					
			Thallium					Thallium	Liver	5.8E-03		6.6E-06	5.8E-03
						Total Risk Across Surface Soil	1.5E-07					Total Hazard Index Across All Media and All Exposure Routes	5.8E-03

Total Risk Across All Media and All Exposure Routes 1.5E-07

Total Liver HI = 5.8E-03

TABLE 9.8a. CENTRAL TENDENCY EXPOSURE (CTE)
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - FUTURE CHILD RESIDENT
SITE 13 - OIL SLUDGE DISPOSAL AREA
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child (0 - 6 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface and Subsurface Soil	Benzo(a)pyrene	2.2E-07		3.2E-08	2.5E-07	Benzo(a)pyrene					
			Dibenzo(a,h)anthracene	1.2E-07		1.8E-08	1.4E-07	Dibenzo(a,h)anthracene					
			Thallium					Thallium	Liver	5.4E-02		6.0E-05	5.4E-02
						Total Risk Across Surface Soil	3.9E-07		Total Hazard Index Across All Media and All Exposure Routes				5.4E-02
						Total Risk Across All Media and All Exposure Routes	3.9E-07					Total Liver HI =	5.4E-02

APPENDIX H

WILCOXON RANK-SUM ANALYSIS

SUMMARY OF WILCOXON RANK SUM BACKGROUND TESTS
SITE 5 - OPEN BURN AREAS
FORMER NSWC, SILVER SPRING, MARYLAND

PARAMETER	RANK SUM SITE	RANK SUM BACK	U	Z	p-level	Z-adjusted	p-level	VALID N SITE	VALID N BACK	SITE ABOVE BACKGROUND?
ALUMINUM	201.0	540.0	30	-4.3853	0.0000	-4.3853	0.0000	18	20	NO
ANTIMONY	371.5	369.5	160	0.5993	0.5490	0.6003	0.5483	18	20	NO
ARSENIC	280.5	460.5	110	-2.0611	0.0393	-2.0615	0.0393	18	20	NO
BARIUM	283.5	457.5	113	-1.9734	0.0485	-1.9735	0.0484	18	20	NO
BERYLLIUM	363.5	377.5	168	0.3654	0.7148	0.3866	0.6991	18	20	NO
CADMIUM	327.5	413.5	157	-0.6870	0.4921	-0.6917	0.4892	18	20	NO
CALCIUM	360.0	381.0	171	0.2631	0.7925	0.2631	0.7925	18	20	NO
CHROMIUM	280.0	461.0	109	-2.0757	0.0379	-2.0758	0.0379	18	20	NO
COBALT	221.0	520.0	50	-3.8006	0.0001	-3.8008	0.0001	18	20	NO
COPPER	**414.5**	**326.5**	**117**	**1.8564**	**0.0634**	**1.8567**	**0.0634**	**18**	**20**	**YES**
IRON	247.0	494.0	76	-3.0405	0.0024	-3.0406	0.0024	18	20	NO
LEAD	281.0	460.0	110	-2.0465	0.0407	-2.0466	0.0407	18	20	NO
MAGNESIUM	260.0	481.0	89	-2.6604	0.0078	-2.6609	0.0078	18	20	NO
MANGANESE	246.0	495.0	75	-3.0697	0.0021	-3.0699	0.0021	18	20	NO
MERCURY	**398.5**	**342.5**	**133**	**1.3887**	**0.1649**	**1.3971**	**0.1624**	**18**	**20**	**YES**
NICKEL	264.5	476.5	94	-2.5289	0.0114	-2.5294	0.0114	18	20	NO
POTASSIUM	241.0	500.0	70	-3.2159	0.0013	-3.2159	0.0013	18	20	NO
SELENIUM	**514.5**	**226.5**	**17**	**4.7800**	**0.0000**	**4.7818**	**0.0000**	**18**	**20**	**YES**
SILVER	361.0	380.0	170	0.2924	0.7700	0.2943	0.7686	18	20	NO
SODIUM	363.0	378.0	168	0.3508	0.7257	0.3508	0.7257	18	20	NO
THALLIUM	**442.0**	**299.0**	**89**	**2.6604**	**0.0078**	**2.6646**	**0.0077**	**18**	**20**	**YES**
VANADIUM	254.0	487.0	83	-2.8358	0.0046	-2.8360	0.0046	18	20	NO
ZINC	278.0	463.0	107	-2.1342	0.0328	-2.1343	0.0328	18	20	NO

Site is above background if Z-adjusted > 0.86.

SUMMARY OF WILCOXON RANK SUM BACKGROUND TESTS
SITE 13 - OIL SLUDGE DISPOSAL AREA
FORMER NSWC, SILVER SPRING, MARYLAND

PARAMETER	RANK SUM SITE	RANK SUM BACK	U	Z	p-level	Z-adjusted	p-level	VALID N SITE	VALID N BACK	SITE ABOVE BACKGROUND?
ALUMINUM	144.5	416.5	53.5	-2.82	0.0048	-2.82	0.0048	13	20	NO
ANTIMONY	167	394	76	-1.99	0.0466	-2.00	0.0452	13	20	NO
ARSENIC	158.5	402.5	67.5	-2.30	0.0213	-2.30	0.0212	13	20	NO
BARIUM	157	404	66	-2.36	0.0184	-2.36	0.0184	13	20	NO
BERYLLIUM	**274**	**287**	**77**	**1.95**	**0.0509**	**2.00**	**0.0453**	**13**	**20**	**YES**
CADMIUM	185.5	375.5	94.5	-1.31	0.1909	-1.31	0.1886	13	20	NO
CALCIUM	**262**	**299**	**89**	**1.51**	**0.1309**	**1.51**	**0.1309**	**13**	**20**	**YES**
CHROMIUM	147	414	56	-2.73	0.0064	-2.73	0.0064	13	20	NO
COBALT	182.5	378.5	91.5	-1.42	0.1561	-1.42	0.1560	13	20	NO
COPPER	212.5	348.5	121.5	-0.31	0.7542	-0.31	0.7541	13	20	NO
IRON	158	403	67	-2.32	0.0203	-2.32	0.0203	13	20	NO
LEAD	133	428	42	-3.24	0.0012	-3.24	0.0012	13	20	NO
MAGNESIUM	212	349	121	-0.33	0.7402	-0.33	0.7402	13	20	NO
MANGANESE	189	372	98	-1.18	0.2384	-1.18	0.2384	13	20	NO
MERCURY	208.5	352.5	117.5	-0.46	0.6451	-0.46	0.6434	13	20	NO
NICKEL	197.5	363.5	106.5	-0.87	0.3866	-0.87	0.3864	13	20	NO
POTASSIUM	195	366	104	-0.96	0.3381	-0.96	0.3381	13	20	NO
SELENIUM	**272.5**	**288.5**	**78.5**	**1.90**	**0.0578**	**1.90**	**0.0576**	**13**	**20**	**YES**
SILVER	171.5	389.5	80.5	-1.82	0.0682	-1.85	0.0646	13	20	NO
SODIUM	196	365	105	-0.92	0.3570	-0.92	0.3570	13	20	NO
THALLIUM	**311.5**	**249.5**	**39.5**	**3.33**	**0.0009**	**3.34**	**0.0008**	**13**	**20**	**YES**
VANADIUM	131.5	429.5	40.5	-3.30	0.0010	-3.30	0.0010	13	20	NO
ZINC	178.5	382.5	87.5	-1.57	0.1174	-1.57	0.1174	13	20	NO

APPENDIX I

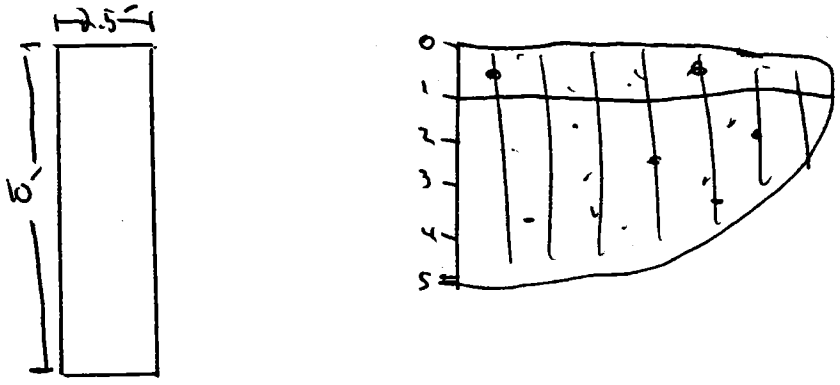
FIELD DATA

TEST PIT LOG

PROJECT NAME: WHITE OAK, MD
PROJECT NUMBER: CTO 839 N4246
LOCATION: SITE 13
TEST PIT NUMBER: 13-TP-03
DATE: 5/16/02
GEOLOGIST: B. BALKOVIC

Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION — Soil/Waste Characteristics (lithology, density, color, etc.)	USCS	Remarks	PID/FID READING Source (ppm)	PID/FID READING BZ (ppm)
0				GROUNDCOVER 2"	0.0	0.0
1	1'	LT. BROWN - SILTY SAND & COBBLES	GM		↓	↓
2		YELLOW ORANGE - SILTY SAND W/ T-GRAVEL	SM	NO WASTE		
3		↓	GM			
4		↓				
5		↓	↓		↓	↓
	T.D. 5'					
		DID NOT FIND ANY WASTE MATERIAL				

TEST PIT CROSS SECTION AND / OR PLAN VIEW



REMARKS: SAMPLED 137P03SB0405 - NATURAL MATERIAL @ 1410

PHOTO LOG:

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: WHITE OAK, MD
Project No.: CTO 839 N4246

Sample ID No.: 13TP03SB0405
Sample Location: 13-TP-03
Sampled By: BB / KS
C.O.C. No.:

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 5/16/02	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1410	4-5'	YELLOW ORANGE	SILTY SAND W/ T- GRAVEL
Method: BACK HOE			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TCL VOCs	(3) ENCORES	✓	
TCL SVOCs	4OZ JAR	✓	
TCL PEST/PCBS	4OZ JAR	✓	
TAL METALS + CN	4OZ JAR	✓	
EXPLOSIVES	4OZ JAR		

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

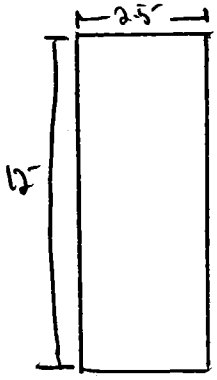
Robert Bellmore

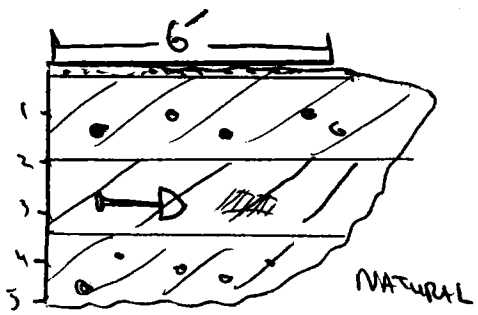
TEST PIT LOG

PROJECT NAME: WHITE OAK, MD
PROJECT NUMBER: CTO 839 N4246
LOCATION: SITE 13
TEST PIT NUMBER: 13-TP-04
DATE: 5/16/02
GEOLOGIST: B. BALLOVER

Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION: Soil/Waste Characteristics (lithology, density, color, etc.)	USCS	Remarks	PID/FID READING: Source (ppm)	BZ (ppm)
		2" - METAL PLATE 6' x 4.5' x 1/2" THICK			0.0	0.0
0		4" OF PEA GRAVEL W/ METAL CONDUIT	GP			
1		LT. BR. SAND W/ CLAY & COBBLES	GC			
2		LT. BR BURY SHOVEL	↓			
3		BLK & GRAY SANDY CLAY W/ ASH	CL	WASTE MATERIAL		
4		↓	↓			
5		LT. BR. - SANDY CLAY W/ COBBLES	GC	NATURAL 3.5'		
		& GRAY				

TEST PIT CROSS SECTION AND / OR PLAN VIEW





REMARKS: SAMPLED 13TP04WS0203 - WASTE MATERIAL @ 1330
SAMPLED 13TP04SB0405 - NATURAL MATERIAL @ 1350

PHOTO LOG:

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: WHITE OAK, MD
Project No.: CTO 839 N4246

Sample ID No.: 13TP04WS02203
Sample Location: 13-TP-04
Sampled By: B.B / K.S.
C.O.C. No.:

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: WASTE MATERIAL
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 5/16/02	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1330	2-3'	BLACK & GRAY	SANDY CLAY W/ ASH
Method: BACK HOE			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TCL VOCs	2 4oz JAR	✓	
TCL SVOCs	4oz JAR	✓	
TCL PEST/PCBs	4oz JAR	✓	
TAL METALS + CN	4oz JAR	✓	
EXPLOSIVES	4oz JAR	✓	
TCLP (FULL)	8oz JAR	✓	

OBSERVATIONS / NOTES:

MAP:

Circle If Applicable:

MS/MSD —

Duplicate ID No.:

Signature(s):

Robert Balkcom

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: WHITE OAK, MD
Project No.: CTO 839 N4246

Sample ID No.: 13TP04SB0405
Sample Location: 13-TP-04
Sampled By: BB / KS
C.O.C. No.:

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 5/16/02	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1350	4-5'	LIGHT BROWN & GRAY	SANDY CLAY W/ COBBLES
Method: BACK HOE			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TCL VOCs	(3) ENCORES	✓	
TCL SVOCs	4OZ JAR	✓	
TCL PEST/PCBs	4OZ JAR	✓	
TAL METALS + CN	4OZ JAR	✓	
EXPLOSIVES	4OZ JAR	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD —

Duplicate ID No.:

Signature(s):

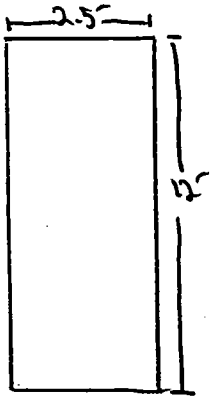
Robert Balkhouse

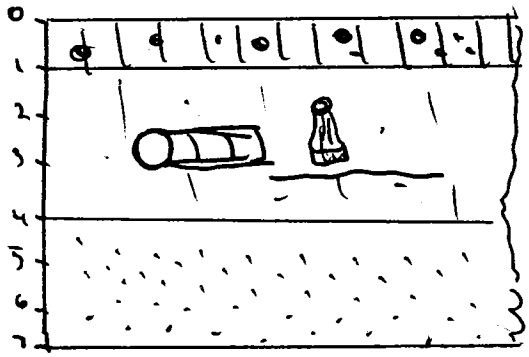
TEST PIT LOG

PROJECT NAME: WHITE OAK, MD
PROJECT NUMBER: CTO 839 N4246
LOCATION: SITE 13
TEST PIT NUMBER: 13-TP-05
DATE: 5/16/08
GEOLOGIST: B. BAUKOVEC

Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION: Soil/Waste Characteristics (lithology, density, color, etc.)	USCS	Remarks	PID/FID READING: Source (ppm)	PID/FID READING: BZ (ppm)
1	0-1.5'	BROWN - SILTY SAND W/ COBBLES	GM		0.0	0.0
2		TAN - BURNED DRUMS @ 2'	F	WASTE @ 2'		
3		BROWN - & TEXTILE FABRICS - BROKEN	I			
4		GLASS -	L			
5		YELLOW - F-M SAND W/ T-SILT & GRAVEL	SP			
6		" -		NATURAL		
7		GRAY -				

TEST PIT CROSS SECTION AND / OR PLAN VIEW





REMARKS: SAMPLES 13TP05WS0103 - WASTE MATERIAL @ 1045
SAMPLES 13TP05SB0607 - NATURAL MATERIAL @ 1110

PHOTO LOG:

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: WHITE OAK, MD
Project No.: CTO 839 N4246

Sample ID No.: 13TP05WS0103
Sample Location: 13-TP-05
Sampled By: B.B / KS
C.O.C. No.:

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: WASTE MATERIAL
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 5/16/02	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1045	1-3'	BROWN	SILTY SAND W/ GRAVEL
Method: BACK HOE			MOIST
Monitor Reading (ppm): 0-2			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TCL VOCs	(2) 4oz JAR	4	
TCL SVOCs	4oz JAR	2	
TCL PEST/PCBs	4oz JAR	2	
TAL METALS + CYANIDE	4oz JAR	2	
EXPLOSIVES	4oz JAR	2	
TCLP (FULL)	8oz JAR	2	

OBSERVATIONS / NOTES:

3 COLLECTED AROUND DRUM.

MAP:

Circle if Applicable:

MS/MSD: —

Duplicate ID No.: FD05160201

Signature(s):

Robert Balthrop

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: WHITE OAK, MD
Project No.: CTO 839 N4246

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 13TP05SB0607
Sample Location: 13-TP-05
Sampled By: BB / KB
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 5/16/02 Time: 1110 Method: BACK HOE Monitor Reading (ppm): 11.8	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	6-7'	YELLOW OR. & GRAY	F-M SAND W/ T-SILT & GRAVEL

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TCL VOCs	(3) ENCORES	9	
TCL SVOCs	4oz JAR	3	
TCL PEST/PCBs	4oz JAR	3	
TAL METALS	4oz JAR	3	
EXPLOSIVES	4oz JAR	3	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:
MS/MSD

Duplicate ID No.: [redacted]

Signature(s):
Robert Balkcom

TEST PIT LOG

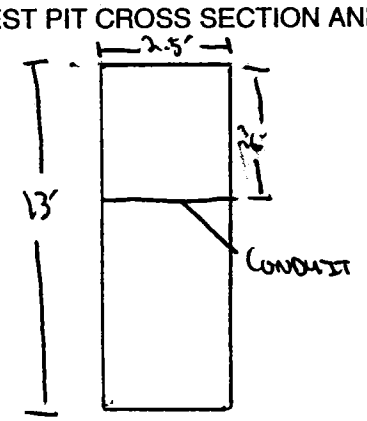
PROJECT NAME: WHITE OAK, MD
PROJECT NUMBER: CTO 839 N4246
LOCATION: SITE 13

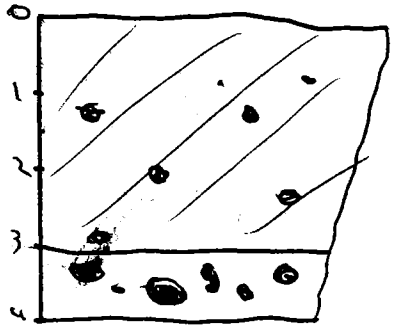
TEST PIT NUMBER: 13-TP-06
DATE: 5/16/02
GEOLOGIST: B. BALKOVEC

250

Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION: Soil/Waste Characteristics (lithology, density, color, etc.)	USCS	Remarks	PID/FID READING: Source (ppm)	PID/FID READING: BZ (ppm)
1		LT. BROWN - CLAYEY SAND W/ COBBLES	GC	NATURAL	0.0	0.0
		- CONDUIT FOUND @ 6"	↓	↓	↓	↓
2		LT. BR. - CLAYEY SAND W/ COBBLES	↓	↓	↓	↓
3		↓	↓	↓	↓	↓
4		↓ COBBLES W/ SOME SAND	GW	↓	↓	↓
	T.D. 4'					
		* CONDUIT APPEARED TO BE THE ANOMALIE. DID NOT FIND ANY WASTE.				

TEST PIT CROSS SECTION AND / OR PLAN VIEW





REMARKS: SAMPLED: 13TP06SB0203 - NATURAL @ 1310

PHOTO LOG:

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: WHITE OAK, MD
Project No.: CTO 839 N4246

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 13TP06SB0203
Sample Location: 13-TP-06
Sampled By: B.B / K.S
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 5/16/02	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1310	2-3'	LIGHT BROWN	CLAYEY SAND W/ COBBLES
Method: BACK HOE			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TCL VOCs	(3) ENCORES	✓	
TCL SVOCs	4OZ JAR	✓	
TCL PEST/PCBs	4OZ JAR	✓	
TAL METALS + CN	4OZ JAR	✓	
EXPLOSIVES	4OZ JAR	✓	

OBSERVATIONS / NOTES:

MAP:

Circle If Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

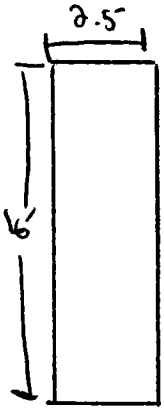
Robert Balkovec

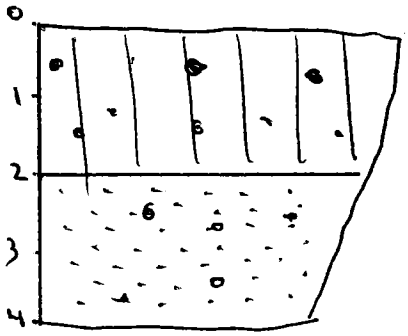
TEST PIT LOG

PROJECT NAME: WHITE OAK, MD
PROJECT NUMBER: CTO 839 N4246
LOCATION: SITE 13
TEST PIT NUMBER: B-TP-07
DATE: 5/16/02
GEOLOGIST: B. BALLCOVET

Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION: Soil/Waste Characteristics (lithology, density, color, etc.)	USCS	Remarks	PID/FID READING: Source (ppm)	PID/FID READING: BZ (ppm)
1	0	LIGHT BROWN - SILTY SAND & COBBLES	GM	SOME ASPHALT	0.0	0.0
2	0.6	YELLOW ORANGE - "	↓	CHUNKS	↓	↓
3		↓ : M-C SAND W/ T-GRAVEL	SP/			
4		↓ SOME CLAY	GP		↓	↓
	T.D. 4'					
		DID NOT FIND WASTE MATERIAL				

TEST PIT CROSS SECTION AND / OR PLAN VIEW





REMARKS: SAMPLED B7P07SB0304 - NATURAL - @ 1450

PHOTO LOG:

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: WHITE OAK, MD
Project No.: CTO 839 N4246

Sample ID No.: 13TP07SB0304
Sample Location: 13-TP-07
Sampled By: BB / KS
C.O.C. No.:

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 5/16/02	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1450	3'-4'	YELLOW ORANGE	M-C SAND W/ T- GRAVEL + SOME CLAY
Method: BACK HOE			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TCL VOCs	(3) ENCORES	✓	
TCL SVOCs	4OZ JAR	✓	
TCL PEST/PCBs	4OZ JAR	✓	
TAL METALS + CN	4OZ JAR	✓	
EXPLOSIVES	4OZ JAR	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD —

Duplicate ID No.:

Signature(s):

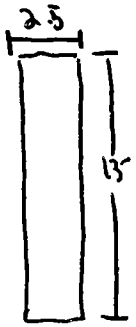
Robert Balkevich

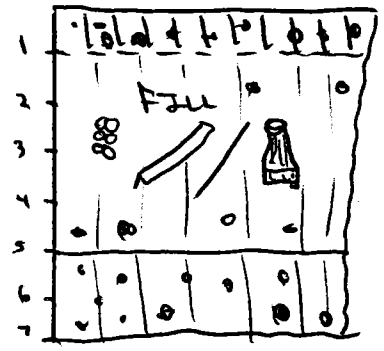
TEST PIT LOG

PROJECT NAME: WHITE OAK, MD
PROJECT NUMBER: CTO 839 N4246
LOCATION: SITE 5
TEST PIT NUMBER: 05-TP-01
DATE: 5/16/02
GEOLOGIST: BOB BALKOVEC

Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION: Soil/Waste Characteristics (lithology, density, color, etc.)	USCS	Remarks	PID/FID READING: Source (ppm)	PID/FID READING: BZ (ppm)
1		SILTY SAND + COBBLES - BR-	GM		0.0	0.0
2		STEEL ROD, TIN, METAL FRAGS	F	WASTE FROM 1-5'		
3		FENCING + BRICKS, BOTTLES	I			
4		ANGLE IRON, ASH, SILT + SAND	L	PAINT CAN		
5		↓	L			
6		YELLOW ORANGE - SILTY M-C SAND	GM	- NATURAL		
7		W/ COBBLES	↓	MATERIAL -	↓	↓
	T.D. 7'					

TEST PIT CROSS SECTION AND / OR PLAN VIEW





REMARKS: SAMPLED 05TP01WS0304 - WASTE MATERIAL @ 0815
SAMPLED 05TP01SB0507 - NATURAL MATERIAL @ 0825

PHOTO LOG:

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: WHITE OAK, MD
Project No.: CTO 839 N4246

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[X] Other: WASTE MATERIAL
[] QA Sample Type:

Sample ID No.: 05TP01WS0204
Sample Location: 05-TP-01
Sampled By: B.B. / R.S.
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 5/6/02 Time: 0815 Method: BACKHOE Monitor Reading (ppm): 0.0	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	2-4'	BLACK & BROWN	ASH, SILTY SAND, W/ FILL DEBRIS

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TCL VOC's	(2) 4oz JAR	✓	
TCL SVOC's	4oz JAR	✓	
TCL PEST/PCBs	4oz JAR	✓	
TAL METALS + CYANIDE	4oz JAR	✓	
EXPLOSIVES	4oz JAR	✓	
TCLP (PLUS)	8oz JAR	✓	

OBSERVATIONS / NOTES:

WOOD, METAL, FENCING, OLD PAINT CAN, ANGLE IRON, GLASS & BRICK FOUND.

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Robert Balkwill

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: WHITE OAK, MD
Project No.: CTO 839 N4246

[] Surface Soil
[x] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 05-SB01SB0507
Sample Location: 05-SB-01
Sampled By: B. BALKOVEC
C.O.C. No.:

Type of Sample:
[x] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 5/16/02 Time: 0825 Method: BACK HOE Monitor Reading (ppm): 0-0	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	5-7'	YELLOW ORANGE	SILTY M-C SAND, MOIST

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TCL VOC's	(3) ENCORES	✓	
TCL SVOC's	4OZ JAR	✓	
TCL PEST/PCB's	4OZ JAR	✓	
TAL METALS + CYANIDE	4OZ JAR	✓	
EXPLOSIVES	4OZ JAR	✓	

OBSERVATIONS / NOTES:

MAP:

Circle If Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Robert Balkovec

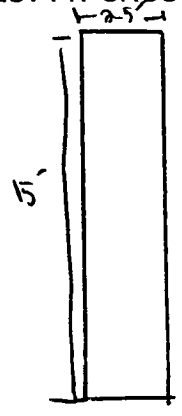
TEST PIT LOG

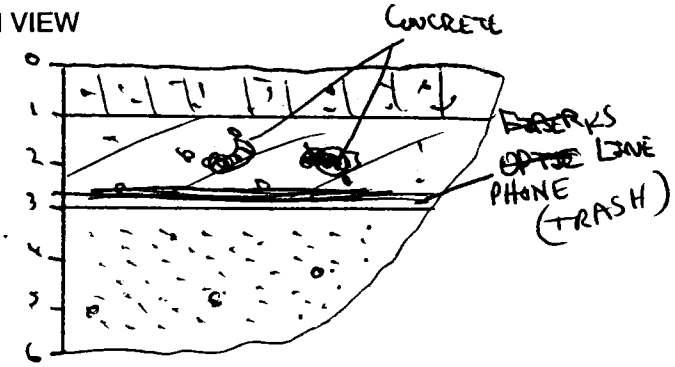
PROJECT NAME: WHITE OAK, MD
PROJECT NUMBER: CTO 839 N4246
LOCATION: SITE 5
TEST PIT NUMBER: 05-TP-08
DATE: 5/16/02
GEOLOGIST: B. BALKOVEC

START 1517

Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION: Soil/Waste Characteristics (lithology, density, color, etc.)	USCS	Remarks	PID/FID READING: Source (ppm)	BZ (ppm)
1	1'-1.5'	BROWN - SILTY SAND & COBBLES	GM		0.0	0.0
2		YELLOW ORANGE - CLAYEY SAND + COBBLES	GC	FIBER OPTIC		
3		↓ + CONCRETE	↓	LINE 2-2.5'		
4		MC SAND & GRAVEL	SP/GP	CLEAN		
5						
6					↓	↓
	T.D. 6'					
		DO NOT FIND ANY WASTE MATERIAL. FOUND FIBER OPTIC & CONCRETE				

TEST PIT CROSS SECTION AND / OR PLAN VIEW





REMARKS: SAMPLED - 05TP080506 - NATURAL - @ 1530

PHOTO LOG:

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: WHITE OAK, MD
Project No.: CTO 839 N4246

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 05TP08SB0506
Sample Location: 05-TP-08
Sampled By: BB/MS
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 5/16/02	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1530	5'-6'	YELLOW ORANGE	M-C SAND + GRAVEL
Method: BACK HOE			
Monitor Reading (ppm): 0-0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TCL VOCs	(3) ENCORES	✓	
TCL SVOCs	4oz JAR	✓	
TCL PEST/PCBs	4oz JAR	✓	
TAL METALS + CN	4oz JAR	✓	
EXPLOSIVES	4oz JAR	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD ✓ Duplicate ID No.:

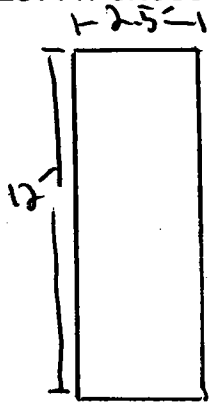
Signature(s): Robert Balkwill

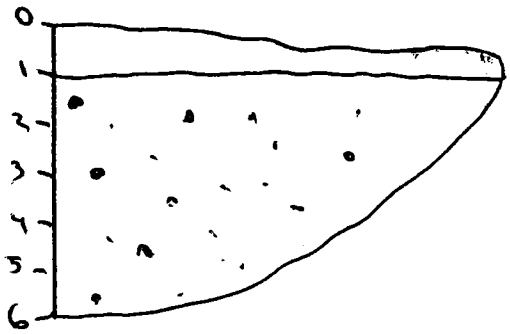
TEST PIT LOG

PROJECT NAME: WHITE OAK, MD
PROJECT NUMBER: CTO 839 N4246
LOCATION: SITE 5
TEST PIT NUMBER: 05-TP-09
DATE: 5/17/02
GEOLOGIST: B. BALLOVEC

Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION: Soil/Waste Characteristics (lithology, density, color, etc.)	USCS	Remarks	PID/FID READING: Source (ppm)	PID/FID READING: BZ (ppm)
1	1.1	BROWN - SILTY SAND & COBBLES	GM		0.0	0.0
2		YELL-ORG - M-C SAND W/ COBBLES & GRAVEL	GP	CLEAN		
3		M-C SAND W/ COBBLES & SOME CLAY				
4						
5						
6						
	2.0'					
		DO NOT FIND ANY WASTE MATERIAL				

TEST PIT CROSS SECTION AND / OR PLAN VIEW





REMARKS: SAMPLED 05TP09SB0506 - NATURAL MATERIAL - @ 0800

PHOTO LOG:

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: WHITE OAK, MD
Project No.: CTO 839 N4246

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 05SB090506
Sample Location: 05-SB-09
Sampled By: BB / KS
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 5/17/02	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0800	5-6'	YELLOW OR + GRAY	M-C SAND W/ COBBLES + SOME CLAY
Method: BACK HOE			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TCL VOCs	(3) ENCORES	✓ 6	
TCL SVOCs	4oz JAR	✓ 2	
TCL PEST/PCBs	4oz JAR	✓ 2	
TAL METALS + CN	4oz JAR	✓ 2	
EXPLOSIVES	4oz JAR	✓ 2	

OBSERVATIONS / NOTES:

MAP:

Circle If Applicable:

MS/MSD —

Duplicate ID No.: FD05120201

Signature(s): Robert Balkcom

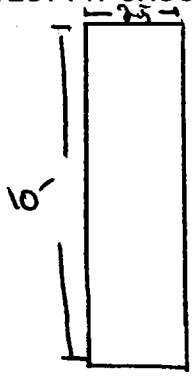
TEST PIT LOG

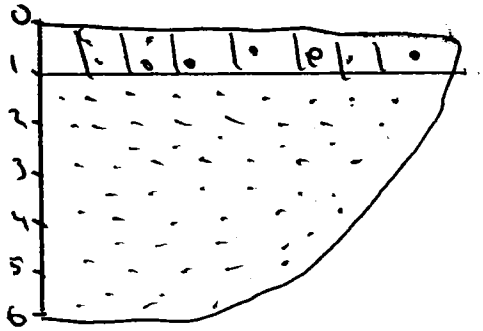
PROJECT NAME: WHITE OAK, MD
PROJECT NUMBER: CTO 839 N4246
LOCATION: SITE 5
TEST PIT NUMBER: 05-TP-40
DATE: 5/17/02
GEOLOGIST: BOB BALCOVER

0815

Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION: Soil/Waste Characteristics (lithology, density, color, etc.)	USCS	Remarks	PID/FID READING: Source (ppm)	B2 (ppm)
1	T to T.	BROWN - SILTY SAND + COBBLES	GM	CLEAN	0-0	0-0
2		YELLOW - M-C SAND T-GRAVEL	SP			
3						
4						
5						
6						
	T.D. 6'					
		DID NOT FIND ANY WASTE MATERIAL				

TEST PIT CROSS SECTION AND / OR PLAN VIEW





REMARKS: SAMPLED - 05TP40SB0506 - NATURAL MATERIAL @ 0830

PHOTO LOG:

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: WHITE OAK, MD
Project No.: CTO 839 N4246

Sample ID No.: 05TP10SB0506
Sample Location: 05-TP-10
Sampled By: B-B / KS
C.O.C. No.:

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 5/17/02	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0830	5-6'	YELLOW ORANGE	M-C SAND, T-GRAVEL
Method: BACK HOE			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TCL VOCs	(3) ENCORES	✓	
TCL SVOCs	4OZ JAR	✓	
TCL PEST/PCBs	4OZ JAR	✓	
TAL METALS + CN	4OZ JAR	✓	
EXPLOSIVES	4OZ JAR	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD | Duplicate ID No.:

Signature(s):

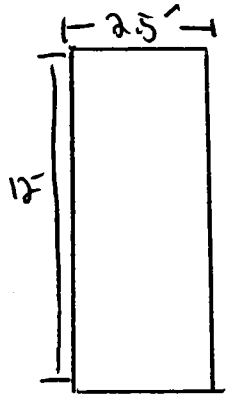
Robert Balkcom

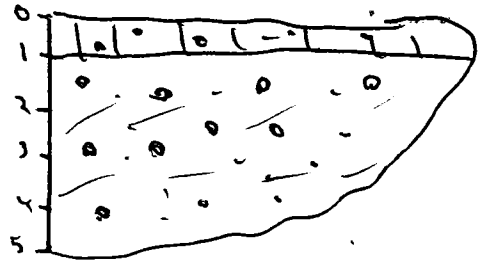
TEST PIT LOG

PROJECT NAME: WHITE OAK, MD
PROJECT NUMBER: CTO 839 N4246
LOCATION: SITE 5
TEST PIT NUMBER: 05-TP-11
DATE: 5/16/02
GEOLOGIST: BOB BALCOMB

Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION — Soil/Waste Characteristics (lithology, density, color, etc.)	USCS	Remarks	PID/FID READING Source (ppm)	PID/FID READING BZ (ppm)
0850 1	0-1'	BROWN - SILTY SAND + COBBLES	GM		0.0	0.0
2		YELLOW-BROWN FINE-COARSE SAND W/ COBBLES	SP			
3		GRAY + CLAY	CL			
4		↓	↓			
5		↓	↓		↓	↓
		DID NOT FIND WASTE MATERIAL				

TEST PIT CROSS SECTION AND / OR PLAN VIEW





REMARKS: SAMPLED - 05TPSB0102 - NOT SURE IF SOIL IS NATURAL @ 0900

PHOTO LOG:

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: WHITE OAK, MD
Project No.: CTO 839 N4246

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 05TP11SB0203
Sample Location: 05-TP-11
Sampled By: BB/KS.
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 5/17/02	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0900	2-3'	YELLOW OR + GRAY	M-C SAND W/ COBBLES + T-CLAY VERY COMPACTED
Method: BACK HOE			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TCL VOCs	(3) ENCORES	✓	
TCL SVOCs	4 OZ JAR	✓	
TCL PEST/PCBs	4 OZ JAR	✓	
TAL METALS + CN	4 OZ JAR	✓	
EXPLOSIVES	4 OZ JAR	✓	

OBSERVATIONS / NOTES:

SOIL VERY COMPACTED

MAP:

Circle If Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Robert Belhaven

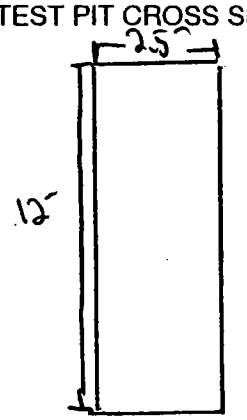
TEST PIT LOG

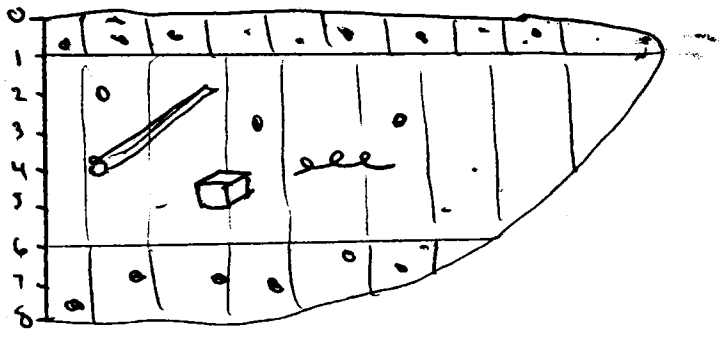
Tetra Tech NUS, Inc.

PROJECT NAME: WHITE OAK
PROJECT NUMBER: 4246
LOCATION: SITE 5
TEST PIT No.: 05-TP-12
DATE: 5/17/02
GEOLOGIST: BOB BALKOVEC

Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION: Soil/Waste Characteristics (lithology, density, color, etc.)	USCS	Remarks	PID/FID READING: Source (ppm)	PID/FID READING: BZ (ppm)
1		BROWN - SILTY SAND + COBBLES	GM		0-0	0-0
2		YELLOW + GREY WIRE, BURNTWOOD +	F			
3		BRICK. SILTY SAND +	I			
4		COBBLES	L			
5			L			
6						
7		SILTY SAND + COBBLES	GM			
8		T-CLAY				
	TD. 8'					

TEST PIT CROSS SECTION AND / OR PLAN VIEW





REMARKS: SAMPLED 05TP12WS0204 - WASTE - @ 0925
05TP12SB0708 - NATURAL - @ 0940

PHOTO LOG:

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: WHITE OAK, MD
Project No.: CTO 839 N4246

Sample ID No.: 05TP12WS0201
Sample Location: 05-TP-12
Sampled By: BB/KS
C.O.C. No.:

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[X] Other: WASTE MATERIAL
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 5/17/02	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0925	2-4'	YELLOW BRN, + BLACK	SILTY SAND W/ COBBLES, BURNT WOOD + ASH
Method: BACK HOE			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TCL VOCs	(2) 4 OZ JAR	✓	
TCL SVOCs	4 OZ JAR	✓	
TCL PEST/PCBs	4 OZ JAR	✓	
TAL METALS + CN	4 OZ JAR	✓	
EXPLOSIVES	4 OZ JAR	✓	
TCLP (FULL)	8 OZ JAR	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD | Duplicate ID No.:

Signature(s):

Robert Balkovec

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: WHITE OAK, MD
Project No.: CTO 839 N4246

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 05TP12SB0708
Sample Location: 05-TP-12
Sampled By: B.B/K.S
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 5/17/02	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0940	7-8'	YELLOW ORANGE	SILTY SAND W/COBBLES T-CLAY
Method: BORE HOE			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TCL VOC's	(3) ENCORES	✓	
TCL SVOC's	4oz JAR	✓	
TCL PEST/PCBs	4oz JAR	✓	
TAL METALS + CN	4oz JAR	✓	
EXPLOSIVES	4oz JAR	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Robert Bilkovec

TEST PIT LOG

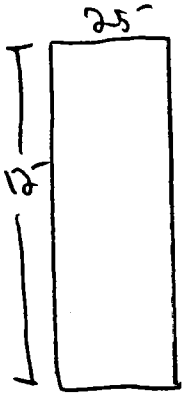
Tetra Tech NUS, Inc.

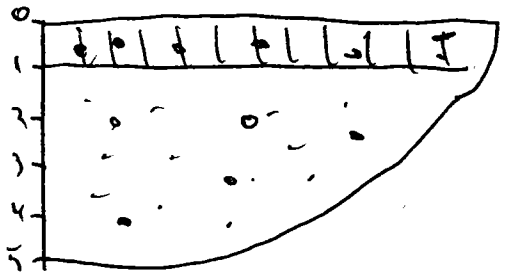
PROJECT NAME: WHITE OAK
PROJECT NUMBER: 4246
LOCATION: SITE 05

TEST PIT No.: 05-TP-13
DATE: 5/17/02
GEOLOGIST: BOB BALKOVIC

Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION: Soil/Waste Characteristics (lithology, density, color, etc.)	USCS	Remarks	PID/FID READING: Source (ppm)	PID/FID READING: BZ (ppm)
1	EE 10'	BROWN - SILTY SAND + COBBLES	GM		0.0	0.0
2		YELLOW OR = M-C SAND W/	GP	PIECE OF TIN +		
3		COBBLES	SP	RED BRICK		
4						
5	5'					
	TD 5'					

TEST PIT CROSS SECTION AND / OR PLAN VIEW





REMARKS: DO NOT SAMPLE

PHOTO LOG: