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TETRA TECH, NUS

Remedial Investigation Report for Operable Unit 7

Portsmouth Naval Shipyard

Kittery, Maine

Naval Facilities Engineering Command Mid-Atlantic

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REMEDIAL INVESTIGATION REPORT FOR OPERABLE UNIT 7

PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

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By affixing my seal to the *"Remedial Investigation Report for Operable Unit 7, Portsmouth Naval Shipyard, Kittery, Maine,"* prepared by Tetra Tech NUS, Inc. and dated July 2011, I am certifying that the geologic information and interpretations herein are true and correct to the best of my knowledge. I further certify that I am licensed to practice in the State of Maine and that it is within my professional expertise to verify the correctness of the information.

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ACRONYMS AND ABBREVIATIONS

4,4-DDE	1,1-dichloro-2,2-bis(4-chlorophenyl)ethene
4,4-DDT	1,1,1-trichloro-2,2-bis(4-chlorophenyl)ethane
ALM	Adult Lead Model
ABS	absorption efficiency
ADAF	age dependent adjustment factor
AOC	Area of Concern
ARAR	Applicable or Relevant and Appropriate Requirement
ATSDR	Agency for Toxic Substances and Disease Registry
BAP	benzo(a)pyrene
bgs	below ground surface
CD	compact disc
CDD	chlorinated dibenzo p-dioxin
CDF	chlorinated dibenzofuran
CERCLA	Comprehensive Environmental Response, Compensation. and Liability Act
CIA	Controlled Industrial Area
CLEAN	Comprehensive Long-Term Environmental Action Navy
CLP	Contract Laboratory Program
CNS	central nervous system
COC	chemical of concern
COPC	chemical of potential concern
cPAH	carcinogenic polycyclic aromatic hydrocarbon
CRQL	Contract-Required Quantitation Limit
CSF	cancer slope factor
CSM	Conceptual Site Model
CTE	central tendency exposure
CTO	Contract Task Order
DMR	Department of Marine Resources
DoD	Department of Defense
DQA	Data Quality Assessment
DQR	Data Quality Review
EERA	Estuarine Ecological Risk Assessment
EPC	exposure point concentration
EU	exposure unit
FEMA	Federal Emergency Management Agency
FFA	Federal Facility Agreement

FS	Feasibility Study
FY	Fiscal Year
GS	gastrointestinal system
HEAST	Health Effects Assessment Summary Table
HHRA	Human Health Risk Assessment
HI	hazard index
HQ	hazard quotient
HSWA	Hazardous and Solid Waste Amendments
IAS	Initial Assessment Study
IDL	instrument detection limit
IEUBK	Integrated Exposure Uptake Biokinetic
ILCR	incremental lifetime cancer risk
IRG	Interim Remediation Goal
IRIS	Integrated Risk Information System
IRP	Installation Restoration Program
IUR	inhalation unit risk
K_d	soil – water portioning coefficient
MDL	method detection limit
MEDEP	Maine Department of Environmental Protection
mg/kg	milligram per kilogram
MHW	Mean High Water
MLLW	Mean Low Low Water
MLW	Mean Low Water
MTADS	Multi-Sensor Towed-Array Detection System
NAD	North American Datum
NAVD	North American Vertical Datum
NAVFAC	Naval Facilities Engineering Command
NCEA	National Center for Environmental Assessment
NERP	Navy Environmental Restoration Program
NHDES	New Hampshire Department of Environmental Services
NHDOT	New Hampshire Department of Transportation
NPL	National Priorities List
NOAA	National Oceanic and Atmospheric Administration
OERR	Office of Emergency and Remedial Response
OSWER	Office of Solid Waste and Emergency Response
OU	Operable Unit
PAH	polycyclic aromatic hydrocarbon

PCB	polycholorinated biphenyl
PNS	Portsmouth Naval Shipyard
PPRTV	Provisional Peer Reviewed Toxicity Value
ppt	part per thousand
PRG	Preliminary Remediation Goal
QAPP	Quality Assurance Project Plan
RAGS	Risk Assessment Guidance for Superfund
RCRA	Resource Conservation and Recovery Act
RfC	reference concentration
RfD	reference dose
RFI	RCRA Facility Investigation
RI	Remedial Investigation
RME	reasonable maximum exposure
ROD	Record of Decision
RSL	Regional Screening Level
SARA	Superfund Amendments and Reauthorization Act
SMP	Site Management Plan
SSI	Site Screening Investigation
SSL	soil screening level
SVOC	semivolatile organic compound
SWMU	Solid Waste Management Unit
TCDD	Tetrachlorodibenzo-p-Dioxin
TSCA	Toxic Substance Control Act
TEF	Toxicity equivalence factor
TEQ	Toxic equivalency
TICS	Tentatively identified compound
TOC	Total organic carbon
TRW	Technical Review Workgroup
TtEC	Tetra Tech EC
TtNUS	Tetra Tech NUS
UCL	Upper Confidence Limit
USEPA	United States Environmental Protection Agency
USDA	United States Department of Agriculture
VOC	volatile organic compound
WHO	World Health Organization
µg/DL	microgram per deciliter
µg/kg	microgram per kilogram
µg/L	microgram per liter

EXECUTIVE SUMMARY

This Remedial Investigation (RI) Report for Operable Unit (OU) 7 at Portsmouth Naval Shipyard (PNS), Kittery, Maine, was prepared by Tetra Tech NUS, Inc. (TtNUS) for the United States Department of the Navy, Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic, under the Comprehensive Long-Term Environmental Action Navy (CLEAN) Program, Contract Number N62472-03-D-0057, Contract Task Order (CTO) 55. OU7 consists of Site 32 - Topeka Pier Site. This RI Report was prepared to fulfill the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by Superfund Amendments and Reauthorization Act (SARA).

The purpose of the RI Report for OU7 is to: (1) characterize the nature and extent of contamination; (2) evaluate the potential risks to human receptors; and (3) determine the potential for OU7 contamination to adversely impact the offshore area. OU7 is in an area that is currently and has historically been an industrial area with no onshore ecological habitats; therefore, potential onshore ecological risks were not evaluated. Current and future potential for offshore migration of contaminants from the site via groundwater discharge to the offshore was evaluated as part of the RI Report for OU7. Historical information for OU7 indicated there were past releases of contamination in the offshore area. Offshore impacts from these past releases are being addressed under OU4 and are therefore outside of the scope of this report.

The operations that resulted in the release of contamination at OU7 were related to the filling of the shoreline and past industrial uses of the site. Fill material included rock, earth, cinders, and other material that could not by destroyed by incineration. Various cans and drums were reportedly disposed of possibly containing sodium hydroxide, sulfuric acid, and organic solvents. The area filled before approximately 1910 is reportedly filled with material excavated during the construction of Dry Dock No.2. Filling activities ceased by 1945. This portion of OU7 includes the area where Building 237 was located, which was a grassy area before construction of the office building. No industrial operations were conducted in this area.

For the onshore evaluation of OU7, soil and groundwater data were evaluated, the nature and extent of contamination were defined, and risks associated with the site were determined. The fill material is mostly soil with minor amounts of debris and small pockets of waste. Debris materials within the surface fill include slag, ash, metal, cinders, coal clinkers, wood, plastic, glass, concrete, porcelain, and brick, depending on the location at the site. Waste represents fill material with more than 30 percent debris. Volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), dioxins, furans, and inorganics were detected in surface and subsurface soil samples. The average concentrations of chemicals in the fill area without debris in the

vicinity of former Building 237 were determined to be statistically less than the average concentrations for the rest of OU7. Based on evaluation of the data roughly half the locations where concentrations were indicated to be elevated above background conditions had debris material in the borings. The presence or absence of debris does not indicate whether contamination will be present. Risks were calculated for the entire site and for the area in the vicinity of former Building 237 without debris. Based on the risk evaluation, adverse risks were not found for the area without debris in the vicinity of former Building 237. Adverse risks for exposure to soil were found for the current and future construction worker, future child resident, adult resident, and lifetime resident exposed to soil. Potentially unacceptable risks were found for the current and future construction worker exposed to entire site soil, for a future child resident exposed to surface soil, and future resident (child and adult) and occupational worker exposed to subsurface soil. SVOCs and inorganics were detected in groundwater. SVOCs were detected infrequently (detected in at most four samples) and at concentrations ranging from 0.1 to 2 micrograms per liter (µg/L). The groundwater at OU7 is not potable, and construction workers were the only receptor evaluated for exposure to groundwater. Based on the risk assessment, no adverse risks were found for exposure to groundwater.

Recreational users at OU7 could recreate in the near-shore/intertidal area offshore of OU7. Therefore, surface water (near-shore), seeps (intertidal), and intertidal sediment data were evaluated, the nature and extent of contamination was defined, and risks were determined. Inorganics were the only chemicals detected in surface water. SVOCs, pesticides, PCBs, and inorganics were detected in OU7 seep samples. SVOCs, pesticides, PCBs, and inorganics were detected in sediment samples. For the risk evaluation, surface water exposure was represented by the near-shore surface water and intertidal seep data. Adverse impacts from recreational exposure to surface water and sediment were not found based on the risk evaluation.

Groundwater, surface water, sediment and soil data for OU7 and contaminant fate and transport modeling conclusions show that migration of contaminants in groundwater from OU7 to the offshore does not pose a current risk under current site conditions and would not pose a future risk under future site conditions (i.e., if the asphalt were removed). Erosion of contaminated soil and waste material does not currently pose a risk to the offshore area of OU7; however, erosion is a potential future risk to the offshore area if the erosion controls fail in the future.

The main chemicals contributing to risk are dioxins/furans (based on 2,3,7,8-TCDD TEQ), total carcinogenic PAHs (based on BAP equivalents), PCBs (based on Aroclor 1260), antimony, copper, iron, lead, and manganese and are considered the chemicals of concern (COCs) for OU7. Based on the RI, the Navy recommends that a Feasibility Study (FS) be conducted to address potentially unacceptable risks posed to current and future construction workers who could be exposed to surface soil and

subsurface soil, future hypothetical residents exposed to surface soil and subsurface soil, future occupational worker exposed to subsurface soil, and future potential erosion of contaminated soil to the offshore.

1.0 INTRODUCTION

This Remedial Investigation (RI) Report for Operable Unit (OU) 7, at Portsmouth Naval Shipyard (PNS), Kittery, Maine, was prepared by Tetra Tech NUS, Inc. (TtNUS) for the United States Department of the Navy, Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic under the Comprehensive Long-Term Environmental Action Navy (CLEAN) Program, Contract Number N62472-03-D-0057, Contract Task Order (CTO) 55. The OU7 RI Report was prepared to fulfill the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA) and is consistent with United States Environmental Protection Agency (USEPA) Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (October 1988) and the Navy Environmental Restoration Program (NERP) Manual, Chapter 8, Remedial Investigation/Feasibility Study (August 2006).

1.1 PURPOSE AND SCOPE OF REPORT

The purpose and scope of the RI for OU7 was to: (1) characterize the nature and extent of contamination; (2) evaluate the potential risks to human receptors; and (3) to determine the potential for OU7 contamination to adversely impact the offshore area. OU7 is in an area that is currently and has historically been an industrial area with no onshore ecological habitats; therefore, potential onshore ecological risks were not evaluated. Current and future potential offshore migration of contaminants from the site via groundwater discharge to the offshore was evaluated as part of the RI Report of OU7. Historical information for OU7 indicated there were past releases of contamination in the offshore area. Offshore impacts from these past releases are being addressed under OU4 and are therefore outside of the scope of this report.

This RI Report is a culmination of the evaluation of data collected under various investigations, as discussed in Section 1.4. The investigations included sampling of soil and groundwater at OU7, groundwater upgradient of OU7, and surface water (outfalls and nearby surface water), seeps, and sediment in the intertidal portion of the offshore area of OU7.

1.2 REPORT ORGANIZATION

This report has been organized into the following seven sections:

- Section 1.0 – Introduction: This section provides a description of the purpose and scope of the RI Report; the facility, site descriptions, and history; and summaries of previous OU7 environmental investigations.

- Section 2.0 – Study Area Investigation: This section describes the RI sampling activities and shoreline stabilization and includes a discussion of the data usability.

- Section 3.0 – Site Characterization: This section describes OU7 demography, land use, surface features, shoreline revetment, soils, geology, hydrogeology, surface water use, hydrogeology, ecology, and climatology.

- Section 4.0 – Nature and Extent of Contamination: This section discusses the types, magnitudes, and spatial distribution of contaminants present in soil and groundwater at OU7 and in surface water and sediment in the intertidal area of the offshore area of OU7.

- Section 5.0 – Contaminant Fate and Transport: This section discusses the properties of the chemicals detected at OU7 and their potential persistence, migration, and dispersion or degradation pathways. This section also discusses the Conceptual Site Model (CSM) and the risk evaluation of contaminant migration and environmental impacts.

- Section 6.0 – Human Health Risk Assessment: This section presents the Human Health Risk Assessment (HHRA) for OU7.

- Section 7.0 – Conclusions and Recommendations: This section presents a summary of the nature and extent of contamination, contaminant fate and transport, and risk assessment, and also provides the conclusions and recommendations of the RI.

Appendix A contains supporting information including a discussion of historical uses and figures displaying historical shorelines, soil boring and monitoring well construction logs for OU7, results of the tidal lag study, results of the slug test, OU7 sample list, shoreline revetment as-built plan, and the results of the 2003 wetlands functions and values assessment. Appendix B contains analytical results, including the complete database printout for soil and groundwater, surface water, and sediment samples from the area offshore of OU7 and upgradient groundwater samples. This appendix also contains the results of the background analysis, trend tests, and correlation analysis between National Oceanic and Atmospheric Administration (NOAA) and USEPA analytical methods for metals. Appendix C contains the fate and transport modeling, and Appendix D contains details supporting the HHRA. Appendix E includes the responses to comments on the draft RI.

1.3 FACILITY AND OU7 DESCRIPTION AND HISTORY

This section provides descriptions and histories for PNS and OU7.

1.3.1 Facility Description and History

PNS is a military facility with restricted access on an island located in the Piscataqua River, as shown on Figure 1-1. PNS is referred to on NOAA nautical charts as Seavey Island, with the eastern tip given the name Jamica Island. Clark's Island is to the east, attached by a rock causeway to Seavey Island. The Piscataqua River is a tidal estuary that forms the southern boundary between Maine and New Hampshire. PNS is located in Kittery, Maine, north of Portsmouth, New Hampshire, at the mouth of the Great Bay Estuary (commonly referred to as Portsmouth Harbor).

PNS is engaged in the conversion, overhaul, and repair of submarines for the Navy. The long history of shipbuilding in Portsmouth Harbor dates back to 1690, when the first warship launched in North America, the Falkland, was built. The first government-built submarine was designed and constructed at PNS during World War I. A large number of submarines have been designed, constructed, and repaired at this facility since 1917. PNS continues to service submarines as its primary military focus.

Prior to CERCLA and Resource Conservation and Recovery Act (RCRA) regulation at PNS, years of shipbuilding and submarine repair work resulted in hazardous substances being released into soil, groundwater, surface water, and sediment on and around Seavey Island. As a result, investigation and remediation activities were performed under the Department of Defense (DoD) Installation Restoration Program (IRP). Paralleling CERCLA, the IRP focuses on the cleanup of contamination from past hazardous waste operations and past hazardous material spills and is further discussed in the Amended Site Management Plan (SMP) for PNS [Fiscal Year (FY)11], (NAVFAC, February 2011).

Investigations of hazardous substance releases at PNS began in 1983 with the Initial Assessment Study (IAS) (Weston, June 1983). USEPA became involved with PNS in 1985 when the agency requested information on PNS' hazardous wastes and conducted a visual site inspection under RCRA authority. Since 1988, the Maine Department of Environmental Protection (MEDEP) has also provided oversight of investigation and remediation of PNS. In March 1989, USEPA issued a Corrective Action Permit under the RCRA Hazardous and Solid Waste Amendments (HSWA) of 1984 (March 1989) that required PNS to investigate 13 Solid Waste Management Units (SWMUs) and take appropriate corrective action. Until the mid-1990s, investigations at PNS were conducted under RCRA authority. Effective May 31, 1994, PNS was included on the National Priorities List (NPL), and subsequent studies have been conducted under the authority of CERCLA, commonly known as Superfund. Consistent with the transition from RCRA to CERCLA, the SWMUs were renamed as "sites." Ongoing studies to develop and evaluate remedial

activities are conducted as part of Feasibility Studies (FSs) (CERCLA terminology) and combine both RCRA and CERCLA criteria.

The Federal Facility Agreement (FFA) for PNS was signed by USEPA and the Navy in September 1999, became effective February 2000, and supersedes the HSWA Permit. The State of Maine has elected not to be a party to the FFA at this time; however, the state is afforded a participatory role in the site remediation process in accordance with CERCLA. Among other things, the FFA outlines roles and responsibilities, establishes deadlines/schedules, outlines work to be performed, and provides a dispute resolution process for primary documents. The FFA ensures that CERCLA decisions will be consistent with RCRA and other federal and state hazardous waste statutes and regulations, as appropriate for the sites at PNS.

1.3.2 OU7 Description and History

OU7 consists of Site 32 - Topeka Pier Site, which is located north of Goodrich Avenue along the northern boundary of PNS. The location of OU7 at PNS is shown on Figure 1-1. Site 32 encompasses the area from just west of Building 162 to east of Building H29 and from the Back Channel south to Building 129 (Figure 1-2). Another IRP Site 30, Former Galvanizing Plant Building 184, is located south of OU7.

Current land use at OU7 includes office parking, equipment storage, vehicle and rail car maintenance, transducer repair, boat launching, Hospital Corps (Building H1) and temporary housing (Building H23 in the southeastern corner of the site is used to house transient Navy personnel).

Before 1900, a waterway (Jenkin's Gut) extended southwest to northeast between Dennett's and Seavey Islands. From 1900 to 1910, during construction of Dry Dock No. 2, material excavated from the southern end of the channel was deposited in the northern end of the channel, connecting Dennett's and Seavey Islands. During the same time period, Topeka Pier was constructed in the Back Channel of the Piscataqua River to dock the prison ship USS Topeka. OU7 was created from various filling activities. Storing and milling of lumber in the area began by 1910, and a timber basin was established at the southeastern corner of the site. The filled area west of the timber basin was used to store coal, wood, and scrap iron. Building 98 was constructed to store combustibles, including paints and oils. By the early 1920s, a sawmill (Building 129), lumber storehouse with timber racks (Building 132), and additional lumber storehouse (Building 149), were built west of the timber basin to accommodate the increased demand for lumber during World War I (see Figure 1-2).

Filling of the shorelines at OU7 continued through the 1930s. Fill material included rock, earth, cinders, and other debris and scrap material that could not be destroyed by incineration. Various cans and drums were reportedly disposed of in the area, possibly containing sodium hydroxide, sulfuric acid, and organic

solvents. By 1939, combustible material was being dumped in the southern portion of the site (timber basin), in the area of current Building 158, for disposal. By 1945, filling of the area had ceased.

Many buildings were constructed on the land created by filling activities at the site, including a transportation and equipment storage building (Building 154), net storage building that was converted to a garage (Building 158), electrical sub-station (Building 162), torpedo overhaul and storage building (Building 176), several storehouses (Buildings 112, 177, and 197), a barracks for the Hospital Corps/temporary housing (Building H23), and an office building (Building H29). Buildings 112 and 197 were later demolished. Building 154 was used primarily for garage space and diesel locomotive engine repair, and Building 306 was used as a transducer repair facility. Portions of the parking area east of Building 154 were repaved in 2003 and 2004, and Building 237 (Public Works Administrative Building) was demolished in 2007. A new transducer testing facility east of Building 306 was constructed in 2009.

Excavation work performed by Shipyard personnel along Goodrich Avenue in 1994 and 1995, near Building H23, uncovered debris including large dry-cell batteries, graphite electrodes, brick, wood, metal pipe and wire, glass, and asbestos cloth. Crucibles were also indentified during excavation activities, indicating the presence of foundry waste. Subsequently, the area was defined as a potential IRP site, and environmental investigations began as discussed further in Section 1.4.

1.4 SUMMARY OF ENVIRONMENTAL REPORTS AND ACTIONS AT OU7

This section provides summaries of previous reports that included onshore and/or offshore areas of OU7. Figure 1-3 presents previous and RI soil and groundwater sample locations for the onshore area, and Figure 1-4 presents previous and RI sediment and water sample locations for the intertidal portion of the offshore area. A list of samples collected and associated analyses by investigation that were included in the RI are presented in Table A.1 in Appendix A.5.

Before OU7 was identified as a potential IRP site several investigations in both the onshore and offshore portions of the site to support work for various IRP sites at PNS were conducted. Information for the onshore area was collected during the RCRA Facility Investigation (RFI) Data Gap Investigation (Halliburton NUS, November 1995), 1996 to 1997 groundwater monitoring (TtNUS, August 1999), 1996 to 1997 seep and sediment monitoring (TtNUS, August 2000) and geophysical survey [Multi-Sensor Towed-Array Detection System (MTADS)] (Naval Research Laboratory, December 2001). After Site 32 was established as an IRP site a Site Screening Investigation (SSI) for Sites 30, 31, and 32 was conducted (TtNUS, May 2000). These investigations are discussed further in Section 1.4.1. After Site 32 was identified as a site, a soil location from the facility background data set (BGS-05) was determined to be located within the site boundaries. BGS-05 was removed from the background data set and included in the OU7 soil data set. Information for the OU7 offshore area was collected through the Estuarine

Ecological Risk Assessment (EERA) for OU4 (NCCOSC, May 2000) and the Interim Offshore Monitoring Program for OU4 (TtNUS, October 1999) as discussed further in Section 1.4.2. Based on the SSI, Site 32 was recommended for an RI and subsequently identified as OU7. The RI was conducted in two phases and is discussed further in Section 2.0. In 2006, the Navy conducted an emergency removal action to address shoreline erosion along the shoreline north of Building 306 during which shoreline controls were placed along the entire OU7 shoreline. Shoreline erosion control activities are discussed further in Section 2.0.

1.4.1 Onshore Investigations Prior to the RI

The RFI Data Gap Investigation, conducted to provide additional information for the RFI, provided geological and hydrogeological information for one location at OU7, the FA monitoring well cluster. The FA monitoring well cluster, including an overburden well and two bedrock wells, is located in the western portion of the site, north of former Building 237 (see Figure 1-3). Data from the RFI Data Gap Investigation were considered along with other geological and hydrogeologcial information to evaluate OU7 conditions including contaminant fate and transport. However, the groundwater chemical data from the RFI Data Gap Investigation are not included in the OU7 data set because the data are not considered representative of site conditions. The groundwater sampling method (bailer method) used during the RFI Data Gap Investigation entrained particulates in the sampled groundwater, thereby causing elevated results compared to more representative results that would have been obtained with the low-flow sampling method used during subsequent sampling events (1996, 1997, 2003, and 2008).

The 1996 to 1997 groundwater monitoring for PNS was conducted in response to the RFI to support upcoming onshore and offshore FSs. The FA well cluster was included to provide groundwater data for tidally influenced areas of PNS. Four rounds of groundwater data were collected between December 1996 and November 1997 to determine if the spatial distribution of chemicals in groundwater changed over time. The overall groundwater flow patterns and tidal influences across PNS were relatively consistent throughout the year, although seasonal changes were reflected in static water levels. Tidal influences were observed along the facility boundaries and extending into fill areas. Similarly, brackish and/or saline water groundwater conditions occur when a greater than 2-foot tidal range was observed. The data from the 1996 to 1997 groundwater monitoring were used as part of data evaluation activities for this RI.

Seep and sediment data were also collected during four events in 1996 and 1997, in conjunction with groundwater monitoring. Seep water and collocated sediment samples were collected in several intertidal areas of PNS (i.e., areas exposed during low tide and submerged during high tide), along with groundwater samples to provide a comprehensive “snapshot” for use in contaminant fate and transport modeling. The four locations sampled offshore of OU7 were BC-1016, BC-1017, BC-1018 (now known to

be storm water outfall OF-63), and BC-1020 (see Figure 1-4). Data from 1996 to 1997 seep/sediment monitoring (Rounds 7 through 10) were used to provide an indication of general chemical concentrations in the intertidal area and were used as part of data evaluation activities for this RI.

The purpose of the MTADS survey was to generate geophysical maps of Jamaica Island (OU3, located east of OU7) and OU7 to identify ferrous or steel-reinforced concrete containers that may have been used to dispose of materials. The MTADS survey was conducted on the approximately one-fourth to one-third of OU7 that was accessible to identify magnetic and electromagnetic anomalies (Naval Research Laboratory, December 2001). The portions of the site not surveyed were inaccessible because of equipment, fenced laydown areas, railroad tracks, and other structures. The MTADS showed buried utility lines throughout the OU7 area, but an anomaly in the southeastern corner of the survey did not correlate to site features (e.g., utilities). Based on historical figures, a railroad previously ran near the location of the anomaly (north of Goodrich Avenue), and utilities were previously located around the anomaly. Although it was likely that this anomaly was associated with former railroad tracks or utilities, the exact nature of the anomaly was unknown. To rule out that the anomaly could be drums the anomaly was investigated further during the RI with the installation of TP-MW09/TP-SB21. Metal waste was found at this boring at a depth of 4 to 8 feet below ground surface (bgs); no drums were found (TtNUS, January 2004).

The SSI was conducted in 2000, after the site was added to the IRP, to document the release or potential release of hazardous substances that may be present, to make recommendations for further action (e.g., an RI), and to eliminate from further investigation those portions of the site that may pose no appreciable risk to the environment or human health. The sampling and analyses targeted potential source areas at OU7 and provided soil and groundwater data for the site. Additionally, the SSI provided geological and hydrogeological information that was combined with other geological and hydrogeological information for the site to understand site conditions including contaminant fate and transport. Figure 1-3 presents the locations of monitoring wells and soil borings. Based on the chemical concentrations in surface and subsurface soil and groundwater samples, the SSI concluded that additional investigation was necessary, and an RI was conducted as discussed in Section 2.0.

In April 2002, the Navy conducted a storm sewer video camera survey to determine the condition of the storm sewer system that flows through OU7. The survey indicated that a majority of the sewers were in poor condition, with debris, dislocated joints, etc., and that groundwater infiltration was occurring at several locations. The storm sewers outfalls in the OU7 intertidal area are tidally influenced, and it is likely that the outfalls are points where groundwater from the site is being transported to the Back Channel. Therefore, the Navy considered the storm sewer outfalls as potential groundwater transport pathways in the RI for OU7.

1.4.2 Offshore Investigations

The EERA, conducted in response to the RFI to evaluate offshore ecological risks associated with the Shipyard's IRP sites, assessed the potential adverse environmental effects from past discharges of contaminants from PNS. The Back Channel Area of Concern (AOC), which includes the offshore area of OU7, was one of the six AOCs identified in the offshore area by the EERA. Two functional phases of the EERA were conducted from 1991 to 1993 to fulfill this objective for the Back Channel AOC. The risk assessment concluded that ecological risks associated with surface water and sediment were low and intermediate, respectively. The chemicals of potential concern (COPCs) identified for the Back Channel AOC were metals and polycyclic aromatic hydrocarbons (PAHs). The EERA data were also used to evaluate human health risks for the offshore. The HHRA for Offshore Media (McLaren/Hart, November 1994) evaluated risks for the offshore area as a whole and determined that risks for exposure to surface water and sediment were acceptable. The EERA results were used as part of project planning for the Interim Offshore Monitoring Program, which included monitoring stations in the OU7 offshore area. The data were not included as part of data evaluation activities for this RI because more recent data from the Interim Offshore Monitoring Program are available, as discussed further below.

In May 1999, an Interim Record of Decision (ROD) for OU4 was signed, requiring the Navy to conduct monitoring in the offshore area of PNS in the interim period before a final remedy is selected and implemented for OU4. Interim monitoring was warranted for OU4 to provide current data on the offshore areas to evaluate whether onshore remedial actions, natural processes, and/or other sources have affected chemical concentrations at OU4. Sediment at the two monitoring stations located in the offshore area of OU7 (MS-3 and MS-4) were sampled during the first seven rounds, September 1999 to August 2003, of Interim Offshore Monitoring Program. The Rounds 1 through 7 Report concluded that additional sediment sampling at MS-3 and MS-4 was needed to determine the extent of copper, nickel, and PAH contamination, and the recommended sediment sampling was conducted as part of the RI (see Section 2.0). Interim Offshore Monitoring Program rounds 8, 9, and 10 were not required for MS-3 and MS-4. The Rounds 1 through 10 Interim Offshore Monitoring Program Report for OU4 recommended that interim offshore monitoring be conducted during Round 11 and every five years until a final remedy for OU4 is implemented. The parameters to be monitored will include PAHs and copper because these were identified as ecological risk drivers (TtNUS, February 2010).

During interim offshore monitoring, foundry slag was noted in areas of the OU7 offshore (particularly by MS-4Loc.1 and MS-3Loc.2) that appears to be the source of elevated [up to 20,500 milligrams per kilogram (mg/kg)] copper concentrations in offshore sediment at OU7. Nickel concentrations, although not as elevated as copper, also were greater at locations where copper concentrations were elevated. Chemical analysis of a sample of the slag (conducted during Round 4) indicated that the slag was

approximately 80 percent copper by weight (TtNUS, September 2001). Other constituents making up the slag included zinc (2 percent by weight), lead (1 percent by weight), and tin and nickel (slightly less than 1 percent by weight). During the RI, mapping was conducted to identify the locations of slag areas along the OU7 shoreline. The results were used to support the shoreline stabilization removal action discussed in Section 2.0.

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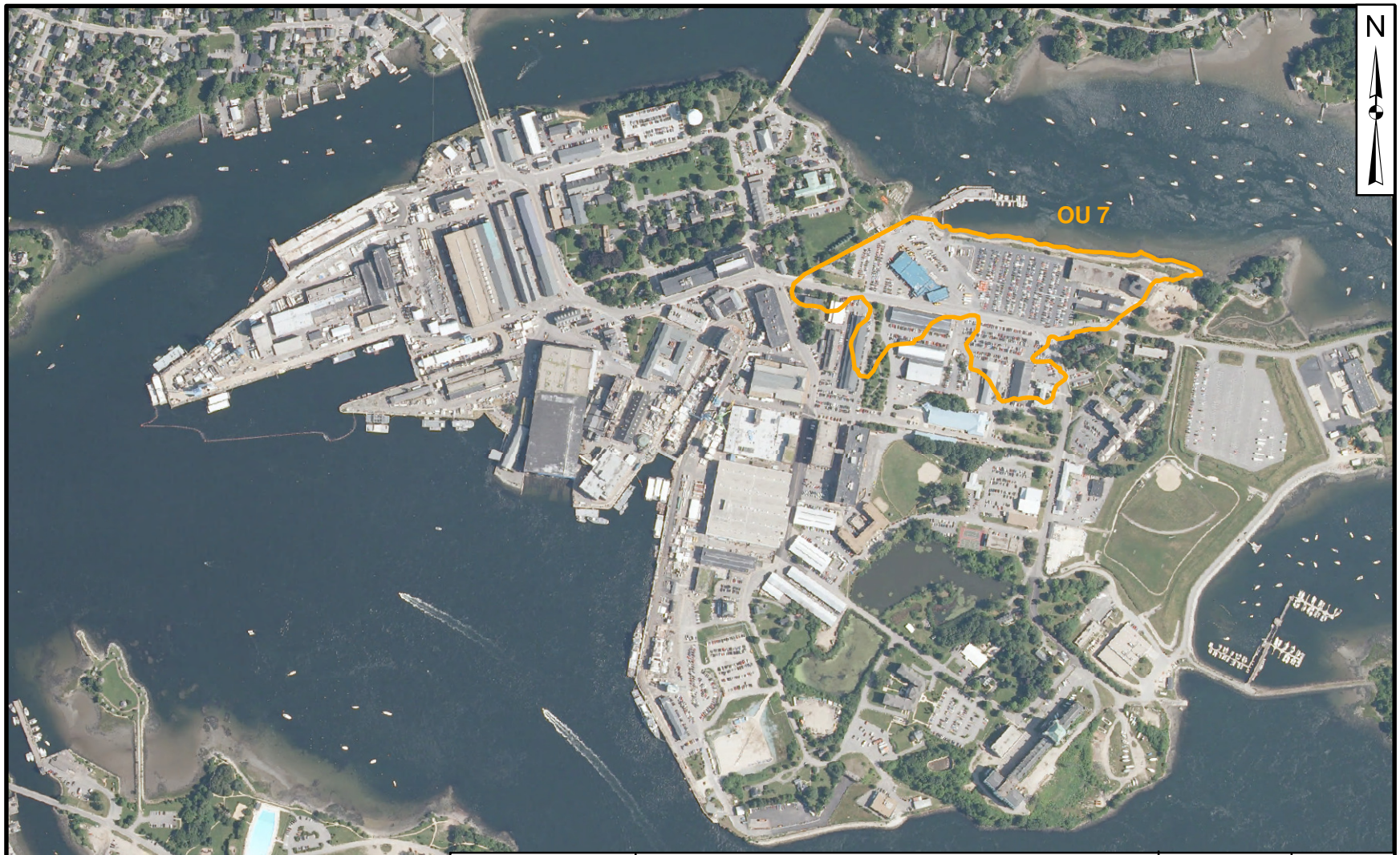

Aerial Photo Source:
2009 aerial photograph received from the USDA FAIP program.

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CHECKED BY A. CHRISTIAN	DATE 6/23/11	PORTSMOUTH NAVAL SHIPYARD VICINITY AND OPERABLE UNIT 7 LOCATION MAP PORTSMOUTH NAVAL SHIPYARD KITTERY, MAINE	APPROVED BY ____ / DATE ____
COST/SCHEDULE-AREA			APPROVED BY ____ / DATE ____
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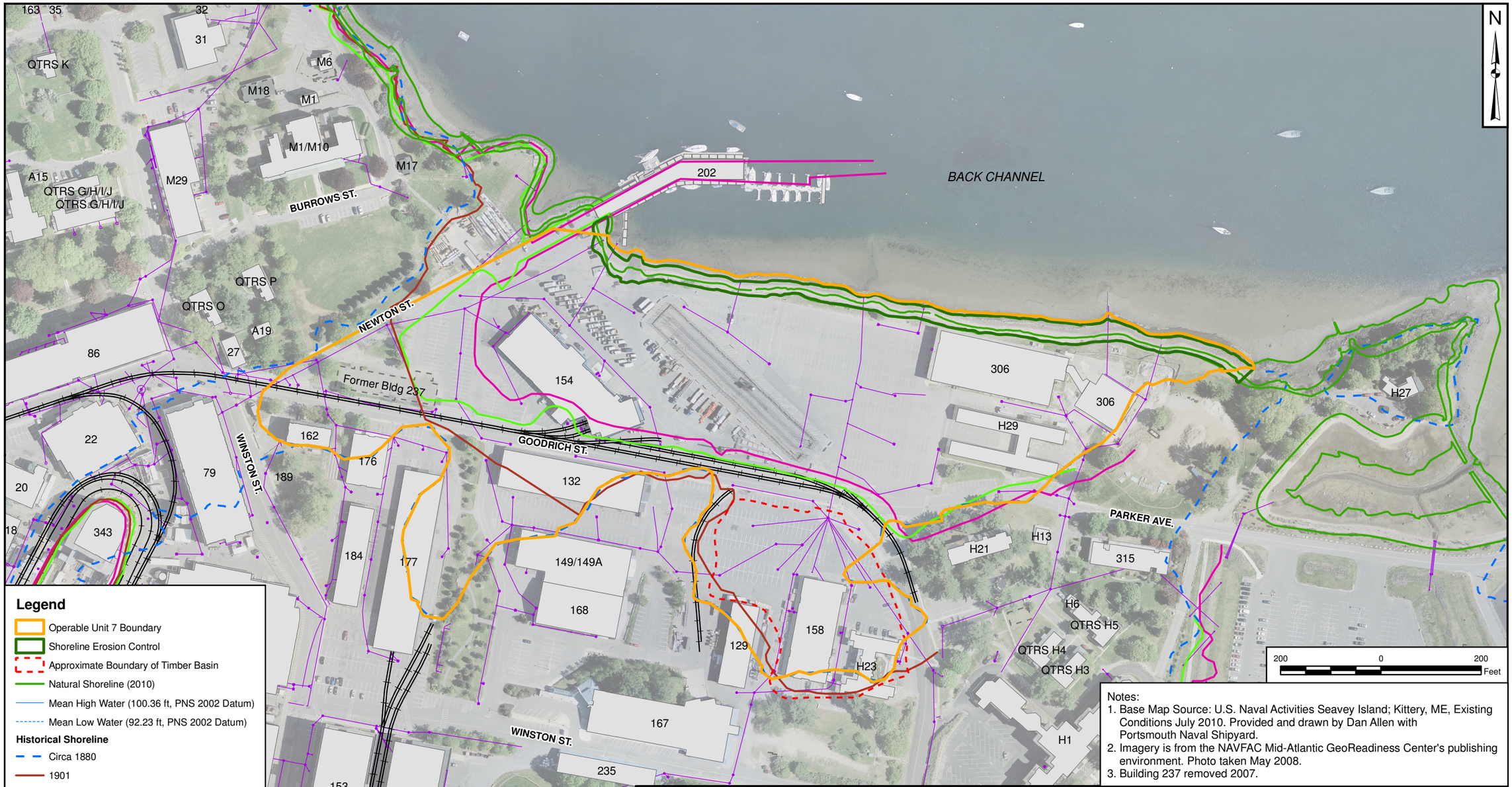

Legend

- Operable Unit 7 Boundary
- Shoreline Erosion Control
- Approximate Boundary of Timber Basin
- Natural Shoreline (2010)
- Mean High Water (100.36 ft, PNS 2002 Datum)
- Mean Low Water (92.23 ft, PNS 2002 Datum)

Historical Shoreline

- Circa 1880
- 1901
- 1910
- 1925
- Railroad
- Storm Sewer Line
- Existing Building
- Demolished Building

Notes:
1. Base Map Source: U.S. Naval Activities Seavey Island; Kittery, ME, Existing Conditions July 2010. Provided and drawn by Dan Allen with Portsmouth Naval Shipyard.
2. Imagery is from the NAVFAC Mid-Atlantic GeoReadiness Center's publishing environment. Photo taken May 2008.
3. Building 237 removed 2007.

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J. ENGLISH	04/28/11
CHECKED BY	DATE
A. CHRISTIAN	06/23/11
REVISED BY	DATE
S. STROZ	06/23/11
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TETRA TECH

SITE LAYOUT
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

CONTRACT NUMBER	CTO NUMBER
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FIGURE NO.	REV
FIGURE 1-2	0

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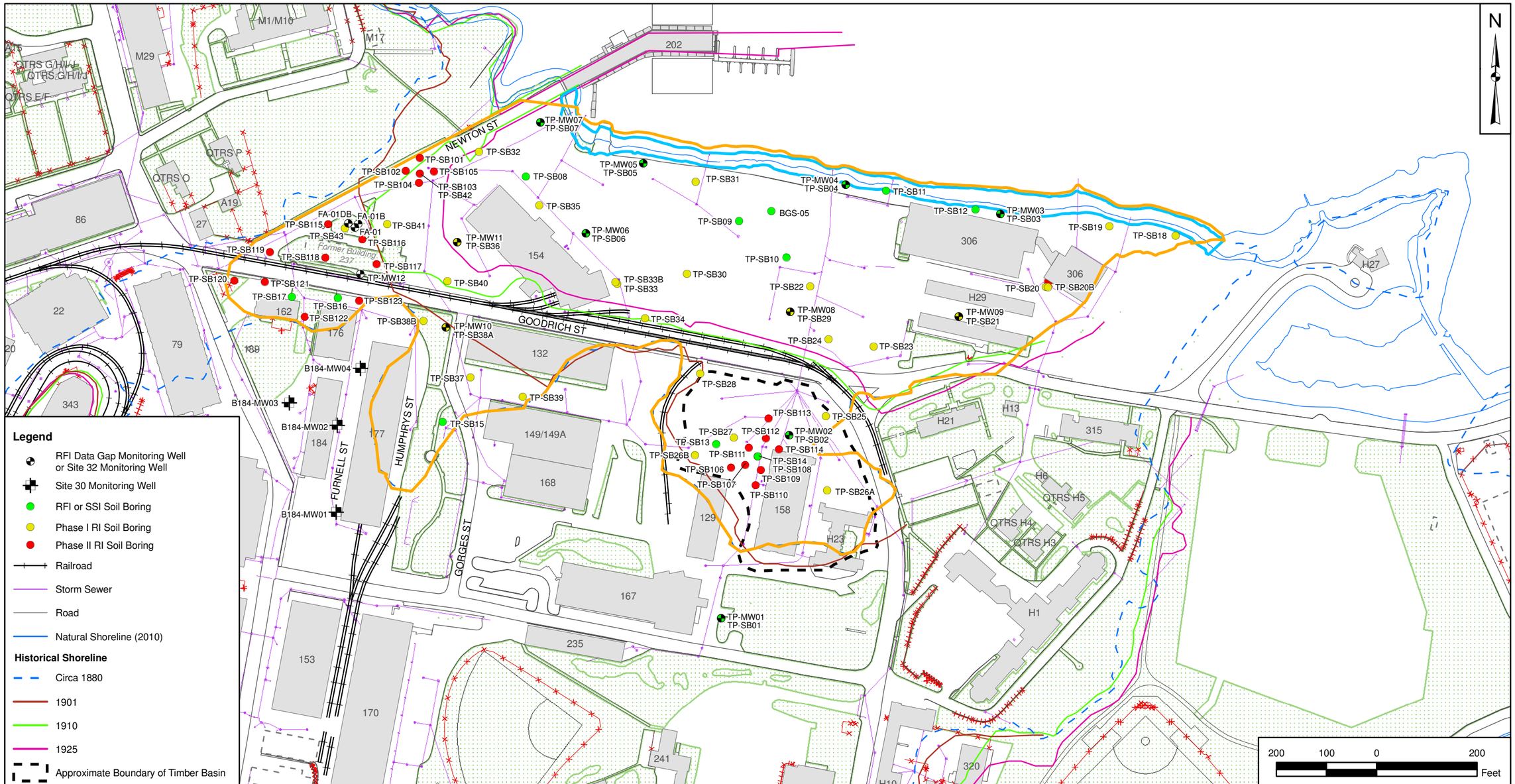

Legend

- RFI Data Gap Monitoring Well or Site 32 Monitoring Well
- Site 30 Monitoring Well
- RFI or SSI Soil Boring
- Phase I RI Soil Boring
- Phase II RI Soil Boring
- Railroad
- Storm Sewer
- Road
- Natural Shoreline (2010)

Historical Shoreline

- Circa 1880
- 1901
- 1910
- 1925
- Approximate Boundary of Timber Basin
- Shoreline Erosion Control
- Approximate OU7 Boundary
- Former Building
- Vegetation
- Building

Notes:
1. Base Map Source: U.S. Naval Activities Seavey Island; Kittery, ME, Existing Conditions July 2010. Provided and drawn by Dan Allen with Portsmouth Naval Shipyard.
2. Building 237 removed 2007.

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S. PAXTON	04/01/09
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A. CHRISTIAN	06/23/11
REVISED BY	DATE
S. STROZ	06/23/11
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TETRA TECH

ONSHORE SAMPLING LOCATIONS
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

CONTRACT NUMBER	OWNER NUMBER
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FIGURE NO.	REV
FIGURE 1 - 3	0

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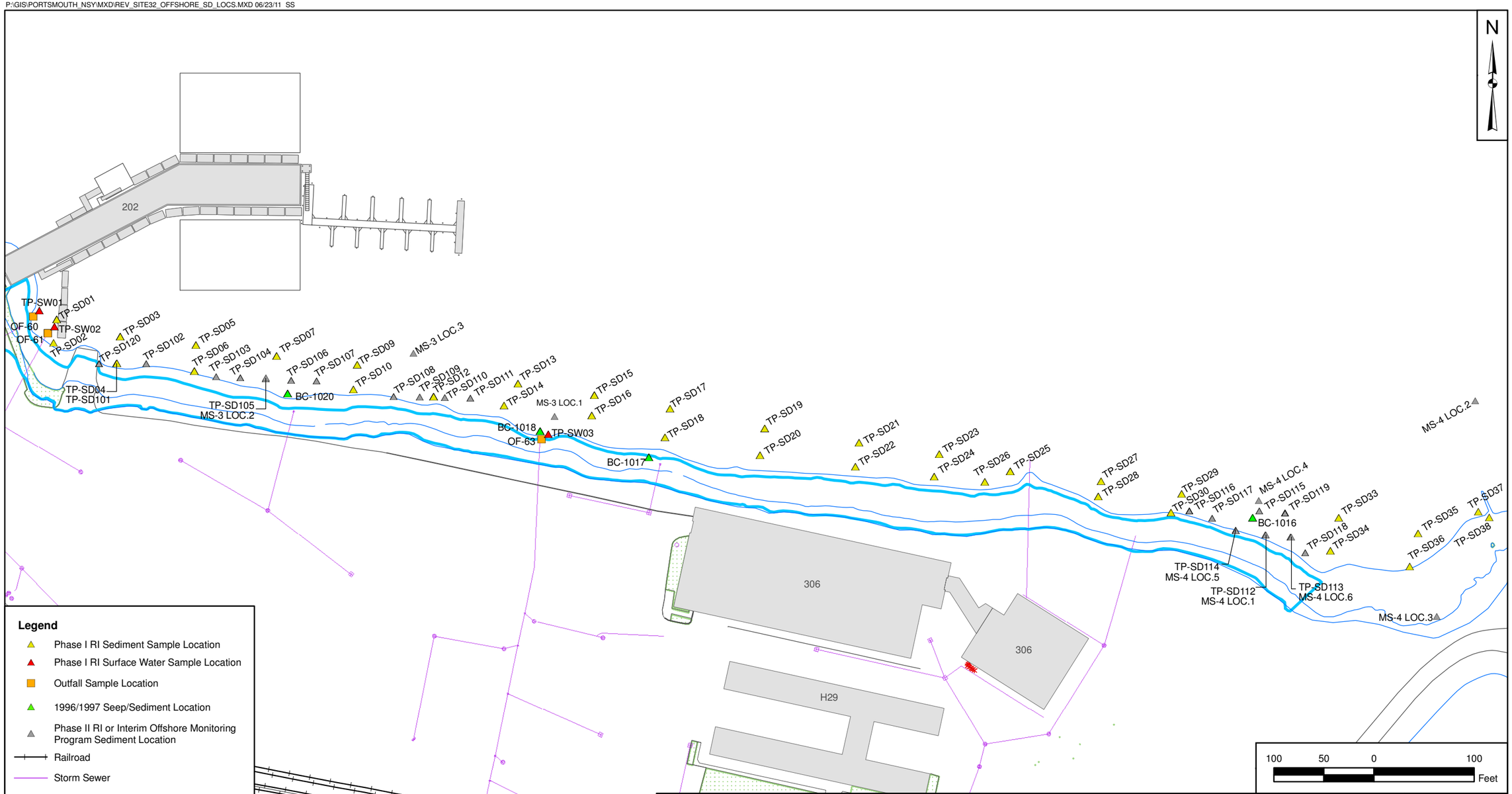

Legend

- Phase I RI Sediment Sample Location
- Phase I RI Surface Water Sample Location
- Outfall Sample Location
- 1996/1997 Seep/Sediment Location
- Phase II RI or Interim Offshore Monitoring Program Sediment Location
- Railroad
- Storm Sewer
- Road
- Natural Shoreline (2010)
- Shoreline Erosion Control
- Vegetation
- Building

Note:
Base Map Source: U.S. Naval Activities Seavey Island; Kittery, ME, Existing Conditions July 2010. Provided and drawn by Dan Allen with Portsmouth Naval Shipyard.

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CHECKED BY A. CHRISTIAN	DATE 06/23/11
REVISED BY S. STROZ	DATE 06/23/11
SCALE AS NOTED	

TETRA TECH

OFFSHORE AREA SAMPLING LOCATIONS
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

CONTRACT NUMBER 0383	OWNER NUMBER CTO 055
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FIGURE NO. FIGURE 1 - 4	REV 0

2.0 STUDY AREA INVESTIGATION

This section provides information on RI sampling activities, the shoreline stabilization conducted in 2006, and an data usability assessment of all the data included in the RI.

2.1 RI SAMPLING ACTIVITIES

The RI was conducted to define the nature and extent of contamination and to provide data to support the risk assessment. Data from the RI were also used to support evaluation of a potential interim action for the metals contamination (copper and nickel from slag) along the shoreline. Two phases of sampling were conducted as part of the RI, For Phase I, soil, sediment, groundwater, and intertidal surface water (outfalls and nearby surface water) samples were collected at the site. Facility background soil samples for dioxin/furan analyses were also collected at selected locations at PNS to support evaluation of data for OU7 and other IRP sites. Other activities during the Phase I investigation included surface mapping of the shoreline, a tidal study, and a wetlands functions and values assessment (TtNUS, January 2004). A list of samples collected as part of the RI sampling activities is included in Table A-1 in Appendix A-5. Figures 1-3 and 1-4 include RI sampling locations.

The surface mapping activity along the shoreline area included slag mapping in the intertidal zone, estimation of the proportion of intertidal areas covered by sediment suitable for sampling, and location of seeps/outfalls through visual observation. The tidal study was conducted before sampling groundwater to determine the magnitude of tidal effects, response times, potential aquifer interactions with storm sewers, and proper sampling times around low tide for tidally influenced monitoring wells. A summary of the wetlands functions and values assessment is provided in Section 3.0.

Data from Phase I of the RI and the SSI were evaluated to determine whether another phase of investigation (Phase II) to support the RI was necessary. The data evaluation focused on determining whether a Phase II investigation was required for groundwater, surface water, soil, and/or sediment based on the adequacy of the data set for risk assessment purposes and/or understanding of the nature and extent of contamination. Based on the evaluation of the Phase I results, it was recommended that one round of groundwater sampling; soil sampling in select areas to define the extent of high chemical concentrations detected [arsenic at TP-SB42 and polychlorinated biphenyls (PCBs) at TP-SB14]; and exploratory borings to define the extent of potential petroleum contamination noted in TP-SB36 be conducted. Chemical concentrations in soil samples around the former location of Building 237, in an area filled before 1910, were less than levels that would cause unacceptable risks and an additional investigation to determine the extent of this potentially clean fill area was recommended.

The purpose of Phase II sampling was to collect additional soil samples, and groundwater samples from OU7 wells and upgradient wells at Site 30, and sediment samples from the intertidal area. Based on the evaluation provided in the Technical Memorandum for Recommendations based on the Phase II RI, the Phase II data were determined to sufficiently fill the data needs identified after the Phase I RI (TtNUS, October 2009). Major conclusions based on the Phase II RI data were that no arsenic hotspot was present at TP-SB42, and TP-SB42 was removed from the data set, the PCB hotspot at TP-SB14 was delineated, free petroleum product and petroleum contamination were not found at TP-SB36, and a potentially clean fill area around the former location of Building 237 appeared to be sufficiently different than the remainder of Site 32 that it warrants further evaluation. As discussed in the OU7 RI Quality Assurance Project Plan (QAPP) (TtNUS, November 2008), evaluation of groundwater data showed that the quantitation limits for several PAHs in Phase I samples were an order of magnitude or more greater than the human health screening levels for groundwater in the SSI, and an additional round of groundwater data for PAHs was needed to confirm the results of the Phase I RI. PAHs were infrequently detected, and at concentrations less than the screening levels. Benzo(a)pyrene and dibenzo(a,h)anthracene detection limits for groundwater slightly exceeded the screening levels in Phase I and Phase II RI samples; other PAH detection limits were less than the screening.

2.2 2006 SHORELINE STABILIZATION

In June 2006, the Navy conducted an emergency removal action along the shoreline of OU7 to address erosion north of Building 306. Based on the presence of eroding debris, including foundry slag, the Navy removed surface debris and placed a shoreline control (a revetment structure) along the entire OU7 shoreline (approximately 1,200 linear feet). The purpose of the shoreline control was to prevent erosion, as described in the Final Closeout Report for Site 29 Removal of Waste Debris and Site 32 Shoreline Stabilization Report (TtEC, June 2008). The controls cover the high- to mid-tide portion of the shoreline and consist of a pea-stone layer to create the necessary grade for an 8-ounce, non-woven, geotextile fabric followed by two layers of graded rock. The initial layer of pea-stone eliminated the need to excavate into the fill material to set grade for installation of erosion protection materials. To ensure the integrity of the revetment structure, the revetment structure was constructed using multiple layers of increasingly larger material that limit the amount of fine-grained material migration through the revetment structure. The migration of the fine-grained material would eventually create voids behind the revetment structure large enough for the revetment structure to sink. Prior to installing stone, surface debris was removed and segregated for appropriate disposal off site. Approximately 500 pounds of wooden debris and 2,000 pounds of scrap metal debris were removed from the shoreline. The wooden debris consisted primarily of marine timbers that had washed ashore, and the metal debris primarily consisted of construction-derived waste (e.g., beam pieces, fence posts, etc.). The existing embankment rock (i.e., granite blocks) was utilized in the surface layer. An evaluation of the revetment is discussed in Section 3.0 of this RI.

The Interim Offshore Monitoring Program for OU4 showed that copper and nickel exceeded the OU4 Interim Remediation Goal (IRGs) at the monitoring stations offshore of OU7 (MS-3 and MS-4) and that additional sampling to determine the extent of copper and nickel contamination in sediment was necessary. The additional sampling was conducted as part of the Phase I RI. The 2006 shoreline stabilization removal action addressed the shoreline area where nickel and the majority of the copper contamination was found; however, in the mid- to low-tide zone, several sediment samples had concentrations of copper that exceeded the IRG. Additional sampling to determine the extent of copper contamination in sediment in the mid- to low-tide zone was conducted during the Phase II RI. Based on the evaluation of the Phase II data, the extent of copper contamination exceeding IRGs is sufficiently bounded (TtNUS, October 2009).

2.3 DATA USABILITY

As discussed in Sections 1.4 and 2.1, data for OU7 were generated during various investigations. The data used in the RI are from the groundwater monitoring investigation, seep/sediment investigation, Interim Offshore Monitoring Program, SSI, and RI sampling events (see Table A-1 in Appendix A.5). Most data were considered useable for evaluating the nature and extent of contamination and site risks. The following discussion of data usability identifies the major data considerations and limitations for the data used in the RI. Samples collected during these investigations were analyzed by fixed-base laboratories and validated in accordance with the project objectives provided in the appropriate investigation work plans/QAPP.

As stated in the OU7 RI QAPP (TtNUS, November 2008), after review of seep/sediment data from the Seep/Sediment Investigation, it was determined that samples for dissolved metals analyses were filtered to 0.45 micron and not to 0.2 micron for comparison to ecological screening levels and criteria. Therefore, the detected metals concentrations may overestimate concentrations that could be bioavailable for ecological evaluation; however, the data are of sufficient quality to use as part of RI data evaluation activities. The seep samples were collected in 1996 and 1997, and more recent data are not available. Seep data from 1996 and 1997 are not representative of current conditions because of changes to the shoreline that occurred as part of the 2006 shoreline stabilization. The seeps sampled in 1996 and 1997 (BC-1016, BC-1017, BC-1018, and BC-10200) are no longer present because the area was covered with shoreline controls and outfall pipes located at or near the seeps were exposed. The covered outfall pipes were the main cause for these seeps. Currently only minor seeps flowing over sediment can be seen in the low-tide area. The seeps flow over soft sediment that is difficult to walk on. The mid- to high-tide portion of the shoreline is covered with shoreline controls.

For the Interim Offshore Monitoring Program, the Data Quality Reviews (DQRs) for Rounds 1 through 4 were presented in the Baseline Report (TtNUS, July 2002), and the DQRs for Rounds 5 through 7 were presented in Appendix A of the Rounds 1 through 7 Report (TtNUS, November 2004). Overall, no gross deficiencies or representative concerns were raised during the individual round Data Quality Assessments (DQAs), and data were deemed suitable for inclusion in the Interim Offshore Monitoring Program. Metals were analyzed using two analytical methods, a NOAA analytical methods and a USEPA analytical method. As part of the Interim Offshore Monitoring Program, an evaluation of the correlation between metals results from NOAA and USEPA analytical methods was conducted. The evaluation, as described in the June 2004 Technical Memorandum Comparison of Analytical Methods for the Interim Offshore Monitoring Program for Operable Unit 4, showed a good correlation. The June 2004 Technical Memorandum from the Additional Scrutiny QAPP for OU4 (TtNUS, August 2005) is presented in Appendix B.4. Therefore, USEPA method equivalent concentrations were calculated using the regression equation for metals based on the observed NOAA concentrations.

For the Phase I RI, non-detected (minimum and maximum) values were compared to the target instrument detection limits (IDLs) or method detection limits (MDLs) provided by the laboratory. The compounds that exceeded the target values were then compared to the screening levels provided in the QAPP. Most non-detected values were less than screening levels; however, several soil samples had very high detection limits (more than 10 times greater than screening levels). The reporting limits from the historical data were the Contract Laboratory Program (CLP) Contract-Required Quantitation Limit (CRQLs), which were, in most cases much higher than the detection limits.

For the Phase II RI, it was determined that data are representative of site conditions. PAH compounds in sediment samples TPSD1120004 and TPSD1121216 (location TP-SD112) were qualified due to holding time exceedances. Upon consideration of the matrix, affected analytes, and applicable storage conditions, loss of analyte due to delayed analysis was considered not to be a significant concern that required rejection of the data. As discussed in the Phase II Technical Memorandum (TtNUS, October 2009), the arsenic result of 2,870 mg/kg at TP-SB42 was determined to be erroneous and was not included in the RI.

3.0 SITE CHARACTERIZATION

This section provides information on demography, land use, surface features, soils, geology, hydrogeology, surface water and hydrology, ecology, and climatology. Information on site characterization is used to support the evaluation of the nature and extent of contamination, development of the CSM, and understanding of potential site risks.

Elevations discussed herein, and throughout the RI, are based on the 2002 PNS Vertical Datum and Control Network. The 2002 PNS Vertical Datum equates Mean High Water (MHW) (which is 3.58 feet in the North American Vertical Datum (NAVD) of 1988) to 100.36 feet. Horizontal locations are based on the North American Datum (NAD) of 1983, Maine State Plane Coordinate System, West Zone.

3.1 DEMOGRAPHY AND LAND USE

PNS is located south of Kittery, York County, Maine, and is an island south of the Town of Kittery and east of Portsmouth, New Hampshire. Portsmouth, located in Rockingham County in southeastern New Hampshire, is equidistant from Portland, Maine, to the north and Boston, Massachusetts, to the south. PNS is situated in the Piscataqua River, approximately 200 feet from Kittery, Maine, and approximately 800 feet from Portsmouth, New Hampshire. PNS is connected to Kittery via two bridges on the northern side of the facility. PNS has approximately 90 officers and enlisted personnel and about 3,900 civilian employees (PNS, June 2007). Kittery, Maine, is a residential community of 9,500 people, and Portsmouth, New Hampshire, has a population of approximately 21,000 (based on the 2000 Census). Area industries include retail and wholesale trades, textiles, manufacturing, fishing, shipbuilding, power plants, and gas storage facilities. The countryside north and west of Kittery consists of forests and some farmland. Along the coast south of Portsmouth are small communities and seasonal dwellings.

Portsmouth is a part of the northeastern market area that serves about one-third of the nation's population in addition to eastern Canada. Major economic sectors in Portsmouth include tourism, retail and service industries, and fishing and agriculture. One of the area's major employers is PNS. The Port of Portsmouth is a center for exporters and importers of road salt, scrap metal, fuel oil, building materials, and other goods; many exporters are located in Portsmouth. Overall, more than 5 million tons of cargo per year are transported between the Atlantic Ocean and the port's dock. (Answers.com, June 2008).

Various vessels operate in Portsmouth Harbor including commercial tankers, cargo ships, fishing trawlers, lobster boats, recreational vessels, and submarines located at PNS. Commercial and recreational fishing activities occur in the harbor, including in the vicinity of PNS. Parts of the Portsmouth Harbor shoreline

are heavily developed, and PNS, commercial docks, and marinas dominate the landscape. Numerous parks and historical areas are also located nearby.

The Navy currently conducts maintenance of submarines at PNS. This activity is conducted mainly in the western portion of the facility in the Controlled Industrial Area (CIA) (the southern and southwestern portions of Dennett's Island, west of OU7), which includes all of the dry docks and submarine berths, and numerous buildings that house trade shops related to maintenance activities. Access to the CIA is tightly controlled and limited to individuals having appropriate clearances. Uses of other portions of PNS include administration offices, officers' residences, equipment storage, parking, and recreational facilities. However, only military operations (related to submarines) occur within the CIA, and no non-military residential or recreational facilities exist within the CIA.

A portion of PNS is on the National Register of Historic Places. The area between the two bridges connecting PNS to Kittery, Maine, was placed on the Register by the National Park Service in 1977. A Cultural Resources Survey of PNS was conducted in the early 2000s by Louis Berger Group, Inc. Based on the survey, the boundary of the PNS Historic District was expanded and includes the majority of the CIA. Two other historic districts were also identified in the survey (Portsmouth Naval Hospital and Portsmouth Naval Prison Historic Districts). According to the survey, the potential for prehistoric and historic archaeological resources, including architectural resources, exists at PNS; however, the entire OU7 area is a low-sensitivity area in terms of potential prehistoric and historic archaeological resource sensitivities, as defined by the Cultural Resources Survey (Louis Berger Group, April 2003). Building H29 is on the eastern side of OU7 and is part of the Portsmouth Naval Hospital Historical District. The Cultural Resources Survey notes that Building H29 is a structure that is a contributing element in the PNS Historic District.

The area of OU7 has been used for industrial and occupational uses since the early 1900s, and the current land uses at OU7 are industrial and commercial, with recreational use in the intertidal area (boat pier). The site is covered with pavement or buildings, with some small areas of grass landscaping. A boat ramp by Topeka Pier provides access to the intertidal area. Access to the intertidal area from other portions of OU7 is more difficult because of the steeper slope and rip rap along the mid- to high-tide portion of the shoreline. There is a Hospital Corps and temporary housing located at OU7; however, residential exposure to soil is not anticipated for OU7 because most of the area is covered by asphalt and concrete, and there would be little exposure to soil under a typical transient residential exposure.

3.2 SURFACE FEATURES

Approximate elevations at PNS range from a maximum of 160 feet at the interiors of the historical islands to 100 feet along the perimeter of the facility. Two-thirds of the facility is a high-density industrial area

containing over 300 buildings, and the remaining areas are flat to gently sloping grass-covered fields. Housing for military personnel is located in various areas of the Shipyard. Minor wooded areas exist on the eastern side of Jamaica Island. Two freshwater ponds are located in the central portion of the facility.

At OU7, elevations are highest in the southernmost area near Building 158 and decrease north to the shoreline. OU7 slopes to the north towards the Back Channel with elevations of 108 to 114 feet south of Goodrich Avenue. OU7 is relatively flat from east to west, with average elevations of 105 feet. The lowest elevation is in the northwestern portion of the site near the boat ramp (Figure 3-1).

OU7 is an industrial area predominantly covered by asphalt and concrete with small grassy areas near the edges. The shoreline is composed of a slope covered with shoreline revetment structure from high-to mid-tide and relatively flat, soft sediment in the low-tide area. Surface water runoff is collected by storm drains that discharge to storm water outfalls along the shoreline (Figure 1-2).

3.2.1 Shoreline Revetment Structure and Evaluation

A shoreline revetment structure was constructed in 2006 to address erosion along the OU7 shoreline behind and adjacent to Building 306, see Figure 1-4. This shoreline revetment structure is approximately 1,160 feet in length and averages 27 feet in width along the shoreline of OU7 as shown on the As-Built Plan (TtEC, June 2008). The following details what is known and unknown about this shoreline revetment structure.

Shoreline Revetment Construction

According to as-built details (Appendix A.6), the shoreline revetment is constructed (bottom to top) of pea-stone (used to establish grade), geotextile, and two layers of riprap. The geotextile and lower riprap layer were installed to stabilize the larger exposed riprap layer and to help minimize the migration of fine-grained material from behind the revetment structure to the surface water. The entire revetment structure extends from the mid-tide elevation to the existing top of slope (variable elevation). The following information is known about the material used to construct the shoreline stabilization revetment.

- **Pea-stone** was placed on the existing shoreline and was used to establish the grade on which the shoreline revetment structure was built. The pea-stone consisted of hard durable rock with a maximum size of 3/8 inch. Approximately 1,321 tons of pea-stone was used to establish the grade for the shoreline stabilization structure. The pea-stone thickness varied along the length of the shoreline stabilization structure.

- **Geotextile** was placed on the top of the pea-stone, extending from the mid-tide elevation to the top of the existing bank where it was keyed into the existing ground surface. The geotextile use was an 8-ounce, non-woven, needle-punched sheet of polymeric, AASHYO M 288-00 class 1 material. For the project, 5,930 square yards of geotextile (with 1 foot overlap at seams) were used. According to the final close-out report, the geotextile was placed to act as a filter allowing water to move though the material while containing finer soil particles in place.

- **Lower Riprap Layer** was placed over the geotextile along the length of the shoreline stabilization structure. The filter stone consists of ASTM #57 stone placed in a 6-inch-thick layer. Approximately 1,099 tons of this lower riprap layer rock was used to create the shoreline stabilization structure.

- **Upper Riprap Layer** was placed over the lower riprap layer rock along the length of the shoreline stabilization structure. The upper riprap layer rock consisted of 12-inch-diameter (minimum), sound, durable, angular rock which would not disintegrate upon exposure to water and weather. Original large granite blocks from the shoreline were reused as part of the upper riprap layer. The upper riprap layer rock used was classified as New Hampshire Department of Transportation (NHDOT) Section 583 Riprap A. Approximately 2,279 tons of surface layer rock was used to create the shoreline stabilization structure.

Shoreline Revetment Purpose

The overall purpose of the shoreline revetment structure is to prevent fill material along the shoreline from eroding under the forces that stormwater runoff and the Piscataqua River Back Channel exert upon the shoreline during storms and everyday tidal action. The purpose of the geotextile and lower riprap layer underlying the upper riprap layer is to create a filter that prevents the migration of finer-grained material found on the shoreline being protected from passing through the riprap revetment, creating voids into which the riprap revetment would fall and causing a failure of the shoreline stabilization structure if the voids become large enough. Depending upon the size of riprap used for the stabilization structure and the size of the fines within the shoreline being protected, geotextiles, stone, or multiple layers and combinations of each, can be used to create the filter system for the shoreline stabilization structure.

Shoreline Revetment Uncertainties

The uncertainties associated with the existing shoreline revetment structure include the design of the revetment structure components. These uncertainties are discussed below.

Revetment Design – A formal calculation is not available for the stone revetment system placed along the shoreline of OU7. As a result, it cannot be determined what strength of storm or wave action the shoreline stabilization revetment will withstand.

Revetment Filter Performance – Because there is no revetment design, an evaluation on the ability of the gravel and geotextile filter system, placed above the high-tide elevation to prevent the migration of fines through the revetment and into the Picataqua River during storm events or normal tidal changes, cannot be performed.

The uncertainties associated with the shoreline stabilization revetment can be addressed by developing a remedial action objective (in an FS) that protects the offshore area of OU7 from future erosion of contaminated soil from the shoreline of OU7. Additionally, with the detailed information provided on the materials used to construct the shoreline stabilization revetment, an evaluation can be performed to determine the filtering capabilities and strength of the revetment.

3.3 SOILS

Natural material overlying bedrock on the original islands consists primarily of glacial till that ranges in thickness from 0 to more than 20 feet. Between and around the islands, 0 to 50 feet of fine-grained sand, silt, and mud have been deposited as tidal flats and beach deposits. Additionally, much of the tidal sediment has been covered by fill material of varying composition since the Shipyard was established in 1800 (McLaren/Hart, March 1994).

The naturally occurring soil material at the Shipyard is classified as Lyman fine sandy loam. In general, where the Lyman is still present, the upper several feet (approximately 2 to 4 feet) of the soil has been disturbed.

There is no evidence of any native material (Lyman) in the filled areas at OU7. The site is mapped as Urban Land (at least 85 percent of the surface covered with urban structures) in the soil survey for York County (USDA, 2009). The entire site was filled from 1900 to 1945; therefore, surface material is composed of fill. The surface fill consists of silt, sand, gravel, and rock fragments. In addition, there is surface fill, which consists of these materials along with anthropogenic material (e.g., wire, brick, etc.). There is a thin veneer of sandy soil overlying this fill in the grassed areas. Detailed descriptions of the fill material are included in Section 3.4.

3.4 GEOLOGY

This section discusses regional and OU7 geology.

3.4.1 Regional Geology

The islands comprising PNS are formed on bedrock highs of the Kittery Formation with thin veneers of glacial till, recent alluvium, and fill materials. The bedrock is part of the Merrimack Group, which includes the Kittery, Berwick, and Eliot Formations. These formations consist of a variety of coarse-grained to fine-grained meta-sedimentary rocks that have been folded, faulted, and metamorphosed. The resulting rocks consist of schist, phyllite, quartzite, and slate. Plutonic rocks, primarily granite, diorite, and quartz monzonite, have intruded the Merrimack Group and occur in generally lenticular bodies that parallel the structural trend. The general structural trend is northeast (strike of faults and fold axes) (Halliburton NUS, November 1995).

As a result of erosion, the bedrock formations have been leveled and now have a gently uneven surface of low relief. Near the bedrock surface, fractures are pervasive because of weathering of the rock. On hills and ridges, weathered bedrock is veneered by glacial till, a result of the most recent glaciation (Wisconsinan). Other unconsolidated materials located along the coastal areas consist of beach deposits and tidal flats.

3.4.2 OU7 Geology

Borings have been advanced as part of environmental investigations at OU7 for the SSI, Phase I RI (2003), and Phase II RI (2008). In addition, geotechnical borings advanced as a part of construction of Buildings 306, the Transducer Testing Facility (east of Building 306), Building H29, and west of former Building 237. Environmental soil borings ranged in depths from 4 feet at TP-SB43 (western edge of OU7 near the original shoreline) to 57 feet at TP-SB11 (northeastern portion of OU7 near current shoreline). Appendix A provides a table of boring locations at OU7, their associated investigations, total depths, ground surface elevations (surveyed or estimated), if applicable, survey information, refusal depths, and depths to bedrock.

Detailed geologic cross-sections were developed for OU7 using the available boring and monitoring well construction logs [provided in Appendix A.2 on compact disc (CD)]. Figure 3-1 shows the soil boring cross-section locations, and Figure 3-2 displays the detailed geologic cross-sections. Surveyed elevations are provided for all monitoring well locations, and estimated elevations are provided for soil borings.

The current coastline and topography of OU7 was created by filling, and based on the historical shorelines as shown on Figure 3-1, all of the land at OU7 has been created by filling. Fill material is encountered from the ground surface to a maximum depth of approximately 23 feet bgs near TP-SB118, but fill material is

present across OU7 to varying depths. Based on depths to refusal during several different investigations, the bedrock surface generally slopes to the north and east towards the Back Channel. Bedrock depths across the site vary from 5 to 60 feet bgs. Bedrock is 5 feet bgs just to the southeast of the site near Building 184 and is deepest at approximately 60 feet bgs at TP-SB11.

Subsurface materials at OU7 include the following (from deep to shallow): bedrock; sand, silt, and clay with shell fragments; and surface fill, surface fill with debris, and/or waste. The bedrock at OU7 consists of a dark gray or greenish-gray quartzite. Sand, silt, and clay with shell fragments are native glaciomarine sediments that generally overlie the bedrock. The fill material (referred to in the following sections as surface fill or surface fill with debris) consists of large angular rock fragments, silt, sand, and gravel. By volume, the majority of the fill material consists of angular rock fragments composed of dark gray, fine-grained quartzite. Debris materials within the surface fill include slag, ash, metal, cinders, coal clinkers, wood, plastic, glass, concrete, porcelain, and brick, depending on the location at the site. In the cross-sections, areas referred to as surface fill contain no debris materials; areas referred to as surface fill with debris contain primarily surface fill by volume, with some occasional debris; and areas referred to as waste indicate that by volume, the subsurface area contained debris (as described above) with no soil material.

3.4.3 Cross-Section Description

Cross-sections A-A', B-B', C-C', and D-D' (Figure 3-1) show the nature and extent of surface and subsurface materials at OU7. The cross-sections are located on the same figure and have equivalent horizontal and vertical scales.

Cross-Section A-A'

Cross-section A-A' (Figure 3-1) represents a north-south section in the western portion of OU7, passing through Site 30, located south of OU7 - to the northwestern corner of OU7. The bedrock surface decreases in elevation from the southeast corner of Building 177 north towards Topeka Pier. The bedrock surface is approximately 3 feet bgs southwest of OU7 at B184-MW01. A bedrock low is present in the area of B184-MW02, and a bedrock high is present in the area of B184-MW04. The bedrock surface slopes gently from the bedrock high to the FA-01/FA-01B well cluster to approximately 24 feet bgs in central-western area of OU7. This area is the northern extent of the former Jenkin's Gut.

South of the former 1880 shoreline, which is outside OU7, silt with sand fills in the bedrock depression in the area of B184-SB02/MW02. The silt with sand is overlain by silt and clay.

North of the 1880 shoreline, bedrock is overlain by approximately 4 feet of sand with silt and trace gravel or rock fragments. Glaciomarine deposits of silty clay with sand and shell fragments is present at boring TP-SB122. Rock fragment fill overlies the sand and silt unit and the silty clay in this area.

Surface fill covers from the area south of B184-SB02/MW02 to northern end of the cross-section. The surface fill consists of sand with silt, gravel, and rock fragments. Debris material (consisting of metal, wood, plastic, and brick) was encountered in shallow surface fill in borings located around Building 184 as well as in boring TP-SB122 to the north.

Cross-Section B-B'

Cross-section B-B' (Figure 3-1) represents a north-south section in the eastern half of OU7, passing through the former timber basin to the current shoreline. The bedrock surface slopes to the north, decreasing in elevation from just south of the former timber basin north to the current shoreline. The bedrock surface is approximately 14 feet bgs in the area south of OU7 near Building 167 (TP-MW01) and 45 feet bgs near the current shoreline at TP-MW04. North of location TP-MW02, bedrock is overlain by between 0 and 12 feet of silty sand with trace gravel or rock fragments.

Overlying bedrock or the silty sand units, a layer of silt and clay with sand and shell fragments extends from south of TP-SB110 to the current shoreline. The silt and clay unit thickens toward the shoreline, with a thickness of 7 feet in the former timber basin to 20 feet along the shoreline.

Surface fill of sand, gravel, and rock fragments is present across the entire cross-section. Small pockets of surface fill with debris were encountered in borings located in the timber basin area and in the filled area north of Parker Avenue. The debris is characterized as surface fill that includes slag, ash, metal, cinders, glass, and brick. Wood was encountered between depths of 5 and 9 feet in the former timber basin.

Cross-Section C-C'

Cross-section C-C' (Figure 3-1) extends along the shoreline of the northern portion of OU7. The bedrock surface elevation varies across the northern portion of OU7, with low elevations between TP-SB08 and TP-SB05/TP-MW05 and in the area of TP-SB11. Silty sand with trace gravel or rock fragments fills the bedrock lows and extends farther east and west of the cross-section ends. The silty sand is absent on the area at TP-SB09.

Glaciomarine deposits of silt and clay with sand and shell fragments are present across the cross-section, with thicknesses ranging from approximately 20 to 37 feet.

Surface fill is present across the section. The surface fill is approximately 11 and 17 feet thick along the cross-section and consists of sand with varying amounts of silt, gravel, and rock fragments. Localized pockets of rock fragment fill were present at borings TP-SB08 and TP-SB12. Surface fill with debris is present in the area of TP-SB32 and in areas between TP-SB35 and TP-SB31, TP-SB04 and TP-SB11, and TP-SB19 and TP-SB18. The debris material included trace amounts of slag, metal, coal clinkers, glass, concrete, and brick.

Cross-Section D-D'

Cross-section D-D' represents an east-west section across the central portion of OU7. The bedrock surface varies across the section, with similar lows as cross-section C-C'. The bedrock is overlain by 1 to 2 feet of silty sand from TP-SB116 in the west to at least TP-SB10, the easternmost boring advanced to bedrock. Glaciomarine deposits of silt and clay with sand and shell fragments overlies the silty sand from west of TP-SB36/TP-MW11 to TP-SB20. The silt and clay unit varies in thickness from 8 feet at TP-SB06/TP-MW06 to approximately 22 feet in TP-SB10.

In the western end of the section, a thin layer of sandy silt with shell fragments was encountered overlying bedrock at TP-SB115. Sand or silt and clay were not observed in the area of FA-01/FA-01B well cluster. Rock fragment fill was observed overlying bedrock or the sandy silt, TP-SB115 to approximately the former 1901 shoreline.

The surface fill with debris was present overlying the glaciomarine deposits across the majority of the section from TP-SB41 through TP-SB20. The surface fill consisted of sand with gravel. The debris in the surface fill included slag, fabric, metal, coal clinkers, wood, glass, concrete, porcelain, and brick. Surface fill with no observed debris was present at the surface in the area west of TP-SB116 and in the area from TP-SB33 to TP-SB23.

Localized pockets of waste material were encountered in borings TP-SB36/TP-MW11, TP-SB06/TP-MW06, and TP-SB20. The waste material lacked observable soil and included wood chips, waste, slag, fibrous material, grit, coal clinkers, charcoal, ash, slag, metal, or brick. The waste was found in layers less than 5 feet thick and at different depths.

3.4.4 Summary of OU7 Geology

The following summarizes OU7 geology:

- The surface of the site is covered by surface fill consisting principally of sand with gravel, angular rock fragments, and silt. Debris material was found throughout the site intermingled with the surface fill. Rock fragment fill was present in the western end of OU7, in the area of former Jenkin's Gut between the 1880 and 1901 shorelines. A few localized pockets of waste material were encountered in the central portion of the site.

- Glaciomarine deposits, composed of varying mixtures of silt, clay, sand, and shell fragments, underlie the majority of the site, which mainly corresponds to the 1880 shoreline boundary.

- Silty sand underlies the glaciomarine deposits throughout much of the site, and metamorphic quartzite bedrock underlies the silty sand or the glaciomarine deposits directly.

- The bedrock surface slopes and the glaciomarine deposits thicken to the north towards the Back Channel. The fill material, including surface fill, metamorphic rock fill, and waste overlying the glaciomarine deposits, is relatively uniform at the surface and varies between 10 and 15 feet in thickness.

3.5 HYDROGEOLOGY

The following describes the hydrogeology of PNS and OU7. A detailed description of the hydrogeology of PNS is provided in the RFI Data Gap Report (Halliburton NUS, November 1995). The RFI Data Gap Report also provides detailed figures showing groundwater elevations at the facility at high tide and low tide and salinity data. Several other reports have detailed information pertaining to the hydrogeology at PNS including the RFI (McLaren/Hart, July 1992) and Groundwater Monitoring Summary Report (TtNUS, August 1999). These reports include estimates of hydraulic conductivities, groundwater elevations during several sampling events, and summaries of other hydrogeologic data collected (e.g., tidal data, groundwater quality parameter data during sampling, etc.). The discussion of the hydrogeology at OU7 is based principally on data collected during the SSI (1998) and the Phase I and II of the RI (2003 and 2008, respectively).

3.5.1 PNS General Hydrogeology

Groundwater is encountered within both unconsolidated materials and bedrock at the facility. In general, the unconsolidated overburden materials are moderately to highly permeable, and bedrock permeability is generally less than that of unconsolidated materials. Groundwater in bedrock occurs principally in fractures that intersect and enable groundwater to potentially travel in various directions. Near the bedrock surface, fractures are pervasive because of weathering of the rock. The size and

interconnectedness of the fractures generally decrease with depth, potentially limiting the movement of groundwater.

Groundwater levels in overburden at PNS are shallow, and groundwater flow directions generally mimic bedrock surface topography and are influenced by the thickness and composition of the overburden and tidal fluctuations. Overall, groundwater flow directions are from the original island interior toward the current coastline. The overall conceptual model of groundwater flow at the facility is that fresh groundwater originating from precipitation in the island interior flows downward and outward through both the overburden and bedrock. Tidal effects near the shorelines result in a localized back-and-forth movement of water between the overburden and bedrock; however, the net groundwater flow is outward into the Piscataqua River. Groundwater flow at the PNS facility is a localized system that is not affected by the mainland groundwater flow system.

For all areas along the coastline at PNS, tides play an important role in the hydrogeology. The Piscataqua River is a tidal estuary with diurnal tidal changes of up to 8 feet. At low tide, groundwater flow through the bedrock underlying the island interior has both lateral and downward components. At some locations in filled areas, groundwater in shallow bedrock moves upward toward the overburden. At some locations along the perimeter of the facility, there are upward gradients from deeper bedrock toward shallow bedrock. These potentials do not imply an actual discharge at these locations. The point of discharge for groundwater in deep bedrock depends on the relative strengths of the vertical and lateral components and the size and interconnection of fractures between the deeper bedrock and more shallow bedrock.

At low tide, groundwater flow directions essentially mimic the bedrock surface. From areas of high bedrock elevations on the original island, fresh water from precipitation infiltrates through the overburden into the bedrock and moves downward and laterally toward the filled areas. Hydraulic gradients are steepest where the bedrock surface slope is steepest and are less steep where the bedrock has a gentler slope. As groundwater moves toward the fill areas, groundwater elevations continue to decline and are similar in the bedrock and overburden. Vertical flow components in the bedrock are downward within the interior of the original island. At high tide, vertical gradients may reverse depending on the degree of seawater intrusion from the Piscatacua River into the overburden and hydraulic loading on the bedrock. Seawater intrusion is primarily enhanced by greater hydraulic conductivities, higher tidal elevations, and weaker opposing freshwater gradients from upgradient source areas. The load on groundwater in the bedrock is increased by seawater intrusion, the weight of water in the overburden, and a hydraulic connection to the tidal load.

PNS does not use groundwater for any purpose. Potable water is supplied to PNS from the Kittery Water District. Kittery's potable water supply originates from surface reservoirs located in the vicinity of York, Maine.

3.5.2 OU7 Hydrogeology

A total of 19 groundwater monitoring wells exist in and around OU7 (as shown on Figure 3-1), of which 14 are located within the OU7 boundary (FA-01, FA-01B, FA-01DB, TP-MW02, TP-MW03, TP-MW04, TP-MW05, TP-MW06, TP-MW07, TP-MW08, TP-MW09, TP-MW10, TP-MW11, TP-MW12). Five wells are located upgradient of the OU7 boundary, including four located southwest of OU7 near Building 184 (B184-MW01, B184-MW02, B184-MW03, B184-MW04) and one located south of the timber basin area (TP-MW01). Table 3-1 lists well construction details for the existing wells at OU7. OU7 monitoring wells range in total depth from 13 to 157.5 feet bgs and are screened in fill only, bedrock only, overburden only, overburden and bedrock, and fill and overburden. Screen lengths included 7 feet, 10 feet, 15 feet, and 20 feet and were selected based on the lithologies encountered and anticipated tidal fluctuations. Specific details concerning construction of the groundwater monitoring wells and hydraulic conductivity testing are provided in the Appendix A.

The hydrogeology of OU7 is primarily influenced by tidal changes in the Back Channel and the storm drainage network at OU7. During high tide, the groundwater in OU7 flows southward into the fill from the Back Channel and flows northward from the island interior toward the shoreline. During low tide, groundwater flows northward out of the fill material toward the Back Channel. The OU7 subsurface hydrology also appears to be influenced by the presence of the stormwater drainage network. This is evidenced by several rounds of groundwater measurements at low and high tide. Groundwater measurements across OU7 at low tide indicate groundwater lows around existing storm sewer networks (Figures 3-3 and 3-4). This is especially evident in the area west of Building 306.

Tidal effects are observed in many of the groundwater monitoring wells at OU7 because of its location along the Back Channel coastline and because the overburden is composed mainly of fill material. Several tidal studies have been performed at OU7 (see Appendix A.3). A tidal study was performed at OU7 during the RFI Data Gap Investigation (Halliburton NUS, 1995) during which wells FA-01, FA-01B, and FA-01DB were monitored over 25 hours. A tidal range of 0.5 foot was observed in the shallow well (FA-01) screened in the fill material (rock fragments). The bedrock wells (FA-01B and FA-01DB) exhibited greater tidal responses (approximately 2.0 and 1.4 feet, respectively), which was attributed to hydraulic loading from enhanced discrete permeability of the bedrock fractures and the low storability of the bedrock system. A tidal lag was not calculated for the OU7 wells during the RFI Data Gap Investigation, as no tidal gauge was installed in the area of OU7.

The shallow groundwater at OU7 is brackish with a salinity lower than the Back Channel, which has a salinity in excess of 20 parts per thousand (ppt). Brackish water is considered to have a salinity between 0.5 and 30 ppt. Fresh water has a salinity of less than 0.5 ppt, and sea water has a salinity of greater than 30 ppt. Salinity of groundwater within OU7 (located outside the original island boundary) ranges from approximately 3 to 26 ppt, an average of approximately 20 ppt, based on the Phase II RI field water quality measurements. In contrast, the salinity of groundwater upgradient to OU7 (located within the original island boundary) ranges from approximately 0.28 (B184-MW01) to 1.4 ppt (TP-MW01), with an average of 0.81 ppt. Groundwater in bedrock is also brackish, based on water quality at the FA-01 well cluster.

During Phase I of the RI activities, a tidal study was performed for monitoring wells screened within the saturated fill material at the site and at a tidal gauge installed in the Piscataqua River. The tidal study was conducted over two complete tidal cycles (i.e., more than 24 hours) in site monitoring wells in the overburden (TP-MW01 through TP-MW05, TP-M07 through TP-MW10, and FA-01) and in a stilling well attached to the Topeka Pier in the Back Channel. TP-MW06 was not equipped with a transducer, because the SSI Report (TtNUS, May 2000) indicated TP-MW06 showed less than a 0.02 feet difference between water levels measured at high tide and low tide, indicating that there was no significant tidal influence at this well. Electronic pressure transducers were installed. The transducer recorded the water levels at 5-minute intervals from 9 PM on April 28, 2003, to the afternoon of May 1, 2003, when tidal study data collection ended, with the exception of TP-MW08 and TP-MW01. These were started on April 29, 2003, following well development. Graphs showing the transducer data are included in Appendix A.3.

Tidal effects were observed in the wells equipped with transducers except TP-MW01 and TP-MW09, which both exhibited a decreasing water level trend. No tidal influence was observed in wells TP-MW01 and TP-MW09. Table 3-1 contains the tidal lag times for each well relative to low tide at Seavey Island. The lag time between low tide at Seavey Island and the first occurrence of the lowest water level (highest positive value) was noted for each well equipped with a transducer. The results of the tidal study indicated that the tidal lags are influenced by the presence of fill material and also by the stormwater drainage network. Wells in close proximity to the more extensive stormwater drainage networks tend to have shorter tidal lag times. Wells located within areas that were filled tend to be tidally influenced, whereas wells located in areas that were part of the original island tend to not be tidally influenced. Wells near the perimeters of the site also tend to have longer lag times. The decreasing water levels (less than 0.1-foot decrease observed) in wells TP-MW01 and TP-MW09 were likely related to background trend conditions. Both of these wells are relatively far from stormwater drainage networks that could influence them. TP-MW01 (an upgradient well) is distant from the shoreline and within the boundary of the original Seavey Island, reducing potential tidal influence.

In October 2008, a tidal evaluation of water levels at TP-MW06 and B184-MW01 to B184-MW04 was conducted to determine whether these wells were tidally influenced. The water level response observed in TP-WM06 had a change of at least 0.4 foot during the water level measurement period on October 23, 2008. The tidal lag was estimated to be 1 hour 10 minutes for this location. Two additional rounds of water levels were measured at OU7 and from the upgradient Site 30 monitoring wells on December 15 and 16, 2008, coincident with the predicted high and low tides in the Back Channel. The water level response to the tides at TP-MW12 was similar to the response observed in FA-01. TP-MW12 is located within the area between TP-SB117, TP-SB118, and TP-SB123, in which metamorphic rock fragments were encountered to depth. This is similar to FA-01. Both TP-MW12 and FA-01 are located within the historical shoreline (circa 1880) in which rock material was filled. Similarly, the groundwater elevations between FA-01 and TP-MW12 differed less than 0.1 foot over several tidal cycles during the synoptic water level measurements during the Phase II RI activities.

The water level response to the tide observed in the Site 30 wells was small (generally less than 0.2 foot). This was consistent with water level measurements during 1996 and 1997.

Groundwater levels that were collected on December 15 and 16, 2008, at high and low tides are presented in Table 3-1. The groundwater flow direction varies at OU7 between high and low tide. Because the tides influence many of the groundwater monitoring wells at OU7, collection of water level data was timed to coincide with high and low tides. Water level data have been measured at OU7 during various investigations since installation of the groundwater monitoring wells. Groundwater levels in December 2008 were similar to levels from the 1998 gauging event. The water level elevations from 1998 are included in Appendix A. Figures 3-3 and 3-4 show the low-tide potentiometric surface maps from December 15 and 16, 2008, respectively, and Figures 3-5 and 3-6 show the high-tide potentiometric surface maps from December 15 and 16, 2008, respectively. Groundwater flow across OU7 is consistent with the predominantly filled nature of the area. A tidal influence is evident across much of the site north of Goodrich Avenue and especially in monitoring wells along the current coastline. The upgradient wells (Site 30 wells and TP-MW01) are not tidally influenced; however, these are located in the area of the original island.

During low tides, the depths to groundwater were approximately 10 feet bgs in the most tidally influenced monitoring wells near the Back Channel, while the depths were as a shallow as 4 feet bgs in the upgradient wells to the south. At high tides, the depths to groundwater ranged between 3 and 7 feet bgs in the most tidally influenced monitoring wells near the Back Channel, while there is little change in the upgradient wells to the south.

During low tides, groundwater flowed from the interior of the island generally north toward the Back Channel. The stormwater drainage system appears to influence groundwater flow, with convergent flow to the pipes during low tides. During high tides, groundwater flow direction reversed near the shoreline and flowed south from the shoreline. This flow is met by groundwater flowing north from the interior of the island and developed an apparent low area that runs east to west in the area of TP-MW11.

Groundwater flow from the area south of Goodrich Avenue is relatively consistent in direction and gradient between low and high tides.

Horizontal gradients were estimated for the groundwater elevations measured on December 15 and 16, 2008. The tide heights for high tide were 8.7 feet and 8.6 feet relative to Mean Low Low Water (MLLW), and tide heights for low tide were -1.2 feet and -1.0 feet relative to MLLW. For the area north of Goodrich Avenue, three horizontal gradient lines were calculated for low and high tides for the December 15 and December 16 water level sets with six gradients averaged. The same was done for the area south of Goodrich Avenue. This distinction was made because the gradients differ significantly due to the nature of the subsurface in these two areas. South of Goodrich Avenue, the subsurface is primarily bedrock and is not part of the filled area of OU7, and potentiometric surface lines tend to be spaced more closely together, while north of Goodrich Avenue, the filled areas are more porous and the potentiometric surface lines tend to be spaced further apart. The high-tide gradients for the areas south and north of Goodrich Avenue were 0.0204 feet per foot (ft/ft) and 0.0097 ft/ft, respectively. As tidal water flows into the OU7 subsurface from the shoreline to the north, a groundwater low is created around Goodrich Avenue and is sandwiched between the groundwater high from the shoreline (tidal influx) and the groundwater high from the island interior (freshwater influx). The low-tide gradients for the areas south and north of Goodrich Avenue were 0.0208 ft/ft and 0.0121 ft/ft, respectively. In the FA-01 cluster, the vertical groundwater gradients on December 15 and 16 were upward at both low tide and high tide. The water level elevation in FA-01B was approximately 1 foot higher than in FA-01 at low tide, and at high tide, the water level elevation was approximately 2 to 2.5 feet higher in FA-01B than in FA-01. This indicates that the bedrock contributes to some portion of the groundwater at OU7 regardless of tide height.

The surface fill material, which is rocky in nature, as illustrated by the cross-sections in Figure 3-2, is relatively permeable. In -situ hydraulic conductivity tests (i.e., slug tests) were conducted in May 2003, during the Phase I RI. Slug tests were conducted in nine wells: TP-MW02, TP-MW03, TP-MW04, TP-MW05, TP-MW07, TP-MW08, TP-MW09, TP-MW10, and FA-01. The results of the slug tests are summarized in Table 3-2, and the supporting test analysis information is provided in Appendix A.4.

The hydraulic conductivity values ranged from 81 to 440 feet per day in the wells, with exception of wells TP-MW09 and TP-MW10, and had a geometric mean of 200 feet per day. The hydraulic conductivity

estimates in wells TP-MW09 and TP-MW10 were 2,360 and 3,750 feet per day, respectively. These wells appear to be localized areas of higher conductivity. A higher volume of sand around the well screen was necessary for construction of TP-MW09, suggesting a void space, and angular gravel was encountered in TP-MW10 at 9 to 15 feet. Additionally, the borehole of TP-MW10 was enlarged during drilling due to the fill material, and void spaces may have developed which were filled with sand during well installation. Therefore, the higher hydraulic conductivities measured in TP-MW09 and TP-MW10 may reflect the permeability of the sand in the void space rather than the formation permeability.

The hydrogeology of OU7 is consistent with the predominantly filled nature of the area. Tidal influence is strong across much of the site, especially at groundwater monitoring wells near the current coastline. All wells within the OU7 boundary are tidally influenced, aside from TP-MW09, FA-01B, and FA-01DB. FA-01B and FA-01DB are both screened in the bedrock, well below the fill. The upgradient monitoring wells (Site 30 wells and TP-MW01) are not tidally influenced. The upgradient wells are located outside of the 1880 shoreline, which is equivalent to the OU7 boundary. Water levels were not recorded at TP-MW11; therefore, tidal influence at this monitoring well is not known. During low tides, the depth to groundwater is approximately 10 feet bgs in the most tidally influenced monitoring wells near the coastline of OU7, while it is a little as 4 feet bgs in the upgradient wells to the south. At high tides, depths to groundwater range between 3 and 7 feet bgs in the most tidally influenced monitoring wells near the coastline of OU7, while there is little change in the upgradient wells to the south. At low tide, groundwater flows from the interior of the island toward the coastline, roughly north. There appears to be some channelized flow along the location of a stormwater discharge pipe that runs from near TP-MW02 north to TP-MW04. At high tide, groundwater flow direction reverses near the shoreline, and flows south to a low trough that runs east to west along the southern boundary of OU7. This flow is met by groundwater flowing north from the interior of the island. This trough appears to have a low point between TP-MW10 and TP-MW11.

3.6 SURFACE WATER USE AND HYDROLOGY

About 3 miles inland from the Atlantic Ocean, PNS is located at the mouth of a broad tidal basin for inland rivers that comprise the Great Bay Estuary. The Great Bay Estuary is strongly influenced by tides, and the Piscatacua River is an ocean-dominated system. The City of Portsmouth lies on the western banks of the Piscataqua River. On the opposite bank of the Piscataqua is the Town of Kittery, Maine, in which PNS is located. The only seaport in the State of New Hampshire, Portsmouth has one of the deepest harbors in the world (Answers.com, June 2008).

Portsmouth Harbor's main channel is approximately 75 feet below Mean Low Water (MLW), and the Back Channel is approximately 20 feet deep MLW in the vicinity of Seavey Island. The salinity of the surface water exceeds 20 ppt, and surface water in the area is not suitable for drinking (McLaren/Hart, March

1994). Commercial, recreational boating, and lobstering activities are conducted in the Back Channel in the general vicinity of OU7.

Much of the shoreline of the estuary is undeveloped, but industrial activities in southeastern New Hampshire, such as foundries and tanneries, have discharged wastes into the estuary, especially from 1940 to 1976. There are many point-source and non-point-source discharges throughout the Great Bay Estuary, including permitted discharges (TtNUS, October 1999). According to the Strafford Regional Planning Area New Hampshire Regional Master Plan (Stafford, May 2005), 44 communities are located in the New Hampshire portion of the Piscataqua River Basin including the Great Bay Estuary and Coastal Drainage Area. Sixteen of the communities have municipal sewage treatment plants or wastewater treatment facilities (e.g., wastewater pollution control facilities). The nearest wastewater treatment plant to PNS is the Portsmouth Wastewater Treatment Facility, located at Pierce Island southwest of PNS (see Figure 1-1). Portsmouth Wastewater Treatment Facility is approximately 1,100 feet southwest of PNS.

PNS is a well-developed highly industrialized area with limited natural surface water drainage. PNS is equipped with an extensive stormwater collection system that drains to the Piscataqua River. Direct surface water runoff also enters the Piscataqua River. Based on a flood zone map for the PNS area, the 100-year flood zone in the vicinity of OU7 is at an elevation of 105 feet, and a portion of OU7 is between the 100-year and 500-year coastal flood zone (FEMA, July 1986). The shoreline of OU7 is at an elevation of approximately 105 feet, and flooding could occur near the shoreline.

According to the Maine Department of Marine Resources (DMR) regulations, effective February 2004, and as updated in August 2008, because of pollution, it is unlawful to collect clams, quahogs, oysters, and mussels from the shores, flats, or waters of Kittery, Eliot, and South Berwick southeast of a line across the Piscataqua River at the Memorial Bridge and northwest of a line running from Jaffrey Point, Newcastle Island, in New Hampshire to the dock at Fort Foster, Gerrish Island, in Maine, which includes the PNS area. In addition, a special permit is required for a restricted area north of the line across the mouth of Spinney Creek at the Causeway (Maine DMR, August 2008).

The New Hampshire Department of Environmental Services (NHDES) is responsible for the classification of shellfish-growing waters to determine whether water quality is acceptable for shellfish harvesting. The NHDES uses the National Shellfish Sanitation Program to establish criteria and methodology to classify the shellfish-growing waters. The river waters around PNS are currently closed for shellfish harvesting. These closures are described in more detail in the NHDES Shellfish Program: 2005 Annual Report (June 2006). As discussed in this report, the closures are caused by fecal coliform bacterial loading from wastewater treatment plants.

Semi-diurnal tidal currents, the horizontal motions associated with tidal changes in water levels, predominate in Portsmouth Harbor. Near Seavey Island, the mean tidal range is 8.1 feet. The overall ebb and flood currents in the vicinity of PNS are high. The average flood currents range from 3.0 knots south of Seavey Island to 3.3 knots southwest of Badgers Island (located approximately 1,000 feet east of PNS). The average ebb currents are 3.8 knots south of Seavey Island and 3.7 knots southwest of Badgers Island. Because of the strong currents, most ships wait for favorable tides before moving up and down the narrow Piscataqua River. The estimated flushing rates of Portsmouth Harbor and the lower reaches of the Great Bay Estuary range from 3.3 to 6.3 tidal cycles (McLaren/Hart, March 1994).

3.7 ECOLOGY

PNS is a highly developed industrial property with limited vegetative growth. A few areas at PNS, such as Clark's Island, have habitat for ecological receptors, but most of the ground cover consists of landscaping plants, with only scattered remnants of naturally occurring species. Because of its general lack of habitat and the intensity of surrounding human and industrial activity, most of PNS is unattractive for most species of wildlife.

OU7 is mostly paved or covered with buildings. There is a narrow grassy area along the shoreline to the north and some smaller grassy medians with few trees near the edges of the site. OU7 provides limited habitat for some ecological receptors, as discussed herein.

No known endangered, threatened, or protected species or critical habitats are located within the boundaries of PNS, including OU7. PNS is not included in the critical habitats of any species (Maine Fisheries and Wildlife, January 1989; NFEC, August 1993). The short-nosed sturgeon is a federally endangered species found along the eastern seaboard, but has no critical habitats located within the State of Maine. Populations in Maine are found in the Sheepscot, Kennebeck, Androscoggin, and Penobscot Rivers, and Merrymeeting Bay (Maine Department of Inland Fisheries and Wildlife, 2003).

The OU7 offshore area is within the Back Channel AOC; however, eelgrass and salt marshes are not present in the OU7 offshore area. Rocky intertidal area is where the shoreline revetment (riprap in high- to mid-tide area) was placed. Intertidal mudflats are present in the low-tide area and the pelagic and channel bottom/subtidal areas are further offshore in the Back Channel. The channel bottom/subtidal habitat is the bottom of the pelagic area and includes hard-bottom areas and fine-grained depositional areas. The hard-bottom areas occur in regions experiencing tidal scouring and active erosion, such as by areas of the Shipyard in the main flow of the Piscataqua River. The fine-grained depositional areas occur outside the main flow of the Piscataqua River, along the Back Channel, Jamaica Cove, and Clark Cove. Eelgrass areas (characterized by the presence of the rooted marine angiosperm *Zostera marina*) occur in subtidal areas by Jamaica Cove, Clark Cove, Sullivan Point, the Dry Docks, and in the Back Channel.

Intertidal mudflats are generally muddy-sand or sandy-mud areas fringing the shoreline along the Back Channel, off Jamaica Island (in Jamaica Cove), and around Clark's Island. Salt marsh habitats have been identified inside Clark Cove, by Clark's Island, and in the Back Channel (including Jamaica Cove.)

The wetlands functions and values assessment was conducted in 2003 for the intertidal area of OU7 in accordance with the QAPP and following the New England District of the United States Army Corps of Engineer's procedure termed the "Highway Methodology." The assessment, originally provided in Appendix E of the Site 32 Phase I RI Data Package, is included as Appendix A.7. The OU7 wetland provides a variety of functions and values ranging in quality from low to high in quality, which is consistent with a developed shoreline area. The middle and lower intertidal zones provide relatively high wetland functions and values. The low functions and values assessments are probably a result of the development of the site and the filling, placement of rip-rap, paving, and building construction of upland areas. This has resulted in some low-quality habitat and low species diversity, especially in the upper tidal and upland areas of the site.

The wetland resources associated with the OU7 study area as of 2003 exhibit moderate value. The three principal factors influencing the lower value of the wetlands include: (1) dense development of the surrounding area; (2) presence of fill materials and rip-rap within the historical tidal area; and (3) altered local, natural hydrologic regime (i.e., flow obstructions/constructions from docks, loss of creeks, and rip-rap/fill).

3.8 CLIMATOLOGY

Climatology information was taken from the NOAA internet site for the National Climatic Data Center Office for the Portland, Maine, weather station, which is the NOAA coastal weather station closest to PNS. The climatological data for Portland, Maine, are based on mean observations from 1975 to 2006 (NOAA, January 2007). Precipitation (including liquid water equivalent for snowfall) is fairly evenly distributed over the year, with approximately 3 to 5 inches falling per month, for an annual total of approximately 46 inches for Portland. Monthly average temperatures for Portland range from approximately 20 to 40 degrees Fahrenheit (°F) from November through April and from approximately 50 to 70°F from May to October. Snowfall occurs mostly from November to April, with a little snow occurring in October and May. The annual snowfall is approximately 24 inches. Portsmouth's climate tends to be similar to Portland's; however, because of its location near the ocean, there tends to be a little less snow and more rainfall in Portsmouth than in Portland.

TABLE 3-1

WELL CONSTRUCTION DATA AND SUMMARY OF HIGH- AND LOW-TIDE ELEVATIONS
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Well ID(1)	Original Datum	Ground Elevation (feet)	Top of Riser Elevation (feet)	Top/Bottom of Screen (feet bgs)	Screened Formation	Total Depth (feet bgs)(2)	Depth to Bedrock/ Refusal (feet bgs)	Hydraulic Conductivity (feet/day)	Tidal Lag Time (Hr:Mn)	Top of Screen Elevation (feet)	Bottom of Screen Elevation (feet)	December 15, 2008 Water Levels				December 16, 2008 Water Levels			
												High Tide (feet below top of PVC riser)	Low Tide (feet below top of PVC riser)	High Tide Elevation (feet)(3)	Low Tide Elevation (feet)(3)	High Tide (feet below top of PVC riser)	Low Tide (feet below top of PVC riser)	High Tide Elevation (feet)(3)	Low Tide Elevation (feet)(3)
Site 32 Wells																			
FA-01	PNS 2002	106.84	106.32	4.0-14.0	Fill	14	14	439.8	3:40	102.84	92.84	7.71	7.97	98.61	98.35	7.92	8.15	98.40	98.17
FA-01B	PNS 2002	106.86	106.18	40.0-55.0	Bedrock	55	23.5	NM	NT	66.86	51.86	6.06	8.67	100.12	97.51	6.60	8.77	99.58	97.41
FA-01DB	PNS 2002	106.86	106.39	137.5-157.5	Bedrock	157.5	22	NM	NT	-30.64	-50.64	7.98	NA	98.41	NA	10.10	9.30	96.29	97.09
TP-MW02	PNS MHW	108	107.61	4.0-14.0	Overburden	14.5	28.8	80.51	1:50	104	94	7.46	8.31	100.19	99.34	4.80	8.69	102.85	98.96
TP-MW03	PNS MHW	105.24	105.01	3.5-13.5	Fill/Overburden	14	47	70.81	3:30	101.74	91.74	3.48	6.26	101.57	98.79	4.43	6.37	100.62	98.68
TP-MW04	PNS MHW	104.94	104.57	3.5-13.5	Fill/Overburden	14	44.9	310.1	2:00	101.44	91.44	2.37	9.85	102.24	94.76	3.00	9.65	101.61	94.96
TP-MW05	PNS 2002	104.89	104.61	3.5-13.5	Fill/Overburden	14	34.6	133.3	2:10	101.39	91.39	6.20	5.67	98.41	98.94	6.65	6.22	97.96	98.39
TP-MW06	PNS MHW	105.83	105.43	4.5-14.5	Fill/Overburden	15	22	NM	1:10	101.33	91.33	6.61	6.47	98.86	99.00	6.70	6.75	98.77	98.72
TP-MW07	PNS MHW	104.69	104.28	4.0-14.0	Fill	14.5	47.2	439.8	3:40	100.69	90.69	2.04	8.22	102.28	96.10	3.14	8.26	101.18	96.06
TP-MW08	PNS 2002	105.57	105.21	6.0-13.0	Fill/Overburden	14	NE	326.5	2:40	99.57	92.57	5.56	9.80	99.65	95.41	4.86	9.85	100.35	95.36
TP-MW09	PNS 2002	106.99	106.53	4.0-14.0	Fill/Overburden	16	NE	2365.7	NT	102.99	92.99	6.33	6.38	100.20	100.15	6.46	6.62	100.07	99.91
TP-MW10	PNS 2002	106.77	106.47	6.0-13.0	Fill/Overburden	14	NE	3745.3	0:25	100.77	93.77	7.62	8.51	98.85	97.96	8.63	8.78	97.84	97.69
TP-MW11	PNS 2002	105.74	105.16	5.5-15.5	Fill	15.5	NE	NM	NA	100.24	90.24	6.22	5.20	98.94	99.96	7.16	7.55	98.00	97.61
TP-MW12	PNS 2002	106.69	106.36	8.0-18.0	Fill	18	NE	NM	3:40(4)	98.69	88.69	7.75	7.98	98.61	98.38	8.02	8.18	98.34	98.18
Upgradient Wells																			
TP-MW01	PNS MHW	114.37	113.91	6.5-16.5	Overburden/ Bedrock	16.5	13.5	NM	NT	107.87	97.87	3.96	4.00	109.99	109.95	4.10	4.09	109.85	109.86
B184-MW01(5)	PNS MHW	108.77	108.36	3.5-13.5	Overburden/ Bedrock	13.5	4.4	NM	NT	105.27	95.27	3.92	3.97	104.48	104.43	3.89	3.88	104.51	104.52
B184-MW02(5)	PNS MHW	107.68	107.32	10.0-20.0	Overburden	20.5	20.5	NM	NT	97.68	87.68	4.61	NA	102.75	NA	4.80	4.75	102.56	102.61
B184-MW03(5)	PNS MHW	107.76	107.43	3.5-13.5	Overburden	14.1	14.1	NM	NT	104.26	94.26	5.00	6.15	102.47	101.32	5.13	5.11	102.34	102.36
B184-MW04(5)	PNS MHW	107.86	107.43	8.0-18.0	Bedrock	18.4	5.5	NM	NT	99.86	89.86	4.08	5.03	103.39	102.44	6.23	6.22	101.24	101.25

(1) FA wells were installed as part of the RFI Data Gap Investigation in 1994; however, wells were converted to flushmount in November 2008 and riser elevation is from resurvey in January 2009.
TP wells were installed as part of the Site 32 Site Screening Investigation or Remedial Investigation (Phases I or II).
Except for TP-MW01, TP wells and FA wells are located within Site 32.
TP-MW01 and B184 wells are located upgradient of Site 32.
(2) Total depth of monitored interval.
(3) Water level elevations are all relative to PNS 2002 Datum.
(4) Tidal lag for FA-01 used.
(5) B184 wells were installed as part of the Site 30 Site Screening Investigation.

bgs	Below ground surface
NE	Bedrock not encountered
NT	Well known not to be tidally influenced
NA	Water level not recorded
NM	Hydraulic conductivity not measured
PNS 2002	Mean High Water = 100.36 feet
PNS MHW	Mean High Water = 100.32 feet

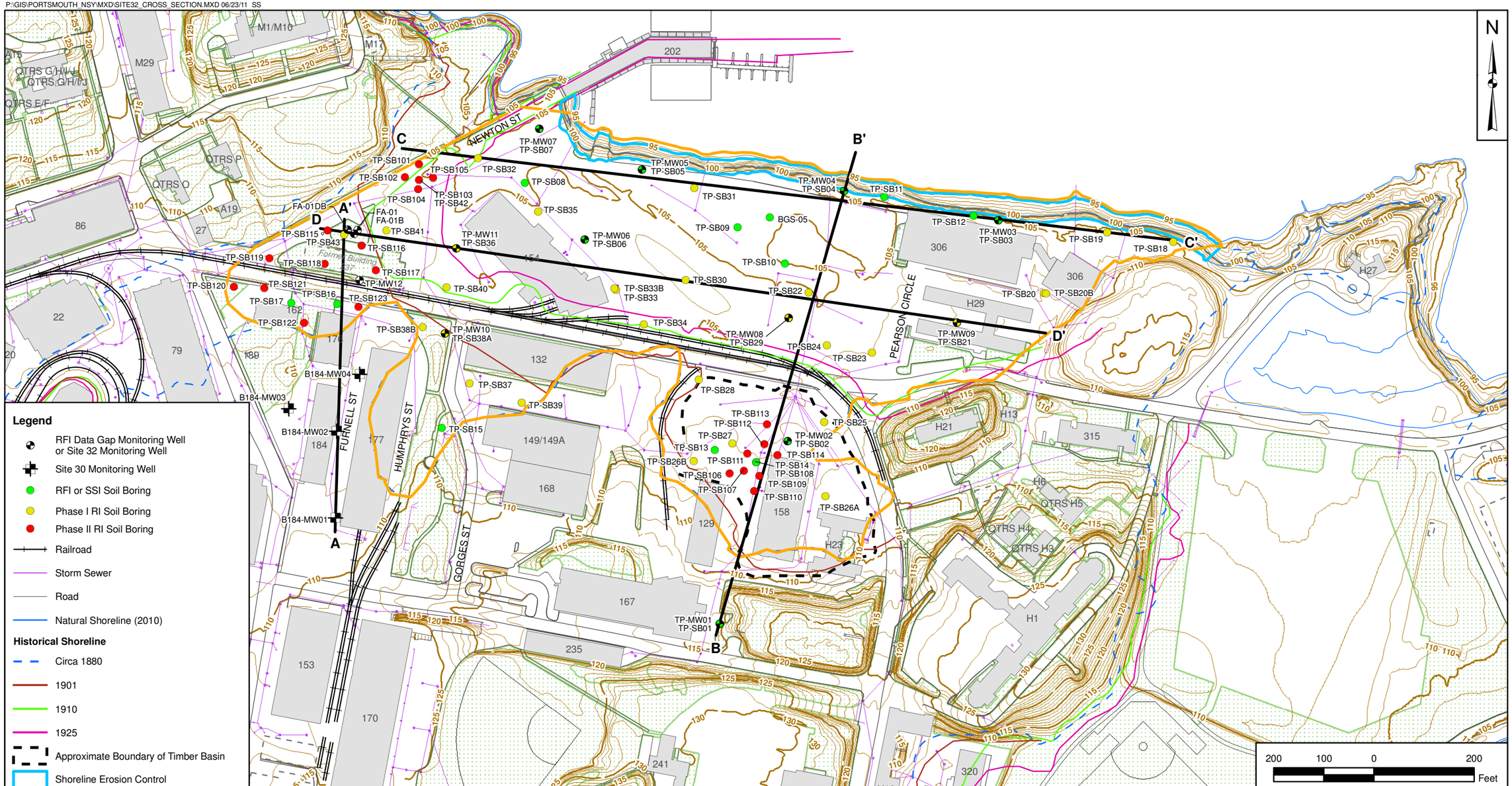
TABLE 3-2

HYDRAULIC CONDUCTIVITY SUMMARY
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Well	Test Type	Hydraulic Conductivity (K)	
		(feet/day)	(cm/sec)
TP-MW02	Rising-head	80.51	2.84E-02
TP-MW03	Rising-head	70.81	2.50E-02
TP-MW04	Rising-head	310.1	1.09E-01
TP-MW05	Rising-head	133.3	4.70E-02
TP-MW07	Rising-head	439.8	1.55E-01
TP-MW08	Rising-head	326.5	1.15E-01
TP-MW09	Rising-head	2365.7	8.35E-01
TP-MW010	Rising-head	3745.3	1.32E+00
FA-01	Rising-head	439.8	1.55E-01
	Arithmetic Mean	879.1	3.29E-01
	Geometric Mean	370.6	1.28E-01
	Arithmetic Mean(1)	257.3	4.23E-01
	Geometric Mean(1)	204.4	2.41E-01

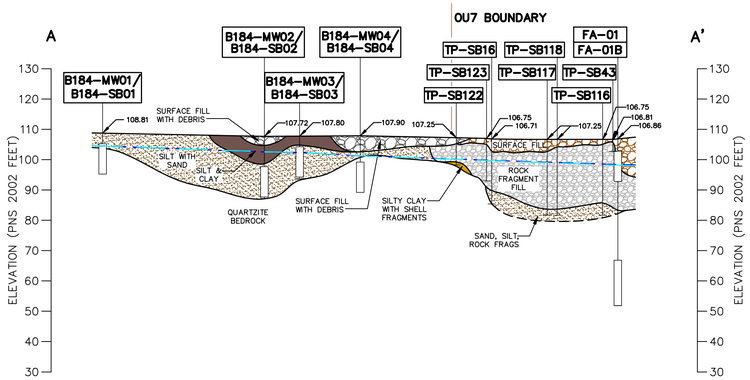
(1) TP-MW09 and TP-MW10 appear to be localized areas of higher conductivity and were excluded from the arithmetic and geometric mean calculations.

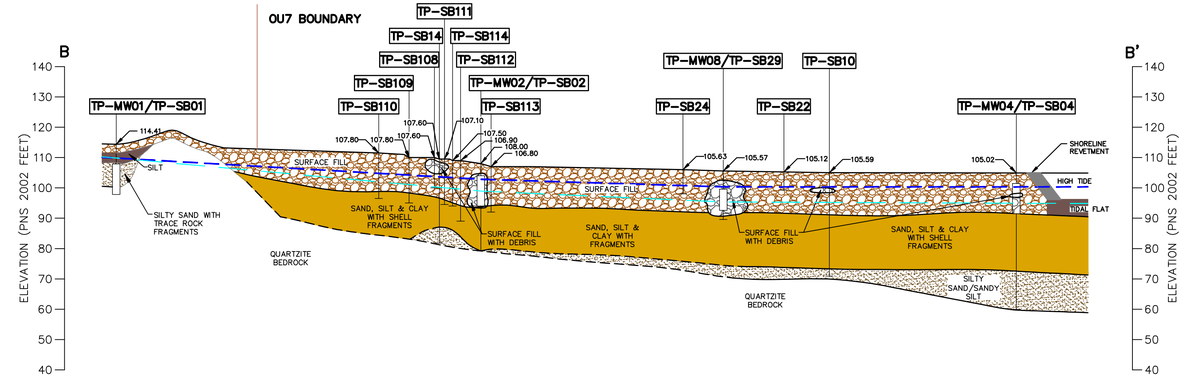
P:\GIS\PORTSMOUTH_NSY\MXD\SITE32_CROSS_SECTION.MXD 06/23/11 SS

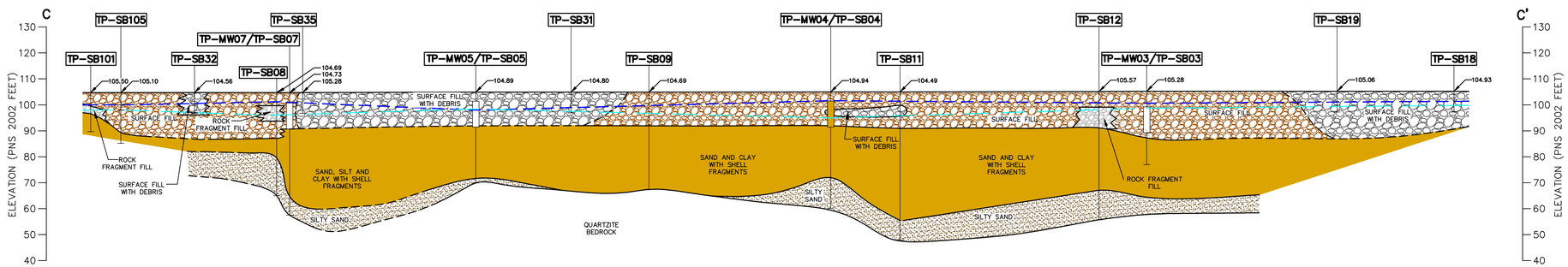


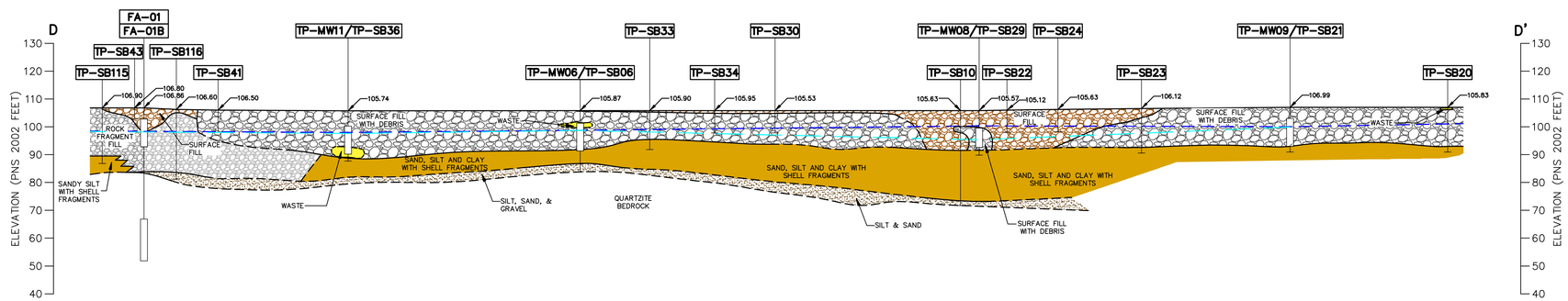
Notes:
1. Base Map Source: U.S. Naval Activities Seavey Island; Kittery, ME, Existing Conditions July 2010. Provided and drawn by Dan Allen with Portsmouth Naval Shipyard.
2. Topographic contours provided in the Portsmouth Naval Shipyard base map provided by Dan Allen.
3. Vertical datum for topographic contours is PNS 2002 Datum.

DRAWN BY S. PAXTON	DATE 04/01/09	TETRA TECH	CONTRACT NUMBER 0383 / OWNER NUMBER CTO 055
CHECKED BY A. CHRISTIAN	DATE 06/23/11	GEOLOGIC CROSS-SECTION LOCATION MAP OPERABLE UNIT 7 PORTSMOUTH NAVAL SHIPYARD KITTERY, MAINE	APPROVED BY / DATE
REVISED BY S. STROZ	DATE 06/23/11		APPROVED BY / DATE
SCALE AS NOTED			FIGURE NO. FIGURE 3 - 1 / REV 0









SURFACE FILL
SILT, SAND, AND GRAVEL OR ROCK FRAGMENTS (GENERALLY GREENISH-GRAY QUARTZITE)

SURFACE FILL WITH DEBRIS
SURFACE FILL WITH MINOR DEBRIS SUCH AS SLAG, ASH, METAL, CINDERS, COAL CLINKERS, WOOD, PLASTIC, GLASS, CONCRETE, PORCELAIN, OR BRICK.

ROCK FRAGMENT FILL
LARGE ANGULAR ROCK FRAGMENTS COMPOSED OF DARK GRAY, FINE-GRAINED QUARTZITE WITH TRACE (<5%) TO SOME (30 TO 45%) SAND, GRAVEL, AND/OR SILT/CLAY. ROCK FRAGMENTS FROM MATERIAL EXCAVATED FROM JENKIN'S GUT.

WASTE
INTERVAL OF DEBRIS MATERIAL ONLY, SUCH AS COAL, ASH, PORCELAIN, WOOD CHIPS, PAPER, SLAG, FIBROUS MATERIAL, METAL, OR BRICK.

SILT OR SILT AND CLAY
NATIVE SILT OR SILT AND CLAY, LANDWARD OF FORMER SHORELINE.

NATIVE SILT, SAND, AND CLAY
NATIVE SAND, SILT, AND/OR CLAY, TYPICALLY WITH SHELL FRAGMENTS.

SILTY SAND
NATIVE SILTY SAND OR SILT AND SAND. TRACE GRAVEL POSSIBLE.

BEDROCK
DARK GRAY OR GREENISH-GRAY METAMORPHIC QUARTZITE.

NOTE:
1. GROUNDWATER ELEVATIONS MEASURED ON DECEMBER 16, 2008.
2. GROUND SURFACE ELEVATIONS ESTIMATED FOR BORINGS TP-SB33 AND TP-101 THROUGH TP-123.

0 75 150
HORIZONTAL SCALE IN FEET
0 25 50
VERTICAL SCALE IN FEET

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MARK	DATE	DESCRIPTION	BY

GEOLOGIC CROSS-SECTIONS
OPERABLE UNIT 7

PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

DATE:	3-2-09
PROJECT NO.:	0383
DESIGNED BY:	---
DRAWN BY:	CK
CHECKED BY:	SW
SHEET:	-- OF --

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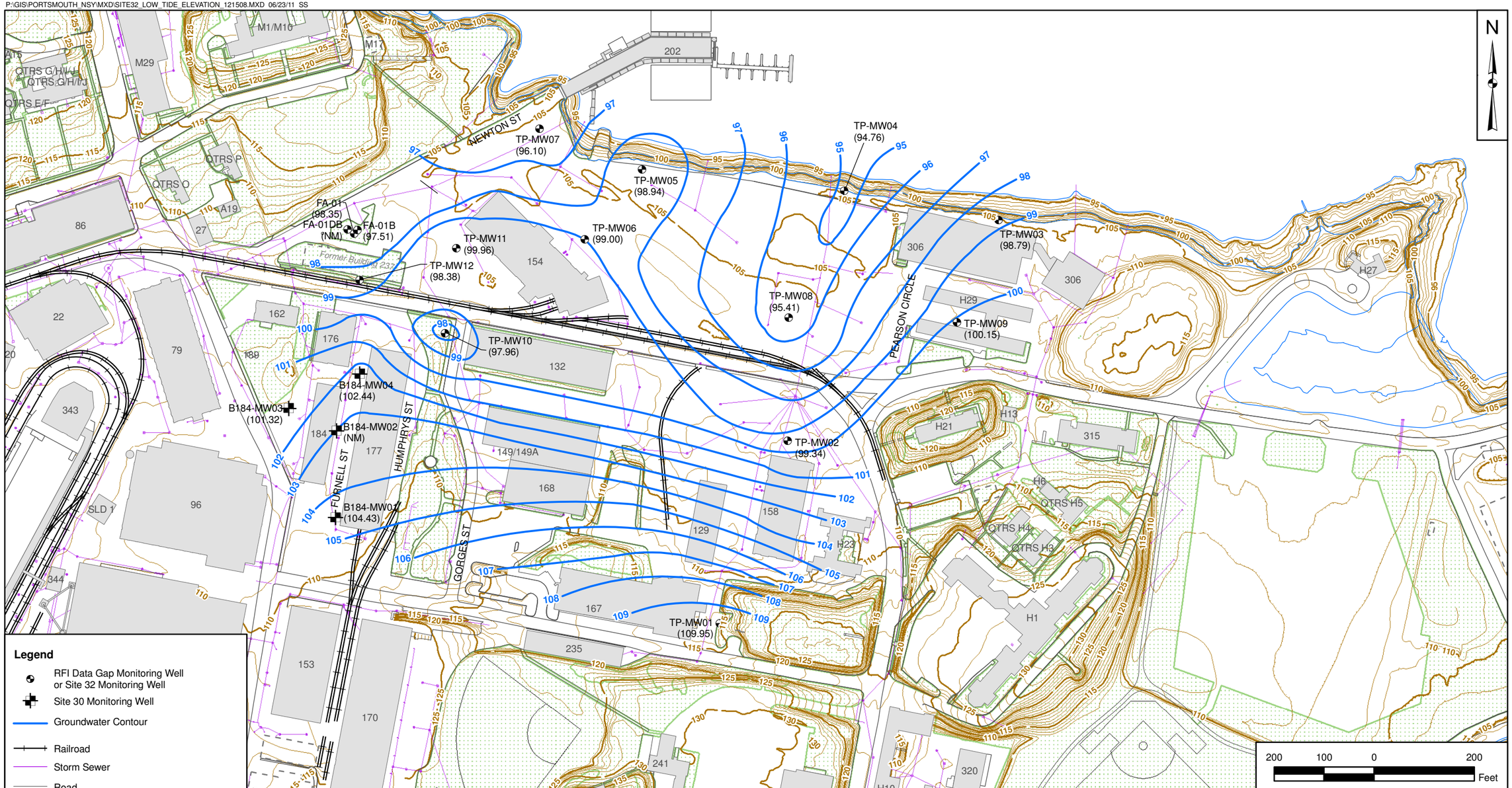
FIGURE 3-2

P:\GIS\PORTSMOUTH_NSY\MXD\SITE32_LOW_TIDE_ELEVATION_121508.MXD 06/23/11 SS



Legend

- RFI Data Gap Monitoring Well or Site 32 Monitoring Well
- Site 30 Monitoring Well
- Groundwater Contour
- Railroad
- Storm Sewer
- Road
- Natural Shoreline (2010)
- Former Building
- Vegetation
- Building
- Topographic Contour Line (1-foot Interval)

Notes:
1. Base Map Source: U.S. Naval Activities Seavey Island; Kittery, ME, Existing Conditions July 2010. Provided and drawn by Dan Allen with Portsmouth Naval Shipyard.
2. Topographic contours provided in the Portsmouth Naval Shipyard base map provided by Dan Allen.
3. Vertical datum for topographic contours is PNS 2002 Datum.

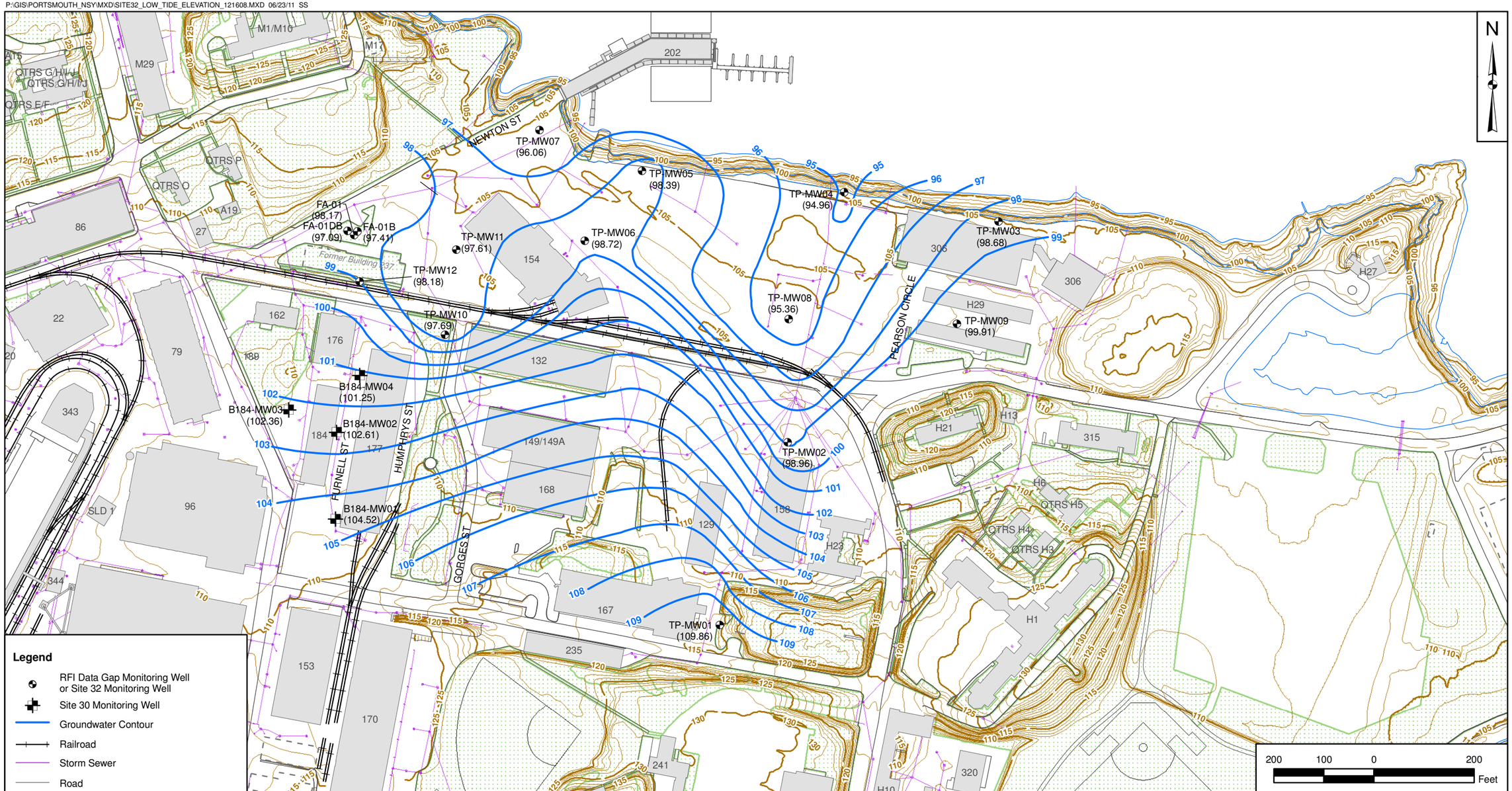
DRAWN BY S. PAXTON	DATE 04/01/09
CHECKED BY A. CHRISTIAN	DATE 06/23/11
REVISED BY S. STROZ	DATE 06/23/11
SCALE AS NOTED	

TETRA TECH

LOW-TIDE WATER ELEVATION MAP
DECEMBER 15, 2008
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

CONTRACT NUMBER 0383	OWNER NUMBER CTO 055
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO. FIGURE 3 - 3	REV 0

P:\GIS\PORTSMOUTH_NSY\MXD\SITE32_LOW_TIDE_ELEVATION_121608.MXD 06/23/11 SS



Notes:
1. Base Map Source: U.S. Naval Activities Seavey Island; Kittery, ME, Existing Conditions July 2010. Provided and drawn by Dan Allen with Portsmouth Naval Shipyard.
2. Topographic contours provided in the Portsmouth Naval Shipyard base map provided by Dan Allen.
3. Vertical datum for topographic contours is PNS 2002 Datum.

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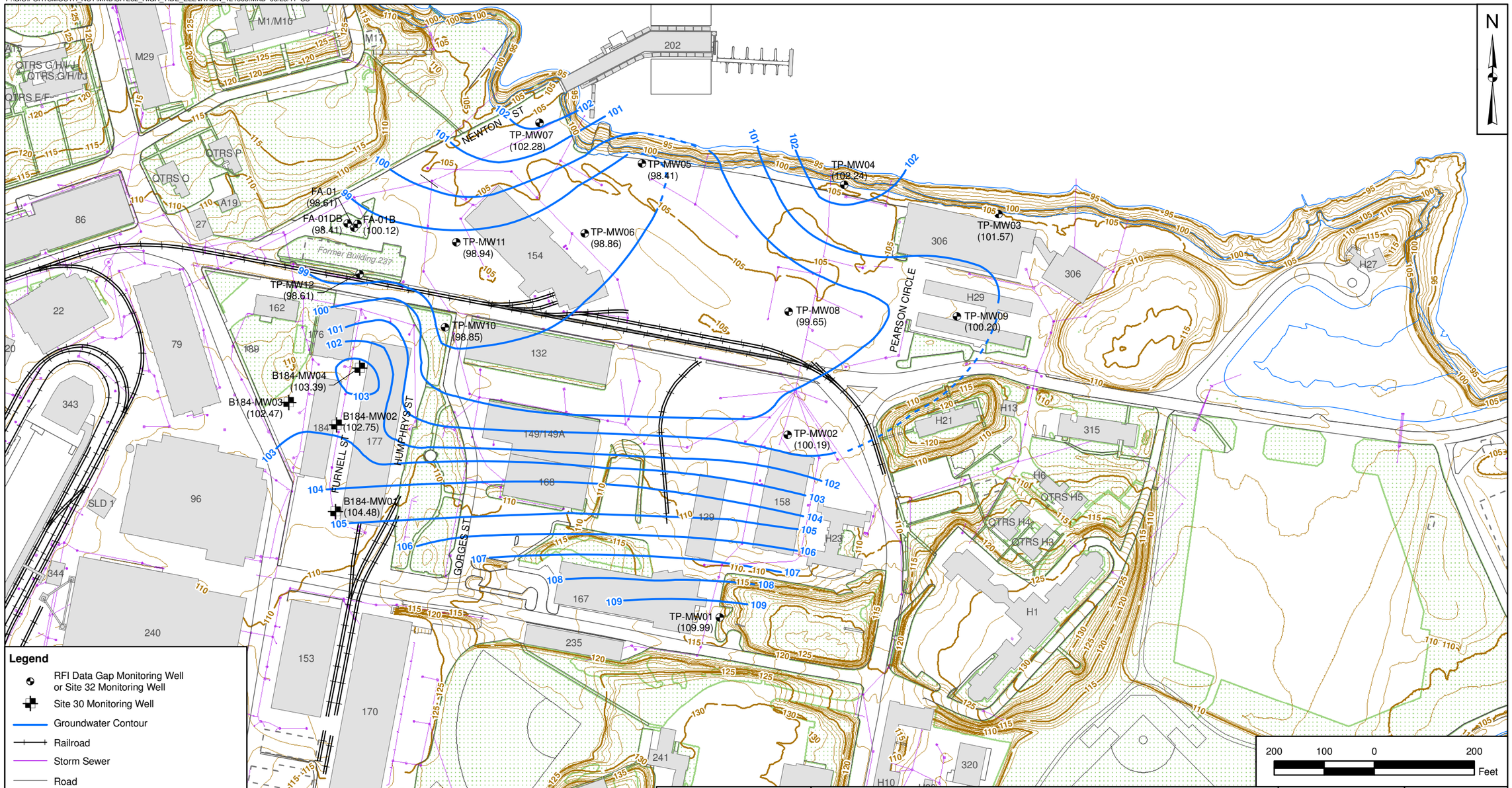
REVISED BY S. STROZ	DATE 06/23/11
SCALE AS NOTED	

TETRA TECH

LOW-TIDE WATER ELEVATION MAP
DECEMBER 16, 2008
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

CONTRACT NUMBER 0383	OWNER NUMBER CTO 055
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO. FIGURE 3 - 4	REV 0

P:\GIS\PORTSMOUTH_NSY\MXD\SITE32_HIGH_TIDE_ELEVATION_121508.MXD 06/23/11 SS



Legend

- RFI Data Gap Monitoring Well or Site 32 Monitoring Well
- Site 30 Monitoring Well
- Groundwater Contour
- Railroad
- Storm Sewer
- Road
- Natural Shoreline (2010)
- Former Building
- Vegetation
- Building
- Topographic Contour Line (1-foot Interval)

Notes:
1. Base Map Source: U.S. Naval Activities Seavey Island; Kittery, ME, Existing Conditions July 2010. Provided and drawn by Dan Allen with Portsmouth Naval Shipyard.
2. Topographic contours provided in the Portsmouth Naval Shipyard base map provided by Dan Allen.
3. Vertical datum for topographic contours is PNS 2002 Datum.

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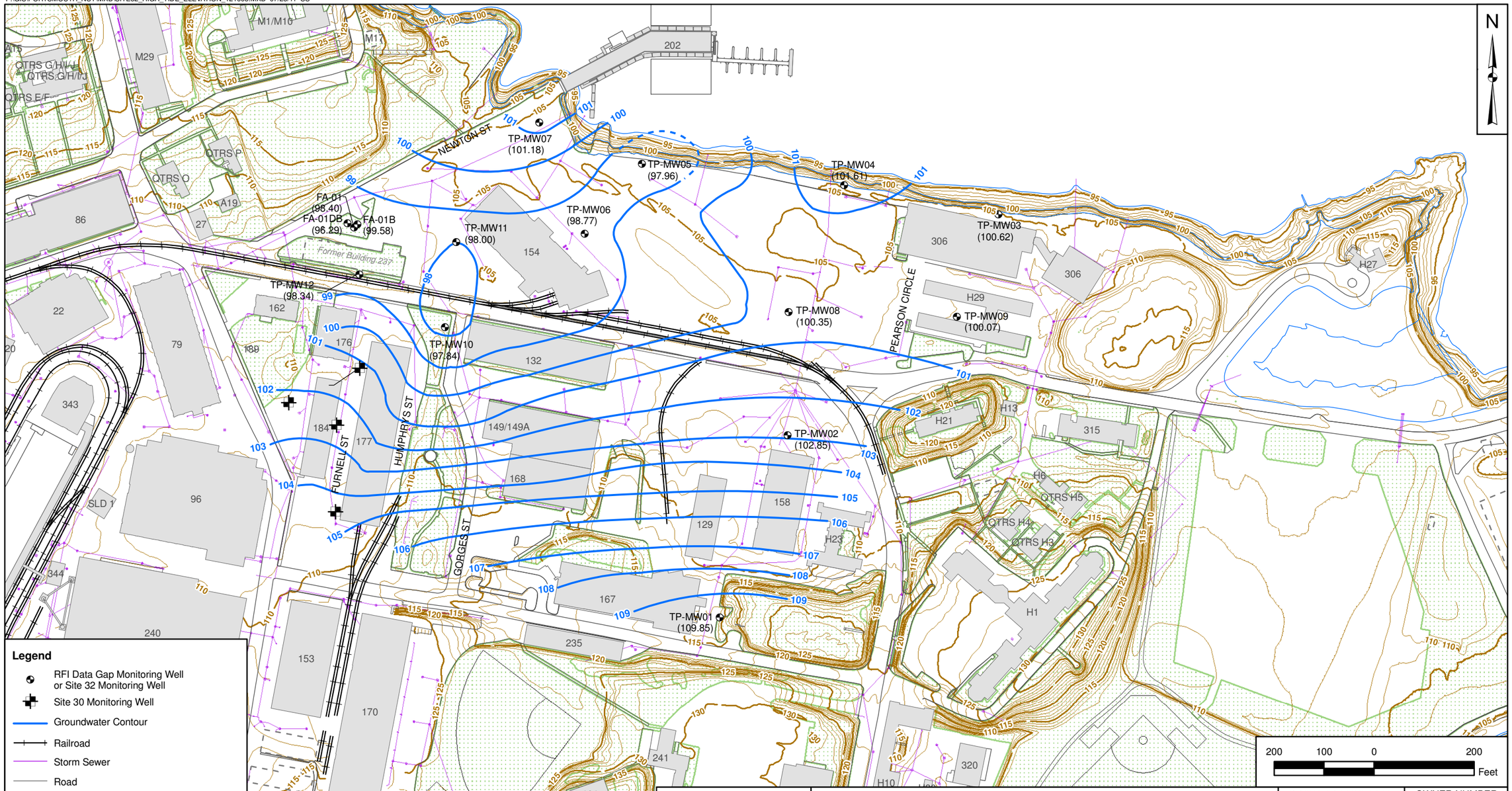
A. CHRISTIAN	06/23/11
REVISED BY	DATE
S. STROZ	06/23/11
SCALE AS NOTED	

TETRA TECH

HIGH-TIDE WATER ELEVATION MAP
DECEMBER 15, 2008
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

CONTRACT NUMBER	OWNER NUMBER
0383	CTO 055
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO. FIGURE 3 - 5	REV 0

P:\GIS\PORTSMOUTH_NSY\MXD\SITE32_HIGH_TIDE_ELEVATION_121608.MXD 07/28/11 SS



Legend

- RFI Data Gap Monitoring Well or Site 32 Monitoring Well
- Site 30 Monitoring Well
- Groundwater Contour
- Railroad
- Storm Sewer
- Road
- Natural Shoreline (2010)
- Former Building
- Vegetation
- Building
- Topographic Contour Line (1-foot Interval)

Notes:
1. Base Map Source: U.S. Naval Activities Seavey Island; Kittery, ME, Existing Conditions July 2010. Provided and drawn by Dan Allen with Portsmouth Naval Shipyard.
2. Topographic contours provided in the Portsmouth Naval Shipyard base map provided by Dan Allen.
3. Vertical datum for topographic contours is PNS 2002 Datum.

DRAWN BY S. PAXTON	DATE 04/01/09
CHECKED BY A. CHRISTIAN	DATE 07/28/11
REVISED BY S. STROZ	DATE 07/28/11
SCALE AS NOTED	

TETRA TECH

HIGH-TIDE WATER ELEVATION MAP
DECEMBER 16, 2008
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

CONTRACT NUMBER 0383	OWNER NUMBER CTO 055
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO. FIGURE 3 - 6	REV 0

4.0 NATURE AND EXTENT OF CONTAMINATION

The discussion of the nature and extent of contamination at OU7 focuses on the distribution of chemical concentrations across OU7 with consideration of site uses and geological conditions. Soil and groundwater were investigated for the onshore area of OU7; surface water (outfalls and nearby surface water), seeps, and sediment were investigated in the intertidal portion of the offshore area. This section discusses the sources of contamination, magnitudes, distribution, and extent of contaminants present in media onshore and offshore of OU7.

As discussed in Section 1.0, the operations that resulted in the release of contamination at OU7 were related to the filling of the shoreline and the industrial uses of the site. Fill material included rock, earth, cinders, and other material that could not be destroyed by incineration. Various cans and drums were reportedly disposed of possibly containing sodium hydroxide, sulfuric acid, and organic solvents. However, no cans or drums have been found during sampling or the geophysical investigations. The area filled before approximately 1910 was reportedly filled with material excavated during the construction of Dry Dock No. 2. This portion of OU7 includes the area where Building 237 was located, which was a grassy area before construction of Building 237, an office building. No industrial operations were conducted in this area. By 1939, combustible material was being dumped in the Timber Basin. Fill activities ceased by 1945.

Figure 4-1 presents the soil boring and monitoring well locations at OU7 and indicates the type of debris or waste, if any, encountered at each location. Figure 1-4 presents the sediment, surface water and seep locations for the offshore area of OU7. Table 4-1 and Table A.1 in Appendix A.5 provide the sample list for samples collected at OU7, and Appendix B provides the complete database printout for OU7 sample results.

4.1 ONSHORE

This section discusses the nature and extent of soil and groundwater contamination for the onshore area at OU7.

4.1.1 Soil Contamination

Figure 4-1 presents the soil boring locations and if any debris was present in the soil boring. If a debris type is not shown then no debris was present in the sample. Tables 4-2 and 4-3 present the chemicals detected in surface soil (0 to 2 feet bgs), and subsurface (2 to 25 feet bgs), respectively. Maximum and representative PNS facility background values [range and 95-percent Upper Confidence Limits (UCLs)]

and risk-based screening levels are presented to identify chemicals to aid in focusing the discussion of the nature and extent of contamination. For soils the risk-based screening levels are the USEPA residential soil screening level from the USEPA Regional Screening Level Table Residential Soil (June 2011). A copy of the analytical database for soil is presented in Appendix B.1.

Volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, PCBs, dioxins, furans, and inorganics were detected in surface soil at OU7. PAHs [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd) pyrene] were the SVOCs detected in excess of risk-based screening levels and facility background concentrations. Two PCBs (Aroclor 1248 and Aroclor 1254) were detected at concentrations exceeding the risk-based screening levels; however, the chemicals were only detected once in 60 samples at TP-SB120 and TP-SB115, respectively; debris material was not present in either sample. Dioxins/furans evaluated as total toxic equivalency quotients (TEQs) and one furan (2,3,4,7,8-PECDF) were detected at values exceeding risk-based screening levels. Eleven inorganics (antimony, arsenic, barium, cadmium, copper, iron, lead, manganese, mercury, thallium, and vanadium) were detected at concentrations exceeding risk-based screening levels or facility background concentrations. All other detected chemicals were less than risk-based screening levels.

VOCs, SVOCs, pesticides, PCBs, dioxins, furans, and inorganics were detected in the subsurface soil at OU7. SVOCs, PCBs, dioxins, furans, and inorganics were detected at concentrations greater than risk-based screening levels. PAHs [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene] were the SVOCs detected at concentrations exceeding risk-based screening levels and facility background concentrations. Three PCBs (Aroclor 1248, Aroclor 1254, and Aroclor 1260) and were detected at concentrations greater than risk-based screening levels. Aroclor 1260 was the only PCB detected more than two times. Dioxins/furans, evaluated as TEQs, were detected at concentrations exceeding risk-based screening levels. Fourteen inorganics (antimony, arsenic, barium, chromium, cobalt, copper, iron, lead, manganese, mercury, nickel, thallium, vanadium, and zinc) were detected at concentrations exceeding risk-based screening levels and facility background concentrations.

PAHs were detected in excess of risk-based screening levels and facility background in surface soil at four soil borings with debris (TP-SB19, TP-SB27, TP-SB31, and TP-SB36) and at four borings without debris (TP-SB15, TP-SB20, TP-SB37, and TP-SB120). PAHs were detected at concentrations exceeding risk-based screening levels and facility background in subsurface soil at seven borings with debris (TP-SB10, TP-SB14, TP-SB18, TP-SB23, TP-SB31, TP-SB35, and TP-SB36) and at five borings without debris (TP-SB09, TP-SB15, TP-SB32, TP-SB38B, and TP-SB39).

Two PCBs (Aroclor 1248 and Aroclor 1254) were detected at concentrations exceeding risk-based screening levels in surface and subsurface soils, with Aroclor 1260 only detected at concentrations exceeding risk-based screening levels in subsurface soil. Aroclor 1254 was detected in less than 5-percent of the samples. Surface soil locations where PCBs exceeded risk-based screening levels are TP-SB120 and TP-SB115; debris material was not present at either location. Subsurface soil locations where PCBs exceeded risk based screening levels are TP-SB11, TP-SB14, TP-SB19, TP-SB108, TP-SB112, TP-SB114, and TP-MW-04. TP-SB112 is the only location where debris material was not present.

Dioxins/furans evaluated as TEQ were found in surface and subsurface soil at concentrations greater than risk-based screening levels and facility background concentrations. TP-SB27 and TP-SB34 are surface locations were TEQ concentrations exceeded risk-based screening levels and facility background and ash was present. TP-SB27 and TP-SB34 are subsurface locations where TEQ concentrations exceeded risk-based screening levels and facility background and ash was present. The calculation of TEQ values are presented in Appendix D.2.

Metals were detected in surface and subsurface soil at concentrations exceeding risk-based screening levels and background concentrations. In general, maximum concentrations detected in the subsurface soil are greater than maximum detected concentrations in the surface soil. Chromium, cobalt, nickel, and zinc were detected in subsurface soil at maximum concentrations exceeding risk-based screening levels and facility background concentrations but were not detected in excess of these levels in the surface soil. TP-SB19, TP-SB23, TP-SB27, TP-SB32, TP-SB33B, TP-SB34, TP-SB35, and TP-SB120 are the surface soil locations where metals were detected at concentrations exceeding risk-based screening levels and background concentrations. Of these locations, TP-SB120 is the only location where debris material is not present. TP-SB09, TP-SB10, TP-SB11, TP-SB14, TP-SB18, TP-SB19, TP-SB20, TP-SB20B, TP-SB23, TP-SB24, TP-SB25, TP-SB27, TP-SB28, TP-SB30, TP-SB31, TP-SB32, TP-SB33, TP-SB33B, TP-SB34, TP-SB35, TP-SB36, TP-SB37, TP-SB39, TP-SB40, TP-SB41, TP-MW01, TP-MW04, TP-MW05, TP-MW06, TP-MW07, and TP-MW09 are the subsurface soil locations where metals concentrations were detected at concentrations exceeding risk-based screening levels and background concentrations. TP-SB09, TP-SB20, TP-SB29, TP-SB33, TP-SB37, TP-SB39, and TP-SB40 are the locations where debris material was not present. It should be noted that antimony was infrequently detected in background samples; however, the maximum OU7 surface soil concentration of 12.4 mg/kg slightly exceeded the maximum background concentration of 9.4 mg/kg.

Figures 4-2 through 4-6 are spatial concentration plots of copper, lead, total PCBs, total carcinogenic PAHs (expressed in terms of benzo(a)pyrene equivalents, see Appendix D.2 for calculation), and dioxins/furans (TEQs) in surface soil and subsurface soil. These plotted concentrations are

representative of the major contaminant groups or chemical groups analyzed at OU7 that had maximum concentrations exceeding risk-based screening levels and facility background concentrations. Based on these plots, detected concentrations exceeding risk-based screening levels correspond to areas filled after 1910, with the exception of TP-SB115, TP-SB120, TP-SB15, and TP-SB39. Aroclor-1254 was detected at 280 µg/kg at location TP-SB115, which slightly exceeds the risk-based screening level of 110 µg/kg. Aroclor-1254 was used in capacitors and transformers as well as hydraulic fuels. Trains have diesel/electric engines and transformers which may leak and drip PCBs onto the track. Therefore the slight exceedance of the risk-based screening level in the area with no known industrial use may be related to the railroad. TP-SB120 has detected concentrations of total PCBs, lead, and PAHs in excess of risk-based screening levels. TP-SB120 is located near Goodrich Avenue and the railroad tracks, and the elevated concentrations of total PCBs, lead, and total carcinogenic PAHs could be related to use of Goodrich Avenue and the railroad tracks. Also, as shown on Figure 4-1, the borings in the area filled before 1910 in the vicinity of former Building 237 do not contain debris material, and the area does not have history of industrial use. In addition to not containing debris material, these locations also did not have concentrations greater than risk-based screening levels for total PCBs, lead, total carcinogenic PAHs, and dioxins. A formal statistical test was conducted to determine if concentrations in this area are statistically different from the rest of OU7. The results of the statistical analysis concluded that the mean concentrations in this area are less than the mean concentrations throughout the rest of OU7. The statistical analysis is presented in Appendix B.2.

Normal probability plots were generated for each chemical in surface soil and subsurface soil where concentrations were detected above risk-based screening levels and background concentrations. Normal probability plots are a useful first step for visually comparing data. If the probability plot contains an inflection point (change in slope), then it can be concluded that data points above the inflection point are more likely representative of concentrations from contamination, and data points below the inflection points are more likely representative of background concentrations. The normal probability plots are presented in Appendix B.2 along with tables summarizing which locations are above an inflection point for each chemical and therefore most likely represent concentrations above background. For surface soil, there were 27 locations corresponding to data points above an inflection point, 13 of these locations were associated with debris material; presence of debris material does not indicate whether or not contamination is present. For subsurface soil, there were 23 locations corresponding to data points above an inflection point, 23 of these locations were associated with debris material; presence of debris material may indicate that contamination is present.

4.1.2 Groundwater Contamination

Figure 1-3 presents the locations of the OU7 monitoring wells. Table 4-4 presents the chemicals detected at least once in groundwater and the comparisons of detected concentrations to ecological and

human health risk-based screening levels. Groundwater data discussed in this section are from the 1996 to 1997 groundwater monitoring, SSI (1998), and Phase I and II RI sampling events (2003 and 2008, respectively). A copy of the analytical database for groundwater is presented in Appendix B.1, and Table A.1 of Appendix A.5 presents the OU7 sampling list. Groundwater risk-based screening levels are the chronic ecological screening levels with a dilution factor of 100 and construction worker screening levels. The construction work screening levels are described in Appendix D.5.

Groundwater samples were analyzed for VOCs, SVOCs, pesticides, PCBs, petroleum hydrocarbons, and inorganic compounds. SVOCs, and inorganics were detected in groundwater at OU7. VOCs, pesticides, and PCBs were not detected in any of the groundwater samples. SVOCs were detected infrequently (detected in at most four samples) and at concentrations ranging from to 0.1 to 2 micrograms per liter (µg/L). Inorganics were frequently detected in groundwater; however, aluminum, copper, and manganese were detected at concentrations exceeding the risk-based screening levels. Aluminum was detected twice; once at TP-MW05 and once at TP-MW08. Only the sample collected from TP-MW08 exceeded the risk-based screening level. Copper was detected in 10 samples, but only once at a concentration that exceeded risk-based screening level at TP-MW08. Manganese concentrations exceeded the human health risk-based screening level three times at monitoring well FA-01DB (December 1996, April 1997, and August 1997). The manganese concentration at FA-01DB in November 1997 was less than the risk-based screening level. However, manganese concentrations were similar to facility background concentrations, and the levels detected in the filtered samples were less than the risk-based screening levels. Debris material consisting of brick and copper were present at TP-MW05 and copper at TP-MW08. No debris types were noted on in the immediate vicinity of FA-01DB and FA-01DB is a deep bedrock well.

4.2 OFFSHORE

This section discusses the nature and extent of surface water, seep, and sediment contamination in the intertidal portion of the offshore area at OU7. Figure 1-4 presents the locations of all offshore samples (surface water, seep and sediment).

4.2.1 Surface Water and Seep Contamination

Tables 4-5 and 4-6 present the chemicals detected at least once in surface water and seep samples, respectively. Surface water and seep data were compared to the PNS human health surface water screening level based on recreational use (see Appendix D.2) and the chronic ecological screening level (with a dilution factor of 100 for seeps). Copies of the analytical database for each media are presented in Appendix B.1.

Inorganics were the only chemicals detected in OU7 surface water. Barium, calcium, magnesium, potassium, silicon, sodium, and manganese were detected in the filtered and unfiltered surface water samples. Aluminum, iron, and vanadium were detected in unfiltered surface water sample from TP-SW02 but was not detected in the filtered samples. Zinc was detected in surface water samples from OF-61, OF-63, TP-SW02, and TP-SW03. Zinc was detected in the filtered samples from OF-61, OF-63, and TP-SW03 but not at TP-SW02.

SVOCs, pesticides, PCBs, and inorganics were detected in OU7 seep samples. Inorganics were detected at concentrations exceeding screening levels. Two inorganic compounds (arsenic and chromium) were detected at concentrations greater than the human health risk-based screening level. Arsenic exceeded the human health risk-based screening level twice at BC-1017, once for total metals and once for the dissolved metals. Chromium exceeded the human health risk-based screening level, once at BC-1016 and once at BC-1017; however, the concentrations from the filtered samples did not exceed the human health risk-based screening level. None of the inorganics were detected at concentrations greater than the ecological screening level.

4.2.2 Sediment Contamination

Table 4-7 presents the chemicals detected at least once in sediment samples along with human health risk-based screening levels and ecological IRGs for OU4. The human health risk-based screening levels are based on recreational exposure (see Appendix D.2). SVOCs, pesticides, PCBs, and inorganics were detected in sediment at OU7. PAHs [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene], PCBs, and inorganics (arsenic, chromium, lead, and manganese) were detected at concentrations exceeding human health risk-based screening levels, and anthracene, fluorene, copper, and nickel were detected at concentrations greater than ecological IRGs.

Benzo(a)pyrene concentrations exceeded human health risk-based screening levels at BC-1016, BC-1017, BC-1018, BC-1020, MS-3 Loc.1, Loc.2, and Loc.3, MS-4 Loc.1, Loc.2, and Loc.3, TP-SD112, and TP-SD113. Benzo(a)anthracene exceeded risk-based screening levels at MS-4 Loc.1 and Loc.2. Benzo(b)fluroanthene and dibenzo(a,h)anthracene were only detected at MS-04 Loc.1 at concentrations exceeding human health risk-based screening levels. The Interim Offshore Monitoring Program indicated that concentrations of PAHs in sediment offshore of OU7, in the vicinity of MS-4 Loc.1 were greater than the IRGs. Additional sampling to determine the extent of PAH contamination around MS-4 Loc.1 was conducted as part of Phase II of the RI. Only PAHs in samples collected at MS-4 Loc.1 exceeded the IRGs. No PAH concentrations in Phase II of the RI sediment samples MS-4 Loc.1 exceeded the IRGs. Therefore, the extent of PAH contamination exceeding IRGs is sufficiently bounded.

TEQ PCBs, see Appendix D.2 for example calculation, were detected at concentrations above human health risk-based screening levels at BC-1020, BC-1018, BC-1017, BC-1016, MS-3 Loc.1, Loc.2, and Loc.3, and MS-4 Loc.1, Loc. 2 and Loc.3. TEQ PCBs were detected at concentrations above human health risk-based screening levels at MS-3 Loc.1, Loc.2, and MS-4 Loc.1.

Arsenic concentrations exceeded human health risk-based screening levels at BC-1016, BC-1017, BC-1018, BC-1020, MS-3 Loc.2, and MS-4 Loc.1. Chromium exceeded human health risk-based screening levels at BC-1016, BC-1017, BC-1018, BC-1020, MS-3 Loc.2, and MS-4 Loc.1. Lead exceeded human health risk-based screening levels at MS-4 Loc.1. Manganese exceeded human health risk-based screening levels at BC-1016, BC-1017, BC-1018, BC-1020, and MS-4 Loc.1. Locations where chemicals are detected in sediment at concentrations exceeding risk-based screening level are the BC-1016, BC-1017, BC-1018, BC-1020, and the areas around MS-3 Loc.1, Loc.2, and Loc.3, and MS-4 Loc.1, Loc.2, and Loc.3 (TP-SB112 and TPSB-113 are near MS-4 Loc.1 and BC-1016).

TABLE 4-1

SAMPLE LIST
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Sample Location	Sample ID	Sample Date
Soil		
BGS-05	BGS-05	19910813
TP-MW01	TP-SB01-0305-98	19980622
TP-MW01	TP-SB01-0810-98	19980622
TP-MW01	TP-SB01-1214-98	19980622
TP-MW01	TP-SS01-0001-98	19980622
TP-MW02	TP-SB02-0305-98	19980620
TP-MW02	TP-SB02-0911-98	19980620
TP-MW02	TP-SB02-1113-98	19980620
TP-MW02	TP-SB02-1517-98	19980620
TP-MW02	TP-SS02-0001-98	19980620
TP-MW03	TP-SB03-0305-98	19980620
TP-MW03	TP-SB03-0507-98	19980620
TP-MW03	TP-SB03-1315-98	19980620
TP-MW03	TP-SB03-1315-98-D	19980620
TP-MW03	TP-SB03-2325-98	19980620
TP-MW03	TP-SS03-0001-98	19980620
TP-MW04	TP-SB04-0305-98	19980618
TP-MW04	TP-SB04-0709-98	19980618
TP-MW04	TP-SB04-1315-98	19980618
TP-MW04	TP-SB04-1315-98-D	19980618
TP-MW04	TP-SS04-0001-98	19980618
TP-MW05	TP-SB05-0305-98	19980609
TP-MW05	TP-SB05-0305-98-D	19980609
TP-MW05	TP-SB05-0507-98	19980609
TP-MW05	TP-SB05-0810-98	19980609
TP-MW05	TP-SS05-0001-98	19980609
TP-MW06	TP-SB06-0305-98	19980616
TP-MW06	TP-SB06-0507-98	19980616
TP-MW06	TP-SB06-1315-98	19980616
TP-MW06	TP-SS06-0001-98	19980616
TP-MW07	TP-SB07-0305-98	19980615
TP-MW07	TP-SB07-0709-98	19980615
TP-MW07	TP-SB07-1315-98	19980615
TP-MW07	TP-SB07-1315-98-D	19980615
TP-MW07	TP-SB07-1820-98	19980615
TP-MW07	TP-SS07-0001-98	19980615
TP-MW08	TPSB290205	20030423
TP-MW08	TPSB290508	20030423
TP-MW08	TPSS290001	20030423
TP-MW09	TPSB210205	20030422
TP-MW09	TPSB210508	20030422
TP-MW09	TPSS210001	20030422
TP-MW10	TPSB38A0305	20030423
TP-MW10	TPSB38A0709	20030423
TP-SB08	TP-SB08-0305-98	19980710

TABLE 4-1

SAMPLE LIST
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Sample Location	Sample ID	Sample Date
TP-SB08	TP-SB08-0507-98	19980710
TP-SB08	TP-SB08-1820-98	19980710
TP-SB08	TP-SS08-0001-98	19980710
TP-SB09	TP-SB09-0305-98	19980609
TP-SB09	TP-SB09-0507-98	19980609
TP-SB09	TP-SB09-0810-98	19980609
TP-SB09	TP-SB09-1315-98	19980609
TP-SB09	TP-SS09-0001-98	19980609
TP-SB09	TP-SS09-0001-98-D	19980609
TP-SB10	TP-SB10-0305-98	19980616
TP-SB10	TP-SB10-0709-98	19980616
TP-SB10	TP-SB10-0911-98	19980616
TP-SB10	TP-SB10-1315-98	19980616
TP-SB10	TP-SS10-0001-98	19980616
TP-SB101	TPSB1010205	20081122
TP-SB101	TPSB1010508	20081122
TP-SB101	TPSS1010001	20081122
TP-SB102	TPSB1020205	20081122
TP-SB102	TPSB1020205-D	20081122
TP-SB102	TPSB1020508	20081122
TP-SB102	TPSS1020001	20081122
TP-SB103	TPSB1030205	20081122
TP-SB103	TPSB1030508	20081122
TP-SB103	TPSB1030508-D	20081122
TP-SB103	TPSS1030001	20081122
TP-SB104	TPSB1040205	20081122
TP-SB104	TPSB1040508	20081122
TP-SB104	TPSS1040001	20081122
TP-SB105	TPSB1050205	20081122
TP-SB105	TPSB1050508	20081122
TP-SB105	TPSS1050001	20081122
TP-SB106	TPSB1060205	20081122
TP-SB106	TPSB1060508	20081122
TP-SB106	TPSS1060001	20081122
TP-SB107	TPSB1070205	20081122
TP-SB107	TPSB1070508	20081122
TP-SB107	TPSS1070001	20081122
TP-SB108	TPSB1080205	20081122
TP-SB108	TPSB1080508	20081122
TP-SB108	TPSS1080001	20081122
TP-SB109	TPSB1090205	20081122
TP-SB109	TPSB1090508	20081122
TP-SB109	TPSS1090001	20081122
TP-SB11	TP-SB11-0305-98	19980716
TP-SB11	TP-SB11-0709-98	19980716
TP-SB11	TP-SB11-1315-98	19980716

TABLE 4-1

SAMPLE LIST
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Sample Location	Sample ID	Sample Date
TP-SB11	TP-SS11-0001-98	19980716
TP-SB11	TP-SS11-0001-98-D	19980716
TP-SB110	TPSB1100205	20081122
TP-SB110	TPSB1100508	20081122
TP-SB110	TPSS1100001	20081122
TP-SB111	TPSB1110205	20081122
TP-SB111	TPSB1110508	20081122
TP-SB111	TPSS1110001	20081122
TP-SB112	TPSB1120205	20081122
TP-SB112	TPSB1120508	20081122
TP-SB112	TPSS1120001	20081122
TP-SB113	TPSB1130205	20081122
TP-SB113	TPSB1130508	20081122
TP-SB113	TPSS1130001	20081122
TP-SB114	TPSB1140205	20081122
TP-SB114	TPSB1140508	20081122
TP-SB114	TPSS1140001	20081122
TP-SB115	TPSS1150001	20081122
TP-SB116	TPSS1160001	20081122
TP-SB116	TPSS1160001-D	20081122
TP-SB117	TPSB1170205	20081123
TP-SB117	TPSB1170205-D	20081123
TP-SB117	TPSS1170001	20081123
TP-SB117	TPSS1170001-D	20081123
TP-SB118	TPSB1180205	20081123
TP-SB118	TPSB1180205-D	20081123
TP-SB118	TPSS1180001	20081123
TP-SB119	TPSS1190001	20081123
TP-SB12	TP-SB12-0507-98	19980713
TP-SB12	TP-SS12-0001-98	19980713
TP-SB120	TPSS1200001	20081123
TP-SB120	TPSS1200001-D	20081123
TP-SB121	TPSS1210001	20081123
TP-SB122	TPSS1220001	20081123
TP-SB123	TPSS1230001	20081123
TP-SB13	TP-SB13-0305-98	19980715
TP-SB13	TP-SB13-0709-98	19980715
TP-SB13	TP-SB13-1315-98	19980715
TP-SB14	TP-SB14-0305-98	19980715
TP-SB14	TP-SB14-0709-98	19980715
TP-SB14	TP-SB14-1315-98	19980715
TP-SB15	TP-SB15-0305-98	19980710
TP-SB15	TP-SB15-0709-98	19980710
TP-SB15	TP-SB15-1315-98	19980710
TP-SB15	TP-SB15-1315-98-D	19980710
TP-SB15	TP-SS15-0001-98	19980710

TABLE 4-1

SAMPLE LIST
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Sample Location	Sample ID	Sample Date
TP-SB16	TP-SB16-0305-98	19980716
TP-SB16	TP-SB16-1719-98	19980716
TP-SB17	TP-SB17-0305-98	19980716
TP-SB17	TP-SB17-0709-98	19980716
TP-SB17	TP-SS17-0001-98	19980716
TP-SB18	TPSB180205	20030425
TP-SB18	TPSB180508	20030425
TP-SB18	TPSS180001	20030425
TP-SB19	TPSB190205	20030425
TP-SB19	TPSB190205-D	20030425
TP-SB19	TPSB190508	20030425
TP-SB19	TPSS190001	20030425
TP-SB20	TPSB200205	20030425
TP-SB20	TPSB200205-D	20030425
TP-SB20	TPSB200506	20030425
TP-SB20	TPSS200001	20030425
TP-SB20B	TPSB20B0203	20030425
TP-SB20B	TPSB20B0508	20030425
TP-SB22	TPSB220205	20030423
TP-SB22	TPSB220508	20030423
TP-SB22	TPSS220001	20030423
TP-SB23	TPSB230205	20030422
TP-SB23	TPSB230508	20030422
TP-SB23	TPSS230001	20030422
TP-SB24	TPSB240205	20030422
TP-SB24	TPSB240508	20030422
TP-SB24	TPSS240001	20030422
TP-SB25	TPSB250205	20030425
TP-SB25	TPSB250508	20030425
TP-SB25	TPSB250508-D	20030425
TP-SB25	TPSS250001	20030425
TP-SB26A	TPSB26A0203	20030426
TP-SB26A	TPSS26A0001	20030426
TP-SB26B	TPSB26B0205	20030426
TP-SB26B	TPSB26B0508	20030426
TP-SB26B	TPSS26B0001	20030426
TP-SB27	TPSB270205	20030425
TP-SB27	TPSB270508	20030425
TP-SB27	TPSB270508-D	20030425
TP-SB27	TPSS270001	20030425
TP-SB28	TPSB280205	20030425
TP-SB28	TPSB280508	20030425
TP-SB28	TPSS280001	20030425
TP-SB30	TPSB300205	20030424
TP-SB30	TPSB300508	20030424
TP-SB30	TPSS300001	20030424

TABLE 4-1

SAMPLE LIST
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Sample Location	Sample ID	Sample Date
TP-SB31	TPSB310205	20030423
TP-SB31	TPSB310205-D	20030423
TP-SB31	TPSB310508	20030423
TP-SB31	TPSS310001	20030423
TP-SB32	TPSB320205	20030425
TP-SB32	TPSB320508	20030425
TP-SB32	TPSS320001	20030425
TP-SB33	TPSB330205	20030425
TP-SB33	TPSS33B0001	20030425
TP-SB33B	TPSB33B0205	20030425
TP-SB33B	TPSB33B0508	20030425
TP-SB34	TPSB340205	20030425
TP-SB34	TPSB340205-D	20030425
TP-SB34	TPSB340508	20030425
TP-SB34	TPSS340001	20030425
TP-SB35	TPSB350205	20030425
TP-SB35	TPSB350508	20030425
TP-SB35	TPSS350001	20030425
TP-SB36	TPSB360205	20030424
TP-SB36	TPSB360508	20030424
TP-SB36	TPSS360001	20030424
TP-SB36	TPSS360001-D	20030424
TP-SB37	TPSB370205	20030425
TP-SB37	TPSB370508	20030425
TP-SB37	TPSS370001	20030425
TP-SB38B	TPSB38B0205	20030424
TP-SB38B	TPSS38B0001	20030424
TP-SB39	TPSB390205	20030425
TP-SB39	TPSS390001	20030425
TP-SB40	TPSB400205	20030424
TP-SB40	TPSB400508	20030424
TP-SB40	TPSS400001	20030424
TP-SB41	TPSB410205	20030424
TP-SB41	TPSB410508	20030424
TP-SB41	TPSS410001	20030424
TP-SB42	TPSS420001	20030424
TP-SB42	TPSS420001-D	20030424
TP-SB43	TPSS430001	20030424
Groundwater		
FA-01	FA-01-GW-07	19961209
FA-01	FA-01-GW-07-D	19961209
FA-01	FA-01-GW-07-F	19961209
FA-01	FA-01-GW-07-F-D	19961209
FA-01	FA-01-GW-08	19970427
FA-01	FA-01-GW-09	19970806
FA-01	FA-01-GW-10	19971101

TABLE 4-1

SAMPLE LIST
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Sample Location	Sample ID	Sample Date
FA-01	TPGWFA010503	20030508
FA-01	TPGWFA010503-F	20030508
FA-01	TPGWFA011208	20081215
FA-01B	FA-01B-GW-07	19961209
FA-01B	FA-01B-GW-08	19970427
FA-01B	FA-01B-GW-08-D	19970427
FA-01B	FA-01B-GW-09	19970806
FA-01B	FA-01B-GW-10	19971101
FA-01B	TPGWFA01B0503	20030508
FA-01B	TPGWFA01B0503-F	20030508
FA-01B	TPGWFA01B1208	20081216
FA-01DB	FA-01DB-GW-07	19961218
FA-01DB	FA-01DB-GW-08	19970426
FA-01DB	FA-01DB-GW-09	19970807
FA-01DB	FA-01DB-GW-10	19971118
FA-01DB	FA-01DB-GW-10-D	19971118
TP-MW01	TP-MW-01-11	19980730
TP-MW01	TPGWMW010503	20030507
TP-MW01	TPGWMW010503-F	20030507
TP-MW01	TPGWMW011208	20081216
TP-MW02	TP-MW-02-11	19980801
TP-MW02	TPGWMW020503	20030507
TP-MW02	TPGWMW020503-F	20030507
TP-MW02	TPGWMW021208	20081215
TP-MW03	TP-MW-03-11	19980731
TP-MW03	TPGWMW030503	20030508
TP-MW03	TPGWMW030503-F	20030508
TP-MW03	TPGWMW031208	20081218
TP-MW04	TP-MW-04-11	19980731
TP-MW04	TP-MW-04-11-D	19980731
TP-MW04	TPGWMW040503	20030506
TP-MW04	TPGWMW040503-D	20030506
TP-MW04	TPGWMW040503-F	20030506
TP-MW04	TPGWMW040503-F-D	20030506
TP-MW04	TPGWMW041208	20081216
TP-MW05	TP-MW-05-11	19980804
TP-MW05	TP-MW-05-11-F	19980804
TP-MW05	TPGWMW050503	20030507
TP-MW05	TPGWMW050503-F	20030507
TP-MW05	TPGWMW051208	20081217
TP-MW06	TP-MW-06-11	19980730
TP-MW06	TPGWMW060503	20030507
TP-MW06	TPGWMW060503-F	20030507
TP-MW06	TPGWMW061208	20081217
TP-MW07	TP-MW-07-11	19980730
TP-MW07	TPGWMW070503	20030509

TABLE 4-1

SAMPLE LIST
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Sample Location	Sample ID	Sample Date
TP-MW07	TPGWMW070503-D	20030509
TP-MW07	TPGWMW070503-F	20030509
TP-MW07	TPGWMW070503-F-D	20030509
TP-MW07	TPGWMW071208-D	20081215
TP-MW07	TPGWMW071208	20081219
TP-MW08	TPGWMW080503	20030507
TP-MW08	TPGWMW080503-F	20030507
TP-MW08	TPGWMW081208	20081216
TP-MW09	TPGWMW090503	20030507
TP-MW09	TPGWMW090503-F	20030507
TP-MW09	TPGWMW091208	20081215
TP-MW09	TPGWMW091208-D	20081215
TP-MW10	TPGWMW100503	20030509
TP-MW10	TPGWMW100503-F	20030509
TP-MW10	TPGWMW1012008	20081218
TP-MW12	TPGWMW121208	20081218
Sediment		
BC-1016	BC-1016-SD-1296	19961224
BC-1016	BC-1016-SD-0497	19970410
BC-1016	BC-1016-SD-0897	19970819
BC-1016	BC-1016-SD-1197	19971113
BC-1016	BC-1016-SD-1197-D	19971113
BC-1017	BC-1017-SD-1296	19970115
BC-1017	BC-1017-SD-0497	19970409
BC-1017	BC-1017-SD-0897	19970819
BC-1017	BC-1017-SD-1197	19971115
BC-1018	BC-1018-SD-1296	19970115
BC-1018	BC-1018-SD-1296-D	19970115
BC-1018	BC-1018-SD-0497	19970409
BC-1018	BC-1018-SD-0897	19970818
BC-1018	BC-1018-SD-1197	19971113
BC-1020	BC-1020-SD-1296	19961224
BC-1020	BC-1020-SD-0497	19970409
BC-1020	BC-1020-SD-0897	19970819
BC-1020	BC-1020-SD-0897-D	19970819
BC-1020	BC-1020-SD-1197	19971114
MS-3 LOC.1	OU4-SD-M03-199A-D	19990909
MS-3 LOC.1	OU4-SD-M03-199A	19990910
MS-3 LOC.1	OU4-SD-M03-100B	20000504
MS-3 LOC.1	OU4-SD-M03-100A	20000827
MS-3 LOC.1	OU4-SD-M03-101B	20010506
MS-3 LOC.1	OU4-SD-M03-101A	20010819
MS-3 LOC.1	OU4-SD-M03-102A	20020810
MS-3 LOC.1	OU4-SD-M03-103A	20030809
MS-3 LOC.2	OU4-SD-M03-299A	19990910
MS-3 LOC.2	OU4-SD-M03-200B	20000504

TABLE 4-1

SAMPLE LIST
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Sample Location	Sample ID	Sample Date
MS-3 LOC.2	OU4-SD-M03-200A	20000827
MS-3 LOC.2	OU4-SD-M03-201B	20010506
MS-3 LOC.2	OU4-SD-M03-201A	20010819
MS-3 LOC.2	OU4-SD-M03-202A	20020810
MS-3 LOC.2	OU4-SD-M03-203A	20030809
MS-3 LOC.3	OU4-SD-M03-399A	19990910
MS-3 LOC.3	OU4-SD-M03-300B	20000504
MS-3 LOC.3	OU4-SD-M03-300A	20000827
MS-3 LOC.3	OU4-SD-M03-301B	20010506
MS-3 LOC.3	OU4-SD-M03-301A	20010819
MS-3 LOC.3	OU4-SD-M03-302A	20020810
MS-3 LOC.3	OU4-SD-M03-303A	20030809
MS-4 LOC.1	OU4-SD-M04-199A	19990910
MS-4 LOC.1	OU4-SD-M04-100B	20000504
MS-4 LOC.1	OU4-SD-M04-100A	20000827
MS-4 LOC.1	OU4-SD-M04-101B	20010506
MS-4 LOC.1	OU4-SD-M04-101B-D	20010506
MS-4 LOC.1	OU4-SD-M04-101A	20010819
MS-4 LOC.1	OU4-SD-M04-101A-D	20010819
MS-4 LOC.1	OU4-SD-M04-102A	20020810
MS-4 LOC.1	OU4-SD-M04-102A-D	20020810
MS-4 LOC.1	OU4-SD-M04-103A	20030809
MS-4 LOC.1	OU4-SD-M04-103A-D	20030809
MS-4 LOC.2	OU4-SD-M04-299A	19990909
MS-4 LOC.2	OU4-SD-M04-200B	20000504
MS-4 LOC.2	OU4-SD-M04-200A	20000827
MS-4 LOC.2	OU4-SD-M04-201B	20010506
MS-4 LOC.2	OU4-SD-M04-201A	20010819
MS-4 LOC.2	OU4-SD-M04-202A	20020810
MS-4 LOC.2	OU4-SD-M04-203A	20030810
MS-4 LOC.3	OU4-SD-M04-399A	19990910
MS-4 LOC.3	OU4-SD-M04-300B	20000504
MS-4 LOC.3	OU4-SD-M04-300A	20000827
MS-4 LOC.3	OU4-SD-M04-301B	20010506
MS-4 LOC.3	OU4-SD-M04-301A	20010819
MS-4 LOC.3	OU4-SD-M04-302A	20020810
MS-4 LOC.3	OU4-SD-M04-303A	20030809
MS-4 LOC.4	OU4-SD-M04-401B	20010508
MS-4 LOC.5	OU4-SD-M04-501B	20010508
MS-4 LOC.6	OU4-SD-M04-601B	20010508
TP-SD01	TPSD010006	20030522
TP-SD01	TPSD010612	20030522
TP-SD01	TPSD010612-D	20030522
TP-SD02	TPSD020006	20030522
TP-SD03	TPSD030006	20030813
TP-SD03	TPSD030006-D	20030813

TABLE 4-1

SAMPLE LIST
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Sample Location	Sample ID	Sample Date
TP-SD03	TPSD030612	20030813
TP-SD04	TPSD040006	20030522
TP-SD04	TPSD040612	20030522
TP-SD05	TPSD050006	20030522
TP-SD05	TPSD050612	20030522
TP-SD06	TPSD060006	20030522
TP-SD06	TPSD060006-D	20030522
TP-SD06	TPSD060612	20030522
TP-SD07	TPSD070006	20030522
TP-SD07	TPSD070612	20030522
TP-SD09	TPSD090006	20030522
TP-SD09	TPSD090612	20030522
TP-SD09	TPSD090612-D	20030522
TP-SD10	TPSD100006	20030522
TP-SD10	TPSD100612	20030522
TP-SD101	TPSD1010004	20081216
TP-SD101	TPSD1011216	20081216
TP-SD102	TPSD1020004	20081216
TP-SD102	TPSD1021216	20081216
TP-SD103	TPSD1030004	20081216
TP-SD103	TPSD1031216	20081216
TP-SD104	TPSD1040004	20081216
TP-SD104	TPSD1041216	20081216
TP-SD105	TPSD1050004	20081216
TP-SD105	TPSD1051216	20081216
TP-SD106	TPSD1060004	20081216
TP-SD106	TPSD1061216	20081216
TP-SD107	TPSD1070004	20081216
TP-SD107	TPSD1071216	20081216
TP-SD108	TPSD1080004	20081216
TP-SD108	TPSD1081216	20081216
TP-SD109	TPSD1090004	20081216
TP-SD109	TPSD1091216	20081216
TP-SD110	TPSD1100004	20081216
TP-SD110	TPSD1101216	20081216
TP-SD111	TPSD1110004	20081216
TP-SD111	TPSD1111216	20081216
TP-SD112	TPSD1120004	20081216
TP-SD112	TPSD1121216	20081216
TP-SD113	TPSD1130004	20081216
TP-SD113	TPSD1131216	20081216
TP-SD114	TPSD1140004	20081216
TP-SD114	TPSD1141216	20081216
TP-SD115	TPSD1150004	20081216
TP-SD115	TPSD1151216	20081216
TP-SD116	TPSD1160004	20081216

TABLE 4-1

SAMPLE LIST
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Sample Location	Sample ID	Sample Date
TP-SD116	TPSD1160004-D	20081216
TP-SD116	TPSD1161216	20081216
TP-SD117	TPSD1170004	20081216
TP-SD117	TPSD1171216	20081216
TP-SD118	TPSD1180004	20081216
TP-SD118	TPSD1181216	20081216
TP-SD119	TPSD1190004	20081216
TP-SD119	TPSD1190004-D	20081216
TP-SD119	TPSD1191216	20081216
TP-SD119	TPSD1191216-D	20081216
TP-SD12	TPSD120006	20030521
TP-SD12	TPSD120612	20030521
TP-SD12	TPSD120612-D	20030521
TP-SD12	TPSD120612-RE	20030521
TP-SD12	TPSD120612-RE-D	20030521
TP-SD120	TPSD1200004	20081216
TP-SD120	TPSD1201216	20081216
TP-SD120	TPSD1201216-D	20081216
TP-SD13	TPSD130006	20030522
TP-SD13	TPSD130612	20030522
TP-SD14	TPSD140006	20030521
TP-SD14	TPSD140612	20030521
TP-SD15	TPSD150006	20030522
TP-SD15	TPSD150006-D	20030522
TP-SD15	TPSD150612	20030522
TP-SD16	TPSD160006	20030521
TP-SD16	TPSD160612	20030521
TP-SD17	TPSD170006	20030521
TP-SD17	TPSD170612	20030521
TP-SD18	TPSD180006	20030521
TP-SD18	TPSD180612	20030521
TP-SD19	TPSD190006	20030521
TP-SD19	TPSD190612	20030521
TP-SD19	TPSD190612-D	20030521
TP-SD20	TPSD200006	20030521
TP-SD20	TPSD200612	20030521
TP-SD21	TPSD210006	20030521
TP-SD21	TPSD210612	20030521
TP-SD22	TPSD220006	20030520
TP-SD22	TPSD220612	20030520
TP-SD23	TPSD230006	20030521
TP-SD23	TPSD230612	20030521
TP-SD24	TPSD240006	20030520
TP-SD24	TPSD240612	20030520
TP-SD25	TPSD250006	20030521
TP-SD25	TPSD250612	20030521

TABLE 4-1

SAMPLE LIST
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Sample Location	Sample ID	Sample Date
TP-SD25	TPSD250612-D	20030521
TP-SD26	TPSD260006	20030520
TP-SD26	TPSD260612	20030520
TP-SD27	TPSD270006	20030521
TP-SD27	TPSD270612	20030521
TP-SD28	TPSD280006	20030520
TP-SD28	TPSD280612	20030520
TP-SD29	TPSD290006	20030521
TP-SD29	TPSD290612	20030521
TP-SD30	TPSD300006	20030520
TP-SD30	TPSD300612	20030520
TP-SD33	TPSD330006	20030521
TP-SD33	TPSD330612	20030521
TP-SD34	TPSD340006	20030520
TP-SD34	TPSD340612	20030520
TP-SD35	TPSD350006	20030521
TP-SD35	TPSD350612	20030521
TP-SD35	TPSD350612-D	20030521
TP-SD36	TPSD360006	20030520
TP-SD37	TPSD370006	20030521
TP-SD37	TPSD370612	20030521
TP-SD38	TPSD380006	20030521
TP-SD38	TPSD380612	20030521
Surface Water		
OF-60	TPOF600503	20030512
OF-60	TPOF600503-F	20030512
OF-61	TPOF610503	20030512
OF-61	TPOF610503-D	20030512
OF-61	TPOF610503-F	20030512
OF-61	TPOF610503-F-D	20030512
OF-63	TPOF630503	20030512
OF-63	TPOF630503-F	20030512
TP-SW01	TPSW010503	20030512
TP-SW01	TPSW010503-F	20030512
TP-SW02	TPSW020503	20030512
TP-SW02	TPSW020503-F	20030512
TP-SW03	TPSW030503	20030512
TP-SW03	TPSW030503-F	20030512
Seeps		
BC-1016	BC-1016-SP-1296-F	19961213
BC-1016	BC-1016-SP-1296	19961216
BC-1016	BC-1016-SP-0497	19970410
BC-1016	BC-1016-SP-0897	19970819
BC-1016	BC-1016-SP-1197	19971113
BC-1016	BC-1016-SP-1197-D	19971113
BC-1016	BC-1016-SP-1197-F	19971113

TABLE 4-1

SAMPLE LIST
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Sample Location	Sample ID	Sample Date
BC-1016	BC-1016-SP-1197-F-D	19971113
BC-1017	BC-1017-SP-1296-F	19961213
BC-1017	BC-1017-SP-1296	19961216
BC-1017	BC-1017-SP-0497	19970409
BC-1017	BC-1017-SP-0897	19970819
BC-1017	BC-1017-SP-1197	19971115
BC-1017	BC-1017-SP-1197-F	19971115
BC-1018	BC-1018-SP-1296-F	19961211
BC-1018	BC-1018-SP-1296	19961212
BC-1018	BC-1018-SP-1296-D	19961212
BC-1018	BC-1018-SP-1296-F-D	19961212
BC-1018	BC-1018-SP-0497	19970409
BC-1018	BC-1018-SP-0897	19970818
BC-1018	BC-1018-SP-1197	19971113
BC-1018	BC-1018-SP-1197-F	19971113
BC-1020	BC-1020-SP-1296-F	19961211
BC-1020	BC-1020-SP-1296	19961212
BC-1020	BC-1020-SP-0497	19970409
BC-1020	BC-1020-SP-0897	19970819
BC-1020	BC-1020-SP-0897-D	19970819
BC-1020	BC-1020-SP-1197	19971114
BC-1020	BC-1020-SP-1197-F	19971114

TABLE 4-2

SUMMARY STATISTICS FOR SURFACE SOIL
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

CHEMICAL	MINIMUM DETECTED CONCENTRATION[1]	MAXIMUM DETECTED CONCENTRATION[1]	LOCATION OF MAXIMUM CONCENTRATION	DETECTION FREQUENCY[2]	RANGE OF DETECTION LIMITS[3]	RANGE OF FACILITY BACKGROUND	FACILITY BACKGROUND 95-PERCENT UCL[4]	USEPA SOIL RSL[5]
VOLATILE ORAGNICS (µg/kg)								
1,1,2-TRICHLOROTRIFLUOROETHANE	3 J	3 J	TP-MW07	1/14	10-12	NA	NA	4300000 n
2-BUTANONE	2 J	4 J	TP-SB09	5/15	11-18	ND	ND	2800000 n
CHLOROFORM	2 J	2 J	TP-SB12	1/15	6-12	ND	ND	290 c
METHYLENE CHLORIDE	4 J	4 J	BGS-05	1/15	11-39	**1 - 2**	NA[6]	11000 c
TOLUENE	1 J	2 J	TP-SB09, TP-MW02	3/14	6-12	**1**	NA[6]	500000 n
TOTAL XYLENES	2 J	7 J	TP-SB09	3/14	6-12	NA	NA	63000 n[7]
TRICHLOROETHENE	2 J	2 J	TP-SB15	1/15	6-12	ND	ND	2800 c
SEMIVOLATILE ORGANICS (µg/kg)								
1,2-DICHLOROBENZENE	1700 J	1700 J	TP-MW06	1/42	40-6900	ND	ND	190000 n
2-METHYLNAPHTHALENE	5.1	720 J	TP-SB27	15/51	3.7-6900	**44**	NA[6]	31000 n
4-HYDROXY-4-METHYL-2-PENTANONE	26000 J	26000 J	BGS-05	1/1	--	**16000 -** 66000	47800	NA
4-METHYLPHENOL	19 J	19 J	TP-SB15	1/51	61-6900	ND	ND	31000 n
ACENAPHTHENE	8.6	1400	TP-SB31	7/51	3.5-6900	ND	ND	340000 n
ACENAPHTHYLENE	3.9	89	TP-SB120	8/51	3.6-6900	**74**	NA[6]	340000 n[8]
ANTHRACENE	3.7	2200	TP-SB31	19/51	3.6-6900	**58 - 62**	NA[6]	1700000 n
BAP EQUIVALENT-HALFND	4.7	6300	TP-SB120	39/51	69-7600	NA	NA	**15 c**
BAP EQUIVALENT-POS	0.5	6280	TP-SB120	38/51	--	NA	NA	**15 c**
BENZO(A)ANTHRACENE	5.7	4500	TP-SB31	34/51	3.8-6600	**37 - 640**	**173**	**150 c**
BENZO(A)PYRENE	6	4000	TP-SB120	35/51	3.8-6600	**36 - 1100**	**222**	**15 c**
BENZO(B)FLUORANTHENE	4.7	6100 J	TP-SB120	34/51	39-6600	**41 - 1700**	**496**	**150 c**
BENZO(G,H,I)PERYLENE	11	2800	TP-SB120	30/51	3.7-6600	**39 - 410**	**121**	170000 n[9]
BENZO(K)FLUORANTHENE	4.3	3000	TP-SB31	33/51	68-6600	**38 - 1100**	**241**	**1500 c**
BIS(2-ETHYLHEXYL)PHTHALATE	93 J	430	TP-MW01	9/51	73-6900	**58 -** 650	**133**	35000 c
BUTYL BENZYL PHTHALATE	23 J	76 J	TP-SB11	4/51	71-6900	ND	ND	260000 c
CARBAZOLE	19 J	740	TP-SB31	11/50	63-6900	**94**	NA[6]	NA
CHRYSENE	4.4	4900	TP-SB31	37/51	57-6600	**37 - 1600**	**300**	15000 c
DI-N-BUTYL PHTHALATE	18 J	51 J	TP-SB17	5/51	220-6900	100	NA[6]	610000 n
DI-N-OCTYL PHTHALATE	210 J	210 J	TP-SB24	1/51	53-6900	**100**	NA[6]	7800 n
DIBENZO(A,H)ANTHRACENE	3.6	1000 J	TP-SB120	15/51	3.6-6900	**180 - 190**	NA[6]	**15 c**
DIBENZOFURAN	29 J	640 J	TP-SB31	6/51	36-6900	ND	ND	7800 n
FLUORANTHENE	34 J	7600	TP-SB31	35/51	8.1-6600	**43 - 1700**	**389**	230000 n
FLUORENE	4.4	1200	TP-SB31	11/51	3.5-6900	**42**	NA[6]	230000 n
INDENO(1,2,3-CD)PYRENE	11	2500	TP-SB120	29/51	3.6-6900	**38 - 440**	**132**	**150 c**
NAPHTHALENE	10	490 J	TP-SB31	12/51	3.5-6900	**42 - 43**	NA[6]	3600 c
PHENANTHRENE	4.8	9500	TP-SB31	35/51	51-6600	**40 - 470**	**178**	170000 n[9]
PYRENE	30	9600	TP-SB31	33/51	7.4-6600	**42 - 1400**	**482**	170000 n
PESTICIDES/PCBs (µg/kg)								
4,4'-DDD	2 J	70 J	TP-MW01	9/41	1.3-18	**0.6 -** 170	**48.8**	2000 c
4,4'-DDE	1.7 J	300	TP-SB17	18/41	1.3-18	**5.2 -** 7100	3220	1400 c
4,4'-DDT	2.2 J	670	TP-SB17	26/41	1.2-18	**5.1 -** 4100	1030	1700 c
AROCLOR-1248	1500	1500	TP-SB120	1/60	4.8-300	ND	ND	**220 c**
AROCLOR-1254	280 J	280 J	TP-SB115	1/60	15-370	ND	ND	**110 n[10]**
AROCLOR-1260	21	210 J	TP-MW04	8/60	7.9-370	ND	ND	220 c
ENDOSULFAN I	2.7 J	2.7 J	TP-SB40	1/42	1.3-15	ND	ND	37000 n[11]
ENDOSULFAN SULFATE	6.5 J	12	TP-SB10	3/41	1.5-30	ND	ND	37000 n[11]

TABLE 4-2

SUMMARY STATISTICS FOR SURFACE SOIL
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

CHEMICAL	MINIMUM DETECTED CONCENTRATION[1]	MAXIMUM DETECTED CONCENTRATION[1]	LOCATION OF MAXIMUM CONCENTRATION	DETECTION FREQUENCY[2]	RANGE OF DETECTION LIMITS[3]	RANGE OF FACILITY BACKGROUND	FACILITY BACKGROUND 95-PERCENT UCL[4]	USEPA SOIL RSL[5]
ENDRIN ALDEHYDE	4 J	9.4	TP-SB27	2/40	1.4-30	ND	ND	1800 n[12]
TOTAL AROCLOR	21	210	TP-MW04	5/38	--	NA	NA	NA
TOTAL AROCLOR HALFND	51.9	2610	TP-SB120	60/60	--	NA	NA	NA
TOTAL AROCLOR ZEROND	21	1500	TP-SB120	10/60	--	NA	NA	NA
PETROLEUM HYDROCARBONS (mg/kg)								
DIESEL-RANGE ORGANICS	19	3900	TP-MW06	10/12	140-190	NA	NA	NA
GASOLINE-RANGE ORGANICS	3.9 J	40 J	TP-MW06	3/12	2.5-3.8	NA	N	NA
DIOXINS/FURANS (ng/kg)								
1,2,3,4,6,7,8,9-OCDD	88.1 J	905 J	TP-SB31	11/12	6.8-6.8	**18 -** 6460	1560	15000 c
1,2,3,4,6,7,8,9-OCDF	2.7 J	62.8	TP-SB26A	7/12	0.6-6.4	**1.9 -** 129	68.0	15000 c
1,2,3,4,6,7,8-HPCDD	5.1 J	38.3	TP-SB31	10/12	0.4-2.5	**1.3 -** 826	251	450 c
1,2,3,4,6,7,8-HPCDF	3.1 J	85.2	TP-SB31	10/12	0.4-0.85	**1.8 - 48.2**	**28.1**	450 c
1,2,3,4,7,8,9-HPCDF	7.6	7.6	TP-SB27	1/12	0.3-4.1	**0.48 - 1.7**	**1.0**	450 c
1,2,3,4,7,8-HXCDD	0.81 J	0.81 J	TP-SB27	1/12	0.2-3.4	**0.23 -** 4.2	1.3	45 c
1,2,3,4,7,8-HXCDF	1 J	41.5	TP-SB27	6/12	0.1-7.3	**0.93 - 12.7**	**5.5**	45 c
1,2,3,6,7,8-HXCDD	1.9 J	3.2 J	TP-SB31	5/12	0.2-3.1	**0.445 -** 9.6	3.2	45 c
1,2,3,6,7,8-HXCDF	0.57 J	16.5	TP-SB27	7/12	0.1-2.2	**0.385 - 5.4**	**2.8**	45 c
1,2,3,7,8,9-HXCDD	1.5 J	3.5 J	TP-SB36, TP-SB34	4/12	0.2-3.3	**0.445 -** 15.2	4.4	45 c
1,2,3,7,8,9-HXCDF	10.2	10.2	TP-SB27	1/12	0.2-1.9	**0.2 - 2.3**	**0.75**	45 c
1,2,3,7,8-PECDD	1 J	1 J	TP-SB27	1/12	0.2-1.4	**0.55 -** 3.3	1.3	4.5 c
1,2,3,7,8-PECDF	0.67 J	41.5	TP-SB27	3/12	0.07-3.9	**0.41 - 3.1**	**1.2**	150 c
2,3,4,6,7,8-HXCDF	0.8 J	19.9	TP-SB27	9/12	0.1-1.4	**0.545 - 7.7**	**4.0**	45 c
2,3,4,7,8-PECDF	1.1 J	25.4	TP-SB27	4/12	0.1-5.3	**0.335 - 7.7**	**3.3**	**15 c**
2,3,7,8-TCDD	0.38 J	0.38 J	TP-SB27	1/12	0.2-1.5	0.47 - 0.48	NA[6]	4.5 c
2,3,7,8-TCDF	23.2	23.2	TP-SB27	1/12	0.1-2.3	**0.48 - 8.9**	**4.6**	45 c
TEQ WHO-2005	0.1	22.2	TP-SB27	11/12	--	**0.18 - 15.8**	**7.0**	**4.5 c**
TEQ WHO-2005 - HALFND	0.5	22	TP-SB27	11/12	0.2-0.2	**0.54 - 15.8**	**6.7**	**4.5 c**
TOTAL HPCDD	14.3	89.8	TP-SB31	10/12	0.4-4.8	**2.6 -** 7430	4310	NA
TOTAL HPCDF	4.3 J	135 J	TP-SB31	10/12	0.85-1.1	**3.7 - 118**	**64.0**	NA
TOTAL HXCDD	4.1 J	57.4	TP-SB36	7/12	0.2-17.3	**2.3 -** 516	213	NA
TOTAL HXCDF	9.7 J	144 J	TP-SB27	9/12	0.1-25.1	**0.44 -** 193	**67.7**	NA
TOTAL PECDD	4.3	28.2 J	TP-SB36	7/12	0.2-5.9	**0.925 -** 50.6	**22.7**	NA
TOTAL PECDF	8.8	193 J	TP-SB27	6/12	0.52-115	**1.1 -** 363	**129**	NA
TOTAL TCDD	3.5 J	26.4 J	TP-SB36	7/12	0.2-3.1	**0.99 -** 30.1	**10.9**	NA
TOTAL TCDF	13.8 J	214 J	TP-SB27	5/12	0.75-228	**4.2** 461	**178**	NA

TABLE 4-2

SUMMARY STATISTICS FOR SURFACE SOIL
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

CHEMICAL	MINIMUM DETECTED CONCENTRATION[1]	MAXIMUM DETECTED CONCENTRATION[1]	LOCATION OF MAXIMUM CONCENTRATION	DETECTION FREQUENCY[2]	RANGE OF DETECTION LIMITS[3]	RANGE OF FACILITY BACKGROUND	FACILITY BACKGROUND 95-PERCENT UCL[4]	USEPA SOIL RSL[5]
INORGANICS (mg/kg)								
ALUMINUM	5520	21100	TP-SB17	51/51	--	4930 - 33500	20900	7700 n
ANTIMONY	0.32 J	12.4 J	TP-SB32	13/35	0.086-5.8	7 - 9.4	7.4	3.1 n
ARSENIC	6.2	82.3 J	TP-SB38B	55/56	2.4-2.4	4.4 - 58.6	17.9	0.39 c
BARIUM	25.2	2530	TP-SB27	51/51	--	22.3 - 223	91.6	1500 n
BERYLLIUM	0.12 J	1.2	TP-SB120	49/51	0.24-0.5	0.34 - 1.1	0.79	16 n
CADMIUM	0.14 J	8.7 J	TP-SB42	30/51	0.3-0.75	0.82 - 3.4	2.1	7 n
CALCIUM	784	15800	TP-SB25	51/51	--	682 - 7910	2380	NA
CHROMIUM	18.8 J	280	TP-SB23	51/51	--	11.6 - 103	65.8	NA [13]
COBALT	3.9 J	20.9	TP-MW02	51/51	--	3.1 - 24.2	12.5	2.3 n
COPPER	13.2	5620	TP-SB32	51/51	--	8.5 - 316	95.6	310 n
IRON	12600	196000	TP-SB27	51/51	--	8730 - 45000	24700	5500 n
LEAD	6.1 J	13200 J	TP-SB27	50/51	21.2-21.2	9.5 - 1100	271	400
MAGNESIUM	2800 J	13900	TP-SB25	51/51	--	1500 - 17200	8450	NA
MANGANESE	101	648	TP-SB19	51/51	--	110 - 611	344	180 n
MERCURY	0.01 J	16.3 J	TP-SB09	44/51	0.01-0.13	0.0825 - 1.8	0.32	1 n[14]
NICKEL	13.2	133	TP-SB19	51/51	--	8.1 - 73.2	43.6	150 n
POTASSIUM	828 J	5820 J	TP-SB25	51/51	--	585 - 6580	2300	NA
SELENIUM	0.21 J	3.7	TP-SB38B	13/51	0.18-3.9	0.32 - 2.1	0.66	39 n
SILVER	0.22 J	4.4 J	TP-SB19	10/50	0.05-1.3	ND	ND	39 n
SODIUM	128 J	1410 J	TP-SB40	47/51	95.4-110	35.1 - 1345	778	NA
THALLIUM	0.24 J	1.1	TP-MW09, TP-SB24, TP-MW08, TP-SB31	8/51	0.22-1.8	0.23	NA[6]	0.078 n
VANADIUM	18.2	109 J	TP-SB23	51/51	--	13.5 - 89.5	55.8	39 n[15]
ZINC	30.6	1630	TP-SB32	51/51	--	23.1 - 1390	392	2300 n
MISCELLANEOUS PARAMETERS (mg/kg)								
TOTAL ORGANIC CARBON	3.9	110000	TP-SB33	16/16	--	0.6 - 4.65	3.3	NA

Notes:
1- Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
2 - Sample and duplicate are counted as one sample when determining frequency of detection.
3 - Values presented are sample-specific quantitation limits.
4 - 95-percent UCLs were calculated using Pro UCL version 4.1.00.
5 - USEPA RSL - Table, June, 2011. (RSLs for non-carcinogens are divided by 10 to correspond to a HI of 0.1).
6 - There are less than three detected concentrations. A meaningful UCL cannot be calculated.
7 - Value is for xylenes, mixture.
8 - Value is for acenaphthene.
9 - Value is for pyrene.
10 - One tenth of the non-carcinogenic value is less than the carcinogenic value. Therefore, the non-carcinogenic value is presented.
11 - Value is for endosulfan.
12 - Value is for endrin.
13 - Value is for total chromium.
14 - Value is for elemental mercury.
15 - Value is for vanadium and compounds.
Shading indicates that the maximum detected concentration exceeded the risk-based screening level or background.

Definitions:
C = Carcinogen
J = Estimated value
N = Non-carcinogen
NA = Not Applicable/Not Available
ND = Not Detected
RSL = Regional Screening Level
sat = Soil saturation limit
UCL = Upper Confidence Limit

TABLE 4-3

SUMMARY STATISTICS FOR SUBSURFACE SOIL
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

PARAMETER	MINIMUM DETECTED CONCENTRATION[1]	MAXIMUM DETECTED CONCENTRATION[1]	LOCATION OF MAXIMUM CONCENTRATION	DETECTION FREQUENCY[2]	RANGE OF DETECTION LIMITS[3]	RANGE OF FACILITY BACKGROUND	Facility Background 95-Percent UCL[4]	USEPA Soil RSL[5]
VOLATILE ORGANICS (µg/kg)								
1,1,2-TRICHLOROTRIFLUOROETHANE	11 J	46 J	TP-MW05	3/46	10 - 58	NA	NA	4300000 n
2-BUTANONE	1 J	42	TP-MW06	12/46	4 - 65	ND	ND	2800000 n
2-HEXANONE	1 J	1 J	TP-MW07	1/44	11 - 58	ND	ND	21000 n
ACETONE	80	14000 J	TP-SB13	20/47	11 - 3400	ND	ND	6100000 n
BENZENE	2 J	2 J	TP-MW05	1/46	10 - 58	ND	ND	1100 c
CARBON DISULFIDE	1 J	22	TP-MW05	20/46	11 - 58	ND	ND	82000 n
CHLOROFORM	8 J	8 J	TP-SB14	1/46	10 - 58	ND	ND	290 c
ETHYLBENZENE	4 J	18	TP-MW05	2/44	11 - 58	ND	ND	5400 c
METHYLENE CHLORIDE	52	64	TP-SB17	4/47	11 - 70	**1 - 2**	NA[6]	11000 c
TETRACHLOROETHENE	1 J	9 J	TP-SB09	3/44	11 - 58	**5.5**	NA[6]	550 c
TOLUENE	1 J	3 J	TP-MW05	2/44	11 - 58	**1**	NA[6]	500000 n
TOTAL XYLENES	1 J	18	TP-SB11	6/44	11 - 58	NA	NA	63000 n [7]
TRICHLOROETHENE	1 J	2 J	TP-SB08 TP-SB11	4/46	11 - 58	ND	ND	2800 c
SEMIVOLATILE ORGANICS (µg/kg)								
1,2,4-TRICHLOROBENZENE	51 J	51 J	TP-MW06	1/89	38 - 1900	ND	ND	22000 c
1,2-DICHLOROBENZENE	720 J	730	TP-MW06	2/89	40 - 530	ND	ND	190000 n
1,3-DICHLOROBENZENE	110 J	130 J	TP-MW06	2/89	39 - 530	ND	ND	NA
1,4-DICHLOROBENZENE	96 J	120 J	TP-SB14	3/89	37 - 460	**67**	NA[6]	2400 c
2,4-DIMETHYLPHENOL	240 J	240 J	TP-SB14	1/91	130 - 1900	ND	ND	120000 n
2-METHYLNAPHTHALENE	14	1200	TP-SB39	27/91	3.8 - 1900	**44**	NA[6]	31000 n
ACENAPHTHENE	20 J	2400	TP-MW02	22/91	3.6 - 1900	ND	ND	340000 n
ACENAPHTHYLENE	22 J	2700	TP-SB14	10/91	3.6 - 1900	**74**	NA[6]	340000 n [8]
ANTHRACENE	26 J	7100	TP-MW02	41/91	3.6 - 1900	**58 - 62**	NA[6]	1700000 n
BAP EQUIVALENT-HALFND	5.3	9340	TP-MW02	74/91	55 - 531.53	NA	NA	**15 c**
BAP EQUIVALENT-POS	1.5	9330	TP-MW02	74/91	0	NA	NA	**15 c**
BENZO(A)ANTHRACENE	5.8	9100 J	TP-MW02	70/91	53 - 460	**37 - 640**	**173**	**150 c**
BENZO(A)PYRENE	6	5700 J	TP-MW02	69/91	3.6 - 460	**36 - 1100**	**222**	**15 c**
BENZO(B)FLUORANTHENE	8.5	6000 J	TP-MW02	69/91	40 - 460	**41 - 1700**	**496**	**150 c**
BENZO(G,H,I)PERYLENE	5.2	1900	TP-SB39, TP-MW05	54/91	3.6 - 1900	**39 - 410**	**121**	170000 n [9]
BENZO(K)FLUORANTHENE	5	6300	TP-MW02	58/91	3.6 - 530	**38 - 1100**	**241**	**1500 c**
BIS(2-ETHYLHEXYL)PHTHALATE	120 J	7600	TP-SB20	14/89	26 - 1900	**58 - 650**	**133**	35000 c
BUTYL BENZYL PHTHALATE	20 J	43 J	TP-SB14	3/89	72 - 1900	ND	ND	260000 c
CARBAZOLE	21 J	1700	TP-MW02	22/91	64 - 1900	**94**	NA[6]	NA
CHRYSENE	14	9600 J	TP-MW02	72/91	58 - 460	**1600**	**300**	15000 c
DI-N-BUTYL PHTHALATE	20 J	62 J	TP-SB13	12/91	220 - 1900	100	NA[6]	610000 n
DI-N-OCTYL PHTHALATE	69 J	340 J	TP-SB23	6/89	55 - 1900	**100**	NA[6]	NA
DIBENZO(A,H)ANTHRACENE	21 J	1800 J	TP-MW02	34/91	3.6 - 1900	180 - **190**	NA[6]	**15 c**
DIBENZOFURAN	19 J	2000	TP-SB39	20/91	36 - 1900	ND	ND	7800 n
DIETHYL PHTHALATE	240 J	240 J	TP-SB20	1/91	44 - 1900	ND	ND	4900000 n
FLUORANTHENE	25 J	16000	TP-MW02	73/91	12 - 460	**43 - 1700**	**389**	230000 n
FLUORENE	22 J	2500	TP-SB39	27/91	3.6 - 1900	**42**	NA[6]	230000 n
INDENO(1,2,3-CD)PYRENE	4.9	3100 J	TP-MW02	66/91	3.6 - 460	**38 - 440**	**132**	**150 c**
NAPHTHALENE	5	2300	TP-SB39	28/91	3.8 - 1900	**42 - 43**	NA[6]	3600 c

TABLE 4-3

SUMMARY STATISTICS FOR SUBSURFACE SOIL
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

PARAMETER	MINIMUM DETECTED CONCENTRATION[1]	MAXIMUM DETECTED CONCENTRATION[1]	LOCATION OF MAXIMUM CONCENTRATION	DETECTION FREQUENCY[2]	RANGE OF DETECTION LIMITS[3]	RANGE OF FACILITY BACKGROUND	Facility Background 95-Percent UCL[4]	USEPA Soil RSL[5]
PHENANTHRENE	10	13000	TP-MW02	69/91	51 - 460	40 - 470	178	170000 n [9]
PHENOL	200 J	200 J	TP-SB14	1/91	75 - 1900	98	NA[6]	1800000 n
PYRENE	19 J	19000 J	TP-MW02	66/91	8.7 - 460	42 - 1400	482	170000 n
PESTICIDES/PCBs (µg/kg)								
4,4'-DDD	5.1 J	5.5	TP-SB41	3/84	1.4 - 150	0.6 - 170	48.8	2000 c
4,4'-DDE	2.5 J	20 J	TP-SB18	17/85	1.4 - 150	5.2 - 7100	3220	1400 c
4,4'-DDT	2 J	1000 J	TP-SB27	21/84	1.2 - 140	5.1 - 4100	1030	1700 c
ALDRIN	2 J	2 J	TP-MW05	1/84	1.2 - 140	ND	ND	29 c
ALPHA-BHC	2.8 J	2.8 J	TP-SB38B	1/85	1.5 - 170	ND	ND	77 c
ALPHA-CHLORDANE	21	21	TP-SB14	1/85	1.5 - 170	ND	ND	1600 c [10]
AROCLOR-1248	41000 J	41000 J	TP-SB108	1/105	4.9 - 680	ND	ND	220 c
AROCLOR-1254	160	200	TP-SB114	2/105	15 - 680	ND	ND	110 n[11]
AROCLOR-1260	17 J	42000	TP-SB14	18/105	8 - 74	ND	ND	220 c
DIELDRIN	32 J	160	TP-SB14	2/85	1.3 - 150	ND	ND	30 c
ENDOSULFAN SULFATE	5.4	22 J	TP-MW05	4/84	1.5 - 170	ND	ND	37000 n [12]
ENDRIN ALDEHYDE	3.2 J	8.8 J	TP-SB36	3/85	1.5 - 170	ND	ND	1800 n [13]
PETROLEUM HYDROCARBONS (mg/kg)								
DIESEL RANGE ORGANICS	6.6	6200	TP-MW02	37/46	5.5 - 2000	NA	NA	NA
GASOLINE RANGE ORGANICS	2.5 J	61 J	TP-MW05	12/48	2.5 - 5	NA	NA	NA
DIOXINS/FURANS (ng/kg)								
1,2,3,4,6,7,8,9-OCDD	29.8 J	1420	TP-SB27	13/13	--	18 - 6460	1560	15000 c
1,2,3,4,6,7,8,9-OCDF	9 J	562 J	TP-SB27	6/13	2.9 - 14.7	1.9 - 129	68.0	15000 c
1,2,3,4,6,7,8-HPCDD	3.1 J	76.3	TP-SB34	12/13	2.4 - 2.4	1.3 - 826	251	450 c
1,2,3,4,6,7,8-HPCDF	3 J	538	TP-SB27	13/13	--	1.8 - 48.2	28.1	450 c
1,2,3,4,7,8,9-HPCDF	7.8	267	TP-SB27	2/13	0.9 - 4.3	0.48 - 1.7	1.0	450 c
1,2,3,4,7,8-HXCDD	5.2 J	5.2 J	TP-SB34	1/13	0.3 - 3.1	0.23 - 4.2	1.3	45 c
1,2,3,4,7,8-HXCDF	0.84 J	1690	TP-SB27	10/13	0.7 - 13.9	0.93 - 12.7	5.5	45 c
1,2,3,6,7,8-HXCDD	1.6 J	16.5	TP-SB34	4/13	0.2 - 2.9	0.445 - 9.6	3.2	45 c
1,2,3,6,7,8-HXCDF	1.7 J	533	TP-SB27	10/13	0.5 - 2.2	0.385 - 5.4	2.8	45 c
1,2,3,7,8,9-HXCDD	2.8 J	17.3	TP-SB34	3/13	0.2 - 3	0.445 - 15.2	4.4	45 c
1,2,3,7,8,9-HXCDF	1.1 J	521 J	TP-SB27	3/13	0.5 - 2.2	0.2 - 2.3	0.75	45 c
1,2,3,7,8-PECDD	2.1 J	10.1	TP-SB34	2/13	0.1 - 1.9	0.55 - 3.3	1.3	4.5 c
1,2,3,7,8-PECDF	0.93 J	5050	TP-SB27	9/13	0.2 - 12.4	0.41 - 3.1	1.2	150 c
2,3,4,6,7,8-HXCDF	2.3 J	549	TP-SB27	10/13	0.5 - 1.7	0.545 - 7.7	4.0	45 c
2,3,4,7,8-PECDF	1.6 J	2240	TP-SB27	8/13	0.3 - 10	0.335 - 7.7	3.3	15 c
2,3,7,8-TCDD	1 J	1 J	TP-SB34	1/13	0.2 - 0.9	0.47 - 0.48	NA[6]	4.5 c
2,3,7,8-TCDF	0.6 J	5210	TP-SB27	9/13	0.4 - 11.5	0.48 - 8.9	4.6	45 c
TEQ WHO-2005	0.18	1683	TP-SB27	13/13	--	0.18 - 15.8	7.0	4.5 c
TEQ WHO-2005 - HALFND	0.88	1684	TP-SB27	13/13	--	0.54 - 15.8	6.7	4.5 c
INORGANICS (mg/kg)								
ALUMINUM	2360	29000	TP-MW01	93/93	--	4930 - 33500	20900	7700 n
ANTIMONY	0.26 J	1430 J	TP-SB24	28/65	0.093 - 3.2	7 - 9.4	7.4	3.1 n
ARSENIC	4.2	65.7	TP-SB34	103/103	3.9 - 3.9	4.4 - 58.6	17.9	0.39 c
BARIUM	8.8	1580 J	TP-SB37	93/93	--	22.3 - 223	91.6	1500 n
BERYLLIUM	0.21	3.1	TP-MW01	63/93	0.08 - 0.54	0.34 - 1.1	0.79	16 n
CADMIUM	0.32 J	24.1	TP-SB37	56/93	0.21 - 3.4	0.82 - 3.4	2.1	7 n

TABLE 4-3

SUMMARY STATISTICS FOR SUBSURFACE SOIL
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

PARAMETER	MINIMUM DETECTED CONCENTRATION[1]	MAXIMUM DETECTED CONCENTRATION[1]	LOCATION OF MAXIMUM CONCENTRATION	DETECTION FREQUENCY[2]	RANGE OF DETECTION LIMITS[3]	RANGE OF FACILITY BACKGROUND	Facility Background 95-Percent UCL[4]	USEPA Soil RSL[5]
CALCIUM	789	57200 J	TP-SB08	93/93	--	682 - 7910	2380	NA
CHROMIUM	14.6	2860	TP-SB35	93/93	--	11.6 - 103	65.8	NA [14]
COBALT	2.8	85.2	TP-SB35	93/93	--	3.1 - 24.2	12.5	2.3 n
COPPER	6.4 J	40400	TP-SB19	92/93	5.3 - 5.3	8.5 - 316	95.6	310 n
IRON	8350	280000	TP-SB23	93/93	--	8730 - 45000	24700	5500 n
LEAD	7.4 J	40000 J	TP-SB24	88/93	3.8 - 23.4	9.5 - 1100	271	400
MAGNESIUM	1150	13300	TP-SB13	93/93	--	1500 - 17200	8450	NA
MANGANESE	59.4	4370	TP-SB25	93/93	--	110 - 611	344	180 n
MERCURY	0.03 J	120 J	TP-SB37	83/93	0.01 - 0.08	0.0825 - 1.8	0.32	1 n [15]
NICKEL	12.3 J	3920	TP-SB35	91/93	16.3 - 29.1	8.1 - 73.2	43.6	150 n
POTASSIUM	460	6330	TP-MW01	86/93	442 - 2260	585 - 6580	2300	NA
SELENIUM	0.45 J	7.5 J	TP-SB35	30/93	0.14 - 24.5	0.32 - 2.1	0.66	39 n
SILVER	0.16 J	25.6 J	TP-SB31	31/93	0.05 - 13	ND	ND	39 n
SODIUM	127 J	5740	TP-SB08	87/93	126 - 347	35.1 - 1345	778	NA
THALLIUM	0.66 J	3.6	TP-MW09	10/93	0.23 - 5.6	0.23	NA[6]	0.078
VANADIUM	8.9 J	98.1 J	TP-SB23	93/93	--	13.5 - 89.5	55.8	39 n[16]
ZINC	15 J	15800 J	TP-SB19	93/93	--	23.1 - 1390	392	2300 n
MISCELLANEOUS PARAMETERS (mg/kg)								
TOTAL ORGANIC CARBON	380	160000	TP-SB14	43/43	--	0.6 - 4.65	3.3	NA

Notes:
1- Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
2 - Sample and duplicate are counted as one sample when determining frequency of detection.
3 - Values presented are sample-specific quantitation limits.
4 - 95-percent UCLs were calculated using Pro UCL version 4.1.00.
5 - USEPA RSL - Table, June, 2011. (RBCs for non-carcinogens are divided by 10 to correspond to a HI of 0.1).
6 - There are less than three detected concentrations. A meaningful UCL cannot be calculated.
7 - Value is for xylenes, mixture.
8 - Value is for acenaphthene.
9 - Value is for pyrene.
10 - Chlrodane screening value used as a surrogate.
11 - One tenth of the non-carcinogenic value is less than the carcinogenic value. Therefore, the non-carcinogenic value is presented.
12- Endosulfan screning value is used as a surrogate.
13 - Endrin screenig value used as a surrogate.
14- Value is for total chromium.
15 - Value is for elemental mercury.
16- Value is for metalic vanadium.

Shading indicates that the maximum detected concentration exceeded the risk-based screenig level or background concentration.

Definitions:
C = Carcinogen
J = Estimated value
N = Non-carcinogen
NA = Not Applicable/Not Available
ND = Not Detected
RSL = Regional Screening Level
sat = Soil saturation limit

TABLE 4-4

SUMMARY STATISTICS FOR GROUNDWATER
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

CHEMICAL	MINIMUM DETECTED CONCENTRATION [1]	MAXIMUM DETECTED CONCENTRATION [1]	LOCATION OF MAXIMUM CONCENTRATION	DETECTION FREQUENCYy[2]	RANGE OF DETECTION LIMITS[3]	CHRONIC ECOLOGICAL SCREENING VALUE 100 X DILUTION FACTOR	CHRONIC ECOLOGICAL SCREENING VALUE SOURCE	CONSTRUCTION WORKER SCREENING LEVEL[4]	RANGE OF UPGRADIENT CONCENTRATIONS[5]
SEMIVOLATILE ORGANICS (µg/L)									
2-METHYLNAPHTHALENE	0.2 J	0.2 J	TP-MW09	1/28	0.07-12	300 [6]	Buchman, 2008	720 n	ND
ACENAPHTHENE	0.4	0.4	TP-MW09	1/28	0.07-12	4000	USEPA, Jan. 1996	10000 n	ND
ACENAPHTHYLENE	0.1 J	0.1 J	TP-MW09	1/28	0.05-12	300 [6]	Buchman, 2008	10000 n	ND
ANTHRACENE	0.021 J	0.6	TP-MW09	3/28	0.07-12	300 [6]	Buchman, 2008	28000 n	ND
BIS(2-ETHYLHEXYL)PHTHALATE	1 J	1 J	TP-MW05	1/17	8-11	36000	Buchman, 2008	810 c	1-6
DI-N-BUTYL PHTHALATE	0.8 J	0.8 J	TP-MW05	1/16	2-11	340	Buchman, 2008	31000 n	0.9-2
FLUORANTHENE	0.16	0.9	TP-MW09	3/28	0.1-12	1100	USEPA, Jan. 1996	200 n	ND
FLUORENE	0.9	0.9	TP-MW09	1/28	0.06-12	300 [6]	Buchman, 2008	5200 n	ND
NAPHTHALENE	0.021 J	0.3	TP-MW09	3/28	0.05-12	140 [6]	Buchman, 2008	730 n	ND
PHENANTHRENE	0.2 J	2	TP-MW09	2/28	0.07-12	830	USEPA, Jan. 1996	270 n	ND
PYRENE	0.1 J	0.4	TP-MW09	4/28	0.08-12	300 [6]	Buchman, 2008	1700 n	ND
TOTAL INORGANICS (µg/L)									
ALUMINUM	2770	14500	TP-MW08	2/41	10-3610	**8700 [7]**	USEPA 2009	2580000 n	ND
ANTIMONY	34	34	TP-MW06	1/41	1.3-39.6	50000	Buchman, 2008	155 n	12.3
ARSENIC	2.6 J	41.2 J	TP-MW02	7/41	1.8-37	3600 [8]	USEPA 2009	774 n	ND
BARIUM	7.2 J	556	TP-MW08	36/41	8.9-37.8	5000000	USEPA May 1986	36100 n	29.3-92.3
CADMIUM	0.18 J	3.9 J	TP-MW06	6/41	0.14-2.3	880 [8]	USEPA 2009	64.5 n	ND
CALCIUM	71500	1080000	FA-01DB	41/41	--	NA	NA	NA	19800-178,000
CHROMIUM	1.2 J	27.4	TP-MW08	4/41	0.68-23.8	5000 [8]	USEPA 2009	25800 n	2.1
COPPER	7.3 J	496	TP-MW05	10/41	2.2-238	**310 [8]**	USEPA 2009	103000 n	7.8
IRON	229	21800	TP-MW08	19/41	6.1-2360	100000 [7]	USEPA 2009	1810000 n	402-2120
LEAD	1.7 J	195 J	TP-MW06	6/41	0.91-26.2	810 [8]	USEPA 2009	1630	0.975-3.6
MAGNESIUM	32200	1240000	FA-01	41/41	--	NA	NA	NA	3,820 -25,700
MANGANESE	3 J	2820	FA-01DB	29/41	0.7-25.8	12000 [7]	Suter and Tsao, 1996	**2480 n**	66.2 -2290
MERCURY	0.01 J	0.46 J	TP-MW02	9/41	0.01-0.13	94 [8]	USEPA 2009	413 n	ND
NICKEL	1.1 J	278	TP-MW06	25/41	1.5-66.4	820 [8]	USEPA 2009	10300 n	4-4.2
POTASSIUM	14300	448000	TP-MW07	41/41	--	NA	NA	N/A	3350-10700
SELENIUM	7.3 J	19.8 J	FA-01	5/38	1.9-63.8	7100 [8]	USEPA 2009	12900 n	6.6-15.6
SILICON	732 J	20600	TP-MW08	10/11	755-755	NA	NA	NA	6140
SILVER	1.4 J	6.2 J	FA-01	2/41	0.57-10.7	19 [9]	USEPA 2009	860 n	ND
SODIUM	433000	10400000	FA-01	41/41	--	NA	NA	NA	38600-412000
THALLIUM	4.8 J	66.1 J	TP-MW07	8/41	0.11-64.4	2130 [6]	Buchman, 2008	168 n	ND
VANADIUM	0.68 J	25.8	TP-MW08	2/41	0.36-22.6	2000 [7]	Suter and Tsao, 1996	470 n	ND
ZINC	5	587	TP-MW05	24/41	2.1-171	8100 [8]	USEPA 2009	1290000 n	6.05-87.6
DISSOLVED INORGANICS (µg/L)									
ARSENIC	7.2	7.2	TP-MW09	1/25	1.8-37	3600 [8]	USEPA 2009	774 n	ND
BARIUM	8.7 J	570	TP-MW08	23/25	9.2-61.4	5000000	USEPA May 1986	36100 n	24.6-92.3
CADMIUM	0.14 J	3.6 J	TP-MW06	8/25	0.14-2.3	880 [8]	USEPA 2009	64.5 n	ND
CALCIUM	69500	360000	TP-MW04	25/25	--	NA	NA	NA	20200-186000
COBALT	1.4 J	1.7 J	FA-01	3/25	0.8-7.1	2300 [7]	Suter and Tsao, 1996	1940 n	1.2-2.7
COPPER	45.4	65.2	TP-MW05	2/25	2.2-65.6	310 [8]	USEPA 2009	103000 n	6.8-16.1
IRON	121 J	6720	TP-MW06	10/25	6.1-79.1	100000 [7]	USEPA 2009	1810000 n	102
LEAD	3.4 J	6.2 J	TP-MW06	2/25	0.91-26.2	810 [8]	USEPA 2009	1630 [8]	1.1

TABLE 4-4

SUMMARY STATISTICS FOR GROUNDWATER
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

CHEMICAL	MINIMUM DETECTED CONCENTRATION [1]	MAXIMUM DETECTED CONCENTRATION [1]	LOCATION OF MAXIMUM CONCENTRATION	DETECTION FREQUENCYy[2]	RANGE OF DETECTION LIMITS[3]	CHRONIC ECOLOGICAL SCREENING VALUE 100 X DILUTION FACTOR	CHRONIC ECOLOGICAL SCREENING VALUE SOURCE	CONSTRUCTION WORKER SCREENING LEVEL[4]	RANGE OF UPGRADIENT CONCENTRATIONS[5]
MAGNESIUM	33700	1070000	TP-MW04	25/25	--	NA	NA	NA	1030-26700
MANGANESE	16.6 J	1380	TP-MW08	16/25	0.75-23.4	12000 [7]	Suter and Tsao, 1996	2480 n	53.8-2310
MERCURY	0.01 J	0.28	TP-MW06	3/25	0.03-0.16	94 [8]	USEPA 2009	413 n	ND
NICKEL	2.5 J	270	TP-MW06	20/25	1.5-28.6	820 [8]	USEPA 2009	10300 n	3.8-10.6
POTASSIUM	14800	401000	TP-MW05	25/25	--	NA	NAA	NA	3400-10400
SELENIUM	2.2 J	24.8	TP-MW08	11/25	2.1-63.8	7100 [8]	USEPA 2009	12900 n	17
SILICON	689 J	5180	FA-01B	11/11	--	NA	NA	NA	6060
SODIUM	446000	9210000	TP-MW04	25/25	--	NA	NA	NA	97600-425000
THALLIUM	4.7 J	4.7 J	TP-MW07	1/25	0.1-64.4	2130 [6]	Buchman, 2008	168 n	ND
ZINC	5.3	572	TP-MW05	19/25	4.1-20.6	8100 [8]	USEPA 2009	1290000 n	10.8-101

Notes:
1- Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
2 - Sample and duplicate are counted as one sample when determining frequency of detection.
3 - Values presented are sample-specific quantitation limits.
4 - Aqueous risk-based screening levels calculated for construction workers (see Appendix D.2). (RBCs for noncarcinogenic compounds are divided by 10 to correspond to a HI of 0.1).
5 - Upgradient groundwater concentration are from B184-MW01, B184-MW02, B184-MW03, B184-MW04, and TP-MW01. Samples were collected from 1998 to 2008.
6 - Chronic value was calculated by multiplying the actue LOEL by 0.01 to estimate a chronic NOEL.
7 - Value is based on freshwater criteria.
8 - Value is based on dissolved concentration.
9 - Chronic value was calculated by multiplying the acute value by 0.1. Acute value was calculated by multiplying the acute LOEL by 0.1 (to esimate an acute NOEL).

Shading indicates that the maximum detected concentration exceeded the risk-based screening level.

Definitions:
c = Carcinogen
J = Estimated value
n = Non-carcinogen
NA = Not Applicable/Not Available
ND = Not detected

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TABLE 4-5

SUMMARY STATISTICS FOR SURFACE WATER
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

CHEMICAL	MINIMUM DETECTED CONCENTRATION (1)	MAXIMUM DETECTED CONCENTRATION (1)	LOCATION OF MAXIMUM CONCENTRATION	DETECTION FREQUENCY(2)	RANGE OF DETECTION LIMITS(3)	PNS HHSL FOR SURFACE WATER(4)	CHRONIC ECOLOGICAL SCREENING LEVEL	CHRONIC ECOLOGICAL SCREENING LEVEL SOURCE
Total Inorganics (ug/L)								
ALUMINUM	1800	1800	TP-SW02	1/6	56.3-337	130000 n	**87 (6)**	USEPA 2009
BARIUM	10.2	21.6	OF-63	6/6	--	13000 n	50000	Buchman, 2008
CALCIUM	312000	379000	OF-61	6/6	--	NA	NA	NA
IRON	2910	2910	TP-SW02	1/6	52.5-369	NA	**1000 (6)**	USEPA 2009
MAGNESIUM	836000	1090000	OF-61	6/6	--	NA	NA	NA
MANGANESE	32.1 J	32.1 J	TP-SW02	1/6	2-8.6	1100 n	120 (6)	Suter and Tsao, 1996
POTASSIUM	329000	407000	OF-61	6/6	--	NA	NA	NA
SILICON	760 J	4490 J	TP-SW02	6/6	--	NA	NA	NA
SODIUM	6550000	8460000	OF-61	6/6	--	NA	NA	NA
VANADIUM	5	5	TP-SW02	1/6	1.8-1.8	240000 n	20 (6)	Suter and Tsao, 1996
ZINC	44 J	55.2 J	OF-61	4/6	34.5-35.9	40000 n	81 (7)	USEPA 2009
Dissolved Inorganics (ug/L)								
BARIUM	10.4	21.8	OF-63	6/6	--	13000 n	50000	Buchman, 2008
CALCIUM	324000	378000	OF-61	6/6	--	NA	NA	NA
MAGNESIUM	796000	1120000	OF-61	6/6	--	NA	NA	NA
POTASSIUM	333000	416000	OF-61	6/6	--	NA	NA	NA
SILICON	715 J	1100 J	OF-63	6/6	--	NA	NA	NA
SODIUM	6350000	8590000	OF-61	6/6	--	NA	NA	NA
ZINC	40.4	56.8	OF-61	3/6	25.9-32.6	40000 n	81 (7)	USEPA 2009

Notes:
1- Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
2 - Sample and duplicate are counted as one sample when determining frequency of detection.
3 - Values presented are sample-specific quantitation limits.
4 - Calculated screening levels for intertidal seep water (recreational users) based on USEPA risk assessment guidance (see Appendix D.2).
6 - Value is based on freshwater criteria.
7 - Value is based on dissolved concentration.

Definitions:
J = Estimated value
n = Non-carcinogen
NA = Not Applicable/Not Available
PNS = Portsmouth Naval Shipyard
HHSL = Human Health Screening Level

Buchman, M.F., 2008. NOAA Screening Quick Reference Tables, NOAA HAZMAT Report 99-1, Seattle WA, Coastal Protection and Restoration Division, National Oceanic and Atmospheric Administration. http://response.restoration.noaa.gov/book_shelf/122_NEW-SQuiRTs.pdf

Suter, G.W. II. And C.L. Tsao. 1996 Toxicological Benchmarks for Screening Potential Constituents of Concern for Effects on Aquatic Biota: 1996 Revision Environmental Sciences Division, Oak Ridge National Laboratory. ES/ER/TM-96/R2.

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TABLE 4-6

SUMMARY STATISTICS FOR SEEP WATER
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

CHEMICAL	MINIMUM DETECTED CONCENTRATION [1]	MAXIMUM DETECTED CONCENTRATION [1]	LOCATION OF MAXIMUM CONCENTRATION	DETECTION FREQUENCY[2]	RANGE OF DETECTION LIMITS[3]	PNS HHSL FOR SURFACE WATER[4,5]	CHRONIC ECOLOGICAL SCREENING LEVEL 100 X DILUTION FACTOR	CHRONIC ECOLOGICAL SCREENING VALUE SOURCE
SEMIVOLATILE ORGANICS (µg/L)								
1,1-BIPHENYL	0.0031 J	0.0031 J	BC-1017	1/16	0.0031-0.011	8700 n	NA	NA
1-METHYLNAPHTHALENE	0.0018 J	0.0159	BC-1016	4/16	0.011925-0.0159	27 c	NA	NA
1-METHYLPHENANTHRENE	0.0001 J	0.0167	BC-1017	6/16	0.0045-0.0071	650 n	NA	NA
2,3,5-TRIMETHYLNAPHTHALENE	0.0029 J	0.0029 J	BC-1017	2/16	0.0057-0.0099	700 n	NA	NA
2,6-DIMETHYLNAPHTHALENE	0.0036 J	0.0067	BC-1017	2/16	0.0057-0.0064	1800 n	NA	NA
2-METHYLNAPHTHALENE	0.0011 J	0.0138	BC-1017	4/16	0.0087-0.0294	1200 n	300 [6]	Buchman, 2008
ACENAPHTHENE	0.0002	0.0055 J	BC-1017	7/16	0.006-0.0081	8800 n	4000	USEPA, Jan. 1996
ACENAPHTHYLENE	0.0002 J	0.024	BC-1020	8/16	0.0083-0.0083	7200 n	300 [6]	Buchman, 2008
ANTHRACENE	0.0004 J	0.0452	BC-1017	10/16	0.0016-0.0025	24000 n	300 [6]	Buchman, 2008
BAP EQUIVALENT[7]	0.0062	0.2413	BC-1017	11/16	0.0003-0.0057	0.5 c	NA	NA
BENZO(A)ANTHRACENE	0.0001 J	0.176	BC-1020	7/16	0.007-0.0241	5 c	300 [6]	Buchman, 2008
BENZO(A)PYRENE	0.0002 J	0.172	BC-1017	10/16	0.0003-0.0057	0.5 c	300 [6]	Buchman, 2008
BENZO(B)FLUORANTHENE	0.0003 J	0.357	BC-1017	8/16	0.0019-0.0136	5 c	300 [6]	Buchman, 2008
BENZO(E)PYRENE	0.0002 J	0.12	BC-1017	7/16	0.0021-0.0085	NA	NA	NA
BENZO(G,H,I)PERYLENE	0.0007 J	0.143	BC-1017	7/16	0.0046-0.0082	160 n	300 [6]	Buchman, 2008
CHRYSENE	0.0006 J	0.478	BC-1020	9/16	0.0012-0.0746	500 c	300 [6]	Buchman, 2008
DIBENZO(A,H)ANTHRACENE	0.0068 J	0.0292	BC-1017	3/16	0.0095-0.023	0.5 c	300 [6]	Buchman, 2008
FLUORANTHENE	0.0017 J	0.272	BC-1017	10/16	0.0044-0.0105	1800 n	1100	Buchman, 2008
FLUORENE	0.0006 J	0.0117	BC-1017	5/16	0.0042-0.0123	4300 n	300 [6]	Buchman, 2008
INDENO(1,2,3-CD)PYRENE	0.0009 J	0.107	BC-1017	8/16	0.0074-0.0184	5	300 [6]	Buchman, 2008
NAPHTHALENE	0.004 J	0.0214	BC-1017	3/16	0.0066-0.0226	5300 n	2350 [6]	Buchman, 2008
PERYLENE	0.0003 J	0.0477	BC-1020	7/16	0.0033-0.0061	NA	NA	NA
PHENANTHRENE	0.0287	0.135	BC-1017	4/16	0.0028-0.0103	2400 n	830	USEPA, Jan. 1996
PYRENE	0.0007 J	0.229	BC-1017	11/16	0.0054-0.0054	1600 n	300 [6]	Buchman, 2008
PESTICIDES/PCBs (µg/L)								
2,4'-DDT	0.0001 J	0.0009 J	BC-1017	4/16	0.0003-0.003	23 c	NA	NA
4,4'-DDE	0.0001 J	0.002	BC-1017	3/16	0.0001-0.0024	23 c	0.1	USEPA 2009
4,4'-DDT	0.0004 J	0.0013 J	BC-1018	3/16	0.0007-0.0037	23 c	0.1	USEPA 2009
ALPHA-CHLORDANE	0.0001 J	0.0002 J	BC-1016,BC-1017	6/16	0.0001-0.003	2 c	0.4	USEPA 2009
GAMMA-BHC (LINDANE)	0.0001 J	0.0001 J	BC-1018	1/16	0.0018-0.003	2 c	0.4	USEPA 2009
HEPTACHLOR	0.0001 J	0.0012 J	BC-1016	12/16	0.0012-0.003	0.4 c	0.36	USEPA 2009
HEPTACHLOR EPOXIDE	0.0001 J	0.0009 J	BC-1016	7/16	0.0028-0.003	0.08 c	0.36	USEPA 2009
HEXACHLOROBENZENE	0.0001 J	0.0001 J	BC-1016, BC-1018, BC-1020	4/16	0.0018-0.0038	5 c	1290	USEPA 2009
MIREX	0.0001 J	0.0109	BC-1017	5/16	0.0012-0.0021	0.064 c	NA	NA
TEQ PCB[8]	0.000000006	0.00000081	BC-1017	5/16	0.00000003-0.000000066	0.000061 c[9]	NA	NA
TOTAL PCB CONGENERS[10]	0.016	1	BC-1017	16/16	--	4 c[11]	NA	NA
TRANS-NONACHLOR	0.0001 J	0.0002 J	BC-1017	3/16	0.0001-0.003	NA	NA	NA
INORGANICS (µg/L)								
ALUMINUM	5 J	343 J	BC-1017	11/16	3-9.1	13000000 n	8700 [7]	USEPA 2009
ARSENIC	5.2 J	11.7 J	BC-1017	2/16	5-5	**4.9 c**	3600 [8]	USEPA 2009
CADMIUM	0.2 J	0.9 J	BC-1020	8/16	0.2-0.2	27 n	880 [8]	USEPA 2009
CHROMIUM	1.2	68	BC-1017	9/16	0.8-0.8	**57 n[12]**	5000 [8]	USEPA 2009
COPPER	4.3	42.5 J	BC-1017	16/16	--	5200 n	310 [8]	USEPA 2009
IRON	20.4	2175 J	BC-1017	16/16	--	91000 n	100000 [7]	USEPA 2009
LEAD	3.2 J	9.3 J	BC-1017	8/16	2.9-2.9	950 [13]	810 [8]	USEPA 2009

TABLE 4-6

SUMMARY STATISTICS FOR SEEP WATER
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

CHEMICAL	MINIMUM DETECTED CONCENTRATION [1]	MAXIMUM DETECTED CONCENTRATION [1]	LOCATION OF MAXIMUM CONCENTRATION	DETECTION FREQUENCY[2]	RANGE OF DETECTION LIMITS[3]	PNS HHSL FOR SURFACE WATER[4,5]	CHRONIC ECOLOGICAL SCREENING LEVEL 100 X DILUTION FACTOR	CHRONIC ECOLOGICAL SCREENING VALUE SOURCE
MANGANESE	2.1	40	BC-1017	15/16	0.9-0.9	1100 n	12000 [7]	Suter and Tsao, 1996
NICKEL	9.3 J	103	BC-1017	14/15	8-8	2000 n	820 [8]	USEPA 2009
SILVER	0.6	1.4	BC-1020	5/16	0.5-0.5	320 n	19 [9]	USEPA 2009
ZINC	36.2	213 J	BC-1020	13/16	64-92.5	40000 n	8100 [8]	USEPA 2009
FILTERED INORGANICS (µg/L)								
ALUMINUM	3.5	105.9	BC-1017	10/16	3-3	130000 n	8700 [7]	USEPA 2009
ARSENIC	9.3 J	9.7	BC-1017	2/16	5-5	**4.9** c	3600 [8]	USEPA 2009
CADMIUM	0.2 J	1	BC-1016	14/16	0.2-0.2	27 n	880 [8]	USEPA 2009
CHROMIUM	1	2.8 J	BC-1016	7/16	0.8-0.8	57 n	5000 [8]	USEPA 2009
COPPER	4.5	32.2 J	BC-1020	15/16	2.5-2.5	5200 n	310 [8]	USEPA 2009
IRON	3.5	645	BC-1016	14/16	3-3	91000 n	100000 [7]	USEPA 2009
LEAD	3.2 J	32.1 J	BC-1016	5/16	2.9-2.9	950 [13]	810 [8]	USEPA 2009
MANGANESE	1.1	29	BC-1017	16/16	0.9-0.9	1100 n	12000 [7]	Suter and Tsao, 1996
NICKEL	11.4	103	BC-1017	14/15	8-8	2000 n	820 [8]	USEPA 2009
SILVER	0.6 J	1.2 J	BC-1016, BC-1020	4/16	0.5-0.5	320 n	19 [9]	USEPA 2009
ZINC	18 J	214 J	BC-1020	16/16	--	40000 n	8100 [8]	USEPA 2009

Shading indicates that the maximum detected concentration exceeded the risk-based screening level.

Notes:
1- Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
2 - Sample and duplicate are counted as one sample when determining frequency of detection.
3 - Values presented are sample-specific quantitation limits.
4 - The maximum detected concentration is used for screening purposes.
5 - Calculated screening levels for undiluted seep water for recreational users based on USEPA risk assessment guidance (see text).
6 - Chronic Ecological Screenig Value.
7 - See Appendix D.2 for methodology used in calculating BAP Equivalent results.
8 - See Appendix D.2 for example calculation and methodology used for calculating TEQ PCB.
9 - Value is for TCDD.
10 - See Appendix D.2 for example calculation and methodology used for calculating Total PCB Congeners.
11 - Value is based on PCB-high risk (CAS # 1336-36-3) toxicitiy information.
12 - Value is for hexavalent chromium.
13 - Calculated screening level for child resident using the IEUBK model.

Definitions:
C = Carcinogen
HHSL = Human Health Screening Level
J = Estimated value
n = Non-carcinogen
NA = Not Applicable/Not Available
PNS = Portsmouth Naval Shipyard

Buchman, M.F., 2008. NOAA Screening Quick Reference Tables, NOAA HAZMAT Report 99-1, Seattle WA, Coastal Protection and Restoration Division, National Oceanic and Atmospheric Administration. http://response.restoration.noaa.gov/book_shelf/122_NEW-SQuiRTs.pdf
Suter, G.W. II. And C.L. Tsao. 1996 Toxicological Benchmarks for Screening Potential Constituents of Concern for Effects on Aquatic Biota: 1996 Revision. Environmental Sciences Division, Oak Ridge National Laboratory ES/ER/TM-96/R2.
United States Environmental Protection Agency (USEPA), January 1996. ECO Update, Ecotox Thresholds. United States Environmental Protection Agency. Office of Solid Waste and Emergency Response. Intermittent Bulletin, Volume 3, Number 2. EPA540/F-95/038.
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USEPA, 2009. National Recommended Water Qaulity Criteria: 2009. Office of Water.

TABLE 4-7

SUMMARY STATISTICS FOR SEDIMENT
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

CHEMICAL	MINIMUM DETECTED CONCENTRATION [1]	MAXIMUM DETECTED CONCENTRATION [1]	LOCATION OF MAXIMUM CONCENTRATION	DETECTION FREQUENCY[2]	RANGE OF DETECTION LIMITS[3]	PNS HHSL FOR SEDIMENT[4]	ECOLOGICAL IRG[5]
SEMIVOLATILE ORGANICS (µg/kg)							
1,1-BIPHENYL	0.9	51.5 J	MS-4 LOC.1	47/58	1.1-13.2	2800000 n	NA
1-METHYLNAPHTHALENE	1.4 J	110 J	MS-4 LOC.1	52/58	3-31.1	110000 c	NA
1-METHYLPHENANTHRENE	4.8	525 J	MS-4 LOC.1	58/58	--	910000 n	NA
2,3,5-TRIMETHYLNAPHTHALENE	0.9	95 J	MS-4 LOC.1	58/58	--	910000 n	NA
2,6-DIMETHYLNAPHTHALENE	1.5	127 J	MS-4 LOC.1	58/58	--	910000 n	NA
2-METHYLNAPHTHALENE	2.6 J	199	MS-4 LOC.1	57/63	4.45-54.4	180000 n	NA
ACENAPHTHENE	1.4 J	460	MS-4 LOC.1	63/63	--	2700000 n	NA
ACENAPHTHYLENE	7.7	557 J	MS-4 LOC.1	63/63	--	2700000 n	210
ANTHRACENE	22.2	5921 J	MS-4 LOC.1	63/63	--	14000000 n	**1236**
BAP EQUIVALENT[14]	66	8200	MS-4 LOC.1	63/63	--	**360 c**	NA
BENZO(A)ANTHRACENE	31.2	4812 J	MS-4 LOC.1	63/63	--	**3600 c**	NA
BENZO(A)PYRENE	32.9 J	6008 J	MS-4 LOC.1	63/63	--	**360 c**	NA
BENZO(B)FLUORANTHENE	49.1 J	5491 J	MS-4 LOC.1	63/63	--	**3600 c**	NA
BENZO(E)PYRENE	25.7	2587 J	MS-4 LOC.1	58/58	--	NA	NA
BENZO(G,H,I)PERYLENE	28	2612 J	MS-4 LOC.1	63/63	--	1400000 n	NA
BENZO(K)FLUORANTHENE	3.7 J	1851 J	MS-4 LOC.1	47/47	--	36000 c	NA
CHRYSENE	31	3920 J	MS-4 LOC.1	63/63	--	360000 c	NA
DIBENZO(A,H)ANTHRACENE	4.7 J	812 J	MS-4 LOC.1	63/63	--	**360 c**	NA
DIBENZOTHIOPHENE	1.4	345 J	MS-4 LOC.1	42/42	--	NA	NA
FLUORANTHENE	65.9	16098 J	MS-4 LOC.1	63/63	--	1800000 n	NA
FLUORENE	3.4 J	1221 J	MS-4 LOC.1	63/63	--	1800000 n	**500**
INDENO(1,2,3-CD)PYRENE	5.4 J	3509 J	MS-4 LOC.1	63/63	--	3600 c	NA
NAPHTHALENE	3.3	269	MS-4 LOC.1	57/63	--	910000 n	NA
PERYLENE	7.6	670 J	MS-4 LOC.1	58/58	--	910000 n	NA
PHENANTHRENE	24.6	8961 J	MS-4 LOC.1	63/63	--	1400000 n[6]	NA
PYRENE	56.5	12102 J	MS-4 LOC.1	63/63	--	1400000 n	NA
PESTICIDES/PCBs (µg/kg)							
1,2,3,4-TETRACHLOROBENZENE	0.02 J	4.02 J	MS-4 LOC.1	33/42	0.12-0.49	17000 n[15]	NA
1,2,4,5-TETRACHLOROBENZENE	0.16 J	5.51 J	MS-4 LOC.1	30/42	0.22-3	17000 n	NA
2,4'-DDD	0.73	27	MS-4 LOC.1	42/42	--	37000 c	NA
2,4'-DDE	0.1	36.81	MS-3 LOC.2	38/58	0.076-0.8	26000 c	NA
2,4'-DDT	0.04 J	34	MS-4 LOC.3	52/58	0.033-1	26000 c	NA
4,4'-DDD	0.73	1060	BC-1018	58/58	--	37000 c	NA
4,4'-DDE	0.51	138	MS-4 LOC.3	58/58	--	26000 c	NA
4,4'-DDT	0.38	174	MS-4 LOC.3	53/58	0.6-4.1	26000 c	NA
ALDRIN	0.01 J	24.26	MS-3 LOC.1	20/57	0.022-0.7	190 c	NA
ALPHA-BHC	0.01 J	0.58	MS-3 LOC.2	34/42	0.033-0.1	1100 c	NA
ALPHA-CHLORDANE	0.1 J	8.89	MS-3 LOC.2	48/58	0.15-0.8	20000 c[7]	NA
BETA-BHC	0.028 J	3.1	MS-3 LOC.1, MS-4-LOC.2	27/42	0.04-0.33	4000 c	NA
CHLORPYRIFOS	0.006 J	1.06	MS-3 LOC.1	19/42	0.065-3.2	170000 n	NA
CIS-NONACHLOR	0.11 J	2.2	MS-3 LOC.1	41/42	0.046-0.046	NA	NA
DELTA-BHC	0.004 J	0.44	MS-3 LOC.1	32/42	0.037-0.1	32000 n[8]	NA
DIELDRIN	0.03 J	33.29	MS-3 LOC.2	32/42	0.041-0.11	210 c	NA
ENDOSULFAN II	0.08 J	2.21	MS-4 LOC.1	36/42	0.12-0.24	340000 n	NA
ENDRIN	0.041 J	0.45	MS-3 LOC.2	8/42	0.055-0.24	17000 n	NA
GAMMA-BHC (LINDANE)	0.02 J	0.6 J	BC-1018	25/58	0.14-1.1	6500 c	NA
GAMMA-CHLORDANE	0.02 J	0.69	MS-3 LOC.1	34/42	0.03-0.11	20000 c[7]	NA
HEPTACHLOR	0.02 J	28.79	MS-3 LOC.2	48/58	0.14-0.5	740 c	NA
HEPTACHLOR EPOXIDE	0.03 J	0.4 J	BC-1018	12/58	0.024-0.5	360 c	NA
HEXACHLOROBENZENE	0.03 J	8.5	MS-3 LOC.1	39/58	0.041-0.6	2100 c	NA
MIREX	0.03 J	8	BC-1017	34/58	0.024-0.6	1800 c	NA
OXYCHLORDANE	0.02 J	1.84 J	MS-4 LOC.1	28/42	0.013-0.08	NA	NA

TABLE 4-7

SUMMARY STATISTICS FOR SEDIMENT
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

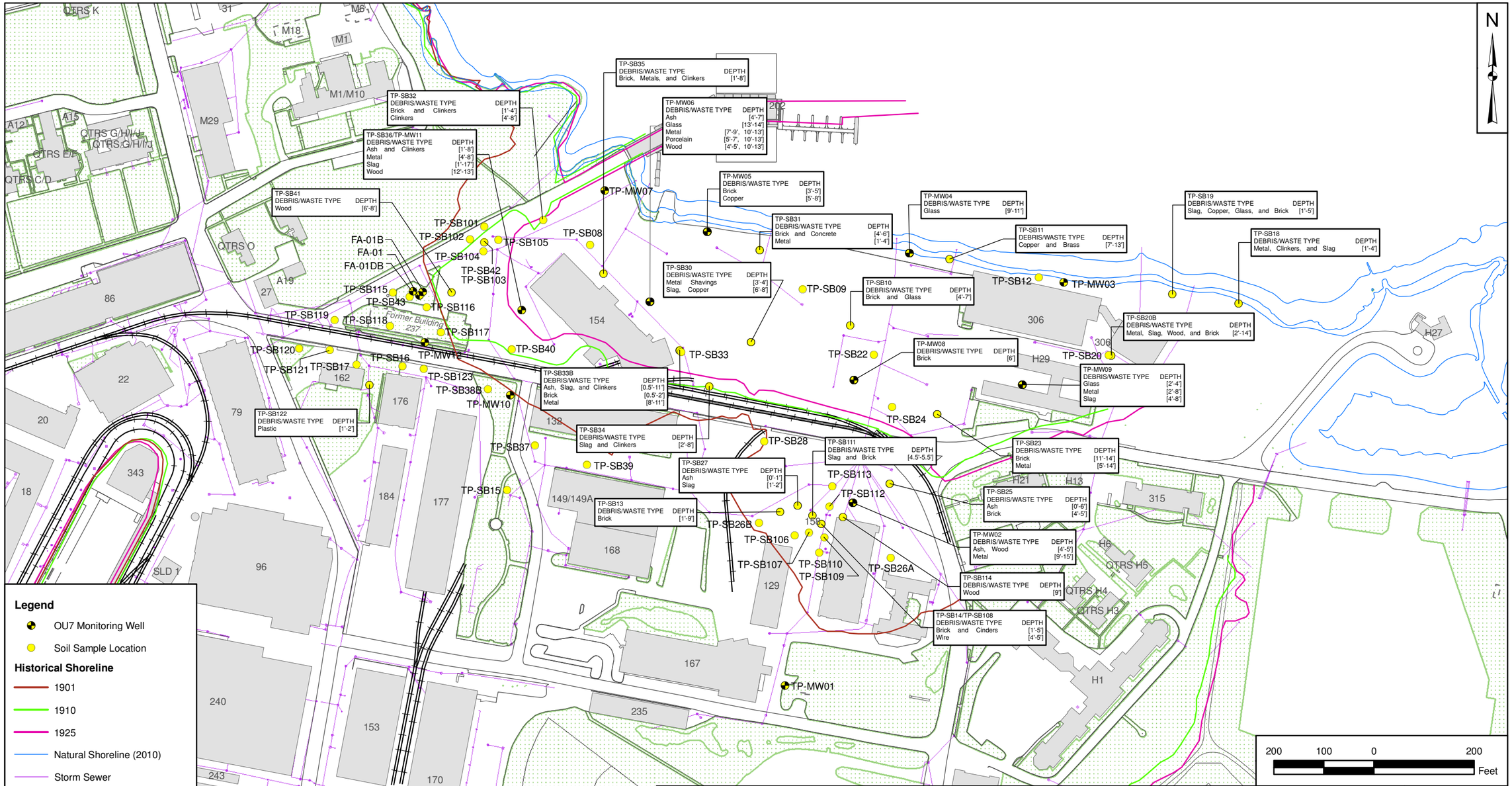
CHEMICAL	MINIMUM DETECTED CONCENTRATION [1]	MAXIMUM DETECTED CONCENTRATION [1]	LOCATION OF MAXIMUM CONCENTRATION	DETECTION FREQUENCY[2]	RANGE OF DETECTION LIMITS[3]	PNS HHSL FOR SEDIMENT[4]	ECOLOGICAL IRG[5]
PENTACHLOROANISOLE	0.03 J	0.33	MS-4 LOC.3	31/42	0.04-0.2	NA	NA
PENTACHLOROBENZENE	0.04 J	1.09	MS-3 LOC.1	30/42	0.087-0.84	45000 n	NA
TEQ PCB[9]	0.000072	7.0	MS-3 LOC.2	56/58	0.000072-0.000084	**0.23 c[10]**	NA
TOTAL PCB CONGENERS[11,12]	32	2700	MS-3 LOC.2	58/58	--	**47 c[12]**	NA
TRANS-NONACHLOR	0.02 J	2.9	BC-1018	54/58	0.15-0.8	NA	NA
INORGANICS (mg/kg)							
ALUMINUM	7870 J	42364.3	BC-1018	18/18	--	200000 n	NA
ARSENIC	7.5 J	36.2 J	MS-4 LOC.1	18/18	--	**5.9 c**	NA
CADMIUM	0.27 J	1.2 J	MS-4 LOC.1	17/17	--	78 n	NA
CHROMIUM	58.1 J	208.8	BC-1016	18/18	--	**50 n**	NA
COPPER	9.1 J	6490 J	MS-4 LOC.1	104/104	--	8000 n	**486**
IRON	23911.4	141000 J	MS-4 LOC.1	18/18	--	NA	NA
LEAD	49 J	575 J	MS-4 LOC.1	17/17	--	**400 [13]**	NA
MANGANESE	185 J	684.4 J	BC-1020	18/18	--	**610 n**	NA
MERCURY	0.46 J	2.975	BC-1016	12/16	0.302-0.58	13 n	NA
NICKEL	12.9 J	500 J	MS-4 LOC.1	75/84	38.3-89	510 n	**124**
SILVER	0.14 J	2.12	BC-1016	14/18	0.39-0.85	130 n	NA
ZINC	469.4	1540 J	MS-4 LOC.1	6/17	266-558	60000 n	NA

Shading indicates that the maximum detected concentration exceeded the screening criteria.

Notes:
1- Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
2 - Sample and duplicate are counted as one sample when determining frequency of detection.
3 - Values presented are sample-specific quantitation limits.
4 - Calculated site-specific human health screening levels for PNS. Note that screening levels for ingestion only were used for PAHs, PCBs, dioxins, and DDT and degredation by-products. See Appendix D.2 for explanation. (Screening levels for noncarcinogenic compounds are divided by 10 to correspond to a HI of 0.1).
5 - Ecological Interim Remediation Goal from OU4 Interim Offshore Monitoring
6 - Toxicity criteria for pyrene were used as surrogate values in calculating screening levels for phenanthrene.
7 - Toxicity criteria for chlordane were used as surrogate values in calculating screening levels for alpha-chlordane and gamma-chlordane.
8 - The non-cancer screening level for gamma-BHC was used as a surrogate for delta-BHC.
9 - See Appendix D.2 for example calculation and methodology used for calculating TEQ PCB.
10 - Value is for TCDD.
11 - See Appendix D.2 for example calculation and methodology used for calculating Total PCB Congeners.
12 - Value is for PCB-hexachlorobiphenyl.
13 - Value is USEPA's OSWER soil screening level for residential land use.
14 - See Appendix D.2 for methodology used in calculating BAP Equivalent results.
15 - The screening level for 1,2,4,5-tetrachlorobenzene was used as a surrogate for 1,2,3,4-tetrachlorobenzene.

Definitions:
C= Carcinogen
HHSL = Human Health Screening Level
IRG = Interim Remediation Goal for OU4
NA= Not Available
N = Non-carcinogen

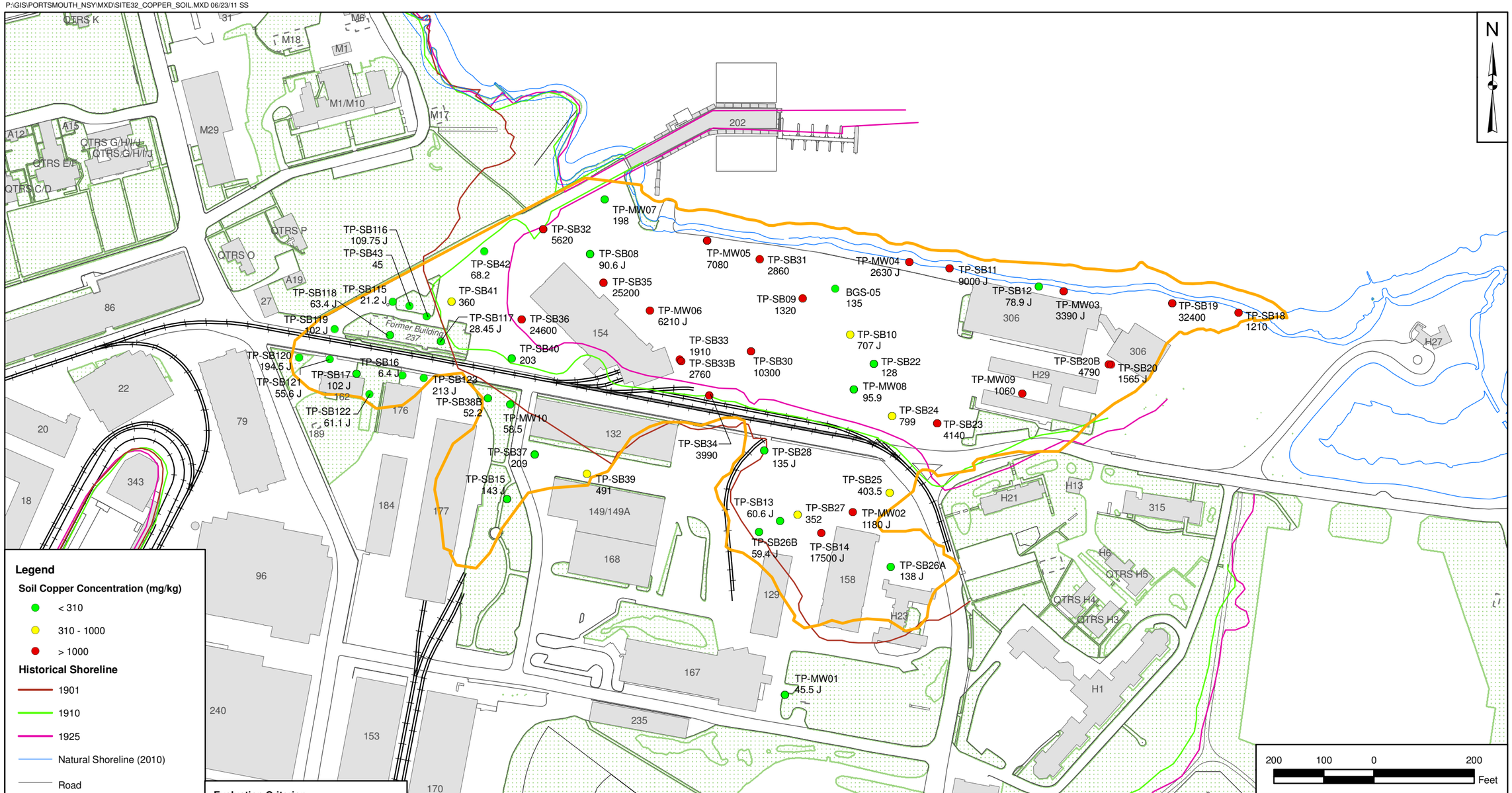
P:\GIS\PORTSMOUTH_NSY\MXD\SITE32_WASTE_DEBRIS.MXD 06/23/11 SS



Notes:
1. Base Map Source: U.S. Naval Activities Seavey Island; Kittery, ME, Existing Conditions July 2010. Provided and drawn by Dan Allen with Portsmouth Naval Shipyard.
2. Topographic contours provided in the Portsmouth Naval Shipyard base map provided by Dan Allen.
3. Vertical datum for topographic contours is PNS 2002 Datum.
4. Locations without tags did not have debris or waste.

DRAWN BY S. PAXTON	DATE 04/01/09	TETRA TECH	CONTRACT NUMBER 0383 / OWNER NUMBER CTO 055
CHECKED BY A. CHRISTIAN	DATE 06/23/11	SOIL BORING AND MONITORING WELL LOCATIONS OPERABLE UNIT 7 PORTSMOUTH NAVAL SHIPYARD KITTERY, MAINE	APPROVED BY ___ DATE ___
REVISED BY S. STROZ	DATE 06/23/11		APPROVED BY ___ DATE ___
SCALE AS NOTED			FIGURE NO. FIGURE 4 - 1 / REV 0

P:\GIS\PORTSMOUTH_NSY\MXD\SITE32_COPPER_SOIL.MXD 06/23/11 SS



Legend

Soil Copper Concentration (mg/kg)

- < 310
- 310 - 1000
- > 1000

Historical Shoreline

- 1901
- 1910
- 1925
- Natural Shoreline (2010)
- Road
- Railroad
- Approximate OU7 Boundary
- Former Buliding
- Vegetation
- Building

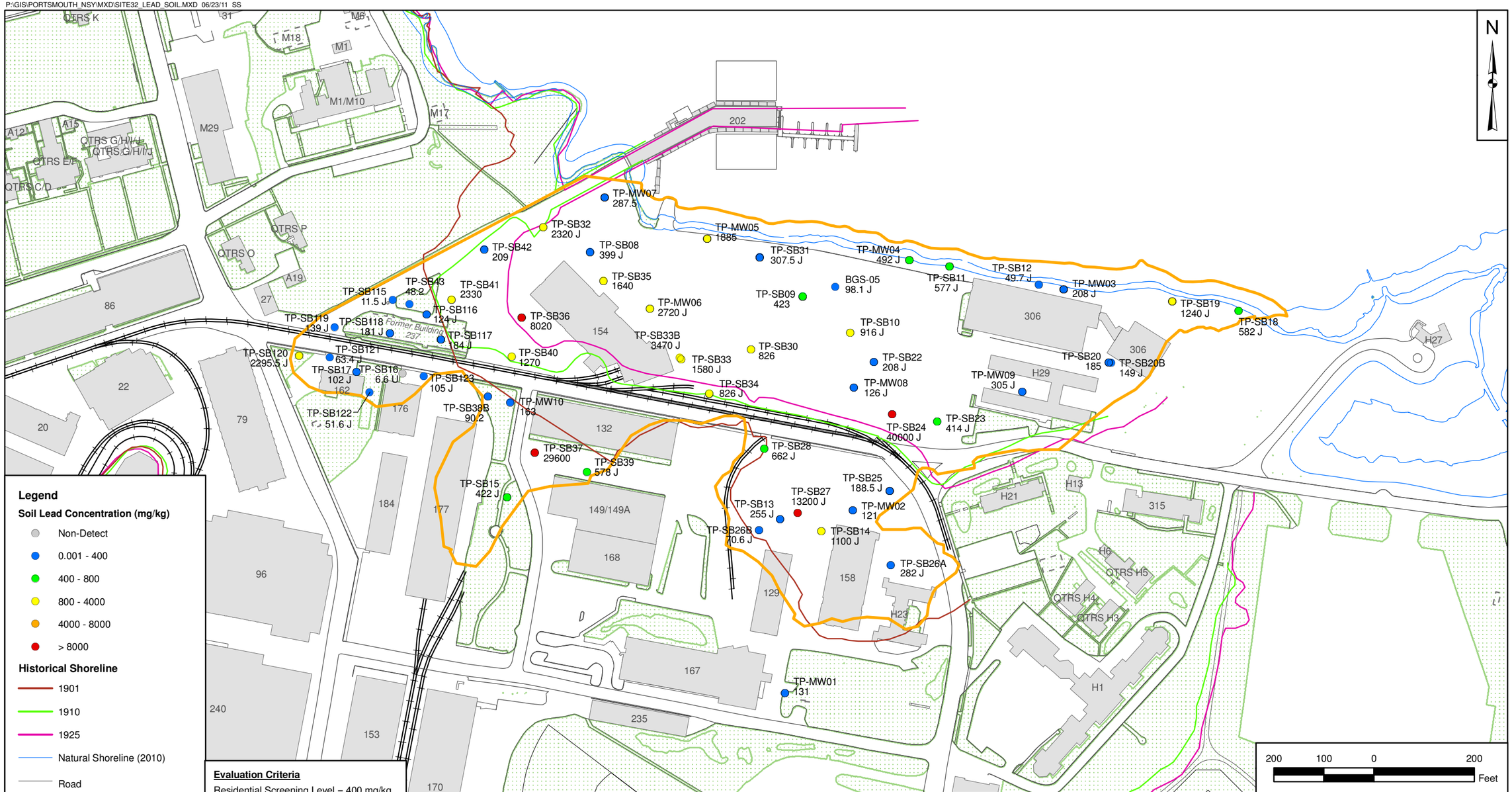
Evaluation Criterion

Residential Screening Level = 310 mg/kg

Notes:
1) The maximum copper result is shown for each location.
2) Where there are duplicate pairs, the average result is used.
3) J indicates the result is estimated.
4) Base Map Source: U.S. Naval Activities Seavey Island; Kittery, ME, Existing Conditions July 2010. Provided and drawn by Dan Allen with Portsmouth Naval Shipyard.

DRAWN BY S. PAXTON	DATE 04/08/09	TETRA TECH	CONTRACT NUMBER 0383 / OWNER NUMBER CTO 055
CHECKED BY A. CHRISTIAN	DATE 06/23/11	COPPER CONCENTRATIONS IN SOIL OPERABLE UNIT 7 PORTSMOUTH NAVAL SHIPYARD KITTERY, MAINE	APPROVED BY / DATE
REVISED BY S. STROZ	DATE 06/23/11		APPROVED BY / DATE
SCALE AS NOTED			FIGURE NO. FIGURE 4 - 2 / REV 0

P:\GIS\PORTSMOUTH_NSY\MXD\SITE32_LEAD_SOIL.MXD 06/23/11 SS



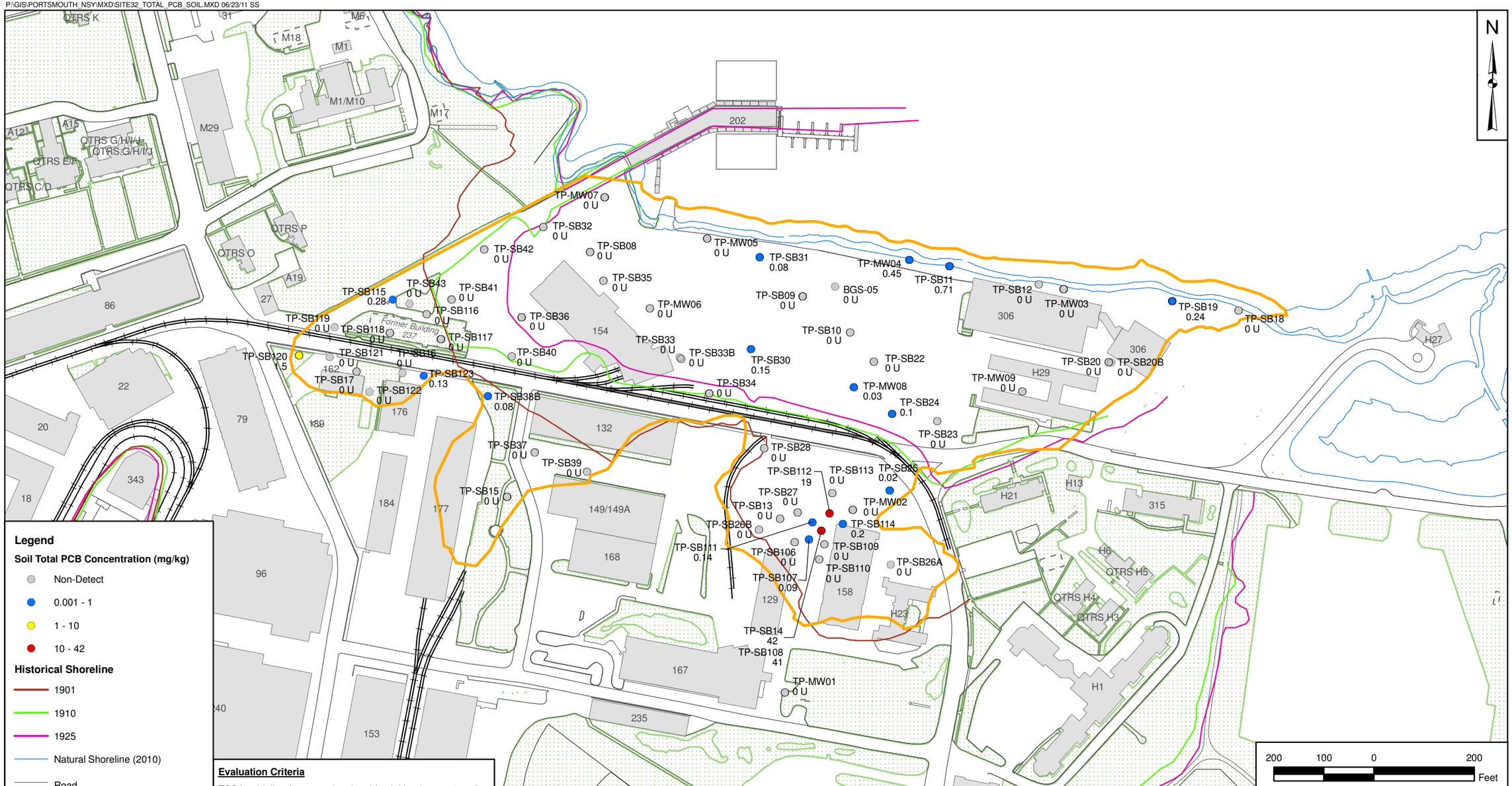
DRAWN BY	DATE
S. PAXTON	04/01/09
CHECKED BY	DATE
A. CHRISTIAN	05/20/11
REVISED BY	DATE
S. STROZ	06/23/11
SCALE	
AS NOTED	

TETRA TECH

LEAD CONCENTRATIONS IN SOIL
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

CONTRACT NUMBER	OWNER NUMBER
0383	CTO 055
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO.	REV
FIGURE 4 - 3	0

P:\GIS\PORTSMOUTH_NSY\MXD\SITE32_TOTAL_PCB_SOIL.MXD 06/23/11 SS



Legend

Soil Total PCB Concentration (mg/kg)

- Non-Detect
- 0.001 - 1
- 1 - 10
- 10 - 42

Historical Shoreline

- 1901
- 1910
- 1925
- Natural Shoreline (2010)
- Road
- Railroad
- Approximate OU7 Boundary
- Former Buliding
- Vegetation
- Building

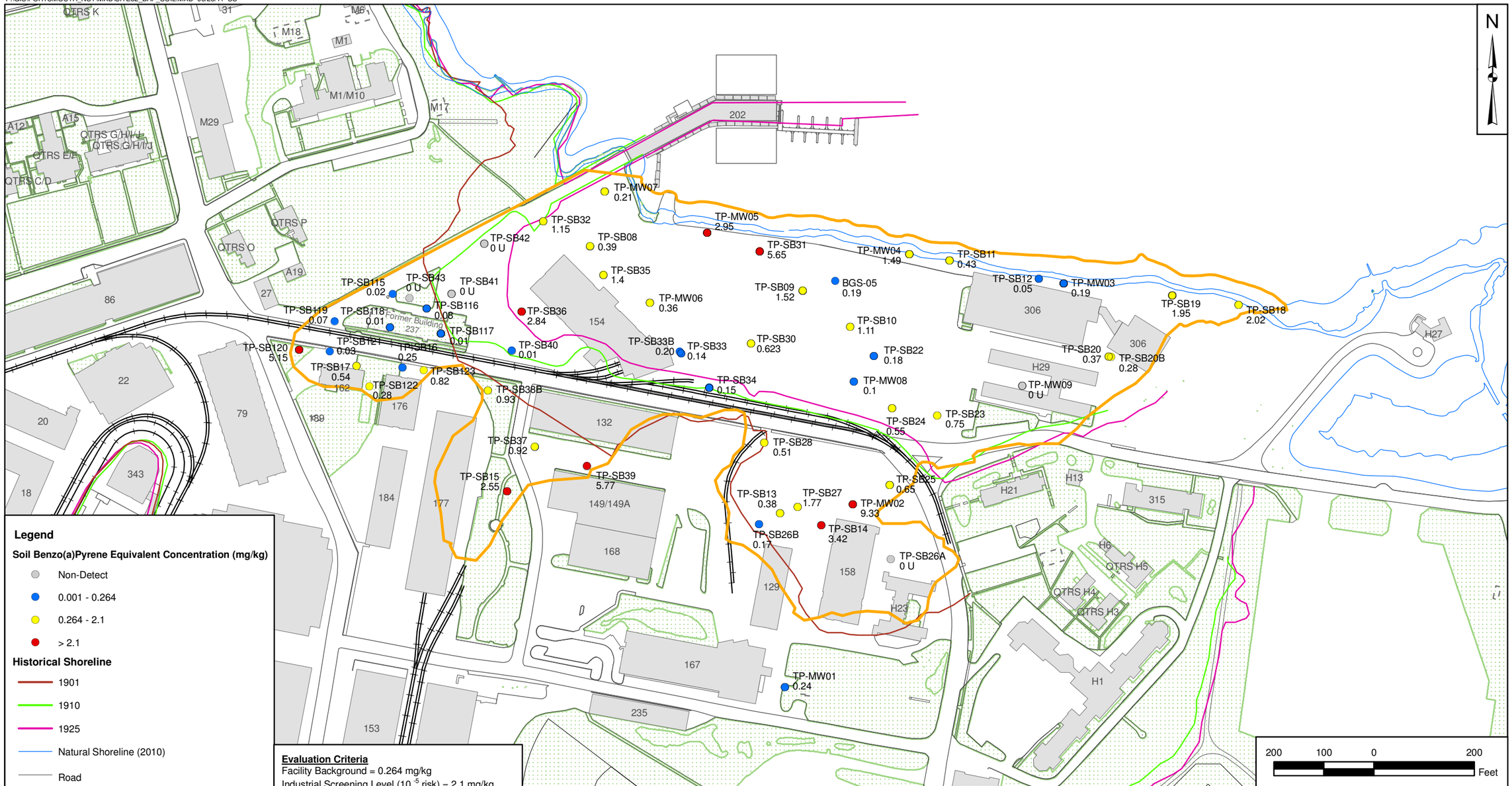
Evaluation Criteria

TSCA guideline for unrestricted residential land use = 1 mg/kg
TSCA guideline for restricted residential land use = 10 mg/kg

Notes:
1) The maximum total PCB result is shown for each location.
2) Where there are duplicate pairs, the average result is used.
3) U indicates the result is non-detect.
4) Base Map Source: U.S. Naval Activities Seavey Island; Kittery, ME, Existing Conditions July 2010. Provided and drawn by Dan Allen with Portsmouth Naval Shipyard.
5) Total PCB Concentrations calculated by Sumation of Aroclors.

DRAWN BY S. PAXTON	DATE 04/01/09	TETRA TECH	CONTRACT NUMBER 0383 / OWNER NUMBER CTO 055
CHECKED BY A. CHRISTIAN	DATE 06/23/11	TOTAL PCB CONCENTRATIONS IN SOIL OPERABLE UNIT 7 PORTSMOUTH NAVAL SHIPYARD KITTERY, MAINE	APPROVED BY ___ DATE ___
REVISED BY T. WHEATON	DATE 06/23/11		APPROVED BY ___ DATE ___
SCALE AS NOTED			FIGURE NO. FIGURE 4 - 4 / REV 0

P:\GIS\PORTSMOUTH_NSY\MXD\SITE32_BAP_SOIL.MXD 06/23/11 SS



Legend

Soil Benzo(a)Pyrene Equivalent Concentration (mg/kg)

- Non-Detect
- 0.001 - 0.264
- 0.264 - 2.1
- > 2.1

Historical Shoreline

- 1901
- 1910
- 1925
- Natural Shoreline (2010)
- Road
- Railroad
- Approximate OU7 Boundary
- Former Buliding
- Vegetation
- Building

Evaluation Criteria

Facility Background = 0.264 mg/kg

Industrial Screening Level (10^{-5} risk) = 2.1 mg/kg

Notes:

1) The maximum benzo(a)pyrene equivalent result is shown for each location.
2) Results are based on detected concentrations.
3) Where there are duplicate pairs, the average result is used.
4) J indicates that the result is estimated.
5) U indicates that the result is non-detect.
6) Base Map Source: U.S. Naval Activities Seavey Island; Kittery, ME, Existing Conditions July 2010. Provided and drawn by Dan Allen with Portsmouth Naval Shipyard.

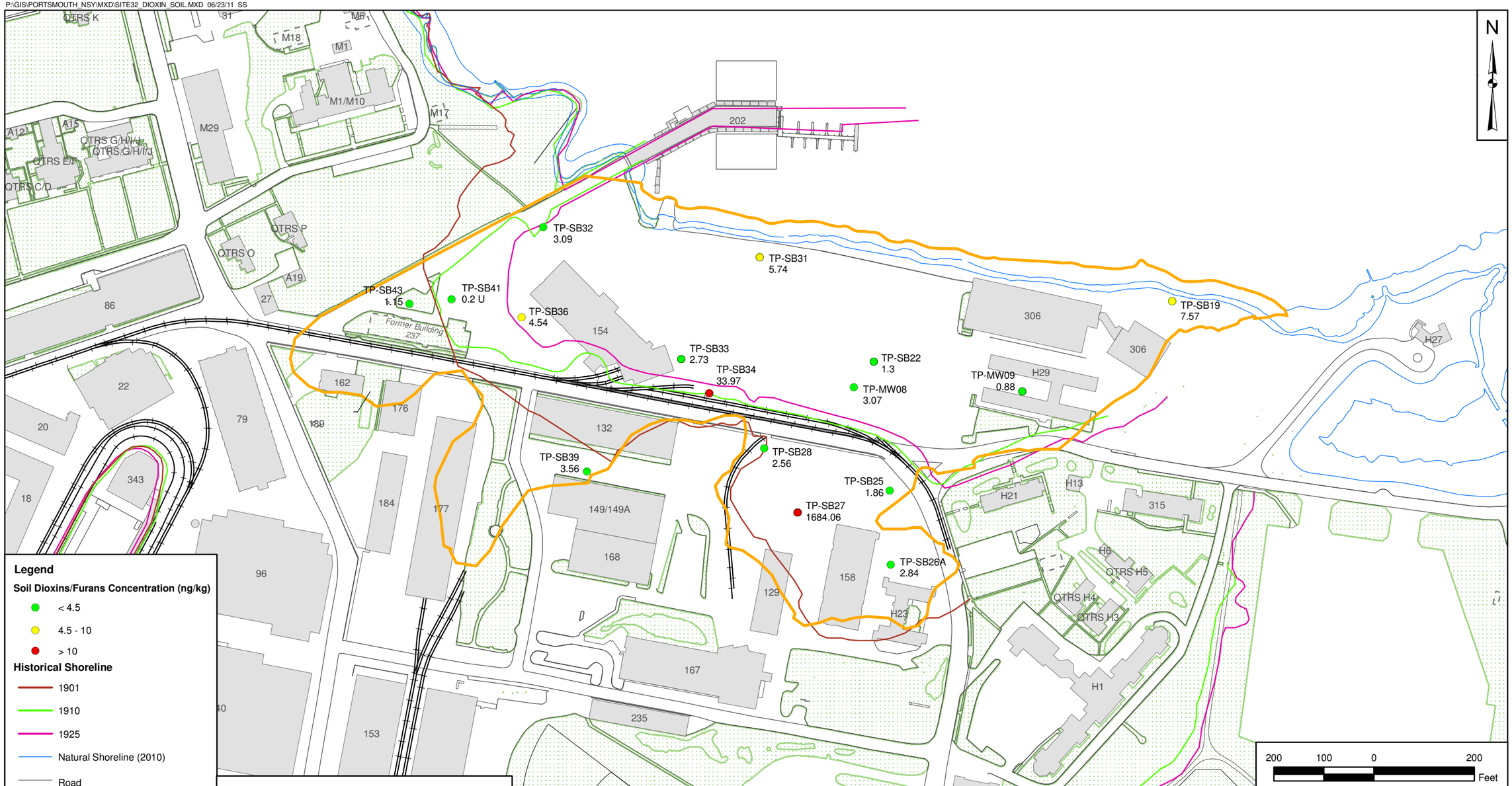
DRAWN BY S. PAXTON	DATE 04/08/09
CHECKED BY A. CHRISTIAN	DATE 06/23/11
REVISED BY S. STROZ	DATE 06/23/11
SCALE AS NOTED	

TETRA TECH

BENZO(A)PYRENE EQUIVALENT CONCENTRATIONS IN SOIL
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

CONTRACT NUMBER 0383	OWNER NUMBER CTO 055
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO. FIGURE 4 - 5	REV 0

P:\GIS\PORTSMOUTH_NSY\MXD\SITE32_DIOXIN_SOIL.MXD 06/23/11 SS



Legend

Soil Dioxins/Furans Concentration (ng/kg)

- < 4.5
- 4.5 - 10
- > 10

Historical Shoreline

- 1901
- 1910
- 1925
- Natural Shoreline (2010)
- Road
- Railroad
- Approximate OU7 Boundary
- Former Buliding
- Vegetation
- Building

Evaluation Criterion

Residential Screening Level = 4.5 ng/kg, based on 2,3,7,8-TCDD

Notes:
1) The maximum dioxin result is shown for each location.
2) Where there are duplicate pairs, the average result is used.
3) U indicates that the result is non-detect.
4) Dioxin concentrations represent 2,3,7,8-TCDD TEQ.
5) Base Map Source: U.S. Naval Activities Seavey Island; Kittery, ME, Existing Conditions July 2010. Provided and drawn by Dan Allen with Portsmouth Naval Shipyard.

DRAWN BY S. PAXTON	DATE 04/08/09
CHECKED BY A. CHRISTIAN	DATE 05/20/11
REVISED BY T. WHEATON	DATE 05/20/11
SCALE AS NOTED	

TETRA TECH

DIOXINS/FURANS CONCENTRATIONS IN SOIL
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

CONTRACT NUMBER 0383	OWNER NUMBER CTO 055
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO. FIGURE 4 - 6	REV 0

5.0 CONTAMINANT FATE AND TRANSPORT ANALYSIS

This section discusses the evaluation of contaminant fate and transport at OU7 to provide an understanding of potential risks from contaminant migration to the offshore area. To support the evaluation, a discussion of the physical and chemical properties of the contaminants associated with OU7 sources and their potential persistence, migration, dispersion, and degradation pathways and the CSM of contaminant migration are provided.

5.1 PHYSICAL AND CHEMICAL PROPERTIES

The persistence of various classes of contaminants and their chemical and physical properties in soil-water environments are discussed in this section. Several chemical transformation mechanisms affect contaminant persistence, including hydrolysis, biodegradation, photolysis, and oxidation/reduction reactions. The following general classes of contaminants were identified as exceeding human health risk-based screening levels in Section 4.0:

- PAHs
- PCBs
- Dioxins/furans
- Metals

Based on investigations in the offshore area of OU7, PAHs, copper, and nickel were also identified as contaminants in sediment exceeding offshore ecological risk-based action levels.

5.1.1 PAHs

PAHs are generally considered to be fairly immobile chemicals in the environment. PAHs are large molecules that have low solubilities, vapor pressures, and Henry's Law constants, and have high partitioning coefficients. The low molecular weight PAHs (e.g., acenaphthene, anthracene, fluorene, and phenanthrene) may volatilize from surface waters, whereas the higher 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 through dissolution. These compounds, when found in the surface 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 water runoff and erosional processes. Especially, when no pavement is present or if erosion controls are not present or functioning properly.

Bio-concentration 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. Bioaccumulation from water through biological membranes requires the chemical in the surrounding water to be available in a dissolved form. Environmental factors that reduce the amount of a chemical in true solution will also reduce the rate of uptake of the chemical. Among the most important processes that reduce bioavailability are adsorption to suspended solids, adsorption to sediments, adsorption to humic acids and other macromolecules, formation of colloidal suspensions, chelation, complexation, and ionization. Some of the bound chemicals may be available to benthic organisms through ingestion or direct uptake from pore water (Rand and Petrocelli, 1985).

PAHs are highly amenable to microbial degradation in soil and sediment. 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, October 1989).

The most important fate processes for PAHs in water are photo-oxidation, chemical oxidation, and biodegradation. PAHs do not contain functional groups that are susceptible to hydrolytic reactions, and hydrolysis is considered 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 they may be metabolized by microbes under oxygenated conditions (ATSDR, October 1989).

The mobility of PAHs via the groundwater pathway at OU7 is not considered significant because PAHs were detected infrequently in OU7 groundwater at levels several orders of magnitude less than the risk-based screening levels. PAHs were not detected in the surface water samples and were detected at concentrations less than risk-based screening levels in the seep samples.

5.1.2 PCBs

PCBs are generally inert and are relatively insoluble in water. PCBs are unlikely to migrate from soil to groundwater due to their affinity to adsorb to soil and sediment (ATSDR, November 2000).

PCBs are considered to be environmentally persistent organic chemicals. Biodegradation is the major process known to transform PCBs under environmental conditions, and only the lighter isomers are measurably biodegraded (ATSDR, November 2000). Although some microorganisms (e.g., the fungi *Phanaerochaete chrysosporium*) may biodegrade PCBs, such fungi may not exist in local soil. No abiotic

processes are known to significantly degrade PCBs in soil and sediment (ATSDR, November 2000). Base-, acid-, and neutral-promoted hydrolysis are considered to be inconsequential degradation mechanisms for PCBs (USEPA, December 1982).

Mobility via the groundwater pathway at OU7 is not considered significant because PCBs have a great affinity for particulates and may be mobilized via particulate transport from surface water runoff or erosional processes. Soil at the site is covered with impermeable material, and shoreline erosion controls are in place.

5.1.3 Dioxins/Furans

Dioxins/furans refer to a collective class of chemical compounds with similar chemical structures and a similar ability to induce certain biological characteristics. Dioxins/furans are not intentionally produced but instead are the result of a number of anthropogenic and a few natural processes. The most significant sources of dioxins/furans are associated with uncontrolled combustion, although these compounds can also be released from various industrial and manufacturing processes. Sources of dioxins/furans in the environment include direct emission by solid waste and industrial incinerators, car exhaust, emissions from oil- or coal-fired power plants, burning of chlorinated compounds such as PCBs, and cigarette smoke (ATSDR, December 1998). Dioxins/furans can volatilize slowly from waste and soil. In addition to air emissions, soil erosion and surface runoff can also transport dioxins/furans into surface waters. Dioxins/furans do not dissolve easily in water. Dioxins/furans will partition strongly to soil or sediment or organic matter and are generally immobile in soil and sediment. Dioxins/furans have been shown to bioaccumulate in aquatic and terrestrial organisms.

Dioxins/furans deposited on land from combustion sources bind strongly to soil and are not likely to contaminate groundwater by moving deeper into the soil. However, the presence of other organic pollutants in contaminated soil (e.g., fuel oil) may dissolve dioxins/furans, making it easier for the dioxins/furans to move through the soil (ATSDR, December 1998). Data for OU7 do not indicate significant concentrations of organic chemicals that would facilitate movement of dioxins/furans. Certain types of soil bacteria and fungi can break down dioxins/furans, but the process is very slow. In fact, dioxins/furans can exist in soil for many years. Plants take up only very small amounts of dioxins/furans by their roots. Most of the dioxins/furans found on the above-ground parts of plants come from air and dust and/or previous use of dioxin-containing pesticides or herbicides. Upper-level land animals feeding on the plants may accumulate dioxins/furans in their body tissues and fluids (ATSDR, December 1998). Only a small portion of OU7 is covered with plants, so exposure to upper-level receptors by feeding on the vegetation is not a concern.

5.1.4 Metals

The fate and transport of inorganics (metals) are controlled mainly by the mobility of soil particles and dissolution into water present in the immediate environment. Metals do not undergo degradation reactions that most organic chemicals do; therefore, they are considered to be persistent. The major fate mechanisms for metals are adsorption to the soil matrix 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.

There are some instances where metals are found at such concentrations or in such forms (e.g., oxidation states) that they may 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. In these cases, it is possible for metals to migrate vertically through the soil column and reach the groundwater. Therefore, the metals detected in groundwater samples may represent the total of dissolved metals and metals adhering to any suspended soil material that may be present in the samples.

The following discussion of physical and chemical properties and general fate and transport of metals in the environment was summarized from information provided by Agency for Toxic Substances and Disease Registry (ATSDR) toxicological profiles (September 2008). The information available on physical and chemical properties as summarized by ATSDR indicates that under normal environmental conditions, metals are not soluble (i.e., they have solubility limits of typically in the low milligrams per liter range under controlled laboratory conditions in distilled water). However, solubilities can be significantly altered by environmental conditions (such as pH, oxidizing or reducing conditions, presence of various naturally occurring organic or inorganic chemical species, water salinity, etc.), which can result in attenuating mechanisms such as precipitation, cation exchange, adsorption, etc. Often whether any metal is in a dissolved phase or solid phase depends on a combination of several chemical mechanisms that vary by metal and by oxidation state or valence. Acidity or alkalinity as measured by pH can directly influence the mobility of metals because metal solubilities generally increase with increasing hydrogen ion content (i.e., decreasing pH levels) and because pH may influence the intensity of reduction-oxidation reactions. Many studies have found that the predominant adsorbates of metal ions are iron and manganese oxides and organic matter such as detrial plant material and humic coatings on mineral surfaces. Metal hydroxides of iron, aluminum, and manganese are important reductive surfaces in subsurface materials with respect to interactions with charged species such as hydrogen, aluminum, cadmium, zinc, lead, and copper and with negatively charged species such as phosphate, sulfate, bicarbonate, and fluoride. The

adsorption of species on oxides is strongly dependent on pH due to the variable pH-dependent surface charge and potential of metal hydroxides and due to a pH-dependent speciation of the adsorbate.

Metals are found naturally in varying concentrations in mineral ores, and consequently, anthropogenic activities (e.g., mining) or natural forces (e.g., surface water erosion, wind, etc.) tend to disperse them over large land areas. However, metals are also co-occurring constituents within the inorganic (non-combustible) fractions of fossil fuels (mainly coal and sometimes fuel oil) at various concentrations. Therefore, the combustion of fossil fuels, which have been a primary source of heat and energy, has resulted in the inadvertent concentration of these metals in the non-combustible portion of fuels (e.g., bottom ash or fly ash) at elevated levels in residential and industrial areas. Metals are also present at varying concentrations in commercial chemical products of daily industrial use. Therefore, at industrial sites, not only do operations involving combustion of fossil fuels lead to a release of metals, but operations involving plumbing (copper pipes, galvanized steel pipes, lead/tin solder, etc.), pesticide/insecticide application, paint, and preservation of wood timbers (especially in older buildings), etc., may also lead to their release.

5.2 CONCEPTUAL SITE MODEL OF CONTAMINANT MIGRATION

The CSM for OU7 was developed based on site history and uses, site characterization (e.g., geology and hydrogeology information), and site contaminant fate and transport pathways and processes.

The primary sources of contamination at OU7 are fill activities and industrial use of the site. Contaminants released from the fill can migrate via several pathways, as discussed in Section 5.2.1. Potential exposure routes and receptors are discussed in Section 5.2.2.

5.2.1 Potential Contaminant Migration Pathways

Figure 5-1 illustrates the potential migration pathways of contaminants from the onshore to the offshore environment. Contaminant migration includes migration within the onshore environment, migration from the onshore environment to the offshore environment (including tidal flux and erosion), and migration within the offshore environment.

Soil (surface and subsurface soil), surface water, seep, and sediment contamination have been identified at OU7. Potential pathways of onshore contaminant migration include movement from the soil, erosion of the shoreline, movement of sediments to offshore, from surface water movement to offshore, from the storm sewer to the offshore.

OU7 is covered with pavement or buildings, with some small areas of grass landscaping. Thus, infiltration of precipitation and surface erosion of site soil are not likely to be a significant current migration mechanism. The mid- to high-tide portion of the shoreline was covered with shoreline controls in 2006. The shoreline controls incorporated filter fabric, which is permeable to water but not to sediment. The filter fabric prevents erosion of sediment from beneath rock cover on the shoreline. Therefore, erosion is not a significant current concern. An evaluation of the shoreline controls is discussed in Section 3.2.1.

Groundwater flow is influenced by the storm sewer system, which contributes to the extent of inland tidal influence at OU7. Based on groundwater contours from the SSI (TtNUS, May 2000) and the RI, the results of the storm sewer camera survey, and information on flow rates at several of the outfalls, groundwater is entering the storm sewer system, particularly at low tide (see Section 3.0). The outfalls at OU7 are located in the mid-tide area. During the placement of the shoreline controls, the storm drain outfalls were exposed and reconstructed. The outfalls are now clearly identifiable and no longer buried under rocks (such as OF-60 and OF-63). The storm sewer lines to the outfalls are tidally influenced, and the outfalls are generally exposed during mid- to low tides. One seep was observed east of the shoreline controls (see Figure 1-4 for the location of the shoreline controls). The seep was not located downgradient of the OU7 groundwater. Groundwater seeps were observed along the shorelines as trickles over and between rocks.

Therefore, potential contaminant migration pathways from the site to the offshore area are groundwater transport from onshore to offshore including through sediment, seeps, and the storm sewer system.

5.2.2 Potential Exposure Routes and Receptors

OU7 is covered with pavement or buildings, with some small areas of grass landscaping. A boat ramp by Topeka Pier provides access to the intertidal area. Access to the intertidal area from other portions of OU7 is more difficult because of the steeper slope and large rocks and boulders on the upper portion of the shoreline. Current onshore land use for OU7 is industrial and commercial, with recreational use in the intertidal area (boat pier). The site uses are likely to remain as they are currently. However, unrestricted residential, recreational, commercial, or industrial use of the site may be possible future scenarios if the Shipyard were to close.

Currently a Hospital Corps/temporary housing area is located at OU7; however, OU7 (including the areas around the temporary housing) is an industrial area predominately covered by asphalt and concrete, with small grassy areas near the edges. There would be little or no exposure to soil under a typical transient (current) resident exposure. Therefore, a current residential exposure was not evaluated.

Sufficient habitat at OU7 is not available for ecological receptors; therefore, onsite ecological exposure is not considered significant. Offshore ecological risks are being characterized through the OU4 Interim Offshore Monitoring Program. Because filling activities ended over 50 years ago, and the majority of the site is covered by buildings and pavement (infiltration of precipitation is likely to be minimal through the vadose zone soil), the site is likely to be at a steady state, and the current OU4 offshore monitoring program data are sufficient for understanding potential current offshore risks. However, if the buildings and pavement were removed, site conditions could change such that contaminants in the vadose zone soil are mobilized to groundwater from infiltration of precipitation, which could then migrate to the offshore. The potential future impact from the OU7 onshore contaminants migrating offshore if site conditions change are evaluated in Section 5.3.

5.3 CONTAMINANT FATE AND TRANSPORT MODELING

Contaminant fate and transport modeling was performed to conservatively estimate potential future constituent concentrations in intertidal sediments and near-shore surface water in the Back Channel adjacent to OU7. The modeling focused on identifying modeling COPCs and providing a conservative estimation of baseline impacts to the near-shore of the Back Channel using simple, one-dimensional, analytical modeling. The modeling estimated leachate concentrations of COPCs from soil, transport of COPCs in groundwater, and mixing and reaction of COPCs in offshore media. The modeling is summarized in the following subsections, including the objective of the modeling, input parameters and assumptions, and the modeling results. Supporting information for the modeling, including input parameter values, modeling calculations, and resultant tables, is included in Appendix C.

5.3.1 Objective

Fill materials placed at OU7 and industrial uses of the site in the past contained soil and debris material that may have affected the quality of shallow groundwater beneath portions of OU7 and seeps and storm sewer outfalls at the northern edge of OU7. Most of OU7 is currently paved, significantly reducing the potential for current impacts. Modeling was proposed as part of the OU7 RI QAPP (TtNUS, November 2008) to evaluate the potential adverse impact that would result from a future hypothetical scenario where the pavement was removed. Under this scenario, contaminant migration may potentially increase due to leaching from increased recharge through the soils with impacts. Therefore, the objective of the modeling effort was to estimate hypothetical future contaminant concentrations in intertidal sediments and near-shore surface water in the Back Channel.

5.3.2 Modeling Protocol

The contaminant fate and transport modeling was performed in accordance with the modeling protocol in Appendix D of the OU7 RI QAPP. The modeling protocol for OU7 was similar to the Phase I and Phase II modeling performed previously for other modeling at PNS (OU2, OU3, and OU5) (Brown & Root Environmental, February 1997; TtNUS, February 1999).

The protocol identified two stages of modeling. The first stage of modeling was designed to be overly conservative and featured the use of simple analytical models, using conservative assumptions and model input values, to represent site complexity relative to contaminant fate and transport. The first stage involved one-dimensional analytical modeling to estimate potential future concentrations in intertidal sediment and near-shore surface water and then comparing the predicted concentrations to surface water screening criteria (without a dilution factor). If the model-predicted concentrations in the first stage did not exceed the screening criteria, then no further evaluation would be performed. For modeling COPCs where concentrations exceed screening criteria, sensitivity analyses would be performed to evaluate the potential impacts using the same set of modeling equations but using more likely and appropriate values for the input parameters. If the modeling results show that screening criteria were still being exceeded, then the chemical would be retained for further evaluation. Otherwise, the chemical would be dropped from further evaluation. If the model predictions for one or more of the COPCs exceed the screening criteria, the predicted concentrations would be compared against concentrations currently observed in the sediment or near-shore water; no further evaluation would be necessary if the predicted concentrations did not exceed the current measured concentrations. If the predicted concentrations exceeded concentrations currently found in the river, additional evaluation would be conducted in the second stage of modeling.

The second stage of modeling would involve more complex two- or three-dimension numerical modeling. The second stage of modeling would be used to support risk assessments and to evaluate the effects of remedial designs on groundwater flow and contaminant transport. Based on the first stage of modeling results, the second stage of modeling was not performed.

The modeling protocol assumed that the pavement was removed from OU7 and the amount of infiltrating precipitation coming in contact with contaminated soil increased significantly compared to current conditions, thereby predicting a rate of contaminant mass leaching greater than present. The modeling protocol also assumed that the overall groundwater flow conditions and the contributions from storm water sewer discharges did not change significantly in the future.

5.3.3 Stage 1 Modeling Approach

The Stage 1 modeling involved a number steps (see Appendix C), which were identical to previous modeling efforts, with one exception. The measured flow and chemical transport of water discharging from the three storm water sewers during the low portion of each tidal cycle was included in the modeling for OU7. Therefore, two general sources of contaminant discharge to the intertidal zone were considered for modeling at OU7, diffuse groundwater flow and discharge of storm water at the storm water sewer outfalls.

The initial step for the modeling involved the identification of COPCs using three substeps, consistent with Section 5 of the On-Shore/Off-Shore Contaminant Fate and Transport Modeling Phase I Report (Brown & Root Environmental, February 1997). First, onshore contaminant maximum positive detections for groundwater, as well as calculated maximum leachate concentrations, as determined from maximum concentrations observed in OU7 soils, were directly compared with established offshore surface water screening criteria. Second, the potential mobility and degradation of each of the remaining contaminants were evaluated. Third, an evaluation based on frequency of detection in both groundwater and soils was performed. Known offshore COPCs from previous studies, based on either ecological or human health risk assessment, were given special consideration. If known offshore COPCs could be attributed to the onshore source area by evaluating frequency of detection in both groundwater and soils, the COPCs were automatically considered potential COPCs for the PNS. Details of the COPC selection are provided in Appendix C.1.

The steps of the Stage 1 model consisted of a set of mixing equations, reaction equations, and a one-dimensional transport equation that mathematically describe and link on-shore and off-shore processes affecting contaminant transport in groundwater and simple mixing of seeps with tidal water (see Table C-1, Appendix C). The development of the CSM and analytical equations for the first stage of modeling is discussed in detail in Sections 6 and 7 of the Phase I modeling report (Brown & Root Environmental, February 1997).

The onshore portion of the model simulated:

- Recharge of precipitation (Step 2a)

- Formation of a leachate in the vadose zone using soil-water partitioning coefficients (Kd) and assuming equilibrium conditions (Step 1)

- Mixing of leachate with shallow groundwater flowing beneath OU7 (Step 4a)

- Advection, dispersion, and biodegradation of organic compounds during transport of contaminants to the river (Step 5a).

The offshore portion of the model simulated:

- Mixing of diffuse groundwater discharge (calculated) and storm sewer outfall discharges (measured) with river water in the intertidal zone (Step 6)

- Mixing of river water and groundwater to form pore water in the intertidal sediments (using salinity to define mixing ratios) (Step 7)

- Equilibrium sorption and desorption between pore water and sediment in the intertidal zone (Step 7b)

- Simple mixing of intertidal water with near-shore river water, based on the return-rate concept.

The Stage 1 modeling assumed that the asphalt cover at OU7 is removed, the aquifer is homogeneous and isotropic, instantaneous equilibrium between sorption and desorption occurs, and the mass of contaminants in the fill material does not deplete with time. For each COPC evaluated, the maximum concentration of the contaminant detected in soil was initially set as the representative concentration for the entire site, and the contaminant source area was considered to cover the entire site. The modeling approach did not take into account erosion and removal of contaminated sediment from the intertidal zone over time, deposition of clean sediment in the intertidal zone that originates from upstream areas over time, or chemical concentrations from other sources in the estuary that may contribute to the final concentration in surface water or sediment.

5.3.4 Stage 1 Modeling Input Parameters

As discussed in Section 5.3.3, a list of COPCs was initially developed, and the list was used in the subsequent model steps. Identification of COPCs is discussed in detail in Appendix C. Table 5-1 presents the COPCs identified for the Stage I modeling. Eighteen metals were selected as inorganic COPCs, and two VOCs (acetone and carbon disulfide), one PAH (pyrene), seven pesticides, and one PCB (Aroclor 1254) were selected as organic COPCs. The COPC list accounts for 100 percent of the cumulative mass at OU7, based on the screening process.

Input values for the Stage 1 model were estimated for physical and hydrogeological parameters. The values included onshore parameters (contaminant source area and saturated zone characteristics) and offshore parameters (interidal zone, near-shore mixing zone, and sediment layer characteristics). Chemical-specific input parameters were also estimated for the COPCs. Table 5-2 summarizes the site-specific physical and hydrogeological input parameters for onshore and offshore zones, and Table 5-3 summarizes the chemical-specific input parameters. Conservative values based on site data were used for input parameters. A detailed discussion of the selection and estimation of input parameters is provided in Appendix C.

For the Stage 1 modeling, discharge from the storm water sewer system was included. A discharge of 50 percent of the possible volumetric flow from the storm water system was included in the baseline model. A discussion of the estimation of the discharge from the storm water sewer system is provided in Appendix C.

5.3.5 Stage 1 Modeling Results

The baseline for Stage 1 modeling incorporated conservative site-specific input values, and estimated surface water and sediment concentrations. These results were compared to surface water and sediment screening criteria. Complete baseline results for the Stage 1 modeling are provided in Appendix C.1.

5.3.5.1 Surface Water Modeling Results

Table 5-4 summarizes the estimated surface water concentrations and the screening criteria. Model estimates for surface water indicate that the baseline conditions for the onshore source areas will not affect the offshore surface water, except potentially acetone and carbon disulfide (acetone with a tidal return rate of 0.5 and carbon disulfide with a tidal return rate of 0.1). However, the modeling results are conservative and rely on leaching of the constituents from the source soils to the groundwater and the use of the maximum soil concentration per constituent. The soil with the maximum detections and most detections of acetone and carbon disulfide are already in contact with groundwater (within the intertidally saturated zone or saturated zone). While the modeling predicts that these constituents will occur in the groundwater and ultimately in the surface water, no VOCs have been detected in groundwater at OU7. Therefore, no additional evaluation is necessary.

5.3.5.2 Sediment Modeling Results

Table 5-5 summarizes the estimated sediment concentrations and the screening criteria. Model estimates for sediment indicate that the baseline conditions for the onshore source areas are potentially affecting the sediment at unacceptable levels for several metals: aluminum, arsenic, cadmium, chromium,

copper, iron, lead, manganese, mercury, nickel, silver, and zinc. However, the modeled sediment concentrations, for inorganics were significantly higher than measured concentrations indicating that the modeling results are extremely conservative and are not necessarily representative of site conditions. The modeled results for inorganics are orders of magnitude higher than observed concentrations, while organic constituents appear to be accurately estimated by the model, with the modeled organic concentrations less than site-specific human health screening levels (see Table 5-5). The modeling results for sediment were evaluated further through uncertainty analysis (Section 5.3.6).

5.3.6 Uncertainty Analysis

An uncertainty analysis was conducted for the Stage 1 modeling to evaluate the level of conservativeness of the baseline case. Two different technical approaches were used in the uncertainty analysis. A deterministic approach was first applied to evaluate specific combinations of important model input parameter values. These specific combinations represent candidates considered for the baseline case other than the one actually developed (Appendix C). A probabilistic approach was then applied in order to evaluate the effective range of various input parameters. For example, a deterministic approach of evaluating changes to the infiltration rate was examined in a probabilistic approach of evaluating multiple possible data inputs (varied from 1 inch/year to 24 inches/year).

The level of conservativeness of the baseline case can be quantified using relative comparisons of the baseline case results with results from the two uncertainty analysis approaches. With each uncertainty analysis approach, the baseline case was shown to be conservative. The baseline case is usually the worst case or close to the worst case for the deterministic approach. Likewise, in many instances with respect to the probabilistic approach, the baseline case results may not even be realistic (e.g. infiltration rate of 24 inches/year, or salinity of 32 ppt for river water in the intertidal zone).

Results of the uncertainty analyses are summarized in Table C.11 of Appendix C.2 and supporting information is provided in Appendix C. To assess the uncertainty (and sensitivity), the result of transfer from contaminated soils to groundwater was emphasized since modeled concentrations of porewater and sediment do not accurately reflect observed site conditions. Additionally, comparisons were made when exceedances to screening criteria differed from baseline conditions, as changes will result in modeled concentrations of the included constituents. It is assumed that only changes that result in a change in exceedances to screening criteria are important.

As observed in Table C.11, most changes to model input parameters have little effect on Stage 1 modeling results. For the following uncertainty analyses, no changes were observed for any of the ranges examined: (1) using all leached values or all maximum groundwater values; (2) any changes to hydraulic conductivity;

(3) any changes to hydraulic gradients; (4) increasing source area by 25 percent; (5) using different assumptions for salinity; (6) changes to sediment fractional organic carbon; (7) use of ranges of site specific soil K_d for metals; (8) different assumptions to amount of water in storm sewer lines; and, (9) travel distance from source to shoreline. While no changes to model output were observed when the maximum site-specific soil K_d values were used, the concentration carried through in the model was from the observed groundwater values for all but antimony and beryllium, and not the calculated leached value. This demonstrates that the assumption of using the lower of the literature or site-specific value for soil K_d is very conservative as it maximizes the concentrations used in the modeling.

Because the Stage 1 modeling results initially identified that acetone and carbon disulfide may be impacting the surface water, uncertainty analyses were developed to further assess the representative nature of their use in the model. Rather than using all available site data, which includes areas quite far from the shoreline (over 500 feet) that would require large scale transport distance, data was examined from only the immediate shoreline area. When the geometric mean and minimum concentration for carbon disulfide was used, it posed a unacceptable level for a tidal return rate of 0.5. For acetone, when the geometric mean and minimum concentration was used, no potential unacceptable level occurred. Only by using the maximum concentrations for both carbon disulfide and acetone, did a potential unacceptable level remain. Model output was evaluated using 95-percent UCLs for soils and groundwater concentrations rather than the site maximums. No potential impacts occur when 95 percent UCLs are used as source concentrations (non-leaching scenario) while potential impacts are minimized to only carbon disulfide at a tidal return rate of 0.5 with one-half detection limits and leaching is included. Overall, these results indicate that using site-specific maximum concentrations for soil and groundwater, and allowing either the calculated leached value or groundwater concentration to be carried through, is overly conservative.

Minor changes occur when the infiltration rate is scaled from 1 inch per year to 24 inches per year. For 1 inch per year, only carbon disulfide at a tidal return rate of 0.5 suggests that a potential risk may occur. At 18 and 24 inches per year, carbon disulfide is potentially a risk at the lowest tidal return rate of 0.0346. For most typical ranges, 6 to 16 inches per year, no changes to potential risk are observed. Similar minor changes are observed when the fraction organic carbon is varied for soils as well.

The most significant changes compared to the Stage 1 baseline scenario occurred when the K_d of the sediment was assumed to be equal to the K_d of the soil, and more importantly, when changes to retardation were examined. When the K_d of the sediment was assumed to be equal to the K_d of the soil, copper, iron and silver were found to potentially cause an impact for surface water. The most sensitive parameter analyzed was retardation in the sediment. When retardation in the soil was reduced to 1 (assumes no retardation), no changes were observed, this factor was already incorporated into the model as it was assumed to not decay or be retarded. As part of the offshore modeling, retardation was included in

determining the contaminant concentration. Effectively, the values of retardation calculated in the Stage 1 baseline scenario are high and do not allow significant migration (particularly for inorganics) through the intertidal zone to the surface water.

5.3.7 Stage 1 Modeling Summary

The modeling results indicate that, regardless of steady-state or unsteady-state input parameters, surface water is not being adversely impacted by onshore sources of contamination. For sediment, using unsteady-state input parameters, the modeling indicates that sediment may be impacted due to onshore migration of metal contamination via groundwater; although, this conclusion is overly conservative based on the nature of the model inputs. For sediment, using steady-state input parameters, impacts generally are not high level, when compared with sediment criteria used for modeling purposes. Observed concentrations of metals in sediment are orders of magnitude lower than the modeled results and do not indicate groundwater migration adversely impacting sediment.

The onshore/offshore modeling for OU7 was conducted to conservatively screen potential COPCs and to provide information for prioritizing potential needs of onshore remedial actions in the various contaminant source areas at OU7. The modeling is designed to be conservative rather than accurate, and the uncertainty analysis must be considered when using the modeling estimates.

TABLE 5-1

SUMMARY OF MODELNG COPC SCREENING
OPERABLE UNIT 7 – REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Parameter	Fraction	Surface Water Criteria (µg/L)	Surface Water Criteria Reference	COPC Retained Based on First Step Screening with Surface Water Criteria		COPC Retained Based on Second-Step Screening for Contaminant Mobility and Degradation (Ranking)	COPC Retained Based on Third-Step Screening for Frequency of Detection	Comments
				Max. Groundwater	Max. Soil Leachate			
Off-shore COPCs Based on Ecological and Human Health Risk Assessment								
Aluminum	M	87	1	X	X	X (8)	NA	
Antimony	M	36.6	2	X	X	X (18)	NA	Retained as HH COPC for modeling
Arsenic	M	4.9	2	X	X	X (16)	NA	Retained as HH COPC for modeling
Beryllium	M	0.53	3	X	--	X (23)	NA	
Cadmium	M	8.8	1	X	X	X(19)	NA	
Chromium	M	50	1	X	X	X (17)	NA	
Cobalt	M	23	4	--	X	X (15)	NA	
Copper	M	3.1	1	X	X	X (1)	NA	
Iron	M	1,000	1	X	X	X (3)	NA	
Lead	M	8.1	1	X	X	X (5)	NA	
Manganese	M	120	4	X	X	X (10)	NA	
Mercury	M	0.94	1	--	X	X (7)	NA	
Nickel	M	8.2	1	X	X	X (4)	NA	
Selenium	M	71	1	--	X	X (22)	NA	
Silver	M	0.19	1	X	X	X (2)	NA	
Thallium	M	9.1	2	--	X	X (21)	NA	Retained as HH COPC for modeling
Vanadium	M	20	4	X	X	X (24)	NA	
Zinc	M	81	1	X	X	X (6)	NA	
Acetone	OV	1,500	4	--	X	X (13)	NA	
Carbon Disulfide	OV	0.92	4	--	X	X (11)	NA	
Pyrene	PAH	3	3	--	X	X (26)	NA	
4-4'-DDD	PEST/PCB	0.001	1	--	X	X (20)	NA	
4-4'-DDE	PEST/PCB	0.001	1	--	X	X(14)	NA	

TABLE 5-1

SUMMARY OF MODELNG COPC SCREENING
OPERABLE UNIT 7 – REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Parameter	Fraction	Surface Water Criteria (µg/L)	Surface Water Criteria Reference	COPC Retained Based on First Step Screening with Surface Water Criteria		COPC Retained Based on Second-Step Screening for Contaminant Mobility and Degradation (Ranking)	COPC Retained Based on Third-Step Screening for Frequency of Detection	Comments
				Max. Groundwater	Max. Soil Leachate			
4-4'-DDT	PEST/PCB	0.001	1	--	X	X (12)	NA	
Aroclor-1254	PEST/PCB	0.03	1	--	X	X (25)	NA	
Dieldrin	PEST/PCB	0.0019	1	--	X	X (9)	NA	
Endosulfan Sulfate	PEST/PCB	0.034	1	--	X	X (28)	NA	
Endrin Aldehyde	PEST/PCB	0.0023	1	--	X	X (27)	NA	

COPC Chemical of Potential Concern
M Metals
NA Not applied as first or second screening step retained as COPC
OV Organic volatile
PEST/PCB Pesticides and polychlorinated biphenyls
X Retained as COPC

1 USEPA, 2002. National Recommended Water Quality Criteria: 2002. Office of Water. EPA 822-R-02-047. November.
2 See Appendix D.5
3 Buchman, M.F., 2008. NOAA Screening Quick Reference Tables, NOAA HAZMAT Report 99-1, Seattle, WA, Coastal Protection and Restoration Division, http://response.restoration.noaa.gov/cpr/sediment/squirt/squirt.html
4 Suter, G.W. II, and C.L. Tsao, 1996. Toxicological Benchmarks for Screening Potential Constituents of Concern for Effects on Aquatic Biota: 1996 Revision. Environmental Sciences Division, Oak Ridge National Laboratory. ES/ER/TM-96/R2.
5 USEPA, 1996. ECO Update, Ecotox Thresholds. Office of Solid Waste and Emergency Response. Intermittent Bulletin, Volume 3, Number 2. EPA-540/F-95/038. January.

TABLE 5-2

SITE-SPECIFIC PHYSICAL AND HYDROLOGICAL INPUT PARAMETERS
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

On-Shore Analytical Model		**Value**	**Units**
Contaminant Source Area	Average Infiltration Rate (Water Balance)[1]	14	in/year
	Contaminant Source Area[2]	1282842	ft^2
	Travel Distance to Shoreline (D)	1	ft
Saturated Zone	Dry Bulk Density[3]	1.5	g/cm^3
	Saturated Effective Porous Space (n)[3]	0.3	
	Hydraulic Gradient (i)[1]	0.01126	ft/ft
	Groundwater Plume Width [2]	1430	ft
	Groundwater Flow Rate (Darcy' Law)[1] - Formation	15291074	ft^3/year
	Groundwater Flow Rate (Darcy' Law)[1] - Storm Sewer's	1477776	ft^3/year
	Net Groundwater Flow Rate (Darcy' Law)[1]	16768850	ft^3/year
	Groundwater Velocity [4]	2.22	ft/day
	Groundwater Salinity (Sgw)	6	ppt
Off-Shore Analytical Model		**Value**	**Units**
Intertidal Zone [5]	Tidal Response Range	8	ft
	Intertidal Zone Width	40	ft
	Shoreline Slope	5	1V:nH
	Intertidal Zone Water Volume	1.28E+05	ft^3
	Seawater Salinity (Ssw)	28	ppt
Near-Shore Mixing Zone	Non-tidal Flow Current (V) [6]	0.206	ft/sec
	Cross Sectional Area of Channel Segment [6]	3326	ft^2
	Shoreline Slope	15	1V:nH
Sediment Layer	Pore Water Salinity (Spw)	12.4	ppt

(1) See Appendix C; Table C-8 of On-Shore/Off-Shore Contaminant Fate and Transport Modeling, Phase I (Brown&Root, 1997).
(2) See Figure 6-5 of On-Shore/Off-Shore Contaminant Fate and Transport Modeling, Phase I (Brown&Root, 1997).
(3) Assumed based on typical values for the types of soils at PNS.
(4) Based on groundwater velocity in the overburden layer.
(5) See the site-specific conceptual models in Section 6.0 of On-Shore/Off-Shore Contaminant Fate and Transport Modeling, Phase I (Brown&Root, 1997).
(6) Based on the model output for channel segment c68 in the UNH WASP model.

TABLE 5-3

SITE-SPECIFIC CONTAMINANT INPUT PARAMETERS
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Retained COPC(1)	Fraction	Maximum Groundwater Concentration	Groundwater Units	Maximum Soil Concentration	Soil Units	Kd (soil) L/kg (2)	Kd (sed) L/kg (2)	Half-Life (years) (3)
ALUMINUM	M	14500	UG/L	29000	MG/KG	1500	207113	NA
ANTIMONY	M	34	UG/L	1430	MG/KG	45	45	NA
ARSENIC	M	41.2	UG/L	82.3	MG/KG	29	4617	NA
BERYLLIUM	M	NA	UG/L	3.1	MG/KG	402	402	NA
CADMIUM	M	3.9	UG/L	24.1	MG/KG	75	4849	NA
CHROMIUM	M	27.4	UG/L	2860	MG/KG	850	41971	NA
COBALT	M	1.15	UG/L	85.2	MG/KG	45	45	NA
COPPER	M	496	UG/L	40400	MG/KG	35	51038	NA
IRON	M	21800	UG/L	280000	MG/KG	25	4342	NA
LEAD	M	195	UG/L	40000	MG/KG	900	10811	NA
MANGANESE	M	1600	UG/L	4370	MG/KG	65	2246	NA
MERCURY	M	0.46	UG/L	120	MG/KG	52	3316	NA
NICKEL	M	278	UG/L	3920	MG/KG	65	3960	NA
SELENIUM	M	19.8	UG/L	7.5	MG/KG	5	5	NA
SILVER	M	6.2	UG/L	25.6	MG/KG	8.3	741	NA
THALLIUM	M	66.1	UG/L	3.6	MG/KG	71	71	NA
VANADIUM	M	25.8	UG/L	109	MG/KG	1000	1000	NA
ZINC	M	587	UG/L	15800	MG/KG	62	19197	NA
ACETONE	OV	NA	NA	14000	UG/KG	0.02582	0.05646	0.3808
CARBON DISULFIDE	OV	NA	NA	22	UG/KG	0.013036	0.0285	2.9000
PYRENE	PAH	NA	NA	19000	UG/KG	904.8288	1978.185	NA
4,4'-DDD	PEST/PCB	NA	NA	70	UG/KG	1987.99	4346.25	NA
4,4'-DDE	PEST/PCB	NA	NA	300	UG/KG	1987.99	4346.25	NA
4,4'-DDT	PEST/PCB	NA	NA	1000	UG/KG	2871.831	6278.55	NA
AROCLOR-1254	PEST/PCB	NA	NA	280	UG/KG	986.043	2155.74	NA
DIELDRIN	PEST/PCB	NA	NA	160	UG/KG	138.1816	302.1	NA
ENDOSULFAN SULFATE	PEST/PCB	NA	NA	22	UG/KG	37.54368	82.08	NA
ENDRIN ALDEHYDE	PEST/PCB	NA	NA	9.4	UG/KG	586.62	1282.5	NA

(1) Chemical of Potential Concern (COPC) identification is described in Appendix C.
(2) Kd values selected for soils and sediment are presented in Appendix C.
(3) Inorganic chemicals were assumed not to decay; so a half-life is not applicable (NA) to them. If an organic chemical did not have a half-life from literature, it was conservatively assumed that it did not decay. Organic half-lives from Howard et al., 1991, consistent with Phase I/Phase II modeling at Portsmouth Naval Shipyard.

kd - soil-water partitioning coefficient
M - metals
NA - not applicable
OV - organic volatiles
PAH - polycylic aromatic hydrobarbons
PEST/PCB - pesticides and polychlorinated biphenyl

TABLE 5-4

BASELINE MODELING RESULTS FOR SURFACE WATER
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

COPC	Fraction	SW Criteria ug/L	Steady State SW Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State SW Conc. In Near Shore Cnear (Df=0.1), ug/L	Steady State SW Conc. In Near Shore Cnear (Df=0.0346), ug/L
ALUMINUM	M	87	0.0025	0.0003	0.0001
ANTIMONY	M	36.6	2.0662	0.2296	0.0740
ARSENIC	M	4.9	0.0018	0.0002	0.0001
BERYLLIUM	M	0.53	0.0001	0.0000	0.0000
CADMIUM	M	8.8	0.0002	0.0000	0.0000
CHROMIUM	M	50	0.0002	0.0000	0.0000
COBALT	M	23	0.1231	0.0137	0.0044
COPPER	M	3.1	0.0665	0.0074	0.0024
IRON	M	1000	7.5805	0.8423	0.2717
LEAD	M	8.1	0.0121	0.0013	0.0004
MANGANESE	M	120	0.0880	0.0098	0.0032
MERCURY	M	0.94	0.0020	0.0002	0.0001
NICKEL	M	8.2	0.0448	0.0050	0.0016
SELENIUM	M	71	0.8478	0.0942	0.0304
SILVER	M	0.19	0.0122	0.0014	0.0004
THALLIUM	M	9.1	0.0333	0.0037	0.0012
VANADIUM	M	20	0.0009	0.0001	0.0000
ZINC	M	81	0.0390	0.0043	0.0014
ACETONE	OV	1500	**6213.6053**	690.4006	222.6855
CARBON DISULFIDE	OV	0.92	**21.7062**	**2.4118**	0.7779
PYRENE	PAH	3	0.0000	0.0000	0.0000
4,4'-DDD	PEST/PCB	0.001	0.0000	0.0000	0.0000
4,4'-DDE	PEST/PCB	0.001	0.0000	0.0000	0.0000
4,4'-DDT	PEST/PCB	0.001	0.0000	0.0000	0.0000
AROCLOR-1254	PEST/PCB	0.03	0.0000	0.0000	0.0000
DIELDRIN	PEST/PCB	0.0019	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	PEST/PCB	0.034	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	PEST/PCB	0.0023	0.0000	0.0000	0.0000

Df - tidal return rate
M - metals
OV - organic volatiles
PAH - polycyclic aromatic hydrocarbons
PEST/PCB - pesticides and polychlorinated biphenyl

Bolded value indicates modelec concentration is greater than the surface water criteria

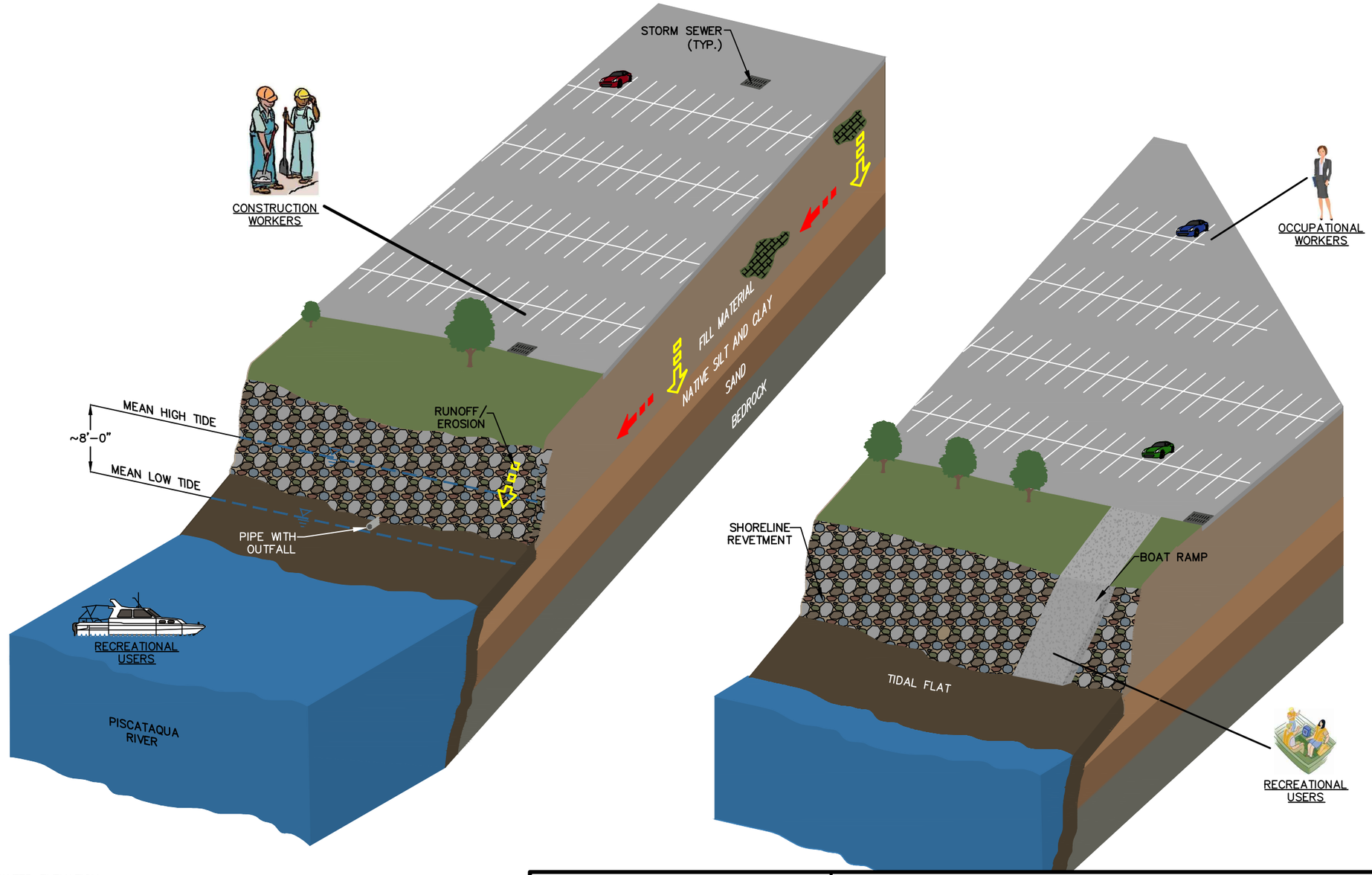
TABLE 5-5

BASELINE MODELING RESULTS SEDIMENT
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

COPC	Fraction	Modeled Sediment Conc. Csed mg/kg Df=0.5	Modeled Sediment Conc. Csed mg/kg Df=0.1	Modeled Sediment Conc. Csed mg/kg Df=0.0346	Maximum Sediment Conc. mg/kg	PNS HHSL for Sediment mg/kg
ALUMINUM	M	***2129498.5***	***2129498.4***	***2129498.4***	42364.3	200000
ANTIMONY	M	83.1	83.1	83.1	ND	--
ARSENIC	M	***761.3***	***761.3***	***761.3***	36.2	5.9
BERYLLIUM	M	0.1801	0.1801	0.1801	ND	--
CADMIUM	M	***90.5***	***90.5***	***90.5***	1.2	78
CHROMIUM	M	***8205.2***	***8205.2***	***8205.2***	208.8	50
COBALT	M	4.95	4.95	4.95	ND	--
COPPER	M	***3422926***	***3422925***	***3422925***	6490	8000
IRON	M	***2825538***	***2825529***	***2825528***	141000	--
LEAD	M	***27917***	***27917***	***27917***	575	400
MANGANESE	M	***8773.5***	***8773.5***	***8773.5***	384.4	610
MERCURY	M	***444.6***	***444.6***	***444.6***	2.975	13
NICKEL	M	***13876***	***13876***	***13876***	500	510
SELENIUM	M	0.4382	0.4371	0.4370	ND	--
SILVER	M	***133***	***133***	***133***	2.12	130
THALLIUM	M	3.3292	3.3286	3.3285	ND	--
VANADIUM	M	18.2951	18.2948	18.2948	ND	--
ZINC	M	***284243***	***284243***	***284243***	1540	60000
ACETONE	OV	1.9825	1.8918	1.8841	NS	--
CARBON DISULFIDE	OV	0.0032	0.0030	0.0030	NS	--
PYRENE	PAH	2.4135	2.4135	2.4135	12.102	1400
4,4'-DDD	PEST/PCB	0.0089	0.0089	0.0089	1.06	37
4,4'-DDE	PEST/PCB	0.0381	0.0381	0.0381	0.138	26
4,4'-DDT	PEST/PCB	0.1270	0.1270	0.1270	0.174	26
AROCLOR-1254	PEST/PCB	0.0356	0.0356	0.0356	ND	--
DIELDRIN	PEST/PCB	0.0203	0.0203	0.0203	0.03329	0.21
ENDOSULFAN SULFATE	PEST/PCB	0.0028	0.0028	0.0028	ND	--
ENDRIN ALDEHYDE	PEST/PCB	0.0012	0.0012	0.0012	ND	--

Df - tidal return rate
M - metals
ND - not detected
OV - organic volatiles
PAH - polycyclic aromatic hydrocarbons
PEST/PCB - pesticide/polychlorinated biphenyl
PNS HHSL - Portsmouth Naval Shipyard Human Health Screening Level for sediment

Bolded value indicates modeled concentration is greater than the sediment criterion
Italicized value indicates modeled concentration is greater than the maximum measured sediment concentration.



LEGEND

- GROUNDWATER ELEVATION
- POCKETS OF DEBRIS
- POTENTIAL MIGRATION
- FUTURE MIGRATION
- (TYP.) TYPICAL

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CONCEPTUAL SITE MODEL
OPERABLE UNIT 7

PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

SCALE: NOT TO SCALE

DATE:	1-25-10
PROJECT NO.:	112G00383
DESIGNED BY:	---
DRAWN BY:	CK
CHECKED BY:	---
SHEET: OF	---

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FIGURE 5-1

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6.0 HUMAN HEALTH RISK ASSESSMENT

The HHRA was performed to characterize and quantify potential risks to select receptors at OU7 based on current and future land use scenarios.

OU7 consists of the onshore area, where soil and groundwater samples were collected, and the intertidal area adjacent to the site along the shoreline, where sediment and surface water samples were collected. Potential receptors at OU7 were identified as current/future construction workers, current/future recreational users (adolescent and adult), future residents (child and adult), and future occupational workers.

Figure 6-1 shows the CSM that was developed for the OU7 HHRA. The CSM indicates all of the receptors and potential pathways by which exposure could occur at OU7. All receptors were evaluated for exposure to surface soil, which was defined as soil from 0 to 1 feet bgs, in accordance with USEPA Region 1 guidance (USEPA, August 1995). Other assessments at PNS have used 0 to 2 feet bgs as a definition for surface soil; however, no OU7 soil samples were collected between 1 to 2 feet bgs. OU7 soil is covered with pavement so any risk evaluations of surface soil assume exposure to uncovered soil for a theoretical future exposure scenario. In addition to surface soil, construction workers were evaluated for exposures to subsurface soil as well as groundwater. Recreational users were evaluated for exposure to surface soil, surface water, and sediment in the offshore area. Residential exposure to sediment and surface water of the intertidal area was assumed to be the same as recreational exposure to these media, so residents were not evaluated separately for exposure to intertidal area media. Recreational exposure to near-shore surface water is evaluated in the main body of the risk assessment. However, due to uncertainty associated with seep data, risks for exposure to undiluted seep water and mid- to high-tide seep water are presented in the uncertainty analysis (Section 6.6). Risks for occupational worker, recreational, and residential exposure to subsurface soil are also presented in Section 6.6 for informational purposes because contact with subsurface soil for these receptors is not anticipated. No receptors were evaluated for groundwater ingestion because groundwater at OU7 is saline/brackish and therefore unsuitable for consumption. No evaluation of vapor intrusion is necessary because site data indicate that a subsurface soil source of sufficiently volatile and toxic chemicals does not exist at OU7. Vapor intrusion requires a source, an inhabited building, and a pathway. A soil source of compounds sufficiently volatile and toxic to pose a vapor intrusion threat is not present at OU7. The majority of soil concentrations for compounds sufficiently volatile and toxic to warrant a vapor intrusion concern were reported as not detected. Where such compounds were detected, the concentrations were low and did not show a source.

An onshore area where no debris was detected was evaluated separately for risks for all receptors. This onshore area with no debris is in the former location of Building 237, referred to in this section as "former location of Building 237". Sample locations representing the area with no debris in the former location of Building 237 are provided in Section 6.2.2. The "Technical Memorandum, Recommended Human Health Risk Assessment Protocol, Site 32 – Topeka Pier, Portsmouth Naval Shipyard, Kittery, Maine" (TtNUS, November 2008, Appendix C), which is included as Appendix D.3 and referred to as the HHRA work plan from here forth, states that residential exposure units (EUs) were originally intended to consist of 1-acre decision units, which would result in a total of 14 decision units for the site. However, if the analytical data showed that detected contaminants were similar in the 1-acre EUs across the site, the areas should be combined into a single exposure unit for the risk assessment. The Phase I Technical Memorandum indicated that analytical data among the 1-acre EUs were similar enough that a single EU could be used (TtNUS, June 2004). The potential risks to human health at OU7 are estimated based on the assumption that no actions are taken to control contaminant releases.

6.1 RISK ASSESSMENT PROCEDURES

Three major aspects of contaminant contamination and exposure must be considered to assess potential public health risks: (1) contaminants with toxic characteristics must be identified in environmental media and be released by either natural processes or human action; (2) pathways by which actual or potential exposure occurs must be present; and (3) human receptors must be present at the point of exposure to complete the exposure route. Risk is a function of both toxicity and exposure; without one of the factors listed above, there is no risk. Once the three major aspects of contaminant contamination and exposure identified above are considered then the human health risk assessment process can begin.

The human risk assessment for OU7 consists of the following four major components:

- Data evaluation
- Exposure assessment
- Toxicity assessment
- Risk characterization (including uncertainty analysis)

Data evaluation is primarily concerned with data usability and the selection of COPCs, which are those contaminants that pose the greatest potential for causing adverse human health effects. A discussion of data usability as related to the HHRA is provided in Section 6.2.1. Methods for selection of COPCs are described further in Section 6.2.2, and COPC selection tables are presented in Appendix D.1 and D.7.

Exposure assessment is the process of identifying potential receptor populations and exposure pathways by which receptors may come in contact with contaminants at the site. Potential exposure routes under current and future land uses are developed from information gathered about the source area, contaminant concentrations, contaminant release mechanisms, patterns of human activity, and other pertinent information. The exposure assessment includes the methodologies used to calculate quantitative estimates of contaminant intake for each identified receptor, pathway, and route of exposure under reasonable maximum exposure (RME) and central tendency exposure (CTE) scenarios. Relevant exposure input parameters and equations used to estimate contaminant intakes are presented in Appendix D.1. The OU7 exposure assessment is discussed further in Section 6.3 and Appendix D.2.

The toxicity assessment presents contaminant-specific toxicity criteria for all identified COPCs at OU7. Toxicity criteria provide the basis for quantifying potential human health risks when integrated with estimated intakes developed in the exposure assessment. Toxicity assessment is further detailed in Section 6.4.

Risk characterization methodologies used to characterize risks associated with non-carcinogenic and carcinogenic effects to select receptors from exposure to COPCs are provided in Section 6.5. Various uncertainties are associated with risk characterization because the quantitative risk estimates developed are based on a number of assumptions (concerning exposure, land use, toxicity, etc.). An uncertainty analysis is provided in Section 6.6 that reviews general uncertainties associated with the risk evaluation for OU7.

The HHRA for OU7 was conducted with reference to current Navy, USEPA, and State of Maine human health risk assessment guidelines including:

- Navy, December 2008. Navy Human Health Risk Assessment Guidance.

- State of Maine Department of Environmental Protection and Center for Disease Control, July 2009. Guidance for Human Health Risk Assessments for Hazardous Substance Sites in Maine. DEP-BRWM 2B 2009.

- USEPA, March 1989b. Interim Procedures for Estimating Risks Associated with Exposures to Mixtures of Chlorinated Dibenzo-p-Dioxins and –Dibenzofurans (CDDs and CDFs) and 1989 Update. EPA/625/3-89/016, Risk Assessment Forum, Washington, D.C.

- USEPA, December 1989. Risk Assessment Guidance for Superfund - Volume I - Human Health Evaluation Manual (Part A) - Interim Final. EPA/540/1-89/002. Office of Emergency and Remedial Response.

- USEPA, March 1991. Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. Office of Solid Waste and Emergency Response, Washington, D.C. Directive 9285.6 03.

- USEPA, February 1992. Guidance on Risk Characterization for Risk Managers and Risk Assessors. Office of the Administrator, Washington, DC.

- USEPA, May 1993. Distribution of Preliminary Review Draft: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure. Office of Solid Waste and Emergency Response (OSWER), Washington, D.C.

- USEPA, July 1993. Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons. EPA/600/R-93/089. Environmental Criteria and Assessment Office.

- USEPA, July 1994. Revised Interim Guidance on Establishing Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities. OSWER Directive 9355.4-12.

- USEPA, August 1997. Exposure Factors Handbook. EPA/600/8-89/043. Office of Health and Environmental Assessment, Exposure Assessment Group. Washington, D.C.

- USEPA, April 1999. Use of the TRW Interim Adult Lead Methodology in Risk Assessment. Memorandum from Pat Van Leewven and Paul White to Mark Maddaloni.

- USEPA, May 2002. User's Guide for the Integrated Exposure Uptake Biokinetic Model for Lead in Children (IEUBK) Windows 32-bit version. EPA 9285.7-42.

- USEPA, December 2002a. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. Office of Solid Waste and Emergency Response, Washington, D.C.

- USEPA, December 2002b. Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. Office of Emergency and Remedial Response (OERR), Washington, D.C. OSWER 9285.6-10.

- USEPA, January 2003. Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil. Washington, DC. EPA-540-R-03-001. http://www.epa.gov/superfund/ programs/lead/adult.htm.

- USEPA, November 2003. Assessing Intermittent or Variable Exposures at Lead Sites. Office of Solid Waste and Emergency Response, Washington, D.C. EPA-540-R03-008, OSWER #9285.7-76.

- USEPA, July 2004. Risk Assessment Guidance for Superfund, Volume I – Human Health Evaluation Manual – Part E, Supplemental Guidance for Dermal Risk Assessment – Final. Office of Superfund Remediation and Technology Innovation. EPA/540/R/99/005.

- USEPA, March 2005a. Guidelines for Carcinogen Risk Assessment. EPA/630/P-03/001B. Risk Assessment Forum, Washington, DC.

- USEPA, March 2005b. Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens. EPA/630/R-03/003F. Risk Assessment Forum, Washington, DC.

- USEPA, 2009. Soil Screening Guidance, USEPA website: http://rais.ornl.gov/epa/ssl1.shtml - Accessed August 2009.

- USEPA, January 2009. Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment), Final. Office of Superfund Remediation and Technology Innovation, Washington, D.C. 20460 EPA-540-R-070-002, OSWER 9285.7-82.

- USEPA, May 2009. User's Guide for the Integrated Exposure Uptake Biokinetic Model for Lead in Children (IEUBK) Windows 32-bit version. EPA 9285.7-42.

- USEPA, June 2009a. Integrated Exposure Uptake Biokinetic Model for Lead in Children, Windows Version (IEUBKwin v 1.1 Build 9).

- USEPA, June 2009b. Update of the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Baseline Geometric Standard Deviation Parameters. Office of Superfund Remediation and Technology Innovation, Washington, D.C. 20460 EPA-540-R-070-002, OSWER 9200.2-82.

- USEPA, August 2009a. Integrated Risk Information System, On-Line Data Base. Environmental Criteria and Assessment Office, Cincinnati, OH. http://www.epa.gov/iris/index.html.

- USEPA, May 2010. ProUCL Version 4.1.00 User Guide. Office of Research and Development, Washington, D.C. EPA/600/R-07/038.

- USEPA, June 2011. Regional Screening Levels for Chemical Contaminants at Superfund Sites, http://epa-prgs.ornl.gov/chemicals/index.shtml.

Deviations from the HHRA work plan are noted in Section 6.6.5.

Analytical data for soil, surface water (including seep water), sediment, and groundwater used in the HHRA for OU7 are expected to adequately characterize potential risks for direct and inadvertent exposure to contaminated site media. The list of COPCs was determined from validated data presented in Appendix B.1.

6.2 DATA EVALUATION

A site-specific data evaluation was performed to determine which of the detected contaminants at the site are most likely to present a risk to potential human receptors. The end result of this quantitative selection process is a list of COPCs for each environmental medium considered. Section 6.2.1 provides a summary of data usability for OU7 as it pertains to the HHRA. The selection process used to identify COPCs is described in Section 6.2.2.

6.2.1 Data Usability

Data Usability Worksheets [suggested in Risk Assessment Guidance for Superfund (RAGS) – Part D] are presented in Appendix D.4. The worksheets guide the evaluation of data usability per matrix with respect to field sampling, analytical techniques, data quality objectives, and data validation. The data evaluation process includes an evaluation of analytical detection limits by comparing the detection limits to the screening criteria presented in the tables provided in Appendix D.4.

Data qualified during the data validation process is not expected to compromise the results of the HHRA. Analytical data qualified as rejected ("R") were not used in the risk assessment. Analytical data qualified as estimated ("J") were used for the OU7 HHRA. The use of estimated data adds to the uncertainty associated with the risk assessment; however, the associated uncertainty is expected to be negligible compared with the other uncertainties inherent in the risk evaluation process (e.g., uncertainties associated with land uses, exposure scenarios, toxicological criteria, etc.). When determining exposure concentrations via statistical procedures, the sample detection limit was used as a surrogate concentration for non-detected results (qualified "U"), as described in Section 6.3.4.

Appendix D.4 consists of Data Usability Worksheets used to assess the overall quality of the data used for this risk assessment. For the purposes of this risk assessment, overall data quality is sufficient. The most notable anomaly was the rejection of 1998, 2003, and 2006 antimony soil results. Antimony soil concentration data from 2003 and 2006 were rejected due to low matrix spike recoveries. It is undetermined why and 1998 antimony concentration data points were qualified as rejected. Low matrix spike recoveries indicate that antimony data qualified due to matrix spike contamination are biased low. The vast majority of rejected data points were presented by laboratories as non-detected. All positive antimony detections were used for calculating EPCs and corresponding antimony soil risks. Estimated soil antimony risks may be biased low due to the low matrix spike recoveries detected during data validation.

6.2.2 Selection of COPCs

The overall goal of the HHRA is to quantify risks associated with those contaminants that represent a potentially significant human health hazard on the basis of toxicity, environmental concentration, and mobility. USEPA guidance recommends focusing the risk assessment by quantifying risk only for a select list of COPCs at a site. COPCs, which are a subset of all detected contaminants in a given medium, are defined as those contaminants likely to dominate the overall potential risks for a site.

General selection criteria for inorganic and organic COPCs are discussed below:

Toxicity Screen. Current USEPA guidance recommends using the USEPA Regional Screening Level (RSL) table (USEPA, June 2011) for a source of general screening criteria to be used in COPC selection. The USEPA RSL table provides soil and tap water screening levels. The USEPA RSLs for residential soil were used as the screening criteria for all receptors for surface and subsurface soil at the site. The residential criteria represent the most conservative land use scenario, and thus screening against residential criteria should be conservative for all potential future land uses. A carcinogenic contaminant detected at a maximum concentration equal to or less than the relevant USEPA RSL level was not

selected as a COPC. A non-carcinogenic contaminant detected at a maximum concentration equal to or less than one-tenth of the relevant USEPA RSL value was not selected as a COPC. One-tenth of the non-carcinogenic screening levels was used to account for potential cumulative effects of multiple compounds affecting the same target organ or producing the same target effect. Contaminants with maximum concentrations greater than the RSLs for carcinogens or one-tenth the RSLs for non-carcinogens were selected as COPCs and carried through the quantitative risk assessment. Maximum contaminant concentrations in soils were also compared to USEPA soil screening levels (SSLs) for migration from soil to air which were calculated using the USEPA website (http://rais.ornl.gov/epa/ssl1.shtml). Contaminants detected at a maximum concentration exceeding the USEPA SSLs for carcinogens or one-tenth of the SSLs for non-carcinogens were selected as COPCs for soil-to-air migration. SSL values are presented in the COPC selection tables located in the site-specific RAGS-Part D tables in Appendix D.1.

Soil data at OU7 were not compared to SSLs for groundwater protection because these SSLs are designed to protect groundwater used as drinking water. The saline/brackish groundwater at OU7 is not potable; therefore, comparison of contaminant concentrations to groundwater protection SSLs was unnecessary.

Screening criteria are currently unavailable for surface water and sediment in the USEPA RSL table. Site-specific screening levels were calculated for surface water and sediment that incorporate conservative site-specific exposure assumptions based on a previous Technical Memorandum for facility-wide screening level development (TtNUS, December 2002). Appendix D.5 describes the methodology used in calculating these screening levels and includes with a summary table of the final screening levels used for surface water and sediment in this assessment. Additionally, because the RSL table provides tap water (i.e., drinking water) screening criteria and there is no fresh water available at the site (only brackish/saline groundwater is present), screening levels were calculated for groundwater exposure via dermal contact, also as presented in Appendix D.5. Contaminants in groundwater selected as COPCs were evaluated for construction worker dermal exposure to groundwater only, in accordance with the HHRA work plan (TtNUS, November 2008, Appendix C).

Guidance from the Office of Prevention, Pesticides, and Toxic Substances and OSWER recommend 400 mg/kg as the lowest screening level for lead-contaminated soil in a residential setting where children are frequently present (USEPA, February and July 1994, May 2002, December 2005). Conservatively, 400 mg/kg was be used as the lead screening level for COPC selection for soil. However, guidance from the USEPA Technical Review Workgroup for lead indicates that “a reasonable screening level for soil lead at commercial/industrial (i.e., non-residential) sites is approximately 800 mg/kg for a typical non-contact intensive worker” (USEPA, June 2009b). The USEPA RSL table lists 800 mg/kg as the RSL for lead in

soil assuming an industrial land use scenario. For lead in intertidal water, surface water, and undiluted seep water, a value of 950 µg/L, was used for screening purposes. This value was calculated using USEPA's IEUBK Model for a child recreational receptor, assuming a 90-day averaging time. A calculated screening level for lead in groundwater of 1,340 µg/L was used, which was calculated using the methodology presented in the OU1 report (TtNUS, July 2007) and updated inputs for the Adult Lead Model (ALM) (USEPA, June 2009b).

Several parameters evaluated in the toxicity screen were calculated parameters: benzo(a)pyene (BAP) equivalents, 2,3,7,8-TCDD TEQ, TEQ PCB, and total PCB congeners. For the carcinogenic PAHs (cPAHs) [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene], a toxicity equivalence factor (TEF) approach was used based on the relative potency of each compound to that of BAP. The TEFs are used to convert each individual cPAH concentration into an equivalent concentration of BAP equivalent. The BAP equivalent concentration was calculated by summing individual cPAH BAP equivalent concentrations. One-half of the detection limit of non-detected cPAHs was used to represent non-detected cPAH concentrations in the calculation. If all the cPAHs were not detected in a sample, then the sample quantitation limit for benzo(a)pyrene was used as the equivalent concentration for that sample. A similar approach was used for the 2,3,7,8-TCDD equivalent using World Health Organization (WHO) TEFs (2006). The PCBs were divided into dioxin-like and non-dioxin-like PCB congeners, represented by PCB TEQ and total PCB congeners, respectively. Example calculations for these parameters are presented in Appendix D.2.

Frequency of Detection Screen and Dataset Definition. The frequency of detection screen includes screening the concentration results of chemical analyses to determine whether or not chemicals are detected in less than 5 percent of the samples collected for a given matrix. A chemical detected in less than 5 percent of the samples collected for a given matrix was not selected as a COPC when at least 20 samples were collected and the available data indicate that a contamination "hot spot" is not present at the site.

For evaluating risks from exposure to soil, the EUs were as follows:

- Entire site
- The former location of Building 237. The samples contained in the former location of Building 237 consist of a subset of the OU7 soil samples from the following locations: TP-SB43, TPSB115, TP-SB116, TP-SB117, TP-SB118, TP-SB119, TP-SB121, and TP-SB16.

Soil exposures for OU7 were evaluated using two data sets including a surface soil (0 to 1 foot bgs) data set and a subsurface soil (2 to 10 feet bgs) data set. USEPA Region 1 guidance (USEPA, August 1995) defines surface soil as soil from 0 to 1 foot bgs and subsurface soil as soil from 1 to 10 feet bgs. No OU7 soil samples were collected between 1 and 2 feet bgs; however, a number of samples were collected at depths greater than 10 feet bgs at OU7. The implications of omitting these data from the risk assessment are discussed in the uncertainty analysis (Section 6.6). As discussed in Section 4.1.1, the area in the former location of Building 237 did not contain debris material, and chemical concentrations in this area were found to be statistically different from chemical concentrations in the remaining portion of OU7.

Exposures to surface water and sediment were evaluated as one EU. Surface water exposures were assessed by evaluating near-shore water, which is tidally influenced surface water along the shoreline at low tide; undiluted seep water, which is present in the intertidal area of OU7 at low tide; and mid- to high-tide surface water, which is a combination of mixed undiluted seep water and near-shore water that occurs at mid to high tide. The entire OU was evaluated as one site when evaluating risks from exposure to groundwater because of the similarity of contaminant concentrations in groundwater and the tidal nature of groundwater at OU7 (groundwater at OU7 is saline/brackish). The frequency screen was applied to each data set separately, and risks for each data set were evaluated separately in the risk assessment.

The selection of COPCs for each environmental medium is summarized in the remainder of this section.

6.2.2.1 Soil

<u>Direct Contact COPCs for Surface Soil – Entire Site</u>

RAGS-Part D Table 2.1, presented in Appendix D.1, shows the results of the comparison of maximum detected surface soil concentrations at OU7 to screening levels based on USEPA RSLs for residential soil and SSLs for soil to air. The following chemicals were retained as surface soil COPCs for exposure to the entire site because their maximum concentrations in surface soil exceeded one or more screening criteria:

- SVOCs: benzo(a)anthracene, BAP, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and BAP equivalents.
- PCBs: Aroclor-1248.
- Metals: barium, copper, iron, lead, mercury, and thallium.

Maximum concentrations of dioxins/furans, evaluated as TEQs, and several metals also exceeded USEPA residential RSLs but did not exceed facility background concentrations (see Appendix B.2). A discussion of chemicals eliminated from COPC selection on the basis of the background comparison is presented in Section 6.6, and detailed information on background screening methodology and data sets used are included in Appendix B.2.

Direct Contact COPCs for Surface Soil – Former Location of Building 237

RAGS-Part D Table 2.2, presented in Appendix D.1, shows the results of the comparison of maximum detected surface soil concentrations in the former location of Building 237 to screening levels based on USEPA RSLs for residential soil and SSLs for soil to air. No chemical concentrations in the former location of Building 237 exceeded corresponding USEPA soil to air SSLs. Although maximum concentrations of several chemicals (e.g. dioxins/furans and several metals) exceeded USEPA residential RSLs, with the exception of Aroclor-1254, all of these chemical concentrations were determined to be within background concentrations. The only chemical in surface soil from the former location of Building 237 selected as a COPC was Aroclor-1254.

Direct Contact COPCs for Subsurface Soil – Entire Site

RAGS-Part D Table 2.3, presented in Appendix D.1, shows the comparison of maximum detected subsurface soil concentrations at OU7 to screening levels based on USEPA RSLs for residential soil and SSLs for soil to air. The following chemicals were retained as COPCs for subsurface soil because their maximum concentrations in subsurface soil exceeded USEPA RSLs for residential soil or SSLs for soil to air:

- SVOCs: benzo(a)anthracene, BAP, benzo(b)fluoranthene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and BAP equivalent.

- PCBs: Aroclor-1248, Aroclor-1260.

- Dioxins/furans: 1,2,3,4,6,7,8-HPCDF, 1,2,3,4,7,8-HXCDF, 1,2,3,6,7,8-HXCDF, 1,2,3,7,8,9-HXCDF, 1,2,3,7,8-PECDD, 1,2,3,7,8-PECDF, 2,3,4,6,7,8-HXCDF, 2,3,4,7,8-PECDF, 2,3,7,8-TCDF, and 2,3,7,8-TCDD TEQ.

- Metals: antimony, barium, cadmium, cobalt, copper, iron, lead, manganese, mercury, nickel, thallium, and zinc.

Maximum concentrations of aluminum, arsenic, and vanadium also exceeded USEPA residential RSLs but did not exceed facility background concentrations (see Appendix B.2).

Direct Contact COPCs for Subsurface Soil – Former Location of Building 237

RAGS-Part D Table 2.4, presented in Appendix D.1, shows the results of the comparison of maximum detected subsurface soil concentrations in the former location of Building 237 to screening levels based on USEPA RSLs for residential soil and SSLs for soil to air. The following chemicals were retained as COPCs for former location of Building 237 subsurface soil because their maximum concentrations in subsurface soil exceeded residential soil screening criteria:

- SVOCs: benzo(a)anthracene, BAP, benzo(b)fluoranthene, and BAP equivalents.
- Metals: manganese.

6.2.2.2 Direct Contact COPCs for Groundwater

RAGS-Part D Table 2.5, presented in Appendix D.1, shows COPC selection for groundwater. Both filtered and unfiltered groundwater data were considered during the groundwater COPC selection process. As discussed in Section 6.2.3, COPCs for groundwater were determined by comparing maximum detected concentrations to screening levels based on construction worker dermal exposure to groundwater. Only the maximum concentrations of manganese and thallium exceeded the corresponding groundwater screening levels, but manganese concentrations were less than facility background concentrations (see Appendix B.2); therefore, only thallium was identified as a COPC for groundwater at OU7.

6.2.2.3 Direct Contact COPCs for Sediment

RAGS-Part D Table 2.6, presented in Appendix D.1, shows the results of the comparison of maximum detected sediment concentrations to calculated sediment criteria for recreational users at PNS. The following chemicals were retained as COPCs for sediment because their maximum concentrations in sediment exceeded calculated screening levels for recreational users at PNS:

- SVOCs: benzo(a)anthracene, BAP, dibenzo(a,h)anthracene, indeno(1,2,3-CD)pyrene and BAP equivalents.

- PCBs: TEQ PCB and total PCB congeners.

- Metals: arsenic, chromium, iron, lead, and manganese.

6.2.2.4 COPC Selection for Near-shore Water

RAGS-Part D Table 2.7, presented in Appendix D.1, shows the results of the comparison of maximum detected near-shore water concentrations at OU7 to calculated surface water criteria for recreational users at PNS. No chemical concentrations exceeded the calculated screening criteria; therefore, no COPCs were selected.

6.3 EXPOSURE ASSESSMENT

The exposure assessment defines and evaluates the exposures experienced by likely receptor populations at a site. The exposure assessment consists of several subsections that characterize the physical site setting and potential receptors of concern. Additionally, the exposure assessment identifies the potential contaminant migration and exposure pathways, defines the contaminant concentrations at the point of exposure, and presents the exposure assumptions used to quantify exposure in terms of contaminant intake (dose). Appendix D.1 of this report includes the intake equations and sample calculations for the quantification of contaminant intakes. Spreadsheets presented in Appendix D.1 include the contaminant-specific intakes for each receptor and medium at OU7. A summary of potential exposure pathways is provided in RAGS-Part D Table 1 in Appendix D.1. RAGS-Part D Table 4s in Appendix D.1 and D.7 provide the exposure parameters used to calculate the contaminant-specific intakes.

6.3.1 <u>Exposure Setting</u>

Site background and history, and a description of sources of environmental contamination, contaminant release mechanisms, and transport/migration pathways are provided in Sections 1.0 and 5.0, respectively, of this report. A detailed description of background screening methodology is presented in Appendix B.2. A description of OU7 and the designated former location of Building 237 is presented in Section 4.0.

6.3.1.1 Potential Exposure Routes

Potential receptors can come into contact with contaminants in many ways, which are generally the result of interactions between a receptor's behavior or lifestyle and an exposure medium. For the purposes of this assessment an exposure route is defined as a description of the behavior that brings a receptor into

contact with a contaminated medium. The CSM for OU7 that displays the HHRA potential exposure routes is presented on Figure 6-1.

6.3.1.1.1 Air

The air pathway is based on the scenario that a receptor inhales air that contains suspended particulates and/or volatile organic vapors originating from the source area.

A qualitative comparison of maximum detected site concentrations in soil to air SSLs based on intermedia transfer (from soil to air) was performed to determine whether additional quantitative analysis of this potential exposure pathway was warranted. The SSLs are based on residential land use and lifetime exposure scenarios. The soil-to-air screening is summarized in the COPC screening tables (RAGS-Part D, Table 2s) included in Appendices D.1 and D.7. If the maximum soil concentration of a constituent exceeded the soil-to-air SSL, then risks for that constituent were quantified in the risk characterization section of this report (Section 6.5).

The release of contaminants from subsurface soil via fugitive dust and volatile emissions is not expected at OU7 under current land use conditions. The release of subsurface soil contaminants to the atmosphere can only occur as a result of ground-intrusive activities. Subsurface soil risk due to fugitive dust and volatile emissions were evaluated for current/future construction worker exposed to surface soil and subsurface soil (Appendix D.1), and future occupational, recreational, and residential receptors (Appendix D.7) exposed to surface and subsurface soil.

6.3.1.1.2 Ingestion of and Dermal Contact with Soil

Potential receptors may come into direct contact with soil affected by the release of contaminants from the source area. During the receptor's period of contact, the individual may be exposed via inadvertent ingestion of a small amount of soil or via dermal absorption of contaminants from the soil.

Dermal contact with contaminants detected in the soil may or may not result in a significant exposure. For contaminants to be percutaneously absorbed, they must first desorb from soil and diffuse through the skin. Various factors affect the rate of dermal absorption, including the amount of soil on the skin surface, soil characteristics (moisture, pH, organic carbon content, etc.), skin characteristics (thickness, temperature, hydration, etc.), volatilization losses, and contaminant-specific properties. Dermal and ingestion exposures to contaminants in soil were evaluated quantitatively for this risk assessment.

6.3.1.1.3 Dermal Contact and Inhalation of Volatiles from Groundwater

No freshwater wells exist within OU7 because all groundwater is saline or brackish. Consequently, residential exposure to groundwater is very unlikely because the groundwater is not potable; therefore, residential exposure to groundwater was not evaluated in the risk assessment.

Dermal contact with groundwater was not considered a significant pathway for residents, but it was assumed that construction workers may come into contact with groundwater during excavation activities or repair of utility lines; therefore, dermal contact and inhalation (i.e., the receptors may be exposed to contaminants volatilizing from the groundwater) exposure to groundwater were evaluated for current and future construction workers. Only thallium was selected as a COPC for groundwater using the screening levels developed for construction worker dermal contact with groundwater (as noted in Section 6.2.3.3). Therefore, construction worker dermal exposure to groundwater was evaluated. However, VOCs were not detected in groundwater; therefore, quantitative risk evaluation of dermal and inhalation pathways from groundwater exposure at OU7 was not necessary.

6.3.1.1.4 Ingestion of and Dermal Contact with Intertidal Water and Sediment

Receptors can potentially be exposed to surface water and sediment in the intertidal areas adjacent to the site. Potential exposures to two of three intertidal water exposure scenarios (i.e., undiluted seep water and mid- to high-tide surface water) are evaluated in the uncertainty analysis (Section 6.6) of this risk assessment due to concerns related to the uncertainty associated with seep water analytical results. For COPCs identified in these media, potential risks were evaluated assuming that incidental ingestion or dermal contact with these media is possible by individuals recreating (e.g., walking) within the study area. Therefore, risks for recreational users (adult and adolescent) were evaluated. The child recreational user receptor was not evaluated because the rocky nature of the site makes access by child receptors (less than 6 years of age) unlikely. Residential exposure to surface water and sediment is considered the same as recreational exposure to these media.

6.3.2 Potential Receptors

Potential receptors were identified for both current and future land use conditions by analyzing current land use practices, possible future land use, and identified sources of contamination. Construction workers and recreational users (adult and adolescent) are considered to be potential human receptors for OU7 under current and future land use.

Construction workers, occupational workers, recreational users (adult and adolescent), and future residents (adult and child) may be potential receptors under future land use. Although current land use

does not include residential land use, land use could potentially include residential use in the future. Recreational users and future residents were evaluated to aid in risk management decisions.

6.3.3 Exposure Pathways

The basic exposure assessment assumptions for OU7 are as follows:

- The receptors evaluated include adult and adolescent recreational users, adult, child, and lifelong residents, occupational workers (e.g., the typical industrial/commercial workers performing routine activities), and construction workers (e.g., remediation and excavation).

- The exposure routes include ingestion, dermal contact, and inhalation of air/dust particulates and vapors for soil, ingestion of and dermal contact with intertidal water and sediment, and groundwater dermal contact. The potentially complete exposure pathways are summarized in the following table and discussed in Appendix D.2.

Potentially Complete Exposure Pathways	
Receptors	**Exposure Routes**
Construction Workers (current/future)	Soil Ingestion - (surface and subsurface soil) Soil Dermal Contact (surface and subsurface soil) Inhalation of Air/Dust Particulates and Vapors (surface and subsurface soil)(1) Dermal Contact with Groundwater
Occupational Worker (current/future) [e.g., typical industrial worker, commercial worker, landscaper, or maintenance worker]	Soil Ingestion (surface soil)(2) Soil Dermal Contact (surface soil) (2) Inhalation of Air/Dust Particulates and Vapors (surface soil)(1,2)
Recreational Users (current/future)	Soil Ingestion (surface soil) (1,2) Soil Dermal Contact (surface soil) (1,2) Inhalation of Air/Dust Particulates and Vapors (surface soil) (1,2) Ingestion of surface water and sediment(1) Dermal contact with surface/seep water and sediment(1)
Residents (future)	Soil Ingestion (surface soil) (1,2) Soil Dermal Contact (surface soil) (1,2) Inhalation of Air/Dust Particulates and Vapors (surface soil) (1,2)

1 Denotes a pathway that is evaluated only if a chemical concentration exceeds that presented in the Soil Screening Guidance (USEPA, 2010, http://rais.ornl.gov/epa/ssl1.shtml).
2 For informational purposes, evaluations of residents, recreational users, and occupational workers for exposure to combined surface/subsurface soil (0 to 10 feet) are included in Appendix D.7.

6.3.4 Exposure Point Concentrations

The following items summarize the protocol used in calculating exposure point concentrations (EPCs) for OU7 media.

For the calculation of EPCs for soil, sediment, and intertidal/seep water, if the data set contains greater than 10 analytical results, the 95-percent UCL on the mean was calculated and used as the EPC, unless that value exceeds the maximum detected concentration. In this case, the maximum detected concentration was used as the EPC for the RME and CTE scenarios (USEPA, August 1995). Use of the maximum value is recommended for small data sets because it is often difficult to define the distribution of a data set when fewer than 10 samples are available. The maximum concentration is also used as the EPC if there are few (i.e., three or less) positive detections in a data set, in accordance with USEPA guidance (February 2009). The maximum detected concentration was also used as the EPC for groundwater.

The 95-percent UCLs on the mean for all COPCs were calculated following USEPAs Calculating UCLs for EPCs at Hazardous Waste Sites (USEPA, December 2002a) and using USEPAs ProUCL (Version 4.1.00) software (May 2010). The sample detection limit was used as an input for non-detected results in the EPC calculations. Averages of original and duplicate samples were used in the calculation of EPCs for site media. Non-detected results were evaluated using the procedures in ProUCL. Appendix D.2.2 contains ProUCL output files.

In accordance with USEPA guidance for the IEUBK Model (June 2009a) and ALM (January 2003), average lead concentrations are used to estimate blood-lead levels resulting from exposure to lead.

COPC EPCs for OU7 are summarized in RAGS-Part D Tables 3.1 through 3.6 presented in Appendix D.1.

6.3.5 Quantification of Exposure

Exposure intakes for the identified potential receptor groups were calculated using current USEPA risk assessment guidance (e.g., March 1991, August 1997, July 2004, and January 2009). Estimates of exposure are based on contaminant concentrations at exposure points and on scenario-specific assumptions and intake parameters. In general, standard default parameters that combine mid-range and upper-end exposure factors were used to assess the RME. CTE was assessed primarily by the use of mid-range exposure factors presented in current risk assessment guidance (e.g., USEPA, July 1993). The same EPCs and equations were used to estimate intakes under the CTE scenario, but exposure input parameters (e.g., exposure frequencies) were modified to reflect average case exposure. The exposure parameters used for the CTE calculations reflect the latest USEPA guidance (see RAGS-Part D

Table 4s in Appendices D.1 and D.7). Therefore, the exposure factors for the CTE differed from those used for the RME, but in accordance with current USEPA guidance, the EPCs were the same for the RME and CTE scenarios.

Exposure assumptions used for human receptor exposure to the intertidal area were based on current site conditions. Shoreline controls, installed to prevent erosion of the shoreline, cover the mid- to high-tide zone of the shoreline, and only sediment below the mid-tide level is exposed. The sediment in the low-tide zone is soft and difficult to walk on and is only exposed for a short portion of the tidal cycle. Therefore, the exposure assumptions for human exposure to intertidal sediment used in the HHRA are appropriate for current site conditions.

The most recent USEPA guidance was used to estimate intakes. USEPA guidance used for this risk assessment includes USEPA Soil Screening Guidance (USEPA, December 2002a), USEPA Exposure Factors Handbook (USEPA, August 1997), USEPA Child-Specific Exposure Factors Handbook (USEPA, September 2008), and the July 2004 Final USEPA Dermal Guidance.

Exposure intake parameters were used in the equations presented in Appendix D.2 along with the EPCs previously defined to estimate contaminant intakes. Individual contaminant intakes for each receptor/exposure route combination at OU7 are presented in the risk assessment spreadsheets in Appendix D.1. Example calculations are provided in Appendix D.2.

6.4 TOXICITY ASSESSMENT

The objective of the toxicity assessment is 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 are defined for the identified COPCs. Quantitative toxicity values determined during this component of the risk assessment are 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 non-carcinogenic health effects for ingestion and dermal exposures is the reference dose (RfD). The reference concentration (RfC) is used to evaluate non-carcinogenic health effects for inhalation exposures. RfDs and RfCs are estimates of the daily exposure level for the human population that are likely to be without appreciable risk during a portion or all of a lifetime. They are 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) for ingestion and dermal exposures and inhalation unit risk (IUR) for inhalation exposures, which is

a plausible upper-bound estimate of the probability of development of cancer per unit intake of contaminant over a lifetime. It is based on available dose-response data from human and/or animal studies.

6.4.1 Toxicity Criteria for Oral and Inhalation Exposures

Oral RfDs and CSFs and inhalation RfCs and IURs used in this risk assessment were obtained from the following primary USEPA literature sources (December 2003):

- Integrated Risk Information System (IRIS).
- USEPA Provisional Peer Reviewed Toxicity Values (PPRTVs) – The Office of Research and Development/National Center for Environmental Assessment (NCEA) Superfund Health Risk Technical Support Center develops PPRTVs on a contaminant-specific basis when requested by USEPA's Superfund program.
- Other toxicity values – These sources include but are not limited to California Environmental Protection Agency toxicity values, Agency for Toxic Substances and Disease Registry (ATSDR) values, and the Annual Health Effects Assessment Summary Tables (HEAST) (USEPA, July 1997).

Although toxicity criteria can be found in several toxicological sources, USEPA's IRIS online database is the preferred source of toxicity values. This database is continuously updated, and the presented values have been verified by USEPA. The USEPA RSL table may also be used as a source of toxicity criteria. This table is updated several times a year and reflects recent changes in IRIS. The toxicity criteria for the constituents selected as COPCs are presented in RAGs Part D Tables 5 and 6 presented in Appendix D.1.

6.4.2 Toxicity Criteria for Dermal Exposure

RfDs and CSFs found in the literature are frequently expressed as administered doses; therefore, these values are considered inappropriate for estimating risks associated with dermal routes of exposure. Oral dose-response parameters based on administered doses must be adjusted to absorbed doses before comparisons to estimated dermal exposure intakes are made.

When oral absorption is essentially complete (i.e., 100 percent), the absorbed dose is equivalent to the administered dose, and no toxicity adjustment is necessary. Conversely, when the gastrointestinal absorption of a contaminant is poor (e.g., 1 percent), the absorbed dose is smaller than the administered

dose; thus, toxicity factors based on absorbed dose should be adjusted to account for the difference in the absorbed dose relative to the administered dose. USEPA (2004) recommends a cutoff of 50 percent absorption to reflect the intrinsic variability in the analysis of absorption studies. Therefore, the adjustment from administered to absorbed dose was only performed when the contaminant-specific gastrointestinal absorption efficiency was less than 50 percent. The adjustment from administered to absorbed dose was made using contaminant-specific gastrointestinal absorption efficiencies (ABSs) published in available guidance [i.e., USEPA, July 2004 (the primary reference); USEPA, 1989, 1998, 2008, 2009] 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
RfD_{dermal} = RfD for the dermal route of exposure
RfDoral = RfD for the oral route of exposure
CSF_{dermal} = CSF for the dermal route of exposure
CSF_{oral} = CSF of the oral route of exposure

If contaminant-specific gastrointestinal absorption efficiencies were not available, then complete oral absorption was assumed and the oral toxicity values were not adjusted for dermal absorbed doses. The contaminant-specific absorption efficiencies used in this HHRA are presented in RAGS-Part D Tables 5.1 and 6.1 in Appendix D.1.

6.4.3 Toxicity Criteria for Carcinogenic Effects of PAHs

Risk estimates for PAHs have, in the past, assumed that all cPAHs have a potency equal to that for BAP. Whereas BAP was well studied, other Class B2 PAHs had insufficient data with which to calculate a CSF. USEPA has since published provisional guidance to assess PAHs (July 1993). Estimated orders of potential potency TEFs were developed and are rounded to one significant figure (based on an order of magnitude). The values are based on a comparable endpoint (complete carcinogenesis after repeated exposure to mouse skin).

USEPA's Guidelines for Carcinogen Risk Assessment (March 2005a) and Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (March 2005b) specify the use of age dependant adjustment factors (ADAFs) for carcinogens that act via a mutagenic mode of action. Carcinogenic PAHs are included in the group of contaminants that have been determined to act via the mutagenic mode of action. No contaminant-specific ADAFs have been derived for carcinogenic PAHs;

therefore, the following default ADAFs were used: 10 for ages 0 to 2, 3 for ages 2 to 16, and 1 (no adjustment) for ages 16 to 70.

6.4.4 Toxicity Criteria for Dioxins/Furans

Chlorinated dibenzo-p-dioxins (CDDs) and chlorinated-dibenzofurans (CDFs) are evaluated using TEFs that relate the toxicity of various congeners to the toxicity of TCDD. TEFs are based on a variety of approaches including structure-activity relationships and available toxicological information. The equivalent oral CSFs for these contaminants are derived by multiplying the CSF for 2,3,7,8-TCDD by the TEFs. As stipulated in the HHRA work plan, current WHO TEF values were used in the risk assessment (2006).

6.5 RISK CHARACTERIZATION

This section provides the methodologies used for the characterization of potential human health risks associated with exposure to OU7 COPCs. Potential human health risks resulting from exposure to COPCs are estimated using algorithms established by USEPA (December 1989). The methods described by USEPA are protective of human health and are likely to overestimate (rather than underestimate) risk. The methodology uses specific algorithms to calculate risk as a function of contaminant concentration, human exposure parameters, and toxicity. Quantitative risks were not calculated for chemicals eliminated from COPC selection based on the background screening. This is because chemicals with concentrations exceeding screening levels, but that do not exceed site background are likely representative of regional contamination and not site conditions. Therefore, the risk characterization in this section provides estimates for site-related contaminants at OU7. Uncertainty associated with eliminating chemicals on the basis of background comparisons alone is discussed in Section 6.6 and in further detail in Appendix B.2.

Risks from hazardous contaminants are calculated for carcinogenic and non-carcinogenic effects. For carcinogenic contaminants that exhibit non-carcinogenic effects, potential impacts were characterized for both types of health effects. Section 6.5.1 defines the characterization methodology for carcinogenic effects. The methodology for non-carcinogenic effects is described in Section 6.5.2.

6.5.1 Carcinogenic Effects

Quantitative estimates of risk for contaminants other than lead were calculated according to risk assessment methods outlined in USEPA guidance (1989). Lifetime cancer risks are expressed in the form of dimensionless probabilities, referred to as incremental lifetime cancer risks (ILCRs), based on CSFs and IURs.

ILCR estimates for ingestion and dermal exposures were generated for each COPC using estimated exposure intakes and published CSFs, as follows:

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

If the above equation resulted in an ILCR greater than 0.01, the following equation was used:

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

This is consistent with the linear low-dose model.

ILCRs estimates for inhalation exposures were generated for each COPC using estimated exposure concentrations and published IURs, as follows:

$$ILCR = (IUR)(\text{Exposure Concentration})(1{,}000\ \mu g/mg)$$

Estimated ILCRs are compared with the USEPA target risk range, 10^{-6} to 10^{-4}. Risks less than 10^{-6} (a risk less than 1 in 1 million) are generally considered to be "acceptable" by USEPA, whereas risks greater than 10^{-4} (1 in 10,000) are generally considered to be "unacceptable" by the agency. Depending on the risk management goals for the site, risks within 10^{-6} to 10^{-4} are also typically regarded as "acceptable." The State of Maine uses an ILCR risk guideline of 10^{-5}.

6.5.2 Non-Carcinogenic Effects

Non-carcinogenic risks were assessed using the concept of hazard quotients (HQs) and hazard indices (HIs). The HQ for a COPC is the ratio of the estimated intake to the RfD and is calculated for ingestion and dermal exposures as follows:

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

For inhalation exposures, HQ is calculated as follows:

$$HQ = (\text{Exposure Concentration})/(RfC)$$

An HI is generated by summing the individual HQs for all the COPCs. If the HI exceeds 1, a potential exists for non-carcinogenic (toxic) effects to occur. When the HI exceeds 1, it is necessary to segregate

the HQs by target-organ effects because the HQs for all non-carcinogens are not considered to be truly additive unless similar target organs are affected. If the HI for an individual target organ exceeds 1, a potential exists for adverse non-carcinogenic health effects.

The estimation of non-carcinogenic effects (i.e., the calculation of HQs/HIs) should not be construed as a probability in the manner of the ILCR, but rather a numerical indicator of the extent to which a predicted intake exceeds, or is less than, an RfD.

6.5.3 Quantitative Risk Estimates – RME Evaluation

Quantitative risk estimates for potential human receptors were developed for those contaminants identified as COPCs. Potential non-carcinogenic and carcinogenic risks for construction worker, occupational workers, adult and adolescent recreational users, and adult and child residents under the RME scenario are summarized in Table 6-1. Risks for each receptor are summed across all applicable exposure routes. Risk spreadsheets containing the detailed contaminant-specific risks calculated for OU7 are included in Appendix D.1. A discussion of the estimated non-carcinogenic and carcinogenic risks is provided in the remainder of this section. Estimates of potential risks from residential and recreational exposure to surface and subsurface soil (0 to 1 and 2 to 10 feet bgs) were calculated for risk management purposes and can be found in Appendix D.7. Potential risks from recreational seep water and mid- to high-tide surface water exposure are discussed in Section 6.6.

Non-Carcinogenic Risks – RME Evaluation

The cumulative HIs calculated for adult and adolescent recreational user exposure to surface soil and sediment are less than 1, indicating that adverse non-carcinogenic effects are not anticipated for recreational exposures to these media. The cumulative HIs for occupational workers (HI = 0.1), and adult residents (HI = 0.2) exposed to surface soils under the RME scenario are less than 1, indicating that no toxic effects are anticipated for these receptors under the defined exposure conditions. The cumulative HI for child residents (HI = 2) is greater than 1; however, on a target organ/system specific basis none of the cumulative HIs for child residents exceeded 1, indicating that adverse non-carcinogenic effects are not anticipated for a child resident exposed to surface soil. Cumulative HIs do not exceed 1 for construction workers exposed to soil in the former location of Building 237.

The cumulative HI calculated for construction workers exposed to entire site surface and subsurface soil exceeds 1 (HI = 8). HIs exceed 1 due to 2,3,7,8-TCDD TEQ (target system developmental) in subsurface soil for the entire site exposure scenario via ingestion. Manganese [target organ central nervous system (CNS)] also contributes to a HI greater than 1 for the CNS via inhalation. The individual HQ for 2,3,7,8-TCDD TEQ was 3, and the individual HQ for manganese was 2.

Carcinogenic Risks – RME Evaluation

Carcinogenic risks estimated for occupational workers, construction workers, recreational users (adult, adolescent, and lifetime), and residents (adult, child, and lifetime) are within the USEPA target risk range of $1x10^{-6}$ to $1x10^{-4}$ and less than the State of Maine risk guideline of $1x10^{-5}$. Carcinogenic risks for the child, adult, and lifetime residents exposed to surface soil exceed the State of Maine risk guideline of $1x10^{-5}$ with cumulative ILCRs of $1x10^{-4}$, $2x10^{-5}$, and $1x10^{-4,}$ respectively but are within the USEPA target risk range. The primary contributors to these cancer risks are cPAHs.

6.5.4 <u>CTE Evaluation</u>

An evaluation of the potential risks associated with the CTE scenario is included to provide a measure of the central or average case exposure. Summaries of the estimated risks for the CTE scenario are presented in Table 6-2.

Non-Carcinogenic Risks – CTE Evaluation

Cumulative HIs calculated for occupational workers, adult residents, and child residents exposed to surface soil under the CTE scenario are less than 1. Additionally, the cumulative HIs for adult and adolescent recreational users exposed to surface soil and sediment under the CTE scenario are less than 1, indicating that no toxic effects are anticipated for these receptors under the defined exposure conditions. Cumulative HIs do not exceed 1 for construction workers exposed to soil in the former location of Building 237.

The cumulative HI for construction workers exposed to entire site soil under the CTE scenario exceeds 1 (HI = 8). The exceedance is due primarily to exposure to 2,3,7,8-TCDD TEQ in subsurface soil by ingestion and manganese in subsurface soil by inhalation. HQs for the 2,3,7,8-TCDD TEQ (target system developmental) and manganese (target organ CNS) both exceed 1.

Carcinogenic Risks – CTE Evaluation

For the CTE, the cumulative ILCRs for recreational users (adult, adolescent, and lifetime), construction workers, occupational workers, and residents (adult, child, and lifetime) are less than or within USEPA's target cancer risk range of $1x10^{-6}$ to $1x10^{-4}$. Cumulative ILCRs for all receptors are equal to or less than the State of Maine risk guideline of $1x10^{-5}$; therefore, adverse effects due to carcinogenic chemicals at OU7 are not anticipated for any receptor exposed under CTE conditions.

6.5.5 Exposure to Lead

Lead was selected as a COPC for the entire site surface soil, subsurface soil, and sediment exposure scenarios at OU7. The exposure and potential risks to a child (0 to 6 years) exposed to lead are assessed through the use of the USEPA IEUBK Model (USEPA, February 1994, May 2002, May 2009, and June 2009a) because of the absence of published dose-response parameters for lead. Adult exposure to lead in soil is addressed by the Lead Model for Adult Exposure (USEPA December 1996, January 2003, June 2009). Documentation for the assessment of lead through the IEUBK Model and the ALM is presented in Appendix D.6.

The maximum concentrations of lead for the entire site surface soil (13,200 mg/kg) and subsurface soil (40,000 mg/kg) exposure scenarios exceed the residential screening criterion of 400 mg/kg (USEPA, February and July 1994, May 2002, and December 2005), the State of Maine lead guideline of 175 mg/kg (MEDEP, January 2010), and the industrial screening criterion of 800 mg/kg (USEPA, June 2009b). Occupational worker, construction worker, and hypothetical future resident exposure to lead in surface soil was assessed using the representative (mean) concentration of 510 mg/kg of lead in surface soil across the entire site. The representative (mean) lead concentration in subsurface soil across the entire site (1,600 mg/kg) was used to evaluate exposure to lead for construction worker exposure. Recreational user exposure to lead in sediment (maximum concentration of 575 mg/kg) was assessed using the mean sediment concentration of 187 mg/kg and the mean concentration of lead in entire site surface soil (510 mg/kg) according to a time-weighted average calculation (487 mg/kg) discussed below and detailed in Appendix D.6.

The probabilities that fetal blood concentrations for occupational workers and construction workers exposed to entire site surface soil would exceed the USEPA target level (i.e., 10 µg lead/dL blood) were less than 5 percent (the probabilities were 0.1 percent and 2.9 percent, respectively). The probability that fetal blood-lead levels would exceed 10 µg/dL for construction workers exposed to subsurface soil was 4.7 percent, which is slightly less than the USEPA goal of 5 percent.

Residential exposure to lead was assessed by evaluating the child recreational user (i.e., the more conservative receptor) using the USEPA IEUBK Model. The average lead exposure concentration in entire site surface soil of 510 mg/kg was used to estimate blood-lead levels in children, and model default exposure parameters were used for other input parameters. Because groundwater at OU7 cannot be used as a source of potable water, the model default lead water concentration of 4 µg/L was used. The estimated geometric mean blood-lead level for a hypothetical child is 5.4 µg/dL, which is less than the established level of “concern” (10 µg/dL). However, approximately 9.2 percent of children assumed to be

exposed are expected to experience blood-lead levels greater than 10 µg/dL. This estimate exceeds the USEPA's goal of limiting childhood risk of exceeding the 10 µg/dL blood-lead concentration to 5 percent.

Adult and adolescent recreational user exposures to lead in surface soil and sediment were assessed using the ALM. The IEUBK lead model is inappropriate for evaluation of the adolescent recreational user exposure scenario because it is designed to address lead exposures for young children, and the ALM model is overly conservative because it is designed to address lead exposures for the fetuses of pregnant workers. Despite the fact that the ALM model is overly conservative for the adolescent recreational user exposure scenario, this model was used in the HHRA to address lead in exposed surface soil and sediment for adolescent recreational users.

Recreational users are expected to spend a portion of time exposed to sediment and a separate portion of time exposed to surface soil while at the site; therefore, recreational lead exposures were assessed by using a time-weighted average calculation to estimate whole-site lead exposure for recreational users. Appendix D.6 explains how the weighted lead concentration was calculated. The resulting weighted lead concentration is 487 mg/kg, which was used as the EPC for recreational users exposed to surface soil/sediment.

For adolescent and adult recreational users exposed to sediment, 1,487 mg/kg was used as the lead concentration input to the ALM. The ingestion rate and exposure frequency used in the model are the same exposure assumptions presented in Appendix D.1. The remaining inputs were model defaults. The probability that blood-lead concentrations exceed 10 µg/dL is less than 5 percent which is less than the USEPA goal. Adverse effects due to lead are not anticipated for adult or adolescent recreational users at OU7. Results from ALM are presented in Appendix D.6. Estimated probabilities for occupational workers, recreational users, and resident exposures to lead in subsurface soil are included in Appendix D.6 and discussed in Section 6.6.

Based on the results of the qualitative and quantitative risk analysis for lead, it is concluded that exposure to the representative lead concentration in surface soil across the entire site at OU7 may result in blood-lead concentrations and risks in excess of acceptable levels for hypothetical future child residents. Results of the ALM indicate that adverse health effects are not anticipated for construction workers, occupational workers, or adolescent and adult recreational users based on average lead concentrations for those exposure scenarios. However, the maximum detected lead concentrations of 13,200 mg/kg in surface soil and 40,000 mg/kg in subsurface soil may present acute exposure concerns; therefore, lead was retained as a COC at those locations (TPSS270001 and TPSB240508).

6.6 UNCERTAINTY ANALYSIS

The uncertainties associated with the OU7 HHRA are presented in this section. Deviations from the HHRA work plan (TtNUS, November 2008, Appendix C) are also discussed in this section. Uncertainty in the selection of COPCs is related to the current status of the predictive databases, the grouping of samples, and the procedures used to include or exclude constituents as COPCs. Uncertainty associated with the exposure assessment includes the values used as input variables for a given intake route/scenario, the assumptions made to determine EPCs, 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 COPCs. Uncertainty in risk characterization includes that associated with exposure to multiple contaminants and the cumulative uncertainty from combining conservative assumptions made in earlier steps of the risk assessment process.

Whereas there are various sources of uncertainty, as listed above, the direction of uncertainty can be influenced by the assumptions made throughout the risk assessment, including selection of COPCs and selection of values for dose response relationships. Throughout the entire risk assessment, assumptions that consider safety factors are made so that the final calculated risks are 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 contaminant, on the biological mechanism of action on a contaminant, or on the behavior of a contaminant in soil.

After the risk assessment is complete, the results must be 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 must be made to ensure that the particular assumptions used are protective of sensitive subpopulations or the maximum exposed individuals. If a number of conservative assumptions are combined in an exposure model, the resulting calculations can propagate the uncertainties associated with those assumptions, thereby producing a much larger uncertainty for the final results. This uncertainty is biased toward over-predicting both carcinogenic and non-carcinogenic 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 less than an acceptable" risk level (i.e., $1x10^{-6}$), the interpretation of no significant risk is typically straightforward. However, when risks calculated using a high degree of uncertainty exceed an "acceptable" risk level (i.e., $1x10^{-4}$), a conclusion can be difficult unless uncertainty is considered.

6.6.1 Uncertainty in Selection of COPCs

A minor amount of uncertainty is associated with the selection of COPCs that may affect the numerical risk estimates presented in the risk assessments. The most significant issues related to uncertainty in COPC selection are: the existing database (i.e., the quality of the analytical data), the differentiation between surface and subsurface soil, the inclusion of contaminants potentially attributable to background, the screening levels used, and the absence of screening levels for a few contaminants detected in the site media. A brief discussion of each of these issues is provided in the remainder of this section.

Existing Database

Groundwater and soil analytical data extracted from samples collected on site were used to evaluate potential risks to human receptors. According to previously published site documents, all of the data used in the OU7 HHRA were validated. Therefore, only limited uncertainty is associated with the analytical data sets used, which was summarized in Section 6.2 and discussed in the Data Usability Worksheets present in Appendix D.4.

Uncertainty is associated with the seep water data available for OU7. The seep water samples were collected in 1996 and 1997, and more recent data are not available. Seep water data from 1996 and 1997 are not representative of current conditions because of changes to the shoreline that occurred in 2006. Additionally, the seeps at OU7 are typically very shallow sheets of water present on the surface of the intertidal area. Therefore, it is very likely that sediment was present in the seep water samples because the shallowness of the seeps could easily allow sediment particles to be collected with the seep water. Undiluted seep water data and mid- to high-tide surface water (i.e., mixed seep and near-shore water that occurs during mid- to high tide) are considered along with near-shore water data to estimate risks for recreational users exposed to surface water. Despite the uncertainties associated with the seep water data set, COPC selection, EPCs, exposure assumptions, and risk estimates for undiluted seep water and mid- to high-tide surface water are discussed in this section for completeness. RAGS-Part D

tables for undiluted seep water exposures are included in Appendix D.7.2. COPC selection for undiluted seep water and mid- to high-tide surface water is presented below.

COPC Selection for Undiluted Seep Water and Mid- to High-Tide Surface Water

Surface water exposures were assessed by evaluating near-shore water, which includes the tidally influenced surface water along the shoreline at low tide; undiluted seep water, which is present in the intertidal area of OU7 at low tide; and mid- to high-tide surface water, which is a combination of mixed undiluted seep water and near-shore water that occurs at mid- to high tide. For all of these data sets, COPCs were chosen using the site-specific screening levels calculated for recreational exposures to surface water. COPC selection was conducted for all of these data sets (i.e., undiluted seep water, near-shore water, and mid-to high-tide surface water) individually; however, RAGS-Part D Table 2s are only presented for undiluted seep water (Appendix D.7) and near-shore water (Appendix D.1), because a mid-to high-tide COPC selection table was not necessary per the COPC selection methodology for mid- to high-tide surface water described below. Discussions on COPC selection for undiluted seep water and mid- to high-tide surface water follows.

COPC Selection for Undiluted Seep Water

RAGS-Part D Table 2.8, presented in Appendix D.7.2, shows the results of comparison of the maximum detected undiluted seep water concentrations at OU7 to calculated surface water criteria for recreational users at PNS. The following chemicals were selected as a COPC in seep water:

- Metals: arsenic and chromium

The aforementioned chemicals were selected as direct contact COPCs because the maximum concentrations in seep water exceeded the calculated surface water criteria for recreational users at PNS.

<u>COPC Selection for Mid- to High-Tide Surface Water</u>

Mid- to high-tide surface water is representative of mixed near-shore (tidally influenced) water and undiluted seep water. The mixing occurs during mid-to-high tides as tidally influenced water mixes with the undiluted seep water. The mid- to high-tide surface water was evaluated by applying a 100 times dilution factor to the undiluted seep water. Applying a 100 times dilution factor to the undiluted seep water to represent concentrations for the mid- to high-tide exposure is considered conservation because contaminant concentrations were greater in the undiluted seep water than near-shore water and the 100 times dilution is conservative for this site. To determine COPCs for the mid-to high-tide exposure scenario, concentrations of COPCs from the undiluted seep water COPC table (RAGS-Part D Table 2.8 in

Appendix D.7) were multiplied by the 100 times dilution factor and then compared to corresponding PNS human health screening values. When the 100 times dilution factor was applied none of the undiluted seep water COPC concentrations exceeded corresponding PNS human health screening values; therefore, no chemicals were selected as COPCs for the mid- to high-tide exposure scenario.

Differentiation of Surface and Subsurface Soil

For the purposes of this risk assessment, the list of COPCs for surface soil was developed using data from samples collected from 0 to 1 foot bgs. This is because USEPA Region 1 defines surface soil as the top 12 inches of soil (August 1995) and because no soil samples between 1 and 2 feet bgs were available. In addition, exposure to subsurface soils was evaluated with a data set that included soil samples collected between 2 and 10 feet bgs. Subsurface soil was analyzed where appropriate (i.e., for the construction worker) for total receptor risks. Subsurface soil risks are also considered for the remaining receptors in Appendix D.7, although exposure of these receptors to subsurface soil at OU7 is unlikely.

Uncertainty is associated with the soil data set evaluated because some soil samples were excluded from the risk assessment because they were collected from greater than 10 feet bgs (deep soil). It is assumed that potential risks from chemicals in deep soil were adequately accounted for by exposures to surface and subsurface soil as long as notably greater concentrations are not present in deep soil. In addition, USEPA Region 1 defines subsurface soil data as data collected from 1 to 10 feet bgs (August 1995). Tables 1 and 2 of Appendix D.8 show the analytical data and summary statistics for chemicals detected in deep soil samples excluded from the risk assessment. Highlighted chemicals in Table 2 indicate that corresponding deep soil concentrations exceed corresponding screening concentrations for surface and subsurface soil. Some chemical concentrations in deep soil are greater than concentrations in both surface and subsurface soil; however, of these samples, only the cPAHs exceed the corresponding RSLs. The maximum concentration of BAP equivalents in deep soil is 9,300 µg/kg, which is greater than the maximum concentrations in surface soil (6,300 µg/kg) and subsurface soil (5,800 µg/kg). Because the deep soil concentration is within one order of magnitude of the concentrations in surface and subsurface soil, it is not likely that risks for receptors due to cPAHs would be significantly greater if concentrations in deep soil were considered. In addition, it is unlikely that exposure to soils greater than 10 feet would occur at OU7 because groundwater is usually encountered at less than 10 feet bgs at the site.

Chemicals Potentially Attributable to Background

COPCs for OU7 were selected, in part, using available background concentrations for soil and groundwater. A statistical data set-to-data set background comparison was conducted to determine if site

concentrations exceeded background concentrations for chemicals with concentrations exceeding screening criteria (see Appendix B.2). However, background data were available for soil and groundwater only. The absence of background data for surface water and sediment may result in retaining chemicals as COPCs that would have been deleted as COPCs based on background data. Therefore, overall site-related risks from surface water and sediment may be overestimated.

Chemicals Eliminated Due to Background

A background screen (i.e., a data set-to-data set comparison) was conducted for chemicals detected at concentrations exceeding screening criteria in soil and groundwater at OU7 (see Appendix B.2). The following chemicals were eliminated from COPC selection as a result of the background screen alone:

- Entire site surface soil: **2,3,4,7,8-PECDF, 2,3,7,8-TCDD TEQ**, aluminum, antimony, **arsenic**, cadmium, cobalt, manganese, and vanadium.
- Former location of Building 237 surface soil: **BAP equivalents, BAP**, aluminum, **arsenic**, cobalt, iron, manganese, and vanadium.
- Entire site subsurface soil: **benzo(k)fluoranthene**, aluminum, **arsenic**, and vanadium.
- Former location of Building 237 subsurface soil: aluminum, **arsenic**, cobalt, and iron.
- Groundwater: manganese.

A chemical name is presented in **bold** font if the maximum concentration of the chemical exceeds the unadjusted RSL (i.e., based on an ILCR of $1x10^{-6}$ or an HI of 1). Risks for 2,3,4,7,8-PECDF are assessed as part of 2,3,7,8-TCDD TEQ, and risks for BAP are assessed as part of BAP equivalents. In the former location of Building 237 subsurface soil, risks due to benzo(k)fluoranthene were already calculated as part of BAP equivalents.

Cumulative site risks, including those chemicals eliminated as COPCs based on background comparison, were calculated and are presented in Appendix D.7.3. The 95-percent UCLs on the mean was used as the EPCs for surface and subsurface soil data sets evaluated for the entire site exposure scenario. Maximum concentrations were used for surface and subsurface soil in the former location of Building 237 because each of these data sets had fewer than 10 samples. Maximum concentrations were used as the EPCs for groundwater. Estimated ILCRs for receptors based on chemicals eliminated as COPCs based on background comparison are less than or within the USEPA target risk range of $1x10^{-6}$ to $1x10^{-4}$ (no

carcinogenic risks were identified for groundwater). Estimated ILCRs for receptors based on chemicals eliminated as COPCs based on background comparison slightly exceed the State of Maine risk guideline of $1x10^{-5}$ for child ($4x10^{-5}$), adult ($2x10^{-5}$), and lifetime ($5x10^{-5}$) residents exposed to entire site surface soil. The background chemical exceedances of the State of Maine risk guideline were primarily due to arsenic; estimated ILCRs for these media would not exceed if arsenic risks were not considered. Arsenic is naturally occurring in soil and was detected in 23 of 25 background soil samples. The 95-percent UCL of arsenic in the background soil data set is 23.2 mg/kg. The carcinogenic residential soil screening level for arsenic is 0.39 mg/kg. Risks from chemicals screened out due to background result in an estimated ILCR of $5x10^{-5}$ for the lifetime resident (most conservative receptor); therefore, although cumulative site risks exceed the State of Maine risk guideline, background alone also exceeds that guideline. The background chemicals causing State of Maine risk guidance exceedances are evidence of regional contamination or natural site background concentrations rather than site-related contamination.

The cumulative HI for non-carcinogenic risks in chemicals eliminated due to background did not exceed the USEPA and State of Maine target HI of 1 on a target organ/system basis for the receptors and media evaluated in Appendix D.7.3. Therefore, adverse non-carcinogenic effects are not anticipated for chemicals eliminated based on background comparisons.

COPC Screening Levels

The use of screening values based on conservative land use scenarios (i.e., residential land use for soil, recreational land use for surface water and sediment, and construction worker dermal contact for groundwater) corresponding to ILCRs of $1x10^{-6}$ and HIs of 0.1 should ensure that the significant risk-contributing chemicals from OU7 were evaluated. The elimination of chemicals that are present at concentrations that correspond to ILCRs less than $1x10^{-6}$ and HIs less than 0.1 should not affect the final conclusions of the risk assessment because these chemicals are not expected to cause a potential health concern for the receptors identified at the concentrations detected.

Absence of COPC Screening Levels

Several contaminants had no available screening levels or toxicity information, including 4-hydroxy-4-methyl-2-pentanone, carbazole, and di-n-octyl phthalate in surface soil; 1,3-dichlorobenzene, carbazole, and di-n-octyl phthalate in subsurface soil; silicon in groundwater and surface water, and benzo(e)pyrene, dibenzothiophene, cis-nonachlor, oxychlordane, pentachloroanisole, and trans-nonachlor in sediment. Therefore, these chemicals were not included as COPCs in the risk assessment. Exclusion of these chemicals from COPC selection adds some uncertainty to the risk assessment; however, it is assumed that chemicals lacking toxicity criteria would not contribute significantly to overall risks. In addition, because risk assessments are generally designed to be conservative (i.e., they tend to over predict rather

than under predict risk), it is unlikely that the exclusion of these chemicals from the quantitative risk analysis will result in a significant underestimation of risk.

Surrogate Screening Levels

During COPC screening, the following surrogates were used for some chemicals lacking screening levels: 1,2,3,5-tetrachlorobenzene was used as a surrogate for 1,2,3,4-tetrachlorobenzene, acenaphthene was used for acenaphthylene, pyrene was used for benzo(g,h,i)perylene and phenanthrene, chlordane was used for alpha- and gamma-chlordane, the non-carcinogenic value for gamma-BHC was used for delta-BHC, endosulfan was used for endosulfan I and endosulfan sulfate, and endrin was used for endrin aldehyde. Applying toxicity values for one compound to another adds to the uncertainty in the risk assessment both in regard to the selection of COPCs and subsequently calculated risks. The direction of the bias is unknown.

Calculated Surface Water and Sediment Screening Levels

The PNS-specific screening levels used for surface water and sediment were developed using methodology that was intentionally conservative (see Appendix D.5). As such, it is possible that more contaminants were carried through the quantitative evaluation of risks than would have been if less conservative screening levels had been used. However, exposure assumptions used in the quantitative risk assessment, although still conservative, were intended to be site specific. Therefore, additional risks due to surface water and sediment contaminants that would not have been COPCs if less conservative screening criteria had been used are not expected to have greatly impacted receptor risks.

6.6.2 Uncertainty in the Exposure Assessment

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

Land Use

The past and current land use patterns at the site are well established, thereby reducing the uncertainty associated with land use assumptions. Land use for OU7 includes office parking (about 35 percent of the site area), equipment storage, vehicle and rail car maintenance, transducer repair, boat launching, and temporary housing/Hospital Corps (Building H23, in the southeastern corner, is used to house transient Navy personnel). Future land use is expected to be similar, with commercial/industrial land use on the

main portion of the site and recreational use in the intertidal area. To be conservative, future hypothetical residents, construction workers, and recreational users were evaluated.

Exposure Point Concentrations

Uncertainty is associated with the use of 95-percent UCLs on the mean as the EPCs. As a result of using 95-percent UCLs, the estimations of potential risk for the RME scenario are most likely overstated because this is a representation of the upper limit to which potential receptors would be exposed to over the entire exposure period. Uncertainty is introduced when the non-detected results are incorporated into the UCL calculation by using detection limits for non-detects as input values when using ProUCL software. This may either overstate or understate the risks to the receptors. However, this methodology is in accordance with USEPA guidance (February 2009). The use of the maximum concentration as the EPC also tends to overestimate risks. The maximum concentration was used as the EPC when evaluating groundwater COPCs.

Exposure Routes and Receptor Identification

An attempt was made to simplify the various receptor groups and exposure routes of potential concern in this report. The uncertainty associated with this approach is minimal because exposure routes and potential receptors are considered to be well defined based on the land use observed at the site. The conservative exposure assumptions used in the risk assessment should be protective of receptor use of the site.

Occupational, Recreational, and Residential Exposures to Subsurface Soil

The risk assessment assumed that occupational workers, recreational users, and future hypothetical residents would be exposed to surface soil only. The possibility that subsurface soil would be excavated and spread across the land surfaces and that future land use would be residential is very remote. It should be noted that the water table is shallow (groundwater across the site can be much shallower than 10 feet bgs) within the study area limiting the potential for significant deep excavation. However, for purposes of completeness, the Navy has included a quantitative evaluation of exposure by occupational workers, recreational users, and hypothetical future residents to surface and subsurface soil contamination (to a depth of 10 feet) in Appendix D.7. Results of these receptors' exposures to subsurface soil are discussed in this section.

Estimated RME and CTE Risks for Occupational Workers, Recreational Users, and Future Residents Exposed to Subsurface Soil

A summary of occupational worker, recreational user, and future resident risks estimated for subsurface soil exposures is summarized below.

Receptor	Reasonable Maximum Exposure				Central Tendency Exposure			
	Subsurface Soil		All Media		Subsurface Soil		All Media	
	ICLR	HI	ILCR	HI	ICLR	HI	ILCR	HI
Occupational Worker	**$1X10^{-4}$**	**3**	**$1X10^{-4}$**	**3**	**$2X10^{-5}$**	1	**$2X10^{-5}$**	1
Adult Recreational User	$2X10^{-5}$	1	**$3X10^{-5}$**	**1**	$5X10^{-6}$	0.5	$6X10^{-6}$	0.5
Adolescent Recreational User	$4X10^{-6}$	2	$4X0^{-5}$	2	$7X10^{-6}$	0.7	$8X10^{-6}$	0.8
Lifetime Recreational User	**$6X10^{-5}$**	NA	**$7X10^{-5}$**	NA	$1X10^{-5}$	NA	$1X10^{-5}$	NA
Adult Resident	**$2X10^{-4}$**	**4**	**$2X10^{-4}$**	**4**	$1X10^{-5}$	1	$1X10^{-5}$	1
Child Resident	**$X10^{-4}$**	**34**	**$5X10^{-4}$**	**36**	**$4X10^{-5}$**	**11**	**$5X10^{-5}$**	**12**
Lifetime Resident	**$6X10^{-4}$**	NA	**$7X10^{-4}$**	NA	**$6X10^{-5}$**	NA	**$7X10^{-5}$**	NA

Highlighted values indicate that the State of Maine risk guideline ($1x10^{-5}$) or USEPA non-cancer benchmark of 1 was exceeded.

For the RME scenarios, total ILCRs for subsurface soil exceeded the State of Maine risk guideline value of $1x10^{-5}$ for occupational workers, adult recreational users, lifetime recreational users, and future residents (adult, child, and lifetime). The child, adult, and lifetime resident subsurface soil ILCRs also exceeded the USEPA target risk range ($1x10^{-6}$ to $1x10^{-4}$). Subsurface soil cumulative HIs exceeded 1 occupational workers and residents (adult and child). Cumulative ILCRs across all media exceeded $1x10^{-5}$ for occupational workers, adult, adolescent, and lifetime recreational users, and all residents. Cumulative risks for occupational workers, lifetime recreational users, and adult residents exceed primarily due to the following contaminants in subsurface soil: cPAHs, Aroclor-1248, Aroclor-1260, and 2,3,7,8-TCDD TEQ. Occupational workers and adult residents cumulative HIs exceeded 1 primarily due to 2,3,7,8-TCDD TEQ in subsurface soil. The child resident cumulative HI exceeded 1 primarily due to the following chemicals detected in subsurface soil, including 2,3,7,8-TCDD TEQ (target system developmental), Aroclor-1260 (no target organ), antimony (target organ blood), iron [target organ gastrointestinal system (GS)], and copper (target organ GS).

CTE risks for occupational workers, and child and lifetime residents exceeded target levels due to subsurface soil. Occupation worker subsurface soil and all-media cumulative ILCRs slightly exceeded the State of Maine risk guideline but did not exceed the USEPA target risk range. The child and lifetime resident ILCRs exceeded both the Maine risk guideline and USEPA target risk range. Non-cancer target

organ/system HIs exceeded 1 due to 2,3,7,8-TCDD TEQ (target system developmental), Aroclor-1260 (no target organ), antimony (target organ blood), and iron (target organ GS).

Risks due to subsurface soil in the former location of Building 237 were also evaluated. Risk results tables (RAGS-Part D 7 and 9 tables) for soil from the former location of Building 237 are presented in Appendix D.7.1. RME all-media cumulative ILCRs are less than or within the USEPA target range ($1x10^{-6}$ to $1x10^{-4}$) and do not exceed the State of Maine risk guideline when subsurface soil from the former location of Building 237 is considered for occupational workers, recreational users (adult, adolescent, lifetime), and adult and child residents. The RME cumulative ILCR for lifetime residents exposed to subsurface soil slightly exceeds the Maine risk guideline but is within the USEPA target risk range (the lifetime resident ILCR of $2x10^{-5}$). RME non-cancer estimates are less than the USEPA threshold (1) for the receptors evaluated.

CTE all-media cumulative ILCRs were less than or within the USEPA risk range and less than the Maine risk guideline for occupational workers, recreational users, and residentials when considering receptor exposure to subsurface soil in the former location of Building 237. CTE non-cancer estimates were less than the USEPA threshold for the receptors evaluated.

The preceding summary and tables presented in Appendix D.7.1 indicate that additional risks are possible for occupational workers, recreational users, and future residents exposed to subsurface soil. Risk drivers in subsurface soil for these receptors include dioxins/furans, cPAHs, Aroclor-1248, Aroclor-1260, and several metals. However, exposure to subsurface soil by the aforementioned receptors at OU7 is unlikely.

Risks for Receptor Exposure to Lead

Exposure to lead in subsurface soil was assessed using the mean subsurface soil (entire site) lead concentration of 1,600 mg/kg for occupational workers and residents (child). For completeness, recreational user exposure to subsurface soil and sediment was also evaluated using the methodology in Appendix D.6. As presented in Appendix D.6, the weighted lead concentrations for recreational exposures to surface soil/sediment, subsurface soil/sediment are 487 mg/kg and 1,500 mg/kg, respectively. Results of the lead exposure evaluations for subsurface soil (residents and occupational workers) and subsurface soil and sediment (recreational users) are presented in Appendix D.6.

IEUBK Model results for the child resident indicate that 69.0 percent of children could have a blood-lead concentration that exceeds 10 µg/dL and the blood-lead level estimate (12.6 µg/dL) exceeded the goal of 10 µg/dL. This exceeds the USEPA goal that no more than 5 percent of children have blood-lead

concentrations exceeding 10 µg/dL. The ALM results for occupational workers exposed to subsurface soil indicate a 2.9 percent probability (geometric mean = 3.6 µg/dL) of fetal blood-lead concentrations exceeding the USEPA goal concentration which does not exceed the USEPA target for childhood exposure to lead.

For adult and adolescent recreational users exposed to surface soil/sediment, the ALM indicates there is a 0.03-percent probability of fetal blood-lead concentrations exceeding 10 µg/dL (geometric mean = 1.2 µg/dL), which is less than the USEPA goal of no more than 5 percent of childhood blood-lead concentrations exceeding 10 µg/dL. For adult and adolescent recreational users exposed to subsurface soil/sediment, the ALM indicates that there is a 0.03-percent probability of fetal blood-level concentrations exceeding 10 µg/dL. These results indicate that adverse effects from exposure to lead in combined surface soil/sediment and subsurface soil/sediment are not anticipated for recreational users.

Recreational Exposures to Surface Water

Surface water risks from two of three surface water exposure scenarios (i.e., undiluted seep water and mid- to high-tide surface water) were not included for recreational receptors in risk characterization due to the uncertainty associated with seep water data. However, for the sake of completeness, risks for recreational receptors exposed to surface water via the undiluted seep water and mid- to high-tide surface water exposure scenarios are included in this section. The COPC selection for surface water indicated that arsenic and chromium from the undiluted seep water data set were selected as COPCs. RAGS-Part D tables containing the EPCs, exposure assumptions, and risk results specific to evaluating surface water are included in Appendix D.7.2. Undiluted seep water risk results are summarized below.

Receptor	RME		CTE	
	ILCR	HI	ILCR	HI
Adult Recreational User	$9x10^{-8}$	$6x10^{-4}$	$7x10^{-9}$	$2x10^{-4}$
Adolescent Recreational User	$6x10^{-8}$	$9x10^{-4}$	$8x10^{-8}$	$3x10^{-4}$

Because the undiluted seep water risks are several orders of magnitude less than the USEPA cancer threshold of $1x10^{-6}$ and non-cancer risk threshold of 1, overall risk results would not be significantly increased by including the undiluted seep water and mid- to high-tide surface water exposure scenarios in the risk characterization.

Receptors/Pathways Not Evaluated

An adolescent recreational user was evaluated instead of a child recreational user. The site characteristics (e.g., rocky shoreline) of OU7 make intertidal area access by a child of 0 to 6 years of age

unlikely; therefore, the child recreational user was not evaluated in order to avoid further overestimation of recreational risks.

Hypothetical future residents (adult and child) were not evaluated for exposures to intertidal area media (i.e., surface water and sediment) because residential exposure to the intertidal area was accounted for during the recreational exposure scenario. Risks due to residential exposure to surface water and sediment are discussed in Section 6.6.4.

Exposure Parameters

Each exposure factor (for RME and CTE scenarios) selected for use in the risk assessment has some associated uncertainty. Generally, exposure factors are based on surveys of physiological and lifestyle profiles across the United States. The attributes and activities studied in these surveys generally have a broad distribution. To avoid underestimation of exposure, in most cases, USEPA guidelines (March 1991) on the RME receptor were used, which generally specify the use of the 95th percentile for most parameters; therefore, the selected values for the RME receptor represent the upper bound of the observed or expected habits of the majority of the population.

Generally, uncertainty can be assessed quantitatively for many 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) is quite large. Consequently, the values chosen for such variables in the RME scenario have low uncertainty. For many parameters for which limited information exists (i.e., dermal absorption of organic contaminants from soil), greater uncertainty exists.

Many of the exposure parameters used to calculate exposures and risks in this report are selected from a distribution of possible values including USEPA guidance (March 1991, May 1993, August 1997, July 2004). Maine guidelines for risk assessments (MEDEP, 1994) were updated with current USEPA values. For the RME scenario, the value representing the 95th percentile is generally selected for each parameter to ensure that the assessment bounds the actual risks from a postulated exposure. This risk number is used in risk management decisions but does not indicate what a more average or typical exposure might be, or what risk range might be expected for individuals in the exposed population.

To address these issues, USEPA (February 1992) has suggested the use of the CTE receptor, whose intake variables are often 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. Some

of the parameters presented in this risk assessment were estimated using professional judgment, although USEPA does provide limited guidance for the CTE evaluation (May 1993).

As noted in Section 6.3.5, the exposure parameters for the intertidal area are based on current site conditions. Uncertainty is associated with future shoreline conditions, because if shoreline conditions changed (e.g., more of the shoreline becomes exposed), it is possible that different exposure assumptions would be more appropriate to evaluate human health risks.

Exposure Parameters for Seep Water

Uncertainty is associated with the exposure assumptions used for seep water. As noted previously, arsenic and chromium in undiluted seep water were the only surface water COPCs for OU7. Undiluted seep water was evaluated according to the exposure assumptions in Tables 4.16 and 4.17 of Appendix D.7.2. Skin surface areas of 3,600 and 2,600 cubic centimeters were used for adult and adolescent recreational users, respectively. These surface areas assume that the lower legs and feet are exposed (RAGS-Part E, July 2004). Undiluted seep water is exposed only during low tide, and the seeps are often as shallow as a thin sheet of water; therefore, dermal contact risks to seep water are very likely overestimated with the exposure assumptions used.

6.6.3 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.

Derivation of Toxicity Criteria

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

Uncertainty in hazard assessment arises from the nature and quality of the animal and human data. Uncertainty is reduced when similar effects are observed across species, strain, gender, and exposure

route; when the magnitude of the response is clearly dose-related; when pharmacokinetic data indicate a similar fate in humans and animals; when postulated mechanisms of toxicity are similar for humans and animals; and when the contaminant of concern is structurally similar to other contaminants for which the toxicity is more completely characterized. Because of the great variability in factors affecting the uncertainty arising from the nature and quality of animal and human data, the direction of bias (i.e., more or less conservative) is generally not known.

Uncertainty in the dose-response evaluation includes the determination of a CSF for the carcinogenic assessment and derivation of an RfD or RfC for the non-carcinogenic assessment. Uncertainty is introduced from interspecies (animal to human) extrapolation, which, in the absence of quantitative pharmacokinetic or mechanistic data, is usually based on consideration of interspecies differences in basal metabolic rate. Uncertainty also results 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 COPC. 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 contaminant are likely to be occupationally exposed. Finally, uncertainty arises from the quality of the key study from which the quantitative estimate is derived and the database. For cancer effects, the uncertainty associated with dose-response factors is mitigated by assuming the 95-percent upper bound for the slope factor. Another source of uncertainty in carcinogenic assessment is the method by which data from high doses in animal studies are 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 non-threshold assumption of carcinogenesis. Evidence suggests, however, that epigenetic carcinogens, as well as many genotoxic carcinogens, have a threshold below which they are non-carcinogenic (Williams and Weisburger, 1991); therefore, the use of the linearized multistage model is conservative for contaminants that exhibit a threshold for carcinogenicity.

For non-cancer effects, additional uncertainty factors may be applied in the derivation of the RfD or RfC to mitigate poor quality of the key study or gaps in the database. Uncertainty for non-cancer effects arises from the use of an effect level in the estimation of an RfD or RfC because this estimation is predicated on the assumption of a threshold below which adverse effects are not expected. Therefore, an uncertainty factor is usually applied to estimate a no-effect level. Additional uncertainty arises in estimation of an RfD or RfC for chronic exposure from subchronic data. Unless empirical data indicate that effects do not worsen with increasing duration of exposure, an additional uncertainty factor is applied to the no-effect level in the subchronic study. Uncertainty in the derivation of RfDs is mitigated by the use of uncertainty and modifying factors that normally range between 3 and 10. The resulting combination of uncertainty

and modifying factors may reach 1,000 or more. The use of uncertainly and modifying factors tends to increase the conservatism in the risk assessment.

The derivation of dermal RfDs and CSFs from oral values may cause uncertainty, when no gastrointestinal absorption rates are available in the literature or when only qualitative statements regarding absorption are available. If adjustments for gastrointestinal absorption are not made, risks from dermal exposure may be underestimated by the use of oral RfDs.

Uncertainty Associated with Evaluation of the Dermal Exposure Pathway

Uncertainty is associated with evaluation of the dermal pathway. USEPA Region 1 only assesses risks to contaminants for which ABS values are provided in RAGS-Part E. The contaminants with ABS values in RAGS-Part E evaluated in this assessment are arsenic, cadmium, chlordane, dioxins, PAHs, and PCBs. Therefore, the dermal route of exposure has been evaluated quantitatively for these contaminants only. Risks from dermal exposure to several metals identified as COPCs at OU7 were not quantified in the risk assessment. Consequently, potential risks may be underestimated by excluding these constituents from the dermal risk assessment calculations.

Quantitation of the dermal pathway for PAHs may add additional uncertainty to the risk assessment because it may not be appropriate to use the oral slope factor to evaluate risks from dermal exposure to PAHs (USEPA, December 1989). This is because PAHs are known to cause skin cancer at the point of contact rather than from systemic action.

Uncertainty Associated with Evaluation of Arsenic

Although the more restrictive basis for evaluating risk associated with exposure to arsenic is to assume it is a carcinogen, carcinogenic effects are not the primary health effects expected to be manifested on exposure to arsenic. Scientific information indicates that humans are capable of metabolizing arsenic to expedite its elimination from the body (ATSDR, 1988). Its elimination from the body obviously mitigates the possibility for arsenic to manifest carcinogenic effects. Therefore, evaluating arsenic as a non-carcinogen would be more appropriate. However, arsenic was conservatively evaluated as a carcinogen in this risk assessment. Consequently, risks for this chemical are probably overestimated to some degree.

The body methylates arsenic to form monomethyl arsenic and dimethyl arsenic. A limited capacity exists for the body to methylate arsenic, but this limit is generally reached when the body's intake of arsenic approximately exceeds 500 µg/day. The intake associated with a given amount of arsenic in soil, assuming a soil ingestion rate of 200 mg/day, may be calculated and related to the 500 µg/day limit.

These concentrations result in intakes that are related to the body's ability to metabolize arsenic. Although some humans may be more sensitive to arsenic, in that they are "poor methylators," the average exposure concentration for a site is usually orders of magnitude less than normal limit of metabolic saturation and is most likely less than levels that would trigger responses in sensitive individuals.

Arsenic was identified as a COPC only in sediment, and arsenic was not identified as a major contributor to the risks calculated for OU7. Arsenic was eliminated as a COPC in soil based on comparison to the background concentration.

Uncertainty Associated with Evaluation of Aroclor-1260

The oral RfD for Aroclor-1254 was used as a surrogate for Aroclor-1260, which adds uncertainty to the risk evaluation of Aroclor-1260. Aroclors are commercial mixtures consisting of different types and quantities of the 209 individual PCB congeners. The toxicity of a particular PCB mixture (such as an Aroclor) is dependent on the type and quantity of individual PCB congeners (which have varying toxic magnitudes) present in the PCB mixture. Aroclor-1254 and Aroclor-1260 consist of different mixtures of PCB congeners; therefore, the toxicity of compounds is not the same, and using Aroclor-1254 as a surrogate for Aroclor-1260 introduces additional uncertainty. No oral RfD exists for Aroclor-1260; therefore, using the Aroclor-1254 RfD as a surrogate for Aroclor-1260 increases non-carcinogenic risk estimates for Aroclor-1260.

Use of Chromium Toxicity Criteria

Some uncertainty was associated with the evaluation of chromium. Criteria for trivalent chromium were used to evaluate total chromium concentrations in the risk assessment based on the conclusions in the RI QAPP that hexavalent chromium was not associated with OU7 (because hexavalent chromium concentrations in SSI samples were less than the screening level). Risks due to chromium at OU7 are not expected to be underestimated because previous chromium testing at the site has found that the chromium present is primarily trivalent chromium (TtNUS, November 2008).

Use of Aluminum, Cobalt, Copper, and Iron Toxicity Criteria

According to USEPA Risk Update Number 5 (September 1999), USEPA Region 1 does not advocate the quantitative evaluation of aluminum, cobalt, copper, and iron. This is because the provisional RfDs for these contaminants are based on allowable intakes rather than adverse effect levels. However, these metals, when selected as COPCs, were included in the quantitative risk evaluation to be conservative. Aluminum was not selected as a COPC at OU7. Cobalt was selected as a COPC in both entire site and

former location of Building 237 subsurface soil. Copper was a COPC for entire site surface and subsurface soil. Iron was selected as a COPC in all soil data sets and sediment. None of these metals was considered to be a risk driver in sediment. Cobalt, copper, and iron were major risk contributors to non-carcinogenic risk for the child resident exposed to entire site subsurface soil in the RME and CTE scenarios.

6.6.4 Uncertainty in the Risk Characterization

Uncertainty in risk characterization results primarily from assumptions made regarding additivity of effects from exposure to multiple COPCs from various exposure routes. High uncertainty exists when summing cancer risks for several substances across different exposure pathways. This assumes that each substance has a similar effect and/or mode of action. Often chemicals affect different organs, have different mechanisms of action, and differ in their fate in the body, so additivity may not be an appropriate assumption. However, the assumption of additivity is made to provide a conservative estimate of risk. Additionally, some contaminants were eliminated as COPCs based on background comparisons alone, as noted in Section 6.2.2 (see Appendix B.2 for further information). Although the site concentrations of some contaminants exceeded background concentrations, uncertainty exists because some chemicals that were risk drivers could still have a considerable background component adding to risks.

Residential risks due to surface water and sediment exposures were assumed to be the same as recreational exposures to these media. Recreational cancer risks for adolescent, adult, and lifetime exposures to sediment were $2x10^{-6}$, $1x10^{-6}$, and $4x10^{-6}$ (i.e., within the USEPA target cancer range), respectively, and non-cancer HIs for sediment were less than 1. No contaminants with CSFs were identified in surface water, and the non-cancer HIs for adolescent and adult recreational users were several orders of magnitude less than 1. Although recreational risks due to lead in combined surface soil/sediment exceed USEPA target levels, residential risks due to lead in soil (assessed for the child resident using the IEUBK Model) were already recognized to be greater than the USEPA target level. The EPC used for the lead was greater for the child resident (1,600 mg/kg) than for the adolescent recreational user (1,500 mg/kg). For these reasons, adding these risks to the total residential receptor risks would not greatly increase overall risks for residents at OU7.

Finally, the risk characterization does not consider antagonistic or synergistic effects. Little or no information is available to determine the potential for antagonism or synergism for the COPCs. Therefore, this uncertainty cannot be discussed for its impact on the risk assessment because it may either underestimate or overestimate potential human health risk.

6.6.5 Deviations from the HHRA Work Plan

The methodology presented in the HHRA work plan (TtNUS, November 2008, Appendix C) was followed in the HHRA evaluation of OU7 except as noted in this section.

Screening Criteria

The HHRA work plan called for the use of USEPA Region 9 Preliminary Remediation Goals (PRGs) to be used for soil in the COPC screening process. However, the USEPA RSLs (June 2011) have incorporated Region 9 methodology and replaced prior screening levels for all regions. As a result, the USEPA RSLs from June 2011 were used for soil COPC selection.

Surface Soil Definition

The HHRA work plan required that receptors exposed to surface soil only (recreational users, occupational workers, and residents) would be evaluated to soil from 0 to 2 feet bgs. However, the surface soil definition used in this HHRA was 0 to 1 foot bgs because no soil samples were collected between 1 and 2 feet bgs. The 0-1 foot bgs surface soil definition is also in compliance with USEPA Region 1 guidance (August 1995).

Quantitative Risk Evaluation for Aluminum, Cobalt, Copper, and Iron

Because aluminum, copper, and iron have not been endorsed by USEPA Region I for quantitative risk assessments, the HHRA work plan stated that these metals would not be selected as COPCs. Cobalt has also been excluded from quantitative evaluation in Region 1 for this reason. However, the OU7 HHRA considered these metals for COPC selection and, if selected, evaluated these metals quantitatively. To be conservative and avoid underestimation of risks by excluding these metals. Section 6.6.3 provides more discussion regarding the risk estimates for these constituents.

Other Screening Criteria

Soil samples from OU7 were not compared to SSLs for groundwater protection, and groundwater data was not compared to federal or state Applicable or Relevant and Appropriate Requirements (ARARs). Even though the HHRA work plan stated that these criteria would be presented (but not used for COPC selection), these criteria apply to sites with potable drinking water. Groundwater protection SSLs are protective of groundwater used as tap water, and ARARs are for drinking water. These criteria were not presented because no potable groundwater exists at OU7.

Software and Guidance Updates

Updated software and guidance from that presented in the HHRA work plan was available for ProUCL, the IEUBK Model, and the ALM. Current USEPA ProUCL software and guidance were used for calculating 95-percent UCLs used as EPCs. Current IEUBK and ALM software and guidance were used in the assessment of lead at OU7. Current USEPA risk assessment guidance available at time of this HHRA (e.g., USEPA, July 2004, January 2009) was used in place of the older USEPA guidance cited in the HHRA work plan. The work plan also stated that Maine guidance (MEDEP, 1994) would be considered for use in the risk assessment. However, the Maine exposure assumptions were replaced by values from more current sources (e.g., USEPA, December 2002a).

Receptors Evaluated

This HHRA evaluated adolescent recreational users instead of child recreational users. Evaluating adolescents instead of children is not expected to underestimate site risks because adolescents are thought to be more likely recreational users for OU7. Implications of using adolescent recreational users instead of child recreational users are discussed in Section 6.6.2.

Chromium Toxicity

Trivalent or total chromium toxicity criteria were used for screening purposes and for risk characterization. The HHRA work plan called for hexavalent chromium screening criteria to be used, and, if chromium was selected as a COPC, the risk characterization should assume that 90 percent of the chromium was trivalent and 10 percent was hexavalent. However, risks are not thought to be underestimated by using trivalent or total chromium criteria because, as the work plan notes, previous sampling indicated that most of the chromium at the site was trivalent (TtNUS, November 2008). Chromium was selected as a COPC in surface and subsurface soil, sediment, and surface water.

6.7 SUMMARY AND CONCLUSIONS

This section and Table 6-1 present a summary of the major risk assessment findings for OU7. Four potential receptor groups were evaluated: current and future construction workers, current and future adult and adolescent recreational users, future adult and child residents, and future occupational workers. The risk characterization section of the HHRA evaluated risks to all receptors across the entire site and in the former location of Building 237 present in surface soil. Adverse receptor effects are not anticipated for exposure to soil in the former location of Building 237. Risks for recreational user exposure to sediment and construction worker exposure to subsurface soil (both over the entire site and in the former location of Building 237) were also assessed in the risk characterization. The uncertainty analysis

considered subsurface soil (both for entire site and the area-with-no-debris) exposure for receptors not evaluated for subsurface soil exposure in the risk characterization (i.e., all receptors except the construction worker). The uncertainty analysis also considered recreational user exposure to two of three (i.e., undiluted seep water and mid- to high-tide surface water) surface water scenarios. The results of these evaluations are summarized below.

6.7.1 Summary of Risks – Risk Characterization

6.7.1.1 Non-Carcinogenic Risks

RME and CTE HIs are less than or equal to 1 for occupational workers and adult residents, exposed to surface soil and for recreational users exposed to surface soil and sediment. The overall HI for the child resident was greater than 1; however, none of the HIs on a target organ/system basis exceeded 1.0 for that receptor. Adverse non-carcinogenic health effects are not anticipated for these receptor groups. RME and CTE HIs were less than 1 for construction workers exposed to surface soil and area-with-no-debris surface and subsurface soil. RME and CTE HIs were greater than 1.0 for future construction workers exposed to entire site soil. 2,3,7,8-TCDD TEQ in subsurface soil (target system developmental) via ingestion was the main risk contributor.

6.7.1.2 Carcinogenic Risks

RME and CTE cancer risk estimates for recreational users (adult, adolescent, and lifetime), occupational workers, residents (adult, child, and lifetime), and construction workers hypothetically exposed to environmental media were less than or within USEPA target cancer risk range ($1x10^{-6}$ to $1x10^{-4}$). RME cancer risks for adult residents ($2x10^{-5}$), child residents ($1x10^{-4}$) and lifetime residents ($1x10^{-4}$) exceeded the State of Maine risk guideline of $1x10^{-5}$. CTE cancer risk estimates did not exceed the USEPA target cancer risk range (1×10^{-6} to $1x10^{-4}$). Residential risks exceeding the Maine risk guideline are primarily due to cPAHs via ingestion and dermal contact in surface soil (entire site).

6.7.1.3 Exposure to Lead

Lead was not selected as a COPC for surface soil or subsurface soil in the former location of Building 237. Therefore, adverse receptor effects are not anticipated due to soil-lead exposure in the former location of Building 237. However, lead was a COPC in both surface and subsurface soil for the entire site; and unacceptable risks from acute exposures may occur at lead hot spots such as those detected at locations TP-SB24 and TP-SB27.

Residential exposures to lead in entire site surface soil were evaluated by using the USEPA's IEUBK Model for lead in children (February 1994, May 2002, May 2009, and June 2009a) using the most current model version (Version 1.1 Build 9). The model was used to estimate the 95th percentile blood-lead concentration among residential children (the most sensitive residential receptor) exposed to soil at OU7. The probability that blood-lead concentrations exceed 10 µg/dL was 9.2 percent for residential exposure to site surface soil, which is greater than the acceptable level of 5 percent established by USEPA.

Exposures to lead in entire site surface and subsurface soil for a future pregnant adult worker were evaluated by using a slope-factor developed by the USEPA Technical Review Work Group for Lead (USEPA, January 2003) using the most current ALM (June 21, 2009) and recommended input values. This model was used to estimate the 95th percentile blood-lead level for women having exposures, the 95th percentile blood-lead concentration among fetuses born to women having exposures, and the probability that the fetal blood-lead concentration exceeds 10 µg/dL. The ALM was used to assess lead risks for occupational worker exposures to surface soil and construction worker exposures to subsurface soil. The probability that occupational worker fetal blood-lead concentration would exceed 10 µg/dL was less than the acceptable level of 5 percent established by USEPA (probability of 0.1 percent). The probability that construction worker fetal blood-lead concentration would exceed 10 µg/dL in surface soil (0.2 percent) and subsurface soil (4.7 percent) did not exceed the USEPA goal of 5 percent.

For recreational users, a time-weighted average lead concentration was used to assess recreational exposure to combined surface soil and sediment. Adolescent recreational user exposures were evaluated using the IEUBK Model, and adult recreational exposures were evaluated using the ALM. For adolescent recreational users, the probability that blood-lead concentrations exceed 10 µg/dL was 8.1 percent, which is greater than the acceptable level of 5 percent established by USEPA. For adult recreational users, the probability that fetal blood-lead concentrations would exceed 10 µg/dL was less than the acceptable level of 5 percent established by USEPA (probability of 0.006 percent).

These results indicate that adverse effects are not likely for children or fetuses of occupational workers, construction workers, or adult recreational users exposed to lead in soil. However, these results indicate that adverse effects may occur for residents and adolescent recreational users exposed to surface soil and surface soil/sediment, respectively, at OU7.

6.7.2 Summary of Risks – Uncertainty Analysis

6.7.2.1 Non-Carcinogenic Risks

Soil

Non-cancer individual HIs exceeded 1 due to 2,3,7,8-TCDD TEQ (target system developmental), Aroclor-1260 (no target organ), antimony (target organ blood), and iron (target organ GS) in subsurface soil.

RME and CTE non-cancer estimates for receptor exposure to the former location of Building 237 subsurface soil are less than the USEPA threshold (1) for the receptors evaluated.

Surface Water

Arsenic and chromium were selected as COPCs in surface water for the undiluted seep water exposure scenario. Non-cancer risks due to arsenic and chromium in surface water were several orders of magnitude less than the USEPA target level of 1 for recreational users. Therefore, risks due to arsenic and chromium in surface water did not significantly affect calculated recreational user risks presented in the risk characterization of this HHRA. Additionally, residential user risks to surface water were anticipated to be the same as recreational risks. Adding surface water risks to total residential receptor risks does not significantly increase overall residential risk. Adverse non-carcinogenic effects were not expected due to recreational/residential exposure to surface water.

6.7.2.2 Carcinogenic Risks

Entire Site

Subsurface soil RME cumulative cancer risks were within the USEPA target range ($1x10^{-6}$ to $1x10^{-4}$) for occupational workers and recreational users (adult, adolescent, and lifetime). Total subsurface soil RME cancer risk estimates for occupational workers ($1x10^{-4}$), adolescent recreational users ($4x10^{-5}$) and lifetime recreational users ($6x10^{-5}$) exceeded the Maine risk guideline of $1x10^{-5}$. Subsurface soil cancer risks for child ($4x10^{-4}$), adult ($2x10^{-4}$) and lifetime ($6x10^{-5}$) residents exceeded the USEPA target risk range and Maine risk guideline primarily due to 2,3,7,8-TCDD, BAP equivalents, Aroclor-1248 and Aroclor-1260 in subsurface soil.

Only CTE risks for the occupational worker and child and lifetime residents exceeded Maine risk guidelines due to entire site subsurface soil. The occupational worker subsurface soil ($2x10^{-5}$) ILCR exceeded the Maine risk guideline but did not exceed the USEPA target risk range. Child subsurface soil ($4x10^{-5}$) and all-media ($5x10^{-5}$) cumulative ILCRs exceeded the Maine risk guideline but did not exceed

the USEPA target risk range. The lifetime resident ILCRs (subsurface soil of $6x10^{-5}$; all-media of $7x10^{-5}$) exceeded the Maine risk guideline but are within the USEPA target risk range.

Location Former Building 237

Risks due to soil in the former location of Building 237 were also evaluated. RME cumulative ILCRs were less than or within the USEPA target risk range ($1x10^{-6}$ to $1x10^{-4}$) and did not exceed the State of Maine risk guideline ($1x10^{-5}$) when subsurface soil from the former location of Building 237 is considered for occupational workers, recreational users (adult, adolescent, lifetime), and adult and child residents. The RME cumulative ILCR for lifetime residents exposed to subsurface soil slightly exceeded the Maine risk guideline but is within the USEPA target risk range (lifetime resident ILCR of $2x10^{-5}$).

CTE cumulative ILCRs were less than or within the USEPA target risk range and less than the Maine risk guideline for occupational workers, recreational users, and residential receptors when considering receptor exposure to subsurface soil in the former location of Building 237.

Surface Water

No carcinogenic surface water COPCs were selected based on the calculated site-specific screening criteria used. Therefore, no adverse carcinogenic effects are anticipated for recreational users (or residents) due to carcinogenic chemicals in surface soil.

6.7.2.3 Exposure to Lead

Risks due to lead in subsurface soil exceeded USEPA target of no more than 5 percent of children having a blood-lead concentration greater than 10 µg/dL for child residents exposed to subsurface soil and adolescent recreational users exposed to subsurface soil and sediment. Risks for occupational workers and adult recreational users exposed to subsurface soil did not exceed the USEPA target of no more than 5 percent of children having a blood-lead concentration greater than 10 µg/dL. Therefore, no adverse effects are anticipated for occupational and adult recreational exposure to OU7 subsurface soil or subsurface soil/sediment.

6.7.3 Human Health Risk Assessment Risk Drivers

Risk Drivers – Risk Characterization

Based on the non-cancer and cancer evaluations, the following USEPA risk drivers (i.e., contaminants with non-cancer HQs greater than 1.0 or with cancer risks greater than $1x10^{-6}$ in a scenario and medium

with total cancer risks greater than $1x10^{-4}$) were identified in the risk characterization: 2,3,7,8-TCDD TEQ, cPAHs, manganese, and lead in soil. Lead was retained as a risk driver for surface soil and subsurface soil due to hot spot concentrations detected at locations TP-SB27 and TP-SB24. Aroclor-1248 and Aroclor-1260 were also retained as subsurface soil risk drivers due to hot spot concentrations in detected at locations TB-SB108 and TP-SB14, respectively. No additional risk drivers were identified based on the State of Maine ILCR guideline (i.e., contaminants with non-cancer hazard quotients greater than 1.0 or with cancer risks greater than $1x10^{-6}$ in a scenario and medium with total cancer risks greater than $1x10^{-5}$). The State of Maine risk guideline is not a regulatory requirement.

Risk Drivers – Uncertainty Analysis

Based on the non-cancer and cancer evaluations, the following USEPA risk drivers (i.e., contaminants with non-cancer HQs greater than 1.0 or with cancer risks greater than $1x10^{-6}$ in a scenario and medium with total cancer risks greater than $1x10^{-4}$) were identified in the uncertainty analysis: 2,3,7,8-TCDD TEQ, antimony, copper, iron, cPAHs, Aroclor-1248, and Aroclor-1260 in soil. Lead was retained as a risk driver because of hot spot concentrations in soil. No additional risk drivers were identified based on the MEDEP risk guideline.

TABLE 6-1

SUMMARY OF CANCER RISKS AND HAZARD INDICES
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Receptor	Media	Exposure Route	Cancer Risk	Chemicals with Cancer Risks $> 10^{-4}$	Chemicals with Cancer Risks $> 10^{-5}$ and $\leq 10^{-4}$	Chemicals with Cancer Risks $> 10^{-6}$ and $\leq 10^{-5}$	Hazard Index (HI)	Chemicals Contributing to an Target Organ HI > 1	Is Lead a Risk Driver?*
Adolescent Recreational Users	Surface Soil	Incidental Ingestion	3E-06	--	--	BAP Equivalent	0.07	--	No
		Dermal Contact	4E-06	--	--	BAP Equivalent	--	--	
		Inhalation	2E-12	--	--	--	0.000002	--	
		Total	7E-06	--	--	BAP Equivalent	0.07	--	
	Sediment	Incidental Ingestion	2E-06	--	--	--	0.07	--	No
		Dermal Contact	5E-07	--	--	--	0.02	--	
		Total	2E-06	--	--	TEQ PCB	0.09	--	
	Receptor Total		9E-06				0.2		
Adult Recreational Users	Surface Soil	Incidental Ingestion	1E-06	--	--	--	0.05	--	No
		Dermal Contact	6E-07	--	--	--	--	--	
		Inhalation	1E-12	--	--	--	0.000002	--	
		Total	2E-06	--	--	--	0.05	--	
	Sediment	Incidental Ingestion	1E-06	--	--	--	0.05	--	No
		Dermal Contact	2E-07	--	--	--	0.005	--	
		Total	1E-06	--	--	--	0.05	--	
	Receptor Total		3E-06				0.10		
Lifetime Recreational Users (Adolescent + Adult)	Surface Soil	Incidental Ingestion	4E-06	--	--	BAP Equivalent	NA	NA	NA
		Dermal Contact	4E-06	--	--	BAP Equivalent	NA	NA	
		Inhalation	3E-12	--	--	--	NA	NA	
		Total	9E-06	--	--	BAP Equivalent	NA	NA	
	Sediment	Incidental Ingestion	3E-06	--	--	TEQ PCB	NA	NA	NA
		Dermal Contact	7E-07	--	--	--	NA	NA	
		Total	4E-06	--	--	TEQ PCB	NA	NA	
	Receptor Total		1E-05				NA		
Construction Workers	Surface Soil	Incidental Ingestion	4E-07	--	--	--	0.3	--	No
		Dermal Contact	2E-07	--	--	--	--	--	
		Inhalation	4E-09	--	--	--	0.07	--	
		Total	6E-07	--	--	--	0.3	--	
	Subsurface Soil	Incidental Ingestion	7E-06	--	--	2,3,7,8-TCDD TEQ, Aroclor-1248	5	2,3,7,8-TCDD TEQ (Developmental)	No
		Dermal Contact	2E-06	--	--	--	0.4	--	
		Inhalation	5E-07	--	--	--	3	Manganese (CNS)	
		Total	9E-06	--	--	2,3,7,8-TCDD TEQ, Aroclor-1248	8	2,3,7,8-TCDD TEQ (Developmental); Manganese (CNS)	
	Groundwater	Dermal Contact	--	--	--	--	0.01	--	NA
	Receptor Total		1E-05				8		

TABLE 6-1

SUMMARY OF CANCER RISKS AND HAZARD INDICES
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Receptor	Media	Exposure Route	Cancer Risk	Chemicals with Cancer Risks > 10^{-4}	Chemicals with Cancer Risks > 10^{-5} and ≤ 10^{-4}	Chemicals with Cancer Risks > 10^{-6} and ≤ 10^{-5}	Hazard Index (HI)	Chemicals Contributing to an Target Organ HI > 1	Is Lead a Risk Driver?*
Construction Workers	Surface Soil - Former Location of Building 237	Incidental Ingestion	2E-08	--	--	--	0.03	--	No
		Dermal Contact	7E-09	--	--	--	0.01	--	
		Inhalation	2E-10	--	--	--	--	--	
		Total	2E-08	--	--	--	0.01	--	
	Subsurface Soil - Former Location of Building 237	Incidental Ingestion	5E-08	--	--	--	0.006	--	No
		Dermal Contact	2E-08	--	--	--	--	--	
		Inhalation	4E-10	--	--	--	0.8	--	
	Subsurface Soil - Former Location of Building 237	**Total**	7E-08	--	--	--	0.8	--	No
	Receptor Total		9E-08				1		
Occupational Workers	Surface Soil	Incidental Ingestion	6E-06	--	--	BAP Equivalent	0.1	--	No
		Dermal Contact	5E-06	--	--	BAP Equivalent	--	--	
		Inhalation	2E-11	--	--	--	0.00002	--	
		Total	1E-05	--	--	BAP Equivalent, Aroclor-1248	0.1	--	
	Receptor Total		1E-05				0.1		
Child Residents (0-6 years)	Surface Soil	Incidental Ingestion	8E-05	--	BAP Equivalent	Aroclor-1248	2	Target Organ HIs ≤ 1	Yes (Probability = 9.2%)
		Dermal Contact	3E-05	--	BAP Equivalent	--	--	--	
		Inhalation	1E-10	--	--	--	0.00008	--	
		Total	1E-04	--	BAP Equivalent	Aroclor-1248	2	Target Organ HIs ≤ 1	
	Receptor Total		1E-04				2		
Adult Residents (6-30 years)	Surface Soil	Incidental Ingestion	1E-05	--	--	BAP Equivalent	0.2	--	NA
		Dermal Contact	7E-06	--	--	BAP Equivalent	--	--	
		Inhalation	2E-10	--	--	--	0.00008	--	
		Total	2E-05	--	BAP Equivalent	Aroclor-1248	0.2	--	
	Receptor Total		2E-05				0.2		
Lifetime Residents (Child + Adult)	Surface Soil	Incidental Ingestion	9E-05	--	BAP Equivalent	Aroclor-1248	NA	NA	NA
		Dermal Contact	4E-05	--	BAP Equivalent	Aroclor-1248	NA	NA	
		Inhalation	3E-10	--	--	--	NA	NA	
		Total	1E-04	--	BAP Equivalent	Aroclor-1248	NA	NA	
	Receptor Total		1E-04				NA		

TABLE 6-1

SUMMARY OF CANCER RISKS AND HAZARD INDICES
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Receptor	Media	Exposure Route	Cancer Risk	Chemicals with Cancer Risks $> 10^{-4}$	Chemicals with Cancer Risks $> 10^{-5}$ and $\leq 10^{-4}$	Chemicals with Cancer Risks $> 10^{-6}$ and $\leq 10^{-5}$	Hazard Index (HI)	Chemicals Contributing to an Target Organ HI > 1	Is Lead a Risk Driver?*

Notes:
Surface water risks are discussed in Section 5.6.
Chemicals contributing to a target organ > 1 are all chemicals (regardless of individual HQs) that contribute to a target organ exceeding 1.
Corresponding non-cancer target organs are listed in parentheses.
*Lead is selected as a risk driver if modeled results indicate that the possibility of fetal blood-lead concentrations exceeding 10 ug/dL is greater than 5%. Lead results are the same for both RME and CTE exposures.

Acronyms:
BAP = Benzo(a)pyrene
CNS = Central Nervous System
COPC = Chemical of Potential Concern
CTE = Central Tendency Exposure
GS= Gastrointestinal
HI = Hazard Index
HQ = Hazard Quotient
NA = Not Applicable
PCB = Polychlorinated Biphenyl
RME = Reasonable Maximum Exposure
TCDD = Tetrachlorodibenzo-p-dioxin
TEQ = Toxic Equivalent

TABLE 6-2

SUMMARY OF CANCER RISKS AND HAZARD INDICES
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Receptor	Media	Exposure Route	Cancer Risk	Chemicals with Cancer Risks > 10^{-4}	Chemicals with Cancer Risks > 10^{-5} and ≤ 10^{-4}	Chemicals with Cancer Risks > 10^{-6} and ≤ 10^{-5}	Hazard Index	Chemicals Contributing to an Target Organ HI > 1	Is Lead a COC?*
Adolescent Recreational Users	Surface Soil	Incidental Ingestion	8E-07	--	--	--	0.04	--	No
		Dermal Contact	4E-07	--	--	--	--	--	
		Inhalation	1E-12	--	--	--	0.000002	--	
		Total	1E-06	--	--	--	0.04	--	
	Sediment	Incidental Ingestion	2E-07	--	--	--	0.02	--	
		Dermal Contact	3E-08	--	--	--	0.002	--	
		Total	3E-07	--	--	--	0.02	--	
	Receptor Total		1E-06				0.02		
Adult Recreational Users	Surface Soil	Incidental Ingestion	2E-07	--	--	--	0.02	--	No
		Dermal Contact	2E-08	--	--	--	--	--	
		Inhalation	4E-13	--	--	--	0.000002	--	
		Total	2E-07	--	--	--	0.02	--	
	Sediment	Incidental Ingestion	2E-07	--	--	--	0.01	--	No
		Dermal Contact	7E-09	--	--	--	0.0004	--	
		Total	2E-07	--	--	--	0.01	--	
	Receptor Total		4E-07				0.04		
Lifetime Recreational Users (Adolescent + Adult)	Surface Soil	Incidental Ingestion	1E-06	--	--	--	NA	NA	NA
		Dermal Contact	4E-07	--	--	--	NA	NA	
		Inhalation	2E-12	--	--	--	NA	NA	
		Total	2E-06	--	--	--	NA	NA	
	Sediment	Incidental Ingestion	4E-07	--	--	--	NA	NA	NA
		Dermal Contact	4E-08	--	--	--	NA	NA	
		Total	4E-07	--	--	--	NA	NA	
	Receptor Total		2E-06				NA		
Construction Workers	Surface Soil	Incidental Ingestion	4E-07	--	--	--	0.3	--	No
		Dermal Contact	6E-08	--	--	--	--	--	
		Inhalation	4E-09	--	--	--	0.07	--	
		Total	5E-07	--	--	--	0.3	--	
	Subsurface Soil	Incidental Ingestion	7E-06	--	--	2,3,7,8-TCDD TEQ, Aroclor-1248	5	2,3,7,8-TCDD TEQ (Developmental)	No
		Dermal Contact	5E-07	--	--	--	0.14	--	
		Inhalation	5E-07	--	--	--	3	Manganese (CNS)	
		Total	8E-06	--	--	2,3,7,8-TCDD TEQ, Aroclor-1248	8	2,3,7,8-TCDD TEQ (Developmental), Manganese (CNS)	
	Groundwater	Dermal Contact	--	--	--	--	0.003	--	NA
	Receptor Total		9E-06				8		
	Surface Soil - Former Location of Building 237	Incidental Ingestion	2E-08	--	--	--	0.03	--	No
		Dermal Contact	2E-09	--	--	--	--	--	
		Inhalation	2E-10	--	--	--	0.004	--	
		Total	2E-08	--	--	--	0.03	--	
	Subsurface Soil - Former Location of Building 237	Incidental Ingestion	5E-08	--	--	--	0.006	--	No
		Dermal Contact	7E-09	--	--	--	--	--	
		Inhalation	4E-10	--	--	--	0.8	--	
		Total	6E-08	--	--	--	0.8	--	
	Receptor Total		1E-07				0.8		

TABLE 6-2

SUMMARY OF CANCER RISKS AND HAZARD INDICES
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Receptor	Media	Exposure Route	Cancer Risk	Chemicals with Cancer Risks $> 10^{-4}$	Chemicals with Cancer Risks $> 10^{-5}$ and $\leq 10^{-4}$	Chemicals with Cancer Risks $> 10^{-6}$ and $\leq 10^{-5}$	Hazard Index	Chemicals Contributing to an Target Organ HI > 1	Is Lead a COC?*
Occupational Workers	Surface Soil	Incidental Ingestion	9E-07	--	--	--	0.06	--	No
		Dermal Contact	2E-07	--	--	--	--	--	
		Inhalation	7E-12	--	--	--	0.00001	--	
		Total	1E-06	--	--	--	0.06	--	
	Receptor Total		1E-06				0.06		
Child Residents (0-6 years)	Surface Soil	Incidental Ingestion	1E-05	--	--	BAP Equivalent	0.6	--	Yes (Probability = 9.2%)
		Dermal Contact	2E-06	--	--	BAP Equivalent	--	--	
		Inhalation	3E-11	--	--	--	0.00005	--	
		Total	1E-05	--	--	BAP Equivalent	0.6	--	
	Receptor Total		1E-05				0.6		
Adult Residents (6-30 years)	Surface Soil	Incidental Ingestion	1E-06	--	--	--	0.06	--	NA
		Dermal Contact	2E-07	--	--	--	--	--	
		Inhalation	3E-11	--	--	--	0.00005	--	
		Total	1E-06	--	--	--	0.06	--	
	Receptor Total		1E-06				0.06		
Lifetime Residents (Child + Adult)	Surface Soil	Incidental Ingestion	1E-05	--	--	BAP Equivalent	NA	NA	NA
		Dermal Contact	2E-06	--	--	BAP Equivalent	NA	NA	
		Inhalation	5E-11	--	--	--	NA	NA	
		Total	1E-05	--	--	BAP Equivalent	NA	NA	
	Receptor Total		1E-05				NA		

Notes:
Surface water risks are discussed in Section 5.6.
Chemicals contributing to a target organ > 1 are all chemicals (regardless of individual HQs) that contribute to a target organ exceeding 1.
Corresponding non-cancer target organs are listed in parentheses.
*Lead is selected as a risk driver if modeled results indicate that the possibility of fetal blood-lead concentrations exceeding 10 ug/dL is greater than 5%. Lead results are the same for both RME and CTE exposures.

Acronyms:
BAP = Benzo(a)pyrene
CNS = Central Nervous System
COPC = Chemical of Potential Concern
CTE = Central Tendency Exposure
HI = Hazard Index
HQ = Hazard Quotient
NA = Not Applicable
PCB = Polychlorinated Biphenyl
RME = Reasonable Maximum Exposure
TCDD = Tetrachlorodibenzo-p-dioxin
TEQ = Toxic Equivalent

TABLE 6-3
RISK SUMMARY TABLE
OPERABLE UNIT 7 REMEDIAL INVESTIGATION
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Receptor	Exposed Matrix	ILCR	Chemical of Concern[1]	EPC (mg/kg or ug/L)	HI	Chemical of Concern[1]	Target System	EPC (mg/kg or ug/L)	Is Lead a Risk Driver [2]	Lead Mean (mg/kg or ug/L)
Current Adolescent Recreational User [3]	SD	2.E-06	- -	- -	0.09	- -	- -	- -	No	187
Future Adolescent Recreational User [3]	SS/SD	9.E-06	- -	- -	0.2	- -	- -	- -	No	487
	SB/SD	4.E-05	- -	- -	2	- -	- -	- -	No	1500
Current Adult Recreational User [3]	SD	1.E-06	- -	- -	0.05	- -	- -	- -	No	187
Future Adult Recreational User [3]	SS/SD	3.E-06	- -	- -	0.10	- -	- -	- -	No	487
	SB/SD	3.E-05	- -	- -	1.0	- -	- -	- -	No	1500
Current Lifetime Recreational User	SD	4.E-06	- -	- -	NA[4]	- -	- -	- -	No	187
Future Lifetime Recreational User	SS/SD	1.E-05	- -	- -	NA[4]	- -	- -	- -	No	187
	SB/SD	6.E-05	- -	- -	NA[4]	- -	- -	- -	No	1500
Current/Future Construction Worker	SS	6.E-07	- -	- -	0.3	- -	- -	- -	No	510
	SB	9.E-06	- -	- -	8	2,3,7,8-TCDD TEQ (HQ=3)	Developmental	0.0013	No	1600
						Manganese (HQ=2)	CNS	969		
	SS (B237)	2.E-08	- -	- -	0.04	- -	- -	- -	No	60
	SB (B237)	7.E-08	- -	- -	0.8	- -	- -	- -	No	123
	GW	- -	- -	- -	0.1	- -	- -	- -	No	8.9
Future Occupational User	SS	1.E-05	- -	- -	0.1	- -	- -	- -	No	510
	SB	1.E-04	- -	- -	3	2,3,7,8-TCDD TEQ (HQ=2)	Developmental	0.0013	No	1600
Future Child Resident	SS	1.E-04	- -	- -	2	- -	- -	- -	Yes (9.2% > 10 µg/dL)	510
	SB	4.E-04	Benzo(a)pyrene Equivalents (6 x 10^{-05})	1.1	34	2,3,7,8-TCDD TEQ (HQ=18)	Developmental	0.0013	Yes(69%> 10 µg/dL)	1600
			Aroclor-1248 (1 x 10^{-04})	41						
			Aroclor-1260 (1 x 10^{-05})	4.6		Aroclor-1260 (HQ =4)	NA	4.6		
			2,3,7,8-TCDD Equivalents (2 x 10^{-04})	0.0013		Antimony (HQ=6)	Blood	182		
						Copper (HQ=3)	GS	9900		
						Iron (HQ=2)	GS	97100		
Future Adult Resident	SS	2.E-05	- -	- -	0.2	- -	- -	- -	Yes (9.2% > 10 µg/dL)	510
	SB	2.E-04	Benzo(a)pyrene Equivalents (1 x 10^{-05})	1.1	4	2,3,7,8-TCDD TEQ (HQ=2)	Developmental	0.0013	Yes(69%> 10 µg/dL)	1600
			Aroclor-1248 (6 x 10^{-05})	41						
			Aroclor-1260 (7 x10^{-06})	4.6						
			2,3,7,8-TCDD Equivalents (9 x 10^{-05})	0.0013						
Future Lifetime Resident	SS	1.E-04	- -	- -	NA[4]	- -	- -	- -	Yes (9.2% > 10 µg/dL)	510
	SB	6.E-04	Benzo(a)pyrene Equivalents (7 x 10^{-05})	1.1	NA[4]	- -	- -	- -	Yes(69%> 10 µg/dL)	1600
			Aroclor-1248 (2 x 10^{-04})	41	NA[4]	- -	- -	- -		
			Aroclor-1260 (2 x 10^{-05})	4.6	NA[4]	- -	- -	- -		
			2,3,7,8-TCDD TEQ (3 x 10^{-04})	0.0013	NA[4]	- -	- -	- -		

* Lead is retained as a COC for surface soil and subsurface soil due to a hotspot concentration detected that may pose acute exposure risks.
All ILCRs and HIs are values for the RME scenario.

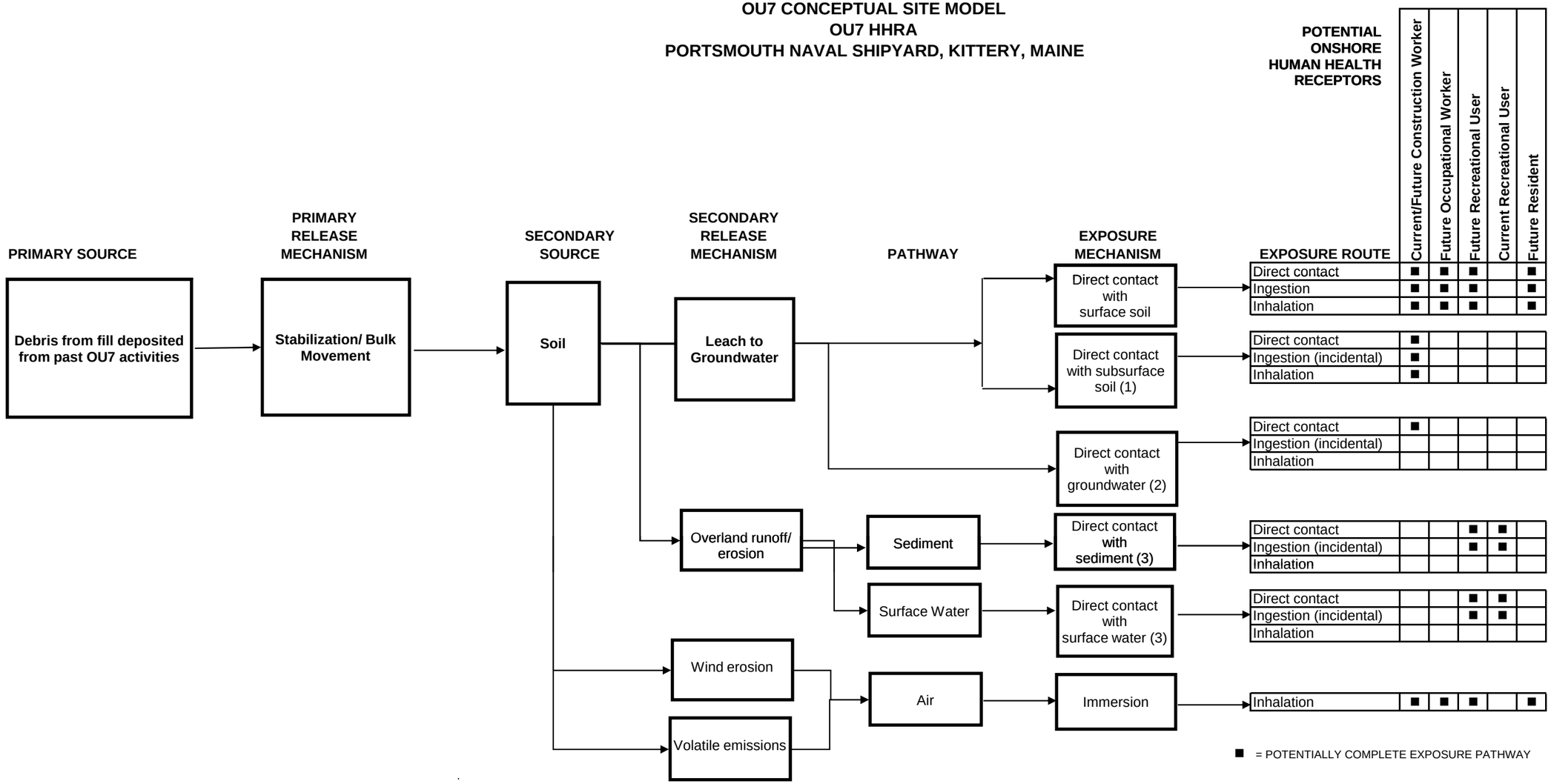
Acryomns

B237 = Location of former Building 237
CNS = Central Nervous System
EPC = Exposure Point Concentration
GS = Gastrointestinal
HI = Hazard Index
HQ = Hazard Quotient
ILCR = Incremental Lifetime Cancer Risk
NA = Not Applicable
SB = Surface Soil
SD = Sediment
SS = Surface Soil
TS = Target System
GW = Groundwater

Footnotes

1 - For receptors with a total RME ILCR greater than 1.0 x 10^{-4} or target organ HI greater than 1, any carcinogenic chemical with an ILCR greater than 1.0 x 10^{-6} or a noncarcinogen chemical contributing to target organ HI greater than 1.0.
2- Based on blood concentration modeling results.
3 - No COPCs were selected for the surface water matrix therefore no risks were calculated for recreational user exposure to surface water.
4 - Lifetime risks are not calculated for noncancer risks because those risks are not additive.

FIGURE 6-1
OU7 CONCEPTUAL SITE MODEL
OU7 HHRA
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE



* Surface soil at OU7 is currently covered. Any surface soil exposures assume uncovered soil during a theortical future exposure event.

* The vapor intrusion pathway is incomplete because a sufficient source of volatile compounds was not found at OU7 to pose a vapor intrusion threat.

1. Direct contact with subsurface soil is considered to be an incomplete pathway for occupational workers, recreational users, and residents because site conditions (e.g., shallow groundwater) make it unlikely that subsurface soil will become exposed. However, exposure to subsurface soil for these receptors is considered as part of the Uncertainty Analysis.

2. Exposure to groundwater is considered to be a potentially complete pathway only for the construction worker because the groundwater at OU7 is saline/brackish. Dermal contact for construction workers is considered to be a potentially complete pathway because contact could occur during excavation activities.

3. Exposure to intertidal area surface water or sediment for residents is considered to be an incomplete pathway because of the site characteristics (e.g., rocky and steep shoreline), and therefore residential exposure to these media is not anticipated to be more intense that recreational exposure. Consequently, residential exposure is evaluated as recreational exposure.

7.0 SUMMARY AND CONCLUSIONS

This section summarizes the findings of the RI and provides conclusions and recommendations for OU7.

7.1 SUMMARY

The following provides a summary of the nature and extent of contamination, fate and transport of contamination, and the results of the HHRA for OU7.

7.1.1 Nature and Extent of Contamination

The discussion of the nature and extent of contamination at OU7 focuses on the distribution of chemical concentrations across OU7 with consideration of site uses and geological conditions. For the onshore area, soil and groundwater were investigated, and for the offshore area, surface water, seeps, and sediment were investigated.

VOCs, SVOCs, pesticides, dioxins/furans, and inorganics were detected in the surface soil and subsurface soil at OU7. Concentrations in the subsurface soil were generally greater than in the surface soil. Based on an evaluation of PAHs (expressed in terms of BAP equivalent), dioxin/furan (expressed as 2,3,7,8-TCDD TEQ), and copper concentrations, locations where risk-based screening level were exceeded correspond to fill activities taking place after 1910, with the exception of TP-SB120, TP-SB15, and TP-SB39. From evaluation of the data, approximately one-half of the locations where concentrations were indicated to be above background levels, debris material was found; therefore the presence of debris material would not delineate contamination. The borings in the area filled before 1910 in the vicinity of former Building 237 neither contain debris material nor have concentrations greater than risk-based screening levels for total PCBs, lead, PAHs, and dioxins/furans. A statistical comparison of mean concentrations in the area without the debris with the mean concentrations in the rest of OU7 demonstrates that the mean concentrations in the filled area before 1910, with the filling of Jenkin's Gut, in the vicinity of former Building 237, are statistically different than the rest of OU7. Therefore, the filled area before 1910 (see Figure 1-3) in the immediate vicinity of former Building 237 can be defined as a separate population from the rest of OU7.

PAHs and inorganics were detected in groundwater at OU7 whereas VOCs, pesticides, and PCBs were not detected in any groundwater sample. Aluminum, copper, and manganese were detected in fewer than four samples at concentrations exceeding the risk-based screening levels. The groundwater at OU7 is saline/brackish and therefore not potable.

Inorganics were the only chemicals detected in OU7 surface water but were detected at concentrations less than the risk-based screening levels. SVOCs, pesticides, PCBs, and inorganics were detected in OU7 seep samples. Arsenic and chromium were the only chemicals detected at concentrations exceeding human health risk-based screening levels in these samples. Benzo(b)fluroanthene, chrysene, 4,4-DDE, 4,4-DDT, heptachlor, and heptachlor epoxide were detected at concentrations exceeding ecological risk-based screening levels.

SVOCs, pesticides/PCBs, and inorganics were detected in OU7 sediment. PAHs, PCBs, and inorganics were detected at concentrations exceeding human health risk-based screening levels in these samples, and anthracene, fluorene, copper, and nickel were detected at concentrations greater than the ecological risk-based screening levels. The extent of sediment contamination is bounded.

7.1.2 Fate and Transport of Contaminants

As discussed in Section 5.0, the following general classes of contaminants were identified as exceeding risk-based screening levels are PAHs, PCBs, dioxins/furans, and metals.

The site surface is mostly covered with asphalt/pavement, limiting mobilization of contaminants through surface water runoff or infiltration of precipitation. Much of the subsurface soil is in contact with groundwater. The mobility of PAHs via the groundwater pathway at OU7 is not considered significant because PAHs were detected in groundwater infrequently and at levels several orders of magnitude less than the risk-based screening levels. PCBs were not detected in groundwater. Data for OU7 do not indicate significant concentrations of organic chemicals that would facilitate movement of dioxins/furans. Only a small portion of OU7 is covered with flora, so exposure from herbivores feeding on the vegetation is not a concern. The fate and transport of inorganics are controlled mainly by the mobility of soil particles and dissolution into water present in their immediate environment. Metals do not undergo any of the degradation reactions that most organic chemicals do; therefore, they are considered to be persistent. The mobility of metals under strong acidic or alkaline conditions is expected to be limited at OU7 because of the buffering action of brackish/saline groundwater. The major fate mechanisms for metals are adsorption to the soil matrix and bioaccumulation.

Shoreline stabilization was conducted in June 2006 to prevent contaminated soil and debris/waste materials from eroding. Current conditions indicate that no further erosion is occurring. The long-term stability and functioning of the shoreline controls are necessary to ensure that future erosion does not occur. Therefore, if the erosion controls fail, there is a potential future risk to the offshore area.

Contaminant fate and transport modeling was conducted to conservatively estimate potential migration of contamination from soil to intertidal sediment and near-shore surface water. The modeling assumed that

the pavement at OU7 was removed; that the amount of infiltrating precipitation coming in contact with soil would be greatly increased compared to current, conditions and that the overall groundwater flow conditions and contributions from storm water sewer discharge would not change significantly in the future. The modeling results using unsteady state and steady state parameters indicate that surface water is not being adversely impacted by onshore sources of contamination. Using unsteady state parameters, the modeling conservatively indicates that sediment may potentially be impacted through the onshore migration of metals contamination through groundwater. Using steady state parameters, the modeled impacts to sediment do not appear to be high compared to sediment criteria. Observed concentrations of metals in sediment are orders of magnitude less than the modeled results and do not indicate groundwater migration is adversely impacting sediment.

7.1.3 Risk Assessment

As discussed in Section 6.0, analytical data for soil, intertidal water (i.e., combined seep and surface water), intertidal sediment, and groundwater were used in the HHRA for OU7. The receptors evaluated included current and future adult and adolescent recreational users, future adult and child residents, future occupational worker (e.g., the typical industrial/commercial worker performing routine activities), and current and future construction worker (e.g., remediation and excavation workers). Although there is a temporary housing unit (Building H23) at OU7 and occupational workers are at OU7, these receptors are considered future receptors because the site is covered with asphalt and soil is not currently exposed. The exposure routes include ingestion of, dermal contact with, and inhalation of air/dust particulates/vapors for soil, and ingestion of and dermal contact with intertidal water, surface water, undiluted seep water, sediment, and groundwater. Current potential risks for exposure to media in the intertidal area of OU7 for occupational works or personnel staying at Building H23 were evaluated under the current recreational user scenario. Potentially unacceptable non-carcinogenic health effects were identified for receptors with HIs greater than 1 (the USEPA target risk level and State of Maine risk guideline). Potentially unacceptable carcinogenic health effects were identified for receptors with ILCRs exceeding the USEPA target risk range ($1x10^{-6}$ to $1x10^{-4}$) and the State of Maine risk guideline ($1x10^{-5}$). The State of Maine risk guideline is not a regulatory requirement and will not be used for identifying cleanup goals.

The HHRA evaluated potential risks under current land use conditions and potential future land use conditions for the entire site, and separately for the area filled before 1910 where no debris was found. No COPCs were identified for surface soil in the area filled before 1910 where no debris was found and therefore a quantitative evaluation for the surface soil was not conducted. Adverse receptor effects are not anticipated for the area filled before 1910 where no debris was found from exposure to surface soil. Current and future constructions workers were the only receptors evaluated for subsurface soil exposure in the area filled before 1910 where no debris was found with no adverse effects being anticipated.

Potentially unacceptable non-carcinogenic health effects are not anticipated for future occupational workers, future adult residents, and future child residents exposed to surface soil and for current and future recreational users (adult and adolescent) exposed to surface soil and sediment based on the HIs being less than or equal to 1 for the RME and CTE scenarios. RME and CTE HIs were less than 1 for current and future construction workers exposed to surface soil and for the area with no debris subsurface soil. RME and CTE HIs are greater than 1.0 for current and future construction workers exposed to entire site soils. Dioxins/furans (based on 2,3,7,8-TCDD TEQ) in subsurface soil are the main risk contributor.

RME and CTE cancer risk estimates for current and future recreational users, future occupational workers, future residents, and current and future construction workers hypothetically exposed to environmental media evaluated in the Risk Characterization are less than or within USEPA target cancer risk range ($1x10^{-6}$ to $1x10^{-4}$). The RME cancer risks for adult residents ($2x10^{-5}$), child residents ($1x10^{-4}$) and lifetime residents ($1x10^{-4}$) exposed to surface soil exceed the State of Maine risk guideline of $1x10^{-5}$. CTE cancer risk estimates did not exceed the State of Maine risk guideline. Residential risks exceeding the State of Maine risk guideline are primarily due to cPAHs via ingestion of and dermal contact with surface soil.

Lead was a COPC in both surface and subsurface soil for the entire site. Results of the lead evaluation indicate that adverse effects are not likely for future occupational workers, current and future construction workers, or current and future adult recreational users exposed to lead in soil at the study area. However, the results indicate that adverse effects may occur for future residents exposed to surface soil.

Potential risks for exposure to subsurface soil that could be excavated and become surface soil were evaluated as part of the uncertainty analysis. The results showed that HIs would be greater than 1.0 for future occupational workers and future residents. Dixons/furans (based on 2,3,7,8-TCDD TEQ), antimony, copper, and iron are the main risk drivers. Cancer risks would exceed the USEPA target risk range for a future child and adult resident. The main risk contributors are cPAHs, Aroclor 1248, Aroclor 1260, and dioxins/furans. Lead exposure would be unacceptable for residents.

No COPCs were identified for surface water and groundwater. Therefore, there are no unacceptable risks for exposure to these media.

The site is currently and has historically been located within an industrial area of PNS, and no ecological habitat has been identified at the site. Therefore, there are no onshore concerns for ecological risk.

Offshore concerns for ecological receptors are being addressed as part of OU4. OU7 is no longer acting as a source of contaminants that may pose unacceptable risk to the offshore area.

7.2 CONCLUSIONS AND RECOMMENDATIONS

Based on evaluation of the nature and extent of contamination, fate and transport of contaminants, and site risks, conclusions and recommendations were identified as described in the following sections.

7.2.1 Conclusions

The site boundary of OU7 was defined by the historical fill lines. The nature and extent of contamination in soil at OU7 has been sufficiently defined to support the FS. Potentially unacceptable risks were found for the current and future construction worker exposed to entire site soil and for the future child resident exposed to surface soil and future child resident, adult resident, and occupational worker exposed to subsurface soil. The main chemicals contributing to risk are dioxins/furans (based on 2,3,7,8-TCDD TEQ), cPAHs (based on BAP equivalents), PCBs (based on Aroclor 1248 and Aroclor 1260), antimony, copper, iron, lead, and manganese and are considered the chemicals of concern (COCs) for OU7. Based on the risk evaluation, groundwater, surface water, and sediment are not media of concern for OU7.

The fill area without debris in the vicinity of former Building 237 was determined to have statistically different mean concentrations than the rest of OU7 and adverse human health risks were not found for this area and the extent of contamination was bounded.

Groundwater, surface water, sediment, and soil data from OU7 and modeling conclusions show that migration of contaminants in groundwater from OU7 to the offshore does not pose a current risk and would not pose a future risk

Shoreline stabilization was conducted in June 2006 to prevent contaminated soil and debris/waste materials from eroding. Current conditions indicate no further erosion is occurring. However, the long-term stability and functioning of the shoreline controls are necessary to ensure future erosion does not occur. Therefore, there is a potential future risk to the offshore area from erosion if erosion controls fail in the future.

7.2.2 Recommendations

The Navy recommends that the FS Report for OU7 be prepared to address potentially unacceptable human health risks posed by exposure to soil and potential future risks if erosion occurs in the future. The Navy recommends that remedial action objectives be developed for the portion of OU7 that poses

risk to human health and potential future erosion. The average concentrations for the fill area without debris in the vicinity of former Building 237 were determined to be statistically less than the average concentrations for the rest of OU7. The FS Report for OU7 should also evaluate remedial options for addressing this area separately from the rest of OU7.

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APPENDIX A

SUPPORTING INFORMATION

A.1 HISTORICAL USE AND FIGURES

A.2 SOIL BORING AND MONITORING WELL CONSTRUCTION LOGS

A.3 TIDAL LAG STUDY

A.4 SLUG TESTS

A.5 SAMPLE LIST

A.6 SHORELINE REVETMENT AS-BUILT PLAN AND SHORELINE PHOTOS FROM APPENDIX B OF 2007 FIVE-YEAR REVIEW

A.7 2003 WETLANDS FUNCTIONS AND VALUES ASSESSMENT

A.1 HISTORICAL USE AND FIGURES

HISTORICAL FIGURES AND USES FOR THE OPERABLE UNIT 7 AREA

The following discusses the review of historical figures and documents to understand the history of site uses at OU 7 (Site 32, Topeka Pier). The review of the historical figures and a description of historical uses of OU7 are provided herein.

Review of Historical Figures

Historical figures for Portsmouth Naval Shipyard (PNS), Kittery, Maine, were reviewed to determine the historical filling and uses of the OU7 area. Using ArcMap 9.1, the figures were electronically scanned and aligned with the current PNS base map (approximately 2003). To align the maps, the maps were georeferenced using the buildings on the map and the GIS building layer for the current PNS base map. The georeferencing was considered complete when the buildings on the historical map "matched" the buildings in the GIS data layer as close as possible across the entire facility, or the area that was shown in the map. A line representing the shoreline in the map was then drawn and labeled with the appropriate year shown on the map. Minor differences between the shoreline for different years appear to be present for some years, likely because of how the shoreline was determined on each map and whether the shoreline represents high, mid, or low tide.

Available Shipyard maps were reviewed and select maps were scanned that would show information on the changes in shorelines. These maps were further reviewed to select maps to print that show the site layout (using the 2006 PNS Base Map) with the scanned features on the historical map. These maps were used to understand changes in site features and land uses. Figures A-1 through A-17 provide historical maps of the OU7 area. Vertical datum provided is the PNS 2002 datum, which equates mean high water to 100.36 feet.

The PNS Base Map includes the circa 1880 shoreline. The historical maps that included the OU7 area start in 1901 until 1982. Filling of the major portion of OU7 began in the early 1990s with the filling of Jenkin's Gut for the construction of Drydock #2.

- 1901: Between 1901 and 1880 it appears that filling occurred in two areas. Filling appears to have taken place between buildings 177 and 149, and between building 79 to north east of building 176. No buildings or structures are currently located within OU7. There are Marine barracks located North West of OU7.
- 1904: The 1904 shoreline is essentially the same as the 1901 shoreline. Some filling of the shoreline took place around the guard shack.
- 1907: The noticeable change between the 1904 and 1907 shorelines is that the pier is now included.
- 1910: Several changes have taken place between 1907 and 1910. First, the timber basin area has been filled in. In addition to the change to the shoreline several new building/structures are present. The U.S.R.S Southern and U.S.S. Topeka are docked off of Topeka Pier and a crematory is present northwest of the Timber Basin. The Naval Hospital Reservation is depicted as being under construction to the east of the Timber Basin.
- 1915: Between 1910 and 1915 filling occurred between Newton Street and Goodrich Avenue. Several buildings and structures are present in 1915 that were not present in 1910. A Naval Hospital and Reservation are present between the Topeka Pier and the Timber Basin. A Parade deck is depicted north of Newton Street and the Naval Hospital Reservation has been completed.
- 1917: There are no noticeable changes between the 1915 and 1917 shorelines. However, several buildings have been built in the Naval Hospital Reservation (H-11, H-12, H-14, H-2W, Wood shed, H-5W, and H-13).
- 1925: There is no noticeable change between the 1917 and 1925 shoreline; however, there are some new features on the filled area. Buildings 132 and 149 along with a lumber storage area were constructed south of Goodrich Avenue and west of the Timber

basin. Building 129 is now present south of the Timber basin and several new buildings are present in the Naval Hospital Reservation.

- 1935: Noticeable filling took place north of Goodrich Avenue around future building 154. Lumber storage racks are present west of the Timber Basin.
- 1940: Noticeable filling took place between 1935 and 1940 north of Goodrich Avenue and Building 154 was constructed.
- 1941: More filling continued north of Building 154. Along with the filling Building 158 was constructed in the former Timber Basin, Buildings 168 and 167 are constructed west of the Timber Basin, and Building 152 was constructed west of Building 132. The area that used to be the Timber Basin is no longer designated as such.
- 1947: Between 1941 and 1947 Buildings H29, H21, 315, 167, 168, and 149A were constructed on the filled area.
- 1957: By 1957 the Parade Ground has changed to a Saluting Battery and the former Timber Basin is listed as a Lumber Storage area.
- 1979: By 1979 the Lumber Storage Area and the Saluting Battery are no longer present on the map and Building 306 has been constructed.
- 1982: There are no noticeable changes in structures on the filled area between 1979 to 1982.

Description of Historical Uses of OU7

In addition to the historical figures, the following documents were reviewed to understand the historical uses of OU7:

- Industrial History of Topeka Pier Landfill Site (PNS, May 1996)
- Initial Assessment Study (IAS, Weston)
- Cradle of American Shipbuilding (PNS, December 1978)

The following discusses the historical filling, buildings, and their uses, and operations at OU7.

Work on Dry Dock No 2 between Dennett's Island and Seavey Island, proposed in 1848, was started in 1900. The channel between the island, referred to as Jenkin's Gut was filled as part of the construction. The south end of the channel was excavated and the material was used to fill the northern part of the Shipyard. At such time, a pier was built on the east side of the Shipyard which became known as Topeka Pier after the prison ship USS TOPEKA, which was docked at the pier when it was initially built. A few years later, another prison ship, U.S.R.S SOUTHERY, was docked at the pier. These ships remained at the Shipyard to house overflow prisoners when there was insufficient space in the Naval Prison (Building 93).

By 1910, the Navy had begun to establish a storage and milling of timber on part of the filled area. A timber basin and timber storage racks were built here.

World War I brought about urgent need for processing of lumber and by 1922, three new buildings and more storage racks were built to support the timber operations. A saw mill (Building 129) was built in 1919 adjacent to the Timber Basin. Later two storehouses were constructed (Buildings 132 and 149).

Filling continued throughout the 1920s and 1930s. The fill areas were convenient dumping grounds for Shipyard refuse. The waste and scrap dumped in the area was reported to contain cans and drums which had not been crushed. It is possible that these cans and drums included combustibles that were stored in the nearby Building 98.

By 1945, the Topeka Pier Site fill was finished. Many buildings were constructed in the early 1940s as required for the World War II industrial effort. Of note was Building 154, in the center of the site. This building was used for transportation equipment maintenance and included underground gasoline tanks.

Sewage and drainage from buildings on the northeast side of the Shipyard were sent to areas near the foot of Topeka Pier and to other areas on the site. The refuse included sodium hydroxide, sulfuric acid, and organic solvents. This ended in the 1970s.

In 1994 and 1995, excavation work at the site uncovered debris including graphite electrodes, large dry cell batteries, metals, bricks, wood, wire, china, glass, asbestos cloth, and crucibles.

Based on review of historical figures and historical information on Topeka Pier Site (PNS, May 1996) the following operations occurred in Buildings located at OU7:

- Building 98: Built in 1910 as a storehouse for combustibles. Combustibles included paints and oils.
- Building 129: Built in 1918 as a saw mill used as part of the timber basin activities. It was converted to a production shop in 1965.
- Building 132: Built in 1919 as a lumber storehouse as part of the timber basin activities. It is currently a supply storage building.
- Building 149: Built in 1920 as a store house used as part of the timber basin activities. Now used for storage.
- Building 154: Built in 1939 for transportation, equipment, and storage. Continues to be used for these operations. In 1955 reported to have had three underground gasoline tanks – 10,290 gallon, 5,506 gallons, and 5,506 gallons.
- Building 158: Built in 1941. Originally net storage building but converted to garage by 1947 and continues to be used as a garage.
- Building 162: Built in 1941 as a sub–station and continues to be used (Sub-Station No. 2).
- Building 176: Built in 1942 as a torpedo overhaul and storage building. Was converted to a radiographic facility.
- Building 177: Built in 1942 as a storehouse and is still used as such.
- Building 197: Built in 1944 as a storehouse and was demolished in 1970.
- Building 237: Built in 1952 as a public works administration building was demolished in 2005.
- Building 306: Built in 1980 as a transducer repair facility and continues to be used.
- H23: Built in 1942 as the hospital corps barracks for corpsmen during World War II. Currently the building is used for housing. The building was updated in 1979 and is currently used for barracks and offices.
- H29: Built in 1945 as a Ship's Service Office and is currently used as administrative offices. The building was updated in 1986 and serves as offices now.

The first operations in the Topeka Pier area were the timber basin which was constructed on the Topeka Pier fill area. During this time the sewage from the Electrical Shop (Building 79) and the Paint Shop (Building 27) was sent to the area at the foot of Topeka Pier.

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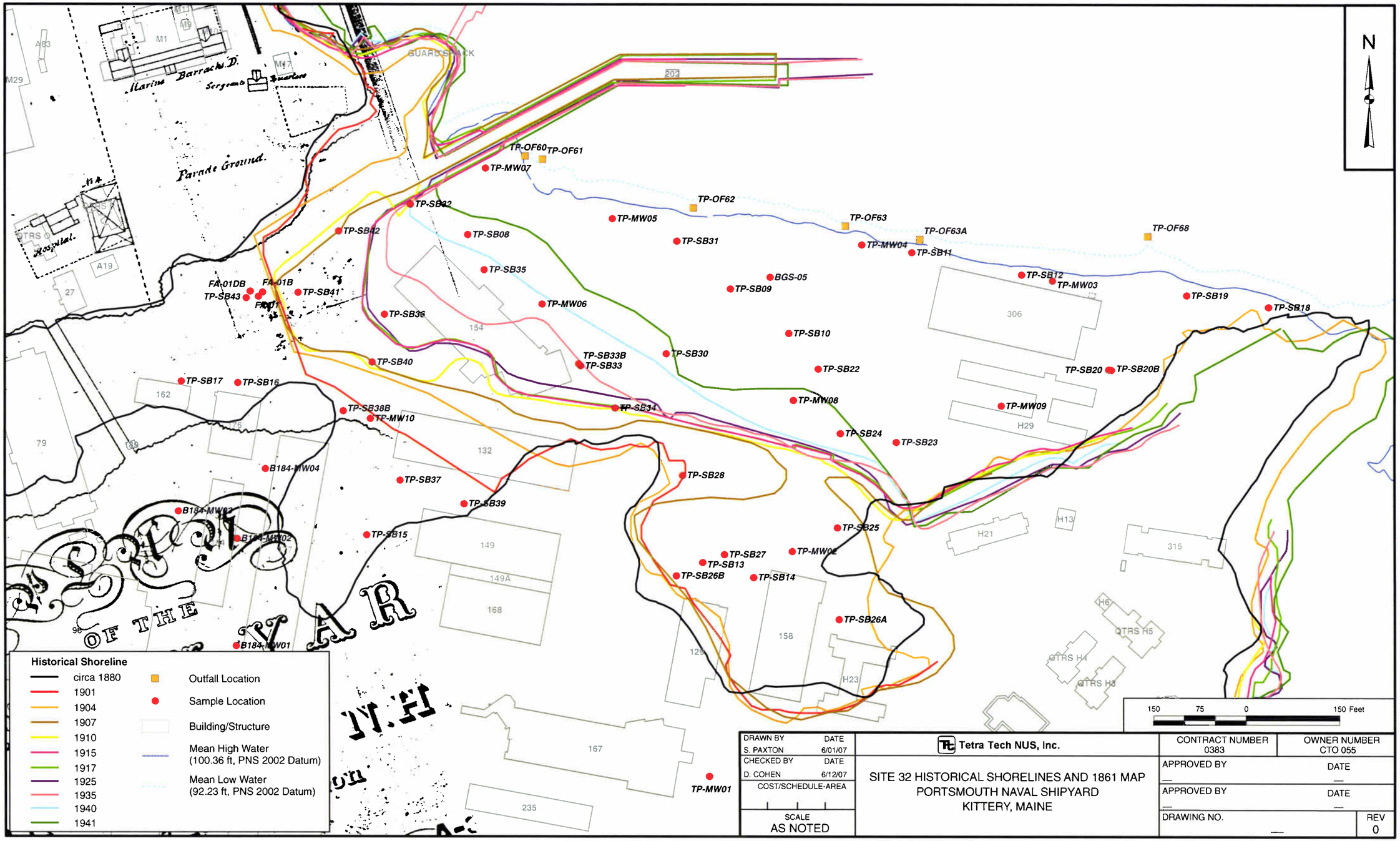

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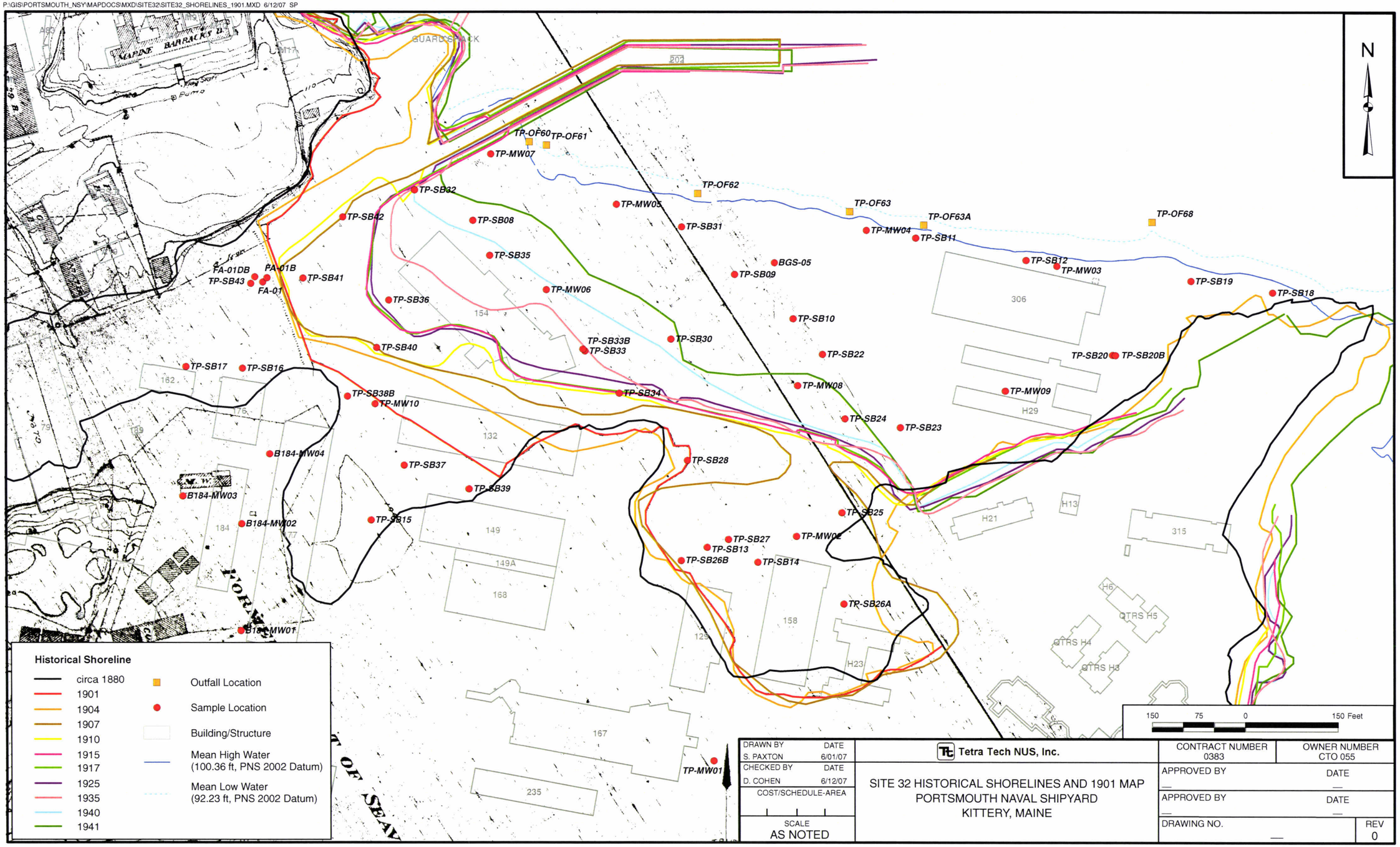

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SITE 32 HISTORICAL SHORELINES AND 1901 MAP
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

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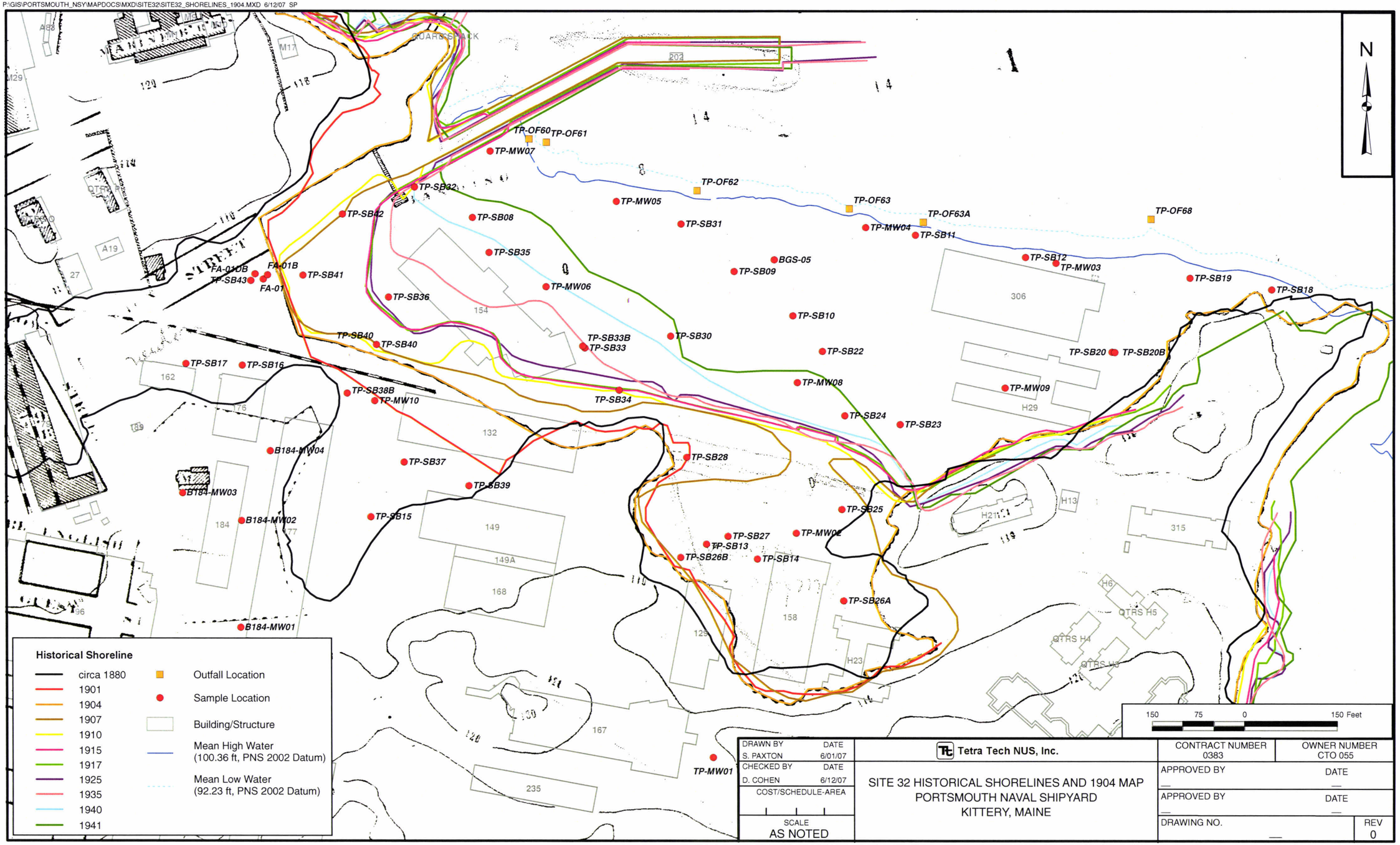

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SITE 32 HISTORICAL SHORELINES AND 1904 MAP
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

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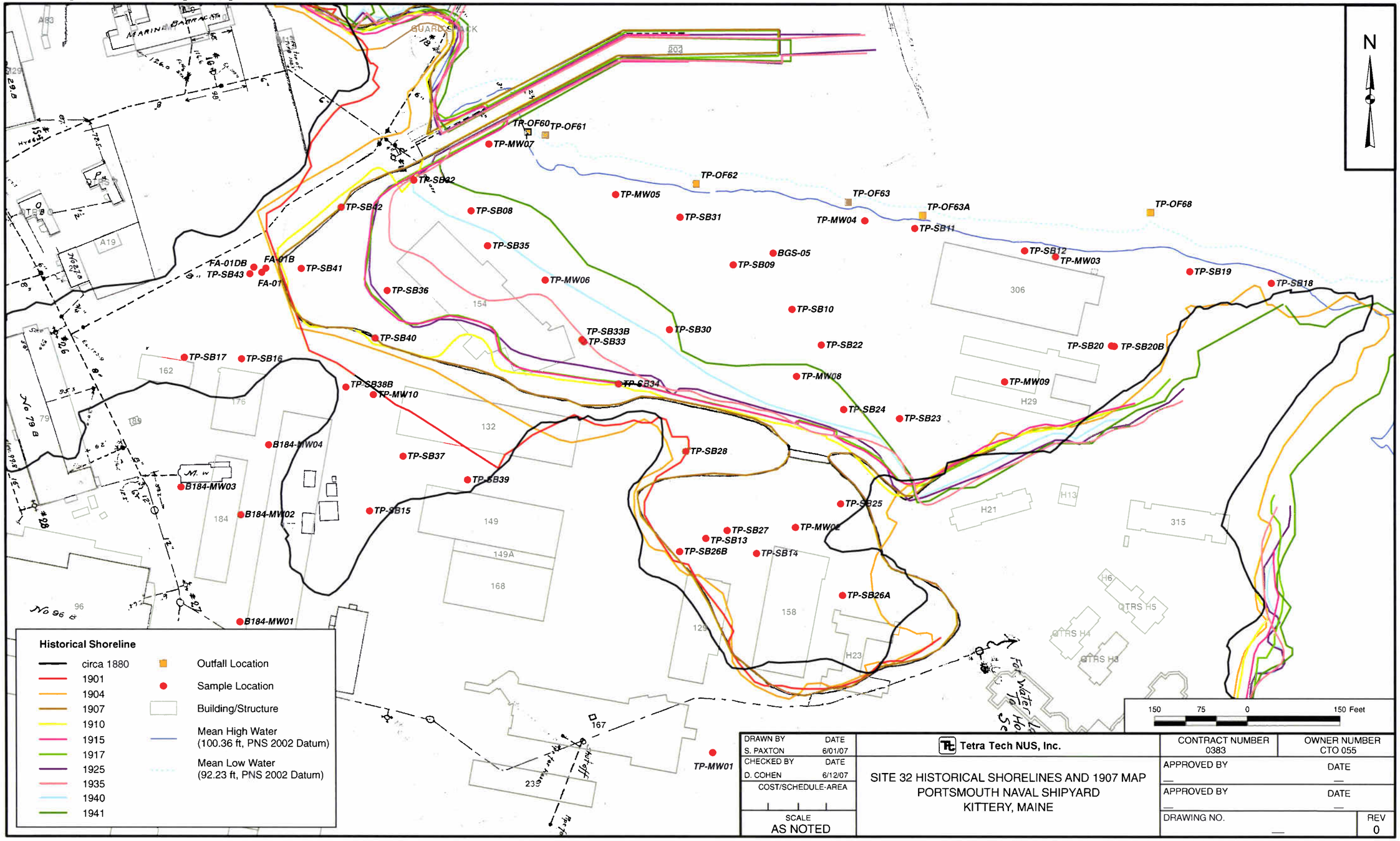

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SITE 32 HISTORICAL SHORELINES AND 1907 MAP
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

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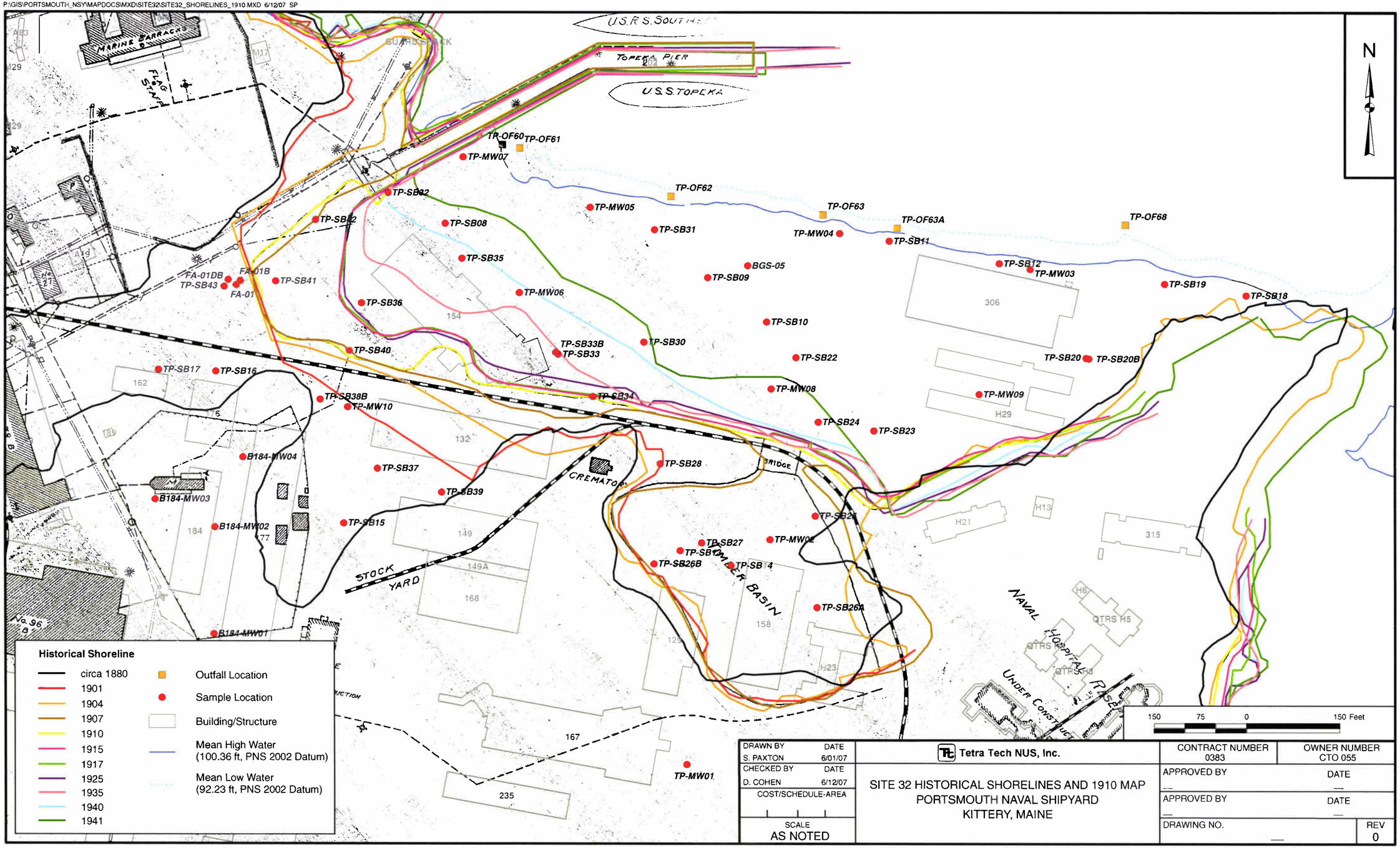

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SITE 32 HISTORICAL SHORELINES AND 1910 MAP
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

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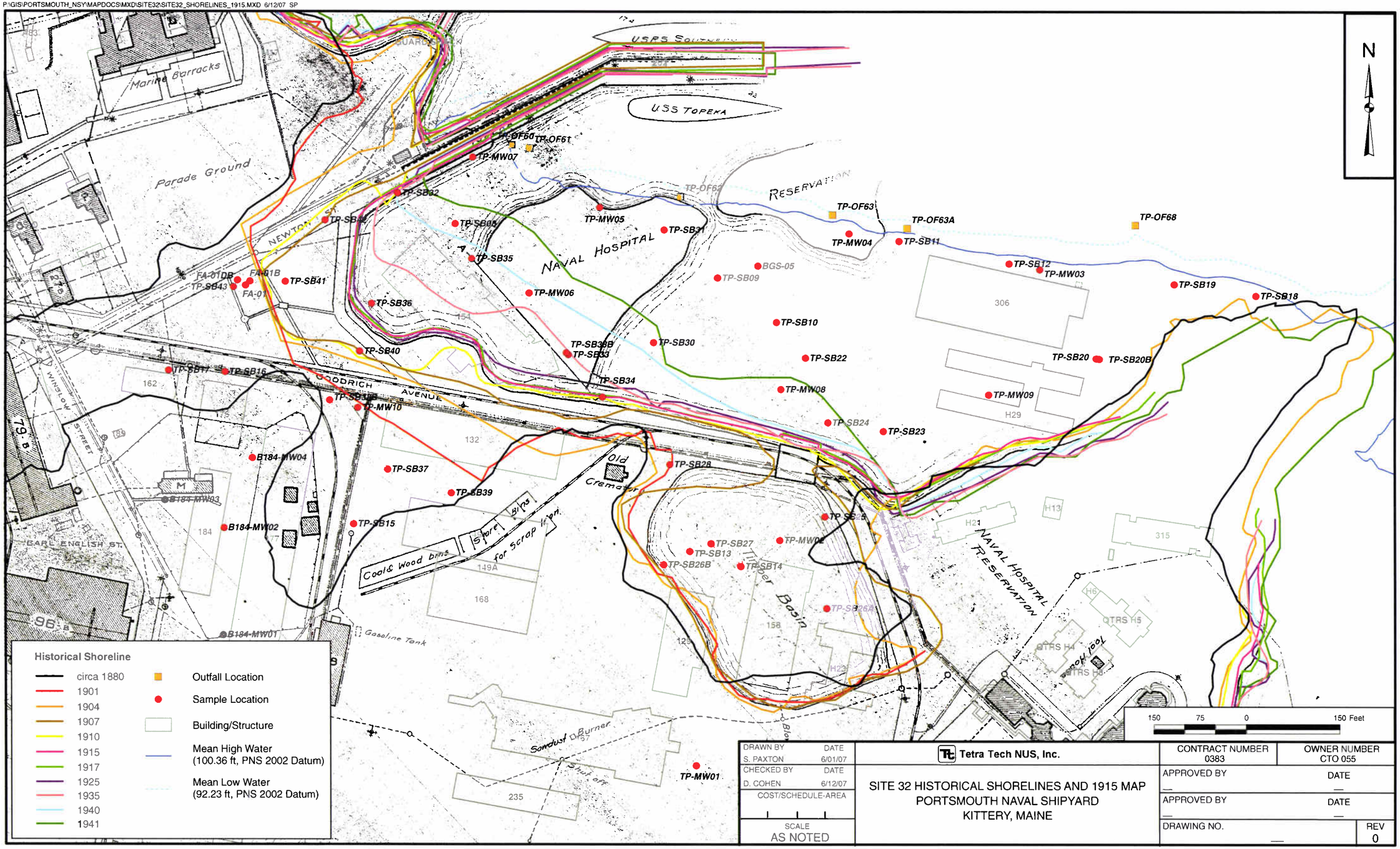

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SITE 32 HISTORICAL SHORELINES AND 1915 MAP
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

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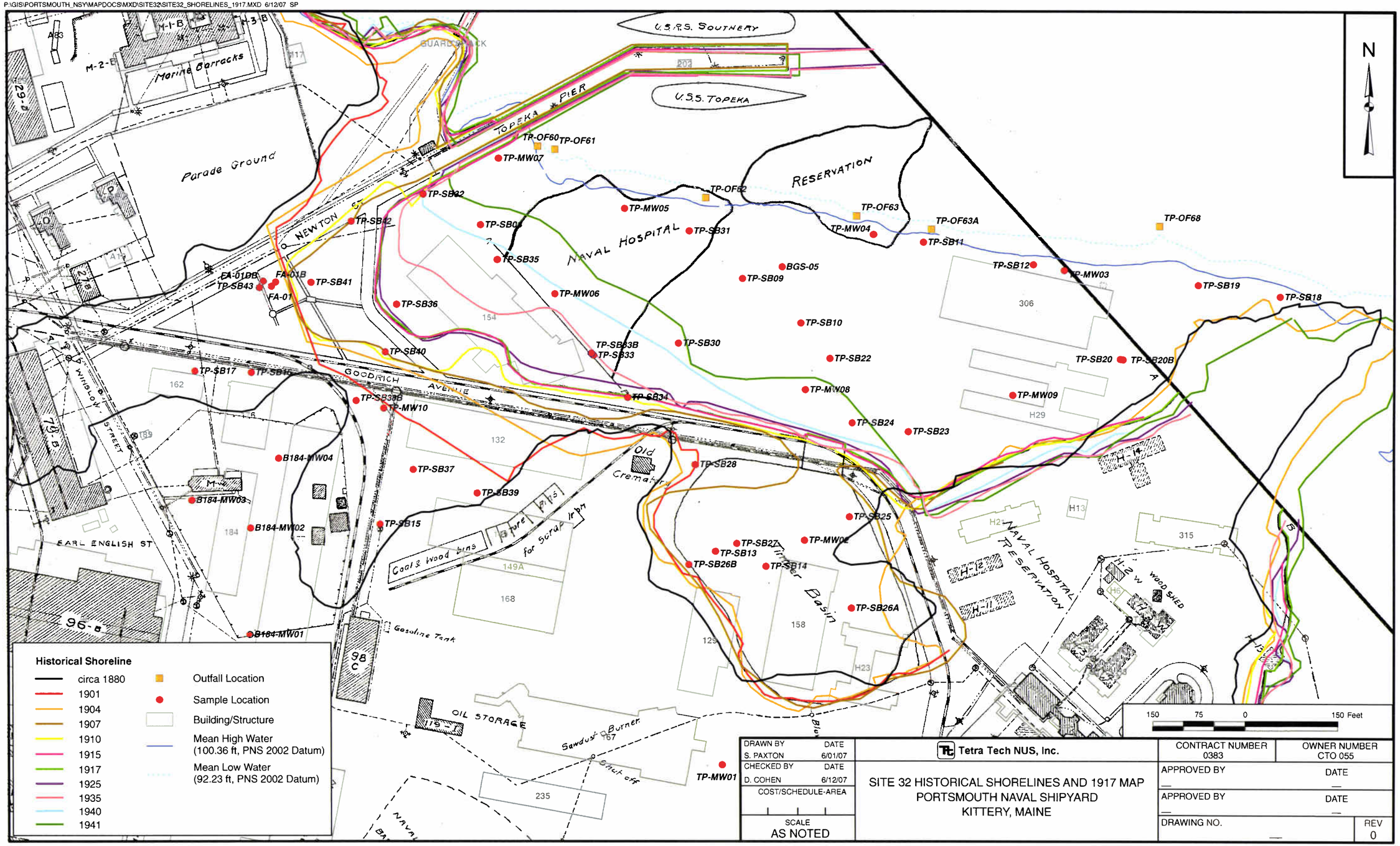

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Tetra Tech NUS, Inc.

SITE 32 HISTORICAL SHORELINES AND 1917 MAP
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

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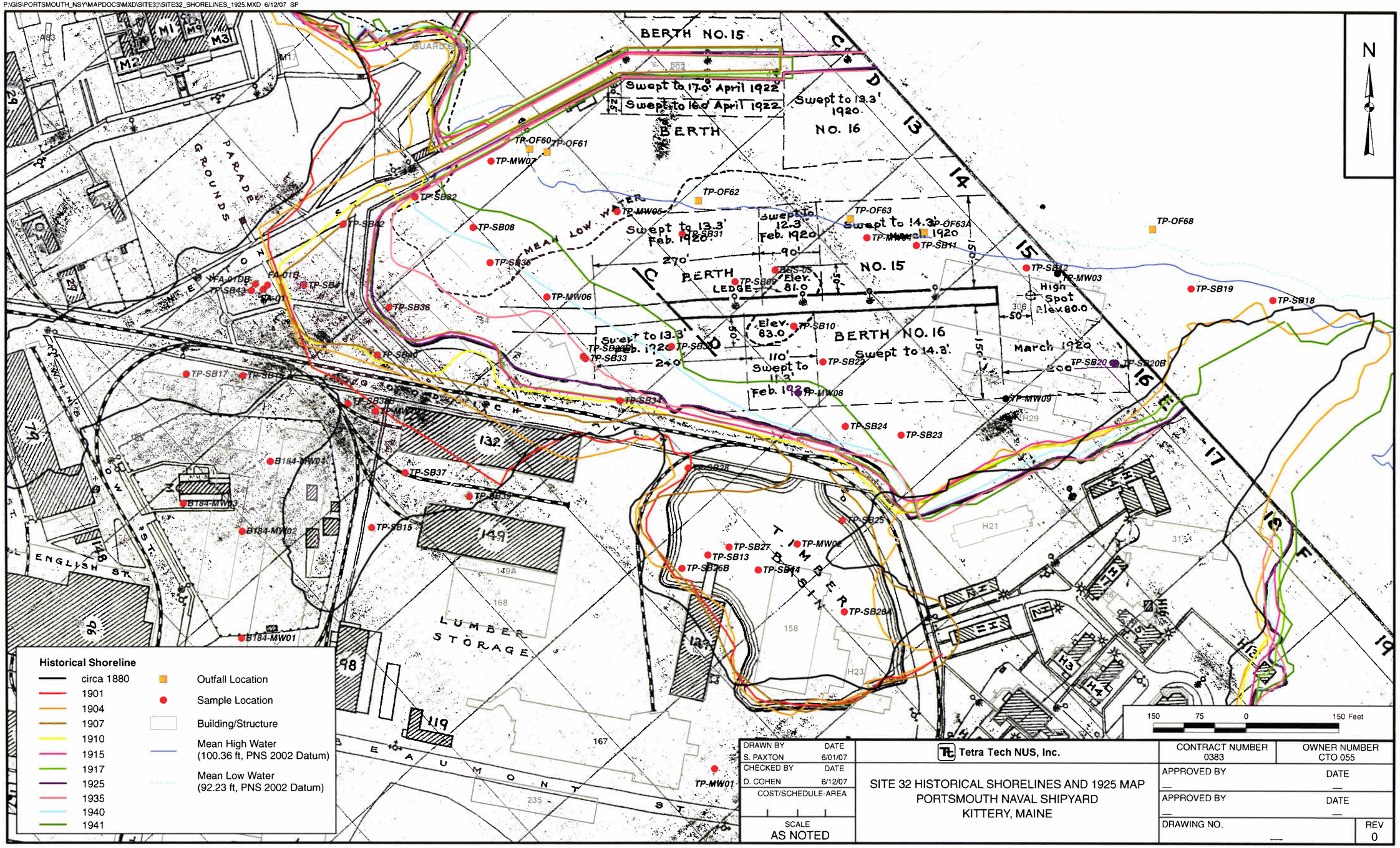

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Tetra Tech NUS, Inc.

SITE 32 HISTORICAL SHORELINES AND 1925 MAP
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

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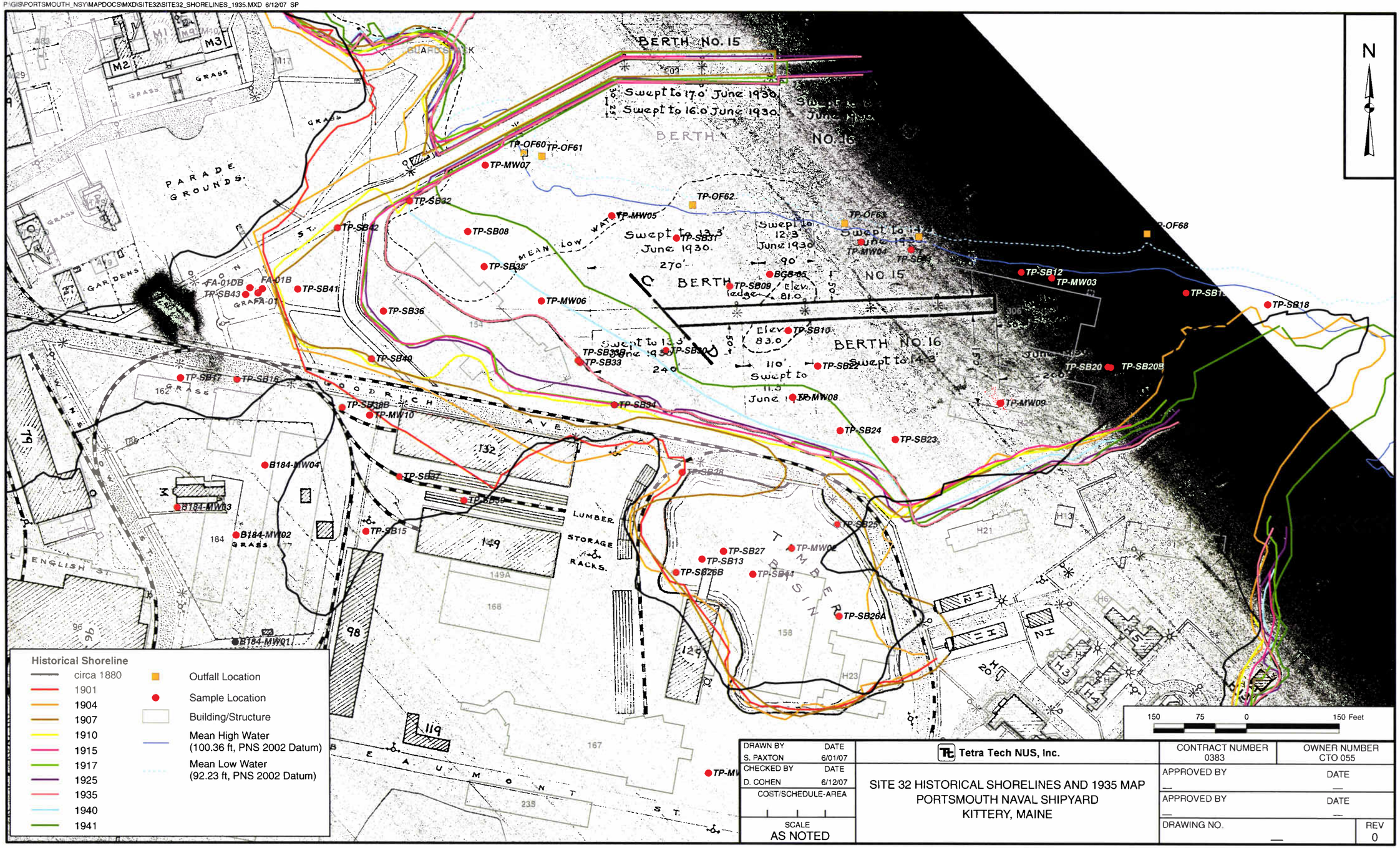

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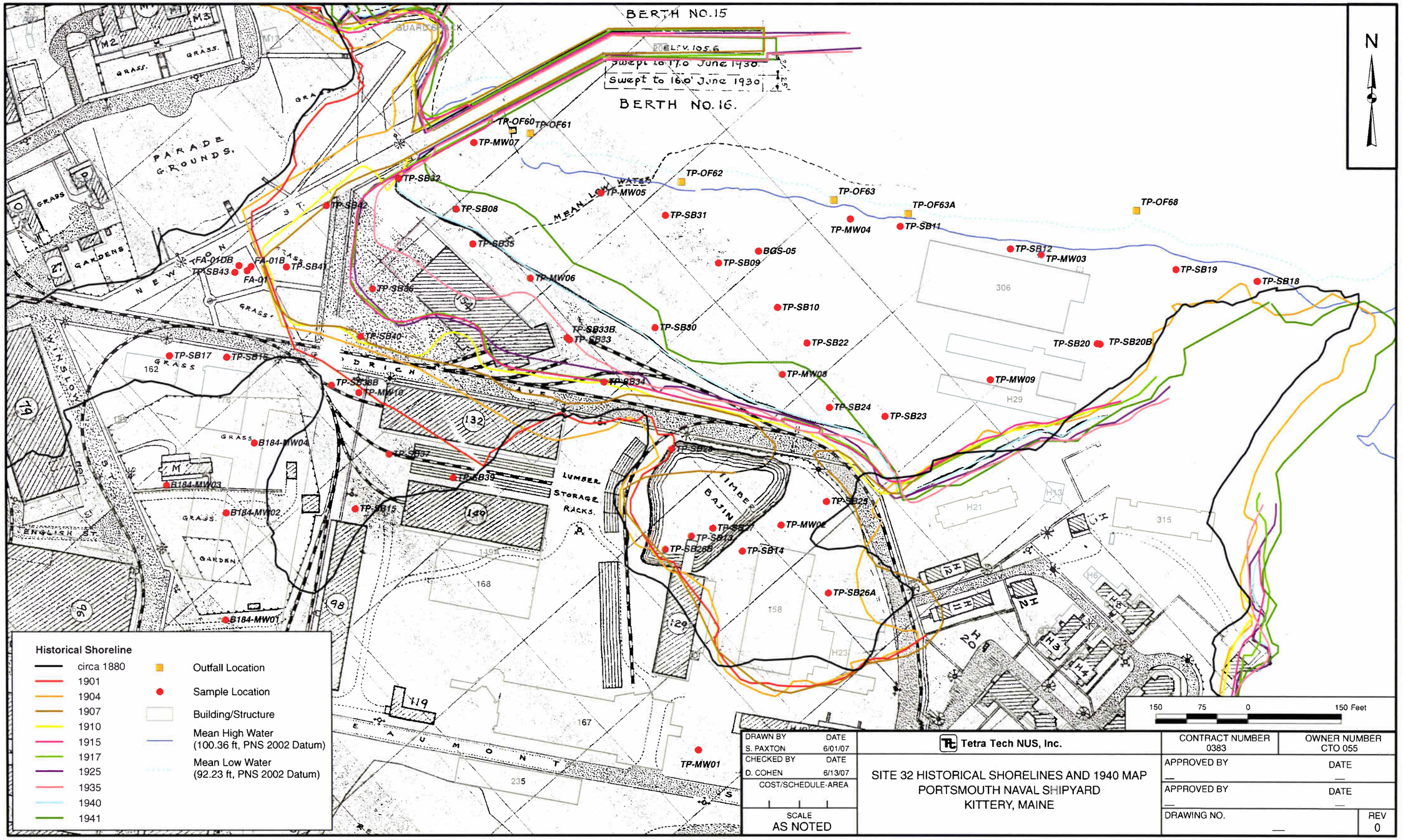

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Tetra Tech NUS, Inc.

SITE 32 HISTORICAL SHORELINES AND 1940 MAP
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

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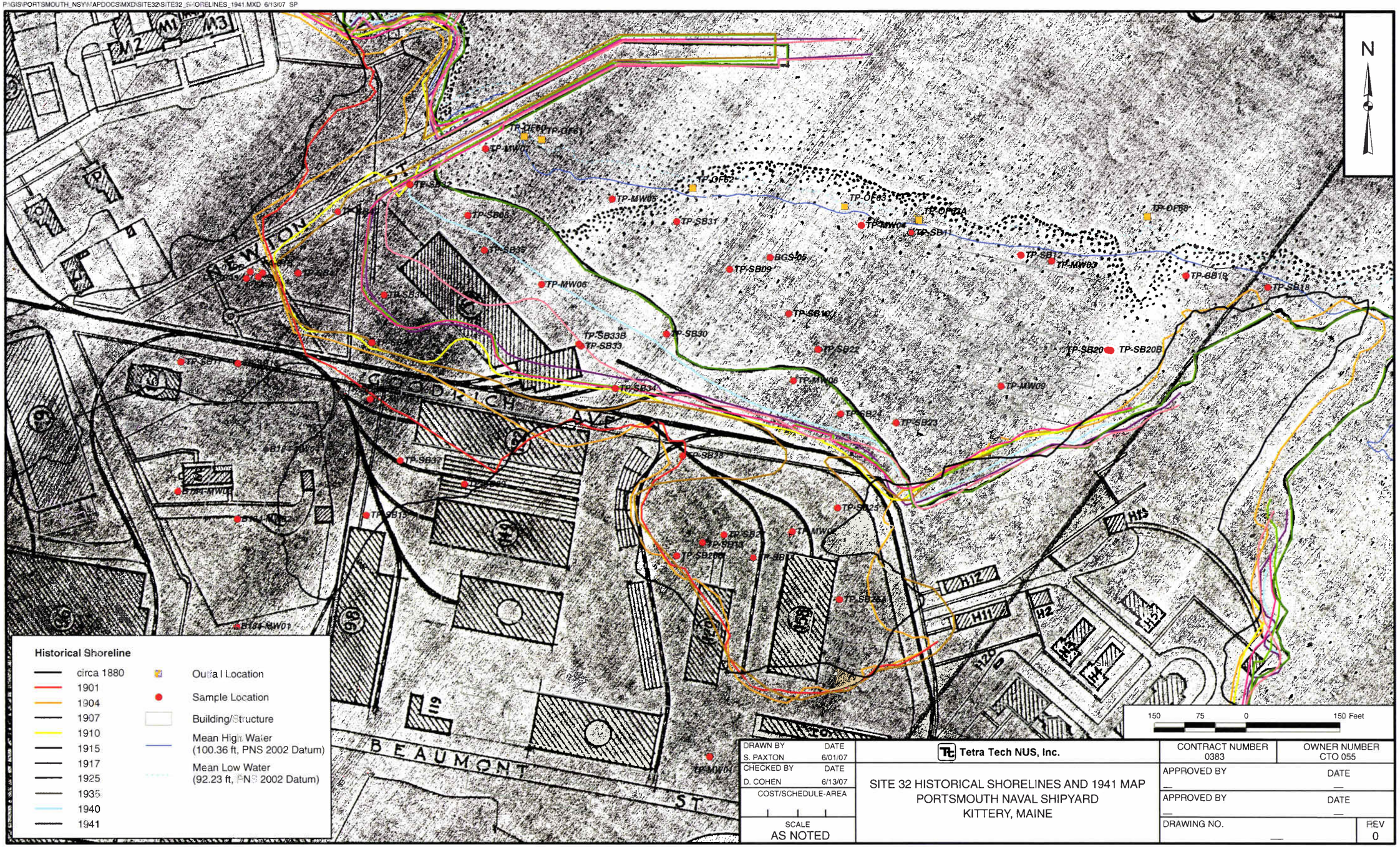

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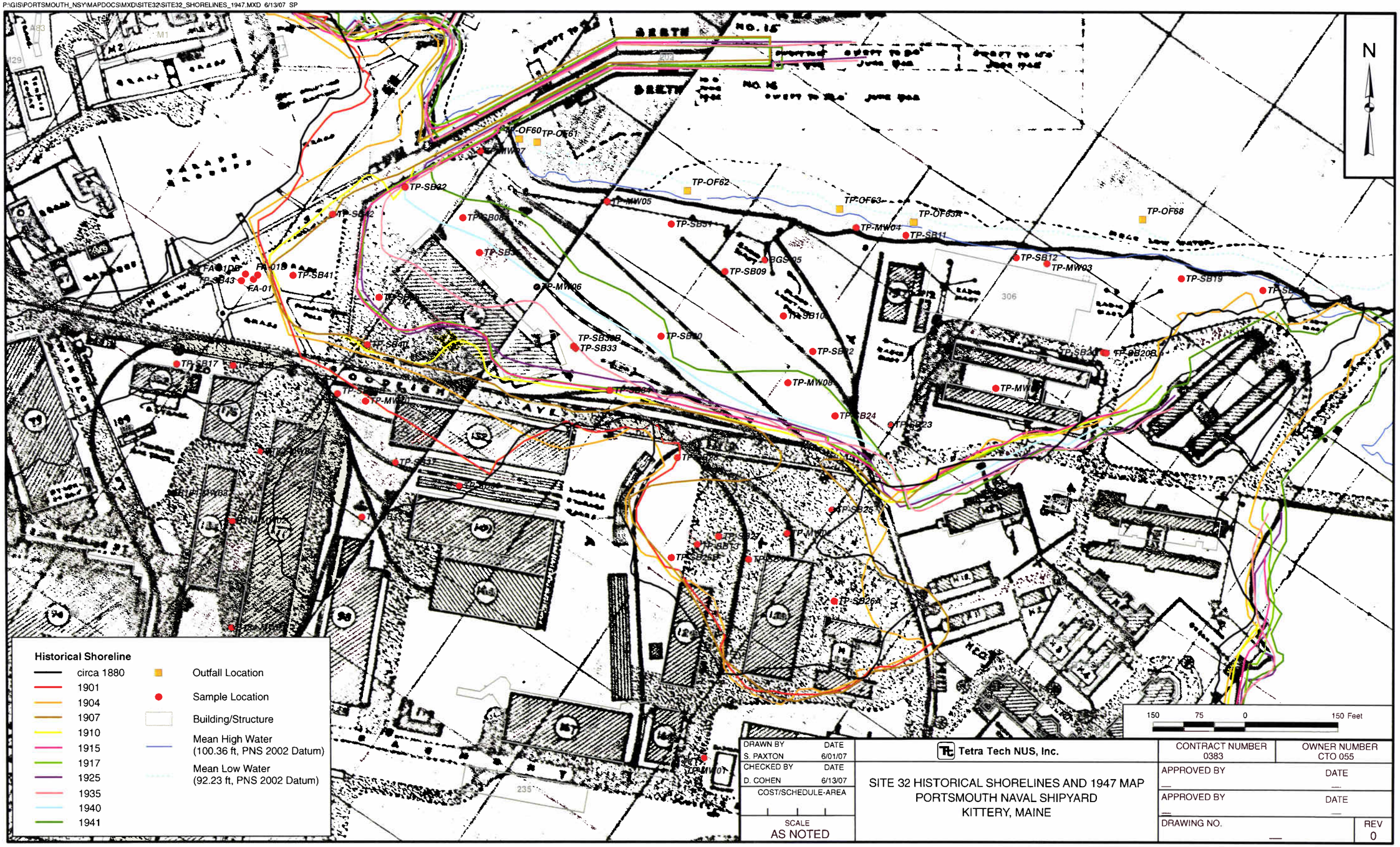

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Tetra Tech NUS, Inc.

SITE 32 HISTORICAL SHORELINES AND 1947 MAP
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

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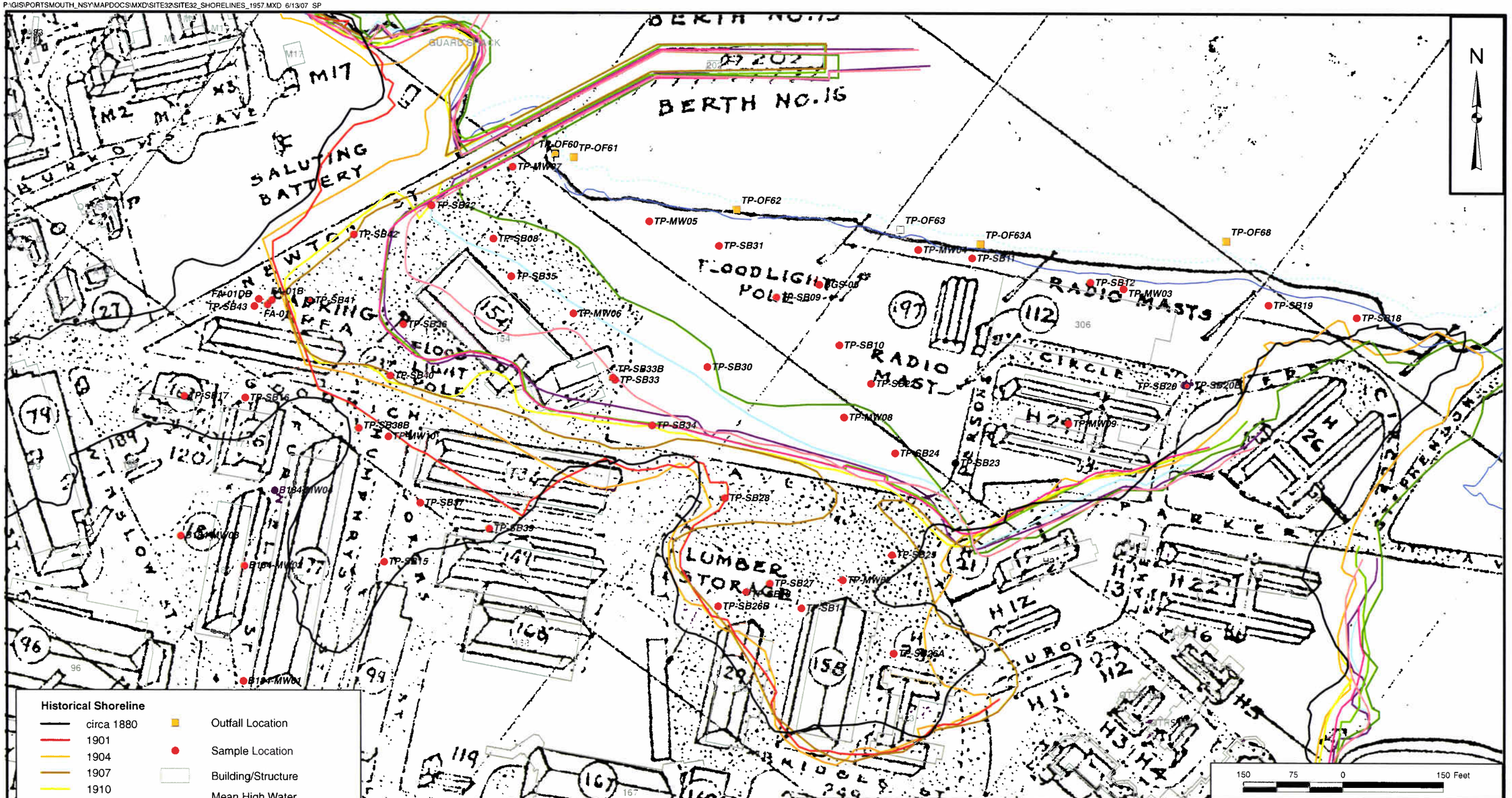

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CHECKED BY D. COHEN	DATE 6/13/07	SITE 32 HISTORICAL SHORELINES AND 1957 MAP PORTSMOUTH NAVAL SHIPYARD KITTERY, MAINE	APPROVED BY — DATE —
COST/SCHEDULE-AREA			APPROVED BY — DATE —
SCALE AS NOTED			DRAWING NO. — REV 0

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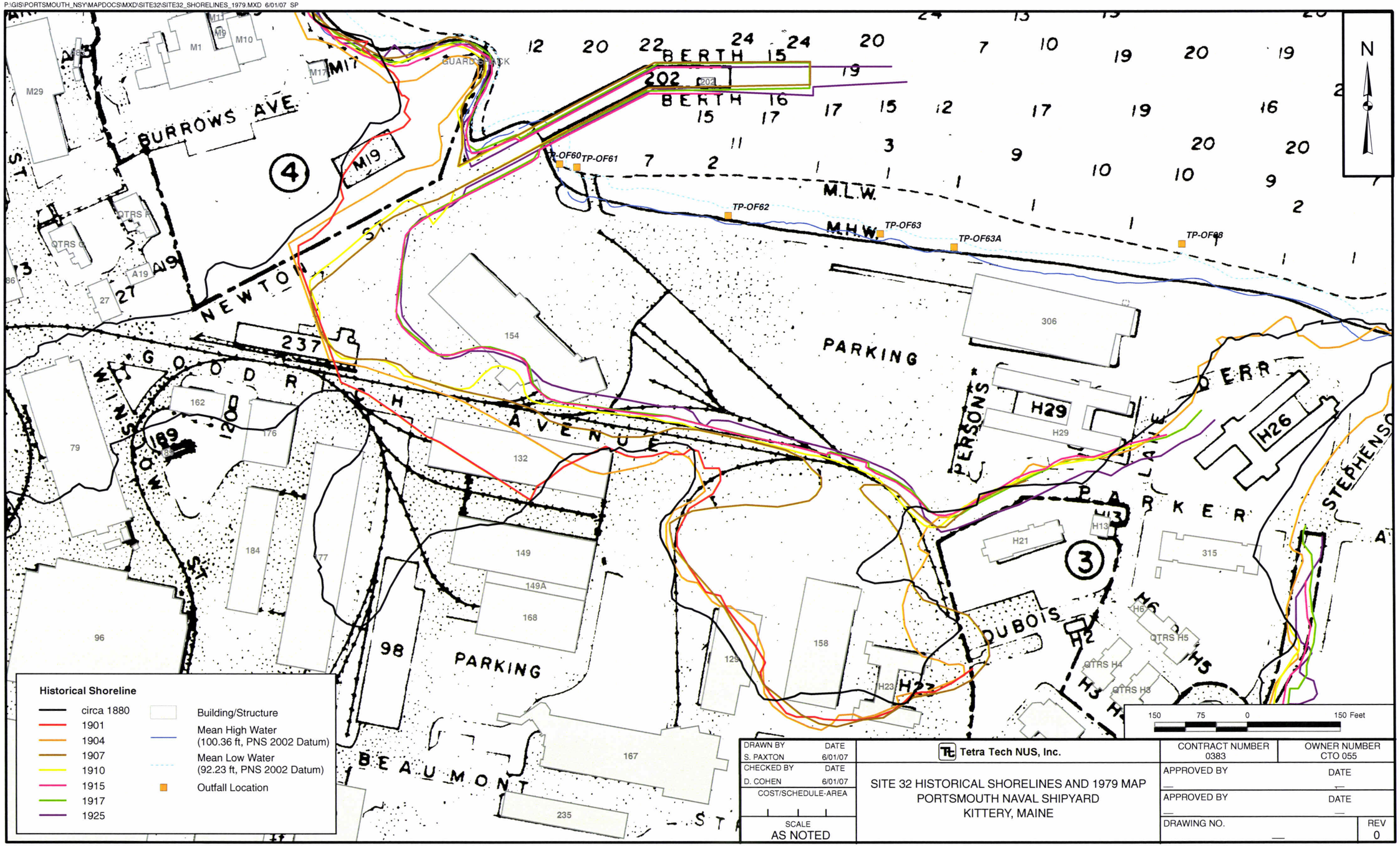

DRAWN BY	DATE
S. PAXTON	6/01/07
CHECKED BY	DATE
D. COHEN	6/01/07
COST/SCHEDULE-AREA	
SCALE AS NOTED	

Tetra Tech NUS, Inc.

SITE 32 HISTORICAL SHORELINES AND 1979 MAP
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

CONTRACT NUMBER 0383	OWNER NUMBER CTO 055
APPROVED BY —	DATE —
APPROVED BY —	DATE —
DRAWING NO. —	REV 0

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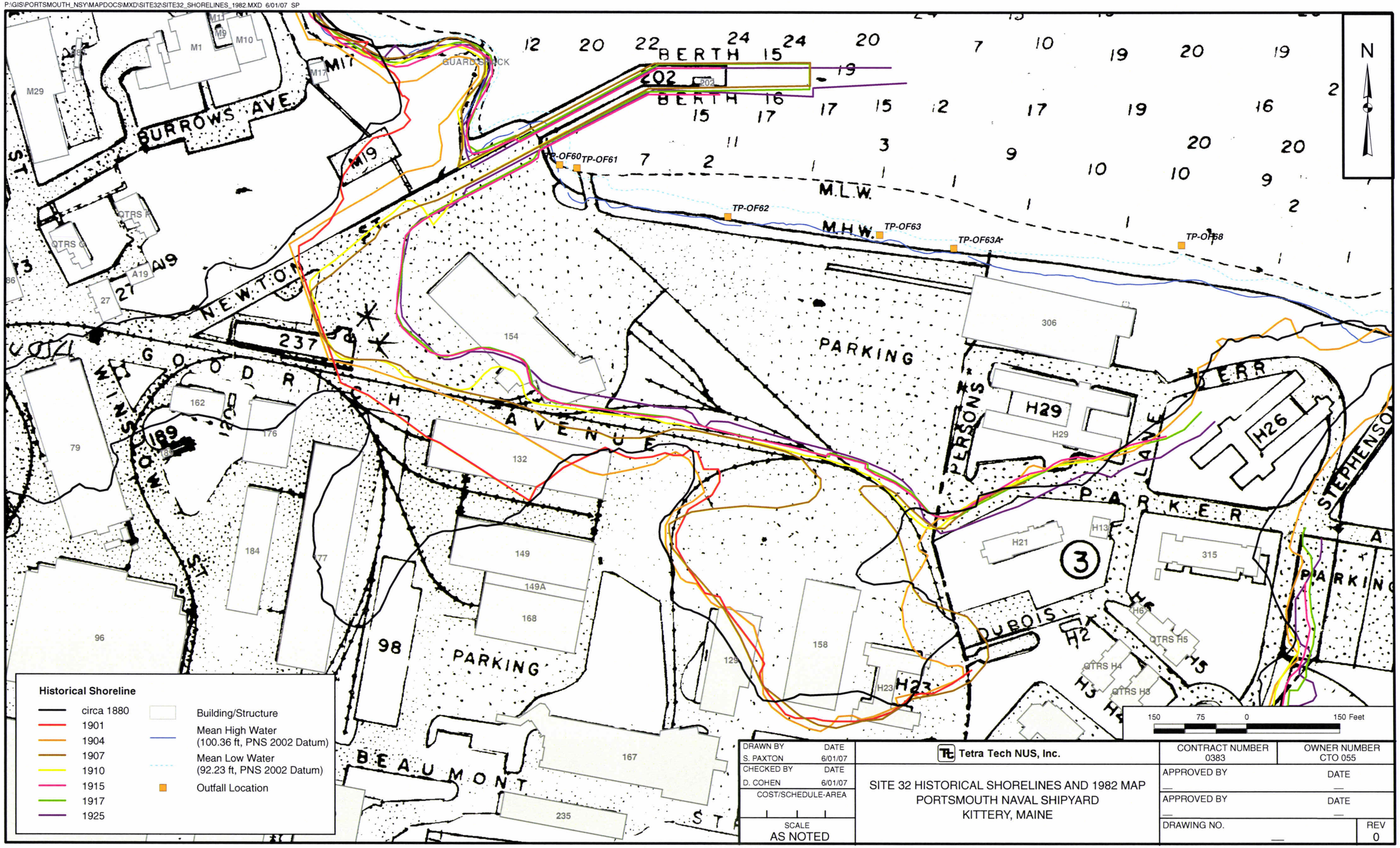

DRAWN BY	DATE
S. PAXTON	6/01/07
CHECKED BY	DATE
D. COHEN	6/01/07
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

Tetra Tech NUS, Inc.

SITE 32 HISTORICAL SHORELINES AND 1982 MAP
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

CONTRACT NUMBER	OWNER NUMBER
0383	CTO 055
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO.	REV
	0

A.2 SOIL BORING AND MONITORING WELL CONSTRUCTION LOGS

TABLE I
SUMMARY OF BORINGS
BACHELOR ENLISTED QUARTER
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

BORING NUMBER	APPROX. GND. SURFACE EL. (FT)	DEPTH (FT)	DEPTH TO WATER (FT)	STRATA THICKNESS (FT)			
				TOPSOIL	FILL	GLACIAL TILL	WEATHERED BEDROCK
BEQ1	106.7	9.0	6.0	0.5	8.5*	--	--
BEQ1A	106.5	9.9	NE	0.5	9.4*	--	--
BEQ2	112.5	6.1	NE	0.8	5.3*	--	--
BEQ3	106.0	7.7	NE	1.5	--	6.0	0.2*
BEQ4	114.0	1.8	NE	--	1.8*	--	--
BEQ4A	114.2	3.5	NE	--	3.5*	--	--
BEQ4B	113.9	2.7	NE	--	2.7*	--	--
BEQ5	113.9	8.0	NE	--	6.6	1.2	0.2*
BEQ6	113.6	8.8	NE	0.5	8.3*	--	--
BEQ7	115.0	1.1	NE	0.2	0.9*	--	--
BEQ7A	115.2	6.2	NE	0.2	6.0*	--	--
BEQ7B	115.2	6.1	NE	0.2	5.9*	--	--
BEQ8	108.0	4.7	NE	1.8	2.9*	--	--
BEQ8A	109.1	7.0	NE	1.0	6.0*	--	--
BEQ9	114.8	2.2	NE	0.5	1.7*	--	--
BEQ9A	114.8	2.5	NE	0.5	2.0*	--	--
BEQ9B	114.8	5.1	NE	0.5	4.6*	--	--
BEQ10	111.8	8.5	NE	0.5	4.7	2.8	0.5*

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TABLE I – CONTINUED

BORING NUMBER	APPROX. GND. SURFACE EL. (FT)	DEPTH (FT)	DEPTH TO WATER (FT)	STRATA THICKNESS (FT)			
				TOPSOIL	FILL	GLACIAL TILL	WEATHERED BEDROCK
BEQ11	109.3	4.3	NE	0.5	3.4	--	0.4*
BEQ12	110.7	6.1	NE	0.5	4.5	0.2	0.9*

NOTES:
1. Elevations referenced to Portsmouth Naval Shipyard Datum
2. NE Indicates groundwater not encountered within depth of boring.
3. -- Indicates stratum not encountered within depth of borings.
4. * Indicates depth of penetration into stratum.

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TEST BORING REPORT

Boring No. BEQ1

Project	Proposed Bachelor Enlisted Quarters Portsmouth Naval Shipyard, Kittery, Maine
Client	Oest Associates, Inc.
Contractor	Maine Test Borings, Inc.

File No.	27448-001
Sheet No.	1 of 1
Start	26 April 2001
Finish	26 April 2001
Driller	M. Porter
H&A Rep.	K. Stephenson
Elevation Datum	106.7
Location	See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S		Rig Make & Model: Mobile B50 Track Mounted
Inside Diameter (in.)	4.25	1 3/8		Bit Type: Cutting Head
Hammer Weight (lb.)		140	-	Drill Mud:
Hammer Fall (in.)		30	-	Casing:
				Hoist/Hammer: Winch/ Doughnut Hammer

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	1 6 8 9	S1 16	0.0 2.0	NO WELL INSTALLED	106.2 0.5	ML	Very soft, brown sandy SILT with grass, roots -TOPSOIL/FILL-			5	5	30	60				
					105.8 0.9	CL	Medium dense, black stained SAND with cinders, dry, mps 1/2" -FILL-						100				
							Very stiff, brown silty CLAY with shells, fibers, dry										
							Note: Metal in auger cuttings										
5	1 1 2 3	S2 18	5.0 7.0		101.2 5.5	CL	Soft, gray silty CLAY, shells, wood						100				
					97.7 9.0		Hollow stem auger refusal at 9.0ft. Bottom of Exploration										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft.) to: Bottom of Casing	Bottom of Hole	Water
4/26/01	1530	0	-	6.7	6.0

Sample Identification

O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon
G Geoprobe

Well Diagram

Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (lin. ft.)	9
Rock Cored (lin. ft.)	-
Samples	2S

Boring No. BEQ1

Field Tests: Dilatancy: R-Rapid, S-Slow, N-None
Toughness: L-Low, M-Medium, H-High
Plasticity: N-Nonplastic, L-Low, M-Medium, H-High
Dry Strength: N-None, L-Low, M-Medium, H-High, V-Very High

*SPT = Sampler blows per 6 in. **Maximum particle size is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

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TEST BORING REPORT

Boring No. BEQ1A

Project	Proposed Bachelor Enlisted Quarters Portsmouth Naval Shipyard, Kittery, Maine
Client	Oest Associates, Inc.
Contractor	Maine Test Borings, Inc.

File No.	27448-001
Sheet No.	1 of 1
Start	26 April 2001
Finish	26 April 2001
Driller	M. Porter
H&A Rep.	K. Stephenson
Elevation Datum	106.5
Location	See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	SSA	S		Rig Make & Model: Mobile B50 Track Mounted
Inside Diameter (in.)		1 3/8		Bit Type: Cutting Head
Hammer Weight (lb.)		140	-	Drill Mud:
Hammer Fall (in.)		30	-	Casing:
				Hoist/Hammer: Winch/ Doughnut Hammer

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0				NO WELL INSTALLED			See BEQ1 for overburden details Solid stem auger to 9.9ft.										
5					96.6												
					9.9		Solid stem auger refusal at 9.9 ft. Bottom of Exploration Note: Borehole caved at 3.1 ft., dry.										

Water Level Data					
Date	Time	Elapsed Time (hr.)	Depth (ft.) to: Bottom of Casing	Bottom of Hole	Water

Sample Identification	
O	Open End Rod
T	Thin Wall Tube
U	Undisturbed Sample
S	Split Spoon
G	Geoprobe

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary	
Overburden (lin. ft.)	9.9
Rock Cored (lin. ft.)	-
Samples	

Boring No. BEQ1A

Field Tests: Dilatancy: R-Rapid, S-Slow, N-None Plasticity: N-Nonplastic, L-Low, M-Medium, H-High
Toughness: L-Low, M-Medium, H-High Dry Strength: N-None, L-Low, M-Medium, H-High, V-Very High

*SPT = Sampler blows per 6 in. **Maximum particle size is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

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HALEY & ALDRICH

TEST BORING REPORT

Boring No. BEQ2

Project	Proposed Bachelor Enlisted Quarters Portsmouth Naval Shipyard, Kittery, Maine
Client	Oest Associates, Inc.
Contractor	Maine Test Borings, Inc.

File No.	27448-001
Sheet No.	1 of 1
Start	26 April 2001
Finish	26 April 2001
Driller	M. Porter
H&A Rep.	K. Stephenson
Elevation Datum	112.5
Location	See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S		Rig Make & Model: Mobile B50 Track Mounted
Inside Diameter (in.)	4.25	1 3/8		Bit Type: Cutting Head
Hammer Weight (lb.)		140	-	Drill Mud:
Hammer Fall (in.)		30	-	Casing:
				Hoist/Hammer: Winch/ Doughnut Hammer

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	2 4 8 8	S1 8	0.0 2.0	NO WELL INSTALLED	111.7	SM	Loose, brown SAND with silt, grass roots, gravel in tip, mps 1.5in., dry	10			20	55	15				
					0.8		-TOPSOIL/FILL-										
						GM	Probable gravel and cobbles to 5.0 ft. -FILL-										
5	12 62 50/.1	S2 7	5.0 6.1		106.4		Very dense, brown silty GRAVEL with sand, mps 1.5in., dry	20	30	20	5	10	15				
					6.1		Solid stem auger refusal at 6.1 ft. Bottom of Exploration										

Water Level Data					
Date	Time	Elapsed Time (hr.)	Depth (ft.) to: Bottom of Casing	Bottom of Hole	Water

Sample Identification

- O Open End Rod
- T Thin Wall Tube
- U Undisturbed Sample
- S Split Spoon
- G Geoprobe

Well Diagram

- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

Summary

Overburden (lin. ft.)	6.1
Rock Cored (lin. ft.)	-
Samples	2S

Boring No. BEQ2

Field Tests: Dilatancy: R-Rapid, S-Slow, N-None; Toughness: L-Low, M-Medium, H-High; Plasticity: N-Nonplastic, L-Low, M-Medium, H-High; Dry Strength: N-None, L-Low, M-Medium, H-High, V-Very High

*SPT = Sampler blows per 6 in. **Maximum particle size is determined by direct observation within the limitations of sampler size.

Note: Soil Identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

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TEST BORING REPORT

Boring No. BEQ3

Project	Proposed Bachelor Enlisted Quarters Portsmouth Naval Shipyard, Kittery, Maine
Client	Oest Associates, Inc.
Contractor	Maine Test Borings, Inc.

File No.	27448-001
Sheet No.	1 of 1
Start	26 April 2001
Finish	26 April 2001
Driller	M. Porter
H&A Rep.	K. Stephenson
Elevation Datum	106.0
Location	See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	SSA	S		Rig Make & Model: Mobile B50 Track Mounted
Inside Diameter (in.)		1 3/8		Bit Type: Cutting Head
Hammer Weight (lb.)		140	-	Drill Mud:
Hammer Fall (in.)		30	-	Casing:
				Hoist/Hammer: Winch/ Doughnut Hammer

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	1	S1	0.0	NO WELL INSTALLED	105.7		-FOREST MAT-										
	2	10	2.0		0.3	ML	Medium stiff, dark brown SILT with sand, trace fine gravel				10	30	60				
	3				104.5		-TOPSOIL-										
	19				1.5	ML	Medium dense, rust brown sandy SILT with gravel, dry, mps 1.25in.	10	5	5	10	10	60				
							-GLACIAL TILL-										
							Solid stem auger to 5.5 ft.										
5	46	S2	5.5			SM	Very dense, brown silty SAND with gravel, mps 1.5in, wet	10	15	5	5	50	15				
	49	24	7.5														
	48																
	50				98.5												
					7.5		Augered through Bedrock to 7.7 ft.										
					98.3		Solid stem auger refusal at 7.7 ft.										
					7.7		Bottom of Exploration										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft.) to: Bottom of Casing	Bottom of Hole	Water

Sample Identification

- O Open End Rod
- T Thin Wall Tube
- U Undisturbed Sample
- S Split Spoon
- G Geoprobe

Well Diagram

- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

Summary

Overburden (lin. ft.)	7.5
Rock Cored (lin. ft.)	-
Samples	2S

Boring No. BEQ3

Field Tests: Dilatancy: R-Rapid, S-Slow, N-None Toughness: L-Low, M-Medium, H-High Plasticity: N-Nonplastic, L-Low, M-Medium, H-High Dry Strength: N-None, L-Low, M-Medium, H-High, V-Very High

*SPT = Sampler blows per 6 in. **Maximum particle size is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

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TEST BORING REPORT

Boring No. BEQ4

Project	Proposed Bachelor Enlisted Quarters Portsmouth Naval Shipyard, Kittery, Maine
Client	Oest Associates, Inc.
Contractor	Maine Test Borings, Inc.

File No.	27448-001
Sheet No.	1 of 1
Start	27 April 2001
Finish	27 April 2001
Driller	M. Porter
H&A Rep.	K. Stephenson
Elevation Datum	114.0
Location	See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	SSA	S		Rig Make & Model: Mobile B50 Track Mounted
Inside Diameter (in.)		1 3/8		Bit Type: Cutting Head
Hammer Weight (lb.)		140	-	Drill Mud:
Hammer Fall (in.)		30	-	Casing:
				Hoist/Hammer: Winch/ Doughnut Hammer

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	23	S1	0.0	NO WELL INSTALLED		SW-SM	Dense, brown well graded SAND with silt and gravel, dry, mps 1-3/8", probable cobbles	15	10	5	30	30	10				
	16	12	1.7														
	25																
	50/.2				112.2		-FILL-										
					1.8												

Water Level Data					
Date	Time	Elapsed Time (hr.)	Depth (ft.) to: Bottom of Casing	Bottom of Hole	Water

Sample Identification	
O	Open End Rod
T	Thin Wall Tube
U	Undisturbed Sample
S	Split Spoon
G	Geoprobe

Well Diagram	
	Riser Pipe
	Screen
	Filter Sand
	Cuttings
	Grout
	Concrete
	Bentonite Seal

Summary	
Overburden (lin. ft.)	1.8
Rock Cored (lin. ft.)	-
Samples	1S

Boring No. BEQ4

Field Tests: Dilatancy: R-Rapid, S-Slow, N-None Toughness: L-Low, M-Medium, H-High Plasticity: N-Nonplastic, L-Low, M-Medium, H-High Dry Strength: N-None, L-Low, M-Medium, H-High, V-Very High

*SPT = Sampler blows per 6 in. **Maximum particle size is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

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HALEY & ALDRICH

TEST BORING REPORT

Boring No. BEQ4A

Project	Proposed Bachelor Enlisted Quarters Portsmouth Naval Shipyard, Kittery, Maine
Client	Oest Associates, Inc.
Contractor	Maine Test Borings, Inc.

File No.	27448-001
Sheet No.	1 of 1
Start	27 April 2001
Finish	27 April 2001
Driller	M. Porter
H&A Rep.	K. Stephenson
Elevation Datum	114.2
Location	See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	SSA	S		Rig Make & Model: Mobile B50 Track Mounted
Inside Diameter (in.)		1 3/8		Bit Type: Cutting Head
Hammer Weight (lb.)		140	-	Drill Mud:
Hammer Fall (in.)		30	-	Casing:
				Hoist/Hammer: Winch/ Doughnut Hammer

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0				NO WELL INSTALLED			See BEQ4 for overburden details Solid stem auger to 3.5 ft.										
					110.7 3.5		Solid stem auger refusal at 3.5 ft. Bottom of Exploration										

Water Level Data					
Date	Time	Elapsed Time (hr.)	Depth (ft.) to: Bottom of Casing	Bottom of Hole	Water

Sample Identification	
O	Open End Rod
T	Thin Wall Tube
U	Undisturbed Sample
S	Split Spoon
G	Geoprobe

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary	
Overburden (lin. ft.)	3.5
Rock Cored (lin. ft.)	-
Samples	
Boring No.	**BEQ4A**

Field Tests: Dilatancy: R-Rapid, S-Slow, N-None Toughness: L-Low, M-Medium, H-High Plasticity: N-Nonplastic, L-Low, M-Medium, H-High Dry Strength: N-None, L-Low, M-Medium, H-High, V-Very High

*SPT = Sampler blows per 6 in. **Maximum particle size is determined by direct observation within the limitations of sampler size.

Note: Soil Identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

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HALEY & ALDRICH

TEST BORING REPORT

Boring No. BEQ4B

Project	Proposed Bachelor Enlisted Quarters Portsmouth Naval Shipyard, Kittery, Maine
Client	Oest Associates, Inc.
Contractor	Maine Test Borings, Inc.

File No.	27448-001
Sheet No.	1 of 1
Start	27 April 2001
Finish	27 April 2001
Driller	M. Porter
H&A Rep.	K. Stephenson
Elevation Datum	113.9
Location	See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	SSA	S		Rig Make & Model: Mobile B50 Track Mounted
Inside Diameter (in.)		1 3/8		Bit Type: Cutting Head
Hammer Weight (lb.)		140	-	Drill Mud:
Hammer Fall (in.)		30	-	Casing:
				Hoist/Hammer: Winch/ Doughnut Hammer

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0				NO WELL INSTALLED			See BEQ4 for overburden details Solid stem auger to 2.7 ft.										
					111.2 2.7		Solid stem auger refusal at 2.7 ft. Bottom of Exploration										

Water Level Data					
Date	Time	Elapsed Time (hr.)	Depth (ft.) to: Bottom of Casing	Bottom of Hole	Water

Sample Identification	
O	Open End Rod
T	Thin Wall Tube
U	Undisturbed Sample
S	Split Spoon
G	Geoprobe

Well Diagram: Riser Pipe, Screen, Filter Sand, Cuttings, Grout, Concrete, Bentonite Seal

Summary	
Overburden (lin. ft.)	2.7
Rock Cored (lin. ft.)	-
Samples	

Boring No. BEQ4B

Field Tests: Dilatancy: R-Rapid, S-Slow, N-None; Toughness: L-Low, M-Medium, H-High; Plasticity: N-Nonplastic, L-Low, M-Medium, H-High; Dry Strength: N-None, L-Low, M-Medium, H-High, V-Very High

*SPT = Sampler blows per 6 in. **Maximum particle size is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

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HALEY & ALDRICH

TEST BORING REPORT

Boring No. BEQ5

Project	Proposed Bachelor Enlisted Quarters Portsmouth Naval Shipyard, Kittery, Maine
Client	Oest Associates, Inc.
Contractor	Maine Test Borings, Inc.

File No.	27448-001
Sheet No.	1 of 1
Start	26 April 2001
Finish	26 April 2001
Driller	M. Porter
H&A Rep.	K. Stephenson
Elevation Datum	113.9
Location	See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	SSA	S		Rig Make & Model: Mobile B50 Track Mounted
Inside Diameter (in.)		1 3/8		Bit Type: Cutting Head
Hammer Weight (lb.)		140	-	Drill Mud:
Hammer Fall (in.)		30	-	Casing:
				Hoist/Hammer: Winch/ Doughnut Hammer

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	11 17 17 17	S1 16	0.0 2.0	NO WELL INSTALLED		SM	Dense, brown silty SAND with gravel, mps 1-1/4in., dry, grass roots -FILL-	15	10	10	10	40	15				
5	23 15 18 22	S2 15	5.0 7.0		107.3 6.6		Dense, brown silty SAND with gravel, dry, mps 1-1/4 in.	20	15	30		20	15				
					106.1 7.8	SP-SM	Dense, brown poorly graded SAND with silt -GLACIAL TILL-					90	10				
					105.9 8.0		Note: Auger grinding-probable Bedrock Auger refusal at 8.0 ft. Bottom of Exploration Note: Borehole caved at 6.3 ft., dry										

Water Level Data					
Date	Time	Elapsed Time (hr.)	Depth (ft.) to: Bottom of Casing	Bottom of Hole	Water

Sample Identification	
O	Open End Rod
T	Thin Wall Tube
U	Undisturbed Sample
S	Split Spoon
G	Geoprobe

Well Diagram: Riser Pipe, Screen, Filter Sand, Cuttings, Grout, Concrete, Bentonite Seal

Summary	
Overburden (lin. ft.)	7.8
Rock Cored (lin. ft.)	-
Samples	2S
Boring No.	**BEQ5**

Field Tests: Dilatancy: R-Rapid, S-Slow, N-None; Toughness: L-Low, M-Medium, H-High; Plasticity: N-Nonplastic, L-Low, M-Medium, H-High; Dry Strength: N-None, L-Low, M-Medium, H-High, V-Very High

*SPT = Sampler blows per 6 in. **Maximum particle size is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

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HALEY & ALDRICH

TEST BORING REPORT

Boring No. BEQ6

Project	Proposed Bachelor Enlisted Quarters Portsmouth Naval Shipyard, Kittery, Maine
Client	Oest Associates, Inc.
Contractor	Maine Test Borings, Inc.

File No.	27448-001
Sheet No.	1 of 1
Start	27 April 2001
Finish	27 April 2001
Driller	M. Porter
H&A Rep.	K. Stephenson
Elevation Datum	113.6
Location	See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	SSA	S		Rig Make & Model: Mobile B50 Track Mounted
Inside Diameter (in.)		1 3/8		Bit Type: Cutting Head
Hammer Weight (lb.)		140	-	Drill Mud:
Hammer Fall (in.)		30	-	Casing:
				Hoist/Hammer: Winch/ Doughnut Hammer

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	6	S1	0.0	NO WELL INSTALLED	113.1	SP-	Dense, brown poorly graded SAND with silt, grass, roots				20	50	30				
	17	18	2.0		0.5	SM	-TOPSOIL/FILL-	10	10	10	10	40	20				
	15				112.1	SM	Dense, brown silty SAND with gravel, mps 1in., dry										
	80				1.5	SP	Very dense, brown poorly graded SAND, mps 1in., dry		5		30	60	5				
							-FILL-										
5	7	S2	5.0			SM	Medium dense, brown silty SAND with gravel, mps 1-3/8 in., dry	20	10	10	10	30	20				
	13	7	7.0														
	9																
	17																
					104.8												
					8.8		Solid stem auger refusal at 8.8 ft. Bottom of Exploration										

Water Level Data					
Date	Time	Elapsed Time (hr.)	Depth (ft.) to: Bottom of Casing	Bottom of Hole	Water

Sample Identification	
O	Open End Rod
T	Thin Wall Tube
U	Undisturbed Sample
S	Split Spoon
G	Geoprobe

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary	
Overburden (lin. ft.)	8.8
Rock Cored (lin. ft.)	-
Samples	2S

Boring No. BEQ6

Field Tests: Dilatancy: R-Rapid, S-Slow, N-None Plasticity: N-Nonplastic, L-Low, M-Medium, H-High
Toughness: L-Low, M-Medium, H-High Dry Strength: N-None, L-Low, M-Medium, H-High, V-Very High

*SPT = Sampler blows per 6 in. **Maximum particle size is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

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HALEY & ALDRICH

TEST BORING REPORT

Boring No. BEQ7

Project	Proposed Bachelor Enlisted Quarters Portsmouth Naval Shipyard, Kittery, Maine
Client	Oest Associates, Inc.
Contractor	Maine Test Borings, Inc.

File No.	27448-001
Sheet No.	1 of 1
Start	27 April 2001
Finish	27 April 2001
Driller	M. Porter
H&A Rep.	K. Stephenson
Elevation Datum	115.0
Location	See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	SSA	S		Rig Make & Model: Mobile B50 Track Mounted
Inside Diameter (in.)		1 3/8		Bit Type: Cutting Head
Hammer Weight (lb.)		140	-	Drill Mud:
Hammer Fall (in.)		30	-	Casing:
				Hoist/Hammer: Winch/ Doughnut Hammer

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	10	S1	0.0	NO WELL INSTALLED	114.8	ML	Hard brown SILT with grass roots					20	80				
	50/.2	4	0.7		0.2	GM	-TOPSOIL/FILL-	30	20		10	20	20				
					113.9		Very dense, brown silty GRAVEL with sand, dry, mps 1.5in.										
					1.1		-FILL-										
							Solid stem auger refusal at 1.1 ft.										
							Bottom of Exploration										
	50/.2	S2 2	5.0 5.2														

Water Level Data					
Date	Time	Elapsed Time (hr.)	Depth (ft.) to: Bottom of Casing	Bottom of Hole	Water

Sample Identification	
O	Open End Rod
T	Thin Wall Tube
U	Undisturbed Sample
S	Split Spoon
G	Geoprobe

Well Diagram	
	Riser Pipe
	Screen
	Filter Sand
	Cuttings
	Grout
	Concrete
	Bentonite Seal

Summary	
Overburden (lin. ft.)	1.1
Rock Cored (lin. ft.)	-
Samples	2S

Boring No. BEQ7

Field Tests: Dilatancy: R-Rapid, S-Slow, N-None Toughness: L-Low, M-Medium, H-High Plasticity: N-Nonplastic, L-Low, M-Medium, H-High Dry Strength: N-None, L-Low, M-Medium, H-High, V-Very High

*SPT = Sampler blows per 6 in. **Maximum particle size is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

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HALEY & ALDRICH

TEST BORING REPORT

Boring No. BEQ7A

Project	Proposed Bachelor Enlisted Quarters Portsmouth Naval Shipyard, Kittery, Maine
Client	Oest Associates, Inc.
Contractor	Maine Test Borings, Inc.

File No.	27448-001
Sheet No.	1 of 1
Start	27 April 2001
Finish	27 April 2001
Driller	M. Porter
H&A Rep.	K. Stephenson
Elevation Datum	115.2
Location	See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	SSA	S		Rig Make & Model: Mobile B50 Track Mounted
Inside Diameter (in.)		1 3/8		Bit Type: Cutting Head
Hammer Weight (lb.)		140	-	Drill Mud:
Hammer Fall (in.)		30	-	Casing:
				Hoist/Hammer: Winch/ Doughnut Hammer

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0				NO WELL INSTALLED		SM	See BEQ7 for overburden details. Augered to 5.0 ft., brick and gravel in cuttings										
5	50/.2	S1 2	5.0 5.2		109.0 6.2		Very dense, brown silty SAND with gravel, trace brick, dry, mps 1in. -FILL-	15	15	20	10	25	15				
							Solid stem auger refusal at 6.2 ft. Bottom of Exploration										

Water Level Data					
Date	Time	Elapsed Time (hr.)	Depth (ft.) to: Bottom of Casing	Bottom of Hole	Water

Sample Identification	
O	Open End Rod
T	Thin Wall Tube
U	Undisturbed Sample
S	Split Spoon
G	Geoprobe

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary	
Overburden (lin. ft.)	6.2
Rock Cored (lin. ft.)	-
Samples	1S

Boring No. BEQ7A

Field Tests: Dilatancy: R-Rapid, S-Slow, N-None Plasticity: N-Nonplastic, L-Low, M-Medium, H-High
Toughness: L-Low, M-Medium, H-High Dry Strength: N-None, L-Low, M-Medium, H-High, V-Very High

*SPT = Sampler blows per 6 in. **Maximum particle size is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

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TEST BORING REPORT

Boring No. BEQ7B

Project	Proposed Bachelor Enlisted Quarters Portsmouth Naval Shipyard, Kittery, Maine
Client	Oest Associates, Inc.
Contractor	Maine Test Borings, Inc.

File No.	27448-001
Sheet No.	1 of 1
Start	27 April 2001
Finish	27 April 2001
Driller	M. Porter
H&A Rep.	K. Stephenson
Elevation Datum	115.2
Location	See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	SSA	S		Rig Make & Model: Mobile B50 Track Mounted
Inside Diameter (in.)		1 3/8		Bit Type: Cutting Head
Hammer Weight (lb.)		140	-	Drill Mud:
Hammer Fall (in.)		30	-	Casing:
				Hoist/Hammer: Winch/ Doughnut Hammer

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0							See BEQ7 and 7A for overburden details Solid stem auger to 6.1 ft.										
5																	
				NO WELL INSTALLED	109.1 6.1		Solid stem auger refusal at 6.1 ft. Bottom of Exploration										

Water Level Data					
Date	Time	Elapsed Time (hr.)	Depth (ft.) to: Bottom of Casing	Bottom of Hole	Water

Sample Identification

- O Open End Rod
- T Thin Wall Tube
- U Undisturbed Sample
- S Split Spoon
- G Geoprobe

Well Diagram

- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

Summary

Overburden (lin. ft.)	6.1
Rock Cored (lin. ft.)	-
Samples	

Boring No. BEQ7B

Field Tests: Dilatancy: R-Rapid, S-Slow, N-None; Toughness: L-Low, M-Medium, H-High; Plasticity: N-Nonplastic, L-Low, M-Medium, H-High; Dry Strength: N-None, L-Low, M-Medium, H-High, V-Very High

*SPT = Sampler blows per 6 in. **Maximum particle size is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

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TEST BORING REPORT

Boring No. BEQ8

Project	Proposed Bachelor Enlisted Quarters Portsmouth Naval Shipyard, Kittery, Maine
Client	Oest Associates, Inc.
Contractor	Maine Test Borings, Inc.

File No.	27448-001
Sheet No.	1 of 1
Start	27 April 2001
Finish	27 April 2001
Driller	M. Porter
H&A Rep.	K. Stephenson
Elevation Datum	108.0
Location	See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	SSA	S		Rig Make & Model: Mobile B50 Track Mounted
Inside Diameter (in.)		1 3/8		Bit Type: Cutting Head
Hammer Weight (lb.)		140	-	Drill Mud:
Hammer Fall (in.)		30	-	Casing:
				Hoist/Hammer: Winch/ Doughnut Hammer

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	1 4 6 15	S1 9	0.0 2.0	NO WELL INSTALLED	106.2	ML	Stiff, dark brown SILT with sand, grass, roots, mps 1/2in. -TOPSOIL/FILL-		10	5	5	5	75				
					1.8	SP-SM	Medium dense, brown SAND with silt and gravel, mps 1.5in., dry -FILL- Note: Borehole caved at 4.2 ft., dry	10	5	10	25	40	10				
					103.3 4.7		Auger refusal at 4.7 ft. Bottom of Exploration Note: Borehole caved at 4.2 ft., dry										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft.) to: Bottom of Casing	Bottom of Hole	Water

Sample Identification

- O Open End Rod
- T Thin Wall Tube
- U Undisturbed Sample
- S Split Spoon
- G Geoprobe

Well Diagram

- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

Summary

Overburden (lin. ft.)	4.7
Rock Cored (lin. ft.)	-
Samples	1S

Boring No. BEQ8

Field Tests: Dilatancy: R-Rapid, S-Slow, N-None Plasticity: N-Nonplastic, L-Low, M-Medium, H-High
Toughness: L-Low, M-Medium, H-High Dry Strength: N-None, L-Low, M-Medium, H-High, V-Very High

*SPT = Sampler blows per 6 in. **Maximum particle size is determined by direct observation within the limitations of sampler size.

Note: Soil Identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

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HALEY & ALDRICH

TEST BORING REPORT

Boring No. BEQ8A

Project	Proposed Bachelor Enlisted Quarters Portsmouth Naval Shipyard, Kittery, Maine
Client	Oest Associates, Inc.
Contractor	Maine Test Borings, Inc.

File No.	27448-001
Sheet No.	1 of 1
Start	27 April 2001
Finish	27 April 2001
Driller	M. Porter
H&A Rep.	K. Stephenson
Elevation Datum	109.1
Location	See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	SSA	S		Rig Make & Model: Mobile B50 Track Mounted
Inside Diameter (in.)		1 3/8		Bit Type: Cutting Head
Hammer Weight (lb.)		140	-	Drill Mud:
Hammer Fall (in.)		30	-	Casing:
				Hoist/Hammer: Winch/ Doughnut Hammer

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0							See BEQ8 for overburden details.										
							Solid stem auger to 7.0 ft.										
5																	
				NO WELL INSTALLED	102.1 / 7.0		Solid stem auger refusal at 7.0 ft. Bottom of Exploration Note: Ground surface elevation ~ 1.2 ft. higher than BEQ8.									

Water Level Data					
Date	Time	Elapsed Time (hr.)	Depth (ft.) to: Bottom of Casing	Bottom of Hole	Water

Sample Identification	
O	Open End Rod
T	Thin Wall Tube
U	Undisturbed Sample
S	Split Spoon
G	Geoprobe

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary	
Overburden (lin. ft.)	7.0
Rock Cored (lin. ft.)	-
Samples	

Boring No. BEQ8A

Field Tests: Dilatancy: R-Rapid, S-Slow, N-None Toughness: L-Low, M-Medium, H-High Plasticity: N-Nonplastic, L-Low, M-Medium, H-High Dry Strength: N-None, L-Low, M-Medium, H-High, V-Very High

*SPT = Sampler blows per 6 in. **Maximum particle size is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

HALEY & ALDRICH

TEST BORING REPORT

Boring No. BEQ9

Project	Proposed Bachelor Enlisted Quarters Portsmouth Naval Shipyard, Kittery, Maine
Client	Oest Associates, Inc.
Contractor	Maine Test Borings, Inc.

File No.	27448-001
Sheet No.	1 of 1
Start	27 April 2001
Finish	27 April 2001
Driller	M. Porter
H&A Rep.	K. Stephenson
Elevation Datum	114.8
Location	See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	SSA	S		Rig Make & Model: Mobile B50 Track Mounted
Inside Diameter (in.)		1 3/8		Bit Type: Cutting Head
Hammer Weight (lb.)		140	-	Drill Mud:
Hammer Fall (in.)		30	-	Casing:
				Hoist/Hammer: Winch/ Doughnut Hammer

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	3	S1	0.0	NO WELL INSTALLED	114.3	SP	Medium dense, brown SAND with silt, grass, roots										
	16	14	2.0		0.5	SM	-TOPSOIL/FILL-	20	10		10	40	20				
	11						Medium dense, brown silty SAND with gravel, mps 1-3/8in., dry										
	46				112.6												
					2.2		Solid stem auger refusal at 2.2 ft. Bottom of Exploration										

Water Level Data					
Date	Time	Elapsed Time (hr.)	Depth (ft.) to: Bottom of Casing	Bottom of Hole	Water

Sample Identification	
O	Open End Rod
T	Thin Wall Tube
U	Undisturbed Sample
S	Split Spoon
G	Geoprobe

Well Diagram	
	Riser Pipe
	Screen
	Filter Sand
	Cuttings
	Grout
	Concrete
	Bentonite Seal

Summary	
Overburden (lin. ft.)	2.2
Rock Cored (lin. ft.)	-
Samples	1S

Boring No. BEQ9

Field Tests: Dilatancy: R-Rapid, S-Slow, N-None Plasticity: N-Nonplastic, L-Low, M-Medium, H-High
Toughness: L-Low, M-Medium, H-High Dry Strength: N-None, L-Low, M-Medium, H-High, V-Very High

*SPT = Sampler blows per 6 in. **Maximum particle size is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

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HALEY & ALDRICH

TEST BORING REPORT

Boring No. BEQ9A

Project	Proposed Bachelor Enlisted Quarters Portsmouth Naval Shipyard, Kittery, Maine
Client	Oest Associates, Inc.
Contractor	Maine Test Borings, Inc.

File No.	27448-001
Sheet No.	1 of 1
Start	27 April 2001
Finish	27 April 2001
Driller	M. Porter
H&A Rep.	K. Stephenson
Elevation Datum	114.8
Location	See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	SSA	S		Rig Make & Model: Mobile B50 Track Mounted
Inside Diameter (in.)		1 3/8		Bit Type: Cutting Head
Hammer Weight (lb.)		140	-	Drill Mud:
Hammer Fall (in.)		30	-	Casing:
				Hoist/Hammer: Winch/ Doughnut Hammer

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0				NO WELL INSTALLED			See BEQ9 for overburden details Solid stem auger to 2.5 ft.										
					112.3 2.5		Solid stem auger refusal at 2.5 ft. Bottom of Exploration										

Water Level Data					
Date	Time	Elapsed Time (hr.)	Depth (ft.) to: Bottom of Casing	Bottom of Hole	Water

Sample Identification	
O	Open End Rod
T	Thin Wall Tube
U	Undisturbed Sample
S	Split Spoon
G	Geoprobe

Well Diagram: Riser Pipe, Screen, Filter Sand, Cuttings, Grout, Concrete, Bentonite Seal

Summary	
Overburden (lin. ft.)	2.5
Rock Cored (lin. ft.)	-
Samples	

Boring No. BEQ9A

Field Tests: Dilatancy: R-Rapid, S-Slow, N-None; Toughness: L-Low, M-Medium, H-High; Plasticity: N-Nonplastic, L-Low, M-Medium, H-High; Dry Strength: N-None, L-Low, M-Medium, H-High, V-Very High

*SPT = Sampler blows per 6 in. **Maximum particle size is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

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HALEY & ALDRICH

TEST BORING REPORT

Boring No. BEQ9B

Project	Proposed Bachelor Enlisted Quarters Portsmouth Naval Shipyard, Kittery, Maine
Client	Oest Associates, Inc.
Contractor	Maine Test Borings, Inc.

File No.	27448-001
Sheet No.	1 of 1
Start	27 April 2001
Finish	27 April 2001
Driller	M. Porter
H&A Rep.	K. Stephenson
Elevation Datum	114.8
Location	See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	SSA	S		Rig Make & Model: Mobile B50 Track Mounted
Inside Diameter (in.)		1 3/8		Bit Type: Cutting Head
Hammer Weight (lb.)		140	-	Drill Mud:
Hammer Fall (in.)		30	-	Casing:
				Hoist/Hammer: Winch/ Doughnut Hammer

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0							See BEQ9 and BEQ9A for overburden details.										
							Solid stem auger to 5.1 ft.										
5					109.7												
				NO WELL INSTALLED	5.1		Solid stem auger refusal at 5.1 ft. Bottom of Exploration										

Water Level Data					
Date	Time	Elapsed Time (hr.)	Depth (ft.) to: Bottom of Casing	Bottom of Hole	Water

Sample Identification	
O	Open End Rod
T	Thin Wall Tube
U	Undisturbed Sample
S	Split Spoon
G	Geoprobe

Well Diagram: Riser Pipe, Screen, Filter Sand, Cuttings, Grout, Concrete, Bentonite Seal

Summary	
Overburden (lin. ft.)	5.1
Rock Cored (lin. ft.)	-
Samples	

Boring No. BEQ9B

Field Tests: Dilatancy: R-Rapid, S-Slow, N-None; Toughness: L-Low, M-Medium, H-High; Plasticity: N-Nonplastic, L-Low, M-Medium, H-High; Dry Strength: N-None, L-Low, M-Medium, H-High, V-Very High

*SPT = Sampler blows per 6 in. **Maximum particle size is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

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HALEY & ALDRICH

TEST BORING REPORT

Boring No. BEQ10

Project	Proposed Bachelor Enlisted Quarters Portsmouth Naval Shipyard, Kittery, Maine
Client	Oest Associates, Inc.
Contractor	Maine Test Borings, Inc.

File No.	27448-001
Sheet No.	1 of 1
Start	27 April 2001
Finish	27 April 2001
Driller	M. Porter
H&A Rep.	K. Stephenson
Elevation Datum	111.8
Location	See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	SSA	S		Rig Make & Model: Mobile B50 Track Mounted
Inside Diameter (in.)		1 3/8		Bit Type: Cutting Head
Hammer Weight (lb.)		140	-	Drill Mud:
Hammer Fall (in.)		30	-	Casing:
				Hoist/Hammer: Winch/ Doughnut Hammer

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	2 5 7 13	S1 3	0.0 2.0	NO WELL INSTALLED	111.3 0.5	ML	Soft brown SILT with sand, grass, roots -TOPSOIL/FILL-				20	20	60				
							No recovery 0.5-2.0 ft. Sand and gravel in auger cuttings. -FILL-										
5	19 50/.2	S2 8	5.0 10.7		106.6 5.2	SM	Very dense, brown silty SAND with gravel, mps 1.5 in. dry -GLACIAL TILL-	20	10		10	40	20				
					103.8 8.0		-WEATHERED BEDROCK-										
					103.3 8.5		Augered to 8.5 ft. Solid stem auger refusal at 8.5 ft. Bottom of Exploration										

Water Level Data					
Date	Time	Elapsed Time (hr.)	Depth (ft.) to: Bottom of Casing	Bottom of Hole	Water

Sample Identification	
O	Open End Rod
T	Thin Wall Tube
U	Undisturbed Sample
S	Split Spoon
G	Geoprobe

Well Diagram: Riser Pipe, Screen, Filter Sand, Cuttings, Grout, Concrete, Bentonite Seal

Summary	
Overburden (lin. ft.)	8.0
Rock Cored (lin. ft.)	-
Samples	2S

Boring No. BEQ10

Field Tests: Dilatancy: R-Rapid, S-Slow, N-None; Toughness: L-Low, M-Medium, H-High; Plasticity: N-Nonplastic, L-Low, M-Medium, H-High; Dry Strength: N-None, L-Low, M-Medium, H-High, V-Very High

*SPT = Sampler blows per 6 in. **Maximum particle size is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

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HALEY & ALDRICH

TEST BORING REPORT

Boring No. BEQ11

Project	Proposed Bachelor Enlisted Quarters Portsmouth Naval Shipyard, Kittery, Maine
Client	Oest Associates, Inc.
Contractor	Maine Test Borings, Inc.

File No.	27448-001
Sheet No.	1 of 1
Start	27 April 2001
Finish	27 April 2001
Driller	M. Porter
H&A Rep.	K. Stephenson
Elevation Datum	109.3
Location	See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	SSA	S		Rig Make & Model: Mobile B50 Track Mounted
Inside Diameter (in.)		1 3/8		Bit Type: Cutting Head
Hammer Weight (lb.)		140	-	Drill Mud:
Hammer Fall (in.)		30	-	Casing:
				Hoist/Hammer: Winch/ Doughnut Hammer

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	3	S1	0.0	NO WELL INSTALLED	108.8	SP	Very loose, brown SAND with silt, grass, roots										
	12	22	2.0		0.5	SP-SM	-TOPSOIL/FILL-	20	20		10	40	10				
	21						Dense, brown SAND with silt and gravel, mps 1.5 in., dry										
	21						-FILL-										
					105.4												
					3.9		-WEATHERED BEDROCK-										
					105.0												
					4.3		Solid stem auger to 4.3 ft.										
							Solid stem auger refusal at 4.3 ft.										
							Bottom of Exploration										

Water Level Data					
Date	Time	Elapsed Time (hr.)	Depth (ft.) to: Bottom of Casing	Bottom of Hole	Water

Sample Identification	
O	Open End Rod
T	Thin Wall Tube
U	Undisturbed Sample
S	Split Spoon
G	Geoprobe

Well Diagram	
	Riser Pipe
	Screen
	Filter Sand
	Cuttings
	Grout
	Concrete
	Bentonite Seal

Summary	
Overburden (lin. ft.)	3.9
Rock Cored (lin. ft.)	-
Samples	1S

Boring No. BEQ11

Field Tests: Dilatancy: R-Rapid, S-Slow, N-None Toughness: L-Low, M-Medium, H-High Plasticity: N-Nonplastic, L-Low, M-Medium, H-High Dry Strength: N-None, L-Low, M-Medium, H-High, V-Very High

*SPT = Sampler blows per 6 in. **Maximum particle size is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

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HALEY & ALDRICH

TEST BORING REPORT

Boring No. BEQ12

Project	Proposed Bachelor Enlisted Quarters Portsmouth Naval Shipyard, Kittery, Maine
Client	Oest Associates, Inc.
Contractor	Maine Test Borings, Inc.

File No.	27448-001
Sheet No.	1 of 1
Start	27 April 2001
Finish	27 April 2001
Driller	M. Porter
H&A Rep.	K. Stephenson
Elevation Datum	110.7
Location	See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	SSA	S		Rig Make & Model: Mobile B50 Track Mounted
Inside Diameter (in.)		1 3/8		Bit Type: Cutting Head
Hammer Weight (lb.)		140	-	Drill Mud:
Hammer Fall (in.)		30	-	Casing:
				Hoist/Hammer: Winch/ Doughnut Hammer

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	2	S1	0.0	NO WELL INSTALLED	110.2	SP	Very loose, brown SAND with silt, grass, roots										
	11	3	2.0		0.5		-TOPSOIL/FILL-										
	25						Note: Gravel in tip of spoon(1-3/8in.)										
	21						Gravelly sand in auger cuttings 0.5-5.0 ft.										
							-FILL-										
					105.7												
5	80/.4	S2	5.0		5.0	SM	Very dense, brown SAND with gravel, dry, mps 1in.	10	10	10	25	30	15				
		4	5.4		105.5												
					5.2		-GLACIAL TILL-										
					104.6		-WEATHERED BEDROCK-										
					6.1		Augered to 6.1 ft.										
							Solid stem auger refusal at 6.1 ft.										
							Bottom of Exploration										

Water Level Data					
Date	Time	Elapsed Time (hr.)	Depth (ft.) to: Bottom of Casing	Bottom of Hole	Water

Sample Identification	
O	Open End Rod
T	Thin Wall Tube
U	Undisturbed Sample
S	Split Spoon
G	Geoprobe

Well Diagram: Riser Pipe, Screen, Filter Sand, Cuttings, Grout, Concrete, Bentonite Seal

Summary	
Overburden (lin. ft.)	5.2
Rock Cored (lin. ft.)	-
Samples	2S
Boring No.	**BEQ12**

Field Tests: Dilatancy: R-Rapid, S-Slow, N-None; Toughness: L-Low, M-Medium, H-High; Plasticity: N-Nonplastic, L-Low, M-Medium, H-High; Dry Strength: N-None, L-Low, M-Medium, H-High, V-Very High

*SPT = Sampler blows per 6 in. **Maximum particle size is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

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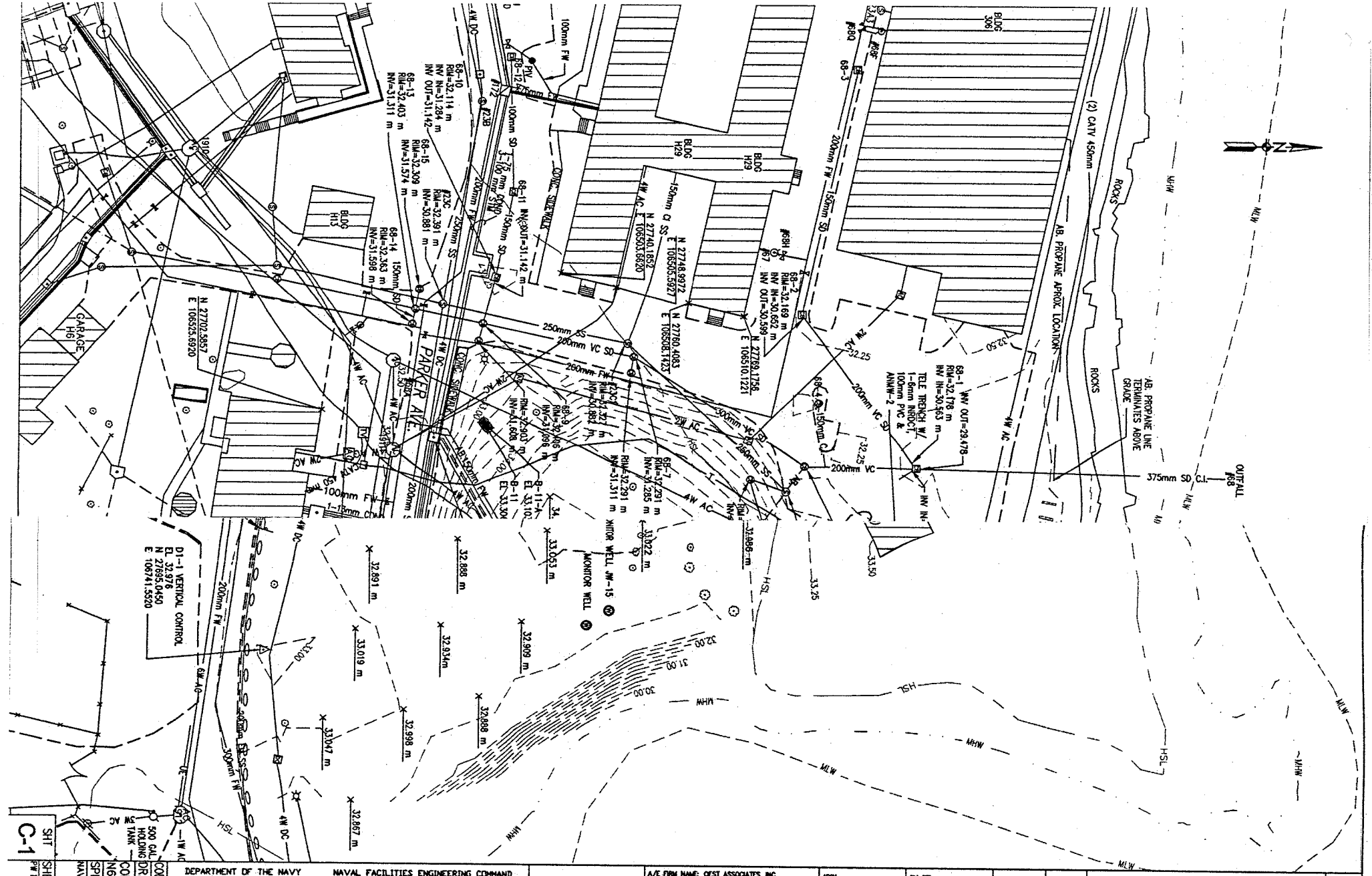


SHT C-1	CODE I.D. NO. 80091	DEPARTMENT OF THE NAVY	NAVAL FACILITIES ENGINEERING COMMAND	A/E FIRM NAME: OEST ASSOCIATES, INC. AND ADDRESS: 343 GORHAM RD. S PORTLAND, ME	ARCH. / CIV. STR.	
SHEET 2 OF 5	DRAWING SIZE: D	NAVAL SHIPYARD	PORTSMOUTH, N.H.	DSGN: TLH DRWN: KYC CHK: THO	MECH. / PRMGR.	
P/W NO.	CONST. CONT. NO. N62472-00-D-1402	SITE ENGINEERING INVESTIGATION FOR NEW BACHELOR ENLISTED QUARTER (BEQ)		SUPV:	ELEC.	
SPEC.	NAVFAC DRAWING NO.	EXISTING CONDITIONS	(SEAL)	SUBMITTED BY: (SIGNED) (TITLE) (DATE)	SATISFACTORY TO / DATE	
				APPROVED / DATE	SATISFACTORY TO / DATE	
				HEAD, FACILITIES DIVISION	HEAD, ENGINEERING BRANCH / DATE	

REVISION	DATE	DESCRIPTION	BY
A	5-10-01	DRAFT SUBMISSION	

REVISIONS

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75

BORING NO.: B184- SB01
DATE: 6-21-98
GEOLOGIST: T. EVANS
DRILLER: J. Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0												
	1.0					DK Brn	Asphalt 0.0-0.1 F-M Sand Some F Gravel	SW	1330 0.1-0.5	0.0			
S-1		4/6	1.6/2.0		V Stiff	Tan Brn	M Sand Some Silt Tr F Gravel	SP/SM	→ 0.5-0.9				
	3.0	9/12					Silt Tr Clay	MH	1356 Dry	0.0			
						Tan &	↓	to ML					
S-2		1/4	1.6/2.0		M Dense	Gray	Silt Tr Clay to	ML	1403 Dry	0.0			
	5.0	9/14					Silt Some F Sand Tr	F Gravel					
S-3		16/37	1.1/2.0		V Dense	tan	Silt Some F-C Wet Rock Frags	ML	1413 Till?	1.4			
	7.0	33/34				↓	↓	↓	↓				
S-4		22/36	1.8/2.0		V Dense				1428	0.1			
	9.0	83/95		TOR @ 9.3?		↓	↓	↓	↓				
S-5		30/64	1.3/1.3	KI ≡ III		tan	F Sandy Silt VTr Rock Frags		1441				
	11.0	100/13											
									Auger Refusal @	11.8'			
				EOB @ 11.8			Pulled augers to switch to AR →		Auger head teeth broken off!				
									Move 5.0' N				
									& re-drill for well completion				
									(see Log B184-SB01A)				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area PID

Background (ppm): 0.0

Remarks: 4 1/4" ID HSA 3" SS

* B184- SS01 - 0001-98 @ 0.5-0.9' @ 1370 + SSFD-062198

** B184- SB01 - 0305-98 @ 1403 ✱ B184-SB01-0527-98 (VOC, Met+ISC, TKC+SO4, Cr+6, F

Converted to Well: Yes ____ No X Well I.D. #: ____

✱✱ B184- SB01 - 0911-98

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75
BORING NO.: B184- SB01A
DATE: 6-21-98
GEOLOGIST: T. EVANS
DRILLER: J. Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0												
							See Log B184-SB01		Re-auger 0-3'				
							for Litho 0-5.5		1620-1700				
									drive 6"ø casing				
									3'-5.5				
									TOR @ 5.5'				
	5.0			▽ 4.4 4 (6/22)									
				14 ≡ 14		DK	Met. Siltstone		1700-1855				
						Gray	(Paraqzite)		6"ø rollerbit				
									5.0-13.5'				
									H2O @ 7.0'?				
	10.0												
									Stop @ 13.5 for day				
									6/22 SWL=4.4 TD=13.5				
	15.0			EOB @ 13.5			6/22 Set 2" Screen 3.5-13.5'		(20-Slot				
							#1 Sand 2.3-13.5						
							Bentonite 1.0-2.3						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ✓ No _____ Well I.D. #: B184- MW01

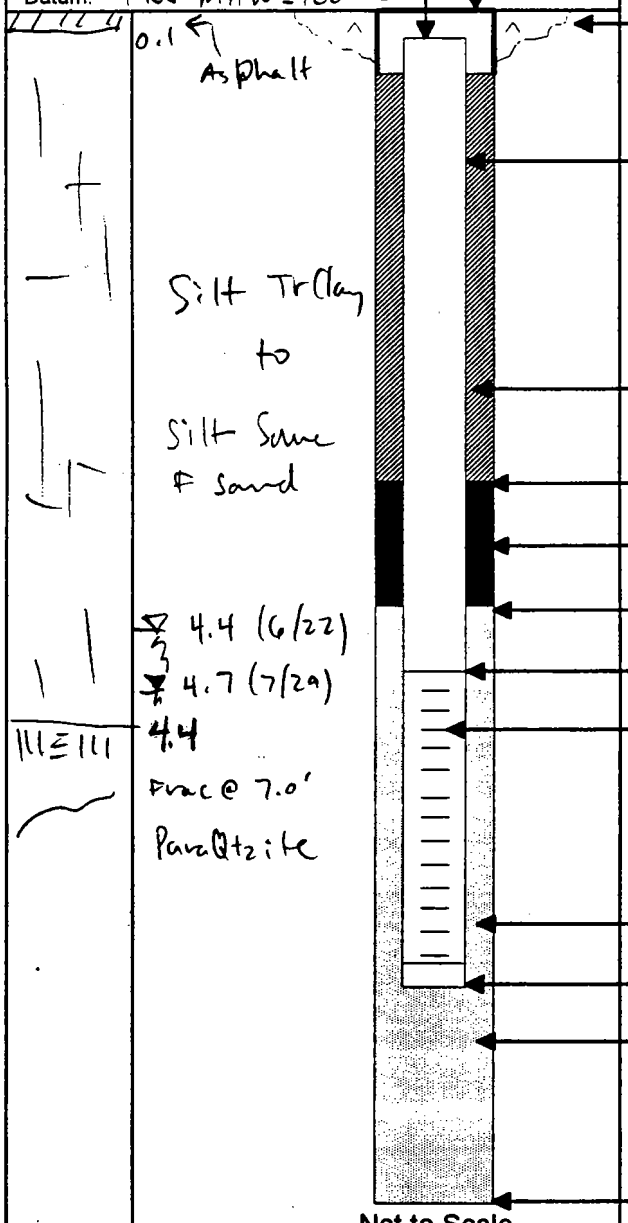
Tetra Tech NUS, Inc.

WELL No.: B184 - MW01

MONITORING WELL SHEET

PROJECT:	PNSY	DRILLING Co.:	Maxim Tech	BORING No.:	B184-SB01A
PROJECT No.:	6515	DRILLER:	J. Leonhardt	DATE COMPLETED:	6/22/98
SITE:	30	DRILLING METHOD:	Air Rotary	NORTHING:	90689.88
GEOLOGIST:	T. Evans	DEV. METHOD:	Pump	EASTING:	348048.01

Ground Elevation = 108.77 ft.
Datum: PNS MHW = 100.32



Not to Scale

Elevation / Depth of Top of Riser:	108.36 / 0.41
Elevation / Height of Top of Surface Casing:	108.77 / —
I.D. of Surface Casing:	8"Ø x 12"
Type of Surface Casing:	Steel
Type of Surface Seal:	Concrete
I.D. of Riser:	2"
Type of Riser:	Sch 40 PVC
Borehole Diameter:	6"
Type of Backfill:	N/A
Elevation / Depth of Seal:	107.77 / 1.0
Type of Seal:	Bentonite
Elevation / Depth of Top of Filter Pack:	106.47 / 2.3
Elevation / Depth of Top of Screen:	105.27 / 3.5
Type of Screen:	Sch 40 PVC
Slot Size x Length:	0.020" x 10'
I.D. of Screen:	2"
Type of Filter Pack:	#1 Qtz Sand
Elevation / Depth of Bottom of Screen:	95.27 / 13.5
Elevation / Depth of Bottom of Filter Pack:	95.27 / 13.5
Type of Backfill Below Well:	—
Elevation / Total Depth of Borehole:	95.27 / 13.5

Tetra Tech NUS, Inc.

WELL DEVELOPMENT DATA SHEET

PROJECT: PORTSMOUTH NSY
PROJECT No.: 6515
SITE: 30 - Bldg 184
PROJECT GEOLOGIST: T. Evans

WELL No.: B184 - MW0
DATE INSTALLED: 6-22-98
DATE DEVELOPED: 7-21-98
DRILLING Co.: Maxim Tech

WELL DATA

WELL MATERIAL: ☒ PVC ☐ STAINLESS STEEL ☐ OTHER:

TOTAL DEPTH: 12.84 (solid) feet (TOC / bgs)
STATIC WATER LEVEL: 4.28 feet (TOC / bgs)
CASING VOLUME 1.39 (gal. / L)

CASING ID: 2 inches
SCREEN LENGTH: 10 feet
BOREHOLE DIA.: 6 inches

PURGE DATA

START TIME: 1839 (hr.)
STOP TIME: 2035 (hr.)

METHOD: Pump
PUMP TYPE: Grundfos Redi flo BT1/MP.1

Time	Cumulative Volume (gal. / L)	Pumping Rate (gpm / Lpm)	Water Level (ft / m.)	Water Meter Type: pH	Sp. Cond. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	Remarks (Color/Odor)
1849	5	0.5	5.83	7.31	1.39	19.0	>999/OR	1.66	Tan Brn
1859	10	0.5	7.21	7.37	1.34	18.0	198/80	1.74	cloudy
1905	15	0.83	7.96	7.41	1.29	17.6	44/45	2.21	clear
1929	19		10.41	- Have trouble w/pump - Stop for recharge					
1934	—		9.18						Continue
1936	20	0.5	—	7.54	1.47	17.0	24/NM	2.42	Clear
(1947-2035 Purge dry + recharge (cycle)									)
1959	25	—	NM	7.55	1.53	16.4	173/NM	5.24	clear
2007	28	—	<11.64	7.55	1.38	17.2	57/37	5.44	clear (WL below pump tip)
2022	30	—	—	7.49	1.39	16.8	31/27	4.55	clear
2033	32			7.48	1.38	16.8	27/22	4.31	clear
2035	34							Dry	/Stop
									(2hr time
									limit exp)

TOTAL PURGE VOLUME: 34 (gal / L)
TOTAL PURGE TIME: 116 (min. / hrs.)

NOTE All depth measurements to nearest 0.01 foot.

COMMENTS/CALCULATIONS:

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75
BORING NO.: B184 - SB02
DATE: 7.14.98
GEOLOGIST: T. EVANS
DRILLER: J Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0								Time				
	1.0			0.7		Brn	Concrete 0-0.7						
							M Sand Tr-Some F Gravel	SP	0926 (0.7-1.0) Dump	7.4			
S-1		13/12	1.3/2.0		M Dense	Dk Gray + Brn	Silt Some Wet Rock	GM	0942	0.0			
	3.0	11/7		2.7			Frags, F Gravel Tr Brick Wood 2.7-3.0						
S-2		1/1	1.6/2.0	3.0	Soft	Gray	Silt Tr Clay	ML	0948	0.0			
	5.0	2/2					Tr Root Traces						
S-3		7/10	2.0/2.0		V Stiff	Brn + Gray	Clayey Silt	CL/ML	0955	0.0			
	7.0	11/12											
S-4		4/7	2.0/2.0		V Stiff			ML	1000 Hard	0.0			
	9.0	8/10		9.0									
S-5		2/7	2.0/2.0	9.2	V Dense	Lt Brn + Brn	F Sand (9.0-9.2)	SP	1020 Saturated	0.0			
	11.0	14/52					Silt Some F Sand Tr F Gravel	SM/ML	← Till				
	12.0												
				12.5			Boulder 12.5-13.0		Auger Refusal @12.5'				
				13.0					Drive 6" Temp Casing to 12.5				
	15.0								5 7/8" AH 12.5-18.5				
						Gray	F-M Sandy Silt Tr Coarse Sand	SM					
	18.0								Still soil @ 18'/Switch to HSA				
S-6		45/35	1.8/1.8		V Dense	Gray	M Sandy Silt Tr Wet Rock	SM	1346	0.0			
	20.0	76/100/.3					Frags (0.5" Ø)		B184-SB02-1820-98				
				20.5					Auger @ 20.5 Refusal				
							2" PVC (.20-slot) 10-20						
							#1 Valve Sand 8.5-20		6 100# bags				
							Bentonite 6.3-8.5		1 bag 50# bag				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0.0

Remarks: 4 1/4" ID HSA, 3" SS 1500 JL returns compressor
* Sampled interval

Converted to Well: Yes ✓ No ____ Well I.D. #: B184-MW02

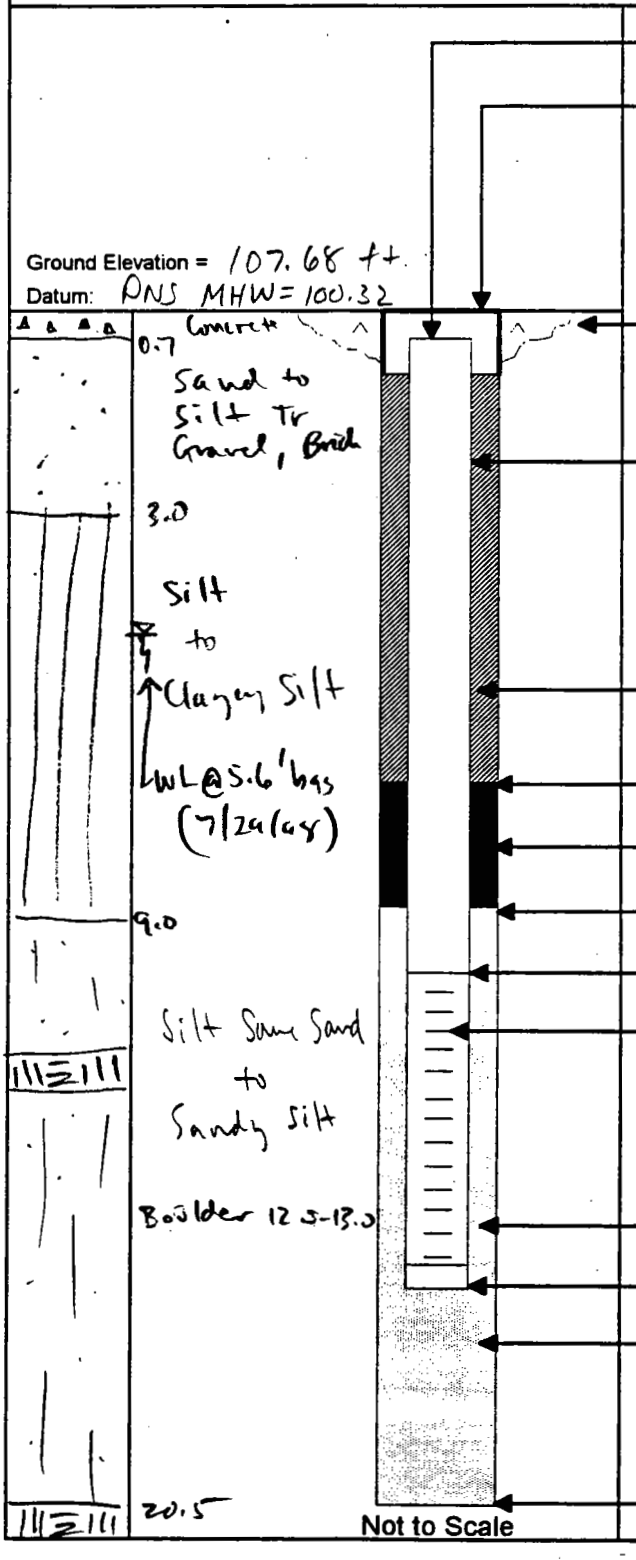
Tetra Tech NUS, Inc.

WELL No.: B184 - MW02

MONITORING WELL SHEET

PROJECT:	PNSY	DRILLING Co.:	Maximum Tech	BORING No.:	B184-SB02
PROJECT No.:	6515	DRILLER:	J. Leonhardt	DATE COMPLETED:	7-14-98
SITE:	30 - Bldg 184	DRILLING METHOD:	HSA	NORTHING:	90862.83
GEOLOGIST:	T. Evans	DEV. METHOD:	Bail / pump	EASTING:	348050.06

Ground Elevation = 107.68 ft.
Datum: PNS MHW = 100.32



Not to Scale

Elevation / Depth of Top of Riser:	107.32 / 0.36
Elevation / Height of Top of Surface Casing:	107.68 / —
I.D. of Surface Casing:	8"ø x 12"
Type of Surface Casing:	Steel
Type of Surface Seal:	Concrete
I.D. of Riser:	2"
Type of Riser:	Sch 40 PVC
Borehole Diameter:	8"
Type of Backfill:	Cement Grout
Elevation / Depth of Seal:	101.38 / 6.3
Type of Seal:	Bentonite
Elevation / Depth of Top of Filter Pack:	99.18 / 8.5
Elevation / Depth of Top of Screen:	97.68 / 10.0
Type of Screen:	Sch 40 PVC
Slot Size x Length:	0.020" x 10'
I.D. of Screen:	2"
Type of Filter Pack:	#1 Qtz Sand
Elevation / Depth of Bottom of Screen:	87.68 / 20.0
Elevation / Depth of Bottom of Filter Pack:	87.68 / 20.0
Type of Backfill Below Well:	Natural
Elevation / Total Depth of Borehole:	87.18 / 20.5

Tetra Tech NUS, Inc.

WELL DEVELOPMENT DATA SHEET

PROJECT: PORTSMOUTH NSY
PROJECT No.: 6515
SITE: Site 30
PROJECT GEOLOGIST: T. Evans

WELL No.: B184-MW02
DATE INSTALLED: 7-14-98
DATE DEVELOPED: 7-22-98
DRILLING Co.: Maxim Tech

WELL DATA

WELL MATERIAL: ☒ PVC ☐ STAINLESS STEEL ☐ OTHER:

TOTAL DEPTH: 17.79 (soft) feet (TOC / bgs)
STATIC WATER LEVEL: 4.45 feet (TOC / bgs)
CASING VOLUME 2.17 (gal. / L)

CASING ID: 2 inches
SCREEN LENGTH: 10 feet
BOREHOLE DIA.: 8 inches

PURGE DATA

START TIME: 1556 (hr.)
STOP TIME: 1756 (hr.)

METHOD: Bail / Pump
PUMP TYPE: Grundfos Rediflo

Water Meter Type: HORIBA U-10 / Lamotte 2020*

Time	Cumulative Volume (gal / L)	Pumping Rate (gpm / Lpm)	Water Level (ft. / m.)	pH	Sp. Cond. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	Remarks (Color/Odor)
1623	10		18.12						Gray / Bail D
1630			15.52						Start pump
1637			16.85						Stop
1644			14.00						Continue
1646	13	-	16.15	7.25	1.18	18.6	327/200*	3.84	cloudy
1657	17		17.80						cloudy / stop
1709			11.80						Continue
1724	22	0.3	17.10	7.11	1.22	19.3	207/85*	2.39	cloudy
1729	23		18.03(?)						stop
1747	-		9.60				-/600*		Continue
1754									Cloudy
1756	26	0.3	16.09						Stop due
									to 2hr
									time limit

TOTAL PURGE VOLUME: 26 (gal / L)
TOTAL PURGE TIME: 120 (min. / hrs.)

NOTE: All depth measurements to nearest 0.01 foot.

COMMENTS/CALCULATIONS:
1556 - Bail 1st 10 gal
1630 - 1756 Cycle, pump on/off due to slow recharge rate

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75

BORING NO.: B184-SB03
DATE: 7-9-98
GEOLOGIST: T. EVANS
DRILLER: J. Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0								Time				
	1.0					yellow brn	Asphalt 0.0-0.3 F-M Sand Tr Some met rock Frags	SW	1613 B184-SB03-0001-98 0.7-1.0	0.0			
S-1		6/7	1.3/2.0		VStiff	tan brn	Silt Tr Clay (mottled)	ML	1626 Dry	0.0			
	3.0	11/19		2.8		gray	Silty F Sand (2.8-3.0)	SP					
S-2		8/12	1.8/2.0		M Dense	brn & gray	↓	↓	1670 Damp	0.0			
	5.0	10/14							B184-SB03-0305-98				
S-3		6/11	1.5/2.0	5	M Dense	yellow brn	Silty F Sand	SP/SM	1635 Saturated	0.0			
	7.0	12/14							B184-SB03-0507-98				
S-4		8/12	2.0/2.0		Dense	yellow brn	Silty F Sand / F Sandy Silt Tr met Rock Frags	SM	1643 wet	0.0			
	9.0	15/17											
S-5		14/16	1.0/2.0		Hard	yellow brn			1650	0.0			
	11.0	21/16				to gray	Sandy Silt	SM/ML					
S-6		5/12	1.3/2.0		V Dense	gray	F Sandy Silt Some met Rock Frags	SM/GM	1655 B184-SB03-1113-98	0.0			
	13.0	43/27				& brn							
S-7		100/1.3	0.0/0.3				- No Recovery -		1700				
	15.0			EOB @ 14.1					Auger Refusal @ 14.1'				
							1720 Set 2" PVC (20-slot) Screen 3.5-13.5						
							#1 Sand 2.5 - 14.1' - 2 3/4 bags						
							Bentonite 1.0 - 2.5						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): --

Remarks: 4 1/4" ID HSA 3" SS
Low Tide @ 1754
• Interval Sampled

Converted to Well: Yes ✓ No ____ Well I.D. #: B184-MW03

Tetra Tech NUS, Inc.

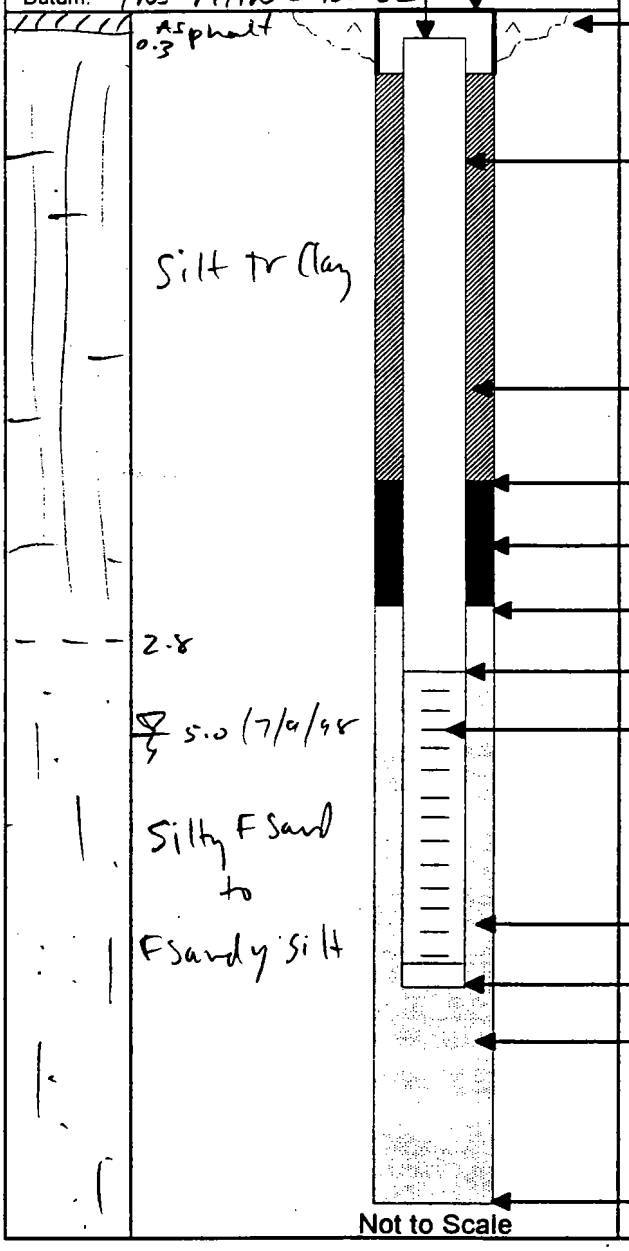
WELL No.: B184 - MW03

MONITORING WELL SHEET

PROJECT:	PNSY	DRILLING Co.:	Maxim Tech	BORING No.:	B184-SB03
PROJECT No.:	6515	DRILLER:	J. Leonhardt	DATE COMPLETED:	7-9-98
SITE:	30	DRILLING METHOD:	HSA	NORTHING:	90907.71
GEOLOGIST:	T. Evans	DEV. METHOD:	Pump / Bail	EASTING:	347954.35

Ground Elevation = 107.76

Datum: PNS MHW = 100.32



Elevation / Depth of Top of Riser:		107.431 0.33
Elevation / Height of Top of Surface Casing:		107.791 0.03
I.D. of Surface Casing:	8"Ø x 12"	
Type of Surface Casing:	Steel	
Type of Surface Seal:	Concrete	
I.D. of Riser:	2"	
Type of Riser:	Sch 40 PVC	
Borehole Diameter:	8"	
Type of Backfill:	N/A	
Elevation / Depth of Seal:		106.761 1.0
Type of Seal:	Bentonite	
Elevation / Depth of Top of Filter Pack:		105.261 2.5
Elevation / Depth of Top of Screen:		104.261 3.5
Type of Screen:	Sch 40 PVC	
Slot Size x Length:	0.020" x 10'	
I.D. of Screen:	2"	
Type of Filter Pack:	#1 Qtz Sand	
Elevation / Depth of Bottom of Screen:		94.261 13.5
Elevation / Depth of Bottom of Filter Pack:		93.66 / 14.1
Type of Backfill Below Well:	N/A	
Elevation / Total Depth of Borehole:		93.66 / 14.1

Tetra Tech NUS, Inc.

WELL DEVELOPMENT DATA SHEET

PROJECT: PORTSMOUTH NSY
PROJECT No.: 6515
SITE: Site 80 -
PROJECT GEOLOGIST: J. Evans

WELL No.: B184-MW03
DATE INSTALLED: 7-9-98
DATE DEVELOPED: 7-21-98
DRILLING Co.: Maxim Tech

WELL DATA

WELL MATERIAL: ☒ PVC ☐ STAINLESS STEEL ☐ OTHER:

TOTAL DEPTH: 13.39 (solid) feet (TOC / bgs)
STATIC WATER LEVEL: 5.87 feet (TOC / bgs)
CASING VOLUME 1.22 (gal. / L)

CASING ID: 2 inches
SCREEN LENGTH: 10 feet
BOREHOLE DIA.: 8 inches

PURGE DATA

	7/21	7/22	
START TIME:	1724	1734	(hr.)
STOP TIME:	1810	1740	(hr.)

METHOD: Pump/Bail
PUMP TYPE: Grundfos Redi Flo BM1/TP1

Time	Cumulative Volume (gal. / L)	Pumping Rate (gpm / Lpm)	Water Level (ft. / m.)	Water Meter Type: pH	Sp. Cond. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	Remarks (Color/Odor)
1732	5	0.63	11.62	7.31	1.69	18.4	189/180	0.87	Tan/Clear
1738	7								Dry/ or pump w.
1745	-								Continue
1746	7.5								Dry -
1758									Start then Goes Dry
1800 - 1810									Bail
1810	9.0		1310						Insufficient
22 1734			5.96	Bail					water for bailing / pumping
1740	14.0		11.77						Tan
Discontinue development due to poor recharge									

TOTAL PURGE VOLUME: 14 (gal. / L)
TOTAL PURGE TIME: 46 (min / hrs.)

NOTE: All depth measurements to nearest 0.01 foot.

COMMENTS/CALCULATIONS:

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75

BORING NO.: B184 - SB04
DATE: 7-9-98
GEOLOGIST: T. EVANS
DRILLER: J. Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0												
	1.0			0.3		Brn	Asphalt 0.0-0.4 F Sand Tr F Gravel	SP.	0815 B184-SB04-0001-98 (0.3-1.0)	0.0			
S-1		18/20	1.4/2.0		M Dense	Gray Brn	Silty F Sand / Silt	SM/ML	0828	0.0			
	3.0	11/7					Tr F Gravel 1 Brick Frag						
S-2		3/5	1.4/2.0		V Stiff	Brn to	Silt Tr F Sand, Metal	ML	0835 B184-SB04-0305-98	0.0			
	5.0	8/11				Tan Brn	F Sandy Silt to VTr F Gravel 1 Tr F Gravel	ML/SM	Dry				
S-3		100/1.4	0.25/1.4	5.5'		Tan Brn	F Sandy Silt	ML/SM	0840	1.5			
	7.0					DK Gray	Weathered BR 6.3-6.6 Frac		0845-Drive 6" temp Casing to 5.2'				
	8.0						(0925 Compressors breaks down)		0905-5 7/8" Air Hammer 5.2' to 18.39'				
	9.0						(1030 Continue)						
	10.0						Pamptite 9.7-10.4 Frac		← dust reduced				
	11.0						11.0-11.1 Frac						
				8/9			Frac?		1133 - H_2O come in after change rods				
	15.0												
	16.0						15.4-15.5 Frac		1141				
									16.0' @ 1143 Break for lunch				
	18.0								1305 WL = 13.41' bgs 1323 Continue 16.0-18.39				
				EOB 18.39'					1334 18.39' EOB				
	20.0						Set 2" PVC (20 Slot) Screen 8-18'						
							#1 Sand 6.9-18.39		12/3 bags				
							Bentonite 5.0-6.9'		1/2 bag				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: 4 1/4" ID HSA 3" SS
High Tide @ 1159

Drilling Area Background (ppm): 0.0

Converted to Well: Yes ✓ No ____ Well I.D. #: B184-MW04

Tetra Tech NUS, Inc.

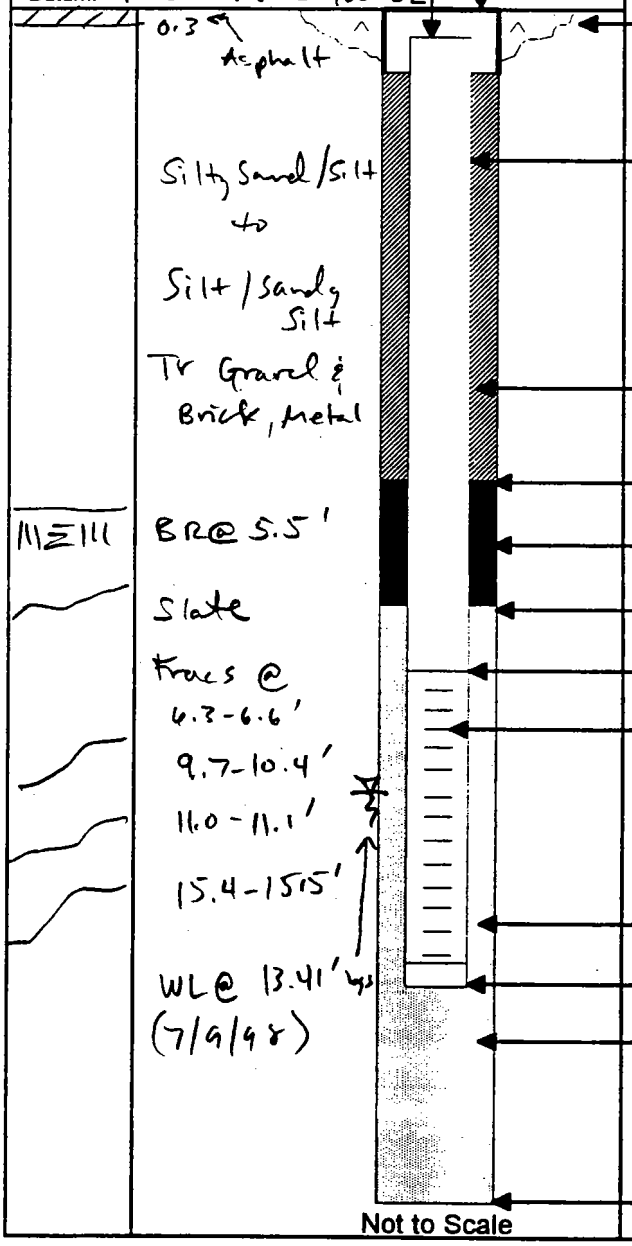
WELL No.: B184 - MW04

MONITORING WELL SHEET

PROJECT:	PNSY	DRILLING Co.:	Maxim Tech	BORING No.:	B184-SB04
PROJECT No.:	6515	DRILLER:	J. Leonhardt	DATE COMPLETED:	7-9-98
SITE:	30-Bldg 184	DRILLING METHOD:	HSA	NORTHING:	90976.07
GEOLOGIST:	T. Evans	DEV. METHOD:	Pump	EASTING:	348096.21

Ground Elevation = 107.86

Datum: PNS MHW = 100.32



Not to Scale

Elevation / Depth of Top of Riser:		107.43 / 0.43
Elevation / Height of Top of Surface Casing:		107.89 / 0.03
I.D. of Surface Casing:	8" Ø x 12"	
Type of Surface Casing:	Steel	
Type of Surface Seal:	Concrete	
I.D. of Riser:	2"	
Type of Riser:	Sch 40 PVC	
Borehole Diameter:	6"	
Type of Backfill:	Cement Grout	
Elevation / Depth of Seal:		102.86 / 5.0
Type of Seal:	Bentonite	
Elevation / Depth of Top of Filter Pack:		100.96 / 6.9
Elevation / Depth of Top of Screen:		99.86 / 8.0
Type of Screen:	Sch 40 PVC	
Slot Size x Length:	0.020" x 10'	
I.D. of Screen:	2"	
Type of Filter Pack:	#1 Qtz Sand	
Elevation / Depth of Bottom of Screen:		89.86 / 18.0
Elevation / Depth of Bottom of Filter Pack:		89.47 / 18.39
Type of Backfill Below Well:	N/A	
Elevation / Total Depth of Borehole:		89.47 / 18.39

Tetra Tech NUS, Inc.

WELL DEVELOPMENT DATA SHEET

PROJECT: PORTSMOUTH NSY
PROJECT No.: 6515
SITE: Site 30 - Building 184
PROJECT GEOLOGIST: T. Evans

WELL No.: B184 - MW04
DATE INSTALLED: 7-9-98
DATE DEVELOPED: 7-21-98
DRILLING Co.: Maxim Tech

WELL DATA

WELL MATERIAL: ☒ PVC ☐ STAINLESS STEEL ☐ OTHER:

TOTAL DEPTH: 17.74' (solid) feet (TOC / bgs)
STATIC WATER LEVEL: 6.93' feet (TOC / bgs)
CASING VOLUME 1.8gal / 6.7 L (gal. / L)

CASING ID: 2" inches
SCREEN LENGTH: 10' feet
BOREHOLE DIA.: 6 inches

PURGE DATA

START TIME: 1028 (hr.)
STOP TIME: 1224 (hr.)

METHOD: Pump
PUMP TYPE: Grundfos / Rad, Flo

Time	Cumulative Volume (gal. / L)	Pumping Rate (gpm / Lpm)	Water Level (ft. / m.)	Water Meter Type: Horiba U-10 / LaMotte 2020* pH	Sp. Cond. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	Remarks (Color/Odor)
1034	5	0.8	13.67	7.50	.724	16.0	>999/OR	0.91	Gray Brn/opaque
1036	6.5	0.8							Dry
1044	–		11.15						Continue
1049	10	0.7	16.01	7.35	.663	17.1	>999/OR	7.18	Lt Gray Brn
1051	11	0.5							Dry
1059	–		12.0						Continue
1103	13	0.5	15.40						Dry
1108	–		13.20						Continue
1110	14	0.5	16.22	7.01	.517	16.8	689/380	6.78	cloudy
1111	15								Dry
1119			12.0						Continue
1123	17.5		16.58						Dry
1131			12.0						Continue
1132	18.0	0.5	–	6.89	.466	17.0	246/130	6.67	cloudy
1134	19.0	0.5	<16.54						Dry
– Continued to p2				–					

TOTAL PURGE VOLUME: (gal. / L) TOTAL PURGE TIME: (min. / hrs.)

NOTE: All depth measurements to nearest 0.01 foot.

COMMENTS/CALCULATIONS:

Tetra Tech NUS, Inc.

WELL DEVELOPMENT DATA SHEET

PROJECT: PORTSMOUTH NSY
PROJECT No.: 6515
SITE: Site 30 - Building
PROJECT GEOLOGIST: T. Evans

WELL No.: B184 - MW02
DATE INSTALLED: 7-9-98
DATE DEVELOPED: 7-21-98
DRILLING Co.: Maxim Tech

WELL DATA

WELL MATERIAL: ☒ PVC ☐ STAINLESS STEEL ☐ OTHER:

TOTAL DEPTH: _____ feet (TOC / bgs)
STATIC WATER LEVEL: _____ feet (TOC / bgs)
CASING VOLUME _____ (gal. / L)

CASING ID: 2" inches
SCREEN LENGTH: 10' feet
BOREHOLE DIA.: 6 inches

PURGE DATA

START TIME: 1028 (hr.)
STOP TIME: 1224 (hr.)

METHOD: Pump
PUMP TYPE:

Time	Cumulative Volume (gal. / L)	Pumping Rate (gpm / Lpm)	Water Level (ft / m.)	Water Meter Type: Horiba U-10 / LaMotte 2020* pH	Sp. Cond. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	Remarks (Color/Odor)
1146	–		10.0						Continue
1148	21.0	1.0	13.89	6.81	.449	16.5	95/85*	6.17	Clear
1150	22.0	1.0							Dry
1202			10.0						Continue
1205	25.0	1.0	14.51	6.94	.449	16.5	91/70	6.64	Cloudy
1207	26.0	0.5							Dry
1220			9.0						Continue
1224	30.0	1.0	16.29	6.79	.426	17.0	116/90	5.98	Stop due
									to 2hr time
									limit on
									development

TOTAL PURGE VOLUME: 30.0 (gal. / L)
TOTAL PURGE TIME: 116 (min. / hrs.)

NOTE: All depth measurements to nearest 0.01 foot.

COMMENTS/CALCULATIONS:

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75

BORING NO.: TP- SB01
DATE: 6-22-98
GEOLOGIST: T. EVANS
DRILLER: J Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0												
	1.0					Brn	F Sand Tr Silt & F Gravel	SW	1345 0.5-1.0	0.0			
S-1		7/9	1.4/2.0	2.5	M Dense	Brn	Silt & Met Rock Frags	GM	1351				
	3.0	9/7		3.0		Gray Red Brn	Silt Some Clay Peat (wood chips)	ML Pt	Moist @ tip	0.0			
S-2		3/6	1.4/2.0		Stiff	Brn +	Silt Tr to Some Clay	ML	1401 Damp				
	5.0	6/8				Gray	(mottled)	to MH					
S-3		2/5	2.0/2.0	5.2 6/23	M Stiff to Stiff				1409				
	7.0	8/16		6.7 6/22		Brn	F-M Sand	SP	wet @ tip				
	8.0												
S-4		18/19	1.5/2.0		Dense	Brn	F Sand Tr Clay	SP	1419 Saturated	0.0			
	10.0	22/25				Tan Brn	Silty F Sand Some Met Ry Frags	to SW	Till(?)				
S-5		24/27	1.0/2.0		M Dense	Gray	Silty F Sand Some Met Rock Frags	SW	1430				
	12.0	9/9				Brn							
S-6		20/12	0.8/1.5		M Dense to V Dense	Gray	Silty F Sand Tr Met Rock Frags	SM	1443				
	14.0	7/100/0"		13.5					Refusal @ 13.5				
						Dk Gray	Pelitic Met Rock		1515 Drive 6" ø Casing	to	13.5		
	16.0					Dk Gray	Met Siltstone		1550 5 7/8" ø Rollerbit				
							- H_2O zone @ 16' - @ 1728		13.5' - 16.5'				
	18.0			EOB 16.5'					NO' @ 1639 15.0' @ 1700 16.5' @ 1737				
									6/23 SWL = 5.21' bgs				
									Set 2" PVC screen 6.5-16.5	(20-	5/0+		
									#1 Sand 5.6-16.5				
									Bentonite 3.0-5.6				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area PID

Background (ppm): 0.0

Remarks: 4¼" ID HSA 3" SS
∘ TP- SB01- 0001-98 ★ TP-SB01-0910-98
∘∘ TP- SB01- 0305-98 ★★ TP-SB01-1214-98

Converted to Well: Yes ✓ No ____ Well I.D. #: TP- MW01

Tetra Tech NUS, Inc.

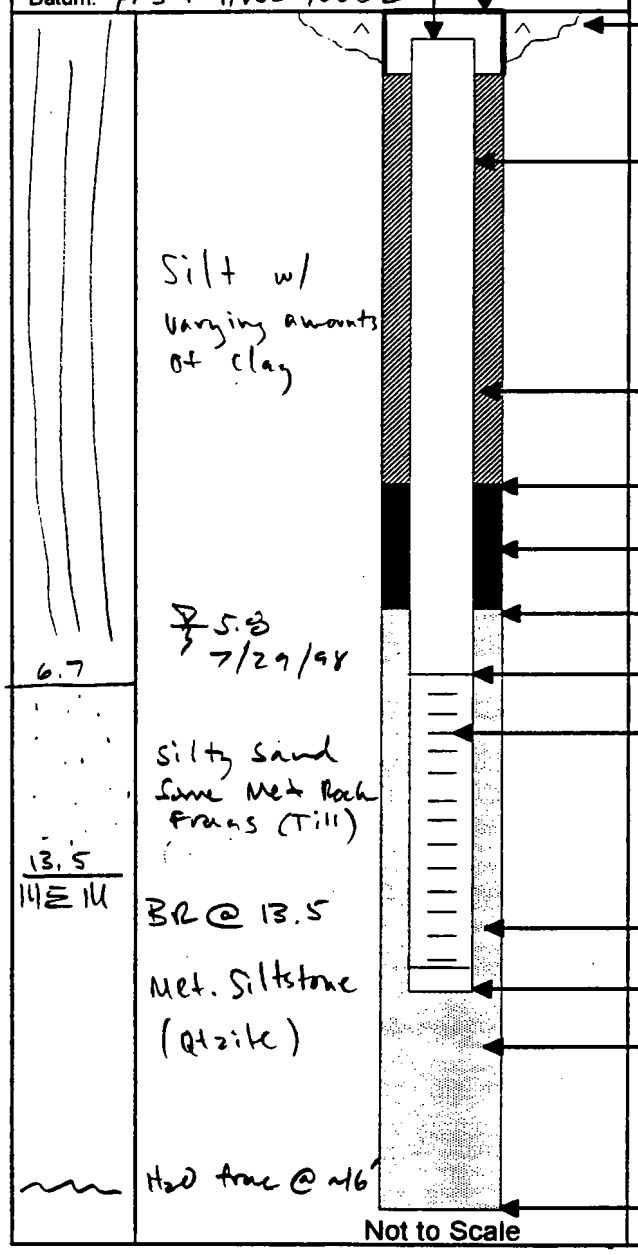
WELL No.: TP-MW01

MONITORING WELL SHEET

PROJECT:	PNSY	DRILLING Co.:	MaximTech	BORING No.:	TP-SB01
PROJECT No.:	6515	DRILLER:	J. Leonhardt	DATE COMPLETED:	6/23/98
SITE:	32	DRILLING METHOD:	Air Rotary	NORTHING:	90479.06
GEOLOGIST:	T. Evans	DEV. METHOD:	Pump	EASTING:	348815.01

Ground Elevation = 114.37 ft

Datum: PNS MHW = 100.32



Not to Scale

Elevation / Depth of Top of Riser:		113.91 / 0.46
Elevation / Height of Top of Surface Casing:		114.37 / —
I.D. of Surface Casing:	8"	
Type of Surface Casing:	Steel	
Type of Surface Seal:	Concrete	
I.D. of Riser:	2"	
Type of Riser:	Sch 40 PVC	
Borehole Diameter:	6"	
Type of Backfill:	NA	
Elevation / Depth of Seal:		111.37 / 3.0
Type of Seal:	Bentonite	
Elevation / Depth of Top of Filter Pack:		108.77 / 5.6
Elevation / Depth of Top of Screen:		107.87 / 6.5
Type of Screen:	Sch 40 PVC	
Slot Size x Length:	0.020" x 10'	
I.D. of Screen:	2"	
Type of Filter Pack:	#1 Qtz Sand	
Elevation / Depth of Bottom of Screen:		97.87 / 16.5
Elevation / Depth of Bottom of Filter Pack:		97.87 / 16.5
Type of Backfill Below Well:	N/A	
Elevation / Total Depth of Borehole:		97.87 / 16.5

Tetra Tech NUS, Inc.

WELL DEVELOPMENT DATA SHEET

PROJECT:	PORTSMOUTH NSY	WELL No.:	TP-MW01
PROJECT No.:	6515	DATE INSTALLED:	6-23-98
SITE:	Site 32. Topeka Pier	DATE DEVELOPED:	7-20-98
PROJECT GEOLOGIST:	T. Evans	DRILLING Co.:	Maxim Tech

WELL DATA

WELL MATERIAL: ☒ PVC ☐ STAINLESS STEEL ☐ OTHER:

TOTAL DEPTH:	15.99' (hard)	feet (TOC / bgs)	CASING ID:	2"	inches
STATIC WATER LEVEL:	4.98'	feet (TOC / bgs)	SCREEN LENGTH:	10	feet
CASING VOLUME	1.79	(gal / L)	BOREHOLE DIA.:	6"	inches

PURGE DATA

START TIME:	7/20 1740	(hr.)	METHOD:	Pumping
STOP TIME:	1851	(hr.)	PUMP TYPE:	Grundfos / Redi Flo

Water Meter Type: HORIBA U-10 / La Motte 2020

Time	Cumulative Volume (gal. / L)	Pumping Rate (gpm / Lpm)	Water Level (ft. / m.)	pH	Sp. Cond. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	Remarks (Color/Odor)
1740-1446	2								Bail / Tan
1750	5		14.1						Pump / Tan
1755	7								Dry
1807	—	—	11.0						—
1813			10.0						
1815 1816	Continue 8	1.0	12.28	7.44	1.49	15.7	147/290*	2.42	cloudy
1824	10	0.25	13.12	7.47	1.46	15.9	452/250*	2.08	cloudy
1826	—								Allow to recharge
1837 1838	11	1.0	11.0 14.59	7.56	1.47	15.3	12/11*	3.56	clear
1841 1848	12		13.0						Dry Continue
1851	13								Dry
									Stop due to poor recharge
									& thunderstorm

TOTAL PURGE VOLUME: 13 (gal / L) TOTAL PURGE TIME: 71 (min / hrs.)

NOTE: All depth measurements to nearest 0.01 foot.

COMMENTS/CALCULATIONS:

HORIBA S/N 507012
La Motte 2020 S/N 0416-4497

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75
BORING NO.: TP-SB02
DATE: 6-20-98
GEOLOGIST: T. EVANS
DRILLER: J. Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks (Creosote odor PID = 29.1 ppm)	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0												
•	1.0			0.25			Asphalt (0.0-0.25) Tar & Gravel (0.25-0.70)		Hit RR tie 0.6-1.2' @ 1710 - Move	0.0			
S-1		10 / 11	1.4/2.0	2.1	M Dense	Brn	F Sand Some F Gravel (0.7-1.0)	SP	6' W 1745 (1'-3')	0.0			
	3.0	14 / 14		2.75		Gray → Dk	→ Gravel → F Sand (2.75-3.0')	GP SP	Dry				
•• S-2		11 / 10	1.2/2.0		M Dense	Brn ↓	↓		1755	0.0			
	5.0	12 / 12		4.3 / 4.7		Black Dk Brn	+ white → Coal + Ash Tr Gravel Silty F Sand Tr Wood	SP					
S-3		2 / 3	0.0/2.0				- No Recovery -		1804	-			
	7.0	2 / 3											
S-4		2 / 1	0.0/2.0				- No Recovery -		1812				
	9.0	2 / 4		▽ 8.9 6/21									
* S-5		2 / 3	0.2/2.0		Loose	Dk Brn	Silty F-C Sand Tr metal cuttings	SW	1821 Saturated Sheen on water	0.0			
	11.0	3 / 5							Poor Recovery				
** S-6		5 / 4	0.3/2.0		V Loose	Black Brn	Silty F-C Sand Tr metal cuttings	SP	1827 Saturated Sheen on water	1.1			
	13.0	3 / 1		13.5					Poor Recovery				
S-7		1 / 1	0.2/2.0		V Loose	Black Brn	1 Gravel Frag, Metal Cuttings, Silty F Sand	SP	1836 Sheen on spoon	0.0			
	15.0	1 / 1							Poor Recovery				
** S-8		1 / 2	1.5/2.0		V Soft	olive gray	Organic Silt Tr Shell, Metal Cuttings	MH	1850	0.0			
	17.0	1 / 2							Natural				
	18.0								1920 Drillers leave 1930 THNS leave				
↓ S-9		1 / 2	1.3/2.0		Soft	olive gray	Organic Silt Tr Shell + Clay	MH	6/21 0738 Continue	0.0			
"SS	20.0	1 / 2											
	23.0												
S-10		WOH / WOH			V Soft	Gray	Clayey Silt	ML +	0753	0.0			
	25.0	WOH / WOH					Silt Tr-Some Clay	MH					

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0.0

Remarks: 3" SS, 4 1/4" ID HSA

• TP-SB02-0001-98 (0.70-1.0') @ 1725 ★ TP-SB02-0911-98 @ 1821

•• TP-SB02-0305-98 @ 1755 ★★ TP-SB02-1113 @ 1827 (PRO, GRO, SVOC, PCB)

Converted to Well: Yes ✓ No ____ Well I.D. #: TP-MW02

★★★ TP-SB02-1517-98 @ 1850

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75
BORING NO.: TP-SB02
DATE: 6-20-98
GEOLOGIST: T. EVANS
DRILLER: J. Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	25.0												
	27.0												
	28.0												
S-11		8 100/.3	0.8/0.8	28.3		Gray	F Sandy Silt Met Rock Frags	SM Gw	0807	0.0			
	30.0			EOB @ 28.8'					Auger Refusal @ 28.8'				
									0825 Pull augers to 15'				
							Natural Backfill 24.5 - 28.8'						
							#1 Sand 17.7-24.5'						
							Bentonite 14.5-17.7'						
							2" PVC (20-slot) 4-14'						
							#1 Sand 3-14.5'						
							Bentonite 1.5-3'						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area: PII

Background (ppm): 0.0

Remarks:

Converted to Well: Yes ✓ No ____ Well I.D. #: TP-MW02

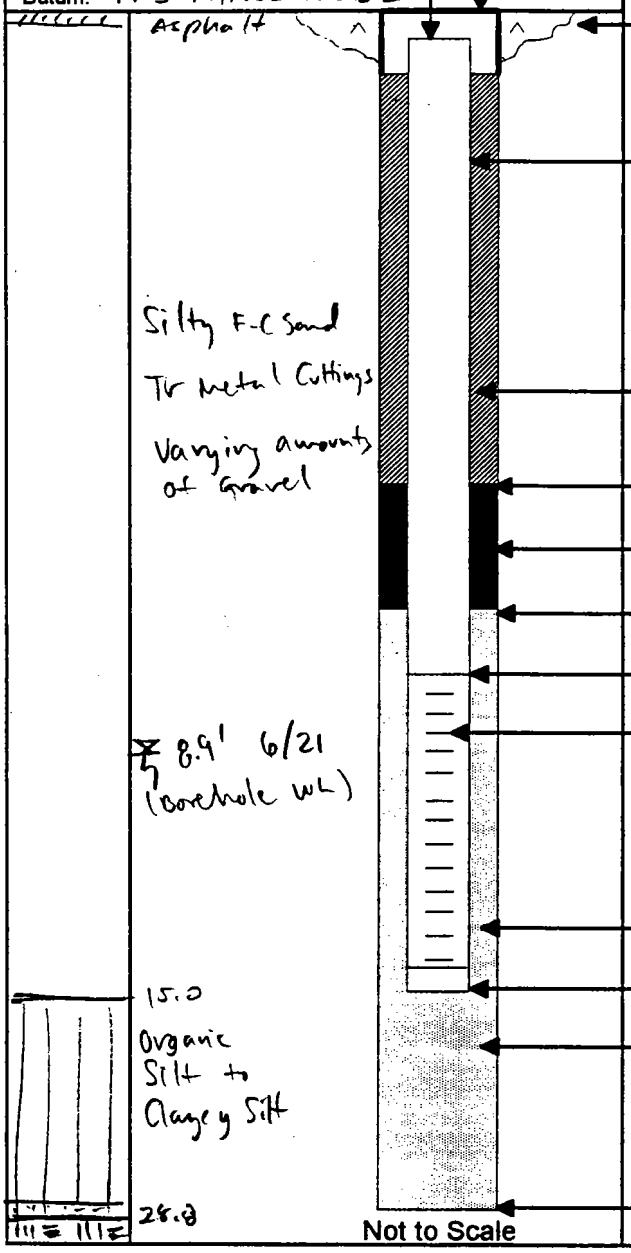
Tetra Tech NUS, Inc.

WELL No.: TP-MW02

MONITORING WELL SHEET

PROJECT:	PNSY	DRILLING Co.:	Maxim Tech	BORING No.:	TP-SB02
PROJECT No.:	6515	DRILLER:	J. Leonhardt	DATE COMPLETED:	6/21/98
SITE:	32	DRILLING METHOD:	HSA	NORTHING:	90842.81
GEOLOGIST:	T. Evans	DEV. METHOD:	Bail / Pump	EASTING:	348950.59

Ground Elevation = 108.00 ft
Datum: PNS MHW = 100.32



Not to Scale

Elevation / Depth of Top of Riser:		107.61 / 0.39
Elevation / Height of Top of Surface Casing:		108.00 / —
I.D. of Surface Casing:	8"	
Type of Surface Casing:	Steel	
Type of Surface Seal:	Concrete	
I.D. of Riser:	2"	
Type of Riser:	Sch 40 PVC	
Borehole Diameter:	8"	
Type of Backfill:	N/A	
Elevation / Depth of Seal:		106.50 / 1.5
Type of Seal:	Bentonite	
Elevation / Depth of Top of Filter Pack:		105.00 / 3.0
Elevation / Depth of Top of Screen:		104.00 / 4.0
Type of Screen:	Sch 40 PVC	
Slot Size x Length:	0.020" x 10'	
I.D. of Screen:	2"	
Type of Filter Pack:	#1 Qtz Sand	
Elevation / Depth of Bottom of Screen:		94.00 / 14.0
Elevation / Depth of Bottom of Filter Pack:		93.50 / 14.5
Type of Backfill Below Well:	Bentonite 14.5-17.7; #1 Sand 17.7-24.5; Natural 24.5-28.8'	
Elevation / Total Depth of Borehole:		79.20 / 28.8'

Tetra Tech NUS, Inc.

WELL DEVELOPMENT DATA SHEET

PROJECT: PORTSMOUTH NSY
PROJECT No.: 6515
SITE: Site 32 - Tapeke Pier
PROJECT GEOLOGIST: T. Evans

WELL No.: TP-MW02
DATE INSTALLED: 6-21-98
DATE DEVELOPED: 7-20-98
DRILLING Co.: Maxim Tech

WELL DATA

WELL MATERIAL: [X] PVC [ ] STAINLESS STEEL [ ] OTHER:

TOTAL DEPTH: 13.00' (50 ft) feet (TOC / bgs)
STATIC WATER LEVEL: 8.75 feet (TOC / bgs)
CASING VOLUME 0.69 (gal / L)

CASING ID: 2 inches
SCREEN LENGTH: 10 feet
BOREHOLE DIA.: 8 inches

PURGE DATA

START TIME: 1620 (hr.)
STOP TIME: 1713 (hr.)

METHOD: Bail / Pump
PUMP TYPE: Grundfos / Redi-Flo

Water Meter Type: Horiba U-10 / LaMotte 2020

Time	Cumulative Volume (gal. / L)	Pumping Rate (gpm / Lpm)	Water Level (ft. / m.)	pH	Sp. Cond. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	Remarks (Color/Odor)
1630	10	–	–	NM	NM	NM	NM	NM	Gray Brn / Bail
1634	15	–	–	↓	↓	↓	↓	↓	Gray Brn / Bail
1639	17	–	9.02	↓	↓	↓	↓	↓	Switch to pump
1645	25	1.3	9.02	7.75	15.4	17.0	233 / 150*	1.97	Cloudy
1654	35	1.1	9.04	7.75	15.0	17.0	199 / 155	3.44	Cloudy
1701	45	1.4	8.99	7.74	14.9	16.8	189 / 120	1.93	Cloudy
1708	55	1.4	9.09	7.76	14.8	16.8	0 / 6.1	2.21	Clear
1712	60	1.3	9.10	7.75	14.6	16.8	1 / 2.2	1.93	Clear
1713	61.5								Stop

TOTAL PURGE VOLUME: 61.5 (gal / L)
TOTAL PURGE TIME: 43 (min. / hrs.)

NOTE: All depth measurements to nearest 0.01 foot.

COMMENTS/CALCULATIONS:

** Bail to remove Fines before pumping
1639 Switch to pump

Horiba S/N 507012
LaMotte 2020 S/N 0416-4497

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75
BORING NO.: TP-SB03
DATE: 6-20-98
GEOLOGIST: T. EVANS
DRILLER: J. Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0								Time				
	1.0					DK Brn	Organic Silt Tr F Gravel	MH	0615		0.0	0.0	
S-1		10/9	1.7/2.0		M Dense	Brn	F - M Sand Tr-Some Silt	SP	0650 Lt Rain 0652	0.0			
	3.0	7/7					Tr Met Ky Frags						
S-2		3/2	1.3/2.0		Loose	Tan Brn to	Silty M Sand VTr C Sand	SM	0655 Moist	0.0			
	5.0	3/3				DK Red Brn							
S-3		1/3	1.3/2.0		Loose	Gray Brn	F Sandy Silt VTr C Sand & F Gravel	SM/ML	0705 wet	0.0			
	7.0	2/7		▽ 7.0' @0712					Saturated @ tip Rain Stops				
S-4		1/6	1.6/2.0		M Dense	Gray to	F Sandy Silt to	ML/SM	0712 Saturated	0.0			
	9.0	12/5				Brn	M-C Sand Some Silt & F Gravel	to SW					
									Auger 9'-13'				
				?-?-									
	13.0	1/1											
S-5		1/1	2.0/2.0		V Loose	Black to	F Sand to	SP	0725 H_2S odor	10.0			
	15.0	2/2				Gray	FSandy Silt Tr Shell	SM/ML	Natural				
									0810 P. Beaudoin @ SB03				
	17.0												
S-6		1/1	2.0/2.0		V Soft	Olive Gray	Organic Silt	MH	0815	0.0			
SS	20.0	1/1											
	25.0												
S-7		WOH/WOH	2.0/2.0		M Stiff	DK Gray	Organic Clayey Silt	ML/CL	0825	33			
	25.0	3/3											

* When rock coring, enter rock brokeness. High Tide @ 0831

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0 ppm

Remarks: 4 1/4" ID HSA, 3" SS
* TP-SB03-0001-98 + MS/MSD (SS travel + Bowl)
** TP-SB03-0305-98 *** TP-SB03-1315-98 + SBFD-062098

Converted to Well: Yes ____ No X Well I.D. #: ____

* TP-SB03-0507-98 *** TP-SB03-2325-98

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75
BORING NO.: TP-SB03
DATE: 6-20-98
GEOLOGIST: T. EVANS
DRILLER: J Leon Harndt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	25.0								Time				
	28.0												
S-8		1 / 2	2.0/2.0		M Stiff	Gray / Brn	Silty Clay / Clayey Silt	CL/ML	0840	0.0			
	30.0	3 / 3											
	33.0												
S-9		WOR / WOR	2.0/2.0		V Loose	Gray	Silt Tr-Some F Sand	MH/SM	0854	0.0			
	35.0	1 / 1											
	37.0												
S-10		WOR / WOR	2.0/2.0		V Soft	Gray	Silt tr Organics & Clay	MH	0915	9.1			
	40.0	WOR / WOR				Some Black	Streaks						
	43.0												
S-11		1 / 1	1.4/2.0		V Loose	Gray	Silty M-C Sand &	SP/	0931	0.0			
	45.0	1 / 1					Silt Tr C	SM					
				EOB 47.0'			1015	→	Auger Refusal @ 47.0' bgs				
									Grout + pull augers				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

** Move 6' W & re-drill to set well screen

Remarks:

Drilling Area Background (ppm): 0.0

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Mavin Tech
DRILLING RIG: CME 75

BORING NO.: TP-SB03A
DATE: 6-20-98
GEOLOGIST: T. EVANS
DRILLER: J Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID* Sample	PID* Sampler BZ	PID* Borehole**	PID* Driller BZ**
	0.0								Time				
							See Log TP-SB03		Auger 0'-9'				
							for litho 0'-9'		@ 1400				
	5.0												
	9.0												
S-1		WOH / WOH	1.2/2.0	9.5' @ HISH	V Soft	Brn to	F Sandy Silt Tr C Sand	SM	1402	0.0			
	11.0	WOH / WOH				Gray			Natural				
S-2		WOH / WOH	0.8/2.0		V Soft	Brn Black	Organic Silt Tr F Sand	MH	1410	70			
	13.0	WOH / WOH											
S-3		WOH / WOH	1.5/2.0		V Soft	Gray	F Sandy Silt Tr Shell	SM	1423	14.0	0.0		
	15.0	1 / 1											
				EOB 15'									
							Set 2" PVC well screen (0.020" slot) 3.5'-13.5'						
							#1 Sand		2.5 - 14.0 (2½ 100# bags)				
							Bentonite		1.3 - 2.5				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: 4¼" ID HSA, 2" SS — 1330 PB @ boring; low tide @ 1446 PS leaves

Drilling Area Background (ppm): ppm

Converted to Well: Yes ✓ No ____ Well I.D. #: TP-MW03

Tetra Tech NUS, Inc.

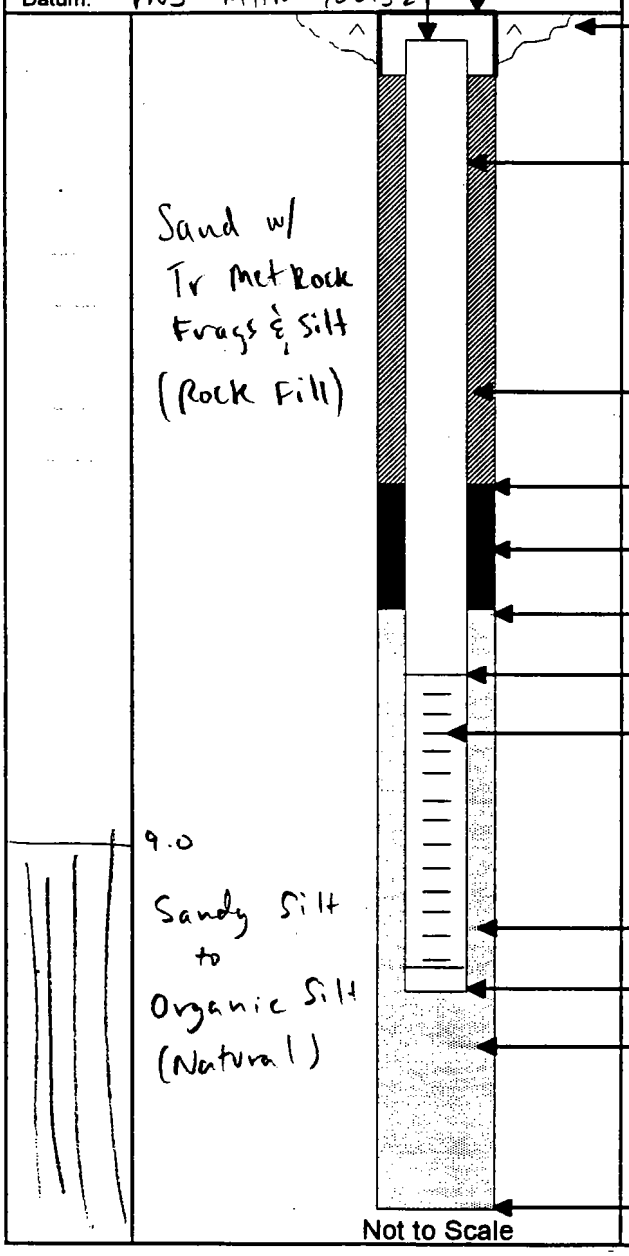
WELL No.: TP-MW03

MONITORING WELL SHEET

PROJECT:	PNSY	DRILLING Co.:	Maxim Tech	BORING No.:	TP-SB03A
PROJECT No.:	6515	DRILLER:	J. Leonhardt	DATE COMPLETED:	6/20/98
SITE:	Site 32	DRILLING METHOD:	HSA	NORTHING:	91282.74
GEOLOGIST:	T. Evans	DEV. METHOD:	Pumping	EASTING:	349371.26

Ground Elevation = 105.24 ft

Datum: PNS MHW 100.32



Not to Scale

Elevation / Depth of Top of Riser:		105.01 / 0.23
Elevation / Height of Top of Surface Casing:		105.34 / 0.10
I.D. of Surface Casing:	8"	
Type of Surface Casing:	Steel	
Type of Surface Seal:	Quikrete	
I.D. of Riser:	2"	
Type of Riser:	Sch 40 PVC	
Borehole Diameter:	8"	
Type of Backfill:	N/A	
Elevation / Depth of Seal:		103.94 / 1.3
Type of Seal:	Bentonite	
Elevation / Depth of Top of Filter Pack:		102.74 / 2.5
Elevation / Depth of Top of Screen:		101.74 / 3.5
Type of Screen:	Sch 40 PVC	
Slot Size x Length:	0.02" x 10'	
I.D. of Screen:	2"	
Type of Filter Pack:	#1 Qtz Sand	
Elevation / Depth of Bottom of Screen:		91.74 / 13.5
Elevation / Depth of Bottom of Filter Pack:		91.24 / 14.0
Type of Backfill Below Well:	N/A	
Elevation / Total Depth of Borehole:		91.24 / 14.0

Tetra Tech NUS, Inc.

WELL DEVELOPMENT DATA SHEET

PROJECT: PORTSMOUTH NSY
PROJECT No.: 6515
SITE: Site 32. Topeka Pier
PROJECT GEOLOGIST: T. Evans

WELL No.: TP-MW03
DATE INSTALLED: 6-20-98
DATE DEVELOPED: 7-20-98
DRILLING Co.: Maxim Tech

WELL DATA

WELL MATERIAL: ☒ PVC ☐ STAINLESS STEEL ☐ OTHER:

TOTAL DEPTH: 13.58 feet (TOC / bgs)
STATIC WATER LEVEL: 6.92 feet (TOC / bgs)
CASING VOLUME 1.09 / 4.11 (gal. / L)

CASING ID: 2 inches
SCREEN LENGTH: 10 feet
BOREHOLE DIA.: 8 inches

PURGE DATA

START TIME: 1400 (hr.)
STOP TIME: 1521 (hr.)

METHOD: Bail / Pump
PUMP TYPE: Grundfos / Radiflo

Time	Cumulative Volume (gal. / L)	Pumping Rate (gpm / Lpm)	Water Level (ft. / m.)	pH	Sp. Cond. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	Remarks (Color/Odor)
				Water Meter Type: HORIBA U-10 / *LaMotte 2020					
1407	10	—	—	NM	NM	NM	NM	NM	Gray Brn / Bail
1415	15	—	—	↓	↓	↓	↓	↓	Gray Brn / Bail
1422	20	0.71	6.50	NM	NM	NM	NM	NM	Gray Brn / pump
1426	25	1.3	6.68	7.58	35.5	16.3	91/50*	2.69	Gray Clear
1432	36	1.8	6.72	7.70	35.1	16.0	124/75*	2.14	Cloudy
1438	47	1.8	6.86	7.70	35.3	15.6	62/45	1.93	clear
1444	58	1.8	6.96	7.72	35.2	15.4	52/35	2.00	clear
1448	64	1.5	6.75	7.73	35.0	15.4	38/28	1.93	Clear
1452	69	1.3	6.24	7.73	34.8	15.3	10/11	2.11	clear
1453	Stop to get addl drums								
1505	Continue								
1508	75	2.0	6.85	7.72	34.0	16.1	16/13	1.74	clear
1513	86	2.2	6.88	7.74	34.6	15.4	27/20	2.05	clear
1519	96	1.7	6.97	7.75	34.6	15.4	1/4.3	1.76	clear
1521	99	Stop							

TOTAL PURGE VOLUME: 99 (gal. / L)
TOTAL PURGE TIME: 74 (min. / hrs.)

NOTE: All depth measurements to nearest 0.01 foot.

COMMENTS/CALCULATIONS: Low Tide @ 1520
** Bail before pumping to remove sediment
1416 switch to pump

HORIBA S/N 50701
LaMotte 2020 S/N 0416-4497

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75
BORING NO.: TP- SB04
DATE: 6-18-98
GEOLOGIST: T. EVANS
DRILLER: J. Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0								Time				
• S-1		2/5	1.4/2.0	1.2		DK Brn	Organic Silt Tr F Gravel	OH	0722 Topsoil 0.0-1.2	0.0			
	2.0	7/6			M Dense	Brn	M Sand Tr Rock Frags	SP					
	3.0			▽ 6/18 @ 0733									
•• S-2		4/6	0.9/2.0		M Dense	Brn	Met Rock frags Tr-Some (Qtzite) Silt & Sand		0733 Saturated	0.0			
	5.0	7/8		Fill									
S-3		6/2	0.9/2.0		Loose	Lt Brn	M-C Sand, Some Silt Tr Rock Frags	GW/SW	0740	0.0			
	7.0	3/6											
★ S-4		1/9	1.0/2.0		M Dense	Lt Brn	F-M Sand Tr Silt & Shell	SP	0746	0.0			
	9.0	20/6		8.7		Lt Brn	M-C Sand Tr Silt & Shell	SW					
S-5		5/6	1.1/2.0		M Dense	Brn	M-C Sand Tr Rock-Chips Glass	SW	0755	0.0			
	11.0	5/11		Fill			Some Silt Tr Met Rock Frags (Qtzite)						
				? ?									
	13.0												
★ S-6		1/1	1.6/2.0		M Stiff	Olive Gray	Organic Silt Tr Shell	ML	0810 H_2S odor	16.3			
	15.0	2/3							Natural				
	18.0			Natural									
↓ S-7 "SS		WOH/WOH	1.1/2.0		V Soft	Gray	Organic Silt Tr Shell	MH	0819	0.0			
	20.0	WOH/WOH											
	23.0												
S-8		3/8	1.8/2.0		V Stiff	Gray +Brn	Clay Some Silt Tr Shell	CL	0845 Mottled	0.0			
	25.0	10/14											

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area P1D

Background (ppm): 0.0

Remarks: 4¼" ID HSA 3" SS High Tide @ 0619
• TP- SS04 - 0001 - 98 (0-1') 0750-0825 P. Blaise @ Lorin
•• TP- SB04 - 0305 - 98 (VOC, SVOC, DRO, GRO, + Metals, CN, pH)

Converted to Well: Yes ____ No X Well I.D. #: ____

★ TP- SB04 - 0709 - 98 (VOC, SVOC, P/P, GRO, DRO + Metals, CN, pH)
★★ TP- SB04 - 1315 - 98 + SBFD-061898

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75

BORING NO.: TP-SB04
DATE: 6-18-99
GEOLOGIST: T. EVANS
DRILLER: J. Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller RZ**
	25.0												
	27.0												
	28.0												
S-9		1/2	1.8/2.0		M Stiff	Brn + Gray	Silty Clay	CL	0857	0.0			
	30.0	2/3											
	33.0												
S-10		1/2	1.1/2.0		Loose	Gray	Silty F Sand Tr C sand to ‡ Gravel	SP	0907	0.0			
	35.0	3/3											
	38.0												
S-11		2/2	1.0/2.0		M Dense	Gray	Silty M-C Sand Tr F Rock frags	SP	0919	0.0			
	40.0	3/10											
	43.0												
S-12		11/14	1.8/1.9		M Dense to V Dense	Gray	M Sand	SP	0951	0.0			
	45.0	9/100/.4				"salt & pepper"	weathered pelitic met Rock in tip						
				EOB 44.9									
							~ 40 gal	—	Grout 0' to 45'				
									Offset 10' E				
									& re-auger to				
									set well (See				

Log TP-SB04A)

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0.0

Remarks:

Converted to Well: Yes ____ No X Well I.D. #: ____

1105 - 1400 MR, Iver + Larry Reabourn (NEPER) @ boring to observe

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: MaximTech
DRILLING RIG: CME 75
BORING NO.: TP-$B04 A
DATE: 6-18-98
GEOLOGIST: T. EVANS
DRILLER: J. Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0												
							See Log TP-$B04		Auger 0 to 5'			0.0	0.0
							for litho 0 to 11		Refusal on boulder @ 4'-5'				
	3.0						-Boulder 3'-5')		Re-locate ~5' SW				
									Auger 0 to 11				
	5.0												
	11.0												
S-1			0.5/2.0			Brn	Med Rock Frags Some Silt M-C Sand	GW	1241 Saturated	0.0			
	13.0			13.0?									
S-2		1 1	1.0/2.0				- No recovery -		1247				
	15.0	1 1											
S-3		1 1	0.5/2.0		Soft	Olive Gray	Organic Silt Tr-Some VF Sand	MH		13.5	0.0		
	17.0	1 2					HSA 0-15'						
				EOB 17.0'			Natural backfill 14' - 17'						
							Set 2" PVC Screen 3.5'-13.5'						
							#1 Sand 2.5'-14.0'						
							Bentonite 1.0-2.5'						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: High Tide @ 0619 hrs 1240-1330-PB@ boring
Low Tide @ 1253 hrs (?)

Drilling Area Background (ppm):

Converted to Well: Yes ✓ No _____ Well I.D. #: TP-MW04

4 1/4" HSA, 2" SS

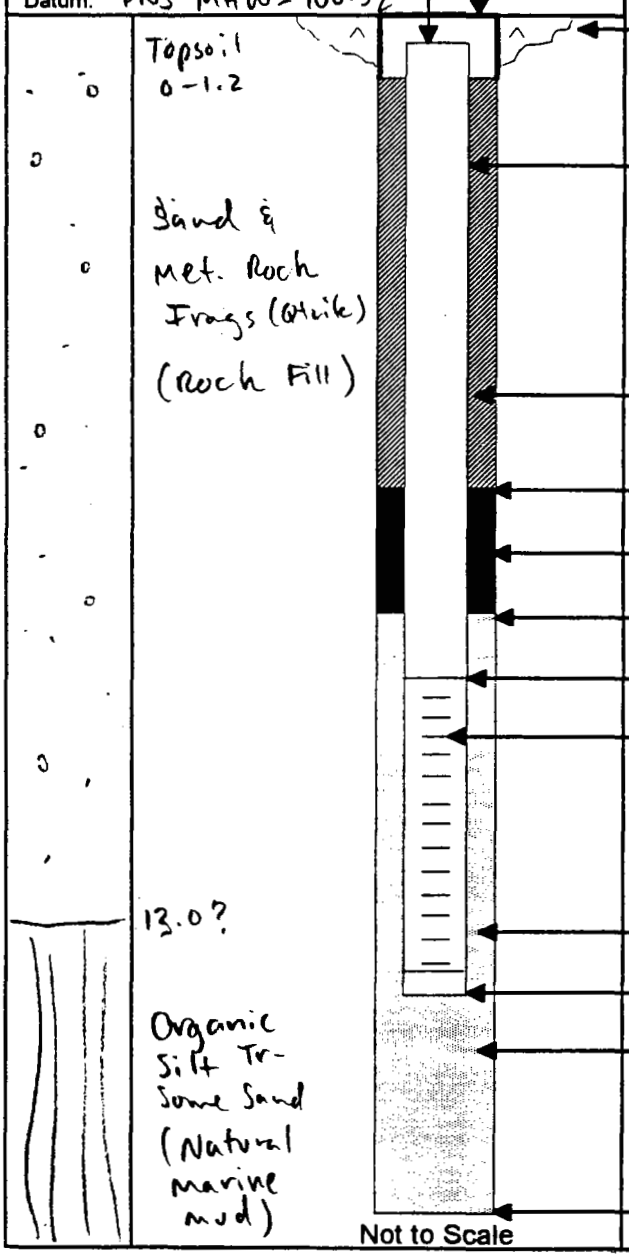
Tetra Tech NUS, Inc.

WELL No.: TP-MW04

MONITORING WELL SHEET

PROJECT:	PNSY	DRILLING Co.:	Maxim Tech	BORING No.:	TP-SB04A
PROJECT No.:	6515	DRILLER:	J. Leonhardt	DATE COMPLETED:	6/18/98
SITE:	Site 32	DRILLING METHOD:	HSA	NORTHING:	91341.02
GEOLOGIST:	T. Evans	DEV. METHOD:	Pumping	EASTING:	349063.53

Ground Elevation = 104.94 ft
Datum: PNS MHW = 100.32



Not to Scale

Elevation / Depth of Top of Riser:		104.57 / 0.37
Elevation / Height of Top of Surface Casing:		105.04 / 0.1
I.D. of Surface Casing:	8" ø	
Type of Surface Casing:	Steel	
Type of Surface Seal:	Quikrete	
I.D. of Riser:	2"	
Type of Riser:	Sch 40 PVC	
Borehole Diameter:	8"	
Type of Backfill:	N/A	
Elevation / Depth of Seal:		103.94 / 1.0
Type of Seal:	Bentonite	
Elevation / Depth of Top of Filter Pack:		102.44 / 2.5
Elevation / Depth of Top of Screen:		101.44 / 3.5
Type of Screen:	Sch 40 PVC	
Slot Size x Length:	0.02" x 10'	
I.D. of Screen:	2"	
Type of Filter Pack:	#1 Qtz Sand	
Elevation / Depth of Bottom of Screen:		91.44 / 13.5
Elevation / Depth of Bottom of Filter Pack:		90.94 / 14.0
Type of Backfill Below Well:	Natural	
Elevation / Total Depth of Borehole:		89.94 / 15.0

Tetra Tech NUS, Inc.

WELL DEVELOPMENT DATA SHEET

PROJECT: PORTSMOUTH NSY
PROJECT No.: 6515
SITE: Topeka Pier (Site 32)
PROJECT GEOLOGIST: T. Evans

WELL No.: TP-MW04
DATE INSTALLED: 6-18-98
DATE DEVELOPED: 7-20-98
DRILLING Co.: Maxim Tech

WELL DATA

WELL MATERIAL: ☒ PVC ☐ STAINLESS STEEL ☐ OTHER:

TOTAL DEPTH: 13.62' (soft) feet (TOC / bgs)
STATIC WATER LEVEL: 5.57' feet (TOC / bgs)
CASING VOLUME 1.31 / 4.96 (gal. / L)

CASING ID: 2 inches
SCREEN LENGTH: 10 feet
BOREHOLE DIA.: 8 inches

PURGE DATA

START TIME: 1140 (hr.)
STOP TIME: 1246 (hr.)

METHOD: Bail / Pump
PUMP TYPE: Grundfos / Redi-flo

Time	Cumulative Volume (gal / L)	Pumping Rate (gpm / Lpm)	Water Level (ft. / m.)	Water Meter Type: HORIBA U-10 / *LaMotte 2020 pH	Sp. Cond. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	Remarks (Color/Odor)
1150	5	–	–	NM	NM	NM	NM	NM	gray Brw / Bail
1203	15	–	–	↓	↓	↓	↓	↓	gray brn / Bail
1212	25	–	–	↓	↓	↓	↓	↓	brn / Bail
1227	30	1.3	NM	↓	↓	↓	↓	↓	Clear / pump
1232	35	1.0	7.20	7.43	42.5	16.0	44/26*	5.08	clear
1240	45	1.3	7.21	7.93	42.6	15.6	34/27*	NM	clear
1243	50	1.7	7.25	7.99	42.5	15.7	4/4.4*	4.65	clear
1246	55	1.7	7.42	7.96	42.6	15.9	0/3.2*	4.64	clear

TOTAL PURGE VOLUME: 55 (gal / L)
TOTAL PURGE TIME: 66 (min. / hrs.)

NOTE: All depth measurements to nearest 0.01 foot.

COMMENTS/CALCULATIONS: High Tide @ 0925
Bail to remove sediment before pumping
1220 Switch to pump

HORIBA S/N 507012 / LaMotte 2020 S/N 0416-4497

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75
BORING NO.: TP-SB05
DATE: 6-9-98
GEOLOGIST: T. EVANS
DRILLER: J. Lean Harrell

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks / Time	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0												
*	1.0			0.25		Dk Brn	Asphalt 0-0.25' Silty F Sand Tr Gravel	SW	1528 TP-SS05-0001-98	0.0			
S-1		11/16	0.6/2.0		M Dense	Brn			1605	0.0			
	3.0	8/8											
* S-2			1.6/2.0	4.0		Dk Brn to Black Brn	Silty Clay & F M Sand Tr Brick	SM	1611 Dry	0.0			
	5.0						F Sand	SP	HSBF0-060998				
* S-3		6/27	0.85/2.0	Fill material	V Dense	Orange Brown to Gray	F-M Sand Some Clay Tr Copper Piece	SC	1615 Saturated @ bottom	0.0			
	7.0	23/28											
	8.0												
* S-4		16/55	1.0/2.0		M Dense	Black	Gravel & F Sandy Silt	GM	1625	NM			
	10.0	17/9											
				??									
	13.0												
S-5		3/4	1.6/2.0		M Stiff	Dk Gray	Silt Some F Sand	ML	1640 Hydrogen sulfide odor	0.0			
	15.0	3/3		Natural			Silt to Tr Clay + Shell		Natural - Back Channel Deposit				
	18.0												
S-6		WOH/WOH	2.0/2.0		M Stiff	Gray	Organic Silt Tr Shell	MH	1650	NM			
	20.0	2/6											
SS	23.0												
S-7		2/4	2.0/2.0		Stiff	Brn &	Clayey Silt	ML	1700	NM			
	25.0	5/4				Gray							

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: 4 1/4" ID HSA 3" SS
* Sampled for TCL VOC SVOC P/P, TAL Metals, CN, pH, TOC, DRO, GRO 1700 PB leaves

Drilling Area Background (ppm): ppm

Converted to Well: Yes X No Well I.D. #: TP-MW05

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75

BORING NO.: TP-SB05
DATE: 6-9-95
GEOLOGIST: T. EVANS
DRILLER: J. Leonhart

Sample No. and Type or RQD	Depth (FL) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	25.0												
	28.0												
S-8		WOH / WOH	2.0/2.0		V Soft	Gray	Clayey Silt	MH	1715 High plasticity	6.0			
	30.0	WOH / WOH											
				-?-?									
	33.0												
S-9		6 / 7			V Dense	Gray	F-M Sand Tr Silt	SP/SM	1730	NM			
	35.0	100/.4	1.2/1.4	EOB 34.6									
									Auger Refusal @ 34.6'				
									1745 Leave site for day				
							6/10		0854 Pull augers				
									to 15'				
									Natural backfill				
									to 20'				
									Backfill Bentonite 14' - 20' bgs				
							2" pvc Screen 3.5-13.5		(20-slot)				
							#1 Sand 2.6 - 14.0						
							Bentonite 1 - 2.6						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area: P11

Background (ppm): 0.0 ppm

Remarks: 0900 - Rad @ site 0830 - 0930 MR @ site
0910 0830 - 0900 DD camp

Converted to Well: Yes X No ____ Well I.D. #: TP-MW05

Tetra Tech NUS, Inc.

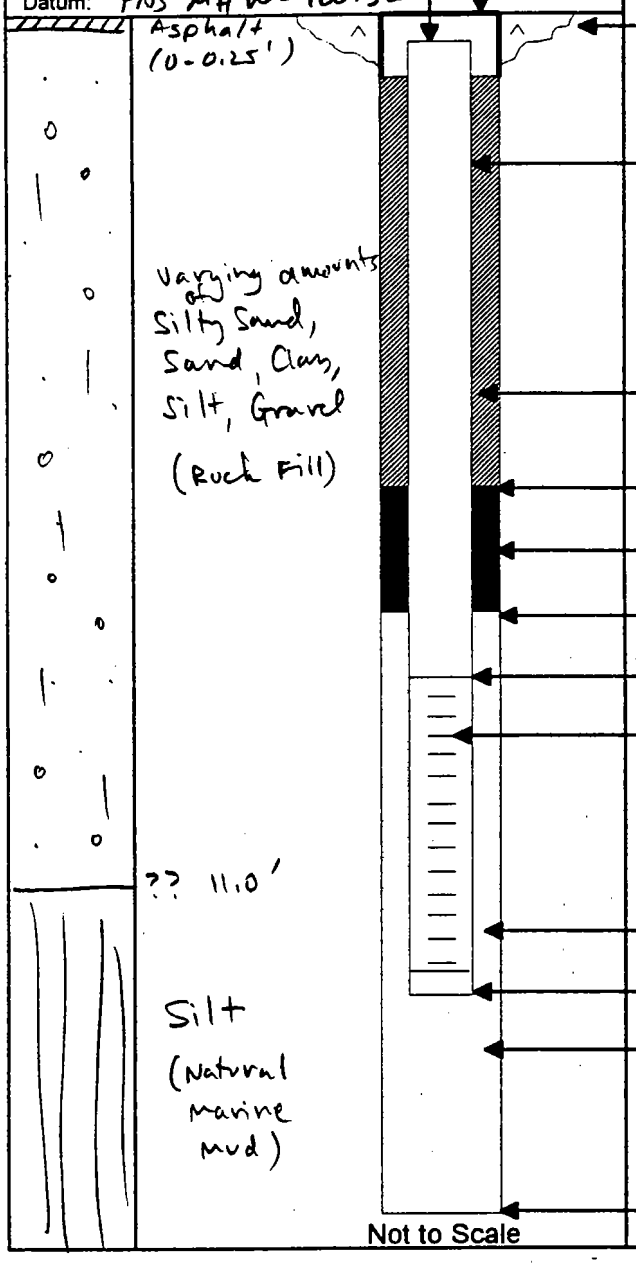
WELL No.: TP-MW05

MONITORING WELL SHEET

PROJECT:	PNSY	DRILLING Co.:	Maxim Tech	BORING No.:	TP-SB05
PROJECT No.:	6515	DRILLER:	J. Leonhardt	DATE COMPLETED:	6/10/98
SITE:	Site 32	DRILLING METHOD:	HSA	NORTHING:	91384.31
GEOLOGIST:	T. Evans	DEV. METHOD:	Pumping	EASTING:	348659.52

Ground Elevation = 104.88 ft

Datum: PNS MHW = 100.32



Not to Scale

Elevation / Depth of Top of Riser:	104.53 / 0.35
Elevation / Height of Top of Surface Casing:	104.93 / 0.05
I.D. of Surface Casing:	8"Ø x 12" Deep
Type of Surface Casing:	Steel
Type of Surface Seal:	Quikrete
I.D. of Riser:	2"
Type of Riser:	Sch 40 PVC
Borehole Diameter:	8"
Type of Backfill:	N/A
Elevation / Depth of Seal:	103.88 / 1.0 ft
Type of Seal:	Bentonite
Elevation / Depth of Top of Filter Pack:	102.28 / 2.6
Elevation / Depth of Top of Screen:	101.38 / 3.5
Type of Screen:	Sch 40 PVC
Slot Size x Length:	0.02" x 10'
I.D. of Screen:	2"
Type of Filter Pack:	#1 Qtz Sand
Elevation / Depth of Bottom of Screen:	91.38 / 13.5
Elevation / Depth of Bottom of Filter Pack:	90.88 / 14.0
Type of Backfill Below Well:	Bentonite 14-20'; Natural 20-34.6'
Elevation / Total Depth of Borehole:	70.28 / 34.6

Tetra Tech NUS, Inc.

WELL DEVELOPMENT DATA SHEET

PROJECT: PORTSMOUTH NSY
PROJECT No.: 6515
SITE: Site 32
PROJECT GEOLOGIST: T. Evans

WELL No.: TP-MW05
DATE INSTALLED: 6/10/98
DATE DEVELOPED: 6/17/98
DRILLING Co.: Maxim Tech

WELL DATA

WELL MATERIAL: ☒ PVC ☐ STAINLESS STEEL ☐ OTHER:

TOTAL DEPTH: 13.68' (solid) feet (TOC / bgs)
STATIC WATER LEVEL: 5.67 feet (TOC / bgs)
CASING VOLUME 1.30 (gal / L)
4.94 L

CASING ID: 2 inches
SCREEN LENGTH: 10 feet
BOREHOLE DIA.: 8 inches

PURGE DATA

START TIME: 1200 (hr.)
STOP TIME: 1247 (hr.)

METHOD: Pumping
PUMP TYPE: 2" Grundfos / redi FI Sub pump

Water Meter Type: HORIBA U-10 (S/N 502017)

Time	Cumulative Volume (gal. / L)	Pumping Rate (gpm / Lpm)	Water Level (ft. / m.)	pH	Sp. Cond. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	Remarks (Color/Odor)
1200	Ø	—	NM	NM	NM	NM	NM	NM	Olive Gray Opaque
1209	10	0.9	NM	↓	↓	↓	↓	↓	olive gray opaque
1214	15	1.0	5.95	7.68	27.6	14.4	705	0.64	gray translucent
1218	20	1.3	5.97	7.60	27.6	13.9	125	1.21	cloudy
1222	25	1.3	5.98	7.53	27.0	13.8	60	1.64	clear
1222-1227									Stop to allow for resurgence of
1232	30	1.0	6.01	7.05	27.0	13.6	19	2.09	clear
1235	35	1.7	6.03	7.53	27.6	13.6	11	0.95	clear
1239	40	1.3	6.09	7.69	27.7	13.5	6	0.99	clear
1243	45	1.3	6.12	7.59	27.7	13.3	5	1.01	clear
1247	50	1.3	6.10	7.69	28.0	13.3	4	0.85	clear
1247									Stop
	$\bar{X}$ =	1.2							

TOTAL PURGE VOLUME: 50 (gal. / L)
TOTAL PURGE TIME: 47 (min / hrs.)

NOTE: All depth measurements to nearest 0.01 foot.

COMMENTS/CALCULATIONS: 11:35 Low Tide

13.68
− 5.67
8.01 ft H_2O × 0.163 gal/ft H_2O = 1.30 gal

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75

BORING NO.: TP-SB06
DATE: 6-16-98
GEOLOGIST: T. EVANS
DRILLER: J. Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Drilling BZ**
	0.0												
	1.0			0.2		DK Brn	Asphalt w/ Dilitar subase → Gravelly M-C Sand	SW	1509 wet - H2O in hole @ surface	0.0			
S-1		10/12	1.3/2.0		M Dense	DK Brn	M-C Sand	SW	Petro odor	0.0			
	3.0	7/7				to Blck	Tr Granular metallic material (Grit?) @ bottom		1529 moist				
S-2		5/10	1.7/2.0	3.3	M Dense				1533	0.0			
	5.0	7/7		4.7		DK Brn Black	M Sand + wood piece → coal frag? @ bottom (w/ white substance = ash(?))	SP					
S-3		3/3	0.8/2.0		Loose	Lt Brn	Coal frag, Slate?	SW	1535 Tr Green spots	0.0			
	7.0	2/3					Ash(?) Tr Porcelain						
S-4		1/1	0.7/2.0	▽ 7.5 ▽ 6/16	V Loose	Lt Brn	Silty M-C Sand	SW	1540 Saturated	0.0			
	9.0	1/1					Tr metal frags, Brick						
S-5						Lt Brn	Silty M-C Sand	SW	1546	0.0			
	11.0				Loose	to Blck	Tr metal Porcelain, Wood						
	13.0			▽ 12.7 ▽ 6/17									
S-6		2/3	1.8/2.0	13.9		Blck	Silty F Sand Tr Glass	SP	1610 oily shell	0.0			
	15.0	3/4				Olive Gray	Silt Tr Shell	ML					
	18.0												
S-7		3/4	1.5/2.0		Dense	Tan & Gray →	Clay (mottled) to	CL	16:15	0.0			
2" SS	20.0	10/14				to Tan →	Clayey/Silty v.f. Sand Tr C Sand	SM					
									1625 oil caps pops on rig!				
	22.0					green to black +	Chloritic Pelitic Met Rock		6/17@1510 continue				
S-8		100/0"		EOB 22.0	M Soft		Backfill #1 Sand 18-20.5		1513				
	24.0						Bentonite 15-18 2" PVC well 4.5-14.5 #1 Sand 3.3-15.0 Bentonite 1.5-3.3		Auger Refusal @ 22.0'				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0 ppm

Remarks: 4 1/4" ID HSA, 3" SS
• TP-SS06-0001-98
•• TP-SB06-0305-98

Converted to Well: Yes ✓ No ____ Well I.D. #: TP-MW06

••• TP-SB06-0507-98 VOC, GRO, DRO, Metals, CN, pH, SVOC, TOC
★ TP-SB06-1315-98

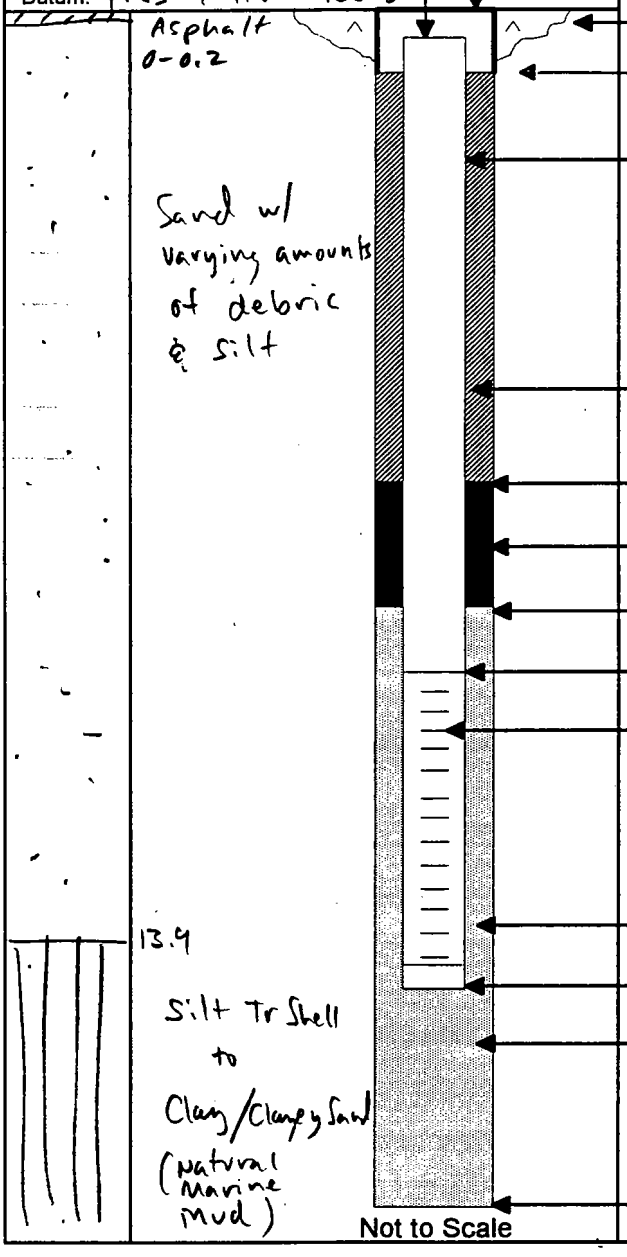
Tetra Tech NUS, Inc.

WELL No.: TP-MW06

MONITORING WELL SHEET

PROJECT:	PNSY	DRILLING Co.:	MaximTech	BORING No.:	TP-SB06
PROJECT No.:	6515	DRILLER:	J. Leonhardt	DATE COMPLETED:	6/17/98
SITE:	Site 32	DRILLING METHOD:	HSA	NORTHING:	91244.17
GEOLOGIST:	T. Evans	DEV. METHOD:	Pumping	EASTING:	34.8545.42

Ground Elevation = 105.83 ft
Datum: PNS MHW = 100.32



Not to Scale

Elevation / Depth of Top of Riser:		105.431 0.40
Elevation / Height of Top of Surface Casing:		105.831 —
I.D. of Surface Casing:	8"ϕ	
Type of Surface Casing:	Steel	
Type of Surface Seal:	Quikcrete	
	6" Sand drain below Surface casing	
I.D. of Riser:	2"	
Type of Riser:	Sch 40 PVC	
Borehole Diameter:	8"	
Type of Backfill:	N/A	
Elevation / Depth of Seal:		104.331 1.5
Type of Seal:	Bentonite	
Elevation / Depth of Top of Filter Pack:		102.531 3.3
Elevation / Depth of Top of Screen:		101.331 4.5
Type of Screen:	Sch 40 PVC	
Slot Size x Length:	0.02" x 10'	
I.D. of Screen:	2"	
Type of Filter Pack:	#1 Qtz Sand	
Elevation / Depth of Bottom of Screen:		91.331 14.5
Elevation / Depth of Bottom of Filter Pack:		90.831 15.0
Type of Backfill Below Well:	Natural 20.5-22.0 ; #1 Sand 18-20.5 ; Bentonite 15-18	
Elevation / Total Depth of Borehole:		83.831 22.0

Tetra Tech NUS, Inc.

WELL DEVELOPMENT DATA SHEET

PROJECT: PORTSMOUTH NSY
PROJECT No.: 6515
SITE: Site 32
PROJECT GEOLOGIST: T. Evans

WELL No.: TP-MW06
DATE INSTALLED: 6/17/98
DATE DEVELOPED: 6/19/98
DRILLING Co.: Maxim Tech

WELL DATA

WELL MATERIAL: ☒ PVC ☐ STAINLESS STEEL ☐ OTHER:

TOTAL DEPTH: 13.66 (soft) feet (TOC / bgs)
STATIC WATER LEVEL: 6.52 feet (TOC / bgs)
CASING VOLUME (gal. / L)

CASING ID: 2 inches
SCREEN LENGTH: 10 feet
BOREHOLE DIA.: 8 inches

PURGE DATA

START TIME: 1154 (hr.)
STOP TIME: 1404 (hr.)

METHOD: Pump & Surge
PUMP TYPE: 2" Grundfos/Redi-Submersible Pump

Time	Cumulative Volume (gal. / L)	Pumping Rate (gpm / Lpm)	Water Level (ft. / m.)	Water Meter Type: HORIBA U-10 / LaMotte 2020 pH	Sp. Cond. (mS/cm)	Temp. (°C)	Turbidity* (NTU)	DO (mg/L)	Remarks (Color/Odor)
1154	∅								olive brn opaque
1211	20	1.20	6.62	7.46	18.7	15.4	>999/550	1.46	olive gray opaque
1232	40	0.90	6.60	7.65	19.3	15.8	>999/>1100	1.78	olive gray translucent
1246	45	0.35	6.61	7.63	19.0	16.4	>999/>1100	0.75	olive brn opaque
1300	55	0.77	6.62	7.63	19.2	15.1	250/160	1.49	olive gray translucent
1313	65	0.77	6.65	7.61	19.3	15.3	84/50	1.72	cloudy
1326	75	0.77	6.64	7.52	19.3	15.3	37/24	1.41	clear/cloudy
1339	85	0.77	6.67	7.59	19.4	15.0	19/12	1.64	Clear
1353	95	0.71	6.66	7.57	19.4	14.9	9/4.2	1.19	Clear
1404	102	0.63							- Stop -
	$\bar{X}$ =	0.73							

TOTAL PURGE VOLUME: 102 (gal / L)
TOTAL PURGE TIME: 130 (min. / hrs.)

NOTE: All depth measurements to nearest 0.01 foot.

COMMENTS/CALCULATIONS:
Low Tide @ 1333

* HORIBA U-10 (S/N 307012) / LaMotte 2020 (S/N 0416-449)

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75

BORING NO.: TP-SB07
DATE: 6-15-98
GEOLOGIST: T. EVANS
DRILLER: J. Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks (Time)	FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
*	1.0			0.4		Brn	Asphalt F Gravelly M-C Sand	SW	0830 Moist	0.0			
S-1		14/35	0.8/1.3	2.2	V Dense	Brn to	Silty F-M Sand	SW	0908 Dry	0.0			
	3.0	100/.3				DK Brn	To F Gravel + Slag?		Hit something hollow @ 2.2' bgs				
** S-2		42/30	1.2/2.0		M Dense	Orange brn	M-C Sand & Rock met Frags	SW/GW	Move 25' WSW 1002 Moist	0.0			
	5.0	14/9											
S-3		6/6	0.6/2.0		Loose	Orange to brn	met Rock Frags & M-C Sand	SW/GW	1014 Moist	0.0			
	7.0	4/6											
** S-4		7/12	0.6/3.0		M Dense	Brn	Silty M Sand Tr Gravel		1018 Poor Recovery Wet	0.0			
	9.0	14/14											
S-5		9/7	1.0/2.0		M Dense	Brn	Silt, M Sand & Rock met Frags	GW/SW	1027 Saturated	0.0			
	11.0	8/7											
	13.0												
• S-6		6/8	1.7/2.0		M Dense	Black to	F Sandy Silt Tr Shell to	SM	1035 Petro Odor	23.3	0.0		0.
	15.0	11/11				DK Brn	M Sand	SP					
	18.0			??									
•• S-7		1/2	1.8/2.0		Loose	Blk to	Silty F Sand to	SM to	1038 H2S Odor	89.9	0.0		0.
	20.0	3/3				Gray	Silt Tr Shell	ML	Natural Back Channel Deposit				
	22.0												
S-8		3/4	2.0/2.0		Stiff	Gray +	Silt	MH	1055 mottled	3.7			
	25.0	8/7				Brn							

* When rock coring, enter rock brokeness. 4¼" ID HSA 3" SS

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area PID

Background (ppm): 0.0 ppm

Remarks: * Collect TP-SB07-0001-98 + MS/MSD
** Sample TP-SB07-0305-98
*** TP-SB07-0709-98 (for GRO + DRO only)

Converted to Well: Yes ____ No X Well I.D. #: ____

Low Tide @ 0948

• Sample TP-SB07-1315-98 (from below WT) + SBFD-061598

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim
DRILLING RIG: CME 75
BORING NO.: TP-SB07
DATE: 6-15-98
GEOLOGIST: T. EVANS
DRILLER: J. Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	28.0												
S-9		WOH / 1	2.0/2.0		V Soft	Gray + Brn	Clayey Silt	ML/CL	1102 mottled	2.3			
	30.0	1 / 2											
	32.0												
S-10		WOH / WOH	2.0/2.0		V Soft	Gray	Silt	MH	1110	0.0			
	35.0	WOH / WOH											
S-11													
	38.0	WOR / WOR	2.0/2.0		V Soft	Gray	Silt	MH	1120	0.0			
		WOH / WOH											
	40.0												
	43.0												
S-12		2 / 4	0.2/2.0		M Dense	Gray	Silty F-M Sand & Rock Frags	SW/GW	1132 Poor recovery	0.0			
	45.0	5 / 7											
				EOB 47.2					Auger Refusal @ 1155 pull augers to 20' -> hole open to 41'	47.2'			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

1415-1445 Grout to 10' top w/ cuttings & concrete

Drilling Area Background (ppm): 0.0

Remarks: 1450 Re-locate auger 10' SE to set well - See Boring Log TP-SB07A

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75

BORING NO.: TP-SB07A
DATE: 6-15-08
GEOLOGIST: T. EVANS
DRILLER: J. Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0								Time				
							See Log TP-SB07		1450 Auger 0-10'				
							Auger 0-10'						
	5.0												
				9.0									
	10.0												
S-1			0.7/2.0			Brn	Silty M-C Sand TR Rock Frags		1500 Saturated				
	12.0								Auger to 12.0				
	13.0												
S-2			1.3/2.0			Brn to	Rock Frags ?	GW/SW	1530	0.0			
	15.0			14.5		Dk Brn	M-C Sand						
							Auger to 14.5'						
							Set well screen 4.0 -		14.0 (2" PVC 0.020" slot)				
							#1 Sand 3.0 -		14.5				
							Bentonite 1.5 -		3.0				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0.0

Remarks: 4 1/4" HSA 2" SS
1609 High Tide

Converted to Well: Yes ✓ No _____ Well I.D. #: TP-MW07

Tetra Tech NUS, Inc.

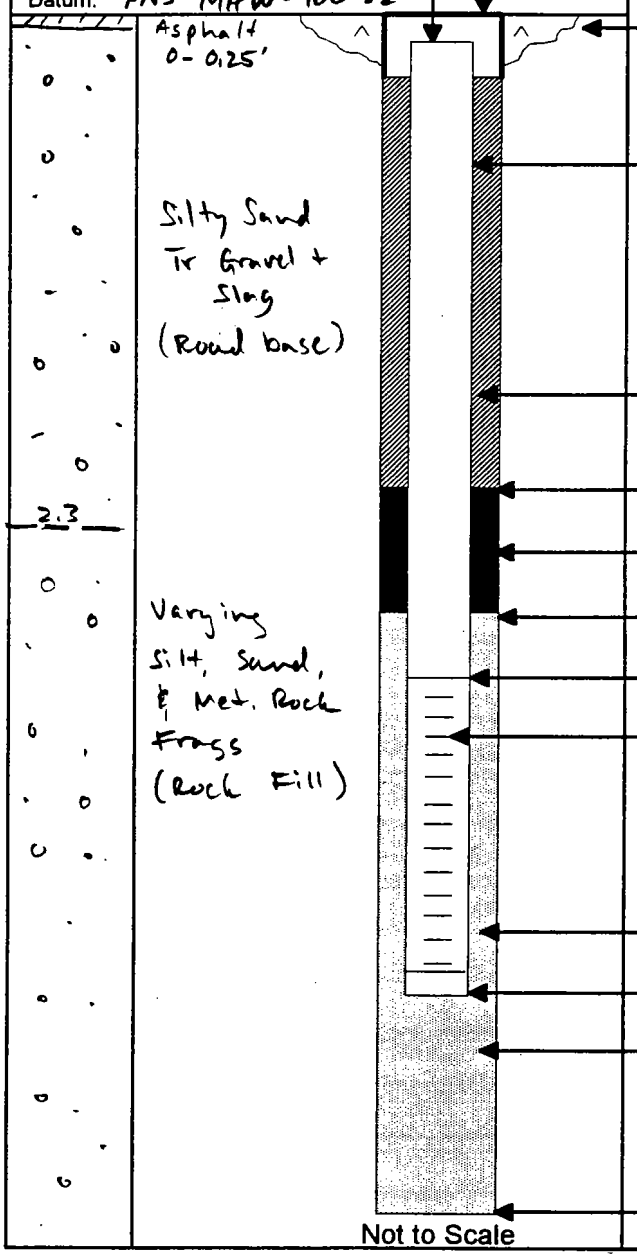
WELL No.: TP-MW07

MONITORING WELL SHEET

PROJECT:	PNSY	DRILLING Co.:	MaximTech	BORING No.:	TP-SB07A
PROJECT No.:	6515	DRILLER:	J. Leonhardt	DATE COMPLETED:	6/15/98
SITE:	Site 32	DRILLING METHOD:	HSA	NORTHING:	91465.53
GEOLOGIST:	T. Evans	DEV. METHOD:	Pumping	EASTING:	348454.95

Ground Elevation = 104.69 ft

Datum: PNS MHW=100.32



Not to Scale

Elevation / Depth of Top of Riser: 104.281 0.41

Elevation / Height of Top of Surface Casing: 104.731 0.04

I.D. of Surface Casing: 8 in. Φ x 12 in

Type of Surface Casing: Steel

Type of Surface Seal: Quikrete

I.D. of Riser: 2"

Type of Riser: Sch 40 PVC

Borehole Diameter: 8 in.

Type of Backfill: N/A

Elevation / Depth of Seal: 103.19 / 1.5 ft

Type of Seal: Bentonite

Elevation / Depth of Top of Filter Pack: 101.69 / 3.0 ft

Elevation / Depth of Top of Screen: 100.69 / 4.0 ft

Type of Screen: Sch 40 PVC

Slot Size x Length: 0.020" x 10'

I.D. of Screen: 2"

Type of Filter Pack: #1 Qtz Sand

Elevation / Depth of Bottom of Screen: 90.69 / 14.0 ft

Elevation / Depth of Bottom of Filter Pack: 90.19 / 14.5 ft

Type of Backfill Below Well: N/A

Elevation / Total Depth of Borehole: 90.19 / 14.5 ft

Tetra Tech NUS, Inc.

WELL DEVELOPMENT DATA SHEET

PROJECT: PORTSMOUTH NSY
PROJECT No.: 6515
SITE: Site 32
PROJECT GEOLOGIST: T. Evans

WELL No.: TP-MW07
DATE INSTALLED: 6/15/08
DATE DEVELOPED: 6/18/08
DRILLING Co.: Maxim Tech

WELL DATA

WELL MATERIAL: ☒ PVC ☐ STAINLESS STEEL ☐ OTHER:

TOTAL DEPTH: 14.64 feet (TOC / bgs)
STATIC WATER LEVEL: 5.49 feet (TOC / bgs)
CASING VOLUME 1.49 (gal / L)

CASING ID: 2 inches
SCREEN LENGTH: 10 feet
BOREHOLE DIA.: 8 inches

PURGE DATA

START TIME: 1619 (hr.)
STOP TIME: 1741 (hr.)

METHOD: Pump
PUMP TYPE: 2" Grundfos/Redi flo Sub pump

Time	Cumulative Volume (gal / L)	Pumping Rate (gpm / Lpm)	Water Level (ft. / m.)	Water Meter Type: HORIBA U-10 pH	Sp. Cond. (mS/cm)	Temp. (°C)	Turbidity* (NTU)	DO (mg/L)	Remarks (Color/Odor)
1619	Ø	–		– No measurement			so not		olive Gray opaque
1620	5	0.7		damage instrument			–		"
1632	10	0.8	5.63	6.67	20.80	14.4	883/584	8.44	olive gray translucent
1638	15	0.8	5.48	7.18	20.70	14.2	110/85.7	4.29	olive gray translucent
1643	18	0.6							Pump Stops
1723	–		4.10						Continue pumping
1725	22	2.5	4.06	7.41	20.2	13.3	474/310	4.00	tan brown
1728	28	1.7	4.00	7.23	20.1	13.6	38/27	4.82	Clear
1733	33	1.0	3.85	7.30	20.0	13.5	1/6.2	4.90	clear
1737	38	1.3	3.74	7.23	20.0	13.5	0/4.2	4.74	clear
1741	43	1.3							Stop
	$\bar{Y}$ =	1.2							

TOTAL PURGE VOLUME: 43 (gal. / L)
TOTAL PURGE TIME: 40 (min / hrs.)

NOTE: All depth measurements to nearest 0.01 foot.

COMMENTS/CALCULATIONS:
1600 Calibrate HORIBA
1857 High Tide

* Turbidity = HORIBA U-10 (S/N 5070127) / Lamotte 2020 (S/N 0416-4497)

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75

BORING NO.: TP-SB08
DATE: 7-10-98
GEOLOGIST: T. EVANS
DRILLER: J. Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks (145 mob to TP) Time	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0												
	1.0					Brn	Asphalt 0.0-0.3 M-C Sand Some F Gravel	SW	1500 TP-SB08-0001-98 (0.0-0.8)	0.0			
S-1		16/50	1.1/2.0		Dense	Brn	Met Rock Frags &	GP/SW	1515	0.0			
	3.0	17/24					M-C Sand Some Silt						
S-2		15/16	1.0/2.0		M Dense	Gray to yellow brn	Silty F-C Sand & Met Rock Frags	SW/GW	1522 TP-SB08-0203-98 (Poor recovery)	0.0			
	5.0	7/8											
S-3		6/12	1.0/2.0		M Dense	Brn	↓	SW/GW	1526 Saturated @ 6.4 TP-SB08-0307-98	0.0			
	7.0	14/14											
	8.0												
S-4		4/12	0.8/2.0	Rock Fill	M Dense	Brn	Met Rock frags Some M-C Sand	GW	1540	0.0			
	10.0	8/8											
	13.0												
S-5		8/7	0.9/2.0		M Dense	Brn	M-C Sand Tr Silt to Met Rock Frags	SW to GP	1550	0.0			
	15.0	7/9											
	18.0			-?-?-									
S-6		3/6	2.0/2.0	18.6	V Stiff	Dk Brn to Brn + Gray	Organic Silt Tr Shell to Silty M Sand / Silt Tr Clay	OH SP / ML	1615 TP-SB08-1820-98 Natural	4.2			
	20.0	11/14											
	23.0												
SS S-7		3/3	1.5/2.0		Loose	Brn + Gray	F Sandy Silt to Silty F Sand	ML/SM to SM	1630	0.0			
	25.0	5/5											

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): [illegible]

Remarks: 4 1/4" ID HSA 3" SS 1500-1625 P. Blais @ TP
* VOC; DRO; GRO; Metals, CN, pH + TOC, Sulfs + PIP
crit

Converted to Well: Yes ____ No X Well I.D. #: ____

* Normal set

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75

BORING NO.: TP-SB08
DATE: 7-10-98
GEOLOGIST: T. EVANS
DRILLER: J. Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	25.0												
	27.0												
	28.0												
S-8		2/4	1.4/2.0		Loose	Gray	Silty F Sand Vtr F Met Rock Frags	SM/SP	1640	0.0			
	30.0	4/5											
	33.0												
S-9		3/5	1.5/2.0		M Dense	Gray	F Sandy Silt / Silty F Sand Tr F Met Rock Frags	SM	1653	0.0			
	35.0	8/11											
									1655 - 1730 plug stuck in augers				
	38.0												
S-10		6/30	1.4/1.4		V Dense	Gray	Sandy Silt	SM/ML	1745	0.0			
	40.0	100/.4					Met Rock Frags some Silt	Gen	Auger Refusal @ 39.7				
				EOB @ 39.7'									
							Natural Backfill 25.3' - 39.7'						
							Bentonite 18.0 - 25.3'						
							Natural Backfill 2.0 - 18.0						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area PID

Background (ppm): 0.0 ppm

Remarks:

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75
BORING NO.: TP - SB05
DATE: 6-9-98
GEOLOGIST: T. EVANS
DRILLER: J. Leonhardi

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
		0.0								Time				
*		1.0			0.25		Dk Brn	Asphalt Silty F Sand Tr Gravel	SW	0905	0.0		0.0	
	S-1		9/25	1.3/2.0		Dense	Lt Brn	F-M Sand & F-C Gravel	SW/GW	0947 Dry	0.0			
		3.0	18/18				Black to	Silty Sand w/ varying						
**	S-2		14/31	1.5/2.0		Loose	Red Brn	amounts of tr clay & F gravel		0953 Dry	0.0			
		5.0	100/1.4											
**	S-3		3/3	0.4/2.0		Loose	Dk Brn	Silty F Sand Tr F Gravel	SW	1001 Poor Recovery	0.0			
		7.0	4/4											
		8.0			▽ @ 1015									
**	S-4		33/32	1.4/2.0	Fill Material	VDense	Dk Brn to Dk Gray	F Sandy Silt Tr Rock Frags	GM	1013 Saturated	0.0			
		10.0	70/56											
					??									
		13.0												
**	S-5		1/1	1.8/2.0		M Stiff	Gray	F Sandy Silt Tr Shell	ML/SM	1055 Hydrogen Sulfide Odor	0.1			
		15.0	2/3		Natural					Natural - Back Channel deposits				
		18.0												
	S-6		WOH/WOH	2.0/2.0		V Soft	Gray	Clayey Silt Tr Shell	MH	1103	0.0			
		20.0	WOH/2											
		23.0												
	S-7		4/5	2.0/2.0		V Stiff	Gray + Brn	Clay	CL	1120 mottled	0.0			
		25.0	8/9											

* When rock coring, enter rock brokeness. High Tide @ 1153

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4¼" ID HSA 3" SS
* collect TP-SS04-0001-98 from 0.25-0.5' + SSFD-060998
** VOCs, GRO, DRO only

Converted to Well: Yes ____ No ✓ Well I.D. #: ____

*** Sampled for TCL VOC, SVOC, P/P, TAL metals CN, pH, TOC, DRO, GRO

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75

BORING NO.: TP-SB09
DATE: 6-9-99
GEOLOGIST: T. EVANS
DRILLER: J. Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	25.0												
	28.0			27.7					Shell bed? @ 27.7'				
S-8		2 2	2.0/2.0		M Stiff	Gray & Brn	Clay	CL	1135 Mottled	0.0			
	30.0	2 3											
	33.0												
S-9		WOH WOH			V Soft	Gray	Clayey Silt	MH	1150	0.0			
	35.0	WOH 2											
S-10	37.5	50/0											
				EOB 37.5					Auger Refusal @ 37.5' @ 1200				
									Natural backfill				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area PII

Background (ppm): 0. ppm

Remarks:

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75
BORING NO.: TP-SB10
DATE: 6-16-98
GEOLOGIST: T. EVANS
DRILLER: J. Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks (Time)	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	1.0			0.18		Brn	F-M Sand Tr F Gravel	SW	0740				
S-1		10/10	1.6/2.0		M Dense	↓	↓	↓	0752	0.0			
	3.0	10/5		2.6		Tan	F-M sand w/ 1 SS Frag (2"Ø)	SP					
S-2		6/18	1.9/2.0	3.5	Dense	↓			0800	0.0			
	5.0	25/18		Rock Fill		DK Brn	Silty F-M Sand Tr-some Rock Frags +	SM/SW					
S-3		4/8	0.2/2.0			DK	Tr Brick, glass Silt & F Sand Tr Rock Frags	SM/SP	Lightning @ 0805 - Stop operations				
	7.0	8/6				Brn							
* S-4		3/5	0.7/2.0		M Dense	Brn	Silt, F-C Sand & Rock Frags	SW/SM	1131 Wet	0.0			
	9.0	8/7											
** S-5		2/7	0.7/2.0		M Dense	Brn	Rock Frags Some F-C Sand	SW	1134 Wet	0.0			
	11.0	6/8							Poor Recovery				
				▽ 11.8									
	13.0												
* S-6		1/1	2.0/2.0		V Loose	Olive Gray	F Sandy Silt Tr Shell	ML/SM	1140 H_2S odor Natural	10/6.3	6.0	0.0	0.
	15.0	1/1											
	18.0												
S-7		WOH/1	2.0/2.0	Natural	Soft	Olive Gray	Clayey Silt Tr Shell	ML	1155	0.0			
	20.0	2/1											
	23.0												
↓ SS S-8		2/5			Stiff	gray +	Silty Clay	CL	1210 mottled	0.0			
	25.0	7/8				brn							

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0 ppm

Remarks: • TP-SS10-0001-98 4¼" ID HSA, 3" SS
•• TP-SB10-0305-98
* TP-SB10-0709-98 (VOC, GRO, & DRO only)

Converted to Well: Yes ____ No X Well I.D. #: ____

** TP-SB10-0911-98 (GRO, DRO only)
*** TP-SB10-1315-98

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75

BORING NO.: TP-SB10
DATE: 10-16-98
GEOLOGIST: T. EVANS
DRILLER: Jim Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	25.0												
	28.0												
S-9		WOH / 1	2.0 / 2.0	28.4	V Soft	Gray + Brn / Gray	Silty Clay / Silt	CL / ML	- mottled 1224	0.0			
	30.0	WOH / 1											
	33.0												
S-10		WOR / 100/.4	0.9 / 0.9			Gray	Silt to VF Sand	SP / SM	1235	0.0			
	35.0			EOB 34.1'									
									1240 Auger Refusal @ 34.1				
									Cave-in to 10'				
									as pull augers				
									Natural backfill				
									to surface				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0.0

Remarks:

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75

BORING NO.: TP- SB11
DATE: 7-16-98
GEOLOGIST: T. EVANS
DRILLER: J. Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0								Time				
	1.0			1.0		Brn	Silt Some Organics,	OL/ML	0830	0.0			
S-1		6/7	1.3/2.0		M Dense		Roots TR F Gravel (0.0-0.7)		0834	0.0			
	3.0	10/20				Brn	Sandy Silt to M Sand Tr not Rock Frags	SM to SW					
S-2		4/5	1.2/2.0		M Dense	Brn	M sand Tr F Gravel	SP	0840 Damp	0.0			
	5.0	7/11											
S-3		4/7	0.9/2.0		Loose	DK Brn	Met Rock Frags & Chips	Gry/Brn	0850 wet	0.0			
	7.0	5/4					Some Silt						
S-4		5/16	1.3/2.0		M Dense	Black to Red Brn to Black	Shredded Material (Plats) F Sandy Silt Tr Copper Bolt, 1 Brass Nugget	SM	0853 Saturated	0.0			
	9.0	15/11											
	13.0												
S-5		2/3	1.4/2.0	14.2	Loose	Black	F Sand Some Silt Tr Gravel	SP	0915	0.0			
	15.0	2/3				Gry	F Sandy Silt	ML	Natural				
	18.0												
S-6		1/1	1.2/2.0		V Soft	Gray	Silt Tr Clay, Shell	MH	0920	0.0			
	20.0	1/1											
	23.0												
S-7		1/2	2.0/2.0		Soft to	Gray	Silt to	MH	0930	0.0			
	25.0	3/7			Stiff		Clayey Silt	ML/CL					

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area P-

Remarks: 4 1/4" ID HSA 3" SS 0810-0905 P.Blais (rad) @ TP
• • Normal set + SSFD-071698 0950 P. Blais check S-4 + S-5
• Normal sample set

Background (ppm): 0

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75

BORING NO.: TP-SB 11
DATE: 7-16-98
GEOLOGIST: T. EVANS
DRILLER: J. Leonhardt

Sample No. and Type or RQD	Depth (Ft) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	25.0								Time				
	28.0												
S-8		3 / 3	2.0/2.0		M Stiff	Tan &	Clayey Silt (mottled)	ML/CL	0945	0.0			
	30.0	2 / 5				Gray							
	33.0												
S-9		1 / 1	0.0/2.0	33.8	V Soft	Tan & Gray	Clayey Silt	ML/CL	0955	0.0			
	35.0	WOH / WOH				to Gray	Silt	ML					
	38.0												
S-10		WOH / 1	1.0/2.0		V Soft	Gray	Silt	MH	1005	0.0			
	41.0	1 / 1											
	43.0												
S-11		WOH / WOH	1.8/2.0		V Soft	Gray	Silt Tr-Some F Sand	MH	1015	0.0			
	45.0	WOH / WOH											
	48.0												
S-12		6 / 7	1.2/2.0		Stiff to	Gray	Silt	MH	1026	0.0			
	50.0	10 / 14		49.5	M Dense		F-M Sand Tr F Gravel	SP					

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area PIS

Remarks:

Background (ppm): 0.0

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75
BORING NO.: TP- SB11
DATE: 7-16-98
GEOLOGIST: T. EVANS
DRILLER: J. Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	50.0												
	53.0												
S-13		27 / 11	1.1 / 2.0		M Dense	Gray	F-M Sand VTr F Gravel	SP	1041	0.0			
	55.0	18 / 12											
				57.1									
	58.0								1050 Auger Refusal @ 57.1'				
	60.0								1100 Pull augers				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm):

Remarks:

Converted to Well: Yes ____ No ____ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75

BORING NO.: TP-SB12
DATE: 7-13-98
GEOLOGIST: T. EVANS
DRILLER: J. Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0												
	1.0					Brn	Silt Tr Plant Roots, F Gravel	OL	0900 TP-SB12-0001-98	0.0			
S-1		10/11	1.8/2.0		M Dense	Brn	F Sand to	SP to	Dry (0.2-0.8) 0906	2.5			
	3.0	14/12					Silty F Sand Tr F Gravel	SM					
S-2		6/7	1.9/2.0		M Dense	Brn	Silt Tr Clay, C Sand	ML	0922	0.0			
	5.0	8/8							mottled				
S-3		2/2	1.2/2.0		Loose	Brn	Clayey/Silty F Sand	SC/	0926 Moist	0.0			
	7.0	3/4				to Brn	Gray Vtr Met Rock Frags	SM	TP-SB12-0507-98				
S-4		5/16	1.7/2.0		M Dense	Lt Brn	Met Rock Frags & Chips	GW	0937 Saturated	0.0			
	9.0	15/11											
	13.0												
S-5		1/1	1.9/2.0		Soft	Dk Gray	Organic Silt Some VF Sand Tr Shell	OL	0940 Natural	0.0			
	15.0	1/2											
	18.0												
S-6		WOH/2	1.9/2.0		V Soft	Dk Gray	Silt Tr Shell + Mica	OH	0948	0.0			
	20.0	1/1											
	23.0												
S-7		WOH/WOH	2.0/2.0		M Stiff	Gray to	Clayey Silt	ML	0955	0.0			
	25.0	2/6				Gray Brn			mottled @ bottom				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area P11

Remarks: 4 1/4" ID HSA, 3" SS 0850-0945 P. Blais @ TP
Low Tide @ 0840
• Normal sample set

Background (ppm): 0.0 ppm

Converted to Well: Yes ____ No Y Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75

BORING NO.: TP-SB12
DATE: 7-13-94
GEOLOGIST: T. EVANS
DRILLER: J. Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	25.0												
	28.0												
S-8		3 / 3	2.0/2.0		M Stiff	Brn &	Silty Clay (mottled)	CL	1005	0.0			
	30.0	4 / 4				Gray							
	33.0												
S-9		WOR / WOR	2.0/2.0		V Soft	Gray	Silt	ML	1016	0.0			
	35.0	WOH / WOH											
	38.0												
S-10		4 / 4	0.9/2.0		M Dense	Gray	Silty F Sand	SM	1026	0.0			
	40.0	5 / 6											
	43.0												
S-11		2 / 6	1.0/2.0		M Dense				1040				
	45.0	14 / 10				Gray	M-C Sand	SP		0.0			
	48.0												
S-12		25 / 11	1.1/2.0		Dense	Gray	M Sand very poorly graded	SP	1120	0.0			
	50.0	100 / 14							Refusal @ 49.4				

* When rock coring, enter rock brokeness. Ends @ 49.4

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): --

Remarks: Natural Back fill 1145 to 1215; drillers pull auger & clean

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75
BORING NO.: TP-SB13
DATE: 7-15-98
GEOLOGIST: T. EVANS
DRILLER: J. Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/HD Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
X	1.0			0.3			Asphalt 0-0.3 Gravel Subbase 0.3-1.0		0817 No Sample				
S-1		5/7	1.3/2.0		M Dense	Brn	F.M Sand, Silt Tr Rock Frags + Brick	SM/ML	0824	0.0			
	3.0	16/5											
• S-2		4/3	0.8/2.0		Loose	Brn			0828	0.0			
	5.0	3/2		4.8 5.0		Tan	Silty F Sand	SM					
S-3		3/3	1.4/2.0		Loose	Brn	F Sandy Silt + Rock Frags Tr Brick	SM	0832 Damp	0.0			
	7.0	3/2											
•• S-4		3/4	0.9/2.0		Loose				0835 wet TP-SB13-0709-98	12.5			
	9.0	3/3											
S-5		1/1	1.3/2.0	▽ 10.35 S @ 0928	V Loose	Gray Brn	F Sand, Silt + Tr Rock Frags	SM	0840 Saturated	0.0			
	11.0	3/1											
	13.0												
* S-6		12/7	1.5/2.0		M Dense	Black to Dk Gray	Silty F Sand. Tr Rock Frags + Shell	SM	0847 Natural	0.1 to 0.9			
	15.0	9/4											
	18.0												
S-7		2/2	2.0/2.0		M Dense	Gray Brn	Silty F Sand	SM	0900	0.0			
	20.0	7/4				Lt Brn	F Sand Some Silt	SP					
	23.0												
S-8		100/.4	0.4/0.4			Lt Brn	Silty M-C Sand + Met Rock Frag → Paragyrite	SW/SM	0910	0.0			
	25.0								Auger Refusal @ 23.5'				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Natural Backfill

Drilling Area PID

Background (ppm): 0.0

Remarks: 4 1/4" ID HSA 3" SS 0925-0935 P.Blais @ TP
• Normal set! γ cuttings = 0.02 mR/hr @ 0929
•• VOC, SVOC, P/P; DRO, GRO; Metals, CN, pH, TOC

Converted to Well: Yes No X Well I.D. #:

X - Not sampled but proposed

* - VOC, SVOC; P/P; DRO; GRO; Metals, CN, pH, TOC + MS/MSD

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75
BORING NO.: TP-SB14
DATE: 7-15-98
GEOLOGIST: T. EVANS
DRILLER: J. Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0								Time				
X	1.0			0.3			Asphalt 0-0.3 Ground Subbase 0.3-1.0		1020	—			
S-1		18/18	2.0/2.0	1.5 / 2.2	V Dense	Brn Black red brn	Silty M-C Sand Tr C Sand 3 Cinders / Coal Frags	SW	1024	0.0			
	3.0	25/24				Brn	Silty M Sand Tr Rock Frags	SW					
S-2		17/14	1.3/2.0	2.8	M Dense	Black	Cinder Tr Wood, Brick, wire	SW	1035 TP-SB14-0305-98 moist	0.0			
	5.0	12/15											
S-3		5/7	0.7/2.0		V Loose	Red Brn	3 Cinder Frags (0.2"Ø)	-	Moist 1040	0.0			
	7.0	1/1											
S-4		1/1	0.6/2.0		M Dense	Brn	M Sand Tr Silt Tr Rock Frags	SP	1045 wet VOC GRO SVOC PIP	0.0			
	9.0	3/22		8.7									
S-5		5/27	0.4/2.0		M Dense	Brn	Wet Rock Frags & Chips	GW	1049	0.0			
	11.0	14/8				Black							
	13.0			?-?									
S-6		14/8	1.0/2.0		Stiff	Black to Gray	Organic Silt Tr Shell Some F Sand Wood	MH	1055 Natural	0.0			
	15.0	8/3											
				?-?									
	18.0												
S-7		1/1		19.1	M Stiff	Brn to	Clayey Silt to	ML/CL	1105	0.0			
	20.0	3/4				Gray	F Sandy Silt	SM/ML					
	23.0												
S-8		WOH/WOH	2.0/2.0		V Soft	Gray	Silt	MH	1113 Soupy	0.0			
	25.0	WOH/WOH											

* When rock coring, enter rock brokeness. 1115 27.7 Auger Refusal @ 27.7' (1125 hrs) Natural Backfill

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm)

Remarks: 4 1/4" ID HSA 3" SS 1010 - 1100 P.Blais @ TP
* Normal set
** GRO; SVOC, VOC, PIP; DRO; Metals, CN, pH; TOC

Converted to Well: Yes ____ No X Well I.D. #: ____

X - Not sampled but proposed

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Mentkin Tech
DRILLING RIG: CME 75
BORING NO.: TP - SB 15
DATE: 7-10-98
GEOLOGIST: T. EVANS
DRILLER: J. Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0								Time				
	1.0					DK Brn	Organic Silt & F-M Sand (Vtr F Gravel)	OL	0933 TP-SS15-0001-98	0.0			
S-1		5/3	1.5/2.0		M Stiff	Brn to	Silt Tr F Sand + F Gravel	ML	0947 (0.3-0.7) mottled	0.0			
	3.0	3/4				yellow brn	↓	↓					
S-2		3/5	1.2/2.0		M Dense	yellow brn.	↓	↓	0951 TP-SB15-0305-98	0.0			
	5.0	14/6		4.2 / 4.8		black yellow brn	→ Silty M-C Sand (slag?) & Damp F Sandy Silt cinder?	SW ML/SM					
S-3		12/100/.3	0.75/0.8			Brn	Silt Some M-C Sand & Met Rock Frags (Partly Fnobl.)	GM	1000 Boulder 5-7 Augers kick out - move 3'	0.0			
	7.0												
S-4		6/3	0.9/2.0		Dense	Brn	Met Rock Frags & Silty M-C Sand	GP/GM	1028 wet @ bottom				
	9.0	8/22							TP-SB15-0709-98	0.0			
S-5		10/7	0.8/2.0		M Dense	DK Brn	Met. Rock Frags & M-C Sandy Silt	GP/GM	1033 Saturated				
	11.0	7/4											
S-6		9/7	0.8/2.0		M Dense	DK Brn	Met Rock Frags Some Silt	GP	1045 (~70% Rock + Poor Recovery - No Sample)	4.9			
	13.0	17/7											
S-7		7/11	1.9/2.0		M Dense to	DK Gray yellow tan	F Sandy Silt	ML to	1053 TP-SB15-1315-98 + SBFD-0710-98	0.0			
	15.0	7/14			/ to	Green	Silty to F Sand	SM	Met Rock Frag in Shoe				
S-8		4/8	2.0/2.0		M Dense	Gray	Silt Tr VF Sand (Vtr F Gravel)	ML	1105	0.0			
	17.0	10/17											
S-9		3/3	1.2/2.0		M Dense	Gray	Silt Tr VF Sand (Met Rock Frag in Shoe)	ML	1115	0.0			
	19.0	5/6											
S-10		3/6	1.4/2.0		M Dense	Gray	Silt Some M Sand (Met Rock Frags)	ML/SM	1122	0.0			
	21.0	9/11											
'55 S-11		4/7	1.0/2.0		M Dense	Gray	F Sandy Silt Tr Met Rock Frags	ML/SM	1128	0.0			
	23.0	10/15											
S-12		7/12	0.5/2.0		M Dense	Gray	M Sand Some Silt (Tr Met Rock Frags)	SP	1140	0.0			
	25.0	12/9											

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area P/D

Remarks: 4 1/4" ID HSA 3" SS 0935 - 1100 P.Blais @ SB15

• GRO; DRO; VOC; TCL SVOC + P/P; metals, CN, pH

•• Normal set + duplicate

Background (ppm): 0.0 ppm

Converted to Well: Yes ____ No X Well I.D. #: ____

• Normal set

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75
BORING NO.: TP-SB15
DATE: 7-10-98
GEOLOGIST: T. EVANS
DRILLER: J. Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	25.0												
S-13		6/7	1.5/2.0		M Dense	Gray	Silty F Sand Tr F Met Rock Frags	SM	1147	0.0			
	27.0	100/.4							HSA to 25'				
				EOBC 26.9			Backfill		Grout 0-12' Natural 12-26.9'				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75

BORING NO.: TP- SB16
DATE: 7-16-98
GEOLOGIST: T. EVANS
DRILLER: J. Leonhardt

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0												
X	1.0						Asphalt 0-0.15' Gravel Subbase 0.15-1.0	GP	1635 No Sample due to gravel	-			
S-1		11/15	0.1/2.0		Dense	Brn	Silt & F Gravel	GW	1636	0.0			
	3.0	16/20					- Poor recovery						
o S-2		3/5	0.8/2.0		M Dense	Brn	Met Rock Frags Some Silt & F-C Sand	GW/GM	1642 Moist	0.0			
	5.0	10/8							GRO only SVOC (20')				
S-3		5/8	0.0/2.0		—	—	- No Recovery -			-			
	7.0	8/2											
X S-4		6/7	0.2/2.0		M Dense	Brn	Met Rock Frags	GW	1656 wet @ 8.8	0.0			
	9.0	7/5		▽									
S-5		9/14	0.2/2.0		M Dense	Gray Brn	Met Rock Frags & Chips	GW	1701	0.0			
	11.0	10/10											
S-6		9/16	0.2/2.0		Dense	Gray Red	Metr Rock Chips	GW	1708	0.0			
	13.0	31/14											
S-7		12/7	0.2/2.0		M Dense	Dk Gray	Met Rock Frag	-	1715	—			
	15.0	8/7											
S-8		15/17	0.2/2.0		Dense	Dk Gray	Met Rock Frags & Chips	GW/SW	1725	-			
	17.0	19/12											
o S-9		15/15	1.4/2.0		M Dense	Dk Brn to	M Sand Tr-Some Silt Tr Met Rock Frags	SP	1731	0.0			
	19.0	11/12				tan							
	20.0												
S-10		14/21	1.4/1.4	21.4	Dense	Tan	F Sand & Met Rock Frags to	GP/SP	1745	0.0			
	22.0	100/.4					Silty F Sand	SP	Refusal @ 21.4'				
									(HSA to 20')				
									Borehole abandoned				
							Backfill w/gravel & top w/grout						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area P.D

Remarks: 4 1/4" ID HSA 3" SS 1630-1750 Pavla (Red) @ TP

X - Not sampled but proposed

o - sampled

Background (ppm): 0.0

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH NSY
PROJECT NUMBER: 6515
DRILLING COMPANY: Maxim Tech
DRILLING RIG: CME 75

BORING NO.: TP-SB17
DATE: 7-16-98
GEOLOGIST: T. EVANS
DRILLER: J Lambert

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks Time	PID/FID Reading (pp Sample	Sampler BZ	Borehole**
	0.0											
	1.0					Brn	Silt Tr-Some M Sand, Plant Roots	OL	1445 +MS/MSD	0.0		
S-1		5/7	1.4/2.0		M Dense	Brn	↓	↓	(0-1) 1510	0.0		
	3.0	6/5		2.6		Tan	M Sand Tr F Met Rock Frags	SP				
S-2		3/3	0.9/2.0		Loose	↓		↓	1512	0.0		
	5.0	3/3		4.6		Brn	Silt Some C Sand & Met Rock Chips & Frags Tr Coal Frags	ML				
S-3		3/5	0.4/1.0		Loose	Gray			1515	0.0		
	7.0	4/6				Brn	Silt Some F Sand Tr Met Rock Chips	ML/OH				
S-4		2/2	1.0/2.0		M Dense	Gray Brn	↓	↓	1522 wet Natural	0.0		
	9.0	2/2		8.5		"	Silt	ML				
S-5		6/7	0.8/2.0		Dense	Gray Brn	Silt & Met Rock Frags	GM/ML	1527 Saturated	0.0		
	11.0	15/21										
	15.0											
S-6		100/.4	0.4/0.4	16.0'	—		Met Rock Chips	GW	1539	0.0		
	17.0			11E 111					1545 Auger Refusal @ 16.0'			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm)

Remarks: 3" SS 4 1/4" ID HSA 1430 - 1544 Panda (Rad) @ TP
* sampled

Converted to Well: Yes ____ No X Well I.D. #: ____

Appendix E

Geotechnical Report

R. W. Gillespie & Associates, Inc.
Geotechnical Engineering • Geohydrology • Materials Testing Services

14 February 2006
17 February 2006 (Revised)

Stephen Towne, P.E.
Oak Point Associates, Inc.
73 Court Street
Portsmouth, NH 03801

Subject: Geotechnical Investigation
New Acoustic Transducer Repair/Test Facility
Portsmouth Naval Shipyard
Kittery, Maine
RWG&A Project No. 767-32

Dear Mr. Towne:

R. W. Gillespie & Associates, Inc., (RWG&A) is pleased to present the results of our geotechnical investigation for New Acoustic Transducer Repair/Test Facility at the Portsmouth Naval Shipyard in Kittery, Maine. This work was performed in general accordance with RWG&A's proposal to you dated 12 January 2006 (revised). The purpose of the investigation was to obtain information about subsurface conditions on which to base recommendations for design and construction of foundations, slabs, and pavement sections, and seismic design parameters. The report has been revised to include Figure 3, Subsurface Profiles, at your request.

The following report presents the findings of our field explorations and engineering evaluations, and provides our geotechnical design recommendations. In summary, subsurface conditions consist of bituminous pavement over two generations of fill underlain by naturally deposited organic silt underlain, in turn, by stiff to soft silty clay. The clay is underlain by gravelly sand with silt extending to bedrock. Explorations were advanced to depths of 15 to 60 feet. Refusal was encountered in each exploration at depths of 10.2 feet to 44 feet; several explorations were extended below refusal elevations with rock coring techniques. Free water was observed in all explorations at depths of approximately 4 to 6 feet.

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The fill and organic silt encountered are not suitable to support the proposed structure on conventional shallow foundations. Removal of these materials and replacement with structural fill is not considered practical due to depth, groundwater, and potential environmental issues; therefore, it is recommended the proposed structure be supported on a deep foundation system consisting of driven, steel H-piles. The floor slab should be designed as a structural slab. Results of our subsurface investigation and engineering recommendations follow.

We trust this report meets the current needs of the project. Please do not hesitate to contact us if you have any questions or if we may be of further service.

Very truly yours,
R.W. GILLESPIE & ASSOCIATES, INC.

Marc R. Grenier, P.E.
Project Geotechnical Engineer

Robert W. Gillespie, P.E.
Principal Geotechnical Engineer

MRG/RWG:ci
In quadruplicate

Report
of
GEOTECHNICAL INVESTIGATION
for
NEW ACOUSTIC TRANSDUCER TEST/REPAIR FACILITY
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

Prepared
for
OAK POINT ASSOCIATES, INC.
PORTSMOUTH, NEW HAMPSHIRE

Prepared
by
R. W. GILLESPIE & ASSOCIATES, INC.
PORTSMOUTH, NEW HAMPSHIRE

Robert W. Gillespie, P.E.
New Hampshire P.E. No. 6743

RWG&A Project No. 767-32

14 February 2006

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FIGURES:
Figure 1. Locus Map
Figure 2. Exploration Location Plan
Figure 3. Subsurface Profiles

APPENDICES:
Appendix A. Exploration Logs
Appendix B. Laboratory Testing

1.0 INTRODUCTION

1.1 Background

The project will be an addition at the east end of Building 306 at the Portsmouth Naval Shipyard (PNSY) in Kittery, Maine, as illustrated on Figure 1, *Locus Map*. Currently, the area is covered with bituminous pavement and topography slopes slightly down from southeast to northwest towards the Piscataqua River. RWG&A's understanding of the existing conditions and proposed construction is based on review of several untitled and undated drawings provided by Oak Point Associates, Inc.

1.2 Scope of Work

This investigation was performed to develop site-specific soil and laboratory data and to make geotechnical evaluations for the proposed building. As performed, RWG&A's scope of work included the following items.

1. Prepared an exploration program suited to the proposed construction and anticipated subsurface conditions to obtain information for soil and foundation design. The exploration program, as completed, consisted of nine soil test borings.

2. Arranged to have the subsurface explorations performed by local contractors. Provided technical monitoring of the exploration activities so that depths, locations, and sampling methods could be modified in response to the subsurface conditions encountered.

3. Conducted engineering evaluations of the geotechnical aspects of foundation and slab design, and evaluated construction and site development issues. The engineering evaluations included foundation alternatives, settlement and its control, slab subgrade preparation, seismic design, and evaluation of building foundation and site design criteria.

4. Attended a design meeting to provide a preliminary presentation of data and evaluation thereof.

5. Prepared this report presenting the results and conclusions of the geotechnical investigation and recommendations for design and construction of the building foundations, ground floor slabs, and pavements.

2.0 SUBSURFACE EXPLORATION

The subsurface exploration program consisted of nine test borings advanced to depths ranging from 15 to 60 feet below local ground surface. Borings were drilled between 19 and 25 January 2006 by Great Works Pump & Test Boring, Inc., of Rollinsford, New Hampshire, using a truck-mounted drill rig. Split-barrel sampling with standard penetration testing (*ASTM D1586, Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils*) was performed at about 5-foot intervals. The explorations were advanced with driven casing and rotary wash techniques. Several explorations were advanced below refusal levels using Nx diamond bit coring techniques.

Exploration activities were monitored by RWG&A personnel. The soils were described in general accordance with *ASTM D2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure).* Logs of the explorations are included in Appendix A. Stratification lines shown on the exploration logs represent the approximate boundaries between the different soil types encountered; the actual transitions will be more gradual and may vary over short distances. Figure 2, *Exploration Location Plan*, shows the locations of the explorations.

3.0 LABORATORY TESTING

Laboratory testing was performed on soil samples recovered from the borings to assist in description and estimation of engineering properties of the soils. The testing program included three Atterberg Limit determinations and three natural moisture content tests. Results of moisture content tests are shown on the exploration logs; results of other laboratory testing performed are included in Appendix B, *Laboratory Testing*.

4.0 SUBSURFACE CONDITIONS

4.1 Subsurface Soils

The subsurface explorations revealed five distinct units identified with increasing depth as follows: bituminous pavement, fill, organic silt, stiff to soft silty clay, and dense gravelly sand with silt. In general, subsurface conditions consist of bituminous pavement underlain by two generations of fill followed by naturally deposited organic silt over stiff to soft silty clay over gravelly sand with silt. The fill was approximately 9 to 14.5 feet in total thickness, was encountered in all explorations, and appears to have been placed in two generations. The upper layer of fill consisted of medium dense gravelly sand with little to trace silt. The lower layer of fill consisted of sandy silt and/or clayey silt mixed with gravel, bricks, metal, shells, and other debris. Each of the explorations were advanced to refusal, encountered at depths of 10 feet to 44 feet.

Several explorations were advanced below refusal levels with rock coring techniques. The results of the coring indicated the refusals encountered represent bedrock. Please refer to the exploration logs in Appendix A for information about soil conditions at specific locations. Subsurface profiles are provided on Figure 3.

4.2 Groundwater

Free water was observed in the explorations at depths of about 4 to 6 feet. Groundwater levels at the site will fluctuate due to season, temperature, rainfall, tides, and construction activity in the area; therefore, water levels during and following construction will vary from those observed in the explorations. A groundwater evaluation is in progress; the results will be provided under separate cover at a later date.

4.3 Bedrock

The bedrock encountered was classified as hard, fresh, light gray Quartzite, with very close to close, high angle to vertical, undulating and planar, discolored, closed, tight joints, with joints frequently infilled and cemented with calcite. Rock quality designation, or RQD, ranges from 10 to 80 percent, supporting the joint spacing described above. Broadly, RQD does not appear to trend in a particular manner with depth.

5.0 ENGINEERING EVALUATIONS

5.1 General

Engineering evaluations for this project are based on the subsurface explorations, laboratory data, and conceptual construction information currently available to RWG&A. Should different information become known prior to or during construction, these evaluations should be reviewed by RWG&A to confirm their continued applicability. It is recommended foundation design and construction be in compliance with the requirements of all applicable ordinances, regulations and rules, and local building codes.

5.2 Proposed Construction

Overall building shape is somewhat irregular but can be encompassed in a rectangle approximately 210 by 160 feet in plan. The building will be five stories high, and construction will be steel frame; exterior finishes are uncertain at this time. The transducer tank will be 60 feet in diameter, 45 feet high, and surrounded by an enclosure. The tank might also be partially below grade. It is understood the tank and building will be supported on independent foundation systems.

5.3 Foundation Considerations

The lower layer of fill, which was likely placed in an uncontrolled manner, and the underlying organic silt will settle under the new foundation loads. These materials are not considered suitable for support of the proposed construction, and removal and replacement will not be practical. Consequently, the structure will require support on a deep foundation system.

Several alternatives were considered, including precast concrete piles, drilled shafts, and steel H-piles. Precast concrete piles are not considered readily available in the area, especially in a small quantity lot, and driving could be difficult. In addition, precast concrete is usually considered as a friction pile rather than end-bearing. Drilled shafts would require disposal of soils (environmental issues), casing and dewatering, and the use of Type V portland cement to resist sulfate attack from the salt water environment. Steel H-piles driven to, or into bedrock offer a high capacity capable of being installed with locally available equipment.

Several sizes were considered in our evaluations, including HP10x42, HP10x57, HP12x53, and HP12x74. A sacrificial layer was assumed to account for corrosion losses in the organic and salt water zones, and hammer energy was limited to 20,000 foot-pounds to reflect local equipment. By wave equation analysis, working capacities range from 40 to 65 tons for a geotechnical factor of safety of 2.5.

5.4 Utilization of On-site Soils

The desire to utilize on-site soils in the construction process was discussed at length in the design meeting. It is RWG&A's opinion the materials can be re-used for landscaping and, possibly, backfilling of pile caps, although the latter would be limited to existing parking lot base/subbase materials. Oversize particles (e.g., larger than 3 inches) could be removed to reduce volume of excavated materials and segregated stockpiles of processed former base/subbase, and the lower fill could be created for use as backfill and landscaping, respectively. Oversize material can be disposed by landfilling or crushing, etc.

6.0 RECOMMENDATIONS

6.1 Site Preparation

1. All bituminous pavement and any underground utilities and/or structures should be removed from the area of new construction. Active and abandoned utilities within the proposed building limits should be removed and/or relocated.

2. All excavation and filling within 4 feet of proposed piles, including excavation for pile caps and grade beams, should be completed before the start of pile driving.

3. Groundwater was encountered at to slightly below the anticipated foundation excavation depths. It should be practicable to accomplish construction dewatering within excavations by open pumping methods. Surface runoff and infiltration of groundwater should be controlled so that excavation, foundation construction, and filling can be completed in-the-dry.

4. Surface grading should provide positive drainage away from constructed facilities both during and after construction.

5. Compacted structural fill is recommended for use as fill beneath the proposed structure and as backfill around pile caps. Structural fill should be a well-graded sand and gravel mixture meeting the following gradation requirements:

Screen Number or Sieve Size	Percent Passing
6 inches	100
3 inches	70 - 100
Number 4	35 - 70
Number 40	5 - 35
Number 200	0 to 5

Note: Maximum particle size limited to 3 inches within 3 feet of foundation walls, pile caps, and floor slabs or if compacted by hand-guided equipment.

The existing fill and naturally deposited soils are not suitable for use as structural fill but may be used as common fill to raise grade in landscaped areas and below paved areas. However, existing base/subbase soils might be suitable for use as pile cap backfill. If gradation tests show general conformance with structural fill requirements, the geotechnical engineer should review the test results and provide further guidance. Other fills which are removed as part of the construction process should be screened to a minus 3-inch size for use in landscaping.

6. In open areas, structural fill should be placed in level, uniform lifts not exceeding 9 inches in uncompacted thickness and be compacted with self-propelled compaction equipment. In confined areas and within 4 feet of foundation walls, structural fill should be placed in lifts not exceeding 6 inches in uncompacted thickness and be compacted with hand-operated compaction equipment. All fill placed should be structural fill

compacted to at least 95 percent of the maximum dry density as determined by ASTM Standard D1557 *Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).*

7. Only structural fill should be used as fill below the proposed structure. Structural fill should extend to the lateral limits defined by a 1 horizontal to 1 vertical (1H:1V) line sloped down and outward from the bottom outside edge of pile caps and floor slabs supported by fill, or a minimum of 5 feet outside the foundation plan limits.

6.2 Pile Foundations

8. The building should be designed to withstand lateral, uplift ,and overturning forces due to earthquake. Fill materials encountered in the explorations may be susceptible to liquefaction. In accordance with the 2003 *International Building Code®*, the soil profile at the site is classified as Site Class E.

9. The proposed structure will be supported on a deep foundation system that will transmit the relatively high foundation loads through the in-place fill and soft silty clay to the underlying glacial till or bedrock. Review of the exploration logs yields estimated pile lengths on the order of 15 to 45 feet. In some locations, the bedrock is highly fractured, and piles may extend below boring refusal elevations. The following pile sections and design capacities are technically feasible and locally available:

Pile Section	Design Capacity (Tons)	Final Set (blows per inch)
HP 10 x 42	40	4
HP 10 x 57	45	6
HP 12 x 53	60	8
HP 12 x 74	65	10

10. The above driving criteria assumes the piles are driven to refusal with a single or double acting hammer delivering about 20,000 foot-pounds of energy. The design capacity at the end of driving should include a geotechnical safety factor of 2.5. A wave equation analysis should be submitted by the contractor to demonstrate that his proposed pile hammer can drive the piles to the required minimum ultimate capacity and depth without over stressing or damaging the piles.

11. The building code requires a pile load test for design capacities greater than 40 tons.

12. Driving stresses should be limited to a maximum compressive stress of 45 kips per square inch for the steel H-piles. Splices should not be allowed in the upper 10 feet of the embedded portion of the pile. Cast steel points should be provided to reduce damage while driving through debris in the fill. The pile points should be "Hard-Bite" pile points manu-factured by American Pile Fittings of Clifton, New Jersey, or equivalent.

13. Each pile should be driven plumb at the prescribed location. A pile should be considered out of plumb if the inclination is greater than 6 inches in 10 feet from its design alignment.

14. Center-to-center pile spacing should be not less than 30 inches for groups of two or more piles. Recommended minimum design eccentricity between the columns and centroid of the supporting piles is 3 inches.

15. It is recommended design bottom of exterior pile cap level be a minimum of 4 feet below lowest adjacent ground surface exposed to freezing. At heated interior locations, pile caps may be designed to bear a minimum of 24 inches below top of ground floor slab. If exposure to freezing is anticipated either during or following construction, then interior pile caps should be lowered in accordance with the recommendations for exterior pile caps.

16. Lateral loads from wind and earthquake may be counteracted by earth pressure against below grade structures. An earth pressure equivalent fluid unit weight of 125 pounds per cubic foot ($K_p = 1.0$) may be used against pile cap faces. Piles can be battered to achieve additional lateral resistance; batter should not be steeper than 1 horizontal to 12 vertical.

17. Structural fill should be used to backfill all foundation excavations, except as noted in Recommendation 5 above.

6.3 Ground Floor Slab

18. Due to the potential for post-construction settlement, a structural slab is recommended for the building ground floor.

6.4 Pavement Sections

19. The following table presents our recommendations for flexible pavement thicknesses.

Component	Thickness, Inches	
	Auto Parking*	Heavy Duty Areas
Wearing Surface (MeDOT Type 9.5 mm)	1	1-1/2
Bituminous Base (MeDOT Type 19 mm)	2	2-1/2
Crushed Base (MeDOT 703.06 Type A)	4	8
Subbase (MeDOT 703.06 Type D)	12	14
Totals	19	26

*AASHTO and AI minimum section

20. Prior to the start of pavement construction, we recommend a thorough evaluation of the parking/drive area subgrade. The evaluation should include proof rolling of the parking/drive area with a loaded tandem axle dump truck. Any unstable areas encountered should be repaired. Repairs should consist of excavation of the soft material(s) and replacement with compacted fill.

6.5 Utilities

21. Utilities within the site and beneath paved areas may be earth supported. Bedding placed between the utility and subgrade should meet the utility and manufacturer requirements for the type of conduit or pipe being installed.

6.6 Temporary Excavations

22. Soils encountered within the anticipated depths of pile cap and underground utility excavations consist of fill, silty clay, and organic silt. It is anticipated foundation excavations can be accomplished using sloped, open-cut techniques provided groundwater is controlled and lowered to an elevation 1 foot below pile cap bottoms

    The Contractor should be aware that slope height, slope inclination, or excavation depths (including utility trench excavations) should in no case exceed those specified in local, state, or federal safety regulations, e.g., OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926, or successor regulations. Such regulations are strictly enforced and, if they are not followed, the Owner, Contractor, and/or earthwork and utility subcontractors could be liable for substantial penalties.

    As a safety measure, it is recommended all vehicles and spoil piles be kept a minimum lateral distance from the top of excavations equal to or greater than 100 percent of the slope height. Exposed slope faces should be protected against the elements.

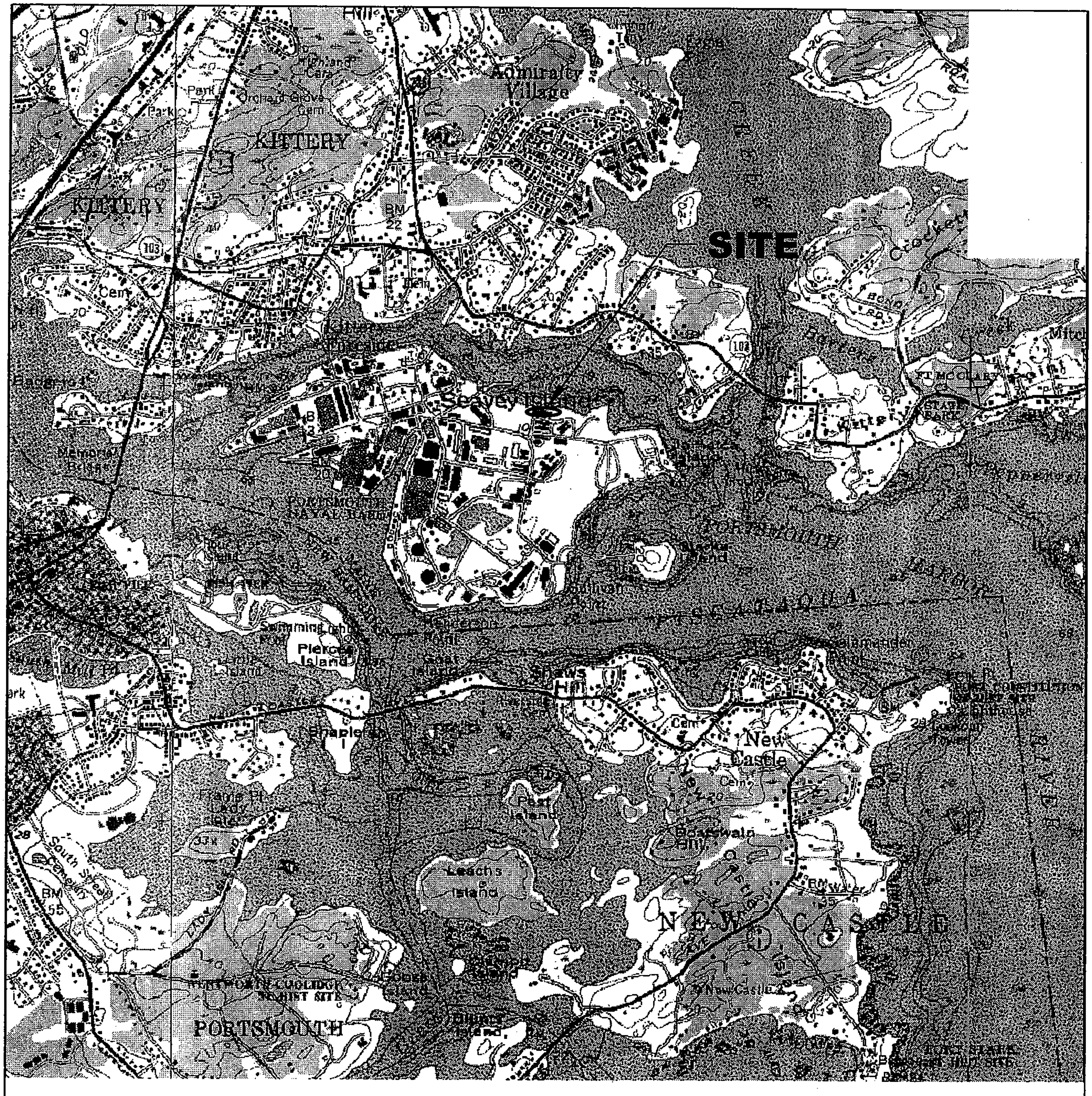
6.7 Geotechnical Observation During Construction

The geotechnical recommendations provided as the basis for design of this project were developed using limited numbers of observations and tests. The owner should be sensitive to the potential need for adjustment in the field. It is recommended that the owner retain RWG&A to observe geotechnical construction aspects of the project. These services include observing general compliance with the design concepts, specifications and recommendations, and assisting in development of design changes should conditions differ from those anticipated prior to the start of construction.

7.0 CLOSURE

This report has been prepared for specific application New Acoustic Transducer Repair/Test Facility at the Portsmouth Naval Shipyard in Kittery, Maine, for the exclusive use of Oak Point Associates, Inc., and the design team. This work has been completed in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made. In the event any changes are made in the nature, design, or location of the proposed construction, the conclusions and recommendations of this report should be reviewed by RWG&A.

The recommendations presented are based on the results of widely spaced explorations. The nature of variations between the explorations may not become evident until construction. If variations are encountered, it will be necessary for RWG&A to re-evaluate the recommendations presented in this report. RWG&A requests an opportunity for a general review of the final design and specifications to determine that earthwork and foundation recommendations have been interpreted in the manner in which they were intended.



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0 2000 3000 4000

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SOURCE:

USGS 7.5-MINUTE TOPOGRAPHIC QUADRANGLS OF PORTSMOUTH (NH-ME), DATED 1993 AND KITTERY (ME-NH) DATED 1990.

FIGURE 1
LOCUS MAP
NEW TRANSDUCER BUILDING
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

FEBRUARY 2006 PROJECT NO. 767-32

R.W.Gillespie & Associates, Inc.
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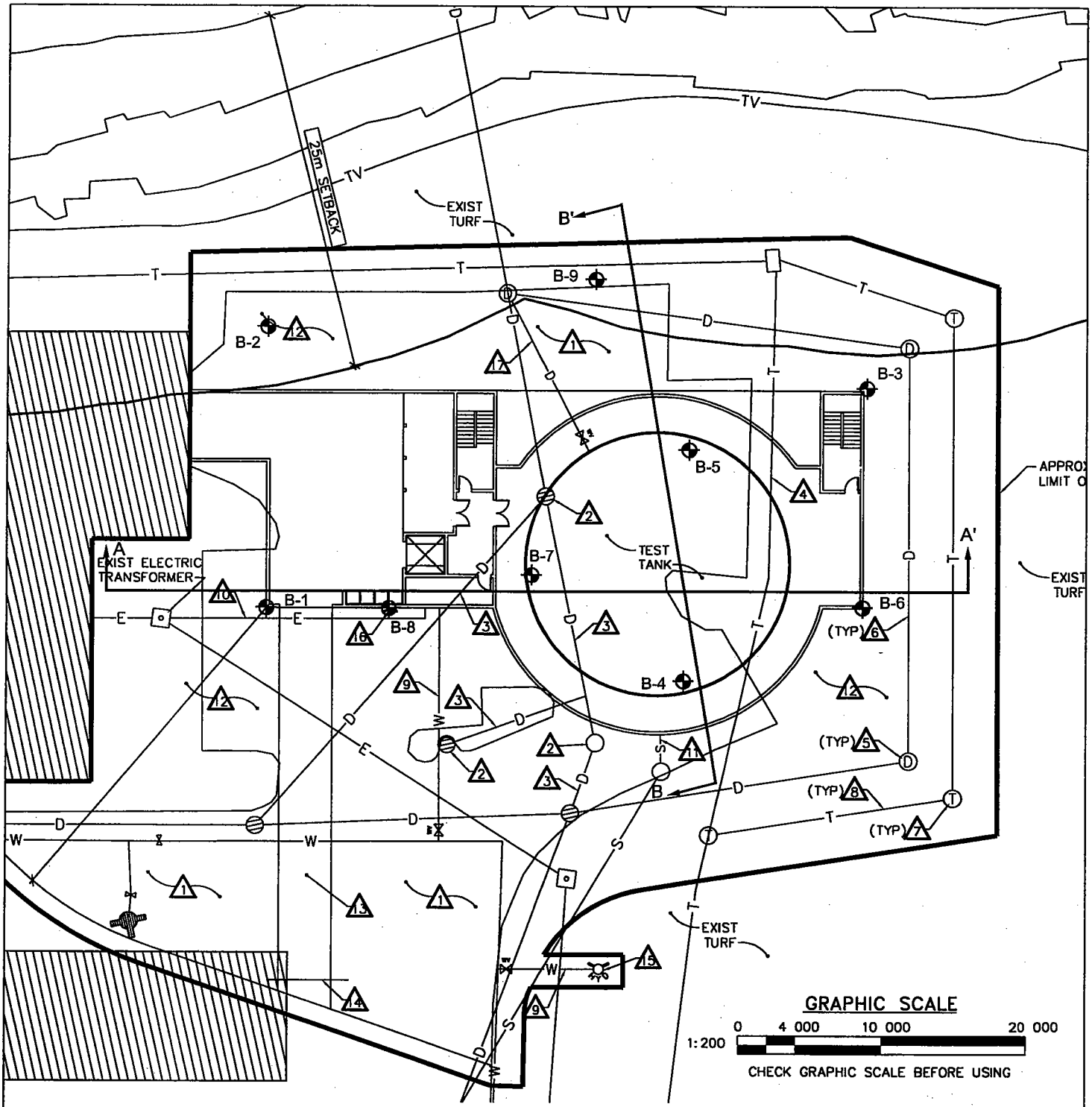

LEGEND:

B-9 BORING LOCATIONS

A A' CROSS-SECTION LINES

N

FIGURE 2
EXPLORATION LOCATION PLAN
NEW TRANSDUCER BUILDING
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

FEBRUARY 2006 PROJECT NO. 767-32

SOURCE:
OAK POINT ASSOCIATES AUTOCAD FILE ENTITLED "bldg 306 Area.dwg" RECEIVED ON JANUARY 10, 2006.

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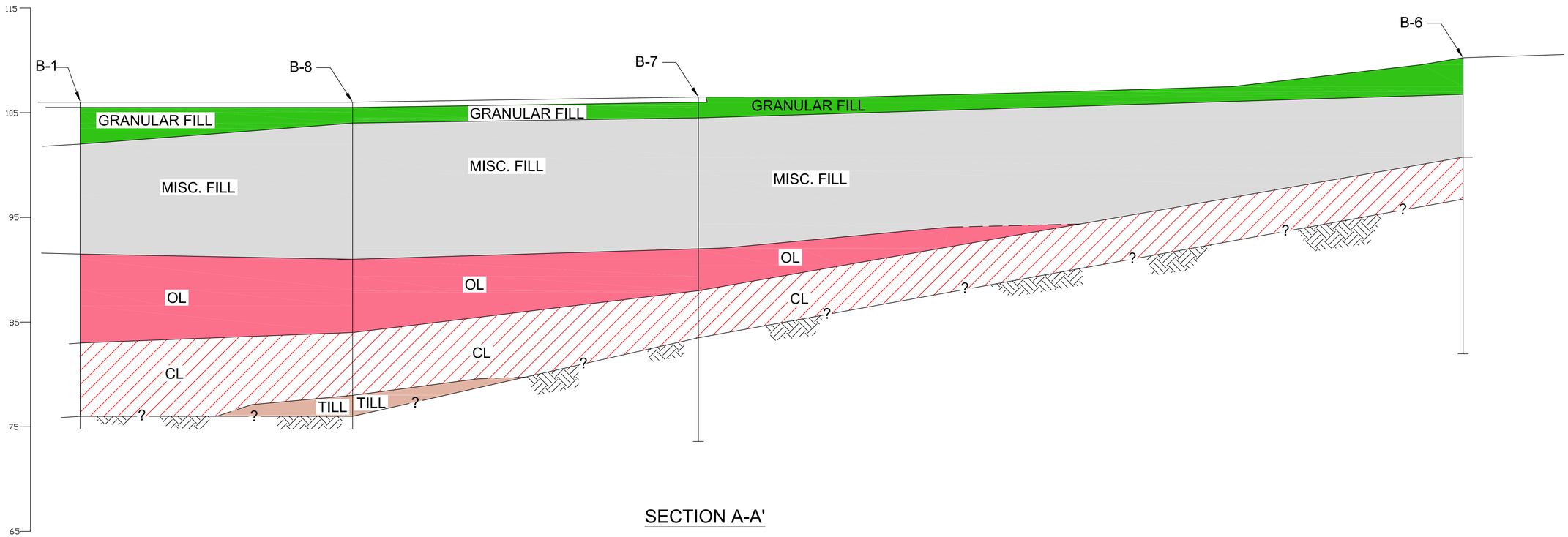
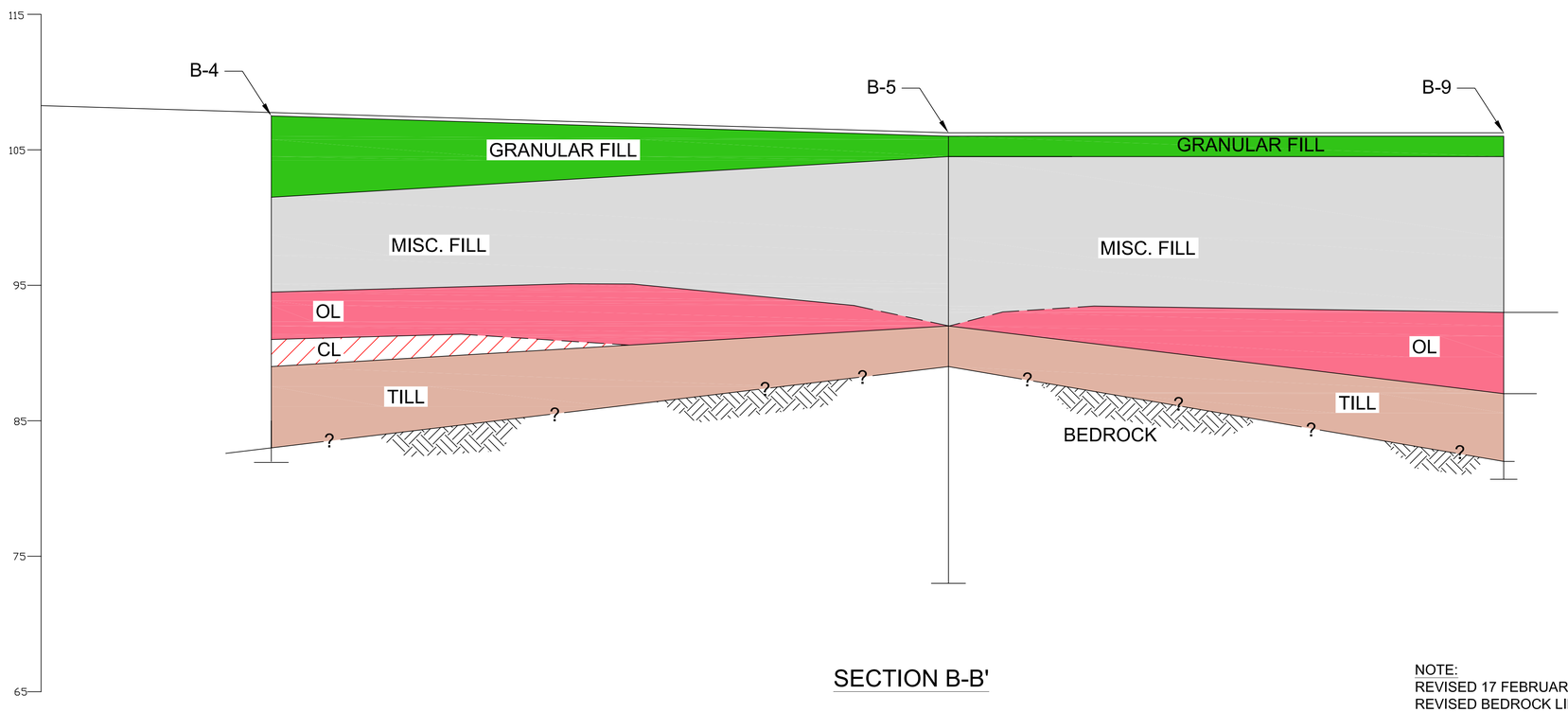


SECTION A-A'



SECTION B-B'

NOTE:
THE LINES DESIGNATING THE INTERFACE BETWEEN SOIL OR ROCK MATERIALS ON THE LOGS OR BORINGS AND ON SOIL OR GEOLOGICAL PROFILES ARE DETERMINED BY INTERPOLATION AND ARE THEREFORE APPROXIMATIONS. THE TRANSITION BETWEEN THE MATERIALS MAY BE ABRUPT OR GRADUAL. ONLY AT BORING LOCATIONS SHOULD PROFILES BE CONSIDERED AS REASONABLY ACCURATE AND THEN ONLY TO THE DEGREE IMPLIED BY THE NOTES ON THE BORING LOGS.

0 5 7.5 10
SCALE, FEET

NOTE:
REVISED 17 FEBRUARY 2006 ADDED NOTE AND REVISED BEDROCK LINES.

FIGURE 3
SUBSURFACE PROFILE–NEW TRANSDUCER BUILDING
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

FEBRUARY 2006 PROJECT NO. 767–32

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APPENDIX A

EXPLORATION LOGS

Geotechnical Investigation
New Acoustic Transducer Repair/Test Facility
Portsmouth Naval Shipyard
Kittery, Maine

R.W. Gillespie & Associates, Inc.
Geotechnical Engineering•Geohydrology•Materials Testing Services

Project Name:	New Acoustic Transducer Building	Log:	B-1
Location:	Portsmouth Naval Shipyard	Surface Elevation:	106
Client:	Oak Point Associates	Observed Water Depth:	6
RWG&A Project No.	767-32	Date Completed:	01/19/06

Depth (ft.)	Symbol Samples	Sample No.	Description of Material	Sample Recovery (in.)	Blows per 6"	SPT-N Blows per foot	Moisture Content (%)	Lab Tests
0		S-1	ASPHALTIC PAVEMENT (2 inches).	20	8 12 12 10	24		
			FILL; Gravelly sand, medium dense, coarse to fine sand, some gravel, trace to little silt, moist, brown.					
			--FILL--					
5		S-2	FILL; Silty sand to sandy silt with gravel, medium dense, medium to fine sand and silt, some gravel, occasional cobbles, trace shells, wood, organics, moist then wet, gray to black.	24	11 6 6 3	12		
			--FILL--					
10		S-3		22	4 10 19 11	29		
			Boulder/cobble from 13' to 14.5'.					
15		S-4	ORGANIC SILT (OL); Soft to very soft, silt and organics, little fine sand, trace shells, wet, gray.	24	5 2 2 3	4		
20		S-5		24	1 1 1 2	2		
			SILTY CLAY (CL); Very stiff, moist, olive brown.					
25		S-6	Pocket Penetrometer: Undrained Shear Strength: Su = 2.5 - 3.25 ksf.	24	5 5 4 5	9		
30		S-7	SILTY SAND WITH GRAVEL (SM); Dense, coarse to fine sand, some silt, little gravel, wet, olive brown.	6	23 25/0"	48+		
			Possible bedrock.					
			Bottom of Exploration at 32.5'; Boring terminated 2' into bedrock/boulder.					
35								

R.W. Gillespie & Associates, Inc.
Geotechnical Engineering•Geohydrology•Materials Testing Services

Project Name:	New Acoustic Transducer Building	Log:	B-2
Location:	Portsmouth Naval Shipyard	Surface Elevation:	106
Client:	Oak Point Associates	Observed Water Depth:	6
RWG&A Project No.	767-32	Date Completed:	01/19/06

Depth (ft.)	Symbol Samples	Sample No.	Description of Material	Sample Recovery (in.)	Blows per 6"	SPT-N Blows per foot	Moisture Content (%)	Lab Tests
0		S-1	ASPHALTIC PAVEMENT (1 inch). FILL; Gravelly sand, loose to medium dense, coarse to fine sand, some gravel, trace to little silt, moist then wet, brown. --FILL--	20	6 9 7 14	15		
5		S-2	FILL; Clayey silt with sand and gravel, soft, silt, clay and fine sand with trace wood, shells, organics, wet, gray. --FILL--	8	9 4 3 8	7		
10		S-3	SILTY CLAY (CL); Soft, trace fine sand, gravel, wet, gray.	16	2 3 2 1	5		
15		S-4	ORGANIC SILT (OL); Soft, silt and organics, little fine sand, trace shells, wet, gray.	24	3 2 2 2	4		
20		S-5		24	2 1 2 2	3		
			SILTY CLAY (CL); Hard, wet, olive brown.					
25		S-6	Pocket Penetrometer: Undrained Shear Strength: Su = 3.5 ksf.	24	9 9 11 12	20		
30		S-7	Becomes medium stiff, stratified with thin (2" -.4") sand seams, gray.	20	3 3 2 2	5		
35		S-8		20	4 4 6 10	10		

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Project Name:	New Acoustic Transducer Building	Log:	B-2
Location:	Portsmouth Naval Shipyard	Surface Elevation:	106
Client:	Oak Point Associates	Observed Water Depth:	6
RWG&A Project No.	767-32	Date Completed:	01/19/06

Depth (ft.)	Symbol Samples	Sample No.	Description of Material	Sample Recovery (in.)	Blows per 6"	SPT-N Blows per foot	Moisture Content (%)	Lab Tests
40		S-9	GRAVELLY SAND WITH SILT (SM); Medium dense, coarse to fine sand, some gravel, little silt, wet, gray.	16	11 12 5 6	17		
45			Top of Bedrock.					
			Began NX rock core at 45' R-1 (45' to 50') Hard, fresh, light gray, fine grained, Quartzite with very close, high angle and vertical, undulating to planar, discolored closed joints, joint frequently infilled and cemented with calcite.					
50			Recovery = 60"/60" RQD = 15%					
			R-2 (50' to 55') Same as R-1 except heavy fractured zone from 51' to 52'. Recovery = 60"/60" RQD = 10%					
55			R-3 (55' to 60') Same as R-1. Recovery = 60" / 60" RQD = 10%					
60			Bottom of Exploration at 60'; Boring terminated 16' into bedrock.					
65								
70								
75								

R.W. Gillespie & Associates, Inc.
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Project Name:	New Acoustic Transducer Building	Log:	B-3
Location:	Portsmouth Naval Shipyard	Surface Elevation:	106
Client:	Oak Point Associates	Observed Water Depth:	4
RWG&A Project No.	767-32	Date Completed:	01/19/06

Depth (ft.)	Symbol Samples	Sample No.	Description of Material	Sample Recovery (in.)	Blows per 6"	SPT-N Blows per foot	Moisture Content (%)	Lab Tests
0		S-1	TOPSOIL AND ORGANIC MATERIAL (6 inches).	15	1 9 9 11	18		
			FILL; Silty clay with sand and gravel, stiff to soft, silt and clay with trace to little sand, gravel, cobbles, shells, bricks, moist then wet, gray. --FILL--					
5		S-2		20	2 2 2 1	4		
10		S-3	Top of bedrock.	3	50/3"	100+		
15			Bottom of Exploration at 15'; Boring terminated 4.8' into bedrock.					
20								
25								
30								
35								

R.W. Gillespie & Associates, Inc.
Geotechnical Engineering•Geohydrology•Materials Testing Services

Project Name:	New Acoustic Transducer Building	Log:	B-4
Location:	Portsmouth Naval Shipyard	Surface Elevation:	107
Client:	Oak Point Associates	Observed Water Depth:	6
RWG&A Project No.	767-32	Date Completed:	01/20/06

Depth (ft.)	Symbol Samples	Sample No.	Description of Material	Sample Recovery (in.)	Blows per 6"	SPT-N Blows per foot	Moisture Content (%)	Lab Tests
0		S-1	ASPHALTIC PAVEMENT (1.5 inches).	21	31 17 11 12	28		
			FILL; Gravelly sand, medium dense, coarse to fine sand, some gravel, trace silt, moist, brown. --FILL--					
5		S-2		2	25 10 7 2	17		
			FILL; Sandy silt, loose to medium dense, sand and silt, with some, gravel, bricks, asphalt, shells, wood, metal, wet, brown. --FILL--					
10		S-3		2	6 4 6 6	10		
			ORGANIC SILT (OL); Soft, silt and organics, trace shells, fine sand, wet, gray.					
15		S-4		24	1 2 4 7	6		
			SILTY CLAY (CL); Very stiff, wet, olive brown.					
			GRAVELLY SAND WITH SILT (SM); Dense, coarse to fine sand, some gravel, little silt, wet, brown.					
20		S-5		24	19 20 20 25	40		
25			Top of bedrock or boulder.					
			Bottom of Exploration at 25'; Boring terminated 0.5' into bedrock.					
30								
35								

R.W. Gillespie & Associates, Inc.
Geotechnical Engineering•Geohydrology•Materials Testing Services

Project Name:	New Acoustic Transducer Building	Log:	B-5
Location:	Portsmouth Naval Shipyard	Surface Elevation:	106
Client:	Oak Point Associates	Observed Water Depth:	6
RWG&A Project No.	767-32	Date Completed:	01/25/06

Depth (ft.)	Symbol Samples	Sample No.	Description of Material	Sample Recovery (in.)	Blows per 6"	SPT-N Blows per foot	Moisture Content (%)	Lab Tests
0		S-1	ASPHALTIC PAVEMENT (1 inch).	20	12 19 12 18	31		
			FILL; Gravelly sand, medium dense to dense, coarse to fine sand, some gravel, moist, brown. --FILL--					
5		S-2	FILL; Sandy silt with clay and gravel, loose, coarse to fine sand and silt, some gravel, little clay, occasional cobbles, trace shells, bricks, metal, moist then wet, gray. --FILL--	12	2 1 1 2	2		
10		S-3		19	2 1 4 7	5		
15		S-4	GRAVELLY SAND WITH SILT (SM); Loose to medium dense, coarse to fine sand, some gravel, little silt, wet, brown.	24	6 8 18 50/4"	26		
			Top of bedrock.					
20			Began NX rock core at 18'. R-1 (18' - 23') Hard, fresh, gray, fine grained, Quartzite with wide spaced, high angle to vertical, undulating to planar, fresh, tight joints. Recovery = 60"/60" RQD = 75%					
25			R-2 (23' to 28') Same as R-1. Recovery = 60"/60" RQD = 65%					
30			R-3 (28' - 33') Same as R-2. Recovery = 48"/60" RQD = 65%					
			Bottom of Exploration at 33'; Boring terminated 16' into bedrock.					
35								

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Project Name:	New Acoustic Transducer Building	Log:	B-6
Location:	Portsmouth Naval Shipyard	Surface Elevation:	109
Client:	Oak Point Associates	Observed Water Depth:	6
RWG&A Project No.	767-32	Date Completed:	01/23/06

Depth (ft.)	Symbol Samples	Sample No.	Description of Material	Sample Recovery (in.)	Blows per 6"	SPT-N Blows per foot	Moisture Content (%)	Lab Tests
0		S-1	FILL; Gravelly sand, medium dense, coarse to fine sand, some gravel, trace silt, moist, brown.	14	13 13 10 9	23		
			--FILL--					
			FILL; Gravelly sand with silt, medium dense, medium to fine sand, some gravel, some silt, occasional cobble, trace wood, moist then wet, black.					
5		S-2	--FILL--	8	28 15 14 16	29		
			SILTY SAND WITH GRAVEL (SM); Medium dense, medium to fine sand, some silt, little gravel, wet, brown.					
10		S-3		10	8 12 8 7	20		
			Top of bedrock.					
15			Began NX rock core at 14'. R-1 (14' - 19') Hard, fresh, light gray, fine grained Quartzite, with wide, high angle, planar, discolored, tight, joints, joints frequently infilled and cemented with calcite. Recovery = 60" / 60" RQD = 70%					
20			R-2 (19' - 24') Same as R-1. Recovery = 60"/60" RQD = 60%					
25			R-3 (24' - 29') Same as R-1. Recovery = 60"/60" RQD = 80%					
30			Bottom of Exploration at 29'; Boring terminated 16' into bedrock.					
35								

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Geotechnical Engineering•Geohydrology•Materials Testing Services

Project Name:	New Acoustic Transducer Building	Log:	B-7
Location:	Portsmouth Naval Shipyard	Surface Elevation:	106
Client:	Oak Point Associates	Observed Water Depth:	6
RWG&A Project No.	767-32	Date Completed:	01/24/06

Depth (ft.)	Symbol Samples	Sample No.	Description of Material	Sample Recovery (in.)	Blows per 6"	SPT-N Blows per foot	Moisture Content (%)	Lab Tests
0		S-1	ASPHALTIC PAVEMENT (1.5 inches).	13	7 8 5 16	13		
			FILL; Gravelly sand, medium dense, coarse to fine sand, some gravel, trace silt, moist, brown. --FILL--					
5		S-2	FILL; Sandy silt with gravel, loose, clay, sand and silt, some gravel, little clay, occasional cobble, trace brick, shells, moist to wet, gray to black. --FILL--	6	2 2 4 4	6		
10		S-3		10	6 4 6 5	10		
15		S-4	ORGANIC SILT (OL); Loose, silt and organics, little fine sand, trace shells, wet, gray.	2	1 1 1 2	2		
			SILTY CLAY (CL); Very stiff, stratified with thin (2 inches) sand seams, wet, olive brown.					
20		S-5	Pocket Penetrometer: Undrained Shear Strength: Su = 3.0 - 3.25 ksf.	11	10 5 6 12	11		
			Top of bedrock.					
25			Began NX rock core at 24'. R-1 (24' - 29') Hard, fresh, light gray, fine grained, Quartizite, with very close to close, high angle and vertical, undulating and planar discolored, cloased, tight joints, jointing frequently infilled and cemented with calcite. Recovery = 60"/60" RQD = 65%					
30			R-2 (29' - 32.5') Same as R-1. Recovery = 42"/42" RQD= 25%					
			R-3 (32.5' - 34.5') Same as R-1. Recovery = 24" / 24" RQD = 50%					
35			Bottom of Exploration at 34.5'; Boring terminated 12' into bedrock.					

R.W. Gillespie & Associates, Inc.
Geotechnical Engineering•Geohydrology•Materials Testing Services

Project Name:	New Acoustic Transducer Building	Log:	B-8
Location:	Portsmouth Naval Shipyard	Surface Elevation:	106
Client:	Oak Point Associates	Observed Water Depth:	6
RWG&A Project No.	767-32	Date Completed:	01/24/06

Depth (ft.)	Symbol Samples	Sample No.	Description of Material	Sample Recovery (in.)	Blows per 6"	SPT-N Blows per foot	Moisture Content (%)	Lab Tests
0		S-1	ASPHALTIC PAVEMENT (1.5 inches).	24	5 11 11 21	22		
			FILL; Gravelly sand, medium dense, coarse to fine sand, some gravel, trace silt, moist, brown. --FILL--					
5		S-2	FILL; Gravelly sand with silt, loose to medium dense, coarse to fine sand, some gravel, little silt, occasional cobbles, bricks, wood, clay, shells, moist then wet, gray to black. --FILL--	18	6 4 5 12	9		
10		S-3		1	3 4 5 4	9		
15		S-4	ORGANIC SILT (OL) Soft to very soft, silt and organics, trace fine sand, trace shells, wet, gray.	24	1 2 1 2	3		
20		U-1		19				
			SILTY CLAY (CL); Stiff, moist, stratified with thin sand seams, olive brown.					
25		S-5		NR	6 8 9 8	17		
			GRAVELLY SAND WITH SILT (logged from cuttings).					
30			Top of bedrock or boulder.					
			Bottom of Exploration at 32'; Boring terminated 2' into bedrock or boulder.					
35								

R.W. Gillespie & Associates, Inc.
Geotechnical Engineering•Geohydrology•Materials Testing Services

Project Name:	New Acoustic Transducer Building	Log:	B-9
Location:	Portsmouth Naval Shipyard	Surface Elevation:	105
Client:	Oak Point Associates	Observed Water Depth:	6
RWG&A Project No.	767-32	Date Completed:	01/25/06

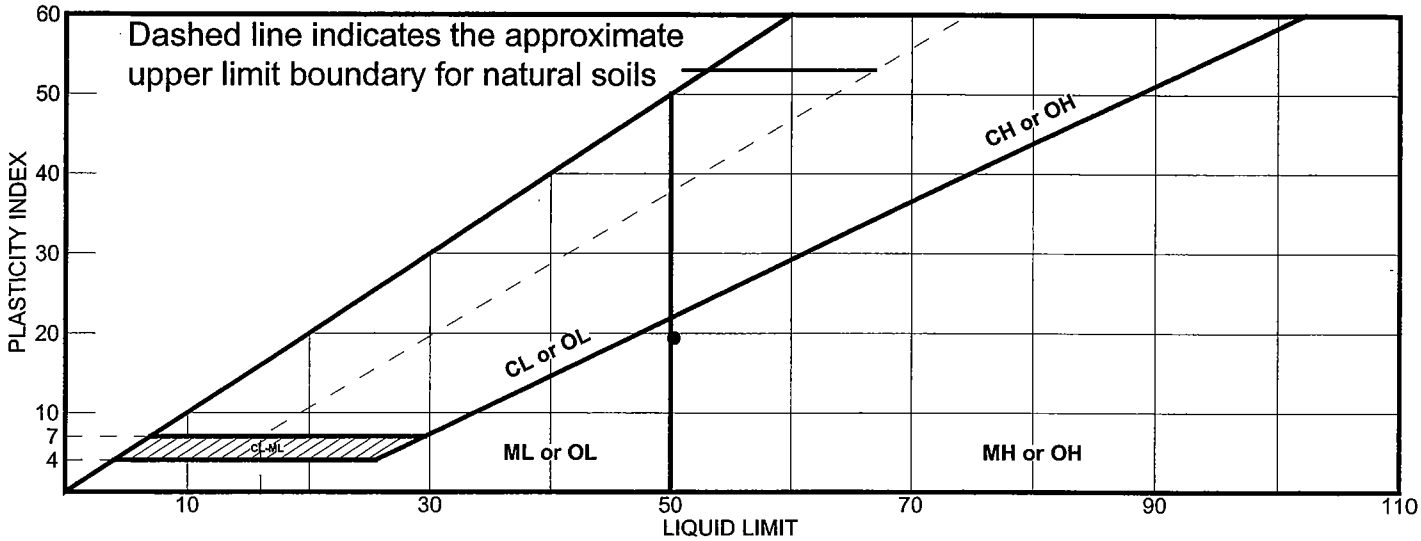
Depth (ft.)	Symbol Samples	Sample No.	Description of Material	Sample Recovery (in.)	Blows per 6"	SPT-N Blows per foot	Moisture Content (%)	Lab Tests
0		S-1	ASPHALTIC PAVEMENT (1.5 inches).	24	4 6 9 15	15		
			FILL; Gravelly sand, medium dense, coarse to fine sand, some gravel, little silt, moist, brown. --FILL--					
5		S-2	FILL; Sandy silt with gravel and clay, loose, coarse to fine sand and silt, some gravel, little clay, trace wood, brick, shells, moist then wet, gray. --FILL--	20	14 3 4 2	7		
10		S-3		19	1 1 1 2	2		
			ORGANIC SILT (OL); Very soft, silt and organics, trace fine sand and shells, wet, gray.					
15		S-4		24	2 1 1 2	2		
			GRAVELLY SAND WITH SILT (SM); Dense, coarse to fine sand, some gravel, little silt, wet, brown.					
20		S-5		24	17 19 23 24	42		
25			Possible bedrock.					
			Bottom of Exploration at 25'; Boring terminated 0.5' into bedrock or boulder.					
30								
35								

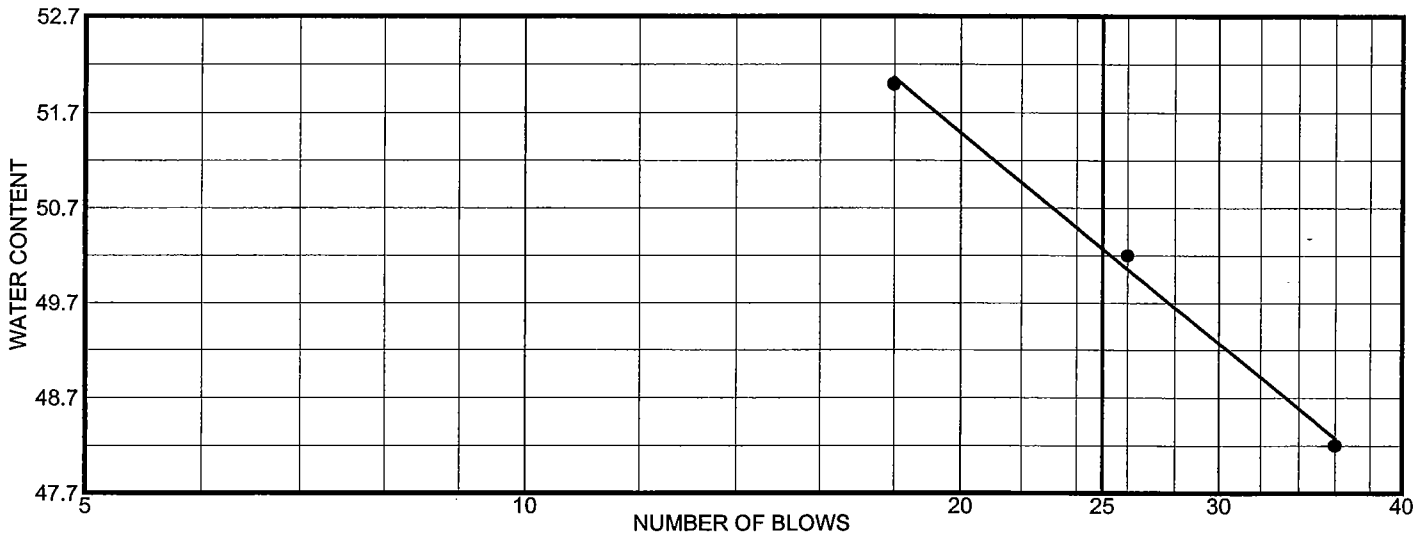
APPENDIX B

LABORATORY TESTING

Geotechnical Investigation
New Acoustic Transducer Repair/Test Facility
Portsmouth Naval Shipyard
Kittery, Maine

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●		50.3	30.9	19.4			

Project No. 767-32 **Client:** Oak Point Point Associate, Inc.

Project: Accoustic Transducer Repair Faclity (Bldg. 306)

● **Source:** B-8 **Sample No.:** U-1 **Elev./Depth:** 20.7'-20.9'

Remarks:

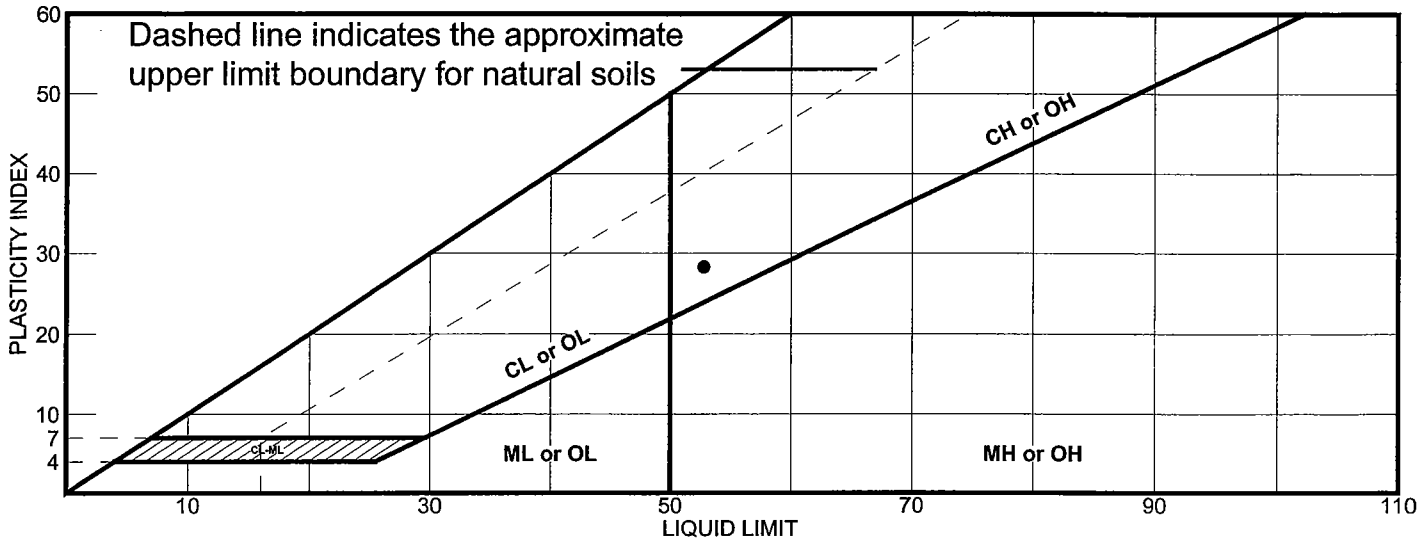
● Tested By: DCH
Natural Moisture: 43.5%

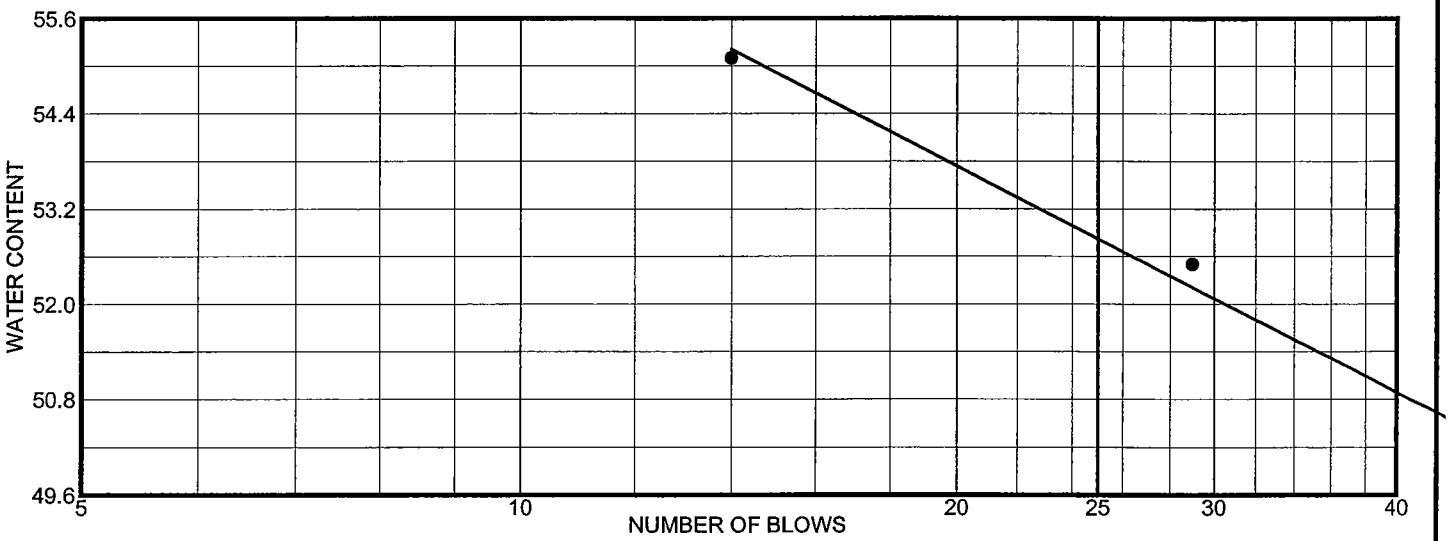
LIQUID AND PLASTIC LIMITS TEST REPORT

R.W. Gillespie & Associates, Inc.

Sample No. 8423a

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●		52.8	24.5	28.3			

Project No. 767-32 **Client:** Oak Point Point Associate, Inc.

Project: Accoustic Transducer Repair Faclity (Bldg. 306)

● **Source:** B-2 **Sample No.:** S-6 **Elev./Depth:** 25'-27'

Remarks:

● Tested By: MPL
Natural Moisture: 36.6%

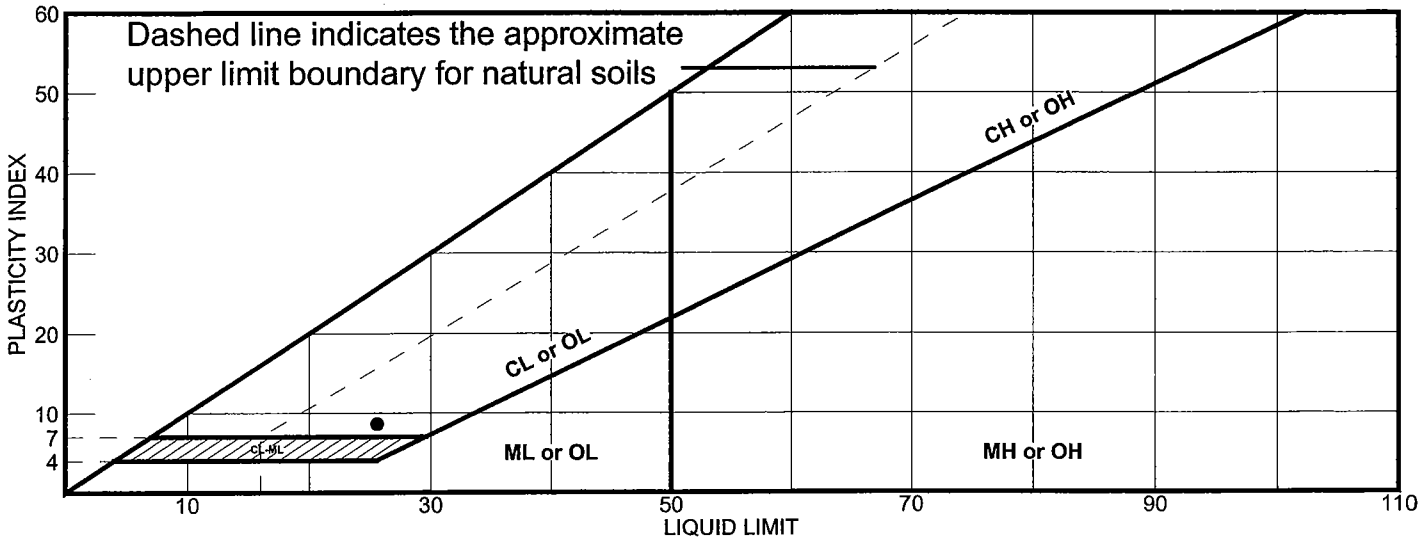
LIQUID AND PLASTIC LIMITS TEST REPORT

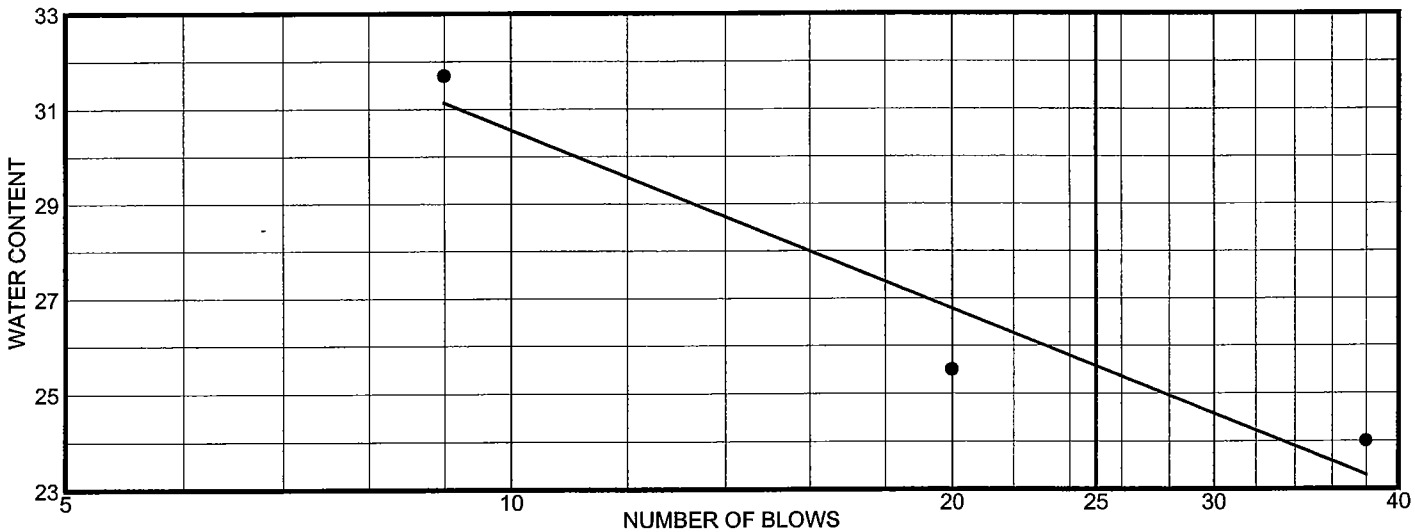
R.W. Gillespie & Associates, Inc.

MTG

Sample No. 8423b

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●		25.6	17.0	8.6			

Project No. 767-32 **Client:** Oak Point Point Associate, Inc.

Project: Accoustic Transducer Repair Faclity (Bldg. 306)

● **Source:** B-2 **Sample No.:** S-8 **Elev./Depth:** 35'-37'

Remarks:

● Tested By: MPL
Natural Moisture: 31.4%

LIQUID AND PLASTIC LIMITS TEST REPORT

R.W. Gillespie & Associates, Inc.

Sample No. 8423c

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS Site 32 RI
PROJECT NUMBER: 9058
DRILLING COMPANY: Yarmouth Env.
DRILLING RIG: Geoprobe

BORING No.: TP SB18
DATE: 4-25-03
GEOLOGIST: C. Race
DRILLER: R. Ponador

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0						GRASS						
	1		22/24	SAND/	Loose		SAND, f-c.; 15-20%		damp, Fill.	0			
	2			GVL		f.	GVL; Tr. Silt		metal wire,				
	3		19/36				Same except bottom		clinkers, slag	0			
	4					Olv	5" - SAND/SILT/CLAY		roots, rock				
	5			SAND/						0			
	6		19/36	SILT		Bt.	SAND/SILT; f. SAND (top		- moist				
	7					Gr.	2"); SAND - fine		~~Fill~~ odor, H_2S				
	8					Bl	Wet, black		odor				
				EOB									

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area 0

Background (ppm): 0

Remarks: BACKFILL w/ SAND.

See Sample log sheet for Samples.

Converted to Well: Yes ____ No ✓ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS SITE 32 RI
PROJECT NUMBER: 9058
DRILLING COMPANY: YARMOUTH ENV.
DRILLING RIG: 620 PROBE

BORING No.: TP SB 19
DATE: 4-25-03
GEOLOGIST: G. RACE
DRILLER: R. DONADON

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0						GRASS						
	1		19/24	SAND	Loose		SAND; f-m, silty		damp, roots,	0			
	2						w/ 5-10% f-gvl		soil org matter				
	3		36/36			red-	SAND; f-c w/ f.		Fill; slag,	0			
	4			SAND		brwn	gvl to 2"		clinker, brick				
	5			SILT					copper, glass, rock	0			
	6		15/36			gray	SILT/CLAY w/ rock						
	7			SAND		brn	frags in lower 5"						
	8												
				EOB		bl.	SAND; f-c w/ 25-35%		SATURATED, fill				
							f-gvl to 1.5" and tr.		metal frags,				
							SILT		brick, slag,				
									clinkers				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area 0
Background (ppm): 0

Remarks: BACKFILL w/ SAND.

SEE Sample log sheet for Samples.

Converted to Well: Yes ____ No ✓ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH
PROJECT NUMBER: ~~N2833~~ N9058 KJ 4/25/04
DRILLING COMPANY: Geosearch / EDI
DRILLING RIG: Failing 6 (F6)
BORING NUMBER: TP SB 20
DATE: 4-25-03
GEOLOGIST: K Jalkut
DRILLER: K Bylund

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth /Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	0			Sample in Fd			Asphalt surface 2-3"						
3" split barrel S-1		25 / -	10" /	0-1' below road base SVOC, metals, PEST/PCB	Loose	Brn	SAND-SOME GRAVEL-TR SILT (f.-med sand, tr. coarse sand,	SP	dry; no slag or metal debris visible - fill				
0916 hr	1	- / 31	/ 12"				poorly graded, f. + coarse subrounded gravel 1/2-1.5")						
S-2		- / 25			Loose	Jet Black	S-2A (8in) ALL FILL DEBRIS clinkers, charred coal or	Fill	dry; all man-made fill - no soil				
3" split barrel 0920 hr	2	- / 35	15" /				charcoal, nails, slag, ash, brick, metal pieces		~~drge~~ KJ 4/25/03				
		- / 38	/ 24"	2-5' SVOC PEST PCB T. metals TOC CEC DIOX (HOLD)	Loose	Red Brown	S-2B (7in) SAND-SOME GRAVEL - TR SILT (f.-med sand, tr. coarse sand poorly graded; f+ coarse SR/SA gravel up to 1")	SP	dry; trace amt of brick - fill				
	3	- / 46											
Shelby Tube ① S-3		N/A	pushed shelby				S-3 (3-5') (MATERIAL FROM FAILED SHELBY TUBE ATTEMPT)		SHELBY TUBE FAILED TUBE CAVED-IN ON BRICKS - EMPTIED				
0930 hr	4		tube initially		Loose	Red Brn	SAND - SOME GRAVEL - TR SILT - SIMILAR TO S-2B		TUBE + LOGGED SAMPLE; lg piece of brick at end of tube				
			No blow counts				w/ trace amount of brick + ash	SP	dry; fill				
	5						KJ 4/25/03						
Shelby Tube ② S-4		N/A	pushed shelby	5-6'	?	?	S-4 (~~S-A~~ 6') VISIBLE METAL SLAG - CUT TUBE TO	?	SHELBY TUBE ATTEMPT #2 - TUBE IS 2.5' LONG				
0950 hr	6		tube, then used hammer				INTERVAL W/ MATERIAL, CAPPED + SEALED W/ WAX		PENETRATED 1-FT PRIOR TO COLLAPSE AT 6' DEPTH				
			to advance slightly	Bulk Density; Grain Size; Porosity			EOB @ 6' - Attempts made for further advance but						
	7	- / 4 blows					augers flights are walking indicating tools are caught on debris. Pulled tools +		Auger caught on giant ball of metal wire -				
							move ahead 3' for retry -		coiled wire				
							Backfilled w/ soil cuttings Patched asphalt w/ silvex						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): N/A

Remarks: No PID @ location - in use at DPT location
Collect field duplicate (ED042503O1) from 2-5 ft. Augers to 5' in hole.

Converted to Well: Yes _____ No X Well I.D. #: _____

Note - Per call to Dave Z - collect interval above Shelby Tube attempts for other analytical parameters including TOC + CEC (as close to Shelby Tube interval as possible)

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH
PROJECT NUMBER: ~~N2838~~ 9058 4-25-03
DRILLING COMPANY: GeoSearch / EDI
DRILLING RIG: Failing (F6)
BORING NUMBER: TP SB 20B
DATE: 4-25-03
GEOLOGIST: K Jalkut
DRILLER: K Bylund

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth /Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
		0		sample info				Asphalt surface = 2 to 3"						
3" split barrel	S-1				No sample 0-1' for analysis	Loose	Brn	0-2' (Similar to 0-2' material in SB 20 - see other log	SP/	0-1' = no slag				
	1035	2					Black	for details)	Fill	1-2' = all manmade fill - metal, brick, slag, clinkers etc.				
SHELBY TUBE	S-2		N/A	~10"	SHELBY TUBE ~2-3'	Loose	Brn	Shelby Tube - Penetrated ~11 in w/ 2.5' long tube - end caved in. SAND - SOME GRAVEL visible		Pushed Shelby Tube initially, then used hammer to tap				
	1055	4						NO SAMPLE 3-4'		After shelby - auger to 4' + resume sample collection				
3" split barrel	S-3		7/2	10"/	~~AAA~~ by 4/25/03	Loose	Brn	S-3 (4-6') SILTY SAND - SOME GRAVEL (f-med sand, tr. coarse sand,	SP/	Fill = slag, wood chips, brick,				
	1108	6	6/3	/24"	5-8' SVOC PEST/PCB metals CEL/TOC DIOX (HOLD)			ft c, SR gravel to 1")	SM	metal debris; wet @ end of spoon (6')				
3" split barrel	S-4		2/5	8"/		Loose	Brn	S-4 (6-8') SAND - SOME GRAVEL - TR. SILT (cf-med sand, ft c. gravel)	SP	Fill = similar to S-3				
	1120	8	7/12	/24"										
FAILED SHELBY	S-5		N/A	SHELBY COLLAPSE @ 9'	NO SAMPLES FOR ANALYSIS BELOW 8' AFTER LAST ATTEMPT AT SHELBY TUBE FAILED 12-14'	?	?	ATTEMPTED SHELBY TUBE IN SATURATED ZONE - FAILED TUBE CAVED IN - AT 9'		SATURATED @ 8' AFTER FAILED SHELBY AUGERED TO 10' +	AT	9'		
	1144	10		NO SAMPLE				NO RECOVERY IN TUBE. (S-5)		RESUMED SPLIT BARREL SAMPLE COLLECTION				
2" split barrel	S-6		5/12	7"/		Loose	Jet Black	S-6 (10-12') SILTY SAND - TR GRAVEL (f./med sand, poorly	SP/ SM	SATURATED - Metal waste - lg. ball of coiled metal				
	1200	12	18/5	/24"				graded, tr. f. gravel to 1/2")		filing on auger				
2" split barrel	S-7		25/10	0"/		?	N/A	2ND ATTEMPT FOR SHELBY TUBE IN SATURATED ZONE FAILED RETRY w/ 2" BARREL - NO RECOVERY		PUSHED TUBE 30" NO RECOVERY.				
	1220	14	9/8	/24"				w/ INTACT BASKET						
2" split barrel	S-8		2/2	4"/		V. SOFT	GREY	S-8 CLAYEY SILT w/ seashells, organic roots/reeds, H_2S like odor	OL/ OH	NATURAL MATERIAL				
	1240	16	3/1	/24"										

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): N/A

Remarks: No field duplicates. Moved ahead 3' to this location from SB 20 because augers were caught on metal waste + started walking, creating too large of a hole. No sample for analysis below 8' after last failed attempt at Shelby @ 12-14'

Converted to Well: Yes ____ No X Well I.D. #: ____

Note - Fill at least to 12', possibly 14'. Natural material @ 14'.

Pay augers to 14'

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH
PROJECT NUMBER: ~~N2833~~ 9058 kg 4/22/03
DRILLING COMPANY: GeoSearch / EDI
DRILLING RIG: Failing F6
BORING NUMBER: TPSB 21 / MW-09
DATE: 4-22-03
GEOLOGIST: K Jalkut
DRILLER: K Bylund

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth /Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	0			sample 10 ft			Asphalt surface=3". Roadbase=±2in						
2" split barrel 12-4/22/03	S-1	15/15	12"/	collect 0-1' DIOX (hold) Strid set	Loose	Brn	S-1 SAND-SOME GRAVEL-TR SILT (f./med sand, poorly graded, f.gravel, SR, to 1/2", tr. coarse gravel, SA, >1")	SP	Fill, material below road base No metal visible	0	0	0	0
	0755 2	6/8	/24"						Silt <5% Dry				
2" split barrel	S-2	20/15	11"/	2-5' sample SVOC PIP=3/4 full - metals, dioxin (hold) analysis kg 4-22-03	Loose	Brn	S-2 similar to S-1 w/ more coarse gravel, debris	SP	Dry; nail, piece of glass (fill)	0	0	0	0
	0800 4	10/10	/24"										
2" split barrel	S-3	12/25	8"/		Loose	Red brn	S-3 SAND-SOME GRAVEL (f./med sand, poorly graded, c.gravel up to 2", quartzite fragment)	SP/GP	Fill- slag, brick, silver corkscrew styl metal pieces	0	0	0	0
	0809 6	20/12	/24"						approx. 1" in length Dry				
2" s.b.	S-4	12/10	5"/	5-8' sample SVOC: 2 jan Pest/PCB DIOX= 1/2 ba TB8210508	Loose	Red brn	S-4 Similar to 4-6' - coarser fragments of quartzite	SP	- Slag - Corkscrew filings	0	0	0	0
	0812 8	7/7	/24"						- Graphite or coal clinker - Dry				
2" s.b.	S-5	8/9	3"/	No sample	Loose	Brn	S-5 Similar to 6-8' - fr. coarse sand - f-coarse gravel (1 piece) up to 1"	SP	SATURATED @ 8' Fill; brick frag	0	0	0	0
	0824 10	8/17	/24"						1-1.5" in diameter; no metal waste or slag visible				
2" s.b.	S-6	9/10	3"/	No sample	Loose	Brn	S-6 - Similar to S-5 (8-10')	SP	Saturated - no metal waste or slag	0	0	0	0
	0830 12	20/10	/24"										
2" s.b.	S-7	20/10	4"/	No sample	Loose	Brn	S-7 - Similar to S-6 (10-12') - mostly f/m sand	SP	Concrete / Brick Fill; no metal waste or slag - sat.	0	0	0	0
	0845 14	5/3	/24"										
2" s.b.	S-8	1/1	24"/	No sample	v. soft	dk grey	S-8 CLAYEY SILT-TR SAND (H2S-like odor; roots/reeds; seashells; fine sand (<5%))	OL/OH	Natural	0	0	0	0
	0854 16	1/3	/24"										

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: Using dedicated bit through asphalt surface. Fill to 14'. Saturated @ 8'.

Drilling Area Background (ppm): 0

Converted to Well: Yes X No ____ Well I.D. #: MW-09

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH
PROJECT NUMBER: ~~N2833~~ 9058 KA 4/23/03
DRILLING COMPANY: Geo Search / EDI
DRILLING RIG: Failing 6 (F6)

BORING NUMBER: TP SB 22
DATE: 4/23/03
GEOLOGIST: K. Jalkut
DRILLER: K. Bylund

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth /Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	0						Asphalt surface = ~3 in						
S-1	1	15/15	18"/	3" split barrel	loose	brn	SAND - SOME GRAVEL - TR SILT (f-m sand, tr. coarse sand,	SP	1x3 in cobble (SA) No slag or metal				
1310 hr	2	17/25	/24"				f to c gravel 1/2"-1.5", subrounded - subangular, dry)		waste observed (TPSB220001 collected)	0	0	0	0
S-2	3	25/15	12"/	3" split barrel	loose	brn	S-2 (similar to S-1 above)	SP	No visible slag/metal waste				
1320 hr	4	10/100/2"	/20"						(TPSB220205 collected)	0	0	0	0
S-3	5	12/10	4"/	3" split barrel	loose med. dense	brn brn	S-3A (3in) Similar to S-2 S-3B (1in) SILTY SAND - SOME	SP SM	No visible slag or metal waste				
1330 hr	6	8/6	/24"				GRAVEL (f-m sand, tr. coarse sand, some silt, some f to c gravel)		Collected TPSB220508 (S-8')	0	0	0	0
S-4	7	12/20	7"/	3" split barrel	med. dense	brn	S-4 dry SILTY SAND, SOME GRAVEL		wet @ 6' (not saturated)				
1340 hr	8	18/14	/24"				- (f. sand, tr. med/coarse sand, some f to c, SR-SA gravel, quartzite chips (fragment)		No slag or metal waste observed	0	0	0	0
	9						EOB @ 8'. Backfill w/soil cuttings		Note - all fill material above				
	10												
	11												
	12												

SAND - SOME GRAVEL 3'
SILTY SAND - SOME GRAVEL 5'

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: All fill material in borehole. No slag or metal waste observed. Wet @ 6' (not saturated). Patch surface w/ silver (?) - cold patch.

Converted to Well: Yes ____ No X Well I.D. #: N/A

No field duplicates

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH
PROJECT NUMBER: N2833 9058 kg 4/28/03
DRILLING COMPANY: Geosearch / EDI
DRILLING RIG: Failing 6 (F6)
BORING NUMBER: TP SB23
DATE: 4/22/03
GEOLOGIST: K Jalkut
DRILLER: K. Bylund

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth /Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
		0			sample info			Asphalt surface = 3in - Road base to 6"						
2" split barrel	S-1	1	50/70	10"/	collect 0-1' below road base	loose	dk	S-1 SAND - SOME GRAVEL	SP	Damp soil (rain?) No slag/metal waste observed				
	1055 hr	2	90/35	/24"			brn	(f-m sand, tr. c. sand, poorly graded, some f. gravel to 1/2" diam., subrounded, tr. c. gravel)		Tr. sm. asphalt pieces (< 10%) Rock lodged in spoon	0	0	0	0
2" s. barrel	S-2	3	15/9	4"/	collect 2-5' 1/2 full sves 1/3 full dioxin	loose	dk brn	S-2 = similar to S-1		No metal waste/no slag viewed 2-4'				
	1100 hr	4	3/8	/24"							0	0	0	0
2" s. barrel	S-3	5	20/20	3"/		med. dense	dk brn	S-3 = similar to S-2, with visible metal waste		visible metal waste @ 5'				
	1108 hr	6	20/10	/24"	collect 5-8' metals only due to poor recovery					(frags, circular pieces, corkscrew style pieces - 1 to 3" long, 1/4" thick, silver	0	0	0	0
2" s. barrel	S-4	7	3/4	2"/		loose	dk brn	S-4 = similar to S-3 w/less metal waste (trace % - filings, only fine gravel)						
	1110 hr	8	4/7	/24"						DAMP	0	0	0	0
2" s. barrel	S-5	9	10/10	4"/		loose	blk	S-5 = similar to S-4 w/less f. gravel + more c. gravel		SATURATED @ 8' Trace % metal waste				
	1120 hr	10	7/10	/24"				1-1.5" asphalt chunks			0	0	0	0
2" s. barrel	S-6	11	4/4	10"/		v. loose	dk. brn.	SAND - SOME GRAVEL (f-m sand, tr. coarse sand,		SATURATED; Trace metal filings (<10%) + metal chips				
	1133 hr	12	4/7	/24"				fine angular gravel to 1/2" diameter)		observed; tr. brick frags, asphalt pieces	0	0	0	0
2" split barrel	S-7	13	35/4	4"/		v. loose	dk brn.	S-7 = similar to S-6		Trace brick pieces Trace metal frags				
	1135 hr	14	4/3	/24"						observed	0	0	0	0
2" split barrel	S-8	15	1/1	24"/		v. soft	gray	CLAYEY SILT (clay-sized particles, organic odor, sea shells, roots similar to H2S)	a/OH	Potential natural surface				
	1145	16	1/2	/24"				EOB @ 16' - Backfilled (see below)						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: No samples for analysis below 8'. Likely fill materials 0-14'. Potential natural environment @ 14' (forms not flat?)
Backfill w/ soil cuttings, bentonite chips, grout

Converted to Well: Yes ____ No X Well I.D. #: NA

Potential problem w/ PID - raining - water vapor?
Metal waste mostly visible 4-8' w/ trace % 8-14'. ▽ @ 8'
No field duplicates

Location approx. 3-4' west of mark in parking lot due to parked cars

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH
PROJECT NUMBER: ~~N2833~~ 9058 KJ 4/23/03
DRILLING COMPANY: GeoSearch / EDI
DRILLING RIG: Failing 6 (F6)
BORING NUMBER: TP SB 24
DATE: 4/22/03
GEOLOGIST: K Jalkut
DRILLER: K Bylund

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth /Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	0	0		Sample info									
2" split barrel S-1	1	12/25	9"/	TPSB240004 0-1' below road base DUX - ½ full SVOC - 2½ MET - full		dk brn	Asphalt surface 2-3" thick Roadbase +4 in SAND - SOME GRAVEL - TR SILT	SP	Damp - raining? No slag or metal waste	0	0		
1340	2	17/20	/24"				Cf-med sand, tr. coarse sand, poorly graded, f. gravel to ½", tr. coarse gravel to 1", SA)						
2" split barrel S-2	3	25/30	1"/	2-5' no DUX SVOC ½ MET (Full)		dk brn	SAND - SOME SILT - SOME GRAVEL (similar to above, ~~less~~ KJ 4/22 no coarse gravel, more silt)	SM	V. low recovery No slag / metal waste observed	0	0		
1342	4	25/5	/24"										
2" split barrel S-3	5	11/7	12"/	TPSB240005		dk brn	SILTY SAND - SOME GRAVEL (f-m sand, tr. coarse sand, poorly graded, fine, angular gravel to ½"	SM	Damp - due to rain? No slag / metal waste observed	0	0		
1352 hr	6	7/19	/24"	5-8' TPSB240008									
2" split barrel S-4	7	13/8	12"/			dk brn	S-4 = similar to above (f. gravel is ~~subangular~~ rounded to angular to ½". KJ 4/22		Damp - not saturated Till ???	0	0		
1410 hr	8	9/20	/24"				coarse gravel to 1.5", subangular → angular		No slag / metal waste observed				
							EOB @ 8' - backfill w/soil cuttings, bent. chips, use Silvex (?) = cold patch surface						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ?

Remarks: Location approx. 3-4' south of marked spot due to parked cars in lot. Increased silt % below 20 ft. No slag / metal waste viewed in borehole

Converted to Well: Yes ____ No X Well I.D. #: N/A

Did not take PID to borehole - heavy rain showers, 40s

No field dups

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH
PROJECT NUMBER: 9058
DRILLING COMPANY: Yarmouth Env. Services
DRILLING RIG: Geoprobe

BORING NUMBER: TP-25
DATE: 4/25/03
GEOLOGIST: J. Lambert
DRILLER: A. Salvatore

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth /Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0	N/A											
S1	1		1.2/2		sl dense	lt brown	silt, some fine sand, trace fine gravel	(ML)	dry	0.0	0.0	0.0	0.0
						black	3" layer ash						
S2	2		1.5/3			lt brown	silt, some fine sand, trace coarse sand	ML		0.0	0.0		
	3					black	2" lens of ash		dry				
						lt brown	fine sand, some silt, some gravel	(SP)					
	4						↓		moist brick at 4'				
S3	5		2.0/3			black	ash - fine - coarse sand-			0.0	0.0		
	6						sized, crumbly ↓					0.0	0.0
	7					brown	fine - coarse sand, trace fine gravel	SW					
	8					white	concrete - 3" layer (deteriorated)						
				EOB 8'		tan	fine sand and silt	~~SW~~	4/25/03				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: S1=TPSS250001, S2=TPSB250205, S3=TPSB250508

Drilling Area Background (ppm): 0.0

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH
PROJECT NUMBER: ~~N2833~~ 9058 4-26-03
DRILLING COMPANY: GeoSearch / EDF
DRILLING RIG: Failing (F6)

BORING NUMBER: TP SB 26 A
DATE: 4-26-03
GEOLOGIST: K Jalkut
DRILLER: K Bylund

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth /Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	0			Sample info			Asphalt surface = 2in; Gravel Road Base = +2"						
		– / 25		0-1' for analysis std; MS/MSD dioxin (hold)			S-1 SAND - SOME GRAVEL - SOME SILT	SM / GM	Dry; no slag or metal waste visible 0-2'	0	0	0	0
3" s.b. S-1 0740	1	– / 35	12" / 24"		Loose	Brn	– f. med sand, tr. coarse sand						
		– / 27					– f+c. subround to subangular gravel to 2"						
	2	– / 35		NO sample									
3" s.b. S-2 0800	3	/ 78 / 120/3"	3" / 9"	2-3' for metals only - poor recovery	Loose	Brn	S-2 Similar to S-1		Augers + spoon refusal at 2'9in (~3') No slag or metal waste visible 2-2'9in	0	0	0	0
							EOB @ ~3'						
	4						Augers grinding @ 2'9inches - loud rig						
							Chatter. Shallow bedrock in area -						
							high foundation to bldg #23 (hotel) - possibly						
							constructed on rock						
							Note - Moved off location + reattempted 4-5' to South						
							Augers grinding @ 2'in new location w/ refusal @ 4' (no samples from 2nd attempt)						
							Backfilled + patched both attempts w/ silvex - moved to another spot w/i same						
							decision on it per JP Kumar See log for SB 26 B.						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: 2 attempts at location. MS/MSD for dioxin (hold) only 0-1'

Drilling Area Background (ppm): 0

Converted to Well: Yes _____ No X Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH
PROJECT NUMBER: ~~N2833~~ 9058 by 4-26-03
DRILLING COMPANY: GeoSearch / EDI
DRILLING RIG: Failing F6

BORING NUMBER: TPSB 26 B
DATE: 4-26-01
GEOLOGIST: K Jalkut
DRILLER: K Bylund

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth /Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole **	Driller BZ**
	0			sample info			Asphalt surface = 2" Gravel Road Base below = +2"						
3" S.6. S-1 0905	1	20/30	16"	0-1-stnd MS/MSD & TOC/CEC & DIOX (HLD)	Loose	BLK	S-1A (8 in) SAND-TR GRAV.-TR SILT (F/M sand, poorly graded, 1 piece each f+c gravel SR+SA	SP	dry; no visible metal waste; clinkers (FILL)				
	2	20/20	/24"		Dense	brn	S-1B (8 in) SILTY SAND-SOME GRAVEL (f. sand, poorly graded, c. gravel 3"x2"	SP-SM	damp; no visible metal waste; chunk of wood (FILL)	0	0	0	0
SHELBY TUBE S-2 0920	3	N/A	20"	SHELBY TUBE. BULKDN. POROSITY GRAIN SIZE	?	brn	S-2 SHELBY TUBE- appears to be SILTY SAND	SP-SM	Penetrated 2.5 ft Recovered 20 in				
	4		30"				- some cave-in of tube @ bottom		No visible metal waste				
	5								No sample 4.5-5'- auger to 5' + resume sampling				
3" S.6. S-3 0940	6	1/1	20"	S-8' TAL MET SVOC PIP (MS/MSD) DIOX DUP (HOLD) FB0426030 1	soft (silts)	Brn	S-3 SAND-SOME SILT-TR. GRAVEL (f. sand, poorly graded, coarse gravel to 1.5"- subangular + subround	SP	DAMP	0	0	0	0
	7	1/1	/24"						SATURATED @ 7'				
3" S.6. S-4 0945	8	1/1	24"		soft (silts)	Brn	S-4 (7-8') SANDY SILT - A SOME GRAVEL (f. sand-poorly graded)	ML	3 pieces f+c gravel to 2"- subrnd + subangular				
	9	1/1	/24"		v. soft	Grey	S-4B (8-9') CLAYEY SILT w/ seashells, H2S like odor, organic roots/reeds	a/bH	NATURAL @ 9'	0	0	0	0
	10												
							EOB @ 9'. Augers to 5'. Backfill w/ soil cuttings + patch w/ silvex						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: No metal drums or visible metal waste observed. All fill above clayey silt layer.

Converted to Well: Yes ____ No X Well I.D. #: ____

Note- Located NW corner of bldg. 129 (within decision unit 6) Sample 5-8' so designated but soil for analysis from 5-7' (above water table + natural material)

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH
PROJECT NUMBER: 9658
DRILLING COMPANY: Yarmouth Env. Services
DRILLING RIG: Geoprobe

BORING NUMBER: TP-27
DATE: 4/25/03
GEOLOGIST: J. Lambert
DRILLER: A. Salvatore

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth /Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	0	N/A											
S1	1		1.1/2			lt brown	fine-coarse sand, trace silt	SW		0.0	0.0	0.0	0.0
						black	ash						
	2					red-brown	fine-coarse sand, some slag	SW	slag = oxidized				
						mottled	silt, trace coarse	ML					
S2	3		2.2/3			red-brown + brown	sand, trace fine gravel			0.0	0.0		
	4						↓		dry				
	5					tan	silt, trace fine gravel	ML					
S3	6		2.0/3							0.0	0.0	0.0	0.0
	7												
	8					gray	silt, some clay	ML	moist				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: S1= TBSS270001, S2= TPSB270205, S3= TPSB270508

Drilling Area Background (ppm): 0.0

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH
PROJECT NUMBER: 9058
DRILLING COMPANY: Yarmouth Env. Services
DRILLING RIG: Geoprobe

BORING NUMBER: TP-28
DATE: 4/25/03
GEOLOGIST: J. Lambert
DRILLER: A. Salvatore

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth /Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0	N/A											
S1	1		2.5/3		sl. dense	brown	silt, some coarse sand + fine gravel (			0.0	0.0	0.0	0.0
						lt	fine sand, trace med-	SW	cobble at 0.5'				
	2					brown	coarse sand, trace silt		dry				
						brown/	fine-coarse sand and	SW					
S2	3		2.0/3			black	ash (mixed)			0.0	0.0		
						lt	fine sand	SP	moist				
	4					brown	↓		moist				
	5					lt brown	fine sand, some med. gravel	SP	moist				
S3	6		2.1/3			lt brown	fine sand	SP	~~dry 7L 4/25/03~~ wet	0.0	0.0	0.0	0.0
	7				loose	gray	fine-coarse sand and gravel		v. dry				
	8				7.5'								
				EOB									

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read. 280508

Remarks: S1=TPSS280001, S2=TPSB280205, S3=TPSB~~0557L~~ 4/25

Drilling Area Background (ppm): 0.0

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH
PROJECT NUMBER: ~~N2893~~ 9058 ↳ 4/23/03
DRILLING COMPANY: GeoSearch / EDI
DRILLING RIG: Failing 6 (F6)

BORING NUMBER: TPSB29 (relocated)
DATE: 4/23/03
GEOLOGIST: K. Jalkut
DRILLER: K. Bylund

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth /Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	0			sample info									
3" split bar. S-1 1040 hr	1	20/20	15"/24"	0-1' below asphalt TPSS290001	loose	brn	Asphalt surface = 3 in; S-1A (4in) quartzite chunks; S-1B (6in) SAND - SOME SILT - SOME GRAVEL (c-f-m sand, tr. c. sand, poorly graded, f. gravel to 3/4"; c. grav. to 2")	— SP	DRY SAND - No slag or metal waste seen				
	2	20/20					S-1C (3in) SILT - SOME GRAVEL	ML	DAMP (fines)	0	0	0	0
3" split bar. S-2 1045 hr	3	20/20	14"/24"	2-5' TPSB290205 MS/MSD (double vol.)			S-1D (2in) SIMILAR TO S-1B; S-2 SAND - SOME GRAV. - TR SILT (f-med sand, tr. c. sand, p. graded, f to c gravel - 1/2 to 1" diam, sub rounded	SP	DRY SAND; DRY; No slag or metal				
	4	25/33			loose	brn			waste viewed; brick visible	0	0	0	0
3" split bar. S-3 1110 hr	5	17/40	12"/24"				S-3A (7") = similar to S-2		visible metal scrap (2 pieces - 1 to 2 in length 1/4" width)				
	6	26/33		5-8' TPSB290508			S-3B (5") ROCK FRAGMENTS - pulverized quartzite, 3" piece of brick at end of barrel		No visible slag or metal waste	0	0	0	0
3" s.b. S-4 1120 hr	7	62/15	10"/24"	1/2 jar = dox; 3/4 jar = SVOC; 3/4 jar = metals	loose	br	S-4 = similar to S-3A		No visible slag - Metal waste visible				
	8	14/12					(f to c gravel 1/2 - 1.25" diam, subrounded to subangular)		(brass pipe fitting (?))	0	0	0	0
2" split bar. S-5 1130 hr	9	4/5	6"/24"		soft	br	S-5 SANDY SILT (f-m sand, poorly graded (~15%)	ML	SATURATED @ 8'; No visible slag or metal waste				
	10	5/4							- concrete, brick				
2" split bar. S-6 1135 hr	11	4/1	9"/24"		soft	br	S-6 SANDY SILTY GRAVEL	GM	SATURATED; visible metal frags, brick, no slag seen	0	0		
	12	1/1											
2" split bar. S-7 1140 hr	13	1/1	9"/24"		v. soft		S-7A (3in) SAND - TR SILT - TR GRAVEL (f-m sand, p. graded, f. grav.)	SP	Saturated; trace metal waste (frags) no slag observed	1	0		
	14	5/9			soft		S-7B (6in) SILTY SAND - TR GRAV (f-med sand, p. graded, fine sr grav.)	SM	Brick, tr. metal frags, no slag				
2" split bar. S-8 1150 hr	15	1/1	16"/24"		v. soft	gray	S-8 CLAYEY SILT (clay sized particles) seashells, H_2S odor	OL/OH	Natural soil - (Former shoreline (?))	0	0		
	16	1/1											

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: Fill 0-14'. Natural @ 14'. ▽ @ 8'. See well construction log associated w/ boring. Screened interval ≅ 13 to 6' (cut screen to fit west materials in)

Converted to Well: Yes ✓ No ____ Well I.D. #: MW08 (relocated)

No field dups

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: Portsmouth - Site 32 RI
PROJECT NUMBER: 9058
DRILLING COMPANY: Yarmouth Env.
DRILLING RIG: Geoprobe

BORING No.: TPSB30
DATE: 4-24-03
GEOLOGIST: G. Rack
DRILLER: R. Donadon

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0						ASPHALT						
	1		54/24	SAND	loose	red-brown	SAND; f-m		dry, fill	0			
	2						10% f. gvl						
	3		16/36				SAND; f-c		dry, fill	0			
	4						10-15% f. gvl		metal shaving				
	5												
	6		12/36	SAND/ GRAVEL			SAND/GRAVEL; f-c		dry, fill	0			
	7						SAND; f. gvl to 2"		slag, copper				
	8												
				EOB									

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area 0
Background (ppm): 0

Remarks: BACKFILL WITH SAND. Cold patch cover.

See Sample log sheet for samples.

Converted to Well: Yes ____ No ✓ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH
PROJECT NUMBER: ~~N2833~~ 9058 B 4/23/03
DRILLING COMPANY: GeoSearch / EDI
DRILLING RIG: Failing 6 (F6)

BORING NUMBER: TP SB 31
DATE: 4/23/03
GEOLOGIST: K Jalkut
DRILLER: K. Byland

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth /Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
		0			sample info									
3" split barrel	S-1	1	25/17	17"/24"	0-1' below asphalt TP8310001			Asphalt 0-6in SAND-SOME GRAVEL-TR SILT	SP	Damp (rain prev. night)				
	0930	2	17/14			loose	Brn	(f-med sand, tr. coarse sand, poorly graded, fine gravel up to 1/2" SR>SA, tr. coarse gravel, SA, >1.5"		2 small cobbles to 2.5" Tr. asphalt, tr. metal debris (nail-1 to 2in) No slag observed	0	0		
3" split barrel	S-2	3	25/25	12"/24"	2-5' FD042303 01 TP-SB31 0205 B 4/23/03	loose	Brn	S-2 = Similar to S-1 w/more silt (10-15%), 1x2.5" SR cobble	SP	Brick waste (constr. debris) Metal debris - 1 nail No slag observed	0	0		
	0935	4	25/15											
3" split barrel	S-3	5	15/15	5"/24"	B 4/23/03 5-8' 31 TPSB250908 metals only - poor recovery wet soil difficult to capture w/ intact basket	stiff	Brn	S-3 SILT-TR SAND (f-med sand, poorly graded)	ML	Concrete / Brick No slag / metal debris	0	0		
	0950	6	13/12											
	S-4	7	3/14	3"/24"		stiff	Brn	S-4 SILTY SAND-SOME GRAVEL (f-med sand, tr. c. sand, poorly graded, f. gravel to 1/2", c. gravel to 1.5"	SM	Saturated @ 6' No slag / metal debris	0	0		
3" split barrel	1000	8	14/10											
								EOB @ 8' Backfill w/soil cuttings. Cold patch used						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: Field Duplicate collected in 2-5' interval. Trace metal debris to 4'. Saturated @ 6'. Field dup for SVOC, VEST/PCB, TAL metals, only - not dioxin

Converted to Well: Yes _____ No X Well I.D. #: N/A

Location ~2-3 ft north of marked spot due to vehicles

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS SITE 32 RI
PROJECT NUMBER: 9058
DRILLING COMPANY: YARMOUTH ENV.
DRILLING RIG: GEOPROBE

BORING No.: TPSB32
DATE: 4-25-03
GEOLOGIST: C. RACE
DRILLER: R. DONAGHY

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0						ASPHALT						
	1		17/24		loose	DK GRAY	SAND, f-m w/10-		dry, fill	0			
	2					↓	15% f. gvl to 1"		clinkers to 1"				
	3			SAND		Bl.	SAND; f-c, tr. silt		dry, fill, brick	0			
	4		18/36						clinkers to 1/2"				
	5									0			
	6		24/36			GRAY	SAND, f-m, w/10-15%		fill, ~~wet~~ dr.				
	7						f-gvl. Lower 5"		frags of brick,				
	8					br.	SAND, f-m, wet		clinkers				
				EOB									

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area 0
Background (ppm): 0

Remarks: BACKFILL W/ SAND, CAP W/ ASPHALT

See Sample logsheet for Samples.

Converted to Well: Yes ____ No ✓ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH
PROJECT NUMBER: ~~N2833~~ 9058 KJ 4-25-03
DRILLING COMPANY: GeoSearch / EDI
DRILLING RIG: Failing F6

BORING NUMBER: TB~~2~~ 1 SB 33
DATE: 4-25-03
GEOLOGIST: K Jalkut
DRILLER: K Byland

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth /Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
3" S.6.	0			sample info			Asphalt surface = 6in						
1380 S-1	1	15/17	4"/12"	0-1' NOT SENT	Loose	Blk	S-1 (0-1') ASPHALT CHUNKS ONLY - NO SOIL	—	NO SAMPLE FOR LAB ANALYSIS 0-1'	0	0		
3" S.6. S-2	2	12/12	18"/		Loose	Blk-Brn	S-2 (1-3') SAND + FILL (f./med sand, tr. coarse sand)	SP	Slag, brick, ash, concrete, clinkers	0	0	0	0
1400	3	18/18	/24"						metal debris (nails)				
3" S.6. S-3	4	12/6	2"/	FAILED ATTEMPT @ SHELBY TUBE 2-5 to lab	v. loose	brn	S-3 (3-5') Similar to S-2 SAND + FILL DEBRIS w/ lots of slag	SP	2" recovery / 30" penetration w/ Shelby caved in @ 16in				
1410	5	14/17	/24"						discarded material (all slag) - used 3" split barrel 3-5'	0	0		
3" S.6 S-4	6	5/8	2"/		Loose	brn	S-4 (5-7') SILTY SAND + FILL DEBRIS - (f./med sand, tr. coarse sand, poorly graded)	SM	poor recovery due to fill SATURATED @ 5' Brick, clinkers, slag, metal waste	0	0		
1419	7	9/6	/24"										
3" S.6. S-5	8	3/5	0"/	NO RECOVERY	?	?	S-5 (7-9') NO RECOVERY		?				
1421	9	4/5	/24"				EOB @ 9'. Backfilled						
	10						w/ cuttings, patch w/ silica and move						
							off borehole for a 2nd attempt (see log for SB 33B)						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: Poor recoveries due to nature of fill material NOT poor drilling equipment
Saturated @ 5' No sample from 5-8 due to saturation and not enough sample after

Converted to Well: Yes ____ No X Well I.D. #: ____

Slag removed from split barrel. Only sample interval for analysis 2-5'

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH
PROJECT NUMBER: ~~N2833~~ 9058 KJ 4-25-03
DRILLING COMPANY: GeoSearch / EDI
DRILLING RIG: Failing F6

BORING NUMBER: TP SB 33 B
DATE: 4-25-03
GEOLOGIST: K Jalkut
DRILLER: K Bylund

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth /Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
		0			sample info			Asphalt surface = 6in						
2" S.b.	S-1	1	25/25	10"/24"	0-1 for analysis Sub, TOC/EC	v. loose	red-blk	SAND-SOME SILT- FILL (slag, clinkers, brick	SP	Dry (fill)	0	0		
	1440	2	25/25		NO SAMPLE			ash, cindles)						
SHELBY	S-2	3	N/A	13"/30"	Pushed Shelby Tube ~2-5'	loose	brn	S-2 - penetrated 30" - collapsed bottom - recovered ~13 in.	SP	dry (fill) Shelby Tube	0	0		
	1500	4						Appears to be SAND-TR SILT - FILL (slag)						
		5	N/A		auger to 5'			(No sample 4.5-5')		Auger to 5' + resume split barrel collection				
2"+ 3" S.b.	S-3	6	2/2	8"/24"	5-8' (0507)	loose	brn	S-3 SAND - SOME SILT - ROCK FRAGS	SW	SLAG visible used 2-sizes of	0	0	0	0
	1525	7	2/1		STOC PIP metals dwx (hold) + dup for (dwx (hold) FROM 2503 05			(f-c sand, well graded, f+c frags)		barrels - no recovery w/ 3" barrel. SATURATED @ 7'				
3" S.b	S-4	8	2/2	8"/24"		loose	brn	S-4 Similar to S-3 w/ coarse subangular	SW	slag, clinkers, ash, metal waste	0	0		
	1530	9	4/4					gravel too						
2" S.b.	S-5	10	1/1	5"/24"		loose	brn	S-5 Similar to S-4	SW	similar to S-4 including	0	0	0	0
	1540	11	1/1							fill debris				
2" S.b.	S-6	12	1/1	13"/24"		v. soft	grey	S-6 CLAYEY SILT w/ seashells, reeds/roots,	OH/OL	Natural	0	0		
	1546	13	1/1					H_2S like odor						
		14												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: No attempt @ saturated zone for Shelby Tube - driller drove barrels too fast before I requested sample!

Converted to Well: Yes ____ No X Well I.D. #: ____

Note - Sample designated 5-8' was really collected 5-7' due to saturation @ 7'. Fill below saturated interval.

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS - Site 32 RI
PROJECT NUMBER: 9058
DRILLING COMPANY: Yarmouth Env.
DRILLING RIG: Geoprobe

BORING No.: TP SB34
DATE: 4-25-03
GEOLOGIST: C. Race
DRILLER: R. Donadon

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0						ASPHALT						
	1		16/24		Loose	dk.	SAND; f-c w/ 25-30%		dry, Fill	0			
	2					brwn	f.gvl to 1"						
	3		18/36	SAND			Same		Clinkers, Slag	0			
	4												
	5												
	6		8/36				Same			0			
	7												
	8												
				EOB									

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area 0

Background (ppm): 0

Remarks: Backfill w/ Sand, Cap w/ Asphalt.

See Sample logsheet for Samples

Converted to Well: Yes ____ No ✓ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS SITE 32 RI
PROJECT NUMBER: 9058
DRILLING COMPANY: YARMOUTH ENV.
DRILLING RIG: GEOPROBE

BORING No.: TPSB35
DATE: 4-25-03
GEOLOGIST: C. RACE
DRILLER: R. DONADON

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0						ASPHALT						
	1		13/24	SAND	LOOSE		SAND f-c w/ 20-25%		dry Fill, brick	0			
	2						f-gvl to 1"		clinkers, metal				
	3		34/36				SAME w/ metal shavings			0			
	4												
	5						SAME to 19", (wet						
	6		32/36				(AT 17"), black &			0			
	7						SAT. AT 22"						
	8												
				EOB									

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area 0

Background (ppm): 0

Remarks: BACKFILL w/ SAND, CAP w/ ASPHALT.

See Sample log sheet for Samples

Converted to Well: Yes ____ No ✓ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH Site 32
PROJECT NUMBER: ~~N2833~~ 4424 N9058
DRILLING COMPANY: GeoSearch/EDI
DRILLING RIG: Failing (F6)
BORING NUMBER: SB 36
DATE: 4-24-03
GEOLOGIST: K Jalkut
DRILLER: K. Bylund

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth /Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	0						Asphalt ~3 in						
S-1		25/25	12"/	~~Asphalt~~ Fill debris w/soil	loose	blk	SAND - SOME GRAVEL (F-M, tr. c. sand, poorly graded, FtC SR-SA gravel 1/2-2.5 in	SP	Dry. Fill.	0	0		
3" sb MSS	2	25/25	/24"				ash, slag, clinkers, asphalt, manmade fibrous material, graphite						
S-2		15/15	12"/				S-2 (similar to S-1 w/ less slag, mostly clinkers,		Dry. Fill	0	0		
3" sb 1500	4	17/20	/24"				incinerator waste, no man made fibrous material observed)						
S-3		12/15	12"/	Fill w/ v. little soil		Red Brn	S-3A (6in) = similar to S-2 S-3B (6in) = slag, ash, clinkers,	SP Fill	Dry. Fill	0	0		
3" sb 1511	6	15/17	/24"				brick, concrete, nails and other metal debris		(Very Little soil)				
3" S-4		12/12	12"/				S-4 - Similar to S-3		Damp. Fill	0	0		
sb 1515	8	11/5	/24"										
2" S-5		2/2	9"/	▽ @ 8' petro. impact @ 8' Fill debris w/ soil		Jet Blk	S-5 SAND - SOME GRAVEL (f. sand, poorly graded, f. gravel to 3/4", slag, manmade fibrous material, petroleum impacted, - fluid but weak odor)	SP	Saturated @ 8' Petroleum sheen on water. Petroleum stained and saturated soil, gravel, fill debris,	0	0		
sb 1525	10	2/2	/24"										
2" S-6		2/2	12"/				S-6 - Similar to S-5 w/ fine and med. sand, f. gravel to 1/2", subangular,	SP	Saturated. Stronger petroleum odor, visible sheen. Fill.	0	0		
s.b 1543	12	2/2	/24"				fill debris similar to S-5						
2" S-7		2/2	12"/	All petro. impacted fill debris (no soil)			S-7 - Fill debris + petro. impact similar to S-6; no soil recovered; wood chips	Fill only	Saturated. Petroleum impacted, sheen Fill	0	0		
sb 1545	14	2/5	/24"				and paper waste, slag manmade fibrous material						
2" S-8		2/2	7"/				S-8 - Similar to S-7, all fill debris (no soil)		Saturated. Fill. Petroleum impacted, sheen Odor detected w/ olfactory senses only	0	0		
sb 1550	16	2/2	/24"										

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: Field duplicate collected (TPFD0424030202) @ 0-1'
Petroleum impact observed @ 8' bgs (at H2O table). Petroleum appears to be locked in soils/fill. As soil is disturbed, petroleum will fill any void space

Converted to Well: Yes ____ No X Well I.D. #: N/A

Field duplicate for - SVOC, PEST/PCB, TAL metals, dioxin/furan (for analysis)

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH Site 32
PROJECT NUMBER: ~~N2833~~ N9058
DRILLING COMPANY: GeoSearch / EDI
DRILLING RIG: Failing (F6)
BORING NUMBER: SB 36 (cont.)
DATE: 4-24-03
GEOLOGIST: K. Jalkut
DRILLER: K. Bylund

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth /Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
2" S-9	16	2/2	14"	Fill ~~debris~~ debris 4-24 no soil	loose	jet blk	S-9A (5in) Similar to S-8 (all fill debris)	Fill ↓	Saturated, Petroleum impacted. Fill.				
56	18	2/2	24"	NATURAL SOIL 16'9"	soft		S-9B (9in) CLAYEY SILT (seashells, organic fibers, hydrogen sulfide like odor)	OL/OH	NATURAL @ 16'9" (petroleum impacted) ↓ NO FILL OBSERVED	0	0		
							EOB @ 18'. Augers to 14 ft						
							Backfill w/ bent. chips to 4' (4 bags); sand + soil cuttings (4 ft to 0'); patch asphalt w/ silurex						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: Field duplicate collected 0-1' (TPFD04240302)

Drilling Area Background (ppm): 0

Converted to Well: Yes ____ No X Well I.D. #: N/A

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS SITE 32 RI
PROJECT NUMBER: 9058
DRILLING COMPANY: YARMOUTH SVC.
DRILLING RIG: GEOPROBE

BORING No.: TP SB 37
DATE: 4-25-03
GEOLOGIST: C. RACE
DRILLER: R. DONADON

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0					1	ASPHALT						
	1		16/24		Loose	TAN-	SAND; f-c w/		dry, fill, pieces	0			
	2					BROWN	20% ± f. gvl		of slag, clinkers,				
	3		26/36	SANDY GVL			SAME, 30% f-gvl to 1"		metal, brick,	0			
	4								rock				
	5						SAME						
	6		24/36				↓			0			
	7			SAND/ SILT		TAN	SAND, f. w/ SILT						
	8						bottom 3" WET						
				EOB									

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area 0
Background (ppm): 0

Remarks: BACKFILL W/ SAND, CAP W/ ASPHALT.

See Sample Log Sheet for Samples

Converted to Well: Yes ____ No ____ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH
PROJECT NUMBER: ~~N2833~~ 9058 4/23/03 KJ
DRILLING COMPANY: GeoSearch / EDI
DRILLING RIG: Failing 6 (F6)

BORING NUMBER: TP SB 38A
DATE: 4-23 + 4/24/03
GEOLOGIST: K JAUKOT
DRILLER: K. BYLWND

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth /Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	0			sample info									
	1			No sample 0-1'	Loose	dk brn	SILTY SAND - SOME GRAVEL (fine/med sand, tr. coarse	SM	Dry. Fill. Approx. 5 in diam. quartzite				
	2			No sample 1-3'		gray	sand, poorly graded, f+c gravel, subrnd! up to 3")	GM	cobbles - hand dug				
	3												
S-1	4	10 / 9	5" / 24"	3-5' TPSB38A0305 metals only (poor recovery)	Loose		S-1 (3-5') GRAVELLY SILTY SAND (similar to 0-3' w/ more gravel (subrnd to subangular)	GM	Quartzite Fill Dry.				
1615	5	8 / 8								0	0		
S-2	6	10 / 8	0" / 24"		?	?	S-2 (5-7') NO RECOVERY (soil)	?	COARSE QUARTZITE PIECES ONLY - NO SOIL				
1620	7	15 / 15				?	KJ 4/23/03	?					
S-3	8	+5 10 / +5 8	5" / 24"	7-9' metals only (poor recovery) TPSB38A0709			S-3 (7-9') GRAVELLY SILTY SAND (similar to S-1)	GM	Fill				
1630	9	+0 12 / 8 9								0	0	0	0
S-4	10	15 / 17	2" / 24"	No samples for analysis			S-4 (9-11') GRAVEL ONLY (QUARTZITE - ANGULAR)	ROCK	SATURATED @ 9' ANGULARITY DUE TO DRILLING				
1645	11	20 / 15											
S-5	12	20 / 22	7" / 24"	KJ 4/24/03			S-5 (11-13') GRAVEL ONLY - similar to S-4	ROCK	Saturated				
0710	13	20 / 35							Fill ~~ends~~. KJ 4/24/03				
S-6	14	20 / 35	8" / 24"		Dense	Brn	S-6 (13-15') GRAVEL ONLY A = 3 in = B = 5 in = SILTY SAND - SOME	SM	Fill to 13.25' approx. Natural @ 13.25' (?)				
0750	15	30 / 30					GRAVEL (fine sand, poorly graded)	GM KJ 4/24/03	Saturated - no slag or metal waste observed TILL?	0	0	0	0
S-7	16	25 / 15	6" / 24"		Dense	Brn	S-7 (15-17') SAND - SOME GRAVEL SOME SILT	SM GM	Saturated - natural? TILL?				

post-hole digger

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: Natural @ ~13.25' (?) - potential dense till layer encountered.
Backfill hole from bottom to 14' w/ bent chips. Use sand below well 14-13'.
No slag or metal debris observed in any soil sample throughout borehole.

Converted to Well: Yes X No ____ Well I.D. #: MW-10

Note - TPSB38A0305 vs. 0205 - no sample collected 2-3'. Used actual depth interval in designation
TPSB38A0709 vs 0508 - no soil recovery 5-7'. Used actual depth interval in designation

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH
PROJECT NUMBER: ~~N2833~~ 9058 by 4-23-03
DRILLING COMPANY: GeoSearch / EDI
DRILLING RIG: Failing (F6)
BORING NUMBER: TPSB38A
DATE: 4/23 + 4/24/03
GEOLOGIST: K Alkut
DRILLER: K Bylund

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth / Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
3" s.b. 0815	17	30 / 17	6" / 24"	No samples for analysis ↓	Dense	Brn	S-7 (15-17') See p. 1 of 2 ↓	SM-GM	Till? saturated				
3" s.b. S-8	18	~~30~~ 12 / ~~17~~ 15	10" / 23"				S-8 (17-19') - similar to S-7 ↓		Till? saturated				
0820	19	~~12~~ 10 / 15 ←	120 / 5"										
	20						EOB - refusal w/ split barrel at almost 19'.						
							Augers to 14'. Set well above potential till layer (bottom of fill (?) to ~6') Cut screen to fit!						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: See p. 1 of 2

Drilling Area Background (ppm): 0

Converted to Well: Yes X No ____ Well I.D. #: MW-10

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH
PROJECT NUMBER: ~~N2833~~ 9058 kj 4/24/03
DRILLING COMPANY: GeoSearch / EDI
DRILLING RIG: Failing 6 (F6)

BORING NUMBER: TP SB 38 B
DATE: 4-24-03
GEOLOGIST: K JALKUT
DRILLER: K BYLUND

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth /Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	0			sample info			GRASS SURFACE						
S-1		N/A		collect 0-1' TPSB5380001 kj 4/24/03 SVOC PP DIOX HOLD metals	Loose	tan to brown	SAND - SOME GRAVEL - TR SILT (fine/med sand, poorly graded, fine + coarse sub-angular to angular gravel 1/2 - 2.5 inches	SP	Dry. Fill. Used posthole digger due to shallow utilities in area.				
0915	1									0	0	0	0
	2	N/A		TPSB3880205									
S-2		N/A		collect 2-3' of 0205 interval SVOC, PP, metals, NO DIOXIN	Loose		(Similar to S-1 with more gravel)	GP	Continue to use post hole digger to 3' due to shallow utilities				
0940	3									0	0	0	0
S-3 kj 4/24/03		12 12	0/24	NO AVAILABLE SOIL FROM 3-5'	?	?	No recovery 3-5' (1 piece of quartzite only)		Attempted 3-5' w/ split-barrel - no recovery - 1 piece of quartzite only - angular up to 2".				
0950	4	12 15											
kj 4/24/03	5	15 15 17					EOB @ 5' - augers + split barrel refusal @ 5'		Can see 1-2 foot diam. pieces of quartzite used as fill				

S.B. 3"

Used post-hole digger

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: Refusal @ 5'. Backfill w/ cuttings + rocks + bentonite chips. SB38B located approx. 30 feet west of SB38A. Filled in when building removed and/or railline present

Converted to Well: Yes _____ No X Well I.D. #: N/A

No field duplicates @ location. ~~Most~~ All of soil in 0205 came from 2-3 ft bgs.

Similar difficulties w/ recovery + rock fill @ SB38A kj 4/24/03 - tried this location as an alternate one - approved

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH
PROJECT NUMBER: 9058
DRILLING COMPANY: Yarmouth Env. Services
DRILLING RIG: Geoprobe

BORING NUMBER: TP-39
DATE: 4/25/03
GEOLOGIST: J. Lambert
DRILLER: A. Salvatore

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth /Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0	N/A											
S1	1		1.5/2		sl. dense	lt brown	fine-coarse sand and fine gravel	SW	dry	0.0	0.0	0.0	0.0
	2				sl. loose	black	fine-coarse sand, some fine gravel, some slag (fine-gravel-sized)	SW					
S2	3		2.0/3			white	1" lens fine-med particles (Anth)						
						black	fine-coarse sand, some fine gravel (SW) (moist)			0.0	0.0		
	4					dk brown	fine-med sand, trace coarse sand	SW	wood at 3.3' moist				
	5					gray	fine sand, some silt	SP		0.0	0.0		
	6		2.1/3			dk gray	fine sand, some silt (color change only)	SP				0.0	0.0
	7					lt brown	fine-med gravel, trace silt	GW	moist 6.5-wet				
	8			8' EOB									

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0.0

Remarks: S1 = TP390001, S2 = TPSB390205, S3 = TPSB390508
note - not enough soil to sample (only trace silt) at S3 Anth = anthropogenic in origin

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PORTSMOUTH
PROJECT NUMBER: ~~N2833~~ 9058 4/24/03
DRILLING COMPANY: GeoSearch / EDI
DRILLING RIG: Failing 6 (F6)

BORING NUMBER: TPSB40
DATE: 4-24-03
GEOLOGIST: K JALKUT
DRILLER: K BYLUND

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth /Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
		0			sample info.			Asphalt surf = 4"; Additional Gray. Road base below for ~2"						
3" S.6.	S-1		18/18	12"/	collect 0-1' below asphalt/ road base and above asphalt pieces (S-1B)	M. dense	Brn	S-1A (6"-12") SAND-TR SILT-TR GRAV. (fine sand, tr. med sand, tr. f/c gravel, 1/2-1", SR→SA	SP	Dry. No slag or metal visible				
	1220	2	15/10	/24"		V. loose	Black	S-1B (12"-18") ASPHALT PIECES		Fill. Dry	0	0	0	0
SHELBY TUBE	S-2		N/A	17"/				S-2 (17") AT END OF TUBE, APPEARS TO BE: SAND-SOME SILT-SOME GRAVEL	SM	Penetrated 30", recovered 17". Pushed tube	0	0	—	—
	1300	4	N/A	/30"				(fine/coarse gravel)		CUT TUBE SO AS NOT TO DISTURB SOIL. CAP + SEAL ENDS w/WAX				
No sample		5								Auger to 5' + collect S-7'				
3" S.6.	S-3	6	5/5	2"/	collect S-8' TPSB40050S8 SVOC P/P, mets, DIOX-HOLD TOC/CEC	Loose		S-3 (5-7') SAND- TR SILT- QUARTZITE ROCK CHIPS, ASPHALT	SP	Broken basket- lost recovery. No sample	0	0	—	—
	1320	7	5/8	/24"				PIECES		for TOC/CEC 5-7' dug to asphalt-rather 7-8' for parameters-more recovery				
3" S.6.	S-4	8	10/8	14"/		Loose	Red brn	S-4 (7-9') A = 7in = SILTY SAND & GRAVEL (f/m sand; pg; SA→Ang. gravel)	SM/GM	SATURATED @ 7' - FILL- porcelain pieces, film pieces				
	1330	9	2/2	/24"	NO SAMPLES FOR ANALYSIS BELOW 8'	V. Soft	DK gray	S-4 B = 7in = CLAYEY SILT (clay-sized particles, seashells, organic fibers, H_2S-like odor)	CL/OH	NATURAL @ ~8'	0	0	0	0
2" S.6.	S-5	10	1/1	24"/										
	1345	11	1/1	/24"				S-5 (9-11') Similar to S-4	CL/OH		0	0	—	—
		12						EOB @ 11'. Drill crew attempted Shelby Tube - but it was below fill - stopped attempt - no Shelby tubes needed below saturated fill! Recollected interval w/ 2" split-barrel.						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: Collected interval 0S08 even though wet - poor recovery 5-7', more 7-8'; still fill
Pen Pit - collect TOC/CEC close to Shelby interval
Out of saturated fill @ ~7.5' - Natural @ ~8'

Converted to Well: Yes _____ No X Well I.D. #: N/A

Note - 0-to1' below road base - sample for SVOC, Pest/PCB, metals, dioxin (hold)
5-8' SVOC P/P mets, dioxin=hold

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS-Site 32 RI
PROJECT NUMBER: 9058
DRILLING COMPANY: YARMOUTH ENV.
DRILLING RIG: GEOPROBE

BORING No.: TPSB41
DATE: 4-24-03
GEOLOGIST: C. RACE
DRILLER: R. DONAGHON

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0						ASPHALT						
	1		14/24	S-G	Loose	Yellow	SAND/GRAVEL; f-c		Fill, dry	0			
	2			SILT ?			SAND, f.gvl to 2"		SILT AT bottom				
	3		12/36				SAND/GRAVEL -		Fill, dry				
	4			S-G			(Above)			0			
	5		14/36										
	6		16/36	SAND		black	SAND; f-c;		Fill, dry. frags	0			
	7						15-20% f.gvl to 2"		of wood, rock,				
	8								slag to 3/4"				
				EOB									

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area 0

Background (ppm): 0

Remarks: BACKFILL W/ SAND CAPPED W/ COLD PATCH

See Sample logsheet for Samples

Converted to Well: Yes ____ No ✓ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS - SITE 32 RI
PROJECT NUMBER: 9058
DRILLING COMPANY: YARMOUTH ENV.
DRILLING RIG: GEOPROBE

BORING No.: TPSB42
DATE: 4-24-03
GEOLOGIST: L. RACE
DRILLER: R. DONADON

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0						ASPHALT						
	1		12/24	S-G	Loose		SAND/GRAVEL; f-c		dry fill; frags	0			
	2						SAND, 30-35% f.gvl		& slag, brick,				
	3		10/36						rock				
	4						GRAVEL/SAND/SILT.		dry fill, rock	0			
	5						F.GVL-to 2"		frags.				
	6		7/36										
	7												
	8			EOB/ Refusal									

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area 0

Background (ppm): 0

Remarks: No soil samples collected for lab. analysis below 1 FT BGS due to poor recovery with multiple attempts. Backfill w/sand and cover w/ asphalt. See sample log sheet for samples.

Converted to Well: Yes _____ No ✓ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS-SITE 32 RI
PROJECT NUMBER: 9058
DRILLING COMPANY: YARMOUTH ENV.
DRILLING RIG: GEOPROBE

BORING No.: TPSB43
DATE: 4-24-03
GEOLOGIST: C. RACE
DRILLER: R. DONADON

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0						GRASS						
	1		24/24	SILT	Loose	Yellow	SILT; w/ f. SAND AND		dry, Fill.	0			
	2						5% f. gvl to 1 in.						
	3		6/12	G-S			GRAVEL/SAND; m-c		Rock-frags				
	4			Refus.			SAND, f. gvl						
	5												
	6												
	7												
	8												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area 0
Background (ppm): 0

Remarks: No samples collected below 1 ft bgs due to poor recovery at multiple boreholes. Backfill w/ sand. See sample logsheet for samples.

Converted to Well: Yes ____ No —— Well I.D. #: ____

MONITORING WELL CONSTRUCTION LOGS

Tetra Tech NUS, Inc.

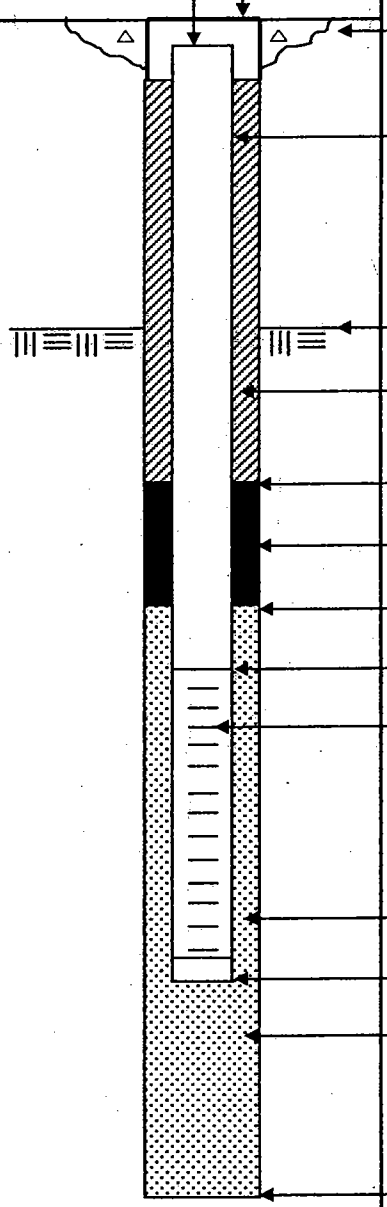
WELL No.: MW08 (rebaled)

MONITORING WELL SHEET

PROJECT:	Portsmouth	DRILLING Co.:	GeoSearch/EDF	BORING No.:	SB 29
PROJECT No.:	~~N2833~~ 9058 BJ 4/23	DRILLER:	K. Bylund	DATE COMPLETED:	4/23/03
SITE:	32	DRILLING METHOD:	HSA	NORTHING:	
GEOLOGIST:	K Jaikut	DEV. METHOD:	Surge/Pump	EASTING:	

Ground Elevation =

Datum:



Not to Scale

Elevation / Depth of Top of Riser: 1 ~2in

Elevation / Height of Top of Surface Casing: 1 0'

I.D. of Surface Casing: 8 in — PVC road box w/ steel cover

Type of Surface Casing: Flush mount (length = 8.5")

Type of Surface Seal: Portland cement 2x2' pad

I.D. of Riser: 2 in

Type of Riser: Sched 40 PVC

Borehole Diameter: ~10 in to ~13 in (below 5') (near top)

Elevation / Depth Top of Rock: 1 N/A — OVERBURDEN WELL

Type of Backfill: Sand

Elevation / Depth of Seal: 1 2'

Type of Seal: Bent. chips

Elevation / Depth of Top of Filter Pack: 1 4'

Elevation / Depth of Top of Screen: 1 6'

Type of Screen: Sched 40 PVC

Slot Size x Length: 0.010 x 7'

I.D. of Screen: 2 in

Type of Filter Pack: Sand 20-40 size

Elevation / Depth of Bottom of Screen: 1 13'

Elevation / Depth of Bottom of Filter Pack: 1 ~~13'~~ 14' BJ 4/23/03

Type of Backfill Below Well: Sand 20-40 Sieve Size

Elevation / Total Depth of Borehole: 1 14'

Note - Augers grabbed onto fill and made borehole diameter larger than standard 8in for 4 1/4" HSA.

Tetra Tech NUS, Inc.

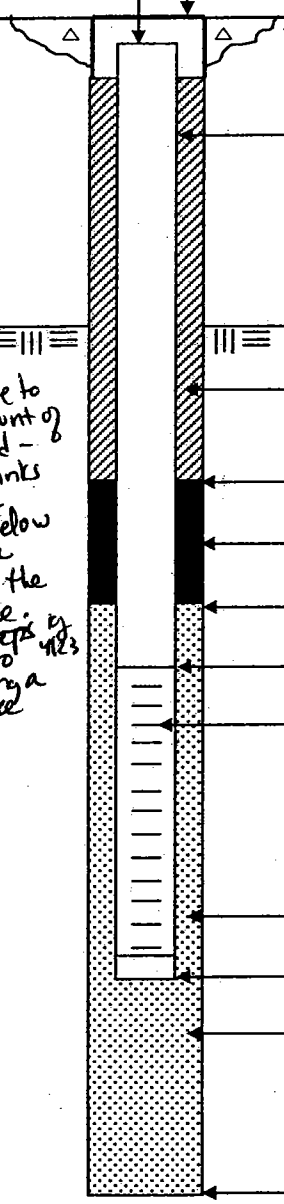
WELL No.: MW09

MONITORING WELL SHEET

PROJECT:	Portsmouth	DRILLING Co.:	Geosearch/EDI	BORING No.:	SB 21
PROJECT No.:	~~N2893~~ 9058 KJ 4/22	DRILLER:	K. Byland	DATE COMPLETED:	4/23/03
SITE:	32	DRILLING METHOD:	HSA	NORTHING:	
GEOLOGIST:	K Jalkut	DEV. METHOD:		EASTING:	

Ground Elevation =

Datum:



Not to Scale

Note - Due to the amount of sand used - Driller thinks there is a cavity below 10' - on a portion of the borehole. Sand ~~keeps~~ KJ 4/23 appears to be filling a void space

Elevation / Depth of Top of Riser:	1 ~2in
Elevation / Height of Top of Surface Casing:	1 0in
I.D. of Surface Casing:	8in
Type of Surface Casing:	Flush-mount (length = 8.5in) PVC road box w/steel cover)
Type of Surface Seal:	Portland cement 2'x2' pad
I.D. of Riser:	2 in
Type of Riser:	Sched 40 PVC
Borehole Diameter:	0-10' (~13-15 in; 10-14' = ~10-12in) plus cavity; augers caught on fill + cobbles + widened hole
Elevation / Depth Top of Rock:	1 N/A OVERBURDEN WELL
Type of Backfill:	Sand 20-40
Elevation / Depth of Seal:	1 2'
Type of Seal:	Bent. Chips
Elevation / Depth of Top of Filter Pack:	1 3'
Elevation / Depth of Top of Screen:	1 4'
Type of Screen:	Sched 40 PVC
Slot Size x Length:	0.010 x 10'
I.D. of Screen:	2 in
Type of Filter Pack:	20-40 Sand
Elevation / Depth of Bottom of Screen:	1 14'
Elevation / Depth of Bottom of Filter Pack:	1 ~~14~~ 16' KJ 4/23/03
Type of Backfill Below Well:	Sand 20-40 Sieve Size
Elevation / Total Depth of Borehole:	1 16'

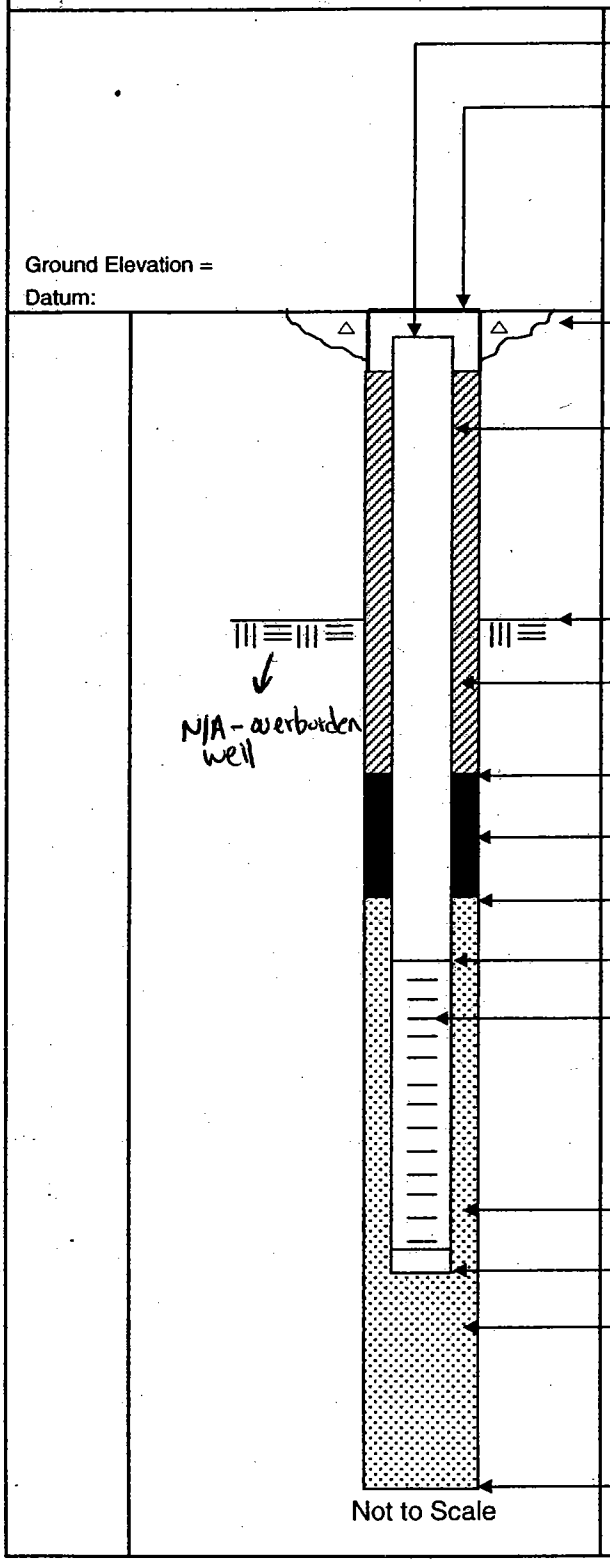
- Due to size of borehole - used total of 33 bags (50lb bags) of sand to cover screen + 1' of riser
- 4¼ HSA (ID) to 8½" OD should normally require 6 bags of sand for 12'
- Not enough room for 2' of filter pack + 2' of bent chips (seal) above screen. Approved by G. Race.

Tetra Tech NUS, Inc.

WELL No.: MW-10

MONITORING WELL SHEET

PROJECT:	Portsmouth	DRILLING Co.:	GeoSearch/EDI	BORING No.:	TPSB 38A
PROJECT No.:	~~N2833~~ 9058	DRILLER:	K Bylund	DATE COMPLETED:	4-24-03
SITE:	32 (KJ 4/24/03)	DRILLING METHOD:	HSA	NORTHING:	
GEOLOGIST:	K. JACKUT	DEV. METHOD:	Surge/Pump	EASTING:	



Ground Elevation =
Datum:

Elevation / Depth of Top of Riser: 1 ~2in

Elevation / Height of Top of Surface Casing: 1 0in

I.D. of Surface Casing: 8in

Type of Surface Casing: PVC road box w/ steel top (8.5in long)

Type of Surface Seal: Portland cement

I.D. of Riser: 2in

Type of Riser: Schedule 40 PVC

Borehole Diameter: Cave-in 0-3' - diam >15in; Below 3' - approx. 10in diameter

Elevation / Depth Top of Rock: 1 N/A (overburden)

Type of Backfill: Soil cuttings, rock pieces, sand

Elevation / Depth of Seal: 1 2

Type of Seal: Bentonite chips

Elevation / Depth of Top of Filter Pack: 1 4

Elevation / Depth of Top of Screen: 1 6

Type of Screen: Schedule 40 PVC

Slot Size x Length: 0.010 x 7 ft

I.D. of Screen: 2in

Type of Filter Pack: Sand 20-40

Elevation / Depth of Bottom of Screen: 1 13

Elevation / Depth of Bottom of Filter Pack: 1 19

Type of Backfill Below Well:

Elevation / Total Depth of Borehole: 1 19' (split barrels to 19' - augers to 14')

Note - Borehole diameter enlarged due to augers grabbing fill materials, thereby making the hole large.

Tetra Tech NUS, Inc.

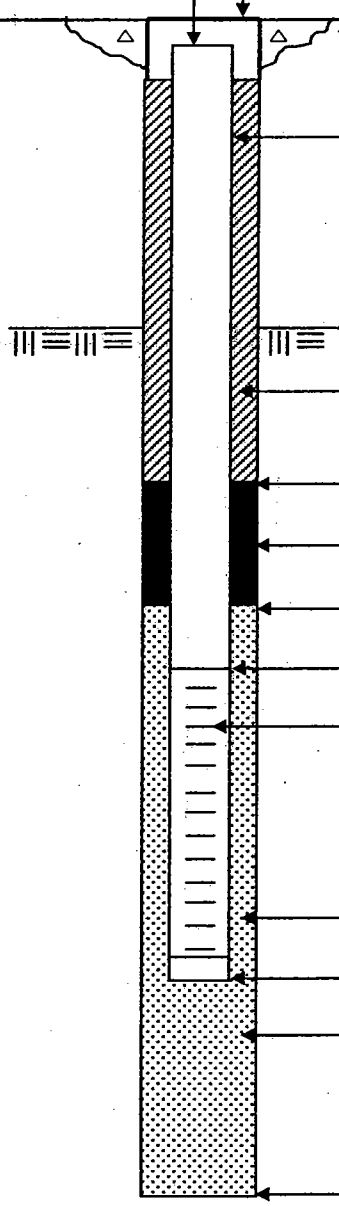
WELL No.: MW08 (rebaked)

MONITORING WELL SHEET

PROJECT:	Portsmouth	DRILLING Co.:	GeoSearch/EDI	BORING No.:	SB 29
PROJECT No.:	~~N2833~~ 9058 BJ 4/23	DRILLER:	K. Bylund	DATE COMPLETED:	4/23/03
SITE:	32	DRILLING METHOD:	HSA	NORTHING:	
GEOLOGIST:	K Jaikut	DEV. METHOD:	Surge/Pump	EASTING:	

Ground Elevation =

Datum:



Not to Scale

Elevation / Depth of Top of Riser: 1 ~2in

Elevation / Height of Top of Surface Casing: 1 0'

I.D. of Surface Casing: 8in — PVC road box w/ steel cover

Type of Surface Casing: Flush mount (length = 8.5")

Type of Surface Seal: Portland cement 2x2' pad

I.D. of Riser: 2in

Type of Riser: Sched 40 PVC

Borehole Diameter: ~10 in to ~13 in (below 5') (near top)

Elevation / Depth Top of Rock: 1 N/A — OVERBURDEN WELL

Type of Backfill: Sand

Elevation / Depth of Seal: 1 2'

Type of Seal: Bent. chips

Elevation / Depth of Top of Filter Pack: 1 4'

Elevation / Depth of Top of Screen: 1 6'

Type of Screen: Sched 40 PVC

Slot Size x Length: 0.010 x 7'

I.D. of Screen: 2in

Type of Filter Pack: Sand 20-40 size

Elevation / Depth of Bottom of Screen: 1 13'

Elevation / Depth of Bottom of Filter Pack: 1 ~~13'~~ 14' BJ 4/23/03

Type of Backfill Below Well: Sand 20-40 Sieve Size

Elevation / Total Depth of Borehole: 1 14'

Note - Augers grabbed onto fill and made borehole diameter larger than standard 8in for 4¼" HSA.

Tetra Tech NUS, Inc.

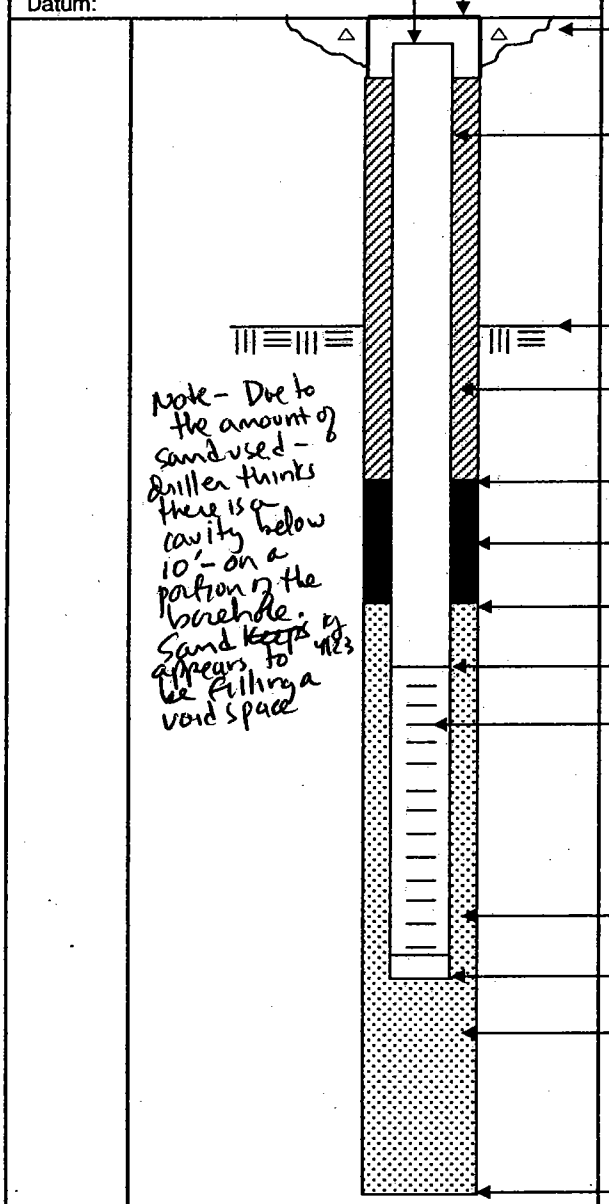
WELL No.: MW09

MONITORING WELL SHEET

PROJECT:	Portsmouth	DRILLING Co.:	Geosearch/EDI	BORING No.:	SB 21
PROJECT No.:	~~N2893~~ 9058 KJ 4/22	DRILLER:	K. Byland	DATE COMPLETED:	4/23/03
SITE:	32	DRILLING METHOD:	HSA	NORTHING:	
GEOLOGIST:	K Jalkut	DEV. METHOD:		EASTING:	

Ground Elevation =

Datum:



Not to Scale

Note - Due to the amount of sand used - driller thinks there is a cavity below 10' - on a portion of the borehole. Sand keeps appears to be filling a void space KJ 4/23

Elevation / Depth of Top of Riser:	1 ~2in
Elevation / Height of Top of Surface Casing:	1 0in
I.D. of Surface Casing:	8in
Type of Surface Casing:	Flush-mount (length = 8.5in) PVC road box w/steel lover)
Type of Surface Seal:	Portland cement 2'x2' pad
I.D. of Riser:	2 in
Type of Riser:	Sched 40 PVC
Borehole Diameter:	0-10' (~13-15 in; 10-14' = ~10-12in) — plus cavity; augers caught on fill + cobbles + widened hole
Elevation / Depth Top of Rock:	1 N/A OVERBURDEN WELL
Type of Backfill:	Sand 20-40
Elevation / Depth of Seal:	1 2'
Type of Seal:	Bent. Chips
Elevation / Depth of Top of Filter Pack:	1 3'
Elevation / Depth of Top of Screen:	1 4'
Type of Screen:	Sched 40 PVC
Slot Size x Length:	0.010 x 10'
I.D. of Screen:	2 in
Type of Filter Pack:	20-40 Sand
Elevation / Depth of Bottom of Screen:	1 14'
Elevation / Depth of Bottom of Filter Pack:	1 ~~14~~ 16' KJ 4/23/03
Type of Backfill Below Well:	Sand 20-40 Sieve Size
Elevation / Total Depth of Borehole:	1 16'

- Due to size of borehole - used total of 33 bags (50lb bags) of sand to cover screen + 1' of riser
- 4¼ HSA (ID) to 8½" OD should normally require 16 bags of sand for 12'
- Not enough room for 2' of filter pack + 2' of bent chips (seal) above screen. Approved by G. Race.

Tetra Tech NUS, Inc.

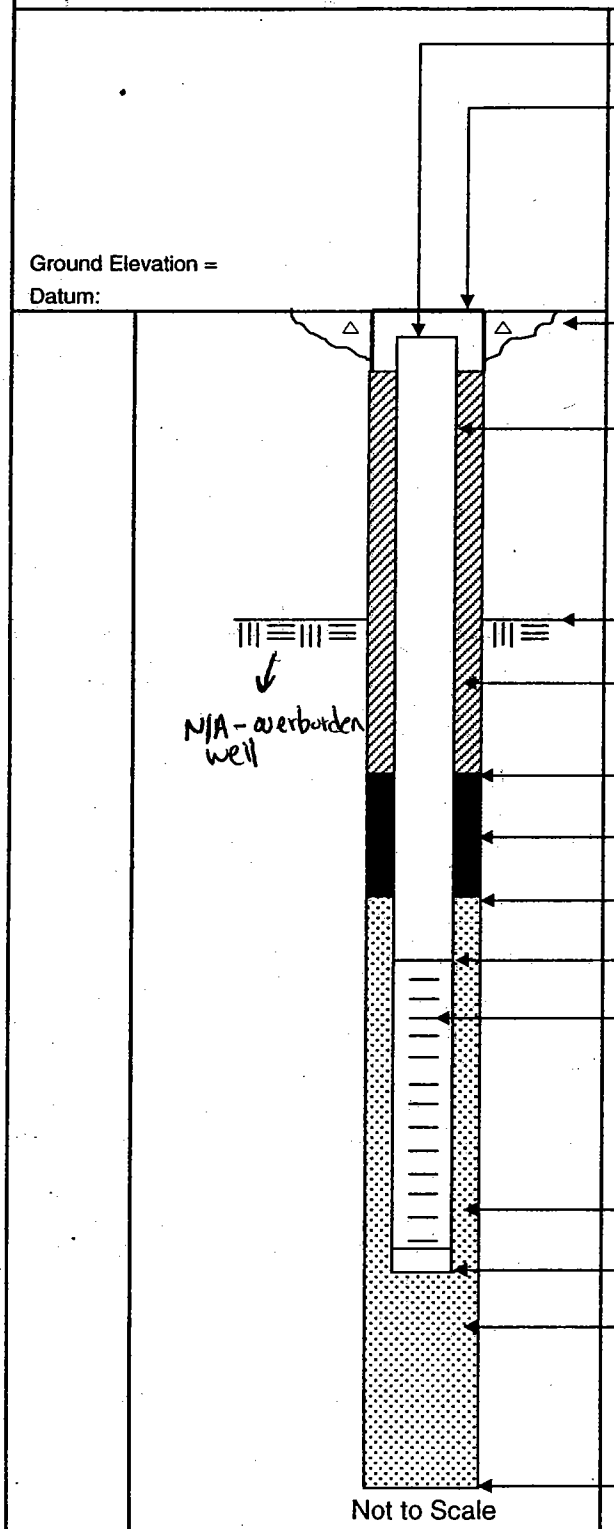
WELL No.: MW-10

MONITORING WELL SHEET

PROJECT:	Portsmouth	DRILLING Co.:	GeoSearch/EDI	BORING No.:	TPSB 38A
PROJECT No.:	~~N2833~~ 9058	DRILLER:	K Bylund	DATE COMPLETED:	4-24-03
SITE:	KJ 4/24/03 32	DRILLING METHOD:	HSA	NORTHING:	
GEOLOGIST:	K JALKUT	DEV. METHOD:	Surge/Pump	EASTING:	

Ground Elevation =

Datum:



Elevation / Depth of Top of Riser: / ~2in

Elevation / Height of Top of Surface Casing: / 0in

I.D. of Surface Casing: 8in

Type of Surface Casing: PVC road box w/ steel top (8.5in long)

Type of Surface Seal: Portland cement

I.D. of Riser: 2in

Type of Riser: Schedule 40 PVC

Borehole Diameter: Cave-in 0-3' - diam >15in Below 3' - approx. 10in diameter

Elevation / Depth Top of Rock: / N/A (overburden)

Type of Backfill: Soil cuttings, rock pieces, sand

Elevation / Depth of Seal: / 2

Type of Seal: Bentonite chips

Elevation / Depth of Top of Filter Pack: / 4

Elevation / Depth of Top of Screen: / 6

Type of Screen: Schedule 40 PVC

Slot Size x Length: 0.010 x 7 ft

I.D. of Screen: 2in

Type of Filter Pack: Sand 20-40

Elevation / Depth of Bottom of Screen: / 13

Elevation / Depth of Bottom of Filter Pack: / 19

Type of Backfill Below Well:

Elevation / Total Depth of Borehole: / 19' (split barrels to 19' - augers to 14')

Note - Borehole diameter enlarged due to augers grabbing fill materials, thereby making the hole large.

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS SITE 32
PROJECT NUMBER: 112G00383
DRILLING COMPANY: Geosearch Inc
DRILLING RIG: Geoprobe DPT

BORING No.: TP-SB101
DATE: 11/22/03
GEOLOGIST: G. W. Arend
DRILLER: John Chase

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0					GRAY	ASPHALT						
	0.5					GRAY/BROWN	F-C SAND,						
			2.5				GRAVEL & ROCK FRAGS						
	5.0					GRAY	ROCK FRAGS (METAMORPHIC),						
			3				GRAVEL & SAND (F-C)		DRY				
			3.0										
	10.0						SAA, WET		WATER @ 10.0'				
							INCREASED SAND WITH						
			3.0				DEPTH		ANOYIC ODOR				
	13.0					GRAY/BROWN	SILTY CLAY, MOIST,						
							MOTTLED, MED PLASTICITY						
						15'	E.O.B.						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ____ No Y Well I.D. #:

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS SITE 32
PROJECT NUMBER: 112G00383
DRILLING COMPANY: Geosearch Inc
DRILLING RIG: Geoprobe DPT

BORING No.: TP-SB 102
DATE: 11/22/08
GEOLOGIST: C. WARNO
DRILLER: John Chase

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0					GRAY	ASPHALT						
	0.5				BROWN/GRAY		F-C SAND, GRAVEL,						
			2.5				BRICK & ROCK FRAG						
							FILL, DRY.						
	5.0				BROWN		F-C SAND, GRAVEL						
							BRICK, ROCK FRAGS.						
			2.5				WATER @ 8.0'						
	10.0						SAA, WET						
			3.5										
	13.0				DK	GRAY	F-C SAND w/ SILT						
							& CLAY. SHELL FRAGS.		ANOXIC ODOR				
							15.0' E.O.B						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS SITE 32
PROJECT NUMBER: 112G00383
DRILLING COMPANY: GEOSEARCH
DRILLING RIG: GEOPROBE DPT

BORING No.: TP-513-103
DATE: 11/22/02
GEOLOGIST: C. WARWICK
DRILLER: JOHN CHASE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0					GRAY	ASPHALT						
	0.5				BROWN/GRAY		F-C SAND, GRAVEL,						
			2.5				SILT, ROCK FRAGS.						
							MOIST.						
	5.0				GRAY/BROWN		F-C SAND,						
							GRAVEL, ROCK FRAGS,						
			2.5				BRICK FRAGS.						
							WATER @ 9.0'						
	10.0				DK GRAY		SAA, WET.						
			3.0				INCREASED SAND						
							WITH DEPTH		ANOXIC ODOR				
	15.0				GRAY/BROWN, MOIST, MOTTLED,								
							SILTY CLAY. MED. PLASTICITY.						
			4.5										
							20.0' E.O.B.						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): [ ]

Remarks:

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS SITE 32
PROJECT NUMBER: 112G00383
DRILLING COMPANY: GEOSEARCH
DRILLING RIG: GEOPROBE DPT

BORING No.: TP-SB 104
DATE: 11/22/08
GEOLOGIST: G WARNO
DRILLER: JOHN CHASE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0					GRAY	ASPHALT						
	0.5					BROWN	SILTY F-C SAND,						
			2.5				GRAVEL & ROCK						
							FRAGMENTS. MOIST						
	5.0				DK	GRAY	ROCK FRAGS (MET)						
							GRAVEL, SOME SAND (F-C)						
			2.5				MOIST						
	10.0						SAA, WATER @ 10.0'						
			2.5										
	15.0						SAA.						
			4.0										
	18.0				DK	GRAY	SILTY, CLAYEY, SAND W/SHELL FRAGS		ANOXIC ODOR				
	19.0				GRAY/BROWN		MOIST, MOTTLED CLAY, MED PLASTICITY.						
							20.0' - E.O.B.						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS SITE 32
PROJECT NUMBER: 112G00383
DRILLING COMPANY: GEOSEARCH
DRILLING RIG: GEOPROBE DPT

BORING No.: TP-SB 105
DATE: 11/22/08
GEOLOGIST: G. WARWO
DRILLER: JOHN CHASE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0					GRAY	ASPHALT						
	0.5					BROWN	MOIST F-C SAND,						
			2.5				SOME SILT & CLAY,						
							GRAVEL & ROCK FRAGS.						
	5.0												
						BROWN	SAA						
			2.5										
	10.0					BROWN	SAA, WATER @ 10.0'						
			3.0										
	15.0					DK GRAY	WET, F-C SAND, SOME						
							GRAVEL & ROCK FRAGS,		ANOMIC ODOR				
			4.5				SOME SILT & CLAY						
	18.0					DK GRAY/BROWN	MOIST, MOTTLED						
							SILTY CLAY, MEDIUM PLASTICITY						
							20.0' E.O.B.						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS SITE 32
PROJECT NUMBER: 112G00383
DRILLING COMPANY: GeoSearch
DRILLING RIG: DPT GEOPROBE

BORING No.: TP-SB-106
DATE: 11/22/05
GEOLOGIST: S Werino
DRILLER: JOHN CHASE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
0 -	0.5					GRAY	ASPHALT / GRAVEL						
0.5 -	1.5		2.5			BROWN	SILTY VF-M SAND SOME CLAY		MOIST				
1.5 -	5.0					GRAY	WET ROCK FRAGS SOME SAND (F-C)		MOIST				
5.0 -	10.0		9.5			BROWN	F-C SAND WITH GRAVEL		MOIST				
						GRAY	WET ROCK FRAGS		WATER ~8'				
10.0 -	12.0					SAA	WET						
12.0 -	14.5		3.0			BRN	C SAND, GRAVEL, ROCK FRAGS, SOME WOOD, WET						
14.5 -	15.0					DK BROWN	SILTY F-M SAND, SOME ROCK FRAGS, WET						
15.0 -	20.0		0.0				ROCK FRAG STUCK IN BARREL, NO RECOVERY						
20.0 -	25.0		0.0				ROCK FRAG STUCK IN BARREL, NO RECOVERY						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm):

Remarks:

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS SITE 32
PROJECT NUMBER: 112G00383
DRILLING COMPANY: GEO SEARCH
DRILLING RIG: DPT GEOPROBE

BORING No.: TP-SB-106
DATE: 11/22/08
GEOLOGIST: C. WARING
DRILLER: JOHN CHASE

Sample No.* and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
							METAMORPHIC ROCK						
							FRAGS WITH SOME						
25.0-28.0			1.0'				BROWN F-C SAND. WET.						
							REFUSAL @ 28'						
							28'.0 E.O.B.						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS SITE 32
PROJECT NUMBER: 112G00383
DRILLING COMPANY: GEOSEARCH
DRILLING RIG: GEOPROBE DPT

BORING No.: TP-SB-107
DATE: 11/22/05
GEOLOGIST: C. WARNO
DRILLER: JOHN CHASE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0					GRAY	ASPHALT						
	0.5					GRAY	GRAVEL WITH C BROWN		DRY				
			2.5				SAND						
	2.0				DK	GRAY	F-C SAND, GRAVEL & ROCK FRAGS		DRY				
	5.5					GRAY	ROCK FRAGS.		MOIST				
	6.0		2.5		DK	BROWN/GRAY	F-C SAND, GRAVEL & ROCK FRAG FILL.		WATER @ ~8'				
							SAA, WET						
			3.5										
	11.5				DK	GRAY	F-M SAND, SHELL FRAGS, SOME SILT.		ANOXIC ODOR				
							15.0' E.O.B						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): [ ]

Remarks:

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS SITE 32
PROJECT NUMBER: 112G00383
DRILLING COMPANY: GEOSEARCH
DRILLING RIG: GEOPROBE DPT

BORING No.: TP-SB-108
DATE: 11/22/08
GEOLOGIST: C. WARLND
DRILLER: JOHN CHASE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0					GRAY	ASPHALT						
	0.5				BROWN	GRAY	F-C SAND, GRAVEL		DRY				
			2.5										
	4.5						SAA WITH BRICK		MOIST				
							FRAGS						
	5.0				DK	GRAY	F-C SAND, GRAVEL		MOIST				
							& ROCK FRAGS						
			4.0						WATER @ 7.0'				
	8.0				DK	GRAY	F-M SAND, SILT, &		WET				
							SHELL FRAGS.		ANOXIC ODOR				
							10.0' E.O.B						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: ____

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS SITE 32
PROJECT NUMBER: 112G00383
DRILLING COMPANY: GEOSEARCH
DRILLING RIG: GEOPROBE DPT

BORING No.: TP-SB-109
DATE: 11/22/03
GEOLOGIST: C. WARING
DRILLER: JOHN CHASE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0					GRAY	ASPHALT						
	0.5				DK	BROWN	F-C SAND, GRAVEL		DRY				
			2.5				ROCK FRAGS.						
	4.0					BROWN	M-C SAND		MOIST				
	5.0					BROWN	F-C SAND, GRAVEL,		MOIST				
							ROCK FRAGS.						
			2.5				WET @ 8.0'						
							SAA WET						
	12.0				DK	GRAY	F-M SAND, SILT &		ANOXIC ODOR				
			3.5				SHELL FRAGS, WET						
	14.5					TAN	CLAY, MOD PLASTICITY,						
							SOME SILT,						
							MOTTLED.						
							15' - END OF BORING						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: ____

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS SITE 32
PROJECT NUMBER: 112G00383
DRILLING COMPANY: GEOSEARCH
DRILLING RIG: GEOPROBE DPT

BORING No.: TP-SB-110
DATE: 11/22/08
GEOLOGIST: G. WARNAO
DRILLER: JOHN CHASE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0					BLK	ASPHALT						
	0.5					GRAY	F-C SAND, GRAVEL,		DRY				
			2.5'				ROCK FRAGS.						
	5.0						SAA		MOIST				
							WATER @ 7.0'						
			2.5'				INCREASED ROCK						
							FRAGMENTS WITH DEPTH						
							SAA						
			3.0'										
	13.0				DK	GRAY	F-M SAND WITH		ANOXIC ODOR				
							SHELL FRAGS.						
							15.0' - E.O.B.						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS SITE 32
PROJECT NUMBER: 112G00383
DRILLING COMPANY: GEOSEARCH
DRILLING RIG: GEOPROBE DPT

BORING No.: TP-SB-111
DATE: 11/22/08
GEOLOGIST: L. WARNO
DRILLER: JOHN CHASE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length FT	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0					DK GRY	ASPHALT						
	0.5						F-C SAND, GRAVEL,		DRY				
			2.5'				& ROCK FRAGS						
							SOME SILT						
	4.5				DK	RED	C SAND W/ SLAG.		MOIST				
	5.5				DK	BROWN	F-C SAND, GRAVEL,		MOIST				
			3.0'				ROCK FRAGS.						
							WATER @ 8'						
							SAA, WET						
	13.0		3.5'		DK	BROWN/GRAY	F-M SAND, SILT,		ANOXIC ODOR				
							SHELL FRAGS.						
							15.0' E.O.B.						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS SITE 32
PROJECT NUMBER: 112G00383
DRILLING COMPANY: GEOSEARCH
DRILLING RIG: GEOPROBE DPT

BORING No.: TP - SB - 112
DATE: 11/22/02
GEOLOGIST: C. WARNO
DRILLER: JOHN CHASE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0				DK	GRAY	ASPHALT						
	0.5					GRAY	GRAVEL, ROCK FRAGS,		DRY				
			2.5				SOME F-C BROWN SAND						
	1.0					BROWN	F-C SAND, GRAVEL,		MOIST				
							ROCK FRAGS						
							SAA		MOIST				
			3.0				WATER @ 9.0'						
	10.0					BLACK	F-C SAND, GRAVEL,						
							ROCK FRAGS, WET.						
			3.0										
	14.5				DK	GRAY	SILTY, SANDY, CLAY W/ SHELLS		ANOXIC ODOR				
							WET.						
							SAA						
			3.5										
	18.5					GRAY/BROWN	MOIST, MOTTLED						
							SILTY CLAY. MED PLASTICITY						
							20.0' E.O.B.						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: ____

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS SITE 32
PROJECT NUMBER: 112G00383
DRILLING COMPANY: GEOSEARCH
DRILLING RIG: GEOPROBE DPT

BORING No.: TP-SB-113
DATE: 11/22/08
GEOLOGIST: G. WARWO
DRILLER: JOHN CHASE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0					DK GRAY	ASPHALT						
	0.5					BROWN	F-C SAND WITH		DRY				
			3.0				GRAVEL & ROCK FRAGS						
	4.0					BROWN	F-C SAND, SOME FINE		MOIST				
							GRAVEL & SILT.						
	5.0												
							SAA 5'-10'		MOIST				
			3.5'				WATER @ 8.5'						
	10.0					GRAY	ANGULAR METAMORPHIC						
							ROCK FRAGS & F-M						
			4.0				GRAVEL. WET						
	12.5					DK GRAY	F-M - SILTY, CLAYEY						
							SAND. SOME SHELL FRAGS		ANOXIC ODOR				
							WET.						
							15.0' - E.O.B.						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: ____

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS SITE 32
PROJECT NUMBER: 112G00383
DRILLING COMPANY: GEOSEARCH
DRILLING RIG: GEOPROBE DPT

BORING No.: TP-SB-114
DATE: 11/22/08
GEOLOGIST: C WARNO
DRILLER: JOHN CHASE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0					GRAY	ASPHALT / GRAVEL						
	0.5					BROWN	F-C SAND WITH		DM				
			3.5				FINE GRAVEL. SOME SILT & CLAY						
									MOIST				
	5.0				ORANGISH-BROWN		- F-C SAND,						
							SOME F GRAVEL, SILT, & CLAY.		MOIST				
			3.5				WOOD @ 9.0'.						
	10.0				DK GRAY/BLACK		F-C SAND, GRAVEL & ROCK FRAGS, WET.						
									WATER @ 10.0'				
			4.0										
	14.5				DK GRAY		F-M SAND, SOME SILT						
							& CLAY. SHELL FRAGS		ANOXIC ODOR				
							WET.						
							15.0' EOB.						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS SITE 32
PROJECT NUMBER: 112G00383
DRILLING COMPANY: GEOSEARCH
DRILLING RIG: GEOPROBE DPT

BORING No.: TP-SB-115
DATE: 11/22/08
GEOLOGIST: C. WAREWO
DRILLER: JOHN CHASE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0					BLK	ASPHALT						
	0.5					BROWN	F-C SAND, SOME		DRY				
			1.0				GRAVEL & ROCK FRAGS						
	1.0					GRAY	ROCK FRAGS (WET)		MOIST				
	5.0					GRY	WET ROCK FRAGS		MOIST				
			0.5										
	10.0						SAA, WET						
			0.5										
	15.0						SAA, WET						
			2.5										
	18.0					BROWN	F-M SAND, SILT,						
							SOME CLAY, SHALE FRAGS.						
							20.0 E.O.B.						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS SITE 32
PROJECT NUMBER: 112G00383
DRILLING COMPANY: GEOSEARCH
DRILLING RIG: GEOPROBE DPT

BORING No.: TP-SB-116
DATE: 11/22/08
GEOLOGIST: C. WARNO
DRILLER: JOHN CHASE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0					GRAY	ASPHALT						
	0.5					BROWN	SILTY F-C SAND AND						
			2.0				GRAVEL WITH ROCK						
							FRAGMENTS. MOIST						
	1.5					GRAY	WET ROCK FRAGS.						
	5.0					GRAY	METAMORPHIC ROCK						
							FRAGMENTS. WET						
			0.5										
	10.0												
							SAA						
			1.0										
	15.0						SAA						
			1.0										
	20.0						SAA						
	22.0		3.5			BROWN	WET F-M SAND.						
							FEW GRAVELS.						
							25.0' E.O.B						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm):

Remarks:

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS SITE 32
PROJECT NUMBER: 112G00383
DRILLING COMPANY: GEOSEARCH
DRILLING RIG: GEOPROBE DPT

BORING No.: TP-SB-117
DATE: 11/23/08
GEOLOGIST: G WARNO
DRILLER: JOHN CHASE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0					BROWN	SILTY SAND (F-C) WITH		DRY				
							SOME GRAVEL						
	0.5		3.5			BROWN	F-C SAND WITH GRAVEL		MOIST				
	4.0					GRAY	METAMORPHIC ROCK FRAG		MOIST				
	5.0					GRAY	METAMORPHIC ROCK		MOIST				
							FRAGMENTS						
			1.0										
	10.0						SAA		WET				
			1.5										
	15.0						SAA		WET				
			1.5										
	20.0						SAA		WET				
	23.0		3.0			GRAY	F-M SAND. TRACE						
							FINE GRAVEL.						
							25.0' E.O.B.						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm):

Remarks:

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS SITE 32
PROJECT NUMBER: 112G00383
DRILLING COMPANY: GEOSEARCH
DRILLING RIG: GEOPROBE DPT

BORING No.: TP SB 118
DATE: 11/23/08
GEOLOGIST: G WARNO
DRILLER: JOHN CHASE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0					BROWN	SILTY F-C SAND, SOME		DM				
							GRAVEL.						
	0.5		2.5			BROWN	F-C SAND WITH		MOIST				
							GRAVEL & METAMORPHIC						
							ROCK FRAGS.						
	2.5					GRAY	METAMORPHIC ROCK FRAGS		MOIST				
	5.0						SAA, TRACE		MOIST				
							C SAND.						
	5.5		0.5			GRAY	METAMORPHIC ROCK		MOIST				
							FRAGMENTS.						
	10.0					GRAY	METAMORPHIC ROCK		WET.				
							FRAGMENTS.						
			1.5										
	15.0					GRAY	SAA		WET				
			1.0										
	20.0					GRAY	SAA		WET				
	23.0		3.5			GRAY	F-M SAND, SOME SILT		ANOXIC ODOR				
							& SHELL FRAGS.						
							25.0' E.O.B.						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS SITE 32
PROJECT NUMBER: 112G00383
DRILLING COMPANY: GEOSEARCH
DRILLING RIG: GEOPROBE DPT

BORING No.: TP SB 119
DATE: 11/23/08
GEOLOGIST: G. WARNO
DRILLER: JOHN CHASE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0					GRAY	ASPHALT		DRY				
	0.5					BROWN	F-C SAND, SOME GRAVEL,		MOIST				
			2.0				& ROCK FRAGS						
	1.0					GRAY	METAMORPHIC ROCK FRAGS		MOIST				
	5.0					GRAY	METAMORPHIC ROCK FRAGS		MOIST				
			0.5										
	10.0					GRAY	SAA		WET				
			2.0										
	14.5					GRAY	F-C SILTY SAND, SOME SHELL FRAGS.		WET ANOXIC ODOR				
							20.0 E.O.B.						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ____ No X Well I.D. #:

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS SITE 32
PROJECT NUMBER: 112G00383
DRILLING COMPANY: GEOSEARCH
DRILLING RIG: GEOPROBE DPT

BORING No.: TP SB 120
DATE: 11/22/08
GEOLOGIST: C. WARNO
DRILLER: JOHN CHASE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0					BROWN	F-L SAND WITH SOME GRAVEL, & MOIST		DRY				
	1.5		2.5			BROWN	F-L SAND WITH SOME GRAVEL & ROCK FRAG'S.						
	2.0					GRAY	METAMORPHIC ROCK FRAG'S, SOME F-L SAND		MOIST				
	5.0					GRAY	METAMORPHIC ROCK FRAGMENTS		WET				
			1.0										
	10.0					GRAY	METAMORPHIC ROCK FRAG'S		WET				
	15.0						SAA		WET				
	19.5					BROWN	F-L SAND WITH METAMORPHIC ROCK FRAG'S		WET				
							REFUSAL @ 20.0'						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm):

Remarks:

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS SITE 32
PROJECT NUMBER: 112G00383
DRILLING COMPANY: GEOSEARCH
DRILLING RIG: GEOPROBE DPT

BORING No.: TP-SB-121
DATE: 11/23/08
GEOLOGIST: L WARNO
DRILLER: JOHN CHASE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0					GRAY	ASPHALT		DRY				
	0.5					BROWN	F-C SAND, SOME		MOIST				
			2.0				GRAVEL & ROCK FRAGS.						
	1.5					GRAY	METAMORPHIC ROCK		MOIST				
							FRAGS.						
	5.0					GRAY	METAMORPHIC ROCK		MOIST				
							FRAGMENTS.						
	10.0					GRAY	SAA		WET				
	15.0					GRAY	SAA		WET				
	20.0					GRAY	SAA		WET				
	21.0					BLACK	F-M SAND, SILT & CLAY.		WET, ANOXIC ODOR				
							SOME SHELL FRAGS.						
							25.0' E.O.B.						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: ____

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS SITE 32
PROJECT NUMBER: 112G00383
DRILLING COMPANY: GEOSEARCH
DRILLING RIG: GEOPROBE DPT

BORING No.: TP-SB-122
DATE: 11/23/08
GEOLOGIST: C. WARNO
DRILLER: JOHN CHASE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0					BROWN	SILTY F-C SAND. DRY						
	0.25					BROWN	F-C SAND, SOME		MOIST				
							GRAVEL & ROCK FRAGS. PLASTIC CHUNKS.						
	2.0					GRAY	METAMORPHIC ROCK		MOIST				
							FRAGS.						
	5.0					GRAY	METAMORPHIC ROCK		MOIST				
							FRAGS						
	8.0				DK	GRAY	SILTY, CLAY, SOME ORGANIC		MOIST				
							MATTER & F SAND. SOME SHELL FRAGS.		ANOXIC ODOR				
	9.0						REFUSAL ON BEDROCK						
							9.0' E.O.B.						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS SITE 32
PROJECT NUMBER: 112G00383
DRILLING COMPANY: GEOSEARCH
DRILLING RIG: GEOPROBE DPT

BORING No.: TP-SB-123
DATE: 11/23/08
GEOLOGIST: C. WARINO
DRILLER: JOHN CHASE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0					GRAY	ASPHALT		DRY				
	0.5					BROWN	F-L SAND, SOME SILT,		MOIST				
							GRAVEL, & ROCK FRAGS						
	2.0					GRAY	METAMORPHIC ROCK		* METAL OBSCT @ 2.0' BGS.				
							FRAGS.		MOVING TO ADJACENT LOCATION.				
	5.0					GRAY	SAA		MOIST				
	10.0					GRAY	SAA		WET				
	14.0						REFUSAL @ 14.0'		3 ATTEMPTS.				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: ____

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS SITE 32
PROJECT NUMBER: 112G00383
DRILLING COMPANY: GEOSEARCH
DRILLING RIG: HSA

BORING No.: MW-11
DATE: 11/24/00
GEOLOGIST: C. WARNO
DRILLER: JASON MORGAN

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0.0-6.0							NO SAMPLE						
	6.0	1/1				BROWN/GRAY	MOT ROCK FRAGS						
		2/2	1'			RUST	DISCOLORATION/BRICK FRAGS		0.0 PID				
						SOME	FABRIC/FIBERS		MOIST				
						F-C	SAND & GRAVEL.						
	8.0	1/1											
		3/3	1'			DK BROWN	- F-C SAND, GRAVEL,		WET				
						GLASS,	ROCK FRAGS.		0.0 PID				
						BRICK	FRAGS. SOME						
							SILT.						
	10.0	5/8	1'			BLACK	C SAND, F GRAVEL,		PID 0.0				
		3/6					ROCK FRAGS, METAL		* METAL PIECES				
							& WOOD, SOME SILT		WOOD				
							WET		ANOXIC ODOR				
	12.0	1/1	1'			BLACK	C SAND, F GRAVEL,		PID 0.0				
		1/11					ROCK FRAGS, METAL,		* METAL				
							WOOD. SOME SILT.		WOOD				
									ANOXIC ODOR				
							WET						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0.0

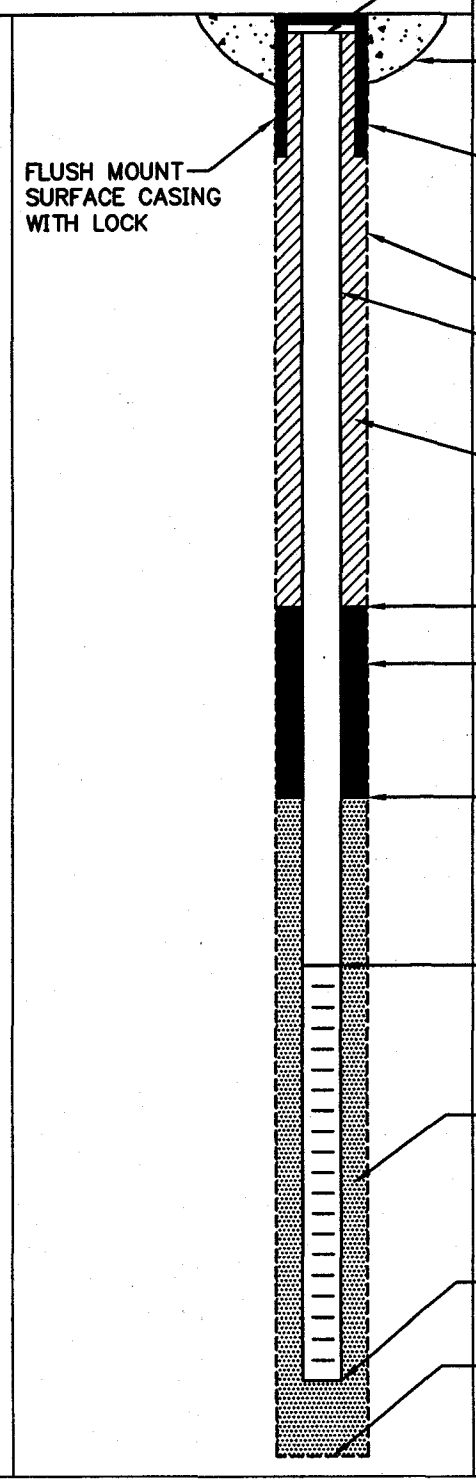
Converted to Well: Yes X No ____ Well I.D. #: TP-MW11

WELL NO.: MW-11

Tetra Tech NUS, Inc.

OVERBURDEN
MONITORING WELL SHEET
FLUSH - MOUNT

PROJECT PNS SITE 32	LOCATION MW-11	DRILLER Jason Morgan
PROJECT NO. 112600383	BORING MW-11	DRILLING METHOD HSA
DATE BEGUN 11/24/08	DATE COMPLETED 11/24/08	
FIELD GEOLOGIST C. WARING		DEVELOPMENT METHOD surge & pump
GROUND ELEVATION 105.74	DATUM PNS 2002	



ELEVATION TOP OF RISER: 105.16

TYPE OF SURFACE SEAL: CONCRETE

TYPE OF PROTECTIVE CASING: STEEL

I.D. OF PROTECTIVE CASING: 8"

DIAMETER OF HOLE: 8.25"

TYPE OF RISER PIPE: PVC 2"

RISER PIPE I.D.: 2"

TYPE OF BACKFILL/SEAL: BENTONITE/GROUT

ELEVATION/DEPTH TOP OF SEAL: 102.16 / 3

TYPE OF SEAL: BENTONITE

ELEVATION/DEPTH TOP OF SAND: 100.66 / 4.5

ELEVATION/DEPTH TOP OF SCREEN: 99.66 / 5.5

TYPE OF SCREEN: .010" PVC 2"

SLOT SIZE x LENGTH: 0.010" 10'

TYPE OF SAND PACK: #00 SAND

DIAMETER OF HOLE IN BEDROCK:

ELEVATION / DEPTH BOTTOM OF SCREEN: 89.66 / 15.5

ELEVATION / DEPTH BOTTOM OF SAND: 89.66 / 15.5

ELEVATION/DEPTH BOTTOM OF HOLE: 89.66 / 15.5

BACKFILL MATERIAL BELOW SAND:

ACAD: FORM_MWFM.dwg 07/20/99 INL

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS SITE 32
PROJECT NUMBER: 112G00383
DRILLING COMPANY: GEOSEARCH
DRILLING RIG: HSA

BORING No.: MW-11
DATE: 11/24/05
GEOLOGIST: G. WARINO
DRILLER: JASON MORGAN

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	14.0	1/1				BLACK	C SAND, GRAVEL		PID 0.0				
		17/8					ROCK FRAGS, METAL		* METAL				
							SHAVINGS. SOME SILT		ANOXIC ODOR				
	16.0	21/20				BLACK	F-C SAND, GRAVEL						
		10/2					ROCK FRAGS, FIBERS		PID 3.9				
							(HAIR?). SOME SILT.		ANOXIC ODOR				
	17.5					BLACK	SILT & F SAND, SOME						
							SHELL FRAGS.		ANOXIC ODOR				
							18.0' B.O.B						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0.0

Converted to Well: Yes X No ____ Well I.D. #: TP-MW 11

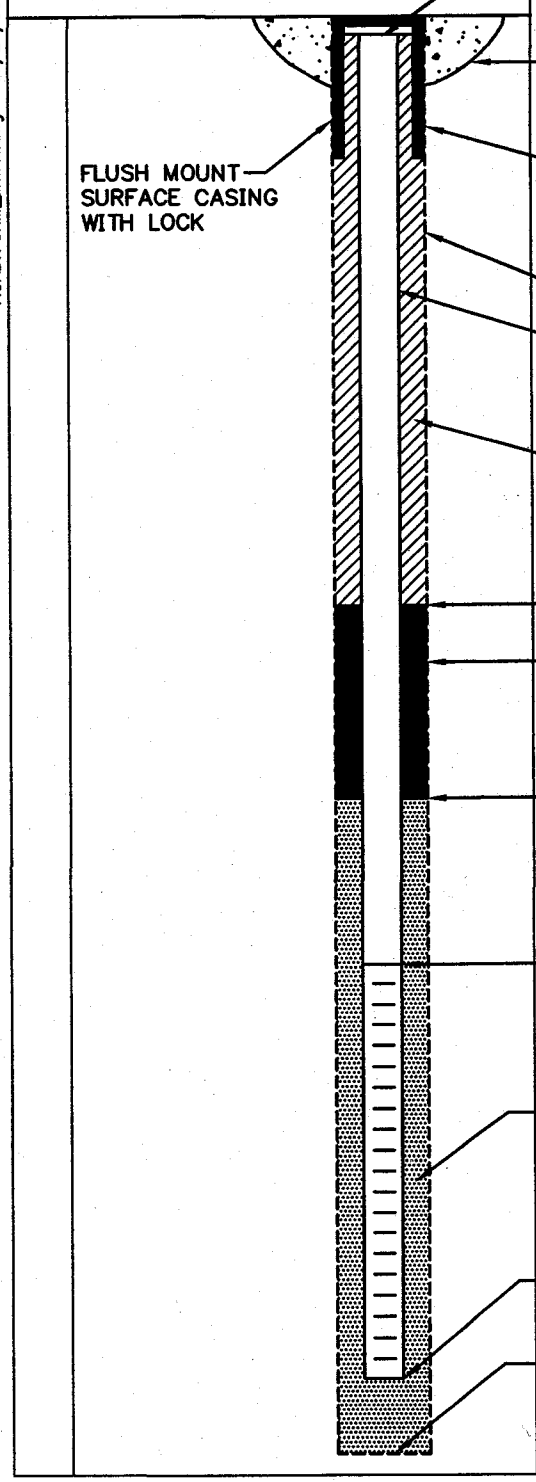
SCREEN 5'-15'
SET WELL @ 15' BGS

WELL NO.: MW-12

Tetra Tech NUS, Inc.

OVERBURDEN
MONITORING WELL SHEET
FLUSH - MOUNT

PROJECT PNS SITE 32	LOCATION MW-12 gw	DRILLER Jason Morgan
PROJECT NO. 112G00383	BORING ~~TP-123~~ MW-12	DRILLING METHOD HSA
DATE BEGUN 11/24/08	DATE COMPLETED 11/24/08	
FIELD GEOLOGIST C. WARNO		DEVELOPMENT METHOD surge & pump
GROUND ELEVATION 106.69	DATUM PNS 2002	



ELEVATION TOP OF RISER: 106.36

TYPE OF SURFACE SEAL: CONCRETE

TYPE OF PROTECTIVE CASING: STEEL

I.D. OF PROTECTIVE CASING: 2"

DIAMETER OF HOLE: 8.25"

TYPE OF RISER PIPE: PVC

RISER PIPE I.D.: 2"

TYPE OF BACKFILL/SEAL: BENTONITE / GROUT

ELEVATION/DEPTH TOP OF SEAL: 101.36 / 5'

TYPE OF SEAL: BENTONITE

ELEVATION/DEPTH TOP OF SAND: 99.36 / 7'

ELEVATION/DEPTH TOP OF SCREEN: 98.36 / 8'

TYPE OF SCREEN: 2" PVC

SLOT SIZE x LENGTH: 0.010 10'

TYPE OF SAND PACK: # 00 SAND

DIAMETER OF HOLE IN BEDROCK:

ELEVATION / DEPTH BOTTOM OF SCREEN: 88.36 / 18'

ELEVATION / DEPTH BOTTOM OF SAND: 88.36 / 18'

ELEVATION/DEPTH BOTTOM OF HOLE: 88.36 / 18'

BACKFILL MATERIAL BELOW SAND:

ACAD: FORM_MWFM.dwg 07/20/99 INL

A.3 TIDAL LAG STUDY

TIDAL STUDY DATA

PNS SITE 32 TIDAL STUDY DATA - APRIL 2003

Date	Seavey Is. Low Tide	Time	ET (sec)	ET (min)	Stilling Well Feet H2O	FA01 Feet H2O	MW02 Feet H2O	MW03 Feet H2O	MW04 Feet H2O	MW05 Feet H2O	MW07 Feet H2O	MW08 Feet H2O	MW10 Feet H2O	MW09 Feet H2O	MW01 Feet H2O
4/28/2003		21:00:00	0	0	-6.56	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	
4/28/2003		21:05:00	300	5	-6.74	-0.01	-0.01	-0.04	-0.10	0.00	0.08		-0.02	0.00	
4/28/2003		21:10:00	600	10	-6.82	-0.02	-0.02	-0.08	-0.20	-0.01	0.17		-0.04	0.00	
4/28/2003		21:15:00	900	15	-6.95	-0.02	-0.03	-0.12	-0.29	-0.01	0.28		-0.06	0.00	
4/28/2003		21:20:00	1200	20	-7.03	-0.03	-0.04	-0.16	-0.37	-0.02	0.37		-0.08	0.00	
4/28/2003		21:25:00	1500	25	-7.16	-0.04	-0.05	-0.20	-0.49	-0.02	0.49		-0.10	0.00	
4/28/2003		21:30:00	1800	30	-7.28	-0.05	-0.06	-0.26	-0.70	-0.03	0.58		-0.12	0.00	
4/28/2003		21:35:00	2100	35	-7.37	-0.06	-0.07	-0.31	-0.93	-0.03	0.70		-0.13	0.00	
4/28/2003		21:40:00	2400	40	-7.46	-0.07	-0.07	-0.37	-1.19	-0.03	0.83		-0.15	0.00	
4/28/2003		21:45:00	2700	45	-7.54	-0.09	-0.08	-0.44	-1.44	-0.04	0.94		-0.17	0.00	
4/28/2003		21:50:00	3000	50	-7.63	-0.10	-0.09	-0.51	-1.59	-0.04	1.07		-0.18	0.00	
4/28/2003		21:55:00	3300	55	-7.70	-0.11	-0.10	-0.58	-1.70	-0.05	1.20		-0.19	0.00	
4/28/2003		22:00:00	3600	60	-7.70	-0.12	-0.10	-0.64	-1.77	-0.05	1.32		-0.20	0.00	
4/28/2003		22:05:00	3900	65	-7.80	-0.13	-0.11	-0.71	-1.84	-0.06	1.45		-0.21	0.00	
4/28/2003		22:10:00	4200	70	-7.81	-0.14	-0.11	-0.79	-1.91	-0.06	1.58		-0.22	0.00	
4/28/2003		22:15:00	4500	75	-7.87	-0.16	-0.12	-0.86	-1.96	-0.07	1.69		-0.23	0.00	
4/28/2003		22:20:00	4800	80	-7.89	-0.17	-0.13	-0.93	-2.02	-0.07	1.81		-0.23	0.00	
4/28/2003		22:25:00	5100	85	-7.93	-0.18	-0.13	-1.01	-2.05	-0.08	1.93		-0.22	0.00	
4/28/2003		22:30:00	5400	90	-7.96	-0.19	-0.13	-1.08	-2.10	-0.08	2.05		-0.22	0.00	
4/28/2003		22:35:00	5700	95	-7.93	-0.21	-0.14	-1.15	-2.10	-0.08	2.17		-0.21	0.00	
4/28/2003		22:40:00	6000	100	-7.97	-0.22	-0.14	-1.21	-2.13	-0.09	2.28		-0.21	0.00	
4/28/2003		22:45:00	6300	105	-7.96	-0.23	-0.14	-1.28	-2.15	-0.09	2.39		-0.20	0.00	
4/28/2003		22:50:00	6600	110	-7.97	-0.24	-0.13	-1.33	-2.17	-0.10	2.50		-0.19	0.00	
4/28/2003		22:55:00	6900	115	-7.91	-0.25	-0.12	-1.39	-2.16	-0.10	2.60		-0.18	0.00	
4/28/2003		23:00:00	7200	120	-7.88	-0.27	-0.11	-1.43	-2.13	-0.10	2.70		-0.17	0.00	
4/28/2003		23:05:00	7500	125	-7.87	-0.28	-0.11	-1.47	-2.14	-0.11	2.79		-0.16	0.00	
4/28/2003		23:10:00	7800	130	-7.79	-0.29	-0.10	-1.50	-2.10	-0.11	2.89		-0.15	0.00	
4/28/2003		23:15:00	8100	135	-7.76	-0.30	-0.09	-1.53	-2.06	-0.12	2.98		-0.14	0.00	
4/28/2003		23:20:00	8400	140	-7.73	-0.32	-0.07	-1.55	-2.06	-0.12	3.06		-0.13	0.00	
4/28/2003		23:25:00	8700	145	-7.65	-0.33	-0.06	-1.57	-2.01	-0.12	3.14		-0.12	0.00	
4/28/2003		23:30:00	9000	150	-7.61	-0.34	-0.06	-1.58	-1.97	-0.12	3.22		-0.10	0.00	
4/28/2003		23:35:00	9300	155	-7.57	-0.35	-0.05	-1.59	-1.94	-0.13	3.30		-0.09	0.00	
4/28/2003		23:40:00	9600	160	-7.49	-0.36	-0.04	-1.59	-1.90	-0.13	3.37		-0.08	0.00	
4/28/2003		23:45:00	9900	165	-7.43	-0.37	-0.03	-1.59	-1.84	-0.13	3.44		-0.06	0.00	
4/28/2003		23:50:00	10200	170	-7.32	-0.38	-0.03	-1.58	-1.74	-0.14	3.51		-0.05	0.00	
4/28/2003		23:55:00	10500	175	-7.24	-0.39	-0.02	-1.57	-1.60	-0.14	3.58		-0.04	0.00	
4/29/2003		0:00:00	10800	180	-7.14	-0.40	-0.01	-1.55	-1.43	-0.14	3.64		-0.02	0.00	
4/29/2003		0:05:00	11100	185	-7.05	-0.41	-0.01	-1.53	-1.32	-0.14	3.70		-0.01	0.00	
4/29/2003		0:10:00	11400	190	-6.93	-0.42	0.00	-1.51	-1.26	-0.14	3.76		0.01	0.00	
4/29/2003		0:15:00	11700	195	-6.82	-0.43	0.01	-1.48	-1.23	-0.14	3.81		0.02	0.00	
4/29/2003		0:20:00	12000	200	-6.71	-0.43	0.01	-1.45	-1.20	-0.14	3.86		0.03	0.00	
4/29/2003		0:25:00	12300	205	-6.58	-0.44	0.02	-1.42	-1.16	-0.14	3.90		0.05	0.00	
4/29/2003		0:30:00	12600	210	-6.48	-0.45	0.03	-1.39	-1.13	-0.14	3.95		0.06	0.00	
4/29/2003		0:35:00	12900	215	-6.28	-0.45	0.03	-1.36	-1.08	-0.15	3.98		0.08	0.00	
4/29/2003		0:40:00	13200	220	-6.20	-0.46	0.03	-1.33	-1.03	-0.15	4.02		0.09	0.00	
4/29/2003		0:45:00	13500	225	-6.02	-0.46	0.04	-1.30	-0.96	-0.14	4.05		0.11	0.00	
4/29/2003		0:50:00	13800	230	-5.84	-0.46	0.04	-1.26	-0.87	-0.15	4.09		0.12	0.00	
4/29/2003		0:55:00	14100	235	-5.73	-0.46	0.05	-1.23	-0.81	-0.15	4.11		0.14	0.00	
4/29/2003		1:00:00	14400	240	-5.53	-0.46	0.05	-1.19	-0.74	-0.14	4.14		0.15	0.00	
4/29/2003		1:05:00	14700	245	-5.36	-0.46	0.05	-1.16	-0.67	-0.14	4.17		0.17	0.00	
4/29/2003		1:10:00	15000	250	-5.18	-0.46	0.06	-1.12	-0.59	-0.14	4.19		0.18	0.00	
4/29/2003		1:15:00	15300	255	-4.98	-0.45	0.06	-1.08	-0.51	-0.14	4.21		0.20	0.00	

PNS SITE 32 TIDAL STUDY DATA - APRIL 2003

Date	Seavey Is. Low Tide	Time	ET (sec)	ET (min)	Stilling Well Feet H2O	FA01 Feet H2O	MW02 Feet H2O	MW03 Feet H2O	MW04 Feet H2O	MW05 Feet H2O	MW07 Feet H2O	MW08 Feet H2O	MW10 Feet H2O	MW09 Feet H2O	MW01 Feet H2O
4/29/2003		1:20:00	15600	260	-4.80	-0.44	0.06	-1.04	-0.44	-0.14	4.23		0.21	0.00	
4/29/2003		1:25:00	15900	265	-4.59	-0.44	0.07	-1.00	-0.35	-0.14	4.25		0.22	0.00	
4/29/2003		1:30:00	16200	270	-4.38	-0.43	0.07	-0.97	-0.27	-0.14	4.27		0.24	0.00	
4/29/2003		1:35:00	16500	275	-4.16	-0.42	0.08	-0.93	-0.18	-0.14	4.29		0.25	0.00	
4/29/2003		1:40:00	16800	280	-3.97	-0.41	0.08	-0.90	-0.09	-0.14	4.31		0.27	0.00	
4/29/2003		1:45:00	17100	285	-3.77	-0.40	0.08	-0.87	-0.01	-0.14	4.32		0.28	0.00	
4/29/2003		1:50:00	17400	290	-3.54	-0.40	0.09	-0.84	0.09	-0.13	4.34		0.30	0.00	
4/29/2003		1:55:00	17700	295	-3.37	-0.39	0.09	-0.82	0.18	-0.13	4.35		0.31	0.00	
4/29/2003		2:00:00	18000	300	-3.17	-0.38	0.09	-0.79	0.27	-0.13	4.36		0.33	0.00	
4/29/2003		2:05:00	18300	305	-2.98	-0.38	0.09	-0.76	0.37	-0.13	4.38		0.34	0.00	
4/29/2003		2:10:00	18600	310	-2.84	-0.37	0.09	-0.74	0.46	-0.13	4.39		0.36	0.00	
4/29/2003		2:15:00	18900	315	-2.62	-0.36	0.10	-0.71	0.55	-0.12	4.40		0.38	0.00	
4/29/2003		2:20:00	19200	320	-2.44	-0.36	0.10	-0.69	0.63	-0.12	4.41		0.39	0.00	
4/29/2003		2:25:00	19500	325	-2.30	-0.35	0.10	-0.67	0.71	-0.12	4.42		0.41	0.00	
4/29/2003		2:30:00	19800	330	-2.11	-0.34	0.11	-0.64	0.78	-0.12	4.43		0.42	0.00	
4/29/2003		2:35:00	20100	335	-1.97	-0.33	0.11	-0.62	0.84	-0.11	4.44		0.43	0.00	
4/29/2003		2:40:00	20400	340	-1.80	-0.33	0.12	-0.60	0.90	-0.11	4.45		0.45	0.00	
4/29/2003		2:45:00	20700	345	-1.61	-0.32	0.12	-0.58	0.96	-0.11	4.46		0.46	0.00	
4/29/2003		2:50:00	21000	350	-1.44	-0.31	0.12	-0.56	1.02	-0.11	4.47		0.48	0.00	
4/29/2003		2:55:00	21300	355	-1.27	-0.31	0.12	-0.54	1.08	-0.10	4.47		0.49	0.00	
4/29/2003		3:00:00	21600	360	-1.13	-0.30	0.13	-0.52	1.13	-0.10	4.48		0.51	0.00	
4/29/2003		3:05:00	21900	365	-0.94	-0.29	0.13	-0.49	1.18	-0.09	4.49		0.52	0.00	
4/29/2003		3:10:00	22200	370	-0.81	-0.29	0.13	-0.48	1.23	-0.09	4.50		0.53	0.00	
4/29/2003		3:15:00	22500	375	-0.65	-0.28	0.14	-0.46	1.29	-0.09	4.50		0.55	0.00	
4/29/2003		3:20:00	22800	380	-0.51	-0.27	0.14	-0.44	1.34	-0.08	4.51		0.56	0.00	
4/29/2003		3:25:00	23100	385	-0.36	-0.27	0.14	-0.42	1.39	-0.08	4.51		0.58	0.00	
4/29/2003		3:30:00	23400	390	-0.26	-0.26	0.15	-0.41	1.44	-0.08	**4.52**		0.59	0.00	
4/29/2003		3:35:00	23700	395	-0.11	-0.26	0.15	-0.39	1.49	-0.07	4.52		0.61	0.00	
4/29/2003		3:40:00	24000	400	-0.04	-0.25	0.15	-0.38	1.53	-0.07	4.52		0.62	0.00	
4/29/2003		3:45:00	24300	405	0.09	-0.24	0.16	-0.36	1.57	-0.06	4.52		0.63	0.00	
4/29/2003		3:50:00	24600	410	0.16	-0.24	0.16	-0.34	1.61	-0.06	4.51		0.65	0.00	
4/29/2003		3:55:00	24900	415	0.23	-0.23	0.16	-0.33	1.65	-0.06	4.51		0.66	0.00	
4/29/2003		4:00:00	25200	420	0.36	-0.23	0.17	-0.31	1.69	-0.05	4.50		0.68	0.00	
4/29/2003		4:05:00	25500	425	0.36	-0.22	0.17	-0.30	1.72	-0.05	4.50		0.69	0.00	
4/29/2003		4:10:00	25800	430	0.44	-0.21	0.17	-0.28	1.75	-0.04	4.49		0.70	0.00	
4/29/2003		4:15:00	26100	435	0.48	-0.21	0.17	-0.27	1.79	-0.04	4.48		0.71	0.00	
4/29/2003		4:20:00	26400	440	0.50	-0.20	0.18	-0.26	1.82	-0.03	4.46		0.73	0.00	
4/29/2003		4:25:00	26700	445	0.60	-0.20	0.18	-0.24	1.85	-0.03	4.44		0.74	0.00	
4/29/2003		4:30:00	27000	450	0.60	-0.19	0.18	-0.23	1.88	-0.03	4.41		0.76	0.00	
4/29/2003		4:35:00	27300	455	0.66	-0.19	0.19	-0.22	1.91	-0.02	4.38		0.77	0.00	
4/29/2003		4:40:00	27600	460	**0.68**	-0.18	0.19	-0.20	1.94	-0.02	4.33		0.78	0.00	
4/29/2003		4:45:00	27900	465	0.62	-0.17	0.19	-0.19	1.97	-0.01	4.28		0.79	0.00	
4/29/2003		4:50:00	28200	470	0.65	-0.17	0.19	-0.18	1.99	-0.01	4.21		0.81	0.00	
4/29/2003		4:55:00	28500	475	0.63	-0.16	0.20	-0.17	2.02	0.00	4.12		0.82	0.00	
4/29/2003		5:00:00	28800	480	0.60	-0.16	0.20	-0.16	2.05	0.00	4.01		0.83	0.00	
4/29/2003	**5:04**	5:05:00	29100	485	0.61	-0.15	0.20	-0.15	2.07	0.01	3.90		0.85	0.00	
4/29/2003		5:10:00	29400	490	0.55	-0.15	0.21	-0.14	2.09	0.01	3.78		0.86	0.00	
4/29/2003		5:15:00	29700	495	0.55	-0.14	0.21	-0.13	2.12	0.02	3.64		0.87	0.00	
4/29/2003		5:20:00	30000	500	0.50	-0.13	0.21	-0.12	2.14	0.02	3.51		0.88	0.00	
4/29/2003		5:25:00	30300	505	0.48	-0.13	0.21	-0.11	2.16	0.03	3.36		0.88	0.00	
4/29/2003		5:30:00	30600	510	0.39	-0.13	0.22	-0.10	2.18	0.03	3.22		**0.89**	0.00	
4/29/2003		5:35:00	30900	515	0.36	-0.12	0.22	-0.09	2.21	0.04	3.08		0.89	0.00	

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Date	Seavey Is. Low Tide	Time	ET (sec)	ET (min)	Stilling Well Feet H2O	FA01 Feet H2O	MW02 Feet H2O	MW03 Feet H2O	MW04 Feet H2O	MW05 Feet H2O	MW07 Feet H2O	MW08 Feet H2O	MW10 Feet H2O	MW09 Feet H2O	MW01 Feet H2O
4/29/2003		5:40:00	31200	520	0.28	-0.12	0.22	-0.08	2.23	0.04	2.94		0.89	0.00	
4/29/2003		5:45:00	31500	525	0.25	-0.11	0.23	-0.07	2.25	0.04	2.80		0.89	0.00	
4/29/2003		5:50:00	31800	530	0.15	-0.10	0.23	-0.06	2.27	0.05	2.66		0.88	0.00	
4/29/2003		5:55:00	32100	535	0.08	-0.10	0.23	-0.05	2.29	0.05	2.51		0.87	0.00	
4/29/2003		6:00:00	32400	540	-0.05	-0.10	0.24	-0.04	2.31	0.06	2.36		0.87	0.01	
4/29/2003		6:05:00	32700	545	-0.17	-0.09	0.24	-0.04	2.33	0.06	2.21		0.86	0.00	
4/29/2003		6:10:00	33000	550	-0.26	-0.09	0.24	-0.03	2.35	0.06	2.07		0.85	0.00	
4/29/2003		6:15:00	33300	555	-0.39	-0.08	0.24	-0.02	2.37	0.07	1.93		0.83	0.00	
4/29/2003		6:20:00	33600	560	-0.49	-0.07	0.25	-0.01	2.38	0.07	1.79		0.82	0.00	
4/29/2003		6:25:00	33900	565	-0.61	-0.07	0.25	0.00	2.40	0.07	1.65		0.81	0.00	
4/29/2003		6:30:00	34200	570	-0.75	-0.07	0.25	0.01	2.42	0.08	1.51		0.79	0.00	
4/29/2003		6:35:00	34500	575	-0.87	-0.06	0.25	0.02	2.43	0.08	1.38		0.78	0.00	
4/29/2003		6:40:00	34800	580	-0.99	-0.06	0.26	0.03	2.45	0.08	1.26		0.76	0.00	
4/29/2003		6:45:00	35100	585	-1.16	-0.05	0.26	0.04	2.46	0.08	1.13		0.75	0.00	
4/29/2003		6:50:00	35400	590	-1.24	-0.05	0.26	0.04	2.48	0.08	1.01		0.73	0.00	
4/29/2003		6:55:00	35700	595	-1.38	-0.04	0.26	0.05	2.49	0.08	0.90		0.71	0.00	
4/29/2003		7:00:00	36000	600	-1.53	-0.04	**0.27**	0.06	2.50	**0.09**	0.78		0.69	0.00	
4/29/2003		7:05:00	36300	605	-1.67	-0.03	0.27	0.07	2.51	0.09	0.68		0.68	0.00	
4/29/2003		7:10:00	36600	610	-1.82	-0.03	0.27	0.08	2.52	0.09	0.57		0.66	0.00	
4/29/2003		7:15:00	36900	615	-1.95	-0.02	0.27	0.09	**2.53**	0.09	0.49		0.64	0.00	
4/29/2003		7:20:00	37200	620	-2.15	-0.02	0.26	0.10	2.53	0.09	0.40		0.62	0.00	
4/29/2003		7:25:00	37500	625	-2.29	-0.01	0.26	0.10	2.52	0.09	0.32		0.60	0.00	
4/29/2003		7:30:00	37800	630	-2.44	-0.01	0.26	0.11	2.50	0.09	0.25		0.58	0.01	
4/29/2003		7:35:00	38100	635	-2.64	0.00	0.26	0.12	2.45	0.09	0.18		0.56	0.00	
4/29/2003		7:40:00	38400	640	-2.77	0.00	0.25	0.13	2.38	0.09	0.13		0.54	0.00	
4/29/2003		7:45:00	38700	645	-2.96	0.00	0.25	0.13	2.29	0.09	0.07		0.52	0.00	
4/29/2003		7:50:00	39000	650	-3.15	0.01	0.24	0.14	2.19	0.09	0.01		0.50	0.00	
4/29/2003		7:55:00	39300	655	-3.32	0.01	0.24	0.15	2.07	0.09	-0.04		0.47	0.00	
4/29/2003		8:00:00	39600	660	-3.52	0.02	0.23	0.16	1.94	0.09	-0.08		0.45	0.00	
4/29/2003		8:05:00	39900	665	-3.69	0.02	0.23	0.16	1.81	0.08	-0.11		0.43	0.01	
4/29/2003		8:10:00	40200	670	-3.88	0.02	0.22	0.17	1.68	0.08	-0.14		0.41	0.00	
4/29/2003		8:15:00	40500	675	-4.03	0.03	0.21	0.18	1.56	0.08	-0.15		0.39	0.00	
4/29/2003		8:20:00	40800	680	-4.20	0.03	0.20	0.18	1.44	0.08	-0.16		0.36	0.00	
4/29/2003		8:25:00	41100	685	-4.41	0.04	0.19	0.19	1.32	0.07	-0.16		0.34	0.00	
4/29/2003		8:30:00	41400	690	-4.54	0.04	0.18	0.19	1.21	0.07	-0.16		0.32	0.00	
4/29/2003		8:35:00	41700	695	-4.76	0.04	0.17	0.19	1.09	0.07	-0.14		0.30	0.00	
4/29/2003		8:40:00	42000	700	-4.89	**0.05**	0.17	**0.20**	0.98	0.07	-0.12		0.27	0.00	
4/29/2003		8:45:00	42300	705	-5.07	0.05	0.16	0.20	0.89	0.06	-0.09		0.25	0.00	
4/29/2003		8:50:00	42600	710	-5.23	0.05	0.15	0.19	0.80	0.06	-0.04		0.23	0.00	
4/29/2003		8:55:00	42900	715	-5.41	0.05	0.14	0.18	0.71	0.05	-0.01		0.21	0.00	
4/29/2003		9:00:00	43200	720	-5.54	0.05	0.13	0.17	0.62	0.05	0.05		0.19	0.00	
4/29/2003		9:05:00	43500	725	-5.70	0.04	0.10	0.16	0.53	0.04	0.12		0.17	0.00	
4/29/2003		9:10:00	43800	730	-5.84	0.04	0.09	0.14	0.45	0.04	0.18		0.15	0.00	
4/29/2003		9:15:00	44100	735	-5.98	0.03	0.08	0.11	0.36	0.03	0.25		0.12	0.00	
4/29/2003		9:20:00	44400	740	-6.07	0.03	0.07	0.09	0.28	0.03	0.32		0.10	0.00	
4/29/2003		9:25:00	44700	745	-6.24	0.02	0.06	0.06	0.20	0.02	0.39		0.09	0.00	
4/29/2003		9:30:00	45000	750	-6.32	0.02	0.05	0.03	0.12	0.02	0.48		0.07	0.00	
4/29/2003		9:35:00	45300	755	-6.46	0.01	0.04	0.00	0.04	0.01	0.56		0.05	0.00	
4/29/2003		9:40:00	45600	760	-6.55	0.00	0.03	-0.04	-0.05	0.01	0.66		0.03	0.00	
4/29/2003		9:45:00	45900	765	-6.69	-0.01	0.03	-0.07	-0.14	0.00	0.75		0.01	0.00	
4/29/2003		9:50:00	46200	770	-6.75	-0.01	0.01	-0.11	-0.23	-0.01	0.86		-0.01	0.00	
4/29/2003		9:55:00	46500	775	-6.85	-0.02	0.01	-0.15	-0.30	-0.01	0.96		-0.02	0.00	

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Date	Seavey Is. Low Tide	Time	ET (sec)	ET (min)	Stilling Well Feet H2O	FA01 Feet H2O	MW02 Feet H2O	MW03 Feet H2O	MW04 Feet H2O	MW05 Feet H2O	MW07 Feet H2O	MW08 Feet H2O	MW10 Feet H2O	MW09 Feet H2O	MW01 Feet H2O
4/29/2003		10:00:00	46800	780	-6.95	-0.03	0.00	-0.18	-0.38	-0.02	1.07		-0.03	0.00	
4/29/2003		10:05:00	47100	785	-7.04	-0.04	-0.01	-0.23	-0.46	-0.03	1.19		-0.05	0.00	
4/29/2003		10:10:00	47400	790	-7.11	-0.05	-0.01	-0.27	-0.56	-0.03	1.30		-0.06	0.00	
4/29/2003		10:15:00	47700	795	-7.21	-0.06	-0.02	-0.32	-0.68	-0.04	1.41		-0.07	0.00	
4/29/2003		10:20:00	48000	800	-7.28	-0.07	-0.03	-0.37	-0.82	-0.05	1.52		-0.08	0.03	
4/29/2003		10:25:00	48300	805	-7.31	-0.08	-0.03	-0.43	-0.99	-0.05	1.64		-0.09	0.03	
4/29/2003		10:30:00	48600	810	-7.38	-0.09	-0.04	-0.49	-1.15	-0.06	1.76		-0.10	0.03	
4/29/2003		10:35:00	48900	815	-7.39	-0.10	-0.04	-0.55	-1.27	-0.06	1.87		-0.10	0.03	
4/29/2003		10:40:00	49200	820	-7.48	-0.11	-0.05	-0.60	-1.44	-0.07	1.99		-0.10	0.04	
4/29/2003		10:45:00	49500	825	-7.51	-0.12	-0.05	-0.66	-1.55	-0.08	2.10		-0.10	0.04	
4/29/2003		10:50:00	49800	830	-7.57	-0.14	-0.05	-0.73	-1.62	-0.08	2.21		-0.09	0.03	
4/29/2003		10:55:00	50100	835	-7.55	-0.15	-0.05	-0.78	-1.66	-0.09	2.32		-0.09	0.04	
4/29/2003		11:00:00	50400	840	-7.58	-0.16	-0.06	-0.84	-1.70	-0.09	2.42		-0.08	0.04	
4/29/2003		11:05:00	50700	845	-7.59	-0.17	-0.05	-0.90	-1.73	-0.10	2.53		-0.07	0.03	
4/29/2003		11:10:00	51000	850	-7.59	-0.18	-0.04	-0.95	-1.76	-0.11	2.63		-0.07	0.03	
4/29/2003		11:15:00	51300	855	-7.57	-0.19	-0.03	-1.01	-1.76	-0.11	2.72		-0.06	0.04	
4/29/2003		11:20:00	51600	860	-7.54	-0.21	-0.02	-1.06	-1.75	-0.11	2.82		-0.05	0.04	
4/29/2003		11:25:00	51900	865	-7.56	-0.22	-0.01	-1.10	-1.76	-0.12	2.90		-0.04	0.04	
4/29/2003		11:30:00	52200	870	-7.50	-0.23	0.00	-1.15	-1.75	-0.12	2.99		-0.03	0.04	
4/29/2003		11:35:00	52500	875	-7.45	-0.24	0.01	-1.18	-1.70	-0.13	3.07		-0.02	0.03	
4/29/2003		11:40:00	52800	880	-7.43	-0.25	0.02	-1.22	-1.70	-0.13	3.16		-0.01	0.04	
4/29/2003		11:45:00	53100	885	-7.34	-0.26	0.03	-1.24	-1.61	-0.14	3.23		0.01	0.04	
4/29/2003		11:50:00	53400	890	-7.29	-0.27	0.03	-1.27	-1.51	-0.14	3.31		0.02	0.03	
4/29/2003		11:55:00	53700	895	-7.25	-0.28	0.04	-1.28	-1.42	-0.14	3.39		0.03	0.03	
4/29/2003		12:00:00	54000	900	-7.14	-0.29	0.05	-1.29	-1.27	-0.15	3.46	0.00	0.04	0.04	
4/29/2003		12:05:00	54300	905	-7.06	-0.30	0.06	-1.30	-1.15	-0.15	3.52	-0.03	0.06	0.04	
4/29/2003		12:10:00	54600	910	-7.00	-0.31	0.06	-1.30	-1.12	-0.16	3.59	-0.06	0.07	0.03	
4/29/2003		12:15:00	54900	915	-6.91	-0.32	0.07	-1.29	-1.10	-0.16	3.65	-0.08	0.08	0.03	
4/29/2003		12:20:00	55200	920	-6.83	-0.33	0.08	-1.29	-1.08	-0.16	3.71	-0.11	0.09	0.04	
4/29/2003		12:25:00	55500	925	-6.75	-0.34	0.08	-1.28	-1.06	-0.16	3.77	-0.13	0.11	0.03	
4/29/2003		12:30:00	55800	930	-6.64	-0.34	0.09	-1.26	-1.04	-0.17	3.82	-0.14	0.12	0.03	
4/29/2003		12:35:00	56100	935	-6.55	-0.35	0.10	-1.24	-1.01	-0.17	3.87	-0.16	0.14	0.03	
4/29/2003		12:40:00	56400	940	-6.43	-0.36	0.10	-1.22	-0.98	-0.17	3.92	-0.17	0.15	0.03	
4/29/2003		12:45:00	56700	945	-6.34	-0.36	0.11	-1.20	-0.95	-0.17	3.96	-0.17	0.16	0.03	
4/29/2003		12:50:00	57000	950	-6.19	-0.37	0.11	-1.18	-0.91	-0.18	4.00	-0.18	0.18	0.03	
4/29/2003		12:55:00	57300	955	-6.12	-0.37	0.12	-1.15	-0.88	-0.18	4.04	-0.17	0.19	0.03	
4/29/2003		13:00:00	57600	960	-5.93	-0.37	0.12	-1.13	-0.82	-0.18	4.07	-0.16	0.21	0.04	0.00
4/29/2003		13:05:00	57900	965	-5.79	-0.38	0.13	-1.10	-0.74	-0.18	4.11	-0.13	0.22	0.03	-0.43
4/29/2003		13:10:00	58200	970	-5.68	-0.38	0.13	-1.07	-0.68	-0.18	4.14	-0.11	0.23	0.03	-0.82
4/29/2003		13:15:00	58500	975	-5.54	-0.38	0.13	-1.04	-0.62	-0.18	4.17	-0.08	0.25	0.03	-1.19
4/29/2003		13:20:00	58800	980	-5.36	-0.38	0.14	-1.01	-0.56	-0.18	4.19	-0.04	0.27	0.04	-1.48
4/29/2003		13:25:00	59100	985	-5.14	-0.37	0.14	-0.98	-0.48	-0.18	4.22	-0.01	0.28	0.03	-1.73
4/29/2003		13:30:00	59400	990	-5.01	-0.37	0.15	-0.95	-0.41	-0.18	4.24	0.03	0.29	0.03	-1.99
4/29/2003		13:35:00	59700	995	-4.80	-0.36	0.15	-0.92	-0.33	-0.18	4.26	0.07	0.31	0.03	-2.21
4/29/2003		13:40:00	60000	1000	-4.60	-0.36	0.15	-0.88	-0.25	-0.18	4.28	0.11	0.32	0.04	-2.42
4/29/2003		13:45:00	60300	1005	-4.46	-0.35	0.16	-0.85	-0.18	-0.18	4.30	0.15	0.34	0.03	-2.60
4/29/2003		13:50:00	60600	1010	-4.23	-0.34	0.16	-0.82	-0.10	-0.18	4.32	0.19	0.35	0.04	-2.80
4/29/2003		13:55:00	60900	1015	-4.01	-0.33	0.16	-0.80	-0.01	-0.18	4.34	0.24	0.37	0.04	-3.15
4/29/2003		14:00:00	61200	1020	-3.81	-0.33	0.17	-0.77	0.08	-0.18	4.35	0.28	0.38	0.04	-3.46
4/29/2003		14:05:00	61500	1025	-3.62	-0.32	0.17	-0.75	0.17	-0.18	4.37	0.33	0.40	0.04	-3.68
4/29/2003		14:10:00	61800	1030	-3.49	-0.31	0.18	-0.72	0.26	-0.18	4.38	0.38	0.41	0.04	-3.82
4/29/2003		14:15:00	62100	1035	-3.31	-0.31	0.18	-0.69	0.34	-0.18	4.39	0.43	0.43	0.04	-3.93

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Date	Seavey Is. Low Tide	Time	ET (sec)	ET (min)	Stilling Well Feet H2O	FA01 Feet H2O	MW02 Feet H2O	MW03 Feet H2O	MW04 Feet H2O	MW05 Feet H2O	MW07 Feet H2O	MW08 Feet H2O	MW10 Feet H2O	MW09 Feet H2O	MW01 Feet H2O
4/29/2003		14:20:00	62400	1040	-3.12	-0.30	0.18	-0.67	0.42	-0.18	4.41	0.48	0.44	0.03	-4.00
4/29/2003		14:25:00	62700	1045	-2.95	-0.29	0.19	-0.65	0.51	-0.17	4.42	0.53	0.45	0.03	-4.05
4/29/2003		14:30:00	63000	1050	-2.75	-0.29	0.19	-0.62	0.59	-0.18	4.43	0.58	0.47	0.04	-4.09
4/29/2003		14:35:00	63300	1055	-2.57	-0.28	0.20	-0.60	0.68	-0.17	4.44	0.64	0.48	0.04	-4.12
4/29/2003		14:40:00	63600	1060	-2.40	-0.27	0.20	-0.58	0.76	-0.17	4.45	0.69	0.50	0.04	-4.14
4/29/2003		14:45:00	63900	1065	-2.25	-0.27	0.20	-0.55	0.84	-0.17	4.46	0.75	0.51	0.03	-4.15
4/29/2003		14:50:00	64200	1070	-2.09	-0.26	0.21	-0.53	0.91	-0.17	4.47	0.81	0.53	0.04	-4.16
4/29/2003		14:55:00	64500	1075	-1.96	-0.25	0.21	-0.51	0.98	-0.16	4.48	0.87	0.54	0.03	-4.16
4/29/2003		15:00:00	64800	1080	-1.77	-0.25	0.22	-0.49	1.04	-0.16	4.49	0.92	0.55	0.03	-4.17
4/29/2003		15:05:00	65100	1085	-1.57	-0.24	0.22	-0.47	1.10	-0.16	4.50	0.97	0.57	0.04	-4.17
4/29/2003		15:10:00	65400	1090	-1.42	-0.24	0.22	-0.45	1.16	-0.16	4.50	1.03	0.58	0.04	-4.18
4/29/2003		15:15:00	65700	1095	-1.27	-0.23	0.22	-0.43	1.22	-0.15	4.51	1.08	0.60	0.04	-4.18
4/29/2003		15:20:00	66000	1100	-1.16	-0.22	0.23	-0.42	1.28	-0.15	4.52	1.13	0.61	0.03	-4.18
4/29/2003		15:25:00	66300	1105	-1.02	-0.22	0.23	-0.40	1.34	-0.15	4.52	1.18	0.62	0.04	-4.18
4/29/2003		15:30:00	66600	1110	-0.84	-0.21	0.24	-0.39	1.39	-0.15	4.53	1.23	0.64	0.04	-4.18
4/29/2003		15:35:00	66900	1115	-0.77	-0.21	0.24	-0.37	1.45	-0.14	4.53	1.28	0.65	0.03	-4.18
4/29/2003		15:40:00	67200	1120	-0.58	-0.20	0.24	-0.35	1.50	-0.14	4.53	1.32	0.67	0.04	-4.18
4/29/2003		15:45:00	67500	1125	-0.47	-0.19	0.25	-0.33	1.54	-0.14	**4.54**	1.37	0.68	0.04	-4.18
4/29/2003		15:50:00	67800	1130	-0.42	-0.19	0.25	-0.32	1.59	-0.13	4.54	1.42	0.70	0.04	-4.18
4/29/2003		15:55:00	68100	1135	-0.22	-0.18	0.25	-0.30	1.63	-0.13	4.53	1.46	0.71	0.04	-4.18
4/29/2003		16:00:00	68400	1140	-0.13	-0.18	0.26	-0.29	1.67	-0.13	4.53	1.50	0.72	0.03	-4.18
4/29/2003		16:05:00	68700	1145	-0.03	-0.17	0.26	-0.27	1.71	-0.12	4.52	1.55	0.74	0.04	-4.18
4/29/2003		16:10:00	69000	1150	0.03	-0.16	0.26	-0.26	1.74	-0.12	4.52	1.59	0.75	0.04	-4.17
4/29/2003		16:15:00	69300	1155	0.16	-0.16	0.27	-0.25	1.78	-0.12	4.50	1.63	0.76	0.04	-4.18
4/29/2003		16:20:00	69600	1160	0.18	-0.16	0.27	-0.23	1.81	-0.11	4.49	1.67	0.78	0.04	-4.18
4/29/2003		16:25:00	69900	1165	0.18	-0.15	0.28	-0.22	1.84	-0.11	4.47	1.72	0.79	0.04	-4.18
4/29/2003		16:30:00	70200	1170	0.28	-0.14	0.28	-0.21	1.87	-0.10	4.44	1.76	0.80	0.03	-4.18
4/29/2003		16:35:00	70500	1175	0.34	-0.14	0.28	-0.20	1.90	-0.10	4.41	1.79	0.82	0.04	-4.18
4/29/2003		16:40:00	70800	1180	0.34	-0.13	0.28	-0.18	1.93	-0.10	4.38	1.83	0.83	0.04	-4.18
4/29/2003		16:45:00	71100	1185	0.34	-0.13	0.29	-0.17	1.96	-0.09	4.32	1.87	0.84	0.04	-4.18
4/29/2003		16:50:00	71400	1190	0.42	-0.12	0.29	-0.16	1.99	-0.09	4.26	1.90	0.85	0.04	-4.18
4/29/2003		16:55:00	71700	1195	**0.46**	-0.12	0.29	-0.15	2.02	-0.09	4.18	1.94	0.87	0.04	-4.18
4/29/2003		17:00:00	72000	1200	0.39	-0.11	0.30	-0.14	2.05	-0.08	4.08	1.97	0.88	0.04	-4.18
4/29/2003		17:05:00	72300	1205	0.38	-0.11	0.30	-0.13	2.07	-0.08	3.97	2.00	0.89	0.04	-4.18
4/29/2003		17:10:00	72600	1210	0.39	-0.10	0.30	-0.12	2.10	-0.07	3.85	2.03	0.90	0.04	-4.18
4/29/2003		17:15:00	72900	1215	0.33	-0.10	0.31	-0.11	2.12	-0.07	3.73	2.05	0.91	0.04	-4.18
4/29/2003	5:19 PM	17:20:00	73200	1220	0.39	-0.09	0.31	-0.10	2.15	-0.06	3.59	2.08	0.92	0.04	-4.18
4/29/2003		17:25:00	73500	1225	0.32	-0.09	0.31	-0.09	2.17	-0.06	3.45	2.09	0.93	0.04	-4.18
4/29/2003		17:30:00	73800	1230	0.23	-0.08	0.32	-0.08	2.19	-0.05	3.30	2.11	**0.94**	0.04	-4.18
4/29/2003		17:35:00	74100	1235	0.23	-0.08	0.32	-0.07	2.21	-0.05	3.16	2.14	0.94	0.04	-4.18
4/29/2003		17:40:00	74400	1240	0.07	-0.07	0.32	-0.06	2.23	-0.04	3.02	2.17	0.94	0.04	-4.18
4/29/2003		17:45:00	74700	1245	0.10	-0.07	0.33	-0.05	2.26	-0.04	2.87	2.21	0.94	0.04	-4.18
4/29/2003		17:50:00	75000	1250	-0.08	-0.06	0.33	-0.04	2.28	-0.04	2.73	2.24	0.93	0.04	-4.18
4/29/2003		17:55:00	75300	1255	-0.02	-0.06	0.33	-0.03	2.30	-0.03	2.58	2.26	0.92	0.04	-4.18
4/29/2003		18:00:00	75600	1260	-0.14	-0.05	0.34	-0.02	2.32	-0.02	2.42	2.30	0.92	0.04	-4.18
4/29/2003		18:05:00	75900	1265	-0.14	-0.05	0.34	-0.01	2.34	-0.02	2.26	2.32	0.91	0.04	-4.18
4/29/2003		18:10:00	76200	1270	-0.25	-0.04	0.34	0.00	2.36	-0.02	2.11	2.35	0.89	0.04	-4.18
4/29/2003		18:15:00	76500	1275	-0.39	-0.04	0.35	0.01	2.38	-0.01	1.95	2.37	0.88	0.04	-4.17
4/29/2003		18:20:00	76800	1280	-0.50	-0.03	0.35	0.02	2.39	-0.01	1.79	2.39	0.87	0.04	-4.17
4/29/2003		18:25:00	77100	1285	-0.55	-0.03	0.35	0.03	2.41	0.00	1.63	2.41	0.86	0.04	-4.17
4/29/2003		18:30:00	77400	1290	-0.70	-0.03	0.35	0.04	2.43	0.00	1.47	2.43	0.84	0.04	-4.17
4/29/2003		18:35:00	77700	1295	-0.79	-0.02	0.36	0.05	2.44	0.01	1.32	2.45	0.83	0.04	-4.17

PNS SITE 32 TIDAL STUDY DATA - APRIL 2003

Date	Seavey Is. Low Tide	Time	ET (sec)	ET (min)	Stilling Well Feet H2O	FA01 Feet H2O	MW02 Feet H2O	MW03 Feet H2O	MW04 Feet H2O	MW05 Feet H2O	MW07 Feet H2O	MW08 Feet H2O	MW10 Feet H2O	MW09 Feet H2O	MW01 Feet H2O
4/29/2003		18:40:00	78000	1300	-0.90	-0.02	0.36	0.06	2.46	0.01	1.18	2.46	0.81	0.04	-4.17
4/29/2003		18:45:00	78300	1305	-1.08	-0.01	0.36	0.06	2.47	0.01	1.03	2.48	0.80	0.04	-4.17
4/29/2003		18:50:00	78600	1310	-1.15	-0.01	**0.37**	0.07	2.49	0.02	0.89	2.49	0.78	0.04	-4.17
4/29/2003		18:55:00	78900	1315	-1.34	0.00	0.37	0.08	2.50	0.02	0.76	2.50	0.76	0.04	-4.17
4/29/2003		19:00:00	79200	1320	-1.48	0.00	0.37	0.09	2.52	0.03	0.63	2.52	0.74	0.04	-4.17
4/29/2003		19:05:00	79500	1325	-1.54	0.01	0.37	0.10	2.53	0.03	0.52	2.53	0.72	0.04	-4.17
4/29/2003		19:10:00	79800	1330	-1.78	0.01	0.37	0.11	2.54	0.03	0.40	2.54	0.70	0.04	-4.17
4/29/2003		19:15:00	80100	1335	-1.88	0.01	0.37	0.12	**2.55**	0.03	0.30	2.56	0.68	0.04	-4.17
4/29/2003		19:20:00	80400	1340	-2.03	0.02	0.36	0.12	2.55	0.04	0.20	2.58	0.66	0.04	-4.17
4/29/2003		19:25:00	80700	1345	-2.25	0.02	0.36	0.13	2.55	0.04	0.12	2.59	0.64	0.04	-4.17
4/29/2003		19:30:00	81000	1350	-2.34	0.03	0.36	0.14	2.53	0.04	0.03	2.61	0.62	0.04	-4.17
4/29/2003		19:35:00	81300	1355	-2.56	0.03	0.35	0.15	2.50	0.04	-0.05	2.62	0.60	0.04	-4.17
4/29/2003		19:40:00	81600	1360	-2.73	0.03	0.35	0.16	2.43	**0.05**	-0.13	2.64	0.58	0.04	-4.17
4/29/2003		19:45:00	81900	1365	-2.89	0.04	0.34	0.16	2.35	0.05	-0.20	2.65	0.55	0.04	-4.17
4/29/2003		19:50:00	82200	1370	-3.04	0.04	0.33	0.17	2.26	0.05	-0.26	**2.66**	0.53	0.04	-4.17
4/29/2003		19:55:00	82500	1375	-3.24	0.05	0.33	0.18	2.15	0.05	-0.32	2.66	0.51	0.04	-4.17
4/29/2003		20:00:00	82800	1380	-3.43	0.05	0.32	0.18	2.01	0.05	-0.36	2.66	0.49	0.04	-4.17
4/29/2003		20:05:00	83100	1385	-3.57	0.06	0.30	0.19	1.89	0.05	-0.42	2.65	0.46	0.04	-4.17
4/29/2003		20:10:00	83400	1390	-3.77	0.06	0.29	0.20	1.77	0.05	-0.46	2.63	0.44	0.04	-4.17
4/29/2003		20:15:00	83700	1395	-3.96	0.06	0.29	0.20	1.63	0.05	-0.51	2.61	0.42	0.04	-4.16
4/29/2003		20:20:00	84000	1400	-4.14	0.07	0.28	0.21	1.51	0.05	-0.54	2.58	0.39	0.04	-4.16
4/29/2003		20:25:00	84300	1405	-4.34	0.07	0.27	0.22	1.39	0.05	-0.57	2.55	0.37	0.04	-4.16
4/29/2003		20:30:00	84600	1410	-4.50	0.07	0.26	0.22	1.27	0.05	-0.58	2.51	0.34	0.04	-4.16
4/29/2003		20:35:00	84900	1415	-4.69	**0.08**	0.25	0.22	1.16	0.05	-0.59	2.46	0.32	0.04	-4.16
4/29/2003		20:40:00	85200	1420	-4.87	0.08	0.24	0.22	1.04	0.05	-0.60	2.40	0.30	0.04	-4.16
4/29/2003		20:45:00	85500	1425	-5.04	0.08	0.23	**0.23**	0.94	0.05	-0.58	2.35	0.27	0.04	-4.16
4/29/2003		20:50:00	85800	1430	-5.22	0.08	0.20	0.22	0.84	0.05	-0.58	2.28	0.25	0.04	-4.16
4/29/2003		20:55:00	86100	1435	-5.38	0.08	0.19	0.21	0.75	0.05	-0.57	2.20	0.23	0.04	-4.16
4/29/2003		21:00:00	86400	1440	-5.57	0.08	0.18	0.20	0.66	0.05	-0.52	2.11	0.20	0.04	-4.16
4/29/2003		21:05:00	86700	1445	-5.72	0.07	0.17	0.19	0.56	0.05	-0.48	1.95	0.17	0.04	-4.16
4/29/2003		21:10:00	87000	1450	-5.88	0.07	0.16	0.17	0.48	0.04	-0.44	1.87	0.15	0.05	-4.16
4/29/2003		21:15:00	87300	1455	-6.05	0.07	0.15	0.14	0.38	0.04	-0.39	1.80	0.13	0.05	-4.16
4/29/2003		21:20:00	87600	1460	-6.19	0.06	0.14	0.11	0.30	0.04	-0.33	1.73	0.11	0.04	-4.16
4/29/2003		21:25:00	87900	1465	-6.36	0.05	0.13	0.08	0.21	0.04	-0.28	1.67	0.08	0.04	-4.16
4/29/2003		21:30:00	88200	1470	-6.49	0.05	0.11	0.05	0.12	0.03	-0.19	1.61	0.06	0.04	-4.16
4/29/2003		21:35:00	88500	1475	-6.59	0.04	0.10	0.01	0.04	0.03	-0.09	1.55	0.04	0.05	-4.16
4/29/2003		21:40:00	88800	1480	-6.73	0.03	0.09	-0.02	-0.06	0.03	-0.02	1.49	0.02	0.04	-4.16
4/29/2003		21:45:00	89100	1485	-6.84	0.03	0.08	-0.07	-0.16	0.02	0.07	1.43	0.00	0.05	-4.16
4/29/2003		21:50:00	89400	1490	-6.99	0.02	0.07	-0.11	-0.26	0.02	0.16	1.36	-0.02	0.04	-4.16
4/29/2003		21:55:00	89700	1495	-7.07	0.01	0.06	-0.15	-0.35	0.02	0.27	1.30	-0.04	0.04	-4.16
4/29/2003		22:00:00	90000	1500	-7.18	0.00	0.05	-0.20	-0.50	0.01	0.40	1.24	-0.06	0.05	-4.16
4/29/2003		22:05:00	90300	1505	-7.28	-0.01	0.05	-0.25	-0.67	0.01	0.49	1.18	-0.08	0.04	-4.16
4/29/2003		22:10:00	90600	1510	-7.39	-0.02	0.04	-0.30	-0.94	0.01	0.63	1.13	-0.10	0.05	-4.16
4/29/2003		22:15:00	90900	1515	-7.48	-0.04	0.03	-0.36	-1.22	0.00	0.74	1.07	-0.12	0.04	-4.15
4/29/2003		22:20:00	91200	1520	-7.53	-0.05	0.02	-0.43	-1.44	0.00	0.87	1.01	-0.13	0.04	-4.16
4/29/2003		22:25:00	91500	1525	-7.62	-0.06	0.01	-0.50	-1.56	-0.01	1.00	0.95	-0.15	0.04	-4.16
4/29/2003		22:30:00	91800	1530	-7.69	-0.07	0.01	-0.57	-1.68	-0.01	1.13	0.90	-0.16	0.04	-4.15
4/29/2003		22:35:00	92100	1535	-7.72	-0.08	0.00	-0.64	-1.75	-0.02	1.26	0.84	-0.17	0.04	-4.15
4/29/2003		22:40:00	92400	1540	-7.81	-0.10	-0.01	-0.71	-1.86	-0.02	1.39	0.78	-0.19	0.04	-4.15
4/29/2003		22:45:00	92700	1545	-7.84	-0.11	-0.01	-0.78	-1.91	-0.03	1.52	0.73	-0.19	0.04	-4.15
4/29/2003		22:50:00	93000	1550	-7.91	-0.12	-0.02	-0.86	-1.98	-0.03	1.65	0.67	-0.20	0.04	-4.15
4/29/2003		22:55:00	93300	1555	-7.88	-0.13	-0.02	-0.94	-2.01	-0.03	1.77	0.62	-0.20	0.04	-4.15

PNS SITE 32 TIDAL STUDY DATA - APRIL 2003

Date	Seavey Is. Low Tide	Time	ET (sec)	ET (min)	Stilling Well Feet H2O	FA01 Feet H2O	MW02 Feet H2O	MW03 Feet H2O	MW04 Feet H2O	MW05 Feet H2O	MW07 Feet H2O	MW08 Feet H2O	MW10 Feet H2O	MW09 Feet H2O	MW01 Feet H2O
4/29/2003		23:00:00	93600	1560	-7.95	-0.14	-0.03	-1.01	-2.05	-0.04	1.89	0.59	-0.20	0.04	-4.15
4/29/2003		23:05:00	93900	1565	-7.99	-0.16	-0.03	-1.08	-2.12	-0.04	2.01	0.54	-0.20	0.04	-4.15
4/29/2003		23:10:00	94200	1570	-8.01	-0.17	-0.04	-1.16	-2.13	-0.05	2.12	0.50	-0.19	0.04	-4.15
4/29/2003		23:15:00	94500	1575	-8.06	-0.18	-0.04	-1.23	-2.21	-0.06	2.24	0.44	-0.19	0.04	-4.15
4/29/2003		23:20:00	94800	1580	-8.03	-0.20	-0.04	-1.29	-2.21	-0.06	2.35	0.38	-0.18	0.04	-4.15
4/29/2003		23:25:00	95100	1585	-8.06	-0.21	-0.04	-1.35	-2.23	-0.06	2.46	0.33	-0.17	0.04	-4.15
4/29/2003		23:30:00	95400	1590	-8.00	-0.22	-0.04	-1.41	-2.22	-0.07	2.56	0.27	-0.17	0.04	-4.15
4/29/2003		23:35:00	95700	1595	-8.05	-0.24	-0.03	-1.46	-2.24	-0.07	2.66	0.22	-0.16	0.04	-4.15
4/29/2003		23:40:00	96000	1600	-7.98	-0.25	-0.02	-1.51	-2.23	-0.08	2.76	0.17	-0.15	0.05	-4.15
4/29/2003		23:45:00	96300	1605	-7.96	-0.26	-0.02	-1.55	-2.20	-0.08	2.86	0.11	-0.14	0.04	-4.15
4/29/2003		23:50:00	96600	1610	-7.97	-0.27	-0.01	-1.58	-2.23	-0.08	2.95	0.07	-0.13	0.04	-4.15
4/29/2003		23:55:00	96900	1615	-7.88	-0.29	0.01	-1.61	-2.18	-0.08	3.04	0.02	-0.11	0.04	-4.15
4/30/2003		0:00:00	97200	1620	-7.79	-0.30	0.02	-1.63	-2.12	-0.09	3.12	-0.02	-0.10	0.04	-4.15
4/30/2003		0:05:00	97500	1625	-7.76	-0.31	0.03	-1.65	-2.10	-0.09	3.20	-0.06	-0.09	0.04	-4.15
4/30/2003		0:10:00	97800	1630	-7.71	-0.32	0.04	-1.66	-2.07	-0.09	3.28	-0.10	-0.07	0.05	-4.15
4/30/2003		0:15:00	98100	1635	-7.60	-0.34	0.05	-1.66	-1.99	-0.10	3.36	-0.13	-0.06	0.04	-4.15
4/30/2003		0:20:00	98400	1640	-7.57	-0.35	0.06	-1.66	-1.94	-0.10	3.43	-0.16	-0.05	0.05	-4.15
4/30/2003		0:25:00	98700	1645	-7.48	-0.36	0.07	-1.65	-1.90	-0.10	3.50	-0.19	-0.04	0.05	-4.14
4/30/2003		0:30:00	99000	1650	-7.32	-0.37	0.08	-1.64	-1.77	-0.10	3.57	-0.22	-0.02	0.04	-4.14
4/30/2003		0:35:00	99300	1655	-7.23	-0.38	0.09	-1.62	-1.58	-0.10	3.63	-0.25	-0.01	0.04	-4.14
4/30/2003		0:40:00	99600	1660	-7.17	-0.39	0.10	-1.59	-1.47	-0.11	3.69	-0.27	0.00	0.05	-4.14
4/30/2003		0:45:00	99900	1665	-7.05	-0.40	0.10	-1.57	-1.32	-0.11	3.75	-0.29	0.02	0.04	-4.14
4/30/2003		0:50:00	100200	1670	-6.98	-0.41	0.11	-1.55	-1.27	-0.11	3.80	-0.30	0.03	0.04	-4.14
4/30/2003		0:55:00	100500	1675	-6.76	-0.41	0.12	-1.52	-1.23	-0.11	3.85	-0.32	0.05	0.04	-4.14
4/30/2003		1:00:00	100800	1680	-6.70	-0.42	0.12	-1.48	-1.19	-0.11	3.90	-0.33	0.06	0.05	-4.14
4/30/2003		1:05:00	101100	1685	-6.56	-0.43	0.13	-1.45	-1.15	-0.11	3.94	-0.33	0.08	0.05	-4.14
4/30/2003		1:10:00	101400	1690	-6.40	-0.43	0.14	-1.41	-1.10	-0.11	3.98	-0.33	0.09	0.04	-4.14
4/30/2003		1:15:00	101700	1695	-6.28	-0.44	0.14	-1.38	-1.07	-0.11	4.01	-0.32	0.10	0.05	-4.14
4/30/2003		1:20:00	102000	1700	-6.06	-0.44	0.15	-1.34	-0.98	-0.11	4.05	-0.31	0.12	0.04	-4.14
4/30/2003		1:25:00	102300	1705	-5.95	-0.45	0.15	-1.31	-0.91	-0.11	4.08	-0.28	0.14	0.05	-4.14
4/30/2003		1:30:00	102600	1710	-5.77	-0.45	0.15	-1.28	-0.83	-0.11	4.11	-0.25	0.15	0.05	-4.14
4/30/2003		1:35:00	102900	1715	-5.59	-0.45	0.16	-1.24	-0.76	-0.11	4.14	-0.22	0.17	0.05	-4.14
4/30/2003		1:40:00	103200	1720	-5.47	-0.45	0.16	-1.20	-0.69	-0.11	4.16	-0.18	0.18	0.04	-4.14
4/30/2003		1:45:00	103500	1725	-5.21	-0.45	0.17	-1.16	-0.62	-0.11	4.19	-0.15	0.19	0.05	-4.14
4/30/2003		1:50:00	103800	1730	-5.05	-0.44	0.17	-1.12	-0.53	-0.11	4.21	-0.11	0.21	0.05	-4.14
4/30/2003		1:55:00	104100	1735	-4.83	-0.43	0.18	-1.08	-0.46	-0.11	4.23	-0.07	0.22	0.05	-4.14
4/30/2003		2:00:00	104400	1740	-4.70	-0.43	0.18	-1.04	-0.38	-0.11	4.25	-0.03	0.24	0.05	-4.14
4/30/2003		2:05:00	104700	1745	-4.50	-0.42	0.18	-1.01	-0.31	-0.11	4.27	0.02	0.25	0.05	-4.14
4/30/2003		2:10:00	105000	1750	-4.23	-0.41	0.19	-0.97	-0.22	-0.11	4.29	0.06	0.27	0.05	-4.14
4/30/2003		2:15:00	105300	1755	-4.02	-0.41	0.19	-0.94	-0.12	-0.10	4.31	0.11	0.28	0.05	-4.14
4/30/2003		2:20:00	105600	1760	-3.82	-0.40	0.20	-0.91	-0.03	-0.10	4.32	0.16	0.30	0.05	-4.14
4/30/2003		2:25:00	105900	1765	-3.61	-0.39	0.20	-0.88	0.06	-0.10	4.34	0.21	0.31	0.04	-4.14
4/30/2003		2:30:00	106200	1770	-3.42	-0.38	0.20	-0.85	0.16	-0.10	4.35	0.26	0.33	0.04	-4.14
4/30/2003		2:35:00	106500	1775	-3.23	-0.38	0.21	-0.82	0.25	-0.10	4.37	0.31	0.34	0.05	-4.14
4/30/2003		2:40:00	106800	1780	-3.02	-0.37	0.21	-0.80	0.34	-0.10	4.38	0.37	0.36	0.05	-4.14
4/30/2003		2:45:00	107100	1785	-2.83	-0.36	0.21	-0.77	0.44	-0.09	4.39	0.42	0.37	0.05	-4.14
4/30/2003		2:50:00	107400	1790	-2.63	-0.36	0.22	-0.74	0.53	-0.09	4.40	0.47	0.39	0.05	-4.14
4/30/2003		2:55:00	107700	1795	-2.50	-0.35	0.22	-0.72	0.61	-0.09	4.42	0.53	0.40	0.05	-4.14
4/30/2003		3:00:00	108000	1800	-2.31	-0.34	0.23	-0.69	0.69	-0.09	4.43	0.58	0.42	0.05	-4.14
4/30/2003		3:05:00	108300	1805	-2.21	-0.33	0.23	-0.67	0.76	-0.08	4.44	0.64	0.43	0.05	-4.14
4/30/2003		3:10:00	108600	1810	-1.98	-0.33	0.23	-0.65	0.83	-0.08	4.45	0.70	0.45	0.05	-4.14
4/30/2003		3:15:00	108900	1815	-1.81	-0.32	0.24	-0.63	0.89	-0.08	4.46	0.76	0.46	0.05	-4.14

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Date	Seavey Is. Low Tide	Time	ET (sec)	ET (min)	Stilling Well Feet H2O	FA01 Feet H2O	MW02 Feet H2O	MW03 Feet H2O	MW04 Feet H2O	MW05 Feet H2O	MW07 Feet H2O	MW08 Feet H2O	MW10 Feet H2O	MW09 Feet H2O	MW01 Feet H2O
4/30/2003		3:20:00	109200	1820	-1.64	-0.32	0.24	-0.60	0.95	-0.07	4.46	0.82	0.47	0.05	-4.13
4/30/2003		3:25:00	109500	1825	-1.39	-0.31	0.24	-0.58	1.01	-0.07	4.47	0.88	0.49	0.04	-4.13
4/30/2003		3:30:00	109800	1830	-1.24	-0.30	0.25	-0.56	1.07	-0.07	4.48	0.93	0.50	0.05	-4.13
4/30/2003		3:35:00	110100	1835	-1.07	-0.29	0.25	-0.54	1.12	-0.07	4.49	0.98	0.52	0.05	-4.13
4/30/2003		3:40:00	110400	1840	-1.01	-0.29	0.25	-0.52	1.18	-0.06	4.50	1.03	0.53	0.05	-4.13
4/30/2003		3:45:00	110700	1845	-0.85	-0.28	0.26	-0.50	1.23	-0.06	4.50	1.08	0.55	0.05	-4.13
4/30/2003		3:50:00	111000	1850	-0.65	-0.28	0.26	-0.48	1.28	-0.05	4.51	1.13	0.56	0.05	-4.13
4/30/2003		3:55:00	111300	1855	-0.59	-0.27	0.26	-0.46	1.34	-0.05	4.52	1.18	0.58	0.05	-4.13
4/30/2003		4:00:00	111600	1860	-0.39	-0.26	0.27	-0.44	1.39	-0.05	4.52	1.23	0.59	0.05	-4.13
4/30/2003		4:05:00	111900	1865	-0.33	-0.26	0.27	-0.43	1.44	-0.04	4.53	1.28	0.60	0.05	-4.13
4/30/2003		4:10:00	112200	1870	-0.18	-0.25	0.27	-0.41	1.49	-0.04	**4.54**	1.32	0.62	0.05	-4.13
4/30/2003		4:15:00	112500	1875	-0.06	-0.25	0.28	-0.40	1.53	-0.04	4.54	1.37	0.63	0.05	-4.13
4/30/2003		4:20:00	112800	1880	0.05	-0.24	0.28	-0.38	1.57	-0.03	4.54	1.42	0.65	0.05	-4.13
4/30/2003		4:25:00	113100	1885	0.22	-0.23	0.28	-0.36	1.61	-0.03	4.54	1.46	0.66	0.05	-4.13
4/30/2003		4:30:00	113400	1890	0.22	-0.23	0.29	-0.35	1.65	-0.02	4.54	1.50	0.67	0.05	-4.13
4/30/2003		4:35:00	113700	1895	0.34	-0.22	0.29	-0.33	1.69	-0.02	4.54	1.55	0.69	0.05	-4.13
4/30/2003		4:40:00	114000	1900	0.51	-0.22	0.29	-0.32	1.73	-0.02	4.53	1.59	0.70	0.05	-4.13
4/30/2003		4:45:00	114300	1905	0.55	-0.21	0.30	-0.30	1.76	-0.01	4.52	1.63	0.71	0.05	-4.13
4/30/2003		4:50:00	114600	1910	0.61	-0.20	0.30	-0.29	1.79	-0.01	4.52	1.67	0.73	0.05	-4.13
4/30/2003		4:55:00	114900	1915	0.67	-0.20	0.30	-0.27	1.82	0.00	4.51	1.71	0.74	0.05	-4.13
4/30/2003		5:00:00	115200	1920	0.67	-0.19	0.31	-0.26	1.85	0.00	4.49	1.75	0.75	0.05	-4.13
4/30/2003		5:05:00	115500	1925	0.71	-0.19	0.31	-0.25	1.88	0.00	4.48	1.79	0.77	0.05	-4.13
4/30/2003		5:10:00	115800	1930	0.72	-0.18	0.31	-0.23	1.91	0.01	4.46	1.82	0.78	0.06	-4.13
4/30/2003		5:15:00	116100	1935	0.77	-0.17	0.32	-0.22	1.94	0.01	4.43	1.86	0.79	0.05	-4.13
4/30/2003		5:20:00	116400	1940	0.85	-0.17	0.32	-0.21	1.97	0.02	4.39	1.89	0.81	0.05	-4.13
4/30/2003		5:25:00	116700	1945	0.80	-0.16	0.32	-0.20	2.00	0.02	4.34	1.93	0.82	0.05	-4.13
4/30/2003		5:30:00	117000	1950	0.79	-0.16	0.33	-0.19	2.03	0.03	4.28	1.96	0.83	0.05	-4.12
4/30/2003		5:35:00	117300	1955	0.80	-0.15	0.33	-0.18	2.05	0.03	4.20	1.99	0.84	0.05	-4.12
4/30/2003		5:40:00	117600	1960	0.80	-0.15	0.33	-0.17	2.08	0.04	4.11	2.02	0.86	0.05	-4.12
4/30/2003	**5:44**	5:45:00	117900	1965	**0.82**	-0.14	0.34	-0.16	2.10	0.04	3.99	2.04	0.87	0.05	-4.12
4/30/2003		5:50:00	118200	1970	0.82	-0.14	0.34	-0.14	2.13	0.04	3.87	2.07	0.88	0.05	-4.12
4/30/2003		5:55:00	118500	1975	0.78	-0.13	0.34	-0.13	2.15	0.05	3.75	2.08	0.89	0.05	-4.12
4/30/2003		6:00:00	118800	1980	0.71	-0.13	0.35	-0.12	2.17	0.05	3.61	2.10	0.90	0.05	-4.12
4/30/2003		6:05:00	119100	1985	0.64	-0.12	0.35	-0.11	2.19	0.06	3.47	2.12	0.91	0.06	-4.12
4/30/2003		6:10:00	119400	1990	0.63	-0.12	0.35	-0.10	2.21	0.06	3.32	2.14	**0.92**	0.05	-4.12
4/30/2003		6:15:00	119700	1995	0.51	-0.11	0.36	-0.09	2.24	0.07	3.18	2.17	0.92	0.05	-4.12
4/30/2003		6:20:00	120000	2000	0.49	-0.11	0.36	-0.08	2.26	0.07	3.04	2.20	0.92	0.05	-4.12
4/30/2003		6:25:00	120300	2005	0.41	-0.10	0.36	-0.07	2.28	0.07	2.90	2.23	0.92	0.05	-4.12
4/30/2003		6:30:00	120600	2010	0.33	-0.09	0.36	-0.07	2.30	0.08	2.76	2.26	0.92	0.05	-4.12
4/30/2003		6:35:00	120900	2015	0.28	-0.09	0.37	-0.06	2.32	0.08	2.60	2.29	0.91	0.05	-4.12
4/30/2003		6:40:00	121200	2020	0.15	-0.09	0.37	-0.05	2.34	0.09	2.46	2.31	0.90	0.05	-4.12
4/30/2003		6:45:00	121500	2025	0.11	-0.08	0.38	-0.04	2.36	0.09	2.32	2.33	0.89	0.05	-4.12
4/30/2003		6:50:00	121800	2030	-0.04	-0.08	0.38	-0.03	2.38	0.09	2.19	2.36	0.88	0.05	-4.12
4/30/2003		6:55:00	122100	2035	-0.12	-0.07	0.38	-0.02	2.39	0.10	2.05	2.38	0.87	0.05	-4.12
4/30/2003		7:00:00	122400	2040	-0.25	-0.07	0.38	-0.01	2.41	0.10	1.91	2.40	0.86	0.05	-4.13
4/30/2003		7:05:00	122700	2045	-0.39	-0.06	0.39	0.00	2.43	0.10	1.78	2.41	0.85	0.05	-4.13
4/30/2003		7:10:00	123000	2050	-0.57	-0.06	0.39	0.01	2.44	0.10	1.63	2.43	0.83	0.05	-4.12
4/30/2003		7:15:00	123300	2055	-0.71	-0.05	0.39	0.02	2.46	0.11	1.50	2.45	0.82	0.05	-4.12
4/30/2003		7:20:00	123600	2060	-0.85	-0.05	0.39	0.03	2.47	0.11	1.36	2.47	0.80	0.05	-4.12
4/30/2003		7:25:00	123900	2065	-0.99	-0.04	0.40	0.04	2.49	0.11	1.23	2.48	0.79	0.05	-4.12
4/30/2003		7:30:00	124200	2070	-1.13	-0.04	0.40	0.05	2.50	0.11	1.10	2.50	0.77	0.06	-4.12
4/30/2003		7:35:00	124500	2075	-1.26	-0.03	0.40	0.05	2.52	0.11	0.97	2.51	0.75	0.06	-4.12

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Date	Seavey Is. Low Tide	Time	ET (sec)	ET (min)	Stilling Well Feet H2O	FA01 Feet H2O	MW02 Feet H2O	MW03 Feet H2O	MW04 Feet H2O	MW05 Feet H2O	MW07 Feet H2O	MW08 Feet H2O	MW10 Feet H2O	MW09 Feet H2O	MW01 Feet H2O
4/30/2003		7:40:00	124800	2080	-1.42	-0.03	0.40	0.06	2.53	0.11	0.85	2.53	0.74	0.05	-4.12
4/30/2003		7:45:00	125100	2085	-1.49	-0.03	**0.41**	0.07	2.54	0.11	0.73	2.55	0.72	0.06	-4.12
4/30/2003		7:50:00	125400	2090	-1.58	-0.02	0.40	0.08	2.55	**0.12**	0.63	2.56	0.70	0.05	-4.12
4/30/2003		7:55:00	125700	2095	-1.79	-0.02	0.40	0.09	2.56	0.12	0.53	2.58	0.68	0.05	-4.12
4/30/2003		8:00:00	126000	2100	-1.88	-0.01	0.40	0.10	**2.57**	0.12	0.44	2.60	0.66	0.06	-4.12
4/30/2003		8:05:00	126300	2105	-2.14	-0.01	0.40	0.10	2.57	0.12	0.34	2.62	0.64	0.05	-4.12
4/30/2003		8:10:00	126600	2110	-2.21	0.00	0.40	0.11	2.56	0.12	0.28	2.63	0.62	0.05	-4.12
4/30/2003		8:15:00	126900	2115	-2.51	0.00	0.39	0.12	2.54	0.12	0.22	2.65	0.60	0.05	-4.12
4/30/2003		8:20:00	127200	2120	-2.69	0.01	0.39	0.13	2.47	0.12	0.16	2.66	0.58	0.05	-4.12
4/30/2003		8:25:00	127500	2125	-2.80	0.01	0.38	0.13	2.39	0.11	0.12	2.68	0.56	0.05	-4.12
4/30/2003		8:30:00	127800	2130	-3.08	0.02	0.38	0.14	2.29	0.11	0.08	**2.69**	0.54	0.05	-4.12
4/30/2003		8:35:00	128100	2135	-3.19	0.02	0.37	0.15	2.17	0.11	0.03	2.69	0.52	0.06	-4.12
4/30/2003		8:40:00	128400	2140	-3.44	0.03	0.36	0.16	2.04	0.11	-0.01	2.69	0.49	0.05	-4.11
4/30/2003		8:45:00	128700	2145	-3.59	0.03	0.35	0.16	1.90	0.11	-0.03	2.67	0.47	0.06	-4.11
4/30/2003		8:50:00	129000	2150	-3.73	0.03	0.34	0.17	1.78	0.11	-0.06	2.65	0.45	0.06	-4.11
4/30/2003		8:55:00	129300	2155	-3.96	0.04	0.33	0.18	1.65	0.11	-0.08	2.63	0.43	0.05	-4.11
4/30/2003		9:00:00	129600	2160	-4.06	0.04	0.32	0.18	1.53	0.10	-0.09	2.60	0.40	0.05	-4.11
4/30/2003		9:05:00	129900	2165	-4.27	0.04	0.31	0.19	1.42	0.10	-0.07	2.57	0.38	0.06	-4.11
4/30/2003		9:10:00	130200	2170	-4.45	0.05	0.31	0.19	1.30	0.10	-0.08	2.53	0.36	0.06	-4.11
4/30/2003		9:15:00	130500	2175	-4.60	0.05	0.30	**0.20**	1.19	0.09	-0.08	2.48	0.34	0.06	-4.11
4/30/2003		9:20:00	130800	2180	-4.86	0.05	0.29	0.20	1.07	0.09	-0.06	2.41	0.32	0.06	-4.11
4/30/2003		9:25:00	131100	2185	-4.96	**0.06**	0.28	0.20	0.96	0.09	-0.03	2.35	0.30	0.06	-4.10
4/30/2003		9:30:00	131400	2190	-5.20	0.06	0.27	0.20	0.87	0.08	0.02	2.29	0.27	0.05	-4.10
4/30/2003		9:35:00	131700	2195	-5.27	0.06	0.26	0.19	0.78	0.08	0.06	2.22	0.25	0.05	-4.10
4/30/2003		9:40:00	132000	2200	-5.41	0.06	0.25	0.18	0.70	0.07	0.12	2.14	0.23	0.06	-4.10
4/30/2003		9:45:00	132300	2205	-5.52	0.05	0.24	0.17	0.61	0.07	0.15	2.00	0.21	0.06	-4.10
4/30/2003		9:50:00	132600	2210	-5.69	0.05	0.23	0.15	0.54	0.06	0.21	1.91	0.19	0.06	-4.10
4/30/2003		9:55:00	132900	2215	-5.87	0.04	0.22	0.13	0.45	0.06	0.27	1.84	0.17	0.06	-4.10
4/30/2003		10:00:00	133200	2220	-5.91	0.04	0.21	0.11	0.37	0.05	0.35	1.78	0.15	0.06	-4.10
4/30/2003		10:05:00	133500	2225	-6.17	0.04	0.20	0.09	0.29	0.05	0.43	1.71	0.13	0.06	-4.10
4/30/2003		10:10:00	133800	2230	-6.21	0.03	0.19	0.06	0.21	0.04	0.51	1.65	0.11	0.06	-4.10
4/30/2003		10:15:00	134100	2235	-6.39	0.02	0.18	0.03	0.13	0.04	0.61	1.59	0.09	0.06	-4.10
4/30/2003		10:20:00	134400	2240	-6.47	0.02	0.17	-0.01	0.05	0.03	0.75	1.54	0.08	0.06	-4.10
4/30/2003		10:25:00	134700	2245	-6.62	0.01	0.16	-0.04	-0.04	0.03	0.84	1.48	0.06	0.06	-4.10
4/30/2003		10:30:00	135000	2250	-6.73	0.00	0.15	-0.08	-0.13	0.02	0.96	1.42	0.04	0.06	-4.10
4/30/2003		10:35:00	135300	2255	-6.83	-0.01	0.14	-0.12	-0.22	0.01	1.05	1.36	0.02	0.06	-4.10
4/30/2003		10:40:00	135600	2260	-6.97	-0.02	0.13	-0.16	-0.30	0.01	1.17	1.30	0.01	0.06	-4.10
4/30/2003		10:45:00	135900	2265	-7.02	-0.02	0.13	-0.20	-0.38	0.00	1.28	1.24	0.00	0.06	-4.10
4/30/2003		10:50:00	136200	2270	-7.05	-0.03	0.12	-0.24	-0.45	-0.01	1.37	1.18	-0.02	0.06	-4.10
4/30/2003		10:55:00	136500	2275	-7.19	-0.04	0.11	-0.29	-0.59	-0.01	1.48	1.13	-0.03	0.06	-4.10
4/30/2003		11:00:00	136800	2280	-7.29	-0.05	0.11	-0.34	-0.75	-0.02	1.58	1.08	-0.04	0.06	-4.10
4/30/2003		11:05:00	137100	2285	-7.30	-0.07	0.10	-0.40	-0.96	-0.02	1.69	1.02	-0.05	0.06	-4.10
4/30/2003		11:10:00	137400	2290	-7.32	-0.08	0.10	-0.46	-0.98	-0.03	1.80	0.97	-0.05	0.06	-4.10
4/30/2003		11:15:00	137700	2295	-7.37	-0.09	0.09	-0.52	-1.17	-0.04	1.91	0.91	-0.06	0.05	-4.10
4/30/2003		11:20:00	138000	2300	-7.43	-0.10	0.09	-0.57	-1.27	-0.04	2.01	0.86	-0.06	0.06	-4.10
4/30/2003		11:25:00	138300	2305	-7.40	-0.11	0.08	-0.63	-1.38	-0.05	2.12	0.81	-0.05	0.06	-4.10
4/30/2003		11:30:00	138600	2310	-7.45	-0.12	0.08	-0.68	-1.43	-0.05	2.23	0.76	-0.05	0.06	-4.10
4/30/2003		11:35:00	138900	2315	-7.53	-0.13	0.08	-0.74	-1.57	-0.06	2.33	0.71	-0.04	0.06	-4.10
4/30/2003		11:40:00	139200	2320	-7.48	-0.14	0.08	-0.80	-1.59	-0.06	2.43	0.66	-0.04	0.06	-4.10
4/30/2003		11:45:00	139500	2325	-7.49	-0.15	0.08	-0.85	-1.60	-0.07	2.54	0.62	-0.03	0.06	-4.10
4/30/2003		11:50:00	139800	2330	-7.50	-0.16	0.09	-0.90	-1.64	-0.07	2.64	0.58	-0.02	0.06	-4.10
4/30/2003		11:55:00	140100	2335	-7.53	-0.18	0.10	-0.96	-1.66	-0.08	2.74	0.54	-0.01	0.06	-4.10

PNS SITE 32 TIDAL STUDY DATA - APRIL 2003

Date	Seavey Is. Low Tide	Time	ET (sec)	ET (min)	Stilling Well Feet H2O	FA01 Feet H2O	MW02 Feet H2O	MW03 Feet H2O	MW04 Feet H2O	MW05 Feet H2O	MW07 Feet H2O	MW08 Feet H2O	MW10 Feet H2O	MW09 Feet H2O	MW01 Feet H2O
4/30/2003		12:00:00	140400	2340	-7.45	-0.19	0.10	-1.01	-1.66	-0.08	2.83	0.49	0.00	0.06	-4.10
4/30/2003		12:05:00	140700	2345	-7.44	-0.20	0.11	-1.05	-1.58	-0.09	2.93	0.44	0.00	0.06	-4.10
4/30/2003		12:10:00	141000	2350	-7.47	-0.21	0.13	-1.09	-1.66	-0.09	3.01	0.39	0.01	0.06	-4.10
4/30/2003		12:15:00	141300	2355	-7.41	-0.22	0.13	-1.13	-1.63	-0.10	3.10	0.35	0.03	0.06	-4.10
4/30/2003		12:20:00	141600	2360	-7.38	-0.23	0.15	-1.17	-1.57	-0.10	3.18	0.30	0.04	0.06	-4.10
4/30/2003		12:25:00	141900	2365	-7.28	-0.24	0.16	-1.19	-1.46	-0.10	3.25	0.26	0.05	0.06	-4.10
4/30/2003		12:30:00	142200	2370	-7.23	-0.25	0.16	-1.22	-1.30	-0.11	3.33	0.22	0.06	0.06	-4.10
4/30/2003		12:35:00	142500	2375	-7.14	-0.26	0.17	-1.23	-1.19	-0.11	3.41	0.18	0.07	0.06	-4.10
4/30/2003		12:40:00	142800	2380	-7.13	-0.27	0.18	-1.24	-1.12	-0.11	3.48	0.14	0.09	0.06	-4.10
4/30/2003		12:45:00	143100	2385	-7.04	-0.28	0.19	-1.25	-1.08	-0.12	3.54	0.11	0.10	0.06	-4.10
4/30/2003		12:50:00	143400	2390	-7.00	-0.29	0.19	-1.26	-1.05	-0.12	3.61	0.08	0.11	0.06	-4.10
4/30/2003		12:55:00	143700	2395	-6.88	-0.29	0.20	-1.26	-1.03	-0.12	3.67	0.05	0.12	0.06	-4.10
4/30/2003		13:00:00	144000	2400	-6.83	-0.30	0.21	-1.25	-1.01	-0.12	3.73	0.03	0.14	0.06	-4.10
4/30/2003		13:05:00	144300	2405	-6.70	-0.31	0.22	-1.24	-0.99	-0.13	3.79	0.01	0.15	0.06	-4.10
4/30/2003		13:10:00	144600	2410	-6.63	-0.32	0.22	-1.22	-0.97	-0.13	3.84	-0.01	0.16	0.06	-4.10
4/30/2003		13:15:00	144900	2415	-6.42	-0.33	0.23	-1.20	-0.94	-0.13	3.89	-0.03	0.18	0.06	-4.10
4/30/2003		13:20:00	145200	2420	-6.32	-0.33	0.23	-1.18	-0.89	-0.13	3.93	-0.04	0.19	0.06	-4.10
4/30/2003		13:25:00	145500	2425	-6.23	-0.33	0.24	-1.15	-0.87	-0.13	3.97	-0.05	0.20	0.06	-4.10
4/30/2003		13:30:00	145800	2430	-6.09	-0.34	0.24	-1.13	-0.82	-0.14	4.01	-0.05	0.22	0.06	-4.09
4/30/2003		13:35:00	146100	2435	-6.01	-0.34	0.25	-1.11	-0.79	-0.14	4.05	-0.04	0.23	0.06	-4.09
4/30/2003		13:40:00	146400	2440	-5.80	-0.35	0.25	-1.08	-0.72	-0.14	4.08	-0.03	0.25	0.06	-4.10
4/30/2003		13:45:00	146700	2445	-5.76	-0.35	0.26	-1.05	-0.66	-0.14	4.12	-0.01	0.26	0.06	-4.10
4/30/2003		13:50:00	147000	2450	-5.61	-0.35	0.26	-1.03	-0.61	-0.14	4.15	0.02	0.28	0.06	-4.10
4/30/2003		13:55:00	147300	2455	-5.48	-0.35	0.26	-1.00	-0.54	-0.14	4.17	0.05	0.29	0.06	-4.10
4/30/2003		14:00:00	147600	2460	-5.34	-0.35	0.27	-0.97	-0.49	-0.14	4.20	0.07	0.30	0.06	-4.09
4/30/2003		14:05:00	147900	2465	-5.16	-0.34	0.27	-0.94	-0.42	-0.14	4.22	0.11	0.32	0.06	-4.09
4/30/2003		14:10:00	148200	2470	-5.00	-0.34	0.28	-0.91	-0.36	-0.14	4.25	0.14	0.33	0.06	-4.09
4/30/2003		14:15:00	148500	2475	-4.84	-0.33	0.28	-0.88	-0.29	-0.14	4.27	0.17	0.35	0.06	-4.09
4/30/2003		14:20:00	148800	2480	-4.66	-0.33	0.28	-0.85	-0.21	-0.14	4.29	0.21	0.36	0.06	-4.09
4/30/2003		14:25:00	149100	2485	-4.42	-0.32	0.28	-0.82	-0.14	-0.14	4.31	0.25	0.38	0.06	-4.09
4/30/2003		14:30:00	149400	2490	-4.27	-0.31	0.29	-0.79	-0.06	-0.14	4.33	0.29	0.39	0.06	-4.09
4/30/2003		14:35:00	149700	2495	-4.10	-0.31	0.29	-0.77	0.02	-0.14	4.34	0.33	0.41	0.06	-4.09
4/30/2003		14:40:00	150000	2500	-3.78	-0.30	0.30	-0.74	0.11	-0.14	4.36	0.38	0.42	0.06	-4.09
4/30/2003		14:45:00	150300	2505	-3.66	-0.29	0.30	-0.71	0.21	-0.13	4.37	0.42	0.44	0.06	-4.09
4/30/2003		14:50:00	150600	2510	-3.40	-0.29	0.30	-0.69	0.29	-0.13	4.39	0.46	0.45	0.06	-4.09
4/30/2003		14:55:00	150900	2515	-3.16	-0.28	0.31	-0.66	0.39	-0.13	4.40	0.51	0.47	0.06	-4.09
4/30/2003		15:00:00	151200	2520	-3.03	-0.27	0.31	-0.64	0.48	-0.13	4.42	0.56	0.48	0.06	-4.09
4/30/2003		15:05:00	151500	2525	-2.87	-0.27	0.31	-0.62	0.57	-0.13	4.43	0.61	0.49	0.06	-4.09
4/30/2003		15:10:00	151800	2530	-2.76	-0.26	0.32	-0.59	0.65	-0.13	4.44	0.67	0.51	0.06	-4.09
4/30/2003		15:15:00	152100	2535	-2.59	-0.26	0.32	-0.57	0.73	-0.13	4.45	0.72	0.52	0.06	-4.09
4/30/2003		15:20:00	152400	2540	-2.40	-0.25	0.33	-0.55	0.81	-0.12	4.46	0.79	0.54	0.06	-4.09
4/30/2003		15:25:00	152700	2545	-2.25	-0.24	0.33	-0.53	0.89	-0.12	4.47	0.84	0.55	0.06	-4.09
4/30/2003		15:30:00	153000	2550	-2.07	-0.24	0.33	-0.51	0.96	-0.12	4.48	0.90	0.57	0.06	-4.09
4/30/2003		15:35:00	153300	2555	-1.91	-0.23	0.34	-0.48	1.03	-0.12	4.49	0.95	0.58	0.06	-4.09
4/30/2003		15:40:00	153600	2560	-1.81	-0.23	0.34	-0.46	1.09	-0.12	4.50	1.00	0.59	0.06	-4.08
4/30/2003		15:45:00	153900	2565	-1.64	-0.22	0.34	-0.45	1.15	-0.11	4.51	1.06	0.61	0.06	-4.08
4/30/2003		15:50:00	154200	2570	-1.45	-0.21	0.34	-0.43	1.21	-0.11	4.51	1.11	0.62	0.06	-4.08
4/30/2003		15:55:00	154500	2575	-1.35	-0.21	0.35	-0.41	1.27	-0.11	4.52	1.16	0.64	0.06	-4.08
4/30/2003		16:00:00	154800	2580	-1.15	-0.20	0.35	-0.40	1.34	-0.10	4.53	1.21	0.65	0.06	-4.08
4/30/2003		16:05:00	155100	2585	-1.07	-0.19	0.36	-0.38	1.40	-0.10	4.53	1.26	0.66	0.06	-4.08
4/30/2003		16:10:00	155400	2590	-0.98	-0.19	0.36	-0.36	1.45	-0.10	4.54	1.31	0.68	0.06	-4.08
4/30/2003		16:15:00	155700	2595	-0.78	-0.18	0.36	-0.34	1.50	-0.09	4.54	1.35	0.69	0.06	-4.09

PNS SITE 32 TIDAL STUDY DATA - APRIL 2003

Date	Seavey Is. Low Tide	Time	ET (sec)	ET (min)	Stilling Well Feet H2O	FA01 Feet H2O	MW02 Feet H2O	MW03 Feet H2O	MW04 Feet H2O	MW05 Feet H2O	MW07 Feet H2O	MW08 Feet H2O	MW10 Feet H2O	MW09 Feet H2O	MW01 Feet H2O
4/30/2003		16:20:00	156000	2600	-0.69	-0.18	0.37	-0.33	1.55	-0.09	4.54	1.40	0.71	0.06	-4.08
4/30/2003		16:25:00	156300	2605	-0.55	-0.17	0.37	-0.31	1.60	-0.09	4.54	1.45	0.72	0.06	-4.08
4/30/2003		16:30:00	156600	2610	-0.33	-0.17	0.37	-0.30	1.64	-0.08	4.54	1.49	0.73	0.06	-4.08
4/30/2003		16:35:00	156900	2615	-0.39	-0.16	0.38	-0.28	1.68	-0.08	4.53	1.53	0.75	0.06	-4.08
4/30/2003		16:40:00	157200	2620	-0.22	-0.16	0.38	-0.27	1.72	-0.08	4.53	1.58	0.76	0.06	-4.08
4/30/2003		16:45:00	157500	2625	-0.17	-0.15	0.38	-0.25	1.76	-0.07	4.52	1.62	0.77	0.06	-4.09
4/30/2003		16:50:00	157800	2630	-0.02	-0.15	0.39	-0.24	1.79	-0.07	4.51	1.66	0.79	0.06	-4.09
4/30/2003		16:55:00	158100	2635	0.10	-0.14	0.39	-0.23	1.83	-0.07	4.50	1.70	0.80	0.06	-4.09
4/30/2003		17:00:00	158400	2640	0.07	-0.13	0.39	-0.21	1.86	-0.06	4.48	1.74	0.81	0.06	-4.09
4/30/2003		17:05:00	158700	2645	0.21	-0.13	0.40	-0.20	1.89	-0.06	4.46	1.78	0.83	0.06	-4.08
4/30/2003		17:10:00	159000	2650	0.26	-0.12	0.40	-0.19	1.92	-0.05	4.43	1.82	0.84	0.06	-4.08
4/30/2003		17:15:00	159300	2655	0.24	-0.12	0.40	-0.18	1.95	-0.05	4.39	1.86	0.85	0.06	-4.08
4/30/2003		17:20:00	159600	2660	0.22	-0.11	0.40	-0.17	1.98	-0.05	4.35	1.89	0.87	0.06	-4.08
4/30/2003		17:25:00	159900	2665	0.34	-0.11	0.41	-0.16	2.01	-0.04	4.28	1.93	0.88	0.06	-4.08
4/30/2003		17:30:00	160200	2670	0.32	-0.10	0.41	-0.14	2.04	-0.04	4.21	1.96	0.89	0.06	-4.08
4/30/2003		17:35:00	160500	2675	0.24	-0.10	0.41	-0.13	2.07	-0.03	4.12	1.99	0.90	0.06	-4.08
4/30/2003		17:40:00	160800	2680	0.34	-0.09	0.41	-0.12	2.09	-0.03	4.01	2.02	0.91	0.06	-4.08
4/30/2003		17:45:00	161100	2685	0.28	-0.09	0.41	-0.11	2.12	-0.03	3.89	2.05	0.93	0.06	-4.08
4/30/2003		17:50:00	161400	2690	0.31	-0.08	0.42	-0.10	2.14	-0.02	3.76	2.07	0.94	0.06	-4.08
4/30/2003	**5:53 PM**	17:55:00	161700	2695	**0.35**	-0.08	0.42	-0.09	2.17	-0.02	3.62	2.08	0.95	0.06	-4.08
4/30/2003		18:00:00	162000	2700	0.24	-0.07	0.43	-0.08	2.19	-0.01	3.48	2.10	0.95	0.06	-4.08
4/30/2003		18:05:00	162300	2705	0.22	-0.07	0.43	-0.07	2.21	-0.01	3.34	2.12	0.96	0.06	-4.08
4/30/2003		18:10:00	162600	2710	0.17	-0.06	0.43	-0.06	2.23	0.00	3.19	2.15	**0.97**	0.06	-4.08
4/30/2003		18:15:00	162900	2715	0.17	-0.06	0.43	-0.05	2.26		3.05	2.18	0.97	0.06	-4.08
4/30/2003		18:20:00	163200	2720	0.06	-0.05	0.44	-0.04	2.28		2.91	2.21	0.96	0.06	-4.08
4/30/2003		18:25:00	163500	2725	-0.02	-0.05	0.44	-0.03	2.30		2.77	2.24	0.96	0.06	-4.08
4/30/2003		18:30:00	163800	2730	0.02	-0.05	0.44	-0.02	2.32		2.62	2.27	0.95	0.06	-4.08
4/30/2003		18:35:00	164100	2735	-0.18	-0.04	0.45	-0.01	2.34		2.47	2.30	0.94	0.06	-4.08
4/30/2003		18:40:00	164400	2740	-0.13	-0.04	0.45	0.00	2.36		2.31	2.32	0.93	0.06	-4.08
4/30/2003		18:45:00	164700	2745	-0.25	-0.03	0.45	0.01	2.38		2.17	2.35	0.92	0.07	-4.08
4/30/2003		18:50:00	165000	2750	-0.34	-0.03	0.45	0.02	2.40		2.02	2.37	0.91	0.06	-4.08
4/30/2003		18:55:00	165300	2755	-0.47	-0.02	0.46	0.03	2.42		1.87	2.39	0.90	0.06	-4.08
4/30/2003		19:00:00	165600	2760	-0.66	-0.02	0.46	0.04	2.43		1.72	2.41	0.88	0.06	-4.08
4/30/2003		19:05:00	165900	2765	-0.62	-0.01	0.46	0.05	2.45		1.56	2.43	0.87	0.06	-4.08
4/30/2003		19:10:00	166200	2770	-0.89	-0.01	**0.47**	0.06	2.46		1.42	2.45	0.86	0.06	-4.08
4/30/2003		19:15:00	166500	2775	-0.95	0.00	0.47	0.07	2.48		1.28	2.46	0.84	0.06	-4.07
4/30/2003		19:20:00	166800	2780	-0.99	0.00	0.47	0.08	2.50		1.14	2.48	0.82	0.06	-4.07
4/30/2003		19:25:00	167100	2785	-1.19	0.00	0.47	0.08	2.51		1.02	2.49	0.81	0.06	-4.07
4/30/2003		19:30:00	167400	2790	-1.38	0.01	0.47	0.09	2.52		0.89	2.51	0.79	0.06	-4.07
4/30/2003		19:35:00	167700	2795	-1.47	0.01	0.48	0.10	2.54		0.76	2.53	0.77	0.06	-4.07
4/30/2003		19:40:00	168000	2800	-1.55	0.02	0.47	0.11	2.55		0.64	2.54	0.75	0.06	-4.07
4/30/2003		19:45:00	168300	2805	-1.76	0.02	0.47	0.12	2.56		0.53	2.56	0.73	0.06	-4.07
4/30/2003		19:50:00	168600	2810	-1.81	0.02	0.47	0.13	**2.57**		0.41	2.58	0.71	0.06	-4.07
4/30/2003		19:55:00	168900	2815	-1.98	0.03	0.47	0.13	2.57		0.31	2.60	0.69	0.07	-4.07
4/30/2003		20:00:00	169200	2820	-2.15	0.03	0.46	0.14	2.57		0.21	2.62	0.67	0.07	-4.07
4/30/2003		20:05:00	169500	2825	-2.30	0.04	0.46	0.15	2.57		0.12	2.63	0.65	0.06	-4.07
4/30/2003		20:10:00	169800	2830	-2.50	0.04	0.46	0.16	2.54		0.05	2.65	0.63	0.06	-4.07
4/30/2003		20:15:00	170100	2835	-2.68	0.05	0.45	0.17	2.47		-0.02	2.67	0.61	0.06	-4.07
4/30/2003		20:20:00	170400	2840	-2.81	0.05	0.44	0.17	2.40		-0.09	2.68	0.59	0.06	-4.07
4/30/2003		20:25:00	170700	2845	-3.07	0.06	0.43	0.18	2.30		-0.15	2.69	0.57	0.07	-4.07
4/30/2003		20:30:00	171000	2850	-3.10	0.06	0.42	0.19	2.19		-0.21	**2.70**	0.54	0.06	-4.07
4/30/2003		20:35:00	171300	2855	-3.45	0.06	0.41	0.19	2.07		-0.27	2.70	0.52	0.06	-4.07

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Date	Seavey Is. Low Tide	Time	ET (sec)	ET (min)	Stilling Well Feet H2O	FA01 Feet H2O	MW02 Feet H2O	MW03 Feet H2O	MW04 Feet H2O	MW05 Feet H2O	MW07 Feet H2O	MW08 Feet H2O	MW10 Feet H2O	MW09 Feet H2O	MW01 Feet H2O
4/30/2003		20:40:00	171600	2860	-3.59	0.07	0.40	0.20	1.92		-0.33	2.69	0.50	0.06	-4.07
4/30/2003		20:45:00	171900	2865	-3.74	0.07	0.39	0.21	1.80		-0.37	2.67	0.48	0.07	-4.07
4/30/2003		20:50:00	172200	2870	-3.96	0.07	0.38	0.21	1.67		-0.41	2.64	0.45	0.06	-4.07
4/30/2003		20:55:00	172500	2875	-4.12	0.08	0.37	0.22	1.54		-0.45	2.61	0.43	0.07	-4.07
4/30/2003		21:00:00	172800	2880	-4.23	0.08	0.36	0.22	1.43		-0.48	2.58	0.41	0.06	-4.07
4/30/2003		21:05:00	173100	2885	-4.49	**0.09**	0.35	0.23	1.31		-0.50	2.55	0.38	0.07	-4.07
4/30/2003		21:10:00	173400	2890	-4.68	0.09	0.34	0.23	1.19		-0.52	2.50	0.36	0.06	-4.07
4/30/2003		21:15:00	173700	2895	-4.78	0.09	0.33	**0.24**	1.08		-0.49	2.44	0.34	0.07	-4.07
4/30/2003		21:20:00	174000	2900	-5.03	0.09	0.32	0.24	0.97		-0.49	2.37	0.31	0.06	-4.07
4/30/2003		21:25:00	174300	2905	-5.16	0.09	0.31	0.24	0.87		-0.48	2.31	0.29	0.07	-4.07
4/30/2003		21:30:00	174600	2910	-5.33	0.09	0.30	0.23	0.79		-0.46	2.24	0.26	0.07	-4.07
4/30/2003		21:35:00	174900	2915	-5.47	0.09	0.29	0.22	0.70		-0.40	2.18	0.24	0.07	-4.06
4/30/2003		21:40:00	175200	2920	-5.63	0.09	0.28	0.20	0.61		-0.38	2.05	0.21	0.07	-4.06
4/30/2003		21:45:00	175500	2925	-5.76	0.09	0.26	0.19	0.53		-0.32	1.93	0.19	0.07	-4.06
4/30/2003		21:50:00	175800	2930	-5.97	0.08	0.25	0.16	0.44		-0.27	1.86	0.17	0.07	-4.06
4/30/2003		21:55:00	176100	2935	-6.05	0.07	0.24	0.14	0.35		-0.20	1.79	0.15	0.07	-4.06
4/30/2003		22:00:00	176400	2940	-6.27	0.07	0.23	0.11	0.27		-0.13	1.73	0.12	0.07	-4.06
4/30/2003		22:05:00	176700	2945	-6.41	0.06	0.22	0.08	0.18		-0.07	1.67	0.10	0.07	-4.07
4/30/2003		22:10:00	177000	2950	-6.47	0.06	0.21	0.05	0.10		0.02	1.60	0.08	0.07	-4.07
4/30/2003		22:15:00	177300	2955	-6.60	0.05	0.20	0.01	0.02		0.10	1.55	0.06	0.07	-4.06
4/30/2003		22:20:00	177600	2960	-6.71	0.04	0.19	-0.03	-0.07		0.19	1.49	0.04	0.07	-4.06
4/30/2003		22:25:00	177900	2965	-6.78	0.03	0.18	-0.07	-0.16		0.30	1.43	0.02	0.07	-4.06
4/30/2003		22:30:00	178200	2970	-6.97	0.03	0.17	-0.11	-0.24		0.39	1.37	0.00	0.07	-4.07
4/30/2003		22:35:00	178500	2975	-7.07	0.01	0.16	-0.15	-0.34		0.53	1.31	-0.02	0.07	-4.06
4/30/2003		22:40:00	178800	2980	-7.14	0.01	0.15	-0.19	-0.45		0.62	1.25	-0.04	0.07	-4.06
4/30/2003		22:45:00	179100	2985	-7.27	-0.01	0.14	-0.24	-0.62		0.73	1.19	-0.06	0.07	-4.06
4/30/2003		22:50:00	179400	2990	-7.37	-0.02	0.14	-0.29	-0.89		0.86	1.14	-0.07	0.07	-4.06
4/30/2003		22:55:00	179700	2995	-7.43	-0.03	0.13	-0.35	-1.12		0.96	1.09	-0.09	0.07	-4.06
4/30/2003		23:00:00	180000	3000	-7.55	-0.04	0.12	-0.42	-1.41		1.10	1.03	-0.10	0.07	-4.06
4/30/2003		23:05:00	180300	3005	-7.55	-0.05	0.11	-0.49	-1.53		1.22	0.97	-0.11	0.07	-4.06
4/30/2003		23:10:00	180600	3010	-7.61	-0.06	0.11	-0.55	-1.59		1.34	0.91	-0.13	0.07	-4.06
4/30/2003		23:15:00	180900	3015	-7.71	-0.07	0.10	-0.62	-1.70		1.48	0.86	-0.14	0.07	-4.06
4/30/2003		23:20:00	181200	3020	-7.68	-0.08	0.09	-0.68	-1.75		1.61	0.81	-0.15	0.07	-4.06
4/30/2003		23:25:00	181500	3025	-7.82	-0.10	0.09	-0.75	-1.84		1.73	0.75	-0.15	0.07	-4.06
4/30/2003		23:30:00	181800	3030	-7.78	-0.11	0.08	-0.82	-1.90		1.86	0.70	-0.15	0.07	-4.06
4/30/2003		23:35:00	182100	3035	-7.90	-0.12	0.08	-0.89	-1.96		1.98	0.65	-0.15	0.07	-4.06
4/30/2003		23:40:00	182400	3040	-7.91	-0.13	0.07	-0.97	-2.03		2.10	0.61	-0.15	0.07	-4.06
4/30/2003		23:45:00	182700	3045	-7.90	-0.15	0.07	-1.04	-2.03		2.22	0.57	-0.14	0.07	-4.06
4/30/2003		23:50:00	183000	3050	-7.94	-0.16	0.07	-1.11	-2.08		2.32	0.53	-0.13	0.07	-4.06
4/30/2003		23:55:00	183300	3055	-8.00	-0.17	0.06	-1.18	-2.14		2.43	0.47	-0.13	0.07	-4.06
5/1/2003		0:00:00	183600	3060	-7.94	-0.18	0.07	-1.24	-2.13		2.54	0.42	-0.12	0.07	-4.06
5/1/2003		0:05:00	183900	3065	-7.98	-0.20	0.07	-1.30	-2.14		2.64	0.36	-0.11	0.07	-4.06
5/1/2003		0:10:00	184200	3070	-7.92	-0.21	0.07	-1.35	-2.15		2.74	0.31	-0.10	0.07	-4.06
5/1/2003		0:15:00	184500	3075	-7.86	-0.22	0.08	-1.40	-2.09		2.84	0.26	-0.09	0.07	-4.06
5/1/2003		0:20:00	184800	3080	-7.87	-0.23	0.09	-1.44	-2.12		2.93	0.21	-0.08	0.07	-4.06
5/1/2003		0:25:00	185100	3085	-7.84	-0.25	0.10	-1.47	-2.09		3.02	0.16	-0.07	0.07	-4.06
5/1/2003		0:30:00	185400	3090	-7.73	-0.26	0.11	-1.50	-2.06		3.10	0.11	-0.06	0.07	-4.06
5/1/2003		0:35:00	185700	3095	-7.70	-0.27	0.12	-1.52	-1.99		3.18	0.07	-0.05	0.07	-4.06
5/1/2003		0:40:00	186000	3100	-7.65	-0.28	0.14	-1.54	-1.99		3.27	0.03	-0.03	0.07	-4.06
5/1/2003		0:45:00	186300	3105	-7.55	-0.29	0.15	-1.55	-1.89		3.35	-0.01	-0.02	0.07	-4.06
5/1/2003		0:50:00	186600	3110	-7.48	-0.31	0.16	-1.56	-1.85		3.42	-0.04	-0.01	0.07	-4.06
5/1/2003		0:55:00	186900	3115	-7.38	-0.32	0.17	-1.55	-1.76		3.49	-0.08	0.01	0.07	-4.06

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Date	Seavey Is. Low Tide	Time	ET (sec)	ET (min)	Stilling Well Feet H2O	FA01 Feet H2O	MW02 Feet H2O	MW03 Feet H2O	MW04 Feet H2O	MW05 Feet H2O	MW07 Feet H2O	MW08 Feet H2O	MW10 Feet H2O	MW09 Feet H2O	MW01 Feet H2O
5/1/2003		1:00:00	187200	3120	-7.31	-0.33	0.18	-1.55	-1.67		3.56	-0.11	0.02	0.07	-4.05
5/1/2003		1:05:00	187500	3125	-7.24	-0.34	0.19	-1.54	-1.55		3.62	-0.14	0.03	0.07	-4.05
5/1/2003		1:10:00	187800	3130	-7.11	-0.35	0.20	-1.52	-1.33		3.68	-0.16	0.05	0.07	-4.05
5/1/2003		1:15:00	188100	3135	-7.06	-0.35	0.20	-1.50	-1.25		3.74	-0.18	0.06	0.07	-4.05
5/1/2003		1:20:00	188400	3140	-6.90	-0.36	0.21	-1.48	-1.20		3.80	-0.20	0.07	0.07	-4.05
5/1/2003		1:25:00	188700	3145	-6.82	-0.37	0.22	-1.46	-1.16		3.85	-0.22	0.09	0.07	-4.05
5/1/2003		1:30:00	189000	3150	-6.66	-0.38	0.23	-1.43	-1.13		3.89	-0.23	0.10	0.07	-4.05
5/1/2003		1:35:00	189300	3155	-6.51	-0.39	0.23	-1.39	-1.08		3.94	-0.24	0.11	0.07	-4.05
5/1/2003		1:40:00	189600	3160	-6.48	-0.39	0.24	-1.36	-1.06		3.98	-0.24	0.13	0.07	-4.06
5/1/2003		1:45:00	189900	3165	-6.21	-0.40	0.24	-1.33	-1.01		4.02	-0.24	0.14	0.07	-4.06
5/1/2003		1:50:00	190200	3170	-6.22	-0.40	0.25	-1.30	-0.97		4.05	-0.23	0.16	0.07	-4.05
5/1/2003		1:55:00	190500	3175	-5.97	-0.41	0.25	-1.28	-0.91		4.09	-0.21	0.17	0.07	-4.05
5/1/2003		2:00:00	190800	3180	-5.81	-0.41	0.26	-1.24	-0.81		4.12	-0.18	0.19	0.07	-4.06
5/1/2003		2:05:00	191100	3185	-5.72	-0.41	0.26	-1.21	-0.75		4.15	-0.16	0.20	0.07	-4.05
5/1/2003		2:10:00	191400	3190	-5.48	-0.41	0.26	-1.17	-0.68		4.17	-0.12	0.22	0.07	-4.06
5/1/2003		2:15:00	191700	3195	-5.29	-0.41	0.27	-1.14	-0.59		4.20	-0.09	0.23	0.07	-4.05
5/1/2003		2:20:00	192000	3200	-5.19	-0.41	0.27	-1.10	-0.53		4.22	-0.05	0.25	0.07	-4.05
5/1/2003		2:25:00	192300	3205	-4.88	-0.40	0.28	-1.06	-0.45		4.24	-0.01	0.26	0.07	-4.05
5/1/2003		2:30:00	192600	3210	-4.75	-0.39	0.28	-1.02	-0.37		4.26	0.03	0.28	0.07	-4.05
5/1/2003		2:35:00	192900	3215	-4.53	-0.39	0.28	-0.99	-0.29		4.28	0.07	0.29	0.07	-4.05
5/1/2003		2:40:00	193200	3220	-4.28	-0.38	0.29	-0.95	-0.20		4.30	0.11	0.31	0.07	-4.05
5/1/2003		2:45:00	193500	3225	-4.15	-0.37	0.29	-0.92	-0.12		4.32	0.16	0.32	0.07	-4.05
5/1/2003		2:50:00	193800	3230	-3.93	-0.37	0.29	-0.89	-0.03		4.33	0.21	0.34	0.07	-4.05
5/1/2003		2:55:00	194100	3235	-3.71	-0.36	0.30	-0.86	0.06		4.35	0.25	0.35	0.07	-4.05
5/1/2003		3:00:00	194400	3240	-3.50	-0.35	0.30	-0.83	0.15		4.37	0.30	0.37	0.07	-4.05
5/1/2003		3:05:00	194700	3245	-3.25	-0.34	0.31	-0.80	0.25		4.38	0.35	0.38	0.07	-4.05
5/1/2003		3:10:00	195000	3250	-3.07	-0.34	0.31	-0.77	0.35		4.39	0.40	0.40	0.07	-4.05
5/1/2003		3:15:00	195300	3255	-2.84	-0.33	0.31	-0.75	0.45		4.40	0.46	0.41	0.07	-4.05
5/1/2003		3:20:00	195600	3260	-2.74	-0.32	0.32	-0.72	0.54		4.42	0.51	0.43	0.07	-4.05
5/1/2003		3:25:00	195900	3265	-2.51	-0.32	0.32	-0.70	0.62		4.43	0.56	0.44	0.07	-4.05
5/1/2003		3:30:00	196200	3270	-2.37	-0.31	0.32	-0.68	0.70		4.44	0.62	0.46	0.07	-4.05
5/1/2003		3:35:00	196500	3275	-2.19	-0.30	0.33	-0.65	0.78		4.45	0.68	0.47	0.07	-4.05
5/1/2003		3:40:00	196800	3280	-2.09	-0.30	0.33	-0.63	0.85		4.46	0.74	0.48	0.07	-4.05
5/1/2003		3:45:00	197100	3285	-1.88	-0.29	0.33	-0.61	0.91		4.47	0.80	0.50	0.07	-4.05
5/1/2003		3:50:00	197400	3290	-1.68	-0.28	0.34	-0.58	0.97		4.48	0.86	0.51	0.07	-4.05
5/1/2003		3:55:00	197700	3295	-1.53	-0.28	0.34	-0.56	1.03		4.49	0.91	0.53	0.08	-4.05
5/1/2003		4:00:00	198000	3300	-1.38	-0.27	0.34	-0.54	1.09		4.50	0.97	0.54	0.07	-4.05
5/1/2003		4:05:00	198300	3305	-1.12	-0.27	0.35	-0.52	1.15		4.51	1.02	0.55	0.07	-4.05
5/1/2003		4:10:00	198600	3310	-1.05	-0.26	0.35	-0.50	1.20		4.51	1.07	0.57	0.07	-4.05
5/1/2003		4:15:00	198900	3315	-0.87	-0.25	0.35	-0.48	1.25		4.52	1.12	0.58	0.07	-4.05
5/1/2003		4:20:00	199200	3320	-0.69	-0.25	0.36	-0.46	1.31		4.53	1.17	0.60	0.07	-4.05
5/1/2003		4:25:00	199500	3325	-0.67	-0.24	0.36	-0.44	1.37		4.54	1.22	0.61	0.07	-4.05
5/1/2003		4:30:00	199800	3330	-0.37	-0.23	0.36	-0.43	1.42		4.55	1.27	0.62	0.07	-4.04
5/1/2003		4:35:00	200100	3335	-0.27	-0.23	0.37	-0.41	1.47		4.55	1.32	0.64	0.07	-4.04
5/1/2003		4:40:00	200400	3340	-0.09	-0.22	0.37	-0.39	1.52		4.56	1.36	0.65	0.07	-4.04
5/1/2003		4:45:00	200700	3345	0.08	-0.22	0.37	-0.38	1.56		4.56	1.41	0.67	0.08	-4.04
5/1/2003		4:50:00	201000	3350	0.22	-0.21	0.38	-0.36	1.60		4.56	1.45	0.68	0.07	-4.04
5/1/2003		4:55:00	201300	3355	0.30	-0.20	0.38	-0.34	1.64		4.57	1.50	0.70	0.07	-4.05
5/1/2003		5:00:00	201600	3360	0.33	-0.20	0.38	-0.33	1.68		4.57	1.54	0.71	0.08	-4.04
5/1/2003		5:05:00	201900	3365	0.47	-0.19	0.39	-0.31	1.71		4.57	1.58	0.72	0.07	-4.04
5/1/2003		5:10:00	202200	3370	0.54	-0.19	0.39	-0.30	1.75		4.57	1.63	0.74	0.08	-4.04
5/1/2003		5:15:00	202500	3375	0.51	-0.18	0.39	-0.28	1.79		4.57	1.67	0.75	0.08	-4.04

PNS SITE 32 TIDAL STUDY DATA - APRIL 2003

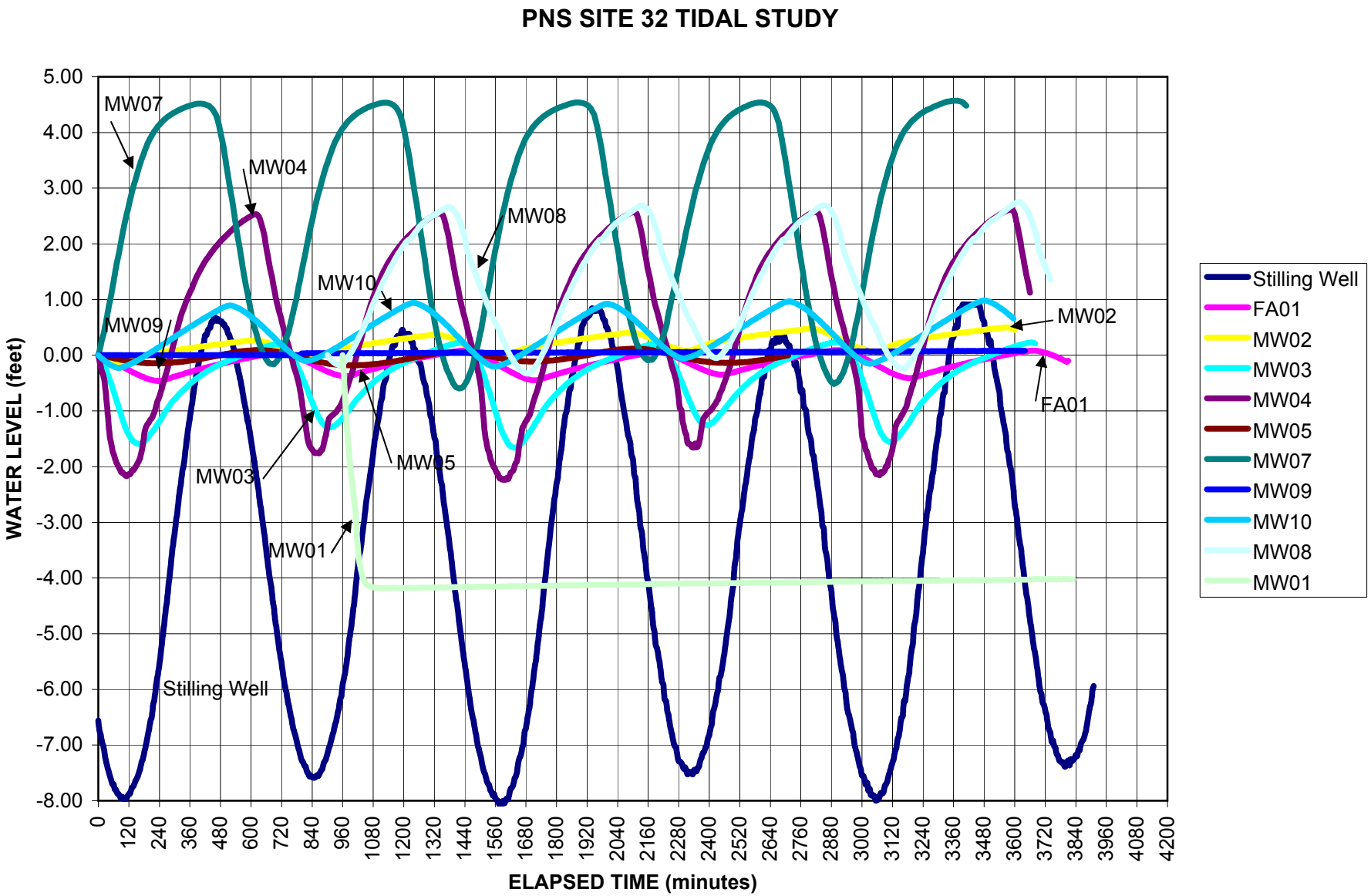
Date	Seavey Is. Low Tide	Time	ET (sec)	ET (min)	Stilling Well Feet H2O	FA01 Feet H2O	MW02 Feet H2O	MW03 Feet H2O	MW04 Feet H2O	MW05 Feet H2O	MW07 Feet H2O	MW08 Feet H2O	MW10 Feet H2O	MW09 Feet H2O	MW01 Feet H2O
5/1/2003		5:20:00	202800	3380	0.79	-0.17	0.40	-0.27	1.82		4.56	1.71	0.76	0.08	-4.04
5/1/2003		5:25:00	203100	3385	0.84	-0.17	0.40	-0.26	1.85		4.56	1.75	0.78	0.08	-4.04
5/1/2003		5:30:00	203400	3390	0.81	-0.17	0.40	-0.24	1.88		4.55	1.79	0.79	0.08	-4.04
5/1/2003		5:35:00	203700	3395	0.91	-0.16	0.41	-0.23	1.91		4.54	1.82	0.80	0.08	-4.04
5/1/2003		5:40:00	204000	3400	0.91	-0.15	0.41	-0.22	1.94		4.53	1.86	0.82	0.08	-4.04
5/1/2003		5:45:00	204300	3405	0.91	-0.15	0.41	-0.21	1.97		4.49	1.89	0.83	0.08	-4.04
5/1/2003		5:50:00	204600	3410	0.91	-0.14	0.42	-0.20	2.00		4.48	1.93	0.84	0.08	-4.04
5/1/2003		5:55:00	204900	3415	0.91	-0.14	0.42	-0.18	2.02			1.96	0.86	0.08	-4.04
5/1/2003		6:00:00	205200	3420	0.91	-0.13	0.42	-0.17	2.05			1.99	0.87	0.08	-4.04
5/1/2003		6:05:00	205500	3425	0.91	-0.13	0.42	-0.16	2.07			2.02	0.88	0.08	-4.04
5/1/2003		6:10:00	205800	3430	0.91	-0.12	0.43	-0.15	2.10			2.05	0.89	0.08	-4.04
5/1/2003		6:15:00	206100	3435	0.91	-0.12	0.43	-0.14	2.12			2.07	0.91	0.08	-4.04
5/1/2003	6:20 AM	6:20:00	206400	3440	0.91	-0.11	0.43	-0.13	2.15			2.09	0.92	0.08	-4.04
5/1/2003		6:25:00	206700	3445	0.91	-0.11	0.44	-0.12	2.17			2.10	0.93	0.08	-4.04
5/1/2003		6:30:00	207000	3450	0.91	-0.10	0.44	-0.11	2.19			2.12	0.94	0.07	-4.04
5/1/2003		6:35:00	207300	3455	0.90	-0.10	0.44	-0.10	2.21			2.14	0.95	0.08	-4.04
5/1/2003		6:40:00	207600	3460	0.91	-0.09	0.44	-0.09	2.24			2.17	0.96	0.08	-4.04
5/1/2003		6:45:00	207900	3465	0.82	-0.09	0.45	-0.08	2.26			2.20	0.97	0.08	-4.04
5/1/2003		6:50:00	208200	3470	0.73	-0.08	0.45	-0.07	2.28			2.23	0.98	0.08	-4.04
5/1/2003		6:55:00	208500	3475	0.64	-0.08	0.45	-0.06	2.30			2.26	0.98	0.08	-4.04
5/1/2003		7:00:00	208800	3480	0.60	-0.07	0.46	-0.05	2.32			2.29	0.99	0.08	-4.04
5/1/2003		7:05:00	209100	3485	0.43	-0.07	0.46	-0.04	2.34			2.31	0.98	0.08	-4.04
5/1/2003		7:10:00	209400	3490	0.42	-0.06	0.46	-0.03	2.36			2.34	0.98	0.08	-4.04
5/1/2003		7:15:00	209700	3495	0.31	-0.06	0.47	-0.03	2.38			2.36	0.97	0.08	-4.04
5/1/2003		7:20:00	210000	3500	0.20	-0.05	0.47	-0.01	2.40			2.38	0.96	0.08	-4.04
5/1/2003		7:25:00	210300	3505	0.26	-0.05	0.47	-0.01	2.41			2.40	0.95	0.08	-4.04
5/1/2003		7:30:00	210600	3510	0.06	-0.04	0.47	0.01	2.43			2.42	0.94	0.08	-4.04
5/1/2003		7:35:00	210900	3515	-0.01	-0.04	0.48	0.02	2.45			2.43	0.93	0.08	-4.03
5/1/2003		7:40:00	211200	3520	-0.20	-0.03	0.48	0.02	2.46			2.44	0.92	0.08	-4.03
5/1/2003		7:45:00	211500	3525	-0.35	-0.03	0.48	0.03	2.48			2.46	0.90	0.08	-4.04
5/1/2003		7:50:00	211800	3530	-0.45	-0.02	0.48	0.04	2.49			2.48	0.89	0.08	-4.04
5/1/2003		7:55:00	212100	3535	-0.56	-0.02	0.49	0.05	2.51			2.49	0.88	0.08	-4.04
5/1/2003		8:00:00	212400	3540	-0.67	-0.02	0.49	0.06	2.52			2.51	0.86	0.08	-4.03
5/1/2003		8:05:00	212700	3545	-0.94	-0.01	0.49	0.07	2.54			2.53	0.85	0.08	-4.03
5/1/2003		8:10:00	213000	3550	-1.04	-0.01	0.50	0.08	2.55			2.55	0.83	0.08	-4.03
5/1/2003		8:15:00	213300	3555	-1.20	0.00	0.50	0.09	2.56			2.57	0.81	0.08	-4.03
5/1/2003		8:20:00	213600	3560	-1.31	0.00	0.50	0.10	2.58			2.59	0.79	0.08	-4.03
5/1/2003		8:25:00	213900	3565	-1.43	0.01	0.50	0.10	2.59			2.61	0.78	0.08	-4.03
5/1/2003		8:30:00	214200	3570	-1.68	0.01	0.50	0.11	2.60			2.63	0.76	0.08	-4.03
5/1/2003		8:35:00	214500	3575	-1.76	0.02	0.50	0.12	2.61			2.64	0.74	0.08	-4.03
5/1/2003		8:40:00	214800	3580	-1.95	0.02	0.49	0.13	2.61			2.66	0.72	0.08	-4.03
5/1/2003		8:45:00	215100	3585	-2.07	0.02	0.49	0.13	2.61			2.68	0.70	0.08	-4.03
5/1/2003		8:50:00	215400	3590	-2.22	0.03	0.49	0.14	2.61			2.70	0.68	0.08	-4.03
5/1/2003		8:55:00	215700	3595	-2.42	0.03	0.48	0.15	2.59			2.71	0.66	0.08	-4.03
5/1/2003		9:00:00	216000	3600	-2.68	0.04	0.46	0.16	2.54			2.72		0.08	-4.03
5/1/2003		9:05:00	216300	3605	-2.81	0.04		0.16	2.45			2.74		0.08	-4.03
5/1/2003		9:10:00	216600	3610	-2.96	0.04		0.17	2.35			2.75		0.08	-4.03
5/1/2003		9:15:00	216900	3615	-3.19	0.05		0.18	2.24			2.75		0.08	-4.03
5/1/2003		9:20:00	217200	3620	-3.38	0.05		0.19	2.09			2.75		0.08	-4.03
5/1/2003		9:25:00	217500	3625	-3.49	0.06		0.19	1.96			2.73		0.08	-4.03
5/1/2003		9:30:00	217800	3630	-3.71	0.06		0.20	1.84			2.71		0.08	-4.03
5/1/2003		9:35:00	218100	3635	-3.87	0.06		0.20	1.72			2.69		0.08	-4.03

PNS SITE 32 TIDAL STUDY DATA - APRIL 2003

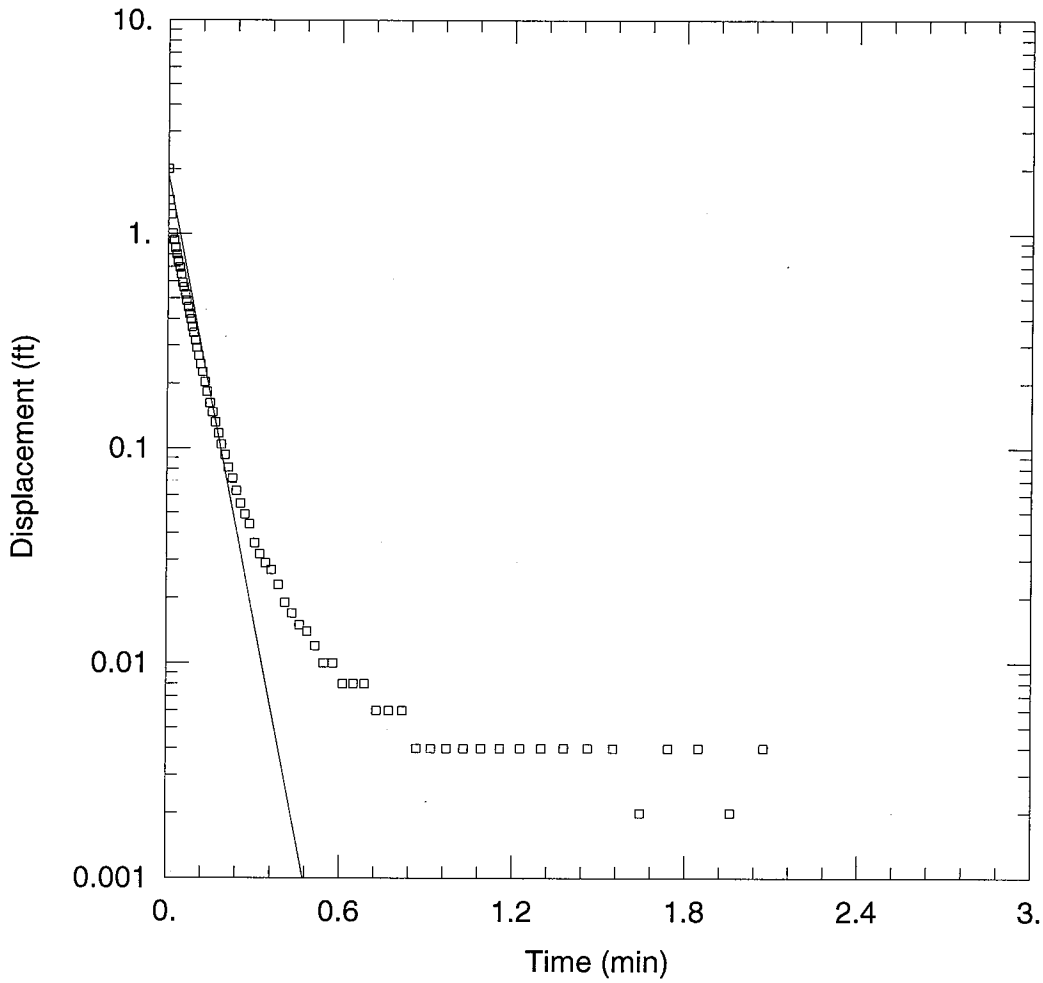
Date	Seavey Is. Low Tide	Time	ET (sec)	ET (min)	Stilling Well Feet H2O	FA01 Feet H2O	MW02 Feet H2O	MW03 Feet H2O	MW04 Feet H2O	MW05 Feet H2O	MW07 Feet H2O	MW08 Feet H2O	MW10 Feet H2O	MW09 Feet H2O	MW01 Feet H2O
5/1/2003		9:40:00	218400	3640	-4.07	0.07		0.21	1.59			2.66		0.08	-4.03
5/1/2003		9:45:00	218700	3645	-4.26	0.07		0.21	1.47			2.63			-4.03
5/1/2003		9:50:00	219000	3650	-4.40	0.07		0.22	1.35			2.60			-4.03
5/1/2003		9:55:00	219300	3655	-4.58	0.08		0.22	1.24			2.55			-4.03
5/1/2003		10:00:00	219600	3660	-4.76	0.08		0.23	1.12			2.50			-4.03
5/1/2003		10:05:00	219900	3665	-4.89	0.08		0.23				2.42			-4.03
5/1/2003		10:10:00	220200	3670	-5.06	0.08		0.23				2.36			-4.03
5/1/2003		10:15:00	220500	3675	-5.23	0.08		0.22				2.30			-4.02
5/1/2003		10:20:00	220800	3680	-5.37	0.08		0.21				2.23			-4.02
5/1/2003		10:25:00	221100	3685	-5.52	0.08						2.16			-4.02
5/1/2003		10:30:00	221400	3690	-5.68	0.08						2.00			-4.02
5/1/2003		10:35:00	221700	3695	-5.85	0.07						1.90			-4.02
5/1/2003		10:40:00	222000	3700	-6.02	0.07						1.84			-4.02
5/1/2003		10:45:00	222300	3705	-6.08	0.06						1.77			-4.02
5/1/2003		10:50:00	222600	3710	-6.23	0.06						1.71			-4.03
5/1/2003		10:55:00	222900	3715	-6.29	0.05						1.65			-4.02
5/1/2003		11:00:00	223200	3720	-6.39	0.05						1.59			-4.03
5/1/2003		11:05:00	223500	3725	-6.46	0.04						1.54			-4.02
5/1/2003		11:10:00	223800	3730	-6.62	0.03						1.48			-4.02
5/1/2003		11:15:00	224100	3735	-6.73	0.02						1.42			-4.02
5/1/2003		11:20:00	224400	3740	-6.77	0.02						1.36			-4.02
5/1/2003		11:25:00	224700	3745	-6.95	0.01									-4.02
5/1/2003		11:30:00	225000	3750	-6.91	0.00									-4.02
5/1/2003		11:35:00	225300	3755	-7.02	-0.01									-4.02
5/1/2003		11:40:00	225600	3760	-7.05	-0.02									-4.03
5/1/2003		11:45:00	225900	3765	-7.16	-0.03									-4.03
5/1/2003		11:50:00	226200	3770	-7.19	-0.04									-4.02
5/1/2003		11:55:00	226500	3775	-7.28	-0.05									-4.02
5/1/2003		12:00:00	226800	3780	-7.29	-0.06									-4.02
5/1/2003		12:05:00	227100	3785	-7.32	-0.07									-4.02
5/1/2003		12:10:00	227400	3790	-7.31	-0.09									-4.02
5/1/2003		12:15:00	227700	3795	-7.38	-0.10									-4.02
5/1/2003		12:20:00	228000	3800	-7.38	-0.11									-4.02
5/1/2003		12:25:00	228300	3805	-7.32	-0.12									-4.02
5/1/2003		12:30:00	228600	3810	-7.28	-0.10									-4.02
5/1/2003		12:35:00	228900	3815	-7.37										-4.03
5/1/2003		12:40:00	229200	3820	-7.25										-4.02
5/1/2003		12:45:00	229500	3825	-7.29										-4.02
5/1/2003		12:50:00	229800	3830	-7.27										-4.03
5/1/2003		12:55:00	230100	3835	-7.24										
5/1/2003		13:00:00	230400	3840	-7.18										
5/1/2003		13:05:00	230700	3845	-7.20										
5/1/2003		13:10:00	231000	3850	-7.09										
5/1/2003		13:15:00	231300	3855	-7.10										
5/1/2003		13:20:00	231600	3860	-6.98										
5/1/2003		13:25:00	231900	3865	-6.94										
5/1/2003		13:30:00	232200	3870	-6.89										
5/1/2003		13:35:00	232500	3875	-6.82										
5/1/2003		13:40:00	232800	3880	-6.74										
5/1/2003		13:45:00	233100	3885	-6.60										
5/1/2003		13:50:00	233400	3890	-6.46										
5/1/2003		13:55:00	233700	3895	-6.33										

PNS SITE 32 TIDAL STUDY DATA - APRIL 2003

	Seavey Is.				Stilling Well	FA01	MW02	MW03	MW04	MW05	MW07	MW08	MW10	MW09	MW01
Date	Low Tide	Time	ET (sec)	ET (min)	Feet H2O	Feet H2O	Feet H2O	Feet H2O	Feet H2O	Feet H2O	Feet H2O	Feet H2O	Feet H2O	Feet H2O	Feet H2O
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/1/2003		14:00:00	234000	3900	-6.23										
5/1/2003		14:05:00	234300	3905	-6.02										
5/1/2003		14:10:00	234600	3910	-5.94										
				MIN	-8.06	-0.46	-0.14	-1.66	-2.24	-0.18	-0.60	-0.33	-0.23	0.00	-4.18
	18:26			MAX	0.91	0.09	0.50	0.24	2.61	0.12	4.57	2.75	0.99	0.08	0.00
				RANGE	8.97	0.55	0.64	1.90	4.85	0.30	5.17	3.08	1.21	0.09	4.18
				TIDALLY INFLUENCED		YES	YES	YES	YES	YES	YES	YES	YES	NO	NO
NOTE: MW01 - transducer installed immediately after well dewatered,															


PNS SITE 32 TIDAL STUDY
WATER LEVEL (feet)
ELAPSED TIME (minutes)
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
-3.00
-4.00
-5.00
-6.00
-7.00
-8.00
0
120
240
360
480
600
720
840
960
1080
1200
1320
1440
1560
1680
1800
1920
2040
2160
2280
2400
2520
2640
2760
2880
3000
3120
3240
3360
3480
3600
3720
3840
3960
4080
4200
MW07
MW04
MW08
MW10
MW09
MW02
FA01
MW03
MW05
MW01
Stilling Well
Stilling Well
FA01
MW02
MW03
MW04
MW05
MW07
MW09
MW10
MW08
MW01

A.4 SLUG TESTS



SITE 32 - TP-MW02 - RISING HEAD

Data Set: F:\Portsmouth Site 32 - Stage I Modeling\TP-MW02_081709sra.aqt
Date: 08/17/09 Time: 17:43:59

PROJECT INFORMATION

Company: Tetra Tech NUS, Inc.
Client: Navy
Project: 112G00332.0000.0806
Location: Portsmouth Naval Shipyard
Test Well: TP-MW02
Test Date: May 1, 2003

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AQUIFER DATA

Saturated Thickness: 19.64 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (TP-MW02)

Initial Displacement: 2. ft
Total Well Penetration Depth: 4.84 ft
Casing Radius: 0.0833 ft
Static Water Column Height: 4.84 ft
Screen Length: 10. ft
Wellbore Radius: 0.3333 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 80.51 ft/day
y0 = 1.897 ft

In-Situ Inc. MiniTroll Pro **TP-MW02**

Report generated: 5/2/2003 13:31:42
Report from file: ...\SN04298 2003-05-01 090447 Test #2.bin
Win-Situ Version 4.4

Serial number: 4298
Firmware Version 3.06
Unit name: 4937-mw02

Test name: Test #2

Test defined on: 5/1/2003 9:01:25
Test started on: 5/1/2003 9:04:47
Test stopped on: N/A N/A
Test extracted on: N/A N/A

Data gathered using Logarithmic testing
Maximum time between data points: 600.0 Seconds.
Number of data samples: 74

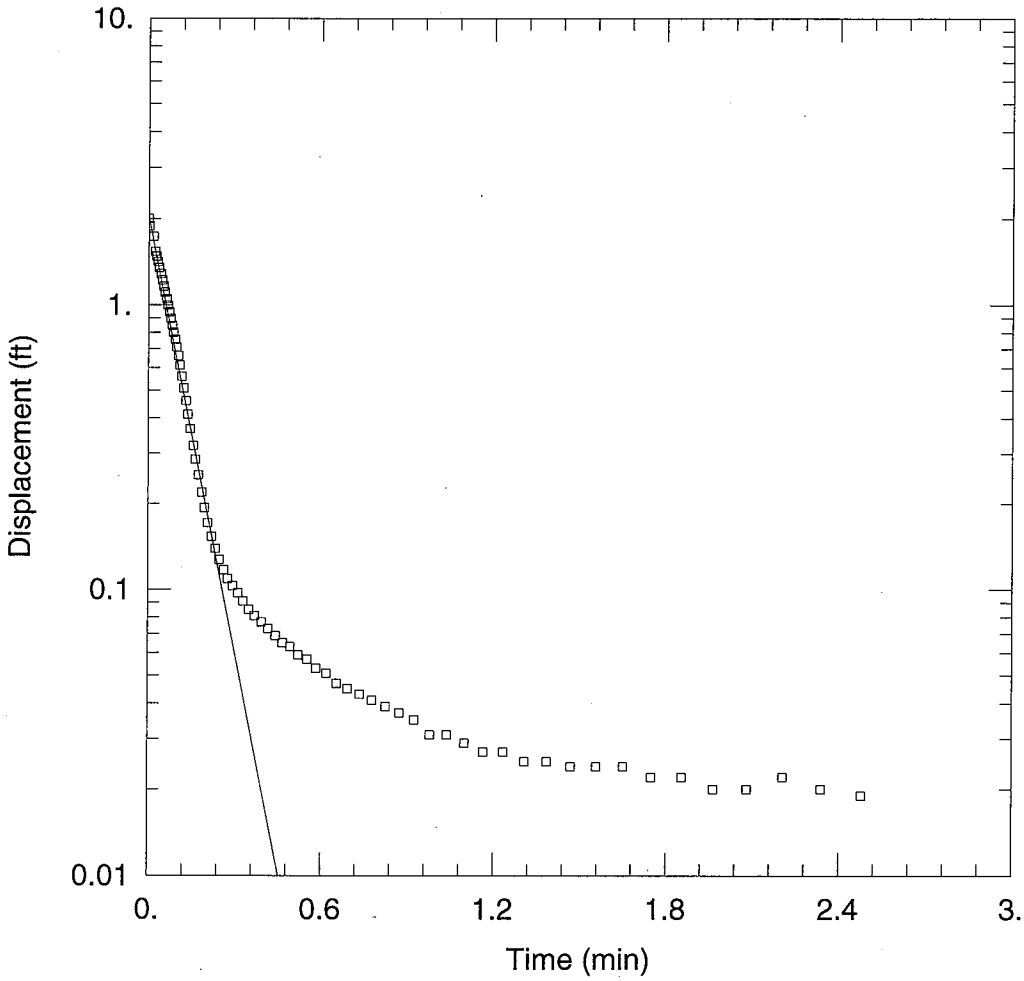
TOTAL DATA SAMPLES 74

Channel number [1]
Measurement type: Temperature
Channel name: Temperature

Channel number [2]
Measurement type: Pressure
Channel name: Pressure
Sensor Range: 30 PSIG.
Specific gravity: 1
Mode: TOC
User-defined reference: 0 Feet H2O
Referenced on: test start
Pressure head at reference: 4.559 Feet H2O

TP-MW02 Date	Time	ET (sec)	Corrected ET(sec)	Chan[2] Feet H2O	Chan[1] Fahrenheit	H/H0
5/1/2003	9:04:47	0		0	53.04	
5/1/2003	9:04:47	0.3		0.04	53.07	
5/1/2003	9:04:48	0.6	0	2.277	53.07	1.00
5/1/2003	9:04:48	0.9	0.3	1.432	53.07	0.72
5/1/2003	9:04:48	1.2	0.6	1.23	53.09	0.62
5/1/2003	9:04:48	1.5	0.9	1.001	53.09	0.50
5/1/2003	9:04:49	1.8	1.2	0.934	53.09	0.47
5/1/2003	9:04:49	2.1	1.5	0.86	53.09	0.43
5/1/2003	9:04:49	2.4	1.8	0.8	53.09	0.40
5/1/2003	9:04:50	2.7	2.1	0.745	53.11	0.37
5/1/2003	9:04:50	3	2.4	0.696	53.11	0.35
5/1/2003	9:04:50	3.3	2.7	0.647	53.11	0.32
5/1/2003	9:04:51	3.6	3	0.589	53.11	0.29
5/1/2003	9:04:51	3.9	3.3	0.561	53.11	0.28
5/1/2003	9:04:51	4.2	3.6	0.52	53.11	0.26
5/1/2003	9:04:51	4.5	3.9	0.486	53.11	0.24
5/1/2003	9:04:52	4.8	4.2	0.454	53.11	0.23

TP-MW02 Date	Time	ET (sec)	Corrected ET(sec)	Chan[2] Feet H2O	Chan[1] Fahrenheit	H/H0
5/1/2003	9:04:52	5.1	4.5	0.422	53.11	0.21
5/1/2003	9:04:52	5.4	4.8	0.398	53.11	0.20
5/1/2003	9:04:53	5.7	5.1	0.368	53.11	0.18
5/1/2003	9:04:53	6	5.4	0.344	53.11	0.17
5/1/2003	9:04:53	6.4	5.8	0.317	53.11	0.16
5/1/2003	9:04:54	6.7	6.1	0.293	53.14	0.15
5/1/2003	9:04:54	7.1	6.5	0.269	53.14	0.13
5/1/2003	9:04:55	7.5	6.9	0.246	53.14	0.12
5/1/2003	9:04:55	8	7.4	0.226	53.14	0.11
5/1/2003	9:04:55	8.4	7.8	0.203	53.14	0.10
5/1/2003	9:04:56	8.9	8.3	0.183	53.14	0.09
5/1/2003	9:04:56	9.5	8.9	0.162	53.14	0.08
5/1/2003	9:04:57	10	9.4	0.147	53.11	0.07
5/1/2003	9:04:58	10.6	10	0.132	53.11	0.07
5/1/2003	9:04:58	11.3	10.7	0.117	53.11	0.06
5/1/2003	9:04:59	11.9	11.3	0.104	53.11	0.05
5/1/2003	9:05:00	12.6	12	0.093	53.11	0.05
5/1/2003	9:05:00	13.4	12.8	0.081	53.11	0.04
5/1/2003	9:05:01	14.2	13.6	0.072	53.11	0.04
5/1/2003	9:05:02	15	14.4	0.063	53.11	0.03
5/1/2003	9:05:03	15.9	15.3	0.055	53.09	0.03
5/1/2003	9:05:04	16.8	16.2	0.049	53.09	0.02
5/1/2003	9:05:05	17.8	17.2	0.044	53.09	0.02
5/1/2003	9:05:06	18.9	18.3	0.036	53.09	0.02
5/1/2003	9:05:07	20	19.4	0.032	53.09	0.02
5/1/2003	9:05:08	21.2	20.6	0.029	53.09	0.01
5/1/2003	9:05:09	22.4	21.8	0.027	53.09	0.01
5/1/2003	9:05:11	23.8	23.2	0.023	53.09	0.01
5/1/2003	9:05:12	25.2	24.6	0.019	53.09	0.01
5/1/2003	9:05:14	26.7	26.1	0.017	53.09	0.01
5/1/2003	9:05:15	28.2	27.6	0.015	53.09	0.01
5/1/2003	9:05:17	29.8	29.2	0.014	53.09	0.01
5/1/2003	9:05:18	31.5	30.9	0.012	53.09	0.01
5/1/2003	9:05:20	33.3	32.7	0.01	53.09	0.01
5/1/2003	9:05:22	35.2	34.6	0.01	53.09	0.01
5/1/2003	9:05:24	37.3	36.7	0.008	53.09	0.00
5/1/2003	9:05:26	39.5	38.9	0.008	53.09	0.00
5/1/2003	9:05:29	41.8	41.2	0.008	53.09	0.00
5/1/2003	9:05:31	44.3	43.7	0.006	53.09	0.00
5/1/2003	9:05:34	46.9	46.3	0.006	53.09	0.00
5/1/2003	9:05:37	49.7	49.1	0.006	53.09	0.00
5/1/2003	9:05:40	52.6	52	0.004	53.07	0.00
5/1/2003	9:05:43	55.7	55.1	0.004	53.09	0.00
5/1/2003	9:05:46	59	58.4	0.004	53.07	0.00
5/1/2003	9:05:49	62.5	61.9	0.004	53.09	0.00
5/1/2003	9:05:53	66.2	65.6	0.004	53.07	0.00
5/1/2003	9:05:57	70.1	69.5	0.004	53.07	0.00
5/1/2003	9:06:01	74.3	73.7	0.004	53.07	0.00
5/1/2003	9:06:06	78.7	78.1	0.004	53.07	0.00
5/1/2003	9:06:10	83.4	82.8	0.004	53.07	0.00
5/1/2003	9:06:15	88.4	87.8	0.004	53.07	0.00
5/1/2003	9:06:21	93.7	93.1	0.004	53.07	0.00
5/1/2003	9:06:26	99.3	98.7	0.002	53.07	0.00
5/1/2003	9:06:32	105.2	104.6	0.004	53.07	0.00
5/1/2003	9:06:38	111.5	110.9	0.004	53.07	0.00
5/1/2003	9:06:45	118.1	117.5	0.002	53.07	0.00
5/1/2003	9:06:52	125.1	124.5	0.004	53.07	0.00



SITE 32 - TP-MW03 - RISING HEAD

Data Set: F:\Portsmouth Site 32 - Stage I Modeling\TP-MW03_081709sra.aqt
Date: 08/17/09 Time: 17:44:05

PROJECT INFORMATION

Company: Tetra Tech NUS, Inc.
Client: Navy
Project: 112G00~~332~~.0000.0~~806~~ 383 802
Location: Portsmouth Naval Shipyard
Test Well: TP-MW03
Test Date: May 1, 2003

AQUIFER DATA

Saturated Thickness: 7.17 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (TP-MW03)

Initial Displacement: 2. ft
Total Well Penetration Depth: 6.67 ft
Casing Radius: 0.0833 ft
Static Water Column Height: 6.67 ft
Screen Length: 10. ft
Wellbore Radius: 0.3333 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 70.81 ft/day
y0 = 2.019 ft

In-Situ Inc. MiniTroll Pro TP-MW03

Report generated: 5/2/2003 13:32:50
Report from file: ...\SN05192 2003-05-01 102616 Test #2.bin
Win-Situ Version 4.4

Serial number: 5192
Firmware Version 3.06
Unit name: 5023-mw03

Test name: Test #2

Test defined on: 5/1/2003 10:23:20
Test started on: 5/1/2003 10:26:16
Test stopped on: 5/1/2003 10:28:53
Test extracted on: N/A N/A

Data gathered using Logarithmic testing
Maximum time between data points: 600.0 Seconds.
Number of data samples: 77

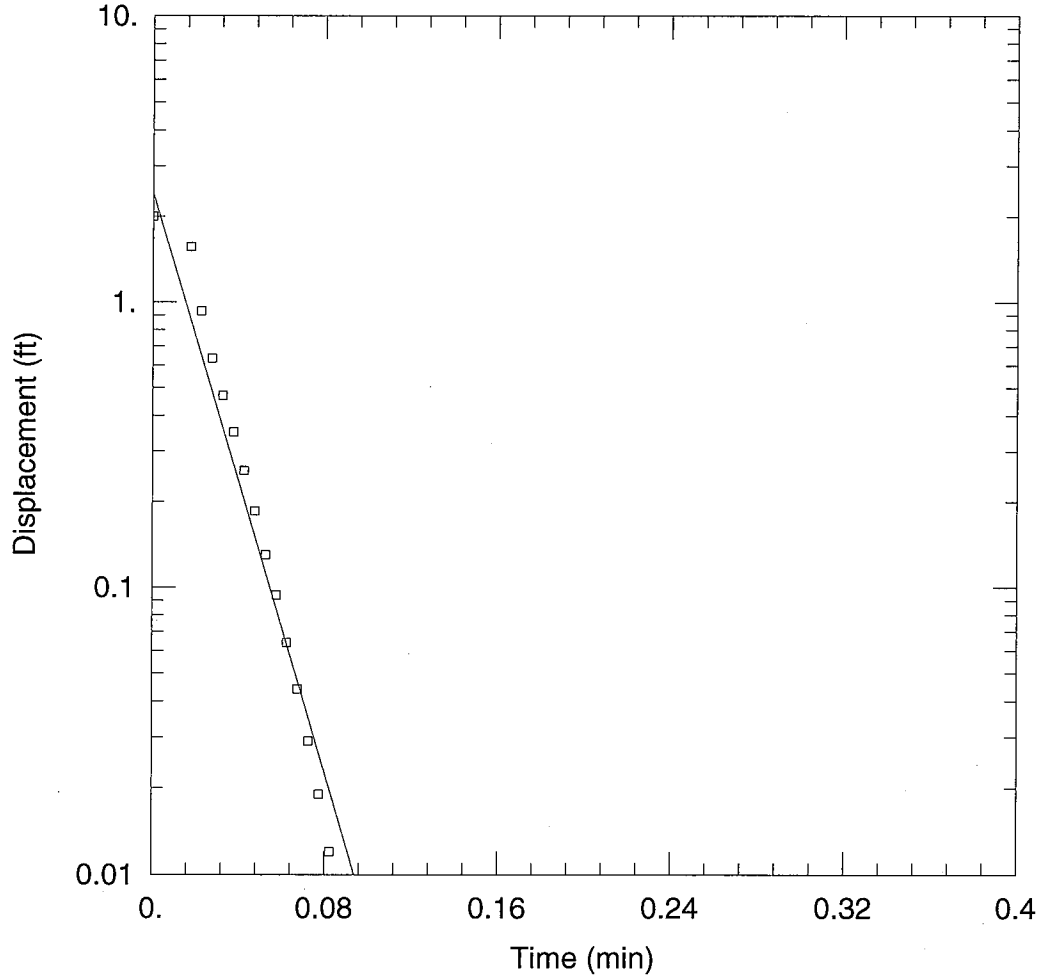
TOTAL DATA SAMPLES 77

Channel number [1]
Measurement type: Temperature
Channel name: Temperature

Channel number [2]
Measurement type: Pressure
Channel name: Pressure
Sensor Range: 30 PSIG.
Specific gravity: 1
Mode: TOC
User-defined reference: 0 Feet H2O
Referenced on: test start
Pressure head at reference: 6.186 Feet H2O

TP-MW03 Date	Time	ET (sec)	Chan[1] Fahrenheit	Chan[2] Feet H2O	Corrected Elapsed time (sec)	H/Ho	
5/1/2003	10:26:16	0	46.2	0			
		0.15		2	0	1.00	Estimate
5/1/2003	10:26:16	0.3	46.25	1.884			Water level oscillating
5/1/2003	10:26:17	0.6	46.25	4.729			Water level oscillating
5/1/2003	10:26:17	0.9	46.25	1.235			Water level oscillating
5/1/2003	10:26:17	1.2	46.27	1.73	1.05	0.87	
5/1/2003	10:26:18	1.5	46.27	1.536	1.35	0.77	
5/1/2003	10:26:18	1.8	46.27	1.476	1.65	0.74	
5/1/2003	10:26:18	2.1	46.27	1.414	1.95	0.71	
5/1/2003	10:26:18	2.4	46.27	1.347	2.25	0.67	
5/1/2003	10:26:19	2.7	46.27	1.283	2.55	0.64	
5/1/2003	10:26:19	3	46.27	1.219	2.85	0.61	
5/1/2003	10:26:19	3.3	46.27	1.161	3.15	0.58	
5/1/2003	10:26:20	3.6	46.27	1.105	3.45	0.55	
5/1/2003	10:26:20	3.9	46.29	1.049	3.75	0.52	
5/1/2003	10:26:20	4.2	46.29	0.997	4.05	0.50	
5/1/2003	10:26:21	4.5	46.29	0.945	4.35	0.47	
5/1/2003	10:26:21	4.8	46.29	0.895	4.65	0.45	
5/1/2003	10:26:21	5.1	46.29	0.845	4.95	0.42	
5/1/2003	10:26:21	5.4	46.29	0.799	5.25	0.40	
5/1/2003	10:26:22	5.7	46.29	0.755	5.55	0.38	
5/1/2003	10:26:22	6	46.29	0.71	5.85	0.36	
5/1/2003	10:26:22	6.4	46.29	0.662	6.25	0.33	
5/1/2003	10:26:23	6.7	46.29	0.612	6.55	0.31	
5/1/2003	10:26:23	7.1	46.29	0.56	6.95	0.28	
5/1/2003	10:26:24	7.5	46.29	0.51	7.35	0.26	
5/1/2003	10:26:24	8	46.29	0.46	7.85	0.23	
5/1/2003	10:26:25	8.4	46.29	0.412	8.25	0.21	
5/1/2003	10:26:25	8.9	46.29	0.366	8.75	0.18	

TP-MW03 Date	Time	ET (sec)	Chan[1] Fahrenheit	Chan[2] Feet H2O	Corrected Elapsed time (sec)	H/Ho
5/1/2003	10:26:26	9.5	46.29	0.32	9.35	0.16
5/1/2003	10:26:26	10	46.29	0.286	9.85	0.14
5/1/2003	10:26:27	10.6	46.29	0.252	10.45	0.13
5/1/2003	10:26:27	11.3	46.27	0.219	11.15	0.11
5/1/2003	10:26:28	11.9	46.27	0.193	11.75	0.10
5/1/2003	10:26:29	12.6	46.27	0.171	12.45	0.09
5/1/2003	10:26:29	13.4	46.27	0.153	13.25	0.08
5/1/2003	10:26:30	14.2	46.27	0.139	14.05	0.07
5/1/2003	10:26:31	15	46.27	0.127	14.85	0.06
5/1/2003	10:26:32	15.9	46.27	0.117	15.75	0.06
5/1/2003	10:26:33	16.8	46.27	0.109	16.65	0.05
5/1/2003	10:26:34	17.8	46.27	0.103	17.65	0.05
5/1/2003	10:26:35	18.9	46.27	0.097	18.75	0.05
5/1/2003	10:26:36	20	46.27	0.091	19.85	0.05
5/1/2003	10:26:37	21.2	46.27	0.085	21.05	0.04
5/1/2003	10:26:39	22.4	46.27	0.081	22.25	0.04
5/1/2003	10:26:40	23.8	46.27	0.077	23.65	0.04
5/1/2003	10:26:41	25.2	46.27	0.073	25.05	0.04
5/1/2003	10:26:43	26.7	46.27	0.069	26.55	0.03
5/1/2003	10:26:44	28.2	46.27	0.065	28.05	0.03
5/1/2003	10:26:46	29.8	46.27	0.063	29.65	0.03
5/1/2003	10:26:48	31.5	46.27	0.059	31.35	0.03
5/1/2003	10:26:49	33.3	46.29	0.057	33.15	0.03
5/1/2003	10:26:51	35.2	46.29	0.053	35.05	0.03
5/1/2003	10:26:53	37.3	46.29	0.051	37.15	0.03
5/1/2003	10:26:56	39.5	46.29	0.047	39.35	0.02
5/1/2003	10:26:58	41.8	46.29	0.045	41.65	0.02
5/1/2003	10:27:00	44.3	46.29	0.043	44.15	0.02
5/1/2003	10:27:03	46.9	46.29	0.041	46.75	0.02
5/1/2003	10:27:06	49.7	46.29	0.039	49.55	0.02
5/1/2003	10:27:09	52.6	46.29	0.037	52.45	0.02
5/1/2003	10:27:12	55.7	46.29	0.035	55.55	0.02
5/1/2003	10:27:15	59	46.29	0.031	58.85	0.02
5/1/2003	10:27:19	62.5	46.29	0.031	62.35	0.02
5/1/2003	10:27:22	66.2	46.32	0.029	66.05	0.01
5/1/2003	10:27:26	70.1	46.32	0.027	69.95	0.01
5/1/2003	10:27:30	74.3	46.32	0.027	74.15	0.01
5/1/2003	10:27:35	78.7	46.32	0.025	78.55	0.01
5/1/2003	10:27:39	83.4	46.32	0.025	83.25	0.01
5/1/2003	10:27:44	88.4	46.34	0.024	88.25	0.01
5/1/2003	10:27:50	93.7	46.34	0.024	93.55	0.01
5/1/2003	10:27:55	99.3	46.34	0.024	99.15	0.01
5/1/2003	10:28:01	105.2	46.34	0.022	105.05	0.01
5/1/2003	10:28:08	111.5	46.36	0.022	111.35	0.01
5/1/2003	10:28:14	118.1	46.34	0.02	117.95	0.01
5/1/2003	10:28:21	125.1	46.34	0.02	124.95	0.01
5/1/2003	10:28:29	132.6	46.34	0.022	132.45	0.01
5/1/2003	10:28:37	140.5	46.34	0.02	140.35	0.01
5/1/2003	10:28:45	148.9	46.32	0.019	148.75	0.01



SITE 32 - TP-MW04 - RISING HEAD

Data Set: F:\Portsmouth Site 32 - Stage I Modeling\TP-MW04_081709sra.aqt
Date: 08/17/09 Time: 17:44:09

PROJECT INFORMATION

Company: Tetra Tech NUS, Inc.
Client: Navy
Project: 112G00~~332~~.0000.0~~806~~ 383 802
Location: Portsmouth Naval Shipyard
Test Well: TP-MW04
Test Date: May 1, 2003

AQUIFER DATA

Saturated Thickness: 37.72 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (TP-MW04)

Initial Displacement: 2. ft
Total Well Penetration Depth: 6.22 ft
Casing Radius: 0.0833 ft
Static Water Column Height: 6.22 ft
Screen Length: 10. ft
Wellbore Radius: 0.3333 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 310.1 ft/day
y0 = 2.406 ft

In-Situ Inc. MiniTroll Pro **TP-MW04**

Report generated: 5/2/2003 13:40:18
Report from file: ...\SN08070 2003-05-01 100733 Test #2.bin
Win-Situ Version 4.4

Serial number: 8070
Firmware Version 3.06
Unit name: 5350-mw04

Test name: Test #2

Test defined on: 5/1/2003 10:04:03
Test started on: 5/1/2003 10:07:33
Test stopped on: 5/1/2003 10:10:15
Test extracted on: N/A N/A

Data gathered using Logarithmic testing
Maximum time between data points: 600.0 Seconds.
Number of data samples: 78

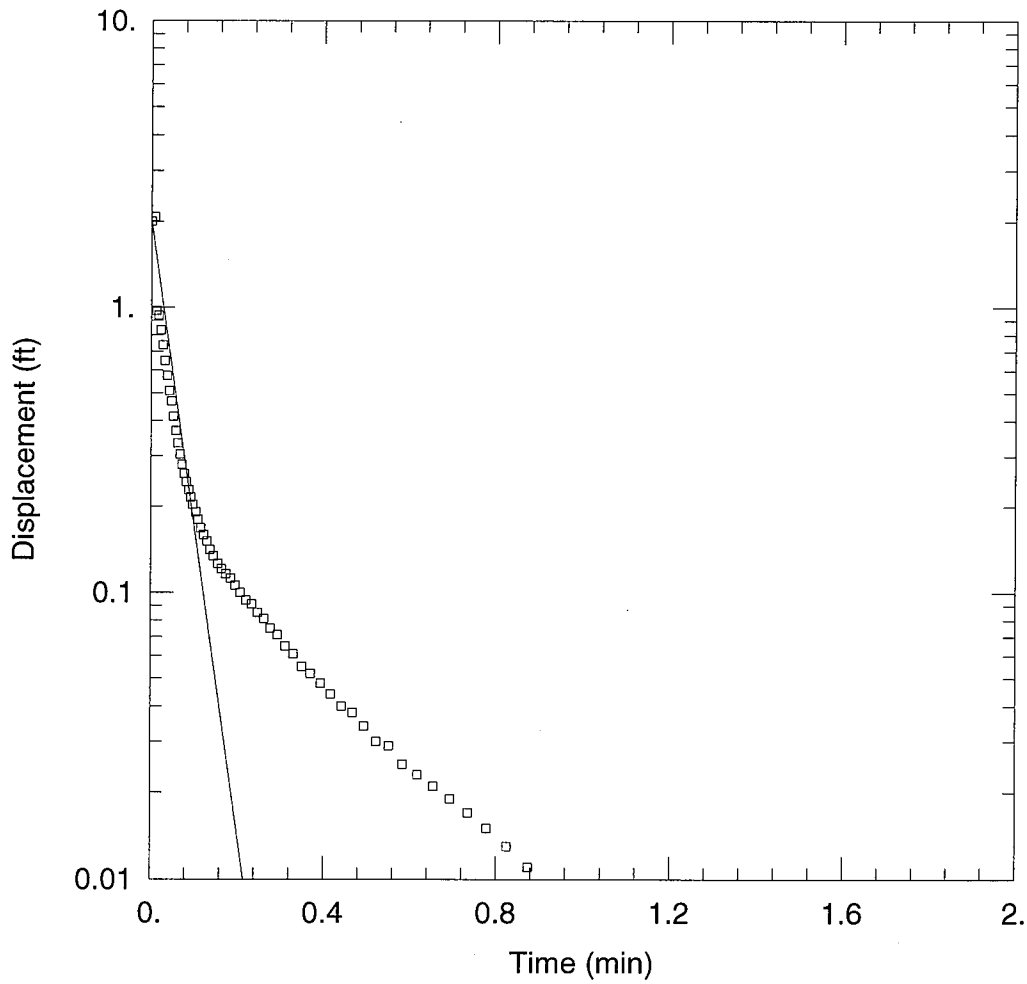
TOTAL DATA SAMPLES 78

Channel number [1]
Measurement type: Temperature
Channel name: Temperature

Channel number [2]
Measurement type: Pressure
Channel name: Pressure
Sensor Range: 30 PSIG.
Specific gravity: 1
Mode: TOC
User-defined reference: 0 Feet H2O
Referenced on: test start
Pressure head at reference: 6.631 Feet H2O

TP-MW04 Date	Time	ET (sec)	Chan[1] Fahrenheit	Chan[2] Feet H2O	Corrected Elapsed time (sec)	H/Ho	
5/1/2003	10:07:33	0	42.95	0			
		0.15		2	0	1.00	Estimate
5/1/2003	10:07:33	0.3	42.99	0.525			Water level oscillating
5/1/2003	10:07:33	0.6	42.99	3.97			Water level oscillating
5/1/2003	10:07:34	0.9	42.99	2.728			Water level oscillating
5/1/2003	10:07:34	1.2	42.99	1.564	1.05	0.78	
5/1/2003	10:07:34	1.5	43.01	0.93	1.35	0.47	
5/1/2003	10:07:34	1.8	43.01	0.635	1.65	0.32	
5/1/2003	10:07:35	2.1	43.01	0.47	1.95	0.24	
5/1/2003	10:07:35	2.4	43.01	0.35	2.25	0.18	
5/1/2003	10:07:35	2.7	43.01	0.256	2.55	0.13	
5/1/2003	10:07:36	3	43.01	0.185	2.85	0.09	
5/1/2003	10:07:36	3.3	43.01	0.13	3.15	0.07	
5/1/2003	10:07:36	3.6	43.04	0.094	3.45	0.05	
5/1/2003	10:07:37	3.9	43.04	0.064	3.75	0.03	
5/1/2003	10:07:37	4.2	43.04	0.044	4.05	0.02	
5/1/2003	10:07:37	4.5	43.04	0.029	4.35	0.01	
5/1/2003	10:07:37	4.8	43.04	0.019	4.65	0.01	
5/1/2003	10:07:38	5.1	43.04	0.012	4.95	0.01	
5/1/2003	10:07:38	5.4	43.04	0.006	5.25	0.00	
5/1/2003	10:07:38	5.7	43.04	0.001	5.55	0.00	
5/1/2003	10:07:39	6	43.04	-0.001	5.85	0.00	
5/1/2003	10:07:39	6.4	43.04	-0.005	6.25	0.00	
5/1/2003	10:07:39	6.7	43.04	-0.005	6.55	0.00	
5/1/2003	10:07:40	7.1	43.04	-0.007	6.95	0.00	
5/1/2003	10:07:40	7.5	43.04	-0.009	7.35	0.00	
5/1/2003	10:07:41	8	43.04	-0.011	7.85	-0.01	
5/1/2003	10:07:41	8.4	43.04	-0.011	8.25	-0.01	

TP-MW04 Date	Time	ET (sec)	Chan[1] Fahrenheit	Chan[2] Feet H2O	Corrected Elapsed time (sec)	H/Ho
5/1/2003	10:07:42	8.9	43.04	-0.014	8.75	-0.01
5/1/2003	10:07:42	9.5	43.04	-0.014	9.35	-0.01
5/1/2003	10:07:43	10	43.04	-0.009	9.85	0.00
5/1/2003	10:07:43	10.6	43.01	-0.01	10.45	-0.01
5/1/2003	10:07:44	11.3	43.01	-0.001	11.15	0.00
5/1/2003	10:07:45	11.9	43.01	-0.01	11.75	-0.01
5/1/2003	10:07:45	12.6	43.01	-0.01	12.45	-0.01
5/1/2003	10:07:46	13.4	43.01	-0.007	13.25	0.00
5/1/2003	10:07:47	14.2	43.01	-0.007	14.05	0.00
5/1/2003	10:07:48	15	43.01	-0.01	14.85	-0.01
5/1/2003	10:07:49	15.9	43.01	-0.01	15.75	-0.01
5/1/2003	10:07:49	16.8	43.01	-0.01	16.65	-0.01
5/1/2003	10:07:50	17.8	43.01	-0.01	17.65	-0.01
5/1/2003	10:07:52	18.9	43.01	-0.01	18.75	-0.01
5/1/2003	10:07:53	20	43.01	-0.01	19.85	-0.01
5/1/2003	10:07:54	21.2	42.99	-0.01	21.05	-0.01
5/1/2003	10:07:55	22.4	42.99	-0.01	22.25	-0.01
5/1/2003	10:07:56	23.8	42.99	-0.01	23.65	-0.01
5/1/2003	10:07:58	25.2	43.01	-0.01	25.05	-0.01
5/1/2003	10:07:59	26.7	42.99	-0.012	26.55	-0.01
5/1/2003	10:08:01	28.2	42.99	-0.012	28.05	-0.01
5/1/2003	10:08:02	29.8	43.01	-0.012	29.65	-0.01
5/1/2003	10:08:04	31.5	43.01	-0.012	31.35	-0.01
5/1/2003	10:08:06	33.3	42.99	-0.012	33.15	-0.01
5/1/2003	10:08:08	35.2	42.99	-0.014	35.05	-0.01
5/1/2003	10:08:10	37.3	42.99	-0.014	37.15	-0.01
5/1/2003	10:08:12	39.5	42.99	-0.014	39.35	-0.01
5/1/2003	10:08:14	41.8	42.99	-0.016	41.65	-0.01
5/1/2003	10:08:17	44.3	42.99	-0.016	44.15	-0.01
5/1/2003	10:08:20	46.9	42.99	-0.016	46.75	-0.01
5/1/2003	10:08:22	49.7	42.99	-0.019	49.55	-0.01
5/1/2003	10:08:25	52.6	42.99	-0.019	52.45	-0.01
5/1/2003	10:08:28	55.7	42.99	-0.021	55.55	-0.01
5/1/2003	10:08:32	59	42.99	-0.021	58.85	-0.01
5/1/2003	10:08:35	62.5	42.99	-0.021	62.35	-0.01
5/1/2003	10:08:39	66.2	42.99	-0.023	66.05	-0.01
5/1/2003	10:08:43	70.1	42.99	-0.025	69.95	-0.01
5/1/2003	10:08:47	74.3	42.99	-0.025	74.15	-0.01
5/1/2003	10:08:51	78.7	42.99	-0.027	78.55	-0.01
5/1/2003	10:08:56	83.4	42.99	-0.027	83.25	-0.01
5/1/2003	10:09:01	88.4	42.99	-0.029	88.25	-0.01
5/1/2003	10:09:06	93.7	42.99	-0.031	93.55	-0.02
5/1/2003	10:09:12	99.3	42.99	-0.034	99.15	-0.02
5/1/2003	10:09:18	105.2	43.01	-0.035	105.05	-0.02
5/1/2003	10:09:24	111.5	43.04	-0.037	111.35	-0.02
5/1/2003	10:09:31	118.1	43.08	-0.041	117.95	-0.02
5/1/2003	10:09:38	125.1	43.1	-0.042	124.95	-0.02
5/1/2003	10:09:45	132.6	43.15	-0.046	132.45	-0.02
5/1/2003	10:09:53	140.5	43.22	-0.047	140.35	-0.02
5/1/2003	10:10:02	148.9	43.24	-0.049	148.75	-0.02
5/1/2003	10:10:10	157.8	43.31	-0.05	157.65	-0.03



SITE 32 - TP-MW05 - RISING HEAD

Data Set: F:\Portsmouth Site 32 - Stage I Modeling\TP-MW05_081709sra.aqt
Date: 08/17/09 Time: 17:44:14

PROJECT INFORMATION

Company: Tetra Tech NUS, Inc.
Client: Navy 383 802
Project: 112G00~~332~~.0000.0~~806~~
Location: Portsmouth Naval Shipyard
Test Well: TP-MW05
Test Date: April 30, 2003

AQUIFER DATA

Saturated Thickness: 27.6 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (TP-MW05)

Initial Displacement: 2. ft
Total Well Penetration Depth: 6.5 ft
Casing Radius: 0.0833 ft
Static Water Column Height: 6.5 ft
Screen Length: 10. ft
Wellbore Radius: 0.3333 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 133.3 ft/day
y0 = 2.001 ft

In-Situ Inc. MiniTroll Pro TP-MW05

Report generated: 5/2/2003 13:39:24
Report from file: ...\SN05621 2003-04-30 181730 Test #2.bin
Win-Situ Version 4.4

Serial number: 5621
Firmware Version 3.06
Unit name: 4642-mw5

Test name: Test #2

Test defined on: 4/30/2003 18:14:27
Test started on: 4/30/2003 18:17:30
Test stopped on: 4/30/2003 18:22:01
Test extracted on: N/A N/A

Data gathered using Logarithmic testing
Maximum time between data points: 600.0 Seconds.
Number of data samples: 87

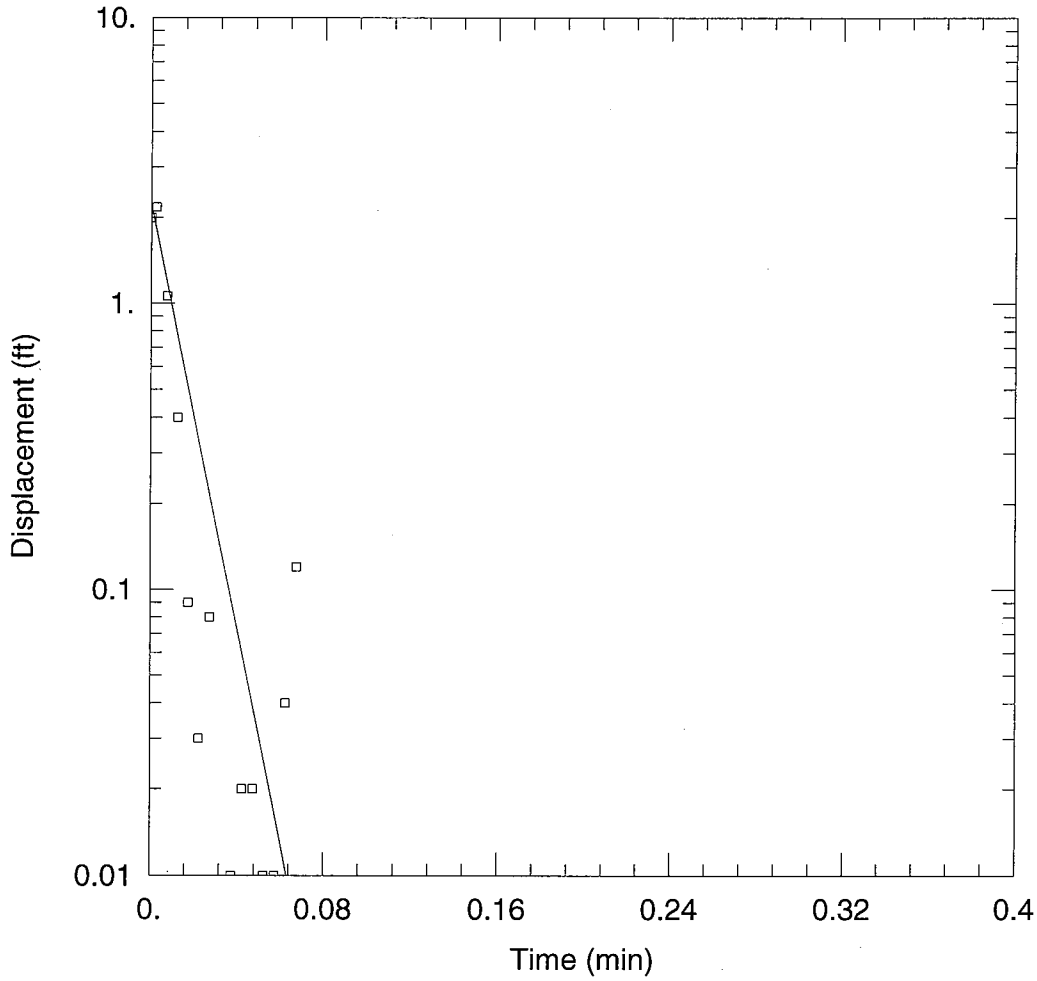
TOTAL DATA SAMPLES 87

Channel number [1]
Measurement type: Temperature
Channel name: Temperature

Channel number [2]
Measurement type: Pressure
Channel name: Pressure
Sensor Range: 30 PSIG.
Specific gravity: 1
Mode: TOC
User-defined reference: 0 Feet H2O
Referenced on: test start
Pressure head at reference: 5.097 Feet H2O

TP-MW05 Date	Time	ET (sec)	Chan[1] Fahrenheit	Chan[2] Feet H2O	Corrected Feet H20	Corrected Elapsed time (sec)	H/Ho	
4/30/2003	18:17:30	0	45.28	0				
		0.15			2	0	1.00	Estimate
4/30/2003	18:17:30	0.3	45.33	3.965	4.955			Water level oscillating
4/30/2003	18:17:30	0.6	45.33	1.084	2.074			Water level oscillating
4/30/2003	18:17:31	0.9	45.33	-0.016	0.974	0.75	0.49	
4/30/2003	18:17:31	1.2	45.35	-0.053	0.937	1.05	0.47	
4/30/2003	18:17:31	1.5	45.35	-0.158	0.832	1.35	0.42	
4/30/2003	18:17:31	1.8	45.35	-0.253	0.737	1.65	0.37	
4/30/2003	18:17:32	2.1	45.35	-0.341	0.649	1.95	0.32	
4/30/2003	18:17:32	2.4	45.35	-0.416	0.574	2.25	0.29	
4/30/2003	18:17:32	2.7	45.35	-0.48	0.51	2.55	0.26	
4/30/2003	18:17:33	3	45.35	-0.522	0.468	2.85	0.23	
4/30/2003	18:17:33	3.3	45.35	-0.576	0.414	3.15	0.21	
4/30/2003	18:17:33	3.6	45.35	-0.622	0.368	3.45	0.18	
4/30/2003	18:17:34	3.9	45.35	-0.657	0.333	3.75	0.17	
4/30/2003	18:17:34	4.2	45.35	-0.685	0.305	4.05	0.15	
4/30/2003	18:17:34	4.5	45.35	-0.71	0.28	4.35	0.14	
4/30/2003	18:17:34	4.8	45.35	-0.73	0.26	4.65	0.13	
4/30/2003	18:17:35	5.1	45.35	-0.747	0.243	4.95	0.12	
4/30/2003	18:17:35	5.4	45.35	-0.762	0.228	5.25	0.11	
4/30/2003	18:17:35	5.7	45.38	-0.775	0.215	5.55	0.11	
4/30/2003	18:17:36	6	45.35	-0.787	0.203	5.85	0.10	
4/30/2003	18:17:36	6.4	45.35	-0.799	0.191	6.25	0.10	
4/30/2003	18:17:36	6.7	45.38	-0.81	0.18	6.55	0.09	
4/30/2003	18:17:37	7.1	45.38	-0.822	0.168	6.95	0.08	
4/30/2003	18:17:37	7.5	45.38	-0.831	0.159	7.35	0.08	
4/30/2003	18:17:38	8	45.38	-0.839	0.151	7.85	0.08	
4/30/2003	18:17:38	8.4	45.38	-0.849	0.141	8.25	0.07	
4/30/2003	18:17:39	8.9	45.38	-0.856	0.134	8.75	0.07	
4/30/2003	18:17:39	9.5	45.38	-0.864	0.126	9.35	0.06	
4/30/2003	18:17:40	10	45.33	-0.869	0.121	9.85	0.06	

TP-MW05 Date	Time	ET (sec)	Chan[1] Fahrenheit	Chan[2] Feet H2O	Corrected Feet H20	Corrected Elapsed time (sec)	H/Ho
4/30/2003	18:17:40	10.6	45.33	-0.874	0.116	10.45	0.06
4/30/2003	18:17:41	11.3	45.33	-0.878	0.112	11.15	0.06
4/30/2003	18:17:42	11.9	45.33	-0.884	0.106	11.75	0.05
4/30/2003	18:17:42	12.6	45.33	-0.89	0.1	12.45	0.05
4/30/2003	18:17:43	13.4	45.33	-0.896	0.094	13.25	0.05
4/30/2003	18:17:44	14.2	45.33	-0.899	0.091	14.05	0.05
4/30/2003	18:17:45	15	45.33	-0.905	0.085	14.85	0.04
4/30/2003	18:17:46	15.9	45.33	-0.909	0.081	15.75	0.04
4/30/2003	18:17:46	16.8	45.31	-0.915	0.075	16.65	0.04
4/30/2003	18:17:47	17.8	45.33	-0.919	0.071	17.65	0.04
4/30/2003	18:17:49	18.9	45.31	-0.925	0.065	18.75	0.03
4/30/2003	18:17:50	20	45.31	-0.929	0.061	19.85	0.03
4/30/2003	18:17:51	21.2	45.31	-0.935	0.055	21.05	0.03
4/30/2003	18:17:52	22.4	45.31	-0.938	0.052	22.25	0.03
4/30/2003	18:17:53	23.8	45.31	-0.942	0.048	23.65	0.02
4/30/2003	18:17:55	25.2	45.31	-0.946	0.044	25.05	0.02
4/30/2003	18:17:56	26.7	45.31	-0.95	0.04	26.55	0.02
4/30/2003	18:17:58	28.2	45.31	-0.952	0.038	28.05	0.02
4/30/2003	18:17:59	29.8	45.31	-0.956	0.034	29.65	0.02
4/30/2003	18:18:01	31.5	45.31	-0.96	0.03	31.35	0.02
4/30/2003	18:18:03	33.3	45.31	-0.961	0.029	33.15	0.01
4/30/2003	18:18:05	35.2	45.31	-0.965	0.025	35.05	0.01
4/30/2003	18:18:07	37.3	45.31	-0.967	0.023	37.15	0.01
4/30/2003	18:18:09	39.5	45.31	-0.969	0.021	39.35	0.01
4/30/2003	18:18:11	41.8	45.31	-0.971	0.019	41.65	0.01
4/30/2003	18:18:14	44.3	45.31	-0.973	0.017	44.15	0.01
4/30/2003	18:18:17	46.9	45.31	-0.975	0.015	46.75	0.01
4/30/2003	18:18:19	49.7	45.31	-0.977	0.013	49.55	0.01
4/30/2003	18:18:22	52.6	45.28	-0.979	0.011	52.45	0.01
4/30/2003	18:18:25	55.7	45.28	-0.981	0.009	55.55	0.00
4/30/2003	18:18:29	59	45.28	-0.981	0.009	58.85	0.00
4/30/2003	18:18:32	62.5	45.28	-0.983	0.007	62.35	0.00
4/30/2003	18:18:36	66.2	45.28	-0.985	0.005	66.05	0.00
4/30/2003	18:18:40	70.1	45.28	-0.985	0.005	69.95	0.00
4/30/2003	18:18:44	74.3	45.28	-0.987	0.003	74.15	0.00
4/30/2003	18:18:48	78.7	45.28	-0.989	0.001	78.55	0.00
4/30/2003	18:18:53	83.4	45.26	-0.989	0.001	83.25	0.00
4/30/2003	18:18:58	88.4	45.26	-0.987	0.003	88.25	0.00
4/30/2003	18:19:03	93.7	45.26	-0.987	0.003	93.55	0.00
4/30/2003	18:19:09	99.3	45.26	-0.987	0.003	99.15	0.00
4/30/2003	18:19:15	105.2	45.26	-0.989	0.001	105.05	0.00
4/30/2003	18:19:21	111.5	45.24	-0.99	0	111.35	0.00
4/30/2003	18:19:28	118.1	45.24	-0.99	0	117.95	0.00
4/30/2003	18:19:35	125.1	45.24	-0.99	0	124.95	0.00
4/30/2003	18:19:42	132.6	45.24	-0.99	0	132.45	0.00
4/30/2003	18:19:50	140.5	45.21	-0.99	0	140.35	0.00
4/30/2003	18:19:59	148.9	45.21	-0.99	0	148.75	0.00
4/30/2003	18:20:07	157.8	45.21	-0.99	0	157.65	0.00
4/30/2003	18:20:17	167.2	45.21	-0.99	0	167.05	0.00
4/30/2003	18:20:27	177.2	45.21	-0.988	0.002	177.05	0.00
4/30/2003	18:20:37	187.8	45.19	-0.989	0.001	187.65	0.00
4/30/2003	18:20:49	199	45.19	-0.989	0.001	198.85	0.00
4/30/2003	18:21:01	210.9	45.19	-0.989	0.001	210.75	0.00
4/30/2003	18:21:13	223.5	45.19	-0.989	0.001	223.35	0.00
4/30/2003	18:21:26	236.8	45.19	-0.989	0.001	236.65	0.00
4/30/2003	18:21:41	250.9	45.19	-0.987	0.003	250.75	0.00
4/30/2003	18:21:55	265.8	45.17	-0.987	0.003	265.65	0.00



SITE 32 - TP-MW07 - RISING HEAD

Data Set: F:\Portsmouth Site 32 - Stage I Modeling\TP-MW07_081709sra.aqt
Date: 08/17/09 Time: 17:44:18

PROJECT INFORMATION

Company: Tetra Tech NUS, Inc.
Client: Navy
Project: 112G00~~332~~.0000.0~~806~~ 383 802
Location: Portsmouth Naval Shipyard
Test Well: TP-MW07
Test Date: May 1, 2003

AQUIFER DATA

Saturated Thickness: 38.71 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (TP-MW07)

Initial Displacement: 2. ft
Total Well Penetration Depth: 5.51 ft
Casing Radius: 0.0833 ft
Static Water Column Height: 5.51 ft
Screen Length: 10. ft
Wellbore Radius: 0.3333 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 439.8 ft/day
y0 = 2.221 ft

In-Situ Inc. MiniTroll Pro TP-MW07

Report generated: 5/2/2003 13:30:01
Report from file: ...\SN03078 2003-05-01 061100 Test #2.bin
Win-Situ Version 4.4

Serial number: 3078
Firmware Version 3.06
Unit name: 4308-mw07

Test name: Test #2

Test defined on: 5/1/2003 6:10:45
Test started on: 5/1/2003 6:11:00
Test stopped on: 5/1/2003 6:13:14
Test extracted on: N/A N/A

Data gathered using Logarithmic testing
Maximum time between data points: 600.0 Seconds.
Number of data samples: 75

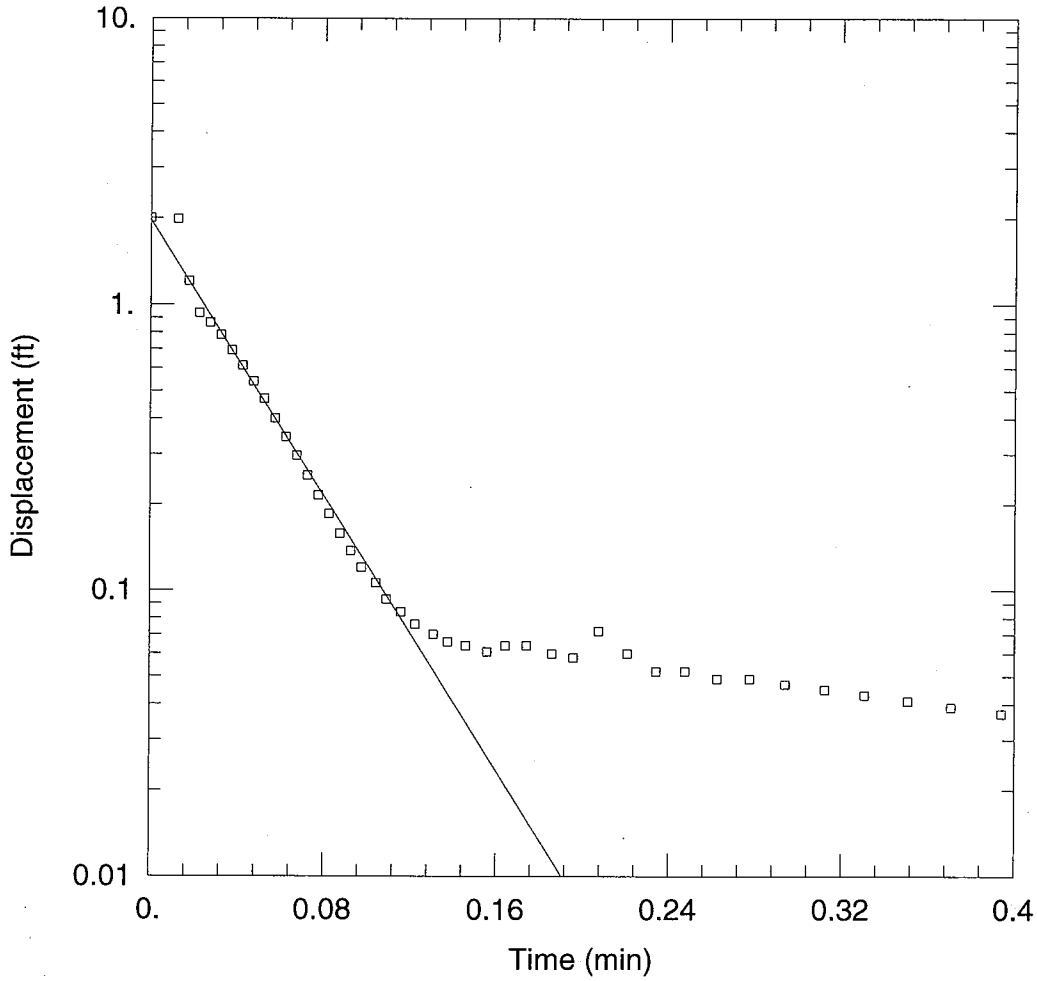
TOTAL DATA SAMPLES 75

Channel number [1]
Measurement type: Temperature
Channel name: Temperature

Channel number [2]
Measurement type: Pressure
Channel name: Pressure
Sensor Range: 30 PSIG.
Specific gravity: 1
Mode: TOC
User-defined reference: 0 Feet H2O
Referenced on: test start
Pressure head at reference: 4.566 Feet H2O

TP-MW07 Date	Time	ET (sec)	Chan[2] Feet H2O	Chan[1] Fahrenheit	Corrected ET (sec)	Corrected Head (ft)	H/H0	
5/1/2003	6:11:00	0	0.000	42.74				
		0.15	2.000		0	2.00	1.00	Estimate
5/1/2003	6:11:00	0.3	0.440	42.74	0.15			water level oscillating
5/1/2003	6:11:00	0.6	-0.672	42.76	0.45	1.06	0.53	
5/1/2003	6:11:01	0.9	-1.329	42.76	0.75	0.40	0.20	
5/1/2003	6:11:01	1.2	-1.640	42.76	1.05	0.09	0.05	
5/1/2003	6:11:01	1.5	-1.697	42.78	1.35	0.03	0.02	
5/1/2003	6:11:02	1.8	-1.653	42.78	1.65	0.08	0.04	
5/1/2003	6:11:02	2.1	-1.729	42.78	1.95	0.00	0.00	Water level stablized
5/1/2003	6:11:02	2.4	-1.724	42.78	2.25	0.01	0.00	
5/1/2003	6:11:03	2.7	-1.710	42.78	2.55	0.02	0.01	
5/1/2003	6:11:03	3	-1.710	42.81	2.85	0.02	0.01	
5/1/2003	6:11:03	3.3	-1.719	42.81	3.15	0.01	0.01	
5/1/2003	6:11:03	3.6	-1.715	42.81	3.45	0.01	0.01	
5/1/2003	6:11:04	3.9	-1.685	42.81	3.75	0.04	0.02	
5/1/2003	6:11:04	4.2	-1.613	42.81	4.05	0.12	0.06	
5/1/2003	6:11:04	4.5	-1.731	42.81	4.35	0.00	0.00	
5/1/2003	6:11:05	4.8	-1.733	42.81	4.65		0.00	
5/1/2003	6:11:05	5.1	-1.733	42.81	4.95		0.00	
5/1/2003	6:11:05	5.4	-1.733	42.81	5.25		0.00	
5/1/2003	6:11:06	5.7	-1.733	42.81	5.55		0.00	
5/1/2003	6:11:06	6	-1.733	42.81	5.85		0.00	
5/1/2003	6:11:06	6.4	-1.733	42.81	6.25		0.00	
5/1/2003	6:11:07	6.7	-1.731	42.81	6.55		0.00	
5/1/2003	6:11:07	7.1	-1.731	42.81	6.95		0.00	
5/1/2003	6:11:07	7.5	-1.730	42.83	7.35		0.00	
5/1/2003	6:11:08	8	-1.731	42.81	7.85		0.00	
5/1/2003	6:11:08	8.4	-1.731	42.81	8.25		0.00	
5/1/2003	6:11:09	8.9	-1.730	42.83	8.75		0.00	
5/1/2003	6:11:09	9.5	-1.730	42.83	9.35		0.00	
5/1/2003	6:11:10	10	-1.726	42.81	9.85		0.00	

TP-MW07 Date	Time	ET (sec)	Chan[2] Feet H2O	Chan[1] Fahrenheit	Corrected ET (sec)	Corrected Head (ft)	H/H0
TP-MW07 Date	Time	ET (sec)	Chan[2] Feet H2O	Chan[1] Fahrenheit	Corrected ET (sec)	Corrected Head (ft)	H/H0
5/1/2003	6:11:11	10.6	-1.726	42.81	10.45		0.00
5/1/2003	6:11:11	11.3	-1.724	42.81	11.15		0.00
5/1/2003	6:11:12	11.9	-1.724	42.81	11.75		0.00
5/1/2003	6:11:12	12.6	-1.724	42.78	12.45		0.00
5/1/2003	6:11:13	13.4	-1.722	42.78	13.25		0.00
5/1/2003	6:11:14	14.2	-1.720	42.78	14.05		0.00
5/1/2003	6:11:15	15	-1.720	42.78	14.85		0.00
5/1/2003	6:11:16	15.9	-1.722	42.78	15.75		0.00
5/1/2003	6:11:17	16.8	-1.722	42.78	16.65		0.00
5/1/2003	6:11:18	17.8	-1.722	42.78	17.65		0.00
5/1/2003	6:11:19	18.9	-1.722	42.78	18.75		0.00
5/1/2003	6:11:20	20	-1.720	42.78	19.85		0.00
5/1/2003	6:11:21	21.2	-1.720	42.78	21.05		0.00
5/1/2003	6:11:22	22.4	-1.720	42.78	22.25		0.00
5/1/2003	6:11:24	23.8	-1.720	42.78	23.65		0.00
5/1/2003	6:11:25	25.2	-1.720	42.78	25.05		0.00
5/1/2003	6:11:27	26.7	-1.720	42.78	26.55		0.00
5/1/2003	6:11:28	28.2	-1.720	42.78	28.05		0.00
5/1/2003	6:11:30	29.8	-1.720	42.78	29.65		0.00
5/1/2003	6:11:31	31.5	-1.720	42.78	31.35		0.00
5/1/2003	6:11:33	33.3	-1.722	42.76	33.15		0.00
5/1/2003	6:11:35	35.2	-1.720	42.78	35.05		0.00
5/1/2003	6:11:37	37.3	-1.722	42.78	37.15		0.00
5/1/2003	6:11:39	39.5	-1.722	42.78	39.35		0.00
5/1/2003	6:11:42	41.8	-1.722	42.78	41.65		0.00
5/1/2003	6:11:44	44.3	-1.722	42.76	44.15		0.00
5/1/2003	6:11:47	46.9	-1.722	42.76	46.75		0.00
5/1/2003	6:11:50	49.7	-1.722	42.76	49.55		0.00
5/1/2003	6:11:52	52.6	-1.725	42.76	52.45		0.00
5/1/2003	6:11:56	55.7	-1.729	42.76	55.55		0.00
5/1/2003	6:11:59	59	-1.729	42.76	58.85		0.00
5/1/2003	6:12:02	62.5	-1.729	42.76	62.35		0.00
5/1/2003	6:12:06	66.2	-1.732	42.76	66.05		0.00
5/1/2003	6:12:10	70.1	-1.732	42.76	69.95		0.00
5/1/2003	6:12:14	74.3	-1.727	42.76	74.15		0.00
5/1/2003	6:12:19	78.7	-1.732	42.76	78.55		0.00
5/1/2003	6:12:23	83.4	-1.732	42.76	83.25		0.00
5/1/2003	6:12:28	88.4	-1.732	42.76	88.25		0.00
5/1/2003	6:12:34	93.7	-1.734	42.76	93.55		0.00
5/1/2003	6:12:39	99.3	-1.734	42.76	99.15		0.00
5/1/2003	6:12:45	105.2	-1.736	42.76	105.05		0.00
5/1/2003	6:12:51	111.5	-1.736	42.76	111.35		0.00
5/1/2003	6:12:58	118.1	-1.736	42.78	117.95		0.00
5/1/2003	6:13:05	125.1	-1.738	42.78	124.95		0.00
5/1/2003	6:13:12	132.6	-1.740	42.78	132.45		0.00



SITE 32 - TP-MW08 - RISING HEAD

Data Set: F:\Portsmouth Site 32 - Stage I Modeling\TP-MW08_081709sra.aqt
Date: 08/17/09 Time: 17:44:23

PROJECT INFORMATION

Company: Tetra Tech NUS, Inc.
Client: Navy
Project: 112G00332.0000.0806
Location: Portsmouth Naval Shipyard
Test Well: TP-MW08
Test Date: May 1, 2003

AQUIFER DATA

Saturated Thickness: 31.88 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (TP-MW08)

Initial Displacement: 2. ft
Total Well Penetration Depth: 5.18 ft
Casing Radius: 0.0833 ft
Static Water Column Height: 5.18 ft
Screen Length: 7. ft
Wellbore Radius: 0.5 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 326.5 ft/day
y0 = 1.957 ft

In-Situ Inc. MiniTroll Pro **TP-MW08**

Report generated: 5/2/2003 13:26:44
Report from file: ...\SN01848 2003-05-01 112509 Test #2.bin
Win-Situ Version 4.4

Serial number: 1848
Firmware Version 3.06
Unit name: 4819-mw08

Test name: Test #2

Test defined on: 5/1/2003 11:21:15
Test started on: 5/1/2003 11:25:09
Test stopped on: N/A N/A
Test extracted on: N/A N/A

Data gathered using Logarithmic testing
Maximum time between data points: 600.0 Seconds.
Number of data samples: 84

TOTAL DATA SAMPLES 84

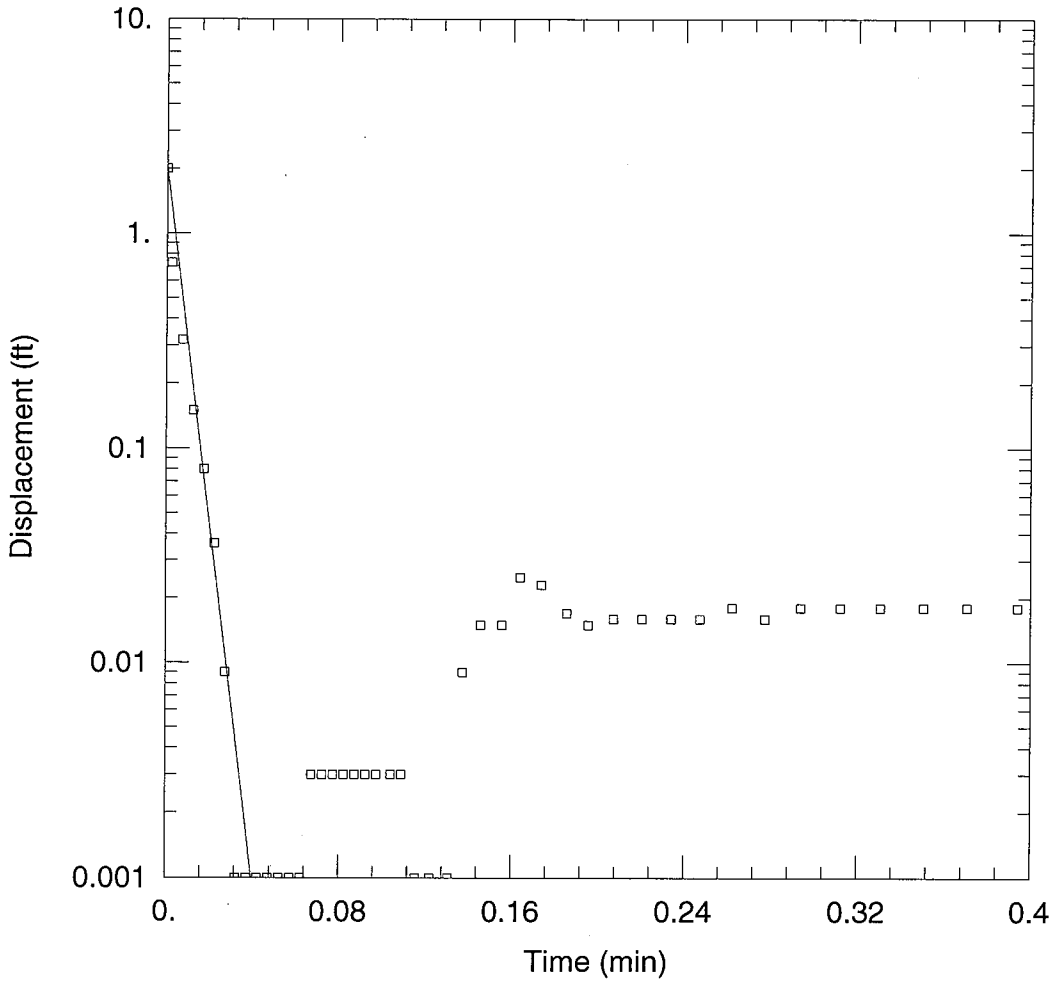
Channel number [1]
Measurement type: Temperature
Channel name: Temperature

Channel number [2]
Measurement type: Pressure
Channel name: Pressure
Sensor Range: 30 PSIG.
Specific gravity: 1
Mode: TOC
User-defined reference: 0 Feet H2O
Referenced on: test start
Pressure head at reference: 4.703 Feet H2O

TP-MW08 Date	Time	ET (sec)	Chan[2] Feet H2O	Chan[1] Fahrenheit	Corrected ET (sec)	H/H0	
5/1/2003	11:25:09	0	0	43.71			
		0.15	2		0	1.00	Estimate
5/1/2003	11:25:09	0.3	0.461	43.76			Water level oscillating
5/1/2003	11:25:09	0.6	2.639	43.76			Water level oscillating
5/1/2003	11:25:09	0.9	1.984	43.78			Water level oscillating
5/1/2003	11:25:10	1.2	1.208	43.78	1.05	0.60	
5/1/2003	11:25:10	1.5	0.935	43.78	1.35	0.47	
5/1/2003	11:25:10	1.8	0.866	43.78	1.65	0.43	
5/1/2003	11:25:11	2.1	0.784	43.78	1.95	0.39	
5/1/2003	11:25:11	2.4	0.693	43.8	2.25	0.35	
5/1/2003	11:25:11	2.7	0.612	43.78	2.55	0.31	
5/1/2003	11:25:12	3	0.54	43.8	2.85	0.27	
5/1/2003	11:25:12	3.3	0.469	43.8	3.15	0.23	
5/1/2003	11:25:12	3.6	0.402	43.8	3.45	0.20	
5/1/2003	11:25:12	3.9	0.345	43.8	3.75	0.17	
5/1/2003	11:25:13	4.2	0.297	43.8	4.05	0.15	
5/1/2003	11:25:13	4.5	0.253	43.8	4.35	0.13	
5/1/2003	11:25:13	4.8	0.215	43.8	4.65	0.11	
5/1/2003	11:25:14	5.1	0.185	43.8	4.95	0.09	
5/1/2003	11:25:14	5.4	0.158	43.8	5.25	0.08	
5/1/2003	11:25:14	5.7	0.137	43.8	5.55	0.07	
5/1/2003	11:25:15	6	0.12	43.8	5.85	0.06	
5/1/2003	11:25:15	6.4	0.106	43.8	6.25	0.05	
5/1/2003	11:25:15	6.7	0.093	43.8	6.55	0.05	
5/1/2003	11:25:16	7.1	0.084	43.82	6.95	0.04	
5/1/2003	11:25:16	7.5	0.076	43.82	7.35	0.04	
5/1/2003	11:25:17	8	0.07	43.82	7.85	0.04	
5/1/2003	11:25:17	8.4	0.066	43.82	8.25	0.03	

TP-MW08

Date	Time	ET (sec)	Chan[2] Feet H2O	Chan[1] Fahrenheit	Corrected ET (sec)	H/H0
5/1/2003	11:25:18	8.9	0.064	43.82	8.75	0.03
5/1/2003	11:25:18	9.5	0.061	43.82	9.35	0.03
5/1/2003	11:25:19	10	0.064	43.8	9.85	0.03
5/1/2003	11:25:19	10.6	0.064	43.8	10.45	0.03
5/1/2003	11:25:20	11.3	0.06	43.78	11.15	0.03
5/1/2003	11:25:20	11.9	0.058	43.78	11.75	0.03
5/1/2003	11:25:21	12.6	0.072	43.8	12.45	0.04
5/1/2003	11:25:22	13.4	0.06	43.78	13.25	0.03
5/1/2003	11:25:23	14.2	0.052	43.78	14.05	0.03
5/1/2003	11:25:24	15	0.052	43.78	14.85	0.03
5/1/2003	11:25:24	15.9	0.049	43.78	15.75	0.02
5/1/2003	11:25:25	16.8	0.049	43.78	16.65	0.02
5/1/2003	11:25:26	17.8	0.047	43.78	17.65	0.02
5/1/2003	11:25:27	18.9	0.045	43.78	18.75	0.02
5/1/2003	11:25:29	20	0.043	43.78	19.85	0.02
5/1/2003	11:25:30	21.2	0.041	43.78	21.05	0.02
5/1/2003	11:25:31	22.4	0.039	43.78	22.25	0.02
5/1/2003	11:25:32	23.8	0.037	43.78	23.65	0.02
5/1/2003	11:25:34	25.2	0.037	43.78	25.05	0.02
5/1/2003	11:25:35	26.7	0.033	43.78	26.55	0.02
5/1/2003	11:25:37	28.2	0.033	43.78	28.05	0.02
5/1/2003	11:25:38	29.8	0.031	43.78	29.65	0.02
5/1/2003	11:25:40	31.5	0.03	43.78	31.35	0.02
5/1/2003	11:25:42	33.3	0.028	43.78	33.15	0.01
5/1/2003	11:25:44	35.2	0.028	43.78	35.05	0.01
5/1/2003	11:25:46	37.3	0.026	43.78	37.15	0.01
5/1/2003	11:25:48	39.5	0.024	43.78	39.35	0.01
5/1/2003	11:25:50	41.8	0.022	43.78	41.65	0.01
5/1/2003	11:25:53	44.3	0.022	43.78	44.15	0.01
5/1/2003	11:25:55	46.9	0.02	43.78	46.75	0.01
5/1/2003	11:25:58	49.7	0.018	43.78	49.55	0.01
5/1/2003	11:26:01	52.6	0.018	43.8	52.45	0.01
5/1/2003	11:26:04	55.7	0.016	43.8	55.55	0.01
5/1/2003	11:26:08	59	0.015	43.8	58.85	0.01
5/1/2003	11:26:11	62.5	0.015	43.8	62.35	0.01
5/1/2003	11:26:15	66.2	0.013	43.8	66.05	0.01
5/1/2003	11:26:19	70.1	0.013	43.8	69.95	0.01
5/1/2003	11:26:23	74.3	0.009	43.82	74.15	0.00
5/1/2003	11:26:27	78.7	0.007	43.82	78.55	0.00
5/1/2003	11:26:32	83.4	0.007	43.82	83.25	0.00
5/1/2003	11:26:37	88.4	0.005	43.82	88.25	0.00
5/1/2003	11:26:42	93.7	0.004	43.85	93.55	0.00
5/1/2003	11:26:48	99.3	0.004	43.85	99.15	0.00
5/1/2003	11:26:54	105.2	0.002	43.85	105.05	0.00
5/1/2003	11:27:00	111.5	0.002	43.87	111.35	0.00
5/1/2003	11:27:07	118.1	0	43.87	117.95	0.00
5/1/2003	11:27:14	125.1	-0.002	43.89	124.95	0.00
5/1/2003	11:27:21	132.6	-0.003	43.89	132.45	0.00
5/1/2003	11:27:29	140.5	-0.005	43.92	140.35	0.00
5/1/2003	11:27:37	148.9	-0.007	43.94	148.75	0.00
5/1/2003	11:27:46	157.8	-0.007	43.94	157.65	0.00
5/1/2003	11:27:56	167.2	-0.01	43.96	167.05	-0.01
5/1/2003	11:28:06	177.2	-0.01	43.98	177.05	-0.01
5/1/2003	11:28:16	187.8	-0.014	43.98	187.65	-0.01
5/1/2003	11:28:28	199	-0.015	44.01	198.85	-0.01
5/1/2003	11:28:39	210.9	-0.017	44.01	210.75	-0.01
5/1/2003	11:28:52	223.5	-0.019	44.03	223.35	-0.01



SITE 32 - TP-MW09 - RISING HEAD

Data Set: F:\Portsmouth Site 32 - Stage I Modeling\TP-MW09_081709sra.aqt
Date: 08/17/09 Time: 17:44:27

PROJECT INFORMATION

Company: Tetra Tech NUS, Inc.
Client: Navy
Project: 112G00~~332~~.0000.0~~8~~06
Location: Portsmouth Naval Shipyard
Test Well: TP-MW09
Test Date: May 2, 2003

AQUIFER DATA

Saturated Thickness: 31.03 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (TP-MW09)

Initial Displacement: 2. ft
Total Well Penetration Depth: 7.53 ft
Casing Radius: 0.0833 ft
Static Water Column Height: 7.53 ft
Screen Length: 10. ft
Wellbore Radius: 0.5833 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 2365.7 ft/day
y0 = 2.009 ft

In-Situ Inc. MiniTroll Pro **TP-MW09**

Report generated: 5/2/2003 13:36:00
Report from file: ...\SN05548 2003-05-02 110356 Test #4-mw9-slug.bin
Win-Situ Version 4.4

Serial number: 5548
Firmware Version 3.06
Unit name: 4649-mw01-mw09[3

Test name: Test #4-mw9-slug

Test defined on: 5/2/2003 11:00:25
Test started on: 5/2/2003 11:03:56
Test stopped on: N/A N/A
Test extracted on: N/A N/A

Data gathered using Logarithmic testing
Maximum time between data points: 600.0 Seconds.
Number of data samples: 68

TOTAL DATA SAMPLES 68

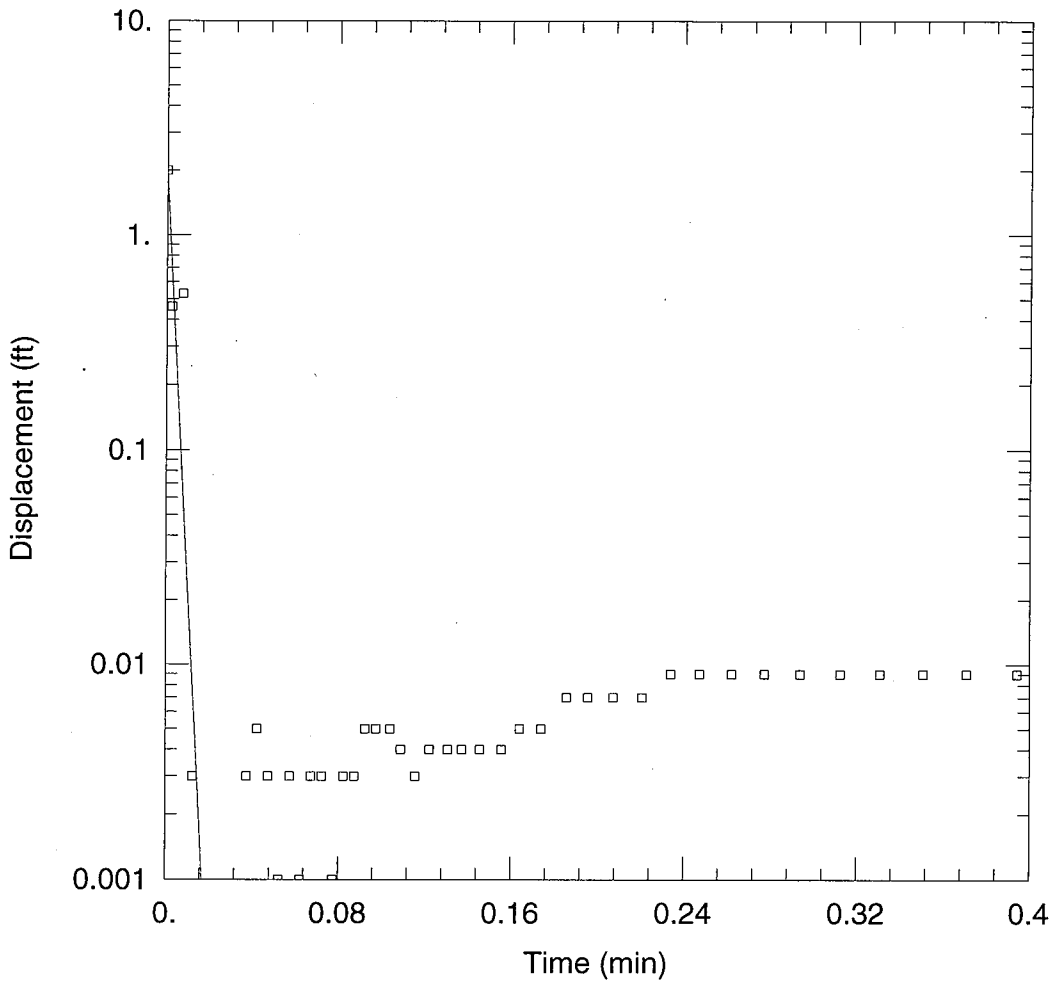
Channel number [1]
Measurement type: Temperature
Channel name: Temperature

Channel number [2]
Measurement type: Pressure
Channel name: Pressure
Sensor Range: 30 PSIG.
Specific gravity: 1
Mode: TOC
User-defined reference: 0 Feet H2O
Referenced on: test start
Pressure head at reference: 6.1 Feet H2O

TP-MW09 Date	Time	ET (sec)	Chan[2] Feet H2O	Chan[1] Fahrenheit	Corrected ET (sec)	Corrected Feet H2O	H/Ho
5/2/2003	11:03:56	0	0.00	54.66			
		0.15	2.00		0	2.01	1.00
5/2/2003	11:03:57	0.3	0.72	54.66	0.15	0.726	0.36
5/2/2003	11:03:57	0.6	0.31	54.69	0.45	0.32	0.16
5/2/2003	11:03:57	0.9	0.14	54.69	0.75	0.15	0.07
5/2/2003	11:03:58	1.2	0.07	54.71	1.05	0.08	0.04
5/2/2003	11:03:58	1.5	0.03	54.71	1.35	0.036	0.01
5/2/2003	11:03:58	1.8	0.00	54.71	1.65	0.009	0.00
5/2/2003	11:03:59	2.1	-0.01	54.71	1.95	0.001	0.00
5/2/2003	11:03:59	2.4	-0.01	54.73	2.25	0.001	0.00
5/2/2003	11:03:59	2.7	-0.01	54.73	2.55	0.001	0.00
5/2/2003	11:03:59	3	-0.01	54.73	2.85	0.001	0.00
5/2/2003	11:04:00	3.3	-0.01	54.73	3.15	0.001	0.00
5/2/2003	11:04:00	3.6	-0.01	54.73	3.45	0.001	0.00
5/2/2003	11:04:00	3.9	-0.01	54.73	3.75	0.001	0.00
5/2/2003	11:04:01	4.2	-0.01	54.73	4.05	0.003	0.00
5/2/2003	11:04:01	4.5	-0.01	54.73	4.35	0.003	0.00
5/2/2003	11:04:01	4.8	-0.01	54.73	4.65	0.003	0.00
5/2/2003	11:04:02	5.1	-0.01	54.73	4.95	0.003	0.00
5/2/2003	11:04:02	5.4	-0.01	54.73	5.25	0.003	0.00
5/2/2003	11:04:02	5.7	-0.01	54.73	5.55	0.003	0.00
5/2/2003	11:04:02	6	-0.01	54.73	5.85	0.003	0.00
5/2/2003	11:04:03	6.4	-0.01	54.73	6.25	0.003	0.00
5/2/2003	11:04:03	6.7	-0.01	54.73	6.55	0.003	0.00
5/2/2003	11:04:04	7.1	-0.01	54.73	6.95	0.001	0.00
5/2/2003	11:04:04	7.5	-0.01	54.73	7.35	0.001	0.00
5/2/2003	11:04:04	8	-0.01	54.75	7.85	0.001	0.00
5/2/2003	11:04:05	8.4	0.00	54.73	8.25	0.009	0.00
5/2/2003	11:04:05	8.9	0.01	54.75	8.75	0.015	0.00
5/2/2003	11:04:06	9.5	0.01	54.75	9.35	0.015	0.00
5/2/2003	11:04:06	10	0.02	54.73	9.85	0.025	0.01
5/2/2003	11:04:07	10.6	0.01	54.73	10.45	0.023	0.01
5/2/2003	11:04:08	11.3	0.01	54.73	11.15	0.017	0.00
5/2/2003	11:04:08	11.9	0.01	54.73	11.75	0.015	0.00
5/2/2003	11:04:09	12.6	0.01	54.71	12.45	0.016	0.00
5/2/2003	11:04:10	13.4	0.01	54.71	13.25	0.016	0.00
5/2/2003	11:04:11	14.2	0.01	54.71	14.05	0.016	0.00

TP-MW09

Date	Time	ET (sec)	Chan[2] Feet H2O	Chan[1] Fahrenheit	Corrected ET (sec)	Corrected Feet H2O	H/Ho
5/2/2003	11:04:11	15	0.01	54.71	14.85	0.016	0.00
5/2/2003	11:04:12	15.9	0.01	54.71	15.75	0.018	0.00
5/2/2003	11:04:13	16.8	0.01	54.71	16.65	0.016	0.00
5/2/2003	11:04:14	17.8	0.01	54.71	17.65	0.018	0.00
5/2/2003	11:04:15	18.9	0.01	54.71	18.75	0.018	0.00
5/2/2003	11:04:16	20	0.01	54.71	19.85	0.018	0.00
5/2/2003	11:04:18	21.2	0.01	54.71	21.05	0.018	0.00
5/2/2003	11:04:19	22.4	0.01	54.71	22.25	0.018	0.00
5/2/2003	11:04:20	23.8	0.01	54.71	23.65	0.018	0.00
5/2/2003	11:04:22	25.2	0.01	54.71	25.05	0.018	0.00
5/2/2003	11:04:23	26.7	0.01	54.71	26.55	0.018	0.00
5/2/2003	11:04:25	28.2	0.01	54.71	28.05	0.02	0.01
5/2/2003	11:04:26	29.8	0.01	54.71	29.65	0.02	0.01
5/2/2003	11:04:28	31.5	0.01	54.71	31.35	0.018	0.00
5/2/2003	11:04:30	33.3	0.01	54.71	33.15	0.02	0.01
5/2/2003	11:04:32	35.2	0.01	54.71	35.05	0.018	0.00
5/2/2003	11:04:34	37.3	0.01	54.71	37.15	0.02	0.01
5/2/2003	11:04:36	39.5	0.01	54.71	39.35	0.02	0.01
5/2/2003	11:04:38	41.8	0.01	54.71	41.65	0.02	0.01
5/2/2003	11:04:41	44.3	0.01	54.69	44.15	0.02	0.01
5/2/2003	11:04:43	46.9	0.01	54.71	46.75	0.02	0.01
5/2/2003	11:04:46	49.7	0.01	54.71	49.55	0.02	0.01
5/2/2003	11:04:49	52.6	0.01	54.71	52.45	0.02	0.01
5/2/2003	11:04:52	55.7	0.01	54.69	55.55	0.02	0.01
5/2/2003	11:04:55	59	0.01	54.69	58.85	0.02	0.01
5/2/2003	11:04:59	62.5	0.01	54.69	62.35	0.02	0.01
5/2/2003	11:05:03	66.2	0.01	54.69	66.05	0.02	0.01
5/2/2003	11:05:06	70.1	0.01	54.69	69.95	0.022	0.01
5/2/2003	11:05:11	74.3	0.01	54.69	74.15	0.022	0.01
5/2/2003	11:05:15	78.7	0.01	54.69	78.55	0.022	0.01
5/2/2003	11:05:20	83.4	0.01	54.69	83.25	0.022	0.01
5/2/2003	11:05:25	88.4	0.01	54.69	88.25	0.02	0.01



SITE 32 - TP-MW10 - RISING HEAD

Data Set: F:\Portsmouth Site 32 - Stage I Modeling\TP-MW10_081709sra.aqt
Date: 08/17/09 Time: 17:44:33

PROJECT INFORMATION

Company: Tetra Tech NUS, Inc.
Client: Navy
Project: 112G00332.0000.0806
Location: Portsmouth Naval Shipyard
Test Well: TP-MW10
Test Date: May 1, 2003

AQUIFER DATA

Saturated Thickness: 24.87 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (TP-MW10)

Initial Displacement: 2. ft
Total Well Penetration Depth: 3.77 ft
Casing Radius: 0.0833 ft
Static Water Column Height: 3.77 ft
Screen Length: 7. ft
Wellbore Radius: 0.4167 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 3745.3 ft/day
y0 = 1.949 ft

In-Situ Inc. MiniTroll Pro **TP-MW10**

Report generated: 5/2/2003 13:37:46
Report from file: ...\SN05551 2003-05-01 090012 Test #2.bin
Win-Situ Version 4.4

Serial number: 5551
Firmware Version 3.06
Unit name: 4648-mw10

Test name: Test #2

Test defined on: 5/1/2003 8:58:03
Test started on: 5/1/2003 9:00:12
Test stopped on: N/A N/A
Test extracted on: N/A N/A

Data gathered using Logarithmic testing
Maximum time between data points: 600.0 Seconds.
Number of data samples: 87

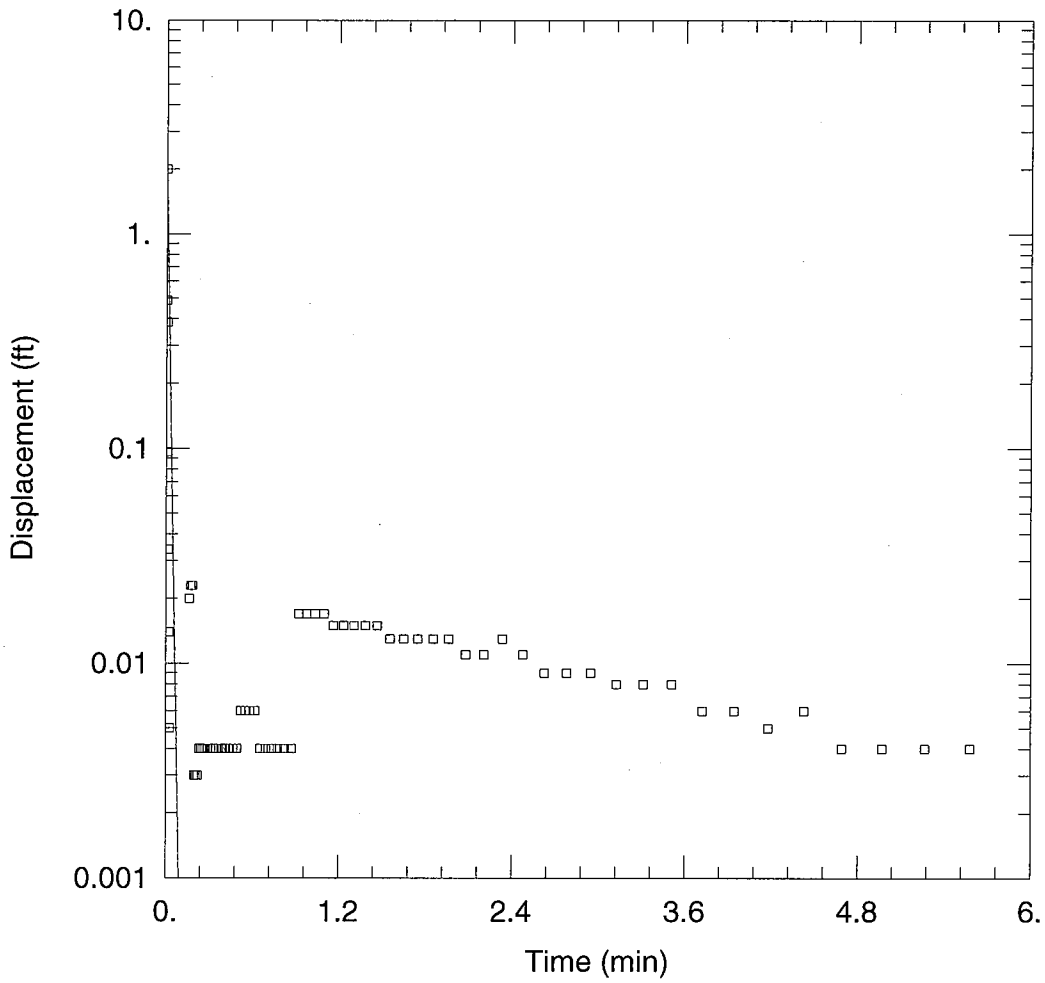
TOTAL DATA SAMPLES 87

Channel number [1]
Measurement type: Temperature
Channel name: Temperature

Channel number [2]
Measurement type: Pressure
Channel name: Pressure
Sensor Range: 30 PSIG.
Specific gravity: 1
Mode: TOC
User-defined reference: 0 Feet H2O
Referenced on: test start
Pressure head at reference: 2.54 Feet H2O

TP-MW10 Date	Time	ET (sec)	Chan[2] Feet H2O	Chan[1] Fahrenheit	Est. ET (sec) Adjusted	H/H0 Adjusted	
5/1/2003	9:00:12	0	0	45.37			
		0.15	1.88		0	1.00	Estimate
5/1/2003	9:00:12	0.3	0.461	45.4	0.15	0.25	
5/1/2003	9:00:13	0.6	0.529	45.42	0.45	0.28	
5/1/2003	9:00:13	0.9	0.003	45.42	0.75	0.00	recovery complete
5/1/2003	9:00:13	1.2	-0.031	45.44	1.05	-0.02	
5/1/2003	9:00:13	1.5	-0.005	45.44	1.35	0.00	
5/1/2003	9:00:14	1.8	-0.005	45.44	1.65	0.00	
5/1/2003	9:00:14	2.1	-0.005	45.44	1.95	0.00	
5/1/2003	9:00:14	2.4	0.003	45.44	2.25	0.00	
5/1/2003	9:00:15	2.7	0.005	45.47	2.55	0.00	
5/1/2003	9:00:15	3	0.003	45.47	2.85	0.00	
5/1/2003	9:00:15	3.3	0.001	45.47	3.15	0.00	
5/1/2003	9:00:16	3.6	0.003	45.47	3.45	0.00	
5/1/2003	9:00:16	3.9	0.001	45.47	3.75	0.00	
5/1/2003	9:00:16	4.2	0.003	45.47	4.05	0.00	
5/1/2003	9:00:16	4.5	0.003	45.47	4.35	0.00	
5/1/2003	9:00:17	4.8	0.001	45.47	4.65	0.00	
5/1/2003	9:00:17	5.1	0.003	45.47	4.95	0.00	
5/1/2003	9:00:17	5.4	0.003	45.47	5.25	0.00	
5/1/2003	9:00:18	5.7	0.005	45.47	5.55	0.00	
5/1/2003	9:00:18	6	0.005	45.47	5.85	0.00	
5/1/2003	9:00:18	6.4	0.005	45.47	6.25	0.00	
5/1/2003	9:00:19	6.7	0.004	45.49	6.55	0.00	
5/1/2003	9:00:19	7.1	0.003	45.47	6.95	0.00	
5/1/2003	9:00:19	7.5	0.004	45.49	7.35	0.00	
5/1/2003	9:00:20	8	0.004	45.49	7.85	0.00	
5/1/2003	9:00:20	8.4	0.004	45.49	8.25	0.00	

TP-MW10 Date	Time	ET (sec)	Chan[2] Feet H2O	Chan[1] Fahrenheit	Est. ET (sec) Adjusted	H/H0 Adjusted
5/1/2003	9:00:21	8.9	0.004	45.49	8.75	0.00
5/1/2003	9:00:21	9.5	0.004	45.49	9.35	0.00
5/1/2003	9:00:22	10	0.005	45.47	9.85	0.00
5/1/2003	9:00:23	10.6	0.005	45.47	10.45	0.00
5/1/2003	9:00:23	11.3	0.007	45.47	11.15	0.00
5/1/2003	9:00:24	11.9	0.007	45.44	11.75	0.00
5/1/2003	9:00:25	12.6	0.007	45.44	12.45	0.00
5/1/2003	9:00:25	13.4	0.007	45.44	13.25	0.00
5/1/2003	9:00:26	14.2	0.009	45.44	14.05	0.00
5/1/2003	9:00:27	15	0.009	45.44	14.85	0.00
5/1/2003	9:00:28	15.9	0.009	45.44	15.75	0.00
5/1/2003	9:00:29	16.8	0.009	45.44	16.65	0.00
5/1/2003	9:00:30	17.8	0.009	45.44	17.65	0.00
5/1/2003	9:00:31	18.9	0.009	45.44	18.75	0.00
5/1/2003	9:00:32	20	0.009	45.44	19.85	0.00
5/1/2003	9:00:33	21.2	0.009	45.44	21.05	0.00
5/1/2003	9:00:34	22.4	0.009	45.44	22.25	0.00
5/1/2003	9:00:36	23.8	0.009	45.44	23.65	0.00
5/1/2003	9:00:37	25.2	0.011	45.44	25.05	0.01
5/1/2003	9:00:39	26.7	0.009	45.44	26.55	0.00
5/1/2003	9:00:40	28.2	0.009	45.44	28.05	0.00
5/1/2003	9:00:42	29.8	0.011	45.44	29.65	0.01
5/1/2003	9:00:43	31.5	0.011	45.44	31.35	0.01
5/1/2003	9:00:45	33.3	0.011	45.44	33.15	0.01
5/1/2003	9:00:47	35.2	0.011	45.44	35.05	0.01
5/1/2003	9:00:49	37.3	0.011	45.44	37.15	0.01
5/1/2003	9:00:51	39.5	0.009	45.44	39.35	0.00
5/1/2003	9:00:54	41.8	0.011	45.44	41.65	0.01
5/1/2003	9:00:56	44.3	0.009	45.44	44.15	0.00
5/1/2003	9:00:59	46.9	0.011	45.44	46.75	0.01
5/1/2003	9:01:02	49.7	0.009	45.44	49.55	0.00
5/1/2003	9:01:04	52.6	0.009	45.44	52.45	0.00
5/1/2003	9:01:08	55.7	0.011	45.44	55.55	0.01
5/1/2003	9:01:11	59	0.011	45.44	58.85	0.01
5/1/2003	9:01:14	62.5	0.011	45.44	62.35	0.01
5/1/2003	9:01:18	66.2	0.009	45.44	66.05	0.00
5/1/2003	9:01:22	70.1	0.009	45.44	69.95	0.00
5/1/2003	9:01:26	74.3	0.009	45.44	74.15	0.00
5/1/2003	9:01:31	78.7	0.009	45.44	78.55	0.00
5/1/2003	9:01:35	83.4	0.009	45.44	83.25	0.00
5/1/2003	9:01:40	88.4	0.007	45.44	88.25	0.00
5/1/2003	9:01:46	93.7	0.009	45.44	93.55	0.00
5/1/2003	9:01:51	99.3	0.007	45.44	99.15	0.00
5/1/2003	9:01:57	105.2	0.007	45.44	105.05	0.00
5/1/2003	9:02:03	111.5	0.007	45.44	111.35	0.00
5/1/2003	9:02:10	118.1	0.007	45.44	117.95	0.00
5/1/2003	9:02:17	125.1	0.007	45.44	124.95	0.00
5/1/2003	9:02:24	132.6	0.005	45.44	132.45	0.00
5/1/2003	9:02:32	140.5	0.005	45.44	140.35	0.00
5/1/2003	9:02:41	148.9	0.005	45.44	148.75	0.00
5/1/2003	9:02:50	157.8	0.003	45.44	157.65	0.00
5/1/2003	9:02:59	167.2	0.003	45.44	167.05	0.00
5/1/2003	9:03:09	177.2	0.003	45.44	177.05	0.00
5/1/2003	9:03:20	187.8	0.001	45.44	187.65	0.00
5/1/2003	9:03:31	199	-0.001	45.44	198.85	0.00
5/1/2003	9:03:43	210.9	0.001	45.42	210.75	0.00
5/1/2003	9:03:55	223.5	0.001	45.42	223.35	0.00
5/1/2003	9:04:09	236.8	-0.001	45.42	236.65	0.00
5/1/2003	9:04:23	250.9	-0.001	45.44	250.75	0.00
5/1/2003	9:04:38	265.8	-0.003	45.42	265.65	0.00



SITE 32 - FA-01 - RISING HEAD

Data Set: F:\Portsmouth Site 32 - Stage I Modeling\FA01_081709sra.aqt
Date: 08/17/09 Time: 17:44:37

PROJECT INFORMATION

Company: Tetra Tech NUS, Inc.
Client: Navy 383
Project: 112G00~~332~~.0000.0~~806~~ 802
Location: Portsmouth Naval Shipyard
Test Well: FA-01
Test Date: May 1, 2003

AQUIFER DATA

Saturated Thickness: 14.95 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (FA-01)

Initial Displacement: 2. ft
Total Well Penetration Depth: 5.45 ft
Casing Radius: 0.0833 ft
Static Water Column Height: 5.45 ft
Screen Length: 10. ft
Wellbore Radius: 0.3333 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 439.8 ft/day
y0 = 1.949 ft

In-Situ Inc. MiniTroll Pro **FAO1**

Report generated: 5/2/2003 13:25:19
Report from file: ...\SN01440 2003-05-01 123502 Test #2.bin
Win-Situ Version 4.4

Serial number: 1440
Firmware Version 3.06
Unit name: 4151-fa01

Test name: Test #2

Test defined on: 5/1/2003 12:34:12
Test started on: 5/1/2003 12:35:02
Test stopped on: N/A N/A
Test extracted on: N/A N/A

Data gathered using Logarithmic testing
Maximum time between data points: 600.0 Seconds.
Number of data samples: 91

TOTAL DATA SAMPLES 91

Channel number [1]
Measurement type: Temperature
Channel name: Temperature

Channel number [2]
Measurement type: Pressure
Channel name: Pressure
Sensor Range: 30 PSIG.
Specific gravity: 1
Mode: TOC
User-defined reference: 0 Feet H2O
Referenced on: test start
Pressure head at reference: 4.774 Feet H2O

FAO1 Date	Time	ET (sec)	Chan[2] Feet H2O	Chan[1] Fahrenheit	Corrected ET (sec)	H/Ho
5/1/2003	12:35:02	0	0	44.25		
		0.15	2		0	1.00
5/1/2003	12:35:03	0.3	0.487	44.27	0.15	0.24
5/1/2003	12:35:03	0.6	0.385	44.27	0.45	0.19
5/1/2003	12:35:03	0.9	0.096	44.29	0.75	0.05
5/1/2003	12:35:04	1.2	0.034	44.29	1.05	0.02
5/1/2003	12:35:04	1.5	0.014	44.29	1.35	0.01
5/1/2003	12:35:04	1.8	0.005	44.32	1.65	0.00
5/1/2003	12:35:04	2.1	-0.001	44.32	1.95	0.00
5/1/2003	12:35:05	2.4	-0.003	44.32	2.25	0.00
5/1/2003	12:35:05	2.7	-0.003	44.32	2.55	0.00
5/1/2003	12:35:05	3	-0.005	44.32	2.85	0.00
5/1/2003	12:35:06	3.3	-0.005	44.32	3.15	0.00
5/1/2003	12:35:06	3.6	-0.007	44.32	3.45	0.00
5/1/2003	12:35:06	3.9	-0.007	44.32	3.75	0.00
5/1/2003	12:35:07	4.2	-0.007	44.32	4.05	0.00
5/1/2003	12:35:07	4.5	-0.006	44.34	4.35	0.00
5/1/2003	12:35:07	4.8	-0.007	44.32	4.65	0.00
5/1/2003	12:35:07	5.1	-0.006	44.34	4.95	0.00
5/1/2003	12:35:08	5.4	-0.003	44.34	5.25	0.00
5/1/2003	12:35:08	5.7	-0.004	44.34	5.55	0.00

FAO1 Date	Time	ET (sec)	Chan[2] Feet H2O	Chan[1] Fahrenheit	Corrected ET (sec)	H/Ho
5/1/2003	12:35:08	6	-0.004	44.34	5.85	0.00
5/1/2003	12:35:09	6.4	-0.004	44.34	6.25	0.00
5/1/2003	12:35:09	6.7	-0.004	44.34	6.55	0.00
5/1/2003	12:35:09	7.1	-0.004	44.34	6.95	0.00
5/1/2003	12:35:10	7.5	-0.004	44.34	7.35	0.00
5/1/2003	12:35:10	8	-0.004	44.34	7.85	0.00
5/1/2003	12:35:11	8.4	-0.004	44.34	8.25	0.00
5/1/2003	12:35:11	8.9	-0.003	44.34	8.75	0.00
5/1/2003	12:35:12	9.5	-0.001	44.34	9.35	0.00
5/1/2003	12:35:12	10	0.02	44.32	9.85	0.01
5/1/2003	12:35:13	10.6	0.023	44.32	10.45	0.01
5/1/2003	12:35:14	11.3	0.023	44.32	11.15	0.01
5/1/2003	12:35:14	11.9	0.003	44.32	11.75	0.00
5/1/2003	12:35:15	12.6	0.003	44.32	12.45	0.00
5/1/2003	12:35:16	13.4	0.003	44.32	13.25	0.00
5/1/2003	12:35:17	14.2	0.004	44.29	14.05	0.00
5/1/2003	12:35:17	15	0.004	44.29	14.85	0.00
5/1/2003	12:35:18	15.9	0.004	44.29	15.75	0.00
5/1/2003	12:35:19	16.8	0.004	44.29	16.65	0.00
5/1/2003	12:35:20	17.8	0.004	44.29	17.65	0.00
5/1/2003	12:35:21	18.9	0.004	44.29	18.75	0.00
5/1/2003	12:35:22	20	0.004	44.29	19.85	0.00
5/1/2003	12:35:24	21.2	0.004	44.29	21.05	0.00
5/1/2003	12:35:25	22.4	0.004	44.29	22.25	0.00
5/1/2003	12:35:26	23.8	0.004	44.29	23.65	0.00
5/1/2003	12:35:28	25.2	0.004	44.29	25.05	0.00
5/1/2003	12:35:29	26.7	0.004	44.29	26.55	0.00
5/1/2003	12:35:31	28.2	0.004	44.29	28.05	0.00
5/1/2003	12:35:32	29.8	0.004	44.29	29.65	0.00
5/1/2003	12:35:34	31.5	0.006	44.29	31.35	0.00
5/1/2003	12:35:36	33.3	0.006	44.29	33.15	0.00
5/1/2003	12:35:38	35.2	0.006	44.29	35.05	0.00
5/1/2003	12:35:40	37.3	0.006	44.29	37.15	0.00
5/1/2003	12:35:42	39.5	0.004	44.29	39.35	0.00
5/1/2003	12:35:44	41.8	0.004	44.27	41.65	0.00
5/1/2003	12:35:47	44.3	0.004	44.27	44.15	0.00
5/1/2003	12:35:49	46.9	0.004	44.29	46.75	0.00
5/1/2003	12:35:52	49.7	0.004	44.27	49.55	0.00
5/1/2003	12:35:55	52.6	0.004	44.27	52.45	0.00
5/1/2003	12:35:58	55.7	0.017	44.27	55.55	0.01
5/1/2003	12:36:01	59	0.017	44.27	58.85	0.01
5/1/2003	12:36:05	62.5	0.017	44.27	62.35	0.01
5/1/2003	12:36:09	66.2	0.017	44.27	66.05	0.01
5/1/2003	12:36:12	70.1	0.015	44.27	69.95	0.01
5/1/2003	12:36:17	74.3	0.015	44.27	74.15	0.01
5/1/2003	12:36:21	78.7	0.015	44.27	78.55	0.01
5/1/2003	12:36:26	83.4	0.015	44.27	83.25	0.01
5/1/2003	12:36:31	88.4	0.015	44.25	88.25	0.01
5/1/2003	12:36:36	93.7	0.013	44.25	93.55	0.01
5/1/2003	12:36:42	99.3	0.013	44.25	99.15	0.01
5/1/2003	12:36:48	105.2	0.013	44.25	105.05	0.01
5/1/2003	12:36:54	111.5	0.013	44.25	111.35	0.01
5/1/2003	12:37:00	118.1	0.013	44.25	117.95	0.01
5/1/2003	12:37:07	125.1	0.011	44.25	124.95	0.01
5/1/2003	12:37:15	132.6	0.011	44.25	132.45	0.01
5/1/2003	12:37:23	140.5	0.013	44.25	140.35	0.01
5/1/2003	12:37:31	148.9	0.011	44.25	148.75	0.01
5/1/2003	12:37:40	157.8	0.009	44.25	157.65	0.00
5/1/2003	12:37:50	167.2	0.009	44.25	167.05	0.00
5/1/2003	12:38:00	177.2	0.009	44.25	177.05	0.00

FAO1 Date	Time	ET (sec)	Chan[2] Feet H2O	Chan[1] Fahrenheit	Corrected ET (sec)	H/Ho
5/1/2003	12:38:10	187.8	0.008	44.25	187.65	0.00
5/1/2003	12:38:21	199	0.008	44.25	198.85	0.00
5/1/2003	12:38:33	210.9	0.008	44.25	210.75	0.00
5/1/2003	12:38:46	223.5	0.006	44.25	223.35	0.00
5/1/2003	12:38:59	236.8	0.006	44.25	236.65	0.00
5/1/2003	12:39:13	250.9	0.005	44.23	250.75	0.00
5/1/2003	12:39:28	265.8	0.006	44.25	265.65	0.00
5/1/2003	12:39:44	281.6	0.004	44.25	281.45	0.00
5/1/2003	12:40:01	298.4	0.004	44.25	298.25	0.00
5/1/2003	12:40:19	316.2	0.004	44.25	316.05	0.00
5/1/2003	12:40:37	335	0.004	44.25	334.85	0.00

A.5 SAMPLE LIST

TABLE A-1
SAMPLE LIST FOR OU7
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY MAINE

LOCATION	SAMPLE	SAMPLE DATE	INVESTIGATION	DIOX	M	MF	OS	OV	PAH	PEST/PCB	PET
			SOIL								
BGS-05	BGS-05	19910813	RFI		X		X	X	X	X	
TP-MW01	TP-SB01-0305-98	19980622	SSI		X		X	X	X	X	X
TP-MW01	TP-SB01-0810-98	19980622	SSI		X		X	X	X	X	X
TP-MW01	TP-SB01-1214-98	19980622	SSI		X		X	X	X	X	X
TP-MW01	TP-SS01-0001-98	19980622	SSI		X		X	X	X	X	X
TP-MW02	TP-SB02-0305-98	19980620	SSI		X		X	X	X	X	X
TP-MW02	TP-SB02-0911-98	19980620	SSI				X		X	X	X
TP-MW02	TP-SB02-1113-98	19980620	SSI				X		X	X	X
TP-MW02	TP-SB02-1517-98	19980620	SSI		X		X	X	X	X	X
TP-MW02	TP-SS02-0001-98	19980620	SSI		X		X	X	X	X	X
TP-MW03	TP-SB03-0305-98	19980620	SSI		X		X	X	X	X	X
TP-MW03	TP-SB03-0507-98	19980620	SSI		X		X	X	X	X	X
TP-MW03	TP-SB03-1315-98	19980620	SSI		X		X	X	X	X	X
TP-MW03	TP-SB03-1315-98-D	19980620	SSI		X		X	X	X	X	X
TP-MW03	TP-SB03-2325-98	19980620	SSI		X		X	X	X	X	X
TP-MW03	TP-SS03-0001-98	19980620	SSI		X		X	X	X	X	X
TP-MW04	TP-SB04-0305-98	19980618	SSI		X		X	X	X		X
TP-MW04	TP-SB04-0709-98	19980618	SSI		X		X	X	X	X	X
TP-MW04	TP-SB04-1315-98	19980618	SSI		X		X	X	X	X	X
TP-MW04	TP-SB04-1315-98-D	19980618	SSI		X		X	X	X	X	X
TP-MW04	TP-SS04-0001-98	19980618	SSI		X		X	X	X	X	X
TP-MW05	TP-SB05-0305-98	19980609	SSI		X		X	X	X	X	X
TP-MW05	TP-SB05-0305-98-D	19980609	SSI		X		X	X	X	X	X
TP-MW05	TP-SB05-0507-98	19980609	SSI		X		X	X	X	X	X
TP-MW05	TP-SB05-0810-98	19980609	SSI		X		X	X	X		X
TP-MW05	TP-SS05-0001-98	19980609	SSI		X		X	X	X	X	X
TP-MW06	TP-SB06-0305-98	19980616	SSI		X		X	X	X	X	X
TP-MW06	TP-SB06-0507-98	19980616	SSI		X		X	X	X		X
TP-MW06	TP-SB06-1315-98	19980616	SSI		X		X	X	X	X	X

TABLE A-1
SAMPLE LIST FOR OU7
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY MAINE

LOCATION	SAMPLE	SAMPLE DATE	INVESTIGATION	DIOX	M	MF	OS	OV	PAH	PEST/PCB	PET
TP-MW06	TP-SS06-0001-98	19980616	SSI		X		X	X	X	X	X
TP-MW07	TP-SB07-0305-98	19980615	SSI		X		X	X	X	X	X
TP-MW07	TP-SB07-0709-98	19980615	SSI								X
TP-MW07	TP-SB07-1315-98	19980615	SSI		X		X	X	X	X	X
TP-MW07	TP-SB07-1315-98-D	19980615	SSI		X		X	X	X	X	X
TP-MW07	TP-SB07-1820-98	19980615	SSI		X		X	X	X	X	X
TP-MW07	TP-SS07-0001-98	19980615	SSI		X		X	X	X	X	X
TP-MW08	TPSB290205	20030423	RI PHASE I	X	X		X		X	X	
TP-MW08	TPSB290508	20030423	RI PHASE I		X		X		X	X	
TP-MW08	TPSS290001	20030423	RI PHASE I		X		X		X	X	
TP-MW09	TPSB210205	20030422	RI PHASE I	X	X		X		X	X	
TP-MW09	TPSB210508	20030422	RI PHASE I		X		X		X	X	
TP-MW09	TPSS210001	20030422	RI PHASE I	X	X		X		X	X	
TP-MW10	TPSB38A0305	20030423	RI PHASE I		X						
TP-MW10	TPSB38A0709	20030423	RI PHASE I		X						
TP-SB08	TP-SB08-0305-98	19980710	SSI		X		X	X	X	X	X
TP-SB08	TP-SB08-0507-98	19980710	SSI		X		X	X	X	X	X
TP-SB08	TP-SB08-1820-98	19980710	SSI		X		X	X	X	X	X
TP-SB08	TP-SS08-0001-98	19980710	SSI		X		X	X	X	X	X
TP-SB09	TP-SB09-0305-98	19980609	SSI		X		X	X	X	X	X
TP-SB09	TP-SB09-0507-98	19980609	SSI					X			X
TP-SB09	TP-SB09-0810-98	19980609	SSI		X		X	X	X	X	X
TP-SB09	TP-SB09-1315-98	19980609	SSI		X		X	X	X	X	X
TP-SB09	TP-SS09-0001-98	19980609	SSI		X		X	X	X	X	X
TP-SB09	TP-SS09-0001-98-D	19980609	SSI		X		X	X	X	X	X
TP-SB10	TP-SB10-0305-98	19980616	SSI		X		X	X	X	X	X
TP-SB10	TP-SB10-0709-98	19980616	SSI					X			X
TP-SB10	TP-SB10-0911-98	19980616	SSI								X
TP-SB10	TP-SB10-1315-98	19980616	SSI		X		X	X	X	X	X
TP-SB10	TP-SS10-0001-98	19980616	SSI		X		X	X	X	X	X

TABLE A-1
SAMPLE LIST FOR OU7
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY MAINE

LOCATION	SAMPLE	SAMPLE DATE	INVESTIGATION	DIOX	M	MF	OS	OV	PAH	PEST/PCB	PET
TP-SB101	TPSB1010205	20081122	PHASE II RI		X						
TP-SB101	TPSB1010508	20081122	PHASE II RI		X						
TP-SB101	TPSS1010001	20081122	PHASE II RI		X						
TP-SB102	TPSB1020205	20081122	PHASE II RI		X						
TP-SB102	TPSB1020205-D	20081122	PHASE II RI		X						
TP-SB102	TPSB1020508	20081122	PHASE II RI		X						
TP-SB102	TPSS1020001	20081122	PHASE II RI		X						
TP-SB103	TPSB1030205	20081122	PHASE II RI		X						
TP-SB103	TPSB1030508	20081122	PHASE II RI		X						
TP-SB103	TPSB1030508-D	20081122	PHASE II RI		X						
TP-SB103	TPSS1030001	20081122	PHASE II RI		X						
TP-SB104	TPSB1040205	20081122	PHASE II RI		X						
TP-SB104	TPSB1040508	20081122	PHASE II RI		X						
TP-SB104	TPSS1040001	20081122	PHASE II RI		X						
TP-SB105	TPSB1050205	20081122	PHASE II RI		X						
TP-SB105	TPSB1050508	20081122	PHASE II RI		X						
TP-SB105	TPSS1050001	20081122	PHASE II RI		X						
TP-SB106	TPSB1060205	20081122	PHASE II RI							X	
TP-SB106	TPSB1060508	20081122	PHASE II RI							X	
TP-SB106	TPSS1060001	20081122	PHASE II RI							X	
TP-SB107	TPSB1070205	20081122	PHASE II RI							X	
TP-SB107	TPSB1070508	20081122	PHASE II RI							X	
TP-SB107	TPSS1070001	20081122	PHASE II RI							X	
TP-SB108	TPSB1080205	20081122	PHASE II RI							X	
TP-SB108	TPSB1080508	20081122	PHASE II RI							X	
TP-SB108	TPSS1080001	20081122	PHASE II RI							X	
TP-SB109	TPSB1090205	20081122	PHASE II RI							X	
TP-SB109	TPSB1090508	20081122	PHASE II RI							X	
TP-SB109	TPSS1090001	20081122	PHASE II RI							X	
TP-SB11	TP-SB11-0305-98	19980716	SSI		X		X	X	X	X	

TABLE A-1
SAMPLE LIST FOR OU7
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY MAINE

LOCATION	SAMPLE	SAMPLE DATE	INVESTIGATION	DIOX	M	MF	OS	OV	PAH	PEST/PCB	PET
TP-SB11	TP-SB11-0709-98	19980716	SSI		X		X	X	X	X	
TP-SB11	TP-SB11-1315-98	19980716	SSI		X		X	X	X	X	
TP-SB11	TP-SS11-0001-98	19980716	SSI		X		X	X	X	X	
TP-SB11	TP-SS11-0001-98-D	19980716	SSI		X		X	X	X	X	
TP-SB110	TPSB1100205	20081122	PHASE II RI							X	
TP-SB110	TPSB1100508	20081122	PHASE II RI							X	
TP-SB110	TPSS1100001	20081122	PHASE II RI							X	
TP-SB111	TPSB1110205	20081122	PHASE II RI							X	
TP-SB111	TPSB1110508	20081122	PHASE II RI							X	
TP-SB111	TPSS1110001	20081122	PHASE II RI							X	
TP-SB112	TPSB1120205	20081122	PHASE II RI							X	
TP-SB112	TPSB1120508	20081122	PHASE II RI							X	
TP-SB112	TPSS1120001	20081122	PHASE II RI							X	
TP-SB113	TPSB1130205	20081122	PHASE II RI							X	
TP-SB113	TPSB1130508	20081122	PHASE II RI							X	
TP-SB113	TPSS1130001	20081122	PHASE II RI							X	
TP-SB114	TPSB1140205	20081122	PHASE II RI							X	
TP-SB114	TPSB1140508	20081122	PHASE II RI							X	
TP-SB114	TPSS1140001	20081122	PHASE II RI							X	
TP-SB115	TPSS1150001	20081122	PHASE II RI		X		X			X	
TP-SB116	TPSS1160001	20081122	PHASE II RI		X		X			X	
TP-SB116	TPSS1160001-D	20081122	PHASE II RI		X		X			X	
TP-SB117	TPSB1170205	20081123	PHASE II RI		X		X			X	
TP-SB117	TPSB1170205-D	20081123	PHASE II RI		X		X			X	
TP-SB117	TPSS1170001	20081123	PHASE II RI		X		X			X	
TP-SB117	TPSS1170001-D	20081123	PHASE II RI							X	
TP-SB118	TPSB1180205	20081123	PHASE II RI		X		X			X	
TP-SB118	TPSB1180205-D	20081123	PHASE II RI							X	
TP-SB118	TPSS1180001	20081123	PHASE II RI		X		X			X	
TP-SB119	TPSS1190001	20081123	PHASE II RI		X		X			X	

TABLE A-1
SAMPLE LIST FOR OU7
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY MAINE

LOCATION	SAMPLE	SAMPLE DATE	INVESTIGATION	DIOX	M	MF	OS	OV	PAH	PEST/PCB	PET
TP-SB12	TP-SB12-0507-98	19980713	SSI		X		X	X	X	X	
TP-SB12	TP-SS12-0001-98	19980713	SSI		X		X	X	X	X	
TP-SB120	TPSS1200001	20081123	PHASE II RI		X		X			X	
TP-SB120	TPSS1200001-D	20081123	PHASE II RI		X		X			X	
TP-SB121	TPSS1210001	20081123	PHASE II RI		X		X			X	
TP-SB122	TPSS1220001	20081123	PHASE II RI		X		X			X	
TP-SB123	TPSS1230001	20081123	PHASE II RI		X		X			X	
TP-SB13	TP-SB13-0305-98	19980715	SSI		X		X	X	X	X	X
TP-SB13	TP-SB13-0709-98	19980715	SSI		X		X	X	X	X	X
TP-SB13	TP-SB13-1315-98	19980715	SSI		X		X	X	X	X	X
TP-SB14	TP-SB14-0305-98	19980715	SSI		X		X	X	X	X	X
TP-SB14	TP-SB14-0709-98	19980715	SSI		X		X	X	X	X	X
TP-SB14	TP-SB14-1315-98	19980715	SSI		X		X	X	X	X	X
TP-SB15	TP-SB15-0305-98	19980710	SSI		X		X	X	X	X	X
TP-SB15	TP-SB15-0709-98	19980710	SSI		X		X	X	X	X	X
TP-SB15	TP-SB15-1315-98	19980710	SSI		X		X	X	X	X	X
TP-SB15	TP-SB15-1315-98-D	19980710	SSI		X		X	X	X	X	X
TP-SB15	TP-SS15-0001-98	19980710	SSI		X		X	X	X	X	X
TP-SB16	TP-SB16-0305-98	19980716	SSI				X		X		X
TP-SB16	TP-SB16-1719-98	19980716	SSI		X		X	X	X	X	X
TP-SB17	TP-SB17-0305-98	19980716	SSI		X		X	X	X	X	X
TP-SB17	TP-SB17-0709-98	19980716	SSI		X		X	X	X	X	X
TP-SB17	TP-SS17-0001-98	19980716	SSI		X		X	X	X	X	X
TP-SB18	TPSB180205	20030425	PHASE I RI		X		X		X	X	
TP-SB18	TPSB180508	20030425	PHASE I RI		X		X		X	X	
TP-SB18	TPSS180001	20030425	PHASE I RI		X		X		X	X	
TP-SB19	TPSB190205	20030425	PHASE I RI	X	X		X		X	X	
TP-SB19	TPSB190205-D	20030425	PHASE I RI	X	X		X		X	X	
TP-SB19	TPSB190508	20030425	PHASE I RI		X		X		X	X	
TP-SB19	TPSS190001	20030425	PHASE I RI	X	X		X		X	X	

TABLE A-1
SAMPLE LIST FOR OU7
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY MAINE

LOCATION	SAMPLE	SAMPLE DATE	INVESTIGATION	DIOX	M	MF	OS	OV	PAH	PEST/PCB	PET
TP-SB20	TPSB200205	20030425	PHASE I RI		X		X		X	X	
TP-SB20	TPSB200205-D	20030425	PHASE I RI		X		X		X	X	
TP-SB20	TPSB200506	20030425	PHASE I RI								
TP-SB20	TPSS200001	20030425	PHASE I RI		X		X		X	X	
TP-SB20B	TPSB20B0203	20030425	PHASE I RI								
TP-SB20B	TPSB20B0508	20030425	PHASE I RI		X		X		X	X	
TP-SB22	TPSB220205	20030423	PHASE I RI	X	X		X		X	X	
TP-SB22	TPSB220508	20030423	PHASE I RI		X		X		X	X	
TP-SB22	TPSS220001	20030423	PHASE I RI	X	X		X		X	X	
TP-SB23	TPSB230205	20030422	PHASE I RI		X		X		X	X	
TP-SB23	TPSB230508	20030422	PHASE I RI		X						
TP-SB23	TPSS230001	20030422	PHASE I RI		X		X		X	X	
TP-SB24	TPSB240205	20030422	PHASE I RI		X		X		X	X	
TP-SB24	TPSB240508	20030422	PHASE I RI		X		X		X	X	
TP-SB24	TPSS240001	20030422	PHASE I RI		X		X		X	X	
TP-SB25	TPSB250205	20030425	PHASE I RI		X		X		X	X	
TP-SB25	TPSB250508	20030425	PHASE I RI		X		X		X	X	
TP-SB25	TPSB250508-D	20030425	PHASE I RI		X		X		X	X	
TP-SB25	TPSS250001	20030425	PHASE I RI	X	X		X		X	X	
TP-SB26A	TPSB26A0203	20030426	PHASE I RI		X						
TP-SB26A	TPSS26A0001	20030426	PHASE I RI	X	X		X		X	X	
TP-SB26B	TPSB26B0205	20030426	PHASE I RI								
TP-SB26B	TPSB26B0508	20030426	PHASE I RI		X		X		X	X	
TP-SB26B	TPSS26B0001	20030426	PHASE I RI		X		X		X	X	
TP-SB27	TPSB270205	20030425	PHASE I RI	X	X		X		X	X	
TP-SB27	TPSB270508	20030425	PHASE I RI	X	X		X		X	X	
TP-SB27	TPSB270508-D	20030425	PHASE I RI	X							
TP-SB27	TPSS270001	20030425	PHASE I RI	X	X		X		X	X	
TP-SB28	TPSB280205	20030425	PHASE I RI	X	X		X		X	X	
TP-SB28	TPSB280508	20030425	PHASE I RI		X		X		X	X	

TABLE A-1
SAMPLE LIST FOR OU7
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY MAINE

LOCATION	SAMPLE	SAMPLE DATE	INVESTIGATION	DIOX	M	MF	OS	OV	PAH	PEST/PCB	PET
TP-SB28	TPSS280001	20030425	PHASE I RI		X		X		X	X	
TP-SB30	TPSB300205	20030424	PHASE I RI		X		X		X	X	
TP-SB30	TPSB300508	20030424	PHASE I RI		X		X		X	X	
TP-SB30	TPSS300001	20030424	PHASE I RI		X		X		X	X	
TP-SB31	TPSB310205	20030423	PHASE I RI	X	X		X		X	X	
TP-SB31	TPSB310205-D	20030423	PHASE I RI		X		X		X	X	
TP-SB31	TPSB310508	20030423	PHASE I RI		X						
TP-SB31	TPSS310001	20030423	PHASE I RI	X	X		X		X	X	
TP-SB32	TPSB320205	20030425	PHASE I RI	X	X		X		X	X	
TP-SB32	TPSB320508	20030425	PHASE I RI		X		X		X	X	
TP-SB32	TPSS320001	20030425	PHASE I RI		X		X		X	X	
TP-SB33	TPSB330205	20030425	PHASE I RI	X	X		X		X	X	
TP-SB33	TPSS33B0001	20030425	PHASE I RI	X	X		X		X	X	
TP-SB33B	TPSB33B0205	20030425	PHASE I RI								
TP-SB33B	TPSB33B0508	20030425	PHASE I RI		X		X		X	X	
TP-SB34	TPSB340205	20030425	PHASE I RI	X	X		X		X	X	
TP-SB34	TPSB340205-D	20030425	PHASE I RI		X		X		X	X	
TP-SB34	TPSB340508	20030425	PHASE I RI	X	X		X		X	X	
TP-SB34	TPSS340001	20030425	PHASE I RI	X	X		X		X	X	
TP-SB35	TPSB350205	20030425	PHASE I RI		X		X		X	X	
TP-SB35	TPSB350508	20030425	PHASE I RI		X		X		X	X	
TP-SB35	TPSS350001	20030425	PHASE I RI		X		X		X	X	
TP-SB36	TPSB360205	20030424	PHASE I RI		X		X		X	X	
TP-SB36	TPSB360508	20030424	PHASE I RI		X		X		X	X	
TP-SB36	TPSS360001	20030424	PHASE I RI	X	X		X		X	X	
TP-SB36	TPSS360001-D	20030424	PHASE I RI	X	X		X		X	X	
TP-SB37	TPSB370205	20030425	PHASE I RI		X		X		X	X	
TP-SB37	TPSB370508	20030425	PHASE I RI		X		X		X	X	
TP-SB37	TPSS370001	20030425	PHASE I RI		X		X		X	X	
TP-SB38B	TPSB38B0205	20030424	PHASE I RI		X		X		X	X	

TABLE A-1
SAMPLE LIST FOR OU7
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY MAINE

LOCATION	SAMPLE	SAMPLE DATE	INVESTIGATION	DIOX	M	MF	OS	OV	PAH	PEST/PCB	PET
TP-SB38B	TPSS38B0001	20030424	PHASE I RI		X		X		X	X	
TP-SB39	TPSB390205	20030425	PHASE I RI	X	X		X		X	X	
TP-SB39	TPSS390001	20030425	PHASE I RI		X		X		X	X	
TP-SB40	TPSB400205	20030424	PHASE I RI								
TP-SB40	TPSB400508	20030424	PHASE I RI		X		X		X	X	
TP-SB40	TPSS400001	20030424	PHASE I RI		X		X		X	X	
TP-SB41	TPSB410205	20030424	PHASE I RI		X		X		X	X	
TP-SB41	TPSB410508	20030424	PHASE I RI		X		X		X	X	
TP-SB41	TPSS410001	20030424	PHASE I RI	X	X		X		X	X	
TP-SB42	TPSS420001	20030424	PHASE I RI		X		X		X	X	
TP-SB42	TPSS420001-D	20030424	PHASE I RI		X		X		X	X	
TP-SB43	TPSS430001	20030424	PHASE I RI	X	X		X		X	X	
GROUNDWATER											
FA-01	FA-01-GW-07	19961209	GROUNDWATER MONITORING		X					X	X
FA-01	FA-01-GW-07-D	19961209	GROUNDWATER MONITORING		X					X	X
FA-01	FA-01-GW-07-F	19961209	GROUNDWATER MONITORING			X					
FA-01	FA-01-GW-07-F-D	19961209	GROUNDWATER MONITORING			X					
FA-01	FA-01-GW-08	19970427	GROUNDWATER MONITORING		X					X	X
FA-01	FA-01-GW-09	19970806	GROUNDWATER MONITORING		X					X	X
FA-01	FA-01-GW-10	19971101	GROUNDWATER MONITORING		X					X	X
FA-01	TPGWFA010503	20030508	PHASE I RI		X		X		X	X	
FA-01	TPGWFA010503-F	20030508	PHASE I RI			X					
FA-01	TPGWFA011208	20081215	PHASE II RI		X	X			X		
FA-01B	FA-01B-GW-07	19961209	GROUNDWATER MONITORING		X					X	X
FA-01B	FA-01B-GW-08	19970427	GROUNDWATER MONITORING		X					X	X
FA-01B	FA-01B-GW-08-D	19970427	GROUNDWATER MONITORING		X					X	X
FA-01B	FA-01B-GW-09	19970806	GROUNDWATER MONITORING		X					X	X
FA-01B	FA-01B-GW-10	19971101	GROUNDWATER MONITORING		X					X	X
FA-01B	TPGWFA01B0503	20030508	PHASE I RI		X		X		X	X	
FA-01B	TPGWFA01B0503-F	20030508	PHASE I RI			X					

TABLE A-1
SAMPLE LIST FOR OU7
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY MAINE

LOCATION	SAMPLE	SAMPLE DATE	INVESTIGATION	DIOX	M	MF	OS	OV	PAH	PEST/PCB	PET
FA-01B	TPGWFA01B1208	20081216	PHASE II RI		X	X			X		
FA-01DB	FA-01DB-GW-07	19961218	GROUNDWATER MONITORING		X					X	X
FA-01DB	FA-01DB-GW-08	19970426	GROUNDWATER MONITORING		X					X	X
FA-01DB	FA-01DB-GW-09	19970807	GROUNDWATER MONITORING		X					X	X
FA-01DB	FA-01DB-GW-10	19971118	GROUNDWATER MONITORING		X					X	X
FA-01DB	FA-01DB-GW-10-D	19971118	GROUNDWATER MONITORING		X					X	X
TP-MW01	TP-MW-01-11	19980730	SSI		X		X	X	X	X	X
TP-MW01	TPGWMW010503	20030507	PHASE I RI		X		X		X	X	
TP-MW01	TPGWMW010503-F	20030507	PHASE I RI			X					
TP-MW01	TPGWMW011208	20081216	PHASE II RI		X	X			X		
TP-MW02	TP-MW-02-11	19980801	SSI		X		X	X	X	X	X
TP-MW02	TPGWMW020503	20030507	PHASE I RI		X		X		X	X	
TP-MW02	TPGWMW020503-F	20030507	PHASE I RI			X					
TP-MW02	TPGWMW021208	20081215	PHASE II RI		X	X			X		
TP-MW03	TP-MW-03-11	19980731	SSI		X		X	X	X	X	X
TP-MW03	TPGWMW030503	20030508	PHASE I RI		X		X		X	X	
TP-MW03	TPGWMW030503-F	20030508	PHASE I RI			X					
TP-MW03	TPGWMW031208	20081218	PHASE II RI		X	X			X		
TP-MW04	TP-MW-04-11	19980731	SSI		X		X	X	X	X	X
TP-MW04	TP-MW-04-11-D	19980731	SSI		X		X	X	X	X	X
TP-MW04	TPGWMW040503	20030506	PHASE I RI		X		X		X	X	
TP-MW04	TPGWMW040503-D	20030506	PHASE I RI		X		X		X	X	
TP-MW04	TPGWMW040503-F	20030506	PHASE I RI			X					
TP-MW04	TPGWMW040503-F-D	20030506	PHASE I RI			X					
TP-MW04	TPGWMW041208	20081216	PHASE II RI		X	X			X		
TP-MW05	TP-MW-05-11	19980804	SSI		X		X	X	X	X	X
TP-MW05	TP-MW-05-11-F	19980804	SSI			X					
TP-MW05	TPGWMW050503	20030507	PHASE I RI		X		X		X	X	
TP-MW05	TPGWMW050503-F	20030507	PHASE I RI			X					
TP-MW05	TPGWMW051208	20081217	PHASE II RI		X	X			X		

TABLE A-1
SAMPLE LIST FOR OU7
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY MAINE

LOCATION	SAMPLE	SAMPLE DATE	INVESTIGATION	DIOX	M	MF	OS	OV	PAH	PEST/PCB	PET
TP-MW06	TP-MW-06-11	19980730	SSI		X		X	X	X	X	X
TP-MW06	TPGWMW060503	20030507	PHASE I RI		X		X		X	X	
TP-MW06	TPGWMW060503-F	20030507	PHASE I RI			X					
TP-MW06	TPGWMW061208	20081217	PHASE II RI		X	X			X		
TP-MW07	TP-MW-07-11	19980730	SSI		X		X	X	X	X	X
TP-MW07	TPGWMW070503	20030509	PHASE I RI		X		X		X	X	
TP-MW07	TPGWMW070503-D	20030509	PHASE I RI		X		X		X	X	
TP-MW07	TPGWMW070503-F	20030509	PHASE I RI			X					
TP-MW07	TPGWMW070503-F-D	20030509	PHASE I RI			X					
TP-MW07	TPGWMW071208-D	20081215	PHASE II RI		X	X			X		
TP-MW07	TPGWMW071208	20081219	PHASE II RI		X	X			X		
TP-MW08	TPGWMW080503	20030507	PHASE I RI		X		X		X	X	
TP-MW08	TPGWMW080503-F	20030507	PHASE I RI			X					
TP-MW08	TPGWMW081208	20081216	PHASE II RI		X	X			X		
TP-MW09	TPGWMW090503	20030507	PHASE I RI		X		X		X	X	
TP-MW09	TPGWMW090503-F	20030507	PHASE I RI			X					
TP-MW09	TPGWMW091208	20081215	PHASE II RI		X	X			X		
TP-MW09	TPGWMW091208-D	20081215	PHASE II RI		X	X			X		
TP-MW10	TPGWMW100503	20030509	PHASE I RI		X		X		X	X	
TP-MW10	TPGWMW100503-F	20030509	PHASE I RI			X					
TP-MW10	TPGWMW1012008	20081218	PHASE II RI		X	X			X		
TP-MW12	TPGWMW121208	20081218	PHASE II RI		X	X			X		
SEDIMENT											
BC-1016	BC-1016-SD-1296	19961224	1996-1997 SEEP/SEDIMENT MONITORING		X		X		X	X	
BC-1016	BC-1016-SD-0497	19970410	1996-1997 SEEP/SEDIMENT MONITORING		X		X		X	X	
BC-1016	BC-1016-SD-0897	19970819	1996-1997 SEEP/SEDIMENT MONITORING		X		X		X	X	
BC-1016	BC-1016-SD-1197	19971113	1996-1997 SEEP/SEDIMENT MONITORING		X		X		X	X	
BC-1016	BC-1016-SD-1197-D	19971113	1996-1997 SEEP/SEDIMENT MONITORING		X		X		X	X	
BC-1017	BC-1017-SD-1296	19970115	1996-1997 SEEP/SEDIMENT MONITORING		X		X		X	X	
BC-1017	BC-1017-SD-0497	19970409	1996-1997 SEEP/SEDIMENT MONITORING		X		X		X	X	

TABLE A-1
SAMPLE LIST FOR OU7
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY MAINE

LOCATION	SAMPLE	SAMPLE DATE	INVESTIGATION	DIOX	M	MF	OS	OV	PAH	PEST/PCB	PET
BC-1017	BC-1017-SD-0897	19970819	1996-1997 SEEP/SEDIMENT MONITORING		X		X		X	X	
BC-1017	BC-1017-SD-1197	19971115	1996-1997 SEEP/SEDIMENT MONITORING		X		X		X	X	
BC-1018	BC-1018-SD-1296	19970115	1996-1997 SEEP/SEDIMENT MONITORING		X		X		X	X	
BC-1018	BC-1018-SD-1296-D	19970115	1996-1997 SEEP/SEDIMENT MONITORING		X		X		X	X	
BC-1018	BC-1018-SD-0497	19970409	1996-1997 SEEP/SEDIMENT MONITORING		X		X		X	X	
BC-1018	BC-1018-SD-0897	19970818	1996-1997 SEEP/SEDIMENT MONITORING		X		X		X	X	
BC-1018	BC-1018-SD-1197	19971113	1996-1997 SEEP/SEDIMENT MONITORING		X		X		X	X	
BC-1020	BC-1020-SD-1296	19961224	1996-1997 SEEP/SEDIMENT MONITORING		X		X		X	X	
BC-1020	BC-1020-SD-0497	19970409	1996-1997 SEEP/SEDIMENT MONITORING		X		X		X	X	
BC-1020	BC-1020-SD-0897	19970819	1996-1997 SEEP/SEDIMENT MONITORING		X		X		X	X	
BC-1020	BC-1020-SD-0897-D	19970819	1996-1997 SEEP/SEDIMENT MONITORING		X		X		X	X	
BC-1020	BC-1020-SD-1197	19971114	1996-1997 SEEP/SEDIMENT MONITORING		X		X		X	X	
MS-3 LOC.1	OU4-SD-M03-199A-D	19990909	INTERIM OFFSHORE MONITORING				X			X	
MS-3 LOC.1	OU4-SD-M03-199A	19990910	INTERIM OFFSHORE MONITORING				X			X	
MS-3 LOC.1	OU4-SD-M03-100B	20000504	INTERIM OFFSHORE MONITORING				X			X	
MS-3 LOC.1	OU4-SD-M03-100A	20000827	INTERIM OFFSHORE MONITORING				X			X	
MS-3 LOC.1	OU4-SD-M03-101B	20010506	INTERIM OFFSHORE MONITORING				X			X	
MS-3 LOC.1	OU4-SD-M03-101A	20010819	INTERIM OFFSHORE MONITORING				X			X	
MS-3 LOC.1	OU4-SD-M03-102A	20020810	INTERIM OFFSHORE MONITORING				X			X	
MS-3 LOC.1	OU4-SD-M03-103A	20030809	INTERIM OFFSHORE MONITORING				X			X	
MS-3 LOC.2	OU4-SD-M03-299A	19990910	INTERIM OFFSHORE MONITORING				X			X	
MS-3 LOC.2	OU4-SD-M03-200B	20000504	INTERIM OFFSHORE MONITORING				X			X	
MS-3 LOC.2	OU4-SD-M03-200A	20000827	INTERIM OFFSHORE MONITORING				X			X	
MS-3 LOC.2	OU4-SD-M03-201B	20010506	INTERIM OFFSHORE MONITORING				X			X	
MS-3 LOC.2	OU4-SD-M03-201A	20010819	INTERIM OFFSHORE MONITORING				X			X	
MS-3 LOC.2	OU4-SD-M03-202A	20020810	INTERIM OFFSHORE MONITORING				X			X	
MS-3 LOC.2	OU4-SD-M03-203A	20030809	INTERIM OFFSHORE MONITORING		X		X			X	
MS-3 LOC.3	OU4-SD-M03-399A	19990910	INTERIM OFFSHORE MONITORING				X			X	
MS-3 LOC.3	OU4-SD-M03-300B	20000504	INTERIM OFFSHORE MONITORING				X			X	
MS-3 LOC.3	OU4-SD-M03-300A	20000827	INTERIM OFFSHORE MONITORING				X			X	

TABLE A-1
SAMPLE LIST FOR OU7
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY MAINE

LOCATION	SAMPLE	SAMPLE DATE	INVESTIGATION	DIOX	M	MF	OS	OV	PAH	PEST/PCB	PET
MS-3 LOC.3	OU4-SD-M03-301B	20010506	INTERIM OFFSHORE MONITORING				X			X	
MS-3 LOC.3	OU4-SD-M03-301A	20010819	INTERIM OFFSHORE MONITORING				X			X	
MS-3 LOC.3	OU4-SD-M03-302A	20020810	INTERIM OFFSHORE MONITORING				X			X	
MS-3 LOC.3	OU4-SD-M03-303A	20030809	INTERIM OFFSHORE MONITORING				X			X	
MS-4 LOC.1	OU4-SD-M04-199A	19990910	INTERIM OFFSHORE MONITORING				X			X	
MS-4 LOC.1	OU4-SD-M04-100B	20000504	INTERIM OFFSHORE MONITORING				X			X	
MS-4 LOC.1	OU4-SD-M04-100A	20000827	INTERIM OFFSHORE MONITORING				X			X	
MS-4 LOC.1	OU4-SD-M04-101B	20010506	INTERIM OFFSHORE MONITORING				X			X	
MS-4 LOC.1	OU4-SD-M04-101B-D	20010506	INTERIM OFFSHORE MONITORING				X			X	
MS-4 LOC.1	OU4-SD-M04-101A	20010819	INTERIM OFFSHORE MONITORING				X			X	
MS-4 LOC.1	OU4-SD-M04-101A-D	20010819	INTERIM OFFSHORE MONITORING				X			X	
MS-4 LOC.1	OU4-SD-M04-102A	20020810	INTERIM OFFSHORE MONITORING				X			X	
MS-4 LOC.1	OU4-SD-M04-102A-D	20020810	INTERIM OFFSHORE MONITORING				X			X	
MS-4 LOC.1	OU4-SD-M04-103A	20030809	INTERIM OFFSHORE MONITORING		X		X			X	
MS-4 LOC.1	OU4-SD-M04-103A-D	20030809	INTERIM OFFSHORE MONITORING		X		X			X	
MS-4 LOC.2	OU4-SD-M04-299A	19990909	INTERIM OFFSHORE MONITORING				X			X	
MS-4 LOC.2	OU4-SD-M04-200B	20000504	INTERIM OFFSHORE MONITORING				X			X	
MS-4 LOC.2	OU4-SD-M04-200A	20000827	INTERIM OFFSHORE MONITORING				X			X	
MS-4 LOC.2	OU4-SD-M04-201B	20010506	INTERIM OFFSHORE MONITORING				X			X	
MS-4 LOC.2	OU4-SD-M04-201A	20010819	INTERIM OFFSHORE MONITORING				X			X	
MS-4 LOC.2	OU4-SD-M04-202A	20020810	INTERIM OFFSHORE MONITORING				X			X	
MS-4 LOC.2	OU4-SD-M04-203A	20030810	INTERIM OFFSHORE MONITORING				X			X	
MS-4 LOC.3	OU4-SD-M04-399A	19990910	INTERIM OFFSHORE MONITORING				X			X	
MS-4 LOC.3	OU4-SD-M04-300B	20000504	INTERIM OFFSHORE MONITORING				X			X	
MS-4 LOC.3	OU4-SD-M04-300A	20000827	INTERIM OFFSHORE MONITORING				X			X	
MS-4 LOC.3	OU4-SD-M04-301B	20010506	INTERIM OFFSHORE MONITORING				X			X	
MS-4 LOC.3	OU4-SD-M04-301A	20010819	INTERIM OFFSHORE MONITORING				X			X	
MS-4 LOC.3	OU4-SD-M04-302A	20020810	INTERIM OFFSHORE MONITORING				X			X	
MS-4 LOC.3	OU4-SD-M04-303A	20030809	INTERIM OFFSHORE MONITORING				X			X	
MS-4 LOC.4	OU4-SD-M04-401B	20010508	INTERIM OFFSHORE MONITORING								

TABLE A-1
SAMPLE LIST FOR OU7
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY MAINE

LOCATION	SAMPLE	SAMPLE DATE	INVESTIGATION	DIOX	M	MF	OS	OV	PAH	PEST/PCB	PET
MS-4 LOC.5	OU4-SD-M04-501B	20010508	INTERIM OFFSHORE MONITORING								
MS-4 LOC.6	OU4-SD-M04-601B	20010508	INTERIM OFFSHORE MONITORING								
TP-SD01	TPSD010006	20030522	PHASE I RI		X						
TP-SD01	TPSD010612	20030522	PHASE I RI		X						
TP-SD01	TPSD010612-D	20030522	PHASE I RI		X						
TP-SD02	TPSD020006	20030522	PHASE I RI		X						
TP-SD03	TPSD030006	20030813	PHASE I RI		X						
TP-SD03	TPSD030006-D	20030813	PHASE I RI		X						
TP-SD03	TPSD030612	20030813	PHASE I RI		X						
TP-SD04	TPSD040006	20030522	PHASE I RI		X						
TP-SD04	TPSD040612	20030522	PHASE I RI		X						
TP-SD05	TPSD050006	20030522	PHASE I RI		X						
TP-SD05	TPSD050612	20030522	PHASE I RI		X						
TP-SD06	TPSD060006	20030522	PHASE I RI		X						
TP-SD06	TPSD060006-D	20030522	PHASE I RI		X						
TP-SD06	TPSD060612	20030522	PHASE I RI		X						
TP-SD07	TPSD070006	20030522	PHASE I RI		X						
TP-SD07	TPSD070612	20030522	PHASE I RI		X						
TP-SD09	TPSD090006	20030522	PHASE I RI		X						
TP-SD09	TPSD090612	20030522	PHASE I RI		X						
TP-SD09	TPSD090612-D	20030522	PHASE I RI		X						
TP-SD10	TPSD100006	20030522	PHASE I RI		X						
TP-SD10	TPSD100612	20030522	PHASE I RI		X						
TP-SD101	TPSD1010004	20081216	PHASE II RI		X						
TP-SD101	TPSD1011216	20081216	PHASE II RI		X						
TP-SD102	TPSD1020004	20081216	PHASE II RI		X						
TP-SD102	TPSD1021216	20081216	PHASE II RI		X						
TP-SD103	TPSD1030004	20081216	PHASE II RI		X						
TP-SD103	TPSD1031216	20081216	PHASE II RI		X						
TP-SD104	TPSD1040004	20081216	PHASE II RI		X						

TABLE A-1
SAMPLE LIST FOR OU7
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY MAINE

LOCATION	SAMPLE	SAMPLE DATE	INVESTIGATION	DIOX	M	MF	OS	OV	PAH	PEST/PCB	PET
TP-SD104	TPSD1041216	20081216	PHASE II RI		X						
TP-SD105	TPSD1050004	20081216	PHASE II RI		X						
TP-SD105	TPSD1051216	20081216	PHASE II RI		X						
TP-SD106	TPSD1060004	20081216	PHASE II RI		X						
TP-SD106	TPSD1061216	20081216	PHASE II RI		X						
TP-SD107	TPSD1070004	20081216	PHASE II RI		X						
TP-SD107	TPSD1071216	20081216	PHASE II RI		X						
TP-SD108	TPSD1080004	20081216	PHASE II RI		X						
TP-SD108	TPSD1081216	20081216	PHASE II RI		X						
TP-SD109	TPSD1090004	20081216	PHASE II RI		X						
TP-SD109	TPSD1091216	20081216	PHASE II RI		X						
TP-SD110	TPSD1100004	20081216	PHASE II RI		X						
TP-SD110	TPSD1101216	20081216	PHASE II RI		X						
TP-SD111	TPSD1110004	20081216	PHASE II RI		X						
TP-SD111	TPSD1111216	20081216	PHASE II RI		X						
TP-SD112	TPSD1120004	20081216	PHASE II RI		X		X				
TP-SD112	TPSD1121216	20081216	PHASE II RI		X		X				
TP-SD113	TPSD1130004	20081216	PHASE II RI		X		X				
TP-SD113	TPSD1131216	20081216	PHASE II RI		X		X				
TP-SD114	TPSD1140004	20081216	PHASE II RI		X		X				
TP-SD114	TPSD1141216	20081216	PHASE II RI		X		X				
TP-SD115	TPSD1150004	20081216	PHASE II RI		X		X				
TP-SD115	TPSD1151216	20081216	PHASE II RI		X		X				
TP-SD116	TPSD1160004	20081216	PHASE II RI		X		X				
TP-SD116	TPSD1160004-D	20081216	PHASE II RI		X		X				
TP-SD116	TPSD1161216	20081216	PHASE II RI		X		X				
TP-SD117	TPSD1170004	20081216	PHASE II RI		X						
TP-SD117	TPSD1171216	20081216	PHASE II RI		X						
TP-SD118	TPSD1180004	20081216	PHASE II RI		X						
TP-SD118	TPSD1181216	20081216	PHASE II RI		X						

TABLE A-1
SAMPLE LIST FOR OU7
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY MAINE

LOCATION	SAMPLE	SAMPLE DATE	INVESTIGATION	DIOX	M	MF	OS	OV	PAH	PEST/PCB	PET
TP-SD119	TPSD1190004	20081216	PHASE II RI		X						
TP-SD119	TPSD1190004-D	20081216	PHASE II RI		X						
TP-SD119	TPSD1191216	20081216	PHASE II RI		X						
TP-SD119	TPSD1191216-D	20081216	PHASE II RI		X						
TP-SD12	TPSD120006	20030521	PHASE I RI		X						
TP-SD12	TPSD120612	20030521	PHASE I RI		X						
TP-SD12	TPSD120612-D	20030521	PHASE I RI		X						
TP-SD12	TPSD120612-RE	20030521	PHASE I RI		X						
TP-SD12	TPSD120612-RE-D	20030521	PHASE I RI		X						
TP-SD120	TPSD1200004	20081216	PHASE II RI		X						
TP-SD120	TPSD1201216	20081216	PHASE II RI		X						
TP-SD120	TPSD1201216-D	20081216	PHASE II RI		X						
TP-SD13	TPSD130006	20030522	PHASE I RI		X						
TP-SD13	TPSD130612	20030522	PHASE I RI		X						
TP-SD14	TPSD140006	20030521	PHASE I RI		X						
TP-SD14	TPSD140612	20030521	PHASE I RI		X						
TP-SD15	TPSD150006	20030522	PHASE I RI		X						
TP-SD15	TPSD150006-D	20030522	PHASE I RI		X						
TP-SD15	TPSD150612	20030522	PHASE I RI		X						
TP-SD16	TPSD160006	20030521	PHASE I RI		X						
TP-SD16	TPSD160612	20030521	PHASE I RI		X						
TP-SD17	TPSD170006	20030521	PHASE I RI		X						
TP-SD17	TPSD170612	20030521	PHASE I RI		X						
TP-SD18	TPSD180006	20030521	PHASE I RI		X						
TP-SD18	TPSD180612	20030521	PHASE I RI		X						
TP-SD19	TPSD190006	20030521	PHASE I RI		X						
TP-SD19	TPSD190612	20030521	PHASE I RI		X						
TP-SD19	TPSD190612-D	20030521	PHASE I RI		X						
TP-SD20	TPSD200006	20030521	PHASE I RI		X						
TP-SD20	TPSD200612	20030521	PHASE I RI		X						

TABLE A-1
SAMPLE LIST FOR OU7
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY MAINE

LOCATION	SAMPLE	SAMPLE DATE	INVESTIGATION	DIOX	M	MF	OS	OV	PAH	PEST/PCB	PET
TP-SD21	TPSD210006	20030521	PHASE I RI		X						
TP-SD21	TPSD210612	20030521	PHASE I RI		X						
TP-SD22	TPSD220006	20030520	PHASE I RI		X						
TP-SD22	TPSD220612	20030520	PHASE I RI		X						
TP-SD23	TPSD230006	20030521	PHASE I RI		X						
TP-SD23	TPSD230612	20030521	PHASE I RI		X						
TP-SD24	TPSD240006	20030520	PHASE I RI		X						
TP-SD24	TPSD240612	20030520	PHASE I RI		X						
TP-SD25	TPSD250006	20030521	PHASE I RI		X						
TP-SD25	TPSD250612	20030521	PHASE I RI		X						
TP-SD25	TPSD250612-D	20030521	PHASE I RI		X						
TP-SD26	TPSD260006	20030520	PHASE I RI		X						
TP-SD26	TPSD260612	20030520	PHASE I RI		X						
TP-SD27	TPSD270006	20030521	PHASE I RI		X						
TP-SD27	TPSD270612	20030521	PHASE I RI		X						
TP-SD28	TPSD280006	20030520	PHASE I RI		X						
TP-SD28	TPSD280612	20030520	PHASE I RI		X						
TP-SD29	TPSD290006	20030521	PHASE I RI		X						
TP-SD29	TPSD290612	20030521	PHASE I RI		X						
TP-SD30	TPSD300006	20030520	PHASE I RI		X						
TP-SD30	TPSD300612	20030520	PHASE I RI		X						
TP-SD33	TPSD330006	20030521	PHASE I RI		X						
TP-SD33	TPSD330612	20030521	PHASE I RI		X						
TP-SD34	TPSD340006	20030520	PHASE I RI		X						
TP-SD34	TPSD340612	20030520	PHASE I RI		X						
TP-SD35	TPSD350006	20030521	PHASE I RI		X						
TP-SD35	TPSD350612	20030521	PHASE I RI		X						
TP-SD35	TPSD350612-D	20030521	PHASE I RI		X						
TP-SD36	TPSD360006	20030520	PHASE I RI		X						
TP-SD37	TPSD370006	20030521	PHASE I RI		X						

TABLE A-1
SAMPLE LIST FOR OU7
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY MAINE

LOCATION	SAMPLE	SAMPLE DATE	INVESTIGATION	DIOX	M	MF	OS	OV	PAH	PEST/PCB	PET
TP-SD37	TPSD370612	20030521	PHASE I RI		X						
TP-SD38	TPSD380006	20030521	PHASE I RI		X						
TP-SD38	TPSD380612	20030521	PHASE I RI		X						
INTERTIDAL SURFACE WATER											
OF-60	TPOF600503	20030512	PHASE I RI		X		X		X	X	
OF-60	TPOF600503-F	20030512	PHASE I RI			X					
OF-61	TPOF610503	20030512	PHASE I RI		X		X		X	X	
OF-61	TPOF610503-D	20030512	PHASE I RI		X		X		X	X	
OF-61	TPOF610503-F	20030512	PHASE I RI			X					
OF-61	TPOF610503-F-D	20030512	PHASE I RI			X					
OF-63	TPOF630503	20030512	PHASE I RI		X		X		X	X	
OF-63	TPOF630503-F	20030512	PHASE I RI			X					
TP-SW01	TPSW010503	20030512	PHASE I RI		X		X		X	X	
TP-SW01	TPSW010503-F	20030512	PHASE I RI			X					
TP-SW02	TPSW020503	20030512	PHASE I RI		X		X		X	X	
TP-SW02	TPSW020503-F	20030512	PHASE I RI			X					
TP-SW03	TPSW030503	20030512	PHASE I RI		X		X		X	X	
TP-SW03	TPSW030503-F	20030512	PHASE I RI			X					
BC-1016	BC-1016-SP-1296-F	19961213	1996-1997 SEEP/SEDIMENT MONITORING			X					
BC-1016	BC-1016-SP-1296	19961216	SEEP/SEDIMENT		X		X		X	X	
BC-1016	BC-1016-SP-0497	19970410	SEEP/SEDIMENT		X	X	X		X	X	
BC-1016	BC-1016-SP-0897	19970819	SEEP/SEDIMENT		X	X	X		X	X	
BC-1016	BC-1016-SP-1197	19971113	SEEP/SEDIMENT		X		X		X	X	
BC-1016	BC-1016-SP-1197-D	19971113	SEEP/SEDIMENT		X		X		X	X	
BC-1016	BC-1016-SP-1197-F	19971113	SEEP/SEDIMENT			X					
BC-1016	BC-1016-SP-1197-F-D	19971113	SEEP/SEDIMENT			X					
BC-1017	BC-1017-SP-1296-F	19961213	SEEP/SEDIMENT			X					
BC-1017	BC-1017-SP-1296	19961216	SEEP/SEDIMENT		X		X		X	X	
BC-1017	BC-1017-SP-0497	19970409	SEEP/SEDIMENT		X	X	X		X	X	
BC-1017	BC-1017-SP-0897	19970819	SEEP/SEDIMENT		X	X	X		X	X	

TABLE A-1
SAMPLE LIST FOR OU7
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY MAINE

LOCATION	SAMPLE	SAMPLE DATE	INVESTIGATION	DIOX	M	MF	OS	OV	PAH	PEST/PCB	PET
BC-1017	BC-1017-SP-1197	19971115	SEEP/SEDIMENT		X		X		X	X	
BC-1017	BC-1017-SP-1197-F	19971115	SEEP/SEDIMENT			X					
BC-1018	BC-1018-SP-1296-F	19961211	SEEP/SEDIMENT			X					
BC-1018	BC-1018-SP-1296	19961212	SEEP/SEDIMENT		X		X		X	X	
BC-1018	BC-1018-SP-1296-D	19961212	SEEP/SEDIMENT		X		X		X	X	
BC-1018	BC-1018-SP-1296-F-D	19961212	SEEP/SEDIMENT			X					
BC-1018	BC-1018-SP-0497	19970409	SEEP/SEDIMENT		X	X	X		X	X	
BC-1018	BC-1018-SP-0897	19970818	SEEP/SEDIMENT		X	X	X		X	X	
BC-1018	BC-1018-SP-1197	19971113	SEEP/SEDIMENT		X		X		X	X	
BC-1018	BC-1018-SP-1197-F	19971113	SEEP/SEDIMENT			X					
BC-1020	BC-1020-SP-1296-F	19961211	SEEP/SEDIMENT			X					
BC-1020	BC-1020-SP-1296	19961212	SEEP/SEDIMENT		X		X		X	X	
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BC-1020	BC-1020-SP-0897	19970819	SEEP/SEDIMENT		X	X	X		X	X	
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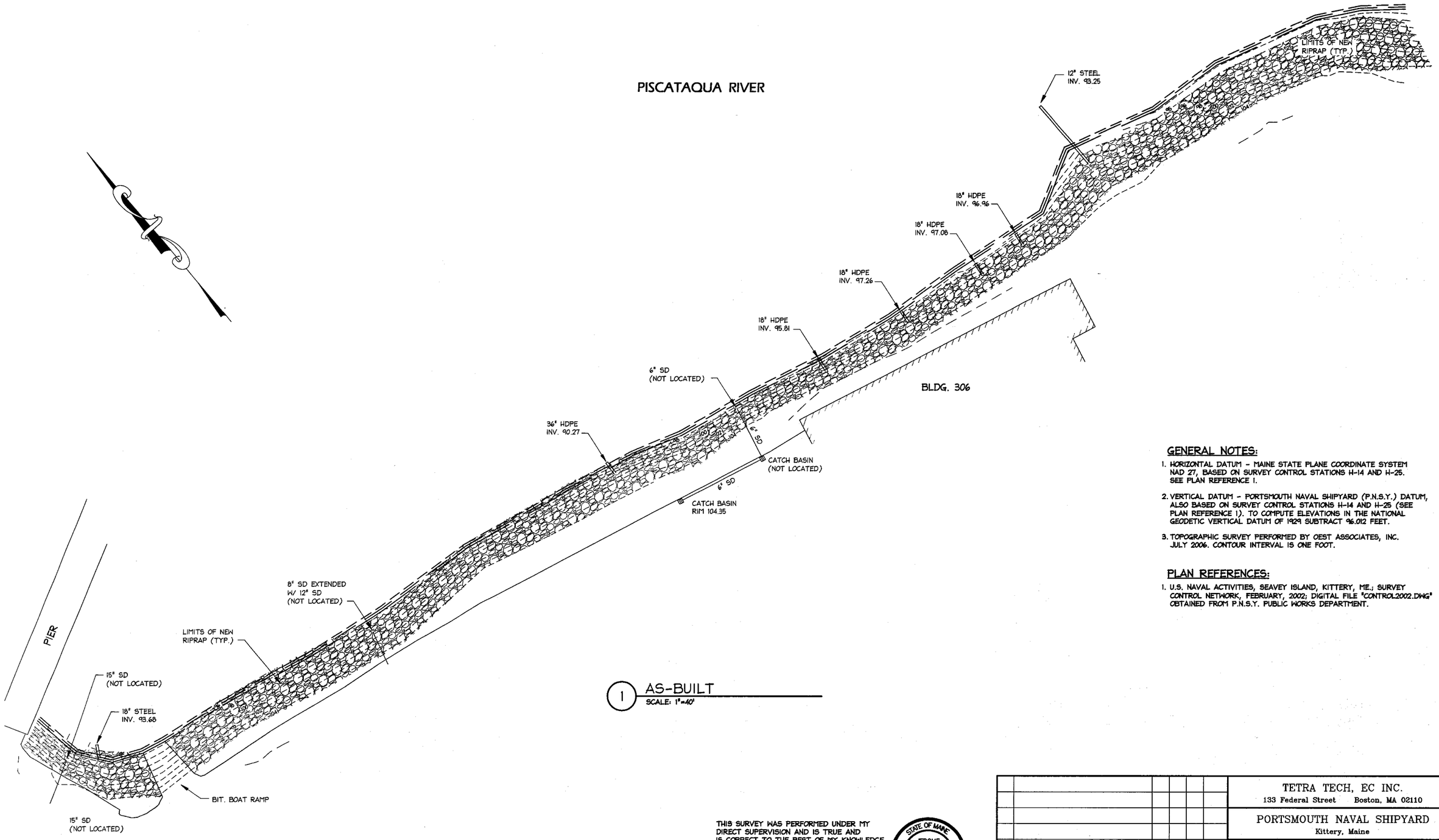
BC-1020	BC-1020-SP-1197	19971114	SEEP/SEDIMENT		X		X		X	X	
BC-1020	BC-1020-SP-1197-F	19971114	SEEP/SEDIMENT			X					

A.6 SHORELINE REVETMENT AS-BUILT PLAN AND SHORELINE PHOTOS FROM APPENDIX B FIVE-YEAR REVIEW REPORT PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE JUNE 2007 (N00102.PF.001601)



1 AS-BUILT
SCALE: 1"=40'

GENERAL NOTES:

1. HORIZONTAL DATUM - MAINE STATE PLANE COORDINATE SYSTEM NAD 27, BASED ON SURVEY CONTROL STATIONS H-14 AND H-25. SEE PLAN REFERENCE 1.
2. VERTICAL DATUM - PORTSMOUTH NAVAL SHIPYARD (P.N.S.Y.) DATUM, ALSO BASED ON SURVEY CONTROL STATIONS H-14 AND H-25 (SEE PLAN REFERENCE 1). TO COMPUTE ELEVATIONS IN THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 SUBTRACT 96.012 FEET.
3. TOPOGRAPHIC SURVEY PERFORMED BY OEST ASSOCIATES, INC. JULY 2006. CONTOUR INTERVAL IS ONE FOOT.

PLAN REFERENCES:

1. U.S. NAVAL ACTIVITIES, SEAVEY ISLAND, KITTERY, ME.; SURVEY CONTROL NETWORK, FEBRUARY, 2002; DIGITAL FILE "CONTROL2002.DWG" OBTAINED FROM P.N.S.Y. PUBLIC WORKS DEPARTMENT.

THIS SURVEY WAS PERFORMED UNDER MY DIRECT SUPERVISION AND IS TRUE AND IS CORRECT TO THE BEST OF MY KNOWLEDGE.

JEROME B. WATTS P.L.S. 1245

STATE OF MAINE
JEROME B. WATTS
1245
PROFESSIONAL LAND SURVEYOR

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REV.	DESCRIPTION	DR. BY	CKD. BY	APP. BY	DATE
A	As-Built	WJW	DRB	DRB	7-14-06

TETRA TECH, EC INC.
133 Federal Street Boston, MA 02110

PORTSMOUTH NAVAL SHIPYARD
Kittery, Maine

AS-BUILT PLAN
SITE 32

OEST Associates, Inc.
343 Gorham Road · South Portland, ME 04106-2317
Tel: (207)761-1770 Fax: (207)774-1246
Web: www.oest.com Email: mail@oest.com
engineers · architects · surveyors · construction managers

SCALE: As Noted
DATE : July 2006
DES BY: D.R. Bolender
DWN BY: W. Whitten
CHK BY: D.R. Bolender

PROJECT NO. 323.10.05
SHEET 1 OF 1

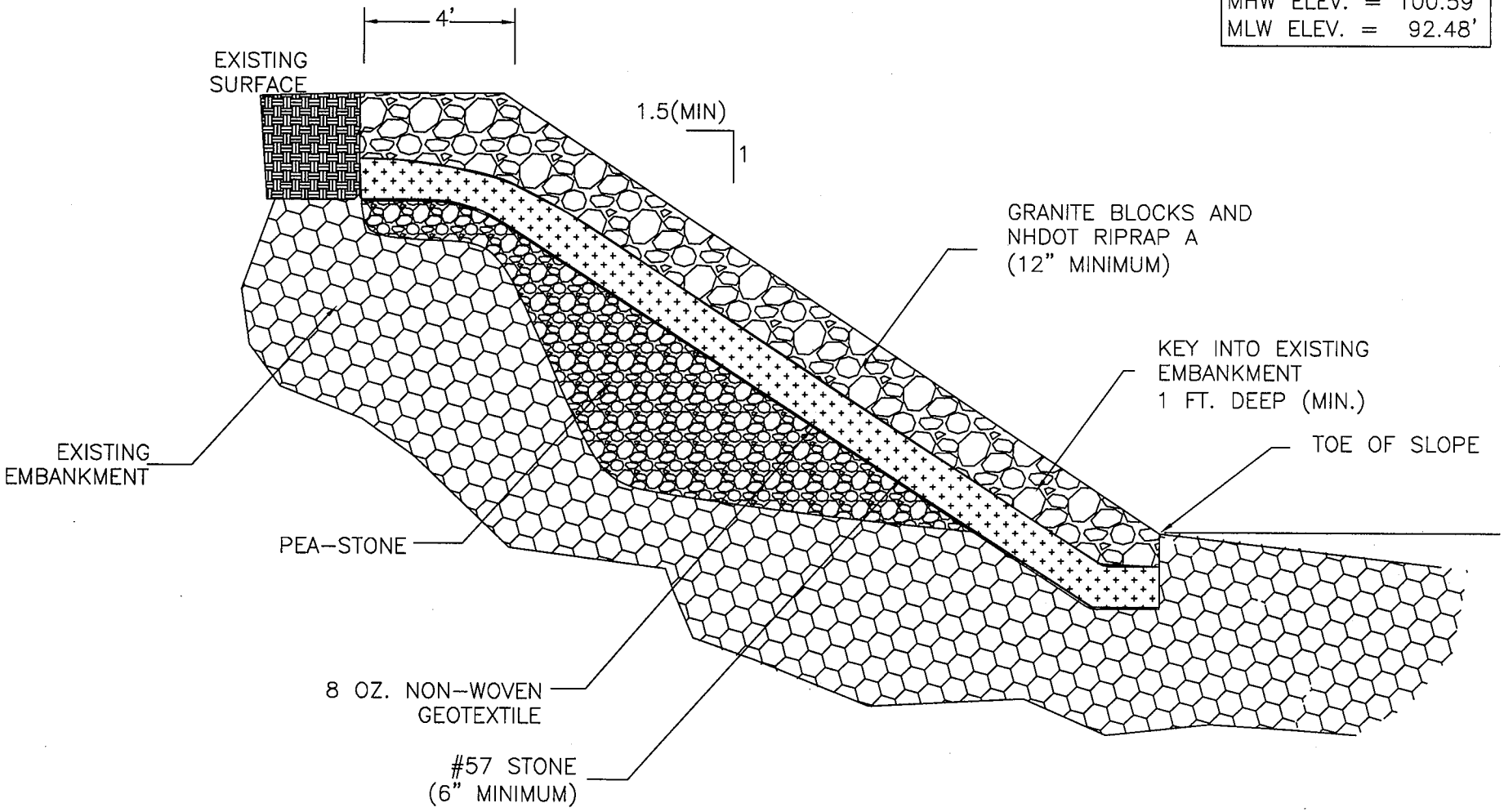
DRAWING NO. C-1

Cadd: 3230302_01-C1.dwg

T:\3230302\Sheets\3230302_01-C1.dwg Jul 13, 2006 - 11:29am

NOTE:

MHW ELEV. = 100.59'
MLW ELEV. = 92.48'



U.S. Navy RAC
Portsmouth Naval Shipyard
Kittery, Maine

Figure 4
Typical Section

TETRA TECH EC INC.

Photograph of OU7: Stabilized shoreline (in June 2006) between boat ramp near Topeka Pier to past Building 306 at eastern end of OU7 shoreline.

Photograph of OU7: Eastern portion of shoreline by Building 306 at low tide, showing shoreline controls to approximate mid tide level.

Photograph of OU7: OU7 shoreline facing north toward Topeka Pier, at low tide.

A.7 2003 WETLANDS FUNCTIONS AND VALUES ASSESSMENT

Technical Memorandum
Site 32 Intertidal Wetland Function and Value Assessment
Portsmouth Naval Shipyard, Kittery, Maine

August 2003

FROM: Kevin O'Neill, Wetlands Scientist/PWS Kevin O'Neill

TO: Deborah Cohen, Project Manager

1.0 INTRODUCTION

This Wetlands Assessment Technical Memorandum was prepared to document a Functions and Values Assessment for the intertidal wetlands associated with Site 32 at the Portsmouth Naval Shipyard (PNS) in Kittery, Maine. This document was prepared by Tetra Tech NUS, Inc. (TtNUS) for the U.S. Navy (Navy) under CLEAN Contract Task Order (CTO) 0850, Contract No. N62467-94-D-0888. The wetlands functions and values assessment was conducted in accordance with the Site 32 Remedial Investigation Quality Assurance Project Plan (Site 32 RI QAPP) (TtNUS, March 2003). Figures 1-1 and 1-2 in the Site 32 RI QAPP show the location of PNS and the location of Site 32 at PNS, respectively. The study area and graphic representation of the results are shown on Figures 1 and 2 included herein.

1.1 OBJECTIVE OF WETLAND EVALUATION

The purpose of this report is to evaluate the present conditions of the study area intertidal wetlands and to present information that can be used to evaluate the current functions and values of these tidal wetlands.

This wetland evaluation includes a qualitative description of the physical characteristics of the wetlands and identifies the functions and values presently exhibited. This characterization can be used to: establish compensatory wetland mitigation goals; design effective remediation options, if necessary; and allow for effective protection and management of the wetlands resource. Identification of the wetland functions and values assists in evaluating whether any proposed projects impair these functions and whether such impacts are permissible.

1.2 DEFINITIONS

All wetlands are inherently important for the functions and values they exhibit. Wetland functions are evaluated independently of human values. Representative biological functions include wildlife, fish and shellfish habitat. Representative chemical functions include toxics retention, nutrient removal/attenuation, and nutrient export. Representative physical functions include flood alteration, groundwater recharge/discharge, sediment retention, and shoreline stabilization.

Wetland values are sociological, subjective terms, based on anthropogenic properties by which the wetlands are determined to be useful or impart public good or benefit. Representative values include educational and recreational value, uniqueness or noteworthiness, visual quality/aesthetics, and endangered species habitat.

The terms "wetland" and "intertidal zone" are used interchangeably throughout this document. All of the wetlands evaluated as part of this task are tidally influenced wetlands. Please see the glossary section for definition of terms.

1.3 BACKGROUND INFORMATION

Background information is provided in Section 1.3 of the Site 32 RI QAPP and summarized below.

PNS is a military facility with restricted access, located on an island in the Piscataqua River, which separates Kittery, Maine and Portsmouth, New Hampshire. PNS is located at the mouth of the Great Bay Estuary which is commonly referred to as "Portland Harbor". PNS is engaged in the conversion, overhaul, and repair of submarines for the Navy.

Site 32, Topeka Pier Site, is located on the northern portion of Seavey Island. It is an area that was filled from approximately 1900 to 1945 with various materials including excavated materials from other portions of the facility, and construction, foundry, and other industrial wastes. The pier was constructed in the early 1900s and is still in use. Many buildings were constructed at the site from 1941 to 1945. The current use of Site 32 includes office parking (about 35 percent of the Site 32 area), equipment storage, vehicle and rail car maintenance, transducer repair, boat launch, and temporary housing/Hospital Corps.

1.4 WETLAND EVALUATION METHODS

The wetlands within the study area were evaluated using the U.S. Army Corp of Engineers, "Highway Methodology" (US Army, 1999), in accordance with the Site 32 RI QAPP. This method is a descriptive approach to wetlands evaluation, which presents the functions and values presently exhibited by each wetland.

1.5 COASTAL TIDAL WETLANDS

All the wetlands within this study area are considered coastal wetlands and are classified within the Estuarine System (Cowardin *et al*, 1979). The Estuarine System includes tidal wetlands and deepwater habitats that are partly enclosed by land but are open to the ocean, where ocean water and freshwater from rivers and streams mix. Salinities in estuaries typically range from 0.5 parts per thousand (ppt) to 30 ppt. In contrast, ocean water salinity is generally considered to range from 30 to 36 ppt. The range of salinity and the tidal flooding frequency and duration influence the dominant plant community that becomes established in an area.

Tidal wetlands are important for the maintenance of a healthy coastal ecosystem. The wetlands and tidal action provide wildlife, finfish, and shellfish with breeding, feeding, protection and resting habitats; they can provide nutrient removal during periods of abundance and can provide transformation or retention of excess nutrients during other times of the year; and they can provide sediment and toxicant retention and shoreline stabilization.

Fragmentation of coastal systems by residential or commercial development, roads, culverts, bridges, etc. or the deposition of fill material onto marsh surfaces can alter or interrupt the flow of tidal waters within a marsh system. Any changes in the natural hydrologic regime can have a significant negative impact on the ecological integrity (natural undisturbed quality of the environment) which can be expressed by a reduction in or loss of functions and/or values.

1.6 ORGANIZATION OF DOCUMENT

Section 1.0 provides the introduction, history, and wetland definitions for the project; Section 2.0 describes the methodology used to assess the wetlands; Section 3.0 provides a study area habitat description and classification of the study wetlands; Section 4.0 provides results of the function and values assessment and Section 5.0 provides a summary of these results.

A graphic representation of the results is presented on Figures 1 and 2 and data form and supporting information, photos, and species lists in Attachments A through D.

2.0 FUNCTION AND VALUE ASSESSMENT METHODOLOGY

The "Highway Methodology" Workbook Supplement (Highway Method, US Army, 1999) provides important information that can be used for mitigation, restoration, land use planning, and management options for the evaluated tidal wetland. Table 3-1 of the Highway Method lists the functions and values addressed by the method. A brief overview of the method is provided in this report. A detailed description is provided in the above referenced manual.

The Highway Method is a "descriptive approach" to the evaluation of wetlands functions and values. The thirteen functions and values evaluated by this method include:

- Groundwater Recharge/Discharge
- Floodflow Alteration
- Fish and Shellfish Habitat
- Sediment/Toxicant/Pathogen Retention

- Nutrient Removal (Retention/Transformation)
- Production Export (Nutrient)
- Sediment/Shoreline Stabilization
- Wildlife Habitat
- Recreation (Non-Consumptive)
- Education/Scientific Value
- Uniqueness/Heritage
- Visual Quality/Aesthetics
- Endangered Species Habitat

This methodology is considered to be an unbiased, objective approach, allowing independent judgment and interpretation by the reviewer. The Highway Method Workbook *Supplement* provides guidance on the identification and display of wetland functions and values. The format includes a data form, observed species lists, photographs, and a study area map which graphically displays functions and values exhibited by the tidal wetland.

The Highway Method's Wetland Function-Value Assessment data form provides general information about the wetland, including: wetland identification, acreage, the dominant wetland system present, etc. The form also provides a list of the functions and values evaluated, the functions occurrence, the rationale and considerations used for determining the functions occurrence, and an indication of the principle function and/or value. Since wetlands exhibit most functions or values to some degree, the principal function and/or value is used to identify the most important function(s) and/or value(s) that the wetland exhibits. The Wetland Function-Value Assessment data form is presented in Attachment A. The inputs to the form were taken from information gathered during the wetland scientist meander survey of the site and a comparison of that information against the standards provided by the Highway Method (see Attachment D for support information for the Highway Method).

Figures 1 and 2 present the surrounding landscape, the configuration of the wetland in the surrounding landscape, habitat areas, photograph locations and views, and the corresponding functions and values.

3.0 STUDY AREA HABITAT DESCRIPTION AND SETTING

Field data for this evaluation was collected during onsite activities conducted from May 19 to 23, 2003. Three habitat types were present within the study area and include upland shoreline, intertidal zone wetlands, and subtidal habitat. The upland habitat and intertidal zone wetlands are described below. The subtidal habitats of the Site 32 wetlands were not assessed in this study.

The intertidal zone wetland resources within the study area are presented on Figures 1 and 2. The Site 32 wetland is located along a portion of the southern shoreline of the northern channel of the Piscataqua River. This channel is referred to as the "Back Channel" and is relatively protected from wind and wave action by Seavey Island. The upland edge of the shoreline is rip-rap fill, primarily consisting of large cut granite blocks with smaller boulders, cobbles, and building debris present. A bedrock outcrop extends into the intertidal zone on the eastern end of the study area and a wooden marina pier with docks (Topeka Pier) and an asphalt ramp boat launch is present at the western limit of the study area. The opposite shoreline of the Piscataqua River is developed and primarily consists of residential properties. The upland area to the south of the Site 32 wetland is developed and consists of parking lots, buildings, and maintained turf grass. Surface water runoff from these areas discharges through a series of storm water outfalls.

A delineation of the wetland boundary was not conducted as part of this study; however, the acreage (3.05 acres) was estimated from the aerial photograph (Figures 1 and 2).

The Site 32 wetland has been mapped and classified on the Kittery, ME-NH National Wetlands Inventory map as an intertidal and regularly flooded estuarine wetland with unconsolidated shore comprised of mud. Other bottom substrates that were observed during the field visit included small areas of bedrock outcrop, cobble-gravel, and a minor amount of persistent emergent vegetation.

3.1 UPLAND AND SHORELINE HABITAT

The upland area in the vicinity of Site 32 consists of parking lots, buildings, turf grass, and roadways. The shoreline for most of the area is heavily rip-rapped with granite blocks and boulders, with the exception of the eastern end, which consists of bedrock outcrop. The rip-rap slope is relatively short and steep compared to the more natural bedrock slope. A small woodlot (estimated at 1,000 square feet) is present upgradient of the bedrock outcrop. The dense canopy in this small woodlot is dominated by red oak (*Quercus rubra*) and white pine (*Pinus strobus*). The understory consists of red oak, black cherry (*Prunus serotina*) and white ash (*Fraxinus americana*) saplings and a shrub layer dominated by staghorn sumac (*Rhus hirta*), rugosa rose (*Rosa rugosa*), and common buckthorn (*Rhamnus cathartica*). Herbaceous vegetation in the woodlot area consists of seaside goldenrod (*Solidago sempervirens*) and rugosa rose. The upland edge along the rip-rap shoreline is a narrow band of maintained turf grass with a sparse scattering of quaking aspen (*Populus tremuloides*) saplings and Russian olive (*Elaeagnus angustifolia*).

3.2 INTERTIDAL ZONE HABITAT

The intertidal zone ranges from approximately 13 feet to 125 feet in width towards the deeper open water subtidal zone (see Figures 1 and 2). The upper tidal zone primarily consists of a narrow band of rip-rap embankment with a steep slope, while the middle and lower intertidal zones consist primarily of unconsolidated mud with a relatively low gradient slope down to deep water habitat.

The upper intertidal zone slope is relatively steep, with an estimated slope ranging from 20 to 35 degrees. Vegetation in this zone is virtually non-existent, with the exception of very small stands of saltmeadow cordgrass (*Spartina patens*) and smooth cordgrass (*Spartina alterniflora*) located at the bedrock outcrop at the eastern most end of the study area. Beach heather (*Hudsonia tomentosa*) and spiral rockweed (*Fucus spiralis*) are also present in this area. Northern barnacle (*Semibalanus balanoides*) is present throughout the rip-rap and bedrock outcrop areas. During the site visit, empty green crab (*Carcinus maenas*) carapaces and claws and blue mussel (*Mytilus edulis*) shells littered the area where herring gulls (*Larus argentatus*) were observed foraging.

The middle intertidal zone substrate consists of areas of cobble, gravel, fines, and mudflats with a slope ranging from approximately 10 to 25 degrees. Dense stands of knotted wrackweed (*Ascophyllum nodosum*) and rockweeds (*Fucus* spp.), and beds of blue mussels covered with common periwinkles (*Littorina littorea*) were observed in the eastern half of the study area but were more sparse in the western half. Worms and softshell clams (*Mya arenaria*) were also common throughout the mudflats area.

The lower intertidal zone substrate consists of mudflats with a relatively flat slope. Generally, this area was devoid of blue mussels, periwinkle beds, knotted wrackweed, and rockweed, with the exception of areas where outfall pipes or rip-rap extended into this habitat. The absence of these types of biota is likely due to the absence of suitable hard substrate for attachment. The presence of worms was evident based on the abundance of wormholes and fecal piles.

3.3 WILDLIFE

Wildlife species observed during the May 2003 fieldwork included common species that are adapted to developed areas (Attachment C). These include herring gulls, common crow (*Corvus brachyrhynchos*), mockingbird (*Mimus polyglottos*), American goldfinch (*Carduelis tristis*) and woodchuck (*Marmota monax*). Woodchuck burrows were present in the upland lawn area on the eastern end of the shoreline. It should be noted that this was a short duration field study and the observed species list should not be considered a comprehensive list of species potentially utilizing the study area. It is likely that a much larger list of

species would be generated if the study was conducted over a longer period of time which included different seasons.

4.0 FUNCTION AND VALUE ASSESSMENT RESULTS

The results of the wetlands assessment are presented in graphic format in the Wetland Function-Value Assessment summary documentation form (Attachment A), photographs (Attachment B), and Observed Species List (Attachment C). The Highway Methodology Rationale Reference Numbers for the Wetland Function-Value Assessment form are presented in Attachment D.

The following provides a descriptive summary of the functions and values that are exhibited at the Site 32 intertidal wetland:

4.1 PRINCIPAL FUNCTIONS

The principal functions exhibited by the wetland include "Marine Fish and Shellfish Habitat" and "Production Export".

Marine Fish and Shellfish Habitat: The mudflats and bedrock outcrop provide a relatively high level of marine habitat functions given the abundant shellfish, worms, and other benthic and epibenthic species present. The relative abundance of these organisms provides a forage resource for higher wildlife trophic levels.

Production Export: The abundant benthic and epibenthic communities observed (mussels, clams, worms, etc.) indicate that the intertidal zone is highly productive. Tidal activity provides resource access for marine species during high tides and terrestrial/avian species during low tide cycles. Tidal activity also flushes the system and provides and removes nutrients and wastes from the zone.

4.2 MINOR FUNCTIONS

The minor functions exhibited by the wetland include:

- Groundwater Recharge/Discharge
- Sediment/Toxicant/Pathogen Retention
- Nutrient Removal (Retention/Transformation)
- Sediment/Shoreline Stabilization
- Wildlife Habitat

- Recreation

Groundwater Recharge/Discharge: A few small groundwater seeps were observed in the upper intertidal zone during low tide indicates groundwater discharge. Limiting factors for this function include the high percentage of nearby non-permeable cover (asphalt parking lots, buildings, roadways) which has limited recharge ability. The Seavey Island surface water runoff is discharged through culverts to the river. The marine environment (salinity) also limits the potential of freshwater groundwater recharge.

Sediment/Toxicant/Pathogen Retention: The soft sediments consisting of silts and sand have the potential to attenuate or bind potential contaminants. However, the low vegetation density reduces the effectiveness and limits this potential.

Nutrient Removal (Retention/Transformation): The mudflats can retain and transform nutrients, however, the lack of vegetated tidal marshes, and low vegetation density and diversity and steep rip-rap gradient in the intertidal zone limit the potential.

Sediment/Shoreline Stabilization: The intertidal zone can provide shoreline stabilization during storm events, storm surges, high winds, and heavy precipitation. The rip-rap hardscape provides a relatively stable shoreline for soils and upland areas. However, the low vegetation density in the middle and lower intertidal zones presents a lower potential for sediment stabilization in these zones.

Wildlife Habitat: The middle and lower intertidal zones of the wetland provide foraging opportunity for a variety of terrestrial, avian, and marine wildlife but habitat is considered low to moderate because of lack of cover and breeding habitat, and due to filling of the shoreline, development, and the presence of the boat dock facility.

Recreation: The Shipyard has restricted access. The public is allowed to use subtidal and deepwater areas for boating and anchoring; however, the Shipyard has specific restrictions for use of the boat launch and dock facility in the Site 32 interdial area. Therefore the intertidal area may be used by limited groups.

4.3 NON-APPLICABLE FUNCTIONS

Several functions were considered not to be exhibited by the Site 32 wetland. These include:

- Floodflow Alteration
- Educational/Scientific Value
- Uniqueness/Heritage

- Visual Quality/Aesthetics
- Endangered Species Habitat

Floodflow Alteration: The present state of Site 32 wetland provides little opportunity for floodflow alteration because of the steep rip-rap embankment with no high or low tidal marsh area for storm surge, heavy precipitation, or high water attenuation or storage.

Educational/Scientific Value: The potential for this value is severely limited because the development of the area and the restricted access to the Shipyard, and therefore to the Site 32 study area. This wetland type, with less restrictive access, is common in the area.

Uniqueness/Heritage: The potential for this value is severely limited because the development of the area and the restricted access to the Shipyard, and therefore to the Site 32 study area. This wetland type, with less restrictive access, is common in the area.

Visual Quality/Aesthetics: When compared to an unspoiled, natural system or offsite wetlands of this type, which are common in the area, the potential for this value is severely limited. This is due to historical activities which have significantly lowered the aesthetics of the area. These include the placement of rip-rap and other fill material along the shoreline and the extensive area development (buildings, parking lots, marina dock, etc.). The restricted access to the Shipyard, and therefore to the Site 32 study area, also limits the value.

Endangered Species: No known endangered or threatened species are expected to utilize the Site 32 wetland. The site does provide foraging resources for a variety of wildlife but has limited potential because of disturbances and development of the area.

5.0 SUMMARY

Overall, the Site 32 wetland provides a variety of functions and values ranging from low to high in quality which is consistent with a developed shoreline area. The middle and lower intertidal zones provide relatively high wetland functions and values. The low functions and values assessments are probably a result of the development of the Topeka Pier site and the filling, placement of rip-rap, paving and building construction of upland areas. This has resulted in some low quality habitat and species diversity, especially in the upper tidal and upland areas of the site.

The wetland resources associated with the Site 32 study area presently exhibit moderate value. The three principal factors influencing the lower value of the wetlands include: (1) dense development of the

surrounding area; (2) presence of fill materials and rip-rap within the historical tidal area; and (3) altered local, natural hydrologic regime (i.e. flow obstructions/constructions from docks, loss of creeks, and rip-rap/fill).

GLOSSARY

Intertidal – The area of the shore that lies between the highest normal tide and the lowest normal low tide. Also called the littoral zone.

Wetland - Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Wetland Mitigation - The President's Council on Environmental Quality defined the term "mitigation" in the National Environmental Policy Act regulations to include "(a) avoiding the impact altogether by not taking a certain action or parts of an action; (b) minimizing impacts by limiting the degree or magnitude of the action and its implementation; (c) rectifying the impact by repairing, rehabilitating, or restoring the affected environment; (d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and (e) compensating for the impact by replacing or providing substitute resources or environments" (40 CFR Part 1508.20 [a-e]). For the purposes of this document, mitigation refers only to restoration, creation, or enhancement of wetlands to compensate for permitted wetland losses.

Tidal or Salt marsh - Vegetation often found on mud banks formed at river mouths showing regular zonation reflecting the length of time different areas are inundated by tides. Sea water has a high salt content that produces problems of osmotic pressure for the vegetation so that only plants adapted to this environment (*halophtes*) can survive.

Upland (Upland site) - As used here, any area that does not qualify as a wetland because the associated hydrologic regime is not sufficiently wet for vegetation, soils, and/or hydrologic characteristics associated with wetlands. Such areas occurring within the flood plains are more appropriately termed non-wetlands.

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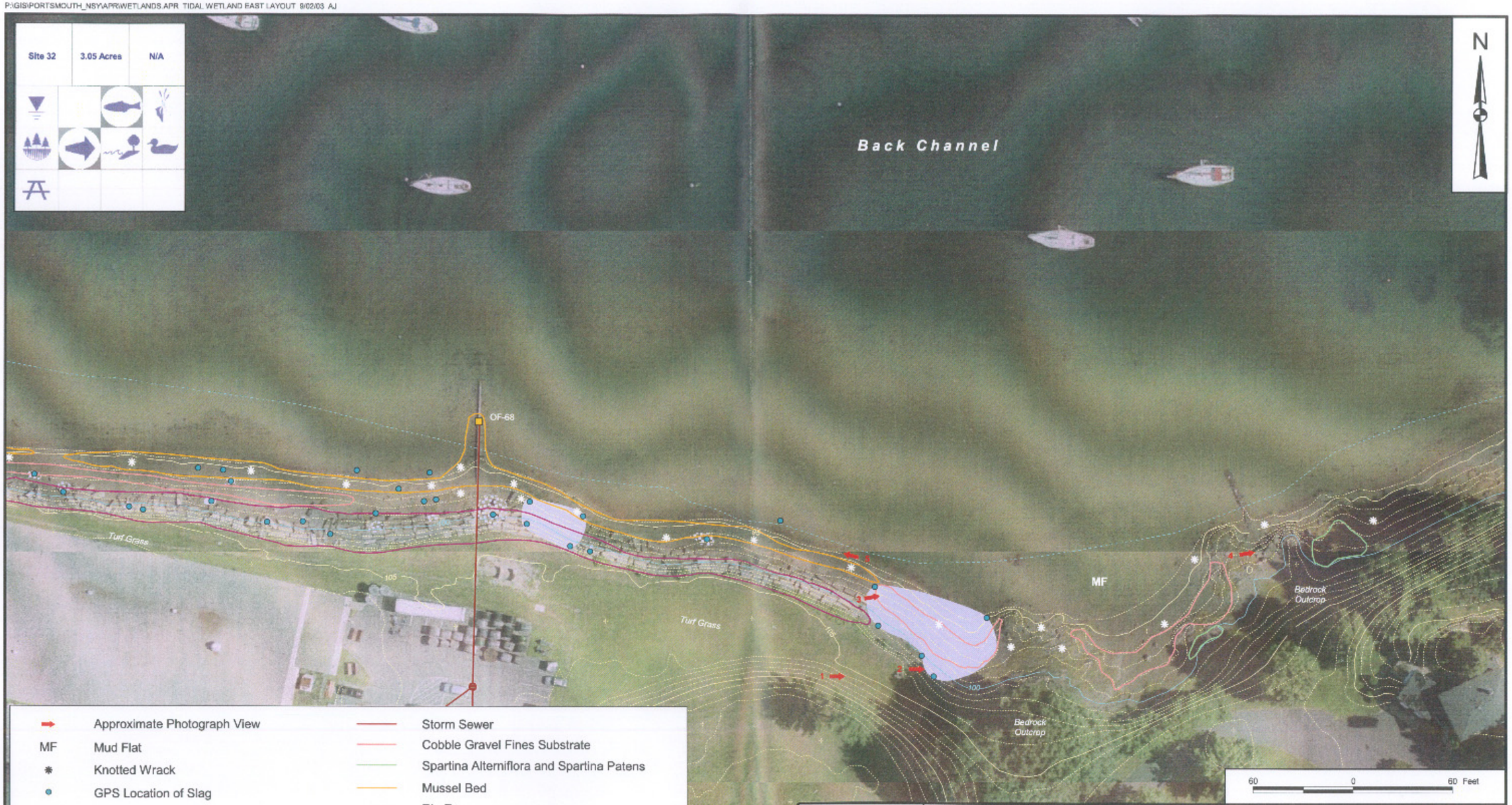
P:\GIS\PORTSMOUTH_NSY\APR\WETLANDS.APR TIDAL WETLAND WEST LAYOUT 8/29/03 AJ

DRAWN BY A. JANOCHA	DATE 7/31/03	Tetra Tech NUS, Inc.	CONTRACT NUMBER 9058 / OWNER NUMBER 0850
CHECKED BY J.P. KUMAR	DATE 8/29/03	TIDAL WETLAND STUDY AREA - WEST SITE 32 (TOPEKA PIER) SHORELINE PORTSMOUTH NAVAL SHIPYARD KITTERY, MAINE	APPROVED BY Kevin O'Neill / DATE 9-8-03
COST/SCHEDULE-AREA			APPROVED BY — / DATE —
SCALE AS NOTED			DRAWING NO. FIGURE 1 / REV 0

P:\GIS\PORTSMOUTH_NSY\APR\WETLANDS.APR TIDAL WETLAND EAST LAYOUT 8/02/03 AJ



Approximate Photograph View	Storm Sewer
MF Mud Flat	Cobble Gravel Fines Substrate
Knotted Wrack	Spartina Alterniflora and Spartina Patens
GPS Location of Slag	Mussel Bed
Outfall	Rip Rap
Approximate Area of Slag/Metal Fragments	Approximate High Water Line @ 100.32 Feet
Pieces or Fragments of Slag/Metal	Low Water Line as Provided by PNS
	Topographic Index Contour
	Topographic Intermediate Contour

DRAWN BY A. JANOCHA DATE 7/31/03	Tetra Tech NUS, Inc.	CONTRACT NUMBER 9058	OWNER NUMBER 0850
CHECKED BY J.P. KUMAR DATE 8/29/03	TIDAL WETLAND STUDY AREA - EAST SITE 32 (TOPEKA PIER) SHORELINE PORTSMOUTH NAVAL SHIPYARD KITTERY, MAINE	APPROVED BY Kevin O'Neill	DATE 9-8-03
COST/SCHEDULE-AREA		APPROVED BY —	DATE —
SCALE AS NOTED		DRAWING NO. FIGURE 2	REV 0

ATTACHMENT A

Wetland Function-Value Assessment Form

WETLAND FUNCTION-VALUE ASSESSMENT FORM
SITE 32, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Total area of wetland: 3.05 acres Human made? No Part of a wildlife corridor? Yes or a "habitat island"? No

Adjacent land use? PNS and boat docks Distance to nearest roadway or other development <15 feet

Dominant wetland systems present: Estuarine intertidal Contiguous undeveloped buffer zone present? No

Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? Lower

How may tributaries contribute to the wetland? Large river tidal system w/ culvert outfalls

Wildlife & vegetation diversity/abundance (see attached list) Corps Manual wetland delineation completed: Y___ N X

Wetland ID: PNS Site 32
UTM Zone 19N
Latitude: 043-04'-57.7605"
Longitude: 70-43'-46.1197"
Prepared by :K. O'Neill 5/23/2003

Wetland Impact:
Type: N/A Area: N/A

Evaluation based on field observations

FUNCTION	Suitability		Rationale (Appendix D)	Principal function/value	Comments
	Y	N			
Groundwater Recharge/Discharge	X		7,13,15	Minor	A few small groundwater seeps observed during low tide, marine environment limits fresh groundwater recharge potential
Floodflow Alteration		X	3,4,5,13	None	Steep bank, unrestricted inlets/outlets, and little area with persistent emergent vegetation limit potential
Marine Fish and Shellfish Habitat	X		19,20,21,22,23	**YES**	Intertidal zone w/mudflats having abundant shellfish, worms, etc. present. Bedrock outcrop provides "hard" substrate for mussel and barnacle species attachment.
Sediment/Toxicant/Pathogen Retention	X		2,4,7,8,10	Minor	Sediments have potential for reduction but would be limited due to low vegetation density and diversity and daily tidal flows which would generally remove any sediment accumulation. Riprap banks reduce erosion potential and exposure of fill.
Nutrient Removal (Retention/Transformation)	X		2,3,4,5,6,7,10	Minor	High productivity in middle and lower intertidal zone indicate use of nutrients but low vegetation density and diversity reduce nutrient retention and removal potential.
Production Export (Nutrient)	X		1,2,3,4,5,6,10,13	**YES**	Abundant benthic and epibenthic productivity observed (mussels, clams, worms) which provides resources/forage for higher trophic levels.

FUNCTION	Suitability		Rationale (Appendix D)	Principal function/value	Comments
	Y	N			
Sediment/Shoreline Stabilization	X		1,2,3,4,6,7,9,10,11	Minor	Shoreline is heavily rip-rapped which provides stabilization of upland areas. Low vegetation density somewhat reduces potential. Outfalls may be sources of sediments.
Wildlife Habitat	X		6,7,8,11,12,16,17,19,21	Minor	Middle and lower intertidal zone provide foraging opportunity for a variety of wildlife but habitat is considered low to moderate because of lack of cover, filling, development, and boat dock. #18 is unknown because of short duration of fieldwork.
Recreation ((Non) Consumptive)	X		8,9	Minor	Potential is present but Shipyard has restricted access to public. Public is allowed to use sub-tidal areas for boating and anchor. Western end has boat launch and docks for restricted use.
Educational / Scientific Value		X	-	None	Potential is present but Shipyard has restricted access. This wetland type, with less restrictive access, is common in the area.
Uniqueness/Heritage		X	-	None	Potential is present but Shipyard has restricted access. This wetland type, with less restrictive access, is common in the area.
Visual Quality/Aesthetics		X	-	None	Restrictive access to Shipyard, extensive development, filling and rip-rap have limited potential value.
Endangered Species Habitat		X	-	None	Provides resources to food chain but has limited potential as endangered species habitat.

ATTACHMENT B

Site Photographs

Photograph 1. PNS – Site 32 23 May 2003
From upland area facing northeast; showing bedrock outcrop and eastern limit of study

Photograph 2. PNS – Site 32 23 May 2003
Facing east showing bedrock outcrop, knotted wrackweed, and cobble-gravel-fines substrate

Photograph 3 PNS – Site 32 23 May 2003

Facing east showing bedrock outcrops and small cove and home

Photograph 4. PNS – Site 32 23 May 2003
Western limit of study at stone wavebreak or barrier. Facing northeast showing small *Spartina alterniflora* and *S. patens* stand beyond barrier.

Photograph 5. PNS – Site 32 23 May 2003
Facing west from bedrock outcrop area showing Outfall 68 and mussel bed

Photograph 6. PNS – Site 32 23 May 2003
Facing west showing dock and Outfall 63 discharge

Photograph 7. PNS – Site 32 23 May 2003
From boat ramp facing east; showing cobble-gravel-fines substrate

Photograph 8. PNS – Site 32 23 May 2003
From boat ramp facing east showing Piscataqua River back channel opposite shoreline development

Photograph 9. PNS – Site 32 23 May 2003
From boat ramp showing dock and knotted wrackweed

.

ATTACHMENT C

Observed Species List

Observed Species List – Site 32
Portsmouth Naval Shipyard, Kittery, Maine
May 23, 2003

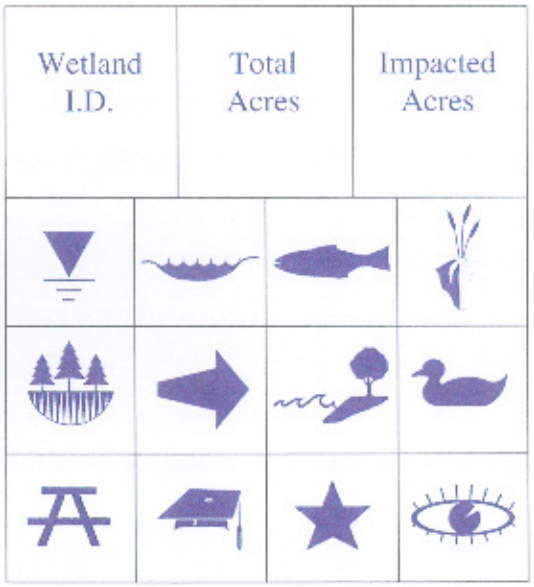
:

INTERTIDAL ZONE	
Common Name	**Scientific Name**
beach heather	*Hudsonia tomentosa*
knotted wrackweed	*Ascophyllum nodosum*
rockweeds	Fucus spp.
saltmeadow cordgrass	*Spartina patens*
smooth cordgrass	*Spartina alterniflora*
spiral rockweed	*Fucus spiralis*
blue mussel	*Mytilus edulis*
clam worm	*Nereis virens*
common periwinkle	*Littorina littorea*
green crab	*Carcinus maenas*
herring gull	*Larus argentatus*
northern barnacle	*Semibalanus balanoides*
softshell clams	*Mya arenaria*
worms	Class Polychaeta
worms	unidentified
UPLAND	
Common Name	**Scientific Name**
black cherry	*Prunus serotina*
common buckthorn	*Rhamnus cathartica*
quaking aspen	*Populus tremuloides*
red oak	*Quercus rubra*
rugosa rose	*Rosa rugosa*
russian olive	*Elaeagnus angustifolia*
seaside goldenrod	*Solidago sempervirens*
staghorn sumac	*Rhus hirta*
white ash	*Fraxinus Americana*
white pine	*Pinus strobus*
American goldfinch	*Carduelis tristis*
common crow	*Corvus brachyrhynchos*
mockingbird	*Mimus polyglottos*
woodchuck	*Marmota monax*

ATTACHMENT D

Wetlands Assessment Rationale Reference Numbers for US Army Corps of Engineers Highway Method

Graphical Representation of Wetland Functions and Values



Symbols Key

Indicates Principal Function or Value

ES Endangered Species

This graphical summary of wetland characteristics was developed as a tool to help construct an annotated map of functions and values for project analysis. Based on the findings reported on a data collection form, an icon box is prepared for each wetland investigated during Phase II of the Highway Methodology. The Endangered Species value may be added when present.

RATIONALE REFERENCE NUMBERS FOR THE
US ARMY CORPS OF ENGINEERS HIGHWAY METHOD
WETLAND FUNCTION-VALUE ASSESSMENT FORM
PORTSMOUTH NAVAL SHIPYARD SITE 32 WETLANDS ASSESSMENT

Below is the list of considerations that was used for the Site 32 wetland evaluation (see Attachment A). Considerations are flexible, based on best professional judgment and interdisciplinary team consensus.

1. **GROUNDWATER RECHARGE/DISCHARGE** - This function considers the potential for a wetland to serve as a groundwater recharge and/or discharge area. It refers to the fundamental interaction between wetlands and aquifers, regardless of the size or importance of either.

   CONSIDERATIONS/QUALIFIERS

   1. Public or private wells occur downstream of the wetland.
   2. Potential exists for public or private wells downstream of the wetland.
   3. Wetland is underlain by stratified drift.
   4. Gravel or sandy soils present in/or adjacent to the wetland.
   5. Fragipan does not occur in the wetland.
   6. Fragipan, impervious soils, or bedrock, does occur in the wetland.
   7. Wetland is associated with a perennial or intermittent watercourse.
   8. Signs of groundwater recharge are present or piezometer data demonstrates recharge.
   9. Wetland is associated with a watercourse, but lacks a defined outlet or contains a constricted outlet.
   10. Wetland contains only an outlet, no inlet.
   11. Groundwater quality of stratified drift aquifer within or downstream of wetland meets drinking water standards.
   12. Quality of water associated with the wetland is high.
   13. Signs of groundwater discharge are present (e.g. springs).
   14. Water temperature suggests it is a discharge site.
   15. Wetland shows signs of variable water levels.
   16. Piezometer data demonstrates discharge.
   17. Other

2. **FLOODFLOW ALTERATION** (Storage & Desynchronization) - This function considers the effectiveness of the wetland in reducing flood damage by water retention for prolonged periods following precipitation events and the gradual release of floodwaters. It adds to the stability of the wetland ecological system or its buffering characteristics and provides social or economic value relative to erosion and/or flood prone areas.

   CONSIDERATIONS/QUALIFIERS

   1. Area of this wetland is large relative to its watershed.
   2. Wetland occurs in the upper portions of its watershed.
   3. Effective flood storage is small or non-existent upslope of or above the wetland.
   4. Wetland watershed contains a high degree of impervious surfaces.
   5. Wetland contains hydric soils which are able to absorb and detain water.

6. Wetland exists in a relatively flat area that has flood storage potential.
7. Wetland has an intermittent outlet, ponded water, or signs are present of variable water level.
8. During flood events, this wetland can retain higher volumes of water than under normal or average rainfall conditions.
9. Wetland receives and retains overland or sheet flow runoff from surrounding uplands.
10. In the event of a large storm, this wetland may receive and detain excessive flood water from a nearby watercourse.
11. Valuable properties, structures or resources are located in or near the floodplain downstream from the wetland.
12. The watershed has a history of economic loss due to flooding.
13. This wetland is associated with one or more watercourses.
14. This wetland watercourse is sinuous or diffuse.
15. This wetland outlet is constricted.
16. Channel flow velocity is affected by this wetland.
17. Land uses downstream are protected by this wetland.
18. This wetland contains a high density of vegetation.
19. Other

3. **FISH AND SHELLFISH HABITAT (Freshwater)** - This function considers the effectiveness of seasonal or permanent watercourses associated with the wetland in question for fish and shellfish habitat.

CONSIDERATIONS/QUALIFIERS

1. Forest land dominant in the watershed above this wetland.
2. Abundance of cover objects present.
   STOP HERE IF THIS WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE
3. Size of this wetland is able to support large fish/shellfish populations.
4. Wetland is part of a larger, contiguous watercourse.
5. Wetland has sufficient size and depth in open water areas so as not to freeze solid and retains some open water during winter.
6. Stream width (bank to bank) is more than 50 feet.
7. Quality of the watercourse associated with this wetland is able to support healthy fish/shellfish populations.
8. Streamside vegetation provides shade for the watercourse.
9. Spawning areas are present (submerged vegetation or gravel beds).
10. Food is available to fish/shellfish populations within this wetland.
11. Barrier(s) to anadromous fish (such as dams, including beaver dams, water falls, road crossing, etc.) are absent from the stream reach associated with this wetland.
12. Evidence of fish is present.
13. Wetland is stocked with fish.
14. The watercourse is persistent.
15. Man-made streams are absent.
16. Water velocities are not too excessive for fish usage.
17. Defined stream channel is present.
18. Other

FISH AND SHELLFISH HABITAT (Marine) - This function considers the effectiveness of wetlands, embayments, tidal flats, vegetated shallows, and other environments in supporting marine resources such as fish, shellfish, marine mammals, and sea turtles.

CONSIDERATIONS/QUALIFIERS*

19. Special aquatic sites (tidal marsh, mud flats, eelgrass beds) are present.
20. Suitable spawning habitat is present at the site or in the area.
21. Commercially or recreationally important species are present or suitable habitat exists.
22. The wetland/waterway supports prey for higher trophic level marine organisms.
23. The waterway provides migratory habitat for anadromous fish.
24. Essential fish habitat, as defined by the 1996 amendments to the Magnuson-Stevens Fishery & conservation Act, is present.
25. Other

*Note: Numbers have been modified from the standard method to distinguish Marine from Freshwater system considerations.

4. **SEDIMENT/TOXICANT/PATHOGEN RETENTION** - This function reduces or prevents degradation of water quality. It relates to the effectiveness of the wetland as a trap for sediments, toxicants, or pathogens in runoff water from surrounding uplands, or upstream eroding wetland areas.

CONSIDERATIONS/QUALIFIERS

1. Potential sources of excess sediment are in the watershed above the wetland.
2. Potential or known sources of toxicants are in the watershed above the wetland.
3. Opportunity for sediment trapping by slow moving water or deepwater habitat are present in this wetland.
4. Mineral, fine grained, or organic soils are present.
5. Long duration water retention time is present in this wetland.
6. Public or private water sources occur downstream.
7. The wetland edge is broad and intermittently aerobic.
8. The wetland is known to have existed for more than 50 years.
9. Drainage ditches have not been constructed in the wetland.
   STOP HERE IF WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE.
10. Wetland is associated with an intermittent or perennial stream, or a lake.
11. Channelized flows have visible velocity decreases in the wetland.
12. Effective floodwater storage in wetland is occurring. Areas of impounded open water are present.
13. No indicators of erosive forces are present. No high water velocities are present.
14. Diffuse water flows are present in the wetland.
15. Wetland has a high degree of water and vegetation interspersion.
16. Dense vegetation provides opportunity for sediment trapping and/or signs of sediment accumulation is present by dense vegetation.
17. Other

5. **NUTRIENT REMOVAL/RETENTION/TRANSFORMATION** - This function considers the effectiveness of the wetland as a trap for nutrients in runoff water from surrounding

uplands or contiguous wetlands, and the ability of the wetland to process these nutrients into other forms or trophic levels. One aspect of this function is to prevent ill effects of nutrients entering aquifers or surface waters such as ponds, lakes, streams, rivers or estuaries.

CONSIDERATIONS/QUALIFIERS

1. Wetland is large relative to the size of its watershed.
2. Deep water or open water habitat exists.
3. Overall potential for sediment trapping exists in the wetland.
4. Potential sources of excess nutrients present in the watershed above the wetland.
5. Wetland saturated for most of the season. Ponded water is present in the wetland.
6. Deep organic/sediment deposits are present.
7. Slowly drained mineral, fine grained, or organic soils, are present.
8. Dense vegetation is present.
9. Emergent vegetation and/or dense woody stems are dominant.
10. Opportunity for nutrient attenuation exists.
11. Vegetation diversity/abundance sufficient to utilize nutrients.

STOP HERE IF WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE.

12 Waterflow through this wetland is diffuse.
13. Water retention/detention time in this wetland is increased by constricted outlet or thick vegetation.
14. Water moves slowly through this wetland.
15. Other

6. PRODUCTION EXPORT (Nutrient) - This function evaluates the effectiveness of the wetland to produce food or usable products for man or other living organisms.

CONSIDERATIONS/QUALIFIERS

1. Wildlife food sources grow within this wetland.
2. Detritus development is present within this wetland
3. Economically or commercially used products found in this wetland.
4. Evidence of wildlife use found within this wetland.
5. Higher trophic level consumers are utilizing this wetland.
6. Fish or shellfish develop or occur in this wetland.
7. High vegetation density is present.
8. Wetland exhibits high degree of plant community structure/species diversity.
9. High aquatic diversity/abundance is present.
10. Nutrients exported in wetland watercourses (permanent outlet present).
11. "Flushing" of relatively large amounts of organic plant material occurs from this wetland.
12. Wetland contains flowering plants which are used by nectar-gathering insects.
13. Indications of export are present.
14. High production levels occurring however, no visible signs of export (assumes export is attenuated).
15. Other

7. **SEDIMENT/SHORELINE STABILIZATION** - This function considers the effectiveness of a wetland to stabilize stream banks and shorelines against erosion.

CONSIDERATIONS/QUALIFIERS

1. Indications of erosion, siltation present.
2. Topographical gradient is present in wetland.
3. Potential sediment sources are present up-slope.
4. No distinct shoreline or bank is evident between the waterbody and the wetland or upland.
5. A distinct step between the open waterbody or stream and the adjacent land exists (i.e. sharp bank) with dense roots throughout.
6. Wide wetland (> 10') bordering watercourse, lake, or pond.
7. High flow velocities in the wetland.
8. Potential sediment sources present upstream.
9. The watershed is of sufficient size to produce channelized flow.
10. Open water fetch is present.
11. Boating activity is present.
12. Dense vegetation is bordering watercourse, lake, or pond.
13. High percentage of energy absorbing emergents and/or shrubs bordering watercourse, lake or pond.
14. Vegetation comprised of large trees and shrubs which withstand major flood events or erosive incidents and stabilize the shoreline on a large scale (feet).
15. Vegetation comprised of dense resilient herbaceous layer which stabilizes sediments and the shoreline on a small scale (inches) during minor flood events or potentially erosive events.
16. Other

8. **WILDLIFE HABITAT** - This function considers the effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with wetlands and the wetland edge. Both resident and/or migrating species must be considered. Species lists of observed and potential animals should be included in the wetland assessment report.

CONSIDERATIONS/QUALIFIERS

1. Wetland is not degraded by human activity.
2. Water quality of the watercourse, pond, or lake associated with this wetland meets or exceeds Class A or B standards.
3. Wetland is not fragmented by development.
4. Upland surrounding this wetland is undeveloped.
5. More than 40% of this wetland edge is bordered by upland wildlife habitat (e.g. brushland. wood land, active farmland, or idle land) at least 500 feet in width.
6. Wetland contiguous with other wetland systems connected by watercourse or lake.
7. Wildlife overland access to other wetlands is present.
8. Wildlife food sources are within this wetland or are nearby.
9. Wetland exhibits a high degree of interspersion of vegetation classes and/or open water.

10. Two or more islands or inclusions of upland within the wetland are present.
11. Dominant wetland class includes deep or shallow marsh or wooded swamp.
12. More than three acres of shallow permanent open water (less than 6.6 feet deep), including streams in or adjacent to wetland are present.
13. Density of the wetland vegetation is high.
14. Wetland exhibits a high degree of plant species diversity.
15. Wetland exhibits a high degree of diversity in plant community structure (e.g. tree/shrub/vine /grasses/mosses/etc.)
16. Plant/animal indicator species present.
17. Animal signs observed (tracks, scats, nesting areas, etc.)
18. Seasonal uses vary for wildlife, and wetland appears to support varied population diversity/abundance during different seasons.
19. Wetland contains or has potential to contain a high population of insects.
20. Wetland contains or has potential to contain large amphibian populations.
21. Wetland has a high avian utilization or its potential.
22. Indications of less disturbance-tolerant species present.
23. Signs of wildlife habitat enhancement present (birdhouses, nesting boxes, food sources, etc.).
24. Other

9. **RECREATION** (Consumptive and Non-Consumptive) - This value considers the suitability of the wetland and associated watercourses to provide recreational opportunities such as hiking, canoeing, boating, fishing, hunting and other active or passive recreational activities. Consumptive opportunities consume or diminish the plants, animals, or other resources that are intrinsic to the wetland. Non- consumptive opportunities do not consume or diminish these resources of the wetland.

CONSIDERATIONS/QUALIFIERS

1. Wetland is part of a recreation area, park, forest, or refuge.
2. Fishing is available within or from the wetland.
3. Hunting is permitted in the wetland.
4. Hiking occurs or has potential to occur within the wetland.
5. Wetland is a valuable wildlife habitat.
6. The watercourse, pond, or lake, associated with the wetland is unpolluted.
7. High visual/aesthetic quality of this potential recreation site.
8. Access to water is available at this potential recreation site for boating, canoeing, or fishing.
9. The watercourse associated with this wetland is wide and deep enough to accommodate canoeing and/or non-powered boating.
10. Off-road public parking available at the potential recreation site.
11. Accessibility and travel ease is present at this site.
12. The wetland is within a short drive or safe walk from highly populated public and private areas.
13. Other

10. **EDUCATIONAL/SCIENTIFIC VALUE** - This value considers the suitability of the wetland as a site for an "outdoor classroom" or as a location for scientific study or research.

CONSIDERATIONS/QUALIFIERS

1. Wetland contains or is known to contain threatened, rare, or endangered species.
2. Little or no disturbance is occurring in this wetland.
3. Potential educational site contains a diversity of wetland classes which are accessible or potentially accessible.
4. Potential educational site is undisturbed and natural.
5. Wetland is considered to be a valuable wildlife habitat.
6. Wetland is located within a nature preserve or wildlife management area.
7. Signs of wildlife habitat enhancement present (bird houses, nesting boxes. food sources, etc.).
8. Off-road parking at potential educational site suitable for school bus access in or near wetland.
9. Potential educational site is within safe walking distance or a short drive to schools.
10. Potential educational site within safe walking distance to other plant communities.
11. Direct access to perennial stream at potential educational site available.
12. Direct access to pond or lake at potential educational site available.
13. No known safety hazards within the potential educational site.
14. Public access to the potential educational site is controlled.
15. Handicap accessibility is available.
16. Site is currently used for educational or scientific purposes.
17. Other

11. UNIQUENESS/HERITAGE - This value considers the effectiveness of the wetland or its associated waterbodies to provide certain special values. These may include archaeological sites, critical habitat for endangered species, its overall health and appearance, its role in the ecological system of the area, its relative importance as a typical wetland class for this geographic location. These functions are clearly valuable wetland attributes relative to aspects of public health, recreation, and habitat diversity.

CONSIDERATIONS/QUALIFIERS

1. Upland surrounding wetland primarily urban.
2. Upland surrounding wetland developing rapidly.
3. More than 3 acres of shallow permanent open water occur in wetlands (less than 6.6 feet deep) including streams.
4. Three or more wetland classes present.
5. Deep and/or shallow marsh, or wooded swamp dominate.
6. High degree of interspersion of vegetation and/or open water occurring in this wetland.
7. Well-vegetated stream corridor (I 5 feet on each side of the stream) occurs in this wetland.
8. Potential educational site is within a short drive or a safe walk from schools.
9. Off-road parking at potential educational site is suitable for school buses.
10. No known safety hazards exist within this potential educational site.
11. Direct access to perennial stream or lake at potential educational site.

12. Two or more wetland classes visible from primary viewing locations.
13. Low-growing wetlands (marshes, scrub-shrub, bogs, open water) visible from primary viewing locations.
14. Half an acre of open water or 200 feet of stream is visible from the primary viewing locations.
15. Large area of wetland is dominated by flowering plants, or plants which turn vibrant colors in different seasons.
16. General appearance of the wetland visible from primary viewing locations is unpolluted and/or undisturbed.
17. Overall view of the wetland is available from the surrounding upland.
18. Quality of the water associated with the wetland is high.
19. Opportunities for wildlife observations are available.
20. Historical buildings occur within the wetland.
21. Presence of pond or pond site and remains of a dam occur within the wetland.
22. Wetland within 50 yards of the nearest perennial watercourse.
23. Visible stone or earthen foundations, berms, dams, standing structures or associated features occur within the wetland.
24. Wetland contains critical habitat for a state or federally listed threatened or endangered species.
25. Wetland is known to be a study site for scientific research.
26. Wetland is a natural landmark or recognized by the state natural heritage inventory authority as an exemplary natural community.
27. Wetland has local significance because it serves several functional values.
28. Wetland has local significance because it has biological, geological, or other features which are locally rare or unique.
29. Wetland is known to contain an important archaeological site.
30. Wetland is hydrologically connected to a state or federally designated scenic river.
31. Wetland is located in an area experiencing a high wetland loss rate.
32. Other

12. VISUAL QUALITY/AESTHETICS - This value considers the visual and aesthetic quality or usefulness of the wetland.

CONSIDERATIONS/QUALIFIERS

1. Multiple wetland classes visible from primary viewing locations.
2. Emergent marsh and/or open water visible from primary viewing locations.
3. Diversity of vegetation species visible from primary viewing locations.
4. Wetland dominated by flowering plants, or plants which turn vibrant colors in different seasons.
5. Land use surrounding the wetland is undeveloped as seen from primary viewing locations.
6. Visible surrounding land use form contrasts with wetland.
7. Wetland views absent of trash, debris, and signs of disturbance.
8. Wetland is considered to be valuable wildlife habitat.
9. Wetland is easily accessed.
10. Low noise level at primary viewing locations.
11. Unpleasant odors absent at primary viewing locations.
12. Relatively unobstructed sight line exists through wetland.
13. Other

13. **ENDANGERED SPECIES HABITAT** - This value considers the suitability of the wetland to support threatened or endangered species.

CONSIDERATIONS/QUALIFIERS

1. Wetland contains or is known to contain threatened or endangered species.
2. Wetland contains critical habitat for a state or federally listed threatened or endangered species.
3. Other

APPENDIX B

ANALYTICAL RESULTS

B.1 OU7 DATABASE PRINTOUT

B.2 STATISTICAL EVALUATIONS

B.3 TREND TESTS

B.4 TECHNICAL MEMORANDUM COMPARISON OF ANALYTICAL METHODS FOR THE INTERIM OFFSHORE MONITORING PROGRAM FOR OPERABLE UNIT 4

B.1 OU7 DATABASE PRINTOUT

LOCATION	BGS-05	TP-MW01	TP-MW02	TP-MW03	TP-MW04	TP-MW05	TP-MW06	TP-MW07	TP-MW08
SAMPLE ID	BGS-05	TP-SS01-0001-98	TP-SS02-0001-98	TP-SS03-0001-98	TP-SS04-0001-98	TP-SS05-0001-98	TP-SS06-0001-98	TP-SS07-0001-	TPSS290001
SAMPLE DATE	19910813	19980622	19980620	19980620	19980618	19980609	19980616	19980615	20030423
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1.2	1	1	1	1	1	1	1	1
DIOXINS/FURANS (NG/KG)									
1,2,3,4,6,7,8,9-OCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8,9-OCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HPCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HPCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HPCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HXCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HXCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HXCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PECDD	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PECDF	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-PECDF	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-2005	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-2005 - HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HPCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HPCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HXCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HXCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PECDD	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PECDF	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL TCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL TCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA
INORGANICS (MG/KG)									
ALUMINUM	18400	11900	10800	18000	13100	10900	5520	9800	9920
ANTIMONY	5.8 U	0.36 UR	0.3 UR	0.37 UR	0.33 UR	5 J	1 U	0.43 UR	0.18 UR
ARSENIC	13.3 J	7.5 J	12.2 J	11	10.3	12.8	2.4 U	8.4	16.5
BARIUM	77.2	49.1 J	49.8 J	76	60.4	54	31.2	43.6	35.2 J
BERYLLIUM	0.91	0.64 J	0.64	0.98 J	0.7 J	0.64 J	0.24 U	0.5 U	0.34
CADMIUM	2.9	0.41 UJ	0.34 U	0.42 UJ	0.39 UJ	0.46 U	0.52 J	0.5 U	0.27 J
CALCIUM	2500	1860 J	6270 J	2230	1660	1470 J	3170	1820 J	1620
CHROMIUM	42.2	46.3 J	49.4 J	44.9 J	33.5 J	65.2 J	18.8 J	37.7 J	26

LOCATION	BGS-05	TP-MW01	TP-MW02	TP-MW03	TP-MW04	TP-MW05	TP-MW06	TP-MW07	TP-MW08
SAMPLE ID	BGS-05	TP-SS01-0001-98	TP-SS02-0001-98	TP-SS03-0001-98	TP-SS04-0001-98	TP-SS05-0001-98	TP-SS06-0001-98	TP-SS07-0001-	TPSS290001
SAMPLE DATE	19910813	19980622	19980620	19980620	19980618	19980609	19980616	19980615	20030423
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1.2	1	1	1	1	1	1	1	1
COBALT	12.4	9.6	20.9	10.8	9.2	12.5	7.6	11.5	8.6
COPPER	135	45.5 J	29.9 J	82.5 J	223 J	68	46.8 J	21.9	55.4
CYANIDE	2 U	NA	NA	NA	NA	NA	NA	NA	NA
IRON	24100	19600	32600	23600	20900	24000	12600	20200	19500
LEAD	98.1 J	131	16.7	60.2 J	58.2 J	79.6	78.9 J	15.7	27.5 J
MAGNESIUM	6040	4480	8120	5310	4930	6380	3920	6080	4960 J
MANGANESE	451	254	528	377 J	310 J	439 J	130 J	334 J	364
MERCURY	0.22	0.05 U	0.01 UJ	0.32 J	0.36 J	0.06 J	0.05 J	0.04 J	0.04 U
NICKEL	34.5	36.6 J	67.6 J	35.7	37.8	42.9	20.9	35.5	27.7 J
POTASSIUM	2740	1310	3070	2100	2230	2080 J	1800	2160 J	1470 J
SELENIUM	0.9 U	0.87 U	0.48 UJ	0.59 UJ	0.54 UJ	0.63 U	0.75 U	0.69 U	0.31 U
SILVER	1.3 R	0.48 U	0.4 U	0.93	0.45 U	0.53 U	0.44 U	0.58 U	0.08 UJ
SODIUM	1020	936	791	107 U	252	239	347	304	240 J
THALLIUM	0.24 J	0.58 U	0.87 U	0.59 U	0.89 U	1.3 U	0.54 U	0.7 U	1.1
VANADIUM	46.7	45.3	41.6	48.6 J	35.4 J	49.7	44.4 J	31.3	23 J
ZINC	147	120 J	74 J	106 J	208 J	148	96.9 J	71.2	69.2
MISCELLANEOUS PARAMETERS (%)									
TOTAL ORGANIC CARBON	3.9	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL SOLIDS	NA	NA	NA	NA	NA	NA	NA	NA	88
MISCELLANEOUS PARAMETERS (MEQ/100)									
CATION EXCHANGE CAPACITY	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)									
CYANIDE	NA	2 U	2 U	2 U	2 U	2 UR	2 U	2 U	NA
HEXAVALENT CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL ORGANIC CARBON	NA	30000	34000	45000	21000	34000	81000	12000	NA
MISCELLANEOUS PARAMETERS (S.U.)									
PH	6.9	8.4	8.5	7.1	6.8	6.3	8.4	8	NA
PESTICIDES/PCBS (UG/KG)									
4,4'-DDD	18 U	70 J	3.4 U	2.1 J	3.8 U	18 U	38 J	3.8 U	1.4 U
4,4'-DDE	18 U	44	19 J	35	29 J	75	87	3.8 U	1.4 U
4,4'-DDT	18 U	20	29 R	15 J	35	250	14 J	3.8 U	1.2 UJ
ALDRIN	9.2 U	5.7 U	1.8 U	2 U	1.9 U	9.1 U	3.8 U	2 U	1.3 U
ALPHA-BHC	9.2 U	5.7 U	1.8 U	2 U	1.9 U	9.1 U	3.8 U	2 U	1.5 U
ALPHA-CHLORDANE	92 U	5.7 U	1.8 U	2 U	1.9 U	9.1 U	3.8 U	2 U	1.6 U
AROCLOR-1016	92 U	110 U	34 U	40 U	38 U	180 U	73 U	38 U	14 UJ
AROCLOR-1221	92 U	230 U	70 U	81 U	77 U	360 U	150 U	78 U	34 UJ
AROCLOR-1232	92 U	110 U	34 U	40 U	38 U	180 U	73 U	38 U	21 UJ

LOCATION	BGS-05	TP-MW01	TP-MW02	TP-MW03	TP-MW04	TP-MW05	TP-MW06	TP-MW07	TP-MW08
SAMPLE ID	BGS-05	TP-SS01-0001-98	TP-SS02-0001-98	TP-SS03-0001-98	TP-SS04-0001-98	TP-SS05-0001-98	TP-SS06-0001-98	TP-SS07-0001-	TPSS290001
SAMPLE DATE	19910813	19980622	19980620	19980620	19980618	19980609	19980616	19980615	20030423
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1.2	1	1	1	1	1	1	1	1
AROCLOR-1242	92 U	110 U	34 U	40 U	38 U	180 U	73 U	38 U	14 UJ
AROCLOR-1248	92 U	110 U	34 U	40 U	38 U	180 U	73 U	38 U	5.1 UJ
AROCLOR-1254	180 U	110 U	34 U	40 U	38 U	180 U	73 U	38 U	16 UJ
AROCLOR-1260	180 U	110 U	34 U	40 U	210 J	180 U	73 U	38 U	8.5 UJ
BETA-BHC	9.2 U	5.7 U	1.8 U	2 U	1.9 U	9.1 U	3.8 U	2 U	2.3 U
DELTA-BHC	9.2 U	5.7 U	1.8 U	2 U	1.9 U	9.1 U	3.8 U	2 U	1.3 U
DIELDRIN	18 U	11 U	3.4 U	4 U	3.8 U	18 U	7.3 U	3.8 U	1.4 UJ
ENDOSULFAN I	9.2 U	5.7 U	1.8 U	2 U	1.9 U	9.1 U	3.8 U	2 U	1.4 UJ
ENDOSULFAN II	18 U	11 U	3.4 U	4 U	3.8 U	18 U	7.3 U	3.8 U	1.3 U
ENDOSULFAN SULFATE	18 U	11 U	3.4 U	4 U	6.2 R	18 U	6.5 J	3.8 U	1.6 UJ
ENDRIN	18 U	11 U	3.4 U	4 U	3.8 U	18 U	7.3 U	3.8 U	1.3 U
ENDRIN ALDEHYDE	NA	11 U	2.6 R	4 U	3.8 U	18 U	7.3 U	3.8 U	1.5 U
ENDRIN KETONE	18 U	11 U	3.4 U	4 U	3.8 U	18 U	7.3 U	3.8 U	1.6 UJ
GAMMA-BHC (LINDANE)	9.2 U	5.7 U	1.8 U	2 U	1.9 U	9.1 U	3.8 U	2 U	1.3 U
GAMMA-CHLORDANE	92 U	5.7 U	1.8 U	2 U	1.9 U	9.1 U	3.8 U	2 U	1.4 UJ
HEPTACHLOR	9.2 U	5.7 U	1.8 U	2 U	1.9 U	9.1 U	3.8 U	2 U	1.2 U
HEPTACHLOR EPOXIDE	9.2 U	5.7 U	1.8 U	2 U	1.9 U	9.1 U	3.8 U	2 U	1.5 U
METHOXYCHLOR	92 U	57 U	18 U	20 U	19 U	91 U	38 U	20 U	2.3 U
TOTAL AROCLOR	0 U	0 U	0 U	0 U	210	0 U	0 U	0 U	0 U
TOTAL AROCLOR HALFND	410	445	137	160.5	343.5	720	294	153	56.3
TOTAL AROCLOR ZEROND	0 U	0 U	0 U	0 U	210	0 U	0 U	0 U	0 U
TOXAPHENE	180 U	570 U	180 U	200 U	190 U	910 U	380 U	200 U	26 U
PETROLEUM HYDROCARBONS (MG/KG)									
DIESEL RANGE ORGANICS	NA	44	1200	19	26	370 J	3900	56 J	NA
GASOLINE RANGE ORGANICS	NA	2.5 U	2.5 U	2.5 U	2.8 U	3.9 J	40 J	2.5 U	NA
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)									
ACENAPHTHENE	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 U	56 U
ACENAPHTHYLENE	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 U	41 U
ANTHRACENE	58 J	28 J	6900 U	400 U	53 J	360 U	6600 U	360 U	49 U
BAP EQUIVALENT-HALFND	381.07	240.96	4612.63	237.095	288.21	404.86	6600 U	210.84	57 U
BAP EQUIVALENT-POS	191.07	240.96	817.63	37.095	288.21	25.06	0 U	30.843	0 U
BENZO(A)ANTHRACENE	160 J	150 J	590 J	27 J	190 J	71 J	6600 U	28 J	56 U
BENZO(A)PYRENE	150 J	160 J	690 J	28 J	180 J	360 UJ	6600 U	22 J	57 U
BENZO(B)FLUORANTHENE	140 J	160 J	460 J	30 J	240 J	170 J	6600 U	24 J	41 U
BENZO(G,H,I)PERYLENE	68 J	76 J	1800 J	48 J	51 J	360 UJ	6600 U	92 J	75 U
BENZO(K)FLUORANTHENE	150 J	160 J	390 J	28 J	150 J	79 J	6600 U	18 J	72 U
DIBENZO(A,H)ANTHRACENE	380 U	38 J	6900 U	400 U	51 J	360 UJ	6600 U	360 U	72 U

LOCATION	BGS-05	TP-MW01	TP-MW02	TP-MW03	TP-MW04	TP-MW05	TP-MW06	TP-MW07	TP-MW08
SAMPLE ID	BGS-05	TP-SS01-0001-98	TP-SS02-0001-98	TP-SS03-0001-98	TP-SS04-0001-98	TP-SS05-0001-98	TP-SS06-0001-98	TP-SS07-0001-	TPSS290001
SAMPLE DATE	19910813	19980622	19980620	19980620	19980618	19980609	19980616	19980615	20030423
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1.2	1	1	1	1	1	1	1	1
DIBENZOFURAN	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 U	39 U
FLUORANTHENE	300 J	370	1500 J	62 J	370 J	120 J	6600 U	34 J	62 U
FLUORENE	380 U	360 U	6900 U	400 U	20 J	360 U	6600 U	360 U	56 U
HIGH MOLECULAR WEIGHT PAHS	1280	1288	8960	402	1351	1051	19800	341	198
INDENO(1,2,3-CD)PYRENE	87 J	94 J	6900 U	26 J	120 J	360 UJ	6600 U	25 J	67 U
LOW MOLECULAR WEIGHT PAHS	1228	1118	22100	1233	1073	998	23100	1260	170
NAPHTHALENE	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 U	38 U
PHENANTHRENE	220 J	190 J	1400 J	33 J	200 J	66 J	6600 U	360 U	54 U
PYRENE	290 J	370	2000 J	50 J	360 J	330 J	6600 U	34 J	88 U
SEMIVOLATILES (UG/KG)									
1,2,4-TRICHLOROBENZENE	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 U	40 U
1,2-DICHLOROBENZENE	380 U	360 U	6900 U	400 U	400 U	360 U	1700 J	360 U	43 U
1,3-DICHLOROBENZENE	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 U	41 U
1,4-DICHLOROBENZENE	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 UJ	39 U
2,2'-OXYBIS(1-CHLOROPROPANE)	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 UJ	55 U
2,4,5-TRICHLOROPHENOL	1800 U	910 U	17000 U	1000 U	1000 U	910 U	17000 U	910 U	97 U
2,4,6-TRICHLOROPHENOL	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 U	100 U
2,4-DICHLOROPHENOL	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 U	75 U
2,4-DIMETHYLPHENOL	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 U	130 U
2,4-DINITROPHENOL	1800 U	910 UJ	17000 UJ	1000 UJ	1000 UJ	910 UJ	17000 UJ	910 UJ	290 U
2,4-DINITROTOLUENE	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 UJ	38 U
2,6-DINITROTOLUENE	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 U	45 U
2-CHLORONAPHTHALENE	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 U	50 U
2-CHLOROPHENOL	380 U	360 U	6900 U	400 UJ	400 UJ	360 U	6600 UJ	360 U	74 U
2-METHYLNAPHTHALENE	380 U	360 U	6900 U	400 U	400 U	32 J	6600 U	360 U	46 U
2-METHYLPHENOL	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 U	70 U
2-NITROANILINE	1800 U	910 U	17000 U	1000 U	1000 U	910 U	17000 U	910 U	46 U
2-NITROPHENOL	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 U	92 U
3,3'-DICHLOROBENZIDINE	760 U	360 U	6900 U	400 U	400 U	360 UJ	6600 U	360 U	220 U
3-NITROANILINE	1800 U	910 U	17000 U	1000 U	1000 U	910 U	17000 U	910 U	160 U
4,6-DINITRO-2-METHYLPHENOL	1800 U	910 U	17000 U	1000 UJ	1000 U	910 UJ	17000 U	910 U	240 U
4-BROMOPHENYL PHENYL ETHER	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 U	56 U
4-CHLORO-3-METHYLPHENOL	380 U	360 U	6900 U	400 UJ	400 UJ	360 U	6600 UJ	360 UJ	100 U
4-CHLOROANILINE	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 U	38 U
4-CHLOROPHENYL PHENYL ETHER	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 U	59 U
4-HYDROXY-4-METHYL-2-PENTANONE	26000 J	NA	NA	NA	NA	NA	NA	NA	NA
4-METHYLPHENOL	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 U	66 U

LOCATION	BGS-05	TP-MW01	TP-MW02	TP-MW03	TP-MW04	TP-MW05	TP-MW06	TP-MW07	TP-MW08
SAMPLE ID	BGS-05	TP-SS01-0001-98	TP-SS02-0001-98	TP-SS03-0001-98	TP-SS04-0001-98	TP-SS05-0001-98	TP-SS06-0001-98	TP-SS07-0001-	TPSS290001
SAMPLE DATE	19910813	19980622	19980620	19980620	19980618	19980609	19980616	19980615	20030423
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1.2	1	1	1	1	1	1	1	1
4-NITROANILINE	1800 U	910 U	17000 U	1000 U	1000 U	910 U	17000 U	910 U	190 U
4-NITROPHENOL	1800 U	910 U	17000 U	1000 UJ	1000 UJ	910 U	17000 UJ	910 UJ	240 U
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZOIC ACID	1800 U	NA	NA	NA	NA	NA	NA	NA	NA
BENZYL ALCOHOL	380 U	NA	NA	NA	NA	NA	NA	NA	NA
BIS(2-CHLOROETHOXY)METHANE	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 U	52 U
BIS(2-CHLOROETHYL)ETHER	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 U	60 U
BIS(2-ETHYLHEXYL)PHTHALATE	380 U	430	6900 U	400 U	400 U	360 U	6600 U	360 U	90 U
BUTYL BENZYL PHTHALATE	380 U	360 U	6900 U	400 U	400 U	360 UJ	6600 U	360 U	76 U
CARBAZOLE	NA	21 J	6900 U	400 U	20 J	22 J	6600 U	360 U	67 U
CHRYSENE	190 J	200 J	730 J	35 J	200 J	170 J	6600 U	43 J	61 U
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIETHYL PHTHALATE	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 U	47 U
DIMETHYL PHTHALATE	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 U	51 U
DI-N-BUTYL PHTHALATE	380 U	360 U	6900 U	400 U	24 J	18 J	6600 U	28 J	230 U
DI-N-OCTYL PHTHALATE	380 U	360 UJ	6900 UJ	400 U	400 U	360 UJ	6600 U	360 UJ	57 U
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLOROBENZENE	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 U	69 U
HEXACHLOROBUTADIENE	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 U	41 U
HEXACHLOROCYCLOPENTADIENE	380 U	360 U	6900 U	400 UJ	400 U	360 UJ	6600 U	360 U	43 U
HEXACHLOROETHANE	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 U	38 U
HIGH MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
ISOPHORONE	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 U	32 U
LOW MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	BGS-05	TP-MW01	TP-MW02	TP-MW03	TP-MW04	TP-MW05	TP-MW06	TP-MW07	TP-MW08
SAMPLE ID	BGS-05	TP-SS01-0001-98	TP-SS02-0001-98	TP-SS03-0001-98	TP-SS04-0001-98	TP-SS05-0001-98	TP-SS06-0001-98	TP-SS07-0001-	TPSS290001
SAMPLE DATE	19910813	19980622	19980620	19980620	19980618	19980609	19980616	19980615	20030423
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1.2	1	1	1	1	1	1	1	1
NITROBENZENE	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 U	56 U
N-NITROSO-DI-N-PROPYLAMINE	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 UJ	50 U
N-NITROSODIPHENYLAMINE	380 U	360 U	6900 U	400 U	400 U	360 U	6600 U	360 U	100 U
PENTACHLOROPHENOL	1800 U	910 U	17000 U	1000 UJ	1000 UJ	910 U	17000 UJ	910 U	210 U
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
PHENOL	380 U	360 U	6900 U	400 UJ	400 UJ	360 U	6600 UJ	360 UJ	80 U
PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
VOLATILES (UG/KG)									
1,1,1-TRICHLOROETHANE	6 U	11 U	10 U	12 UJ	12 U	11 UJ	11 U	11 U	NA
1,1,2,2-TETRACHLOROETHANE	6 U	11 U	10 U	12 UJ	12 UJ	11 UJ	11 UJ	11 U	NA
1,1,2-TRICHLOROETHANE	6 U	11 U	10 U	12 UJ	12 U	11 UJ	11 U	11 U	NA
1,1,2-TRICHLOROTRIFLUOROETHANE	NA	11 U	10 U	12 U	12 U	11 UJ	11 U	3 J	NA
1,1-DICHLOROETHANE	6 U	11 U	10 U	12 U	12 U	11 U	11 U	11 U	NA
1,1-DICHLOROETHENE	6 U	11 U	10 U	12 U	12 U	11 U	11 U	11 U	NA
1,2-DICHLOROETHANE	6 U	11 U	10 U	12 U	12 U	11 U	11 U	11 U	NA
1,2-DICHLOROPROPANE	6 U	11 U	10 U	12 UJ	12 U	11 UJ	11 U	11 U	NA
2-BUTANONE	11 U	2 J	3 J	12 U	12 U	2 J	18 U	2 J	NA
2-HEXANONE	11 U	11 U	10 U	12 UJ	12 UJ	11 UJ	11 UJ	11 U	NA
4-METHYL-2-PENTANONE	11 U	11 U	10 U	12 UJ	12 U	11 UJ	11 UJ	11 U	NA
ACETONE	4 U	11 U	15 U	3 U	12 U	13 U	16 U	13 U	NA
BENZENE	6 U	11 U	10 U	12 UJ	12 U	11 UJ	11 U	11 U	NA
BROMODICHLOROMETHANE	6 U	11 U	10 U	12 UJ	12 U	11 UJ	11 U	11 U	NA
BROMOFORM	6 U	11 U	10 U	12 UJ	12 U	11 U	11 U	11 U	NA
BROMOMETHANE	11 U	11 U	10 U	12 U	12 U	11 U	11 U	11 U	NA
CARBON DISULFIDE	6 U	11 U	10 U	12 U	12 U	11 U	11 U	11 U	NA
CARBON TETRACHLORIDE	6 U	11 U	10 U	12 UJ	12 U	11 UJ	11 U	11 U	NA
CHLOROBENZENE	6 U	11 U	10 U	12 UJ	12 U	11 UJ	11 UJ	11 U	NA
CHLORODIBROMOMETHANE	6 U	11 U	10 U	12 UJ	12 U	11 UJ	11 U	11 U	NA
CHLOROETHANE	11 U	11 U	10 U	12 U	12 U	11 U	11 U	11 U	NA
CHLOROFORM	6 U	11 U	10 U	12 U	12 U	11 U	11 U	11 U	NA
CHLOROMETHANE	11 U	11 U	10 U	12 U	12 U	11 U	11 U	11 U	NA
CIS-1,3-DICHLOROPROPENE	6 U	11 U	10 U	12 UJ	12 U	11 UJ	11 U	11 U	NA
ETHYLBENZENE	6 U	11 U	10 U	12 UJ	12 U	11 UJ	11 UJ	11 U	NA
METHYLENE CHLORIDE	4 J	11 U	15 U	12 U	14 U	19 U	12 U	11 U	NA
STYRENE	6 U	11 U	10 U	12 UJ	12 U	11 UJ	11 UJ	11 U	NA
TETRACHLOROETHENE	6 U	11 U	10 U	12 U	12 U	11 UJ	11 UJ	11 U	NA
TOLUENE	6 U	11 U	2 J	12 UJ	12 U	11 UJ	1 J	11 U	NA

LOCATION	BGS-05	TP-MW01	TP-MW02	TP-MW03	TP-MW04	TP-MW05	TP-MW06	TP-MW07	TP-MW08
SAMPLE ID	BGS-05	TP-SS01-0001-98	TP-SS02-0001-98	TP-SS03-0001-98	TP-SS04-0001-98	TP-SS05-0001-98	TP-SS06-0001-98	TP-SS07-0001-	TPSS290001
SAMPLE DATE	19910813	19980622	19980620	19980620	19980618	19980609	19980616	19980615	20030423
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1.2	1	1	1	1	1	1	1	1
TOTAL 1,2-DICHLOROETHENE	6 U	11 U	10 U	12 U	12 U	11 U	11 U	11 U	NA
TOTAL XYLENES	6 U	11 U	4 J	12 UJ	12 U	11 UJ	2 J	11 U	NA
TRANS-1,3-DICHLOROPROPENE	6 U	11 U	10 U	12 UJ	12 U	11 UJ	11 U	11 U	NA
TRICHLOROETHENE	6 U	11 U	10 U	12 U	12 U	11 UJ	11 U	11 U	NA
VINYL ACETATE	11 U	NA	NA	NA	NA	NA	NA	NA	NA
VINYL CHLORIDE	11 U	11 U	10 U	12 U	12 U	11 U	11 U	11 U	NA

LOCATION	TP-MW09	TP-SB08	TP-SB09			TP-SB10	TP-SB101	TP-SB102
SAMPLE ID	TPSS210001	TP-SS08-0001-98	TP-SS09-0001-98	TP-SS09-0001-98-AVG	TP-SS09-0001-98-D	TP-SS10-0001-98	TPSS1010001	TPSS1020001
SAMPLE DATE	20030422	19980710	19980609	19980609	19980609	19980616	20081122	20081122
SAMPLE CODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1
DIOXINS/FURANS (NG/KG)								
1,2,3,4,6,7,8,9-OCDD	434	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8,9-OCDF	0.9 U	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HPCDD	2.5 U	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HPCDF	0.4 U	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HPCDF	0.5 U	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HXCDD	0.3 U	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HXCDF	0.2 U	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HXCDD	0.3 U	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HXCDF	0.2 U	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HXCDD	0.3 U	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HXCDF	0.2 U	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PECDD	0.2 U	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PECDF	0.1 U	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-HXCDF	0.2 U	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-PECDF	0.2 U	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD	0.2 U	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDF	0.1 U	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-2005	0.1302	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-2005 - HALFND	0.4688	NA	NA	NA	NA	NA	NA	NA
TOTAL HPCDD	4.8 U	NA	NA	NA	NA	NA	NA	NA
TOTAL HPCDF	1.1 U	NA	NA	NA	NA	NA	NA	NA
TOTAL HXCDD	2 U	NA	NA	NA	NA	NA	NA	NA
TOTAL HXCDF	0.8 U	NA	NA	NA	NA	NA	NA	NA
TOTAL PECDD	1.5 U	NA	NA	NA	NA	NA	NA	NA
TOTAL PECDF	1.2 U	NA	NA	NA	NA	NA	NA	NA
TOTAL TCDD	0.53 U	NA	NA	NA	NA	NA	NA	NA
TOTAL TCDF	0.75 U	NA	NA	NA	NA	NA	NA	NA
INORGANICS (MG/KG)								
ALUMINUM	9530	14200	7400	7955	8510	7200	NA	NA
ANTIMONY	0.11 UR	0.41 UR	0.85 U	1.025 U	1.2 U	1 U	NA	NA
ARSENIC	14.2	10.1 J	9.2	10	10.8	8	6.4 J	6.3 J
BARIUM	44.9 J	50.2	39.5	42.05	44.6	35	NA	NA
BERYLLIUM	0.36	0.48	0.34 U	0.365	0.56 J	0.45 J	NA	NA
CADMIUM	0.3 U	0.63 J	0.43 U	0.3925	0.57 J	0.36 UJ	NA	NA
CALCIUM	1330	1830 J	2080 J	2360	2640 J	1520	NA	NA
CHROMIUM	31.2	61.1 J	59 J	68.8	78.6 J	45.8 J	NA	NA

LOCATION	TP-MW09	TP-SB08	TP-SB09			TP-SB10	TP-SB101	TP-SB102
SAMPLE ID	TPSS210001	TP-SS08-0001-98	TP-SS09-0001-98	TP-SS09-0001-98-AVG	TP-SS09-0001-98-D	TP-SS10-0001-98	TPSS1010001	TPSS1020001
SAMPLE DATE	20030422	19980710	19980609	19980609	19980609	19980616	20081122	20081122
SAMPLE CODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1
COBALT	7.1	15.8	11.7	11.9	12.1	8.6	NA	NA
COPPER	13.2	32.6 J	131	141.5	152	63.7 J	NA	NA
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA
IRON	15900	28200	22400	24000	25600	19200	NA	NA
LEAD	6.1 J	21.2 U	249	270.5	292	916 J	NA	NA
MAGNESIUM	4630 J	9270	4910	5235	5560	4100	NA	NA
MANGANESE	250	450 J	324 J	345	366 J	290 J	NA	NA
MERCURY	0.02 U	0.01 J	16.3 J	8.385	0.47 J	0.87 J	NA	NA
NICKEL	20.8 J	50.3	41.2	42.85	44.5	30.1	NA	NA
POTASSIUM	2470 J	2870	1660 J	1745	1830 J	1270	NA	NA
SELENIUM	0.25 U	0.73 U	0.7 U	0.66 U	0.62 U	0.51 UJ	NA	NA
SILVER	0.05 UJ	0.55 U	0.5 U	0.505 U	0.51 U	0.42 U	NA	NA
SODIUM	142 J	567	257	269.5	282	242	NA	NA
THALLIUM	1.1	0.66 U	0.81 J	0.56	0.62 UJ	0.51 U	NA	NA
VANADIUM	24.1 J	43.8	58.9	63.25	67.6	31.5 J	NA	NA
ZINC	30.6	55.2 J	138	145.5	153	162 J	NA	NA
MISCELLANEOUS PARAMETERS (%)								
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL SOLIDS	94	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MEQ/100)								
CATION EXCHANGE CAPACITY	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)								
CYANIDE	NA	2 U	2 U	2 U	2 UR	2 U	NA	NA
HEXAVALENT CHROMIUM	NA	0.53 U	NA	NA	NA	NA	NA	NA
TOTAL ORGANIC CARBON	NA	9100	62000	70000	78000	22000	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)								
PH	NA	7.8	7.6	7.7	7.8	7.5	NA	NA
PESTICIDES/PCBS (UG/KG)								
4,4'-DDD	1.3 U	3.5 U	27 J	25	23 J	3.5 U	NA	NA
4,4'-DDE	1.3 U	7.4	85 J	75.5	66 J	17 R	NA	NA
4,4'-DDT	1.2 UJ	24	330 J	280	230 J	47	NA	NA
ALDRIN	1.2 U	1.8 U	1.8 U	1.75 U	1.7 U	1.6 U	NA	NA
ALPHA-BHC	1.4 U	1.8 U	1.8 U	1.75 U	1.7 U	1.8 U	NA	NA
ALPHA-CHLORDANE	1.5 U	1.8 U	1.8 U	1.75 U	1.7 U	1.8 U	NA	NA
AROCLOR-1016	13 UJ	35 U	34 U	34 U	34 U	35 U	NA	NA
AROCLOR-1221	32 UJ	71 U	70 U	69 U	68 U	70 U	NA	NA
AROCLOR-1232	20 UJ	35 U	34 U	34 U	34 U	35 U	NA	NA

LOCATION	TP-MW09	TP-SB08	TP-SB09			TP-SB10	TP-SB101	TP-SB102
SAMPLE ID	TPSS210001	TP-SS08-0001-98	TP-SS09-0001-98	TP-SS09-0001-98-AVG	TP-SS09-0001-98-D	TP-SS10-0001-98	TPSS1010001	TPSS1020001
SAMPLE DATE	20030422	19980710	19980609	19980609	19980609	19980616	20081122	20081122
SAMPLE CODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1
AROCLOR-1242	13 UJ	35 U	34 U	34 U	34 U	35 U	NA	NA
AROCLOR-1248	4.8 UJ	35 U	34 U	34 U	34 U	35 U	NA	NA
AROCLOR-1254	15 UJ	35 U	34 U	34 U	34 U	35 U	NA	NA
AROCLOR-1260	8 UJ	35 U	34 U	34 U	34 U	35 U	NA	NA
BETA-BHC	2.2 U	1.8 U	1.8 U	1.75 U	1.7 U	1.8 U	NA	NA
DELTA-BHC	1.2 U	1.8 U	1.8 U	1.75 U	1.7 U	1.8 U	NA	NA
DIELDRIN	1.3 UJ	3.5 U	3.4 U	3.4 U	3.4 U	3.5 U	NA	NA
ENDOSULFAN I	1.3 U	1.8 U	1.8 U	1.75 U	1.7 U	1.8 U	NA	NA
ENDOSULFAN II	1.2 U	3.5 U	3.4 U	3.4 U	3.4 U	3.5 U	NA	NA
ENDOSULFAN SULFATE	1.5 UJ	3.5 U	3.4 U	4.85	8 J	12	NA	NA
ENDRIN	1.2 U	3.5 U	3.4 U	3.4 U	3.4 U	3.5 U	NA	NA
ENDRIN ALDEHYDE	1.4 U	3.5 U	3.4 U	3.4 U	3.4 U	3.5 U	NA	NA
ENDRIN KETONE	1.6 UJ	3.5 U	3.4 U	3.4 U	3.4 U	3.5 U	NA	NA
GAMMA-BHC (LINDANE)	1.3 U	1.8 U	1.8 U	1.75 U	1.7 U	1.8 U	NA	NA
GAMMA-CHLORDANE	1.3 U	1.8 U	1.8 U	1.75 U	1.7 U	1.8 U	NA	NA
HEPTACHLOR	1.2 U	1.8 U	1.8 U	1.75 U	1.7 U	1.8 U	NA	NA
HEPTACHLOR EPOXIDE	1.4 U	1.8 U	1.8 U	1.75 U	1.7 U	1.8 U	NA	NA
METHOXYCHLOR	2.2 UJ	18 U	18 U	17.5 U	17 U	18 U	NA	NA
TOTAL AROCLOR	0 U	0 U	0 U	0 U	0 U	0 U	NA	NA
TOTAL AROCLOR HALFND	52.9	140.5	137	136.5	136	140	NA	NA
TOTAL AROCLOR ZEROND	0 U	0 U	0 U	0 U	0 U	0 U	NA	NA
TOXAPHENE	25 U	180 U	180 U	175 U	170 U	180 U	NA	NA
PETROLEUM HYDROCARBONS (MG/KG)								
DIESEL RANGE ORGANICS	NA	140 U	280	235	190	170	NA	NA
GASOLINE RANGE ORGANICS	NA	2.5 U	2.5 UJ	6.625	12 J	2.5 UJ	NA	NA
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)								
ACENAPHTHENE	53 U	360 U	330 U	330 U	330 U	330 U	NA	NA
ACENAPHTHYLENE	39 U	360 U	24 J	25	26 J	330 U	NA	NA
ANTHRACENE	46 U	360 U	26 J	27	28 J	330 U	NA	NA
BAP EQUIVALENT-HALFND	54 U	344.175	331.38	370.5	409.62	123.114	NA	NA
BAP EQUIVALENT-POS	0 U	124.575	164.73	204.675	244.62	121.464	NA	NA
BENZO(A)ANTHRACENE	53 U	360 U	140 J	150	160 J	56 J	NA	NA
BENZO(A)PYRENE	54 U	120 J	120 J	155	190 J	67 J	NA	NA
BENZO(B)FLUORANTHENE	39 U	45 J	160 J	175	190 J	87 J	NA	NA
BENZO(G,H,I)PERYLENE	71 U	360 U	330 UJ	190 J	190 J	330 U	NA	NA
BENZO(K)FLUORANTHENE	68 U	360 U	150 J	195	240 J	57 J	NA	NA
DIBENZO(A,H)ANTHRACENE	68 U	360 U	330 UJ	330 U	330 UJ	35 J	NA	NA

LOCATION	TP-MW09	TP-SB08	TP-SB09			TP-SB10	TP-SB101	TP-SB102
SAMPLE ID	TPSS210001	TP-SS08-0001-98	TP-SS09-0001-98	TP-SS09-0001-98-AVG	TP-SS09-0001-98-D	TP-SS10-0001-98	TPSS1010001	TPSS1020001
SAMPLE DATE	20030422	19980710	19980609	19980609	19980609	19980616	20081122	20081122
SAMPLE CODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1
DIBENZOFURAN	36 U	360 U	330 U	33 J	33 J	330 U	NA	NA
FLUORANTHENE	58 U	41 J	110 J	120	130 J	120 J	NA	NA
FLUORENE	53 U	360 U	330 U	330 U	330 U	20 J	NA	NA
HIGH MOLECULAR WEIGHT PAHS	186.5	668	1195	1350	1505	512	NA	NA
INDENO(1,2,3-CD)PYRENE	63 U	360 U	130 J	140	150 J	45 J	NA	NA
LOW MOLECULAR WEIGHT PAHS	160.5	1116	657	715.5	774	824	NA	NA
NAPHTHALENE	36 U	360 U	72 J	86	100 J	330 U	NA	NA
PHENANTHRENE	51 U	36 J	110 J	130	150 J	120 J	NA	NA
PYRENE	82 U	72 J	430 J	485	540 J	140 J	NA	NA
SEMIVOLATILES (UG/KG)								
1,2,4-TRICHLOROBENZENE	38 U	360 U	330 U	330 U	330 U	330 U	NA	NA
1,2-DICHLOROBENZENE	40 U	360 U	330 U	330 U	330 U	330 U	NA	NA
1,3-DICHLOROBENZENE	39 U	360 U	330 U	330 U	330 U	330 U	NA	NA
1,4-DICHLOROBENZENE	37 U	360 U	330 U	330 U	330 U	330 U	NA	NA
2,2'-OXYBIS(1-CHLOROPROPANE)	52 U	360 U	330 U	330 U	330 U	330 U	NA	NA
2,4,5-TRICHLOROPHENOL	92 U	910 U	830 U	830 U	830 UJ	830 U	NA	NA
2,4,6-TRICHLOROPHENOL	100 U	360 U	330 U	330 U	330 U	330 U	NA	NA
2,4-DICHLOROPHENOL	71 U	360 U	330 U	330 U	330 U	330 U	NA	NA
2,4-DIMETHYLPHENOL	130 U	360 U	330 U	330 U	330 U	330 U	NA	NA
2,4-DINITROPHENOL	270 U	910 UJ	830 UJ	830 U	830 U	830 UJ	NA	NA
2,4-DINITROTOLUENE	36 U	360 U	330 U	330 U	330 U	330 U	NA	NA
2,6-DINITROTOLUENE	42 U	360 U	330 U	330 U	330 U	330 U	NA	NA
2-CHLORONAPHTHALENE	47 U	360 U	330 U	330 U	330 U	330 U	NA	NA
2-CHLOROPHENOL	70 U	360 U	330 U	330 U	330 U	330 UJ	NA	NA
2-METHYLNAPHTHALENE	43 U	360 U	95 J	117.5	140 J	24 J	NA	NA
2-METHYLPHENOL	66 U	360 U	330 U	330 U	330 U	330 U	NA	NA
2-NITROANILINE	44 U	910 U	830 U	830 U	830 U	830 U	NA	NA
2-NITROPHENOL	87 U	360 U	330 U	330 U	330 U	330 U	NA	NA
3,3'-DICHLOROBENZIDINE	200 UJ	360 UJ	330 UJ	330 U	330 UJ	330 U	NA	NA
3-NITROANILINE	150 U	910 U	830 U	830 U	830 U	830 U	NA	NA
4,6-DINITRO-2-METHYLPHENOL	230 U	910 U	830 U	830 U	830 U	830 UJ	NA	NA
4-BROMOPHENYL PHENYL ETHER	53 U	360 U	330 U	330 U	330 U	330 U	NA	NA
4-CHLORO-3-METHYLPHENOL	97 U	360 U	330 U	330 U	330 U	330 UJ	NA	NA
4-CHLOROANILINE	36 U	360 UJ	330 U	330 U	330 U	330 U	NA	NA
4-CHLOROPHENYL PHENYL ETHER	56 U	360 U	330 U	330 U	330 U	330 U	NA	NA
4-HYDROXY-4-METHYL-2-PENTANONE	NA	NA	NA	NA	NA	NA	NA	NA
4-METHYLPHENOL	62 U	360 U	330 U	330 U	330 U	330 U	NA	NA

LOCATION	TP-MW09	TP-SB08	TP-SB09			TP-SB10	TP-SB101	TP-SB102
SAMPLE ID	TPSS210001	TP-SS08-0001-98	TP-SS09-0001-98	TP-SS09-0001-98-AVG	TP-SS09-0001-98-D	TP-SS10-0001-98	TPSS1010001	TPSS1020001
SAMPLE DATE	20030422	19980710	19980609	19980609	19980609	19980616	20081122	20081122
SAMPLE CODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1
4-NITROANILINE	180 U	910 U	830 U	830 U	830 U	830 U	NA	NA
4-NITROPHENOL	220 U	910 U	830 U	830 U	830 U	830 UJ	NA	NA
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA
BENZOIC ACID	NA	NA	NA	NA	NA	NA	NA	NA
BENZYL ALCOHOL	NA	NA	NA	NA	NA	NA	NA	NA
BIS(2-CHLOROETHOXY)METHANE	49 U	360 U	330 U	330 U	330 U	330 U	NA	NA
BIS(2-CHLOROETHYL)ETHER	57 U	360 UJ	330 U	330 U	330 U	330 U	NA	NA
BIS(2-ETHYLHEXYL)PHTHALATE	84 U	360 U	330 U	330 U	330 U	330 U	NA	NA
BUTYL BENZYL PHTHALATE	71 U	360 U	330 UJ	330 U	330 UJ	330 U	NA	NA
CARBAZOLE	63 U	360 U	19 J	19.5	20 J	330 U	NA	NA
CHRYSENE	58 U	75 J	230 J	275	320 J	94 J	NA	NA
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
DIETHYL PHTHALATE	44 U	360 U	330 U	330 U	330 U	330 U	NA	NA
DIMETHYL PHTHALATE	48 U	360 U	330 U	330 U	330 U	330 U	NA	NA
DI-N-BUTYL PHTHALATE	220 U	360 U	330 U	330 U	330 U	330 U	NA	NA
DI-N-OCTYL PHTHALATE	54 U	360 U	330 UJ	330 U	330 UJ	330 U	NA	NA
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLOROBENZENE	65 U	360 U	330 U	330 U	330 U	330 U	NA	NA
HEXACHLOROBUTADIENE	38 U	360 U	330 U	330 U	330 U	330 U	NA	NA
HEXACHLOROCYCLOPENTADIENE	40 U	360 U	330 UJ	330 U	330 UJ	330 UJ	NA	NA
HEXACHLOROETHANE	35 U	360 U	330 U	330 U	330 U	330 U	NA	NA
HIGH MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA
ISOPHORONE	30 U	360 U	330 U	330 U	330 U	330 U	NA	NA
LOW MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-MW09	TP-SB08	TP-SB09			TP-SB10	TP-SB101	TP-SB102
SAMPLE ID	TPSS210001	TP-SS08-0001-98	TP-SS09-0001-98	TP-SS09-0001-98-AVG	TP-SS09-0001-98-D	TP-SS10-0001-98	TPSS1010001	TPSS1020001
SAMPLE DATE	20030422	19980710	19980609	19980609	19980609	19980616	20081122	20081122
SAMPLE CODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1
NITROBENZENE	53 U	360 U	330 U	330 U	330 U	330 U	NA	NA
N-NITROSO-DI-N-PROPYLAMINE	48 U	360 U	330 U	330 U	330 U	330 U	NA	NA
N-NITROSODIPHENYLAMINE	98 U	360 U	330 U	330 U	330 U	330 U	NA	NA
PENTACHLOROPHENOL	200 U	910 UJ	830 U	830 U	830 U	830 UJ	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA
PHENOL	75 U	360 UJ	330 U	330 U	330 U	330 UJ	NA	NA
PYRENE	NA	NA	NA	NA	NA	NA	NA	NA
VOLATILES (UG/KG)								
1,1,1-TRICHLOROETHANE	NA	11 U	10 UJ	10 U	10 UJ	11 U	NA	NA
1,1,2,2-TETRACHLOROETHANE	NA	11 U	10 UJ	10 U	10 UJ	11 UJ	NA	NA
1,1,2-TRICHLOROETHANE	NA	11 U	10 UJ	10 U	10 UJ	11 U	NA	NA
1,1,2-TRICHLOROTRIFLUOROETHANE	NA	11 U	10 UJ	10 U	10 UJ	11 U	NA	NA
1,1-DICHLOROETHANE	NA	11 U	10 U	10 U	10 UJ	11 U	NA	NA
1,1-DICHLOROETHENE	NA	11 U	10 U	10 U	10 UJ	11 U	NA	NA
1,2-DICHLOROETHANE	NA	11 U	10 U	10 U	10 UJ	11 U	NA	NA
1,2-DICHLOROPROPANE	NA	11 U	10 UJ	10 U	10 UJ	11 U	NA	NA
2-BUTANONE	NA	11 U	2 J	3	4 J	11 U	NA	NA
2-HEXANONE	NA	11 U	10 UJ	10 U	10 UJ	11 UJ	NA	NA
4-METHYL-2-PENTANONE	NA	11 U	10 UJ	10 U	10 UJ	11 U	NA	NA
ACETONE	NA	11 U	14 U	19 U	24 U	11 U	NA	NA
BENZENE	NA	11 U	10 UJ	10 U	10 UJ	11 U	NA	NA
BROMODICHLOROMETHANE	NA	11 U	10 UJ	10 U	10 UJ	11 U	NA	NA
BROMOFORM	NA	11 U	10 U	10 U	10 U	11 U	NA	NA
BROMOMETHANE	NA	11 U	10 U	10 U	10 UJ	11 U	NA	NA
CARBON DISULFIDE	NA	11 U	10 U	10 U	10 UJ	11 U	NA	NA
CARBON TETRACHLORIDE	NA	11 U	10 UJ	10 U	10 UJ	11 U	NA	NA
CHLOROBENZENE	NA	11 U	10 UJ	10 U	10 UJ	11 U	NA	NA
CHLORODIBROMOMETHANE	NA	11 U	10 UJ	10 U	10 UJ	11 U	NA	NA
CHLOROETHANE	NA	11 U	10 U	10 U	10 UJ	11 U	NA	NA
CHLOROFORM	NA	11 U	10 U	10 U	10 UJ	11 U	NA	NA
CHLOROMETHANE	NA	11 U	10 U	10 U	10 UJ	11 U	NA	NA
CIS-1,3-DICHLOROPROPENE	NA	11 U	10 UJ	10 U	10 UJ	11 U	NA	NA
ETHYLBENZENE	NA	11 U	10 UJ	10 U	10 UJ	11 U	NA	NA
METHYLENE CHLORIDE	NA	14 U	12 U	18 U	24 U	16 U	NA	NA
STYRENE	NA	11 U	10 UJ	10 U	10 UJ	11 U	NA	NA
TETRACHLOROETHENE	NA	11 U	10 UJ	10 U	10 UJ	11 U	NA	NA
TOLUENE	NA	11 U	10 UJ	2 J	2 J	11 U	NA	NA

LOCATION	TP-MW09	TP-SB08	TP-SB09			TP-SB10	TP-SB101	TP-SB102
SAMPLE ID	TPSS210001	TP-SS08-0001-98	TP-SS09-0001-98	TP-SS09-0001-98-AVG	TP-SS09-0001-98-D	TP-SS10-0001-98	TPSS1010001	TPSS1020001
SAMPLE DATE	20030422	19980710	19980609	19980609	19980609	19980616	20081122	20081122
SAMPLE CODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1
TOTAL 1,2-DICHLOROETHENE	NA	11 U	10 U	10 U	10 U	11 U	NA	NA
TOTAL XYLENES	NA	11 U	2 J	4.5	7 J	11 U	NA	NA
TRANS-1,3-DICHLOROPROPENE	NA	11 U	10 UJ	10 U	10 UJ	11 U	NA	NA
TRICHLOROETHENE	NA	11 U	10 UJ	10 U	10 UJ	11 U	NA	NA
VINYL ACETATE	NA	NA	NA	NA	NA	NA	NA	NA
VINYL CHLORIDE	NA	11 U	10 U	10 U	10 UJ	11 U	NA	NA

LOCATION	TP-SB103	TP-SB104	TP-SB105	TP-SB106	TP-SB107	TP-SB108	TP-SB109	
SAMPLE ID	TPSS1030001	TPSS1040001	TPSS1050001	TPSS1060001	TPSS1070001	TPSS1080001	TPSS1090001	TP-SS11-0001-98
SAMPLE DATE	20081122	20081122	20081122	20081122	20081122	20081122	20081122	19980716
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	0.7
DIOXINS/FURANS (NG/KG)								
1,2,3,4,6,7,8,9-OCDD	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8,9-OCDF	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HPCDD	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HPCDF	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HPCDF	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HXCDD	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HXCDD	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HXCDD	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PECDD	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PECDF	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-PECDF	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDF	NA	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-2005	NA	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-2005 - HALFND	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HPCDD	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HPCDF	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HXCDD	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HXCDF	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PECDD	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PECDF	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL TCDD	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL TCDF	NA	NA	NA	NA	NA	NA	NA	NA
INORGANICS (MG/KG)								
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	12900
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	0.33 UJ
ARSENIC	14.9 J	8.3 J	12.1 J	NA	NA	NA	NA	10.3
BARIUM	NA	NA	NA	NA	NA	NA	NA	66.7
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	0.68
CADMIUM	NA	NA	NA	NA	NA	NA	NA	0.7 J
CALCIUM	NA	NA	NA	NA	NA	NA	NA	1460
CHROMIUM	NA	NA	NA	NA	NA	NA	NA	34

LOCATION	TP-SB103	TP-SB104	TP-SB105	TP-SB106	TP-SB107	TP-SB108	TP-SB109	
SAMPLE ID	TPSS1030001	TPSS1040001	TPSS1050001	TPSS1060001	TPSS1070001	TPSS1080001	TPSS1090001	TP-SS11-0001-98
SAMPLE DATE	20081122	20081122	20081122	20081122	20081122	20081122	20081122	19980716
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	0.7
COBALT	NA	NA	NA	NA	NA	NA	NA	8.4
COPPER	NA	NA	NA	NA	NA	NA	NA	63.4 J
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	19600
LEAD	NA	NA	NA	NA	NA	NA	NA	61.7 J
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	4570
MANGANESE	NA	NA	NA	NA	NA	NA	NA	346
MERCURY	NA	NA	NA	NA	NA	NA	NA	0.11 U
NICKEL	NA	NA	NA	NA	NA	NA	NA	26.2
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	1860
SELENIUM	NA	NA	NA	NA	NA	NA	NA	0.53 U
SILVER	NA	NA	NA	NA	NA	NA	NA	0.25 U
SODIUM	NA	NA	NA	NA	NA	NA	NA	311
THALLIUM	NA	NA	NA	NA	NA	NA	NA	1.1 U
VANADIUM	NA	NA	NA	NA	NA	NA	NA	39.5 J
ZINC	NA	NA	NA	NA	NA	NA	NA	92.8 J
MISCELLANEOUS PARAMETERS (%)								
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL SOLIDS	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MEQ/100)								
CATION EXCHANGE CAPACITY	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)								
CYANIDE	NA	NA	NA	NA	NA	NA	NA	2 U
HEXAVALENT CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA	22000
MISCELLANEOUS PARAMETERS (S.U.)								
PH	NA	NA	NA	NA	NA	NA	NA	6.9
PESTICIDES/PCBS (UG/KG)								
4,4'-DDD	NA	NA	NA	NA	NA	NA	NA	18 U
4,4'-DDE	NA	NA	NA	NA	NA	NA	NA	190
4,4'-DDT	NA	NA	NA	NA	NA	NA	NA	59
ALDRIN	NA	NA	NA	NA	NA	NA	NA	9.3 U
ALPHA-BHC	NA	NA	NA	NA	NA	NA	NA	9.3 U
ALPHA-CHLORDANE	NA	NA	NA	NA	NA	NA	NA	9.3 U
AROCLOR-1016	NA	NA	NA	37 UJ	35 UJ	35 U	34 U	180 U
AROCLOR-1221	NA	NA	NA	37 UJ	35 U	35 U	34 U	370 U
AROCLOR-1232	NA	NA	NA	37 UJ	35 U	35 U	34 U	180 U

LOCATION	TP-SB103	TP-SB104	TP-SB105	TP-SB106	TP-SB107	TP-SB108	TP-SB109	
SAMPLE ID	TPSS1030001	TPSS1040001	TPSS1050001	TPSS1060001	TPSS1070001	TPSS1080001	TPSS1090001	TP-SS11-0001-98
SAMPLE DATE	20081122	20081122	20081122	20081122	20081122	20081122	20081122	19980716
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	0.7
AROCLOR-1242	NA	NA	NA	37 UJ	35 U	35 U	34 U	180 U
AROCLOR-1248	NA	NA	NA	37 UJ	35 U	35 U	34 U	180 U
AROCLOR-1254	NA	NA	NA	37 UJ	35 U	35 U	34 U	180 U
AROCLOR-1260	NA	NA	NA	37 UJ	35 UJ	35 U	34 U	180 U
BETA-BHC	NA	NA	NA	NA	NA	NA	NA	9.3 U
DELTA-BHC	NA	NA	NA	NA	NA	NA	NA	9.3 U
DIELDRIN	NA	NA	NA	NA	NA	NA	NA	18 U
ENDOSULFAN I	NA	NA	NA	NA	NA	NA	NA	9.3 U
ENDOSULFAN II	NA	NA	NA	NA	NA	NA	NA	18 U
ENDOSULFAN SULFATE	NA	NA	NA	NA	NA	NA	NA	18 U
ENDRIN	NA	NA	NA	NA	NA	NA	NA	18 U
ENDRIN ALDEHYDE	NA	NA	NA	NA	NA	NA	NA	18 U
ENDRIN KETONE	NA	NA	NA	NA	NA	NA	NA	18 U
GAMMA-BHC (LINDANE)	NA	NA	NA	NA	NA	NA	NA	9.3 U
GAMMA-CHLORDANE	NA	NA	NA	NA	NA	NA	NA	9.3 U
HEPTACHLOR	NA	NA	NA	NA	NA	NA	NA	9.3 U
HEPTACHLOR EPOXIDE	NA	NA	NA	NA	NA	NA	NA	9.3 U
METHOXYCHLOR	NA	NA	NA	NA	NA	NA	NA	93 U
TOTAL AROCLOR	NA	NA	NA	NA	NA	NA	NA	0 U
TOTAL AROCLOR HALFND	NA	NA	NA	129.5	122.5	122.5	119	725
TOTAL AROCLOR ZEROND	NA	NA	NA	0 U	0 U	0 U	0 U	0 U
TOXAPHENE	NA	NA	NA	NA	NA	NA	NA	930 U
PETROLEUM HYDROCARBONS (MG/KG)								
DIESEL RANGE ORGANICS	NA	NA	NA	NA	NA	NA	NA	NA
GASOLINE RANGE ORGANICS	NA	NA	NA	NA	NA	NA	NA	NA
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)								
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	360 U
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA	NA	360 U
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	22 J
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA	NA	NA	200.74
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA	NA	NA	200.74
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	110 J
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA	NA	110 J
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	170 J
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	NA	NA	96 J
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	82 J
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	53 J

LOCATION	TP-SB103	TP-SB104	TP-SB105	TP-SB106	TP-SB107	TP-SB108	TP-SB109	
SAMPLE ID	TPSS1030001	TPSS1040001	TPSS1050001	TPSS1060001	TPSS1070001	TPSS1080001	TPSS1090001	TP-SS11-0001-98
SAMPLE DATE	20081122	20081122	20081122	20081122	20081122	20081122	20081122	19980716
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	0.7
DIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	360 U
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	270 J
FLUORENE	NA	NA	NA	NA	NA	NA	NA	360 U
HIGH MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	923
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA	NA	78 J
LOW MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	1052
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	360 U
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	130 J
PYRENE	NA	NA	NA	NA	NA	NA	NA	220 J
SEMIVOLATILES (UG/KG)								
1,2,4-TRICHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	360 U
1,2-DICHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	360 U
1,3-DICHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	360 U
1,4-DICHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	360 U
2,2'-OXYBIS(1-CHLOROPROPANE)	NA	NA	NA	NA	NA	NA	NA	360 U
2,4,5-TRICHLOROPHENOL	NA	NA	NA	NA	NA	NA	NA	910 U
2,4,6-TRICHLOROPHENOL	NA	NA	NA	NA	NA	NA	NA	360 U
2,4-DICHLOROPHENOL	NA	NA	NA	NA	NA	NA	NA	360 U
2,4-DIMETHYLPHENOL	NA	NA	NA	NA	NA	NA	NA	360 U
2,4-DINITROPHENOL	NA	NA	NA	NA	NA	NA	NA	910 UJ
2,4-DINITROTOLUENE	NA	NA	NA	NA	NA	NA	NA	360 U
2,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA	NA	360 U
2-CHLORONAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	360 U
2-CHLOROPHENOL	NA	NA	NA	NA	NA	NA	NA	360 U
2-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	360 UJ
2-METHYLPHENOL	NA	NA	NA	NA	NA	NA	NA	360 U
2-NITROANILINE	NA	NA	NA	NA	NA	NA	NA	910 U
2-NITROPHENOL	NA	NA	NA	NA	NA	NA	NA	360 U
3,3'-DICHLOROBENZIDINE	NA	NA	NA	NA	NA	NA	NA	360 UJ
3-NITROANILINE	NA	NA	NA	NA	NA	NA	NA	910 U
4,6-DINITRO-2-METHYLPHENOL	NA	NA	NA	NA	NA	NA	NA	910 U
4-BROMOPHENYL PHENYL ETHER	NA	NA	NA	NA	NA	NA	NA	360 U
4-CHLORO-3-METHYLPHENOL	NA	NA	NA	NA	NA	NA	NA	360 U
4-CHLOROANILINE	NA	NA	NA	NA	NA	NA	NA	360 U
4-CHLOROPHENYL PHENYL ETHER	NA	NA	NA	NA	NA	NA	NA	360 U
4-HYDROXY-4-METHYL-2-PENTANONE	NA	NA	NA	NA	NA	NA	NA	NA
4-METHYLPHENOL	NA	NA	NA	NA	NA	NA	NA	360 U

LOCATION	TP-SB103	TP-SB104	TP-SB105	TP-SB106	TP-SB107	TP-SB108	TP-SB109	
SAMPLE ID	TPSS1030001	TPSS1040001	TPSS1050001	TPSS1060001	TPSS1070001	TPSS1080001	TPSS1090001	TP-SS11-0001-98
SAMPLE DATE	20081122	20081122	20081122	20081122	20081122	20081122	20081122	19980716
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	0.7
4-NITROANILINE	NA	NA	NA	NA	NA	NA	NA	910 U
4-NITROPHENOL	NA	NA	NA	NA	NA	NA	NA	910 U
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA
BENZOIC ACID	NA	NA	NA	NA	NA	NA	NA	NA
BENZYL ALCOHOL	NA	NA	NA	NA	NA	NA	NA	NA
BIS(2-CHLOROETHOXY)METHANE	NA	NA	NA	NA	NA	NA	NA	360 U
BIS(2-CHLOROETHYL)ETHER	NA	NA	NA	NA	NA	NA	NA	360 U
BIS(2-ETHYLHEXYL)PHTHALATE	NA	NA	NA	NA	NA	NA	NA	290 U
BUTYL BENZYL PHTHALATE	NA	NA	NA	NA	NA	NA	NA	76 J
CARBAZOLE	NA	NA	NA	NA	NA	NA	NA	19 J
CHRYSENE	NA	NA	NA	NA	NA	NA	NA	160 J
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
DIETHYL PHTHALATE	NA	NA	NA	NA	NA	NA	NA	360 U
DIMETHYL PHTHALATE	NA	NA	NA	NA	NA	NA	NA	360 U
DI-N-BUTYL PHTHALATE	NA	NA	NA	NA	NA	NA	NA	19 J
DI-N-OCTYL PHTHALATE	NA	NA	NA	NA	NA	NA	NA	360 U
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	360 U
HEXACHLOROBUTADIENE	NA	NA	NA	NA	NA	NA	NA	360 U
HEXACHLOROCYCLOPENTADIENE	NA	NA	NA	NA	NA	NA	NA	360 U
HEXACHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	360 U
HIGH MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA
ISOPHORONE	NA	NA	NA	NA	NA	NA	NA	360 U
LOW MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SB103	TP-SB104	TP-SB105	TP-SB106	TP-SB107	TP-SB108	TP-SB109	
SAMPLE ID	TPSS1030001	TPSS1040001	TPSS1050001	TPSS1060001	TPSS1070001	TPSS1080001	TPSS1090001	TP-SS11-0001-98
SAMPLE DATE	20081122	20081122	20081122	20081122	20081122	20081122	20081122	19980716
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	0.7
NITROBENZENE	NA	NA	NA	NA	NA	NA	NA	360 U
N-NITROSO-DI-N-PROPYLAMINE	NA	NA	NA	NA	NA	NA	NA	360 U
N-NITROSODIPHENYLAMINE	NA	NA	NA	NA	NA	NA	NA	360 U
PENTACHLOROPHENOL	NA	NA	NA	NA	NA	NA	NA	910 UJ
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA
PHENOL	NA	NA	NA	NA	NA	NA	NA	360 U
PYRENE	NA	NA	NA	NA	NA	NA	NA	NA
VOLATILES (UG/KG)								
1,1,1-TRICHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	11 UJ
1,1,2,2-TETRACHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	11 UJ
1,1,2-TRICHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	11 UJ
1,1,2-TRICHLOROTRIFLUOROETHANE	NA	NA	NA	NA	NA	NA	NA	11 U
1,1-DICHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	11 U
1,1-DICHLOROETHENE	NA	NA	NA	NA	NA	NA	NA	11 U
1,2-DICHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	11 U
1,2-DICHLOROPROPANE	NA	NA	NA	NA	NA	NA	NA	11 UJ
2-BUTANONE	NA	NA	NA	NA	NA	NA	NA	11 U
2-HEXANONE	NA	NA	NA	NA	NA	NA	NA	11 UJ
4-METHYL-2-PENTANONE	NA	NA	NA	NA	NA	NA	NA	11 UJ
ACETONE	NA	NA	NA	NA	NA	NA	NA	11 U
BENZENE	NA	NA	NA	NA	NA	NA	NA	11 UJ
BROMODICHLOROMETHANE	NA	NA	NA	NA	NA	NA	NA	11 UJ
BROMOFORM	NA	NA	NA	NA	NA	NA	NA	11 UJ
BROMOMETHANE	NA	NA	NA	NA	NA	NA	NA	11 U
CARBON DISULFIDE	NA	NA	NA	NA	NA	NA	NA	11 U
CARBON TETRACHLORIDE	NA	NA	NA	NA	NA	NA	NA	11 UJ
CHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	11 UJ
CHLORODIBROMOMETHANE	NA	NA	NA	NA	NA	NA	NA	11 UJ
CHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	11 U
CHLOROFORM	NA	NA	NA	NA	NA	NA	NA	11 U
CHLOROMETHANE	NA	NA	NA	NA	NA	NA	NA	11 U
CIS-1,3-DICHLOROPROPENE	NA	NA	NA	NA	NA	NA	NA	11 UJ
ETHYLBENZENE	NA	NA	NA	NA	NA	NA	NA	11 UJ
METHYLENE CHLORIDE	NA	NA	NA	NA	NA	NA	NA	11 U
STYRENE	NA	NA	NA	NA	NA	NA	NA	11 UJ
TETRACHLOROETHENE	NA	NA	NA	NA	NA	NA	NA	11 UJ
TOLUENE	NA	NA	NA	NA	NA	NA	NA	11 UJ

LOCATION	TP-SB103	TP-SB104	TP-SB105	TP-SB106	TP-SB107	TP-SB108	TP-SB109	
SAMPLE ID	TPSS1030001	TPSS1040001	TPSS1050001	TPSS1060001	TPSS1070001	TPSS1080001	TPSS1090001	TP-SS11-0001-98
SAMPLE DATE	20081122	20081122	20081122	20081122	20081122	20081122	20081122	19980716
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	0.7
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA	NA	NA	NA	NA	11 U
TOTAL XYLENES	NA	NA	NA	NA	NA	NA	NA	11 UJ
TRANS-1,3-DICHLOROPROPENE	NA	NA	NA	NA	NA	NA	NA	11 UJ
TRICHLOROETHENE	NA	NA	NA	NA	NA	NA	NA	11 UJ
VINYL ACETATE	NA	NA	NA	NA	NA	NA	NA	NA
VINYL CHLORIDE	NA	NA	NA	NA	NA	NA	NA	11 U

LOCATION	TP-SB11		TP-SB110	TP-SB111	TP-SB112	TP-SB113	TP-SB114	TP-SB115
SAMPLE ID	TP-SS11-0001-98-AVG	TP-SS11-0001-98-	TPSS1100001	TPSS1110001	TPSS1120001	TPSS1130001	TPSS1140001	TPSS1150001
SAMPLE DATE	19980716	19980716	20081122	20081122	20081122	20081122	20081122	20081122
SAMPLE CODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0.7	0.7	1	1	1	1	1	1
DIOXINS/FURANS (NG/KG)								
1,2,3,4,6,7,8,9-OCDD	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8,9-OCDF	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HPCDD	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HPCDF	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HPCDF	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HXCDD	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HXCDD	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HXCDD	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PECDD	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PECDF	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-PECDF	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDF	NA	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-2005	NA	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-2005 - HALFND	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HPCDD	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HPCDF	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HXCDD	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HXCDF	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PECDD	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PECDF	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL TCDD	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL TCDF	NA	NA	NA	NA	NA	NA	NA	NA
INORGANICS (MG/KG)								
ALUMINUM	13650	14400	NA	NA	NA	NA	NA	9330
ANTIMONY	0.34 U	0.35 UJ	NA	NA	NA	NA	NA	0.11 UJ
ARSENIC	10.8	11.3	NA	NA	NA	NA	NA	9.8
BARIUM	69.15	71.6	NA	NA	NA	NA	NA	43.1
BERYLLIUM	0.69	0.7	NA	NA	NA	NA	NA	0.79
CADMIUM	0.735	0.77 J	NA	NA	NA	NA	NA	0.17 J
CALCIUM	1490	1520	NA	NA	NA	NA	NA	5260
CHROMIUM	34.65	35.3	NA	NA	NA	NA	NA	48.9 J

LOCATION	TP-SB11		TP-SB110	TP-SB111	TP-SB112	TP-SB113	TP-SB114	TP-SB115
SAMPLE ID	TP-SS11-0001-98-AVG	TP-SS11-0001-98-	TPSS1100001	TPSS1110001	TPSS1120001	TPSS1130001	TPSS1140001	TPSS1150001
SAMPLE DATE	19980716	19980716	20081122	20081122	20081122	20081122	20081122	20081122
SAMPLE CODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0.7	0.7	1	1	1	1	1	1
COBALT	9.4	10.4	NA	NA	NA	NA	NA	7.5
COPPER	61.3	59.2 J	NA	NA	NA	NA	NA	21.2 J
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA
IRON	21200	22800	NA	NA	NA	NA	NA	17900
LEAD	60.65	59.6 J	NA	NA	NA	NA	NA	11.5 J
MAGNESIUM	4910	5250	NA	NA	NA	NA	NA	5610
MANGANESE	441	536	NA	NA	NA	NA	NA	284
MERCURY	0.12 U	0.13 U	NA	NA	NA	NA	NA	0.025 J
NICKEL	27.05	27.9	NA	NA	NA	NA	NA	28.6
POTASSIUM	1985	2110	NA	NA	NA	NA	NA	2070
SELENIUM	0.58 U	0.63 U	NA	NA	NA	NA	NA	0.45 U
SILVER	0.21 U	0.17 U	NA	NA	NA	NA	NA	0.083 U
SODIUM	333.5	356	NA	NA	NA	NA	NA	382
THALLIUM	1 U	0.9 U	NA	NA	NA	NA	NA	0.27 U
VANADIUM	42.55	45.6 J	NA	NA	NA	NA	NA	29.5
ZINC	90.2	87.6 J	NA	NA	NA	NA	NA	37.5 J
MISCELLANEOUS PARAMETERS (%)								
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL SOLIDS	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MEQ/100)								
CATION EXCHANGE CAPACITY	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)								
CYANIDE	2.8	4.6	NA	NA	NA	NA	NA	NA
HEXAVALENT CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL ORGANIC CARBON	19000	16000	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)								
PH	7	7.1	NA	NA	NA	NA	NA	NA
PESTICIDES/PCBS (UG/KG)								
4,4'-DDD	18 U	18 U	NA	NA	NA	NA	NA	NA
4,4'-DDE	185	180	NA	NA	NA	NA	NA	NA
4,4'-DDT	59	59	NA	NA	NA	NA	NA	NA
ALDRIN	9.35 U	9.4 U	NA	NA	NA	NA	NA	NA
ALPHA-BHC	9.35 U	9.4 U	NA	NA	NA	NA	NA	NA
ALPHA-CHLORDANE	9.35 U	9.4 U	NA	NA	NA	NA	NA	NA
AROCLOR-1016	180 U	180 U	33 UJ	37 U	35 UJ	37 UJ	34 U	36 UJ
AROCLOR-1221	370 U	370 U	33 UJ	37 U	35 UJ	37 UJ	34 U	36 UJ
AROCLOR-1232	180 U	180 U	33 UJ	37 U	35 UJ	37 UJ	34 U	36 UJ

LOCATION	TP-SB11		TP-SB110	TP-SB111	TP-SB112	TP-SB113	TP-SB114	TP-SB115
SAMPLE ID	TP-SS11-0001-98-AVG	TP-SS11-0001-98-	TPSS1100001	TPSS1110001	TPSS1120001	TPSS1130001	TPSS1140001	TPSS1150001
SAMPLE DATE	19980716	19980716	20081122	20081122	20081122	20081122	20081122	20081122
SAMPLE CODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0.7	0.7	1	1	1	1	1	1
AROCLOR-1242	180 U	180 U	33 UJ	37 U	35 UJ	37 UJ	34 U	36 UJ
AROCLOR-1248	180 U	180 U	33 UJ	37 U	35 UJ	37 UJ	34 U	36 UJ
AROCLOR-1254	180 U	180 U	33 UJ	37 U	35 UJ	37 UJ	34 U	280 J
AROCLOR-1260	180 U	180 U	33 UJ	140	81 J	37 UJ	34 U	36 UJ
BETA-BHC	9.35 U	9.4 U	NA	NA	NA	NA	NA	NA
DELTA-BHC	9.35 U	9.4 U	NA	NA	NA	NA	NA	NA
DIELDRIN	18 U	18 U	NA	NA	NA	NA	NA	NA
ENDOSULFAN I	9.35 U	9.4 U	NA	NA	NA	NA	NA	NA
ENDOSULFAN II	18 U	18 U	NA	NA	NA	NA	NA	NA
ENDOSULFAN SULFATE	18 U	18 U	NA	NA	NA	NA	NA	NA
ENDRIN	18 U	18 U	NA	NA	NA	NA	NA	NA
ENDRIN ALDEHYDE	18 U	18 U	NA	NA	NA	NA	NA	NA
ENDRIN KETONE	18 U	18 U	NA	NA	NA	NA	NA	NA
GAMMA-BHC (LINDANE)	9.35 U	9.4 U	NA	NA	NA	NA	NA	NA
GAMMA-CHLORDANE	9.35 U	9.4 U	NA	NA	NA	NA	NA	NA
HEPTACHLOR	9.35 U	9.4 U	NA	NA	NA	NA	NA	NA
HEPTACHLOR EPOXIDE	9.35 U	9.4 U	NA	NA	NA	NA	NA	NA
METHOXYCHLOR	93.5 U	94 U	NA	NA	NA	NA	NA	NA
TOTAL AROCLOR	0 U	0 U	NA	NA	NA	NA	NA	NA
TOTAL AROCLOR HALFND	725	725	115.5	251	186	129.5	119	388
TOTAL AROCLOR ZEROND	0 U	0 U	0 U	140	81	0 U	0 U	280
TOXAPHENE	935 U	940 U	NA	NA	NA	NA	NA	NA
PETROLEUM HYDROCARBONS (MG/KG)								
DIESEL RANGE ORGANICS	NA	NA	NA	NA	NA	NA	NA	NA
GASOLINE RANGE ORGANICS	NA	NA	NA	NA	NA	NA	NA	NA
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)								
ACENAPHTHENE	360 U	360 U	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	360 U	360 U	NA	NA	NA	NA	NA	NA
ANTHRACENE	21	20 J	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	203.85	206.96	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-POS	203.85	206.96	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	110	110 J	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	115	120 J	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	160	150 J	NA	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	98	100 J	NA	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	106	130 J	NA	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	51.5	50 J	NA	NA	NA	NA	NA	NA

LOCATION	TP-SB11		TP-SB110	TP-SB111	TP-SB112	TP-SB113	TP-SB114	TP-SB115
SAMPLE ID	TP-SS11-0001-98-AVG	TP-SS11-0001-98-	TPSS1100001	TPSS1110001	TPSS1120001	TPSS1130001	TPSS1140001	TPSS1150001
SAMPLE DATE	19980716	19980716	20081122	20081122	20081122	20081122	20081122	20081122
SAMPLE CODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0.7	0.7	1	1	1	1	1	1
DIBENZOFURAN	360 U	360 U	NA	NA	NA	NA	NA	NA
FLUORANTHENE	285	300 J	NA	NA	NA	NA	NA	NA
FLUORENE	360 U	360 U	NA	NA	NA	NA	NA	NA
HIGH MOLECULAR WEIGHT PAHS	941.5	960	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	81.5	85 J	NA	NA	NA	NA	NA	NA
LOW MOLECULAR WEIGHT PAHS	1046	1040	NA	NA	NA	NA	NA	NA
NAPHTHALENE	360 U	360 U	NA	NA	NA	NA	NA	NA
PHENANTHRENE	125	120 J	NA	NA	NA	NA	NA	NA
PYRENE	220	220 J	NA	NA	NA	NA	NA	NA
SEMIVOLATILES (UG/KG)								
1,2,4-TRICHLOROBENZENE	360 U	360 U	NA	NA	NA	NA	NA	NA
1,2-DICHLOROBENZENE	360 U	360 U	NA	NA	NA	NA	NA	NA
1,3-DICHLOROBENZENE	360 U	360 U	NA	NA	NA	NA	NA	NA
1,4-DICHLOROBENZENE	360 U	360 U	NA	NA	NA	NA	NA	NA
2,2'-OXYBIS(1-CHLOROPROPANE)	360 U	360 U	NA	NA	NA	NA	NA	360 U
2,4,5-TRICHLOROPHENOL	910 U	910 U	NA	NA	NA	NA	NA	730 U
2,4,6-TRICHLOROPHENOL	360 U	360 U	NA	NA	NA	NA	NA	360 U
2,4-DICHLOROPHENOL	360 U	360 U	NA	NA	NA	NA	NA	360 U
2,4-DIMETHYLPHENOL	360 U	360 U	NA	NA	NA	NA	NA	360 U
2,4-DINITROPHENOL	910 U	910 UJ	NA	NA	NA	NA	NA	730 U
2,4-DINITROTOLUENE	360 U	360 U	NA	NA	NA	NA	NA	360 U
2,6-DINITROTOLUENE	360 U	360 U	NA	NA	NA	NA	NA	360 U
2-CHLORONAPHTHALENE	360 U	360 U	NA	NA	NA	NA	NA	360 U
2-CHLOROPHENOL	360 U	360 U	NA	NA	NA	NA	NA	360 U
2-METHYLNAPHTHALENE	360 U	360 UJ	NA	NA	NA	NA	NA	6.7
2-METHYLPHENOL	360 U	360 U	NA	NA	NA	NA	NA	360 U
2-NITROANILINE	910 U	910 U	NA	NA	NA	NA	NA	730 U
2-NITROPHENOL	360 U	360 U	NA	NA	NA	NA	NA	360 U
3,3'-DICHLOROBENZIDINE	360 U	360 UJ	NA	NA	NA	NA	NA	360 U
3-NITROANILINE	910 U	910 U	NA	NA	NA	NA	NA	730 U
4,6-DINITRO-2-METHYLPHENOL	910 U	910 U	NA	NA	NA	NA	NA	360 U
4-BROMOPHENYL PHENYL ETHER	360 U	360 U	NA	NA	NA	NA	NA	360 U
4-CHLORO-3-METHYLPHENOL	360 U	360 U	NA	NA	NA	NA	NA	360 U
4-CHLOROANILINE	360 U	360 U	NA	NA	NA	NA	NA	360 U
4-CHLOROPHENYL PHENYL ETHER	360 U	360 U	NA	NA	NA	NA	NA	360 U
4-HYDROXY-4-METHYL-2-PENTANONE	NA	NA	NA	NA	NA	NA	NA	NA
4-METHYLPHENOL	360 U	360 U	NA	NA	NA	NA	NA	360 U

LOCATION	TP-SB11		TP-SB110	TP-SB111	TP-SB112	TP-SB113	TP-SB114	TP-SB115
SAMPLE ID	TP-SS11-0001-98-AVG	TP-SS11-0001-98-	TPSS1100001	TPSS1110001	TPSS1120001	TPSS1130001	TPSS1140001	TPSS1150001
SAMPLE DATE	19980716	19980716	20081122	20081122	20081122	20081122	20081122	20081122
SAMPLE CODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0.7	0.7	1	1	1	1	1	1
4-NITROANILINE	910 U	910 U	NA	NA	NA	NA	NA	730 U
4-NITROPHENOL	910 U	910 U	NA	NA	NA	NA	NA	730 U
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	3.6 U
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA	NA	3.6 U
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	3.6 U
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA	NA	NA	25.628
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA	NA	NA	23.648
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	15
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA	NA	17
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	48
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	NA	NA	13
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	17
BENZOIC ACID	NA	NA	NA	NA	NA	NA	NA	NA
BENZYL ALCOHOL	NA	NA	NA	NA	NA	NA	NA	NA
BIS(2-CHLOROETHOXY)METHANE	360 U	360 U	NA	NA	NA	NA	NA	360 U
BIS(2-CHLOROETHYL)ETHER	360 U	360 U	NA	NA	NA	NA	NA	3.6 U
BIS(2-ETHYLHEXYL)PHTHALATE	395 U	500 U	NA	NA	NA	NA	NA	190 J
BUTYL BENZYL PHTHALATE	50	24 J	NA	NA	NA	NA	NA	360 U
CARBAZOLE	19 J	360 U	NA	NA	NA	NA	NA	360 U
CHRYSENE	160	160 J	NA	NA	NA	NA	NA	48
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	3.6 U
DIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	360 U
DIETHYL PHTHALATE	360 U	360 U	NA	NA	NA	NA	NA	360 U
DIMETHYL PHTHALATE	360 U	360 U	NA	NA	NA	NA	NA	360 U
DI-N-BUTYL PHTHALATE	25.5	32 J	NA	NA	NA	NA	NA	360 U
DI-N-OCTYL PHTHALATE	360 U	360 U	NA	NA	NA	NA	NA	360 U
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	17 U
FLUORENE	NA	NA	NA	NA	NA	NA	NA	3.6 U
HEXACHLOROBENZENE	360 U	360 U	NA	NA	NA	NA	NA	3.6 U
HEXACHLOROBUTADIENE	360 U	360 U	NA	NA	NA	NA	NA	360 U
HEXACHLOROCYCLOPENTADIENE	360 U	360 U	NA	NA	NA	NA	NA	360 UJ
HEXACHLOROETHANE	360 U	360 U	NA	NA	NA	NA	NA	360 U
HIGH MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	101.3
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA	NA	3.6 U
ISOPHORONE	360 U	360 U	NA	NA	NA	NA	NA	360 U
LOW MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	52.7
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	3.6 U

LOCATION	TP-SB11		TP-SB110	TP-SB111	TP-SB112	TP-SB113	TP-SB114	TP-SB115
SAMPLE ID	TP-SS11-0001-98-AVG	TP-SS11-0001-98-	TPSS1100001	TPSS1110001	TPSS1120001	TPSS1130001	TPSS1140001	TPSS1150001
SAMPLE DATE	19980716	19980716	20081122	20081122	20081122	20081122	20081122	20081122
SAMPLE CODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0.7	0.7	1	1	1	1	1	1
NITROBENZENE	360 U	360 U	NA	NA	NA	NA	NA	360 U
N-NITROSO-DI-N-PROPYLAMINE	360 U	360 U	NA	NA	NA	NA	NA	3.6 U
N-NITROSODIPHENYLAMINE	360 U	360 U	NA	NA	NA	NA	NA	360 U
PENTACHLOROPHENOL	910 U	910 UJ	NA	NA	NA	NA	NA	730 UJ
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	37
PHENOL	360 U	360 U	NA	NA	NA	NA	NA	360 U
PYRENE	NA	NA	NA	NA	NA	NA	NA	22 U
VOLATILES (UG/KG)								
1,1,1-TRICHLOROETHANE	11 U	11 UJ	NA	NA	NA	NA	NA	NA
1,1,2,2-TETRACHLOROETHANE	11 U	11 UJ	NA	NA	NA	NA	NA	NA
1,1,2-TRICHLOROETHANE	11 U	11 UJ	NA	NA	NA	NA	NA	NA
1,1,2-TRICHLOROTRIFLUOROETHANE	11 U	11 U	NA	NA	NA	NA	NA	NA
1,1-DICHLOROETHANE	11 U	11 U	NA	NA	NA	NA	NA	NA
1,1-DICHLOROETHENE	11 U	11 U	NA	NA	NA	NA	NA	NA
1,2-DICHLOROETHANE	11 U	11 U	NA	NA	NA	NA	NA	NA
1,2-DICHLOROPROPANE	11 U	11 UJ	NA	NA	NA	NA	NA	NA
2-BUTANONE	11 U	11 U	NA	NA	NA	NA	NA	NA
2-HEXANONE	11 U	11 UJ	NA	NA	NA	NA	NA	NA
4-METHYL-2-PENTANONE	11 U	11 UJ	NA	NA	NA	NA	NA	NA
ACETONE	13 U	15 U	NA	NA	NA	NA	NA	NA
BENZENE	11 U	11 UJ	NA	NA	NA	NA	NA	NA
BROMODICHLOROMETHANE	11 U	11 UJ	NA	NA	NA	NA	NA	NA
BROMOFORM	11 U	11 UJ	NA	NA	NA	NA	NA	NA
BROMOMETHANE	11 U	11 U	NA	NA	NA	NA	NA	NA
CARBON DISULFIDE	11 U	11 U	NA	NA	NA	NA	NA	NA
CARBON TETRACHLORIDE	11 U	11 UJ	NA	NA	NA	NA	NA	NA
CHLOROBENZENE	11 U	11 UJ	NA	NA	NA	NA	NA	NA
CHLORODIBROMOMETHANE	11 U	11 UJ	NA	NA	NA	NA	NA	NA
CHLOROETHANE	11 U	11 U	NA	NA	NA	NA	NA	NA
CHLOROFORM	11 U	11 U	NA	NA	NA	NA	NA	NA
CHLOROMETHANE	11 U	11 U	NA	NA	NA	NA	NA	NA
CIS-1,3-DICHLOROPROPENE	11 U	11 UJ	NA	NA	NA	NA	NA	NA
ETHYLBENZENE	11 U	11 UJ	NA	NA	NA	NA	NA	NA
METHYLENE CHLORIDE	25 U	39 U	NA	NA	NA	NA	NA	NA
STYRENE	11 U	11 UJ	NA	NA	NA	NA	NA	NA
TETRACHLOROETHENE	11 U	11 UJ	NA	NA	NA	NA	NA	NA
TOLUENE	11 U	11 UJ	NA	NA	NA	NA	NA	NA

LOCATION	TP-SB11		TP-SB110	TP-SB111	TP-SB112	TP-SB113	TP-SB114	TP-SB115
SAMPLE ID	TP-SS11-0001-98-AVG	TP-SS11-0001-98-	TPSS1100001	TPSS1110001	TPSS1120001	TPSS1130001	TPSS1140001	TPSS1150001
SAMPLE DATE	19980716	19980716	20081122	20081122	20081122	20081122	20081122	20081122
SAMPLE CODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0.7	0.7	1	1	1	1	1	1
TOTAL 1,2-DICHLOROETHENE	11 U	11 U	NA	NA	NA	NA	NA	NA
TOTAL XYLENES	11 U	11 UJ	NA	NA	NA	NA	NA	NA
TRANS-1,3-DICHLOROPROPENE	11 U	11 UJ	NA	NA	NA	NA	NA	NA
TRICHLOROETHENE	11 U	11 UJ	NA	NA	NA	NA	NA	NA
VINYL ACETATE	NA	NA	NA	NA	NA	NA	NA	NA
VINYL CHLORIDE	11 U	11 U	NA	NA	NA	NA	NA	NA

LOCATION	TP-SB116			TP-SB117			TP-SB118	TP-SB119
SAMPLE ID	TPSS1160001	TPSS1160001-AVG	TPSS1160001-D	TPSS1170001	TPSS1170001-AVG	TPSS1170001-D	TPSS1180001	TPSS1190001
SAMPLE DATE	20081122	20081122	20081122	20081123	20081123	20081123	20081123	20081123
SAMPLE CODE	ORIG	AVG	DUP	ORIG	AVG	DUP	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1
DIOXINS/FURANS (NG/KG)								
1,2,3,4,6,7,8,9-OCDD	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8,9-OCDF	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HPCDD	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HPCDF	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HPCDF	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HXCDD	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HXCDD	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HXCDD	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PECDD	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PECDF	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-PECDF	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDF	NA	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-2005	NA	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-2005 - HALFND	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HPCDD	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HPCDF	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HXCDD	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HXCDF	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PECDD	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PECDF	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL TCDD	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL TCDF	NA	NA	NA	NA	NA	NA	NA	NA
INORGANICS (MG/KG)								
ALUMINUM	9550	11975	14400	13600	13600	NA	10500	9570
ANTIMONY	0.11 UJ	0.115 U	0.12 UJ	0.11 UJ	0.11 UJ	NA	0.089 UJ	0.086 UJ
ARSENIC	12.4	13.55	14.7	14	14	NA	14	25.5
BARIUM	58.1	72.6	87.1	39.5	39.5	NA	33.5	40.7
BERYLLIUM	0.47	0.62	0.77	0.69	0.69	NA	0.61	0.52
CADMIUM	0.3	0.465	0.63 J	0.17 J	0.17 J	NA	0.14 J	0.38
CALCIUM	5060	4965	4870	1310	1310	NA	1110	2080
CHROMIUM	38.6 J	50.5	62.4 J	31.7 J	31.7 J	NA	27.3 J	39.6 J

LOCATION	TP-SB116			TP-SB117			TP-SB118	TP-SB119
SAMPLE ID	TPSS1160001	TPSS1160001-AVG	TPSS1160001-D	TPSS1170001	TPSS1170001-AVG	TPSS1170001-D	TPSS1180001	TPSS1190001
SAMPLE DATE	20081122	20081122	20081122	20081123	20081123	20081123	20081123	20081123
SAMPLE CODE	ORIG	AVG	DUP	ORIG	AVG	DUP	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1
COBALT	7.2	8.75	10.3	7.1	7.1	NA	6.7	8.6
COPPER	71.5 J	109.75	148 J	17.5 J	17.5 J	NA	16 J	102 J
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA
IRON	17100	21650	26200	19200	19200	NA	19000	18100
LEAD	106 J	124	142 J	17.5 J	17.5 J	NA	11.5 J	139 J
MAGNESIUM	6120	7440	8760	5220	5220	NA	4820	6060
MANGANESE	268	349	430	262	262	NA	227	240
MERCURY	0.53 J	0.595	0.66 J	0.043 J	0.043 J	NA	0.03 J	0.21 J
NICKEL	28	35.1	42.2	22.6	22.6	NA	22.4	40.1
POTASSIUM	2990	3365	3740	1830	1830	NA	2140	1470
SELENIUM	0.47 U	0.485 U	0.5 U	0.49 U	0.49 U	NA	0.38 U	0.37 U
SILVER	0.086 U	0.0885 U	0.091 UJ	0.09 UJ	0.09 UJ	NA	0.07 U	0.068 U
SODIUM	336	415	494	178	178	NA	214	574
THALLIUM	0.27 U	0.28 U	0.29 U	0.29 U	0.29 U	NA	0.22 U	0.22 U
VANADIUM	28.7	35.85	43	24	24	NA	21.1	38.3
ZINC	96.3 J	124.15	152 J	40.7 J	40.7 J	NA	39.4 J	80.4 J
MISCELLANEOUS PARAMETERS (%)								
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL SOLIDS	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MEQ/100)								
CATION EXCHANGE CAPACITY	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)								
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA
HEXAVALENT CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)								
PH	NA	NA	NA	NA	NA	NA	NA	NA
PESTICIDES/PCBS (UG/KG)								
4,4'-DDD	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	NA	NA	NA	NA	NA	NA	NA	NA
ALDRIN	NA	NA	NA	NA	NA	NA	NA	NA
ALPHA-BHC	NA	NA	NA	NA	NA	NA	NA	NA
ALPHA-CHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA
AROCLOR-1016	36 U	36 U	36 UJ	37 UJ	37 U	37 U	37 U	37 U
AROCLOR-1221	36 U	36 U	36 UJ	37 UJ	37 U	37 U	37 U	37 U
AROCLOR-1232	36 U	36 U	36 UJ	37 UJ	37 U	37 U	37 U	37 U

LOCATION	TP-SB116			TP-SB117			TP-SB118	TP-SB119
SAMPLE ID	TPSS1160001	TPSS1160001-AVG	TPSS1160001-D	TPSS1170001	TPSS1170001-AVG	TPSS1170001-D	TPSS1180001	TPSS1190001
SAMPLE DATE	20081122	20081122	20081122	20081123	20081123	20081123	20081123	20081123
SAMPLE CODE	ORIG	AVG	DUP	ORIG	AVG	DUP	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1
AROCLOR-1242	36 U	36 U	36 UJ	37 UJ	37 U	37 U	37 U	37 U
AROCLOR-1248	36 U	36 U	36 UJ	37 UJ	37 U	37 U	37 U	37 U
AROCLOR-1254	36 U	36 U	36 UJ	37 UJ	37 U	37 U	37 U	37 U
AROCLOR-1260	36 U	36 U	36 UJ	37 UJ	37 U	37 U	37 U	37 U
BETA-BHC	NA	NA	NA	NA	NA	NA	NA	NA
DELTA-BHC	NA	NA	NA	NA	NA	NA	NA	NA
DIELDRIN	NA	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN I	NA	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN II	NA	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN SULFATE	NA	NA	NA	NA	NA	NA	NA	NA
ENDRIN	NA	NA	NA	NA	NA	NA	NA	NA
ENDRIN ALDEHYDE	NA	NA	NA	NA	NA	NA	NA	NA
ENDRIN KETONE	NA	NA	NA	NA	NA	NA	NA	NA
GAMMA-BHC (LINDANE)	NA	NA	NA	NA	NA	NA	NA	NA
GAMMA-CHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR EPOXIDE	NA	NA	NA	NA	NA	NA	NA	NA
METHOXYCHLOR	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL AROCLOR	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL AROCLOR HALFND	126	126	126	129.5	129.5	129.5	129.5	129.5
TOTAL AROCLOR ZEROND	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
TOXAPHENE	NA	NA	NA	NA	NA	NA	NA	NA
PETROLEUM HYDROCARBONS (MG/KG)								
DIESEL RANGE ORGANICS	NA	NA	NA	NA	NA	NA	NA	NA
GASOLINE RANGE ORGANICS	NA	NA	NA	NA	NA	NA	NA	NA
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)								
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SB116			TP-SB117			TP-SB118	TP-SB119
SAMPLE ID	TPSS1160001	TPSS1160001-AVG	TPSS1160001-D	TPSS1170001	TPSS1170001-AVG	TPSS1170001-D	TPSS1180001	TPSS1190001
SAMPLE DATE	20081122	20081122	20081122	20081123	20081123	20081123	20081123	20081123
SAMPLE CODE	ORIG	AVG	DUP	ORIG	AVG	DUP	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1
DIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA	NA	NA	NA	NA
HIGH MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA
LOW MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA
PYRENE	NA	NA	NA	NA	NA	NA	NA	NA
SEMIVOLATILES (UG/KG)								
1,2,4-TRICHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA
1,2-DICHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA
1,3-DICHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA
1,4-DICHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA
2,2'-OXYBIS(1-CHLOROPROPANE)	360 U	360 U	360 U	380 U	380 U	NA	370 U	370 U
2,4,5-TRICHLOROPHENOL	740 UJ	740 U	740 U	770 U	770 U	NA	750 U	750 U
2,4,6-TRICHLOROPHENOL	360 UJ	360 U	360 U	380 U	380 U	NA	370 U	370 U
2,4-DICHLOROPHENOL	360 UJ	360 U	360 U	380 U	380 U	NA	370 U	370 U
2,4-DIMETHYLPHENOL	360 UJ	360 U	360 U	380 U	380 U	NA	370 U	370 U
2,4-DINITROPHENOL	740 UJ	740 U	740 U	770 UJ	770 UJ	NA	750 UJ	750 U
2,4-DINITROTOLUENE	360 UJ	360 U	360 U	380 U	380 U	NA	370 U	370 U
2,6-DINITROTOLUENE	360 UJ	360 U	360 U	380 U	380 U	NA	370 U	370 U
2-CHLORONAPHTHALENE	360 U	360 U	360 U	380 U	380 U	NA	370 U	370 U
2-CHLOROPHENOL	360 UJ	360 U	360 U	380 U	380 U	NA	370 U	370 U
2-METHYLNAPHTHALENE	16	13	10	3.8 U	3.8 U	NA	3.7 U	66
2-METHYLPHENOL	360 UJ	360 U	360 U	380 U	380 U	NA	370 U	370 U
2-NITROANILINE	740 U	740 U	740 U	770 U	770 U	NA	750 U	750 U
2-NITROPHENOL	360 UJ	360 U	360 U	380 U	380 U	NA	370 U	370 U
3,3'-DICHLOROBENZIDINE	360 UR	360 U	360 U	380 UJ	380 UJ	NA	370 U	370 U
3-NITROANILINE	740 UJ	740 U	740 U	770 UJ	770 UJ	NA	750 U	750 U
4,6-DINITRO-2-METHYLPHENOL	360 UJ	360 U	360 U	770 U	770 U	NA	750 U	370 U
4-BROMOPHENYL PHENYL ETHER	360 U	360 U	360 U	380 U	380 U	NA	370 U	370 U
4-CHLORO-3-METHYLPHENOL	360 UJ	360 U	360 U	380 U	380 U	NA	370 U	370 U
4-CHLOROANILINE	360 UJ	360 U	360 U	380 U	380 U	NA	370 U	370 U
4-CHLOROPHENYL PHENYL ETHER	360 U	360 U	360 U	380 U	380 U	NA	370 U	370 U
4-HYDROXY-4-METHYL-2-PENTANONE	NA	NA	NA	NA	NA	NA	NA	NA
4-METHYLPHENOL	360 UJ	360 U	360 U	380 U	380 U	NA	370 U	370 U

LOCATION	TP-SB116			TP-SB117			TP-SB118	TP-SB119
SAMPLE ID	TPSS1160001	TPSS1160001-AVG	TPSS1160001-D	TPSS1170001	TPSS1170001-AVG	TPSS1170001-D	TPSS1180001	TPSS1190001
SAMPLE DATE	20081122	20081122	20081122	20081123	20081123	20081123	20081123	20081123
SAMPLE CODE	ORIG	AVG	DUP	ORIG	AVG	DUP	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1
4-NITROANILINE	740 UJ	740 U	740 U	770 UJ	770 UJ	NA	750 U	750 U
4-NITROPHENOL	740 UJ	740 U	740 U	770 U	770 U	NA	750 U	750 U
ACENAPHTHENE	3.6 U	3.6 U	3.6 U	3.8 U	3.8 U	NA	3.7 U	3.7 U
ACENAPHTHYLENE	13	13	13	3.8 U	3.8 U	NA	3.7 U	12
ANTHRACENE	8.7	9.35	10	3.8 U	3.8 U	NA	3.7 U	10
BAP EQUIVALENT-HALFND	78.438	78.4095	78.381	4.7164	4.7164	NA	9.3288	72.913
BAP EQUIVALENT-POS	78.438	78.4095	78.381	0.5174	0.5174	NA	7.2753	72.913
BENZO(A)ANTHRACENE	50	51.5	53	3.8 U	3.8 U	NA	5.7	43
BENZO(A)PYRENE	48	48	48	3.8 U	3.8 U	NA	6	44
BENZO(B)FLUORANTHENE	97	92.5	88	4.7	4.7	NA	6.4	94
BENZO(G,H,I)PERYLENE	31	29	27	3.8 U	3.8 U	NA	3.7 U	25
BENZO(K)FLUORANTHENE	67	66	65	4.3	4.3	NA	5.8	59
BENZOIC ACID	NA	NA	NA	NA	NA	NA	NA	NA
BENZYL ALCOHOL	NA	NA	NA	NA	NA	NA	NA	NA
BIS(2-CHLOROETHOXY)METHANE	360 U	360 U	360 U	380 U	380 U	NA	370 U	370 U
BIS(2-CHLOROETHYL)ETHER	3.6 U	3.6 U	3.6 U	3.8 U	3.8 U	NA	3.7 U	3.7 U
BIS(2-ETHYLHEXYL)PHTHALATE	360 U	360 U	360 U	380 U	380 U	NA	370 U	370 U
BUTYL BENZYL PHTHALATE	360 U	360 U	360 U	380 U	380 U	NA	370 U	370 U
CARBAZOLE	360 U	360 U	360 U	380 U	380 U	NA	370 U	370 U
CHRYSENE	58	59.5	61	4.4	4.4	NA	7.3	73
DIBENZO(A,H)ANTHRACENE	12	12.5	13	3.8 U	3.8 U	NA	3.7 U	12
DIBENZOFURAN	360 UJ	360 U	360 U	380 U	380 U	NA	370 U	370 U
DIETHYL PHTHALATE	360 UJ	360 U	360 U	380 U	380 U	NA	370 U	370 U
DIMETHYL PHTHALATE	360 UJ	360 U	360 U	380 U	380 U	NA	370 U	370 U
DI-N-BUTYL PHTHALATE	360 U	360 U	360 U	380 U	380 U	NA	370 U	370 U
DI-N-OCTYL PHTHALATE	360 U	360 U	360 U	380 U	380 U	NA	370 U	370 U
FLUORANTHENE	56	59.5	63	8.1 U	8.1 U	NA	13 U	49
FLUORENE	3.6 U	3.1	4.4	3.8 U	3.8 U	NA	3.7 U	7.2
HEXACHLOROBENZENE	3.6 U	3.6 U	3.6 U	3.8 U	3.8 U	NA	3.7 U	3.7 U
HEXACHLOROBUTADIENE	360 U	360 U	360 U	380 U	380 U	NA	370 U	370 U
HEXACHLOROCYCLOPENTADIENE	360 UJ	360 U	360 UJ	380 UJ	380 UJ	NA	370 UJ	370 UJ
HEXACHLOROETHANE	360 U	360 U	360 U	380 U	380 U	NA	370 U	370 U
HIGH MOLECULAR WEIGHT PAHS	274	284.5	295	17.85	17.85	NA	32.85	262
INDENO(1,2,3-CD)PYRENE	27	25	23	3.8 U	3.8 U	NA	3.7 U	23
ISOPHORONE	360 U	360 U	360 U	380 U	380 U	NA	370 U	370 U
LOW MOLECULAR WEIGHT PAHS	90.3	88.25	86.2	16.2	16.2	NA	19.8	215.05
NAPHTHALENE	16	14.5	13	3.8 U	3.8 U	NA	3.7 U	53

LOCATION	TP-SB116			TP-SB117			TP-SB118	TP-SB119
SAMPLE ID	TPSS1160001	TPSS1160001-AVG	TPSS1160001-D	TPSS1170001	TPSS1170001-AVG	TPSS1170001-D	TPSS1180001	TPSS1190001
SAMPLE DATE	20081122	20081122	20081122	20081123	20081123	20081123	20081123	20081123
SAMPLE CODE	ORIG	AVG	DUP	ORIG	AVG	DUP	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1
NITROBENZENE	360 U	360 U	360 U	380 U	380 U	NA	370 U	370 U
N-NITROSO-DI-N-PROPYLAMINE	3.6 U	3.6 U	3.6 U	3.8 U	3.8 U	NA	3.7 U	3.7 U
N-NITROSODIPHENYLAMINE	360 UJ	360 U	360 U	380 U	380 U	NA	370 U	370 U
PENTACHLOROPHENOL	740 UR	740 U	740 U	770 UJ	770 UJ	NA	750 UJ	750 U
PHENANTHRENE	33	33.5	34	4.8	4.8	NA	8.7	65
PHENOL	360 UJ	360 U	360 U	380 U	380 U	NA	370 U	370 U
PYRENE	50	53.5	57	7.4 U	7.4 U	NA	11 U	41
VOLATILES (UG/KG)								
1,1,1-TRICHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-TETRACHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-TRICHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-TRICHLOROTRIFLUOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA
1,1-DICHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA
1,1-DICHLOROETHENE	NA	NA	NA	NA	NA	NA	NA	NA
1,2-DICHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA
1,2-DICHLOROPROPANE	NA	NA	NA	NA	NA	NA	NA	NA
2-BUTANONE	NA	NA	NA	NA	NA	NA	NA	NA
2-HEXANONE	NA	NA	NA	NA	NA	NA	NA	NA
4-METHYL-2-PENTANONE	NA	NA	NA	NA	NA	NA	NA	NA
ACETONE	NA	NA	NA	NA	NA	NA	NA	NA
BENZENE	NA	NA	NA	NA	NA	NA	NA	NA
BROMODICHLOROMETHANE	NA	NA	NA	NA	NA	NA	NA	NA
BROMOFORM	NA	NA	NA	NA	NA	NA	NA	NA
BROMOMETHANE	NA	NA	NA	NA	NA	NA	NA	NA
CARBON DISULFIDE	NA	NA	NA	NA	NA	NA	NA	NA
CARBON TETRACHLORIDE	NA	NA	NA	NA	NA	NA	NA	NA
CHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA
CHLORODIBROMOMETHANE	NA	NA	NA	NA	NA	NA	NA	NA
CHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA
CHLOROFORM	NA	NA	NA	NA	NA	NA	NA	NA
CHLOROMETHANE	NA	NA	NA	NA	NA	NA	NA	NA
CIS-1,3-DICHLOROPROPENE	NA	NA	NA	NA	NA	NA	NA	NA
ETHYLBENZENE	NA	NA	NA	NA	NA	NA	NA	NA
METHYLENE CHLORIDE	NA	NA	NA	NA	NA	NA	NA	NA
STYRENE	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLOROETHENE	NA	NA	NA	NA	NA	NA	NA	NA
TOLUENE	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SB116			TP-SB117			TP-SB118	TP-SB119
SAMPLE ID	TPSS1160001	TPSS1160001-AVG	TPSS1160001-D	TPSS1170001	TPSS1170001-AVG	TPSS1170001-D	TPSS1180001	TPSS1190001
SAMPLE DATE	20081122	20081122	20081122	20081123	20081123	20081123	20081123	20081123
SAMPLE CODE	ORIG	AVG	DUP	ORIG	AVG	DUP	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL XYLENES	NA	NA	NA	NA	NA	NA	NA	NA
TRANS-1,3-DICHLOROPROPENE	NA	NA	NA	NA	NA	NA	NA	NA
TRICHLOROETHENE	NA	NA	NA	NA	NA	NA	NA	NA
VINYL ACETATE	NA	NA	NA	NA	NA	NA	NA	NA
VINYL CHLORIDE	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SB12	TP-SB120			TP-SB121	TP-SB122	TP-SB123	TP-SB15
SAMPLE ID	TP-SS12-0001-98	TPSS1200001	TPSS1200001-AVG	TPSS1200001-D	TPSS1210001	TPSS1220001	TPSS1230001	TP-SS15-0001-98
SAMPLE DATE	19980713	20081123	20081123	20081123	20081123	20081123	20081123	19980710
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0.2	0	0	0	0	0	0	0.3
BOTTOM DEPTH	0.8	1	1	1	1	1	1	0.7
DIOXINS/FURANS (NG/KG)								
1,2,3,4,6,7,8,9-OCDD	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8,9-OCDF	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HPCDD	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HPCDF	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HPCDF	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HXCDD	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HXCDD	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HXCDD	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PECDD	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PECDF	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-PECDF	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDF	NA	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-2005	NA	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-2005 - HALFND	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HPCDD	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HPCDF	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HXCDD	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HXCDF	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PECDD	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PECDF	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL TCDD	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL TCDF	NA	NA	NA	NA	NA	NA	NA	NA
INORGANICS (MG/KG)								
ALUMINUM	17600	16200	16450	16700	12200	8620	12100	10200
ANTIMONY	0.38 UR	0.15 UJ	0.145 U	0.14 UJ	0.13 UJ	0.12 UJ	0.1 UJ	0.79 U
ARSENIC	14.9 J	23.3	22.65	22	14.3	6.2	12	10.2 J
BARIUM	76.3	77.4	79.45	81.5	47.4	25.2	56	87.2
BERYLLIUM	0.74	1.2	1.15	1.1	0.67	0.82	0.64	0.8
CADMIUM	0.54 J	0.84 J	0.855	0.87 J	0.57	0.17 J	0.64	1.3
CALCIUM	1820 J	2610	2605	2600	2640	4730	4230	1640 J
CHROMIUM	43.3 J	72.7 J	74.85	77 J	42.4 J	22.6 J	52.4 J	100 J

LOCATION	TP-SB12	TP-SB120			TP-SB121	TP-SB122	TP-SB123	TP-SB15
SAMPLE ID	TP-SS12-0001-98	TPSS1200001	TPSS1200001-AVG	TPSS1200001-D	TPSS1210001	TPSS1220001	TPSS1230001	TP-SS15-0001-98
SAMPLE DATE	19980713	20081123	20081123	20081123	20081123	20081123	20081123	19980710
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0.2	0	0	0	0	0	0	0.3
BOTTOM DEPTH	0.8	1	1	1	1	1	1	0.7
COBALT	10.6	10.6	10.45	10.3	10.5	6.4	10.2	11.3
COPPER	39.3 J	195 J	194.5	194 J	55.6 J	61.1 J	213 J	143 J
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA
IRON	22800	25200	26700	28200	30100	15700	27300	27500
LEAD	49.7 J	611 J	2295.5	3980 J	63.4 J	51.6 J	105 J	422 J
MAGNESIUM	5820	7200	7215	7230	7740	4030	7980	4290
MANGANESE	382 J	415	390	365	402	296	358	357 J
MERCURY	0.33 J	0.41 J	0.41	0.41 J	0.18 J	0.026 J	0.42 J	1.1 J
NICKEL	30.8	46.2	49.65	53.1	36.4	13.2	51	55.2
POTASSIUM	2190	1710	1935	2160	2170	1230	2550	1160
SELENIUM	0.61 UJ	0.63 U	0.615 U	0.6 U	0.57 U	0.5 U	0.45 U	0.77 U
SILVER	0.51 U	0.58 UJ	0.7 U	0.82 UJ	0.1 U	0.092 U	0.17 UJ	0.64 U
SODIUM	110 U	200	203	206	572	456	435	109 U
THALLIUM	0.93 U	0.37 U	0.36 U	0.35 U	0.33 U	0.29 U	0.26 U	1.4 U
VANADIUM	45.6	92.2	88.1	84	33.5	24.4	31.7	93.9
ZINC	95.7 J	250 J	249	248 J	142 J	58.9 J	270 J	597 J
MISCELLANEOUS PARAMETERS (%)								
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL SOLIDS	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MEQ/100)								
CATION EXCHANGE CAPACITY	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)								
CYANIDE	2 UJ	NA	NA	NA	NA	NA	NA	2 U
HEXAVALENT CHROMIUM	NA	NA	NA	NA	NA	NA	NA	2.2 U
TOTAL ORGANIC CARBON	24000	NA	NA	NA	NA	NA	NA	67000 J
MISCELLANEOUS PARAMETERS (S.U.)								
PH	6	NA	NA	NA	NA	NA	NA	6.3
PESTICIDES/PCBS (UG/KG)								
4,4'-DDD	3.1 J	NA	NA	NA	NA	NA	NA	34 R
4,4'-DDE	54	NA	NA	NA	NA	NA	NA	110
4,4'-DDT	37	NA	NA	NA	NA	NA	NA	250
ALDRIN	1.9 U	NA	NA	NA	NA	NA	NA	15 U
ALPHA-BHC	1.9 U	NA	NA	NA	NA	NA	NA	15 U
ALPHA-CHLORDANE	1.9 U	NA	NA	NA	NA	NA	NA	15 U
AROCLOR-1016	37 U	330 U	350 U	370 U	36 U	35 U	36 U	300 U
AROCLOR-1221	75 U	330 U	350 U	370 U	36 U	35 U	36 U	600 U
AROCLOR-1232	37 U	330 U	350 U	370 U	36 U	35 U	36 U	300 U

LOCATION	TP-SB12	TP-SB120			TP-SB121	TP-SB122	TP-SB123	TP-SB15
SAMPLE ID	TP-SS12-0001-98	TPSS1200001	TPSS1200001-AVG	TPSS1200001-D	TPSS1210001	TPSS1220001	TPSS1230001	TP-SS15-0001-98
SAMPLE DATE	19980713	20081123	20081123	20081123	20081123	20081123	20081123	19980710
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0.2	0	0	0	0	0	0	0.3
BOTTOM DEPTH	0.8	1	1	1	1	1	1	0.7
AROCLOR-1242	37 U	330 U	350 U	370 U	36 U	35 U	36 U	300 U
AROCLOR-1248	37 U	1500	1500	1500	36 U	35 U	36 U	300 U
AROCLOR-1254	37 U	330 U	350 U	370 U	36 U	35 U	36 U	300 U
AROCLOR-1260	37 U	330 U	350 U	370 U	36 U	35 U	130	300 U
BETA-BHC	1.9 U	NA	NA	NA	NA	NA	NA	15 U
DELTA-BHC	1.9 U	NA	NA	NA	NA	NA	NA	15 U
DIELDRIN	3.7 U	NA	NA	NA	NA	NA	NA	30 U
ENDOSULFAN I	1.9 U	NA	NA	NA	NA	NA	NA	15 U
ENDOSULFAN II	3.7 U	NA	NA	NA	NA	NA	NA	30 U
ENDOSULFAN SULFATE	3.7 U	NA	NA	NA	NA	NA	NA	30 U
ENDRIN	3.7 U	NA	NA	NA	NA	NA	NA	30 U
ENDRIN ALDEHYDE	3.7 U	NA	NA	NA	NA	NA	NA	30 U
ENDRIN KETONE	3.7 U	NA	NA	NA	NA	NA	NA	30 U
GAMMA-BHC (LINDANE)	1.9 U	NA	NA	NA	NA	NA	NA	15 U
GAMMA-CHLORDANE	1.9 U	NA	NA	NA	NA	NA	NA	15 U
HEPTACHLOR	1.9 U	NA	NA	NA	NA	NA	NA	15 U
HEPTACHLOR EPOXIDE	1.9 U	NA	NA	NA	NA	NA	NA	15 U
METHOXYCHLOR	19 U	NA	NA	NA	NA	NA	NA	150 U
TOTAL AROCLOR	0 U	NA	NA	NA	NA	NA	NA	0 U
TOTAL AROCLOR HALFND	148.5	2490	2550	2610	126	122.5	238	1200
TOTAL AROCLOR ZEROND	0 U	1500	1500	1500	0 U	0 U	130	0 U
TOXAPHENE	190 U	NA	NA	NA	NA	NA	NA	1500 U
PETROLEUM HYDROCARBONS (MG/KG)								
DIESEL RANGE ORGANICS	NA	NA	NA	NA	NA	NA	NA	190 U
GASOLINE RANGE ORGANICS	NA	NA	NA	NA	NA	NA	NA	3.8 U
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)								
ACENAPHTHENE	360 U	NA	NA	NA	NA	NA	NA	460
ACENAPHTHYLENE	360 U	NA	NA	NA	NA	NA	NA	44 J
ANTHRACENE	360 U	NA	NA	NA	NA	NA	NA	580
BAP EQUIVALENT-HALFND	229.008	NA	NA	NA	NA	NA	NA	2566
BAP EQUIVALENT-POS	49.008	NA	NA	NA	NA	NA	NA	2566
BENZO(A)ANTHRACENE	36 J	NA	NA	NA	NA	NA	NA	1800
BENZO(A)PYRENE	36 J	NA	NA	NA	NA	NA	NA	1700
BENZO(B)FLUORANTHENE	59 J	NA	NA	NA	NA	NA	NA	2100
BENZO(G,H,I)PERYLENE	36 J	NA	NA	NA	NA	NA	NA	890
BENZO(K)FLUORANTHENE	19 J	NA	NA	NA	NA	NA	NA	1200
DIBENZO(A,H)ANTHRACENE	360 U	NA	NA	NA	NA	NA	NA	360

LOCATION	TP-SB12	TP-SB120			TP-SB121	TP-SB122	TP-SB123	TP-SB15
SAMPLE ID	TP-SS12-0001-98	TPSS1200001	TPSS1200001-AVG	TPSS1200001-D	TPSS1210001	TPSS1220001	TPSS1230001	TP-SS15-0001-98
SAMPLE DATE	19980713	20081123	20081123	20081123	20081123	20081123	20081123	19980710
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0.2	0	0	0	0	0	0	0.3
BOTTOM DEPTH	0.8	1	1	1	1	1	1	0.7
DIBENZOFURAN	360 U	NA	NA	NA	NA	NA	NA	300 J
FLUORANTHENE	87 J	NA	NA	NA	NA	NA	NA	3800
FLUORENE	360 U	NA	NA	NA	NA	NA	NA	480
HIGH MOLECULAR WEIGHT PAHS	463	NA	NA	NA	NA	NA	NA	12160
INDENO(1,2,3-CD)PYRENE	29 J	NA	NA	NA	NA	NA	NA	930
LOW MOLECULAR WEIGHT PAHS	1127	NA	NA	NA	NA	NA	NA	5044
NAPHTHALENE	360 U	NA	NA	NA	NA	NA	NA	250 J
PHENANTHRENE	47 J	NA	NA	NA	NA	NA	NA	3100
PYRENE	66 J	NA	NA	NA	NA	NA	NA	2400
SEMIVOLATILES (UG/KG)								
1,2,4-TRICHLOROBENZENE	360 U	NA	NA	NA	NA	NA	NA	360 U
1,2-DICHLOROBENZENE	360 U	NA	NA	NA	NA	NA	NA	360 U
1,3-DICHLOROBENZENE	360 U	NA	NA	NA	NA	NA	NA	360 U
1,4-DICHLOROBENZENE	360 U	NA	NA	NA	NA	NA	NA	360 U
2,2'-OXYBIS(1-CHLOROPROPANE)	360 U	400 U	405 U	410 U	350 U	350 U	370 U	360 U
2,4,5-TRICHLOROPHENOL	910 U	810 U	815 U	820 U	720 U	710 U	740 U	910 U
2,4,6-TRICHLOROPHENOL	360 U	400 U	405 U	410 U	350 U	350 U	370 U	360 U
2,4-DICHLOROPHENOL	360 U	400 U	405 U	410 U	350 U	350 U	370 U	360 U
2,4-DIMETHYLPHENOL	360 U	400 U	405 U	410 U	350 U	350 U	370 U	360 U
2,4-DINITROPHENOL	910 U	810 U	815 U	820 UJ	720 UJ	710 UJ	740 U	910 UJ
2,4-DINITROTOLUENE	360 U	400 U	405 U	410 U	350 U	350 U	370 U	360 U
2,6-DINITROTOLUENE	360 U	400 U	405 U	410 U	350 U	350 U	370 U	360 U
2-CHLORONAPHTHALENE	360 U	400 U	405 U	410 U	350 U	350 U	370 U	360 U
2-CHLOROPHENOL	360 U	400 U	405 U	410 U	350 U	350 U	370 U	360 U
2-METHYLNAPHTHALENE	360 U	43 J	36.5	30	5.1	5.8	6.1	130 J
2-METHYLPHENOL	360 U	400 U	405 U	410 U	350 U	350 U	370 U	360 U
2-NITROANILINE	910 U	810 U	815 U	820 U	720 U	710 U	740 U	910 U
2-NITROPHENOL	360 U	400 U	405 U	410 U	350 U	350 U	370 U	360 U
3,3'-DICHLOROBENZIDINE	360 U	400 U	405 U	410 U	350 U	350 U	370 U	360 UJ
3-NITROANILINE	910 U	810 U	815 U	820 U	720 U	710 U	740 U	910 U
4,6-DINITRO-2-METHYLPHENOL	910 U	400 U	610 U	820 U	720 UJ	710 U	370 U	910 U
4-BROMOPHENYL PHENYL ETHER	360 U	400 U	405 U	410 U	350 U	350 U	370 U	360 U
4-CHLORO-3-METHYLPHENOL	360 U	400 U	405 U	410 U	350 U	350 U	370 U	360 U
4-CHLOROANILINE	360 U	400 U	405 U	410 U	350 U	350 U	370 U	360 UJ
4-CHLOROPHENYL PHENYL ETHER	360 U	400 U	405 U	410 U	350 U	350 U	370 U	360 U
4-HYDROXY-4-METHYL-2-PENTANONE	NA	NA	NA	NA	NA	NA	NA	NA
4-METHYLPHENOL	360 U	400 U	405 U	410 U	350 U	350 U	370 U	19 J

LOCATION	TP-SB12	TP-SB120			TP-SB121	TP-SB122	TP-SB123	TP-SB15
SAMPLE ID	TP-SS12-0001-98	TPSS1200001	TPSS1200001-AVG	TPSS1200001-D	TPSS1210001	TPSS1220001	TPSS1230001	TP-SS15-0001-98
SAMPLE DATE	19980713	20081123	20081123	20081123	20081123	20081123	20081123	19980710
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0.2	0	0	0	0	0	0	0.3
BOTTOM DEPTH	0.8	1	1	1	1	1	1	0.7
4-NITROANILINE	910 U	810 U	815 U	820 U	720 U	710 U	740 U	910 U
4-NITROPHENOL	910 U	810 U	815 U	820 U	720 U	710 U	740 U	910 U
ACENAPHTHENE	NA	400 J	330	260	3.5 U	55	8.6	NA
ACENAPHTHYLENE	NA	88 J	88.5	89	5	3.9	36	NA
ANTHRACENE	NA	580	455	330	3.7	80	47	NA
BAP EQUIVALENT-HALFND	NA	6311.9	5170.8	4029.7	31.734	277.17	823.33	NA
BAP EQUIVALENT-POS	NA	6311.9	5170.8	4029.7	31.734	277.17	823.33	NA
BENZO(A)ANTHRACENE	NA	4000	3350	2700	22	220	530	NA
BENZO(A)PYRENE	NA	4000	3400	2800	22	190	540	NA
BENZO(B)FLUORANTHENE	NA	6100 J	4800	3500 J	25	200	850	NA
BENZO(G,H,I)PERYLENE	NA	2800	2350	1900	11	77	310	NA
BENZO(K)FLUORANTHENE	NA	2000	1900	1800	20	210	270 J	NA
BENZOIC ACID	NA	NA	NA	NA	NA	NA	NA	NA
BENZYL ALCOHOL	NA	NA	NA	NA	NA	NA	NA	NA
BIS(2-CHLOROETHOXY)METHANE	360 U	400 U	405 U	410 U	350 U	350 U	370 U	360 U
BIS(2-CHLOROETHYL)ETHER	360 U	4 UJ	4.05 U	4.1 U	3.5 U	3.5 U	3.7 U	360 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	360 U	400 U	405 U	410 U	350 U	350 U	370 U	360 U
BUTYL BENZYL PHTHALATE	23 J	400 U	405 U	410 U	350 U	350 U	370 U	60 J
CARBAZOLE	360 U	400 J	310	220 J	350 U	350 U	370 U	540
CHRYSENE	58 J	3900	3300	2700	24	200	530	2100
DIBENZO(A,H)ANTHRACENE	NA	1000 J	705	410	3.6	33	110	NA
DIBENZOFURAN	NA	110 J	110 J	410 U	350 U	350 U	370 U	NA
DIETHYL PHTHALATE	360 U	400 U	405 U	410 U	350 U	350 U	370 U	360 U
DIMETHYL PHTHALATE	360 U	400 U	405 U	410 U	350 U	350 U	370 U	360 U
DI-N-BUTYL PHTHALATE	360 U	400 U	405 U	410 U	350 UJ	350 U	370 U	360 U
DI-N-OCTYL PHTHALATE	360 U	400 U	405 U	410 U	350 U	350 U	370 U	360 U
FLUORANTHENE	NA	6800 J	5650	4500 J	34	590	800	NA
FLUORENE	NA	210 J	175	140	3.5 U	46	5.6	NA
HEXACHLOROBENZENE	360 U	4 UJ	4.05 U	4.1 U	3.5 U	3.5 U	3.7 U	360 U
HEXACHLOROBUTADIENE	360 U	400 U	405 U	410 U	350 U	350 U	370 U	360 U
HEXACHLOROCYCLOPENTADIENE	360 U	400 UJ	405 U	410 UJ	350 UJ	350 UJ	370 UJ	360 U
HEXACHLOROETHANE	360 U	400 U	405 U	410 U	350 U	350 U	370 U	360 U
HIGH MOLECULAR WEIGHT PAHS	NA	25200	21005	16810	135.6	1703	3210	NA
INDENO(1,2,3-CD)PYRENE	NA	2500	2050	1600	11	91	290	NA
ISOPHORONE	360 U	400 U	405 U	410 U	350 U	350 U	370 U	360 U
LOW MOLECULAR WEIGHT PAHS	NA	4710	3605	2500	35.05	670.7	286.3	NA
NAPHTHALENE	NA	89 J	70	51 J	3.5 U	10	13	NA

LOCATION	TP-SB12	TP-SB120			TP-SB121	TP-SB122	TP-SB123	TP-SB15
SAMPLE ID	TP-SS12-0001-98	TPSS1200001	TPSS1200001-AVG	TPSS1200001-D	TPSS1210001	TPSS1220001	TPSS1230001	TP-SS15-0001-98
SAMPLE DATE	19980713	20081123	20081123	20081123	20081123	20081123	20081123	19980710
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0.2	0	0	0	0	0	0	0.3
BOTTOM DEPTH	0.8	1	1	1	1	1	1	0.7
NITROBENZENE	360 U	400 U	405 U	410 U	350 U	350 U	370 U	360 U
N-NITROSO-DI-N-PROPYLAMINE	360 U	4 UJ	4.05 U	4.1 U	3.5 U	3.5 U	3.7 U	360 U
N-NITROSODIPHENYLAMINE	360 U	400 U	405 U	410 U	350 U	350 U	370 U	360 U
PENTACHLOROPHENOL	910 UJ	810 U	815 U	820 UJ	720 UJ	710 UJ	740 U	910 UJ
PHENANTHRENE	NA	3300 J	2450	1600 J	16	470	170	NA
PHENOL	360 U	400 U	405 U	410 U	350 U	350 U	370 U	360 UJ
PYRENE	NA	5500 J	4600	3700 J	30	470	700	NA
VOLATILES (UG/KG)								
1,1,1-TRICHLOROETHANE	11 UJ	NA	NA	NA	NA	NA	NA	11 UJ
1,1,2,2-TETRACHLOROETHANE	11 UJ	NA	NA	NA	NA	NA	NA	11 UR
1,1,2-TRICHLOROETHANE	11 UJ	NA	NA	NA	NA	NA	NA	11 UJ
1,1,2-TRICHLOROTRIFLUOROETHANE	11 UJ	NA	NA	NA	NA	NA	NA	11 UJ
1,1-DICHLOROETHANE	11 UJ	NA	NA	NA	NA	NA	NA	11 UJ
1,1-DICHLOROETHENE	11 UJ	NA	NA	NA	NA	NA	NA	11 UJ
1,2-DICHLOROETHANE	11 UJ	NA	NA	NA	NA	NA	NA	11 UJ
1,2-DICHLOROPROPANE	11 UJ	NA	NA	NA	NA	NA	NA	11 UJ
2-BUTANONE	11 UJ	NA	NA	NA	NA	NA	NA	11 UJ
2-HEXANONE	11 UJ	NA	NA	NA	NA	NA	NA	11 UR
4-METHYL-2-PENTANONE	11 UJ	NA	NA	NA	NA	NA	NA	11 UR
ACETONE	11 U	NA	NA	NA	NA	NA	NA	11 UJ
BENZENE	11 UJ	NA	NA	NA	NA	NA	NA	11 UJ
BROMODICHLOROMETHANE	11 UJ	NA	NA	NA	NA	NA	NA	11 UJ
BROMOFORM	11 UJ	NA	NA	NA	NA	NA	NA	11 UJ
BROMOMETHANE	11 UJ	NA	NA	NA	NA	NA	NA	11 UJ
CARBON DISULFIDE	11 UJ	NA	NA	NA	NA	NA	NA	11 UJ
CARBON TETRACHLORIDE	11 UJ	NA	NA	NA	NA	NA	NA	11 UJ
CHLOROBENZENE	11 UJ	NA	NA	NA	NA	NA	NA	11 UR
CHLORODIBROMOMETHANE	11 UJ	NA	NA	NA	NA	NA	NA	11 UJ
CHLOROETHANE	11 UJ	NA	NA	NA	NA	NA	NA	11 UJ
CHLOROFORM	2 J	NA	NA	NA	NA	NA	NA	11 UJ
CHLOROMETHANE	11 UJ	NA	NA	NA	NA	NA	NA	11 UJ
CIS-1,3-DICHLOROPROPENE	11 UJ	NA	NA	NA	NA	NA	NA	11 UJ
ETHYLBENZENE	11 UJ	NA	NA	NA	NA	NA	NA	11 UR
METHYLENE CHLORIDE	16 U	NA	NA	NA	NA	NA	NA	21 U
STYRENE	11 UJ	NA	NA	NA	NA	NA	NA	11 UR
TETRACHLOROETHENE	11 UJ	NA	NA	NA	NA	NA	NA	11 UR
TOLUENE	11 UJ	NA	NA	NA	NA	NA	NA	11 UR

LOCATION	TP-SB12	TP-SB120			TP-SB121	TP-SB122	TP-SB123	TP-SB15
SAMPLE ID	TP-SS12-0001-98	TPSS1200001	TPSS1200001-AVG	TPSS1200001-D	TPSS1210001	TPSS1220001	TPSS1230001	TP-SS15-0001-98
SAMPLE DATE	19980713	20081123	20081123	20081123	20081123	20081123	20081123	19980710
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0.2	0	0	0	0	0	0	0.3
BOTTOM DEPTH	0.8	1	1	1	1	1	1	0.7
TOTAL 1,2-DICHLOROETHENE	11 UJ	NA	NA	NA	NA	NA	NA	11 UJ
TOTAL XYLENES	11 U	NA	NA	NA	NA	NA	NA	11 UR
TRANS-1,3-DICHLOROPROPENE	11 UJ	NA	NA	NA	NA	NA	NA	11 UJ
TRICHLOROETHENE	11 UJ	NA	NA	NA	NA	NA	NA	2 J
VINYL ACETATE	NA	NA	NA	NA	NA	NA	NA	NA
VINYL CHLORIDE	11 UJ	NA	NA	NA	NA	NA	NA	11 UJ

LOCATION	TP-SB17	TP-SB18	TP-SB19	TP-SB20	TP-SB22	TP-SB23	TP-SB24	TP-SB25	TP-SB26A
SAMPLE ID	TP-SS17-0001-98	TPSS180001	TPSS190001	TPSS200001	TPSS220001	TPSS230001	TPSS240001	TPSS250001	TPSS26A0001
SAMPLE DATE	19980716	20030425	20030425	20030425	20030423	20030422	20030422	20030425	20030426
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1	1
DIOXINS/FURANS (NG/KG)									
1,2,3,4,6,7,8,9-OCDD	NA	NA	237	NA	849 J	NA	NA	503 J	674
1,2,3,4,6,7,8,9-OCDF	NA	NA	16.1	NA	6.4 U	NA	NA	2.7 J	62.8
1,2,3,4,6,7,8-HPCDD	NA	NA	16.9	NA	6.9	NA	NA	8.2	35.7
1,2,3,4,6,7,8-HPCDF	NA	NA	21.4	NA	11.6	NA	NA	4.9	20.7
1,2,3,4,7,8,9-HPCDF	NA	NA	1.1 U	NA	0.6 U	NA	NA	0.8 U	1.3 U
1,2,3,4,7,8-HXCDD	NA	NA	0.54 U	NA	0.45 U	NA	NA	0.6 U	1.1 U
1,2,3,4,7,8-HXCDF	NA	NA	4.7 U	NA	1.7 U	NA	NA	3.5 J	4.5 U
1,2,3,6,7,8-HXCDD	NA	NA	1.5 U	NA	0.76 U	NA	NA	0.6 U	2.1 J
1,2,3,6,7,8-HXCDF	NA	NA	2.2 U	NA	1.1 U	NA	NA	1.4 J	2.1 U
1,2,3,7,8,9-HXCDD	NA	NA	1.7 U	NA	0.89 U	NA	NA	0.6 U	2.5 U
1,2,3,7,8,9-HXCDF	NA	NA	0.72 U	NA	0.71 U	NA	NA	0.4 U	0.75 U
1,2,3,7,8-PECDD	NA	NA	0.55 U	NA	0.43 U	NA	NA	0.5 U	0.94 U
1,2,3,7,8-PECDF	NA	NA	0.07 U	NA	0.55 U	NA	NA	0.67 J	1 U
2,3,4,6,7,8-HXCDF	NA	NA	3.3 J	NA	1.4 U	NA	NA	1.6 J	2.8 J
2,3,4,7,8-PECDF	NA	NA	2.3 U	NA	1.1 U	NA	NA	1.3 J	2.4 U
2,3,7,8-TCDD	NA	NA	0.24 U	NA	0.2 U	NA	NA	0.2 U	0.2 U
2,3,7,8-TCDF	NA	NA	0.99 U	NA	0.45 U	NA	NA	1 U	1.3 U
TEQ WHO-2005	NA	NA	0.78893	NA	0.4397	NA	NA	1.34281	1.27504
TEQ WHO-2005 - HALFND	NA	NA	2.15298	NA	1.30491	NA	NA	1.85681	2.83904
TOTAL HPCDD	NA	NA	34.8	NA	14.3	NA	NA	16.7	63.6
TOTAL HPCDF	NA	NA	36.5 J	NA	19.5 J	NA	NA	4.9	38.9 J
TOTAL HXCDD	NA	NA	14.5 U	NA	5.3 U	NA	NA	8.7	17.3 U
TOTAL HXCDF	NA	NA	50.3 J	NA	25.1 U	NA	NA	13	40 J
TOTAL PECDD	NA	NA	15.1 J	NA	2.2 U	NA	NA	4.3	5.9 U
TOTAL PECDF	NA	NA	115 U	NA	51.5 U	NA	NA	20.1 J	45.2 U
TOTAL TCDD	NA	NA	7.1 J	NA	0.2 U	NA	NA	9.4	3.1 U
TOTAL TCDF	NA	NA	181 U	NA	46.2 U	NA	NA	39.4	42.3 U
INORGANICS (MG/KG)									
ALUMINUM	21100	15100	15600	7280	11200	11800	14300	19000	17100
ANTIMONY	0.4 UJ	0.7 J	2.1 J	0.11 UR	0.45 U	0.63 UR	0.52 U	0.24 UJ	0.67 J
ARSENIC	16.9	15.5	29.8	11.1 J	12.9	13.6	12.1	13	11.4
BARIUM	79.4	103 J	532 J	30.7	56.1 J	61.4 J	82.8 J	119	99.8
BERYLLIUM	0.68	0.64	0.65	0.23 J	0.26	0.5	0.41	0.51	0.53
CADMIUM	0.93 J	1 J	3 J	0.31 UJ	0.3 U	8.6 J	0.49 J	0.67 U	0.68 U
CALCIUM	1750	3350	3020	784	2040	5190	3340	15800	4500
CHROMIUM	68.2	56.9	64.1	28.8	106	280	72.1	86.6 J	59 J

LOCATION	TP-SB17	TP-SB18	TP-SB19	TP-SB20	TP-SB22	TP-SB23	TP-SB24	TP-SB25	TP-SB26A
SAMPLE ID	TP-SS17-0001-98	TPSS180001	TPSS190001	TPSS200001	TPSS220001	TPSS230001	TPSS240001	TPSS250001	TPSS26A0001
SAMPLE DATE	19980716	20030425	20030425	20030425	20030423	20030422	20030422	20030425	20030426
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1	1
COBALT	12.1	10.3	11.2	7.3	11.1	14.8	11.2	12.5	12.9
COPPER	98.7 J	726	2410	21.8	31.7	1770	123	42.2 J	138 J
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA
IRON	25500	24800	51500	14800	24200	80500	27100	29000	26500
LEAD	102 J	133 J	1240 J	10.8	208 J	414 J	149 J	97.6 J	279 J
MAGNESIUM	9810	6630	5330	4530	7690 J	7310 J	10400 J	13900	11400
MANGANESE	456	380	648	347	396	619	423	601	527
MERCURY	0.73 J	1.6	4.6	0.02 J	0.05 J	0.15 J	0.58 J	0.28 J	0.51 J
NICKEL	49.8	90.4	133	27.9	40.2 J	123 J	59.8 J	60 J	64.7 J
POTASSIUM	1220	2410 J	2220 J	1250 J	2350 J	2290 J	3910 J	5820 J	4380 J
SELENIUM	0.74 U	0.38 U	1.2	0.18 U	0.34 U	3.9 U	0.78 U	0.4 J	0.39 UJ
SILVER	0.44 U	0.37 J	4.4 J	0.56 U	0.09 UJ	0.5 U	0.1 UJ	0.88 U	0.89 U
SODIUM	95.4 U	153	243	299 J	435 J	438 J	817 J	927 J	817 J
THALLIUM	0.65 UJ	1.4 U	1.2 U	0.86 U	0.58 J	1.4 U	1.1	1.2 U	1.4 U
VANADIUM	53 J	42.5	43.7	18.2	32.3 J	109 J	45.4 J	47.3 J	44 J
ZINC	126 J	629	1450	32.5	77.8	1030	175	96.7 J	203 J
MISCELLANEOUS PARAMETERS (%)									
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL SOLIDS	NA	88	84	92	93	88	91	87	89
MISCELLANEOUS PARAMETERS (MEQ/100)									
CATION EXCHANGE CAPACITY	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)									
CYANIDE	2 U	NA	NA	NA	NA	NA	NA	NA	NA
HEXAVALENT CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL ORGANIC CARBON	19000	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)									
PH	6.9	NA	NA	NA	NA	NA	NA	NA	NA
PESTICIDES/PCBS (UG/KG)									
4,4'-DDD	22	1.4 U	2.5 J	1.3 U	1.3 U	1.4 U	14 U	1.4 U	1.4 UJ
4,4'-DDE	300	1.4 UJ	13 J	1.3 UJ	1.3 U	1.4 U	14 U	1.4 U	2.3 J
4,4'-DDT	670	1.2 UJ	6.2 J	1.2 UJ	1.2 UJ	1.2 UJ	24 J	1.3 U	5.8 J
ALDRIN	4 U	1.3 UJ	1.3 UJ	1.2 UJ	1.2 U	1.3 U	12 U	1.3 U	1.2 UJ
ALPHA-BHC	4 U	1.5 UJ	1.6 UJ	1.5 UJ	1.5 U	1.5 U	15 U	1.6 U	1.5 UJ
ALPHA-CHLORDANE	4 U	1.6 UJ	1.6 UJ	1.5 UJ	1.5 U	1.6 U	15 U	1.6 U	1.5 UJ
AROCLOR-1016	78 U	14 U	15 U	14 U	13 U	14 U	14 U	14 U	14 U
AROCLOR-1221	160 U	34 U	35 U	32 U	32 U	34 U	33 U	34 U	33 U
AROCLOR-1232	78 U	21 U	22 U	20 U	20 U	21 U	20 U	21 U	20 U

LOCATION	TP-SB17	TP-SB18	TP-SB19	TP-SB20	TP-SB22	TP-SB23	TP-SB24	TP-SB25	TP-SB26A
SAMPLE ID	TP-SS17-0001-98	TPSS180001	TPSS190001	TPSS200001	TPSS220001	TPSS230001	TPSS240001	TPSS250001	TPSS26A0001
SAMPLE DATE	19980716	20030425	20030425	20030425	20030423	20030422	20030422	20030425	20030426
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1	1
AROCLOR-1242	78 U	14 U	15 U	13 U	13 U	14 U	14 U	14 U	14 U
AROCLOR-1248	78 U	5.2 U	5.4 U	4.9 U	4.9 U	5.2 U	5 U	5.2 U	5.1 U
AROCLOR-1254	78 U	16 U	17 U	16 U	16 U	16 U	16 U	16 U	16 U
AROCLOR-1260	78 U	8.5 U	21	8.1 U	8.1 U	8.5 U	100	8.6 U	8.4 U
BETA-BHC	4 U	2.3 UJ	2.4 UJ	2.2 UJ	2.2 U	2.3 U	22 U	2.4 U	2.3 UJ
DELTA-BHC	4 U	1.3 UJ	1.4 UJ	1.2 UJ	1.2 U	1.3 U	13 U	1.3 U	1.3 UJ
DIELDRIN	7.8 U	1.4 UJ	1.4 UJ	1.3 UJ	1.3 UJ	1.4 UJ	13 UJ	1.4 U	1.3 UJ
ENDOSULFAN I	4 U	1.4 UJ	1.4 UJ	1.3 UJ	1.3 UJ	1.4 U	13 U	1.4 U	1.4 UJ
ENDOSULFAN II	7.8 U	1.3 UJ	1.4 UJ	1.2 UJ	1.2 U	1.3 U	12 U	1.3 U	1.3 UJ
ENDOSULFAN SULFATE	7.8 U	1.6 UJ	1.6 UJ	1.5 UJ	1.5 UJ	1.6 UJ	15 UJ	1.6 U	1.5 UJ
ENDRIN	7.8 U	1.3 UJ	1.4 UJ	1.2 UJ	1.2 U	1.3 U	12 U	1.3 U	1.3 UJ
ENDRIN ALDEHYDE	7.8 U	1.5 UJ	1.6 UJ	1.4 UJ	1.4 U	1.5 U	15 U	1.5 U	1.5 UJ
ENDRIN KETONE	7.8 U	1.6 UJ	1.7 UJ	1.6 UJ	1.6 UJ	1.6 UJ	16 UJ	1.7 U	1.6 UJ
GAMMA-BHC (LINDANE)	4 U	1.3 UJ	1.4 UJ	1.3 UJ	1.3 U	1.3 U	13 U	1.4 U	1.3 UJ
GAMMA-CHLORDANE	4 U	1.4 UJ	1.5 UJ	1.4 UJ	1.4 UJ	1.4 U	14 U	1.4 U	1.4 UJ
HEPTACHLOR	4 U	1.2 UJ	1.3 UJ	1.2 UJ	1.2 U	1.2 U	12 U	1.3 U	1.2 UJ
HEPTACHLOR EPOXIDE	4 U	1.5 UJ	1.6 UJ	1.4 UJ	1.4 U	1.5 U	14 U	1.5 U	1.4 UJ
METHOXYCHLOR	40 U	2.3 UJ	2.4 UJ	2.2 UJ	2.2 U	2.3 UJ	22 UJ	2.4 U	2.3 UJ
TOTAL AROCLOR	0 U	0 U	21	0 U	0 U	0 U	100	0 U	0 U
TOTAL AROCLOR HALFND	314	56.35	75.7	54	53.5	56.35	151	56.4	55.25
TOTAL AROCLOR ZEROND	0 U	0 U	21	0 U	0 U	0 U	100	0 U	0 U
TOXAPHENE	400 U	26 U	28 U	25 UJ	25 U	26 U	260 U	27 U	26 U
PETROLEUM HYDROCARBONS (MG/KG)									
DIESEL RANGE ORGANICS	26	NA	NA	NA	NA	NA	NA	NA	NA
GASOLINE RANGE ORGANICS	3 U	NA	NA	NA	NA	NA	NA	NA	NA
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)									
ACENAPHTHENE	64 J	110 U	60 U	54 U	54 U	56 U	55 U	110 U	110 U
ACENAPHTHYLENE	400 U	82 U	44 U	39 U	39 U	41 U	40 U	84 U	82 U
ANTHRACENE	140 J	98 U	220 J	47 U	47 U	49 U	48 U	100 U	97 U
BAP EQUIVALENT-HALFND	542.17	207.73	1961.5	54 U	54 U	57 U	591.33	120 U	110 U
BAP EQUIVALENT-POS	542.17	120.13	1961.5	0 U	0 U	0 U	555.83	0 U	0 U
BENZO(A)ANTHRACENE	380 J	110 U	1200	54 U	54 U	56 U	300 J	110 U	110 U
BENZO(A)PYRENE	360 J	120 J	1300	54 U	54 U	57 U	420 J	120 U	110 U
BENZO(B)FLUORANTHENE	380 J	83 U	1600	39 U	39 U	41 U	630 J	84 U	82 U
BENZO(G,H,I)PERYLENE	180 J	150 U	890	72 U	72 U	76 U	310 J	150 U	150 U
BENZO(K)FLUORANTHENE	490	140 U	620	69 U	69 U	72 U	340 J	150 U	140 U
DIBENZO(A,H)ANTHRACENE	81 J	140 U	270 J	69 U	69 U	73 U	71 UJ	150 U	140 U

LOCATION	TP-SB17	TP-SB18	TP-SB19	TP-SB20	TP-SB22	TP-SB23	TP-SB24	TP-SB25	TP-SB26A
SAMPLE ID	TP-SS17-0001-98	TPSS180001	TPSS190001	TPSS200001	TPSS220001	TPSS230001	TPSS240001	TPSS250001	TPSS26A0001
SAMPLE DATE	19980716	20030425	20030425	20030425	20030423	20030422	20030422	20030425	20030426
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1	1
DIBENZOFURAN	29 J	77 U	41 U	37 U	37 U	39 U	38 U	79 U	77 U
FLUORANTHENE	950	120 U	2200	59 U	58 U	62 U	480	120 U	120 U
FLUORENE	60 J	110 U	59 U	54 U	54 U	56 UJ	55 U	110 U	110 U
HIGH MOLECULAR WEIGHT PAHS	2981	525	7970	189	188	198.5	2105.5	400	385
INDENO(1,2,3-CD)PYRENE	180 J	130 U	950	64 U	64 U	67 U	360 J	140 U	130 U
LOW MOLECULAR WEIGHT PAHS	1305	339	1045.5	198	163	170	280	342.5	337.5
NAPHTHALENE	21 J	76 U	40 U	36 U	36 U	38 U	37 U	77 U	75 U
PHENANTHRENE	620	110 U	700	61 J	52 U	54 U	140 J	110 U	110 U
PYRENE	740	180 U	1600	84 U	83 U	88 U	540 J	180 U	170 U
SEMIVOLATILES (UG/KG)									
1,2,4-TRICHLOROBENZENE	400 U	80 U	42 U	38 U	38 U	40 U	39 U	81 U	79 U
1,2-DICHLOROBENZENE	400 U	85 U	45 U	41 U	40 U	43 U	42 U	87 U	84 U
1,3-DICHLOROBENZENE	400 U	82 U	43 U	39 U	39 U	41 U	40 U	84 U	81 U
1,4-DICHLOROBENZENE	400 U	78 U	41 U	37 U	37 U	39 U	38 U	80 U	77 U
2,2'-OXYBIS(1-CHLOROPROPANE)	400 U	110 UJ	58 UJ	52 U	52 U	55 U	54 U	110 U	110 U
2,4,5-TRICHLOROPHENOL	1000 U	190 U	100 U	93 U	92 U	97 U	95 U	200 U	190 U
2,4,6-TRICHLOROPHENOL	400 U	210 U	110 U	100 U	100 U	100 U	100 U	220 U	210 U
2,4-DICHLOROPHENOL	400 U	150 U	79 U	72 U	71 U	75 U	73 U	150 U	150 U
2,4-DIMETHYLPHENOL	400 U	270 U	140 U	130 UJ	130 U	140 U	130 U	270 U	270 UJ
2,4-DINITROPHENOL	1000 UJ	580 U	300 U	270 U	270 U	290 U	280 U	580 U	570 U
2,4-DINITROTOLUENE	400 U	76 U	40 U	36 U	36 U	38 U	37 U	77 U	75 U
2,6-DINITROTOLUENE	400 U	90 U	47 U	43 U	42 U	45 U	44 U	91 U	88 U
2-CHLORONAPHTHALENE	400 U	100 U	53 U	48 U	48 U	50 UJ	49 U	100 U	100 U
2-CHLOROPHENOL	400 U	150 U	78 U	71 U	70 U	74 U	72 U	150 U	150 U
2-METHYLNAPHTHALENE	400 U	92 U	48 U	44 U	44 U	46 U	45 U	94 U	91 U
2-METHYLPHENOL	400 U	140 U	73 U	66 U	66 U	70 U	68 U	140 U	140 U
2-NITROANILINE	1000 UJ	93 U	49 U	44 U	44 U	46 U	45 U	94 U	92 U
2-NITROPHENOL	400 U	180 U	97 U	88 U	88 U	92 U	90 U	190 U	180 U
3,3'-DICHLOROBENZIDINE	400 U	430 UJ	230 UJ	210 UJ	210 U	220 UJ	210 UJ	440 U	430 UJ
3-NITROANILINE	1000 U	320 U	170 U	150 U	150 U	160 UJ	160 U	320 U	320 U
4,6-DINITRO-2-METHYLPHENOL	1000 U	490 U	260 U	230 UR	230 U	240 U	240 U	500 U	480 UR
4-BROMOPHENYL PHENYL ETHER	400 U	110 U	59 U	54 U	53 U	56 U	54 U	110 U	110 U
4-CHLORO-3-METHYLPHENOL	400 U	200 U	110 U	98 U	98 U	100 U	100 U	210 U	200 U
4-CHLOROANILINE	400 U	77 U	41 U	37 U	37 U	39 U	38 U	78 U	76 U
4-CHLOROPHENYL PHENYL ETHER	400 U	120 U	62 U	56 U	56 U	59 U	58 U	120 U	120 U
4-HYDROXY-4-METHYL-2-PENTANONE	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-METHYLPHENOL	400 U	130 U	69 U	63 U	62 U	66 U	64 U	130 U	130 U

LOCATION	TP-SB17	TP-SB18	TP-SB19	TP-SB20	TP-SB22	TP-SB23	TP-SB24	TP-SB25	TP-SB26A
SAMPLE ID	TP-SS17-0001-98	TPSS180001	TPSS190001	TPSS200001	TPSS220001	TPSS230001	TPSS240001	TPSS250001	TPSS26A0001
SAMPLE DATE	19980716	20030425	20030425	20030425	20030423	20030422	20030422	20030425	20030426
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1	1
4-NITROANILINE	1000 U	380 U	200 U	180 U	180 U	190 U	180 U	380 U	370 U
4-NITROPHENOL	1000 UJ	470 UJ	250 UJ	220 UJ	220 U	240 U	230 U	480 U	470 UJ
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZOIC ACID	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZYL ALCOHOL	NA	NA	NA	NA	NA	NA	NA	NA	NA
BIS(2-CHLOROETHOXY)METHANE	400 U	100 U	55 U	50 U	50 U	52 U	51 U	110 U	100 U
BIS(2-CHLOROETHYL)ETHER	400 U	120 U	64 U	58 U	57 U	60 U	59 U	120 U	120 U
BIS(2-ETHYLHEXYL)PHTHALATE	73 U	180 U	95 U	250 J	85 U	400	280 J	180 U	410 J
BUTYL BENZYL PHTHALATE	44 J	150 UJ	80 UJ	72 U	72 U	76 U	74 UJ	150 U	150 U
CARBAZOLE	96 J	130 U	71 U	64 U	64 U	68 U	66 U	140 U	130 U
CHRYSENE	470	130 J	1400	58 U	58 U	61 U	330 J	120 U	120 U
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIETHYL PHTHALATE	400 U	94 U	49 U	45 U	44 U	47 UJ	46 U	95 U	92 U
DIMETHYL PHTHALATE	400 U	100 U	54 U	49 U	49 U	51 U	50 U	100 U	100 U
DI-N-BUTYL PHTHALATE	51 J	470 U	240 U	220 U	220 U	230 U	230 U	470 U	460 U
DI-N-OCTYL PHTHALATE	400 U	110 U	60 U	54 U	54 U	57 U	210 J	120 U	110 U
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLOROBENZENE	400 U	140 U	73 U	66 U	66 U	69 U	67 U	140 U	140 U
HEXACHLOROBUTADIENE	400 U	82 U	43 U	39 U	39 U	41 U	40 U	83 U	81 U
HEXACHLOROCYCLOPENTADIENE	400 U	85 U	45 U	41 U	40 U	43 U	42 U	87 U	84 U
HEXACHLOROETHANE	400 U	75 U	40 U	36 U	36 U	38 U	36 U	76 U	74 U
HIGH MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
ISOPHORONE	400 U	64 U	34 U	30 U	30 U	32 U	31 U	65 U	63 U
LOW MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SB17	TP-SB18	TP-SB19	TP-SB20	TP-SB22	TP-SB23	TP-SB24	TP-SB25	TP-SB26A
SAMPLE ID	TP-SS17-0001-98	TPSS180001	TPSS190001	TPSS200001	TPSS220001	TPSS230001	TPSS240001	TPSS250001	TPSS26A0001
SAMPLE DATE	19980716	20030425	20030425	20030425	20030423	20030422	20030422	20030425	20030426
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1	1
NITROBENZENE	400 U	110 U	59 U	54 U	54 U	56 U	55 U	110 U	110 U
N-NITROSO-DI-N-PROPYLAMINE	400 U	100 U	53 U	48 U	48 U	51 U	49 U	100 U	100 U
N-NITROSODIPHENYLAMINE	400 U	210 U	110 U	100 U	100 U	100 U	100 U	210 U	210 U
PENTACHLOROPHENOL	1000 UJ	430 U	230 U	200 UJ	200 U	220 U	210 U	440 U	420 UJ
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
PHENOL	400 U	160 U	84 U	76 U	76 U	80 U	77 U	160 U	160 U
PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
VOLATILES (UG/KG)									
1,1,1-TRICHLOROETHANE	12 UJ	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-TETRACHLOROETHANE	12 UJ	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-TRICHLOROETHANE	12 UJ	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-TRICHLOROTRIFLUOROETHANE	12 U	NA	NA	NA	NA	NA	NA	NA	NA
1,1-DICHLOROETHANE	12 U	NA	NA	NA	NA	NA	NA	NA	NA
1,1-DICHLOROETHENE	12 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2-DICHLOROETHANE	12 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2-DICHLOROPROPANE	12 UJ	NA	NA	NA	NA	NA	NA	NA	NA
2-BUTANONE	12 U	NA	NA	NA	NA	NA	NA	NA	NA
2-HEXANONE	12 UJ	NA	NA	NA	NA	NA	NA	NA	NA
4-METHYL-2-PENTANONE	12 UJ	NA	NA	NA	NA	NA	NA	NA	NA
ACETONE	12 U	NA	NA	NA	NA	NA	NA	NA	NA
BENZENE	12 UJ	NA	NA	NA	NA	NA	NA	NA	NA
BROMODICHLOROMETHANE	12 UJ	NA	NA	NA	NA	NA	NA	NA	NA
BROMOFORM	12 UJ	NA	NA	NA	NA	NA	NA	NA	NA
BROMOMETHANE	12 U	NA	NA	NA	NA	NA	NA	NA	NA
CARBON DISULFIDE	12 U	NA	NA	NA	NA	NA	NA	NA	NA
CARBON TETRACHLORIDE	12 UJ	NA	NA	NA	NA	NA	NA	NA	NA
CHLOROBENZENE	12 UJ	NA	NA	NA	NA	NA	NA	NA	NA
CHLORODIBROMOMETHANE	12 UJ	NA	NA	NA	NA	NA	NA	NA	NA
CHLOROETHANE	12 U	NA	NA	NA	NA	NA	NA	NA	NA
CHLOROFORM	12 U	NA	NA	NA	NA	NA	NA	NA	NA
CHLOROMETHANE	12 U	NA	NA	NA	NA	NA	NA	NA	NA
CIS-1,3-DICHLOROPROPENE	12 UJ	NA	NA	NA	NA	NA	NA	NA	NA
ETHYLBENZENE	12 UJ	NA	NA	NA	NA	NA	NA	NA	NA
METHYLENE CHLORIDE	26 U	NA	NA	NA	NA	NA	NA	NA	NA
STYRENE	12 UJ	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLOROETHENE	12 UJ	NA	NA	NA	NA	NA	NA	NA	NA
TOLUENE	12 UJ	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SB17	TP-SB18	TP-SB19	TP-SB20	TP-SB22	TP-SB23	TP-SB24	TP-SB25	TP-SB26A
SAMPLE ID	TP-SS17-0001-98	TPSS180001	TPSS190001	TPSS200001	TPSS220001	TPSS230001	TPSS240001	TPSS250001	TPSS26A0001
SAMPLE DATE	19980716	20030425	20030425	20030425	20030423	20030422	20030422	20030425	20030426
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1	1
TOTAL 1,2-DICHLOROETHENE	12 U	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL XYLENES	12 UJ	NA	NA	NA	NA	NA	NA	NA	NA
TRANS-1,3-DICHLOROPROPENE	12 UJ	NA	NA	NA	NA	NA	NA	NA	NA
TRICHLOROETHENE	12 UJ	NA	NA	NA	NA	NA	NA	NA	NA
VINYL ACETATE	NA	NA	NA	NA	NA	NA	NA	NA	NA
VINYL CHLORIDE	12 U	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SB26B	TP-SB27	TP-SB28	TP-SB30	TP-SB31	TP-SB32	TP-SB33	TP-SB34	TP-SB35
SAMPLE ID	TPSS26B0001	TPSS270001	TPSS280001	TPSS300001	TPSS310001	TPSS320001	TPSS33B0001	TPSS340001	TPSS350001
SAMPLE DATE	20030426	20030425	20030425	20030424	20030423	20030425	20030425	20030425	20030425
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1	1
DIOXINS/FURANS (NG/KG)									
1,2,3,4,6,7,8,9-OCDD	NA	142	NA	NA	905 J	NA	88.1 J	259 J	NA
1,2,3,4,6,7,8,9-OCDF	NA	10.1	NA	NA	42.6 J	NA	5.9 UJ	37.2 J	NA
1,2,3,4,6,7,8-HPCDD	NA	15.2	NA	NA	38.3	NA	11.7	31.8	NA
1,2,3,4,6,7,8-HPCDF	NA	13.4	NA	NA	85.2	NA	5.2	31.7	NA
1,2,3,4,7,8,9-HPCDF	NA	7.6	NA	NA	1.6 U	NA	1.4 U	2.1 U	NA
1,2,3,4,7,8-HXCDD	NA	0.81 J	NA	NA	0.9 U	NA	1 U	1.5 U	NA
1,2,3,4,7,8-HXCDF	NA	41.5	NA	NA	7.3 U	NA	3 J	14.7	NA
1,2,3,6,7,8-HXCDD	NA	1.9 J	NA	NA	3.2 J	NA	0.9 U	3.1 J	NA
1,2,3,6,7,8-HXCDF	NA	16.5	NA	NA	4.4 J	NA	1.6 J	6.3	NA
1,2,3,7,8,9-HXCDD	NA	1.5 J	NA	NA	3 J	NA	0.9 U	3.5 J	NA
1,2,3,7,8,9-HXCDF	NA	10.2	NA	NA	0.93 U	NA	0.7 U	0.65 U	NA
1,2,3,7,8-PECDD	NA	1 J	NA	NA	1.4 U	NA	0.8 U	1.4 U	NA
1,2,3,7,8-PECDF	NA	41.5	NA	NA	0.08 U	NA	0.3 U	3.9 U	NA
2,3,4,6,7,8-HXCDF	NA	19.9	NA	NA	5.9	NA	2 J	5.9	NA
2,3,4,7,8-PECDF	NA	25.4	NA	NA	3.7 U	NA	1.1 J	5.3 U	NA
2,3,7,8-TCDD	NA	0.38 J	NA	NA	1.5 U	NA	0.4 U	0.47 U	NA
2,3,7,8-TCDF	NA	23.2	NA	NA	2.1 U	NA	0.5 U	2.3 U	NA
TEQ WHO-2005	NA	22.2036	NA	NA	3.16928	NA	1.18543	4.07386	NA
TEQ WHO-2005 - HALFND	NA	22.2036	NA	NA	5.74498	NA	1.99782	6.09536	NA
TOTAL HPCDD	NA	30.9	NA	NA	89.8	NA	19.6	62.8	NA
TOTAL HPCDF	NA	29.4	NA	NA	135 J	NA	7.3 J	54.1 J	NA
TOTAL HXCDD	NA	25.1 J	NA	NA	55 J	NA	8.2 J	39.4 J	NA
TOTAL HXCDF	NA	144 J	NA	NA	122 J	NA	29.5 J	76.7 J	NA
TOTAL PECDD	NA	20.5 J	NA	NA	19.4 J	NA	5 J	21.8 J	NA
TOTAL PECDF	NA	193 J	NA	NA	164 J	NA	52.7 J	93.9 U	NA
TOTAL TCDD	NA	12.1 J	NA	NA	11.4 J	NA	3.5 J	23.1 J	NA
TOTAL TCDF	NA	214 J	NA	NA	228 U	NA	68.9 J	74.1 U	NA
INORGANICS (MG/KG)									
ALUMINUM	9410	9040	16900	8620	10800	12100	6040	11200	11000
ANTIMONY	0.32 J	0.74 J	3.4 J	0.13 U	0.53 U	12.4 J	1.3 J	0.78 J	0.73 J
ARSENIC	12.8	13.4	15.2	9.5	9.4	8.9	19	37.9	9.8
BARIUM	44.2	2530	83.3	32.6 J	34.1 J	96.3 J	96 J	86.2 J	106 J
BERYLLIUM	0.35	0.63	0.54	0.38	0.4	0.28	0.32	0.4	0.4
CADMIUM	0.35 U	2.6	1.1 J	0.33 U	0.6 J	3.3	0.51 J	0.33 U	0.59 U
CALCIUM	2340	7920	2320	1530	1210	3550	7040	4440	8720
CHROMIUM	36 J	45.3 J	61.2 J	22.8	52.4	51.5	21.1	47	42.9

LOCATION	TP-SB26B	TP-SB27	TP-SB28	TP-SB30	TP-SB31	TP-SB32	TP-SB33	TP-SB34	TP-SB35
SAMPLE ID	TPSS26B0001	TPSS270001	TPSS280001	TPSS300001	TPSS310001	TPSS320001	TPSS33B0001	TPSS340001	TPSS350001
SAMPLE DATE	20030426	20030425	20030425	20030424	20030423	20030425	20030425	20030425	20030425
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1	1
COBALT	7.1	7.9 J	11.5	5.4	9.5	6.5	6.2	9.5	10.4
COPPER	50.4 J	235 J	135 J	39.7	313	5620	1910	3990	394
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA
IRON	25800	196000	26300	17000	26300	18400	17600	19900	20200
LEAD	70.6 J	13200 J	361 J	92 J	80.6 J	1690 J	399 J	826 J	202 J
MAGNESIUM	4910	5340	9640	2800 J	8270 J	6130	3880	7380	8250
MANGANESE	256	488	401	241	353	302	219	267	336
MERCURY	0.11 J	0.74 J	1 J	0.17 J	0.1 J	0.35	2.1	6.1	2.2
NICKEL	34.2 J	59.6 J	58.1 J	23.3 J	75.2 J	92.6	31.3	68	61
POTASSIUM	1540 J	1080 J	2970 J	1100 J	1230 J	3810 J	1650 J	3670 J	3690 J
SELENIUM	0.48 J	1.1 J	0.56 UJ	0.27 U	0.27 U	0.94	0.63	0.92	0.63 J
SILVER	0.59 J	0.93 U	1.3 U	0.05 UJ	0.29 U	0.46 J	0.4 J	0.3 J	0.22 J
SODIUM	838 J	582 J	976 J	214 J	256 J	458	522	294	1300
THALLIUM	1.3 U	1.8 U	1.6 U	0.88	1.1	0.79 U	0.62 U	1 U	0.78 U
VANADIUM	34.3 J	28.9 J	42.8 J	28.8 J	33.8 J	31.4	19.4	35.1	29
ZINC	104 J	1020 J	230 J	72.8	332	1630	384	354	208
MISCELLANEOUS PARAMETERS (%)									
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL SOLIDS	NA	90	90	87	91	90	88	94	90
MISCELLANEOUS PARAMETERS (MEQ/100)									
CATION EXCHANGE CAPACITY	20	NA	NA	NA	NA	NA	48	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)									
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXAVALENT CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL ORGANIC CARBON	51000	NA	NA	NA	NA	NA	110000	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)									
PH	NA	NA	NA	NA	NA	NA	NA	NA	NA
PESTICIDES/PCBS (UG/KG)									
4,4'-DDD	1.4 UJ	1.4 U	1.4 U	1.4 U	14 U	1.4 U	1.4 U	1.3 U	3.4 J
4,4'-DDE	1.4 UJ	1.4 U	1.4 U	7.8 J	14 U	1.4 UJ	1.4 UJ	1.7 J	1.4 UJ
4,4'-DDT	2.2 J	1.2 U	3 J	42 J	71 J	1.2 UJ	1.2 UJ	3 J	2.6 J
ALDRIN	1.2 UJ	1.2 U	1.2 U	1.3 U	12 U	1.2 UJ	1.3 UJ	1.2 UJ	1.2 UJ
ALPHA-BHC	1.5 UJ	1.5 U	1.5 U	1.6 U	15 U	1.5 UJ	1.6 UJ	1.4 UJ	1.5 UJ
ALPHA-CHLORDANE	1.5 UJ	1.5 U	1.5 U	1.6 U	15 U	1.5 UJ	1.6 UJ	1.5 UJ	1.5 UJ
AROCLOR-1016	14 U	14 U	14 U	14 U	14 U	14 U	14 U	13 U	14 U
AROCLOR-1221	33 U	33 U	33 U	34 U	32 U	33 U	34 U	32 U	33 U
AROCLOR-1232	20 U	20 U	20 U	21 U	20 U	20 U	21 U	20 U	20 U

LOCATION	TP-SB26B	TP-SB27	TP-SB28	TP-SB30	TP-SB31	TP-SB32	TP-SB33	TP-SB34	TP-SB35
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SAMPLE DATE	20030426	20030425	20030425	20030424	20030423	20030425	20030425	20030425	20030425
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1	1
AROCLOR-1242	14 U	14 U	14 U	14 U	13 U	14 U	14 U	13 U	14 U
AROCLOR-1248	5.1 U	5 U	5 U	5.2 U	5 U	5 U	5.2 U	4.8 U	5 U
AROCLOR-1254	16 U	16 U	16 U	16 U	16 U	16 U	16 U	15 U	16 U
AROCLOR-1260	8.3 U	8.3 U	8.3 U	150	79	8.3 U	8.5 U	8 U	8.3 U
BETA-BHC	2.3 UJ	2.3 U	2.3 U	2.3 U	22 U	2.2 UJ	2.3 UJ	2.2 UJ	2.2 UJ
DELTA-BHC	1.3 UJ	1.3 U	1.3 UJ	1.3 U	13 U	1.3 UJ	1.3 UJ	1.2 UJ	1.3 UJ
DIELDRIN	1.3 UJ	1.3 U	1.3 U	1.4 UJ	13 UJ	1.3 UJ	1.4 UJ	1.3 UJ	1.3 UJ
ENDOSULFAN I	1.4 UJ	1.4 U	1.4 U	1.4 UJ	13 UJ	1.3 UJ	1.4 UJ	1.3 UJ	1.3 UJ
ENDOSULFAN II	1.3 UJ	1.3 U	1.3 U	1.3 U	12 U	1.3 UJ	1.3 UJ	1.2 UJ	1.3 UJ
ENDOSULFAN SULFATE	1.5 UJ	1.5 U	1.5 UJ	1.6 UJ	15 UJ	1.5 UJ	1.6 UJ	1.5 UJ	1.5 UJ
ENDRIN	1.3 UJ	1.3 U	1.3 U	1.3 U	12 U	1.3 UJ	1.3 UJ	1.2 UJ	1.3 UJ
ENDRIN ALDEHYDE	1.5 UJ	9.4	1.5 U	1.5 U	15 U	1.5 UJ	1.5 UJ	1.4 UJ	1.5 UJ
ENDRIN KETONE	1.6 UJ	1.6 U	1.6 UJ	1.7 UJ	16 UJ	1.6 UJ	1.7 UJ	1.6 UJ	1.6 UJ
GAMMA-BHC (LINDANE)	1.3 UJ	1.3 U	1.3 UJ	1.3 U	13 U	1.3 UJ	1.3 UJ	1.3 UJ	1.3 UJ
GAMMA-CHLORDANE	1.4 UJ	1.4 U	1.4 U	1.4 UJ	14 UJ	1.4 UJ	1.4 UJ	1.3 UJ	1.4 UJ
HEPTACHLOR	1.2 UJ	1.2 U	1.2 UJ	1.2 U	12 U	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ
HEPTACHLOR EPOXIDE	1.4 UJ	1.4 U	1.4 U	1.5 U	14 U	1.4 UJ	1.5 UJ	1.4 UJ	1.4 UJ
METHOXYCHLOR	2.3 UJ	2.3 U	2.3 UJ	2.3 U	22 U	2.2 UJ	2.3 UJ	2.2 UJ	2.2 UJ
TOTAL AROCLOR	0 U	0 U	0 U	150	79	0 U	0 U	0 U	0 U
TOTAL AROCLOR HALFND	55.2	55.15	55.15	202.1	129	55.15	56.35	52.9	55.15
TOTAL AROCLOR ZEROND	0 U	0 U	0 U	150	79	0 U	0 U	0 U	0 U
TOXAPHENE	26 U	26 U	26 U	26 U	250 U	26 U	26 U	25 U	26 U
PETROLEUM HYDROCARBONS (MG/KG)									
DIESEL RANGE ORGANICS	NA	NA	NA	NA	NA	NA	NA	NA	NA
GASOLINE RANGE ORGANICS	NA	NA	NA	NA	NA	NA	NA	NA	NA
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)									
ACENAPHTHENE	110 U	280 U	280 U	57 U	1400	110 U	57 U	53 U	55 U
ACENAPHTHYLENE	81 UJ	200 U	200 U	42 U	80 U	80 U	42 U	39 U	40 U
ANTHRACENE	96 UJ	300 J	240 U	120 J	2200	96 U	49 U	46 U	48 U
BAP EQUIVALENT-HALFND	257.56	1961.6	280 U	664.8	5686.9	615.47	179.545	186.72	189.39
BAP EQUIVALENT-POS	170	1781.6	0 U	628.3	5686.9	545.47	140.58	152.72	153.89
BENZO(A)ANTHRACENE	110 UJ	900 J	280 U	510	4500	260 J	130 J	94 J	150 J
BENZO(A)PYRENE	170 J	1400 J	280 U	470	3800	420 J	110 J	110 J	110 J
BENZO(B)FLUORANTHENE	81 U	1400 J	200 U	570	3600	520 J	42 U	160 J	180 J
BENZO(G,H,I)PERYLENE	150 UJ	1200 J	370 U	350 J	2200	360 J	140 J	150 J	92 J
BENZO(K)FLUORANTHENE	140 UJ	860 J	350 U	520	3000	250 J	73 U	69 J	78 J
DIBENZO(A,H)ANTHRACENE	140 UJ	360 U	360 U	73 U	790	140 U	73 U	68 U	71 U

LOCATION	TP-SB26B	TP-SB27	TP-SB28	TP-SB30	TP-SB31	TP-SB32	TP-SB33	TP-SB34	TP-SB35
SAMPLE ID	TPSS26B0001	TPSS270001	TPSS280001	TPSS300001	TPSS310001	TPSS320001	TPSS33B0001	TPSS340001	TPSS350001
SAMPLE DATE	20030426	20030425	20030425	20030424	20030423	20030425	20030425	20030425	20030425
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1	1
DIBENZOFURAN	76 UJ	190 U	190 U	39 U	640 J	75 U	39 U	36 U	38 U
FLUORANTHENE	160 J	1400 J	300 U	1100	7600	280 J	190 J	160 J	240 J
FLUORENE	110 UJ	280 U	280 U	57 U	1200	110 U	57 U	53 U	55 U
HIGH MOLECULAR WEIGHT PAHS	765	6180	975	3616.5	31190	1700	856.5	698	945.5
INDENO(1,2,3-CD)PYRENE	130 UJ	1300 J	330 U	410	2300	410 J	160 J	150 J	90 J
LOW MOLECULAR WEIGHT PAHS	335.5	2660	835	740	15300	450	314.5	383.5	360
NAPHTHALENE	74 UJ	330 J	180 U	38 U	490 J	74 U	38 U	54 J	37 U
PHENANTHRENE	110 UJ	930 J	270 U	500	9500	170 J	170 J	150 J	220 J
PYRENE	250 J	1300 J	430 U	900 J	9600	300 J	210 J	170 J	220 J
SEMIVOLATILES (UG/KG)									
1,2,4-TRICHLOROBENZENE	78 U	200 U	200 U	40 U	77 U	78 U	40 U	38 U	39 U
1,2-DICHLOROBENZENE	84 UJ	210 U	210 U	43 U	82 U	83 U	43 U	40 U	42 U
1,3-DICHLOROBENZENE	81 UJ	200 U	200 U	41 U	79 U	80 U	41 U	39 U	40 U
1,4-DICHLOROBENZENE	77 U	190 U	190 U	39 U	75 U	76 U	39 U	37 U	38 U
2,2'-OXYBIS(1-CHLOROPROPANE)	110 UJ	270 U	270 U	56 U	110 U	110 UJ	55 U	52 UJ	54 UJ
2,4,5-TRICHLOROPHENOL	190 UJ	480 U	480 U	98 U	190 U	190 U	98 U	92 U	95 U
2,4,6-TRICHLOROPHENOL	210 UJ	520 U	520 U	110 U	200 U	210 U	110 U	100 U	100 U
2,4-DICHLOROPHENOL	150 UJ	370 U	370 U	76 U	140 U	150 U	76 U	71 U	73 U
2,4-DIMETHYLPHENOL	260 UJ	660 U	660 U	140 U	260 U	260 U	140 U	130 U	130 U
2,4-DINITROPHENOL	570 U	1400 U	1400 U	290 UJ	560 U	560 U	290 U	270 U	280 U
2,4-DINITROTOLUENE	74 UJ	180 U	180 U	38 U	73 U	74 U	38 U	36 U	37 U
2,6-DINITROTOLUENE	88 UJ	220 U	220 U	45 U	86 U	87 U	45 U	42 U	44 U
2-CHLORONAPHTHALENE	99 UJ	250 U	250 U	51 U	97 U	98 U	51 U	47 U	49 U
2-CHLOROPHENOL	140 U	360 U	360 U	74 U	140 U	140 U	74 U	70 U	72 U
2-METHYLNAPHTHALENE	90 UJ	720 J	220 U	46 U	470 J	90 U	46 U	84 J	45 U
2-METHYLPHENOL	140 UJ	340 U	340 U	70 U	130 U	140 U	70 U	66 U	68 U
2-NITROANILINE	91 UJ	230 U	230 U	47 U	90 U	91 U	47 U	44 U	45 U
2-NITROPHENOL	180 UJ	450 U	450 U	93 U	180 U	180 U	93 U	87 U	90 U
3,3'-DICHLOROBENZIDINE	430 UJ	1100 U	1100 U	220 U	420 U	420 UJ	220 U	200 UJ	210 UJ
3-NITROANILINE	310 UJ	780 U	780 U	160 U	310 U	310 U	160 U	150 U	160 U
4,6-DINITRO-2-METHYLPHENOL	480 UR	1200 U	1200 U	250 U	470 U	480 U	250 U	230 U	240 U
4-BROMOPHENYL PHENYL ETHER	110 U	270 U	280 U	56 U	110 U	110 U	56 U	53 U	55 U
4-CHLORO-3-METHYLPHENOL	200 U	500 U	500 U	100 U	200 U	200 U	100 U	97 U	100 U
4-CHLOROANILINE	76 UJ	190 U	190 U	39 U	74 U	75 U	39 U	36 U	38 U
4-CHLOROPHENYL PHENYL ETHER	120 UJ	290 U	290 U	60 U	110 U	120 U	60 U	56 U	58 U
4-HYDROXY-4-METHYL-2-PENTANONE	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-METHYLPHENOL	130 UJ	320 U	320 U	66 U	130 U	130 U	66 U	62 U	64 U

LOCATION	TP-SB26B	TP-SB27	TP-SB28	TP-SB30	TP-SB31	TP-SB32	TP-SB33	TP-SB34	TP-SB35
SAMPLE ID	TPSS26B0001	TPSS270001	TPSS280001	TPSS300001	TPSS310001	TPSS320001	TPSS33B0001	TPSS340001	TPSS350001
SAMPLE DATE	20030426	20030425	20030425	20030424	20030423	20030425	20030425	20030425	20030425
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1	1
4-NITROANILINE	370 UJ	920 U	920 U	190 U	360 U	370 U	190 U	180 U	180 U
4-NITROPHENOL	460 UJ	1200 U	1200 U	240 U	450 U	460 UJ	240 U	220 UJ	230 UJ
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZOIC ACID	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZYL ALCOHOL	NA	NA	NA	NA	NA	NA	NA	NA	NA
BIS(2-CHLOROETHOXY)METHANE	100 UJ	260 U	260 U	53 U	100 U	100 U	53 U	49 U	51 U
BIS(2-CHLOROETHYL)ETHER	120 UJ	300 U	300 U	61 U	120 U	120 U	61 U	57 U	59 U
BIS(2-ETHYLHEXYL)PHTHALATE	180 U	440 U	440 U	330 J	170 U	170 U	93 J	84 U	87 U
BUTYL BENZYL PHTHALATE	150 U	370 U	370 U	76 U	150 U	150 UJ	76 U	71 UJ	74 UJ
CARBAZOLE	130 UJ	330 U	330 U	95 J	740	130 U	68 U	63 U	66 U
CHRYSENE	120 UJ	1000 J	300 U	600	4900	370 J	180 J	130 J	190 J
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIETHYL PHTHALATE	92 UJ	230 U	230 U	47 U	90 U	91 U	47 U	44 U	46 U
DIMETHYL PHTHALATE	100 UJ	250 U	250 U	52 U	99 U	100 U	52 U	48 U	50 U
DI-N-BUTYL PHTHALATE	460 U	1100 U	1100 U	240 U	450 U	450 U	230 U	220 U	230 U
DI-N-OCTYL PHTHALATE	110 U	280 U	280 U	57 U	110 U	110 U	57 U	54 U	56 U
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLOROBENZENE	140 UJ	340 U	340 U	70 U	130 U	130 U	70 U	65 U	68 U
HEXACHLOROBUTADIENE	80 U	200 U	200 U	41 U	79 U	80 U	41 U	38 U	40 U
HEXACHLOROCYCLOPENTADIENE	84 UR	210 U	210 U	43 U	82 U	83 U	43 U	40 U	42 U
HEXACHLOROETHANE	74 UJ	180 U	180 U	38 U	72 U	73 U	38 U	35 U	37 U
HIGH MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
ISOPHORONE	63 UJ	160 U	160 U	32 U	62 U	62 U	32 U	30 U	31 U
LOW MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SB26B	TP-SB27	TP-SB28	TP-SB30	TP-SB31	TP-SB32	TP-SB33	TP-SB34	TP-SB35
SAMPLE ID	TPSS26B0001	TPSS270001	TPSS280001	TPSS300001	TPSS310001	TPSS320001	TPSS33B0001	TPSS340001	TPSS350001
SAMPLE DATE	20030426	20030425	20030425	20030424	20030423	20030425	20030425	20030425	20030425
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1	1
NITROBENZENE	110 UJ	280 U	280 U	57 U	110 U	110 U	57 U	53 U	55 U
N-NITROSO-DI-N-PROPYLAMINE	99 U	250 U	250 U	51 U	98 U	98 U	51 U	48 U	49 U
N-NITROSODIPHENYLAMINE	200 U	510 U	510 U	100 U	200 U	200 U	100 U	98 U	100 U
PENTACHLOROPHENOL	420 UJ	1000 U	1000 U	220 U	410 U	420 U	220 U	200 U	210 U
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
PHENOL	160 U	390 U	390 U	80 U	150 U	160 U	80 U	75 U	78 U
PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
VOLATILES (UG/KG)									
1,1,1-TRICHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-TETRACHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-TRICHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-TRICHLOROTRIFLUOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-DICHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-DICHLOROETHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-DICHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-DICHLOROPROPANE	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-BUTANONE	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-HEXANONE	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-METHYL-2-PENTANONE	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACETONE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BROMODICHLOROMETHANE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BROMOFORM	NA	NA	NA	NA	NA	NA	NA	NA	NA
BROMOMETHANE	NA	NA	NA	NA	NA	NA	NA	NA	NA
CARBON DISULFIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA
CARBON TETRACHLORIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHLORODIBROMOMETHANE	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHLOROFORM	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHLOROMETHANE	NA	NA	NA	NA	NA	NA	NA	NA	NA
CIS-1,3-DICHLOROPROPENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
ETHYLBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
METHYLENE CHLORIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA
STYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLOROETHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOLUENE	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SB26B	TP-SB27	TP-SB28	TP-SB30	TP-SB31	TP-SB32	TP-SB33	TP-SB34	TP-SB35
SAMPLE ID	TPSS26B0001	TPSS270001	TPSS280001	TPSS300001	TPSS310001	TPSS320001	TPSS33B0001	TPSS340001	TPSS350001
SAMPLE DATE	20030426	20030425	20030425	20030424	20030423	20030425	20030425	20030425	20030425
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1	1
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL XYLENES	NA	NA	NA	NA	NA	NA	NA	NA	NA
TRANS-1,3-DICHLOROPROPENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
TRICHLOROETHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
VINYL ACETATE	NA	NA	NA	NA	NA	NA	NA	NA	NA
VINYL CHLORIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SB36			TP-SB37	TP-SB38B	TP-SB39	TP-SB40	TP-SB41
SAMPLE ID	TPSS360001	TPSS360001-AVG	TPSS360001-D	TPSS370001	TPSS38B0001	TPSS390001	TPSS400001	TPSS410001
SAMPLE DATE	20030424	20030424	20030424	20030425	20030424	20030425	20030424	20030424
SAMPLE CODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1
DIOXINS/FURANS (NG/KG)								
1,2,3,4,6,7,8,9-OCDD	120 J	114.5	109 J	NA	NA	NA	NA	6.8 U
1,2,3,4,6,7,8,9-OCDF	17.5 J	18.7	19.9 J	NA	NA	NA	NA	0.6 UJ
1,2,3,4,6,7,8-HPCDD	18.5	15.55	12.6	NA	NA	NA	NA	0.4 U
1,2,3,4,6,7,8-HPCDF	17.1	16.85	16.6	NA	NA	NA	NA	0.85 U
1,2,3,4,7,8,9-HPCDF	4.1 U	2.8 U	1.5 U	NA	NA	NA	NA	0.3 U
1,2,3,4,7,8-HXCDD	3.4 U	2.15 U	0.9 U	NA	NA	NA	NA	0.2 U
1,2,3,4,7,8-HXCDF	9.6	8.65	7.7	NA	NA	NA	NA	0.1 U
1,2,3,6,7,8-HXCDD	3.1 U	2.5 J	2.5 J	NA	NA	NA	NA	0.2 U
1,2,3,6,7,8-HXCDF	3.8 J	3.75	3.7 J	NA	NA	NA	NA	0.1 U
1,2,3,7,8,9-HXCDD	3.3 U	2.575	3.5 J	NA	NA	NA	NA	0.2 U
1,2,3,7,8,9-HXCDF	1.9 U	1.3 U	0.7 U	NA	NA	NA	NA	0.2 U
1,2,3,7,8-PECDD	1.4 U	1 U	0.6 U	NA	NA	NA	NA	0.2 U
1,2,3,7,8-PECDF	2.8 J	2.3	1.8 J	NA	NA	NA	NA	0.22 U
2,3,4,6,7,8-HXCDF	4.6 J	4.2	3.8 J	NA	NA	NA	NA	0.1 U
2,3,4,7,8-PECDF	3.7 J	3.05	2.4 J	NA	NA	NA	NA	0.1 U
2,3,7,8-TCDD	0.7 U	0.5 U	0.3 U	NA	NA	NA	NA	0.2 U
2,3,7,8-TCDF	1.7 U	1.85 U	2 U	NA	NA	NA	NA	0.2 U
TEQ WHO-2005	3.39125	3.30796	3.22467	NA	NA	NA	NA	0 U
TEQ WHO-2005 - HALFND	5.13175	4.49696	3.86217	NA	NA	NA	NA	0.2 U
TOTAL HPCDD	39.7	33.35	27	NA	NA	NA	NA	0.4 U
TOTAL HPCDF	17.1	19.75	22.4	NA	NA	NA	NA	0.85 U
TOTAL HXCDD	57.4	46.3	35.2	NA	NA	NA	NA	0.2 U
TOTAL HXCDF	43	40.65	38.3	NA	NA	NA	NA	0.1 U
TOTAL PECDD	17 J	22.6	28.2 J	NA	NA	NA	NA	0.2 U
TOTAL PECDF	61.3 J	54.4	47.5 J	NA	NA	NA	NA	0.52 U
TOTAL TCDD	26.4 J	23.1	19.8 J	NA	NA	NA	NA	0.2 U
TOTAL TCDF	59.7 J	53.75	47.8 J	NA	NA	NA	NA	1 U
INORGANICS (MG/KG)								
ALUMINUM	7460	7165	6870	7080	7730	7280	11800	10900
ANTIMONY	0.27 U	0.37 U	0.47 U	0.42 J	0.24 UR	0.62 J	0.2 UR	0.25 UR
ARSENIC	14.9 J	14.65	14.4 J	16	82.3 J	9.3	12 J	12.1 J
BARIUM	118	139.5	161	78	34.5	53.9	60.1	37.3
BERYLLIUM	0.48 J	0.545	0.61 J	0.79	0.12 J	0.31	0.4 J	0.38 J
CADMIUM	1.7 J	1.8	1.9 J	0.62 U	0.67 UJ	0.34 U	0.54 UJ	0.67 UJ
CALCIUM	15400 J	10590	5780 J	2780	1120	1790	2570	909
CHROMIUM	42.3	35.7	29.1	35.5 J	27	31.7 J	68.5	38.4

LOCATION	TP-SB36			TP-SB37	TP-SB38B	TP-SB39	TP-SB40	TP-SB41
SAMPLE ID	TPSS360001	TPSS360001-AVG	TPSS360001-D	TPSS370001	TPSS38B0001	TPSS390001	TPSS400001	TPSS410001
SAMPLE DATE	20030424	20030424	20030424	20030425	20030424	20030425	20030424	20030424
SAMPLE CODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1
COBALT	6.6	6.65	6.7	7.7	3.9 J	6.7	7.8	8.8
COPPER	67.3	75.85	84.4	106 J	28.9	72.7 J	19.7	16.6
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA
IRON	17000	18100	19200	18400	37400	18100	18600	24000
LEAD	422	417	412	424 J	15	207 J	28	8.4
MAGNESIUM	4990	4590	4190	4190	5490	4630	8030	6300
MANGANESE	340 J	269.5	199 J	321	101	249	359	497
MERCURY	0.87 J	0.9	0.93 J	0.15 J	0.01 U	0.21 J	0.08 J	0.01 U
NICKEL	31.4	29.35	27.3	29.1 J	33.3	25.6 J	37.2	31.6
POTASSIUM	2390 J	2075	1760 J	1690 J	828 J	1680 J	2340 J	1580 J
SELENIUM	0.21 J	0.45	0.69 J	0.67 J	3.7	0.19 UJ	0.31 U	0.39 U
SILVER	0.52 U	0.615 U	0.71 U	1 J	1.1 U	0.59 J	0.77 U	0.88 U
SODIUM	862 J	961	1060 J	256 J	199 J	128 J	1410 J	204 J
THALLIUM	0.92 U	0.84 U	0.76 U	0.68 U	0.81 U	0.84 U	0.84 U	1.5 U
VANADIUM	24.9	25.65	26.4	34.8 J	27.8	26.7 J	33.2	26.6
ZINC	857	948.5	1040	220 J	52	168 J	43.9	33.9
MISCELLANEOUS PARAMETERS (%)								
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL SOLIDS	88	87.5	87	92	89	92	89	94
MISCELLANEOUS PARAMETERS (MEQ/100)								
CATION EXCHANGE CAPACITY	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)								
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA
HEXAVALENT CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)								
PH	NA	NA	NA	NA	NA	NA	NA	NA
PESTICIDES/PCBS (UG/KG)								
4,4'-DDD	1.4 UJ	1.4 U	1.4 UJ	1.3 UJ	1.4 UJ	1.4 U	1.4 UJ	1.3 U
4,4'-DDE	1.4 UJ	1.4 U	1.4 UJ	2.7 J	1.4 UJ	1.4 U	1.4 UJ	1.3 UJ
4,4'-DDT	1.2 UJ	1.25 U	1.3 UJ	8 J	1.2 UJ	2.4 J	3.2 J	1.2 UJ
ALDRIN	1.3 UJ	1.3 U	1.3 UJ	1.2 UJ	1.2 UJ	1.2 U	1.2 UJ	1.2 UJ
ALPHA-BHC	1.5 UJ	1.55 U	1.6 UJ	1.5 UJ	1.5 UJ	1.5 U	1.5 UJ	1.4 UJ
ALPHA-CHLORDANE	1.6 UJ	1.6 U	1.6 UJ	1.5 UJ	1.5 UJ	1.5 U	1.6 UJ	1.5 UJ
AROCLOR-1016	14 U	14 U	14 U	14 UJ	14 U	14 U	14 U	13 U
AROCLOR-1221	33 U	33.5 U	34 U	32 UJ	33 U	32 U	33 U	31 U
AROCLOR-1232	21 U	21 U	21 U	20 UJ	20 U	20 U	20 U	19 U

LOCATION	TP-SB36			TP-SB37	TP-SB38B	TP-SB39	TP-SB40	TP-SB41
SAMPLE ID	TPSS360001	TPSS360001-AVG	TPSS360001-D	TPSS370001	TPSS38B0001	TPSS390001	TPSS400001	TPSS410001
SAMPLE DATE	20030424	20030424	20030424	20030425	20030424	20030425	20030424	20030424
SAMPLE CODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1
AROCLOR-1242	14 U	14 U	14 U	13 UJ	14 U	13 U	14 U	13 U
AROCLOR-1248	5.1 U	5.15 U	5.2 U	4.9 UJ	5.1 U	5 U	5.1 U	4.8 U
AROCLOR-1254	16 U	16 U	16 U	16 UJ	16 U	16 U	16 U	15 U
AROCLOR-1260	8.4 U	8.5 U	8.6 U	8.1 UJ	8.4 U	8.2 U	8.4 U	7.9 U
BETA-BHC	2.3 UJ	2.3 U	2.3 UJ	2.2 UJ	2.3 UJ	2.2 U	2.3 UJ	2.2 UJ
DELTA-BHC	1.3 UJ	1.3 U	1.3 UJ	1.3 UJ	1.3 UJ	1.3 UJ	1.3 UJ	1.2 UJ
DIELDRIN	1.4 UJ	1.4 U	1.4 UJ	1.3 UJ	1.3 UJ	1.3 U	1.3 UJ	1.3 UJ
ENDOSULFAN I	1.4 UJ	1.4 U	1.4 UJ	1.3 UJ	1.4 UJ	1.3 U	2.7 J	1.3 UJ
ENDOSULFAN II	1.3 UJ	1.3 U	1.3 UJ	1.2 UJ	1.3 UJ	1.2 U	1.3 UJ	1.2 UJ
ENDOSULFAN SULFATE	1.6 UJ	1.6 U	1.6 UJ	1.5 UJ	1.5 UJ	1.5 UJ	1.6 UJ	1.5 UJ
ENDRIN	1.3 UJ	1.3 U	1.3 UJ	1.2 UJ	1.3 UJ	1.2 U	1.3 UJ	1.2 UJ
ENDRIN ALDEHYDE	1.5 UJ	2.375	4 J	1.4 UJ	1.5 UJ	1.5 U	1.5 UJ	1.4 UJ
ENDRIN KETONE	1.6 UJ	1.65 U	1.7 UJ	1.6 UJ	1.6 UJ	1.6 UJ	1.6 UJ	1.5 UJ
GAMMA-BHC (LINDANE)	1.3 UJ	1.35 U	1.4 UJ	1.3 UJ	1.3 UJ	1.3 UJ	1.3 UJ	1.2 UJ
GAMMA-CHLORDANE	1.4 UJ	1.4 U	1.4 UJ	1.4 UJ	1.4 UJ	1.4 U	1.4 UJ	1.3 UJ
HEPTACHLOR	1.2 UJ	1.25 U	1.3 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ
HEPTACHLOR EPOXIDE	1.5 UJ	1.5 U	1.5 UJ	1.4 UJ	1.4 UJ	1.4 U	1.5 UJ	1.4 UJ
METHOXYCHLOR	2.3 UJ	2.3 U	2.3 UJ	2.2 UJ	2.3 UJ	2.2 UJ	2.3 UJ	2.2 UJ
TOTAL AROCLOR	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
TOTAL AROCLOR HALFND	55.75	56.075	56.4	54	55.25	54.1	55.25	51.85
TOTAL AROCLOR ZEROND	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
TOXAPHENE	26 UJ	26.5 U	27 UJ	25 UJ	26 UJ	25 U	26 UJ	25 UJ
PETROLEUM HYDROCARBONS (MG/KG)								
DIESEL RANGE ORGANICS	NA	NA	NA	NA	NA	NA	NA	NA
GASOLINE RANGE ORGANICS	NA	NA	NA	NA	NA	NA	NA	NA
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)								
ACENAPHTHENE	260 J	260 J	290 U	110 U	56 U	110 U	110 U	53 U
ACENAPHTHYLENE	82 U	146 U	210 U	79 U	41 U	79 U	82 U	38 U
ANTHRACENE	760	710	660 J	180 J	48 U	94 U	97 U	46 U
BAP EQUIVALENT-HALFND	2007.4	1879.35	1751.3	998.08	259.7	149.08	110 U	53 U
BAP EQUIVALENT-POS	2007.4	1786.85	1566.3	928.08	224.2	12.18	0 U	0 U
BENZO(A)ANTHRACENE	1600	1500	1400 J	580 J	180 J	120 J	110 U	53 U
BENZO(A)PYRENE	1300	1250	1200 J	700 J	170 J	110 U	110 U	53 U
BENZO(B)FLUORANTHENE	1700	1500	1300 J	1000	200 J	80 U	82 U	39 U
BENZO(G,H,I)PERYLENE	760	760	760 J	490 J	120 J	140 U	150 U	70 U
BENZO(K)FLUORANTHENE	730 J	730	730 J	620 J	180 J	140 U	140 U	68 U
DIBENZO(A,H)ANTHRACENE	280 J	280 J	370 U	140 U	71 U	140 U	140 U	68 U

LOCATION	TP-SB36			TP-SB37	TP-SB38B	TP-SB39	TP-SB40	TP-SB41
SAMPLE ID	TPSS360001	TPSS360001-AVG	TPSS360001-D	TPSS370001	TPSS38B0001	TPSS390001	TPSS400001	TPSS410001
SAMPLE DATE	20030424	20030424	20030424	20030425	20030424	20030425	20030424	20030424
SAMPLE CODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1
DIBENZOFURAN	220 J	160	200 U	74 U	38 U	74 U	77 U	36 U
FLUORANTHENE	2200	2150	2100	750	310 J	200 J	120 U	58 U
FLUORENE	280 J	280 J	290 U	110 U	56 U	110 U	110 U	53 U
HIGH MOLECULAR WEIGHT PAHS	9980	9532.5	9085	3860	1115.5	710	385	185.5
INDENO(1,2,3-CD)PYRENE	810	805	800 J	580 J	130 J	130 U	130 U	62 U
LOW MOLECULAR WEIGHT PAHS	3991	3728	3465	680	209.5	327.5	337.5	159.5
NAPHTHALENE	110 J	110 J	190 U	73 U	37 U	73 U	75 U	35 U
PHENANTHRENE	2400	2300	2200	270 J	68 J	100 U	110 U	51 U
PYRENE	3100	2950	2800	780	220 J	170 U	170 U	82 U
SEMIVOLATILES (UG/KG)								
1,2,4-TRICHLOROBENZENE	79 U	139.5 U	200 U	76 U	39 U	77 U	79 U	37 U
1,2-DICHLOROBENZENE	85 U	152.5 U	220 U	82 U	42 U	82 U	84 U	40 U
1,3-DICHLOROBENZENE	82 U	146 U	210 U	79 U	40 U	79 U	81 U	38 U
1,4-DICHLOROBENZENE	78 U	139 U	200 U	75 U	38 U	75 U	78 U	36 U
2,2'-OXYBIS(1-CHLOROPROPANE)	110 U	195 U	280 U	100 U	54 U	100 U	110 U	51 U
2,4,5-TRICHLOROPHENOL	190 U	340 U	490 U	190 U	96 U	190 U	190 U	91 U
2,4,6-TRICHLOROPHENOL	210 U	375 U	540 U	200 U	100 U	200 U	210 U	99 U
2,4-DICHLOROPHENOL	150 U	265 U	380 U	140 U	74 U	140 U	150 U	70 U
2,4-DIMETHYLPHENOL	270 UJ	475 U	680 UJ	260 U	130 UJ	260 U	270 UJ	120 UJ
2,4-DINITROPHENOL	570 UJ	1035 U	1500 UJ	550 U	280 UJ	550 U	570 UJ	270 UJ
2,4-DINITROTOLUENE	76 U	133 U	190 U	73 U	37 U	73 U	75 U	35 U
2,6-DINITROTOLUENE	89 U	159.5 U	230 U	86 U	44 U	86 U	89 U	42 U
2-CHLORONAPHTHALENE	100 U	180 U	260 U	96 U	50 U	97 U	100 U	47 U
2-CHLOROPHENOL	150 U	265 U	380 U	140 U	73 U	140 U	150 U	69 U
2-METHYLNAPHTHALENE	140 J	140 J	230 U	88 U	45 U	89 U	91 U	43 U
2-METHYLPHENOL	140 U	245 U	350 U	130 U	69 U	130 U	140 U	65 U
2-NITROANILINE	93 U	166.5 U	240 U	89 U	46 U	89 U	92 U	43 U
2-NITROPHENOL	180 U	325 U	470 U	180 U	91 U	180 U	180 U	86 U
3,3'-DICHLOROBENZIDINE	430 UJ	765 U	1100 UJ	420 U	210 U	420 U	430 UJ	200 UJ
3-NITROANILINE	320 U	565 U	810 U	300 U	160 U	310 U	320 U	150 U
4,6-DINITRO-2-METHYLPHENOL	490 UR	845 R	1200 UR	470 U	240 UR	470 U	480 UR	230 UR
4-BROMOPHENYL PHENYL ETHER	110 U	195 U	280 U	110 U	55 U	110 U	110 U	52 U
4-CHLORO-3-METHYLPHENOL	200 U	360 U	520 U	200 U	100 U	200 U	200 U	96 U
4-CHLOROANILINE	77 U	138.5 U	200 U	74 U	38 U	74 U	76 U	36 U
4-CHLOROPHENYL PHENYL ETHER	120 U	210 U	300 U	110 U	58 U	110 U	120 U	55 U
4-HYDROXY-4-METHYL-2-PENTANONE	NA	NA	NA	NA	NA	NA	NA	NA
4-METHYLPHENOL	130 U	230 U	330 U	120 U	65 U	130 U	130 U	61 U

LOCATION	TP-SB36			TP-SB37	TP-SB38B	TP-SB39	TP-SB40	TP-SB41
SAMPLE ID	TPSS360001	TPSS360001-AVG	TPSS360001-D	TPSS370001	TPSS38B0001	TPSS390001	TPSS400001	TPSS410001
SAMPLE DATE	20030424	20030424	20030424	20030425	20030424	20030425	20030424	20030424
SAMPLE CODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1
4-NITROANILINE	380 UJ	670 U	960 UJ	360 U	180 U	360 U	370 UJ	180 UJ
4-NITROPHENOL	470 UJ	835 U	1200 UJ	450 U	230 UJ	450 U	470 UJ	220 UJ
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA
BENZOIC ACID	NA	NA	NA	NA	NA	NA	NA	NA
BENZYL ALCOHOL	NA	NA	NA	NA	NA	NA	NA	NA
BIS(2-CHLOROETHOXY)METHANE	100 U	180 U	260 U	100 U	51 U	100 U	100 U	49 U
BIS(2-CHLOROETHYL)ETHER	120 U	215 U	310 U	120 U	60 U	120 U	120 U	56 U
BIS(2-ETHYLHEXYL)PHTHALATE	180 U	320 U	460 U	170 U	88 U	170 U	180 U	310 J
BUTYL BENZYL PHTHALATE	150 U	265 U	380 U	140 U	75 U	140 U	150 U	71 U
CARBAZOLE	140 J	140 J	340 U	130 U	66 U	130 U	130 U	63 U
CHRYSENE	1500	1450	1400 J	980	200 J	180 J	120 U	57 U
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
DIETHYL PHTHALATE	93 U	166.5 U	240 U	90 U	46 U	90 U	93 U	44 U
DIMETHYL PHTHALATE	100 U	180 U	260 U	98 U	50 U	98 U	100 U	48 U
DI-N-BUTYL PHTHALATE	460 U	830 U	1200 U	450 U	230 U	450 U	460 U	220 U
DI-N-OCTYL PHTHALATE	110 U	200 U	290 U	110 U	56 U	110 U	110 U	53 U
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLOROBENZENE	140 U	245 U	350 U	130 U	68 U	130 U	140 U	65 U
HEXACHLOROBUTADIENE	82 U	146 U	210 U	78 U	40 U	79 U	81 U	38 U
HEXACHLOROCYCLOPENTADIENE	85 U	152.5 U	220 U	82 U	42 U	82 U	84 U	40 U
HEXACHLOROETHANE	75 U	132.5 U	190 U	72 U	37 U	72 U	74 U	35 U
HIGH MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA
ISOPHORONE	64 U	112 U	160 U	61 U	32 U	62 U	63 U	30 U
LOW MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SB36			TP-SB37	TP-SB38B	TP-SB39	TP-SB40	TP-SB41
SAMPLE ID	TPSS360001	TPSS360001-AVG	TPSS360001-D	TPSS370001	TPSS38B0001	TPSS390001	TPSS400001	TPSS410001
SAMPLE DATE	20030424	20030424	20030424	20030425	20030424	20030425	20030424	20030424
SAMPLE CODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1
NITROBENZENE	110 U	195 U	280 U	110 U	55 U	110 U	110 U	52 U
N-NITROSO-DI-N-PROPYLAMINE	100 U	180 U	260 U	97 U	50 U	97 U	100 U	47 U
N-NITROSODIPHENYLAMINE	210 U	370 U	530 U	200 U	100 U	200 U	210 U	98 U
PENTACHLOROPHENOL	430 UJ	765 U	1100 UJ	410 U	210 UJ	410 U	420 UJ	200 UJ
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA
PHENOL	160 U	280 U	400 U	150 U	78 U	150 U	160 U	74 U
PYRENE	NA	NA	NA	NA	NA	NA	NA	NA
VOLATILES (UG/KG)								
1,1,1-TRICHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-TETRACHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-TRICHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-TRICHLOROTRIFLUOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA
1,1-DICHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA
1,1-DICHLOROETHENE	NA	NA	NA	NA	NA	NA	NA	NA
1,2-DICHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA
1,2-DICHLOROPROPANE	NA	NA	NA	NA	NA	NA	NA	NA
2-BUTANONE	NA	NA	NA	NA	NA	NA	NA	NA
2-HEXANONE	NA	NA	NA	NA	NA	NA	NA	NA
4-METHYL-2-PENTANONE	NA	NA	NA	NA	NA	NA	NA	NA
ACETONE	NA	NA	NA	NA	NA	NA	NA	NA
BENZENE	NA	NA	NA	NA	NA	NA	NA	NA
BROMODICHLOROMETHANE	NA	NA	NA	NA	NA	NA	NA	NA
BROMOFORM	NA	NA	NA	NA	NA	NA	NA	NA
BROMOMETHANE	NA	NA	NA	NA	NA	NA	NA	NA
CARBON DISULFIDE	NA	NA	NA	NA	NA	NA	NA	NA
CARBON TETRACHLORIDE	NA	NA	NA	NA	NA	NA	NA	NA
CHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA
CHLORODIBROMOMETHANE	NA	NA	NA	NA	NA	NA	NA	NA
CHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA
CHLOROFORM	NA	NA	NA	NA	NA	NA	NA	NA
CHLOROMETHANE	NA	NA	NA	NA	NA	NA	NA	NA
CIS-1,3-DICHLOROPROPENE	NA	NA	NA	NA	NA	NA	NA	NA
ETHYLBENZENE	NA	NA	NA	NA	NA	NA	NA	NA
METHYLENE CHLORIDE	NA	NA	NA	NA	NA	NA	NA	NA
STYRENE	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLOROETHENE	NA	NA	NA	NA	NA	NA	NA	NA
TOLUENE	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SB36			TP-SB37	TP-SB38B	TP-SB39	TP-SB40	TP-SB41
SAMPLE ID	TPSS360001	TPSS360001-AVG	TPSS360001-D	TPSS370001	TPSS38B0001	TPSS390001	TPSS400001	TPSS410001
SAMPLE DATE	20030424	20030424	20030424	20030425	20030424	20030425	20030424	20030424
SAMPLE CODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	1	1	1	1	1	1	1	1
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL XYLENES	NA	NA	NA	NA	NA	NA	NA	NA
TRANS-1,3-DICHLOROPROPENE	NA	NA	NA	NA	NA	NA	NA	NA
TRICHLOROETHENE	NA	NA	NA	NA	NA	NA	NA	NA
VINYL ACETATE	NA	NA	NA	NA	NA	NA	NA	NA
VINYL CHLORIDE	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SB42			TP-SB43
SAMPLE ID	TPSS420001	TPSS420001-AVG	TPSS420001-D	TPSS430001
SAMPLE DATE	20030424	20030424	20030424	20030424
SAMPLE CODE	ORIG	AVG	DUP	NORMAL
MATRIX	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS
TOP DEPTH	0	0	0	0
BOTTOM DEPTH	1	1	1	1
DIOXINS/FURANS (NG/KG)				
1,2,3,4,6,7,8,9-OCDD	NA	NA	NA	654
1,2,3,4,6,7,8,9-OCDF	NA	NA	NA	2.6 U
1,2,3,4,6,7,8-HPCDD	NA	NA	NA	5.1 J
1,2,3,4,6,7,8-HPCDF	NA	NA	NA	3.1 J
1,2,3,4,7,8,9-HPCDF	NA	NA	NA	0.8 U
1,2,3,4,7,8-HXCDD	NA	NA	NA	0.7 U
1,2,3,4,7,8-HXCDF	NA	NA	NA	1 J
1,2,3,6,7,8-HXCDD	NA	NA	NA	0.6 U
1,2,3,6,7,8-HXCDF	NA	NA	NA	0.57 J
1,2,3,7,8,9-HXCDD	NA	NA	NA	0.6 U
1,2,3,7,8,9-HXCDF	NA	NA	NA	0.5 U
1,2,3,7,8-PECDD	NA	NA	NA	0.6 U
1,2,3,7,8-PECDF	NA	NA	NA	0.3 U
2,3,4,6,7,8-HXCDF	NA	NA	NA	0.8 J
2,3,4,7,8-PECDF	NA	NA	NA	0.3 U
2,3,7,8-TCDD	NA	NA	NA	0.3 U
2,3,7,8-TCDF	NA	NA	NA	0.3 U
TEQ WHO-2005	NA	NA	NA	0.5152
TEQ WHO-2005 - HALFND	NA	NA	NA	1.15409
TOTAL HPCDD	NA	NA	NA	15.5 J
TOTAL HPCDF	NA	NA	NA	4.3 J
TOTAL HXCDD	NA	NA	NA	4.1 J
TOTAL HXCDF	NA	NA	NA	9.7 J
TOTAL PECDD	NA	NA	NA	0.6 U
TOTAL PECDF	NA	NA	NA	8.8
TOTAL TCDD	NA	NA	NA	0.3 U
TOTAL TCDF	NA	NA	NA	13.8 J
INORGANICS (MG/KG)				
ALUMINUM	13000	12500	12000	19900
ANTIMONY	0.27 UR	0.26 R	0.25 UR	0.14 UR
ARSENIC	12.9 J	12.9 J	NA	13 J
BARIUM	82.5	89.5	96.5	55.2
BERYLLIUM	0.41 J	0.43	0.45 J	0.65 J
CADMIUM	0.75 UJ	4.5375	8.7 J	0.44 J
CALCIUM	3840	4450	5060	1060
CHROMIUM	48.4	47.3	46.2	65.5

LOCATION	TP-SB42			TP-SB43
SAMPLE ID	TPSS420001	TPSS420001-AVG	TPSS420001-D	TPSS430001
SAMPLE DATE	20030424	20030424	20030424	20030424
SAMPLE CODE	ORIG	AVG	DUP	NORMAL
MATRIX	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS
TOP DEPTH	0	0	0	0
BOTTOM DEPTH	1	1	1	1
COBALT	11.6	11.95	12.3	10.3
COPPER	54	68.2	82.4	45
CYANIDE	NA	NA	NA	NA
IRON	25100	25350	25600	22000
LEAD	166	209	252	48.2
MAGNESIUM	10800	9660	8520	8060
MANGANESE	528	457.5	387	288
MERCURY	0.25 J	0.23	0.21 J	0.1 J
NICKEL	43.8	43.4	43	42.2
POTASSIUM	2120 J	2595	3070 J	1260 J
SELENIUM	0.79 J	0.495	0.4 U	0.86
SILVER	0.99 U	0.955 U	0.92 U	0.84 U
SODIUM	1080 J	1115	1150 J	167 J
THALLIUM	1.1 U	1.1 U	1.1 U	1.5 U
VANADIUM	42.6	41.2	39.8	42.7
ZINC	112	111.5	111	90.2
MISCELLANEOUS PARAMETERS (%)				
TOTAL ORGANIC CARBON	NA	NA	NA	NA
TOTAL SOLIDS	88	87.5	87	79
MISCELLANEOUS PARAMETERS (MEQ/100)				
CATION EXCHANGE CAPACITY	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)				
CYANIDE	NA	NA	NA	NA
HEXAVALENT CHROMIUM	NA	NA	NA	NA
TOTAL ORGANIC CARBON	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)				
PH	NA	NA	NA	NA
PESTICIDES/PCBS (UG/KG)				
4,4'-DDD	2 J	1.35	1.4 UJ	1.6 U
4,4'-DDE	1.4 UJ	1.4 U	1.4 UJ	18 J
4,4'-DDT	2.2 J	1.425	1.3 UJ	14 J
ALDRIN	1.3 UJ	1.3 U	1.3 UJ	1.4 UJ
ALPHA-BHC	1.5 UJ	1.55 U	1.6 UJ	1.7 UJ
ALPHA-CHLORDANE	1.6 UJ	1.6 U	1.6 UJ	1.8 UJ
AROCLOR-1016	14 U	14 U	14 U	16 U
AROCLOR-1221	34 U	34 U	34 U	37 U
AROCLOR-1232	21 U	21 U	21 U	23 U

LOCATION	TP-SB42			TP-SB43
SAMPLE ID	TPSS420001	TPSS420001-AVG	TPSS420001-D	TPSS430001
SAMPLE DATE	20030424	20030424	20030424	20030424
SAMPLE CODE	ORIG	AVG	DUP	NORMAL
MATRIX	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS
TOP DEPTH	0	0	0	0
BOTTOM DEPTH	1	1	1	1
AROCLOR-1242	14 U	14 U	14 U	16 U
AROCLOR-1248	5.2 U	5.2 U	5.2 U	5.8 U
AROCLOR-1254	16 U	16 U	16 U	18 U
AROCLOR-1260	8.5 U	8.55 U	8.6 U	9.5 U
BETA-BHC	2.3 UJ	2.3 U	2.3 UJ	2.6 UJ
DELTA-BHC	1.3 UJ	1.3 U	1.3 UJ	1.5 UJ
DIELDRIN	1.4 UJ	1.4 U	1.4 UJ	1.5 UJ
ENDOSULFAN I	1.4 UJ	1.4 U	1.4 UJ	1.5 UJ
ENDOSULFAN II	1.3 UJ	1.3 U	1.3 UJ	1.4 UJ
ENDOSULFAN SULFATE	1.6 UJ	1.6 U	1.6 UJ	1.8 UJ
ENDRIN	1.3 UJ	1.3 U	1.3 UJ	1.4 UJ
ENDRIN ALDEHYDE	1.5 UJ	1.5 U	1.5 UJ	1.7 UJ
ENDRIN KETONE	1.7 UJ	1.7 U	1.7 UJ	1.8 UJ
GAMMA-BHC (LINDANE)	1.3 UJ	1.35 U	1.4 UJ	1.5 UJ
GAMMA-CHLORDANE	1.4 UJ	1.4 U	1.4 UJ	1.6 UJ
HEPTACHLOR	1.2 UJ	1.25 U	1.3 UJ	1.4 UJ
HEPTACHLOR EPOXIDE	1.5 UJ	1.5 U	1.5 UJ	1.6 UJ
METHOXYCHLOR	2.3 UJ	2.3 U	2.3 UJ	2.6 UJ
TOTAL AROCLOR	0 U	0 U	0 U	0 U
TOTAL AROCLOR HALFND	56.35	56.375	56.4	62.65
TOTAL AROCLOR ZEROND	0 U	0 U	0 U	0 U
TOXAPHENE	26 UJ	26.5 U	27 UJ	29 UJ
PETROLEUM HYDROCARBONS (MG/KG)				
DIESEL RANGE ORGANICS	NA	NA	NA	NA
GASOLINE RANGE ORGANICS	NA	NA	NA	NA
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)				
ACENAPHTHENE	110 U	110 U	110 U	63 U
ACENAPHTHYLENE	83 U	83.5 U	84 U	46 U
ANTHRACENE	98 U	98.5 U	99 U	55 U
BAP EQUIVALENT-HALFND	110 U	115 U	120 U	64 U
BAP EQUIVALENT-POS	0 U	0 U	0 U	0 U
BENZO(A)ANTHRACENE	110 U	110 U	110 U	63 U
BENZO(A)PYRENE	110 U	115 U	120 U	64 U
BENZO(B)FLUORANTHENE	83 U	83.5 U	84 U	46 U
BENZO(G,H,I)PERYLENE	150 U	150 U	150 U	84 U
BENZO(K)FLUORANTHENE	140 U	145 U	150 U	81 U
DIBENZO(A,H)ANTHRACENE	140 U	145 U	150 U	81 U

LOCATION	TP-SB42			TP-SB43
SAMPLE ID	TPSS420001	TPSS420001-AVG	TPSS420001-D	TPSS430001
SAMPLE DATE	20030424	20030424	20030424	20030424
SAMPLE CODE	ORIG	AVG	DUP	NORMAL
MATRIX	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS
TOP DEPTH	0	0	0	0
BOTTOM DEPTH	1	1	1	1
DIBENZOFURAN	78 U	78 U	78 U	43 U
FLUORANTHENE	120 U	120 U	120 U	88 J
FLUORENE	110 U	110 U	110 U	63 U
HIGH MOLECULAR WEIGHT PAHS	390	395	400	275
INDENO(1,2,3-CD)PYRENE	130 U	135 U	140 U	75 U
LOW MOLECULAR WEIGHT PAHS	339.5	340.5	341.5	191
NAPHTHALENE	76 U	76.5 U	77 U	42 U
PHENANTHRENE	110 U	110 U	110 U	61 U
PYRENE	180 U	180 U	180 U	98 U
SEMIVOLATILES (UG/KG)				
1,2,4-TRICHLOROBENZENE	80 U	80.5 U	81 U	44 U
1,2-DICHLOROBENZENE	86 U	86 U	86 U	48 U
1,3-DICHLOROBENZENE	82 U	82.5 U	83 U	46 U
1,4-DICHLOROBENZENE	79 U	79 U	79 U	44 U
2,2'-OXYBIS(1-CHLOROPROPANE)	110 U	110 U	110 U	62 U
2,4,5-TRICHLOROPHENOL	200 U	200 U	200 U	110 U
2,4,6-TRICHLOROPHENOL	210 U	210 U	210 U	120 U
2,4-DICHLOROPHENOL	150 U	150 U	150 U	84 U
2,4-DIMETHYLPHENOL	270 UJ	270 U	270 UJ	150 UJ
2,4-DINITROPHENOL	580 UJ	580 U	580 U	320 UJ
2,4-DINITROTOLUENE	76 U	76.5 U	77 U	42 U
2,6-DINITROTOLUENE	90 U	90.5 U	91 U	50 U
2-CHLORONAPHTHALENE	100 U	100 U	100 U	56 U
2-CHLOROPHENOL	150 U	150 U	150 U	83 U
2-METHYLNAPHTHALENE	92 U	92.5 U	93 U	52 U
2-METHYLPHENOL	140 U	140 U	140 U	78 U
2-NITROANILINE	93 U	93.5 U	94 U	52 U
2-NITROPHENOL	180 U	185 U	190 U	100 U
3,3'-DICHLOROBENZIDINE	440 U	440 U	440 U	240 U
3-NITROANILINE	320 U	320 U	320 U	180 U
4,6-DINITRO-2-METHYLPHENOL	490 UR	495 R	500 UR	270 UR
4-BROMOPHENYL PHENYL ETHER	110 U	110 U	110 U	63 U
4-CHLORO-3-METHYLPHENOL	210 U	210 U	210 U	110 U
4-CHLOROANILINE	77 U	77.5 U	78 U	43 U
4-CHLOROPHENYL PHENYL ETHER	120 U	120 U	120 U	66 U
4-HYDROXY-4-METHYL-2-PENTANONE	NA	NA	NA	NA
4-METHYLPHENOL	130 U	130 U	130 U	73 U

LOCATION	TP-SB42			TP-SB43
SAMPLE ID	TPSS420001	TPSS420001-AVG	TPSS420001-D	TPSS430001
SAMPLE DATE	20030424	20030424	20030424	20030424
SAMPLE CODE	ORIG	AVG	DUP	NORMAL
MATRIX	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS
TOP DEPTH	0	0	0	0
BOTTOM DEPTH	1	1	1	1
4-NITROANILINE	380 U	380 U	380 U	210 U
4-NITROPHENOL	470 UJ	475 U	480 UJ	260 UJ
ACENAPHTHENE	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	NA	NA	NA	NA
BAP EQUIVALENT-POS	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	NA	NA	NA
BENZO(A)PYRENE	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	NA	NA	NA	NA
BENZOIC ACID	NA	NA	NA	NA
BENZYL ALCOHOL	NA	NA	NA	NA
BIS(2-CHLOROETHOXY)METHANE	100 U	100 U	100 U	58 U
BIS(2-CHLOROETHYL)ETHER	120 U	120 U	120 U	68 U
BIS(2-ETHYLHEXYL)PHTHALATE	180 U	180 U	180 U	100 U
BUTYL BENZYL PHTHALATE	150 U	150 U	150 U	85 U
CARBAZOLE	140 U	140 U	140 U	75 U
CHRYSENE	120 U	120 U	120 U	68 U
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA
DIBENZOFURAN	NA	NA	NA	NA
DIETHYL PHTHALATE	94 U	94.5 U	95 U	52 U
DIMETHYL PHTHALATE	100 U	100 U	100 U	57 U
DI-N-BUTYL PHTHALATE	470 U	470 U	470 U	260 U
DI-N-OCTYL PHTHALATE	110 U	115 U	120 U	64 U
FLUORANTHENE	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA
HEXACHLOROBENZENE	140 U	140 U	140 U	77 U
HEXACHLOROBUTADIENE	82 U	82.5 U	83 U	46 U
HEXACHLOROCYCLOPENTADIENE	86 U	86 U	86 U	48 U
HEXACHLOROETHANE	75 U	75.5 U	76 U	42 U
HIGH MOLECULAR WEIGHT PAHS	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA
ISOPHORONE	64 U	64.5 U	65 U	36 U
LOW MOLECULAR WEIGHT PAHS	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA

LOCATION	TP-SB42			TP-SB43
SAMPLE ID	TPSS420001	TPSS420001-AVG	TPSS420001-D	TPSS430001
SAMPLE DATE	20030424	20030424	20030424	20030424
SAMPLE CODE	ORIG	AVG	DUP	NORMAL
MATRIX	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS
TOP DEPTH	0	0	0	0
BOTTOM DEPTH	1	1	1	1
NITROBENZENE	110 U	110 U	110 U	63 U
N-NITROSO-DI-N-PROPYLAMINE	100 U	100 U	100 U	56 U
N-NITROSODIPHENYLAMINE	210 U	210 U	210 U	120 U
PENTACHLOROPHENOL	430 UJ	435 U	440 UJ	240 UJ
PHENANTHRENE	NA	NA	NA	NA
PHENOL	160 U	160 U	160 U	89 U
PYRENE	NA	NA	NA	NA
VOLATILES (UG/KG)				
1,1,1-TRICHLOROETHANE	NA	NA	NA	NA
1,1,2,2-TETRACHLOROETHANE	NA	NA	NA	NA
1,1,2-TRICHLOROETHANE	NA	NA	NA	NA
1,1,2-TRICHLOROTRIFLUOROETHANE	NA	NA	NA	NA
1,1-DICHLOROETHANE	NA	NA	NA	NA
1,1-DICHLOROETHENE	NA	NA	NA	NA
1,2-DICHLOROETHANE	NA	NA	NA	NA
1,2-DICHLOROPROPANE	NA	NA	NA	NA
2-BUTANONE	NA	NA	NA	NA
2-HEXANONE	NA	NA	NA	NA
4-METHYL-2-PENTANONE	NA	NA	NA	NA
ACETONE	NA	NA	NA	NA
BENZENE	NA	NA	NA	NA
BROMODICHLOROMETHANE	NA	NA	NA	NA
BROMOFORM	NA	NA	NA	NA
BROMOMETHANE	NA	NA	NA	NA
CARBON DISULFIDE	NA	NA	NA	NA
CARBON TETRACHLORIDE	NA	NA	NA	NA
CHLOROBENZENE	NA	NA	NA	NA
CHLORODIBROMOMETHANE	NA	NA	NA	NA
CHLOROETHANE	NA	NA	NA	NA
CHLOROFORM	NA	NA	NA	NA
CHLOROMETHANE	NA	NA	NA	NA
CIS-1,3-DICHLOROPROPENE	NA	NA	NA	NA
ETHYLBENZENE	NA	NA	NA	NA
METHYLENE CHLORIDE	NA	NA	NA	NA
STYRENE	NA	NA	NA	NA
TETRACHLOROETHENE	NA	NA	NA	NA
TOLUENE	NA	NA	NA	NA

LOCATION	TP-SB42			TP-SB43
SAMPLE ID	TPSS420001	TPSS420001-AVG	TPSS420001-D	TPSS430001
SAMPLE DATE	20030424	20030424	20030424	20030424
SAMPLE CODE	ORIG	AVG	DUP	NORMAL
MATRIX	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS
TOP DEPTH	0	0	0	0
BOTTOM DEPTH	1	1	1	1
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA	NA
TOTAL XYLENES	NA	NA	NA	NA
TRANS-1,3-DICHLOROPROPENE	NA	NA	NA	NA
TRICHLOROETHENE	NA	NA	NA	NA
VINYL ACETATE	NA	NA	NA	NA
VINYL CHLORIDE	NA	NA	NA	NA

LOCATION	TP-MW01			TP-MW02					
SAMPLE ID	TP-SB01-0305-98	TP-SB01-0810-98	TP-SB01-1214-98	TP-SB02-0305-98	TP-SB02-0911-98	TP-SB02-1113-98	TP-SB02-1517-98	TP-SB03-0305-98	TP-SB03-0507-98
SAMPLE DATE	19980622	19980622	19980622	19980620	19980620	19980620	19980620	19980620	19980620
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	3	8	12	3	9	11	15	3	5
BOTTOM DEPTH	5	10	14	5	11	13	17	5	7
METALS (MG/KG)									
ALUMINUM	29000	8520	6680	10200	NA	NA	9470	11800	13600
ANTIMONY	0.35 UR	0.34 UR	0.3 UR	0.39 UR	NA	NA	0.49 UR	0.37 UR	0.39 UR
ARSENIC	14 J	23 J	6.4 J	9 J	NA	NA	8.7 J	9.7	11.9
BARIUM	128 J	53.6 J	33.2 J	63.3 J	NA	NA	47.8 J	45.1	68.8
BERYLLIUM	3.1	0.31 U	0.27 U	0.45 J	NA	NA	0.6 J	0.51 J	0.77 J
CADMIUM	0.4 U	0.39 UJ	0.35 U	0.61 J	NA	NA	0.56 UJ	0.43 UJ	0.46 UJ
CALCIUM	2440 J	3000 J	8470 J	4670 J	NA	NA	22400 J	2080	2550
CHROMIUM	47.3 J	34.2 J	30.4 J	38 J	NA	NA	144 J	38.4 J	34.6 J
COBALT	15.7	10.5	7.7	10.3	NA	NA	12.8	8.6	11.1
COPPER	35.4 J	17.3 J	15.7 J	1180 J	NA	NA	852 J	3390 J	2090 J
IRON	56300	19900	14600	20800	NA	NA	46100	21600	24800
LEAD	28	4.3 U	3.8 U	121	NA	NA	68.7	110 J	208 J
MAGNESIUM	7490	7190	5770	6000	NA	NA	5090	4440	6050
MANGANESE	490	1040	253	390	NA	NA	283	232 J	526 J
MERCURY	0.01 UJ	0.01 UJ	0.04 U	0.05 U	NA	NA	1.2 J	0.18 J	1.1 J
NICKEL	38.7 J	44.4 J	24.1 J	50.8 J	NA	NA	661 J	50.4	53.9
POTASSIUM	6330	1990	1920	2370	NA	NA	3080	1420	3790
SELENIUM	1.8 U	1 U	0.73 U	0.62 UJ	NA	NA	1.3 U	0.6 UJ	0.63 UJ
SILVER	0.47 U	0.45 U	0.41 U	0.52 U	NA	NA	0.66 U	0.5 U	0.53 U
SODIUM	987	261	169	486	NA	NA	2060	127 U	1670
THALLIUM	0.57 U	1.6 U	0.49 U	0.63 U	NA	NA	0.79 U	0.6 U	1 U
VANADIUM	85.3	21.8	20.8	25.4	NA	NA	39.4	28.5 J	34.5 J
ZINC	135 J	30.8 J	24.7 J	953 J	NA	NA	364 J	781 J	376 J
MISCELLANEOUS PARAMETERS (MG/KG)									
CYANIDE	2 U	2 U	2 U	2 U	NA	NA	2 U	2 U	2 U
HEXAVALENT CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL ORGANIC CARBON	9400	9300	8700	13000	NA	NA	10000	26000	29000
MISCELLANEOUS PARAMETERS (S.U.)									
PH	7.5	6.5	8.6	7.8	NA	NA	8.7	7.7	7.7
PESTICIDES/PCBS (UG/KG)									
4,4'-DDD	4.1 U	3.8 U	3.7 U	3.6 U	4.5 U	4.5 U	4.4 U	3.9 U	4.2 U
4,4'-DDE	4.1 U	3.8 U	3.7 U	3.6 U	4.5 U	4.5 U	4.4 U	6.4	4.9 J
4,4'-DDT	4.1 U	3.8 U	3.7 U	3.6 U	4.5 U	4.5 U	4.4 U	5	4.2 U
ALDRIN	2.1 U	2 U	1.9 U	1.9 U	2.3 U	2.3 U	2.3 U	2 U	2.2 U
ALPHA-BHC	2.1 U	2 U	1.9 U	1.9 U	2.3 U	2.3 U	2.3 U	2 U	2.2 U
ALPHA-CHLORDANE	2.1 U	2 U	1.9 U	1.9 U	2.3 U	2.3 U	2.3 U	2 U	2.2 U

LOCATION	TP-MW01			TP-MW02					
SAMPLE ID	TP-SB01-0305-98	TP-SB01-0810-98	TP-SB01-1214-98	TP-SB02-0305-98	TP-SB02-0911-98	TP-SB02-1113-98	TP-SB02-1517-98	TP-SB03-0305-98	TP-SB03-0507-98
SAMPLE DATE	19980622	19980622	19980622	19980620	19980620	19980620	19980620	19980620	19980620
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	3	8	12	3	9	11	15	3	5
BOTTOM DEPTH	5	10	14	5	11	13	17	5	7
AROCLOR-1016	41 U	38 U	37 U	36 U	45 U	45 U	34 U	39 U	43 U
AROCLOR-1221	83 U	77 U	74 U	74 U	92 U	92 U	89 U	79 U	85 U
AROCLOR-1232	41 U	38 U	37 U	36 U	45 U	45 U	44 U	39 U	42 U
AROCLOR-1242	41 U	38 U	37 U	36 U	45 U	45 U	44 U	39 U	42 U
AROCLOR-1248	41 U	38 U	37 U	36 U	45 U	45 U	44 U	39 U	42 U
AROCLOR-1254	41 U	38 U	37 U	36 U	45 U	45 U	44 U	39 U	42 U
AROCLOR-1260	41 U	38 U	37 U	36 U	45 U	45 U	44 U	39 U	42 U
BETA-BHC	2.1 U	2 U	1.9 U	1.9 U	2.3 U	2.3 U	2.3 U	2 U	2.2 U
DELTA-BHC	2.1 U	2 U	1.9 U	1.9 U	2.3 U	2.3 U	2.3 U	2 U	2.2 U
DIELDRIN	4.1 U	3.8 U	3.7 U	3.6 U	4.5 U	4.5 U	4.4 U	3.9 U	4.2 U
ENDOSULFAN I	2.1 U	2 U	1.9 U	1.9 U	2.3 U	2.3 U	2.3 U	2 U	2.2 U
ENDOSULFAN II	4.1 U	3.8 U	3.7 U	3.6 U	4.5 U	4.5 U	4.4 U	3.9 U	4.2 U
ENDOSULFAN SULFATE	4.1 U	3.8 U	3.7 U	5.4	4.5 U	4.5 U	4.4 U	3.9 U	4.2 U
ENDRIN	4.1 U	3.8 U	3.7 U	3.6 U	4.5 U	4.5 U	4.4 U	3.9 U	4.2 U
ENDRIN ALDEHYDE	4.1 U	3.8 U	3.7 U	3.6 U	4.5 U	4.5 U	4.4 U	3.9 U	4.2 U
ENDRIN KETONE	4.1 U	3.8 U	3.7 U	3.6 U	4.5 U	4.5 U	4.4 U	3.9 U	4.2 U
GAMMA-BHC (LINDANE)	2.1 U	2 U	1.9 U	1.9 U	2.3 U	2.3 U	2.3 U	2 U	2.2 U
GAMMA-CHLORDANE	2.1 U	2 U	1.9 U	1.9 U	2.3 U	2.3 U	2.3 U	2 U	2.2 U
HEPTACHLOR	2.1 U	2 U	1.9 U	1.9 U	2.3 U	2.3 U	2.3 U	2 U	2.2 U
HEPTACHLOR EPOXIDE	2.1 U	2 U	1.9 U	1.9 U	2.3 U	2.3 U	2.3 U	2 U	2.2 U
METHOXYCHLOR	21 U	20 U	19 U	19 U	23 U	23 U	23 U	20 U	22 U
TOTAL AROCLOR	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
TOTAL AROCLOR HALFND	164.5	152.5	148	145	181	181	171.5	156.5	169
TOTAL AROCLOR ZEROND	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
TOXAPHENE	210 U	200 U	190 U	190 U	230 U	230 U	230 U	200 U	220 U
PETROLEUM HYDROCARBONS (MG/KG)									
DIESEL RANGE ORGANICS	10	5.5 U	5.5 U	89	NA	6200	320	43	130
GASOLINE RANGE ORGANICS	2.5 U	2.8 U	2.5 U	3 U	2.8 U	30	3 U	2.8	2.8 U
SEMIVOLATILES (UG/KG)									
1,2,4-TRICHLOROBENZENE	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 U	430 U
1,2-DICHLOROBENZENE	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 U	430 U
1,3-DICHLOROBENZENE	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 U	430 U
1,4-DICHLOROBENZENE	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 U	430 U
2,2'-OXYBIS(1-CHLOROPROPANE)	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 U	430 U
2,4,5-TRICHLOROPHENOL	1000 U	910 U	910 U	910 U	1200 U	1200 U	1100 U	1000 U	1100 U
2,4,6-TRICHLOROPHENOL	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 U	430 U
2,4-DICHLOROPHENOL	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 U	430 U

LOCATION	TP-MW01			TP-MW02					
SAMPLE ID	TP-SB01-0305-98	TP-SB01-0810-98	TP-SB01-1214-98	TP-SB02-0305-98	TP-SB02-0911-98	TP-SB02-1113-98	TP-SB02-1517-98	TP-SB03-0305-98	TP-SB03-0507-98
SAMPLE DATE	19980622	19980622	19980622	19980620	19980620	19980620	19980620	19980620	19980620
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	3	8	12	3	9	11	15	3	5
BOTTOM DEPTH	5	10	14	5	11	13	17	5	7
2,4-DIMETHYLPHENOL	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 U	430 U
2,4-DINITROPHENOL	1000 U	910 U	910 U	910 U	1200 U	1200 U	1100 U	1000 UJ	1100 UJ
2,4-DINITROTOLUENE	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 U	430 U
2,6-DINITROTOLUENE	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 U	430 U
2-CHLORONAPHTHALENE	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 U	430 U
2-CHLOROPHENOL	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 UJ	430 UJ
2-METHYLNAPHTHALENE	400 U	360 U	360 U	21 J	390 J	180 J	430 U	400 U	430 U
2-METHYLPHENOL	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 U	430 U
2-NITROANILINE	1000 U	910 U	910 U	910 U	1200 U	1200 U	1100 U	1000 U	1100 U
2-NITROPHENOL	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 U	430 U
3,3'-DICHLOROBENZIDINE	400 U	360 U	360 U	360 U	460 UR	460 UR	430 U	400 U	430 U
3-NITROANILINE	1000 U	910 U	910 U	910 U	1200 U	1200 U	1100 U	1000 U	1100 U
4,6-DINITRO-2-METHYLPHENOL	1000 U	910 U	910 U	910 U	1200 U	1200 U	1100 U	1000 U	1100 UJ
4-BROMOPHENYL PHENYL ETHER	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 U	430 U
4-CHLORO-3-METHYLPHENOL	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 UJ	430 UJ
4-CHLOROANILINE	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 U	430 U
4-CHLOROPHENYL PHENYL ETHER	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 U	430 U
4-METHYLPHENOL	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 U	430 U
4-NITROANILINE	1000 U	910 U	910 U	910 U	1200 U	1200 U	1100 U	1000 U	1100 U
4-NITROPHENOL	1000 U	910 U	910 U	910 U	1200 U	1200 U	1100 U	1000 UJ	1100 UJ
ACENAPHTHENE	400 U	360 U	360 U	360 U	2400	880	33 J	400 U	23 J
ACENAPHTHYLENE	400 U	360 U	360 U	360 U	100 J	460 U	430 U	400 U	430 U
ANTHRACENE	400 U	360 U	360 U	28 J	7100	3100	41 J	400 U	36 J
BAP EQUIVALENT-HALFND	400 U	360 U	415.98 U	466.16	9337.9	3177.6	326.93	195.411	189.57
BAP EQUIVALENT-POS	0 U	0 U	0 U	466.16	9328.3	3175	111.79	195.411	189.57
BENZO(A)ANTHRACENE	400 U	360 U	360 U	200 J	9100 J	3300 J	120 J	70 J	120 J
BENZO(A)PYRENE	400 U	360 U	360 U	260 J	5700 J	1500 J	85 J	96 J	120 J
BENZO(B)FLUORANTHENE	400 U	360 U	360 U	290 J	6000 J	2600 J	97 J	170 J	120 J
BENZO(G,H,I)PERYLENE	400 U	360 U	360 U	230 J	830 J	500 J	49 J	46 J	59 J
BENZO(K)FLUORANTHENE	400 U	360 U	360 U	360	6300	1900 J	87 J	86 J	85 J
BIS(2-CHLOROETHOXY)METHANE	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 U	430 U
BIS(2-CHLOROETHYL)ETHER	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 U	430 U
BIS(2-ETHYLHEXYL)PHTHALATE	400 U	360 U	360 U	360 U	460 UR	460 UR	440	400 U	430 U
BUTYL BENZYL PHTHALATE	400 U	360 U	360 U	360 U	460 UR	460 UR	430 U	400 U	430 U
CARBAZOLE	400 U	360 U	360 U	360 U	1700	280 J	36 J	400 U	430 U
CHRYSENE	400 U	360 U	360 U	260 J	9600 J	2600 J	140 J	91 J	130 J
DIBENZO(A,H)ANTHRACENE	400 U	360 U	360 U	120 J	1800 J	930 J	430 U	60 J	34 J
DIBENZOFURAN	400 U	360 U	360 U	360 U	1000	410 J	430 U	400 U	430 U

LOCATION	TP-MW01			TP-MW02					
SAMPLE ID	TP-SB01-0305-98	TP-SB01-0810-98	TP-SB01-1214-98	TP-SB02-0305-98	TP-SB02-0911-98	TP-SB02-1113-98	TP-SB02-1517-98	TP-SB03-0305-98	TP-SB03-0507-98
SAMPLE DATE	19980622	19980622	19980622	19980620	19980620	19980620	19980620	19980620	19980620
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	3	8	12	3	9	11	15	3	5
BOTTOM DEPTH	5	10	14	5	11	13	17	5	7
DIETHYL PHTHALATE	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 U	430 U
DIMETHYL PHTHALATE	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 U	430 U
DI-N-BUTYL PHTHALATE	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 U	24 J
DI-N-OCTYL PHTHALATE	400 U	360 U	360 U	360 U	460 UR	460 UR	430 U	400 U	430 U
FLUORANTHENE	400 U	360 U	360 U	200 J	16000	2600	210 J	110 J	210 J
FLUORENE	400 U	360 U	360 U	360 U	2100	730	32 J	400 U	430 U
HEXACHLOROBENZENE	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 U	430 U
HEXACHLOROBUTADIENE	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 U	430 U
HEXACHLOROCYCLOPENTADIENE	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 U	430 UJ
HEXACHLOROETHANE	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 U	430 U
HIGH MOLECULAR WEIGHT PAHS	1200	1080	1080	1290	61200	19630	1030	537	804
INDENO(1,2,3-CD)PYRENE	400 U	360 U	360 U	310 J	3100 J	1500	46 J	140 J	100 J
ISOPHORONE	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 U	430 U
LOW MOLECULAR WEIGHT PAHS	1400	1260	1260	737	26490	8470	758	1272	908
NAPHTHALENE	400 U	360 U	360 U	28 J	1400	750	32 J	400 U	24 J
NITROBENZENE	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 U	430 U
N-NITROSO-DI-N-PROPYLAMINE	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 U	430 U
N-NITROSODIPHENYLAMINE	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 U	430 U
PENTACHLOROPHENOL	1000 U	910 U	910 U	910 U	1200 U	1200 U	1100 U	1000 UJ	1100 UJ
PHENANTHRENE	400 U	360 U	360 U	120 J	13000	2600	190 J	72 J	180 J
PHENOL	400 U	360 U	360 U	360 U	460 U	460 U	430 U	400 UJ	430 UJ
PYRENE	400 U	360 U	360 U	250 J	19000 J	8700 J	260 J	110 J	190 J
VOLATILES (UG/KG)									
1,1,1-TRICHLOROETHANE	12 U	12 U	11 U	11 U	NA	NA	13 U	12 U	13 U
1,1,2,2-TETRACHLOROETHANE	12 U	12 U	11 U	11 UJ	NA	NA	13 U	12 UJ	13 U
1,1,2-TRICHLOROETHANE	12 U	12 U	11 U	11 U	NA	NA	13 U	12 U	13 U
1,1,2-TRICHLOROTRIFLUOROETHANE	12 U	12 U	11 U	11 U	NA	NA	13 U	12 U	13 U
1,1-DICHLOROETHANE	12 U	12 U	11 U	11 U	NA	NA	13 U	12 U	13 U
1,1-DICHLOROETHENE	12 U	12 U	11 U	11 U	NA	NA	13 U	12 U	13 U
1,2-DICHLOROETHANE	12 U	12 U	11 U	11 U	NA	NA	13 U	12 U	13 U
1,2-DICHLOROPROPANE	12 U	12 U	11 U	11 U	NA	NA	13 U	12 U	13 U
2-BUTANONE	6 J	12 U	2 J	2 J	NA	NA	9 J	12 U	13 U
2-HEXANONE	12 U	12 U	11 U	11 UJ	NA	NA	13 U	12 UJ	13 U
4-METHYL-2-PENTANONE	12 U	12 U	11 U	11 UJ	NA	NA	13 U	12 UJ	13 U
ACETONE	34 U	12 U	86 U	28 U	NA	NA	420 U	500	1200
BENZENE	12 U	12 U	11 U	11 U	NA	NA	13 U	12 U	13 U
BROMODICHLOROMETHANE	12 U	12 U	11 U	11 U	NA	NA	13 U	12 U	13 U
BROMOFORM	12 U	12 U	11 U	11 U	NA	NA	13 U	12 U	13 U

LOCATION	TP-MW01			TP-MW02					
SAMPLE ID	TP-SB01-0305-98	TP-SB01-0810-98	TP-SB01-1214-98	TP-SB02-0305-98	TP-SB02-0911-98	TP-SB02-1113-98	TP-SB02-1517-98	TP-SB03-0305-98	TP-SB03-0507-98
SAMPLE DATE	19980622	19980622	19980622	19980620	19980620	19980620	19980620	19980620	19980620
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	3	8	12	3	9	11	15	3	5
BOTTOM DEPTH	5	10	14	5	11	13	17	5	7
BROMOMETHANE	12 U	12 U	11 U	11 U	NA	NA	13 U	12 U	13 U
CARBON DISULFIDE	12 U	12 U	11 U	11 U	NA	NA	15	12 U	13 U
CARBON TETRACHLORIDE	12 U	12 U	11 U	11 U	NA	NA	13 U	12 U	13 U
CHLOROBENZENE	12 U	12 U	11 U	11 UJ	NA	NA	13 U	12 UJ	13 U
CHLORODIBROMOMETHANE	12 U	12 U	11 U	11 U	NA	NA	13 U	12 U	13 U
CHLOROETHANE	12 U	12 U	11 U	11 U	NA	NA	13 U	12 U	13 U
CHLOROFORM	12 U	12 U	11 U	11 U	NA	NA	13 U	12 U	13 U
CHLOROMETHANE	12 U	12 U	11 U	11 U	NA	NA	13 U	12 U	13 U
CIS-1,3-DICHLOROPROPENE	12 U	12 U	11 U	11 U	NA	NA	13 U	12 U	13 U
ETHYLBENZENE	12 U	12 U	11 U	11 UJ	NA	NA	13 U	12 UJ	13 U
METHYLENE CHLORIDE	12 U	12 U	11 U	13 U	NA	NA	13 U	12 U	13 U
STYRENE	12 U	12 U	11 U	11 UJ	NA	NA	13 U	12 UJ	13 U
TETRACHLOROETHENE	12 U	12 U	11 U	11 UJ	NA	NA	13 U	12 UJ	13 U
TOLUENE	12 U	12 U	11 U	11 U	NA	NA	13 U	12 UJ	13 U
TOTAL 1,2-DICHLOROETHENE	12 U	12 U	11 U	11 U	NA	NA	13 U	12 U	13 U
TOTAL XYLENES	12 U	12 U	11 U	11 UJ	NA	NA	13 U	12 UJ	13 U
TRANS-1,3-DICHLOROPROPENE	12 U	12 U	11 U	11 UJ	NA	NA	13 U	12 U	13 U
TRICHLOROETHENE	12 U	12 U	11 U	11 U	NA	NA	13 U	12 U	13 U
VINYL CHLORIDE	12 U	12 U	11 U	11 U	NA	NA	13 U	12 U	13 U

LOCATION	TP-MW03				TP-MW04			
SAMPLE ID	TP-SB03-1315-98	TP-SB03-1315-98-AVG	TP-SB03-1315-98-	TP-SB03-2325-98	TP-SB04-0305-98	TP-SB04-0709-98	TP-SB04-1315-98	TP-SB04-1315-98-AVG
SAMPLE DATE	19980620	19980620	19980620	19980620	19980618	19980618	19980618	19980618
SAMPLE CODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	ORIG	AVG
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	13	13	13	23	3	7	13	13
BOTTOM DEPTH	15	15	15	25	5	9	15	15
METALS (MG/KG)								
ALUMINUM	7600	8460	9320	16000	16900	8240	8300	8475
ANTIMONY	0.4 UR	0.38 R	0.36 UR	0.51 UR	0.94 U	2.7 J	0.36 UR	0.385 R
ARSENIC	5	4.95	4.9	11.4	12.3	10.7	4.2	4.55
BARIUM	22.5	24.15	25.8	41.8	71.5	156	27	32.85
BERYLLIUM	0.43 U	0.46 U	0.49 U	0.89	0.52 J	0.28 U	0.46 U	0.445 U
CADMIUM	0.45 U	0.445 U	0.44 U	0.53 U	0.4 UJ	0.72	0.42 U	0.45 U
CALCIUM	2400	3450	4500	5540	5870	3820	6150	5885
CHROMIUM	20 J	20.9	21.8 J	30.6 J	72.8 J	64.6 J	22.6 J	25.7
COBALT	5.1	5.25	5.4	8.2	13.9	13.8	5.4	6.2
COPPER	24.3 J	30.25	36.2 J	15.6 J	231 J	2630 J	130 J	251.5
IRON	12900	13750	14600	25800	26900	61100	14000	15100
LEAD	13.6 J	22.2	30.8 J	15.4 J	93.7 J	492 J	21.3 J	28.25
MAGNESIUM	4180	4475	4770	6600	12800	5930	4480	4840
MANGANESE	143 J	151	159 J	268 J	596 J	614 J	163 J	180.5
MERCURY	0.25 J	0.16	0.07 J	0.03 J	0.2 J	2.6 J	0.04 J	0.1
NICKEL	12.3 J	13.95	15.6 J	18.7 J	72.4	203	18.4	25.05
POTASSIUM	2510	2745	2980	4820	4740	1870	2420	2525
SELENIUM	0.62 U	0.615 U	0.61 U	0.74 UJ	0.56 UJ	0.54 UJ	0.58 UJ	0.625 U
SILVER	0.52 U	0.515 U	0.51 U	0.61 U	0.47 U	6	0.49 U	0.525 U
SODIUM	3180	3510	3840	5170	1410	1310	3390	3525
THALLIUM	0.63 U	0.625 U	0.62 U	0.74 U	0.56 U	0.74 U	0.59 U	0.63 U
VANADIUM	23.4 J	25.15	26.9 J	36.7 J	43 J	41.1 J	25.3 J	26.35
ZINC	38.7 J	40.85	43 J	67.6 K	493 J	1570 J	89.9 J	112.95
MISCELLANEOUS PARAMETERS (MG/KG)								
CYANIDE	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
HEXAVALENT CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL ORGANIC CARBON	14000	14500	15000	19000	NA	NA	13000	12500
MISCELLANEOUS PARAMETERS (S.U.)								
PH	8.3	8.3	8.3	8	7.8	8	8.2	8.2
PESTICIDES/PCBS (UG/KG)								
4,4'-DDD	4.3 U	4.3 U	4.3 U	4.6 U	NA	4 U	4.2 U	4.3 U
4,4'-DDE	4.3 U	4.3 U	4.3 U	4.6 U	NA	4 U	4.2 U	4.3 U
4,4'-DDT	4.3 U	4.3 U	4.3 U	4.6 U	NA	4 U	3.5 J	3.5 J
ALDRIN	2.2 U	2.2 U	2.2 U	2.4 U	NA	2.1 U	2.2 U	2.25 U
ALPHA-BHC	2.2 U	2.2 U	2.2 U	2.4 U	NA	2.1 U	2.2 U	2.25 U
ALPHA-CHLORDANE	2.2 U	2.2 U	2.2 U	2.4 U	NA	2.1 U	2.2 U	2.25 U

LOCATION	TP-MW03				TP-MW04			
SAMPLE ID	TP-SB03-1315-98	TP-SB03-1315-98-AVG	TP-SB03-1315-98-	TP-SB03-2325-98	TP-SB04-0305-98	TP-SB04-0709-98	TP-SB04-1315-98	TP-SB04-1315-98-AVG
SAMPLE DATE	19980620	19980620	19980620	19980620	19980618	19980618	19980618	19980618
SAMPLE CODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	ORIG	AVG
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	13	13	13	23	3	7	13	13
BOTTOM DEPTH	15	15	15	25	5	9	15	15
AROCLOR-1016	43 U	43 U	43 U	43 U	NA	40 U	42 U	43 U
AROCLOR-1221	88 U	88 U	88 U	93 U	NA	81 U	86 U	87.5 U
AROCLOR-1232	43 U	43 U	43 U	46 U	NA	40 U	42 U	43 U
AROCLOR-1242	43 U	43 U	43 U	46 U	NA	40 U	42 U	43 U
AROCLOR-1248	43 U	43 U	43 U	46 U	NA	40 U	42 U	43 U
AROCLOR-1254	43 U	43 U	43 U	46 U	NA	40 U	42 U	43 U
AROCLOR-1260	43 U	43 U	43 U	46 U	NA	450	42 U	43 U
BETA-BHC	2.2 U	2.2 U	2.2 U	2.4 U	NA	2.1 U	2.2 U	2.25 U
DELTA-BHC	2.2 U	2.2 U	2.2 U	2.4 U	NA	2.1 U	2.2 U	2.25 U
DIELDRIN	4.3 U	4.3 U	4.3 U	4.6 U	NA	4 U	4.2 U	4.3 U
ENDOSULFAN I	2.2 U	2.2 U	2.2 U	2.4 U	NA	2.1 U	2.2 U	2.25 U
ENDOSULFAN II	4.3 U	4.3 U	4.3 U	4.6 U	NA	4 U	4.2 U	4.3 U
ENDOSULFAN SULFATE	4.3 U	4.3 U	4.3 U	4.6 U	NA	8.7 R	4.2 U	4.3 U
ENDRIN	4.3 U	4.3 U	4.3 U	4.6 U	NA	4 U	4.2 U	4.3 U
ENDRIN ALDEHYDE	4.3 U	4.3 U	4.3 U	4.6 U	NA	4 U	4.2 U	4.3 U
ENDRIN KETONE	4.3 U	4.3 U	4.3 U	4.6 U	NA	4 U	4.2 U	4.3 U
GAMMA-BHC (LINDANE)	2.2 U	2.2 U	2.2 U	2.4 U	NA	2.1 U	2.2 U	2.25 U
GAMMA-CHLORDANE	2.2 U	2.2 U	2.2 U	2.4 U	NA	2.1 U	2.2 U	2.25 U
HEPTACHLOR	2.2 U	2.2 U	2.2 U	2.4 U	NA	2.1 U	2.2 U	2.25 U
HEPTACHLOR EPOXIDE	2.2 U	2.2 U	2.2 U	2.4 U	NA	2.1 U	2.2 U	2.25 U
METHOXYCHLOR	22 U	22 U	22 U	24 U	NA	21 U	22 U	22.5 U
TOTAL AROCLOR	0 U	0 U	0 U	0 U	NA	450	0 U	0 U
TOTAL AROCLOR HALFND	173	173	173	183	NA	590.5	169	172.75
TOTAL AROCLOR ZEROND	0 U	0 U	0 U	0 U	NA	450	0 U	0 U
TOXAPHENE	220 U	220 U	220 U	240 U	NA	210 U	220 U	225 U
PETROLEUM HYDROCARBONS (MG/KG)								
DIESEL RANGE ORGANICS	38	30	22	7.7	110	96	22	14.3
GASOLINE RANGE ORGANICS	3 U	3 U	3 U	3.8 U	3 U	2.8 U	2.5 U	2.75 U
SEMIVOLATILES (UG/KG)								
1,2,4-TRICHLOROBENZENE	430 U	430 U	430 U	460 U	400 U	400 U	430 U	430 U
1,2-DICHLOROBENZENE	430 U	430 U	430 U	460 U	400 U	400 U	430 U	430 U
1,3-DICHLOROBENZENE	430 U	430 U	430 U	460 U	400 U	400 U	430 U	430 U
1,4-DICHLOROBENZENE	430 U	430 U	430 U	460 U	400 U	400 U	430 U	430 U
2,2'-OXYBIS(1-CHLOROPROPANE)	430 U	430 U	430 U	460 U	400 U	400 U	430 U	430 U
2,4,5-TRICHLOROPHENOL	1100 U	1100 U	1100 U	1200 U	1000 U	1000 U	1100 U	1100 U
2,4,6-TRICHLOROPHENOL	430 U	430 U	430 U	460 U	400 U	400 U	430 U	430 U
2,4-DICHLOROPHENOL	430 U	430 U	430 U	460 U	400 U	400 U	430 U	430 U

LOCATION	TP-MW03				TP-MW04			
SAMPLE ID	TP-SB03-1315-98	TP-SB03-1315-98-AVG	TP-SB03-1315-98-	TP-SB03-2325-98	TP-SB04-0305-98	TP-SB04-0709-98	TP-SB04-1315-98	TP-SB04-1315-98-AVG
SAMPLE DATE	19980620	19980620	19980620	19980620	19980618	19980618	19980618	19980618
SAMPLE CODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	ORIG	AVG
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	13	13	13	23	3	7	13	13
BOTTOM DEPTH	15	15	15	25	5	9	15	15
2,4-DIMETHYLPHENOL	430 U	430 U	430 U	460 U	400 U	400 U	430 U	430 U
2,4-DINITROPHENOL	1100 UJ	1100 U	1100 UJ	1200 UJ	1000 UJ	1000 UJ	1100 UJ	1100 U
2,4-DINITROTOLUENE	430 U	430 U	430 U	460 U	400 U	400 U	430 U	430 U
2,6-DINITROTOLUENE	430 U	430 U	430 U	460 U	400 U	400 U	430 U	430 U
2-CHLORONAPHTHALENE	430 U	430 U	430 U	460 U	400 U	400 U	430 U	430 U
2-CHLOROPHENOL	430 UJ	430 U	430 UJ	460 UJ	400 UJ	400 UJ	430 UJ	430 U
2-METHYLNAPHTHALENE	430 U	430 U	430 U	460 U	79 J	24 J	430 U	430 U
2-METHYLPHENOL	430 U	430 U	430 U	460 U	400 U	400 U	430 U	430 U
2-NITROANILINE	1100 U	1100 U	1100 U	1200 U	1000 U	1000 U	1100 U	1100 U
2-NITROPHENOL	430 U	430 U	430 U	460 U	400 U	400 U	430 U	430 U
3,3'-DICHLOROBENZIDINE	430 U	430 U	430 U	460 U	400 U	400 U	430 U	430 U
3-NITROANILINE	1100 U	1100 U	1100 U	1200 U	1000 U	1000 U	1100 U	1100 U
4,6-DINITRO-2-METHYLPHENOL	1100 UJ	1100 U	1100 U	1200 UJ	1000 U	1000 U	1100 U	1100 U
4-BROMOPHENYL PHENYL ETHER	430 U	430 U	430 U	460 U	400 U	400 U	430 U	430 U
4-CHLORO-3-METHYLPHENOL	430 UJ	430 U	430 UJ	460 UJ	400 UJ	400 UJ	430 UJ	430 U
4-CHLOROANILINE	430 U	430 U	430 U	460 U	400 U	400 U	430 U	430 U
4-CHLOROPHENYL PHENYL ETHER	430 U	430 U	430 U	460 U	400 U	400 U	430 U	430 U
4-METHYLPHENOL	430 U	430 U	430 U	460 U	400 U	400 U	430 U	430 U
4-NITROANILINE	1100 U	1100 U	1100 U	1200 U	1000 U	1000 U	1100 U	1100 U
4-NITROPHENOL	1100 UJ	1100 U	1100 UJ	1200 UJ	1000 UJ	1000 UJ	1100 UJ	1100 U
ACENAPHTHENE	430 U	430 U	430 U	460 U	110 J	32 J	430 U	430 U
ACENAPHTHYLENE	430 U	430 U	430 U	460 U	41 J	400 U	430 U	430 U
ANTHRACENE	430 U	430 U	430 U	460 U	500	140 J	30 J	30 J
BAP EQUIVALENT-HALFND	285.282	269.427	253.572	531.53 U	1502.26	364.78	92.811	181.3425
BAP EQUIVALENT-POS	70.22	53.31	36.4	0 U	1502.26	364.78	90.6	60.9
BENZO(A)ANTHRACENE	57 J	40	23 J	460 U	1200	240 J	70 J	50
BENZO(A)PYRENE	54 J	41.5	29 J	460 U	990	220 J	52 J	39
BENZO(B)FLUORANTHENE	60 J	42.5	25 J	460 U	1100	230 J	56 J	39
BENZO(G,H,I)PERYLENE	42 J	42 J	430 U	460 U	36 J	54 J	430 U	430 U
BENZO(K)FLUORANTHENE	60 J	42.5	25 J	460 U	780	200 J	40 J	31.5
BIS(2-CHLOROETHOXY)METHANE	430 U	430 U	430 U	460 U	400 U	400 U	430 U	430 U
BIS(2-CHLOROETHYL)ETHER	430 U	430 U	430 U	460 U	400 U	400 U	430 U	430 U
BIS(2-ETHYLHEXYL)PHTHALATE	430 U	430 U	430 U	460 U	580 U	400 U	430 U	430 U
BUTYL BENZYL PHTHALATE	430 U	430 U	430 U	460 U	400 U	400 U	430 U	430 U
CARBAZOLE	430 U	430 U	430 U	460 U	200 J	67 J	430 U	430 U
CHRYSENE	62 J	42	22 J	460 U	1100	240 J	61 J	42.5
DIBENZO(A,H)ANTHRACENE	430 U	430 U	430 U	460 U	220 J	80 J	23 J	23 J
DIBENZOFURAN	430 U	430 U	430 U	460 U	220 J	46 J	430 U	430 U

LOCATION	TP-MW03				TP-MW04			
SAMPLE ID	TP-SB03-1315-98	TP-SB03-1315-98-AVG	TP-SB03-1315-98-	TP-SB03-2325-98	TP-SB04-0305-98	TP-SB04-0709-98	TP-SB04-1315-98	TP-SB04-1315-98-AVG
SAMPLE DATE	19980620	19980620	19980620	19980620	19980618	19980618	19980618	19980618
SAMPLE CODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	ORIG	AVG
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	13	13	13	23	3	7	13	13
BOTTOM DEPTH	15	15	15	25	5	9	15	15
DIETHYL PHTHALATE	430 U	430 U	430 U	460 U	400 U	400 U	430 U	430 U
DIMETHYL PHTHALATE	430 U	430 U	430 U	460 U	400 U	400 U	430 U	430 U
DI-N-BUTYL PHTHALATE	430 U	430 U	430 U	460 U	21 J	400 U	430 U	430 U
DI-N-OCTYL PHTHALATE	430 U	430 U	430 UJ	460 U	400 U	400 UJ	430 U	430 U
FLUORANTHENE	94 J	59.5	25 J	460 U	2300	570	150 J	107.5
FLUORENE	430 U	430 U	430 U	460 U	290 J	76 J	24 J	24 J
HEXACHLOROBENZENE	430 U	430 U	430 U	460 U	400 U	400 U	430 U	430 U
HEXACHLOROBUTADIENE	430 U	430 U	430 U	460 U	400 U	400 U	430 U	430 U
HEXACHLOROCYCLOPENTADIENE	430 UJ	430 U	430 U	460 UJ	400 U	400 U	430 U	430 U
HEXACHLOROETHANE	430 U	430 U	430 U	460 U	400 U	400 U	430 U	430 U
HIGH MOLECULAR WEIGHT PAHS	563	451.5	340	1380	8410	1750	476	446
INDENO(1,2,3-CD)PYRENE	41 J	33.5	26 J	460 U	530	150 J	30 J	30 J
ISOPHORONE	430 U	430 U	430 U	460 U	400 U	400 U	430 U	430 U
LOW MOLECULAR WEIGHT PAHS	1335	1420	1505	1610	3082	957	1054	1201
NAPHTHALENE	430 U	430 U	430 U	460 U	62 J	35 J	430 U	430 U
NITROBENZENE	430 U	430 U	430 U	460 U	400 U	400 U	430 U	430 U
N-NITROSO-DI-N-PROPYLAMINE	430 U	430 U	430 U	460 U	400 U	400 U	430 U	430 U
N-NITROSODIPHENYLAMINE	430 U	430 U	430 U	460 U	400 U	400 U	430 U	430 U
PENTACHLOROPHENOL	1100 UJ	1100 U	1100 UJ	1200 UJ	1000 UJ	1000 UJ	1100 UJ	1100 U
PHENANTHRENE	45 J	45 J	430 U	460 U	2000	450	140 J	99
PHENOL	430 UJ	430 U	430 UJ	460 UJ	400 UJ	400 UJ	430 UJ	430 U
PYRENE	81 J	53.5	26 J	460 U	2600	400	120 J	88
VOLATILES (UG/KG)								
1,1,1-TRICHLOROETHANE	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U
1,1,2,2-TETRACHLOROETHANE	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U
1,1,2-TRICHLOROETHANE	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U
1,1,2-TRICHLOROTRIFLUOROETHANE	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U
1,1-DICHLOROETHANE	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U
1,1-DICHLOROETHENE	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U
1,2-DICHLOROETHANE	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U
1,2-DICHLOROPROPANE	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U
2-BUTANONE	13 U	13 U	13 U	14 U	12 U	14 U	13 U	13 U
2-HEXANONE	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U
4-METHYL-2-PENTANONE	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U
ACETONE	1000	1000	1700 U	6400	19 U	80	80	90
BENZENE	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U
BROMODICHLOROMETHANE	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U
BROMOFORM	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U

LOCATION	TP-MW03				TP-MW04			
SAMPLE ID	TP-SB03-1315-98	TP-SB03-1315-98-AVG	TP-SB03-1315-98-	TP-SB03-2325-98	TP-SB04-0305-98	TP-SB04-0709-98	TP-SB04-1315-98	TP-SB04-1315-98-AVG
SAMPLE DATE	19980620	19980620	19980620	19980620	19980618	19980618	19980618	19980618
SAMPLE CODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	ORIG	AVG
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	13	13	13	23	3	7	13	13
BOTTOM DEPTH	15	15	15	25	5	9	15	15
BROMOMETHANE	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U
CARBON DISULFIDE	3 J	4	5 J	16	12 U	2 J	3 J	2.5
CARBON TETRACHLORIDE	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U
CHLOROBENZENE	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U
CHLORODIBROMOMETHANE	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U
CHLOROETHANE	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U
CHLOROFORM	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U
CHLOROMETHANE	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U
CIS-1,3-DICHLOROPROPENE	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U
ETHYLBENZENE	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U
METHYLENE CHLORIDE	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U
STYRENE	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U
TETRACHLOROETHENE	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U
TOLUENE	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U
TOTAL 1,2-DICHLOROETHENE	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U
TOTAL XYLENES	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U
TRANS-1,3-DICHLOROPROPENE	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U
TRICHLOROETHENE	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U
VINYL CHLORIDE	13 U	13 U	13 U	14 U	12 U	12 U	13 U	13 U

LOCATION		TP-MW05					TP-MW06			
SAMPLE ID	TP-SB04-1315-98-D	TP-SB05-0305-98	TP-SB05-0305-98-AVG	TP-SB05-0305-98-D	TP-SB05-0507-98	TP-SB05-0810-98	TP-SB06-0305-98	TP-SB06-0507-98	TP-SB06-1315-98	TP-SB07-0305-98
SAMPLE DATE	19980618	19980609	19980609	19980609	19980609	19980609	19980616	19980616	19980616	19980615
SAMPLE CODE	DUP	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	13	3	3	3	5	8	3	5	13	3
BOTTOM DEPTH	15	5	5	5	7	10	5	7	15	5
METALS (MG/KG)										
ALUMINUM	8650	4260	4655	5050	10500	4390	5140	3020	8840	11400
ANTIMONY	0.41 UR	1.2 U	0.855 U	0.51 U	0.96 U	2 U	8.8 J	18 J	10.7 J	0.68 U
ARSENIC	4.9	4.4 J	3.175	3.9 U	11.9	21.4	5	20.2	21	16
BARIUM	38.7	19.7	21	22.3	145	47	81	42.4 J	458	55.7
BERYLLIUM	0.43 U	0.24 U	0.29 U	0.34 U	0.62	0.35 U	0.28 U	0.19 U	0.58	0.87
CADMIUM	0.48 U	2.8	2.65	2.5	3.8	3.8	0.87	0.39 UJ	15.6	0.47 U
CALCIUM	5620	1860 J	2750	3640 J	9800 J	17900 J	1820	6560	16400	8490 J
CHROMIUM	28.8 J	23.5 J	21.9	20.3 J	68.9 J	71.1 J	17.5 J	97.8 J	47.5 J	61.8 J
COBALT	7	5	5.1	5.2	16	18.2	4.5	20	11.8	18.2
COPPER	373 J	7560	6630	5700	7080	2340	867 J	6210 J	1500 J	198
IRON	16200	17300	16850	16400	65400	128000	15800	234000	93000	85500
LEAD	35.2 J	1900	1885	1870	1280	260	560 J	1400 J	2720 J	148
MAGNESIUM	5200	1510	1735	1960	6060	3920	1760	1710	8460	8260
MANGANESE	198 J	270 J	251	232 J	952 J	600 J	138 J	895 J	537 J	1380 J
MERCURY	0.16 J	1.2 J	0.805	0.41 J	2.5 J	1 J	0.35 J	0.48 J	2.1 J	0.68 J
NICKEL	31.7	78.4	69.65	60.9	324	368	41.3	282	86	74.8
POTASSIUM	2630	603 J	821.5	1040 J	2620 J	1350 J	860	564	1720	3500 J
SELENIUM	0.67 UJ	3.2 UJ	3.3 U	3.4 UJ	3.4 UJ	3.2 U	0.51 UJ	5.4 UJ	0.7 UJ	2.5 U
SILVER	0.56 U	2.9	2.5	2.1	5.1	3.4	0.42 U	1.5	2.8	0.75 J
SODIUM	3660	272	267	262	2470	2300	449	949	3320	1490
THALLIUM	0.67 U	0.64 U	0.7 U	0.76 U	1.7 U	0.81 UJ	0.51 U	5.5 U	1 U	2.1 U
VANADIUM	27.4 J	13.7	14.95	16.2	31.8	21	16.6 J	8.9 J	26.6 J	47.7
ZINC	136 J	3740	3310	2880	1550	2550	491 J	701 J	3620 J	240
MISCELLANEOUS PARAMETERS (MG/KG)										
CYANIDE	2 U	2 UR	2 R	2 UR	NA	2 UR	2 U	2 U	2 U	2 U
HEXAVALENT CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL ORGANIC CARBON	12000	12000	11500	11000	59000	NA	100000	NA	22000	36000
MISCELLANEOUS PARAMETERS (S.U.)										
PH	8.2	8.5	8.45	8.4	NA	8.2	8	7.2	7.1	8.1
PESTICIDES/PCBS (UG/KG)										
4,4'-DDD	4.4 U	3.7 U	3.7 U	3.7 U	3.9 U	NA	3.8 U	NA	4.8 U	3.6 U
4,4'-DDE	4.4 U	3.7 U	3.7 U	3.7 U	3.9 U	NA	10 J	NA	4.8 U	3.6 U
4,4'-DDT	4.4 U	3.7 U	3.7 U	3.7 U	3.9 U	NA	3.8 U	NA	4.8 U	3.6 U
ALDRIN	2.3 U	1.6 R	2	2 J	2 U	NA	1.9 U	NA	2.5 U	1.9 U
ALPHA-BHC	2.3 U	1.9 U	1.9 U	1.9 U	2 U	NA	1.9 U	NA	2.5 U	1.9 U
ALPHA-CHLORDANE	2.3 U	1.9 U	1.9 U	1.9 U	2 U	NA	1.9 U	NA	2.5 U	1.9 U

LOCATION		TP-MW05					TP-MW06			
SAMPLE ID	TP-SB04-1315-98-D	TP-SB05-0305-98	TP-SB05-0305-98-AVG	TP-SB05-0305-98-D	TP-SB05-0507-98	TP-SB05-0810-98	TP-SB06-0305-98	TP-SB06-0507-98	TP-SB06-1315-98	TP-SB07-0305-98
SAMPLE DATE	19980618	19980609	19980609	19980609	19980609	19980609	19980616	19980616	19980616	19980615
SAMPLE CODE	DUP	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	13	3	3	3	5	8	3	5	13	3
BOTTOM DEPTH	15	5	5	5	7	10	5	7	15	5
AROCLOR-1016	44 U	37 U	37 U	37 U	39 U	NA	38 U	NA	48 U	36 U
AROCLOR-1221	89 U	75 U	74.5 U	74 U	79 U	NA	77 U	NA	97 U	74 U
AROCLOR-1232	44 U	37 U	37 U	37 U	39 U	NA	38 U	NA	48 U	36 U
AROCLOR-1242	44 U	37 U	37 U	37 U	39 U	NA	38 U	NA	48 U	36 U
AROCLOR-1248	44 U	37 U	37 U	37 U	39 U	NA	38 U	NA	48 U	36 U
AROCLOR-1254	44 U	37 U	37 U	37 U	39 U	NA	38 U	NA	48 U	36 U
AROCLOR-1260	44 U	37 U	37 U	37 U	39 U	NA	38 U	NA	48 U	36 U
BETA-BHC	2.3 U	1.9 U	1.9 U	1.9 U	2 U	NA	1.9 U	NA	2.5 U	1.9 U
DELTA-BHC	2.3 U	1.9 U	1.9 U	1.9 U	2 U	NA	1.9 U	NA	2.5 U	1.9 U
DIELDRIN	4.4 U	3.7 U	3.7 U	3.7 U	3.9 U	NA	3.8 U	NA	4.8 U	3.6 U
ENDOSULFAN I	2.3 U	1.9 U	1.9 U	1.9 U	2 U	NA	1.9 U	NA	2.5 U	1.9 U
ENDOSULFAN II	4.4 U	3.7 U	3.7 U	3.7 U	3.9 U	NA	3.8 U	NA	4.8 U	3.6 U
ENDOSULFAN SULFATE	4.4 U	3.7 U	3.7 U	3.7 U	22 J	NA	3.8 U	NA	4.8 U	3.6 U
ENDRIN	4.4 U	3.7 U	3.7 U	3.7 U	3.9 U	NA	3.8 U	NA	4.8 U	3.6 U
ENDRIN ALDEHYDE	4.4 U	3.7 U	3.7 U	3.7 U	3.9 U	NA	3.8 U	NA	4.8 U	3.6 U
ENDRIN KETONE	4.4 U	3.7 U	3.7 U	3.7 U	3.9 U	NA	3.8 U	NA	4.8 U	3.6 U
GAMMA-BHC (LINDANE)	2.3 U	1.9 U	1.9 U	1.9 U	2 U	NA	1.9 U	NA	2.5 U	1.9 U
GAMMA-CHLORDANE	2.3 U	1.9 U	1.9 U	1.9 U	2 U	NA	1.9 U	NA	2.5 U	1.9 U
HEPTACHLOR	2.3 U	1.9 U	1.9 U	1.9 U	2 U	NA	1.9 U	NA	2.5 U	1.9 U
HEPTACHLOR EPOXIDE	2.3 U	1.9 U	1.9 U	1.9 U	2 U	NA	1.9 U	NA	2.5 U	1.9 U
METHOXYCHLOR	23 U	19 U	19 U	19 U	20 U	NA	19 U	NA	25 U	19 U
TOTAL AROCLOR	0 U	0 U	0 U	0 U	0 U	NA	0 U	NA	0 U	0 U
TOTAL AROCLOR HALFND	176.5	148.5	148.25	148	156.5	NA	152.5	NA	192.5	145
TOTAL AROCLOR ZEROND	0 U	0 U	0 U	0 U	0 U	NA	0 U	NA	0 U	0 U
TOXAPHENE	230 U	190 U	190 U	190 U	200 U	NA	190 U	NA	250 U	190 U
PETROLEUM HYDROCARBONS (MG/KG)										
DIESEL RANGE ORGANICS	6.6	280	320	360	270	4800	1900	820	340	320
GASOLINE RANGE ORGANICS	3 U	5.7 J	4.1	2.5 J	7.6 J	61 J	2.8 U	3.3 UJ	3.3 UJ	2.5 U
SEMIVOLATILES (UG/KG)										
1,2,4-TRICHLOROBENZENE	430 U	360 U	360 U	360 U	400 U	460 U	1900 U	51 J	460 U	360 U
1,2-DICHLOROBENZENE	430 U	360 U	360 U	360 U	400 U	460 U	720 J	730	460 U	360 U
1,3-DICHLOROBENZENE	430 U	360 U	360 U	360 U	400 U	460 U	110 J	130 J	460 U	360 U
1,4-DICHLOROBENZENE	430 U	360 UJ	360 U	360 UJ	400 UJ	460 UJ	96 J	110 J	460 U	360 U
2,2'-OXYBIS(1-CHLOROPROPANE)	430 U	360 UJ	360 U	360 UJ	400 UJ	460 UJ	1900 U	400 U	460 U	360 U
2,4,5-TRICHLOROPHENOL	1100 U	910 U	910 U	910 U	1000 U	1200 U	4700 U	1000 U	1200 U	910 U
2,4,6-TRICHLOROPHENOL	430 U	360 U	360 U	360 U	400 U	460 U	1900 U	400 U	460 U	360 U
2,4-DICHLOROPHENOL	430 U	360 U	360 U	360 U	400 U	460 U	1900 U	400 U	460 U	360 U

LOCATION		TP-MW05					TP-MW06			
SAMPLE ID	TP-SB04-1315-98-D	TP-SB05-0305-98	TP-SB05-0305-98-AVG	TP-SB05-0305-98-D	TP-SB05-0507-98	TP-SB05-0810-98	TP-SB06-0305-98	TP-SB06-0507-98	TP-SB06-1315-98	TP-SB07-0305-98
SAMPLE DATE	19980618	19980609	19980609	19980609	19980609	19980609	19980616	19980616	19980616	19980615
SAMPLE CODE	DUP	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	13	3	3	3	5	8	3	5	13	3
BOTTOM DEPTH	15	5	5	5	7	10	5	7	15	5
2,4-DIMETHYLPHENOL	430 U	360 U	360 U	360 U	400 U	460 U	1900 U	400 U	460 U	360 U
2,4-DINITROPHENOL	1100 UJ	910 UJ	910 U	910 UJ	1000 UJ	1200 UJ	4700 UJ	1000 UJ	1200 UJ	910 UJ
2,4-DINITROTOLUENE	430 U	360 UJ	360 U	360 UJ	400 UJ	460 UJ	1900 U	400 U	460 U	360 U
2,6-DINITROTOLUENE	430 U	360 U	360 U	360 U	400 U	460 U	1900 U	400 U	460 U	360 U
2-CHLORONAPHTHALENE	430 U	360 U	360 U	360 U	400 U	460 U	1900 U	400 U	460 U	360 U
2-CHLOROPHENOL	430 UJ	360 U	360 U	360 U	400 U	460 U	1900 UJ	400 UJ	460 UJ	360 U
2-METHYLNAPHTHALENE	430 U	74 J	122	170 J	110 J	470	1900 U	52 J	77 J	34 J
2-METHYLPHENOL	430 U	360 U	360 U	360 U	400 U	460 U	1900 U	400 U	460 U	360 U
2-NITROANILINE	1100 U	910 U	910 U	910 U	1000 U	1200 U	4700 U	1000 U	1200 U	910 U
2-NITROPHENOL	430 U	360 U	360 U	360 U	400 U	460 U	1900 U	400 U	460 U	360 U
3,3'-DICHLOROBENZIDINE	430 U	360 U	360 U	360 U	400 U	460 U	1900 U	400 U	460 U	360 UJ
3-NITROANILINE	1100 U	910 U	910 U	910 U	1000 U	1200 U	4700 U	1000 U	1200 U	910 U
4,6-DINITRO-2-METHYLPHENOL	1100 U	910 U	910 U	910 U	1000 U	1200 U	4700 U	1000 U	1200 U	910 UJ
4-BROMOPHENYL PHENYL ETHER	430 U	360 U	360 U	360 U	400 U	460 U	1900 U	400 U	460 U	360 U
4-CHLORO-3-METHYLPHENOL	430 UJ	360 UJ	360 U	360 UJ	400 UJ	460 UJ	1900 UJ	400 UJ	460 UJ	360 U
4-CHLOROANILINE	430 U	360 U	360 U	360 U	400 U	460 U	1900 U	400 U	460 U	360 U
4-CHLOROPHENYL PHENYL ETHER	430 U	360 U	360 U	360 U	400 U	460 U	1900 U	400 U	460 U	360 U
4-METHYLPHENOL	430 U	360 U	360 U	360 U	400 U	460 U	1900 U	400 U	460 U	360 U
4-NITROANILINE	1100 U	910 U	910 U	910 U	1000 U	1200 U	4700 U	1000 U	1200 U	910 U
4-NITROPHENOL	1100 UJ	910 UJ	910 U	910 UJ	1000 UJ	1200 UJ	4700 UJ	1000 UJ	1200 UJ	910 U
ACENAPHTHENE	430 U	230 J	215	200 J	150 J	270 J	1900 U	400 U	460 U	24 J
ACENAPHTHYLENE	430 U	360 U	360 U	360 U	400 U	460 U	1900 U	400 U	27 J	97 J
ANTHRACENE	430 U	520	475	430	330 J	310 J	1900 U	400 U	39 J	60 J
BAP EQUIVALENT-HALFND	269.874	3563	2961.65	2360.3	1338	484.04	1322.12	333.69	436.73	662.54
BAP EQUIVALENT-POS	31.2	3563	2961.65	2360.3	1138	484.04	362.62	131.69	206.54	480.74
BENZO(A)ANTHRACENE	30 J	1800	1550	1300	720	360 J	240 J	120 J	160 J	350 J
BENZO(A)PYRENE	26 J	2200	1800	1400	870 J	270 J	280 J	96 J	160 J	380 J
BENZO(B)FLUORANTHENE	22 J	2300	2200	2100	1200 J	360 J	350 J	160 J	190 J	310 J
BENZO(G,H,I)PERYLENE	430 U	1900	1450	1000	610 J	300 J	1900 U	400 U	54 J	360 UJ
BENZO(K)FLUORANTHENE	23 J	1200	1045	890	710 J	260 J	130 J	58 J	120 J	430 J
BIS(2-CHLOROETHOXY)METHANE	430 U	360 U	360 U	360 U	400 U	460 U	1900 U	400 U	460 U	360 U
BIS(2-CHLOROETHYL)ETHER	430 U	360 U	360 U	360 U	400 U	460 U	1900 U	400 U	460 U	360 U
BIS(2-ETHYLHEXYL)PHTHALATE	430 U	360 U	360 U	360 U	400 U	460 U	1900 U	400 U	460 U	360 U
BUTYL BENZYL PHTHALATE	430 U	360 U	360 U	360 U	400 U	460 U	1900 U	400 U	460 U	360 UJ
CARBAZOLE	430 U	300 J	275	250 J	180 J	460 U	1900 U	400 U	34 J	40 J
CHRYSENE	24 J	2000	1700	1400	800	440 J	320 J	210 J	190 J	440 J
DIBENZO(A,H)ANTHRACENE	430 U	750	615	480	400 UJ	110 J	1900 U	400 U	460 U	360 UJ
DIBENZOFURAN	430 U	130 J	125	120 J	95 J	460 U	1900 U	400 U	460 U	19 J

LOCATION		TP-MW05					TP-MW06			
SAMPLE ID	TP-SB04-1315-98-D	TP-SB05-0305-98	TP-SB05-0305-98-AVG	TP-SB05-0305-98-D	TP-SB05-0507-98	TP-SB05-0810-98	TP-SB06-0305-98	TP-SB06-0507-98	TP-SB06-1315-98	TP-SB07-0305-98
SAMPLE DATE	19980618	19980609	19980609	19980609	19980609	19980609	19980616	19980616	19980616	19980615
SAMPLE CODE	DUP	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	13	3	3	3	5	8	3	5	13	3
BOTTOM DEPTH	15	5	5	5	7	10	5	7	15	5
DIETHYL PHTHALATE	430 U	360 U	360 U	360 U	400 U	460 U	1900 U	400 U	460 U	360 U
DIMETHYL PHTHALATE	430 U	360 U	360 U	360 U	400 U	460 U	1900 U	400 U	460 U	360 U
DI-N-BUTYL PHTHALATE	430 U	21 J	21 J	360 U	22 J	460 U	1900 U	38 J	30 J	21 J
DI-N-OCTYL PHTHALATE	430 UJ	360 UJ	360 U	360 UJ	400 UJ	460 UJ	1900 UJ	400 UJ	460 UJ	360 UJ
FLUORANTHENE	65 J	2600	2650	2700	1600	430 J	230 J	140 J	340 J	290 J
FLUORENE	430 U	230 J	230	230 J	180 J	400 J	1900 U	400 U	32 J	41 J
HEXACHLOROBENZENE	430 U	360 U	360 U	360 U	400 U	460 U	1900 U	400 U	460 U	360 U
HEXACHLOROBUTADIENE	430 U	360 U	360 U	360 U	400 U	460 U	1900 U	400 U	460 U	360 U
HEXACHLOROCYCLOPENTADIENE	430 U	360 U	360 U	360 U	400 U	460 U	1900 U	400 U	460 U	360 UJ
HEXACHLOROETHANE	430 U	360 U	360 U	360 U	400 U	460 U	1900 U	400 U	460 U	360 U
HIGH MOLECULAR WEIGHT PAHS	416	11950	10615	9280	5490	2420	2260	926	1380	2580
INDENO(1,2,3-CD)PYRENE	430 U	1700	1450	1200	620 J	260 J	220 J	69 J	110 J	300 J
ISOPHORONE	430 U	360 U	360 U	360 U	400 U	460 U	1900 U	400 U	460 U	360 U
LOW MOLECULAR WEIGHT PAHS	1348	3495	3276.5	3058	2231	2750	5840	998	706	534
NAPHTHALENE	430 U	61 J	54.5	48 J	61 J	290 J	1900 U	36 J	61 J	28 J
NITROBENZENE	430 U	360 U	360 U	360 U	400 U	460 U	1900 U	400 U	460 U	360 U
N-NITROSO-DI-N-PROPYLAMINE	430 U	360 UJ	360 U	360 UJ	400 UJ	460 UJ	1900 U	400 U	460 U	360 U
N-NITROSODIPHENYLAMINE	430 U	360 U	360 U	360 U	400 U	460 U	1900 U	400 U	460 U	360 U
PENTACHLOROPHENOL	1100 UJ	910 U	910 U	910 U	1000 U	1200 U	4700 UJ	1000 UJ	1200 UJ	910 U
PHENANTHRENE	58 J	2200	2000	1800	1200	780	140 J	110 J	240 J	250 J
PHENOL	430 UJ	360 UJ	360 U	360 UJ	400 UJ	460 UJ	1900 UJ	400 UJ	460 UJ	360 U
PYRENE	56 J	2600	2300	2000	1300	810	240 J	160 J	300 J	940 J
VOLATILES (UG/KG)										
1,1,1-TRICHLOROETHANE	13 U	11 U	11 U	11 UJ	12 U	14 U	12 U	58 U	14 U	11 U
1,1,2,2-TETRACHLOROETHANE	13 U	11 U	11 U	11 UJ	12 U	14 U	12 UJ	58 UJ	14 UJ	11 UJ
1,1,2-TRICHLOROETHANE	13 U	11 U	11 U	11 UJ	12 U	14 U	12 U	58 U	14 U	11 U
1,1,2-TRICHLOROTRIFLUOROETHANE	13 U	11 UJ	11 U	11 UJ	38 J	46 J	12 U	58 U	14 U	11 J
1,1-DICHLOROETHANE	13 U	11 U	11 U	11 U	12 U	14 U	12 U	58 U	14 U	11 U
1,1-DICHLOROETHENE	13 U	11 U	11 U	11 U	12 U	14 U	12 U	58 U	14 U	11 U
1,2-DICHLOROETHANE	13 U	11 U	11 U	11 U	12 U	14 U	12 U	58 U	14 U	11 U
1,2-DICHLOROPROPANE	13 U	11 U	11 U	11 UJ	12 U	14 U	12 U	58 U	14 U	11 U
2-BUTANONE	13 U	11 U	2 J	2 J	1 J	11 J	12 U	58 U	42	22 J
2-HEXANONE	13 U	11 U	11 U	11 UJ	12 U	14 U	12 UJ	58 UJ	14 UJ	11 UJ
4-METHYL-2-PENTANONE	13 U	11 U	11 U	11 UJ	12 U	14 U	12 U	58 U	14 U	11 U
ACETONE	100	11 U	13 U	15 U	45 U	160	710	700 J	410	100 J
BENZENE	13 U	11 U	11 U	11 UJ	12 U	2 J	12 U	58 U	14 U	11 U
BROMODICHLOROMETHANE	13 U	11 U	11 U	11 UJ	12 U	14 U	12 U	58 U	14 U	11 U
BROMOFORM	13 U	11 U	11 U	11 U	12 U	14 U	12 U	58 U	14 U	11 U

LOCATION		TP-MW05					TP-MW06			
SAMPLE ID	TP-SB04-1315-98-D	TP-SB05-0305-98	TP-SB05-0305-98-AVG	TP-SB05-0305-98-D	TP-SB05-0507-98	TP-SB05-0810-98	TP-SB06-0305-98	TP-SB06-0507-98	TP-SB06-1315-98	TP-SB07-0305-98
SAMPLE DATE	19980618	19980609	19980609	19980609	19980609	19980609	19980616	19980616	19980616	19980615
SAMPLE CODE	DUP	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	13	3	3	3	5	8	3	5	13	3
BOTTOM DEPTH	15	5	5	5	7	10	5	7	15	5
BROMOMETHANE	13 U	11 U	11 U	11 U	12 U	14 U	12 U	58 U	14 U	11 U
CARBON DISULFIDE	2 J	11 U	11 U	11 U	12 U	22	12 U	58 U	14 U	11 U
CARBON TETRACHLORIDE	13 U	11 U	11 U	11 UJ	12 U	14 U	12 U	58 U	14 U	11 U
CHLOROBENZENE	13 U	11 U	11 U	11 UJ	12 U	14 U	12 U	58 U	14 U	11 U
CHLORODIBROMOMETHANE	13 U	11 U	11 U	11 UJ	12 U	14 U	12 U	58 U	14 U	11 U
CHLOROETHANE	13 U	11 U	11 U	11 U	12 U	14 U	12 U	58 U	14 U	11 U
CHLOROFORM	13 U	11 U	11 U	11 U	12 U	14 U	12 U	58 U	14 U	11 U
CHLOROMETHANE	13 U	11 U	11 U	11 U	12 U	14 U	12 U	58 U	14 U	11 U
CIS-1,3-DICHLOROPROPENE	13 U	11 U	11 U	11 UJ	12 U	14 U	12 U	58 U	14 U	11 U
ETHYLBENZENE	13 U	11 U	11 U	11 UJ	12 U	18	12 U	58 U	14 U	11 U
METHYLENE CHLORIDE	13 U	26 U	27 U	28 U	61 U	20 U	13 U	70 U	14 U	16 U
STYRENE	13 U	11 U	11 U	11 UJ	12 U	14 U	12 U	58 U	14 U	11 U
TETRACHLOROETHENE	13 U	11 U	11 U	11 UJ	1 J	14 U	12 U	58 U	14 U	11 U
TOLUENE	13 U	11 U	11 U	11 UJ	12 U	3 J	12 U	58 U	14 U	11 U
TOTAL 1,2-DICHLOROETHENE	13 U	11 U	11 U	11 U	12 U	14 U	12 U	58 U	14 U	11 U
TOTAL XYLENES	13 U	2 J	3	4 J	1 J	16	12 U	58 U	14 U	2 J
TRANS-1,3-DICHLOROPROPENE	13 U	11 U	11 U	11 UJ	12 U	14 U	12 U	58 U	14 U	11 U
TRICHLOROETHENE	13 U	11 U	11 U	11 UJ	12 U	14 U	12 U	58 U	14 U	11 U
VINYL CHLORIDE	13 U	11 U	11 U	11 U	12 U	14 U	12 U	58 U	14 U	11 U

LOCATION	TP-MW07					TP-SB08		
SAMPLE ID	TP-SB07-0709-98	TP-SB07-1315-98	TP-SB07-1315-98-AVG	TP-SB07-1315-98-D	TP-SB07-1820-98	TP-SB08-0305-98	TP-SB08-0507-98	TP-SB08-1820-98
SAMPLE DATE	19980615	19980615	19980615	19980615	19980615	19980710	19980710	19980710
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	7	13	13	13	18	3	5	18
BOTTOM DEPTH	9	15	15	15	20	5	7	20
METALS (MG/KG)								
ALUMINUM	NA	11900	10080	8260	10500	14000	15000	9040
ANTIMONY	NA	0.44 UR	0.425 R	0.41 UR	0.37 UR	0.36 UR	0.35 UR	0.49 UR
ARSENIC	NA	10.7	8.9	7.1	8.1	25.8 J	13.9 J	7.3 J
BARIUM	NA	62.9	56.95	51	30.6	109	84.7	33
BERYLLIUM	NA	1 J	0.77	0.54 J	0.86 J	0.35	0.43	0.41
CADMIUM	NA	0.51 U	0.495 U	0.48 U	0.42 U	0.54 J	0.7 J	1
CALCIUM	NA	3660 J	4420	5180 J	3950 J	13600 J	4240 J	57200 J
CHROMIUM	NA	42.1 J	42.5	42.9 J	27.7 J	128 J	91.5 J	33.3 J
COBALT	NA	9.7	9.1	8.5	7.2	14.5	15.3	5.8
COPPER	NA	257	292	327	9.7	66.8 J	90.6 J	17.8 J
IRON	NA	26600	24150	21700	20400	23800	27900	14700
LEAD	NA	291	287.5	284	9.2	102 J	399 J	59.8 J
MAGNESIUM	NA	6440	6350	6260	5410	10900	11700	8840
MANGANESE	NA	223 J	230.5	238 J	202 J	453 J	553 J	168 J
MERCURY	NA	0.84 J	0.97	1.1 J	0.08 J	0.34 J	0.32 J	0.24 J
NICKEL	NA	35.7	34.65	33.6	18.7	70.5	77.4	16.3 U
POTASSIUM	NA	3410 J	2670	1930 J	3730 J	5750	5010	2830
SELENIUM	NA	0.7 U	1 U	1.3 U	0.65 U	0.57 UJ	0.56 UJ	0.78 UJ
SILVER	NA	0.59 U	0.9975	1.7	0.49 U	0.48 U	0.47 U	0.65 U
SODIUM	NA	3180	2690	2200	4120	490	1270	5740
THALLIUM	NA	0.71 UJ	0.69 U	0.67 UJ	0.59 UJ	1 U	1.2 U	0.93 U
VANADIUM	NA	33.9	30.95	28	33.3	39.1	44.4	28.2
ZINC	NA	313	310	307	48	99 J	148 J	78.3 J
MISCELLANEOUS PARAMETERS (MG/KG)								
CYANIDE	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U
HEXAVALENT CHROMIUM	NA	NA	NA	NA	NA	0.5 U	0.55 UJ	0.62 UJ
TOTAL ORGANIC CARBON	NA	62000	65500	69000	19000	19000	22000	2800
MISCELLANEOUS PARAMETERS (S.U.)								
PH	NA	8.2	8.2	8.2	8.2	9.1	8.3	8.5
PESTICIDES/PCBS (UG/KG)								
4,4'-DDD	NA	4 U	4 U	4 U	4.4 U	3.4 U	3.9 U	4.2 U
4,4'-DDE	NA	4 U	4 U	4 U	4.4 U	3.4 U	3.9 J	4.2 U
4,4'-DDT	NA	4 U	4 U	4 U	4.4 U	3.4 U	3.9 U	4.2 U
ALDRIN	NA	2.1 U	2.1 U	2.1 U	2.3 U	1.8 U	1.9 U	2.1 U
ALPHA-BHC	NA	2.1 U	2.1 U	2.1 U	2.3 U	1.8 U	1.9 U	2.1 U
ALPHA-CHLORDANE	NA	2.1 U	2.1 U	2.1 U	2.3 U	1.8 U	1.9 U	2.1 U

LOCATION	TP-MW07					TP-SB08		
SAMPLE ID	TP-SB07-0709-98	TP-SB07-1315-98	TP-SB07-1315-98-AVG	TP-SB07-1315-98-D	TP-SB07-1820-98	TP-SB08-0305-98	TP-SB08-0507-98	TP-SB08-1820-98
SAMPLE DATE	19980615	19980615	19980615	19980615	19980615	19980710	19980710	19980710
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	7	13	13	13	18	3	5	18
BOTTOM DEPTH	9	15	15	15	20	5	7	20
AROCLOR-1016	NA	40 U	40 U	40 U	44 U	34 U	36 U	42 U
AROCLOR-1221	NA	82 U	82 U	82 U	90 U	69 U	74 U	84 U
AROCLOR-1232	NA	40 U	40 U	40 U	44 U	34 U	36 U	42 U
AROCLOR-1242	NA	40 U	40 U	40 U	44 U	34 U	36 U	42 U
AROCLOR-1248	NA	40 U	40 U	40 U	44 U	34 U	36 U	42 U
AROCLOR-1254	NA	40 U	40 U	40 U	44 U	34 U	36 U	42 U
AROCLOR-1260	NA	40 U	40 U	40 U	44 U	34 U	36 U	42 U
BETA-BHC	NA	2.1 U	2.1 U	2.1 U	2.3 U	1.8 U	1.9 U	2.1 U
DELTA-BHC	NA	2.1 U	2.1 U	2.1 U	2.3 U	1.8 U	1.9 U	2.1 U
DIELDRIN	NA	4 U	4 U	4 U	4.4 U	3.4 U	3.9 U	4.2 U
ENDOSULFAN I	NA	2.1 U	2.1 U	2.1 U	2.3 U	1.8 U	1.9 U	2.1 U
ENDOSULFAN II	NA	4 U	4 U	4 U	4.4 U	3.4 U	3.9 U	4.2 U
ENDOSULFAN SULFATE	NA	4 U	4 U	4 U	4.4 U	3.4 U	3.9 U	4.2 U
ENDRIN	NA	4 U	4 U	4 U	4.4 U	3.4 U	3.9 U	4.2 U
ENDRIN ALDEHYDE	NA	4 U	4 U	4 U	4.4 U	3.4 U	3.9 U	4.2 U
ENDRIN KETONE	NA	4 U	4 U	4 U	4.4 U	3.4 U	3.9 U	4.2 U
GAMMA-BHC (LINDANE)	NA	2.1 U	2.1 U	2.1 U	2.3 U	1.8 U	1.9 U	2.1 U
GAMMA-CHLORDANE	NA	2.1 U	2.1 U	2.1 U	2.3 U	1.8 U	1.9 U	2.1 U
HEPTACHLOR	NA	2.1 U	2.1 U	2.1 U	2.3 U	1.8 U	1.9 U	2.1 U
HEPTACHLOR EPOXIDE	NA	2.1 U	2.1 U	2.1 U	2.3 U	1.8 U	1.9 U	2.1 U
METHOXYCHLOR	NA	20 U	20.5 U	21 U	23 U	18 U	19 U	21 U
TOTAL AROCLOR	NA	0 U	0 U	0 U	0 U	0 U	0 U	0 U
TOTAL AROCLOR HALFND	NA	161	161	161	177	136.5	145	168
TOTAL AROCLOR ZEROND	NA	0 U	0 U	0 U	0 U	0 U	0 U	0 U
TOXAPHENE	NA	210 U	210 U	210 U	230 U	180 U	190 U	210 U
PETROLEUM HYDROCARBONS (MG/KG)								
DIESEL RANGE ORGANICS	100	1100	1200	1300	14	84 U	140 U	24 U
GASOLINE RANGE ORGANICS	2.5 U	21	14.1	7.2	4.6	2.5 U	4.6	2.8 U
SEMIVOLATILES (UG/KG)								
1,2,4-TRICHLOROBENZENE	NA	400 U	400 U	400 U	430 U	330 U	360 U	430 U
1,2-DICHLOROBENZENE	NA	400 U	400 U	400 U	430 U	330 U	360 U	430 U
1,3-DICHLOROBENZENE	NA	400 U	400 U	400 U	430 U	330 U	360 U	430 U
1,4-DICHLOROBENZENE	NA	400 UJ	400 U	400 UJ	430 UJ	330 U	360 U	430 U
2,2'-OXYBIS(1-CHLOROPROPANE)	NA	400 UJ	400 U	400 UJ	430 UJ	330 U	360 U	430 U
2,4,5-TRICHLOROPHENOL	NA	1000 U	1000 U	1000 U	1100 U	830 U	910 U	1100 U
2,4,6-TRICHLOROPHENOL	NA	400 U	400 U	400 U	430 U	330 U	360 U	430 U
2,4-DICHLOROPHENOL	NA	400 U	400 U	400 U	430 U	330 U	360 U	430 U

LOCATION	TP-MW07					TP-SB08		
SAMPLE ID	TP-SB07-0709-98	TP-SB07-1315-98	TP-SB07-1315-98-AVG	TP-SB07-1315-98-D	TP-SB07-1820-98	TP-SB08-0305-98	TP-SB08-0507-98	TP-SB08-1820-98
SAMPLE DATE	19980615	19980615	19980615	19980615	19980615	19980710	19980710	19980710
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	7	13	13	13	18	3	5	18
BOTTOM DEPTH	9	15	15	15	20	5	7	20
2,4-DIMETHYLPHENOL	NA	400 U	400 U	400 U	430 U	330 U	360 U	430 U
2,4-DINITROPHENOL	NA	1000 UJ	1000 U	1000 UJ	1100 UJ	830 UJ	910 UJ	1100 UJ
2,4-DINITROTOLUENE	NA	400 UJ	400 U	400 UJ	430 UJ	330 U	360 U	430 U
2,6-DINITROTOLUENE	NA	400 U	400 U	400 U	430 U	330 U	360 U	430 U
2-CHLORONAPHTHALENE	NA	400 U	400 U	400 U	430 U	330 U	360 U	430 U
2-CHLOROPHENOL	NA	400 U	400 U	400 U	430 U	330 U	360 U	430 U
2-METHYLNAPHTHALENE	NA	38 J	41.5	45 J	430 U	61 J	19 J	430 U
2-METHYLPHENOL	NA	400 U	400 U	400 U	430 U	330 U	360 U	430 U
2-NITROANILINE	NA	1000 U	1000 U	1000 U	1100 U	830 U	910 U	1100 U
2-NITROPHENOL	NA	400 U	400 U	400 U	430 U	330 U	360 U	430 U
3,3'-DICHLOROBENZIDINE	NA	400 U	400 U	400 U	430 U	330 UJ	360 UJ	430 UJ
3-NITROANILINE	NA	1000 U	1000 U	1000 U	1100 U	830 U	910 U	1100 U
4,6-DINITRO-2-METHYLPHENOL	NA	1000 U	1000 U	1000 U	1100 U	830 U	910 U	1100 U
4-BROMOPHENYL PHENYL ETHER	NA	400 U	400 U	400 U	430 U	330 U	360 U	430 U
4-CHLORO-3-METHYLPHENOL	NA	400 UJ	400 U	400 UJ	430 UJ	330 U	360 U	430 U
4-CHLOROANILINE	NA	400 U	400 U	400 U	430 U	330 UJ	360 UJ	430 UJ
4-CHLOROPHENYL PHENYL ETHER	NA	400 U	400 U	400 U	430 U	330 U	360 U	430 U
4-METHYLPHENOL	NA	400 U	400 U	400 U	430 U	330 U	360 U	430 U
4-NITROANILINE	NA	1000 U	1000 U	1000 U	1100 U	830 U	910 U	1100 U
4-NITROPHENOL	NA	1000 UJ	1000 U	1000 UJ	1100 UJ	830 U	910 U	1100 U
ACENAPHTHENE	NA	34 J	41.5	49 J	430 U	73 J	360 U	430 U
ACENAPHTHYLENE	NA	400 U	400 U	400 U	430 U	22 J	360 U	430 U
ANTHRACENE	NA	58 J	64.5	71 J	430 U	150 J	35 J	430 U
BAP EQUIVALENT-HALFND	NA	186.93	214.065	241.2	496.865 U	396.84	184.35	139.914
BAP EQUIVALENT-POS	NA	186.74	213.84	240.94	0 U	396.84	184.35	137.7
BENZO(A)ANTHRACENE	NA	130 J	165	200 J	430 U	300 J	140 J	63 J
BENZO(A)PYRENE	NA	110 J	125	140 J	430 U	260 J	120 J	79 J
BENZO(B)FLUORANTHENE	NA	140 J	160	180 J	430 U	340	210 J	59 J
BENZO(G,H,I)PERYLENE	NA	84 J	79	74 J	430 U	110 J	63 J	430 U
BENZO(K)FLUORANTHENE	NA	80 J	100	120 J	430 U	240 J	96 J	74 J
BIS(2-CHLOROETHOXY)METHANE	NA	400 U	400 U	400 U	430 U	330 U	360 U	430 U
BIS(2-CHLOROETHYL)ETHER	NA	400 U	400 U	400 U	430 U	330 UJ	360 UJ	430 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	NA	400 U	400 U	400 U	430 U	460 U	650	430 U
BUTYL BENZYL PHTHALATE	NA	400 U	400 U	400 U	430 U	330 U	360 U	430 U
CARBAZOLE	NA	38 J	32	26 J	430 U	84 J	32 J	430 U
CHRYSENE	NA	190 J	225	260 J	430 U	340	160 J	64 J
DIBENZO(A,H)ANTHRACENE	NA	40 J	46.5	53 J	430 U	58 J	21 J	43 J
DIBENZOFURAN	NA	42 J	46	50 J	430 U	70 J	360 U	430 U

LOCATION	TP-MW07					TP-SB08		
SAMPLE ID	TP-SB07-0709-98	TP-SB07-1315-98	TP-SB07-1315-98-AVG	TP-SB07-1315-98-D	TP-SB07-1820-98	TP-SB08-0305-98	TP-SB08-0507-98	TP-SB08-1820-98
SAMPLE DATE	19980615	19980615	19980615	19980615	19980615	19980710	19980710	19980710
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	7	13	13	13	18	3	5	18
BOTTOM DEPTH	9	15	15	15	20	5	7	20
DIETHYL PHTHALATE	NA	400 U	400 U	400 U	430 U	330 U	360 U	430 U
DIMETHYL PHTHALATE	NA	400 U	400 U	400 U	430 U	330 U	360 U	430 U
DI-N-BUTYL PHTHALATE	NA	400 U	400 U	400 U	430 U	30 J	360 U	430 U
DI-N-OCTYL PHTHALATE	NA	400 UJ	400 U	400 UJ	430 UJ	330 U	360 U	430 U
FLUORANTHENE	NA	780	885	990	430 U	590	300 J	89 J
FLUORENE	NA	40 J	41	42 J	430 U	97 J	22 J	430 U
HEXACHLOROBENZENE	NA	400 U	400 U	400 U	430 U	330 U	360 U	430 U
HEXACHLOROBUTADIENE	NA	400 U	400 U	400 U	430 U	330 U	360 U	430 U
HEXACHLOROCYCLOPENTADIENE	NA	400 U	400 U	400 U	430 U	330 U	360 U	430 U
HEXACHLOROETHANE	NA	400 U	400 U	400 U	430 U	330 U	360 U	430 U
HIGH MOLECULAR WEIGHT PAHS	NA	1720	2041.5	2363	1290	2048	1001	458
INDENO(1,2,3-CD)PYRENE	NA	89 J	90.5	92 J	430 U	110 J	66 J	35 J
ISOPHORONE	NA	400 U	400 U	400 U	430 U	330 U	360 U	430 U
LOW MOLECULAR WEIGHT PAHS	NA	524	564	604	1505	1068	786	1353
NAPHTHALENE	NA	34 J	35.5	37 J	430 U	85 J	360 U	430 U
NITROBENZENE	NA	400 U	400 U	400 U	430 U	330 U	360 U	430 U
N-NITROSO-DI-N-PROPYLAMINE	NA	400 UJ	400 U	400 UJ	430 UJ	330 U	360 U	430 U
N-NITROSODIPHENYLAMINE	NA	400 U	400 U	400 U	430 U	330 U	360 U	430 U
PENTACHLOROPHENOL	NA	1000 U	1000 U	1000 U	1100 U	830 UJ	910 UJ	1100 UJ
PHENANTHRENE	NA	120 J	140	160 J	430 U	580	170 J	63 J
PHENOL	NA	400 UJ	400 U	400 UJ	430 UJ	330 UJ	360 UJ	430 UJ
PYRENE	NA	470	595	720	430 U	500	260 J	120 J
VOLATILES (UG/KG)								
1,1,1-TRICHLOROETHANE	NA	12 U	12 U	12 U	14 U	10 UJ	11 UJ	13 U
1,1,2,2-TETRACHLOROETHANE	NA	12 UJ	12 U	12 UJ	14 UJ	10 UR	11 UJ	13 U
1,1,2-TRICHLOROETHANE	NA	12 U	12 U	12 U	14 U	10 UJ	11 UJ	13 U
1,1,2-TRICHLOROTRIFLUOROETHANE	NA	12 U	12 U	12 U	14 U	10 UJ	11 U	13 U
1,1-DICHLOROETHANE	NA	12 U	12 U	12 U	14 U	10 UJ	11 UJ	13 U
1,1-DICHLOROETHENE	NA	12 U	12 U	12 U	14 U	10 UJ	11 UJ	13 U
1,2-DICHLOROETHANE	NA	12 U	12 U	12 U	14 U	10 UJ	11 UJ	13 U
1,2-DICHLOROPROPANE	NA	12 U	12 U	12 U	14 U	10 UJ	11 UJ	13 U
2-BUTANONE	NA	12 UJ	12 U	12 UJ	14 UJ	10 UJ	11 U	4 U
2-HEXANONE	NA	12 UJ	12 U	12 UJ	1 J	10 UR	11 UJ	13 U
4-METHYL-2-PENTANONE	NA	12 U	12 U	12 U	14 U	10 UR	11 UJ	13 U
ACETONE	NA	1700 U	130 J	130 J	170 U	28 U	42 U	21 U
BENZENE	NA	12 U	12 U	12 U	14 U	10 UJ	11 UJ	13 U
BROMODICHLOROMETHANE	NA	12 U	12 U	12 U	14 U	10 UJ	11 UJ	13 U
BROMOFORM	NA	12 U	12 U	12 U	14 U	10 UJ	11 UJ	13 U

LOCATION	TP-MW07					TP-SB08		
SAMPLE ID	TP-SB07-0709-98	TP-SB07-1315-98	TP-SB07-1315-98-AVG	TP-SB07-1315-98-D	TP-SB07-1820-98	TP-SB08-0305-98	TP-SB08-0507-98	TP-SB08-1820-98
SAMPLE DATE	19980615	19980615	19980615	19980615	19980615	19980710	19980710	19980710
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	7	13	13	13	18	3	5	18
BOTTOM DEPTH	9	15	15	15	20	5	7	20
BROMOMETHANE	NA	12 U	12 U	12 U	14 U	10 UJ	11 UJ	13 U
CARBON DISULFIDE	NA	12 U	12 U	12 U	6 J	2 J	8 J	6 J
CARBON TETRACHLORIDE	NA	12 U	12 U	12 U	14 U	10 UJ	11 UJ	13 U
CHLOROBENZENE	NA	12 U	12 U	12 U	14 U	10 UR	11 UJ	13 U
CHLORODIBROMOMETHANE	NA	12 U	12 U	12 U	14 U	10 UJ	11 UJ	13 U
CHLOROETHANE	NA	12 U	12 U	12 U	14 U	10 UJ	11 UJ	13 U
CHLOROFORM	NA	12 U	12 U	12 U	14 U	10 UJ	11 UJ	13 U
CHLOROMETHANE	NA	12 U	12 U	12 U	14 U	10 UJ	11 UJ	13 U
CIS-1,3-DICHLOROPROPENE	NA	12 U	12 U	12 U	14 U	10 UJ	11 UJ	13 U
ETHYLBENZENE	NA	12 U	12 U	12 U	14 U	10 UR	11 UJ	13 U
METHYLENE CHLORIDE	NA	12 U	12 U	12 U	14 U	43 U	39 U	15 U
STYRENE	NA	12 U	12 U	12 U	14 U	10 UR	11 UJ	13 U
TETRACHLOROETHENE	NA	12 U	12 U	12 U	14 U	10 UR	11 UJ	13 U
TOLUENE	NA	12 U	12 U	12 U	14 U	10 UR	11 UJ	13 U
TOTAL 1,2-DICHLOROETHENE	NA	12 U	12 U	12 U	14 U	10 UJ	11 UJ	13 U
TOTAL XYLENES	NA	12 U	12 U	12 U	14 U	10 UR	11 U	13 U
TRANS-1,3-DICHLOROPROPENE	NA	12 U	12 U	12 U	14 U	10 UJ	11 UJ	13 U
TRICHLOROETHENE	NA	12 U	12 U	12 U	14 U	2 J	2 J	13 U
VINYL CHLORIDE	NA	12 U	12 U	12 U	14 U	10 UJ	11 UJ	13 U

LOCATION	TP-SB09				TP-SB10				
SAMPLE ID	TP-SB09-0305-98	TP-SB09-0507-98	TP-SB09-0810-98	TP-SB09-1315-98	TP-SB10-0305-98	TP-SB10-0709-98	TP-SB10-0911-98	TP-SB10-1315-98	TP-SB11-0305-98
SAMPLE DATE	19980609	19980609	19980609	19980609	19980616	19980616	19980616	19980616	19980716
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	3	5	8	13	3	7	9	13	3
BOTTOM DEPTH	5	7	10	15	5	9	11	15	5
METALS (MG/KG)									
ALUMINUM	6970	NA	8510	7460	11900	NA	NA	9400	5870
ANTIMONY	6.1 J	NA	1.6 U	0.5 UR	1.2 U	NA	NA	0.43 UR	0.3 UJ
ARSENIC	11	NA	22.9	5.7	15.1	NA	NA	5.5	7.5
BARIUM	92.9	NA	49.6	22.8	85.8	NA	NA	26.4	16.2
BERYLLIUM	0.42 U	NA	0.35 U	0.52 U	0.48 J	NA	NA	0.62	0.48
CADMIUM	1.7	NA	0.92	0.58 U	0.41 UJ	NA	NA	0.49 U	0.26 U
CALCIUM	20500 J	NA	7910 J	2520 J	21600	NA	NA	4840	948
CHROMIUM	45.9 J	NA	111 J	23.2 J	45.5 J	NA	NA	24.3 J	15.6
COBALT	9.1	NA	20.6	5.8	10.5	NA	NA	6.3	6.2
COPPER	1320	NA	565	22.7	707 J	NA	NA	9.2 J	34.9 J
IRON	32300	NA	160000	16200	19700	NA	NA	16500	9280
LEAD	423	NA	139	13.4	223 J	NA	NA	10.3 J	18.2 J
MAGNESIUM	4400	NA	6640	4280	7640	NA	NA	5120	3430
MANGANESE	426 J	NA	929 J	164 J	358 J	NA	NA	173 J	142
MERCURY	0.95 J	NA	0.47 J	0.05 J	0.5 J	NA	NA	0.01 UJ	0.95 J
NICKEL	69.3	NA	178	19.3	52.5	NA	NA	14.5	19.2
POTASSIUM	1750 J	NA	2740 J	2560 J	2860	NA	NA	3010	1570
SELENIUM	0.61 U	NA	7	0.81 U	0.57 UJ	NA	NA	0.69 UJ	0.48 U
SILVER	0.56 J	NA	0.66 J	0.67 U	0.48 U	NA	NA	0.57 U	0.11 U
SODIUM	270	NA	3490	3480	400	NA	NA	3880	984
THALLIUM	0.62 UJ	NA	2.6 U	0.81 UJ	0.58 U	NA	NA	0.7 U	0.49 U
VANADIUM	25.9	NA	30.1	24.2	27.8 J	NA	NA	28 J	13.1 J
ZINC	849	NA	1220	56.9	436 J	NA	NA	45.7 J	88.5 J
MISCELLANEOUS PARAMETERS (MG/KG)									
CYANIDE	2 U	NA	2 UR	2 UR	2 U	NA	NA	2 U	10
HEXAVALENT CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL ORGANIC CARBON	NA	NA	18000	11000	53000	NA	NA	11000	3200
MISCELLANEOUS PARAMETERS (S.U.)									
PH	8.5	NA	6.8	8.1	8.4	NA	NA	8.2	8.6
PESTICIDES/PCBS (UG/KG)									
4,4'-DDD	3.7 U	NA	4.3 U	4.4 U	3.7 U	NA	NA	4.4 U	7.2 U
4,4'-DDE	8.9 J	NA	4.3 U	4.4 U	3.7 U	NA	NA	4.4 U	7.2 U
4,4'-DDT	27 J	NA	4.3 U	4.4 U	3.7 U	NA	NA	4.4 U	7.2 U
ALDRIN	1.9 U	NA	2.2 U	2.3 U	1.2 R	NA	NA	2.3 U	3.7 U
ALPHA-BHC	1.9 U	NA	2.2 U	2.3 U	1.9 U	NA	NA	2.3 U	3.7 U
ALPHA-CHLORDANE	1.9 U	NA	2.2 U	2.3 U	1.9 U	NA	NA	2.3 U	3.7 U

LOCATION	TP-SB09				TP-SB10				
SAMPLE ID	TP-SB09-0305-98	TP-SB09-0507-98	TP-SB09-0810-98	TP-SB09-1315-98	TP-SB10-0305-98	TP-SB10-0709-98	TP-SB10-0911-98	TP-SB10-1315-98	TP-SB11-0305-98
SAMPLE DATE	19980609	19980609	19980609	19980609	19980616	19980616	19980616	19980616	19980716
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	3	5	8	13	3	7	9	13	3
BOTTOM DEPTH	5	7	10	15	5	9	11	15	5
AROCLOR-1016	37 U	NA	43 U	44 U	37 U	NA	NA	44 U	72 U
AROCLOR-1221	75 U	NA	87 U	90 U	75 U	NA	NA	89 U	150 U
AROCLOR-1232	37 U	NA	43 U	44 U	37 U	NA	NA	44 U	72 U
AROCLOR-1242	37 U	NA	43 U	44 U	37 U	NA	NA	44 U	72 U
AROCLOR-1248	37 U	NA	43 U	44 U	37 U	NA	NA	44 U	72 U
AROCLOR-1254	37 U	NA	43 U	44 U	37 U	NA	NA	44 U	72 U
AROCLOR-1260	37 U	NA	43 U	44 U	37 U	NA	NA	44 U	710
BETA-BHC	1.9 U	NA	2.2 U	2.3 U	1.9 U	NA	NA	2.3 U	3.7 U
DELTA-BHC	1.9 U	NA	2.2 U	2.3 U	1.9 U	NA	NA	2.3 U	3.7 U
DIELDRIN	3.7 U	NA	4.3 U	4.4 U	3.7 U	NA	NA	4.4 U	7.2 U
ENDOSULFAN I	1.9 U	NA	2.2 U	2.3 U	1.9 U	NA	NA	2.3 U	3.7 U
ENDOSULFAN II	3.7 U	NA	4.3 U	4.4 U	3.7 U	NA	NA	4.4 U	7.2 U
ENDOSULFAN SULFATE	3.7 U	NA	6.1 J	4.4 U	3.7 U	NA	NA	4.4 U	7.2 U
ENDRIN	3.7 U	NA	4.3 U	4.4 U	3.7 U	NA	NA	4.4 U	7.2 U
ENDRIN ALDEHYDE	3.7 U	NA	4.3 U	4.4 U	3.7 U	NA	NA	4.4 U	7.2 U
ENDRIN KETONE	3.7 U	NA	4.3 U	4.4 U	3.7 U	NA	NA	4.4 U	7.2 U
GAMMA-BHC (LINDANE)	1.9 U	NA	2.2 U	2.3 U	1.9 U	NA	NA	2.3 U	3.7 U
GAMMA-CHLORDANE	1.9 U	NA	2.2 U	2.3 U	1.9 U	NA	NA	2.3 U	3.7 U
HEPTACHLOR	1.9 U	NA	2.2 U	2.3 U	1.9 U	NA	NA	2.3 U	3.7 U
HEPTACHLOR EPOXIDE	1.9 U	NA	2.2 U	2.3 U	1.9 U	NA	NA	2.3 U	3.7 U
METHOXYCHLOR	19 U	NA	22 U	23 U	19 U	NA	NA	23 U	37 U
TOTAL AROCLOR	0 U	NA	0 U	0 U	0 U	NA	NA	0 U	710
TOTAL AROCLOR HALFND	148.5	NA	172.5	177	148.5	NA	NA	176.5	965
TOTAL AROCLOR ZEROND	0 U	NA	0 U	0 U	0 U	NA	NA	0 U	710
TOXAPHENE	190 U	NA	220 U	230 U	190 U	NA	NA	230 U	370 U
PETROLEUM HYDROCARBONS (MG/KG)									
DIESEL RANGE ORGANICS	1100	720	240	7.5	210	65	36	14	NA
GASOLINE RANGE ORGANICS	2.8 J	9.3 J	5.7 J	5 UJ	3 UJ	2.5 UJ	2.5 UJ	2.8 UJ	NA
SEMIVOLATILES (UG/KG)									
1,2,4-TRICHLOROBENZENE	360 U	NA	430 U	430 U	360 U	NA	NA	430 U	360 U
1,2-DICHLOROBENZENE	360 U	NA	430 U	430 U	360 U	NA	NA	430 U	360 U
1,3-DICHLOROBENZENE	360 U	NA	430 U	430 U	360 U	NA	NA	430 U	360 U
1,4-DICHLOROBENZENE	360 U	NA	430 U	430 U	360 U	NA	NA	430 U	360 U
2,2'-OXYBIS(1-CHLOROPROPANE)	360 U	NA	430 U	430 U	360 U	NA	NA	430 U	360 U
2,4,5-TRICHLOROPHENOL	910 U	NA	1100 U	1100 U	910 U	NA	NA	1100 U	910 U
2,4,6-TRICHLOROPHENOL	360 U	NA	430 U	430 U	360 U	NA	NA	430 U	360 U
2,4-DICHLOROPHENOL	360 U	NA	430 U	430 U	360 U	NA	NA	430 U	360 U

LOCATION	TP-SB09				TP-SB10				
SAMPLE ID	TP-SB09-0305-98	TP-SB09-0507-98	TP-SB09-0810-98	TP-SB09-1315-98	TP-SB10-0305-98	TP-SB10-0709-98	TP-SB10-0911-98	TP-SB10-1315-98	TP-SB11-0305-98
SAMPLE DATE	19980609	19980609	19980609	19980609	19980616	19980616	19980616	19980616	19980716
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	3	5	8	13	3	7	9	13	3
BOTTOM DEPTH	5	7	10	15	5	9	11	15	5
2,4-DIMETHYLPHENOL	360 U	NA	430 U	430 U	360 U	NA	NA	430 U	360 U
2,4-DINITROPHENOL	910 UJ	NA	1100 UJ	1100 UJ	910 UJ	NA	NA	1100 UJ	910 UJ
2,4-DINITROTOLUENE	360 U	NA	430 U	430 U	360 U	NA	NA	430 U	360 U
2,6-DINITROTOLUENE	360 U	NA	430 U	430 U	360 U	NA	NA	430 U	360 U
2-CHLORONAPHTHALENE	360 U	NA	430 U	430 U	360 U	NA	NA	430 U	360 U
2-CHLOROPHENOL	360 U	NA	430 U	430 U	360 UJ	NA	NA	430 UJ	360 U
2-METHYLNAPHTHALENE	95 J	NA	61 J	430 U	66 J	NA	NA	430 U	360 U
2-METHYLPHENOL	360 U	NA	430 U	430 U	360 U	NA	NA	430 U	360 U
2-NITROANILINE	910 U	NA	1100 U	1100 U	910 U	NA	NA	1100 U	910 UJ
2-NITROPHENOL	360 U	NA	430 U	430 U	360 U	NA	NA	430 U	360 U
3,3'-DICHLOROBENZIDINE	360 U	NA	430 U	430 U	360 U	NA	NA	430 U	360 U
3-NITROANILINE	910 U	NA	1100 U	1100 U	910 U	NA	NA	1100 U	910 U
4,6-DINITRO-2-METHYLPHENOL	910 UJ	NA	1100 UJ	1100 UJ	910 U	NA	NA	1100 U	910 U
4-BROMOPHENYL PHENYL ETHER	360 U	NA	430 U	430 U	360 U	NA	NA	430 U	360 U
4-CHLORO-3-METHYLPHENOL	360 U	NA	430 U	430 U	360 UJ	NA	NA	430 UJ	360 U
4-CHLOROANILINE	360 U	NA	430 U	430 U	360 U	NA	NA	430 U	360 U
4-CHLOROPHENYL PHENYL ETHER	360 U	NA	430 U	430 U	360 U	NA	NA	430 U	360 U
4-METHYLPHENOL	360 U	NA	430 U	430 U	360 U	NA	NA	430 U	360 U
4-NITROANILINE	910 U	NA	1100 U	1100 U	910 U	NA	NA	1100 U	910 U
4-NITROPHENOL	910 U	NA	1100 U	1100 U	910 UJ	NA	NA	1100 UJ	910 UJ
ACENAPHTHENE	200 J	NA	180 J	430 U	100 J	NA	NA	430 U	360 U
ACENAPHTHYLENE	33 J	NA	430 U	430 U	41 J	NA	NA	430 U	360 U
ANTHRACENE	450	NA	330 J	430 U	330 J	NA	NA	430 U	360 U
BAP EQUIVALENT-HALFND	1528.5	NA	605.53	460.787	1121.96	NA	NA	496.865 U	257.23
BAP EQUIVALENT-POS	1528.5	NA	605.53	7.1	1120.16	NA	NA	0 U	21.25
BENZO(A)ANTHRACENE	1200	NA	530	37 J	680	NA	NA	430 U	360 U
BENZO(A)PYRENE	910	NA	340 J	430 U	650	NA	NA	430 U	21 J
BENZO(B)FLUORANTHENE	1000	NA	480	34 J	830	NA	NA	430 U	360 U
BENZO(G,H,I)PERYLENE	580	NA	220 J	430 U	360 U	NA	NA	430 U	25 J
BENZO(K)FLUORANTHENE	750	NA	280 J	43 J	550	NA	NA	430 U	360 U
BIS(2-CHLOROETHOXY)METHANE	360 U	NA	430 U	430 U	360 U	NA	NA	430 U	360 U
BIS(2-CHLOROETHYL)ETHER	360 U	NA	430 U	430 U	360 U	NA	NA	430 U	360 U
BIS(2-ETHYLHEXYL)PHTHALATE	360 U	NA	500 U	430 U	360 U	NA	NA	430 U	160 U
BUTYL BENZYL PHTHALATE	360 U	NA	430 U	35 J	360 U	NA	NA	430 U	20 J
CARBAZOLE	230 J	NA	130 J	430 U	110 J	NA	NA	430 U	360 U
CHRYSENE	1200	NA	530	37 J	660	NA	NA	430 U	360 U
DIBENZO(A,H)ANTHRACENE	320 J	NA	140 J	430 U	250 J	NA	NA	430 U	360 U
DIBENZOFURAN	120 J	NA	140 J	430 U	100 J	NA	NA	430 U	360 U

LOCATION	TP-SB09				TP-SB10				
SAMPLE ID	TP-SB09-0305-98	TP-SB09-0507-98	TP-SB09-0810-98	TP-SB09-1315-98	TP-SB10-0305-98	TP-SB10-0709-98	TP-SB10-0911-98	TP-SB10-1315-98	TP-SB11-0305-98
SAMPLE DATE	19980609	19980609	19980609	19980609	19980616	19980616	19980616	19980616	19980716
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	3	5	8	13	3	7	9	13	3
BOTTOM DEPTH	5	7	10	15	5	9	11	15	5
DIETHYL PHTHALATE	360 U	NA	430 U	430 U	360 U	NA	NA	430 U	360 U
DIMETHYL PHTHALATE	360 U	NA	430 U	430 U	360 U	NA	NA	430 U	360 U
DI-N-BUTYL PHTHALATE	20 J	NA	430 U	430 U	25 J	NA	NA	430 U	360 U
DI-N-OCTYL PHTHALATE	360 UJ	NA	430 UJ	430 UJ	360 UJ	NA	NA	430 U	360 U
FLUORANTHENE	1700	NA	1000	61 J	1400	NA	NA	430 U	360 U
FLUORENE	210 J	NA	300 J	430 U	140 J	NA	NA	430 U	360 U
HEXACHLOROBENZENE	360 U	NA	430 U	430 U	360 U	NA	NA	430 U	360 U
HEXACHLOROBUTADIENE	360 U	NA	430 U	430 U	360 U	NA	NA	430 U	360 U
HEXACHLOROCYCLOPENTADIENE	360 UJ	NA	430 UJ	430 UJ	360 U	NA	NA	430 U	360 U
HEXACHLOROETHANE	360 U	NA	430 U	430 U	360 U	NA	NA	430 U	360 U
HIGH MOLECULAR WEIGHT PAHS	8030	NA	3940	654	5040	NA	NA	1290	760
INDENO(1,2,3-CD)PYRENE	640	NA	190 J	430 U	630	NA	NA	430 U	360 U
ISOPHORONE	360 U	NA	430 U	430 U	360 U	NA	NA	430 U	360 U
LOW MOLECULAR WEIGHT PAHS	2767	NA	2774	1372	1755	NA	NA	1505	1260
NAPHTHALENE	79 J	NA	88 J	430 U	78 J	NA	NA	430 U	360 U
NITROBENZENE	360 U	NA	430 U	430 U	360 U	NA	NA	430 U	360 U
N-NITROSO-DI-N-PROPYLAMINE	360 U	NA	430 U	430 U	360 U	NA	NA	430 U	360 U
N-NITROSODIPHENYLAMINE	360 U	NA	430 U	430 U	360 U	NA	NA	430 U	360 U
PENTACHLOROPHENOL	910 U	NA	1100 U	1100 U	910 UJ	NA	NA	1100 UJ	910 UJ
PHENANTHRENE	1700	NA	1600	82 J	1000	NA	NA	430 U	360 U
PHENOL	360 U	NA	430 U	430 U	360 UJ	NA	NA	430 UJ	360 U
PYRENE	2700	NA	1400	89 J	1400	NA	NA	430 U	19 J
VOLATILES (UG/KG)									
1,1,1-TRICHLOROETHANE	11 UJ	11 UJ	13 U	13 U	11 U	11 U	NA	13 U	11 U
1,1,2,2-TETRACHLOROETHANE	11 UJ	11 UJ	13 U	13 U	11 UJ	11 UJ	NA	13 UJ	11 U
1,1,2-TRICHLOROETHANE	11 UJ	11 UJ	13 U	13 U	11 U	11 U	NA	13 U	11 U
1,1,2-TRICHLOROTRIFLUOROETHANE	11 UJ	11 UJ	13 UJ	13 UJ	11 U	11 U	NA	13 U	11 U
1,1-DICHLOROETHANE	11 UJ	11 UJ	13 U	13 U	11 U	11 U	NA	13 U	11 U
1,1-DICHLOROETHENE	11 UJ	11 UJ	13 U	13 U	11 U	11 U	NA	13 U	11 U
1,2-DICHLOROETHANE	11 UJ	11 UJ	13 U	13 U	11 U	11 U	NA	13 U	11 U
1,2-DICHLOROPROPANE	11 UJ	11 UJ	13 U	13 U	11 U	11 U	NA	13 U	11 U
2-BUTANONE	11 UJ	38 J	32	2 J	11 U	11 U	NA	13 U	11 U
2-HEXANONE	11 UJ	11 UJ	13 U	13 U	11 UJ	11 UJ	NA	13 UJ	11 U
4-METHYL-2-PENTANONE	11 UJ	11 UJ	13 U	13 U	11 U	11 U	NA	13 U	11 U
ACETONE	52 U	300 J	3400 U	49 U	230 U	160 U	NA	18 U	11 U
BENZENE	11 UJ	11 UJ	13 U	13 U	11 U	11 U	NA	13 UJ	11 U
BROMODICHLOROMETHANE	11 UJ	11 UJ	13 U	13 U	11 U	11 U	NA	13 U	11 U
BROMOFORM	11 UJ	11 U	13 U	13 U	11 U	11 U	NA	13 U	11 U

LOCATION	TP-SB09				TP-SB10				
SAMPLE ID	TP-SB09-0305-98	TP-SB09-0507-98	TP-SB09-0810-98	TP-SB09-1315-98	TP-SB10-0305-98	TP-SB10-0709-98	TP-SB10-0911-98	TP-SB10-1315-98	TP-SB11-0305-98
SAMPLE DATE	19980609	19980609	19980609	19980609	19980616	19980616	19980616	19980616	19980716
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	3	5	8	13	3	7	9	13	3
BOTTOM DEPTH	5	7	10	15	5	9	11	15	5
BROMOMETHANE	11 UJ	11 UJ	13 U	13 U	11 U	11 U	NA	13 U	11 U
CARBON DISULFIDE	8 J	4 J	7 J	5 J	11 U	11 U	NA	4 J	11 U
CARBON TETRACHLORIDE	11 UJ	11 UJ	13 U	13 U	11 U	11 U	NA	13 U	11 U
CHLOROBENZENE	11 UJ	11 UJ	13 U	13 U	11 U	11 U	NA	13 U	11 U
CHLORODIBROMOMETHANE	11 UJ	11 UJ	13 U	13 U	11 U	11 U	NA	13 U	11 U
CHLOROETHANE	11 UJ	11 UJ	13 U	13 U	11 U	11 U	NA	13 U	11 U
CHLOROFORM	11 UJ	11 UJ	13 U	13 U	11 U	11 U	NA	13 U	11 U
CHLOROMETHANE	11 UJ	11 UJ	13 U	13 UJ	11 U	11 U	NA	13 U	11 U
CIS-1,3-DICHLOROPROPENE	11 UJ	11 UJ	13 U	13 U	11 U	11 U	NA	13 U	11 U
ETHYLBENZENE	11 UJ	11 UJ	13 U	13 U	11 U	11 U	NA	13 U	11 U
METHYLENE CHLORIDE	41 U	54 U	13 U	30 U	17 U	14 U	NA	13 U	19 U
STYRENE	11 UJ	11 UJ	13 U	13 U	11 U	11 U	NA	13 U	11 U
TETRACHLOROETHENE	9 J	11 UJ	13 U	13 U	11 U	11 U	NA	13 U	11 U
TOLUENE	11 UJ	11 UJ	13 U	13 U	11 U	11 U	NA	13 U	11 U
TOTAL 1,2-DICHLOROETHENE	11 UJ	11 U	13 U	13 U	11 U	11 U	NA	13 U	11 U
TOTAL XYLENES	11 UJ	11 UJ	13 U	13 U	11 U	11 U	NA	13 U	11 U
TRANS-1,3-DICHLOROPROPENE	11 UJ	11 UJ	13 U	13 U	11 U	11 U	NA	13 U	11 U
TRICHLOROETHENE	11 UJ	11 UJ	13 U	13 U	11 U	11 U	NA	13 UJ	11 U
VINYL CHLORIDE	11 UJ	11 UJ	13 U	13 U	11 U	11 U	NA	13 U	11 U

LOCATION	TP-SB11		TP-SB12	TP-SB13			TP-SB14			
SAMPLE ID	TP-SB11-0709-98	TP-SB11-1315-98	TP-SB12-0507-98	TP-SB13-0305-98	TP-SB13-0709-98	TP-SB13-1315-98	TP-SB14-0305-98	TP-SB14-0709-98	TP-SB14-1315-98	TP-SB15-0305-98
SAMPLE DATE	19980716	19980716	19980713	19980715	19980715	19980715	19980715	19980715	19980715	19980710
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	7	13	5	3	7	13	3	7	13	3
BOTTOM DEPTH	9	15	7	5	9	15	5	9	15	5
METALS (MG/KG)										
ALUMINUM	2360	5480	16100	19600	20000	6890	5180	9810	9000	14200
ANTIMONY	1.2 U	0.73 U	0.43 UR	0.38 UJ	0.44 U	0.35 UJ	1.5 UJ	0.55 UJ	0.39 UJ	0.35 UR
ARSENIC	8.3	4.5 J	15.5 J	15	14.8	4.4 J	13.1	18.1	11	10.7 J
BARIUM	8.8	16.2	62.5	101	103	20.3	66.4	170	30.1	96.1
BERYLLIUM	0.08 U	0.26	0.75	0.63	0.49	0.28	0.21	0.37	0.47	0.77
CADMIUM	1.5	1.2	0.58 J	0.65 J	0.72 J	0.41 U	1.7	7.7	0.7 J	0.8
CALCIUM	914	4330	1470 J	4690	4620	1340	2700	4740	8840	2360 J
CHROMIUM	36.4	16.7	34 J	64.3	81	23.4	111	88.6	28.6	56.7 J
COBALT	7.6	3.9	11.1	16.8	15.6	4.1	35	45.8	5.9	11.1
COPPER	9000 J	30600 J	78.9 J	32.6 J	60.6 J	5.3 U	17500 J	12800 J	67.3 J	139 J
IRON	44600	14100	26200	27700	27400	10700	190000	117000	23000	21600
LEAD	325 J	577 J	17 U	255 J	21.2 J	7.4 J	398 J	1100 J	133 J	159 J
MAGNESIUM	1320	3590	6490	11000	13300	4190	4120	6380	5300	6190
MANGANESE	452	120	318 J	597	507	81.8	1580	1390	200	329 J
MERCURY	0.28 J	0.03 U	0.12 J	0.42 J	0.04 U	0.05 U	0.77 J	10.8 J	1 J	0.26 J
NICKEL	83.1	62.5	29.6	55.8	116	14.6	354	1540	36	34.9
POTASSIUM	460	1670	4200	2600	4080	1800	1240	2520	2930	2320
SELENIUM	3.1 UJ	12.2 U	0.69 UJ	0.62 U	0.63 U	0.57 U	24.5 UJ	4.5 U	0.63 U	0.57 UJ
SILVER	1.6 U	2.3 U	0.57 U	0.24 U	0.42 U	0.13 U	1.9 U	2.8 U	0.48 U	0.48 U
SODIUM	1680	2660	1590	294 U	491	226 U	420	1030	1580	141 U
THALLIUM	0.63 U	0.61 U	0.76 U	0.62 UJ	0.75 U	0.58 U	2.7 U	1.6 U	0.64 UJ	0.84 U
VANADIUM	28.6 J	17.2 J	37.6	43 J	47.8 J	20 J	27.3 J	39.5 J	28.9 J	44.3
ZINC	2810 J	9630 J	108 J	87.6 J	99.6 J	23.1 J	778 J	5360 J	64.5 J	189 J
MISCELLANEOUS PARAMETERS (MG/KG)										
CYANIDE	2 U	7.6	2 UJ	2 U	2 U	2 U	2 U	2 U	2 U	2 U
HEXAVALENT CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.2 U
TOTAL ORGANIC CARBON	4100	4100	6200	10000	3100	2500	4600	160000	7100	67000 J
MISCELLANEOUS PARAMETERS (S.U.)										
PH	8.2	8.6	8.1	7	7.8	8.1	7.2	7.7	9.6	6.2
PESTICIDES/PCBS (UG/KG)										
4,4'-DDD	3.8 U	4.2 U	3.9 U	4 U	3.9 U	3.9 U	68 U	27 U	4.5 U	4.6 R
4,4'-DDE	3.8 U	4.2 U	3.9 U	4 U	3.9 U	3.9 U	68 U	27 U	4.5 U	18 J
4,4'-DDT	3.8 U	4.2 U	2.7 J	4 U	3.9 U	3.9 U	68 U	27 U	4.5 U	69
ALDRIN	2 U	2.2 U	2 U	2 U	2 U	2 U	35 U	14 U	2.3 U	3.8 U
ALPHA-BHC	2 U	2.2 U	2 U	2 U	2 U	2 U	35 U	14 U	2.3 U	3.8 U
ALPHA-CHLORDANE	2 U	2.2 U	2 U	2 U	2 U	2 U	35 U	21	2.3 U	3.8 U

LOCATION	TP-SB11		TP-SB12	TP-SB13			TP-SB14			
SAMPLE ID	TP-SB11-0709-98	TP-SB11-1315-98	TP-SB12-0507-98	TP-SB13-0305-98	TP-SB13-0709-98	TP-SB13-1315-98	TP-SB14-0305-98	TP-SB14-0709-98	TP-SB14-1315-98	TP-SB15-0305-98
SAMPLE DATE	19980716	19980716	19980713	19980715	19980715	19980715	19980715	19980715	19980715	19980710
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	7	13	5	3	7	13	3	7	13	3
BOTTOM DEPTH	9	15	7	5	9	15	5	9	15	5
AROCLOR-1016	38 U	43 U	39 U	40 U	39 U	39 U	680 U	270 U	45 U	74 U
AROCLOR-1221	78 U	42 U	79 U	81 U	79 U	78 U	1400 U	540 U	91 U	150 U
AROCLOR-1232	38 U	42 U	39 U	40 U	39 U	39 U	680 U	540 U	45 U	74 U
AROCLOR-1242	38 U	42 U	39 U	40 U	39 U	39 U	680 U	540 U	45 U	74 U
AROCLOR-1248	38 U	42 U	39 U	40 U	39 U	39 U	680 U	540 U	45 U	74 U
AROCLOR-1254	38 U	42 U	39 U	40 U	39 U	39 U	680 U	540 U	45 U	74 U
AROCLOR-1260	47	48	39 U	40 U	39 U	39 U	42000	20000	160	74 U
BETA-BHC	2 U	2.2 U	2 U	2 U	2 U	2 U	35 U	14 U	2.3 U	3.8 U
DELTA-BHC	2 U	2.2 U	2 U	2 U	2 U	2 U	35 U	14 U	2.3 U	3.8 U
DIELDRIN	3.8 U	4.2 U	3.9 U	4 U	3.9 U	3.9 U	68 U	160	4.5 U	7.4 U
ENDOSULFAN I	2 U	2.2 U	2 U	2 U	2 U	2 U	35 U	14 U	2.3 U	3.8 U
ENDOSULFAN II	3.8 U	4.2 U	3.9 U	4 U	3.9 U	3.9 U	68 U	27 U	4.5 U	7.4 U
ENDOSULFAN SULFATE	3.8 U	4.2 U	3.9 U	4 U	3.9 U	3.9 U	68 U	27 U	4.5 U	7.4 U
ENDRIN	3.8 U	4.2 U	3.9 U	4 U	3.9 U	3.9 U	68 U	27 U	4.5 U	7.4 U
ENDRIN ALDEHYDE	3.8 U	4.2 U	3.9 U	4 U	3.9 U	3.9 U	68 U	27 U	4.5 U	7.4 U
ENDRIN KETONE	3.8 U	4.2 U	3.9 U	4 U	3.9 U	3.9 U	68 U	27 U	4.5 U	7.4 U
GAMMA-BHC (LINDANE)	2 U	2.2 U	2 U	2 U	2 U	2 U	35 U	14 U	2.3 U	3.8 U
GAMMA-CHLORDANE	2 U	2.2 U	2 U	2 U	2 U	2 U	35 U	14 U	2.3 U	3.8 U
HEPTACHLOR	2 U	2.2 U	2 U	2 U	2 U	2 U	35 U	14 U	2.3 U	3.8 U
HEPTACHLOR EPOXIDE	2 U	2.2 U	2 U	2 U	2 U	2 U	35 U	14 U	2.3 U	3.8 U
METHOXYCHLOR	20 U	22 U	20 U	20 U	20 U	20 U	350 U	140 U	23 U	38 U
TOTAL AROCLOR	47	48	0 U	0 U	0 U	0 U	42000	20000	160	0 U
TOTAL AROCLOR HALFND	181	174.5	156.5	160.5	156.5	156	44400	21485	318	297
TOTAL AROCLOR ZEROND	47	48	0 U	0 U	0 U	0 U	42000	20000	160	0 U
TOXAPHENE	200 U	220 U	200 U	200 U	200 U	200 U	3500 U	1400 U	230 U	380 U
PETROLEUM HYDROCARBONS (MG/KG)										
DIESEL RANGE ORGANICS	NA	NA	NA	49	10	87	1900	2700	56	86 U
GASOLINE RANGE ORGANICS	NA	NA	NA	2.5 U	2.5 U	2.8 U	2.5 U	3.5 U	3 U	2.8 U
SEMIVOLATILES (UG/KG)										
1,2,4-TRICHLOROBENZENE	400 U	430 U	400 U	400 U	400 U	400 U	360 U	530 U	460 U	360 U
1,2-DICHLOROBENZENE	400 U	430 U	400 U	400 U	400 U	400 U	360 U	530 U	460 U	360 U
1,3-DICHLOROBENZENE	400 U	430 U	400 U	400 U	400 U	400 U	360 U	530 U	460 U	360 U
1,4-DICHLOROBENZENE	400 U	430 U	400 U	400 U	400 U	400 U	360 U	120 J	460 U	360 U
2,2'-OXYBIS(1-CHLOROPROPANE)	400 U	430 U	400 U	400 U	400 U	400 U	360 U	530 U	460 U	360 U
2,4,5-TRICHLOROPHENOL	1000 U	1100 U	1000 U	1000 U	1000 U	1000 U	910 U	1300 U	1200 U	910 U
2,4,6-TRICHLOROPHENOL	400 U	430 U	400 U	400 U	400 U	400 U	360 U	530 U	460 U	360 U
2,4-DICHLOROPHENOL	400 U	430 U	400 U	400 UJ	400 UJ	400 UJ	360 U	530 U	460 U	360 U

LOCATION	TP-SB11		TP-SB12	TP-SB13			TP-SB14			
SAMPLE ID	TP-SB11-0709-98	TP-SB11-1315-98	TP-SB12-0507-98	TP-SB13-0305-98	TP-SB13-0709-98	TP-SB13-1315-98	TP-SB14-0305-98	TP-SB14-0709-98	TP-SB14-1315-98	TP-SB15-0305-98
SAMPLE DATE	19980716	19980716	19980713	19980715	19980715	19980715	19980715	19980715	19980715	19980710
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	7	13	5	3	7	13	3	7	13	3
BOTTOM DEPTH	9	15	7	5	9	15	5	9	15	5
2,4-DIMETHYLPHENOL	400 U	430 U	400 U	400 U	400 U	400 U	360 U	240 J	460 U	360 U
2,4-DINITROPHENOL	1000 UJ	1100 UJ	1000 U	1000 UJ	1000 UJ	1000 UJ	910 UJ	1300 UJ	1200 UJ	910 UJ
2,4-DINITROTOLUENE	400 U	430 U	400 U	400 U	400 U	400 U	360 U	530 U	460 U	360 U
2,6-DINITROTOLUENE	400 U	430 U	400 U	400 U	400 U	400 U	360 U	530 U	460 U	360 U
2-CHLORONAPHTHALENE	400 U	430 U	400 U	400 U	400 U	400 U	360 U	530 U	460 U	360 U
2-CHLOROPHENOL	400 U	430 U	400 U	400 U	400 U	400 U	360 U	530 U	460 U	360 U
2-METHYLNAPHTHALENE	25 J	430 UJ	400 U	400 UJ	22 J	400 UJ	360 U	330 J	460 U	74 J
2-METHYLPHENOL	400 U	430 U	400 U	400 U	400 U	400 U	360 U	530 U	460 U	360 U
2-NITROANILINE	1000 UJ	1100 U	1000 U	1000 U	1000 U	1000 U	910 U	1300 U	1200 U	910 U
2-NITROPHENOL	400 U	430 U	400 U	400 U	400 U	400 U	360 U	530 U	460 U	360 U
3,3'-DICHLOROBENZIDINE	400 U	430 UJ	400 U	400 U	400 U	400 U	360 U	530 UJ	460 U	360 UJ
3-NITROANILINE	1000 U	1100 U	1000 U	1000 U	1000 U	1000 U	910 U	1300 U	1200 U	910 U
4,6-DINITRO-2-METHYLPHENOL	1000 U	1100 U	1000 U	1000 U	1000 U	1000 U	910 U	1300 U	1200 U	910 U
4-BROMOPHENYL PHENYL ETHER	400 U	430 U	400 U	400 U	400 U	400 U	360 U	530 U	460 U	360 U
4-CHLORO-3-METHYLPHENOL	400 U	430 U	400 U	400 U	400 U	400 U	360 U	530 U	460 U	360 U
4-CHLOROANILINE	400 U	430 U	400 U	400 U	400 U	400 U	360 U	530 U	460 U	360 UJ
4-CHLOROPHENYL PHENYL ETHER	400 U	430 U	400 U	400 U	400 U	400 U	360 U	530 U	460 U	360 U
4-METHYLPHENOL	400 U	430 U	400 U	400 U	400 U	400 U	360 U	530 U	460 U	360 U
4-NITROANILINE	1000 U	1100 U	1000 U	1000 U	1000 U	1000 U	910 U	1300 U	1200 U	910 U
4-NITROPHENOL	1000 UJ	1100 U	1000 U	1000 U	1000 U	1000 U	910 U	1300 U	1200 U	910 U
ACENAPHTHENE	41 J	430 U	400 U	400 U	400 U	400 U	360 U	530 U	460 U	230 J
ACENAPHTHYLENE	400 U	430 U	400 U	400 U	400 U	24 J	360 U	2700	460 U	360 U
ANTHRACENE	38 J	26 J	400 U	400 U	400 U	150 J	360 U	870	35 J	280 J
BAP EQUIVALENT-HALFND	432.74	409.2	241.694	276.649	239.132	379.59	390.86	3693.06	356.388	1213.26
BAP EQUIVALENT-POS	432.74	408.9	41.694	76.649	35.132	379.35	9.26	3422.76	124	1213.26
BENZO(A)ANTHRACENE	180 J	160 J	36 J	36 J	26 J	220 J	360 U	620 J	80 J	820
BENZO(A)PYRENE	260 J	210 J	32 J	64 J	27 J	230 J	360 U	3100 J	100 J	750
BENZO(B)FLUORANTHENE	300 J	490	34 J	45 J	29 J	230 J	39 J	1300 J	98 J	990
BENZO(G,H,I)PERYLENE	150 J	190 J	24 J	67 J	400 U	35 J	360 U	530 UJ	460 U	400
BENZO(K)FLUORANTHENE	300 J	210 J	21 J	23 J	400 U	170 J	360 U	530 UJ	88 J	430
BIS(2-CHLOROETHOXY)METHANE	400 U	430 U	400 U	400 U	400 U	400 U	360 U	530 U	460 U	360 U
BIS(2-CHLOROETHYL)ETHER	400 U	430 U	400 U	400 U	400 U	400 U	360 U	530 U	460 U	360 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	100 U	40 U	400 U	120 U	200 U	130 U	220 U	530 UJ	160 U	360 U
BUTYL BENZYL PHTHALATE	400 U	430 U	400 U	400 U	400 U	400 U	360 U	530 UJ	43 J	360 U
CARBAZOLE	32 J	430 U	400 U	400 U	400 U	31 J	360 U	530 U	460 U	240 J
CHRYSENE	240 J	300 J	44 J	49 J	32 J	240 J	60 J	760 J	88 J	960
DIBENZO(A,H)ANTHRACENE	100 J	110 J	400 U	400 U	400 U	87 J	360 U	530 UJ	460 U	230 J
DIBENZOFURAN	24 J	430 U	400 U	400 U	400 U	21 J	360 U	190 J	460 U	160 J

LOCATION	TP-SB11		TP-SB12	TP-SB13			TP-SB14			
SAMPLE ID	TP-SB11-0709-98	TP-SB11-1315-98	TP-SB12-0507-98	TP-SB13-0305-98	TP-SB13-0709-98	TP-SB13-1315-98	TP-SB14-0305-98	TP-SB14-0709-98	TP-SB14-1315-98	TP-SB15-0305-98
SAMPLE DATE	19980716	19980716	19980713	19980715	19980715	19980715	19980715	19980715	19980715	19980710
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	7	13	5	3	7	13	3	7	13	3
BOTTOM DEPTH	9	15	7	5	9	15	5	9	15	5
DIETHYL PHTHALATE	400 U	430 U	400 U	400 U	400 U	400 U	360 U	530 U	460 U	360 U
DIMETHYL PHTHALATE	400 U	430 U	400 U	400 U	400 U	400 U	360 U	530 U	460 U	360 U
DI-N-BUTYL PHTHALATE	400 U	430 U	400 U	400 U	400 U	62 J	360 U	530 U	460 U	360 U
DI-N-OCTYL PHTHALATE	400 U	430 U	400 U	400 U	400 U	400 UJ	360 U	530 UJ	460 U	360 U
FLUORANTHENE	260 J	160 J	66 J	42 J	36 J	390 J	38 J	400 J	130 J	2100
FLUORENE	40 J	430 U	400 U	400 U	400 U	40 J	360 U	280 J	460 U	200 J
HEXACHLOROBENZENE	400 U	430 U	400 U	400 U	400 U	400 U	360 U	530 U	460 U	360 U
HEXACHLOROBUTADIENE	400 U	430 U	400 U	400 U	400 U	400 U	360 U	530 U	460 U	360 U
HEXACHLOROCYCLOPENTADIENE	400 U	430 U	400 U	400 U	400 U	400 U	360 UJ	530 UJ	460 UJ	360 U
HEXACHLOROETHANE	400 U	430 U	400 U	400 U	400 U	400 U	360 U	530 U	460 U	360 U
HIGH MOLECULAR WEIGHT PAHS	1300	1100	442	480	382	1577	699	6545	768	6560
INDENO(1,2,3-CD)PYRENE	200 J	220 J	22 J	36 J	26 J	170 J	53 J	1300 J	62 J	430
ISOPHORONE	400 U	430 U	400 U	400 U	400 U	400 U	360 U	530 U	460 U	360 U
LOW MOLECULAR WEIGHT PAHS	551	1186	1253	1239	1055	858	1110	5305	1230	2854
NAPHTHALENE	37 J	430 U	400 U	400 U	400 U	24 J	360 U	520 J	460 U	190 J
NITROBENZENE	400 U	430 U	400 U	400 U	400 U	400 U	360 U	530 U	460 U	360 U
N-NITROSO-DI-N-PROPYLAMINE	400 U	430 U	400 U	400 U	400 U	400 U	360 U	530 U	460 U	360 U
N-NITROSODIPHENYLAMINE	400 U	430 U	400 U	400 UJ	400 UJ	400 UJ	360 U	530 U	460 U	360 U
PENTACHLOROPHENOL	1000 UJ	1100 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	910 UJ	1300 UJ	1200 UJ	910 UJ
PHENANTHRENE	170 J	85 J	53 J	39 J	33 J	220 J	30 J	340 J	45 J	1700
PHENOL	400 U	430 U	400 U	400 U	400 U	400 U	360 U	200 J	460 U	360 UJ
PYRENE	260 J	160 J	64 J	89 J	61 J	410	61 J	1400 J	140 J	1700
VOLATILES (UG/KG)										
1,1,1-TRICHLOROETHANE	12 U	13 U	12 UJ	12 U	12 U	12 U	11 U	16 U	14 U	11 UJ
1,1,2,2-TETRACHLOROETHANE	12 U	13 U	12 UJ	12 UJ	12 UJ	12 UJ	11 UJ	16 U	14 U	11 UR
1,1,2-TRICHLOROETHANE	12 U	13 U	12 UJ	12 U	12 U	12 U	11 U	16 U	14 U	11 UJ
1,1,2-TRICHLOROTRIFLUOROETHANE	12 U	13 U	12 U	12 U	12 U	12 U	11 U	16 U	14 U	11 UJ
1,1-DICHLOROETHANE	12 U	13 U	12 UJ	12 U	12 U	12 U	11 U	16 U	14 U	11 UJ
1,1-DICHLOROETHENE	12 U	13 U	12 UJ	12 U	12 U	12 U	11 U	16 U	14 U	11 UJ
1,2-DICHLOROETHANE	12 U	13 U	12 UJ	12 U	12 U	12 U	11 U	16 U	14 U	11 UJ
1,2-DICHLOROPROPANE	12 U	13 U	12 UJ	12 U	12 U	12 U	11 U	16 U	14 U	11 UJ
2-BUTANONE	12 U	13 U	12 U	12 UJ	12 UJ	65 UJ	57 UJ	36 U	14 U	11 UJ
2-HEXANONE	12 U	13 U	12 UJ	12 UJ	12 UJ	12 UJ	11 UJ	16 U	14 U	11 UR
4-METHYL-2-PENTANONE	12 U	13 U	12 UJ	12 UJ	12 UJ	12 UJ	11 UJ	16 U	14 U	11 UR
ACETONE	58 U	26 U	24 U	100 J	14000 J	2800 J	8600 J	420 J	130	28 U
BENZENE	12 U	13 U	12 UJ	12 U	12 U	12 U	11 U	16 U	14 U	11 UJ
BROMODICHLOROMETHANE	12 U	13 U	12 UJ	12 U	12 U	12 U	11 U	16 U	14 U	11 UJ
BROMOFORM	12 U	13 U	12 UJ	12 U	12 U	12 U	11 U	16 U	14 U	11 UJ

LOCATION	TP-SB11		TP-SB12	TP-SB13			TP-SB14			
SAMPLE ID	TP-SB11-0709-98	TP-SB11-1315-98	TP-SB12-0507-98	TP-SB13-0305-98	TP-SB13-0709-98	TP-SB13-1315-98	TP-SB14-0305-98	TP-SB14-0709-98	TP-SB14-1315-98	TP-SB15-0305-98
SAMPLE DATE	19980716	19980716	19980713	19980715	19980715	19980715	19980715	19980715	19980715	19980710
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	7	13	5	3	7	13	3	7	13	3
BOTTOM DEPTH	9	15	7	5	9	15	5	9	15	5
BROMOMETHANE	12 U	13 U	12 UJ	12 U	12 U	12 U	11 U	16 U	14 U	11 UJ
CARBON DISULFIDE	2 J	2 J	12 UJ	12 U	12 U	11 J	1 J	16 U	3 J	11 UJ
CARBON TETRACHLORIDE	12 U	13 U	12 UJ	12 U	12 U	12 U	11 U	16 U	14 U	11 UJ
CHLOROBENZENE	12 U	13 U	12 UJ	12 U	12 U	12 U	11 U	16 U	14 U	11 UR
CHLORODIBROMOMETHANE	12 U	13 U	12 UJ	12 U	12 U	12 U	11 U	16 U	14 U	11 UJ
CHLOROETHANE	12 U	13 U	12 UJ	12 U	12 U	12 U	11 U	16 U	14 U	11 UJ
CHLOROFORM	12 U	13 U	12 UJ	12 U	12 U	12 U	11 U	8 J	14 U	11 UJ
CHLOROMETHANE	12 U	13 U	12 UJ	12 U	12 U	12 U	11 U	16 U	14 U	11 UJ
CIS-1,3-DICHLOROPROPENE	12 U	13 U	12 UJ	12 U	12 U	12 U	11 U	16 U	14 U	11 UJ
ETHYLBENZENE	12 U	4 J	12 UJ	12 U	12 U	12 U	11 U	16 U	14 U	11 UR
METHYLENE CHLORIDE	52	22 U	12 U	27 U	23 U	25 U	39 U	16 U	14 U	13 U
STYRENE	12 U	13 U	12 UJ	12 U	12 U	12 U	11 U	16 U	14 U	11 UR
TETRACHLOROETHENE	12 U	13 U	12 UJ	12 U	12 U	12 U	11 U	16 U	14 U	11 UR
TOLUENE	12 U	1 J	12 UJ	12 U	12 U	12 U	11 U	16 U	14 U	11 UR
TOTAL 1,2-DICHLOROETHENE	12 U	13 U	12 UJ	12 U	12 U	12 U	11 U	16 U	14 U	11 UJ
TOTAL XYLENES	12 U	18	12 UJ	12 U	12 U	12 U	9 J	16 U	14 U	11 UR
TRANS-1,3-DICHLOROPROPENE	12 U	13 U	12 UJ	12 U	12 U	12 U	11 U	16 U	14 U	11 UJ
TRICHLOROETHENE	2 J	13 U	12 UJ	12 U	12 U	12 U	11 U	16 U	1 J	11 UJ
VINYL CHLORIDE	12 U	13 U	12 UJ	12 U	12 U	12 U	11 U	16 U	14 U	11 UJ

LOCATION	TP-SB15				TP-SB16		TP-SB17	
SAMPLE ID	TP-SB15-0709-98	TP-SB15-1315-98	TP-SB15-1315-98-AVG	TP-SB15-1315-98-D	TP-SB16-0305-98	TP-SB16-1719-98	TP-SB17-0305-98	TP-SB17-0709-98
SAMPLE DATE	19980710	19980710	19980710	19980710	19980716	19980716	19980716	19980716
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	7	13	13	13	3	17	3	7
BOTTOM DEPTH	9	15	15	15	5	19	5	9
METALS (MG/KG)								
ALUMINUM	11600	11800	10740	9680	NA	3700	11200	10900
ANTIMONY	0.45 UR	0.51 U	0.49 U	0.47 U	NA	0.41 UJ	0.34 UJ	0.36 U
ARSENIC	12.5 J	9.6 J	10.85	12.1 J	NA	9.3 J	9.2 J	8.4 J
BARIUM	42.4	42.8	38.55	34.3	NA	19.1	68.4	34.1
BERYLLIUM	0.48	0.63	0.58	0.53	NA	0.1 U	0.36	0.56
CADMIUM	0.52 U	0.77 J	0.505	0.48 U	NA	0.21 U	0.45 U	0.52 U
CALCIUM	3670 J	4700 J	3875	3050 J	NA	789	19300	1530
CHROMIUM	43.5 J	40.7 J	31.25	21.8 J	NA	16.4	30.8	32.6
COBALT	11.5	9.2	8.5	7.8	NA	2.8	9.2	11.2
COPPER	24 J	39.6 J	26.5	13.4 J	NA	6.4 J	102 J	26.3 J
IRON	21200	20800	19650	18500	NA	8350	17400	18300
LEAD	23.4 U	63 J	34.075	10.3 U	NA	6.6 U	71.1 J	38.8 J
MAGNESIUM	7810	6000	4960	3920	NA	2620	6850	5020
MANGANESE	307 J	284 J	230	176 J	NA	59.4	252	152
MERCURY	0.13 J	0.06 J	0.07	0.08 J	NA	0.02 U	0.2 J	0.08 U
NICKEL	41.9	29.2	24.3	19.4	NA	13.6	29.1	30.7
POTASSIUM	2790	3080	2590	2100	NA	1120	3020	3190
SELENIUM	0.84 U	0.69 UJ	0.675 U	0.66 UJ	NA	0.66 U	0.55 U	0.59 U
SILVER	0.6 U	0.58 U	0.565 U	0.55 U	NA	0.16 U	0.13 U	0.17 U
SODIUM	305 U	967	570.25	347 U	NA	1980	126 U	1400
THALLIUM	0.73 U	0.7 U	0.75 U	0.8 U	NA	0.67 U	0.72 U	0.59 U
VANADIUM	31.6	37.8	32.95	28.1	NA	10.4 J	26.1 J	31 J
ZINC	68.7 J	92.5 J	63.5	34.5 J	NA	15 J	65.7 J	69.9 J
MISCELLANEOUS PARAMETERS (MG/KG)								
CYANIDE	2 U	2 U	2 U	2 U	NA	2 U	2 U	2 U
HEXAVALENT CHROMIUM	1.1 U	1.2 U	0.88 U	0.56 U	NA	NA	NA	NA
TOTAL ORGANIC CARBON	17000 J	2100 J	2450	2800 J	NA	380	7700	9700
MISCELLANEOUS PARAMETERS (S.U.)								
PH	7.8	7.7	7.9	8.1	NA	7.6	7.9	7.5
PESTICIDES/PCBS (UG/KG)								
4,4'-DDD	3.9 U	5.1 J	5.1 J	2.3 R	NA	3.8 U	3.5 U	4 U
4,4'-DDE	2.5 J	4 U	3.95 U	3.9 U	NA	3.8 U	9.4	5.6
4,4'-DDT	9.4	4 U	3.95 U	3.9 U	NA	3.8 U	27	16
ALDRIN	2 U	2.1 U	2.05 U	2 U	NA	2 U	1.8 U	2 U
ALPHA-BHC	2 U	2.1 U	2.05 U	2 U	NA	2 U	1.8 U	2 U
ALPHA-CHLORDANE	2 U	2.1 U	2.05 U	2 U	NA	2 U	1.8 U	2 U

LOCATION	TP-SB15				TP-SB16		TP-SB17	
SAMPLE ID	TP-SB15-0709-98	TP-SB15-1315-98	TP-SB15-1315-98-AVG	TP-SB15-1315-98-D	TP-SB16-0305-98	TP-SB16-1719-98	TP-SB17-0305-98	TP-SB17-0709-98
SAMPLE DATE	19980710	19980710	19980710	19980710	19980716	19980716	19980716	19980716
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	7	13	13	13	3	17	3	7
BOTTOM DEPTH	9	15	15	15	5	19	5	9
AROCLOR-1016	39 U	40 U	39.5 U	39 U	NA	38 U	35 U	40 U
AROCLOR-1221	78 U	82 U	80.5 U	79 U	NA	78 U	180 U	81 U
AROCLOR-1232	39 U	40 U	39.5 U	39 U	NA	38 U	35 U	40 U
AROCLOR-1242	39 U	40 U	39.5 U	39 U	NA	38 U	35 U	40 U
AROCLOR-1248	39 U	40 U	39.5 U	39 U	NA	38 U	35 U	40 U
AROCLOR-1254	39 U	40 U	39.5 U	39 U	NA	38 U	35 U	40 U
AROCLOR-1260	39 U	40 U	39.5 U	39 U	NA	38 U	35 U	40 U
BETA-BHC	2 U	2.1 U	2.05 U	2 U	NA	2 U	1.8 U	2 U
DELTA-BHC	2 U	2.1 U	2.05 U	2 U	NA	2 U	1.8 U	2 U
DIELDRIN	3.9 U	4 U	3.95 U	3.9 U	NA	3.8 U	3.5 U	4 U
ENDOSULFAN I	2 U	2.1 U	2.05 U	2 U	NA	2 U	1.8 U	2 U
ENDOSULFAN II	3.9 U	4 U	3.95 U	3.9 U	NA	3.8 U	3.5 U	4 U
ENDOSULFAN SULFATE	3.9 U	4 U	3.95 U	3.9 U	NA	3.8 U	3.5 U	4 U
ENDRIN	3.9 U	4 U	3.95 U	3.9 U	NA	3.8 U	3.5 U	4 U
ENDRIN ALDEHYDE	3.9 U	4 U	3.95 U	3.9 U	NA	3.8 U	3.5 U	4 U
ENDRIN KETONE	3.9 U	4 U	3.95 U	3.9 U	NA	3.8 U	3.5 U	4 U
GAMMA-BHC (LINDANE)	2 U	2.1 U	2.05 U	2 U	NA	2 U	1.8 U	2 U
GAMMA-CHLORDANE	2 U	2.1 U	2.05 U	2 U	NA	2 U	1.8 U	2 U
HEPTACHLOR	2 U	2.1 U	2.05 U	2 U	NA	2 U	1.8 U	2 U
HEPTACHLOR EPOXIDE	2 U	2.1 U	2.05 U	2 U	NA	2 U	1.8 U	2 U
METHOXYCHLOR	20 U	21 U	20.5 U	20 U	NA	20 U	18 U	20 U
TOTAL AROCLOR	0 U	0 U	0 U	0 U	NA	0 U	0 U	0 U
TOTAL AROCLOR HALFND	156	161	158.75	156.5	NA	153	195	160.5
TOTAL AROCLOR ZEROND	0 U	0 U	0 U	0 U	NA	0 U	0 U	0 U
TOXAPHENE	200 U	210 U	205 U	200 U	NA	200 U	180 U	200 U
PETROLEUM HYDROCARBONS (MG/KG)								
DIESEL RANGE ORGANICS	2000 U	31 U	50.5 U	70 U	NA	6 U	9.9	33
GASOLINE RANGE ORGANICS	2.5 U	2.8 U	2.65 U	2.5 U	2.5 U	2.8 U	2.5 U	4
SEMIVOLATILES (UG/KG)								
1,2,4-TRICHLOROBENZENE	400 U	400 U	400 U	400 U	360 U	400 U	360 U	400 U
1,2-DICHLOROBENZENE	400 U	400 U	400 U	400 U	360 U	400 U	360 U	400 U
1,3-DICHLOROBENZENE	400 U	400 U	400 U	400 U	360 U	400 U	360 U	400 U
1,4-DICHLOROBENZENE	400 U	400 U	400 U	400 U	360 U	400 U	360 U	400 U
2,2'-OXYBIS(1-CHLOROPROPANE)	400 U	400 U	400 U	400 U	360 U	400 U	360 U	400 U
2,4,5-TRICHLOROPHENOL	1000 U	1000 U	1000 U	1000 U	910 UJ	1000 U	910 U	1000 U
2,4,6-TRICHLOROPHENOL	400 U	400 U	400 U	400 U	360 UJ	400 U	360 U	400 U
2,4-DICHLOROPHENOL	400 U	400 U	400 U	400 U	360 UJ	400 U	360 U	400 U

LOCATION	TP-SB15				TP-SB16		TP-SB17	
SAMPLE ID	TP-SB15-0709-98	TP-SB15-1315-98	TP-SB15-1315-98-AVG	TP-SB15-1315-98-D	TP-SB16-0305-98	TP-SB16-1719-98	TP-SB17-0305-98	TP-SB17-0709-98
SAMPLE DATE	19980710	19980710	19980710	19980710	19980716	19980716	19980716	19980716
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	7	13	13	13	3	17	3	7
BOTTOM DEPTH	9	15	15	15	5	19	5	9
2,4-DIMETHYLPHENOL	400 U	400 U	400 U	400 U	360 UJ	400 U	360 U	400 U
2,4-DINITROPHENOL	1000 UJ	1000 UJ	1000 U	1000 UJ	910 UJ	1000 UJ	910 UJ	1000 UJ
2,4-DINITROTOLUENE	400 U	400 U	400 U	400 U	360 U	400 U	360 U	400 U
2,6-DINITROTOLUENE	400 U	400 U	400 U	400 U	360 U	400 U	360 U	400 U
2-CHLORONAPHTHALENE	400 U	400 U	400 U	400 U	360 U	400 U	360 U	400 U
2-CHLOROPHENOL	400 U	400 U	400 U	400 U	360 UJ	400 U	360 U	400 U
2-METHYLNAPHTHALENE	41 J	400 U	400 U	400 U	360 UJ	400 UJ	360 UJ	400 UJ
2-METHYLPHENOL	400 U	400 U	400 U	400 U	360 UJ	400 U	360 U	400 U
2-NITROANILINE	1000 U	1000 U	1000 U	1000 U	910 U	1000 U	910 U	1000 U
2-NITROPHENOL	400 U	400 U	400 U	400 U	360 UJ	400 U	360 U	400 U
3,3'-DICHLOROBENZIDINE	400 UJ	400 UJ	400 U	400 UJ	360 UJ	400 UJ	360 UJ	400 UJ
3-NITROANILINE	1000 U	1000 U	1000 U	1000 U	910 U	1000 U	910 U	1000 U
4,6-DINITRO-2-METHYLPHENOL	1000 U	1000 U	1000 U	1000 U	910 UJ	1000 U	910 U	1000 U
4-BROMOPHENYL PHENYL ETHER	400 U	400 U	400 U	400 U	360 U	400 U	360 U	400 U
4-CHLORO-3-METHYLPHENOL	400 U	400 U	400 U	400 U	360 UJ	400 U	360 U	400 U
4-CHLOROANILINE	400 UJ	400 UJ	400 U	400 UJ	360 U	400 U	360 U	400 U
4-CHLOROPHENYL PHENYL ETHER	400 U	400 U	400 U	400 U	360 U	400 U	360 U	400 U
4-METHYLPHENOL	400 U	400 U	400 U	400 U	360 UJ	400 U	360 U	400 U
4-NITROANILINE	1000 U	1000 U	1000 U	1000 U	910 U	1000 U	910 U	1000 U
4-NITROPHENOL	1000 U	1000 U	1000 U	1000 U	910 UJ	1000 U	910 U	1000 U
ACENAPHTHENE	39 J	26 J	23	20 J	360 U	400 U	360 U	400 U
ACENAPHTHYLENE	400 U	400 U	400 U	400 U	360 U	400 U	360 U	400 U
ANTHRACENE	130 J	39 J	35	31 J	30 J	400 U	31 J	400 U
BAP EQUIVALENT-HALFND	465.91	143.941	222.569	301.197	251.1	462.2 U	239.7	240.01
BAP EQUIVALENT-POS	265.91	143.85	122.48	101.11	251.1	0 U	239.7	40.013
BENZO(A)ANTHRACENE	220 J	94 J	89.5	85 J	180 J	400 U	170 J	28 J
BENZO(A)PYRENE	200 J	82 J	80	78 J	170 J	400 U	160 J	31 J
BENZO(B)FLUORANTHENE	250 J	98 J	98	98 J	230 J	400 U	160 J	29 J
BENZO(G,H,I)PERYLENE	210 J	45 J	43	41 J	140 J	400 U	98 J	53 J
BENZO(K)FLUORANTHENE	160 J	58 J	55.5	53 J	150 J	400 U	110 J	25 J
BIS(2-CHLOROETHOXY)METHANE	400 U	400 U	400 U	400 U	360 U	400 U	360 U	400 U
BIS(2-CHLOROETHYL)ETHER	400 UJ	400 UJ	400 U	400 UJ	360 U	400 U	360 U	400 U
BIS(2-ETHYLHEXYL)PHTHALATE	970	400 U	400 U	400 U	210 U	26 U	65 U	220 U
BUTYL BENZYL PHTHALATE	400 U	400 U	400 U	400 U	360 U	400 U	360 U	400 U
CARBAZOLE	400 U	21 J	22	23 J	360 U	400 U	360 U	400 U
CHRYSENE	210 J	91 J	89	87 J	200 J	400 U	220 J	33 J
DIBENZO(A,H)ANTHRACENE	400 U	37 J	37 J	400 U	26 J	400 U	35 J	400 U
DIBENZOFURAN	25 J	400 U	400 U	400 U	360 U	400 U	360 U	400 U

LOCATION	TP-SB15				TP-SB16		TP-SB17	
SAMPLE ID	TP-SB15-0709-98	TP-SB15-1315-98	TP-SB15-1315-98-AVG	TP-SB15-1315-98-D	TP-SB16-0305-98	TP-SB16-1719-98	TP-SB17-0305-98	TP-SB17-0709-98
SAMPLE DATE	19980710	19980710	19980710	19980710	19980716	19980716	19980716	19980716
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	7	13	13	13	3	17	3	7
BOTTOM DEPTH	9	15	15	15	5	19	5	9
DIETHYL PHTHALATE	400 U	400 U	400 U	400 U	360 U	400 U	360 U	400 U
DIMETHYL PHTHALATE	400 U	400 U	400 U	400 U	360 U	400 U	360 U	400 U
DI-N-BUTYL PHTHALATE	400 U	400 U	27 J	27 J	360 U	400 U	360 U	400 U
DI-N-OCTYL PHTHALATE	400 U	400 U	400 U	400 U	360 U	400 U	360 U	400 U
FLUORANTHENE	490	190 J	190	190 J	380	400 U	300 J	53 J
FLUORENE	46 J	22 J	22 J	400 U	360 U	400 U	360 U	400 U
HEXACHLOROBENZENE	400 U	400 U	400 U	400 U	360 U	400 U	360 U	400 U
HEXACHLOROBUTADIENE	400 U	400 U	400 U	400 U	360 U	400 U	360 U	400 U
HEXACHLOROCYCLOPENTADIENE	400 U	400 U	400 U	400 U	360 U	400 U	360 U	400 U
HEXACHLOROETHANE	400 U	400 U	400 U	400 U	360 U	400 U	360 U	400 U
HIGH MOLECULAR WEIGHT PAHS	1780	664	752	840	1256	1200	1235	396
INDENO(1,2,3-CD)PYRENE	150 J	52 J	48	44 J	110 J	400 U	94 J	25 J
ISOPHORONE	400 U	400 U	400 U	400 U	360 U	400 U	360 U	400 U
LOW MOLECULAR WEIGHT PAHS	833	847	919	991	1080	1400	1101	1234
NAPHTHALENE	57 J	400 U	400 U	400 U	360 U	400 U	360 U	400 U
NITROBENZENE	400 U	400 U	400 U	400 U	360 U	400 U	360 U	400 U
N-NITROSO-DI-N-PROPYLAMINE	400 U	400 U	400 U	400 U	360 U	400 U	360 U	400 U
N-NITROSODIPHENYLAMINE	400 U	400 U	400 U	400 U	360 U	400 U	360 U	400 U
PENTACHLOROPHENOL	1000 UJ	1000 UJ	1000 U	1000 UJ	910 UJ	1000 UJ	910 UJ	1000 UJ
PHENANTHRENE	320 J	160 J	150	140 J	150 J	400 U	170 J	34 J
PHENOL	400 UJ	400 UJ	400 U	400 UJ	360 UJ	400 U	360 U	400 U
PYRENE	460	170 J	185	200 J	300 J	400 U	350 J	51 J
VOLATILES (UG/KG)								
1,1,1-TRICHLOROETHANE	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 UJ
1,1,2,2-TETRACHLOROETHANE	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 UJ
1,1,2-TRICHLOROETHANE	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 UJ
1,1,2-TRICHLOROTRIFLUOROETHANE	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 U
1,1-DICHLOROETHANE	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 U
1,1-DICHLOROETHENE	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 U
1,2-DICHLOROETHANE	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 U
1,2-DICHLOROPROPANE	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 UJ
2-BUTANONE	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 U
2-HEXANONE	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 UJ
4-METHYL-2-PENTANONE	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 UJ
ACETONE	2700 U	100 U	77 U	54 U	NA	21 U	11 UJ	130
BENZENE	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 UJ
BROMODICHLOROMETHANE	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 UJ
BROMOFORM	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 UJ

LOCATION	TP-SB15				TP-SB16		TP-SB17	
SAMPLE ID	TP-SB15-0709-98	TP-SB15-1315-98	TP-SB15-1315-98-AVG	TP-SB15-1315-98-D	TP-SB16-0305-98	TP-SB16-1719-98	TP-SB17-0305-98	TP-SB17-0709-98
SAMPLE DATE	19980710	19980710	19980710	19980710	19980716	19980716	19980716	19980716
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	7	13	13	13	3	17	3	7
BOTTOM DEPTH	9	15	15	15	5	19	5	9
BROMOMETHANE	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 U
CARBON DISULFIDE	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 U
CARBON TETRACHLORIDE	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 UJ
CHLOROBENZENE	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 UJ
CHLORODIBROMOMETHANE	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 UJ
CHLOROETHANE	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 U
CHLOROFORM	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 U
CHLOROMETHANE	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 U
CIS-1,3-DICHLOROPROPENE	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 UJ
ETHYLBENZENE	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 UJ
METHYLENE CHLORIDE	23 U	44 U	42.5 U	41 U	NA	54	58 J	64
STYRENE	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 UJ
TETRACHLOROETHENE	2 J	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 UJ
TOLUENE	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 UJ
TOTAL 1,2-DICHLOROETHENE	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 U
TOTAL XYLENES	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 UJ
TRANS-1,3-DICHLOROPROPENE	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 UJ
TRICHLOROETHENE	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 UJ
VINYL CHLORIDE	12 U	12 UR	12 R	12 UR	NA	12 U	11 UJ	12 U

LOCATION	TP-MW08		TP-MW09		TP-MW10		TP-SB101		TP-SB102		
SAMPLE ID	TPSB290205	TPSB290508	TPSB210205	TPSB210508	TPSB38A0305	TPSB38A0709	TPSB1010205	TPSB1010508	TPSB1020205	TPSB1020205-AVG	TPSB1020205-D
SAMPLE DATE	20030423	20030423	20030422	20030422	20030423	20030423	20081122	20081122	20081122	20081122	20081122
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	2	5	2	5	3	7	2	5	2	2	2
BOTTOM DEPTH	5	8	5	8	5	9	5	8	5	5	5
DIOXINS/FURANS (NG/KG)											
1,2,3,4,6,7,8,9-OCDD	264 J	NA	304 J	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8,9-OCDF	22.9 J	NA	2.9 UJ	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HPCDD	16.4	NA	3.9 J	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HPCDF	71.6	NA	4.4	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HPCDF	0.9 U	NA	0.9 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HXCDD	0.7 U	NA	0.8 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HXCDF	3.2 J	NA	0.84 J	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HXCDD	1.6 J	NA	0.7 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HXCDF	2.4 J	NA	0.5 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HXCDD	0.7 U	NA	0.8 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HXCDF	0.5 U	NA	0.6 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PECDD	0.4 U	NA	0.4 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PECDF	14.5 J	NA	0.2 U	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-HXCDF	3.9 J	NA	0.5 U	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-PECDF	0.3 U	NA	0.3 U	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD	0.3 U	NA	0.3 U	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDF	0.6 J	NA	0.4 U	NA	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-1998	2.804	NA	0.197	NA	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-1998 - HALFND	3.328	NA	0.847	NA	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-2005	2.571	NA	0.258	NA	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-2005 - HALFND	3.066	NA	0.876	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HPCDD	35.5	NA	8.2	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HPCDF	107	NA	6.9	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HXCDD	45.1 J	NA	3 J	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HXCDF	79.7 J	NA	5	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PECDD	10.4	NA	1.9 J	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PECDF	79 J	NA	4.7 J	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL TCDD	1.8 J	NA	3.4 J	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL TCDF	79.9 J	NA	10.3 J	NA	NA	NA	NA	NA	NA	NA	NA
METALS (MG/KG)											
ALUMINUM	13200	13100	10200	8320	15100	8990	NA	NA	NA	NA	NA
ANTIMONY	0.66 U	0.25 U	0.24 UR	1.8 U	0.26 UR	0.1 UR	NA	NA	NA	NA	NA
ARSENIC	17.4	14.4	15.9	17.7	19.4 J	12 J	6.2 J	14.4 J	11.8 J	12.1	12.4
BARIUM	109 J	86.2 J	53 J	46.8 J	111	83.8	NA	NA	NA	NA	NA
BERYLLIUM	0.45	0.37	0.49	1.1	0.44 J	0.27 J	NA	NA	NA	NA	NA
CADMIUM	0.59 J	0.35 U	0.43 J	2.6 J	0.72 UJ	0.29 UJ	NA	NA	NA	NA	NA

LOCATION	TP-MW08		TP-MW09		TP-MW10		TP-SB101		TP-SB102		
SAMPLE ID	TPSB290205	TPSB290508	TPSB210205	TPSB210508	TPSB38A0305	TPSB38A0709	TPSB1010205	TPSB1010508	TPSB1020205	TPSB1020205-AVG	TPSB1020205-D
SAMPLE DATE	20030423	20030423	20030422	20030422	20030423	20030423	20081122	20081122	20081122	20081122	20081122
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	2	5	2	5	3	7	2	5	2	2	2
BOTTOM DEPTH	5	8	5	8	5	9	5	8	5	5	5
CALCIUM	1670	37000	8300	3220	13200	16900	NA	NA	NA	NA	NA
CHROMIUM	137	50.2	35.8	1120	63.8	35.5	NA	NA	NA	NA	NA
COBALT	13.8	9.2	8.1	27.2	14.5	7.5	NA	NA	NA	NA	NA
COPPER	72.6	95.9	87.7	1060	58.5	19.6	NA	NA	NA	NA	NA
IRON	32800	20400	33100	1E+05	27800	16400	NA	NA	NA	NA	NA
LEAD	108 J	126 J	38.1 J	305 J	163	25.7	NA	NA	NA	NA	NA
MAGNESIUM	8150 J	8710 J	6130 J	4610 J	11400	7500	NA	NA	NA	NA	NA
MANGANESE	553	317	328	923	556	274	NA	NA	NA	NA	NA
MERCURY	0.15 J	0.15 J	0.16 J	0.1 J	0.48 J	0.16 J	NA	NA	NA	NA	NA
NICKEL	47.6 J	38.4 J	30.5 J	1560 J	67.8	34.5	NA	NA	NA	NA	NA
POTASSIUM	1700 J	3000 J	2470 J	2400 J	4300 J	2690 J	NA	NA	NA	NA	NA
SELENIUM	0.44 U	0.38 U	0.4 U	2.7 U	0.42 U	0.16 U	NA	NA	NA	NA	NA
SILVER	0.18 U	0.05 UJ	0.1 UJ	0.31 UJ	1.2 U	0.37 U	NA	NA	NA	NA	NA
SODIUM	1010 J	704 J	180 J	253 J	485 J	332 J	NA	NA	NA	NA	NA
THALLIUM	0.95 J	0.92	1.6	3.6	1.4 U	0.96 U	NA	NA	NA	NA	NA
VANADIUM	38.4 J	30.8 J	24 J	24.6 J	40.1	25	NA	NA	NA	NA	NA
ZINC	272	140	62.7	718	214	48.7	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (%)											
SIEVE 1"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE 1/2"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE 1-1/2"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE 3/4"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE 3/8"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 040	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 060	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL SOLIDS	91	91	90	89	89	88	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (LB/F3)											
BULK DENSITY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MEQ/100)											
CATION EXCHANGE CAPACITY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-MW08		TP-MW09		TP-MW10		TP-SB101		TP-SB102		
SAMPLE ID	TPSB290205	TPSB290508	TPSB210205	TPSB210508	TPSB38A0305	TPSB38A0709	TPSB1010205	TPSB1010508	TPSB1020205	TPSB1020205-AVG	TPSB1020205-D
SAMPLE DATE	20030423	20030423	20030422	20030422	20030423	20030423	20081122	20081122	20081122	20081122	20081122
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	2	5	2	5	3	7	2	5	2	2	2
BOTTOM DEPTH	5	8	5	8	5	9	5	8	5	5	5
MISCELLANEOUS PARAMETERS (MG/KG)											
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)											
POROSITY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PESTICIDES/PCBS (UG/KG)											
4,4'-DDD	1.4 U	1.4 U	1.4 U	1.4 U	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	14 J	4.6	1.4 U	1.4 U	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	39 J	14 J	1.2 UJ	1.2 UJ	NA	NA	NA	NA	NA	NA	NA
ALDRIN	1.2 UJ	1.2 U	1.2 U	1.2 U	NA	NA	NA	NA	NA	NA	NA
ALPHA-BHC	1.5 U	1.5 U	1.5 U	1.5 U	NA	NA	NA	NA	NA	NA	NA
ALPHA-CHLORDANE	1.5 UJ	1.5 U	1.5 U	1.5 U	NA	NA	NA	NA	NA	NA	NA
AROCLOR-1016	14 UJ	14 UJ	14 U	14 U	NA	NA	NA	NA	NA	NA	NA
AROCLOR-1221	32 U	32 UJ	33 U	33 U	NA	NA	NA	NA	NA	NA	NA
AROCLOR-1232	20 U	20 UJ	20 U	20 U	NA	NA	NA	NA	NA	NA	NA
AROCLOR-1242	14 U	14 UJ	14 U	14 U	NA	NA	NA	NA	NA	NA	NA
AROCLOR-1248	5 U	5 UJ	5 U	5.1 U	NA	NA	NA	NA	NA	NA	NA
AROCLOR-1254	16 U	16 UJ	16 U	16 U	NA	NA	NA	NA	NA	NA	NA
AROCLOR-1260	28 J	17 J	8.3 U	8.4 U	NA	NA	NA	NA	NA	NA	NA
BETA-BHC	2.2 UJ	2.2 U	2.2 U	2.3 U	NA	NA	NA	NA	NA	NA	NA
DELTA-BHC	1.3 U	1.3 U	1.3 U	1.3 U	NA	NA	NA	NA	NA	NA	NA
DIELDRIN	1.3 UJ	1.3 UJ	1.3 UJ	1.3 UJ	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN I	1.3 UJ	1.3 UJ	1.4 U	1.4 U	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN II	1.2 UJ	1.2 U	1.3 U	1.3 U	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN SULFATE	1.5 UJ	1.5 UJ	1.5 UJ	1.5 UJ	NA	NA	NA	NA	NA	NA	NA
ENDRIN	1.2 UJ	1.2 U	1.3 U	1.3 U	NA	NA	NA	NA	NA	NA	NA
ENDRIN ALDEHYDE	1.5 U	1.5 U	1.5 U	1.5 U	NA	NA	NA	NA	NA	NA	NA
ENDRIN KETONE	1.6 UJ	1.6 UJ	1.6 UJ	1.6 UJ	NA	NA	NA	NA	NA	NA	NA
GAMMA-BHC (LINDANE)	1.3 U	1.3 U	1.3 U	1.3 U	NA	NA	NA	NA	NA	NA	NA
GAMMA-CHLORDANE	1.4 UJ	1.4 UJ	1.4 U	1.4 U	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR	1.2 U	1.2 U	1.2 U	1.2 U	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR EPOXIDE	1.4 UJ	1.4 U	1.4 U	1.4 U	NA	NA	NA	NA	NA	NA	NA
METHOXYCHLOR	2.2 U	2.2 U	2.2 UJ	2.3 UJ	NA	NA	NA	NA	NA	NA	NA
TOTAL AROCLOR	28	17	0 U	0 U	NA	NA	NA	NA	NA	NA	NA
TOTAL AROCLOR HALFND	78.5	67.5	55.15	55.25	NA	NA	NA	NA	NA	NA	NA
TOTAL AROCLOR ZEROND	28	17	0 U	0 U	NA	NA	NA	NA	NA	NA	NA
TOXAPHENE	26 U	26 U	26 U	26 U	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-MW08		TP-MW09		TP-MW10		TP-SB101		TP-SB102		
SAMPLE ID	TPSB290205	TPSB290508	TPSB210205	TPSB210508	TPSB38A0305	TPSB38A0709	TPSB1010205	TPSB1010508	TPSB1020205	TPSB1020205-AVG	TPSB1020205-D
SAMPLE DATE	20030423	20030423	20030422	20030422	20030423	20030423	20081122	20081122	20081122	20081122	20081122
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	2	5	2	5	3	7	2	5	2	2	2
BOTTOM DEPTH	5	8	5	8	5	9	5	8	5	5	5
SEMIVOLATILES (UG/KG)											
1,2,4-TRICHLOROBENZENE	39 U	39 U	78 U	39 U	NA	NA	NA	NA	NA	NA	NA
1,2-DICHLOROBENZENE	41 UJ	41 U	83 U	42 U	NA	NA	NA	NA	NA	NA	NA
1,3-DICHLOROBENZENE	40 UJ	40 U	80 U	40 U	NA	NA	NA	NA	NA	NA	NA
1,4-DICHLOROBENZENE	38 U	38 U	76 U	39 U	NA	NA	NA	NA	NA	NA	NA
2,2'-OXYBIS(1-CHLOROPROPANE)	53 UJ	54 U	110 U	54 U	NA	NA	NA	NA	NA	NA	NA
2,4,5-TRICHLOROPHENOL	94 U	94 U	190 U	96 U	NA	NA	NA	NA	NA	NA	NA
2,4,6-TRICHLOROPHENOL	100 U	100 U	210 U	100 U	NA	NA	NA	NA	NA	NA	NA
2,4-DICHLOROPHENOL	73 U	73 U	150 U	74 U	NA	NA	NA	NA	NA	NA	NA
2,4-DIMETHYLPHENOL	130 UJ	130 U	260 U	130 U	NA	NA	NA	NA	NA	NA	NA
2,4-DINITROPHENOL	280 U	280 U	560 U	280 U	NA	NA	NA	NA	NA	NA	NA
2,4-DINITROTOLUENE	37 U	37 U	74 U	37 U	NA	NA	NA	NA	NA	NA	NA
2,6-DINITROTOLUENE	43 U	44 U	87 U	44 U	NA	NA	NA	NA	NA	NA	NA
2-CHLORONAPHTHALENE	49 U	49 U	98 UJ	50 UJ	NA	NA	NA	NA	NA	NA	NA
2-CHLOROPHENOL	72 U	72 U	140 U	73 U	NA	NA	NA	NA	NA	NA	NA
2-METHYLNAPHTHALENE	45 U	45 U	90 U	46 U	NA	NA	NA	NA	NA	NA	NA
2-METHYLPHENOL	68 UJ	68 U	140 U	69 U	NA	NA	NA	NA	NA	NA	NA
2-NITROANILINE	45 U	45 U	91 U	46 U	NA	NA	NA	NA	NA	NA	NA
2-NITROPHENOL	89 U	90 U	180 U	91 U	NA	NA	NA	NA	NA	NA	NA
3,3'-DICHLOROBENZIDINE	210 UJ	210 U	420 UJ	210 UJ	NA	NA	NA	NA	NA	NA	NA
3-NITROANILINE	150 UJ	150 U	310 UJ	160 UJ	NA	NA	NA	NA	NA	NA	NA
4,6-DINITRO-2-METHYLPHENOL	240 U	240 U	480 U	240 U	NA	NA	NA	NA	NA	NA	NA
4-BROMOPHENYL PHENYL ETHER	54 U	54 U	110 U	55 U	NA	NA	NA	NA	NA	NA	NA
4-CHLORO-3-METHYLPHENOL	100 U	100 U	200 U	100 U	NA	NA	NA	NA	NA	NA	NA
4-CHLOROANILINE	37 UJ	37 U	75 U	38 U	NA	NA	NA	NA	NA	NA	NA
4-CHLOROPHENYL PHENYL ETHER	57 U	58 U	120 U	58 U	NA	NA	NA	NA	NA	NA	NA
4-METHYLPHENOL	64 U	64 U	130 U	65 U	NA	NA	NA	NA	NA	NA	NA
4-NITROANILINE	180 U	180 U	370 U	190 U	NA	NA	NA	NA	NA	NA	NA
4-NITROPHENOL	230 U	230 U	460 U	230 U	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHENE	55 U	55 U	110 U	56 U	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	40 UJ	40 U	80 U	41 U	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	48 U	48 U	96 U	48 U	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	55 U	138	110 U	56 U	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-POS	0 U	99.01	0 U	0 U	NA	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	55 U	77 J	110 U	56 U	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	55 U	82 J	110 U	56 U	NA	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	40 U	92 J	81 U	41 U	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-MW08		TP-MW09		TP-MW10		TP-SB101		TP-SB102		
SAMPLE ID	TPSB290205	TPSB290508	TPSB210205	TPSB210508	TPSB38A0305	TPSB38A0709	TPSB1010205	TPSB1010508	TPSB1020205	TPSB1020205-AVG	TPSB1020205-D
SAMPLE DATE	20030423	20030423	20030422	20030422	20030423	20030423	20081122	20081122	20081122	20081122	20081122
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	2	5	2	5	3	7	2	5	2	2	2
BOTTOM DEPTH	5	8	5	8	5	9	5	8	5	5	5
BENZO(G,H,I)PERYLENE	73 U	73 U	150 U	74 U	NA	NA	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	70 U	70 U	140 U	71 U	NA	NA	NA	NA	NA	NA	NA
BIS(2-CHLOROETHOXY)METHANE	51 UJ	51 U	100 U	52 U	NA	NA	NA	NA	NA	NA	NA
BIS(2-CHLOROETHYL)ETHER	59 UJ	59 U	120 U	60 U	NA	NA	NA	NA	NA	NA	NA
BIS(2-ETHYLHEXYL)PHTHALATE	87 U	130 J	180 U	89 U	NA	NA	NA	NA	NA	NA	NA
BUTYL BENZYL PHTHALATE	74 U	74 U	150 U	75 U	NA	NA	NA	NA	NA	NA	NA
CARBAZOLE	65 U	65 U	130 U	66 U	NA	NA	NA	NA	NA	NA	NA
CHRYSENE	59 U	110 J	120 U	60 U	NA	NA	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	70 U	70 U	140 U	72 U	NA	NA	NA	NA	NA	NA	NA
DIBENZOFURAN	38 U	38 U	76 U	38 U	NA	NA	NA	NA	NA	NA	NA
DIETHYL PHTHALATE	45 U	45 U	91 UJ	46 UJ	NA	NA	NA	NA	NA	NA	NA
DIMETHYL PHTHALATE	50 U	50 U	100 U	50 U	NA	NA	NA	NA	NA	NA	NA
DI-N-BUTYL PHTHALATE	230 U	230 U	460 U	230 U	NA	NA	NA	NA	NA	NA	NA
DI-N-OCTYL PHTHALATE	55 U	250 J	110 U	56 U	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	66 J	87 J	120 U	61 U	NA	NA	NA	NA	NA	NA	NA
FLUORENE	55 U	55 U	110 UJ	56 UJ	NA	NA	NA	NA	NA	NA	NA
HEXACHLOROBENZENE	67 U	67 U	140 U	68 U	NA	NA	NA	NA	NA	NA	NA
HEXACHLOROBUTADIENE	40 UJ	40 U	80 U	40 U	NA	NA	NA	NA	NA	NA	NA
HEXACHLOROCYCLOPENTADIENE	41 UJ	41 U	83 U	42 U	NA	NA	NA	NA	NA	NA	NA
HEXACHLOROETHANE	36 UJ	36 U	73 U	37 U	NA	NA	NA	NA	NA	NA	NA
HIGH MOLECULAR WEIGHT PAHS	228	531	385	195.5	NA	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	65 U	65 U	130 U	66 U	NA	NA	NA	NA	NA	NA	NA
ISOPHORONE	31 UJ	31 U	62 U	32 U	NA	NA	NA	NA	NA	NA	NA
LOW MOLECULAR WEIGHT PAHS	166.5	205	335	169	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	37 UJ	37 U	74 U	37 U	NA	NA	NA	NA	NA	NA	NA
NITROBENZENE	55 UJ	55 U	110 U	56 U	NA	NA	NA	NA	NA	NA	NA
N-NITROSO-DI-N-PROPYLAMINE	49 U	49 U	99 U	50 U	NA	NA	NA	NA	NA	NA	NA
N-NITROSODIPHENYLAMINE	100 U	100 U	200 U	100 U	NA	NA	NA	NA	NA	NA	NA
PENTACHLOROPHENOL	210 U	210 U	420 U	210 U	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	53 U	65 J	110 U	54 U	NA	NA	NA	NA	NA	NA	NA
PHENOL	77 U	77 U	160 U	79 U	NA	NA	NA	NA	NA	NA	NA
PYRENE	85 U	140 J	170 U	86 U	NA	NA	NA	NA	NA	NA	NA

LOCATION		TP-SB103				TP-SB104		TP-SB105		TP-SB106	
SAMPLE ID	TPSB1020508	TPSB1030205	TPSB1030508	TPSB1030508-AVG	TPSB1030508-	TPSB1040205	TPSB1040508	TPSB1050205	TPSB1050508	TPSB1060205	TPSB1060508
SAMPLE DATE	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122
SAMPLE CODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	5	2	5	5	5	2	5	2	5	2	5
BOTTOM DEPTH	8	5	8	8	8	5	8	5	8	5	8
DIOXINS/FURANS (NG/KG)											
1,2,3,4,6,7,8,9-OCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8,9-OCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HPCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HPCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HPCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HXCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HXCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HXCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PECDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PECDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-PECDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-1998	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-1998 - HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-2005 - HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HPCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HPCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HXCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HXCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PECDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PECDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL TCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL TCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
METALS (MG/KG)											
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	28.6 J	10.1 J	17.4 J	17.75	18.1	18.4 J	20.8 J	14.7 J	16 J	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION		TP-SB103				TP-SB104		TP-SB105		TP-SB106	
SAMPLE ID	TPSB1020508	TPSB1030205	TPSB1030508	TPSB1030508-AVG	TPSB1030508-	TPSB1040205	TPSB1040508	TPSB1050205	TPSB1050508	TPSB1060205	TPSB1060508
SAMPLE DATE	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122
SAMPLE CODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	5	2	5	5	5	2	5	2	5	2	5
BOTTOM DEPTH	8	5	8	8	8	5	8	5	8	5	8
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (%)											
SIEVE 1"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE 1/2"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE 1-1/2"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE 3/4"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE 3/8"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 040	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 060	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL SOLIDS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (LB/F3)											
BULK DENSITY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MEQ/100)											
CATION EXCHANGE CAPACITY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION		TP-SB103				TP-SB104		TP-SB105		TP-SB106	
SAMPLE ID	TPSB1020508	TPSB1030205	TPSB1030508	TPSB1030508-AVG	TPSB1030508-	TPSB1040205	TPSB1040508	TPSB1050205	TPSB1050508	TPSB1060205	TPSB1060508
SAMPLE DATE	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122
SAMPLE CODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	5	2	5	5	5	2	5	2	5	2	5
BOTTOM DEPTH	8	5	8	8	8	5	8	5	8	5	8
MISCELLANEOUS PARAMETERS (MG/KG)											
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)											
POROSITY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PESTICIDES/PCBS (UG/KG)											
4,4'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALPHA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALPHA-CHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AROCLOR-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	38 UJ	38 UJ
AROCLOR-1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	38 U	38 U
AROCLOR-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	38 U	38 U
AROCLOR-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	38 U	38 U
AROCLOR-1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	38 U	38 U
AROCLOR-1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	38 U	38 U
AROCLOR-1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	38 UJ	38 UJ
BETA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DELTA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIELDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN I	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN II	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN SULFATE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDRIN ALDEHYDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDRIN KETONE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GAMMA-BHC (LINDANE)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GAMMA-CHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR EPOXIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
METHOXYCHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL AROCLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL AROCLOR HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	133	133
TOTAL AROCLOR ZEROND	NA	NA	NA	NA	NA	NA	NA	NA	NA	0 U	0 U
TOXAPHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION		TP-SB103				TP-SB104		TP-SB105		TP-SB106	
SAMPLE ID	TPSB1020508	TPSB1030205	TPSB1030508	TPSB1030508-AVG	TPSB1030508-	TPSB1040205	TPSB1040508	TPSB1050205	TPSB1050508	TPSB1060205	TPSB1060508
SAMPLE DATE	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122
SAMPLE CODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	5	2	5	5	5	2	5	2	5	2	5
BOTTOM DEPTH	8	5	8	8	8	5	8	5	8	5	8
SEMIVOLATILES (UG/KG)											
1,2,4-TRICHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-DICHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-DICHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-DICHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2'-OXYBIS(1-CHLOROPROPANE)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-TRICHLOROPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-TRICHLOROPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-DICHLOROPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-DIMETHYLPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-DINITROPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-DINITROTOLUENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-CHLORONAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-CHLOROPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-METHYLPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-NITROANILINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-NITROPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-DICHLOROBENZIDINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-NITROANILINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,6-DINITRO-2-METHYLPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-BROMOPHENYL PHENYL ETHER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-CHLORO-3-METHYLPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-CHLOROANILINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-CHLOROPHENYL PHENYL ETHER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-METHYLPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-NITROANILINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-NITROPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION		TP-SB103				TP-SB104		TP-SB105		TP-SB106	
SAMPLE ID	TPSB1020508	TPSB1030205	TPSB1030508	TPSB1030508-AVG	TPSB1030508-	TPSB1040205	TPSB1040508	TPSB1050205	TPSB1050508	TPSB1060205	TPSB1060508
SAMPLE DATE	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122
SAMPLE CODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	5	2	5	5	5	2	5	2	5	2	5
BOTTOM DEPTH	8	5	8	8	8	5	8	5	8	5	8
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BIS(2-CHLOROETHOXY)METHANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BIS(2-CHLOROETHYL)ETHER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BIS(2-ETHYLHEXYL)PHTHALATE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BUTYL BENZYL PHTHALATE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CARBAZOLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHRYSENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIETHYL PHTHALATE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIMETHYL PHTHALATE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DI-N-BUTYL PHTHALATE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DI-N-OCTYL PHTHALATE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLOROBUTADIENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLOROCYCLOPENTADIENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HIGH MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ISOPHORONE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LOW MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NITROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-NITROSO-DI-N-PROPYLAMINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-NITROSODIPHENYLAMINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLOROPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SB107		TP-SB108		TP-SB109		TP-SB110		TP-SB111		TP-S
SAMPLE ID	TPSB1070205	TPSB1070508	TPSB1080205	TPSB1080508	TPSB1090205	TPSB1090508	TPSB1100205	TPSB1100508	TPSB1110205	TPSB1110508	TPSB1120205
SAMPLE DATE	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	2	5	2	5	2	5	2	5	2	5	2
BOTTOM DEPTH	5	8	5	8	5	8	5	8	5	8	5
DIOXINS/FURANS (NG/KG)											
1,2,3,4,6,7,8,9-OCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8,9-OCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HPCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HPCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HPCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HXCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HXCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HXCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PECDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PECDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-PECDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-1998	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-1998 - HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-2005 - HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HPCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HPCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HXCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HXCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PECDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PECDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL TCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL TCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
METALS (MG/KG)											
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SB107		TP-SB108		TP-SB109		TP-SB110		TP-SB111		TP-S
SAMPLE ID	TPSB1070205	TPSB1070508	TPSB1080205	TPSB1080508	TPSB1090205	TPSB1090508	TPSB1100205	TPSB1100508	TPSB1110205	TPSB1110508	TPSB1120205
SAMPLE DATE	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	2	5	2	5	2	5	2	5	2	5	2
BOTTOM DEPTH	5	8	5	8	5	8	5	8	5	8	5
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (%)											
SIEVE 1"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE 1/2"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE 1-1/2"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE 3/4"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE 3/8"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 040	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 060	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL SOLIDS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (LB/F3)											
BULK DENSITY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MEQ/100)											
CATION EXCHANGE CAPACITY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SB107		TP-SB108		TP-SB109		TP-SB110		TP-SB111		TP-S
SAMPLE ID	TPSB1070205	TPSB1070508	TPSB1080205	TPSB1080508	TPSB1090205	TPSB1090508	TPSB1100205	TPSB1100508	TPSB1110205	TPSB1110508	TPSB1120205
SAMPLE DATE	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	2	5	2	5	2	5	2	5	2	5	2
BOTTOM DEPTH	5	8	5	8	5	8	5	8	5	8	5
MISCELLANEOUS PARAMETERS (MG/KG)											
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)											
POROSITY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PESTICIDES/PCBS (UG/KG)											
4,4'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALPHA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALPHA-CHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AROCLOR-1016	38 UJ	39 UJ	36 U	40 U	35 U	37 U	34 UJ	34 UJ	39 U	38 UJ	37 U
AROCLOR-1221	38 UJ	39 UJ	36 U	40 U	35 U	37 U	34 UJ	34 UJ	39 U	38 UJ	37 U
AROCLOR-1232	38 UJ	39 UJ	36 U	40 U	35 U	37 U	34 UJ	34 UJ	39 U	38 UJ	37 U
AROCLOR-1242	38 UJ	39 UJ	36 U	40 U	35 U	37 U	34 UJ	34 UJ	39 U	38 UJ	37 U
AROCLOR-1248	38 UJ	39 UJ	36 U	41000 J	35 U	37 U	34 UJ	34 UJ	39 U	38 UJ	37 U
AROCLOR-1254	38 UJ	39 UJ	36 U	40 U	35 U	37 U	34 UJ	34 UJ	39 U	38 UJ	37 U
AROCLOR-1260	93 J	39 UJ	210 J	40 U	35 U	37 U	34 UJ	34 UJ	39 U	38 UJ	180
BETA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DELTA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIELDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN I	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN II	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN SULFATE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDRIN ALDEHYDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDRIN KETONE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GAMMA-BHC (LINDANE)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GAMMA-CHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR EPOXIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
METHOXYCHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL AROCLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL AROCLOR HALFND	207	136.5	318	41120	122.5	129.5	119	119	136.5	133	291
TOTAL AROCLOR ZEROND	93	0 U	210	41000	0 U	0 U	0 U	0 U	0 U	0 U	180
TOXAPHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SB107		TP-SB108		TP-SB109		TP-SB110		TP-SB111		TP-S
SAMPLE ID	TPSB1070205	TPSB1070508	TPSB1080205	TPSB1080508	TPSB1090205	TPSB1090508	TPSB1100205	TPSB1100508	TPSB1110205	TPSB1110508	TPSB1120205
SAMPLE DATE	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	2	5	2	5	2	5	2	5	2	5	2
BOTTOM DEPTH	5	8	5	8	5	8	5	8	5	8	5
SEMIVOLATILES (UG/KG)											
1,2,4-TRICHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-DICHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-DICHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-DICHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2'-OXYBIS(1-CHLOROPROPANE)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-TRICHLOROPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-TRICHLOROPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-DICHLOROPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-DIMETHYLPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-DINITROPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-DINITROTOLUENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-CHLORONAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-CHLOROPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-METHYLPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-NITROANILINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-NITROPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-DICHLOROBENZIDINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-NITROANILINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,6-DINITRO-2-METHYLPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-BROMOPHENYL PHENYL ETHER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-CHLORO-3-METHYLPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-CHLOROANILINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-CHLOROPHENYL PHENYL ETHER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-METHYLPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-NITROANILINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-NITROPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SB107		TP-SB108		TP-SB109		TP-SB110		TP-SB111		TP-S
SAMPLE ID	TPSB1070205	TPSB1070508	TPSB1080205	TPSB1080508	TPSB1090205	TPSB1090508	TPSB1100205	TPSB1100508	TPSB1110205	TPSB1110508	TPSB1120205
SAMPLE DATE	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122	20081122
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	2	5	2	5	2	5	2	5	2	5	2
BOTTOM DEPTH	5	8	5	8	5	8	5	8	5	8	5
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BIS(2-CHLOROETHOXY)METHANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BIS(2-CHLOROETHYL)ETHER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BIS(2-ETHYLHEXYL)PHTHALATE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BUTYL BENZYL PHTHALATE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CARBAZOLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHRYSENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIETHYL PHTHALATE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIMETHYL PHTHALATE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DI-N-BUTYL PHTHALATE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DI-N-OCTYL PHTHALATE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLOROBUTADIENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLOROCYCLOPENTADIENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HIGH MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ISOPHORONE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LOW MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NITROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-NITROSO-DI-N-PROPYLAMINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-NITROSODIPHENYLAMINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLOROPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	B112	TP-SB113		TP-SB114		TP-SB117			TP-SB118	
SAMPLE ID	TPSB1120508	TPSB1130205	TPSB1130508	TPSB1140205	TPSB1140508	TPSB1170205	TPSB1170205-AVG	TPSB1170205-	TPSB1180205	TPSB1180205-AVG
SAMPLE DATE	20081122	20081122	20081122	20081122	20081122	20081123	20081123	20081123	20081123	20081123
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	ORIG	AVG
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	5	2	5	2	5	2	2	2	2	2
BOTTOM DEPTH	8	5	8	5	8	5	5	5	5	5
DIOXINS/FURANS (NG/KG)										
1,2,3,4,6,7,8,9-OCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8,9-OCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HPCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HPCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HPCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HXCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HXCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HXCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PECDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PECDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-HXCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-PECDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-1998	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-1998 - HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-2005 - HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HPCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HPCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HXCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HXCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PECDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PECDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL TCDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL TCDF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
METALS (MG/KG)										
ALUMINUM	NA	NA	NA	NA	NA	12100	11950	11800	16200	16200
ANTIMONY	NA	NA	NA	NA	NA	0.14 UJ	0.1165 U	0.093 UJ	0.11 UJ	0.11 UJ
ARSENIC	NA	NA	NA	NA	NA	14.1	13.65	13.2	19.6	19.6
BARIUM	NA	NA	NA	NA	NA	54.5	53.05	51.6	85.8	85.8
BERYLLIUM	NA	NA	NA	NA	NA	0.67	0.65	0.63	0.95	0.95
CADMIUM	NA	NA	NA	NA	NA	0.46	0.485	0.51	0.32 J	0.32 J

LOCATION	B112	TP-SB113		TP-SB114		TP-SB117			TP-SB118	
SAMPLE ID	TPSB1120508	TPSB1130205	TPSB1130508	TPSB1140205	TPSB1140508	TPSB1170205	TPSB1170205-AVG	TPSB1170205-	TPSB1180205	TPSB1180205-AVG
SAMPLE DATE	20081122	20081122	20081122	20081122	20081122	20081123	20081123	20081123	20081123	20081123
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	ORIG	AVG
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	5	2	5	2	5	2	2	2	2	2
BOTTOM DEPTH	8	5	8	5	8	5	5	5	5	5
CALCIUM	NA	NA	NA	NA	NA	1540	1495	1450	1880	1880
CHROMIUM	NA	NA	NA	NA	NA	42.8 J	42.25	41.7 J	47.2 J	47.2 J
COBALT	NA	NA	NA	NA	NA	8.3	8.9	9.5	8.9	8.9
COPPER	NA	NA	NA	NA	NA	27.8 J	28.45	29.1 J	63.4 J	63.4 J
IRON	NA	NA	NA	NA	NA	22000	22450	22900	23100	23100
LEAD	NA	NA	NA	NA	NA	180 J	184	188 J	181 J	181 J
MAGNESIUM	NA	NA	NA	NA	NA	7210	7225	7240	6380	6380
MANGANESE	NA	NA	NA	NA	NA	405	380.5	356	335	335
MERCURY	NA	NA	NA	NA	NA	0.21 J	0.225	0.24 J	0.65 J	0.65 J
NICKEL	NA	NA	NA	NA	NA	33.2	33.7	34.2	30.7	30.7
POTASSIUM	NA	NA	NA	NA	NA	1720	1845	1970	1860	1860
SELENIUM	NA	NA	NA	NA	NA	0.6 U	0.5 U	0.4 U	0.47 U	0.47 U
SILVER	NA	NA	NA	NA	NA	0.11 U	0.0915 U	0.073 U	0.087 UJ	0.087 UJ
SODIUM	NA	NA	NA	NA	NA	225	221.5	218	223	223
THALLIUM	NA	NA	NA	NA	NA	0.35 U	0.29 U	0.23 U	0.28 U	0.28 U
VANADIUM	NA	NA	NA	NA	NA	26.6	29.2	31.8	35.2	35.2
ZINC	NA	NA	NA	NA	NA	84.2 J	92.6	101 J	82.8 J	82.8 J
MISCELLANEOUS PARAMETERS (%)										
SIEVE 1"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE 1/2"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE 1-1/2"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE 3/4"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE 3/8"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 040	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 060	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL SOLIDS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (LB/F3)										
BULK DENSITY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MEQ/100)										
CATION EXCHANGE CAPACITY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	B112	TP-SB113		TP-SB114		TP-SB117			TP-SB118	
SAMPLE ID	TPSB1120508	TPSB1130205	TPSB1130508	TPSB1140205	TPSB1140508	TPSB1170205	TPSB1170205-AVG	TPSB1170205-	TPSB1180205	TPSB1180205-AVG
SAMPLE DATE	20081122	20081122	20081122	20081122	20081122	20081123	20081123	20081123	20081123	20081123
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	ORIG	AVG
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	5	2	5	2	5	2	2	2	2	2
BOTTOM DEPTH	8	5	8	5	8	5	5	5	5	5
MISCELLANEOUS PARAMETERS (MG/KG)										
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)										
POROSITY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PESTICIDES/PCBS (UG/KG)										
4,4'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALPHA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALPHA-CHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AROCLOR-1016	36 U	39 UJ	40 U	37 U	38 U	36 U	36.5 U	37 U	38 U	38 U
AROCLOR-1221	36 U	39 UJ	40 U	37 U	38 U	36 U	36.5 U	37 U	38 U	38 U
AROCLOR-1232	36 U	39 UJ	40 U	37 U	38 U	36 U	36.5 U	37 U	38 U	38 U
AROCLOR-1242	36 U	39 UJ	40 U	37 U	38 U	36 U	36.5 U	37 U	38 U	38 U
AROCLOR-1248	36 U	39 UJ	40 U	37 U	38 U	36 U	36.5 U	37 U	38 U	38 U
AROCLOR-1254	36 U	39 UJ	40 U	200	38 U	36 U	36.5 U	37 U	38 U	38 U
AROCLOR-1260	19000 J	39 UJ	40 U	37 U	38 U	36 U	36.5 U	37 U	38 U	38 U
BETA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DELTA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIELDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN I	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN II	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN SULFATE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDRIN ALDEHYDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDRIN KETONE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GAMMA-BHC (LINDANE)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GAMMA-CHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR EPOXIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
METHOXYCHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL AROCLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL AROCLOR HALFND	19108	136.5	140	311	133	126	127.75	129.5	133	133
TOTAL AROCLOR ZEROND	19000	0 U	0 U	200	0 U	0 U	0 U	0 U	0 U	0 U
TOXAPHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	B112	TP-SB113		TP-SB114		TP-SB117			TP-SB118	
SAMPLE ID	TPSB1120508	TPSB1130205	TPSB1130508	TPSB1140205	TPSB1140508	TPSB1170205	TPSB1170205-AVG	TPSB1170205-	TPSB1180205	TPSB1180205-AVG
SAMPLE DATE	20081122	20081122	20081122	20081122	20081122	20081123	20081123	20081123	20081123	20081123
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	ORIG	AVG
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	5	2	5	2	5	2	2	2	2	2
BOTTOM DEPTH	8	5	8	5	8	5	5	5	5	5
SEMIVOLATILES (UG/KG)										
1,2,4-TRICHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-DICHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-DICHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-DICHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2'-OXYBIS(1-CHLOROPROPANE)	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
2,4,5-TRICHLOROPHENOL	NA	NA	NA	NA	NA	740 U	740 U	740 U	770 U	770 U
2,4,6-TRICHLOROPHENOL	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
2,4-DICHLOROPHENOL	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
2,4-DIMETHYLPHENOL	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
2,4-DINITROPHENOL	NA	NA	NA	NA	NA	740 UJ	740 U	740 UJ	770 UJ	770 UJ
2,4-DINITROTOLUENE	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
2,6-DINITROTOLUENE	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
2-CHLORONAPHTHALENE	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
2-CHLOROPHENOL	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
2-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	14	14.5	15	3.8 U	3.8 U
2-METHYLPHENOL	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
2-NITROANILINE	NA	NA	NA	NA	NA	740 U	740 U	740 U	770 U	770 U
2-NITROPHENOL	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
3,3'-DICHLOROBENZIDINE	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
3-NITROANILINE	NA	NA	NA	NA	NA	740 U	740 U	740 U	770 U	770 U
4,6-DINITRO-2-METHYLPHENOL	NA	NA	NA	NA	NA	740 U	740 U	740 U	770 U	770 U
4-BROMOPHENYL PHENYL ETHER	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
4-CHLORO-3-METHYLPHENOL	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
4-CHLOROANILINE	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
4-CHLOROPHENYL PHENYL ETHER	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
4-METHYLPHENOL	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
4-NITROANILINE	NA	NA	NA	NA	NA	740 U	740 U	740 U	770 U	770 U
4-NITROPHENOL	NA	NA	NA	NA	NA	740 U	740 U	740 U	770 U	770 U
ACENAPHTHENE	NA	NA	NA	NA	NA	3.6 U	3.6 U	3.6 U	3.8 U	3.8 U
ACENAPHTHYLENE	NA	NA	NA	NA	NA	3.6 U	3.6 U	3.6 U	3.8 U	3.8 U
ANTHRACENE	NA	NA	NA	NA	NA	3.6 U	3.6 U	3.6 U	3.8 U	3.8 U
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA	5.269	7.7275	10.186	11.782	11.782
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA	1.453	4.8205	8.188	9.882	9.882
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	5.8	6.95	8.1	7.7	7.7
BENZO(A)PYRENE	NA	NA	NA	NA	NA	3.6 U	3.9	6	7.6	7.6
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	8.5	10.75	13	8.8	8.8

LOCATION	B112	TP-SB113		TP-SB114		TP-SB117			TP-SB118	
SAMPLE ID	TPSB1120508	TPSB1130205	TPSB1130508	TPSB1140205	TPSB1140508	TPSB1170205	TPSB1170205-AVG	TPSB1170205-	TPSB1180205	TPSB1180205-AVG
SAMPLE DATE	20081122	20081122	20081122	20081122	20081122	20081123	20081123	20081123	20081123	20081123
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	ORIG	AVG
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	5	2	5	2	5	2	2	2	2	2
BOTTOM DEPTH	8	5	8	5	8	5	5	5	5	5
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	3.6 U	3.6 U	3.6 U	5.2	5.2
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA	3.6 U	3.4	5	7.6	7.6
BIS(2-CHLOROETHOXY)METHANE	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
BIS(2-CHLOROETHYL)ETHER	NA	NA	NA	NA	NA	3.6 U	3.6 U	3.6 U	3.8 U	3.8 U
BIS(2-ETHYLHEXYL)PHTHALATE	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
BUTYL BENZYL PHTHALATE	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
CARBAZOLE	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
CHRYSENE	NA	NA	NA	NA	NA	23	25.5	28	14	14
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	3.6 U	3.6 U	3.6 U	3.8 U	3.8 U
DIBENZOFURAN	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
DIETHYL PHTHALATE	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
DIMETHYL PHTHALATE	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
DI-N-BUTYL PHTHALATE	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
DI-N-OCTYL PHTHALATE	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
FLUORANTHENE	NA	NA	NA	NA	NA	12 U	15 U	18 U	13 U	13 U
FLUORENE	NA	NA	NA	NA	NA	3.6 U	3.6 U	3.6 U	3.8 U	3.8 U
HEXACHLOROBENZENE	NA	NA	NA	NA	NA	3.6 U	3.6 U	3.6 U	3.8 U	3.8 U
HEXACHLOROBUTADIENE	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
HEXACHLOROCYCLOPENTADIENE	NA	NA	NA	NA	NA	360 UJ	360 U	360 UJ	380 UJ	380 UJ
HEXACHLOROETHANE	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
HIGH MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	42.75	51.075	59.4	43.2	43.2
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	3.6 U	3.6 U	3.6 U	4.9	4.9
ISOPHORONE	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
LOW MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	52.7	57.95	63.2	21.4	21.4
NAPHTHALENE	NA	NA	NA	NA	NA	5.5	5.25	5	3.8 U	3.8 U
NITROBENZENE	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
N-NITROSO-DI-N-PROPYLAMINE	NA	NA	NA	NA	NA	3.6 U	3.6 U	3.6 U	3.8 U	3.8 U
N-NITROSODIPHENYLAMINE	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
PENTACHLOROPHENOL	NA	NA	NA	NA	NA	740 UJ	740 U	740 UJ	770 UJ	770 UJ
PHENANTHRENE	NA	NA	NA	NA	NA	26	31	36	10	10
PHENOL	NA	NA	NA	NA	NA	360 U	360 U	360 U	380 U	380 U
PYRENE	NA	NA	NA	NA	NA	8.7 U	10.85 U	13 U	11 U	11 U

LOCATION		TP-SB18		TP-SB19				TP-SB20			
SAMPLE ID	TPSB1180205-	TPSB180205	TPSB180508	TPSB190205	TPSB190205-AVG	TPSB190205-D	TPSB190508	TPSB200205	TPSB200205-AVG	TPSB200205-D	TPSB200506
SAMPLE DATE	20081123	20030425	20030425	20030425	20030425	20030425	20030425	20030425	20030425	20030425	20030425
SAMPLE CODE	DUP	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	ORIG	AVG	DUP	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	2	2	5	2	2	2	5	2	2	2	5
BOTTOM DEPTH	5	5	8	5	5	5	8	5	5	5	6
DIOXINS/FURANS (NG/KG)											
1,2,3,4,6,7,8,9-OCDD	NA	NA	NA	164 J	148	132 J	NA	NA	NA	NA	NA
1,2,3,4,6,7,8,9-OCDF	NA	NA	NA	27.9 J	30.25	32.6 J	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HPCDD	NA	NA	NA	20	21.9	23.8	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HPCDF	NA	NA	NA	34.1	36.55	39	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HPCDF	NA	NA	NA	3.7 U	4 U	4.3 U	NA	NA	NA	NA	NA
1,2,3,4,7,8-HXCDD	NA	NA	NA	2 U	2.4 U	2.8 U	NA	NA	NA	NA	NA
1,2,3,4,7,8-HXCDF	NA	NA	NA	14	14.05	14.1	NA	NA	NA	NA	NA
1,2,3,6,7,8-HXCDD	NA	NA	NA	1.9 U	2.25 U	2.6 U	NA	NA	NA	NA	NA
1,2,3,6,7,8-HXCDF	NA	NA	NA	7.8	7.25	6.7 J	NA	NA	NA	NA	NA
1,2,3,7,8,9-HXCDD	NA	NA	NA	1.9 U	2.35 U	2.8 U	NA	NA	NA	NA	NA
1,2,3,7,8,9-HXCDF	NA	NA	NA	1.7 U	1.9 U	2.1 U	NA	NA	NA	NA	NA
1,2,3,7,8-PECDD	NA	NA	NA	1.2 U	1.4 U	1.6 U	NA	NA	NA	NA	NA
1,2,3,7,8-PECDF	NA	NA	NA	16.7 J	17.3	17.9 J	NA	NA	NA	NA	NA
2,3,4,6,7,8-HXCDF	NA	NA	NA	8.1	8.1	8.1	NA	NA	NA	NA	NA
2,3,4,7,8-PECDF	NA	NA	NA	5.6	5.45	5.3	NA	NA	NA	NA	NA
2,3,7,8-TCDD	NA	NA	NA	0.7 U	0.8 U	0.9 U	NA	NA	NA	NA	NA
2,3,7,8-TCDF	NA	NA	NA	2.8 U	2.7	2.7	NA	NA	NA	NA	NA
TEQ WHO-1998	NA	NA	NA	7.1852	7.2673	7.3495	NA	NA	NA	NA	NA
TEQ WHO-1998 - HALFND	NA	NA	NA	8.6687	8.9023	9.136	NA	NA	NA	NA	NA
TEQ WHO-2005	NA	NA	NA	5.7696	5.867	5.9644	NA	NA	NA	NA	NA
TEQ WHO-2005 - HALFND	NA	NA	NA	7.2531	7.502	7.7509	NA	NA	NA	NA	NA
TOTAL HPCDD	NA	NA	NA	41.7	43.85	46	NA	NA	NA	NA	NA
TOTAL HPCDF	NA	NA	NA	55.4	60.4	65.4	NA	NA	NA	NA	NA
TOTAL HXCDD	NA	NA	NA	23.7	25.5	27.3	NA	NA	NA	NA	NA
TOTAL HXCDF	NA	NA	NA	66.6 J	63.6	60.6 J	NA	NA	NA	NA	NA
TOTAL PECDD	NA	NA	NA	5.1	6.65	8.2 J	NA	NA	NA	NA	NA
TOTAL PECDF	NA	NA	NA	102 J	105.5	109 J	NA	NA	NA	NA	NA
TOTAL TCDD	NA	NA	NA	1.5 J	1.6	1.7 J	NA	NA	NA	NA	NA
TOTAL TCDF	NA	NA	NA	182 J	182	182 J	NA	NA	NA	NA	NA
METALS (MG/KG)											
ALUMINUM	NA	7810	5540	7190	7075	6960	5340	5490	6495	7500	NA
ANTIMONY	NA	3.7 J	0.68 J	7.2 J	9.8	12.4 J	2.1 J	0.39 U	0.4875	0.78 J	NA
ARSENIC	NA	11	6.9	17.6	18.3	19	10.4	8.2 J	9.15	10.1	NA
BARIUM	NA	236 J	24.4 J	204 J	245.5	287 J	63.6 J	65.2	58.85	52.5 J	NA
BERYLLIUM	NA	0.26 U	0.11 U	0.27 U	0.22 U	0.17 U	0.14 U	0.22 J	0.22 J	0.33 U	NA
CADMIUM	NA	0.94 U	1 U	4.4 J	4.85	5.3 J	2.9 J	1.6 J	1.4	1.2 J	NA

LOCATION		TP-SB18		TP-SB19				TP-SB20			
SAMPLE ID	TPSB1180205-	TPSB180205	TPSB180508	TPSB190205	TPSB190205-AVG	TPSB190205-D	TPSB190508	TPSB200205	TPSB200205-AVG	TPSB200205-D	TPSB200506
SAMPLE DATE	20081123	20030425	20030425	20030425	20030425	20030425	20030425	20030425	20030425	20030425	20030425
SAMPLE CODE	DUP	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	ORIG	AVG	DUP	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	2	2	5	2	2	2	5	2	2	2	5
BOTTOM DEPTH	5	5	8	5	5	5	8	5	5	5	6
CALCIUM	NA	2670	7400	3850	4845	5840	24200	1920 J	3150	4380 J	NA
CHROMIUM	NA	28.7	22.5	55.5 J	96.25	137 J	67.7	103 J	73	43 J	NA
COBALT	NA	8.4	7.1	18	23.2	28.4	15.4	8	8.6	9.2	NA
COPPER	NA	1210	232	40400	32400	24400	10000	2080 J	1565	1050 J	NA
IRON	NA	46800	35700	42100 J	61350	80600 J	107000	27800	36850	45900	NA
LEAD	NA	582 J	50.2 J	818 J	1009	1200 J	388 J	218	185	152 J	NA
MAGNESIUM	NA	3640	7290	2370	2545	2720	3860	2670	3195	3720	NA
MANGANESE	NA	287	248	886	943	1000	435	287	348.5	410	NA
MERCURY	NA	0.65	0.09	1.2 J	1.9	2.6 J	0.64	0.27 J	0.3	0.33	NA
NICKEL	NA	66.1	41.8 J	475 J	674	873 J	419	245	273.5	302	NA
POTASSIUM	NA	1730 J	1380 J	840 J	624.75	819 U	891 U	867 J	1123.5	1380 J	NA
SELENIUM	NA	1.1	0.45 J	3.6	4	4.4	3	0.72 J	1.01	1.3	NA
SILVER	NA	0.67 J	0.18 J	7.3	9.25	11.2	2.9 J	2 U	0.23 J	0.23 J	NA
SODIUM	NA	1270	2890	371	411.5	452	1280	414 J	467	520	NA
THALLIUM	NA	1.3 U	1 U	0.58 U	1.49 U	2.4 U	2.4 U	0.68 U	0.84 U	1 U	NA
VANADIUM	NA	20.1	15.1	15.4	19.45	23.5	16.1	16.6	17.8	19	NA
ZINC	NA	901	440	15800 J	12440	9080 J	5310	958	968	978	NA
MISCELLANEOUS PARAMETERS (%)											
SIEVE 1"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	77
SIEVE 1/2"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	69
SIEVE 1-1/2"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	100
SIEVE 3/4"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	74
SIEVE 3/8"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	63
SIEVE NO. 004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	53
SIEVE NO. 010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	43
SIEVE NO. 020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	35
SIEVE NO. 040	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	27
SIEVE NO. 060	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	23
SIEVE NO. 100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	18
SIEVE NO. 200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	14
TOTAL SOLIDS	NA	88	81	91	90.5	90	87	90	90.5	91	NA
MISCELLANEOUS PARAMETERS (LB/F3)											
BULK DENSITY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	122.2
MISCELLANEOUS PARAMETERS (MEQ/100)											
CATION EXCHANGE CAPACITY	NA	NA	NA	NA	NA	NA	NA	20 J	27	34 J	NA

LOCATION		TP-SB18		TP-SB19				TP-SB20			
SAMPLE ID	TPSB1180205-	TPSB180205	TPSB180508	TPSB190205	TPSB190205-AVG	TPSB190205-D	TPSB190508	TPSB200205	TPSB200205-AVG	TPSB200205-D	TPSB200506
SAMPLE DATE	20081123	20030425	20030425	20030425	20030425	20030425	20030425	20030425	20030425	20030425	20030425
SAMPLE CODE	DUP	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	ORIG	AVG	DUP	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	2	2	5	2	2	2	5	2	2	2	5
BOTTOM DEPTH	5	5	8	5	5	5	8	5	5	5	6
MISCELLANEOUS PARAMETERS (MG/KG)											
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA	140000	125000	110000	NA
MISCELLANEOUS PARAMETERS (S.U.)											
POROSITY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37
PESTICIDES/PCBS (UG/KG)											
4,4'-DDD	NA	1.4 U	150 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	NA
4,4'-DDE	NA	20 J	150 UJ	1.4 UJ	1.4 U	1.4 UJ	1.4 UJ	1.4 UJ	1.4 U	1.4 UJ	NA
4,4'-DDT	NA	14 J	130 UJ	1.2 UJ	1.2 U	1.2 UJ	11 J	1.2 UJ	1.2 U	1.2 UJ	NA
ALDRIN	NA	1.3 UJ	140 UJ	1.2 UJ	1.2 U	1.2 UJ	1.3 UJ	1.2 UJ	1.2 U	1.2 UJ	NA
ALPHA-BHC	NA	1.5 UJ	170 UJ	1.5 UJ	1.5 U	1.5 UJ	1.6 UJ	1.5 UJ	1.5 U	1.5 UJ	NA
ALPHA-CHLORDANE	NA	1.6 UJ	170 UJ	1.5 UJ	1.5 U	1.5 UJ	1.6 UJ	1.5 UJ	1.5 U	1.5 UJ	NA
AROCLOR-1016	38 U	14 U	15 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	NA
AROCLOR-1221	38 U	34 U	36 U	32 U	32.5 U	33 U	34 U	33 U	32.5 U	32 U	NA
AROCLOR-1232	38 U	21 U	22 U	20 U	20 U	20 U	21 U	20 U	20 U	20 U	NA
AROCLOR-1242	38 U	14 U	15 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	NA
AROCLOR-1248	38 U	5.2 U	5.6 U	5 U	5 U	5 U	5.2 U	5 U	5 U	5 U	NA
AROCLOR-1254	38 U	16 U	18 U	16 U	16 U	16 U	160	16 U	16 U	16 U	NA
AROCLOR-1260	38 U	8.5 U	9.2 U	23	22.5	22	78	8.3 U	8.25 U	8.2 U	NA
BETA-BHC	NA	2.3 UJ	250 UJ	2.2 UJ	2.25 U	2.3 UJ	2.3 UJ	2.3 UJ	2.25 U	2.2 UJ	NA
DELTA-BHC	NA	1.3 UJ	140 UJ	1.3 UJ	1.3 U	1.3 UJ	1.3 UJ	1.3 UJ	1.3 U	1.3 UJ	NA
DIELDRIN	NA	1.4 UJ	150 UJ	1.3 UJ	1.3 U	1.3 UJ	1.4 UJ	1.3 UJ	1.3 U	1.3 UJ	NA
ENDOSULFAN I	NA	1.4 UJ	150 UJ	1.3 UJ	1.35 U	1.4 UJ	1.4 UJ	1.4 UJ	1.35 U	1.3 UJ	NA
ENDOSULFAN II	NA	1.3 UJ	140 UJ	1.2 UJ	1.25 U	1.3 UJ	1.3 UJ	1.3 UJ	1.25 U	1.2 UJ	NA
ENDOSULFAN SULFATE	NA	1.6 UJ	170 UJ	1.5 UJ	1.5 U	1.5 UJ	1.6 UJ	1.5 UJ	1.5 U	1.5 UJ	NA
ENDRIN	NA	1.3 UJ	140 UJ	1.2 UJ	1.25 U	1.3 UJ	1.3 UJ	1.3 UJ	1.25 U	1.2 UJ	NA
ENDRIN ALDEHYDE	NA	3.2 J	160 UJ	1.5 UJ	1.5 U	1.5 UJ	1.5 UJ	1.5 UJ	1.5 U	1.5 UJ	NA
ENDRIN KETONE	NA	1.6 UJ	180 UJ	1.6 UJ	1.6 U	1.6 UJ	1.7 UJ	1.6 UJ	1.6 U	1.6 UJ	NA
GAMMA-BHC (LINDANE)	NA	1.3 UJ	140 UJ	1.3 UJ	1.3 U	1.3 UJ	1.4 UJ	1.3 UJ	1.3 U	1.3 UJ	NA
GAMMA-CHLORDANE	NA	1.4 UJ	150 UJ	1.4 UJ	1.4 U	1.4 UJ	1.4 UJ	1.4 UJ	1.4 U	1.4 UJ	NA
HEPTACHLOR	NA	1.2 UJ	130 UJ	1.2 UJ	1.2 U	1.2 UJ	1.3 UJ	1.2 UJ	1.2 U	1.2 UJ	NA
HEPTACHLOR EPOXIDE	NA	1.5 UJ	160 UJ	1.4 UJ	1.4 U	1.4 UJ	1.5 UJ	1.4 UJ	1.4 U	1.4 UJ	NA
METHOXYCHLOR	NA	2.3 UJ	250 UJ	2.2 UJ	2.25 U	2.3 UJ	2.3 UJ	2.3 UJ	2.25 U	2.2 UJ	NA
TOTAL AROCLOR	NA	0 U	0 U	23	22.5	22	238	0 U	0 U	0 U	NA
TOTAL AROCLOR HALFND	133	56.35	60.4	73.5	73.25	73	282.1	55.15	54.875	54.6	NA
TOTAL AROCLOR ZEROND	0 U	0 U	0 U	23	22.5	22	238	0 U	0 U	0 U	NA
TOXAPHENE	NA	26 U	2800 U	26 U	26 U	26 U	27 U	26 UJ	26 U	26 U	NA

LOCATION		TP-SB18		TP-SB19				TP-SB20			
SAMPLE ID	TPSB1180205-	TPSB180205	TPSB180508	TPSB190205	TPSB190205-AVG	TPSB190205-D	TPSB190508	TPSB200205	TPSB200205-AVG	TPSB200205-D	TPSB200506
SAMPLE DATE	20081123	20030425	20030425	20030425	20030425	20030425	20030425	20030425	20030425	20030425	20030425
SAMPLE CODE	DUP	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	ORIG	AVG	DUP	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	2	2	5	2	2	2	5	2	2	2	5
BOTTOM DEPTH	5	5	8	5	5	5	8	5	5	5	6
SEMIVOLATILES (UG/KG)											
1,2,4-TRICHLOROBENZENE	NA	80 U	43 U	39 U	39 U	39 U	80 U	200 U	175 U	150 U	NA
1,2-DICHLOROBENZENE	NA	85 U	46 U	41 U	41.5 U	42 U	86 U	210 U	185 U	160 U	NA
1,3-DICHLOROBENZENE	NA	82 U	44 U	40 U	40 U	40 U	83 U	200 U	180 U	160 U	NA
1,4-DICHLOROBENZENE	NA	78 U	42 U	38 U	38 U	38 U	79 U	190 U	170 U	150 U	NA
2,2'-OXYBIS(1-CHLOROPROPANE)	NA	110 UJ	60 U	53 U	53.5 U	54 UJ	110 UJ	270 U	240 U	210 U	NA
2,4,5-TRICHLOROPHENOL	NA	190 U	100 U	94 U	94.5 U	95 U	200 U	480 U	430 U	380 U	NA
2,4,6-TRICHLOROPHENOL	NA	210 U	110 U	100 U	100 U	100 U	210 U	520 U	465 U	410 U	NA
2,4-DICHLOROPHENOL	NA	150 U	81 U	73 U	73 U	73 U	150 U	370 U	330 U	290 U	NA
2,4-DIMETHYLPHENOL	NA	270 U	140 U	130 U	130 U	130 U	270 U	660 UJ	590 U	520 U	NA
2,4-DINITROPHENOL	NA	580 U	310 U	280 U	280 U	280 U	580 U	1400 UJ	1250 U	1100 UJ	NA
2,4-DINITROTOLUENE	NA	76 U	41 U	37 U	37 U	37 U	77 U	180 U	165 U	150 U	NA
2,6-DINITROTOLUENE	NA	90 U	48 U	43 U	43.5 U	44 U	90 U	220 U	195 U	170 U	NA
2-CHLORONAPHTHALENE	NA	100 U	54 U	49 U	49 U	49 U	100 U	250 U	225 U	200 U	NA
2-CHLOROPHENOL	NA	150 U	80 U	72 U	72 U	72 U	150 U	360 U	325 U	290 U	NA
2-METHYLNAPHTHALENE	NA	92 U	50 U	45 U	45 U	45 U	93 U	220 U	200 U	180 U	NA
2-METHYLPHENOL	NA	140 U	75 U	68 U	68 U	68 U	140 U	340 U	305 U	270 U	NA
2-NITROANILINE	NA	93 U	50 U	45 U	45 U	45 U	94 U	230 U	205 U	180 U	NA
2-NITROPHENOL	NA	180 U	100 U	90 U	90 U	90 U	190 U	450 U	405 U	360 U	NA
3,3'-DICHLOROBENZIDINE	NA	430 UJ	230 U	210 UJ	210 U	210 U	440 UJ	1100 U	970 U	840 U	NA
3-NITROANILINE	NA	320 U	170 U	150 U	155 U	160 U	320 U	780 U	700 U	620 U	NA
4,6-DINITRO-2-METHYLPHENOL	NA	490 U	260 U	240 U	240 U	240 U	500 U	1200 UR	950 U	950 UJ	NA
4-BROMOPHENYL PHENYL ETHER	NA	110 U	61 U	54 U	54.5 U	55 U	110 U	280 U	250 U	220 U	NA
4-CHLORO-3-METHYLPHENOL	NA	200 U	110 U	100 U	100 U	100 U	210 U	500 U	450 U	400 U	NA
4-CHLOROANILINE	NA	77 U	42 U	37 U	37.5 U	38 U	78 U	190 U	170 U	150 U	NA
4-CHLOROPHENYL PHENYL ETHER	NA	120 U	64 U	57 U	57.5 U	58 U	120 U	290 U	260 U	230 U	NA
4-METHYLPHENOL	NA	130 U	71 U	64 U	64 U	64 U	130 U	320 U	285 U	250 U	NA
4-NITROANILINE	NA	380 U	200 U	180 U	180 U	180 U	380 U	920 U	825 U	730 U	NA
4-NITROPHENOL	NA	470 UJ	250 U	230 U	230 U	230 UJ	480 UJ	1200 UJ	1055 U	910 U	NA
ACENAPHTHENE	NA	110 U	61 U	55 U	55 U	55 U	110 U	280 U	250 U	220 U	NA
ACENAPHTHYLENE	NA	82 U	45 U	40 U	40 U	40 U	83 U	200 U	180 U	160 U	NA
ANTHRACENE	NA	560 J	53 U	58 J	41	48 U	99 U	240 U	215 U	190 U	NA
BAP EQUIVALENT-HALFND	NA	2028	179.97	719.61	583.25	446.88	794.98	280 U	415.17	690.34	NA
BAP EQUIVALENT-POS	NA	2028	135.28	719.61	583.25	446.88	719.98	0 U	275.17	550.34	NA
BENZO(A)ANTHRACENE	NA	1400	61 U	290 J	235	180 J	280 J	280 U	220	300 J	NA
BENZO(A)PYRENE	NA	1300	120 J	420	335	250 J	550 J	280 U	290	440 J	NA
BENZO(B)FLUORANTHENE	NA	1800	45 U	440	420	400	710 J	200 U	235	370 J	NA

LOCATION		TP-SB18		TP-SB19				TP-SB20			
SAMPLE ID	TPSB1180205-	TPSB180205	TPSB180508	TPSB190205	TPSB190205-AVG	TPSB190205-D	TPSB190508	TPSB200205	TPSB200205-AVG	TPSB200205-D	TPSB200506
SAMPLE DATE	20081123	20030425	20030425	20030425	20030425	20030425	20030425	20030425	20030425	20030425	20030425
SAMPLE CODE	DUP	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	ORIG	AVG	DUP	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	2	2	5	2	2	2	5	2	2	2	5
BOTTOM DEPTH	5	5	8	5	5	5	8	5	5	5	6
BENZO(G,H,I)PERYLENE	NA	900	120 J	490	475	460	600 J	370 U	320 J	320 J	NA
BENZO(K)FLUORANTHENE	NA	730 J	78 U	240 J	220	200 J	260 J	350 U	277.5	380 J	NA
BIS(2-CHLOROETHOXY)METHANE	NA	100 U	56 U	51 U	51 U	51 U	100 U	260 U	230 U	200 U	NA
BIS(2-CHLOROETHYL)ETHER	NA	120 U	65 U	59 U	59 U	59 U	120 U	300 U	265 U	230 U	NA
BIS(2-ETHYLHEXYL)PHTHALATE	NA	180 U	97 U	150 J	97	88 U	180 U	7600	3887.5	350 U	NA
BUTYL BENZYL PHTHALATE	NA	150 UJ	82 U	74 UJ	74 U	74 UJ	150 UJ	1400 U	845 U	290 U	NA
CARBAZOLE	NA	130 U	73 U	65 U	65.5 U	66 U	140 U	330 U	295 U	260 U	NA
CHRYSENE	NA	1700	75 J	310 J	295	280 J	380 J	300 U	245	340 J	NA
DIBENZO(A,H)ANTHRACENE	NA	290 J	78 U	170 J	132.5	95 J	150 U	360 U	320 U	280 U	NA
DIBENZOFURAN	NA	77 U	42 U	38 U	38 U	38 U	78 U	190 U	170 U	150 U	NA
DIETHYL PHTHALATE	NA	94 U	50 U	45 U	45.5 U	46 U	94 U	240 J	165	180 U	NA
DIMETHYL PHTHALATE	NA	100 U	55 U	50 U	50 U	50 U	100 U	250 U	225 U	200 U	NA
DI-N-BUTYL PHTHALATE	NA	470 U	250 U	230 U	230 U	230 U	470 U	1400 U	1150 U	900 U	NA
DI-N-OCTYL PHTHALATE	NA	110 U	62 U	55 U	55.5 U	56 U	120 U	280 U	250 U	220 U	NA
FLUORANTHENE	NA	2200	87 J	360 J	325	290 J	240 J	300 U	270 J	270 J	NA
FLUORENE	NA	110 U	61 U	55 U	55 U	55 U	110 U	280 U	250 U	220 U	NA
HEXACHLOROBENZENE	NA	140 U	75 U	67 U	67.5 U	68 U	140 U	340 U	305 U	270 U	NA
HEXACHLOROBUTADIENE	NA	82 U	44 U	40 U	40 U	40 U	83 U	200 U	180 U	160 U	NA
HEXACHLOROCYCLOPENTADIENE	NA	85 U	46 U	41 U	41.5 U	42 U	86 U	210 U	185 U	160 U	NA
HEXACHLOROETHANE	NA	75 U	41 U	36 U	36.5 U	37 U	76 U	180 U	160 U	140 U	NA
HIGH MOLECULAR WEIGHT PAHS	NA	9490	399	1890	1632.5	1375	1885	975	1317.5	1660	NA
INDENO(1,2,3-CD)PYRENE	NA	1000	140 J	490	430	370	620 J	330 U	262.5	360 J	NA
ISOPHORONE	NA	64 U	35 U	31 U	31 U	31 U	65 U	160 U	140 U	120 U	NA
LOW MOLECULAR WEIGHT PAHS	NA	2095	223.5	414	407	400	476	835	750	665	NA
NAPHTHALENE	NA	76 U	41 U	37 U	37 U	37 U	77 U	180 U	165 U	150 U	NA
NITROBENZENE	NA	110 U	61 U	55 U	55 U	55 U	110 U	280 U	250 U	220 U	NA
N-NITROSO-DI-N-PROPYLAMINE	NA	100 U	55 U	49 U	49 U	49 U	100 U	250 U	225 U	200 U	NA
N-NITROSODIPHENYLAMINE	NA	210 U	110 U	100 U	100 U	100 U	210 U	510 U	455 U	400 U	NA
PENTACHLOROPHENOL	NA	430 U	230 U	210 U	210 U	210 U	430 U	1000 UJ	915 U	830 U	NA
PHENANTHRENE	NA	1300	68 J	240 J	250	260 J	190 J	270 U	240 U	210 U	NA
PHENOL	NA	160 U	86 U	77 U	77.5 U	78 U	160 U	390 U	350 U	310 U	NA
PYRENE	NA	2600	95 U	340 J	310	280 J	360 J	430 U	385 U	340 U	NA

LOCATION	TP-SB20B		TP-SB22		TP-SB23		TP-SB24		TP-SB25		
SAMPLE ID	TPSB20B0203	TPSB20B0508	TPSB220205	TPSB220508	TPSB230205	TPSB230508	TPSB240205	TPSB240508	TPSB250205	TPSB250508	TPSB250508-AVG
SAMPLE DATE	20030425	20030425	20030423	20030423	20030422	20030422	20030422	20030422	20030425	20030425	20030425
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	2	5	2	5	2	5	2	5	2	5	5
BOTTOM DEPTH	3	8	5	8	5	8	5	8	5	8	8
DIOXINS/FURANS (NG/KG)											
1,2,3,4,6,7,8,9-OCDD	NA	NA	83.2 J	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8,9-OCDF	NA	NA	4.5 UJ	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HPCDD	NA	NA	2.4 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HPCDF	NA	NA	3 J	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HPCDF	NA	NA	1.5 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HXCDD	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HXCDF	NA	NA	0.7 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HXCDD	NA	NA	1.1 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HXCDF	NA	NA	0.6 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HXCDD	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HXCDF	NA	NA	0.8 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PECDD	NA	NA	0.6 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PECDF	NA	NA	1.2 J	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-HXCDF	NA	NA	0.6 U	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-PECDF	NA	NA	0.4 U	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD	NA	NA	0.4 U	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDF	NA	NA	0.88 J	NA	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-1998	NA	NA	0.1863	NA	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-1998 - HALFND	NA	NA	1.116	NA	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-2005	NA	NA	0.179	NA	NA	NA	NA	NA	NA	NA	NA
TEQ WHO-2005 - HALFND	NA	NA	1.0691	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HPCDD	NA	NA	2.4 U	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HPCDF	NA	NA	3	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HXCDD	NA	NA	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL HXCDF	NA	NA	3.9 J	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PECDD	NA	NA	0.64 J	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PECDF	NA	NA	5.9 J	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL TCDD	NA	NA	0.4 U	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL TCDF	NA	NA	7.9 J	NA	NA	NA	NA	NA	NA	NA	NA
METALS (MG/KG)											
ALUMINUM	NA	3600	11400	9810	7450	4500	16200	14300	5320	9030	11265
ANTIMONY	NA	155 J	0.36 U	0.47 U	1.1 UR	3.2 U	0.24 UR	1430 J	1.8 J	0.58 J	0.58 J
ARSENIC	NA	21.7	17.9	12.6	14.3 J	24.3	15.7	35.8	17	8.6	10.7
BARIUM	NA	22 J	40.1 J	72.8 J	45.1 J	19.6 J	100 J	79.4 J	151 J	76.8 J	90.4
BERYLLIUM	NA	0.27 U	0.27	0.4	0.25 U	0.27 U	0.55	0.38	0.29 U	0.53	0.51
CADMIUM	NA	13.8	0.34 J	0.37 J	7.5	7.8 J	1 J	1 J	3.4 U	0.97 U	1.335 U

LOCATION	TP-SB20B		TP-SB22		TP-SB23		TP-SB24		TP-SB25		
SAMPLE ID	TPSB20B0203	TPSB20B0508	TPSB220205	TPSB220508	TPSB230205	TPSB230508	TPSB240205	TPSB240508	TPSB250205	TPSB250508	TPSB250508-AVG
SAMPLE DATE	20030425	20030425	20030423	20030423	20030422	20030422	20030422	20030422	20030425	20030425	20030425
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	2	5	2	5	2	5	2	5	2	5	5
BOTTOM DEPTH	3	8	5	8	5	8	5	8	5	8	8
CALCIUM	NA	4840	3090	2870	7880	6250	4350	3040	11700	36000	39800
CHROMIUM	NA	302	41.6	32.4	387	291	64.9	75.8	159 J	92.3 J	104.65
COBALT	NA	25.7 J	12.9	7.3	22.9	24.5	16.8	13.4	11.9	11.3	11.85
COPPER	NA	4790	55.6	128	826	4140	122	799	139	379	403.5
IRON	NA	255000	28100	19500	148000	280000	24600	26600	124000	92200	89000
LEAD	NA	149 J	61.1 J	180 J	268 J	172 J	56.2 J	40000 J	164	172	188.5
MAGNESIUM	NA	2480	8540 J	4650 J	5870 J	2910 J	9600 J	10200 J	4380	7050	7555
MANGANESE	NA	1930	400	321	809	1290	616	545	4370	906	1048
MERCURY	NA	0.07	0.07 J	0.31 J	0.18 J	0.13 J	0.14 J	0.22 J	0.63 J	6.4 J	4.85
NICKEL	NA	511	44.2 J	31 J	1190 J	719 J	95.1 J	111 J	100 J	329 J	350.5
POTASSIUM	NA	443 U	1720 J	1630 J	1920 J	882 J	4080 J	4280 J	955 J	1650 J	2175
SELENIUM	NA	5.5	0.61 U	0.71 U	4.9 U	5.1 U	0.39 U	0.5 U	3.5 J	0.97 J	0.97 J
SILVER	NA	0.99 J	0.09 UJ	0.06 U	0.46 UJ	0.51 UJ	0.1 UJ	4 J	4.5 U	1.3 U	1.75 U
SODIUM	NA	345	432 J	672 J	520 J	796 J	1090 J	1010 J	1680 J	779 J	869
THALLIUM	NA	3.8 U	0.66 J	1.1	2.4 U	5.3 U	0.66 J	2.8	4.8 U	1.2 U	1.65 U
VANADIUM	NA	19.4 J	28.4 J	24.3 J	98.1 J	58.7 J	40.6 J	41.2 J	15.6	24.9	29
ZINC	NA	1140	87.5	125	603	1690	486	212	542 J	344 J	339.5
MISCELLANEOUS PARAMETERS (%)											
SIEVE 1"	81	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE 1/2"	77	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE 1-1/2"	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE 3/4"	79	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE 3/8"	73	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 004	63	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 010	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 020	37	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 040	27	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 060	21	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 100	15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 200	11	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL SOLIDS	NA	86	93	85	90	87	86	88	91	89	88.5
MISCELLANEOUS PARAMETERS (LB/F3)											
BULK DENSITY	80.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MEQ/100)											
CATION EXCHANGE CAPACITY	NA	18	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SB20B		TP-SB22		TP-SB23		TP-SB24		TP-SB25		
SAMPLE ID	TPSB20B0203	TPSB20B0508	TPSB220205	TPSB220508	TPSB230205	TPSB230508	TPSB240205	TPSB240508	TPSB250205	TPSB250508	TPSB250508-AVG
SAMPLE DATE	20030425	20030425	20030423	20030423	20030422	20030422	20030422	20030422	20030425	20030425	20030425
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	2	5	2	5	2	5	2	5	2	5	5
BOTTOM DEPTH	3	8	5	8	5	8	5	8	5	8	8
MISCELLANEOUS PARAMETERS (MG/KG)											
TOTAL ORGANIC CARBON	NA	18000	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)											
POROSITY	0.54	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PESTICIDES/PCBS (UG/KG)											
4,4'-DDD	NA	1.4 U	13 U	1.5 U	14 U	NA	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
4,4'-DDE	NA	1.4 U	13 U	1.5 U	14 U	NA	1.4 U	3 J	1.4 U	1.4 U	1.4 U
4,4'-DDT	NA	1.3 UJ	49 J	2 J	12 U	NA	1.3 UJ	4.8 J	1.2 U	1.2 U	1.2 U
ALDRIN	NA	1.3 U	12 U	1.3 U	12 U	NA	1.3 U	1.3 U	1.2 U	1.2 U	1.25 U
ALPHA-BHC	NA	1.6 U	14 U	1.6 U	15 U	NA	1.6 U	1.5 U	1.5 U	1.5 U	1.5 U
ALPHA-CHLORDANE	NA	1.6 U	15 U	1.6 U	15 U	NA	1.6 U	1.6 U	1.5 U	1.5 U	1.55 U
AROCLOR-1016	NA	14 U	13 U	15 U	14 U	NA	14 U	14 U	14 U	14 U	14 U
AROCLOR-1221	NA	34 U	32 U	35 U	33 U	NA	34 U	34 U	32 U	33 U	33 U
AROCLOR-1232	NA	21 U	20 U	22 U	20 U	NA	21 U	21 U	20 U	20 U	20.5 U
AROCLOR-1242	NA	14 U	13 U	14 U	14 U	NA	14 U	14 U	14 U	14 U	14 U
AROCLOR-1248	NA	5.2 U	4.9 U	5.3 U	5.1 U	NA	5.2 U	5.2 U	5 U	5.1 U	5.1 U
AROCLOR-1254	NA	17 U	15 U	17 U	16 U	NA	17 U	16 U	16 U	16 U	16 U
AROCLOR-1260	NA	8.6 U	8 U	8.8 U	8.4 U	NA	8.6 U	20	22	8.4 U	8.45 U
BETA-BHC	NA	2.4 U	22 U	2.4 U	23 U	NA	2.4 U	2.3 U	2.2 U	2.3 U	2.3 U
DELTA-BHC	NA	1.3 UJ	12 U	1.4 U	13 U	NA	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
DIELDRIN	NA	1.4 U	13 UJ	1.4 UJ	13 UJ	NA	1.4 UJ	1.4 UJ	1.3 U	1.3 U	1.35 U
ENDOSULFAN I	NA	1.4 U	13 UJ	1.4 UJ	14 U	NA	1.4 U	1.4 U	1.3 U	1.4 U	1.4 U
ENDOSULFAN II	NA	1.3 U	12 U	1.3 U	13 U	NA	1.3 U	1.3 U	1.2 U	1.3 U	1.3 U
ENDOSULFAN SULFATE	NA	7.8 J	15 UJ	1.6 UJ	15 UJ	NA	1.6 UJ	1.6 UJ	1.5 U	1.5 U	1.55 U
ENDRIN	NA	1.3 U	12 U	1.3 U	13 U	NA	1.3 U	1.3 U	1.2 U	1.3 U	1.3 U
ENDRIN ALDEHYDE	NA	1.6 U	35 U	1.6 U	15 U	NA	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
ENDRIN KETONE	NA	1.7 UJ	35 UJ	1.7 UJ	16 UJ	NA	1.7 UJ	1.7 UJ	1.6 U	1.6 U	1.6 U
GAMMA-BHC (LINDANE)	NA	1.4 U	13 U	1.4 U	13 U	NA	1.4 U	1.3 U	1.3 U	1.3 U	1.3 U
GAMMA-CHLORDANE	NA	1.4 U	14 UJ	1.5 UJ	14 U	NA	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
HEPTACHLOR	NA	1.3 U	12 U	1.3 U	12 U	NA	1.3 U	1.2 U	1.2 U	1.2 U	1.2 U
HEPTACHLOR EPOXIDE	NA	1.5 U	14 U	1.5 U	14 U	NA	1.5 U	1.5 U	1.4 U	1.4 U	1.45 U
METHOXYCHLOR	NA	2.4 U	22 U	2.4 U	23 UJ	NA	2.4 UJ	2.3 UJ	2.2 U	2.3 U	2.3 U
TOTAL AROCLOR	NA	0 U	0 U	0 U	0 U	NA	0 U	20	22	0 U	0 U
TOTAL AROCLOR HALFND	NA	56.9	52.95	58.55	55.25	NA	56.9	72.1	72.5	55.25	55.525
TOTAL AROCLOR ZEROND	NA	0 U	0 U	0 U	0 U	NA	0 U	20	22	0 U	0 U
TOXAPHENE	NA	27 U	350 U	27 U	260 U	NA	27 U	26 U	26 U	26 U	26 U

LOCATION	TP-SB20B		TP-SB22		TP-SB23		TP-SB24		TP-SB25		
SAMPLE ID	TPSB20B0203	TPSB20B0508	TPSB220205	TPSB220508	TPSB230205	TPSB230508	TPSB240205	TPSB240508	TPSB250205	TPSB250508	TPSB250508-AVG
SAMPLE DATE	20030425	20030425	20030423	20030423	20030422	20030422	20030422	20030422	20030425	20030425	20030425
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	2	5	2	5	2	5	2	5	2	5	5
BOTTOM DEPTH	3	8	5	8	5	8	5	8	5	8	8
SEMIVOLATILES (UG/KG)											
1,2,4-TRICHLOROBENZENE	NA	41 U	38 U	41 U	78 U	NA	40 U	40 U	39 U	39 U	39.5 U
1,2-DICHLOROBENZENE	NA	44 U	40 U	44 U	84 U	NA	43 U	43 U	41 U	42 U	42 U
1,3-DICHLOROBENZENE	NA	42 U	39 U	43 U	81 U	NA	42 U	41 U	40 U	40 U	40.5 U
1,4-DICHLOROBENZENE	NA	40 U	37 U	41 U	77 U	NA	40 U	39 U	38 U	39 U	39 U
2,2'-OXYBIS(1-CHLOROPROPANE)	NA	56 U	52 U	57 U	110 U	NA	56 U	55 U	53 U	54 U	54.5 U
2,4,5-TRICHLOROPHENOL	NA	99 U	92 U	100 U	190 U	NA	99 U	98 U	94 U	96 U	96.5 U
2,4,6-TRICHLOROPHENOL	NA	110 U	100 U	110 U	210 U	NA	110 U	110 U	100 U	100 U	100 U
2,4-DICHLOROPHENOL	NA	76 U	71 U	78 U	150 U	NA	76 U	75 U	73 U	74 U	74.5 U
2,4-DIMETHYLPHENOL	NA	140 U	130 U	140 U	260 U	NA	140 U	140 U	130 U	130 U	130 U
2,4-DINITROPHENOL	NA	290 U	270 U	300 U	570 U	NA	290 U	290 U	280 UJ	280 UJ	285 U
2,4-DINITROTOLUENE	NA	39 U	36 U	39 U	75 U	NA	39 U	38 U	37 U	37 U	37.5 U
2,6-DINITROTOLUENE	NA	46 U	42 U	46 U	88 U	NA	46 U	45 U	43 U	44 U	44.5 U
2-CHLORONAPHTHALENE	NA	51 U	48 U	52 U	99 UJ	NA	51 UJ	50 U	49 U	50 U	50 U
2-CHLOROPHENOL	NA	75 U	70 U	77 U	140 U	NA	75 U	74 U	72 U	73 U	73.5 U
2-METHYLNAPHTHALENE	NA	47 U	44 U	48 U	91 U	NA	47 U	46 U	45 U	45 U	45.5 U
2-METHYLPHENOL	NA	71 U	66 U	72 U	140 U	NA	71 U	70 U	68 U	69 U	69 U
2-NITROANILINE	NA	47 U	44 U	48 U	92 U	NA	47 U	47 U	45 U	46 U	46 U
2-NITROPHENOL	NA	94 U	87 U	96 U	180 U	NA	94 U	92 U	89 U	91 U	91.5 U
3,3'-DICHLOROBENZIDINE	NA	220 U	200 U	220 U	430 UJ	NA	220 UJ	220 UJ	210 U	210 U	215 U
3-NITROANILINE	NA	160 U	150 U	160 U	310 UJ	NA	160 UJ	160 U	150 U	160 U	160 U
4,6-DINITRO-2-METHYLPHENOL	NA	250 U	230 U	250 U	480 U	NA	250 U	250 U	240 UJ	240 UJ	240 U
4-BROMOPHENYL PHENYL ETHER	NA	57 U	53 U	58 U	110 U	NA	57 U	56 U	54 U	55 U	55.5 U
4-CHLORO-3-METHYLPHENOL	NA	100 U	97 U	110 U	200 U	NA	100 U	100 U	100 U	100 U	100 U
4-CHLOROANILINE	NA	39 U	36 U	40 U	76 U	NA	39 U	39 U	37 U	38 U	38 U
4-CHLOROPHENYL PHENYL ETHER	NA	60 U	56 U	61 U	120 U	NA	60 U	59 U	57 U	58 U	58.5 U
4-METHYLPHENOL	NA	67 U	62 U	68 U	130 U	NA	67 U	66 U	64 U	65 U	65 U
4-NITROANILINE	NA	190 U	180 U	200 U	370 U	NA	190 U	190 U	180 U	190 U	190 U
4-NITROPHENOL	NA	240 U	220 U	240 U	460 U	NA	240 U	240 U	230 U	230 U	235 U
ACENAPHTHENE	NA	58 U	53 U	58 U	110 U	NA	57 U	57 U	55 U	56 U	56 U
ACENAPHTHYLENE	NA	42 U	39 U	43 U	81 U	NA	42 U	41 U	40 U	41 U	41 U
ANTHRACENE	NA	50 U	46 U	51 U	120 J	NA	50 U	49 U	48 U	48 U	48.5 U
BAP EQUIVALENT-HALFND	NA	317.37	72.324	219.45	821.43	NA	348.76	57 U	648.57	140.79	139.3
BAP EQUIVALENT-POS	NA	280	4.8	181.95	751.43	NA	311.39	0 U	648.57	104.42	102.93
BENZO(A)ANTHRACENE	NA	150 J	53 U	130 J	410 J	NA	93 J	56 U	280 J	64 J	66.5
BENZO(A)PYRENE	NA	220 J	54 U	140 J	590 J	NA	250 J	57 U	410	80 J	78.5
BENZO(B)FLUORANTHENE	NA	230 J	48 J	140 J	660 J	NA	270 J	42 U	430	96 J	94

LOCATION	TP-SB20B		TP-SB22		TP-SB23		TP-SB24		TP-SB25		
SAMPLE ID	TPSB20B0203	TPSB20B0508	TPSB220205	TPSB220508	TPSB230205	TPSB230508	TPSB240205	TPSB240508	TPSB250205	TPSB250508	TPSB250508-AVG
SAMPLE DATE	20030425	20030425	20030423	20030423	20030422	20030422	20030422	20030422	20030425	20030425	20030425
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	2	5	2	5	2	5	2	5	2	5	5
BOTTOM DEPTH	3	8	5	8	5	8	5	8	5	8	8
BENZO(G,H,I)PERYLENE	NA	180 J	71 U	140 J	380 J	NA	200 J	76 U	360	74 U	74.5 U
BENZO(K)FLUORANTHENE	NA	74 U	68 U	140 J	520 J	NA	74 U	73 U	360 J	73 J	74.5
BIS(2-CHLOROETHOXY)METHANE	NA	53 U	49 U	54 U	100 U	NA	53 U	52 U	51 U	52 U	52 U
BIS(2-CHLOROETHYL)ETHER	NA	62 U	57 U	63 U	120 U	NA	62 U	61 U	58 U	60 U	60 U
BIS(2-ETHYLHEXYL)PHTHALATE	NA	92 U	85 U	130 J	470 J	NA	300 J	490	87 U	89 U	89 U
BUTYL BENZYL PHTHALATE	NA	77 U	72 U	79 U	150 U	NA	77 U	76 U	73 U	75 U	75.5 U
CARBAZOLE	NA	69 U	64 U	70 U	130 U	NA	69 U	68 U	65 U	66 U	66.5 U
CHRYSENE	NA	200 J	58 U	150 J	430 J	NA	91 J	62 U	370	86 J	85
DIBENZO(A,H)ANTHRACENE	NA	74 U	68 U	75 U	140 U	NA	74 U	73 U	120 J	72 U	72 U
DIBENZOFURAN	NA	39 U	36 U	40 U	76 U	NA	39 U	39 U	38 U	38 U	38.5 U
DIETHYL PHTHALATE	NA	48 U	44 U	48 U	92 UJ	NA	48 UJ	47 U	45 U	46 U	46.5 U
DIMETHYL PHTHALATE	NA	52 U	48 U	53 U	100 U	NA	52 U	51 U	50 U	50 U	50.5 U
DI-N-BUTYL PHTHALATE	NA	240 U	220 U	240 U	460 U	NA	240 U	230 U	220 U	230 U	230 U
DI-N-OCTYL PHTHALATE	NA	58 U	69 J	200 J	340 J	NA	200 J	240 J	55 U	56 U	56.5 U
FLUORANTHENE	NA	180 J	63 J	270 J	990	NA	290 J	62 U	300 J	79 J	79.5
FLUORENE	NA	58 U	53 U	58 U	110 UJ	NA	57 UJ	57 U	55 U	56 U	56 U
HEXACHLOROBENZENE	NA	71 U	65 U	72 U	140 U	NA	70 U	70 U	67 U	68 U	68.5 U
HEXACHLOROBUTADIENE	NA	42 U	39 U	42 U	81 U	NA	42 U	41 U	40 U	40 U	40.5 U
HEXACHLOROCYCLOPENTADIENE	NA	44 U	40 U	44 U	84 U	NA	43 U	43 U	41 U	42 U	42 U
HEXACHLOROETHANE	NA	38 U	35 U	39 U	74 U	NA	38 U	38 U	36 U	37 U	37 U
HIGH MOLECULAR WEIGHT PAHS	NA	1017	221	987.5	3080	NA	891	199	1770	388	388.75
INDENO(1,2,3-CD)PYRENE	NA	200 J	63 U	120 J	450 J	NA	230 J	67 U	400	76 J	75.5
ISOPHORONE	NA	33 U	30 U	33 U	63 U	NA	32 U	32 U	31 U	32 U	32 U
LOW MOLECULAR WEIGHT PAHS	NA	267	161	308.5	843.5	NA	220	171.5	260	168.5	169.25
NAPHTHALENE	NA	39 U	36 U	39 U	75 U	NA	39 U	38 U	37 U	37 U	37.5 U
NITROBENZENE	NA	57 U	53 U	58 U	110 U	NA	57 U	56 U	54 U	56 U	56 U
N-NITROSO-DI-N-PROPYLAMINE	NA	52 U	48 U	52 U	100 U	NA	52 U	51 U	49 U	50 U	50 U
N-NITROSODIPHENYLAMINE	NA	110 U	99 U	110 U	200 U	NA	110 U	100 U	100 U	100 U	100 U
PENTACHLOROPHENOL	NA	220 U	200 U	220 U	420 U	NA	220 U	220 U	210 U	210 U	210 U
PHENANTHRENE	NA	120 J	51 U	160 J	490 J	NA	74 J	55 U	120 J	54 U	54 U
PHENOL	NA	81 U	75 U	82 U	160 U	NA	81 U	80 U	77 U	78 U	78.5 U
PYRENE	NA	230 J	83 U	260 J	590 J	NA	130 J	88 U	290 J	86 U	86.5 U

LOCATION		TP-SB26A	TP-SB26B		TP-SB27				TP-SB28		TP-S
SAMPLE ID	TPSB250508-D	TPSB26A0203	TPSB26B0205	TPSB26B0508	TPSB270205	TPSB270508	TPSB270508-AVG	TPSB270508-D	TPSB280205	TPSB280508	TPSB300205
SAMPLE DATE	20030425	20030426	20030426	20030426	20030425	20030425	20030425	20030425	20030425	20030425	20030424
SAMPLE CODE	DUP	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	5	2	2	5	2	5	5	5	2	5	2
BOTTOM DEPTH	8	3	5	8	5	8	8	8	5	8	5
DIOXINS/FURANS (NG/KG)											
1,2,3,4,6,7,8,9-OCDD	NA	NA	NA	NA	278 J	1010	1215	1420	803	NA	NA
1,2,3,4,6,7,8,9-OCDF	NA	NA	NA	NA	562 J	4 U	7.05 U	10.1 U	9 J	NA	NA
1,2,3,4,6,7,8-HPCDD	NA	NA	NA	NA	12.5	10.6	12.15	13.7	9.2	NA	NA
1,2,3,4,6,7,8-HPCDF	NA	NA	NA	NA	538	4.4 J	18.95	33.5 J	7	NA	NA
1,2,3,4,7,8,9-HPCDF	NA	NA	NA	NA	267	1.1 U	1.75 U	2.4 U	1 U	NA	NA
1,2,3,4,7,8-HXCDD	NA	NA	NA	NA	1.4 U	0.3 U	0.35 U	0.4 U	0.8 U	NA	NA
1,2,3,4,7,8-HXCDF	NA	NA	NA	NA	1690	6.6 U	8.45 U	10.3 U	4 J	NA	NA
1,2,3,6,7,8-HXCDD	NA	NA	NA	NA	4.9 J	0.2 U	0.25 U	0.3 U	0.7 U	NA	NA
1,2,3,6,7,8-HXCDF	NA	NA	NA	NA	533	2.2 U	2.25	3.4 J	1.7 J	NA	NA
1,2,3,7,8,9-HXCDD	NA	NA	NA	NA	1.4 U	0.2 U	0.25 U	0.3 U	0.7 U	NA	NA
1,2,3,7,8,9-HXCDF	NA	NA	NA	NA	521 J	2.4 J	1.65	1.8 U	0.6 U	NA	NA
1,2,3,7,8-PECDD	NA	NA	NA	NA	1.6 U	0.2 U	0.15 U	0.1 U	0.7 U	NA	NA
1,2,3,7,8-PECDF	NA	NA	NA	NA	5050	12.4 U	11.45 U	10.5 U	0.93 J	NA	NA
2,3,4,6,7,8-HXCDF	NA	NA	NA	NA	549	2.6 J	3.3	4 J	2.4 J	NA	NA
2,3,4,7,8-PECDF	NA	NA	NA	NA	2240	6.6 U	6.9 U	7.2 U	1.6 J	NA	NA
2,3,7,8-TCDD	NA	NA	NA	NA	0.8 U	0.2 U	0.2 U	0.2 U	0.4 U	NA	NA
2,3,7,8-TCDF	NA	NA	NA	NA	5210	8.3 U	9.9 U	11.5 U	1.4	NA	NA
TEQ WHO-1998	NA	NA	NA	NA	2231.5	0.751	1.0525	1.354	2.0397	NA	NA
TEQ WHO-1998 - HALFND	NA	NA	NA	NA	2232.9	3.807	4.3079	4.809	2.7347	NA	NA
TEQ WHO-2005	NA	NA	NA	NA	1682.7	0.953	1.2955	1.638	1.8635	NA	NA
TEQ WHO-2005 - HALFND	NA	NA	NA	NA	1684.1	3.225	3.7471	4.269	2.5585	NA	NA
TOTAL HPCDD	NA	NA	NA	NA	22.3 J	28.5	31.25	34	18.5	NA	NA
TOTAL HPCDF	NA	NA	NA	NA	957 J	5.9 U	20.625	38.3	9.4	NA	NA
TOTAL HXCDD	NA	NA	NA	NA	125 J	2 U	4.7 U	7.4 U	12.9	NA	NA
TOTAL HXCDF	NA	NA	NA	NA	4720 J	26.9 U	23.725	34 J	13.7	NA	NA
TOTAL PECDD	NA	NA	NA	NA	485 J	4.1 U	13.025	24 J	12.7 J	NA	NA
TOTAL PECDF	NA	NA	NA	NA	16420 J	66 U	61.05 U	56.1 U	17.3 J	NA	NA
TOTAL TCDD	NA	NA	NA	NA	5.5 J	0.73 U	0.465 U	0.2 U	10.2	NA	NA
TOTAL TCDF	NA	NA	NA	NA	13410 J	65.5 U	59.65 U	53.8 U	31.3	NA	NA
METALS (MG/KG)											
ALUMINUM	13500	15700	NA	12100	11300	23800	23800	NA	15100	24800	6060
ANTIMONY	0.62 UJ	0.35 J	NA	0.26 J	0.65 UJ	0.27 UJ	0.27 UJ	NA	0.71 J	0.26 UJ	0.13 UR
ARSENIC	12.8	8.9	NA	11.9	35.8	13.9	13.9	NA	14.5	22.8	4.5 J
BARIUM	104 J	86.8 J	NA	51.1	647 J	113 J	113 J	NA	93.6 J	70.7 J	23.5
BERYLLIUM	0.49	0.4	NA	0.44	0.72	0.82	0.82	NA	0.59	0.77	0.52 J
CADMIUM	1.7 U	0.59 U	NA	0.58 U	1.8 U	1 J	1 J	NA	0.69 J	0.72 U	0.85 J

LOCATION		TP-SB26A	TP-SB26B		TP-SB27				TP-SB28		TP-S
SAMPLE ID	TPSB250508-D	TPSB26A0203	TPSB26B0205	TPSB26B0508	TPSB270205	TPSB270508	TPSB270508-AVG	TPSB270508-D	TPSB280205	TPSB280508	TPSB300205
SAMPLE DATE	20030425	20030426	20030426	20030426	20030425	20030425	20030425	20030425	20030425	20030425	20030424
SAMPLE CODE	DUP	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	5	2	2	5	2	5	5	5	2	5	2
BOTTOM DEPTH	8	3	5	8	5	8	8	8	5	8	5
CALCIUM	43600	5600	NA	2620	8680	1550	1550	NA	2920	4020	1020
CHROMIUM	117 J	63.9 J	NA	36	63.7 J	56.8 J	56.8 J	NA	51.6 J	70.8 J	14.6
COBALT	12.4	14	NA	8.4	26.8	15	15	NA	9.3	25.9	8.3
COPPER	428	100	NA	59.4 J	352	17.3	17.3	NA	108	31.1	10300
IRON	85800	22300	NA	20000	114000	23400	23400	NA	24300	21800	14100
LEAD	205 J	282 J	NA	45.2 J	811	46.1	46.1	NA	662 J	65.7 J	279
MAGNESIUM	8060	11400	NA	5600	8780	6570	6570	NA	7300	13100	1150
MANGANESE	1190	420	NA	316	1830	2260	2260	NA	330	615	114
MERCURY	3.3 J	1.5 J	NA	0.14	0.92 J	0.3 J	0.3 J	NA	4.4 J	0.18 J	0.08 J
NICKEL	372 J	69.3 J	NA	29.2	136 J	40.4 J	40.4 J	NA	41.6 J	83.8 J	82.9
POTASSIUM	2700 J	3850 J	NA	1520 J	1560 J	1360 J	1360 J	NA	2520 J	4620 J	589 J
SELENIUM	0.98 UJ	0.51 J	NA	0.33 U	1.2 J	0.85 J	0.85 J	NA	0.6 J	0.41 UJ	1.4 J
SILVER	2.2 U	0.77 U	NA	0.79 J	2.3 U	0.98 U	0.98 U	NA	1.1 J	0.94 U	2.8 J
SODIUM	959 J	709 J	NA	848	1260 J	1530 J	1530 J	NA	1160 J	1050 J	127 J
THALLIUM	2.1 U	1.8 U	NA	0.96 U	1.5 U	1.7 U	1.7 U	NA	0.91 U	1.1 U	0.92 U
VANADIUM	33.1	49.2	NA	26.8	39.4	48.4	48.4	NA	39.2	49.2	30.6
ZINC	335 J	186 J	NA	68.5 J	1440 J	194 J	194 J	NA	289 J	127 J	2000
MISCELLANEOUS PARAMETERS (%)											
SIEVE 1"	NA	NA	83	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE 1/2"	NA	NA	63	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE 1-1/2"	NA	NA	100	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE 3/4"	NA	NA	79	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE 3/8"	NA	NA	57	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 004	NA	NA	46	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 010	NA	NA	39	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 020	NA	NA	35	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 040	NA	NA	31	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 060	NA	NA	28	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 100	NA	NA	24	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 200	NA	NA	18	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL SOLIDS	88	91	NA	NA	82	71	71	NA	84	89	91
MISCELLANEOUS PARAMETERS (LB/F3)											
BULK DENSITY	NA	NA	124.2	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MEQ/100)											
CATION EXCHANGE CAPACITY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION		TP-SB26A	TP-SB26B		TP-SB27				TP-SB28		TP-S
SAMPLE ID	TPSB250508-D	TPSB26A0203	TPSB26B0205	TPSB26B0508	TPSB270205	TPSB270508	TPSB270508-AVG	TPSB270508-D	TPSB280205	TPSB280508	TPSB300205
SAMPLE DATE	20030425	20030426	20030426	20030426	20030425	20030425	20030425	20030425	20030425	20030425	20030424
SAMPLE CODE	DUP	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	5	2	2	5	2	5	5	5	2	5	2
BOTTOM DEPTH	8	3	5	8	5	8	8	8	5	8	5
MISCELLANEOUS PARAMETERS (MG/KG)											
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)											
POROSITY	NA	NA	0.34	NA	NA	NA	NA	NA	NA	NA	NA
PESTICIDES/PCBS (UG/KG)											
4,4'-DDD	1.4 U	NA	NA	1.5 UJ	30 U	35 UJ	35 UJ	NA	1.5 U	1.4 U	1.4 U
4,4'-DDE	1.4 U	NA	NA	1.5 UJ	30 U	35 UJ	35 UJ	NA	1.5 U	1.4 U	1.4 UJ
4,4'-DDT	1.2 UJ	NA	NA	1.3 UR	1000 J	31 UJ	31 UJ	NA	1.3 UJ	1.2 UJ	1.2 UJ
ALDRIN	1.3 U	NA	NA	1.3 UJ	27 U	32 UJ	32 UJ	NA	1.3 U	1.2 U	1.2 UJ
ALPHA-BHC	1.5 U	NA	NA	1.6 UJ	33 U	38 U	38 U	NA	1.6 U	1.5 U	1.5 UJ
ALPHA-CHLORDANE	1.6 U	NA	NA	1.6 UJ	34 U	39 U	39 U	NA	1.6 U	1.5 U	1.5 UJ
AROCLOR-1016	14 U	NA	NA	15 U	15 U	18 U	18 U	NA	15 U	14 U	14 U
AROCLOR-1221	33 U	NA	NA	35 U	36 U	42 U	42 U	NA	35 U	33 U	32 U
AROCLOR-1232	21 U	NA	NA	22 U	22 U	26 U	26 U	NA	22 U	20 U	20 U
AROCLOR-1242	14 U	NA	NA	14 U	15 U	17 U	17 U	NA	15 U	14 U	13 U
AROCLOR-1248	5.1 U	NA	NA	5.3 U	5.5 U	6.4 U	6.4 U	NA	5.4 U	5.1 U	5 U
AROCLOR-1254	16 U	NA	NA	17 U	18 U	20 U	20 U	NA	17 U	16 U	16 U
AROCLOR-1260	8.5 U	NA	NA	8.8 UJ	9.1 U	10 U	10 U	NA	8.9 U	8.4 U	8.2 U
BETA-BHC	2.3 U	NA	NA	2.4 UJ	50 U	57 UJ	57 UJ	NA	2.4 U	2.3 U	2.2 UJ
DELTA-BHC	1.3 UJ	NA	NA	1.4 UJ	28 UJ	33 UJ	33 UJ	NA	1.4 UJ	1.3 UJ	1.3 UJ
DIELDRIN	1.4 U	NA	NA	1.4 UJ	32 J	34 UJ	34 UJ	NA	1.4 U	1.3 U	1.3 UJ
ENDOSULFAN I	1.4 U	NA	NA	1.4 UJ	30 U	34 UJ	34 UJ	NA	1.4 U	1.4 U	1.3 UJ
ENDOSULFAN II	1.3 U	NA	NA	1.3 UJ	28 U	32 UJ	32 UJ	NA	1.4 U	1.3 U	1.2 UJ
ENDOSULFAN SULFATE	1.6 UJ	NA	NA	1.6 UJ	34 UJ	39 UJ	39 UJ	NA	1.6 UJ	1.5 UJ	1.5 UJ
ENDRIN	1.3 U	NA	NA	1.3 UJ	28 U	32 UJ	32 UJ	NA	1.4 U	1.3 U	1.2 UJ
ENDRIN ALDEHYDE	1.5 U	NA	NA	1.6 UJ	33 U	38 U	38 U	NA	1.6 U	1.5 U	1.5 UJ
ENDRIN KETONE	1.6 UJ	NA	NA	1.7 UJ	36 UJ	41 UJ	41 UJ	NA	1.7 UJ	1.6 UJ	1.6 UJ
GAMMA-BHC (LINDANE)	1.3 UJ	NA	NA	1.4 UJ	29 UJ	33 UJ	33 UJ	NA	1.4 UJ	1.3 UJ	1.3 UJ
GAMMA-CHLORDANE	1.4 U	NA	NA	1.5 UJ	31 U	35 UJ	35 UJ	NA	1.5 U	1.4 U	1.4 UJ
HEPTACHLOR	1.2 UJ	NA	NA	1.3 UJ	27 UJ	31 UJ	31 UJ	NA	1.3 UJ	1.2 UJ	1.2 UJ
HEPTACHLOR EPOXIDE	1.5 U	NA	NA	1.5 UJ	32 U	36 UJ	36 UJ	NA	1.5 U	1.4 U	1.4 UJ
METHOXYCHLOR	2.3 UJ	NA	NA	2.4 UJ	50 UJ	57 U	57 U	NA	2.4 UJ	2.3 UJ	2.2 UJ
TOTAL AROCLOR	0 U	NA	NA	0 U	0 U	0 U	0 U	NA	0 U	0 U	0 U
TOTAL AROCLOR HALFND	55.8	NA	NA	58.55	60.3	69.7	69.7	NA	59.15	55.25	54.1
TOTAL AROCLOR ZEROND	0 U	NA	NA	0 U	0 U	0 U	0 U	NA	0 U	0 U	0 U
TOXAPHENE	26 U	NA	NA	27 U	570 U	650 U	650 U	NA	28 U	26 U	25 UJ

LOCATION		TP-SB26A	TP-SB26B		TP-SB27				TP-SB28		TP-S
SAMPLE ID	TPSB250508-D	TPSB26A0203	TPSB26B0205	TPSB26B0508	TPSB270205	TPSB270508	TPSB270508-AVG	TPSB270508-D	TPSB280205	TPSB280508	TPSB300205
SAMPLE DATE	20030425	20030426	20030426	20030426	20030425	20030425	20030425	20030425	20030425	20030425	20030424
SAMPLE CODE	DUP	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	5	2	2	5	2	5	5	5	2	5	2
BOTTOM DEPTH	8	3	5	8	5	8	8	8	5	8	5
SEMIVOLATILES (UG/KG)											
1,2,4-TRICHLOROBENZENE	40 U	NA	NA	41 U	43 U	49 U	49 U	NA	42 U	39 U	77 U
1,2-DICHLOROBENZENE	42 U	NA	NA	44 U	46 U	53 UJ	53 UJ	NA	45 U	42 U	82 UJ
1,3-DICHLOROBENZENE	41 U	NA	NA	43 U	44 U	51 UJ	51 UJ	NA	43 U	41 U	79 UJ
1,4-DICHLOROBENZENE	39 U	NA	NA	41 U	42 U	48 U	48 U	NA	41 U	39 U	76 UJ
2,2'-OXYBIS(1-CHLOROPROPANE)	55 U	NA	NA	57 U	59 U	68 U	68 U	NA	58 U	54 U	110 UJ
2,4,5-TRICHLOROPHENOL	97 U	NA	NA	100 U	100 U	120 U	120 U	NA	100 U	96 U	190 UJ
2,4,6-TRICHLOROPHENOL	100 U	NA	NA	110 U	110 U	130 U	130 U	NA	110 U	100 U	200 UJ
2,4-DICHLOROPHENOL	75 U	NA	NA	78 U	81 U	93 U	93 U	NA	79 U	74 U	140 UJ
2,4-DIMETHYLPHENOL	130 U	NA	NA	140 U	140 U	170 U	170 U	NA	140 U	130 U	260 UJ
2,4-DINITROPHENOL	290 UJ	NA	NA	300 U	310 UJ	360 UJ	360 UJ	NA	300 U	280 UJ	560 UJ
2,4-DINITROTOLUENE	38 U	NA	NA	39 U	41 U	47 U	47 U	NA	40 U	38 U	73 UJ
2,6-DINITROTOLUENE	45 U	NA	NA	46 U	48 U	56 U	56 U	NA	47 U	44 U	86 UJ
2-CHLORONAPHTHALENE	50 U	NA	NA	52 U	54 U	62 U	62 U	NA	53 U	50 U	97 UJ
2-CHLOROPHENOL	74 U	NA	NA	77 U	80 U	92 U	92 U	NA	78 U	73 U	140 UJ
2-METHYLNAPHTHALENE	46 U	NA	NA	48 U	50 U	57 U	57 U	NA	48 U	46 U	89 UJ
2-METHYLPHENOL	69 U	NA	NA	72 U	75 U	86 U	86 U	NA	73 U	69 U	130 UJ
2-NITROANILINE	46 U	NA	NA	48 U	50 U	58 U	58 U	NA	49 U	46 U	90 UJ
2-NITROPHENOL	92 U	NA	NA	96 U	99 U	110 U	110 U	NA	96 U	91 U	180 UJ
3,3'-DICHLOROBENZIDINE	220 U	NA	NA	220 U	230 U	270 UJ	270 UJ	NA	230 U	210 U	420 UJ
3-NITROANILINE	160 U	NA	NA	160 U	170 U	200 U	200 U	NA	170 U	160 U	310 UJ
4,6-DINITRO-2-METHYLPHENOL	240 UJ	NA	NA	250 U	260 UJ	300 UJ	300 UJ	NA	260 U	240 UJ	470 UR
4-BROMOPHENYL PHENYL ETHER	56 U	NA	NA	58 U	60 U	70 U	70 U	NA	59 U	56 U	110 UJ
4-CHLORO-3-METHYLPHENOL	100 U	NA	NA	110 U	110 U	130 U	130 U	NA	110 U	100 U	200 UJ
4-CHLOROANILINE	38 U	NA	NA	40 UJ	42 U	48 UJ	48 UJ	NA	40 U	38 U	74 UJ
4-CHLOROPHENYL PHENYL ETHER	59 U	NA	NA	61 U	64 U	73 U	73 U	NA	62 U	58 U	110 UJ
4-METHYLPHENOL	65 U	NA	NA	68 U	71 U	81 U	81 U	NA	69 U	65 U	130 UJ
4-NITROANILINE	190 U	NA	NA	200 U	200 U	230 U	230 U	NA	200 U	190 U	360 UJ
4-NITROPHENOL	240 U	NA	NA	240 U	250 U	290 U	290 U	NA	250 U	230 U	450 UJ
ACENAPHTHENE	56 U	NA	NA	59 U	61 U	70 U	70 U	NA	59 U	56 U	110 UJ
ACENAPHTHYLENE	41 U	NA	NA	43 U	44 U	51 U	51 U	NA	43 U	41 U	80 UJ
ANTHRACENE	49 U	NA	NA	51 U	53 U	61 U	61 U	NA	93 J	48 U	94 UJ
BAP EQUIVALENT-HALFND	137.82	NA	NA	59 U	62 U	71 U	71 U	NA	553.2	56 U	306.58
BAP EQUIVALENT-POS	101.44	NA	NA	0 U	0 U	0 U	0 U	NA	515.2	0 U	235.88
BENZO(A)ANTHRACENE	69 J	NA	NA	58 U	61 U	70 U	70 U	NA	370 J	56 U	140 J
BENZO(A)PYRENE	77 J	NA	NA	59 U	62 U	71 U	71 U	NA	400	56 U	180 J
BENZO(B)FLUORANTHENE	92 J	NA	NA	43 U	44 U	51 U	51 U	NA	410	41 U	240 J

LOCATION		TP-SB26A	TP-SB26B		TP-SB27				TP-SB28		TP-S
SAMPLE ID	TPSB250508-D	TPSB26A0203	TPSB26B0205	TPSB26B0508	TPSB270205	TPSB270508	TPSB270508-AVG	TPSB270508-D	TPSB280205	TPSB280508	TPSB300205
SAMPLE DATE	20030425	20030426	20030426	20030426	20030425	20030425	20030425	20030425	20030425	20030425	20030424
SAMPLE CODE	DUP	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	5	2	2	5	2	5	5	5	2	5	2
BOTTOM DEPTH	8	3	5	8	5	8	8	8	5	8	5
BENZO(G,H,I)PERYLENE	75 U	NA	NA	78 U	81 U	94 U	94 U	NA	260 J	75 U	170 J
BENZO(K)FLUORANTHENE	76 J	NA	NA	75 U	78 U	90 U	90 U	NA	320 J	72 U	140 UJ
BIS(2-CHLOROETHOXY)METHANE	52 U	NA	NA	54 U	56 U	65 U	65 U	NA	55 U	52 U	100 UJ
BIS(2-CHLOROETHYL)ETHER	60 U	NA	NA	63 U	65 U	75 U	75 U	NA	63 U	60 U	120 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	89 U	NA	NA	93 U	97 U	110 U	110 U	NA	94 U	89 U	170 UJ
BUTYL BENZYL PHTHALATE	76 U	NA	NA	79 U	82 U	94 U	94 U	NA	79 U	75 U	150 UJ
CARBAZOLE	67 U	NA	NA	70 U	72 U	84 U	84 U	NA	70 U	67 U	130 UJ
CHRYSENE	84 J	NA	NA	64 U	66 U	76 U	76 U	NA	400	61 U	180 J
DIBENZO(A,H)ANTHRACENE	72 U	NA	NA	75 U	78 U	90 U	90 U	NA	76 U	72 U	140 UJ
DIBENZOFURAN	39 U	NA	NA	40 U	42 U	48 U	48 U	NA	40 U	38 U	75 UJ
DIETHYL PHTHALATE	47 U	NA	NA	48 U	50 U	58 U	58 U	NA	49 U	46 U	90 UJ
DIMETHYL PHTHALATE	51 U	NA	NA	53 U	55 U	64 U	64 U	NA	54 U	51 U	99 UJ
DI-N-BUTYL PHTHALATE	230 U	NA	NA	240 U	250 U	290 U	290 U	NA	240 U	230 U	450 UJ
DI-N-OCTYL PHTHALATE	57 U	NA	NA	59 U	61 U	71 U	71 U	NA	60 U	56 U	110 UJ
FLUORANTHENE	80 J	NA	NA	67 J	66 U	150 J	150 J	NA	720	61 U	130 J
FLUORENE	56 U	NA	NA	58 U	61 U	70 U	70 U	NA	59 U	56 U	110 UJ
HEXACHLOROBENZENE	69 U	NA	NA	72 U	75 U	86 U	86 U	NA	72 U	68 U	130 UJ
HEXACHLOROBUTADIENE	41 U	NA	NA	42 U	44 U	51 UJ	51 UJ	NA	43 U	40 U	79 UJ
HEXACHLOROCYCLOPENTADIENE	42 U	NA	NA	44 UJ	46 U	53 UR	53 UR	NA	45 U	42 U	82 UJ
HEXACHLOROETHANE	37 U	NA	NA	39 U	40 U	46 UJ	46 UJ	NA	39 U	37 U	72 UJ
HIGH MOLECULAR WEIGHT PAHS	389.5	NA	NA	240.5	213.5	423.5	423.5	NA	2548	196.5	785
INDENO(1,2,3-CD)PYRENE	75 J	NA	NA	70 U	72 U	83 U	83 U	NA	310 J	66 U	160 J
ISOPHORONE	32 U	NA	NA	33 U	34 U	40 U	40 U	NA	34 U	32 U	62 UJ
LOW MOLECULAR WEIGHT PAHS	170	NA	NA	177	184	269	269	NA	657.5	169.5	328
NAPHTHALENE	38 U	NA	NA	39 U	41 U	47 U	47 U	NA	40 U	38 U	73 UJ
NITROBENZENE	56 U	NA	NA	58 U	61 U	70 U	70 U	NA	59 U	56 U	110 UJ
N-NITROSO-DI-N-PROPYLAMINE	50 U	NA	NA	52 U	54 U	63 U	63 U	NA	53 U	50 U	98 UJ
N-NITROSODIPHENYLAMINE	100 U	NA	NA	110 U	110 U	130 U	130 U	NA	110 U	100 U	200 UJ
PENTACHLOROPHENOL	210 U	NA	NA	220 U	230 U	270 U	270 U	NA	220 U	210 U	410 UJ
PHENANTHRENE	54 U	NA	NA	56 U	58 U	91 J	91 J	NA	440	54 U	100 UJ
PHENOL	79 U	NA	NA	83 U	86 U	99 U	99 U	NA	83 U	79 U	150 UJ
PYRENE	87 U	NA	NA	91 U	94 U	120 J	120 J	NA	620	87 U	170 UJ

LOCATION	B30	TP-SB31				TP-SB32		TP-SB33	TP-SB33B		
SAMPLE ID	TPSB300508	TPSB310205	TPSB310205-AVG	TPSB310205-D	TPSB310508	TPSB320205	TPSB320508	TPSB330205	TPSB33B0205	TPSB33B0508	TPSB340205
SAMPLE DATE	20030424	20030423	20030423	20030423	20030423	20030425	20030425	20030425	20030425	20030425	20030425
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	5	2	2	2	5	2	5	2	2	5	2
BOTTOM DEPTH	8	5	5	5	8	5	8	5	5	8	5
DIOXINS/FURANS (NG/KG)											
1,2,3,4,6,7,8,9-OCDD	NA	264 J	264 J	NA	NA	85 J	NA	29.8 J	NA	NA	908 J
1,2,3,4,6,7,8,9-OCDF	NA	29.3 J	29.3 J	NA	NA	11.7 UJ	NA	7.7 UJ	NA	NA	72.6 J
1,2,3,4,6,7,8-HPCDD	NA	20.1	20.1	NA	NA	8.3	NA	3.1 J	NA	NA	76.3
1,2,3,4,6,7,8-HPCDF	NA	35	35	NA	NA	9.7	NA	8.2 J	NA	NA	101
1,2,3,4,7,8,9-HPCDF	NA	1.7 U	1.7 U	NA	NA	2.8 U	NA	1.9 U	NA	NA	7.8
1,2,3,4,7,8-HXCDD	NA	1.4 U	1.4 U	NA	NA	1.8 U	NA	1.3 U	NA	NA	5.2 J
1,2,3,4,7,8-HXCDF	NA	7.9	7.9	NA	NA	4.3 J	NA	4.9 J	NA	NA	55.9
1,2,3,6,7,8-HXCDD	NA	2.5 J	2.5 J	NA	NA	1.7 U	NA	1.2 U	NA	NA	16.5
1,2,3,6,7,8-HXCDF	NA	3.8 J	3.8 J	NA	NA	2.6 J	NA	1.8 J	NA	NA	23.7
1,2,3,7,8,9-HXCDD	NA	2.8 J	2.8 J	NA	NA	1.7 U	NA	1.3 U	NA	NA	17.3
1,2,3,7,8,9-HXCDF	NA	1 U	1 U	NA	NA	1.3 U	NA	1 U	NA	NA	1.1 J
1,2,3,7,8-PECDD	NA	0.7 U	0.7 U	NA	NA	1.1 U	NA	1 U	NA	NA	10.1
1,2,3,7,8-PECDF	NA	25.9 J	25.9 J	NA	NA	0.5 U	NA	0.97 J	NA	NA	19.1
2,3,4,6,7,8-HXCDF	NA	4.9 J	4.9 J	NA	NA	3.2 J	NA	2.3 J	NA	NA	14.2
2,3,4,7,8-PECDF	NA	2.9 J	2.9 J	NA	NA	2.1 J	NA	2.1 J	NA	NA	18.4
2,3,7,8-TCDD	NA	0.4 U	0.4 U	NA	NA	0.5 U	NA	0.4 U	NA	NA	1 J
2,3,7,8-TCDF	NA	1.2 J	1.2 J	NA	NA	2 U	NA	0.95 J	NA	NA	12.4
TEQ WHO-1998	NA	5.6353	5.63533	NA	NA	2.2485	NA	2.2095	NA	NA	37.834
TEQ WHO-1998 - HALFND	NA	6.3138	6.31383	NA	NA	3.5006	NA	3.1594	NA	NA	37.834
TEQ WHO-2005	NA	4.596	4.59599	NA	NA	1.8455	NA	1.776	NA	NA	33.968
TEQ WHO-2005 - HALFND	NA	5.2745	5.27449	NA	NA	3.0938	NA	2.7267	NA	NA	33.968
TOTAL HPCDD	NA	44.7	44.7	NA	NA	15.8 J	NA	8.6	NA	NA	161
TOTAL HPCDF	NA	56.8	56.8	NA	NA	9.7	NA	8.2 J	NA	NA	136
TOTAL HXCDD	NA	59.9	59.9	NA	NA	6.8	NA	6.1 J	NA	NA	220 J
TOTAL HXCDF	NA	82.2 J	82.2 J	NA	NA	43.7	NA	19.9	NA	NA	198 J
TOTAL PECDD	NA	26.1 J	26.1 J	NA	NA	1.1 U	NA	1 U	NA	NA	196 J
TOTAL PECDF	NA	101 J	101 J	NA	NA	65.1 J	NA	24.5 J	NA	NA	204 J
TOTAL TCDD	NA	8.4	8.4	NA	NA	0.5 U	NA	5.4 J	NA	NA	98.2 J
TOTAL TCDF	NA	95.5 J	95.5 J	NA	NA	62.6 J	NA	41.1 J	NA	NA	223
METALS (MG/KG)											
ALUMINUM	9640	9290	10645	12000	11200	10300	13200	4840	NA	4300	9870
ANTIMONY	1.1 U	1.7 U	1.25 U	0.8 U	0.62 U	74.3 J	1.2 J	4.8 J	NA	5.7 J	0.45 J
ARSENIC	15.8 J	11.9	12.45	13	12.8	10.2	4.8	14.6	NA	19.8	13.3
BARIUM	104	105 J	112	119 J	67.6 J	34.9 J	17.4 J	577 J	NA	916 J	81.6 J
BERYLLIUM	0.57 J	0.32	0.35	0.38	0.27	0.26 U	0.17 U	0.26 U	NA	0.21 U	0.4
CADMIUM	1.1 J	2.6 J	2.35	2.1 J	0.38 U	6.2 J	5.1	6.2	NA	6.6 J	0.71 U

LOCATION	B30	TP-SB31				TP-SB32		TP-SB33	TP-SB33B		
SAMPLE ID	TPSB300508	TPSB310205	TPSB310205-AVG	TPSB310205-D	TPSB310508	TPSB320205	TPSB320508	TPSB330205	TPSB33B0205	TPSB33B0508	TPSB340205
SAMPLE DATE	20030424	20030423	20030423	20030423	20030423	20030425	20030425	20030425	20030425	20030425	20030425
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	5	2	2	2	5	2	5	2	2	5	2
BOTTOM DEPTH	8	5	5	5	8	5	8	5	5	8	5
CALCIUM	3120	15600	18500	21400	13900	6800	3750	4760	NA	4670	5440
CHROMIUM	50.3	68.4	68.6	68.8	69.6	30.2	19.3	23.7	NA	62.2	42.7
COBALT	18.1	14.3	14.65	15	10.2	8.1	4.1	5.8	NA	9.6 J	8.4
COPPER	4020	3220	2860	2500	163	4880	3900	1320	NA	2760	189
IRON	37900	51100	44850	38600	30100	55200	21700	36000	NA	111000	25100
LEAD	826	279 J	307.5	336 J	113 J	2320 J	314 J	1580 J	NA	3470 J	569 J
MAGNESIUM	5880	5300 J	7275	9250 J	8920 J	2870	3050	1160	NA	2330	5800
MANGANESE	498	636	708.5	781	421	480	162	228	NA	487	296
MERCURY	0.46 J	0.24 J	0.27	0.3 J	0.07 J	0.15	0.03	0.5	NA	1.5	0.36 J
NICKEL	64.8	174 J	152	130 J	76.3 J	120	80.8	62.2	NA	299	47.2
POTASSIUM	2810 J	1500 J	1565	1630 J	3720 J	1240 J	1050 J	494 U	NA	442 U	2580 J
SELENIUM	1 J	0.8 U	0.56 U	0.32 U	0.43 U	1.3	0.85	0.96	NA	1.7 J	0.83
SILVER	1.7 U	1.4 J	13.5	25.6 J	0.12 UJ	0.51 J	0.44 J	2 J	NA	1.3 J	0.16 J
SODIUM	140 J	799 J	919.5	1040 J	2140 J	665	1840	566	NA	1490	280
THALLIUM	1.2 U	1.2 J	1.025	0.85 J	1.4	1.3 U	0.51 U	0.75 U	NA	2.2 U	1.4 U
VANADIUM	25.8	26.1 J	27.35	28.6 J	29.2 J	20.4	11.8	14.9	NA	19.5	34
ZINC	593	1940	1990	2040	196	3880	3580	1340	NA	3700	324
MISCELLANEOUS PARAMETERS (%)											
SIEVE 1"	NA	NA	NA	NA	NA	NA	NA	NA	100	NA	NA
SIEVE 1/2"	NA	NA	NA	NA	NA	NA	NA	NA	83	NA	NA
SIEVE 1-1/2"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE 3/4"	NA	NA	NA	NA	NA	NA	NA	NA	95	NA	NA
SIEVE 3/8"	NA	NA	NA	NA	NA	NA	NA	NA	78	NA	NA
SIEVE NO. 004	NA	NA	NA	NA	NA	NA	NA	NA	62	NA	NA
SIEVE NO. 010	NA	NA	NA	NA	NA	NA	NA	NA	49	NA	NA
SIEVE NO. 020	NA	NA	NA	NA	NA	NA	NA	NA	37	NA	NA
SIEVE NO. 040	NA	NA	NA	NA	NA	NA	NA	NA	26	NA	NA
SIEVE NO. 060	NA	NA	NA	NA	NA	NA	NA	NA	20	NA	NA
SIEVE NO. 100	NA	NA	NA	NA	NA	NA	NA	NA	15	NA	NA
SIEVE NO. 200	NA	NA	NA	NA	NA	NA	NA	NA	12	NA	NA
TOTAL SOLIDS	90	88	87.5	87	79	90	84	89	NA	71	90
MISCELLANEOUS PARAMETERS (LB/F3)											
BULK DENSITY	NA	NA	NA	NA	NA	NA	NA	NA	100.3	NA	NA
MISCELLANEOUS PARAMETERS (MEQ/100)											
CATION EXCHANGE CAPACITY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	B30	TP-SB31				TP-SB32		TP-SB33	TP-SB33B		
SAMPLE ID	TPSB300508	TPSB310205	TPSB310205-AVG	TPSB310205-D	TPSB310508	TPSB320205	TPSB320508	TPSB330205	TPSB33B0205	TPSB33B0508	TPSB340205
SAMPLE DATE	20030424	20030423	20030423	20030423	20030423	20030425	20030425	20030425	20030425	20030425	20030425
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	5	2	2	2	5	2	5	2	2	5	2
BOTTOM DEPTH	8	5	5	5	8	5	8	5	5	8	5
MISCELLANEOUS PARAMETERS (MG/KG)											
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)											
POROSITY	NA	NA	NA	NA	NA	NA	NA	NA	0.41	NA	NA
PESTICIDES/PCBS (UG/KG)											
4,4'-DDD	1.4 U	1.4 U	1.4 U	1.4 U	NA	1.4 U	150 U	1.4 U	NA	1.8 U	1.4 U
4,4'-DDE	1.4 UJ	1.4 U	1.4 U	1.4 U	NA	1.4 UJ	150 UJ	1.4 U	NA	1.8 UJ	1.4 UJ
4,4'-DDT	1.2 UJ	1.2 UJ	1.6	2.6 J	NA	1.2 UJ	130 UJ	1.2 UJ	NA	2.9 J	1.2 UJ
ALDRIN	1.2 UJ	1.3 U	1.3 U	1.3 U	NA	1.2 UJ	130 UJ	1.2 U	NA	1.6 UJ	1.2 UJ
ALPHA-BHC	1.5 UJ	1.6 U	1.6 U	1.6 U	NA	1.5 UJ	160 UJ	1.5 U	NA	1.9 UJ	1.5 UJ
ALPHA-CHLORDANE	1.5 UJ	1.6 U	1.6 U	1.6 U	NA	1.5 UJ	160 UJ	1.6 U	NA	1.9 UJ	1.5 UJ
AROCLOR-1016	14 U	14 U	14 U	14 UJ	NA	14 U	15 U	14 U	NA	18 U	14 U
AROCLOR-1221	33 U	34 U	34 U	34 UJ	NA	33 U	35 U	33 U	NA	42 U	33 U
AROCLOR-1232	20 U	21 U	21 U	21 UJ	NA	20 U	22 U	20 U	NA	26 U	20 U
AROCLOR-1242	14 U	14 U	14 U	14 UJ	NA	14 U	15 U	14 U	NA	17 U	14 U
AROCLOR-1248	5 U	5.2 U	5.2 U	5.2 UJ	NA	5 U	5.4 U	5.1 U	NA	6.4 U	5 U
AROCLOR-1254	16 U	16 U	16 U	16 UJ	NA	16 U	17 U	16 U	NA	20 U	16 U
AROCLOR-1260	8.3 U	8.5 U	8.55 U	8.6 UJ	NA	8.3 U	9 U	8.4 U	NA	10 U	8.3 U
BETA-BHC	2.2 UJ	2.3 U	2.3 U	2.3 U	NA	2.3 UJ	240 UJ	2.3 U	NA	2.9 UJ	2.3 UJ
DELTA-BHC	1.3 UJ	1.3 U	1.3 U	1.3 U	NA	1.3 UJ	140 UJ	1.3 UJ	NA	1.6 UJ	1.3 UJ
DIELDRIN	1.3 UJ	1.4 UJ	1.4 U	1.4 UJ	NA	1.3 UJ	140 UJ	1.3 U	NA	1.7 UJ	1.3 UJ
ENDOSULFAN I	1.3 UJ	1.4 UJ	1.4 U	1.4 UJ	NA	1.4 UJ	150 UJ	1.4 U	NA	1.7 UJ	1.4 UJ
ENDOSULFAN II	1.3 UJ	1.3 U	1.3 U	1.3 U	NA	1.3 UJ	140 UJ	1.3 U	NA	1.6 UJ	1.3 UJ
ENDOSULFAN SULFATE	1.5 UJ	1.6 UJ	1.6 U	1.6 UJ	NA	1.5 UJ	160 UJ	1.6 UJ	NA	1.9 UJ	1.5 UJ
ENDRIN	1.3 UJ	1.3 U	1.3 U	1.3 U	NA	1.3 UJ	140 UJ	1.3 U	NA	1.6 UJ	1.3 UJ
ENDRIN ALDEHYDE	1.5 UJ	1.5 U	1.5 U	1.5 U	NA	1.5 UJ	160 UJ	1.5 U	NA	1.9 UJ	1.5 UJ
ENDRIN KETONE	1.6 UJ	1.7 UJ	1.7 U	1.7 UJ	NA	1.6 UJ	170 UJ	1.6 UJ	NA	2.1 UJ	1.6 UJ
GAMMA-BHC (LINDANE)	1.3 UJ	1.3 U	1.35 U	1.4 U	NA	1.3 UJ	140 UJ	1.3 U	NA	1.7 UJ	1.3 UJ
GAMMA-CHLORDANE	1.4 UJ	1.4 UJ	1.4 U	1.4 UJ	NA	1.4 UJ	150 UJ	1.4 U	NA	1.8 UJ	1.4 UJ
HEPTACHLOR	1.2 UJ	1.2 U	1.25 U	1.3 U	NA	1.2 UJ	130 UJ	1.2 U	NA	1.6 UJ	1.2 UJ
HEPTACHLOR EPOXIDE	1.4 UJ	1.5 U	1.5 U	1.5 U	NA	1.4 UJ	160 UJ	1.5 U	NA	1.8 UJ	1.4 UJ
METHOXYCHLOR	2.2 UJ	2.3 U	2.3 U	2.3 U	NA	2.3 UJ	240 UJ	2.3 U	NA	2.9 UJ	2.3 UJ
TOTAL AROCLOR	0 U	0 U	0 U	0 U	NA	0 U	0 U	0 U	NA	0 U	0 U
TOTAL AROCLOR HALFND	55.15	56.35	56.375	56.4	NA	55.15	59.2	55.25	NA	69.7	55.15
TOTAL AROCLOR ZEROND	0 U	0 U	0 U	0 U	NA	0 U	0 U	0 U	NA	0 U	0 U
TOXAPHENE	26 UJ	26 U	26.5 U	27 U	NA	26 U	2800 U	26 U	NA	33 U	26 U

LOCATION	B30	TP-SB31				TP-SB32		TP-SB33	TP-SB33B		
SAMPLE ID	TPSB300508	TPSB310205	TPSB310205-AVG	TPSB310205-D	TPSB310508	TPSB320205	TPSB320508	TPSB330205	TPSB33B0205	TPSB33B0508	TPSB340205
SAMPLE DATE	20030424	20030423	20030423	20030423	20030423	20030425	20030425	20030425	20030425	20030425	20030425
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	5	2	2	2	5	2	5	2	2	5	2
BOTTOM DEPTH	8	5	5	5	8	5	8	5	5	8	5
SEMIVOLATILES (UG/KG)											
1,2,4-TRICHLOROBENZENE	39 U	40 U	40 U	40 U	NA	78 U	42 U	40 U	NA	50 U	78 U
1,2-DICHLOROBENZENE	42 U	43 U	43 U	43 U	NA	84 U	45 U	42 U	NA	53 U	84 U
1,3-DICHLOROBENZENE	40 U	41 U	41.5 U	42 U	NA	80 U	43 U	41 U	NA	51 U	80 U
1,4-DICHLOROBENZENE	38 U	39 U	39.5 U	40 U	NA	77 U	41 U	39 U	NA	49 U	77 U
2,2'-OXYBIS(1-CHLOROPROPANE)	54 U	55 U	55.5 U	56 U	NA	110 UJ	58 UJ	54 U	NA	68 UJ	110 UJ
2,4,5-TRICHLOROPHENOL	95 U	98 U	98 U	98 U	NA	190 U	100 U	96 U	NA	120 U	190 U
2,4,6-TRICHLOROPHENOL	100 U	110 U	110 U	110 U	NA	210 U	110 U	100 U	NA	130 U	210 U
2,4-DICHLOROPHENOL	73 U	75 U	75.5 U	76 U	NA	150 U	79 U	74 U	NA	93 U	150 U
2,4-DIMETHYLPHENOL	130 UJ	140 U	140 U	140 U	NA	260 U	140 U	130 U	NA	170 U	260 U
2,4-DINITROPHENOL	280 U	290 U	290 U	290 U	NA	560 U	300 U	280 U	NA	360 U	560 U
2,4-DINITROTOLUENE	37 U	38 U	38 U	38 U	NA	74 U	40 U	38 U	NA	47 U	74 U
2,6-DINITROTOLUENE	44 U	45 U	45 U	45 U	NA	88 U	47 U	44 U	NA	56 U	88 U
2-CHLORONAPHTHALENE	49 U	51 U	51 U	51 U	NA	99 U	53 U	50 U	NA	63 U	99 U
2-CHLOROPHENOL	72 U	74 U	74.5 U	75 U	NA	140 U	78 U	73 U	NA	92 U	140 U
2-METHYLNAPHTHALENE	45 U	46 UJ	66.5	110 J	NA	90 U	48 U	46 U	NA	57 U	90 U
2-METHYLPHENOL	68 U	70 U	70 U	70 U	NA	140 U	74 U	69 U	NA	87 U	140 U
2-NITROANILINE	45 U	47 U	47 U	47 U	NA	91 U	49 U	46 U	NA	58 U	91 U
2-NITROPHENOL	90 U	93 U	93 U	93 U	NA	180 U	97 U	91 U	NA	110 U	180 U
3,3'-DICHLOROBENZIDINE	210 U	220 U	220 U	220 U	NA	420 UJ	230 UJ	210 U	NA	270 UJ	420 UJ
3-NITROANILINE	160 U	160 U	160 U	160 U	NA	310 U	170 U	160 U	NA	200 U	310 U
4,6-DINITRO-2-METHYLPHENOL	240 UR	250 U	250 U	250 U	NA	480 U	260 U	240 U	NA	300 U	480 U
4-BROMOPHENYL PHENYL ETHER	55 U	56 U	56.5 U	57 U	NA	110 U	59 U	56 U	NA	70 U	110 U
4-CHLORO-3-METHYLPHENOL	100 U	100 U	100 U	100 U	NA	200 U	110 U	100 U	NA	130 U	200 U
4-CHLOROANILINE	38 U	39 U	39 U	39 U	NA	76 U	41 U	38 U	NA	48 U	76 U
4-CHLOROPHENYL PHENYL ETHER	58 U	60 U	60 U	60 U	NA	120 U	62 U	59 U	NA	74 U	120 U
4-METHYLPHENOL	64 U	66 U	66 U	66 U	NA	130 U	69 U	65 U	NA	82 U	130 U
4-NITROANILINE	180 U	190 U	190 U	190 U	NA	370 U	200 U	190 U	NA	230 U	370 U
4-NITROPHENOL	230 UJ	240 U	240 U	240 U	NA	460 UJ	250 UJ	230 U	NA	290 UJ	460 UJ
ACENAPHTHENE	55 U	110 J	185	260 J	NA	110 U	60 U	56 U	NA	70 U	110 U
ACENAPHTHYLENE	40 U	41 U	41.5 U	42 U	NA	81 U	44 U	41 U	NA	51 U	81 U
ANTHRACENE	88 J	190 J	305	420 J	NA	96 U	52 U	48 U	NA	61 U	96 U
BAP EQUIVALENT-HALFND	489.49	1849	2209.25	2569.5	NA	311.29	1154.5	76.695	NA	253.87	218.61
BAP EQUIVALENT-POS	489.49	1849	2209.25	2569.5	NA	240.59	1154.5	6.11	NA	201.2	135.16
BENZO(A)ANTHRACENE	350 J	860	1030	1200	NA	130 J	560	60 J	NA	110 J	110 U
BENZO(A)PYRENE	320 J	1200	1450	1700	NA	180 J	710	57 U	NA	190 J	120 J
BENZO(B)FLUORANTHENE	320 J	1200	1500	1800	NA	270 J	1300	41 U	NA	52 U	150 J

LOCATION	B30	TP-SB31				TP-SB32		TP-SB33	TP-SB33B		
SAMPLE ID	TPSB300508	TPSB310205	TPSB310205-AVG	TPSB310205-D	TPSB310508	TPSB320205	TPSB320508	TPSB330205	TPSB33B0205	TPSB33B0508	TPSB340205
SAMPLE DATE	20030424	20030423	20030423	20030423	20030423	20030425	20030425	20030425	20030425	20030425	20030425
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	5	2	2	2	5	2	5	2	2	5	2
BOTTOM DEPTH	8	5	5	5	8	5	8	5	5	8	5
BENZO(G,H,I)PERYLENE	230 J	1200	1250	1300	NA	240 J	500	75 U	NA	94 U	150 U
BENZO(K)FLUORANTHENE	280 J	1000	1250	1500	NA	140 U	480	72 U	NA	90 U	140 U
BIS(2-CHLOROETHOXY)METHANE	51 U	52 U	52.5 U	53 U	NA	100 U	55 U	52 U	NA	65 U	100 U
BIS(2-CHLOROETHYL)ETHER	59 U	61 U	61 U	61 U	NA	120 U	64 U	60 U	NA	75 U	120 U
BIS(2-ETHYLHEXYL)PHTHALATE	190 J	90 U	90.5 U	91 U	NA	180 U	95 U	89 U	NA	110 U	180 U
BUTYL BENZYL PHTHALATE	130 U	76 U	76.5 U	77 U	NA	150 UJ	80 UJ	75 U	NA	94 UJ	150 UJ
CARBAZOLE	66 U	100 J	160	220 J	NA	130 U	71 U	67 U	NA	84 U	130 U
CHRYSENE	390	1000	1250	1500	NA	190 J	650	110 J	NA	200 J	160 J
DIBENZO(A,H)ANTHRACENE	74 J	300 J	340	380	NA	140 U	190 J	72 U	NA	90 U	140 U
DIBENZOFURAN	38 U	67 J	123.5	180 J	NA	76 U	41 U	38 U	NA	48 U	76 U
DIETHYL PHTHALATE	46 U	47 U	47 U	47 U	NA	92 U	49 U	46 U	NA	58 U	92 U
DIMETHYL PHTHALATE	50 U	51 U	51.5 U	52 U	NA	100 U	54 U	51 U	NA	64 U	100 U
DI-N-BUTYL PHTHALATE	1100 U	230 U	235 U	240 U	NA	460 U	240 U	230 U	NA	290 U	460 U
DI-N-OCTYL PHTHALATE	56 U	57 U	57.5 U	58 U	NA	110 U	60 U	56 U	NA	71 U	110 U
FLUORANTHENE	680	1100	1450	1800	NA	120 U	140 J	66 J	NA	220 J	120 U
FLUORENE	55 U	91 J	160.5	230 J	NA	110 U	60 U	56 U	NA	70 U	110 U
HEXACHLOROBENZENE	68 U	70 U	70 U	70 U	NA	140 U	73 U	69 U	NA	86 U	140 U
HEXACHLOROBUTADIENE	40 U	41 U	41 U	41 U	NA	80 U	43 U	40 U	NA	51 U	80 U
HEXACHLOROCYCLOPENTADIENE	42 U	43 U	43 U	43 U	NA	84 U	45 U	42 U	NA	53 U	84 U
HEXACHLOROETHANE	37 U	38 U	38 U	38 U	NA	74 U	40 U	37 U	NA	47 U	74 U
HIGH MOLECULAR WEIGHT PAHS	2334	5660	7070	8480	NA	715	2540	390.5	NA	985	550
INDENO(1,2,3-CD)PYRENE	230 J	1200	1400	1600	NA	180 J	580	66 U	NA	83 U	130 U
ISOPHORONE	31 U	32 U	32 U	32 U	NA	63 U	34 U	32 U	NA	40 U	63 U
LOW MOLECULAR WEIGHT PAHS	604	1414.5	2227.75	3041	NA	335.5	244	210.5	NA	328	400.5
NAPHTHALENE	37 U	100 J	200	300 J	NA	74 U	40 U	38 U	NA	47 U	74 U
NITROBENZENE	55 U	56 U	56.5 U	57 U	NA	110 U	59 U	56 U	NA	70 U	110 U
N-NITROSO-DI-N-PROPYLAMINE	49 U	51 U	51 U	51 U	NA	99 U	53 U	50 U	NA	63 U	99 U
N-NITROSODIPHENYLAMINE	100 U	100 U	100 U	100 U	NA	200 U	110 U	100 U	NA	130 U	200 U
PENTACHLOROPHENOL	210 UJ	220 U	220 U	220 U	NA	420 U	230 U	210 U	NA	270 U	420 U
PHENANTHRENE	400	880 J	1290	1700	NA	110 U	92 J	68 J	NA	150 J	120 J
PHENOL	78 U	80 U	80 U	80 U	NA	160 U	84 U	79 U	NA	99 U	160 U
PYRENE	520	1200	1550	1900	NA	170 U	290 J	90 J	NA	220 J	170 U

LOCATION	TP-SB34			TP-SB35		TP-SB36		TP-SB37		TP-SB38B	TP-SB39
SAMPLE ID	TPSB340205-AVG	TPSB340205-D	TPSB340508	TPSB350205	TPSB350508	TPSB360205	TPSB360508	TPSB370205	TPSB370508	TPSB38B0205	TPSB390205
SAMPLE DATE	20030425	20030425	20030425	20030425	20030425	20030424	20030424	20030425	20030425	20030424	20030425
SAMPLE CODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	2	2	5	2	5	2	5	2	5	2	2
BOTTOM DEPTH	5	5	8	5	8	5	8	5	8	5	5
DIOXINS/FURANS (NG/KG)											
1,2,3,4,6,7,8,9-OCDD	908 J	NA	1260 J	NA	NA	NA	NA	NA	NA	NA	58.8 J
1,2,3,4,6,7,8,9-OCDF	72.6 J	NA	6.1 U	NA	NA	NA	NA	NA	NA	NA	14.7 UJ
1,2,3,4,6,7,8-HPCDD	76.3	NA	15.5 J	NA	NA	NA	NA	NA	NA	NA	15.3
1,2,3,4,6,7,8-HPCDF	101	NA	14.1 J	NA	NA	NA	NA	NA	NA	NA	8.6
1,2,3,4,7,8,9-HPCDF	7.8	NA	1.2 UJ	NA	NA	NA	NA	NA	NA	NA	4.3 U
1,2,3,4,7,8-HXCDD	5.2 J	NA	0.8 UJ	NA	NA	NA	NA	NA	NA	NA	3.1 U
1,2,3,4,7,8-HXCDF	55.9	NA	13.9 U	NA	NA	NA	NA	NA	NA	NA	4.9
1,2,3,6,7,8-HXCDD	16.5	NA	2 U	NA	NA	NA	NA	NA	NA	NA	2.9 U
1,2,3,6,7,8-HXCDF	23.7	NA	5.5 J	NA	NA	NA	NA	NA	NA	NA	1.7 U
1,2,3,7,8,9-HXCDD	17.3	NA	4.2 J	NA	NA	NA	NA	NA	NA	NA	3 U
1,2,3,7,8,9-HXCDF	1.1 J	NA	0.6 UJ	NA	NA	NA	NA	NA	NA	NA	2.2 U
1,2,3,7,8-PECDD	10.1	NA	2.1 J	NA	NA	NA	NA	NA	NA	NA	1.9 UJ
1,2,3,7,8-PECDF	19.1	NA	3.4 U	NA	NA	NA	NA	NA	NA	NA	1.3 J
2,3,4,6,7,8-HXCDF	14.2	NA	7.8 J	NA	NA	NA	NA	NA	NA	NA	1.7 U
2,3,4,7,8-PECDF	18.4	NA	10 U	NA	NA	NA	NA	NA	NA	NA	1.7 J
2,3,7,8-TCDD	1 J	NA	0.5 UJ	NA	NA	NA	NA	NA	NA	NA	0.8 U
2,3,7,8-TCDF	12.4	NA	4 U	NA	NA	NA	NA	NA	NA	NA	1.6
TEQ WHO-1998	37.8341	NA	4.272	NA	NA	NA	NA	NA	NA	NA	1.8099
TEQ WHO-1998 - HALFND	37.8341	NA	8.1783	NA	NA	NA	NA	NA	NA	NA	3.9121
TEQ WHO-2005	33.9682	NA	4.524	NA	NA	NA	NA	NA	NA	NA	1.4556
TEQ WHO-2005 - HALFND	33.9682	NA	7.3969	NA	NA	NA	NA	NA	NA	NA	3.5593
TOTAL HPCDD	161	NA	38.5 J	NA	NA	NA	NA	NA	NA	NA	30
TOTAL HPCDF	136	NA	21.1 J	NA	NA	NA	NA	NA	NA	NA	8.6
TOTAL HXCDD	220 J	NA	35.8 J	NA	NA	NA	NA	NA	NA	NA	71.4
TOTAL HXCDF	198 J	NA	54.9 J	NA	NA	NA	NA	NA	NA	NA	10.8
TOTAL PECDD	196 J	NA	24.7 J	NA	NA	NA	NA	NA	NA	NA	70.5 J
TOTAL PECDF	204 J	NA	93.1 U	NA	NA	NA	NA	NA	NA	NA	17.8 J
TOTAL TCDD	98.2 J	NA	10 J	NA	NA	NA	NA	NA	NA	NA	60.8
TOTAL TCDF	223	NA	115 U	NA	NA	NA	NA	NA	NA	NA	40.6 J
METALS (MG/KG)											
ALUMINUM	10635	11400	15300	5150	22800	8880	6730	4810	6140	12400	7750
ANTIMONY	1.475	2.5 J	2.6 J	7.9 J	10.1 J	0.09 UR	104 J	2.6 J	0.4 J	0.67 U	0.14 UJ
ARSENIC	13.15	13	65.7	34	27.2	18 J	37 J	24.6	16.3	11.3 J	8.5
BARIUM	96.3	111 J	70.2 J	73.8 J	107 J	79.2	1300	1580 J	578 J	53.5	49.7 J
BERYLLIUM	0.42	0.44	0.54 U	0.25 U	0.31 U	0.29 J	0.26 U	0.26	0.35	0.61 J	0.34
CADMIUM	0.69 U	0.67 U	3.1 U	12.1 J	20.1	0.43 J	15.3 J	24.1	4.6	0.64 J	6.9

LOCATION	TP-SB34			TP-SB35		TP-SB36		TP-SB37		TP-SB38B	TP-SB39
SAMPLE ID	TPSB340205-AVG	TPSB340205-D	TPSB340508	TPSB350205	TPSB350508	TPSB360205	TPSB360508	TPSB370205	TPSB370508	TPSB38B0205	TPSB390205
SAMPLE DATE	20030425	20030425	20030425	20030425	20030425	20030424	20030424	20030425	20030425	20030424	20030425
SAMPLE CODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	2	2	5	2	5	2	5	2	5	2	2
BOTTOM DEPTH	5	5	8	5	8	5	8	5	8	5	5
CALCIUM	5110	4780	3570	16600	5000	8370	12600	8410	7030	4310	5920
CHROMIUM	45.95	49.2 J	79.2	2860	138 J	34.1	387	32.1 J	28.5 J	42.5	19 J
COBALT	8.35	8.3	26.9	85.2	18.1	9.6	13.5 J	6.5 J	7	10	4.9
COPPER	167.5	146	1830	25200	15800	70.4	24600	209	188	52.2	491
IRON	29450	33800	208000	189000	177000	12800	151000	142000	31600	24500	15900
LEAD	632.5	696	489 J	1530 J	1640	70.8	8020	29600	10400	90.2	578 J
MAGNESIUM	6285	6770	9750	4080	8110	6280	3950	3410	2880	7040	2970
MANGANESE	305.5	315	1050	1550	1770	198	849	442	608	392	172
MERCURY	0.58	0.8 J	0.09	2.5	0.17 J	0.2 J	0.21 J	120 J	24.3 J	0.21 J	0.78 J
NICKEL	48.8	50.4 J	406	3920	334 J	34	644	29.1 U	21.9 J	35.7	17 J
POTASSIUM	3205	3830 J	2260 U	1010 U	509 UJ	3500 J	1670 J	1220 J	1370 J	1770 J	1520 J
SELENIUM	0.66	0.49 J	4	6.3	7.5 J	0.14 U	5.6	3.1 J	2 J	0.53 J	0.65 J
SILVER	0.16 J	0.88 U	0.59 J	2.2 J	11	0.36 U	13 U	3.3 J	1 U	0.81 U	0.84 J
SODIUM	313.5	347 J	2790	1770	716 J	487 J	1540 J	272 J	420 J	269 J	227 J
THALLIUM	1.195 U	0.99 U	3.4 U	2.4 U	5.6 U	0.72 U	2.5 U	2.8 U	1 U	1.2 U	0.81 U
VANADIUM	35.35	36.7	44.8	63.8	23.6	26.5	31.8	26.9	18.8	40.7	25.5
ZINC	299	274 J	580	3190	11400 J	141	7250	10800 J	4920 J	143	1980 J
MISCELLANEOUS PARAMETERS (%)											
SIEVE 1"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE 1/2"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE 1-1/2"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE 3/4"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE 3/8"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 040	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 060	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SIEVE NO. 200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL SOLIDS	90.5	91	85	87	80	92	84	85	80	86	82
MISCELLANEOUS PARAMETERS (LB/F3)											
BULK DENSITY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MEQ/100)											
CATION EXCHANGE CAPACITY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SB34			TP-SB35		TP-SB36		TP-SB37		TP-SB38B	TP-SB39
SAMPLE ID	TPSB340205-AVG	TPSB340205-D	TPSB340508	TPSB350205	TPSB350508	TPSB360205	TPSB360508	TPSB370205	TPSB370508	TPSB38B0205	TPSB390205
SAMPLE DATE	20030425	20030425	20030425	20030425	20030425	20030424	20030424	20030425	20030425	20030424	20030425
SAMPLE CODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	2	2	5	2	5	2	5	2	5	2	2
BOTTOM DEPTH	5	5	8	5	8	5	8	5	8	5	5
MISCELLANEOUS PARAMETERS (MG/KG)											
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)											
POROSITY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PESTICIDES/PCBS (UG/KG)											
4,4'-DDD	1.4 U	1.4 U	140 U	1.4 U	150 U	1.4 UJ	1.5 UJ	1.4 U	1.5 U	1.4 UJ	1.5 U
4,4'-DDE	1.4 U	1.4 U	140 UJ	8.6 J	150 U	1.4 UJ	1.5 UJ	1.4 U	1.5 U	4.6 J	1.5 U
4,4'-DDT	1.2 U	1.2 U	130 UJ	1.3 UJ	140 UJ	1.2 UJ	1.3 UJ	1.3 U	1.4 U	27 J	1.3 UJ
ALDRIN	1.2 U	1.2 U	130 UJ	1.3 UJ	140 U	1.2 UJ	1.3 UJ	1.3 U	1.4 U	1.3 UJ	1.4 U
ALPHA-BHC	1.5 U	1.5 U	160 UJ	1.6 UJ	170 U	1.5 UJ	1.6 UJ	1.6 U	1.7 U	2.8 J	1.7 U
ALPHA-CHLORDANE	1.5 U	1.5 U	160 UJ	1.6 UJ	170 U	1.5 UJ	1.6 UJ	1.6 U	1.7 U	1.6 UJ	1.7 U
AROCLOR-1016	14 U	14 U	15 U	14 U	16 U	14 U	15 U	15 U	16 U	14 U	15 U
AROCLOR-1221	32.5 U	32 U	35 U	34 U	37 U	32 U	35 U	35 U	37 U	34 U	36 U
AROCLOR-1232	20 U	20 U	21 U	21 U	23 U	20 U	22 U	21 U	23 U	21 U	22 U
AROCLOR-1242	14 U	14 U	14 U	14 U	15 U	13 U	14 U	14 U	15 U	14 U	15 U
AROCLOR-1248	5 U	5 U	5.3 U	5.2 U	5.6 U	5 U	5.4 U	5.3 U	5.6 U	5.3 U	5.6 U
AROCLOR-1254	16 U	16 U	17 U	16 U	18 U	16 U	17 U	17 U	18 U	17 U	18 U
AROCLOR-1260	8.25 U	8.2 U	8.8 U	8.6 U	9.3 U	8.2 U	8.9 UJ	8.8 U	9.3 U	75	9.2 U
BETA-BHC	2.25 U	2.2 U	240 UJ	2.3 UJ	250 U	2.2 UJ	2.4 UJ	2.4 U	2.5 U	2.4 UJ	2.5 U
DELTA-BHC	1.3 U	1.3 U	140 UJ	1.3 UJ	140 U	1.3 UJ	1.4 UJ	1.4 U	1.4 U	1.3 UJ	1.4 UJ
DIELDRIN	1.3 U	1.3 U	140 UJ	1.4 UJ	150 U	1.3 UJ	1.4 UJ	1.4 U	1.5 U	1.4 UJ	1.5 U
ENDOSULFAN I	1.35 U	1.3 U	140 UJ	1.4 UJ	150 U	1.3 UJ	1.4 UJ	1.4 U	1.5 U	1.4 UJ	1.5 U
ENDOSULFAN II	1.25 U	1.2 U	130 UJ	1.3 UJ	140 U	1.2 UJ	1.4 UJ	1.3 U	1.4 U	1.3 UJ	1.4 U
ENDOSULFAN SULFATE	1.5 U	1.5 U	160 UJ	1.6 UJ	170 U	1.5 UJ	1.6 UJ	1.6 U	1.7 U	1.6 UJ	1.7 UJ
ENDRIN	1.25 U	1.2 U	130 UJ	1.3 UJ	140 U	1.2 UJ	1.4 UJ	1.3 U	1.4 U	1.3 UJ	1.4 U
ENDRIN ALDEHYDE	1.5 U	1.5 U	160 UJ	1.5 UJ	170 U	8.8 J	1.6 UJ	1.6 U	1.7 U	4.2 J	1.6 U
ENDRIN KETONE	1.6 U	1.6 U	170 UJ	1.7 UJ	180 UJ	1.6 UJ	1.7 UJ	1.7 U	1.8 U	1.7 UJ	1.8 UJ
GAMMA-BHC (LINDANE)	1.3 U	1.3 U	140 UJ	1.4 UJ	150 U	1.3 UJ	1.4 UJ	1.4 U	1.5 U	1.4 UJ	1.4 UJ
GAMMA-CHLORDANE	1.4 U	1.4 U	150 UJ	1.4 UJ	160 U	1.4 UJ	1.5 UJ	1.5 U	1.6 U	1.5 UJ	1.5 U
HEPTACHLOR	1.2 U	1.2 U	130 UJ	1.3 UJ	140 U	1.2 UJ	1.3 UJ	1.3 U	1.4 U	1.3 UJ	1.3 UJ
HEPTACHLOR EPOXIDE	1.4 U	1.4 U	150 UJ	1.5 UJ	160 UJ	1.4 UJ	1.5 UJ	1.5 U	1.6 U	1.5 UJ	1.6 U
METHOXYCHLOR	2.25 U	2.2 U	240 UJ	2.3 UJ	250 U	2.2 UJ	2.4 UJ	2.4 U	2.5 U	2.4 UJ	2.5 UJ
TOTAL AROCLOR	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	75	0 U
TOTAL AROCLOR HALFND	54.875	54.6	58.05	56.4	61.95	54.1	58.65	58.05	61.95	127.65	60.4
TOTAL AROCLOR ZEROND	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	75	0 U
TOXAPHENE	26 U	26 U	2700 U	27 U	2900 U	25 UJ	28 UJ	27 U	29 U	27 UJ	28 U

LOCATION	TP-SB34			TP-SB35		TP-SB36		TP-SB37		TP-SB38B	TP-SB39
SAMPLE ID	TPSB340205-AVG	TPSB340205-D	TPSB340508	TPSB350205	TPSB350508	TPSB360205	TPSB360508	TPSB370205	TPSB370508	TPSB38B0205	TPSB390205
SAMPLE DATE	20030425	20030425	20030425	20030425	20030425	20030424	20030424	20030425	20030425	20030424	20030425
SAMPLE CODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	2	2	5	2	5	2	5	2	5	2	2
BOTTOM DEPTH	5	5	8	5	8	5	8	5	8	5	5
SEMIVOLATILES (UG/KG)											
1,2,4-TRICHLOROBENZENE	77.5 U	77 U	41 U	81 U	44 U	77 U	83 U	41 U	44 U	41 U	86 U
1,2-DICHLOROBENZENE	83.5 U	83 U	44 U	86 U	47 U	82 U	89 UJ	44 U	47 U	44 U	92 U
1,3-DICHLOROBENZENE	80 U	80 U	42 U	83 U	45 U	79 U	86 UJ	42 U	45 U	42 U	89 U
1,4-DICHLOROBENZENE	76.5 U	76 U	41 U	79 U	43 U	75 U	82 U	40 U	43 U	40 U	85 U
2,2'-OXYBIS(1-CHLOROPROPANE)	110 U	110 U	57 U	110 UJ	60 U	110 U	120 UJ	57 U	60 U	56 U	120 U
2,4,5-TRICHLOROPHENOL	190 U	190 U	100 U	200 U	110 U	190 U	200 UJ	100 U	110 U	100 U	210 U
2,4,6-TRICHLOROPHENOL	205 U	200 U	110 U	210 U	120 U	200 U	220 UJ	110 U	120 U	110 U	230 U
2,4-DICHLOROPHENOL	145 U	140 U	78 U	150 U	82 U	140 U	160 UJ	78 U	82 U	77 U	160 U
2,4-DIMETHYLPHENOL	260 U	260 U	140 U	270 U	150 U	260 UJ	280 UJ	140 U	150 U	140 UJ	290 U
2,4-DINITROPHENOL	560 U	560 U	300 U	580 U	320 UJ	550 UJ	600 UJ	300 UJ	320 UJ	290 UJ	620 U
2,4-DINITROTOLUENE	74 U	74 U	39 U	77 U	41 U	73 U	79 U	39 U	42 U	39 U	82 U
2,6-DINITROTOLUENE	87.5 U	87 U	46 U	91 U	49 U	86 U	93 UJ	46 U	49 U	46 U	97 U
2-CHLORONAPHTHALENE	98.5 U	98 U	52 U	100 U	55 U	97 U	100 UJ	52 U	55 U	51 U	110 U
2-CHLOROPHENOL	140 U	140 U	77 U	150 U	81 U	140 U	150 U	77 U	81 U	76 U	160 U
2-METHYLNAPHTHALENE	69	93 J	48 U	93 U	270 J	89 U	96 UJ	48 U	50 U	47 U	1200
2-METHYLPHENOL	140 U	140 U	72 U	140 U	76 U	130 U	140 UJ	72 U	76 U	71 U	150 U
2-NITROANILINE	90.5 U	90 U	48 U	94 U	51 U	90 U	97 UJ	48 U	51 U	48 U	100 U
2-NITROPHENOL	180 U	180 U	96 U	190 U	100 U	180 U	190 UJ	95 U	100 U	94 U	200 U
3,3'-DICHLOROBENZIDINE	420 U	420 U	220 U	440 U	240 U	420 UJ	450 UR	220 U	240 U	220 UJ	470 U
3-NITROANILINE	310 U	310 U	160 U	320 U	170 U	310 U	330 UR	160 U	170 U	160 U	340 U
4,6-DINITRO-2-METHYLPHENOL	480 U	480 U	250 U	500 U	270 UJ	470 UR	510 UR	250 UJ	270 UJ	250 UR	530 U
4-BROMOPHENYL PHENYL ETHER	110 U	110 U	58 U	110 U	61 U	110 U	120 U	58 U	61 U	57 U	120 U
4-CHLORO-3-METHYLPHENOL	200 U	200 U	110 U	210 U	110 U	200 U	210 U	110 U	110 U	100 U	220 U
4-CHLOROANILINE	75.5 U	75 U	40 U	78 U	42 U	74 U	80 UR	40 U	42 U	39 U	83 U
4-CHLOROPHENYL PHENYL ETHER	115 U	110 U	61 U	120 U	65 U	110 U	120 UJ	61 U	65 U	60 U	130 U
4-METHYLPHENOL	130 U	130 U	68 U	130 U	72 U	130 U	140 UJ	68 U	72 U	67 U	140 U
4-NITROANILINE	365 U	360 U	200 U	380 U	210 U	360 UJ	390 UJ	200 U	210 U	190 UJ	410 U
4-NITROPHENOL	460 U	460 U	240 U	480 UJ	260 U	450 UJ	490 UR	240 U	260 U	240 UJ	510 U
ACENAPHTHENE	110 U	110 U	58 U	110 U	62 U	180 J	120 U	58 U	62 U	58 U	1400
ACENAPHTHYLENE	80.5 U	80 U	43 U	84 U	45 U	79 U	86 UJ	43 U	45 U	50 J	89 U
ANTHRACENE	95.5 U	95 U	51 U	160 J	150 J	920	160 J	51 U	54 U	120 J	3500
BAP EQUIVALENT-HALFND	200.14	181.67	59 U	420.03	1405.4	2854.1	585.6	226.08	208.59	937.68	5809.3
BAP EQUIVALENT-POS	95.19	55.22	0 U	343.53	1405.4	2854.1	510.6	188.58	169.09	937.68	5809.3
BENZO(A)ANTHRACENE	97.5	140 J	58 U	320 J	760	2200	400 J	130 J	100 J	660	5100
BENZO(A)PYRENE	87.5	110 U	59 U	260 J	870	1900	370 J	140 J	130 J	600	4100
BENZO(B)FLUORANTHENE	190	230 J	43 U	330 J	980	2200	490 J	190 J	160 J	1000	3200

LOCATION	TP-SB34			TP-SB35		TP-SB36		TP-SB37		TP-SB38B	TP-SB39
SAMPLE ID	TPSB340205-AVG	TPSB340205-D	TPSB340508	TPSB350205	TPSB350508	TPSB360205	TPSB360508	TPSB370205	TPSB370508	TPSB38B0205	TPSB390205
SAMPLE DATE	20030425	20030425	20030425	20030425	20030425	20030424	20030424	20030425	20030425	20030424	20030425
SAMPLE CODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
TOP DEPTH	2	2	5	2	5	2	5	2	5	2	2
BOTTOM DEPTH	5	5	8	5	8	5	8	5	8	5	5
BENZO(G,H,I)PERYLENE	150 U	150 U	78 U	150 U	680	1200	450 J	120 J	94 J	350 J	1900
BENZO(K)FLUORANTHENE	140 U	140 U	75 U	150 U	560	1000	260 J	120 J	100 J	430	3600
BIS(2-CHLOROETHOXY)METHANE	100 U	100 U	54 U	100 U	57 U	100 U	110 UJ	54 U	57 U	53 U	110 U
BIS(2-CHLOROETHYL)ETHER	120 U	120 U	63 U	120 U	66 U	120 U	130 UJ	62 U	66 U	62 U	130 U
BIS(2-ETHYLHEXYL)PHTHALATE	175 U	170 U	93 U	200 J	98 U	170 U	190 U	93 U	180 J	120 J	190 U
BUTYL BENZYL PHTHALATE	150 U	150 U	78 U	150 UJ	83 U	140 U	160 U	78 U	83 U	78 U	160 U
CARBAZOLE	130 U	130 U	70 U	140 U	74 U	130 U	140 UJ	70 U	74 U	89 J	1300
CHRYSENE	190	220 J	64 U	530 J	970	2100	500 J	180 J	150 J	880	4300
DIBENZO(A,H)ANTHRACENE	140 U	140 U	75 U	150 U	270 J	380 J	150 UJ	75 U	79 U	120 J	610 J
DIBENZOFURAN	75.5 U	75 U	40 U	78 U	42 U	170 J	81 UJ	40 U	42 U	40 U	2000
DIETHYL PHTHALATE	91.5 U	91 U	48 U	95 U	51 U	90 U	98 UJ	48 U	51 U	48 U	100 U
DIMETHYL PHTHALATE	99.5 U	99 U	53 U	100 U	56 U	98 U	110 UJ	53 U	56 U	52 U	110 U
DI-N-BUTYL PHTHALATE	455 U	450 U	240 U	470 U	260 U	450 U	490 UJ	240 U	260 U	240 U	500 U
DI-N-OCTYL PHTHALATE	110 U	110 U	59 U	120 U	62 U	110 U	120 U	59 U	62 U	58 U	120 U
FLUORANTHENE	120	180 J	100 J	480 J	1100	3000	630 J	130 J	110 J	1200	12000
FLUORENE	110 U	110 U	58 U	110 U	170 J	200 J	120 UJ	58 U	62 U	58 U	2500
HEXACHLOROBENZENE	135 U	130 U	72 U	140 U	76 U	130 U	140 UJ	72 U	76 U	71 U	150 U
HEXACHLOROBUTADIENE	79.5 U	79 U	42 U	83 U	45 U	79 U	86 UJ	42 U	45 U	42 U	88 U
HEXACHLOROCYCLOPENTADIENE	83.5 U	83 U	44 U	86 U	47 U	82 U	89 UR	44 U	47 U	44 U	92 U
HEXACHLOROETHANE	73.5 U	73 U	39 U	76 U	41 U	72 U	78 UJ	39 U	41 U	38 U	81 U
HIGH MOLECULAR WEIGHT PAHS	707.5	865	273.5	2295	4830	13980	2555	767.5	659.5	4760	34310
INDENO(1,2,3-CD)PYRENE	122.5	180 J	69 U	180 J	780	1100	440 J	140 J	110 J	430	2100
ISOPHORONE	62.5 U	62 U	33 U	65 U	35 U	62 U	67 UJ	33 U	35 U	33 U	69 U
LOW MOLECULAR WEIGHT PAHS	454	507.5	343	947	1609.5	4220.5	990.5	230.5	230.5	771	22945
NAPHTHALENE	74 U	74 U	94 J	77 U	86 J	73 U	79 UJ	39 U	42 U	39 U	2300
NITROBENZENE	110 U	110 U	58 U	110 U	62 U	110 U	120 UJ	58 U	62 U	58 U	120 U
N-NITROSO-DI-N-PROPYLAMINE	98.5 U	98 U	52 U	100 U	55 U	97 U	100 U	52 U	55 U	52 U	110 U
N-NITROSODIPHENYLAMINE	200 U	200 U	110 U	210 U	110 U	200 U	220 U	110 U	110 U	110 U	230 U
PENTACHLOROPHENOL	420 U	420 U	220 U	440 U	240 U	410 UJ	450 UJ	220 U	240 U	220 UJ	460 U
PHENANTHRENE	150	180 J	120 J	550 J	880	2800	580 J	82 J	73 J	500	12000
PHENOL	155 U	150 U	82 U	160 U	87 U	150 U	170 U	82 U	87 U	81 U	170 U
PYRENE	142.5	200 J	91 U	630 J	860	4400	580 J	150 J	130 J	1300	8200

LOCATION	TP-SB40		TP-SB41	
SAMPLE ID	TPSB400205	TPSB400508	TPSB410205	TPSB410508
SAMPLE DATE	20030424	20030424	20030424	20030424
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB
TOP DEPTH	2	5	2	5
BOTTOM DEPTH	5	8	5	8
DIOXINS/FURANS (NG/KG)				
1,2,3,4,6,7,8,9-OCDD	NA	NA	NA	NA
1,2,3,4,6,7,8,9-OCDF	NA	NA	NA	NA
1,2,3,4,6,7,8-HPCDD	NA	NA	NA	NA
1,2,3,4,6,7,8-HPCDF	NA	NA	NA	NA
1,2,3,4,7,8,9-HPCDF	NA	NA	NA	NA
1,2,3,4,7,8-HXCDD	NA	NA	NA	NA
1,2,3,4,7,8-HXCDF	NA	NA	NA	NA
1,2,3,6,7,8-HXCDD	NA	NA	NA	NA
1,2,3,6,7,8-HXCDF	NA	NA	NA	NA
1,2,3,7,8,9-HXCDD	NA	NA	NA	NA
1,2,3,7,8,9-HXCDF	NA	NA	NA	NA
1,2,3,7,8-PECDD	NA	NA	NA	NA
1,2,3,7,8-PECDF	NA	NA	NA	NA
2,3,4,6,7,8-HXCDF	NA	NA	NA	NA
2,3,4,7,8-PECDF	NA	NA	NA	NA
2,3,7,8-TCDD	NA	NA	NA	NA
2,3,7,8-TCDF	NA	NA	NA	NA
TEQ WHO-1998	NA	NA	NA	NA
TEQ WHO-1998 - HALFND	NA	NA	NA	NA
TEQ WHO-2005	NA	NA	NA	NA
TEQ WHO-2005 - HALFND	NA	NA	NA	NA
TOTAL HPCDD	NA	NA	NA	NA
TOTAL HPCDF	NA	NA	NA	NA
TOTAL HXCDD	NA	NA	NA	NA
TOTAL HXCDF	NA	NA	NA	NA
TOTAL PECDD	NA	NA	NA	NA
TOTAL PECDF	NA	NA	NA	NA
TOTAL TCDD	NA	NA	NA	NA
TOTAL TCDF	NA	NA	NA	NA
METALS (MG/KG)				
ALUMINUM	NA	13100	3560	5320
ANTIMONY	NA	1.5 U	0.6 UR	0.32 U
ARSENIC	NA	32.1 J	32.8 J	23.8 J
BARIUM	NA	452	196	253
BERYLLIUM	NA	0.46 J	0.72 J	0.46 J
CADMIUM	NA	15.5 J	3.5 J	1.4 J

LOCATION	TP-SB40		TP-SB41	
SAMPLE ID	**TPSB400205**	**TPSB400508**	**TPSB410205**	**TPSB410508**
SAMPLE DATE	**20030424**	**20030424**	**20030424**	**20030424**
SAMPLE CODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**SO**	**SO**	**SO**	**SO**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**SB**	**SB**	**SB**	**SB**
TOP DEPTH	**2**	**5**	**2**	**5**
BOTTOM DEPTH	**5**	**8**	**5**	**8**
CALCIUM	NA	1460	2920	3480
CHROMIUM	NA	60.8	17.8	21
COBALT	NA	13.1 J	15.1	10.8
COPPER	NA	203	360	146
IRON	NA	214000	77600	43000
LEAD	NA	1270	2330	1860
MAGNESIUM	NA	5640	1680	3230
MANGANESE	NA	622	370	311
MERCURY	NA	1.5 J	0.41 J	0.32 J
NICKEL	NA	38.1	37.4	25.5
POTASSIUM	NA	2960 J	537 J	1220 J
SELENIUM	NA	3.5 J	2.6 J	2.1
SILVER	NA	5.3 U	2.1 U	0.92 U
SODIUM	NA	2480 J	476 J	463 J
THALLIUM	NA	2.9 U	1.3 U	0.96 U
VANADIUM	NA	37.2	20.9	25
ZINC	NA	2900	1020	574
MISCELLANEOUS PARAMETERS (%)				
SIEVE 1"	82	NA	NA	NA
SIEVE 1/2"	46	NA	NA	NA
SIEVE 1-1/2"	100	NA	NA	NA
SIEVE 3/4"	63	NA	NA	NA
SIEVE 3/8"	39	NA	NA	NA
SIEVE NO. 004	27	NA	NA	NA
SIEVE NO. 010	21	NA	NA	NA
SIEVE NO. 020	17	NA	NA	NA
SIEVE NO. 040	14	NA	NA	NA
SIEVE NO. 060	12	NA	NA	NA
SIEVE NO. 100	11	NA	NA	NA
SIEVE NO. 200	8	NA	NA	NA
TOTAL SOLIDS	NA	81	87	90
MISCELLANEOUS PARAMETERS (LB/F3)				
BULK DENSITY	104.7	NA	NA	NA
MISCELLANEOUS PARAMETERS (MEQ/100)				
CATION EXCHANGE CAPACITY	NA	14	NA	NA

LOCATION	TP-SB40		TP-SB41	
SAMPLE ID	TPSB400205	TPSB400508	TPSB410205	TPSB410508
SAMPLE DATE	20030424	20030424	20030424	20030424
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB
TOP DEPTH	2	5	2	5
BOTTOM DEPTH	5	8	5	8
MISCELLANEOUS PARAMETERS (MG/KG)				
TOTAL ORGANIC CARBON	NA	16000	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)				
POROSITY	0.39	NA	NA	NA
PESTICIDES/PCBS (UG/KG)				
4,4'-DDD	NA	1.5 UJ	5.2	5.5
4,4'-DDE	NA	1.5 UJ	3.6 J	4 J
4,4'-DDT	NA	1.4 UJ	6.9 J	10 J
ALDRIN	NA	1.4 UJ	1.3 UJ	1.2 UJ
ALPHA-BHC	NA	1.7 UJ	1.6 UJ	1.5 UJ
ALPHA-CHLORDANE	NA	1.7 UJ	1.6 UJ	1.5 UJ
AROCLOR-1016	NA	15 U	14 U	14 U
AROCLOR-1221	NA	36 U	34 U	33 U
AROCLOR-1232	NA	22 U	21 U	20 U
AROCLOR-1242	NA	15 U	14 U	14 U
AROCLOR-1248	NA	5.6 U	5.2 U	5 U
AROCLOR-1254	NA	18 U	16 U	16 U
AROCLOR-1260	NA	9.2 U	8.6 U	8.3 U
BETA-BHC	NA	2.5 UJ	2.4 UJ	2.3 UJ
DELTA-BHC	NA	1.4 UJ	1.3 UJ	1.3 UJ
DIELDRIN	NA	1.5 UJ	1.4 UJ	1.3 UJ
ENDOSULFAN I	NA	1.5 UJ	1.4 UJ	1.4 UJ
ENDOSULFAN II	NA	1.4 UJ	1.3 UJ	1.3 UJ
ENDOSULFAN SULFATE	NA	1.7 UJ	1.6 UJ	1.5 UJ
ENDRIN	NA	1.4 UJ	1.3 UJ	1.3 UJ
ENDRIN ALDEHYDE	NA	1.6 UJ	1.5 UJ	1.5 UJ
ENDRIN KETONE	NA	1.8 UJ	1.7 UJ	1.6 UJ
GAMMA-BHC (LINDANE)	NA	1.4 UJ	1.4 UJ	1.3 UJ
GAMMA-CHLORDANE	NA	1.6 UJ	1.4 UJ	1.4 UJ
HEPTACHLOR	NA	1.4 UJ	1.3 UJ	1.2 UJ
HEPTACHLOR EPOXIDE	NA	1.6 UJ	1.5 UJ	1.4 UJ
METHOXYCHLOR	NA	2.5 UJ	2.4 UJ	2.3 UJ
TOTAL AROCLOR	NA	0 U	0 U	0 U
TOTAL AROCLOR HALFND	NA	60.4	56.4	55.15
TOTAL AROCLOR ZEROND	NA	0 U	0 U	0 U
TOXAPHENE	NA	29 UJ	27 UJ	26 UJ

LOCATION	TP-SB40		TP-SB41	
SAMPLE ID	TPSB400205	TPSB400508	TPSB410205	TPSB410508
SAMPLE DATE	20030424	20030424	20030424	20030424
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB
TOP DEPTH	2	5	2	5
BOTTOM DEPTH	5	8	5	8
SEMIVOLATILES (UG/KG)				
1,2,4-TRICHLOROBENZENE	NA	43 U	160 U	200 U
1,2-DICHLOROBENZENE	NA	46 U	170 U	210 U
1,3-DICHLOROBENZENE	NA	45 U	170 U	200 U
1,4-DICHLOROBENZENE	NA	43 U	160 U	190 U
2,2'-OXYBIS(1-CHLOROPROPANE)	NA	60 U	220 U	270 U
2,4,5-TRICHLOROPHENOL	NA	100 U	400 U	480 U
2,4,6-TRICHLOROPHENOL	NA	120 U	430 U	520 U
2,4-DICHLOROPHENOL	NA	82 U	300 U	370 U
2,4-DIMETHYLPHENOL	NA	150 UJ	550 UJ	660 UJ
2,4-DINITROPHENOL	NA	310 UJ	1200 UJ	1400 UJ
2,4-DINITROTOLUENE	NA	41 U	150 U	180 U
2,6-DINITROTOLUENE	NA	49 U	180 U	220 U
2-CHLORONAPHTHALENE	NA	55 U	200 U	250 U
2-CHLOROPHENOL	NA	80 U	300 U	360 U
2-METHYLNAPHTHALENE	NA	50 U	190 U	220 U
2-METHYLPHENOL	NA	76 U	280 U	340 U
2-NITROANILINE	NA	51 U	190 U	230 U
2-NITROPHENOL	NA	100 U	380 U	450 U
3,3'-DICHLOROBENZIDINE	NA	240 U	880 UJ	1100 UJ
3-NITROANILINE	NA	170 U	650 U	780 U
4,6-DINITRO-2-METHYLPHENOL	NA	270 UR	1000 UR	1200 UR
4-BROMOPHENYL PHENYL ETHER	NA	61 U	230 U	270 U
4-CHLORO-3-METHYLPHENOL	NA	110 U	420 U	500 U
4-CHLOROANILINE	NA	42 U	160 U	190 U
4-CHLOROPHENYL PHENYL ETHER	NA	64 U	240 U	290 U
4-METHYLPHENOL	NA	71 U	270 U	320 U
4-NITROANILINE	NA	200 U	770 UJ	920 UJ
4-NITROPHENOL	NA	260 UJ	960 UJ	1200 UJ
ACENAPHTHENE	NA	61 U	230 U	280 U
ACENAPHTHYLENE	NA	45 U	170 U	200 U
ANTHRACENE	NA	53 U	200 U	240 U
BAP EQUIVALENT-HALFND	NA	83.882	230 U	280 U
BAP EQUIVALENT-POS	NA	6.677	0 U	0 U
BENZO(A)ANTHRACENE	NA	66 J	230 U	280 U
BENZO(A)PYRENE	NA	62 U	230 U	280 U
BENZO(B)FLUORANTHENE	NA	45 U	170 U	200 U

LOCATION	TP-SB40		TP-SB41	
SAMPLE ID	TPSB400205	TPSB400508	TPSB410205	TPSB410508
SAMPLE DATE	20030424	20030424	20030424	20030424
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB
TOP DEPTH	2	5	2	5
BOTTOM DEPTH	5	8	5	8
BENZO(G,H,I)PERYLENE	NA	82 U	310 U	370 U
BENZO(K)FLUORANTHENE	NA	79 U	290 U	350 U
BIS(2-CHLOROETHOXY)METHANE	NA	57 U	210 U	260 U
BIS(2-CHLOROETHYL)ETHER	NA	66 U	240 U	300 U
BIS(2-ETHYLHEXYL)PHTHALATE	NA	98 U	360 U	440 U
BUTYL BENZYL PHTHALATE	NA	82 U	310 U	370 U
CARBAZOLE	NA	73 U	270 U	330 U
CHRYSENE	NA	77 J	250 U	300 U
DIBENZO(A,H)ANTHRACENE	NA	79 U	300 U	360 U
DIBENZOFURAN	NA	42 U	160 U	190 U
DIETHYL PHTHALATE	NA	51 U	190 U	230 U
DIMETHYL PHTHALATE	NA	56 U	210 U	250 U
DI-N-BUTYL PHTHALATE	NA	250 U	950 U	1100 U
DI-N-OCTYL PHTHALATE	NA	62 U	230 U	280 U
FLUORANTHENE	NA	140 J	250 U	300 U
FLUORENE	NA	61 U	230 U	280 U
HEXACHLOROBENZENE	NA	75 U	280 U	340 U
HEXACHLOROBUTADIENE	NA	44 U	170 U	200 U
HEXACHLOROCYCLOPENTADIENE	NA	46 U	170 U	210 U
HEXACHLOROETHANE	NA	41 U	150 U	180 U
HIGH MOLECULAR WEIGHT PAHS	NA	503.5	810	975
INDENO(1,2,3-CD)PYRENE	NA	73 U	270 U	330 U
ISOPHORONE	NA	35 U	130 U	160 U
LOW MOLECULAR WEIGHT PAHS	NA	217.5	695	835
NAPHTHALENE	NA	41 U	150 U	180 U
NITROBENZENE	NA	61 U	230 U	280 U
N-NITROSO-DI-N-PROPYLAMINE	NA	55 U	200 U	250 U
N-NITROSODIPHENYLAMINE	NA	110 U	420 U	510 U
PENTACHLOROPHENOL	NA	230 UJ	870 UJ	1000 UJ
PHENANTHRENE	NA	62 J	220 U	270 U
PHENOL	NA	86 U	320 U	390 U
PYRENE	NA	150 J	360 U	430 U

LOCATION	FA-01									
SAMPLE ID	FA-01-GW-07	FA-01-GW-07-AVG	FA-01-GW-07-D	FA-01-GW-07-F	FA-01-GW-07-F-AVG	FA-01-GW-07-F-D	FA-01-GW-08	FA-01-GW-09	FA-01-GW-10	TPGWFA010503
SAMPLE DATE	19961209	19961209	19961209	19961209	19961209	19961209	19970427	19970806	19971101	20030508
SAMPLE CODE	ORIG	AVG	DUP	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	4	4	4	4	4	4	4	4	4	4
BOTTOM DEPTH	14	14	14	14	14	14	14	14	14	14
DISSOLVED METALS (UG/L)										
ALUMINUM	NA	NA	NA	102 U	116 U	130 U	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	6.2 U	6.2 U	6.2 U	NA	NA	NA	NA
ARSENIC	NA	NA	NA	6.3 U	6.3 U	6.3 U	NA	NA	NA	NA
BARIUM	NA	NA	NA	9.2 U	9.3 U	9.4 U	NA	NA	NA	NA
BERYLLIUM	NA	NA	NA	0.39 UJ	0.39 U	0.39 UJ	NA	NA	NA	NA
CADMIUM	NA	NA	NA	0.82 U	0.82 U	0.82 U	NA	NA	NA	NA
CALCIUM	NA	NA	NA	266000	269500	273000	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	2.5 U	2.5 U	2.5 U	NA	NA	NA	NA
COBALT	NA	NA	NA	2.4 U	2.4 U	2.4 U	NA	NA	NA	NA
COPPER	NA	NA	NA	19 U	17.25 U	15.5 U	NA	NA	NA	NA
IRON	NA	NA	NA	35 U	35 U	35 U	NA	NA	NA	NA
LEAD	NA	NA	NA	3.9 U	3.9 U	3.9 U	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	834000	843500	853000	NA	NA	NA	NA
MANGANESE	NA	NA	NA	0.96 U	0.975 U	0.99 U	NA	NA	NA	NA
MERCURY	NA	NA	NA	0.03 J	0.02	0.01 J	NA	NA	NA	NA
NICKEL	NA	NA	NA	2.6 U	2.6 U	2.6 U	NA	NA	NA	NA
POTASSIUM	NA	NA	NA	278000	280500	283000	NA	NA	NA	NA
SELENIUM	NA	NA	NA	9.4 U	9.4 U	9.4 U	NA	NA	NA	NA
SILICON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	5.4 U	5.4 U	5.4 U	NA	NA	NA	NA
SODIUM	NA	NA	NA	6E+06	6605000	6730000	NA	NA	NA	NA
THALLIUM	NA	NA	NA	15 U	14.35 U	13.7 U	NA	NA	NA	NA
VANADIUM	NA	NA	NA	1.7 UJ	1.7 U	1.7 U	NA	NA	NA	NA
ZINC	NA	NA	NA	6.1 U	5.1 U	4.1 U	NA	NA	NA	NA
FIELD (C)										
TEMPERATURE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FIELD (MG/L)										
DISSOLVED OXYGEN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FIELD (MS/CM)										
SPECIFIC CONDUCTANCE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FIELD (MV)										
OXIDATION REDUCTION POTENTIAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FIELD (NTU)										
TURBIDITY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FIELD (PPT)										
SALINITY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FIELD (S.U.)										
PH	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	FA-01									
SAMPLE ID	FA-01-GW-07	FA-01-GW-07-AVG	FA-01-GW-07-D	FA-01-GW-07-F	FA-01-GW-07-F-AVG	FA-01-GW-07-F-D	FA-01-GW-08	FA-01-GW-09	FA-01-GW-10	TPGWFA010503
SAMPLE DATE	19961209	19961209	19961209	19961209	19961209	19961209	19970427	19970806	19971101	20030508
SAMPLE CODE	ORIG	AVG	DUP	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	4	4	4	4	4	4	4	4	4	4
BOTTOM DEPTH	14	14	14	14	14	14	14	14	14	14
METALS (UG/L)										
ALUMINUM	142 U	127 U	112 U	NA	NA	NA	20 UJ	379 U	77.7 U	101 U
ANTIMONY	6.2 U	6.2 U	6.2 U	NA	NA	NA	3 U	21.2 U	2.5 UJ	6.7 U
ARSENIC	10.6 U	8.45 U	6.3 U	NA	NA	NA	3 U	17.5 UJ	2.5 U	9 U
BARIUM	9.8 U	9.35 U	8.9 U	NA	NA	NA	7.2 J	13.6 U	12.5 J	9.8
BERYLLIUM	0.39 UJ	0.39 U	0.39 UJ	NA	NA	NA	0.2 UJ	1.4 U	0.11 UJ	1.6 U
CADMIUM	0.82 U	0.82 U	0.82 U	NA	NA	NA	0.3 U	1.9 U	0.22 U	1.4 U
CALCIUM	274000	267500	261000	NA	NA	NA	239000	383000	363000 J	337000
CHROMIUM	3.5 U	3 U	2.5 U	NA	NA	NA	0.9 UJ	5.3 U	2.3 J	7.1 U
COBALT	2.5 U	2.45 U	2.4 U	NA	NA	NA	0.8 UJ	5.1 U	0.8 UJ	4 U
COPPER	21.9 U	20 U	18.1 U	NA	NA	NA	10.7 J	15.7 U	14.7 J	22.9 U
IRON	35 U	35 U	35 U	NA	NA	NA	40 U	99.3 UJ	229	303 U
LEAD	3.9 U	3.9 U	3.9 U	NA	NA	NA	2 U	14.2 U	1.7 J	4.6 UJ
MAGNESIUM	858000	837000	816000	NA	NA	NA	774000	1E+06	1E+06	1020000
MANGANESE	1.8 U	1.36 U	0.92 U	NA	NA	NA	0.7 U	1.6 U	3 J	3.1 U
MERCURY	0.03 J	0.02	0.01 J	NA	NA	NA	0.02 U	0.01 UJ	0.13 U	0.13 U
NICKEL	4.5 U	3.55 U	2.6 U	NA	NA	NA	1.4 J	7.2 UJ	3.2 J	5.4 J
POTASSIUM	289000	280000	271000	NA	NA	NA	272000	383000 J	422000	302000
SELENIUM	9.4 U	9.4 U	9.4 U	NA	NA	NA	4 U	29 UR	1.9 UJ	10.5 U
SILICON	NA	NA	NA	NA	NA	NA	NA	NA	NA	755 U
SILVER	7.1 U	5.65 U	4.2 U	NA	NA	NA	5 UJ	8.2 U	6.2 J	2.9 U
SODIUM	7E+06	6495000	6290000	NA	NA	NA	6E+06	1E+07	1E+07	8530000
THALLIUM	16.2 U	13.6 U	11 UJ	NA	NA	NA	6 J	61.3 U	4.8 UJ	0.4 U
VANADIUM	1.7 UJ	1.7 U	1.7 UJ	NA	NA	NA	0.6 UJ	5.7 U	0.68 J	1.8 U
ZINC	15.6 U	9.75 U	3.9 U	NA	NA	NA	22.3 J	39.2 U	53.2 U	21.2
MISCELLANEOUS PARAMETERS (MG/L)										
ALKALINITY	96	96.5	97	NA	NA	NA	83	98 J	110	NA
BROMIDE	39	39.5	40	NA	NA	NA	44	57 J	48	NA
CARBONATE ALKALINITY	96	96.5	97	NA	NA	NA	83	98	110	NA
CHLORIDE	13000 J	13000	13000 J	NA	NA	NA	12000	18000	19000 J	NA
NITRATE	0.36 J	0.345	0.33 J	NA	NA	NA	0.45	0.28	0.29 J	NA
SULFATE	1600	1550	1500	NA	NA	NA	1800	2400	2100	NA
TOTAL DISSOLVED SOLIDS	NA	NA	NA	NA	NA	NA	NA	NA	NA	11000
TOTAL ORGANIC CARBON	1.5	1.5	1.5	NA	NA	NA	1.5	1.5	1.7 J	NA
TOTAL ORGANIC HALIDES	0.67 J	2.485	4.3 J	NA	NA	NA	0.29 J	2 J	NA	NA
TOTAL SUSPENDED SOLIDS	NA	NA	NA	NA	NA	NA	NA	NA	NA	17 J
MISCELLANEOUS PARAMETERS (PPT)										
SALINITY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	FA-01									
SAMPLE ID	FA-01-GW-07	FA-01-GW-07-AVG	FA-01-GW-07-D	FA-01-GW-07-F	FA-01-GW-07-F-AVG	FA-01-GW-07-F-D	FA-01-GW-08	FA-01-GW-09	FA-01-GW-10	TPGWFA010503
SAMPLE DATE	19961209	19961209	19961209	19961209	19961209	19961209	19970427	19970806	19971101	20030508
SAMPLE CODE	ORIG	AVG	DUP	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	4	4	4	4	4	4	4	4	4	4
BOTTOM DEPTH	14	14	14	14	14	14	14	14	14	14
MISCELLANEOUS PARAMETERS (S.U.)										
PH	7.5	7.5	7.5	NA	NA	NA	7.6	7.5	7.7	NA
MISCELLANEOUS PARAMETERS (UG/L)										
CYANIDE	10 U	10 U	10 U	NA	NA	NA	20 UJ	20 U	20 U	NA
PESTICIDES/PCBS (UG/L)										
4,4'-DDD	0.11 U	0.11 U	0.11 U	NA	NA	NA	0.11 U	0.1 U	0.1 U	0.026 U
4,4'-DDE	0.11 U	0.11 U	0.11 U	NA	NA	NA	0.11 U	0.1 U	0.1 U	0.026 U
4,4'-DDT	0.11 U	0.11 U	0.11 U	NA	NA	NA	0.11 U	0.1 U	0.1 U	0.028 U
ALDRIN	0.053 U	0.0545 U	0.056 U	NA	NA	NA	0.053 U	0.051 U	0.051 U	0.02 U
ALPHA-BHC	0.053 U	0.0545 U	0.056 U	NA	NA	NA	0.053 U	0.051 U	0.051 U	0.023 U
ALPHA-CHLORDANE	0.053 U	0.0545 U	0.056 U	NA	NA	NA	0.053 U	0.051 U	0.051 U	0.018 U
AROCLOR-1016	1.1 U	1.1 U	1.1 U	NA	NA	NA	1.1 U	1 U	1 U	0.11 U
AROCLOR-1221	2.1 U	2.15 U	2.2 U	NA	NA	NA	2.1 U	2 U	2 U	0.28 U
AROCLOR-1232	1.1 U	1.1 U	1.1 U	NA	NA	NA	1.1 U	1 U	1 U	0.3 U
AROCLOR-1242	1.1 U	1.1 U	1.1 U	NA	NA	NA	1.1 U	1 U	1 U	0.23 U
AROCLOR-1248	1.1 U	1.1 U	1.1 U	NA	NA	NA	1.1 U	1 U	1 U	0.12 U
AROCLOR-1254	1.1 U	1.1 U	1.1 U	NA	NA	NA	1.1 U	1 U	1 U	0.15 U
AROCLOR-1260	1.1 U	1.1 U	1.1 U	NA	NA	NA	1.1 U	1 U	1 U	0.11 U
BETA-BHC	0.053 U	0.0545 U	0.056 U	NA	NA	NA	0.053 U	0.051 U	0.051 U	0.039 U
DELTA-BHC	0.053 U	0.0545 U	0.056 U	NA	NA	NA	0.053 U	0.051 U	0.051 U	0.027 UJ
DIELDRIN	0.11 U	0.11 U	0.11 U	NA	NA	NA	0.11 U	0.1 U	0.1 U	0.016 U
ENDOSULFAN I	0.053 U	0.0545 U	0.056 U	NA	NA	NA	0.053 U	0.051 U	0.051 U	0.017 U
ENDOSULFAN II	0.11 U	0.11 U	0.11 U	NA	NA	NA	0.11 U	0.1 U	0.1 U	0.015 U
ENDOSULFAN SULFATE	0.11 U	0.11 U	0.11 U	NA	NA	NA	0.11 U	0.1 U	0.1 U	0.021 UJ
ENDRIN	0.11 U	0.11 U	0.11 U	NA	NA	NA	0.11 U	0.1 U	0.1 U	0.017 U
ENDRIN ALDEHYDE	0.11 U	0.11 U	0.11 U	NA	NA	NA	0.11 U	0.1 U	0.1 U	0.02 U
ENDRIN KETONE	0.11 U	0.11 U	0.11 U	NA	NA	NA	0.11 U	0.1 U	0.1 U	0.019 U
GAMMA-BHC (LINDANE)	0.053 U	0.0545 U	0.056 U	NA	NA	NA	0.053 U	0.051 U	0.051 U	0.02 U
GAMMA-CHLORDANE	0.053 U	0.0545 U	0.056 U	NA	NA	NA	0.053 U	0.051 U	0.051 U	0.018 U
HEPTACHLOR	0.053 U	0.0545 U	0.056 U	NA	NA	NA	0.053 U	0.051 U	0.051 U	0.022 U
HEPTACHLOR EPOXIDE	0.053 U	0.0545 U	0.056 U	NA	NA	NA	0.053 U	0.051 U	0.051 U	0.021 U
METHOXYCHLOR	0.53 U	0.545 U	0.56 U	NA	NA	NA	0.53 UJ	0.51 U	0.51 U	0.042 U
TOTAL AROCLOR HALFND	4.35	4.375	4.4	NA	NA	NA	4.35	4	4	0.65
TOTAL AROCLOR ZEROND	0 U	0 U	0 U	NA	NA	NA	0 U	0 U	0 U	0 U
TOXAPHENE	5.3 U	5.45 U	5.6 U	NA	NA	NA	5.3 U	5.1 U	5.1 U	0.86 U
PETROLEUM HYDROCARBONS (UG/L)										
DIESEL RANGE ORGANICS	55 U	55 U	55 U	NA	NA	NA	55 U	50 U	50 U	NA
GASOLINE RANGE ORGANICS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	FA-01									
SAMPLE ID	FA-01-GW-07	FA-01-GW-07-AVG	FA-01-GW-07-D	FA-01-GW-07-F	FA-01-GW-07-F-AVG	FA-01-GW-07-F-D	FA-01-GW-08	FA-01-GW-09	FA-01-GW-10	TPGWFA010503
SAMPLE DATE	19961209	19961209	19961209	19961209	19961209	19961209	19970427	19970806	19971101	20030508
SAMPLE CODE	ORIG	AVG	DUP	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	4	4	4	4	4	4	4	4	4	4
BOTTOM DEPTH	14	14	14	14	14	14	14	14	14	14
POLYCYCLIC AROMATIC HYDROCARBONS (UG/L)										
2-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.08 U
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.05 U
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.08 U
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.08 U
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA	NA	NA	NA	NA	0 U
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.1 U
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.08 U
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.08 U
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.08 U
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.08 U
CHRYSENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.1 U
DIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.1 U
FLUORENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.06 U
HIGH MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.27
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.09 U
LOW MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.24
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.05 U
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.08 U
PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.08 U
SEMIVOLATILES (UG/L)										
1,2,4-TRICHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.9 U
1,2-DICHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.7 U
1,3-DICHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.6 U
1,4-DICHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.8 U
2,2'-OXYBIS(1-CHLOROPROPANE)	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 UJ
2,4,5-TRICHLOROPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	2 U
2,4,6-TRICHLOROPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	2 U
2,4-DICHLOROPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	2 U
2,4-DIMETHYLPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	2 U
2,4-DINITROPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	5 UJ
2,4-DINITROTOLUENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.7 UJ
2,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	2 U
2-CHLORONAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	3 U
2-CHLOROPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	2 U

LOCATION	FA-01									
SAMPLE ID	FA-01-GW-07	FA-01-GW-07-AVG	FA-01-GW-07-D	FA-01-GW-07-F	FA-01-GW-07-F-AVG	FA-01-GW-07-F-D	FA-01-GW-08	FA-01-GW-09	FA-01-GW-10	TPGWFA010503
SAMPLE DATE	19961209	19961209	19961209	19961209	19961209	19961209	19970427	19970806	19971101	20030508
SAMPLE CODE	ORIG	AVG	DUP	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	4	4	4	4	4	4	4	4	4	4
BOTTOM DEPTH	14	14	14	14	14	14	14	14	14	14
2-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.08 U
2-METHYLPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U
2-NITROANILINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.8 U
2-NITROPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	2 U
3,3'-DICHLOROBENZIDINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	2 UJ
3-NITROANILINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	2 U
4,6-DINITRO-2-METHYLPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	7 U
4-BROMOPHENYL PHENYL ETHER	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U
4-CHLORO-3-METHYLPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U
4-CHLOROANILINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U
4-CHLOROPHENYL PHENYL ETHER	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U
4-METHYLPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	2 U
4-NITROANILINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	2 UJ
4-NITROPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	3 U
BIS(2-CHLOROETHOXY)METHANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.8 U
BIS(2-CHLOROETHYL)ETHER	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U
BIS(2-ETHYLHEXYL)PHTHALATE	NA	NA	NA	NA	NA	NA	NA	NA	NA	9 U
BUTYL BENZYL PHTHALATE	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.7 U
CARBAZOLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.8 U
CHRYSENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.07 U
DIETHYL PHTHALATE	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.6 U
DIMETHYL PHTHALATE	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.7 U
DI-N-BUTYL PHTHALATE	NA	NA	NA	NA	NA	NA	NA	NA	NA	2 U
DI-N-OCTYL PHTHALATE	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U
HEXACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.7 U
HEXACHLOROBUTADIENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	2 U
HEXACHLOROCYCLOPENTADIENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U
HEXACHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	2 U
ISOPHORONE	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.8 U
NITROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U
N-NITROSO-DI-N-PROPYLAMINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	2 U
N-NITROSODIPHENYLAMINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	2 U
PENTACHLOROPHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	5 U
PHENOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	2 U
VOLATILES (UG/L)										
1,1,1-TRICHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-TETRACHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-TRICHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-TRICHLOROTRIFLUOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	FA-01									
SAMPLE ID	FA-01-GW-07	FA-01-GW-07-AVG	FA-01-GW-07-D	FA-01-GW-07-F	FA-01-GW-07-F-AVG	FA-01-GW-07-F-D	FA-01-GW-08	FA-01-GW-09	FA-01-GW-10	TPGWFA010503
SAMPLE DATE	19961209	19961209	19961209	19961209	19961209	19961209	19970427	19970806	19971101	20030508
SAMPLE CODE	ORIG	AVG	DUP	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	4	4	4	4	4	4	4	4	4	4
BOTTOM DEPTH	14	14	14	14	14	14	14	14	14	14
1,1-DICHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-DICHLOROETHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-DICHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-DICHLOROPROPANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-BUTANONE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-HEXANONE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-METHYL-2-PENTANONE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACETONE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BROMODICHLOROMETHANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BROMOFORM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BROMOMETHANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CARBON DISULFIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CARBON TETRACHLORIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHLORODIBROMOMETHANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHLOROETHANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHLOROFORM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHLOROMETHANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CIS-1,3-DICHLOROPROPENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ETHYLBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
METHYLENE CHLORIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLOROETHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOLUENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL XYLENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TRANS-1,3-DICHLOROPROPENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TRICHLOROETHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VINYL CHLORIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION							FA-01B
SAMPLE ID	TPGWFA010503-F	TPGWFA011208	FA-01B-GW-07	FA-01B-GW-08	FA-01B-GW-08-AVG	FA-01B-GW-08-D	FA-01B-GW-09
SAMPLE DATE	20030508	20081215	19961209	19970427	19970427	19970427	19970806
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	4	4	40	40	40	40	40
BOTTOM DEPTH	14	14	55	55	55	55	55
DISSOLVED METALS (UG/L)							
ALUMINUM	40.9 U	56 U	NA	NA	NA	NA	NA
ANTIMONY	6.7 U	4.6 U	NA	NA	NA	NA	NA
ARSENIC	9 U	5.3 U	NA	NA	NA	NA	NA
BARIUM	9.8	8.7 J	NA	NA	NA	NA	NA
BERYLLIUM	1.2 U	0.13 U	NA	NA	NA	NA	NA
CADMIUM	1.4 U	0.15 J	NA	NA	NA	NA	NA
CALCIUM	342000	236000	NA	NA	NA	NA	NA
CHROMIUM	2.9 U	1.1 U	NA	NA	NA	NA	NA
COBALT	4.5 U	1.7 J	NA	NA	NA	NA	NA
COPPER	18.6 U	5 U	NA	NA	NA	NA	NA
IRON	6.1 U	61 U	NA	NA	NA	NA	NA
LEAD	4.6 UJ	2.2 UJ	NA	NA	NA	NA	NA
MAGNESIUM	1000000	916000	NA	NA	NA	NA	NA
MANGANESE	0.75 U	0.96 U	NA	NA	NA	NA	NA
MERCURY	0.16 U	0.032 U	NA	NA	NA	NA	NA
NICKEL	3.7 J	4.8 J	NA	NA	NA	NA	NA
POTASSIUM	373000	282000	NA	NA	NA	NA	NA
SELENIUM	10.5 U	6.6 U	NA	NA	NA	NA	NA
SILICON	689 J	NA	NA	NA	NA	NA	NA
SILVER	2.9 U	1 U	NA	NA	NA	NA	NA
SODIUM	8320000	8150000	NA	NA	NA	NA	NA
THALLIUM	0.4 U	4.2 U	NA	NA	NA	NA	NA
VANADIUM	1.8 U	0.96 U	NA	NA	NA	NA	NA
ZINC	19.3	19.6	NA	NA	NA	NA	NA
FIELD (C)							
TEMPERATURE	NA	8.35	NA	NA	NA	NA	NA
FIELD (MG/L)							
DISSOLVED OXYGEN	NA	6.66	NA	NA	NA	NA	NA
FIELD (MS/CM)							
SPECIFIC CONDUCTANCE	NA	25.943	NA	NA	NA	NA	NA
FIELD (MV)							
OXIDATION REDUCTION POTENTIAL	NA	111.3	NA	NA	NA	NA	NA
FIELD (NTU)							
TURBIDITY	NA	0	NA	NA	NA	NA	NA
FIELD (PPT)							
SALINITY	NA	23.97	NA	NA	NA	NA	NA
FIELD (S.U.)							
PH	NA	7.44	NA	NA	NA	NA	NA

LOCATION							FA-01B
SAMPLE ID	TPGWFA010503-F	TPGWFA011208	FA-01B-GW-07	FA-01B-GW-08	FA-01B-GW-08-AVG	FA-01B-GW-08-D	FA-01B-GW-09
SAMPLE DATE	20030508	20081215	19961209	19970427	19970427	19970427	19970806
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	4	4	40	40	40	40	40
BOTTOM DEPTH	14	14	55	55	55	55	55
METALS (UG/L)							
ALUMINUM	NA	56 U	10 UJ	20 UJ	20 U	20 UJ	138 U
ANTIMONY	NA	4.6 U	2.1 U	3 U	3 U	3 U	6.4 U
ARSENIC	NA	5.3 U	2.1 U	3 U	3 U	3 U	5.3 UJ
BARIUM	NA	12.8 J	40.8	31.9 J	32.85	33.8 J	37.8 U
BERYLLIUM	NA	0.13 U	0.13 UJ	0.2 UJ	0.2 U	0.2 UJ	0.42 UJ
CADMIUM	NA	0.44 U	0.27 U	0.3 U	0.3 U	0.3 U	0.57 U
CALCIUM	NA	267000	162000	132000	136000	140000	160000
CHROMIUM	NA	1.1 U	0.83 U	1.2 J	0.825	0.9 UJ	1.6 U
COBALT	NA	1.2 UJ	0.79 U	1.1 U	1.15 U	1.2 U	1.5 U
COPPER	NA	5 U	4.6 U	5.2 U	5.55 U	5.9 U	2.2 UJ
IRON	NA	61 U	279 J	20 U	25 U	30 U	55.7 U
LEAD	NA	2.2 U	1.7 J	2 U	2 U	2 U	4.3 U
MAGNESIUM	NA	901000	259000	202000	207500	213000	256000
MANGANESE	NA	0.96 U	230	112 J	115	118 J	187
MERCURY	NA	0.032 UJ	0.01 J	0.01 UJ	0.01 U	0.01 UJ	0.01 UJ
NICKEL	NA	1.5 U	7.4 U	6.8 J	7	7.2 J	7.7 U
POTASSIUM	NA	269000	78400	68600	70250	71900	75500 J
SELENIUM	NA	19.8 J	3.1 U	4 U	4 U	4 U	8.7 UR
SILICON	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	0.59 UJ	1.7 U	5 U	5 U	5 U	2.5 U
SODIUM	NA	7510000	2070000	1890000	1940000	1990000	2160000
THALLIUM	NA	26.7 J	3.7 UJ	4 U	3.5	5 J	14.3 U
VANADIUM	NA	1.1 U	0.58 UJ	0.6 U	0.6 U	0.6 U	1.7 U
ZINC	NA	21.6 U	3.8 U	9.7 U	11.35 U	13 U	18.7 U
MISCELLANEOUS PARAMETERS (MG/L)							
ALKALINITY	NA	NA	200	180	185	190	160 J
BROMIDE	NA	NA	12	14	12.5	11	12 J
CARBONATE ALKALINITY	NA	NA	200	180	185	190	160
CHLORIDE	NA	NA	4100 J	3800	3800	3800	4200
NITRATE	NA	NA	0.096 J	0.1	0.096	0.092	0.093
SULFATE	NA	NA	560	590	595	600	540
TOTAL DISSOLVED SOLIDS	NA	NA	NA	NA	NA	NA	NA
TOTAL ORGANIC CARBON	NA	NA	1.1	1.3	1.25	1.2	1.3
TOTAL ORGANIC HALIDES	NA	NA	1.8 J	0.14 J	0.18	0.22 J	0.6 J
TOTAL SUSPENDED SOLIDS	NA	34	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (PPT)							
SALINITY	NA	NA	NA	NA	NA	NA	NA

LOCATION							FA-01B
SAMPLE ID	TPGWFA010503-F	TPGWFA011208	FA-01B-GW-07	FA-01B-GW-08	FA-01B-GW-08-AVG	FA-01B-GW-08-D	FA-01B-GW-09
SAMPLE DATE	20030508	20081215	19961209	19970427	19970427	19970427	19970806
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	4	4	40	40	40	40	40
BOTTOM DEPTH	14	14	55	55	55	55	55
MISCELLANEOUS PARAMETERS (S.U.)							
PH	NA	NA	7.7	7.6	7.55	7.5	7.6
MISCELLANEOUS PARAMETERS (UG/L)							
CYANIDE	NA	NA	10 U	20 UJ	20 U	20 UJ	20 U
PESTICIDES/PCBS (UG/L)							
4,4'-DDD	NA	NA	0.1 U	0.11 U	0.105 U	0.1 U	0.11 U
4,4'-DDE	NA	NA	0.1 U	0.11 U	0.105 U	0.1 U	0.11 U
4,4'-DDT	NA	NA	0.1 U	0.11 U	0.105 U	0.1 U	0.11 U
ALDRIN	NA	NA	0.052 U	0.056 U	0.0535 U	0.051 U	0.057 U
ALPHA-BHC	NA	NA	0.052 U	0.056 U	0.0535 U	0.051 U	0.057 U
ALPHA-CHLORDANE	NA	NA	0.052 U	0.056 U	0.0535 U	0.051 U	0.057 U
AROCLOR-1016	NA	NA	1 U	1.1 U	1.05 U	1 U	1.1 U
AROCLOR-1221	NA	NA	2.1 U	2.2 U	2.1 U	2 U	2.3 U
AROCLOR-1232	NA	NA	1 U	1.1 U	1.05 U	1 U	1.1 U
AROCLOR-1242	NA	NA	1 U	1.1 U	1.05 U	1 U	1.1 U
AROCLOR-1248	NA	NA	1 U	1.1 U	1.05 U	1 U	1.1 U
AROCLOR-1254	NA	NA	1 U	1.1 U	1.05 U	1 U	1.1 U
AROCLOR-1260	NA	NA	1 U	1.1 U	1.05 U	1 U	1.1 U
BETA-BHC	NA	NA	0.052 U	0.056 U	0.0535 U	0.051 U	0.057 U
DELTA-BHC	NA	NA	0.052 U	0.056 U	0.0535 U	0.051 U	0.057 U
DIELDRIN	NA	NA	0.1 U	0.11 U	0.105 U	0.1 U	0.11 U
ENDOSULFAN I	NA	NA	0.052 U	0.056 U	0.0535 U	0.051 U	0.057 U
ENDOSULFAN II	NA	NA	0.1 U	0.11 U	0.105 U	0.1 U	0.11 U
ENDOSULFAN SULFATE	NA	NA	0.1 U	0.11 U	0.105 U	0.1 U	0.11 U
ENDRIN	NA	NA	0.1 U	0.11 U	0.105 U	0.1 U	0.11 U
ENDRIN ALDEHYDE	NA	NA	0.1 U	0.11 U	0.105 U	0.1 U	0.11 U
ENDRIN KETONE	NA	NA	0.1 U	0.11 U	0.105 U	0.1 U	0.11 U
GAMMA-BHC (LINDANE)	NA	NA	0.052 U	0.056 U	0.0535 U	0.051 U	0.057 U
GAMMA-CHLORDANE	NA	NA	0.052 U	0.056 U	0.0535 U	0.051 U	0.057 U
HEPTACHLOR	NA	NA	0.052 U	0.056 U	0.0535 U	0.051 U	0.057 U
HEPTACHLOR EPOXIDE	NA	NA	0.052 U	0.056 U	0.0535 U	0.051 U	0.057 U
METHOXYCHLOR	NA	NA	0.52 U	0.56 UJ	0.535 U	0.51 UJ	0.57 U
TOTAL AROCLOR HALFND	NA	NA	4.05	4.4	4.2	4	4.45
TOTAL AROCLOR ZEROND	NA	NA	0 U	0 U	0 U	0 U	0 U
TOXAPHENE	NA	NA	5.2 U	5.6 U	5.35 U	5.1 U	5.7 U
PETROLEUM HYDROCARBONS (UG/L)							
DIESEL RANGE ORGANICS	NA	NA	55 U	78	89	100	50 U
GASOLINE RANGE ORGANICS	NA	NA	NA	NA	NA	NA	NA

LOCATION							FA-01B
SAMPLE ID	TPGWFA010503-F	TPGWFA011208	FA-01B-GW-07	FA-01B-GW-08	FA-01B-GW-08-AVG	FA-01B-GW-08-D	FA-01B-GW-09
SAMPLE DATE	20030508	20081215	19961209	19970427	19970427	19970427	19970806
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	4	4	40	40	40	40	40
BOTTOM DEPTH	14	14	55	55	55	55	55
POLYCYCLIC AROMATIC HYDROCARBONS (UG/L)							
2-METHYLNAPHTHALENE	NA	0.1 U	NA	NA	NA	NA	NA
ACENAPHTHENE	NA	0.1 U	NA	NA	NA	NA	NA
ACENAPHTHYLENE	NA	0.1 U	NA	NA	NA	NA	NA
ANTHRACENE	NA	0.1 U	NA	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	NA	0.1 U	NA	NA	NA	NA	NA
BAP EQUIVALENT-POS	NA	0 U	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	0.1 U	NA	NA	NA	NA	NA
BENZO(A)PYRENE	NA	0.1 U	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	0.1 U	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	NA	0.1 U	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	NA	0.1 U	NA	NA	NA	NA	NA
CHRYSENE	NA	0.1 U	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	NA	0.1 U	NA	NA	NA	NA	NA
DIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	NA	0.1 U	NA	NA	NA	NA	NA
FLUORENE	NA	0.1 U	NA	NA	NA	NA	NA
HIGH MOLECULAR WEIGHT PAHS	NA	0.3 U	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	0.1 U	NA	NA	NA	NA	NA
LOW MOLECULAR WEIGHT PAHS	NA	0.35	NA	NA	NA	NA	NA
NAPHTHALENE	NA	0.1 U	NA	NA	NA	NA	NA
PHENANTHRENE	NA	0.1 U	NA	NA	NA	NA	NA
PYRENE	NA	0.1 U	NA	NA	NA	NA	NA
SEMIVOLATILES (UG/L)							
1,2,4-TRICHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA
1,2-DICHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA
1,3-DICHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA
1,4-DICHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA
2,2'-OXYBIS(1-CHLOROPROPANE)	NA	NA	NA	NA	NA	NA	NA
2,4,5-TRICHLOROPHENOL	NA	NA	NA	NA	NA	NA	NA
2,4,6-TRICHLOROPHENOL	NA	NA	NA	NA	NA	NA	NA
2,4-DICHLOROPHENOL	NA	NA	NA	NA	NA	NA	NA
2,4-DIMETHYLPHENOL	NA	NA	NA	NA	NA	NA	NA
2,4-DINITROPHENOL	NA	NA	NA	NA	NA	NA	NA
2,4-DINITROTOLUENE	NA	NA	NA	NA	NA	NA	NA
2,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA	NA
2-CHLORONAPHTHALENE	NA	NA	NA	NA	NA	NA	NA
2-CHLOROPHENOL	NA	NA	NA	NA	NA	NA	NA

LOCATION							FA-01B
SAMPLE ID	TPGWFA010503-F	TPGWFA011208	FA-01B-GW-07	FA-01B-GW-08	FA-01B-GW-08-AVG	FA-01B-GW-08-D	FA-01B-GW-09
SAMPLE DATE	20030508	20081215	19961209	19970427	19970427	19970427	19970806
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	4	4	40	40	40	40	40
BOTTOM DEPTH	14	14	55	55	55	55	55
2-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA
2-METHYLPHENOL	NA	NA	NA	NA	NA	NA	NA
2-NITROANILINE	NA	NA	NA	NA	NA	NA	NA
2-NITROPHENOL	NA	NA	NA	NA	NA	NA	NA
3,3'-DICHLOROBENZIDINE	NA	NA	NA	NA	NA	NA	NA
3-NITROANILINE	NA	NA	NA	NA	NA	NA	NA
4,6-DINITRO-2-METHYLPHENOL	NA	NA	NA	NA	NA	NA	NA
4-BROMOPHENYL PHENYL ETHER	NA	NA	NA	NA	NA	NA	NA
4-CHLORO-3-METHYLPHENOL	NA	NA	NA	NA	NA	NA	NA
4-CHLOROANILINE	NA	NA	NA	NA	NA	NA	NA
4-CHLOROPHENYL PHENYL ETHER	NA	NA	NA	NA	NA	NA	NA
4-METHYLPHENOL	NA	NA	NA	NA	NA	NA	NA
4-NITROANILINE	NA	NA	NA	NA	NA	NA	NA
4-NITROPHENOL	NA	NA	NA	NA	NA	NA	NA
BIS(2-CHLOROETHOXY)METHANE	NA	NA	NA	NA	NA	NA	NA
BIS(2-CHLOROETHYL)ETHER	NA	NA	NA	NA	NA	NA	NA
BIS(2-ETHYLHEXYL)PHTHALATE	NA	NA	NA	NA	NA	NA	NA
BUTYL BENZYL PHTHALATE	NA	NA	NA	NA	NA	NA	NA
CARBAZOLE	NA	NA	NA	NA	NA	NA	NA
CHRYSENE	NA	NA	NA	NA	NA	NA	NA
DIETHYL PHTHALATE	NA	NA	NA	NA	NA	NA	NA
DIMETHYL PHTHALATE	NA	NA	NA	NA	NA	NA	NA
DI-N-BUTYL PHTHALATE	NA	NA	NA	NA	NA	NA	NA
DI-N-OCTYL PHTHALATE	NA	NA	NA	NA	NA	NA	NA
HEXACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA
HEXACHLOROBUTADIENE	NA	NA	NA	NA	NA	NA	NA
HEXACHLOROCYCLOPENTADIENE	NA	NA	NA	NA	NA	NA	NA
HEXACHLOROETHANE	NA	NA	NA	NA	NA	NA	NA
ISOPHORONE	NA	NA	NA	NA	NA	NA	NA
NITROBENZENE	NA	NA	NA	NA	NA	NA	NA
N-NITROSO-DI-N-PROPYLAMINE	NA	NA	NA	NA	NA	NA	NA
N-NITROSODIPHENYLAMINE	NA	NA	NA	NA	NA	NA	NA
PENTACHLOROPHENOL	NA	NA	NA	NA	NA	NA	NA
PHENOL	NA	NA	NA	NA	NA	NA	NA
VOLATILES (UG/L)							
1,1,1-TRICHLOROETHANE	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-TETRACHLOROETHANE	NA	NA	NA	NA	NA	NA	NA
1,1,2-TRICHLOROETHANE	NA	NA	NA	NA	NA	NA	NA
1,1,2-TRICHLOROTRIFLUOROETHANE	NA	NA	NA	NA	NA	NA	NA

LOCATION							FA-01B
SAMPLE ID	TPGWFA010503-F	TPGWFA011208	FA-01B-GW-07	FA-01B-GW-08	FA-01B-GW-08-AVG	FA-01B-GW-08-D	FA-01B-GW-09
SAMPLE DATE	20030508	20081215	19961209	19970427	19970427	19970427	19970806
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	4	4	40	40	40	40	40
BOTTOM DEPTH	14	14	55	55	55	55	55
1,1-DICHLOROETHANE	NA	NA	NA	NA	NA	NA	NA
1,1-DICHLOROETHENE	NA	NA	NA	NA	NA	NA	NA
1,2-DICHLOROETHANE	NA	NA	NA	NA	NA	NA	NA
1,2-DICHLOROPROPANE	NA	NA	NA	NA	NA	NA	NA
2-BUTANONE	NA	NA	NA	NA	NA	NA	NA
2-HEXANONE	NA	NA	NA	NA	NA	NA	NA
4-METHYL-2-PENTANONE	NA	NA	NA	NA	NA	NA	NA
ACETONE	NA	NA	NA	NA	NA	NA	NA
BENZENE	NA	NA	NA	NA	NA	NA	NA
BROMODICHLOROMETHANE	NA	NA	NA	NA	NA	NA	NA
BROMOFORM	NA	NA	NA	NA	NA	NA	NA
BROMOMETHANE	NA	NA	NA	NA	NA	NA	NA
CARBON DISULFIDE	NA	NA	NA	NA	NA	NA	NA
CARBON TETRACHLORIDE	NA	NA	NA	NA	NA	NA	NA
CHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA
CHLORODIBROMOMETHANE	NA	NA	NA	NA	NA	NA	NA
CHLOROETHANE	NA	NA	NA	NA	NA	NA	NA
CHLOROFORM	NA	NA	NA	NA	NA	NA	NA
CHLOROMETHANE	NA	NA	NA	NA	NA	NA	NA
CIS-1,3-DICHLOROPROPENE	NA	NA	NA	NA	NA	NA	NA
ETHYLBENZENE	NA	NA	NA	NA	NA	NA	NA
METHYLENE CHLORIDE	NA	NA	NA	NA	NA	NA	NA
STYRENE	NA	NA	NA	NA	NA	NA	NA
TETRACHLOROETHENE	NA	NA	NA	NA	NA	NA	NA
TOLUENE	NA	NA	NA	NA	NA	NA	NA
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA	NA	NA	NA	NA
TOTAL XYLENES	NA	NA	NA	NA	NA	NA	NA
TRANS-1,3-DICHLOROPROPENE	NA	NA	NA	NA	NA	NA	NA
TRICHLOROETHENE	NA	NA	NA	NA	NA	NA	NA
VINYL CHLORIDE	NA	NA	NA	NA	NA	NA	NA

LOCATION						
SAMPLE ID	**FA-01B-GW-10**	**TPGWFA01B0503**	**TPGWFA01B0503-F**	**TPGWFA01B1208**	**FA-01DB-GW-07**	**FA-01DB-GW-08**
SAMPLE DATE	**19971101**	**20030508**	**20030508**	**20081216**	**19961218**	**19970426**
SAMPLE CODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**40**	**40**	**40**	**40**	**137.5**	**137.5**
BOTTOM DEPTH	**55**	**55**	**55**	**55**	**157.5**	**157.5**
DISSOLVED METALS (UG/L)						
ALUMINUM	NA	NA	20.2 U	56 U	NA	NA
ANTIMONY	NA	NA	1.7 U	4.6 U	NA	NA
ARSENIC	NA	NA	1.8 U	5.3 U	NA	NA
BARIUM	NA	NA	31.5	34.8	NA	NA
BERYLLIUM	NA	NA	0.23 U	0.13 U	NA	NA
CADMIUM	NA	NA	0.28 U	0.16 J	NA	NA
CALCIUM	NA	NA	110000	138000	NA	NA
CHROMIUM	NA	NA	0.57 U	1.1 U	NA	NA
COBALT	NA	NA	0.82 U	1.4 J	NA	NA
COPPER	NA	NA	2.2 U	5 U	NA	NA
IRON	NA	NA	33.8 U	121 J	NA	NA
LEAD	NA	NA	0.91 UJ	2.2 U	NA	NA
MAGNESIUM	NA	NA	169000	204000	NA	NA
MANGANESE	NA	NA	77.2	56.9	NA	NA
MERCURY	NA	NA	0.1 U	0.032 U	NA	NA
NICKEL	NA	NA	7.1	15.8	NA	NA
POTASSIUM	NA	NA	63900	65600	NA	NA
SELENIUM	NA	NA	2.1 U	6.6 U	NA	NA
SILICON	NA	NA	5180	NA	NA	NA
SILVER	NA	NA	0.57 U	0.59 U	NA	NA
SODIUM	NA	NA	1730000	2060000	NA	NA
THALLIUM	NA	NA	0.2 U	4.2 U	NA	NA
VANADIUM	NA	NA	4.7 U	0.96 U	NA	NA
ZINC	NA	NA	5.3	7.8 J	NA	NA
FIELD (C)						
TEMPERATURE	NA	NA	NA	7.58	NA	NA
FIELD (MG/L)						
DISSOLVED OXYGEN	NA	NA	NA	1.27	NA	NA
FIELD (MS/CM)						
SPECIFIC CONDUCTANCE	NA	NA	NA	11.922	NA	NA
FIELD (MV)						
OXIDATION REDUCTION POTENTIAL	NA	NA	NA	-70.3	NA	NA
FIELD (NTU)						
TURBIDITY	NA	NA	NA	0.1	NA	NA
FIELD (PPT)						
SALINITY	NA	NA	NA	6.77	NA	NA
FIELD (S.U.)						
PH	NA	NA	NA	7.55	NA	NA

LOCATION						
SAMPLE ID	**FA-01B-GW-10**	**TPGWFA01B0503**	**TPGWFA01B0503-F**	**TPGWFA01B1208**	**FA-01DB-GW-07**	**FA-01DB-GW-08**
SAMPLE DATE	**19971101**	**20030508**	**20030508**	**20081216**	**19961218**	**19970426**
SAMPLE CODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**40**	**40**	**40**	**40**	**137.5**	**137.5**
BOTTOM DEPTH	**55**	**55**	**55**	**55**	**157.5**	**157.5**
METALS (UG/L)						
ALUMINUM	10 UJ	101 U	NA	56 U	31 UJ	20 UJ
ANTIMONY	2.5 UJ	1.3 U	NA	4.6 U	6.2 U	3 U
ARSENIC	2.5 U	2.6 J	NA	5.3 U	6.3 U	5 J
BARIUM	46.7	31	NA	41.1	73.9	75.1 J
BERYLLIUM	0.11 UJ	0.23 U	NA	0.13 U	0.39 U	0.2 UJ
CADMIUM	0.22 U	0.33 J	NA	0.38 U	0.82 U	0.3 U
CALCIUM	180000 J	108000	NA	145000	955000 J	1020000
CHROMIUM	0.68 UJ	0.86 U	NA	1.1 U	2.5 U	0.9 UJ
COBALT	0.8 UJ	1.1 U	NA	1.2 U	2.4 U	0.8 UJ
COPPER	2.7 U	3 U	NA	5 U	7.3 J	7.6 U
IRON	282	51 U	NA	111 U	3230 J	3250
LEAD	1.3 U	0.91 UJ	NA	2.2 U	3.9 U	2 U
MAGNESIUM	282000	163000	NA	217000	994000 J	1030000
MANGANESE	290	79.2	NA	58	2630	2760 J
MERCURY	0.09 U	0.03 U	NA	0.032 UJ	0.01 UJ	0.03 U
NICKEL	9.3 J	7.1	NA	13.9 U	2.6 U	1.1 J
POTASSIUM	81800	59300	NA	73400	179000	204000
SELENIUM	1.9 UJ	2.1 U	NA	13.5	9.4 U	4 U
SILICON	NA	4860	NA	NA	NA	NA
SILVER	1.4 J	0.57 U	NA	0.59 U	5.1 U	5 UJ
SODIUM	2270000	1700000	NA	2120000	5710000	6460000
THALLIUM	4.8 UJ	0.2 U	NA	4.2 U	11 UJ	4 U
VANADIUM	0.55 UJ	0.4 U	NA	0.96 U	1.7 U	0.6 UJ
ZINC	12.3 U	5	NA	8.5 U	2.1 UJ	15.4 J
MISCELLANEOUS PARAMETERS (MG/L)						
ALKALINITY	180	NA	NA	NA	110	110
BROMIDE	13	NA	NA	NA	43	47
CARBONATE ALKALINITY	180	NA	NA	NA	110	110
CHLORIDE	2500 J	NA	NA	NA	13000	13000
NITRATE	0.05 UJ	NA	NA	NA	0.05 U	0.05 U
SULFATE	500	NA	NA	NA	1800 J	1800
TOTAL DISSOLVED SOLIDS	NA	2300	NA	NA	NA	NA
TOTAL ORGANIC CARBON	4.7 J	NA	NA	NA	1.2	1
TOTAL ORGANIC HALIDES	NA	NA	NA	NA	3.1 U	0.16 J
TOTAL SUSPENDED SOLIDS	NA	4 UJ	NA	10	NA	NA
MISCELLANEOUS PARAMETERS (PPT)						
SALINITY	NA	NA	NA	NA	NA	NA

LOCATION						
SAMPLE ID	**FA-01B-GW-10**	**TPGWFA01B0503**	**TPGWFA01B0503-F**	**TPGWFA01B1208**	**FA-01DB-GW-07**	**FA-01DB-GW-08**
SAMPLE DATE	**19971101**	**20030508**	**20030508**	**20081216**	**19961218**	**19970426**
SAMPLE CODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**40**	**40**	**40**	**40**	**137.5**	**137.5**
BOTTOM DEPTH	**55**	**55**	**55**	**55**	**157.5**	**157.5**
MISCELLANEOUS PARAMETERS (S.U.)						
PH	7.9	NA	NA	NA	7.2	7.1
MISCELLANEOUS PARAMETERS (UG/L)						
CYANIDE	20 U	NA	NA	NA	10 U	20 UJ
PESTICIDES/PCBS (UG/L)						
4,4'-DDD	0.11 U	0.026 U	NA	NA	0.11 U	0.11 U
4,4'-DDE	0.11 U	0.026 U	NA	NA	0.11 U	0.11 U
4,4'-DDT	0.11 U	0.028 U	NA	NA	0.11 U	0.11 U
ALDRIN	0.053 U	0.02 U	NA	NA	0.056 U	0.056 U
ALPHA-BHC	0.053 U	0.023 U	NA	NA	0.056 U	0.056 U
ALPHA-CHLORDANE	0.053 U	0.018 U	NA	NA	0.056 U	0.056 U
AROCLOR-1016	1.1 U	0.11 U	NA	NA	1.1 U	1.1 U
AROCLOR-1221	2.1 U	0.28 U	NA	NA	2.2 U	2.2 U
AROCLOR-1232	1.1 U	0.3 U	NA	NA	1.1 U	1.1 U
AROCLOR-1242	1.1 U	0.23 U	NA	NA	1.1 U	1.1 U
AROCLOR-1248	1.1 U	0.12 U	NA	NA	1.1 U	1.1 U
AROCLOR-1254	1.1 U	0.15 U	NA	NA	1.1 U	1.1 U
AROCLOR-1260	1.1 U	0.11 UJ	NA	NA	1.1 U	1.1 U
BETA-BHC	0.053 U	0.039 U	NA	NA	0.056 U	0.056 U
DELTA-BHC	0.053 U	0.027 UJ	NA	NA	0.056 U	0.056 U
DIELDRIN	0.11 U	0.016 U	NA	NA	0.11 U	0.11 U
ENDOSULFAN I	0.053 U	0.017 U	NA	NA	0.056 U	0.056 U
ENDOSULFAN II	0.11 U	0.015 U	NA	NA	0.11 U	0.11 U
ENDOSULFAN SULFATE	0.11 U	0.021 UJ	NA	NA	0.11 U	0.11 U
ENDRIN	0.11 U	0.017 U	NA	NA	0.11 U	0.11 U
ENDRIN ALDEHYDE	0.11 U	0.02 U	NA	NA	0.11 U	0.11 U
ENDRIN KETONE	0.11 U	0.019 U	NA	NA	0.11 U	0.11 U
GAMMA-BHC (LINDANE)	0.053 U	0.02 U	NA	NA	0.056 U	0.056 U
GAMMA-CHLORDANE	0.053 U	0.018 U	NA	NA	0.056 U	0.056 U
HEPTACHLOR	0.053 U	0.022 U	NA	NA	0.056 U	0.056 U
HEPTACHLOR EPOXIDE	0.053 U	0.021 U	NA	NA	0.056 U	0.056 U
METHOXYCHLOR	0.53 U	0.042 U	NA	NA	0.56 U	0.56 U
TOTAL AROCLOR HALFND	4.35	0.65	NA	NA	4.4	4.4
TOTAL AROCLOR ZEROND	0 U	0 U	NA	NA	0 U	0 U
TOXAPHENE	5.3 U	0.86 U	NA	NA	5.6 U	5.6 U
PETROLEUM HYDROCARBONS (UG/L)						
DIESEL RANGE ORGANICS	70	NA	NA	NA	210 U	90
GASOLINE RANGE ORGANICS	NA	NA	NA	NA	NA	NA

LOCATION						
SAMPLE ID	**FA-01B-GW-10**	**TPGWFA01B0503**	**TPGWFA01B0503-F**	**TPGWFA01B1208**	**FA-01DB-GW-07**	**FA-01DB-GW-08**
SAMPLE DATE	**19971101**	**20030508**	**20030508**	**20081216**	**19961218**	**19970426**
SAMPLE CODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**40**	**40**	**40**	**40**	**137.5**	**137.5**
BOTTOM DEPTH	**55**	**55**	**55**	**55**	**157.5**	**157.5**
POLYCYCLIC AROMATIC HYDROCARBONS (UG/L)						
2-METHYLNAPHTHALENE	NA	NA	NA	0.1 U	NA	NA
ACENAPHTHENE	NA	0.08 U	NA	0.1 U	NA	NA
ACENAPHTHYLENE	NA	0.05 U	NA	0.1 U	NA	NA
ANTHRACENE	NA	0.08 U	NA	0.1 U	NA	NA
BAP EQUIVALENT-HALFND	NA	0.08 U	NA	0.1 U	NA	NA
BAP EQUIVALENT-POS	NA	0 U	NA	0 U	NA	NA
BENZO(A)ANTHRACENE	NA	0.1 U	NA	0.1 U	NA	NA
BENZO(A)PYRENE	NA	0.08 U	NA	0.1 U	NA	NA
BENZO(B)FLUORANTHENE	NA	0.08 U	NA	0.1 U	NA	NA
BENZO(G,H,I)PERYLENE	NA	0.08 U	NA	0.1 U	NA	NA
BENZO(K)FLUORANTHENE	NA	0.08 U	NA	0.1 U	NA	NA
CHRYSENE	NA	NA	NA	0.1 U	NA	NA
DIBENZO(A,H)ANTHRACENE	NA	0.1 U	NA	0.1 U	NA	NA
DIBENZOFURAN	NA	1 U	NA	NA	NA	NA
FLUORANTHENE	NA	0.1 U	NA	0.1 U	NA	NA
FLUORENE	NA	0.06 U	NA	0.1 U	NA	NA
HIGH MOLECULAR WEIGHT PAHS	NA	0.27	NA	0.3 U	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	0.1 U	NA	0.1 U	NA	NA
LOW MOLECULAR WEIGHT PAHS	NA	0.24	NA	0.35	NA	NA
NAPHTHALENE	NA	0.05 U	NA	0.1 U	NA	NA
PHENANTHRENE	NA	0.08 U	NA	0.1 U	NA	NA
PYRENE	NA	0.08 U	NA	0.1 U	NA	NA
SEMIVOLATILES (UG/L)						
1,2,4-TRICHLOROBENZENE	NA	0.9 U	NA	NA	NA	NA
1,2-DICHLOROBENZENE	NA	0.7 U	NA	NA	NA	NA
1,3-DICHLOROBENZENE	NA	0.6 U	NA	NA	NA	NA
1,4-DICHLOROBENZENE	NA	0.8 U	NA	NA	NA	NA
2,2'-OXYBIS(1-CHLOROPROPANE)	NA	1 UJ	NA	NA	NA	NA
2,4,5-TRICHLOROPHENOL	NA	2 U	NA	NA	NA	NA
2,4,6-TRICHLOROPHENOL	NA	2 U	NA	NA	NA	NA
2,4-DICHLOROPHENOL	NA	2 U	NA	NA	NA	NA
2,4-DIMETHYLPHENOL	NA	2 U	NA	NA	NA	NA
2,4-DINITROPHENOL	NA	5 UJ	NA	NA	NA	NA
2,4-DINITROTOLUENE	NA	0.7 UJ	NA	NA	NA	NA
2,6-DINITROTOLUENE	NA	2 U	NA	NA	NA	NA
2-CHLORONAPHTHALENE	NA	3 U	NA	NA	NA	NA
2-CHLOROPHENOL	NA	2 U	NA	NA	NA	NA

LOCATION						
SAMPLE ID	**FA-01B-GW-10**	**TPGWFA01B0503**	**TPGWFA01B0503-F**	**TPGWFA01B1208**	**FA-01DB-GW-07**	**FA-01DB-GW-08**
SAMPLE DATE	**19971101**	**20030508**	**20030508**	**20081216**	**19961218**	**19970426**
SAMPLE CODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**40**	**40**	**40**	**40**	**137.5**	**137.5**
BOTTOM DEPTH	**55**	**55**	**55**	**55**	**157.5**	**157.5**
2-METHYLNAPHTHALENE	NA	0.08 U	NA	NA	NA	NA
2-METHYLPHENOL	NA	1 U	NA	NA	NA	NA
2-NITROANILINE	NA	0.8 U	NA	NA	NA	NA
2-NITROPHENOL	NA	2 U	NA	NA	NA	NA
3,3'-DICHLOROBENZIDINE	NA	2 UJ	NA	NA	NA	NA
3-NITROANILINE	NA	2 U	NA	NA	NA	NA
4,6-DINITRO-2-METHYLPHENOL	NA	7 U	NA	NA	NA	NA
4-BROMOPHENYL PHENYL ETHER	NA	1 U	NA	NA	NA	NA
4-CHLORO-3-METHYLPHENOL	NA	1 U	NA	NA	NA	NA
4-CHLOROANILINE	NA	1 U	NA	NA	NA	NA
4-CHLOROPHENYL PHENYL ETHER	NA	1 U	NA	NA	NA	NA
4-METHYLPHENOL	NA	2 U	NA	NA	NA	NA
4-NITROANILINE	NA	2 UJ	NA	NA	NA	NA
4-NITROPHENOL	NA	3 U	NA	NA	NA	NA
BIS(2-CHLOROETHOXY)METHANE	NA	0.8 U	NA	NA	NA	NA
BIS(2-CHLOROETHYL)ETHER	NA	1 U	NA	NA	NA	NA
BIS(2-ETHYLHEXYL)PHTHALATE	NA	9 U	NA	NA	NA	NA
BUTYL BENZYL PHTHALATE	NA	0.7 U	NA	NA	NA	NA
CARBAZOLE	NA	0.8 U	NA	NA	NA	NA
CHRYSENE	NA	0.07 U	NA	NA	NA	NA
DIETHYL PHTHALATE	NA	0.6 U	NA	NA	NA	NA
DIMETHYL PHTHALATE	NA	0.7 U	NA	NA	NA	NA
DI-N-BUTYL PHTHALATE	NA	2 U	NA	NA	NA	NA
DI-N-OCTYL PHTHALATE	NA	1 U	NA	NA	NA	NA
HEXACHLOROBENZENE	NA	0.7 U	NA	NA	NA	NA
HEXACHLOROBUTADIENE	NA	2 U	NA	NA	NA	NA
HEXACHLOROCYCLOPENTADIENE	NA	1 U	NA	NA	NA	NA
HEXACHLOROETHANE	NA	2 U	NA	NA	NA	NA
ISOPHORONE	NA	0.8 U	NA	NA	NA	NA
NITROBENZENE	NA	1 U	NA	NA	NA	NA
N-NITROSO-DI-N-PROPYLAMINE	NA	2 U	NA	NA	NA	NA
N-NITROSODIPHENYLAMINE	NA	2 U	NA	NA	NA	NA
PENTACHLOROPHENOL	NA	5 U	NA	NA	NA	NA
PHENOL	NA	2 U	NA	NA	NA	NA
VOLATILES (UG/L)						
1,1,1-TRICHLOROETHANE	NA	NA	NA	NA	NA	NA
1,1,2,2-TETRACHLOROETHANE	NA	NA	NA	NA	NA	NA
1,1,2-TRICHLOROETHANE	NA	NA	NA	NA	NA	NA
1,1,2-TRICHLOROTRIFLUOROETHANE	NA	NA	NA	NA	NA	NA

LOCATION						
SAMPLE ID	**FA-01B-GW-10**	**TPGWFA01B0503**	**TPGWFA01B0503-F**	**TPGWFA01B1208**	**FA-01DB-GW-07**	**FA-01DB-GW-08**
SAMPLE DATE	**19971101**	**20030508**	**20030508**	**20081216**	**19961218**	**19970426**
SAMPLE CODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**40**	**40**	**40**	**40**	**137.5**	**137.5**
BOTTOM DEPTH	**55**	**55**	**55**	**55**	**157.5**	**157.5**
1,1-DICHLOROETHANE	NA	NA	NA	NA	NA	NA
1,1-DICHLOROETHENE	NA	NA	NA	NA	NA	NA
1,2-DICHLOROETHANE	NA	NA	NA	NA	NA	NA
1,2-DICHLOROPROPANE	NA	NA	NA	NA	NA	NA
2-BUTANONE	NA	NA	NA	NA	NA	NA
2-HEXANONE	NA	NA	NA	NA	NA	NA
4-METHYL-2-PENTANONE	NA	NA	NA	NA	NA	NA
ACETONE	NA	NA	NA	NA	NA	NA
BENZENE	NA	NA	NA	NA	NA	NA
BROMODICHLOROMETHANE	NA	NA	NA	NA	NA	NA
BROMOFORM	NA	NA	NA	NA	NA	NA
BROMOMETHANE	NA	NA	NA	NA	NA	NA
CARBON DISULFIDE	NA	NA	NA	NA	NA	NA
CARBON TETRACHLORIDE	NA	NA	NA	NA	NA	NA
CHLOROBENZENE	NA	NA	NA	NA	NA	NA
CHLORODIBROMOMETHANE	NA	NA	NA	NA	NA	NA
CHLOROETHANE	NA	NA	NA	NA	NA	NA
CHLOROFORM	NA	NA	NA	NA	NA	NA
CHLOROMETHANE	NA	NA	NA	NA	NA	NA
CIS-1,3-DICHLOROPROPENE	NA	NA	NA	NA	NA	NA
ETHYLBENZENE	NA	NA	NA	NA	NA	NA
METHYLENE CHLORIDE	NA	NA	NA	NA	NA	NA
STYRENE	NA	NA	NA	NA	NA	NA
TETRACHLOROETHENE	NA	NA	NA	NA	NA	NA
TOLUENE	NA	NA	NA	NA	NA	NA
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA	NA	NA	NA
TOTAL XYLENES	NA	NA	NA	NA	NA	NA
TRANS-1,3-DICHLOROPROPENE	NA	NA	NA	NA	NA	NA
TRICHLOROETHENE	NA	NA	NA	NA	NA	NA
VINYL CHLORIDE	NA	NA	NA	NA	NA	NA

LOCATION	FA-01DB				TP-MW01		
SAMPLE ID	FA-01DB-GW-09	FA-01DB-GW-10	FA-01DB-GW-10-AVG	FA-01DB-GW-10-D	TPGWMW010503	TPGWMW010503-F	TPGWMW011208
SAMPLE DATE	19970807	19971118	19971118	19971118	20030507	20030507	20081216
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	137.5	137.5	137.5	137.5	6.5	6.5	6.5
BOTTOM DEPTH	157.5	157.5	157.5	157.5	16.5	16.5	16.5
DISSOLVED METALS (UG/L)							
ALUMINUM	NA	NA	NA	NA	NA	101 U	56 U
ANTIMONY	NA	NA	NA	NA	NA	1.3 U	4.6 U
ARSENIC	NA	NA	NA	NA	NA	1.8 U	5.3 U
BARIUM	NA	NA	NA	NA	NA	64.7	92.3 J
BERYLLIUM	NA	NA	NA	NA	NA	0.53 U	0.13 U
CADMIUM	NA	NA	NA	NA	NA	0.28 U	0.14 U
CALCIUM	NA	NA	NA	NA	NA	186000	122000
CHROMIUM	NA	NA	NA	NA	NA	1.2 U	1.1 U
COBALT	NA	NA	NA	NA	NA	0.81 U	1.2 J
COPPER	NA	NA	NA	NA	NA	16.1	6.1 U
IRON	NA	NA	NA	NA	NA	30.3 U	61 U
LEAD	NA	NA	NA	NA	NA	1.1 J	2.2 U
MAGNESIUM	NA	NA	NA	NA	NA	26700	20000
MANGANESE	NA	NA	NA	NA	NA	127	53.8
MERCURY	NA	NA	NA	NA	NA	0.05 U	0.032 U
NICKEL	NA	NA	NA	NA	NA	3.8	3.9
POTASSIUM	NA	NA	NA	NA	NA	10400	7030
SELENIUM	NA	NA	NA	NA	NA	2.1 U	17
SILICON	NA	NA	NA	NA	NA	6060	NA
SILVER	NA	NA	NA	NA	NA	0.57 U	3 U
SODIUM	NA	NA	NA	NA	NA	327000	425000
THALLIUM	NA	NA	NA	NA	NA	0.1 U	4.2 UJ
VANADIUM	NA	NA	NA	NA	NA	0.52 U	0.96 U
ZINC	NA	NA	NA	NA	NA	101	18 U
FIELD (C)							
TEMPERATURE	NA	NA	NA	NA	NA	NA	9.25
FIELD (MG/L)							
DISSOLVED OXYGEN	NA	NA	NA	NA	NA	NA	2.34
FIELD (MS/CM)							
SPECIFIC CONDUCTANCE	NA	NA	NA	NA	NA	NA	2.688
FIELD (MV)							
OXIDATION REDUCTION POTENTIAL	NA	NA	NA	NA	NA	NA	73.6
FIELD (NTU)							
TURBIDITY	NA	NA	NA	NA	NA	NA	9.8
FIELD (PPT)							
SALINITY	NA	NA	NA	NA	NA	NA	1.4
FIELD (S.U.)							
PH	NA	NA	NA	NA	NA	NA	6.11

LOCATION	FA-01DB				TP-MW01		
SAMPLE ID	FA-01DB-GW-09	FA-01DB-GW-10	FA-01DB-GW-10-AVG	FA-01DB-GW-10-D	TPGWMW010503	TPGWMW010503-F	TPGWMW011208
SAMPLE DATE	19970807	19971118	19971118	19971118	20030507	20030507	20081216
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	137.5	137.5	137.5	137.5	6.5	6.5	6.5
BOTTOM DEPTH	157.5	157.5	157.5	157.5	16.5	16.5	16.5
METALS (UG/L)							
ALUMINUM	294 U	115 U	88.85 U	62.7 UJ	101 U	NA	56 U
ANTIMONY	10.6 U	24.8 U	24.8 U	24.8 U	1.3 U	NA	4.6 U
ARSENIC	8.8 U	25.4 U	25.4 U	25.4 U	1.8 U	NA	5.3 U
BARIUM	80.9 J	49.4	48.5	47.6	66.4	NA	92.3 J
BERYLLIUM	0.7 UJ	1.1 UJ	1.1 U	1.1 UJ	0.37 U	NA	0.13 U
CADMIUM	0.95 U	2.2 U	2.2 U	2.2 U	0.28 U	NA	0.14 U
CALCIUM	1080000	191000 J	190000	189000 J	178000	NA	122000
CHROMIUM	2.7 U	6.8 U	6.8 U	6.8 U	0.87 U	NA	1.1 U
COBALT	2.6 U	8 U	8 U	8 U	0.7 U	NA	1.2 U
COPPER	9 J	7.4 U	7.4 U	7.4 U	10.8 U	NA	7.8 J
IRON	3320	176 U	153 U	130 UJ	30.3 U	NA	402
LEAD	7.1 U	12.8 U	12.8 U	12.8 U	0.91 UJ	NA	2.2 U
MAGNESIUM	1090000	304000	302000	300000	25700	NA	20000
MANGANESE	2820	233	225.5	218	184	NA	97.9
MERCURY	0.01 J	0.01 UJ	0.01 U	0.01 UJ	0.05 U	NA	0.016 UJ
NICKEL	3.6 U	11.3 U	10.35 U	9.4 U	4	NA	4.2
POTASSIUM	204000	72500	69250	66000	10700	NA	7050
SELENIUM	14.5 U	18.8 UR	18.8 R	18.8 UR	2.1 U	NA	6.6 U
SILICON	NA	NA	NA	NA	6140	NA	NA
SILVER	7 U	10.7 U	10.7 U	10.7 U	0.57 U	NA	0.59 U
SODIUM	6750000	2240000	2240000	2240000	332000	NA	412000
THALLIUM	19.6 UJ	48.4 UJ	48.4 U	48.4 UJ	0.1 U	NA	4.2 UJ
VANADIUM	2.9 U	5.5 U	5.5 U	5.5 U	0.42 U	NA	0.96 U
ZINC	12.5 U	9.9 U	6.6 U	3.3 UJ	87.6	NA	19.5
MISCELLANEOUS PARAMETERS (MG/L)							
ALKALINITY	100 J	180	175	170	NA	NA	NA
BROMIDE	54 J	11	11.5	12	NA	NA	NA
CARBONATE ALKALINITY	100	180	175	170	NA	NA	NA
CHLORIDE	15000 J	4100	4250	4400	NA	NA	NA
NITRATE	0.1 U	0.054 J	0.0395	0.05 UJ	NA	NA	NA
SULFATE	1800	540	485	430	NA	NA	NA
TOTAL DISSOLVED SOLIDS	NA	NA	NA	NA	1700	NA	NA
TOTAL ORGANIC CARBON	1.7	1.4	1.55	1.7	NA	NA	NA
TOTAL ORGANIC HALIDES	0.62 J	NA	NA	NA	NA	NA	NA
TOTAL SUSPENDED SOLIDS	NA	NA	NA	NA	4 UJ	NA	10 U
MISCELLANEOUS PARAMETERS (PPT)							
SALINITY	NA	NA	NA	NA	NA	NA	NA

LOCATION	FA-01DB				TP-MW01		
SAMPLE ID	FA-01DB-GW-09	FA-01DB-GW-10	FA-01DB-GW-10-AVG	FA-01DB-GW-10-D	TPGWMW010503	TPGWMW010503-F	TPGWMW011208
SAMPLE DATE	19970807	19971118	19971118	19971118	20030507	20030507	20081216
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	137.5	137.5	137.5	137.5	6.5	6.5	6.5
BOTTOM DEPTH	157.5	157.5	157.5	157.5	16.5	16.5	16.5
MISCELLANEOUS PARAMETERS (S.U.)							
PH	7.2	7.6	7.6	7.6	NA	NA	NA
MISCELLANEOUS PARAMETERS (UG/L)							
CYANIDE	20 U	20 U	20 U	20 U	NA	NA	NA
PESTICIDES/PCBS (UG/L)							
4,4'-DDD	0.11 U	0.11 U	0.11 U	0.11 U	0.026 U	NA	NA
4,4'-DDE	0.11 U	0.11 U	0.11 U	0.11 U	0.026 U	NA	NA
4,4'-DDT	0.11 U	0.11 U	0.11 U	0.11 U	0.028 U	NA	NA
ALDRIN	0.053 U	0.054 U	0.0535 U	0.053 U	0.021 U	NA	NA
ALPHA-BHC	0.053 U	0.054 U	0.0535 U	0.053 U	0.024 U	NA	NA
ALPHA-CHLORDANE	0.053 U	0.054 U	0.0535 U	0.053 U	0.018 U	NA	NA
AROCLOR-1016	1.1 U	1.1 U	1.1 U	1.1 U	0.11 U	NA	NA
AROCLOR-1221	2.1 U	2.2 U	2.15 U	2.1 U	0.28 U	NA	NA
AROCLOR-1232	1.1 U	1.1 U	1.1 U	1.1 U	0.3 U	NA	NA
AROCLOR-1242	1.1 U	1.1 U	1.1 U	1.1 U	0.24 U	NA	NA
AROCLOR-1248	1.1 U	1.1 U	1.1 U	1.1 U	0.12 U	NA	NA
AROCLOR-1254	1.1 U	1.1 U	1.1 U	1.1 U	0.15 U	NA	NA
AROCLOR-1260	1.1 U	1.1 U	1.1 U	1.1 U	0.11 UJ	NA	NA
BETA-BHC	0.053 U	0.054 U	0.0535 U	0.053 U	0.04 U	NA	NA
DELTA-BHC	0.053 U	0.054 U	0.0535 U	0.053 U	0.027 U	NA	NA
DIELDRIN	0.11 U	0.11 U	0.11 U	0.11 U	0.016 U	NA	NA
ENDOSULFAN I	0.053 U	0.054 U	0.0535 U	0.053 U	0.017 U	NA	NA
ENDOSULFAN II	0.11 U	0.11 U	0.11 U	0.11 U	0.015 U	NA	NA
ENDOSULFAN SULFATE	0.11 U	0.11 U	0.11 U	0.11 U	0.022 U	NA	NA
ENDRIN	0.11 U	0.11 U	0.11 U	0.11 U	0.017 U	NA	NA
ENDRIN ALDEHYDE	0.11 U	0.11 U	0.11 U	0.11 U	0.02 U	NA	NA
ENDRIN KETONE	0.11 U	0.11 U	0.11 U	0.11 U	0.019 U	NA	NA
GAMMA-BHC (LINDANE)	0.053 U	0.054 U	0.0535 U	0.053 U	0.021 U	NA	NA
GAMMA-CHLORDANE	0.053 U	0.054 U	0.0535 U	0.053 U	0.018 U	NA	NA
HEPTACHLOR	0.053 U	0.054 U	0.0535 U	0.053 U	0.023 U	NA	NA
HEPTACHLOR EPOXIDE	0.053 U	0.054 U	0.0535 U	0.053 U	0.022 U	NA	NA
METHOXYCHLOR	0.53 U	0.54 U	0.535 U	0.53 U	0.042 U	NA	NA
TOTAL AROCLOR HALFND	4.35	4.4	4.375	4.35	0.66	NA	NA
TOTAL AROCLOR ZEROND	0 U	0 U	0 U	0 U	0 U	NA	NA
TOXAPHENE	5.3 U	5.4 U	5.35 U	5.3 U	0.88 U	NA	NA
PETROLEUM HYDROCARBONS (UG/L)							
DIESEL RANGE ORGANICS	110	100 U	92 U	84 U	NA	NA	NA
GASOLINE RANGE ORGANICS	NA	NA	NA	NA	NA	NA	NA

LOCATION	FA-01DB				TP-MW01		
SAMPLE ID	FA-01DB-GW-09	FA-01DB-GW-10	FA-01DB-GW-10-AVG	FA-01DB-GW-10-D	TPGWMW010503	TPGWMW010503-F	TPGWMW011208
SAMPLE DATE	19970807	19971118	19971118	19971118	20030507	20030507	20081216
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	137.5	137.5	137.5	137.5	6.5	6.5	6.5
BOTTOM DEPTH	157.5	157.5	157.5	157.5	16.5	16.5	16.5
POLYCYCLIC AROMATIC HYDROCARBONS (UG/L)							
2-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	0.1 U
ACENAPHTHENE	NA	NA	NA	NA	0.08 U	NA	0.1 U
ACENAPHTHYLENE	NA	NA	NA	NA	0.05 U	NA	0.1 U
ANTHRACENE	NA	NA	NA	NA	0.08 U	NA	0.1 U
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	0.09 U	NA	0.1 U
BAP EQUIVALENT-POS	NA	NA	NA	NA	0 U	NA	0 U
BENZO(A)ANTHRACENE	NA	NA	NA	NA	0.1 U	NA	0.1 U
BENZO(A)PYRENE	NA	NA	NA	NA	0.09 U	NA	0.1 U
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	0.09 U	NA	0.1 U
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	0.08 U	NA	0.1 U
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	0.08 U	NA	0.1 U
CHRYSENE	NA	NA	NA	NA	NA	NA	0.1 U
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	0.1 U	NA	0.1 U
DIBENZOFURAN	NA	NA	NA	NA	1 U	NA	NA
FLUORANTHENE	NA	NA	NA	NA	0.1 U	NA	0.1 U
FLUORENE	NA	NA	NA	NA	0.06 U	NA	0.1 U
HIGH MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	0.28	NA	0.3 U
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	0.1 U	NA	0.1 U
LOW MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	0.24	NA	0.35
NAPHTHALENE	NA	NA	NA	NA	0.05 U	NA	0.1 U
PHENANTHRENE	NA	NA	NA	NA	0.08 U	NA	0.1 U
PYRENE	NA	NA	NA	NA	0.09 U	NA	0.1 U
SEMIVOLATILES (UG/L)							
1,2,4-TRICHLOROBENZENE	NA	NA	NA	NA	0.9 U	NA	NA
1,2-DICHLOROBENZENE	NA	NA	NA	NA	0.7 U	NA	NA
1,3-DICHLOROBENZENE	NA	NA	NA	NA	0.6 U	NA	NA
1,4-DICHLOROBENZENE	NA	NA	NA	NA	0.8 U	NA	NA
2,2'-OXYBIS(1-CHLOROPROPANE)	NA	NA	NA	NA	1 U	NA	NA
2,4,5-TRICHLOROPHENOL	NA	NA	NA	NA	2 U	NA	NA
2,4,6-TRICHLOROPHENOL	NA	NA	NA	NA	2 U	NA	NA
2,4-DICHLOROPHENOL	NA	NA	NA	NA	2 U	NA	NA
2,4-DIMETHYLPHENOL	NA	NA	NA	NA	2 U	NA	NA
2,4-DINITROPHENOL	NA	NA	NA	NA	5 UJ	NA	NA
2,4-DINITROTOLUENE	NA	NA	NA	NA	0.7 U	NA	NA
2,6-DINITROTOLUENE	NA	NA	NA	NA	2 U	NA	NA
2-CHLORONAPHTHALENE	NA	NA	NA	NA	3 U	NA	NA
2-CHLOROPHENOL	NA	NA	NA	NA	2 U	NA	NA

LOCATION	FA-01DB				TP-MW01		
SAMPLE ID	FA-01DB-GW-09	FA-01DB-GW-10	FA-01DB-GW-10-AVG	FA-01DB-GW-10-D	TPGWMW010503	TPGWMW010503-F	TPGWMW011208
SAMPLE DATE	19970807	19971118	19971118	19971118	20030507	20030507	20081216
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	137.5	137.5	137.5	137.5	6.5	6.5	6.5
BOTTOM DEPTH	157.5	157.5	157.5	157.5	16.5	16.5	16.5
2-METHYLNAPHTHALENE	NA	NA	NA	NA	0.08 U	NA	NA
2-METHYLPHENOL	NA	NA	NA	NA	1 U	NA	NA
2-NITROANILINE	NA	NA	NA	NA	0.8 U	NA	NA
2-NITROPHENOL	NA	NA	NA	NA	2 U	NA	NA
3,3'-DICHLOROBENZIDINE	NA	NA	NA	NA	2 U	NA	NA
3-NITROANILINE	NA	NA	NA	NA	2 U	NA	NA
4,6-DINITRO-2-METHYLPHENOL	NA	NA	NA	NA	7 UJ	NA	NA
4-BROMOPHENYL PHENYL ETHER	NA	NA	NA	NA	1 U	NA	NA
4-CHLORO-3-METHYLPHENOL	NA	NA	NA	NA	1 U	NA	NA
4-CHLOROANILINE	NA	NA	NA	NA	1 U	NA	NA
4-CHLOROPHENYL PHENYL ETHER	NA	NA	NA	NA	1 U	NA	NA
4-METHYLPHENOL	NA	NA	NA	NA	2 U	NA	NA
4-NITROANILINE	NA	NA	NA	NA	2 U	NA	NA
4-NITROPHENOL	NA	NA	NA	NA	3 U	NA	NA
BIS(2-CHLOROETHOXY)METHANE	NA	NA	NA	NA	0.8 U	NA	NA
BIS(2-CHLOROETHYL)ETHER	NA	NA	NA	NA	1 U	NA	NA
BIS(2-ETHYLHEXYL)PHTHALATE	NA	NA	NA	NA	9 U	NA	NA
BUTYL BENZYL PHTHALATE	NA	NA	NA	NA	0.8 U	NA	NA
CARBAZOLE	NA	NA	NA	NA	0.8 U	NA	NA
CHRYSENE	NA	NA	NA	NA	0.07 U	NA	NA
DIETHYL PHTHALATE	NA	NA	NA	NA	0.6 U	NA	NA
DIMETHYL PHTHALATE	NA	NA	NA	NA	0.8 U	NA	NA
DI-N-BUTYL PHTHALATE	NA	NA	NA	NA	2 U	NA	NA
DI-N-OCTYL PHTHALATE	NA	NA	NA	NA	1 U	NA	NA
HEXACHLOROBENZENE	NA	NA	NA	NA	0.7 U	NA	NA
HEXACHLOROBUTADIENE	NA	NA	NA	NA	2 U	NA	NA
HEXACHLOROCYCLOPENTADIENE	NA	NA	NA	NA	1 U	NA	NA
HEXACHLOROETHANE	NA	NA	NA	NA	2 U	NA	NA
ISOPHORONE	NA	NA	NA	NA	0.8 U	NA	NA
NITROBENZENE	NA	NA	NA	NA	1 U	NA	NA
N-NITROSO-DI-N-PROPYLAMINE	NA	NA	NA	NA	2 U	NA	NA
N-NITROSODIPHENYLAMINE	NA	NA	NA	NA	2 U	NA	NA
PENTACHLOROPHENOL	NA	NA	NA	NA	5 U	NA	NA
PHENOL	NA	NA	NA	NA	2 U	NA	NA
VOLATILES (UG/L)							
1,1,1-TRICHLOROETHANE	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-TETRACHLOROETHANE	NA	NA	NA	NA	NA	NA	NA
1,1,2-TRICHLOROETHANE	NA	NA	NA	NA	NA	NA	NA
1,1,2-TRICHLOROTRIFLUOROETHANE	NA	NA	NA	NA	NA	NA	NA

LOCATION	FA-01DB				TP-MW01		
SAMPLE ID	FA-01DB-GW-09	FA-01DB-GW-10	FA-01DB-GW-10-AVG	FA-01DB-GW-10-D	TPGWMW010503	TPGWMW010503-F	TPGWMW011208
SAMPLE DATE	19970807	19971118	19971118	19971118	20030507	20030507	20081216
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	137.5	137.5	137.5	137.5	6.5	6.5	6.5
BOTTOM DEPTH	157.5	157.5	157.5	157.5	16.5	16.5	16.5
1,1-DICHLOROETHANE	NA	NA	NA	NA	NA	NA	NA
1,1-DICHLOROETHENE	NA	NA	NA	NA	NA	NA	NA
1,2-DICHLOROETHANE	NA	NA	NA	NA	NA	NA	NA
1,2-DICHLOROPROPANE	NA	NA	NA	NA	NA	NA	NA
2-BUTANONE	NA	NA	NA	NA	NA	NA	NA
2-HEXANONE	NA	NA	NA	NA	NA	NA	NA
4-METHYL-2-PENTANONE	NA	NA	NA	NA	NA	NA	NA
ACETONE	NA	NA	NA	NA	NA	NA	NA
BENZENE	NA	NA	NA	NA	NA	NA	NA
BROMODICHLOROMETHANE	NA	NA	NA	NA	NA	NA	NA
BROMOFORM	NA	NA	NA	NA	NA	NA	NA
BROMOMETHANE	NA	NA	NA	NA	NA	NA	NA
CARBON DISULFIDE	NA	NA	NA	NA	NA	NA	NA
CARBON TETRACHLORIDE	NA	NA	NA	NA	NA	NA	NA
CHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA
CHLORODIBROMOMETHANE	NA	NA	NA	NA	NA	NA	NA
CHLOROETHANE	NA	NA	NA	NA	NA	NA	NA
CHLOROFORM	NA	NA	NA	NA	NA	NA	NA
CHLOROMETHANE	NA	NA	NA	NA	NA	NA	NA
CIS-1,3-DICHLOROPROPENE	NA	NA	NA	NA	NA	NA	NA
ETHYLBENZENE	NA	NA	NA	NA	NA	NA	NA
METHYLENE CHLORIDE	NA	NA	NA	NA	NA	NA	NA
STYRENE	NA	NA	NA	NA	NA	NA	NA
TETRACHLOROETHENE	NA	NA	NA	NA	NA	NA	NA
TOLUENE	NA	NA	NA	NA	NA	NA	NA
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA	NA	NA	NA	NA
TOTAL XYLENES	NA	NA	NA	NA	NA	NA	NA
TRANS-1,3-DICHLOROPROPENE	NA	NA	NA	NA	NA	NA	NA
TRICHLOROETHENE	NA	NA	NA	NA	NA	NA	NA
VINYL CHLORIDE	NA	NA	NA	NA	NA	NA	NA

LOCATION		TP-MW02				
SAMPLE ID	**TP-MW-01-11**	**TPGWMW020503**	**TPGWMW020503-F**	**TPGWMW021208**	**TP-MW-02-11**	**TPGWMW030503**
SAMPLE DATE	**19980730**	**20030507**	**20030507**	**20081215**	**19980801**	**20030508**
SAMPLE CODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**6.5**	**4**	**4**	**4**	**4**	**3.5**
BOTTOM DEPTH	**16.5**	**14**	**14**	**14**	**14**	**13.5**
DISSOLVED METALS (UG/L)						
ALUMINUM	NA	NA	101 U	56 U	NA	NA
ANTIMONY	NA	NA	1.3 U	4.6 U	NA	NA
ARSENIC	NA	NA	1.8 U	5.3 U	NA	NA
BARIUM	NA	NA	45	50.8 J	NA	NA
BERYLLIUM	NA	NA	0.23 U	0.13 U	NA	NA
CADMIUM	NA	NA	0.28 U	0.32 J	NA	NA
CALCIUM	NA	NA	90000	215000	NA	NA
CHROMIUM	NA	NA	0.92 U	1.1 U	NA	NA
COBALT	NA	NA	0.8 U	1.2 U	NA	NA
COPPER	NA	NA	6.6 U	23.3 U	NA	NA
IRON	NA	NA	65.4 U	1000	NA	NA
LEAD	NA	NA	0.91 UJ	2.2 UJ	NA	NA
MAGNESIUM	NA	NA	129000	678000	NA	NA
MANGANESE	NA	NA	42.1	21.7 J	NA	NA
MERCURY	NA	NA	0.05 U	0.032 U	NA	NA
NICKEL	NA	NA	66.6	112	NA	NA
POTASSIUM	NA	NA	41300	202000	NA	NA
SELENIUM	NA	NA	2.1 U	22	NA	NA
SILICON	NA	NA	2580	NA	NA	NA
SILVER	NA	NA	0.57 U	0.59 UJ	NA	NA
SODIUM	NA	NA	1100000	5660000	NA	NA
THALLIUM	NA	NA	0.21 U	6.6 U	NA	NA
VANADIUM	NA	NA	0.36 U	0.96 UJ	NA	NA
ZINC	NA	NA	57.1	94.5	NA	NA
FIELD (C)						
TEMPERATURE	NA	NA	NA	10.65	NA	NA
FIELD (MG/L)						
DISSOLVED OXYGEN	NA	NA	NA	6.27	NA	NA
FIELD (MS/CM)						
SPECIFIC CONDUCTANCE	NA	NA	NA	29.212	NA	NA
FIELD (MV)						
OXIDATION REDUCTION POTENTIAL	NA	NA	NA	-103.4	NA	NA
FIELD (NTU)						
TURBIDITY	NA	NA	NA	3.1	NA	NA
FIELD (PPT)						
SALINITY	NA	NA	NA	17.99	NA	NA
FIELD (S.U.)						
PH	NA	NA	NA	7.76	NA	NA

LOCATION		TP-MW02				
SAMPLE ID	**TP-MW-01-11**	**TPGWMW020503**	**TPGWMW020503-F**	**TPGWMW021208**	**TP-MW-02-11**	**TPGWMW030503**
SAMPLE DATE	**19980730**	**20030507**	**20030507**	**20081215**	**19980801**	**20030508**
SAMPLE CODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**6.5**	**4**	**4**	**4**	**4**	**3.5**
BOTTOM DEPTH	**16.5**	**14**	**14**	**14**	**14**	**13.5**
METALS (UG/L)						
ALUMINUM	62.1 U	101 U	NA	56 U	1060 U	101 U
ANTIMONY	2 U	1.8 U	NA	4.6 U	19.8 U	6.7 U
ARSENIC	2.8 U	1.8 U	NA	5.3 U	41.2 J	9 U
BARIUM	48.4 J	41.6	NA	50.8 J	51.9 J	50.8
BERYLLIUM	0.17 UJ	0.78 U	NA	0.13 U	1.2 U	2 U
CADMIUM	2.3 U	0.28 U	NA	0.37 J	2.3 UJ	1.4 U
CALCIUM	145000	89800	NA	209000	254000	283000
CHROMIUM	10.5 U	0.88 U	NA	1.1 U	3.4 U	3.6 U
COBALT	2.7 U	1.1 U	NA	1.2 U	2.7 U	5.7 U
COPPER	2.9 U	10.3 U	NA	19.6	65.3 U	17.5 U
IRON	116 U	129 U	NA	780	2360 U	1450
LEAD	1.3 UJ	0.91 UJ	NA	2.2 UJ	13.1 UJ	4.6 UJ
MAGNESIUM	19600	129000	NA	655000	788000	788000
MANGANESE	648 J	39.3	NA	18.4 J	196 J	132
MERCURY	0.01 UJ	0.05 U	NA	0.016 UJ	0.46 J	0.13 U
NICKEL	24.1 U	61.3	NA	107	118 J	16.9
POTASSIUM	10200	42300	NA	209000	262000	254000
SELENIUM	3.2 U	2.1 U	NA	6.6 UJ	31.9 U	10.5 U
SILICON	NA	2560	NA	NA	NA	1790
SILVER	2.7 U	0.57 U	NA	0.59 U	2.7 U	2.9 U
SODIUM	137000	1120000	NA	5840000	6020000	6690000
THALLIUM	3.2 UJ	0.45 U	NA	4.2 UJ	32.2 UJ	0.4 U
VANADIUM	3.2 U	0.36 U	NA	0.96 UJ	4.9 U	1.8 U
ZINC	6.6 U	55.3	NA	86.8	56.5 U	18.4
MISCELLANEOUS PARAMETERS (MG/L)						
ALKALINITY	NA	NA	NA	NA	NA	NA
BROMIDE	2 U	NA	NA	NA	34	NA
CARBONATE ALKALINITY	120	NA	NA	NA	97	NA
CHLORIDE	250 J	NA	NA	NA	7600 J	NA
NITRATE	4.6 J	NA	NA	NA	0.067 J	NA
SULFATE	150	NA	NA	NA	1500	NA
TOTAL DISSOLVED SOLIDS	NA	3400	NA	NA	NA	13000
TOTAL ORGANIC CARBON	1.8	NA	NA	NA	1.4	NA
TOTAL ORGANIC HALIDES	NA	NA	NA	NA	NA	NA
TOTAL SUSPENDED SOLIDS	NA	4 UJ	NA	23	NA	18 J
MISCELLANEOUS PARAMETERS (PPT)						
SALINITY	0.79	NA	NA	NA	17	NA

LOCATION		TP-MW02				
SAMPLE ID	**TP-MW-01-11**	**TPGWMW020503**	**TPGWMW020503-F**	**TPGWMW021208**	**TP-MW-02-11**	**TPGWMW030503**
SAMPLE DATE	**19980730**	**20030507**	**20030507**	**20081215**	**19980801**	**20030508**
SAMPLE CODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**6.5**	**4**	**4**	**4**	**4**	**3.5**
BOTTOM DEPTH	**16.5**	**14**	**14**	**14**	**14**	**13.5**
MISCELLANEOUS PARAMETERS (S.U.)						
PH	7.6	NA	NA	NA	7.6	NA
MISCELLANEOUS PARAMETERS (UG/L)						
CYANIDE	20 U	NA	NA	NA	20 U	NA
PESTICIDES/PCBS (UG/L)						
4,4'-DDD	0.12 U	0.027 U	NA	NA	0.1 U	0.026 U
4,4'-DDE	0.12 U	0.027 U	NA	NA	0.1 U	0.026 U
4,4'-DDT	0.12 U	0.029 U	NA	NA	0.1 U	0.028 U
ALDRIN	0.06 U	0.021 U	NA	NA	0.051 U	0.02 U
ALPHA-BHC	0.06 U	0.024 U	NA	NA	0.051 U	0.023 U
ALPHA-CHLORDANE	0.06 U	0.018 U	NA	NA	0.051 U	0.018 U
AROCLOR-1016	1.2 U	0.12 U	NA	NA	1 U	0.11 U
AROCLOR-1221	2.4 U	0.29 U	NA	NA	2 U	0.28 U
AROCLOR-1232	1.2 U	0.31 U	NA	NA	1 U	0.3 U
AROCLOR-1242	1.2 U	0.24 U	NA	NA	1 U	0.23 U
AROCLOR-1248	1.2 U	0.12 U	NA	NA	1 U	0.12 U
AROCLOR-1254	1.2 U	0.15 U	NA	NA	1 U	0.15 U
AROCLOR-1260	1.2 U	0.12 U	NA	NA	1 U	0.11 UJ
BETA-BHC	0.06 U	0.04 U	NA	NA	0.051 U	0.039 U
DELTA-BHC	0.06 U	0.028 U	NA	NA	0.051 U	0.027 UJ
DIELDRIN	0.12 U	0.016 U	NA	NA	0.1 U	0.016 U
ENDOSULFAN I	0.06 U	0.017 U	NA	NA	0.051 U	0.017 U
ENDOSULFAN II	0.12 U	0.015 U	NA	NA	0.1 U	0.015 U
ENDOSULFAN SULFATE	0.12 U	0.022 U	NA	NA	0.1 U	0.021 UJ
ENDRIN	0.12 U	0.017 U	NA	NA	0.1 U	0.017 U
ENDRIN ALDEHYDE	0.12 U	0.02 U	NA	NA	0.1 U	0.02 U
ENDRIN KETONE	0.12 U	0.019 U	NA	NA	0.1 U	0.019 U
GAMMA-BHC (LINDANE)	0.06 U	0.021 U	NA	NA	0.051 U	0.02 U
GAMMA-CHLORDANE	0.06 U	0.018 U	NA	NA	0.051 U	0.018 U
HEPTACHLOR	0.06 U	0.023 U	NA	NA	0.051 U	0.022 U
HEPTACHLOR EPOXIDE	0.06 U	0.022 U	NA	NA	0.051 U	0.021 U
METHOXYCHLOR	0.6 U	0.043 U	NA	NA	0.51 U	0.042 U
TOTAL AROCLOR HALFND	4.8	0.68	NA	NA	4	0.65
TOTAL AROCLOR ZEROND	0 U	0 U	NA	NA	0 U	0 U
TOXAPHENE	6 U	0.88 U	NA	NA	5.1 U	0.86 U
PETROLEUM HYDROCARBONS (UG/L)						
DIESEL RANGE ORGANICS	60 U	NA	NA	NA	77	NA
GASOLINE RANGE ORGANICS	10 U	NA	NA	NA	10 U	NA

LOCATION		TP-MW02				
SAMPLE ID	**TP-MW-01-11**	**TPGWMW020503**	**TPGWMW020503-F**	**TPGWMW021208**	**TP-MW-02-11**	**TPGWMW030503**
SAMPLE DATE	**19980730**	**20030507**	**20030507**	**20081215**	**19980801**	**20030508**
SAMPLE CODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**6.5**	**4**	**4**	**4**	**4**	**3.5**
BOTTOM DEPTH	**16.5**	**14**	**14**	**14**	**14**	**13.5**
POLYCYCLIC AROMATIC HYDROCARBONS (UG/L)						
2-METHYLNAPHTHALENE	NA	NA	NA	0.1 U	NA	NA
ACENAPHTHENE	12 U	0.08 U	NA	0.1 U	11 U	0.08 U
ACENAPHTHYLENE	12 U	0.05 U	NA	0.1 U	11 U	0.05 U
ANTHRACENE	12 U	0.08 U	NA	0.1 U	11 U	0.08 U
BAP EQUIVALENT-HALFND	12 U	0.09 U	NA	0.1 U	11 U	0.08 U
BAP EQUIVALENT-POS	0 U	0 U	NA	0 U	0 U	0 U
BENZO(A)ANTHRACENE	12 U	0.1 U	NA	0.1 U	11 U	0.1 U
BENZO(A)PYRENE	12 U	0.09 U	NA	0.1 U	11 U	0.08 U
BENZO(B)FLUORANTHENE	12 U	0.09 U	NA	0.1 U	11 U	0.08 U
BENZO(G,H,I)PERYLENE	12 U	0.08 U	NA	0.1 U	11 U	0.08 U
BENZO(K)FLUORANTHENE	12 U	0.08 U	NA	0.1 U	11 U	0.08 U
CHRYSENE	NA	NA	NA	0.1 U	NA	NA
DIBENZO(A,H)ANTHRACENE	12 U	0.2 U	NA	0.1 U	11 U	0.1 U
DIBENZOFURAN	12 U	1 U	NA	NA	11 U	1 U
FLUORANTHENE	12 U	0.1 U	NA	0.1 U	11 U	0.1 U
FLUORENE	12 U	0.06 U	NA	0.1 U	11 U	0.06 U
HIGH MOLECULAR WEIGHT PAHS	36	0.33	NA	0.3 U	33	0.33
INDENO(1,2,3-CD)PYRENE	12 U	0.1 U	NA	0.1 U	11 U	0.09 U
LOW MOLECULAR WEIGHT PAHS	42	0.24	NA	0.35	38.5	0.24
NAPHTHALENE	12 U	0.05 U	NA	0.1 U	11 U	0.05 U
PHENANTHRENE	12 U	0.08 U	NA	0.1 U	11 U	0.08 U
PYRENE	12 UJ	0.09 U	NA	0.1 U	11 UJ	0.1 J
SEMIVOLATILES (UG/L)						
1,2,4-TRICHLOROBENZENE	12 UJ	0.9 U	NA	NA	11 UJ	0.9 U
1,2-DICHLOROBENZENE	12 U	0.7 U	NA	NA	11 U	0.7 U
1,3-DICHLOROBENZENE	12 U	0.6 U	NA	NA	11 U	0.6 U
1,4-DICHLOROBENZENE	12 U	0.8 U	NA	NA	11 U	0.8 U
2,2'-OXYBIS(1-CHLOROPROPANE)	12 U	1 U	NA	NA	11 U	1 UJ
2,4,5-TRICHLOROPHENOL	30 U	2 U	NA	NA	28 U	2 U
2,4,6-TRICHLOROPHENOL	12 U	2 U	NA	NA	11 U	2 U
2,4-DICHLOROPHENOL	12 U	2 U	NA	NA	11 U	2 U
2,4-DIMETHYLPHENOL	12 U	2 U	NA	NA	11 U	2 U
2,4-DINITROPHENOL	30 UJ	5 UJ	NA	NA	28 UJ	5 UJ
2,4-DINITROTOLUENE	12 U	0.7 U	NA	NA	11 U	0.7 UJ
2,6-DINITROTOLUENE	12 U	2 U	NA	NA	11 U	2 U
2-CHLORONAPHTHALENE	12 U	3 U	NA	NA	11 U	3 U
2-CHLOROPHENOL	12 UJ	2 U	NA	NA	11 UJ	2 U

LOCATION		TP-MW02				
SAMPLE ID	**TP-MW-01-11**	**TPGWMW020503**	**TPGWMW020503-F**	**TPGWMW021208**	**TP-MW-02-11**	**TPGWMW030503**
SAMPLE DATE	**19980730**	**20030507**	**20030507**	**20081215**	**19980801**	**20030508**
SAMPLE CODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**6.5**	**4**	**4**	**4**	**4**	**3.5**
BOTTOM DEPTH	**16.5**	**14**	**14**	**14**	**14**	**13.5**
2-METHYLNAPHTHALENE	12 U	0.08 U	NA	NA	11 U	0.08 U
2-METHYLPHENOL	12 U	1 U	NA	NA	11 U	1 U
2-NITROANILINE	30 U	0.8 U	NA	NA	28 U	0.8 U
2-NITROPHENOL	12 U	2 U	NA	NA	11 U	2 U
3,3'-DICHLOROBENZIDINE	12 U	2 U	NA	NA	11 U	2 UJ
3-NITROANILINE	30 U	2 U	NA	NA	28 U	2 U
4,6-DINITRO-2-METHYLPHENOL	30 U	7 UJ	NA	NA	28 U	7 U
4-BROMOPHENYL PHENYL ETHER	12 U	1 U	NA	NA	11 U	1 U
4-CHLORO-3-METHYLPHENOL	12 U	1 U	NA	NA	11 U	1 U
4-CHLOROANILINE	12 U	1 U	NA	NA	11 U	1 U
4-CHLOROPHENYL PHENYL ETHER	12 U	1 U	NA	NA	11 U	1 U
4-METHYLPHENOL	12 U	2 U	NA	NA	11 U	2 U
4-NITROANILINE	30 U	2 U	NA	NA	28 U	2 UJ
4-NITROPHENOL	30 U	3 U	NA	NA	28 U	3 U
BIS(2-CHLOROETHOXY)METHANE	12 U	0.8 U	NA	NA	11 U	0.8 U
BIS(2-CHLOROETHYL)ETHER	12 U	1 U	NA	NA	11 U	1 U
BIS(2-ETHYLHEXYL)PHTHALATE	12 U	9 U	NA	NA	11 U	9 U
BUTYL BENZYL PHTHALATE	12 U	0.8 U	NA	NA	11 U	0.7 U
CARBAZOLE	12 U	0.9 U	NA	NA	11 U	0.8 U
CHRYSENE	12 U	0.07 U	NA	NA	11 U	0.07 U
DIETHYL PHTHALATE	12 U	0.7 U	NA	NA	11 U	0.6 U
DIMETHYL PHTHALATE	12 U	0.8 U	NA	NA	11 U	0.7 U
DI-N-BUTYL PHTHALATE	12 U	3 U	NA	NA	11 U	2 U
DI-N-OCTYL PHTHALATE	12 U	1 U	NA	NA	11 U	1 U
HEXACHLOROBENZENE	12 U	0.7 U	NA	NA	11 U	0.7 U
HEXACHLOROBUTADIENE	12 U	2 U	NA	NA	11 U	2 U
HEXACHLOROCYCLOPENTADIENE	12 UJ	1 U	NA	NA	11 UJ	1 U
HEXACHLOROETHANE	12 U	2 U	NA	NA	11 U	2 U
ISOPHORONE	12 U	0.8 U	NA	NA	11 U	0.8 U
NITROBENZENE	12 U	1 U	NA	NA	11 U	1 U
N-NITROSO-DI-N-PROPYLAMINE	12 U	2 U	NA	NA	11 U	2 U
N-NITROSODIPHENYLAMINE	12 U	2 U	NA	NA	11 U	2 U
PENTACHLOROPHENOL	30 UJ	6 U	NA	NA	28 UJ	5 U
PHENOL	12 U	2 U	NA	NA	11 U	2 U
VOLATILES (UG/L)						
1,1,1-TRICHLOROETHANE	10 U	NA	NA	NA	10 U	NA
1,1,2,2-TETRACHLOROETHANE	10 U	NA	NA	NA	10 U	NA
1,1,2-TRICHLOROETHANE	10 U	NA	NA	NA	10 U	NA
1,1,2-TRICHLOROTRIFLUOROETHANE	10 U	NA	NA	NA	10 U	NA

LOCATION		TP-MW02				
SAMPLE ID	**TP-MW-01-11**	**TPGWMW020503**	**TPGWMW020503-F**	**TPGWMW021208**	**TP-MW-02-11**	**TPGWMW030503**
SAMPLE DATE	**19980730**	**20030507**	**20030507**	**20081215**	**19980801**	**20030508**
SAMPLE CODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**6.5**	**4**	**4**	**4**	**4**	**3.5**
BOTTOM DEPTH	**16.5**	**14**	**14**	**14**	**14**	**13.5**
1,1-DICHLOROETHANE	10 U	NA	NA	NA	10 U	NA
1,1-DICHLOROETHENE	10 U	NA	NA	NA	10 U	NA
1,2-DICHLOROETHANE	10 U	NA	NA	NA	10 U	NA
1,2-DICHLOROPROPANE	10 U	NA	NA	NA	10 U	NA
2-BUTANONE	10 U	NA	NA	NA	10 U	NA
2-HEXANONE	10 U	NA	NA	NA	10 U	NA
4-METHYL-2-PENTANONE	10 U	NA	NA	NA	10 U	NA
ACETONE	10 UJ	NA	NA	NA	18 U	NA
BENZENE	10 U	NA	NA	NA	10 U	NA
BROMODICHLOROMETHANE	10 U	NA	NA	NA	10 U	NA
BROMOFORM	10 U	NA	NA	NA	10 U	NA
BROMOMETHANE	10 U	NA	NA	NA	10 U	NA
CARBON DISULFIDE	10 U	NA	NA	NA	10 U	NA
CARBON TETRACHLORIDE	10 U	NA	NA	NA	10 U	NA
CHLOROBENZENE	10 U	NA	NA	NA	10 U	NA
CHLORODIBROMOMETHANE	10 U	NA	NA	NA	10 U	NA
CHLOROETHANE	10 U	NA	NA	NA	10 U	NA
CHLOROFORM	10 U	NA	NA	NA	10 U	NA
CHLOROMETHANE	10 U	NA	NA	NA	10 U	NA
CIS-1,3-DICHLOROPROPENE	10 U	NA	NA	NA	10 U	NA
ETHYLBENZENE	10 U	NA	NA	NA	10 U	NA
METHYLENE CHLORIDE	10 U	NA	NA	NA	10 U	NA
STYRENE	10 U	NA	NA	NA	10 U	NA
TETRACHLOROETHENE	10 U	NA	NA	NA	10 U	NA
TOLUENE	10 U	NA	NA	NA	10 U	NA
TOTAL 1,2-DICHLOROETHENE	10 U	NA	NA	NA	10 U	NA
TOTAL XYLENES	10 U	NA	NA	NA	10 U	NA
TRANS-1,3-DICHLOROPROPENE	10 U	NA	NA	NA	10 U	NA
TRICHLOROETHENE	10 U	NA	NA	NA	10 U	NA
VINYL CHLORIDE	10 U	NA	NA	NA	10 U	NA

LOCATION	TP-MW03						
SAMPLE ID	TPGWMW030503-F	TPGWMW031208	TP-MW-03-11	TPGWMW040503	TPGWMW040503-AVG	TPGWMW040503-D	TPGWMW040503-F
SAMPLE DATE	20030508	20081218	19980731	20030506	20030506	20030506	20030506
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	ORIG
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	3.5	3.5	3.5	3.5	3.5	3.5	3.5
BOTTOM DEPTH	13.5	13.5	13.5	13.5	13.5	13.5	13.5
DISSOLVED METALS (UG/L)							
ALUMINUM	134 U	56 U	NA	NA	NA	NA	23.2 U
ANTIMONY	8.9 U	4.6 U	NA	NA	NA	NA	6.7 U
ARSENIC	9 U	5.3 U	NA	NA	NA	NA	9 U
BARIUM	50.6	60.6 J	NA	NA	NA	NA	10.1
BERYLLIUM	2.1 U	0.13 U	NA	NA	NA	NA	1.2 U
CADMIUM	1.4 U	0.14 U	NA	NA	NA	NA	1.4 U
CALCIUM	282000	231000	NA	NA	NA	NA	360000
CHROMIUM	2.9 U	1.1 U	NA	NA	NA	NA	2.9 U
COBALT	4 U	1.2 U	NA	NA	NA	NA	4.9 U
COPPER	27.1 U	5 U	NA	NA	NA	NA	18 U
IRON	1980	871	NA	NA	NA	NA	6.1 U
LEAD	4.6 UJ	2.2 UJ	NA	NA	NA	NA	4.6 UJ
MAGNESIUM	789000	791000	NA	NA	NA	NA	1070000
MANGANESE	132	59.2 J	NA	NA	NA	NA	2.2 U
MERCURY	0.08 U	0.032 U	NA	NA	NA	NA	0.04 U
NICKEL	17	12.4	NA	NA	NA	NA	22.2
POTASSIUM	261000	237000	NA	NA	NA	NA	399000
SELENIUM	10.5 U	23.3	NA	NA	NA	NA	10.5 U
SILICON	1820	NA	NA	NA	NA	NA	727 J
SILVER	2.9 U	0.59 UJ	NA	NA	NA	NA	2.9 U
SODIUM	6320000	6750000	NA	NA	NA	NA	8810000
THALLIUM	0.4 U	10.6 U	NA	NA	NA	NA	1 U
VANADIUM	1.8 U	0.96 UJ	NA	NA	NA	NA	1.8 U
ZINC	116	18.9 U	NA	NA	NA	NA	46.3
FIELD (C)							
TEMPERATURE	NA	7.15	NA	NA	NA	NA	NA
FIELD (MG/L)							
DISSOLVED OXYGEN	NA	0.38	NA	NA	NA	NA	NA
FIELD (MS/CM)							
SPECIFIC CONDUCTANCE	NA	31.878	NA	NA	NA	NA	NA
FIELD (MV)							
OXIDATION REDUCTION POTENTIAL	NA	-277.6	NA	NA	NA	NA	NA
FIELD (NTU)							
TURBIDITY	NA	0	NA	NA	NA	NA	NA
FIELD (PPT)							
SALINITY	NA	19.79	NA	NA	NA	NA	NA
FIELD (S.U.)							
PH	NA	7.44	NA	NA	NA	NA	NA

LOCATION	TP-MW03						
SAMPLE ID	TPGWMW030503-F	TPGWMW031208	TP-MW-03-11	TPGWMW040503	TPGWMW040503-AVG	TPGWMW040503-D	TPGWMW040503-F
SAMPLE DATE	20030508	20081218	19980731	20030506	20030506	20030506	20030506
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	ORIG
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	3.5	3.5	3.5	3.5	3.5	3.5	3.5
BOTTOM DEPTH	13.5	13.5	13.5	13.5	13.5	13.5	13.5
METALS (UG/L)							
ALUMINUM	NA	56 U	171 U	38.4 U	44.6 U	50.8 U	NA
ANTIMONY	NA	4.6 U	39.6 U	6.7 U	10.05 U	13.4 U	NA
ARSENIC	NA	5.3 U	37 U	9 U	7.55	10.6 J	NA
BARIUM	NA	61.4 J	128 J	10.1	10.25	10.4	NA
BERYLLIUM	NA	0.13 U	0.95 U	2.4 U	1.8 U	1.2 U	NA
CADMIUM	NA	0.14 U	2.3 UJ	1.4 U	1.4 U	1.4 U	NA
CALCIUM	NA	241000	323000	350000	351500	353000	NA
CHROMIUM	NA	1.1 U	9.4 U	18.8 U	17.1	24.8	NA
COBALT	NA	1.2 U	2.7 U	5.3 U	5.95 U	6.6 U	NA
COPPER	NA	5 U	42.4 U	27.8 U	22.05 U	16.3 U	NA
IRON	NA	926	1330 J	84.9 U	97.95 U	111 U	NA
LEAD	NA	2.2 UJ	26.2 UJ	4.6 UJ	4.6 U	4.6 UJ	NA
MAGNESIUM	NA	762000	867000	1040000	1035000	1030000	NA
MANGANESE	NA	51.4 J	791 J	3 U	2.85 U	2.7 U	NA
MERCURY	NA	0.016 UJ	0.01 UJ	0.1 U	0.1 U	0.1 U	NA
NICKEL	NA	7.4	59 U	22.3	23.5	24.7	NA
POTASSIUM	NA	241000	331000	388000	388500	389000	NA
SELENIUM	NA	6.6 UJ	63.8 U	10.5 U	10.5 U	10.5 U	NA
SILICON	NA	NA	NA	732 J	738.5	745 J	NA
SILVER	NA	0.59 U	2.7 U	2.9 U	2.9 U	2.9 U	NA
SODIUM	NA	6730000	7260000	8750000	8595000	8440000	NA
THALLIUM	NA	4.8 J	64.4 UJ	1.8 U	1.175 U	0.55 U	NA
VANADIUM	NA	0.96 UJ	3.2 U	2.3 U	2.05 U	1.8 U	NA
ZINC	NA	10.7 J	117 U	46.4	46.35	46.3	NA
MISCELLANEOUS PARAMETERS (MG/L)							
ALKALINITY	NA	NA	NA	NA	NA	NA	NA
BROMIDE	NA	NA	39	NA	NA	NA	NA
CARBONATE ALKALINITY	NA	NA	160	NA	NA	NA	NA
CHLORIDE	NA	NA	13000 J	NA	NA	NA	NA
NITRATE	NA	NA	0.05 UJ	NA	NA	NA	NA
SULFATE	NA	NA	1600	NA	NA	NA	NA
TOTAL DISSOLVED SOLIDS	NA	NA	NA	27000 J	26500	26000 J	NA
TOTAL ORGANIC CARBON	NA	NA	3.4	NA	NA	NA	NA
TOTAL ORGANIC HALIDES	NA	NA	NA	NA	NA	NA	NA
TOTAL SUSPENDED SOLIDS	NA	10	NA	22 J	28	34 J	NA
MISCELLANEOUS PARAMETERS (PPT)							
SALINITY	NA	NA	19	NA	NA	NA	NA

LOCATION	TP-MW03						
SAMPLE ID	TPGWMW030503-F	TPGWMW031208	TP-MW-03-11	TPGWMW040503	TPGWMW040503-AVG	TPGWMW040503-D	TPGWMW040503-F
SAMPLE DATE	20030508	20081218	19980731	20030506	20030506	20030506	20030506
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	ORIG
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	3.5	3.5	3.5	3.5	3.5	3.5	3.5
BOTTOM DEPTH	13.5	13.5	13.5	13.5	13.5	13.5	13.5
MISCELLANEOUS PARAMETERS (S.U.)							
PH	NA	NA	7.5	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (UG/L)							
CYANIDE	NA	NA	20 U	NA	NA	NA	NA
PESTICIDES/PCBS (UG/L)							
4,4'-DDD	NA	NA	0.11 U	0.026 U	0.0265 U	0.027 U	NA
4,4'-DDE	NA	NA	0.11 U	0.026 U	0.0265 U	0.027 U	NA
4,4'-DDT	NA	NA	0.11 U	0.028 U	0.028 U	0.028 U	NA
ALDRIN	NA	NA	0.057 U	0.021 U	0.021 U	0.021 U	NA
ALPHA-BHC	NA	NA	0.057 U	0.024 U	0.024 U	0.024 U	NA
ALPHA-CHLORDANE	NA	NA	0.057 U	0.018 U	0.018 U	0.018 U	NA
AROCLOR-1016	NA	NA	1.1 U	0.11 U	0.11 U	0.11 U	NA
AROCLOR-1221	NA	NA	2.3 U	0.28 U	0.28 U	0.28 U	NA
AROCLOR-1232	NA	NA	1.1 U	0.3 U	0.3 U	0.3 U	NA
AROCLOR-1242	NA	NA	1.1 U	0.24 U	0.24 U	0.24 U	NA
AROCLOR-1248	NA	NA	1.1 U	0.12 U	0.12 U	0.12 U	NA
AROCLOR-1254	NA	NA	1.1 U	0.15 U	0.15 U	0.15 U	NA
AROCLOR-1260	NA	NA	1.1 U	0.11 U	0.11 U	0.11 U	NA
BETA-BHC	NA	NA	0.057 U	0.04 U	0.04 U	0.04 U	NA
DELTA-BHC	NA	NA	0.057 U	0.027 U	0.0275 U	0.028 U	NA
DIELDRIN	NA	NA	0.11 U	0.016 U	0.016 U	0.016 U	NA
ENDOSULFAN I	NA	NA	0.057 U	0.017 U	0.017 U	0.017 U	NA
ENDOSULFAN II	NA	NA	0.11 U	0.015 U	0.015 U	0.015 U	NA
ENDOSULFAN SULFATE	NA	NA	0.11 U	0.022 U	0.022 U	0.022 U	NA
ENDRIN	NA	NA	0.11 U	0.017 U	0.017 U	0.017 U	NA
ENDRIN ALDEHYDE	NA	NA	0.11 U	0.02 U	0.02 U	0.02 U	NA
ENDRIN KETONE	NA	NA	0.11 U	0.019 U	0.019 U	0.019 U	NA
GAMMA-BHC (LINDANE)	NA	NA	0.057 U	0.021 U	0.021 U	0.021 U	NA
GAMMA-CHLORDANE	NA	NA	0.057 U	0.018 U	0.018 U	0.018 U	NA
HEPTACHLOR	NA	NA	0.057 U	0.023 U	0.023 U	0.023 U	NA
HEPTACHLOR EPOXIDE	NA	NA	0.057 U	0.022 U	0.022 U	0.022 U	NA
METHOXYCHLOR	NA	NA	0.57 U	0.042 U	0.0425 U	0.043 U	NA
TOTAL AROCLOR HALFND	NA	NA	4.45	0.66	0.66	0.66	NA
TOTAL AROCLOR ZEROND	NA	NA	0 U	0 U	0 U	0 U	NA
TOXAPHENE	NA	NA	5.7 U	0.87 U	0.875 U	0.88 U	NA
PETROLEUM HYDROCARBONS (UG/L)							
DIESEL RANGE ORGANICS	NA	NA	70	NA	NA	NA	NA
GASOLINE RANGE ORGANICS	NA	NA	10 U	NA	NA	NA	NA

LOCATION	TP-MW03						
SAMPLE ID	TPGWMW030503-F	TPGWMW031208	TP-MW-03-11	TPGWMW040503	TPGWMW040503-AVG	TPGWMW040503-D	TPGWMW040503-F
SAMPLE DATE	20030508	20081218	19980731	20030506	20030506	20030506	20030506
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	ORIG
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	3.5	3.5	3.5	3.5	3.5	3.5	3.5
BOTTOM DEPTH	13.5	13.5	13.5	13.5	13.5	13.5	13.5
POLYCYCLIC AROMATIC HYDROCARBONS (UG/L)							
2-METHYLNAPHTHALENE	NA	0.1 U	NA	NA	NA	NA	NA
ACENAPHTHENE	NA	0.1 U	11 U	0.08 U	0.08 U	0.08 U	NA
ACENAPHTHYLENE	NA	0.1 U	11 U	0.05 U	0.05 U	0.05 U	NA
ANTHRACENE	NA	0.021 J	11 U	0.08 U	0.08 U	0.08 U	NA
BAP EQUIVALENT-HALFND	NA	0.1 U	11 U	0.09 U	0.09 U	0.09 U	NA
BAP EQUIVALENT-POS	NA	0 U	0 U	0 U	0 U	0 U	NA
BENZO(A)ANTHRACENE	NA	0.1 U	11 U	0.1 U	0.1 U	0.1 U	NA
BENZO(A)PYRENE	NA	0.1 U	11 U	0.09 U	0.09 U	0.09 U	NA
BENZO(B)FLUORANTHENE	NA	0.1 U	11 U	0.09 U	0.09 U	0.09 U	NA
BENZO(G,H,I)PERYLENE	NA	0.1 U	11 U	0.08 U	0.08 U	0.08 U	NA
BENZO(K)FLUORANTHENE	NA	0.1 U	11 U	0.08 U	0.08 U	0.08 U	NA
CHRYSENE	NA	0.1 U	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	NA	0.1 U	11 U	0.1 U	0.1 U	0.1 U	NA
DIBENZOFURAN	NA	NA	11 U	1 U	1 U	1 U	NA
FLUORANTHENE	NA	0.16	0.6 J	0.1 U	0.1 U	0.1 U	NA
FLUORENE	NA	0.1 U	11 U	0.06 U	0.06 U	0.06 U	NA
HIGH MOLECULAR WEIGHT PAHS	NA	0.52	28.1	0.28	0.355	0.43	NA
INDENO(1,2,3-CD)PYRENE	NA	0.1 U	11 U	0.1 U	0.1 U	0.1 U	NA
LOW MOLECULAR WEIGHT PAHS	NA	0.32	38.5	0.24	0.32	0.4	NA
NAPHTHALENE	NA	0.1 U	11 U	0.05 U	0.05 U	0.05 U	NA
PHENANTHRENE	NA	0.1 U	11 U	0.08 UJ	0.12	0.2 J	NA
PYRENE	NA	0.16	11 U	0.09 UJ	0.1225	0.2 J	NA
SEMIVOLATILES (UG/L)							
1,2,4-TRICHLOROBENZENE	NA	NA	11 U	0.9 U	0.9 U	0.9 U	NA
1,2-DICHLOROBENZENE	NA	NA	11 U	0.7 U	0.7 U	0.7 UJ	NA
1,3-DICHLOROBENZENE	NA	NA	11 U	0.6 U	0.6 U	0.6 UJ	NA
1,4-DICHLOROBENZENE	NA	NA	11 U	0.8 U	0.8 U	0.8 U	NA
2,2'-OXYBIS(1-CHLOROPROPANE)	NA	NA	11 U	1 U	1 U	1 U	NA
2,4,5-TRICHLOROPHENOL	NA	NA	28 U	2 U	2 U	2 U	NA
2,4,6-TRICHLOROPHENOL	NA	NA	11 U	2 U	2 U	2 U	NA
2,4-DICHLOROPHENOL	NA	NA	11 U	2 U	2 U	2 U	NA
2,4-DIMETHYLPHENOL	NA	NA	11 U	2 U	2 U	2 U	NA
2,4-DINITROPHENOL	NA	NA	28 UJ	5 UJ	5 U	5 UJ	NA
2,4-DINITROTOLUENE	NA	NA	11 U	0.7 U	0.7 U	0.7 U	NA
2,6-DINITROTOLUENE	NA	NA	11 U	2 U	2 U	2 U	NA
2-CHLORONAPHTHALENE	NA	NA	11 U	3 U	3 U	3 U	NA
2-CHLOROPHENOL	NA	NA	11 UJ	2 U	2 U	2 U	NA

LOCATION	TP-MW03						
SAMPLE ID	TPGWMW030503-F	TPGWMW031208	TP-MW-03-11	TPGWMW040503	TPGWMW040503-AVG	TPGWMW040503-D	TPGWMW040503-F
SAMPLE DATE	20030508	20081218	19980731	20030506	20030506	20030506	20030506
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	ORIG
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	3.5	3.5	3.5	3.5	3.5	3.5	3.5
BOTTOM DEPTH	13.5	13.5	13.5	13.5	13.5	13.5	13.5
2-METHYLNAPHTHALENE	NA	NA	11 UJ	0.08 U	0.08 U	0.08 U	NA
2-METHYLPHENOL	NA	NA	11 U	1 U	1 U	1 U	NA
2-NITROANILINE	NA	NA	28 U	0.8 U	0.8 U	0.8 U	NA
2-NITROPHENOL	NA	NA	11 U	2 U	2 U	2 U	NA
3,3'-DICHLOROBENZIDINE	NA	NA	11 UJ	2 U	2 U	2 UJ	NA
3-NITROANILINE	NA	NA	28 U	2 U	2 U	2 U	NA
4,6-DINITRO-2-METHYLPHENOL	NA	NA	28 U	7 UJ	7 U	7 UJ	NA
4-BROMOPHENYL PHENYL ETHER	NA	NA	11 U	1 U	1 U	1 U	NA
4-CHLORO-3-METHYLPHENOL	NA	NA	11 U	1 U	1 U	1 U	NA
4-CHLOROANILINE	NA	NA	11 U	1 U	1 U	1 UJ	NA
4-CHLOROPHENYL PHENYL ETHER	NA	NA	11 U	1 U	1 U	1 U	NA
4-METHYLPHENOL	NA	NA	11 U	2 U	2 U	2 U	NA
4-NITROANILINE	NA	NA	28 U	2 U	2 U	2 U	NA
4-NITROPHENOL	NA	NA	28 U	3 U	3 U	3 U	NA
BIS(2-CHLOROETHOXY)METHANE	NA	NA	11 U	0.8 U	0.8 U	0.8 U	NA
BIS(2-CHLOROETHYL)ETHER	NA	NA	11 U	1 U	1 U	1 U	NA
BIS(2-ETHYLHEXYL)PHTHALATE	NA	NA	11 U	9 U	9 U	9 U	NA
BUTYL BENZYL PHTHALATE	NA	NA	11 U	0.8 U	0.8 U	0.8 U	NA
CARBAZOLE	NA	NA	11 U	0.8 U	0.85 U	0.9 U	NA
CHRYSENE	NA	NA	11 U	0.07 U	0.07 U	0.07 U	NA
DIETHYL PHTHALATE	NA	NA	11 U	0.6 U	0.65 U	0.7 U	NA
DIMETHYL PHTHALATE	NA	NA	11 U	0.8 U	0.8 U	0.8 U	NA
DI-N-BUTYL PHTHALATE	NA	NA	11 U	2 U	2.5 U	3 U	NA
DI-N-OCTYL PHTHALATE	NA	NA	11 U	1 U	1 U	1 UJ	NA
HEXACHLOROBENZENE	NA	NA	11 U	0.7 U	0.7 U	0.7 U	NA
HEXACHLOROBUTADIENE	NA	NA	11 U	2 U	2 U	2 UJ	NA
HEXACHLOROCYCLOPENTADIENE	NA	NA	11 U	1 U	1 U	1 UJ	NA
HEXACHLOROETHANE	NA	NA	11 U	2 U	2 U	2 UJ	NA
ISOPHORONE	NA	NA	11 U	0.8 U	0.8 U	0.8 U	NA
NITROBENZENE	NA	NA	11 U	1 U	1 U	1 U	NA
N-NITROSO-DI-N-PROPYLAMINE	NA	NA	11 U	2 U	2 U	2 U	NA
N-NITROSODIPHENYLAMINE	NA	NA	11 U	2 U	2 U	2 U	NA
PENTACHLOROPHENOL	NA	NA	28 UJ	5 U	5 U	5 U	NA
PHENOL	NA	NA	11 U	2 U	2 U	2 U	NA
VOLATILES (UG/L)							
1,1,1-TRICHLOROETHANE	NA	NA	10 U	NA	NA	NA	NA
1,1,2,2-TETRACHLOROETHANE	NA	NA	10 U	NA	NA	NA	NA
1,1,2-TRICHLOROETHANE	NA	NA	10 U	NA	NA	NA	NA
1,1,2-TRICHLOROTRIFLUOROETHANE	NA	NA	10 U	NA	NA	NA	NA

LOCATION	TP-MW03						
SAMPLE ID	TPGWMW030503-F	TPGWMW031208	TP-MW-03-11	TPGWMW040503	TPGWMW040503-AVG	TPGWMW040503-D	TPGWMW040503-F
SAMPLE DATE	20030508	20081218	19980731	20030506	20030506	20030506	20030506
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	ORIG
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	3.5	3.5	3.5	3.5	3.5	3.5	3.5
BOTTOM DEPTH	13.5	13.5	13.5	13.5	13.5	13.5	13.5
1,1-DICHLOROETHANE	NA	NA	10 U	NA	NA	NA	NA
1,1-DICHLOROETHENE	NA	NA	10 U	NA	NA	NA	NA
1,2-DICHLOROETHANE	NA	NA	10 U	NA	NA	NA	NA
1,2-DICHLOROPROPANE	NA	NA	10 U	NA	NA	NA	NA
2-BUTANONE	NA	NA	10 U	NA	NA	NA	NA
2-HEXANONE	NA	NA	10 U	NA	NA	NA	NA
4-METHYL-2-PENTANONE	NA	NA	10 U	NA	NA	NA	NA
ACETONE	NA	NA	10 U	NA	NA	NA	NA
BENZENE	NA	NA	10 U	NA	NA	NA	NA
BROMODICHLOROMETHANE	NA	NA	10 U	NA	NA	NA	NA
BROMOFORM	NA	NA	10 U	NA	NA	NA	NA
BROMOMETHANE	NA	NA	10 U	NA	NA	NA	NA
CARBON DISULFIDE	NA	NA	10 U	NA	NA	NA	NA
CARBON TETRACHLORIDE	NA	NA	10 U	NA	NA	NA	NA
CHLOROBENZENE	NA	NA	10 U	NA	NA	NA	NA
CHLORODIBROMOMETHANE	NA	NA	10 U	NA	NA	NA	NA
CHLOROETHANE	NA	NA	10 U	NA	NA	NA	NA
CHLOROFORM	NA	NA	10 U	NA	NA	NA	NA
CHLOROMETHANE	NA	NA	10 U	NA	NA	NA	NA
CIS-1,3-DICHLOROPROPENE	NA	NA	10 U	NA	NA	NA	NA
ETHYLBENZENE	NA	NA	10 U	NA	NA	NA	NA
METHYLENE CHLORIDE	NA	NA	10 U	NA	NA	NA	NA
STYRENE	NA	NA	10 U	NA	NA	NA	NA
TETRACHLOROETHENE	NA	NA	10 U	NA	NA	NA	NA
TOLUENE	NA	NA	10 U	NA	NA	NA	NA
TOTAL 1,2-DICHLOROETHENE	NA	NA	10 U	NA	NA	NA	NA
TOTAL XYLENES	NA	NA	10 U	NA	NA	NA	NA
TRANS-1,3-DICHLOROPROPENE	NA	NA	10 U	NA	NA	NA	NA
TRICHLOROETHENE	NA	NA	10 U	NA	NA	NA	NA
VINYL CHLORIDE	NA	NA	10 U	NA	NA	NA	NA

LOCATION	TP-MW04						
SAMPLE ID	TPGWMW040503-F-AVG	TPGWMW040503-F-D	TPGWMW041208	TP-MW-04-11	TP-MW-04-11-AVG	TP-MW-04-11-D	TPGWMW050503
SAMPLE DATE	20030506	20030506	20081216	19980731	19980731	19980731	20030507
SAMPLE CODE	AVG	DUP	NORMAL	ORIG	AVG	DUP	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	3.5	3.5	3.5	3.5	3.5	3.5	3.5
BOTTOM DEPTH	13.5	13.5	13.5	13.5	13.5	13.5	13.5
DISSOLVED METALS (UG/L)							
ALUMINUM	30.25 U	37.3 U	56 U	NA	NA	NA	NA
ANTIMONY	6.95 U	7.2 U	4.6 U	NA	NA	NA	NA
ARSENIC	9 U	9 U	5.3 U	NA	NA	NA	NA
BARIUM	10	9.9	23.7 J	NA	NA	NA	NA
BERYLLIUM	1.2 U	1.2 U	0.13 U	NA	NA	NA	NA
CADMIUM	1.4 U	1.4 U	0.14 U	NA	NA	NA	NA
CALCIUM	357000	354000	272000	NA	NA	NA	NA
CHROMIUM	2.9 U	2.9 U	1.1 U	NA	NA	NA	NA
COBALT	4.8 U	4.7 U	1.2 U	NA	NA	NA	NA
COPPER	17.65 U	17.3 U	5 U	NA	NA	NA	NA
IRON	6.1 U	6.1 U	61 U	NA	NA	NA	NA
LEAD	4.6 U	4.6 UJ	2.2 UJ	NA	NA	NA	NA
MAGNESIUM	1055000	1040000	968000	NA	NA	NA	NA
MANGANESE	2.25 U	2.3 U	16.6 J	NA	NA	NA	NA
MERCURY	0.06 U	0.08 U	0.032 U	NA	NA	NA	NA
NICKEL	22.3	22.4	14.8	NA	NA	NA	NA
POTASSIUM	394500	390000	274000	NA	NA	NA	NA
SELENIUM	10.5 U	10.5 U	21.6	NA	NA	NA	NA
SILICON	725	723 J	NA	NA	NA	NA	NA
SILVER	2.9 U	2.9 U	0.59 UJ	NA	NA	NA	NA
SODIUM	9010000	9210000	8010000	NA	NA	NA	NA
THALLIUM	0.705 U	0.41 U	4.2 UJ	NA	NA	NA	NA
VANADIUM	1.8 U	1.8 U	0.96 UJ	NA	NA	NA	NA
ZINC	45.95	45.6	88.4	NA	NA	NA	NA
FIELD (C)							
TEMPERATURE	NA	NA	6.24	NA	NA	NA	NA
FIELD (MG/L)							
DISSOLVED OXYGEN	NA	NA	6.8	NA	NA	NA	NA
FIELD (MS/CM)							
SPECIFIC CONDUCTANCE	NA	NA	38.166	NA	NA	NA	NA
FIELD (MV)							
OXIDATION REDUCTION POTENTIAL	NA	NA	168.2	NA	NA	NA	NA
FIELD (NTU)							
TURBIDITY	NA	NA	4.75	NA	NA	NA	NA
FIELD (PPT)							
SALINITY	NA	NA	23.98	NA	NA	NA	NA
FIELD (S.U.)							
PH	NA	NA	7.27	NA	NA	NA	NA

LOCATION	TP-MW04						
SAMPLE ID	TPGWMW040503-F-AVG	TPGWMW040503-F-D	TPGWMW041208	TP-MW-04-11	TP-MW-04-11-AVG	TP-MW-04-11-D	TPGWMW050503
SAMPLE DATE	20030506	20030506	20081216	19980731	19980731	19980731	20030507
SAMPLE CODE	AVG	DUP	NORMAL	ORIG	AVG	DUP	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	3.5	3.5	3.5	3.5	3.5	3.5	3.5
BOTTOM DEPTH	13.5	13.5	13.5	13.5	13.5	13.5	13.5
METALS (UG/L)							
ALUMINUM	NA	NA	56 U	3450 U	2198.5 U	947 U	101 U
ANTIMONY	NA	NA	4.6 U	39.6 U	39.6 U	39.6 U	6.7 U
ARSENIC	NA	NA	5.3 U	37 U	37 U	37 U	9 U
BARIUM	NA	NA	25.7 J	25.8 U	17.45 U	9.1 U	48.2
BERYLLIUM	NA	NA	0.13 U	1.3 U	1.45 U	1.6 U	1.2 U
CADMIUM	NA	NA	0.14 U	2.3 UJ	2.3 U	2.3 UJ	1.4 U
CALCIUM	NA	NA	279000	343000	343500	344000	331000
CHROMIUM	NA	NA	1.1 U	23.8 U	16.9 U	10 U	3.3 U
COBALT	NA	NA	1.2 U	2.7 U	2.7 U	2.7 U	5 U
COPPER	NA	NA	5 U	238 U	154.95 U	71.9 U	76.7
IRON	NA	NA	61 U	7030 J	4320	1610 J	966
LEAD	NA	NA	2.2 UJ	36.4 J	24.75	26.2 UJ	4.6 UJ
MAGNESIUM	NA	NA	946000	1130000	1135000	1140000	1010000
MANGANESE	NA	NA	21.7 J	290 J	210.5	131 J	291
MERCURY	NA	NA	0.016 UJ	0.36 J	0.21	0.06 J	0.03 U
NICKEL	NA	NA	14	66.4 U	63.9 U	61.4 U	22.4
POTASSIUM	NA	NA	278000	406000	410000	414000	319000
SELENIUM	NA	NA	6.6 UJ	63.8 U	63.8 U	63.8 U	10.5 U
SILICON	NA	NA	NA	NA	NA	NA	2120
SILVER	NA	NA	0.59 U	2.7 U	2.7 U	2.7 U	2.9 U
SODIUM	NA	NA	7870000	8710000	8775000	8840000	8650000
THALLIUM	NA	NA	4.2 UJ	64.4 UJ	64.4 U	64.4 UJ	0.4 U
VANADIUM	NA	NA	0.96 UJ	22.6 U	15.6 U	8.6 U	1.8 U
ZINC	NA	NA	11.9 J	171 U	122.35 U	73.7 U	190
MISCELLANEOUS PARAMETERS (MG/L)							
ALKALINITY	NA	NA	NA	NA	NA	NA	NA
BROMIDE	NA	NA	NA	54	51.5	49	NA
CARBONATE ALKALINITY	NA	NA	NA	110	110	110	NA
CHLORIDE	NA	NA	NA	14000 J	14000	14000 J	NA
NITRATE	NA	NA	NA	0.21 J	0.165	0.12 J	NA
SULFATE	NA	NA	NA	2200	2200	2200	NA
TOTAL DISSOLVED SOLIDS	NA	NA	NA	NA	NA	NA	25000
TOTAL ORGANIC CARBON	NA	NA	NA	1.9	1.7	1.5	NA
TOTAL ORGANIC HALIDES	NA	NA	NA	NA	NA	NA	NA
TOTAL SUSPENDED SOLIDS	NA	NA	31	NA	NA	NA	36 J
MISCELLANEOUS PARAMETERS (PPT)							
SALINITY	NA	NA	NA	24	25	26	NA

LOCATION	TP-MW04						
SAMPLE ID	TPGWMW040503-F-AVG	TPGWMW040503-F-D	TPGWMW041208	TP-MW-04-11	TP-MW-04-11-AVG	TP-MW-04-11-D	TPGWMW050503
SAMPLE DATE	20030506	20030506	20081216	19980731	19980731	19980731	20030507
SAMPLE CODE	AVG	DUP	NORMAL	ORIG	AVG	DUP	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	3.5	3.5	3.5	3.5	3.5	3.5	3.5
BOTTOM DEPTH	13.5	13.5	13.5	13.5	13.5	13.5	13.5
MISCELLANEOUS PARAMETERS (S.U.)							
PH	NA	NA	NA	7.7	7.75	7.8	NA
MISCELLANEOUS PARAMETERS (UG/L)							
CYANIDE	NA	NA	NA	20 U	20 U	20 U	NA
PESTICIDES/PCBS (UG/L)							
4,4'-DDD	NA	NA	NA	0.1 U	0.1 U	0.1 U	0.026 U
4,4'-DDE	NA	NA	NA	0.1 U	0.1 U	0.1 U	0.026 U
4,4'-DDT	NA	NA	NA	0.1 U	0.1 U	0.1 U	0.028 U
ALDRIN	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.021 U
ALPHA-BHC	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.024 U
ALPHA-CHLORDANE	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.018 U
AROCLOR-1016	NA	NA	NA	1 U	1 U	1 U	0.11 U
AROCLOR-1221	NA	NA	NA	2 U	2 U	2 U	0.28 U
AROCLOR-1232	NA	NA	NA	1 U	1 U	1 U	0.3 U
AROCLOR-1242	NA	NA	NA	1 U	1 U	1 U	0.24 U
AROCLOR-1248	NA	NA	NA	1 U	1 U	1 U	0.12 U
AROCLOR-1254	NA	NA	NA	1 U	1 U	1 U	0.15 U
AROCLOR-1260	NA	NA	NA	1 U	1 U	1 U	0.11 U
BETA-BHC	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.04 U
DELTA-BHC	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.027 U
DIELDRIN	NA	NA	NA	0.1 U	0.1 U	0.1 U	0.016 U
ENDOSULFAN I	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.017 U
ENDOSULFAN II	NA	NA	NA	0.1 U	0.1 U	0.1 U	0.015 U
ENDOSULFAN SULFATE	NA	NA	NA	0.1 U	0.1 U	0.1 U	0.022 U
ENDRIN	NA	NA	NA	0.1 U	0.1 U	0.1 U	0.017 U
ENDRIN ALDEHYDE	NA	NA	NA	0.1 U	0.1 U	0.1 U	0.02 U
ENDRIN KETONE	NA	NA	NA	0.1 U	0.1 U	0.1 U	0.019 U
GAMMA-BHC (LINDANE)	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.021 U
GAMMA-CHLORDANE	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.018 U
HEPTACHLOR	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.023 U
HEPTACHLOR EPOXIDE	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.022 U
METHOXYCHLOR	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.042 U
TOTAL AROCLOR HALFND	NA	NA	NA	4	4	4	0.66
TOTAL AROCLOR ZEROND	NA	NA	NA	0 U	0 U	0 U	0 U
TOXAPHENE	NA	NA	NA	5 U	5 U	5 U	0.87 U
PETROLEUM HYDROCARBONS (UG/L)							
DIESEL RANGE ORGANICS	NA	NA	NA	50 U	50 U	50 U	NA
GASOLINE RANGE ORGANICS	NA	NA	NA	10 U	10 U	10 U	NA

LOCATION	TP-MW04						
SAMPLE ID	TPGWMW040503-F-AVG	TPGWMW040503-F-D	TPGWMW041208	TP-MW-04-11	TP-MW-04-11-AVG	TP-MW-04-11-D	TPGWMW050503
SAMPLE DATE	20030506	20030506	20081216	19980731	19980731	19980731	20030507
SAMPLE CODE	AVG	DUP	NORMAL	ORIG	AVG	DUP	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	3.5	3.5	3.5	3.5	3.5	3.5	3.5
BOTTOM DEPTH	13.5	13.5	13.5	13.5	13.5	13.5	13.5
POLYCYCLIC AROMATIC HYDROCARBONS (UG/L)							
2-METHYLNAPHTHALENE	NA	NA	0.1 U	NA	NA	NA	NA
ACENAPHTHENE	NA	NA	0.1 U	10 U	10 U	10 U	0.08 U
ACENAPHTHYLENE	NA	NA	0.1 U	10 U	10 U	10 U	0.05 U
ANTHRACENE	NA	NA	0.1 U	10 U	10 U	10 U	0.08 U
BAP EQUIVALENT-HALFND	NA	NA	0.1 U	10 U	10 U	10 U	0.09 U
BAP EQUIVALENT-POS	NA	NA	0 U	0 U	0 U	0 U	0 U
BENZO(A)ANTHRACENE	NA	NA	0.1 U	10 U	10 U	10 U	0.1 U
BENZO(A)PYRENE	NA	NA	0.1 U	10 U	10 U	10 U	0.09 U
BENZO(B)FLUORANTHENE	NA	NA	0.1 U	10 U	10 U	10 U	0.09 U
BENZO(G,H,I)PERYLENE	NA	NA	0.1 U	10 U	10 U	10 U	0.08 U
BENZO(K)FLUORANTHENE	NA	NA	0.1 U	10 U	10 U	10 U	0.08 U
CHRYSENE	NA	NA	0.1 U	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	NA	NA	0.1 U	10 U	10 U	10 U	0.1 U
DIBENZOFURAN	NA	NA	NA	10 U	10 U	10 U	1 U
FLUORANTHENE	NA	NA	0.1 U	10 U	10 U	10 U	0.1 U
FLUORENE	NA	NA	0.1 U	10 U	10 U	10 U	0.06 U
HIGH MOLECULAR WEIGHT PAHS	NA	NA	0.3 U	30	30	30	0.28
INDENO(1,2,3-CD)PYRENE	NA	NA	0.1 U	10 U	10 U	10 U	0.1 U
LOW MOLECULAR WEIGHT PAHS	NA	NA	0.35	35	35	35	0.24
NAPHTHALENE	NA	NA	0.1 U	10 U	10 U	10 U	0.05 U
PHENANTHRENE	NA	NA	0.1 U	10 U	10 U	10 U	0.08 U
PYRENE	NA	NA	0.1 U	10 U	10 U	10 UJ	0.09 U
SEMIVOLATILES (UG/L)							
1,2,4-TRICHLOROBENZENE	NA	NA	NA	10 U	10 U	10 UJ	0.9 U
1,2-DICHLOROBENZENE	NA	NA	NA	10 U	10 U	10 U	0.7 U
1,3-DICHLOROBENZENE	NA	NA	NA	10 U	10 U	10 U	0.6 U
1,4-DICHLOROBENZENE	NA	NA	NA	10 U	10 U	10 U	0.8 U
2,2'-OXYBIS(1-CHLOROPROPANE)	NA	NA	NA	10 U	10 U	10 U	1 U
2,4,5-TRICHLOROPHENOL	NA	NA	NA	25 U	25 U	25 U	2 U
2,4,6-TRICHLOROPHENOL	NA	NA	NA	10 U	10 U	10 U	2 U
2,4-DICHLOROPHENOL	NA	NA	NA	10 U	10 U	10 U	2 U
2,4-DIMETHYLPHENOL	NA	NA	NA	10 U	10 U	10 U	2 U
2,4-DINITROPHENOL	NA	NA	NA	25 UJ	25 U	25 UJ	5 UJ
2,4-DINITROTOLUENE	NA	NA	NA	10 U	10 U	10 U	0.7 U
2,6-DINITROTOLUENE	NA	NA	NA	10 U	10 U	10 U	2 U
2-CHLORONAPHTHALENE	NA	NA	NA	10 U	10 U	10 U	3 U
2-CHLOROPHENOL	NA	NA	NA	10 UJ	10 U	10 UJ	2 U

LOCATION	TP-MW04						
SAMPLE ID	TPGWMW040503-F-AVG	TPGWMW040503-F-D	TPGWMW041208	TP-MW-04-11	TP-MW-04-11-AVG	TP-MW-04-11-D	TPGWMW050503
SAMPLE DATE	20030506	20030506	20081216	19980731	19980731	19980731	20030507
SAMPLE CODE	AVG	DUP	NORMAL	ORIG	AVG	DUP	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	3.5	3.5	3.5	3.5	3.5	3.5	3.5
BOTTOM DEPTH	13.5	13.5	13.5	13.5	13.5	13.5	13.5
2-METHYLNAPHTHALENE	NA	NA	NA	10 UJ	10 U	10 U	0.08 U
2-METHYLPHENOL	NA	NA	NA	10 U	10 U	10 U	1 U
2-NITROANILINE	NA	NA	NA	25 U	25 U	25 U	0.8 U
2-NITROPHENOL	NA	NA	NA	10 U	10 U	10 U	2 U
3,3'-DICHLOROBENZIDINE	NA	NA	NA	10 UJ	10 U	10 U	2 U
3-NITROANILINE	NA	NA	NA	25 U	25 U	25 U	2 U
4,6-DINITRO-2-METHYLPHENOL	NA	NA	NA	25 U	25 U	25 U	7 UJ
4-BROMOPHENYL PHENYL ETHER	NA	NA	NA	10 U	10 U	10 U	1 U
4-CHLORO-3-METHYLPHENOL	NA	NA	NA	10 U	10 U	10 U	1 U
4-CHLOROANILINE	NA	NA	NA	10 U	10 U	10 U	1 U
4-CHLOROPHENYL PHENYL ETHER	NA	NA	NA	10 U	10 U	10 U	1 U
4-METHYLPHENOL	NA	NA	NA	10 U	10 U	10 U	2 U
4-NITROANILINE	NA	NA	NA	25 U	25 U	25 U	2 U
4-NITROPHENOL	NA	NA	NA	25 U	25 U	25 U	3 U
BIS(2-CHLOROETHOXY)METHANE	NA	NA	NA	10 U	10 U	10 U	0.8 U
BIS(2-CHLOROETHYL)ETHER	NA	NA	NA	10 U	10 U	10 U	1 U
BIS(2-ETHYLHEXYL)PHTHALATE	NA	NA	NA	10 U	10 U	10 U	9 U
BUTYL BENZYL PHTHALATE	NA	NA	NA	10 U	10 U	10 U	0.8 U
CARBAZOLE	NA	NA	NA	10 U	10 U	10 U	0.9 U
CHRYSENE	NA	NA	NA	10 U	10 U	10 U	0.07 U
DIETHYL PHTHALATE	NA	NA	NA	10 U	10 U	10 U	0.7 U
DIMETHYL PHTHALATE	NA	NA	NA	10 U	10 U	10 U	0.8 U
DI-N-BUTYL PHTHALATE	NA	NA	NA	10 U	10 U	10 U	3 U
DI-N-OCTYL PHTHALATE	NA	NA	NA	10 U	10 U	10 U	1 U
HEXACHLOROBENZENE	NA	NA	NA	10 U	10 U	10 U	0.7 U
HEXACHLOROBUTADIENE	NA	NA	NA	10 U	10 U	10 U	2 U
HEXACHLOROCYCLOPENTADIENE	NA	NA	NA	10 U	10 U	10 UJ	1 U
HEXACHLOROETHANE	NA	NA	NA	10 U	10 U	10 U	2 U
ISOPHORONE	NA	NA	NA	10 U	10 U	10 U	0.8 U
NITROBENZENE	NA	NA	NA	10 U	10 U	10 U	1 U
N-NITROSO-DI-N-PROPYLAMINE	NA	NA	NA	10 U	10 U	10 U	2 U
N-NITROSODIPHENYLAMINE	NA	NA	NA	10 U	10 U	10 U	2 U
PENTACHLOROPHENOL	NA	NA	NA	25 UJ	25 U	25 UJ	5 U
PHENOL	NA	NA	NA	10 U	10 U	10 U	2 U
VOLATILES (UG/L)							
1,1,1-TRICHLOROETHANE	NA	NA	NA	10 U	10 U	10 U	NA
1,1,2,2-TETRACHLOROETHANE	NA	NA	NA	10 U	10 U	10 U	NA
1,1,2-TRICHLOROETHANE	NA	NA	NA	10 U	10 U	10 U	NA
1,1,2-TRICHLOROTRIFLUOROETHANE	NA	NA	NA	10 U	10 U	10 U	NA

LOCATION	TP-MW04						
SAMPLE ID	TPGWMW040503-F-AVG	TPGWMW040503-F-D	TPGWMW041208	TP-MW-04-11	TP-MW-04-11-AVG	TP-MW-04-11-D	TPGWMW050503
SAMPLE DATE	20030506	20030506	20081216	19980731	19980731	19980731	20030507
SAMPLE CODE	AVG	DUP	NORMAL	ORIG	AVG	DUP	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	3.5	3.5	3.5	3.5	3.5	3.5	3.5
BOTTOM DEPTH	13.5	13.5	13.5	13.5	13.5	13.5	13.5
1,1-DICHLOROETHANE	NA	NA	NA	10 U	10 U	10 U	NA
1,1-DICHLOROETHENE	NA	NA	NA	10 U	10 U	10 U	NA
1,2-DICHLOROETHANE	NA	NA	NA	10 U	10 U	10 U	NA
1,2-DICHLOROPROPANE	NA	NA	NA	10 U	10 U	10 U	NA
2-BUTANONE	NA	NA	NA	10 U	10 U	10 U	NA
2-HEXANONE	NA	NA	NA	10 U	10 U	10 U	NA
4-METHYL-2-PENTANONE	NA	NA	NA	10 U	10 U	10 U	NA
ACETONE	NA	NA	NA	10 U	10 U	10 U	NA
BENZENE	NA	NA	NA	10 U	10 U	10 U	NA
BROMODICHLOROMETHANE	NA	NA	NA	10 U	10 U	10 U	NA
BROMOFORM	NA	NA	NA	10 U	10 U	10 U	NA
BROMOMETHANE	NA	NA	NA	10 U	10 U	10 U	NA
CARBON DISULFIDE	NA	NA	NA	10 U	10 U	10 U	NA
CARBON TETRACHLORIDE	NA	NA	NA	10 U	10 U	10 U	NA
CHLOROBENZENE	NA	NA	NA	10 U	10 U	10 U	NA
CHLORODIBROMOMETHANE	NA	NA	NA	10 U	10 U	10 U	NA
CHLOROETHANE	NA	NA	NA	10 U	10 U	10 U	NA
CHLOROFORM	NA	NA	NA	10 U	10 U	10 U	NA
CHLOROMETHANE	NA	NA	NA	10 U	10 U	10 U	NA
CIS-1,3-DICHLOROPROPENE	NA	NA	NA	10 U	10 U	10 U	NA
ETHYLBENZENE	NA	NA	NA	10 U	10 U	10 U	NA
METHYLENE CHLORIDE	NA	NA	NA	10 U	10 U	10 U	NA
STYRENE	NA	NA	NA	10 U	10 U	10 U	NA
TETRACHLOROETHENE	NA	NA	NA	10 U	10 U	10 U	NA
TOLUENE	NA	NA	NA	10 U	10 U	10 U	NA
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA	10 U	10 U	10 U	NA
TOTAL XYLENES	NA	NA	NA	10 U	10 U	10 U	NA
TRANS-1,3-DICHLOROPROPENE	NA	NA	NA	10 U	10 U	10 U	NA
TRICHLOROETHENE	NA	NA	NA	10 U	10 U	10 U	NA
VINYL CHLORIDE	NA	NA	NA	10 U	10 U	10 U	NA

LOCATION	TP-MW05				TP-MW06		
SAMPLE ID	TPGWMW050503-F	TPGWMW051208	TP-MW-05-11	TP-MW-05-11-F	TPGWMW060503	TPGWMW060503-F	TPGWMW061208
SAMPLE DATE	20030507	20081217	19980804	19980804	20030507	20030507	20081217
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	3.5	3.5	3.5	3.5	4.5	4.5	4.5
BOTTOM DEPTH	13.5	13.5	13.5	13.5	14.5	14.5	14.5
DISSOLVED METALS (UG/L)							
ALUMINUM	101 U	56 U	NA	51.5 U	NA	101 U	56 U
ANTIMONY	6.7 U	4.6 U	NA	39.6 U	NA	15.3 U	34.5 U
ARSENIC	9 U	5.3 U	NA	37 U	NA	9 U	5.3 U
BARIUM	45.4	64.1 J	NA	61.4 U	NA	60	70.1 J
BERYLLIUM	3.8 U	0.13 U	NA	1 U	NA	1.7 U	0.13 U
CADMIUM	1.4 U	2 J	NA	2.3 U	NA	1.4 U	3.6 J
CALCIUM	340000	246000	NA	356000	NA	110000	220000
CHROMIUM	2.9 U	1.1 U	NA	3.4 U	NA	2.9 U	1.1 U
COBALT	5.8 U	1.2 U	NA	2.7 U	NA	3.5 U	1.2 U
COPPER	65.6 U	65.2	NA	45.4	NA	9.2 U	16.5 U
IRON	867	61 U	NA	79.1 U	NA	6720	963
LEAD	4.6 UJ	2.2 UJ	NA	26.2 U	NA	4.6 UJ	6.2 J
MAGNESIUM	1030000	747000	NA	1020000	NA	553000	785000
MANGANESE	291	115	NA	429	NA	176	56.8 J
MERCURY	0.03 U	0.032 U	NA	0.11 U	NA	0.04 U	0.28
NICKEL	23.8	71.8	NA	28.6 U	NA	46.4	270
POTASSIUM	303000	219000	NA	401000	NA	187000	232000
SELENIUM	10.5 U	23.5	NA	63.8 U	NA	10.5 U	21.5
SILICON	2120	NA	NA	NA	NA	1520	NA
SILVER	2.9 U	4.1 U	NA	2.7 U	NA	2.9 U	0.59 UJ
SODIUM	8580000	6400000	NA	8200000	NA	5430000	6880000
THALLIUM	0.4 U	6.5 U	NA	64.4 U	NA	0.4 U	4.2 UJ
VANADIUM	1.8 U	0.96 UJ	NA	3.2 U	NA	1.8 U	0.96 UJ
ZINC	181	572	NA	248	NA	12.9 U	357
FIELD (C)							
TEMPERATURE	NA	8.51	NA	NA	NA	NA	11.02
FIELD (MG/L)							
DISSOLVED OXYGEN	NA	0.93	NA	NA	NA	NA	1.92
FIELD (MS/CM)							
SPECIFIC CONDUCTANCE	NA	31.084	NA	NA	NA	NA	32.486
FIELD (MV)							
OXIDATION REDUCTION POTENTIAL	NA	90.4	NA	NA	NA	NA	-81.4
FIELD (NTU)							
TURBIDITY	NA	6.79	NA	NA	NA	NA	9
FIELD (PPT)							
SALINITY	NA	19.21	NA	NA	NA	NA	20.28
FIELD (S.U.)							
PH	NA	7.78	NA	NA	NA	NA	7.53

LOCATION	TP-MW05				TP-MW06		
SAMPLE ID	TPGWMW050503-F	TPGWMW051208	TP-MW-05-11	TP-MW-05-11-F	TPGWMW060503	TPGWMW060503-F	TPGWMW061208
SAMPLE DATE	20030507	20081217	19980804	19980804	20030507	20030507	20081217
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	3.5	3.5	3.5	3.5	4.5	4.5	4.5
BOTTOM DEPTH	13.5	13.5	13.5	13.5	14.5	14.5	14.5
METALS (UG/L)							
ALUMINUM	NA	56 U	2770	NA	127 U	NA	56 U
ANTIMONY	NA	4.6 U	39.6 U	NA	7.2 U	NA	34
ARSENIC	NA	5.3 U	37 U	NA	9 U	NA	5.3 U
BARIUM	NA	67 J	76.7 J	NA	59.6	NA	73.7 J
BERYLLIUM	NA	0.13 U	1.3 U	NA	1.5 U	NA	0.13 U
CADMIUM	NA	2.1 J	2.3 U	NA	1.4 U	NA	3.9 J
CALCIUM	NA	251000	338000	NA	108000	NA	229000
CHROMIUM	NA	1.1 U	11.5 U	NA	12.3 U	NA	1.1 U
COBALT	NA	1.2 U	2.7 U	NA	2.4 U	NA	1.2 U
COPPER	NA	64.1	496	NA	13.5 U	NA	9.9 J
IRON	NA	61 U	7560	NA	7180	NA	1520
LEAD	NA	2.2 UJ	37.2	NA	4.6 UJ	NA	2.2 UJ
MAGNESIUM	NA	776000	959000	NA	526000	NA	791000
MANGANESE	NA	119	451	NA	172	NA	56
MERCURY	NA	0.016 UJ	0.07 U	NA	0.03 U	NA	0.26
NICKEL	NA	71.5	48.9 U	NA	55	NA	278
POTASSIUM	NA	219000	368000	NA	180000	NA	234000
SELENIUM	NA	6.6 UJ	63.8 U	NA	10.5 U	NA	6.6 UJ
SILICON	NA	NA	NA	NA	1580	NA	NA
SILVER	NA	4.2 U	2.7 U	NA	2.9 U	NA	0.59 U
SODIUM	NA	6370000	7710000	NA	5170000	NA	6810000
THALLIUM	NA	4.2 UJ	64.4 U	NA	0.4 U	NA	4.2 UJ
VANADIUM	NA	0.96 UJ	10.7 U	NA	1.8 U	NA	0.96 UJ
ZINC	NA	587	532	NA	19.9	NA	364
MISCELLANEOUS PARAMETERS (MG/L)							
ALKALINITY	NA	NA	NA	NA	NA	NA	NA
BROMIDE	NA	NA	50	NA	NA	NA	NA
CARBONATE ALKALINITY	NA	NA	160	NA	NA	NA	NA
CHLORIDE	NA	NA	11000	NA	NA	NA	NA
NITRATE	NA	NA	0.05 UJ	NA	NA	NA	NA
SULFATE	NA	NA	1800	NA	NA	NA	NA
TOTAL DISSOLVED SOLIDS	NA	NA	NA	NA	16000	NA	NA
TOTAL ORGANIC CARBON	NA	NA	1.6	NA	NA	NA	NA
TOTAL ORGANIC HALIDES	NA	NA	NA	NA	NA	NA	NA
TOTAL SUSPENDED SOLIDS	NA	22	NA	NA	58 J	NA	38
MISCELLANEOUS PARAMETERS (PPT)							
SALINITY	NA	NA	25	NA	NA	NA	NA

LOCATION	TP-MW05				TP-MW06		
SAMPLE ID	TPGWMW050503-F	TPGWMW051208	TP-MW-05-11	TP-MW-05-11-F	TPGWMW060503	TPGWMW060503-F	TPGWMW061208
SAMPLE DATE	20030507	20081217	19980804	19980804	20030507	20030507	20081217
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	3.5	3.5	3.5	3.5	4.5	4.5	4.5
BOTTOM DEPTH	13.5	13.5	13.5	13.5	14.5	14.5	14.5
MISCELLANEOUS PARAMETERS (S.U.)							
PH	NA	NA	7.7	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (UG/L)							
CYANIDE	NA	NA	10 U	NA	NA	NA	NA
PESTICIDES/PCBS (UG/L)							
4,4'-DDD	NA	NA	0.11 U	NA	0.027 U	NA	NA
4,4'-DDE	NA	NA	0.11 U	NA	0.027 U	NA	NA
4,4'-DDT	NA	NA	0.11 U	NA	0.028 U	NA	NA
ALDRIN	NA	NA	0.054 U	NA	0.021 U	NA	NA
ALPHA-BHC	NA	NA	0.054 U	NA	0.024 U	NA	NA
ALPHA-CHLORDANE	NA	NA	0.054 U	NA	0.018 U	NA	NA
AROCLOR-1016	NA	NA	1.1 U	NA	0.11 U	NA	NA
AROCLOR-1221	NA	NA	2.2 U	NA	0.28 U	NA	NA
AROCLOR-1232	NA	NA	1.1 U	NA	0.3 U	NA	NA
AROCLOR-1242	NA	NA	1.1 U	NA	0.24 U	NA	NA
AROCLOR-1248	NA	NA	1.1 U	NA	0.12 U	NA	NA
AROCLOR-1254	NA	NA	1.1 U	NA	0.15 U	NA	NA
AROCLOR-1260	NA	NA	1.1 U	NA	0.11 U	NA	NA
BETA-BHC	NA	NA	0.054 U	NA	0.04 U	NA	NA
DELTA-BHC	NA	NA	0.054 UJ	NA	0.027 U	NA	NA
DIELDRIN	NA	NA	0.11 U	NA	0.016 U	NA	NA
ENDOSULFAN I	NA	NA	0.054 U	NA	0.017 U	NA	NA
ENDOSULFAN II	NA	NA	0.11 U	NA	0.015 U	NA	NA
ENDOSULFAN SULFATE	NA	NA	0.11 U	NA	0.022 U	NA	NA
ENDRIN	NA	NA	0.11 U	NA	0.017 U	NA	NA
ENDRIN ALDEHYDE	NA	NA	0.11 U	NA	0.02 U	NA	NA
ENDRIN KETONE	NA	NA	0.11 U	NA	0.019 U	NA	NA
GAMMA-BHC (LINDANE)	NA	NA	0.054 U	NA	0.021 U	NA	NA
GAMMA-CHLORDANE	NA	NA	0.054 U	NA	0.018 U	NA	NA
HEPTACHLOR	NA	NA	0.054 U	NA	0.023 U	NA	NA
HEPTACHLOR EPOXIDE	NA	NA	0.054 U	NA	0.022 U	NA	NA
METHOXYCHLOR	NA	NA	0.54 U	NA	0.043 U	NA	NA
TOTAL AROCLOR HALFND	NA	NA	4.4	NA	0.66	NA	NA
TOTAL AROCLOR ZEROND	NA	NA	0 U	NA	0 U	NA	NA
TOXAPHENE	NA	NA	5.4 U	NA	0.88 U	NA	NA
PETROLEUM HYDROCARBONS (UG/L)							
DIESEL RANGE ORGANICS	NA	NA	200	NA	NA	NA	NA
GASOLINE RANGE ORGANICS	NA	NA	10 U	NA	NA	NA	NA

LOCATION	TP-MW05				TP-MW06		
SAMPLE ID	TPGWMW050503-F	TPGWMW051208	TP-MW-05-11	TP-MW-05-11-F	TPGWMW060503	TPGWMW060503-F	TPGWMW061208
SAMPLE DATE	20030507	20081217	19980804	19980804	20030507	20030507	20081217
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	3.5	3.5	3.5	3.5	4.5	4.5	4.5
BOTTOM DEPTH	13.5	13.5	13.5	13.5	14.5	14.5	14.5
POLYCYCLIC AROMATIC HYDROCARBONS (UG/L)							
2-METHYLNAPHTHALENE	NA	0.1 U	NA	NA	NA	NA	0.1 U
ACENAPHTHENE	NA	0.1 U	12 U	NA	0.07 U	NA	0.1 U
ACENAPHTHYLENE	NA	0.1 U	12 U	NA	0.05 U	NA	0.1 U
ANTHRACENE	NA	0.022 J	12 U	NA	0.07 U	NA	0.1 U
BAP EQUIVALENT-HALFND	NA	0.1 U	12 U	NA	0.08 U	NA	0.1 U
BAP EQUIVALENT-POS	NA	0 U	0 U	NA	0 U	NA	0 U
BENZO(A)ANTHRACENE	NA	0.1 U	12 U	NA	0.1 U	NA	0.1 U
BENZO(A)PYRENE	NA	0.1 U	12 U	NA	0.08 U	NA	0.1 U
BENZO(B)FLUORANTHENE	NA	0.1 U	12 U	NA	0.08 U	NA	0.1 U
BENZO(G,H,I)PERYLENE	NA	0.1 U	12 U	NA	0.07 U	NA	0.1 U
BENZO(K)FLUORANTHENE	NA	0.1 U	12 U	NA	0.07 U	NA	0.1 U
CHRYSENE	NA	0.1 U	NA	NA	NA	NA	0.1 U
DIBENZO(A,H)ANTHRACENE	NA	0.1 U	12 U	NA	0.1 U	NA	0.1 U
DIBENZOFURAN	NA	NA	12 U	NA	1 U	NA	NA
FLUORANTHENE	NA	0.1 U	12 U	NA	0.1 U	NA	0.1 U
FLUORENE	NA	0.1 U	12 U	NA	0.06 U	NA	0.1 U
HIGH MOLECULAR WEIGHT PAHS	NA	0.3 U	36	NA	0.26	NA	0.3 U
INDENO(1,2,3-CD)PYRENE	NA	0.1 U	12 U	NA	0.09 U	NA	0.1 U
LOW MOLECULAR WEIGHT PAHS	NA	0.32	42	NA	0.4	NA	0.35
NAPHTHALENE	NA	0.1 U	12 U	NA	0.2 J	NA	0.1 U
PHENANTHRENE	NA	0.1 U	12 U	NA	0.07 U	NA	0.1 U
PYRENE	NA	0.1 U	12 U	NA	0.08 U	NA	0.1 U
SEMIVOLATILES (UG/L)							
1,2,4-TRICHLOROBENZENE	NA	NA	12 U	NA	0.8 U	NA	NA
1,2-DICHLOROBENZENE	NA	NA	12 U	NA	0.7 U	NA	NA
1,3-DICHLOROBENZENE	NA	NA	12 U	NA	0.6 U	NA	NA
1,4-DICHLOROBENZENE	NA	NA	12 U	NA	0.8 U	NA	NA
2,2'-OXYBIS(1-CHLOROPROPANE)	NA	NA	12 U	NA	1 U	NA	NA
2,4,5-TRICHLOROPHENOL	NA	NA	30 U	NA	2 UR	NA	NA
2,4,6-TRICHLOROPHENOL	NA	NA	12 U	NA	2 UR	NA	NA
2,4-DICHLOROPHENOL	NA	NA	12 U	NA	2 UR	NA	NA
2,4-DIMETHYLPHENOL	NA	NA	12 U	NA	2 UR	NA	NA
2,4-DINITROPHENOL	NA	NA	30 U	NA	5 UR	NA	NA
2,4-DINITROTOLUENE	NA	NA	12 U	NA	0.7 U	NA	NA
2,6-DINITROTOLUENE	NA	NA	12 U	NA	1 U	NA	NA
2-CHLORONAPHTHALENE	NA	NA	12 U	NA	3 U	NA	NA
2-CHLOROPHENOL	NA	NA	12 U	NA	2 UR	NA	NA

LOCATION	TP-MW05				TP-MW06		
SAMPLE ID	TPGWMW050503-F	TPGWMW051208	TP-MW-05-11	TP-MW-05-11-F	TPGWMW060503	TPGWMW060503-F	TPGWMW061208
SAMPLE DATE	20030507	20081217	19980804	19980804	20030507	20030507	20081217
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	3.5	3.5	3.5	3.5	4.5	4.5	4.5
BOTTOM DEPTH	13.5	13.5	13.5	13.5	14.5	14.5	14.5
2-METHYLNAPHTHALENE	NA	NA	12 U	NA	0.07 U	NA	NA
2-METHYLPHENOL	NA	NA	12 U	NA	1 UR	NA	NA
2-NITROANILINE	NA	NA	30 U	NA	0.8 U	NA	NA
2-NITROPHENOL	NA	NA	12 U	NA	2 UR	NA	NA
3,3'-DICHLOROBENZIDINE	NA	NA	12 U	NA	2 U	NA	NA
3-NITROANILINE	NA	NA	30 U	NA	2 U	NA	NA
4,6-DINITRO-2-METHYLPHENOL	NA	NA	30 U	NA	7 UR	NA	NA
4-BROMOPHENYL PHENYL ETHER	NA	NA	12 U	NA	1 U	NA	NA
4-CHLORO-3-METHYLPHENOL	NA	NA	12 U	NA	1 UR	NA	NA
4-CHLOROANILINE	NA	NA	12 U	NA	1 U	NA	NA
4-CHLOROPHENYL PHENYL ETHER	NA	NA	12 U	NA	1 U	NA	NA
4-METHYLPHENOL	NA	NA	12 U	NA	2 UR	NA	NA
4-NITROANILINE	NA	NA	30 UJ	NA	2 U	NA	NA
4-NITROPHENOL	NA	NA	30 U	NA	2 UR	NA	NA
BIS(2-CHLOROETHOXY)METHANE	NA	NA	12 U	NA	0.8 U	NA	NA
BIS(2-CHLOROETHYL)ETHER	NA	NA	12 U	NA	1 U	NA	NA
BIS(2-ETHYLHEXYL)PHTHALATE	NA	NA	1 J	NA	8 U	NA	NA
BUTYL BENZYL PHTHALATE	NA	NA	12 U	NA	0.7 U	NA	NA
CARBAZOLE	NA	NA	12 U	NA	0.8 U	NA	NA
CHRYSENE	NA	NA	12 U	NA	0.06 U	NA	NA
DIETHYL PHTHALATE	NA	NA	12 U	NA	0.6 U	NA	NA
DIMETHYL PHTHALATE	NA	NA	12 U	NA	0.7 U	NA	NA
DI-N-BUTYL PHTHALATE	NA	NA	0.8 J	NA	2 U	NA	NA
DI-N-OCTYL PHTHALATE	NA	NA	12 U	NA	1 U	NA	NA
HEXACHLOROBENZENE	NA	NA	12 U	NA	0.7 U	NA	NA
HEXACHLOROBUTADIENE	NA	NA	12 U	NA	2 U	NA	NA
HEXACHLOROCYCLOPENTADIENE	NA	NA	12 U	NA	1 U	NA	NA
HEXACHLOROETHANE	NA	NA	12 U	NA	2 U	NA	NA
ISOPHORONE	NA	NA	12 U	NA	0.8 U	NA	NA
NITROBENZENE	NA	NA	12 U	NA	1 U	NA	NA
N-NITROSO-DI-N-PROPYLAMINE	NA	NA	12 U	NA	2 U	NA	NA
N-NITROSODIPHENYLAMINE	NA	NA	12 U	NA	2 U	NA	NA
PENTACHLOROPHENOL	NA	NA	30 U	NA	5 UR	NA	NA
PHENOL	NA	NA	12 U	NA	2 UR	NA	NA
VOLATILES (UG/L)							
1,1,1-TRICHLOROETHANE	NA	NA	10 U	NA	NA	NA	NA
1,1,2,2-TETRACHLOROETHANE	NA	NA	10 U	NA	NA	NA	NA
1,1,2-TRICHLOROETHANE	NA	NA	10 U	NA	NA	NA	NA
1,1,2-TRICHLOROTRIFLUOROETHANE	NA	NA	10 U	NA	NA	NA	NA

LOCATION	TP-MW05				TP-MW06		
SAMPLE ID	TPGWMW050503-F	TPGWMW051208	TP-MW-05-11	TP-MW-05-11-F	TPGWMW060503	TPGWMW060503-F	TPGWMW061208
SAMPLE DATE	20030507	20081217	19980804	19980804	20030507	20030507	20081217
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	3.5	3.5	3.5	3.5	4.5	4.5	4.5
BOTTOM DEPTH	13.5	13.5	13.5	13.5	14.5	14.5	14.5
1,1-DICHLOROETHANE	NA	NA	10 U	NA	NA	NA	NA
1,1-DICHLOROETHENE	NA	NA	10 U	NA	NA	NA	NA
1,2-DICHLOROETHANE	NA	NA	10 U	NA	NA	NA	NA
1,2-DICHLOROPROPANE	NA	NA	10 U	NA	NA	NA	NA
2-BUTANONE	NA	NA	10 U	NA	NA	NA	NA
2-HEXANONE	NA	NA	10 U	NA	NA	NA	NA
4-METHYL-2-PENTANONE	NA	NA	10 U	NA	NA	NA	NA
ACETONE	NA	NA	10 U	NA	NA	NA	NA
BENZENE	NA	NA	10 U	NA	NA	NA	NA
BROMODICHLOROMETHANE	NA	NA	10 U	NA	NA	NA	NA
BROMOFORM	NA	NA	10 U	NA	NA	NA	NA
BROMOMETHANE	NA	NA	10 U	NA	NA	NA	NA
CARBON DISULFIDE	NA	NA	10 U	NA	NA	NA	NA
CARBON TETRACHLORIDE	NA	NA	10 U	NA	NA	NA	NA
CHLOROBENZENE	NA	NA	10 U	NA	NA	NA	NA
CHLORODIBROMOMETHANE	NA	NA	10 U	NA	NA	NA	NA
CHLOROETHANE	NA	NA	10 U	NA	NA	NA	NA
CHLOROFORM	NA	NA	10 U	NA	NA	NA	NA
CHLOROMETHANE	NA	NA	10 UJ	NA	NA	NA	NA
CIS-1,3-DICHLOROPROPENE	NA	NA	10 U	NA	NA	NA	NA
ETHYLBENZENE	NA	NA	10 U	NA	NA	NA	NA
METHYLENE CHLORIDE	NA	NA	10 U	NA	NA	NA	NA
STYRENE	NA	NA	10 U	NA	NA	NA	NA
TETRACHLOROETHENE	NA	NA	10 U	NA	NA	NA	NA
TOLUENE	NA	NA	10 U	NA	NA	NA	NA
TOTAL 1,2-DICHLOROETHENE	NA	NA	10 U	NA	NA	NA	NA
TOTAL XYLENES	NA	NA	10 U	NA	NA	NA	NA
TRANS-1,3-DICHLOROPROPENE	NA	NA	10 U	NA	NA	NA	NA
TRICHLOROETHENE	NA	NA	10 U	NA	NA	NA	NA
VINYL CHLORIDE	NA	NA	10 UJ	NA	NA	NA	NA

LOCATION		TP-MW07					
SAMPLE ID	TP-MW-06-11	TPGWMW070503	TPGWMW070503-AVG	TPGWMW070503-D	TPGWMW070503-F	TPGWMW070503-F-AVG	TPGWMW070503-F-D
SAMPLE DATE	19980730	20030509	20030509	20030509	20030509	20030509	20030509
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	ORIG	AVG	DUP
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	4.5	4	4	4	4	4	4
BOTTOM DEPTH	14.5	14	14	14	14	14	14
DISSOLVED METALS (UG/L)							
ALUMINUM	NA	NA	NA	NA	20.2 U	27.45 U	34.7 U
ANTIMONY	NA	NA	NA	NA	9.2 U	7.95 U	6.7 U
ARSENIC	NA	NA	NA	NA	9 U	9 U	9 U
BARIUM	NA	NA	NA	NA	13.6	13.6	13.6
BERYLLIUM	NA	NA	NA	NA	1.2 U	1.2 U	1.2 U
CADMIUM	NA	NA	NA	NA	1.4 U	1.4 U	1.4 U
CALCIUM	NA	NA	NA	NA	336000	334500	333000
CHROMIUM	NA	NA	NA	NA	3 U	2.95 U	2.9 U
COBALT	NA	NA	NA	NA	2.2 U	2.2 U	2.2 U
COPPER	NA	NA	NA	NA	4.6 U	5.1 U	5.6 U
IRON	NA	NA	NA	NA	6.1 U	6.1 U	6.1 U
LEAD	NA	NA	NA	NA	4.6 U	4.6 U	4.6 U
MAGNESIUM	NA	NA	NA	NA	974000	962500	951000
MANGANESE	NA	NA	NA	NA	0.75 U	0.75 U	0.75 U
MERCURY	NA	NA	NA	NA	0.04 U	0.05 U	0.06 U
NICKEL	NA	NA	NA	NA	11.7 U	11.7 U	11.7 U
POTASSIUM	NA	NA	NA	NA	369000	363500	358000
SELENIUM	NA	NA	NA	NA	10.5 U	10.5 U	10.5 U
SILICON	NA	NA	NA	NA	992 J	978.5	965 J
SILVER	NA	NA	NA	NA	2.9 U	2.9 U	2.9 U
SODIUM	NA	NA	NA	NA	8510000	8490000	8470000
THALLIUM	NA	NA	NA	NA	9.6 U	9.6 U	9.6 U
VANADIUM	NA	NA	NA	NA	1.8 U	1.8 U	1.8 U
ZINC	NA	NA	NA	NA	67.6	68.2	68.8
FIELD (C)							
TEMPERATURE	NA	NA	NA	NA	NA	NA	NA
FIELD (MG/L)							
DISSOLVED OXYGEN	NA	NA	NA	NA	NA	NA	NA
FIELD (MS/CM)							
SPECIFIC CONDUCTANCE	NA	NA	NA	NA	NA	NA	NA
FIELD (MV)							
OXIDATION REDUCTION POTENTIAL	NA	NA	NA	NA	NA	NA	NA
FIELD (NTU)							
TURBIDITY	NA	NA	NA	NA	NA	NA	NA
FIELD (PPT)							
SALINITY	NA	NA	NA	NA	NA	NA	NA
FIELD (S.U.)							
PH	NA	NA	NA	NA	NA	NA	NA

LOCATION		TP-MW07					
SAMPLE ID	TP-MW-06-11	TPGWMW070503	TPGWMW070503-AVG	TPGWMW070503-D	TPGWMW070503-F	TPGWMW070503-F-AVG	TPGWMW070503-F-D
SAMPLE DATE	19980730	20030509	20030509	20030509	20030509	20030509	20030509
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	ORIG	AVG	DUP
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	4.5	4	4	4	4	4	4
BOTTOM DEPTH	14.5	14	14	14	14	14	14
METALS (UG/L)							
ALUMINUM	3610 U	26.3 U	23.25 U	20.2 U	NA	NA	NA
ANTIMONY	21.2 U	6.7 U	6.7 U	6.7 U	NA	NA	NA
ARSENIC	19.6 J	9 U	9 U	9 U	NA	NA	NA
BARIUM	91.9 J	14	13.7	13.4	NA	NA	NA
BERYLLIUM	0.86 U	1.2 U	1.2 U	1.2 U	NA	NA	NA
CADMIUM	2.3 U	1.4 U	1.4 U	1.4 U	NA	NA	NA
CALCIUM	122000	340000	339500	339000	NA	NA	NA
CHROMIUM	15 U	4.2 U	3.55 U	2.9 U	NA	NA	NA
COBALT	5 U	2.2 U	2.2 U	2.2 U	NA	NA	NA
COPPER	142 U	4.6 U	6.2 U	7.8 U	NA	NA	NA
IRON	17000 J	6.1 U	6.1 U	6.1 U	NA	NA	NA
LEAD	195 J	4.6 U	4.6 U	4.6 U	NA	NA	NA
MAGNESIUM	571000	996000	983500	971000	NA	NA	NA
MANGANESE	1070 J	0.75 U	0.75 U	0.75 U	NA	NA	NA
MERCURY	0.25 J	0.12 U	0.115 U	0.11 U	NA	NA	NA
NICKEL	128	11.7 U	11.7 U	11.7 U	NA	NA	NA
POTASSIUM	212000	368000	366500	365000	NA	NA	NA
SELENIUM	31.9 U	10.5 U	10.5 U	10.5 U	NA	NA	NA
SILICON	NA	974 J	981	988 J	NA	NA	NA
SILVER	2.7 U	2.9 U	2.9 U	2.9 U	NA	NA	NA
SODIUM	5160000	8610000	8490000	8370000	NA	NA	NA
THALLIUM	32.2 UJ	9.6 U	9.6 U	9.6 U	NA	NA	NA
VANADIUM	11.5 U	1.8 U	1.8 U	1.8 U	NA	NA	NA
ZINC	165 U	72 J	71.35	70.7 J	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/L)							
ALKALINITY	NA	NA	NA	NA	NA	NA	NA
BROMIDE	21	NA	NA	NA	NA	NA	NA
CARBONATE ALKALINITY	340	NA	NA	NA	NA	NA	NA
CHLORIDE	7800 J	NA	NA	NA	NA	NA	NA
NITRATE	0.05 UJ	NA	NA	NA	NA	NA	NA
SULFATE	930	NA	NA	NA	NA	NA	NA
TOTAL DISSOLVED SOLIDS	NA	20000	20500	21000	NA	NA	NA
TOTAL ORGANIC CARBON	8.4	NA	NA	NA	NA	NA	NA
TOTAL ORGANIC HALIDES	NA	NA	NA	NA	NA	NA	NA
TOTAL SUSPENDED SOLIDS	NA	22	21.5	21	NA	NA	NA
MISCELLANEOUS PARAMETERS (PPT)							
SALINITY	14	NA	NA	NA	NA	NA	NA

LOCATION		TP-MW07					
SAMPLE ID	**TP-MW-06-11**	**TPGWMW070503**	**TPGWMW070503-AVG**	**TPGWMW070503-D**	**TPGWMW070503-F**	**TPGWMW070503-F-AVG**	**TPGWMW070503-F-D**
SAMPLE DATE	**19980730**	**20030509**	**20030509**	**20030509**	**20030509**	**20030509**	**20030509**
SAMPLE CODE	**NORMAL**	**ORIG**	**AVG**	**DUP**	**ORIG**	**AVG**	**DUP**
MATRIX	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**4.5**	**4**	**4**	**4**	**4**	**4**	**4**
BOTTOM DEPTH	**14.5**	**14**	**14**	**14**	**14**	**14**	**14**
MISCELLANEOUS PARAMETERS (S.U.)							
PH	7.3	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (UG/L)							
CYANIDE	20 U	NA	NA	NA	NA	NA	NA
PESTICIDES/PCBS (UG/L)							
4,4'-DDD	0.1 U	0.026 UJ	0.027 U	0.028 UJ	NA	NA	NA
4,4'-DDE	0.1 U	0.026 U	0.027 U	0.028 U	NA	NA	NA
4,4'-DDT	0.1 U	0.028 UJ	0.029 U	0.03 UJ	NA	NA	NA
ALDRIN	0.052 U	0.02 U	0.021 U	0.022 U	NA	NA	NA
ALPHA-BHC	0.052 U	0.023 U	0.024 U	0.025 U	NA	NA	NA
ALPHA-CHLORDANE	0.052 U	0.018 U	0.0185 U	0.019 U	NA	NA	NA
AROCLOR-1016	1 U	0.11 U	0.115 U	0.12 U	NA	NA	NA
AROCLOR-1221	2.1 U	0.28 U	0.29 U	0.3 U	NA	NA	NA
AROCLOR-1232	1 U	0.3 U	0.31 U	0.32 U	NA	NA	NA
AROCLOR-1242	1 U	0.23 U	0.24 U	0.25 U	NA	NA	NA
AROCLOR-1248	1 U	0.12 U	0.125 U	0.13 U	NA	NA	NA
AROCLOR-1254	1 U	0.15 U	0.155 U	0.16 U	NA	NA	NA
AROCLOR-1260	1 U	0.11 UJ	0.115 U	0.12 UJ	NA	NA	NA
BETA-BHC	0.052 U	0.039 U	0.0405 U	0.042 U	NA	NA	NA
DELTA-BHC	0.052 U	0.027 UJ	0.028 U	0.029 UJ	NA	NA	NA
DIELDRIN	0.1 U	0.016 U	0.0165 U	0.017 U	NA	NA	NA
ENDOSULFAN I	0.052 U	0.017 U	0.0175 U	0.018 U	NA	NA	NA
ENDOSULFAN II	0.1 U	0.015 U	0.0155 U	0.016 U	NA	NA	NA
ENDOSULFAN SULFATE	0.1 U	0.021 UJ	0.022 U	0.023 UJ	NA	NA	NA
ENDRIN	0.1 U	0.017 U	0.0175 U	0.018 U	NA	NA	NA
ENDRIN ALDEHYDE	0.1 U	0.02 UJ	0.0205 U	0.021 UJ	NA	NA	NA
ENDRIN KETONE	0.1 U	0.019 UJ	0.0195 U	0.02 UJ	NA	NA	NA
GAMMA-BHC (LINDANE)	0.052 U	0.02 U	0.021 U	0.022 U	NA	NA	NA
GAMMA-CHLORDANE	0.052 U	0.018 U	0.0185 U	0.019 U	NA	NA	NA
HEPTACHLOR	0.052 U	0.022 U	0.023 U	0.024 U	NA	NA	NA
HEPTACHLOR EPOXIDE	0.052 U	0.021 U	0.022 U	0.023 U	NA	NA	NA
METHOXYCHLOR	0.52 U	0.042 U	0.043 U	0.044 U	NA	NA	NA
TOTAL AROCLOR HALFND	4.05	0.65	0.675	0.7	NA	NA	NA
TOTAL AROCLOR ZEROND	0 U	0 U	0 U	0 U	NA	NA	NA
TOXAPHENE	5.2 U	0.86 U	0.885 U	0.91 U	NA	NA	NA
PETROLEUM HYDROCARBONS (UG/L)							
DIESEL RANGE ORGANICS	190	NA	NA	NA	NA	NA	NA
GASOLINE RANGE ORGANICS	10 U	NA	NA	NA	NA	NA	NA

LOCATION		TP-MW07					
SAMPLE ID	TP-MW-06-11	TPGWMW070503	TPGWMW070503-AVG	TPGWMW070503-D	TPGWMW070503-F	TPGWMW070503-F-AVG	TPGWMW070503-F-D
SAMPLE DATE	19980730	20030509	20030509	20030509	20030509	20030509	20030509
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	ORIG	AVG	DUP
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	4.5	4	4	4	4	4	4
BOTTOM DEPTH	14.5	14	14	14	14	14	14
POLYCYCLIC AROMATIC HYDROCARBONS (UG/L)							
2-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHENE	10 UR	0.08 U	0.08 U	0.08 U	NA	NA	NA
ACENAPHTHYLENE	10 UR	0.05 U	0.05 U	0.05 U	NA	NA	NA
ANTHRACENE	10 UR	0.08 U	0.08 U	0.08 U	NA	NA	NA
BAP EQUIVALENT-HALFND	10 UR	0.08 U	0.085 U	0.09 U	NA	NA	NA
BAP EQUIVALENT-POS	0 UR	0 U	0 U	0 U	NA	NA	NA
BENZO(A)ANTHRACENE	10 UR	0.1 U	0.1 U	0.1 U	NA	NA	NA
BENZO(A)PYRENE	10 UR	0.08 U	0.085 U	0.09 U	NA	NA	NA
BENZO(B)FLUORANTHENE	10 UR	0.08 U	0.085 U	0.09 U	NA	NA	NA
BENZO(G,H,I)PERYLENE	10 UR	0.08 U	0.08 U	0.08 U	NA	NA	NA
BENZO(K)FLUORANTHENE	10 UR	0.08 U	0.08 U	0.08 U	NA	NA	NA
CHRYSENE	NA	NA	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	10 UR	0.1 U	0.1 U	0.1 U	NA	NA	NA
DIBENZOFURAN	10 UR	1 U	1 U	1 U	NA	NA	NA
FLUORANTHENE	10 UR	0.1 U	0.1 U	0.1 U	NA	NA	NA
FLUORENE	10 UR	0.06 U	0.06 U	0.06 U	NA	NA	NA
HIGH MOLECULAR WEIGHT PAHS	30	0.27	0.275	0.28	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	10 UR	0.09 U	0.095 U	0.1 U	NA	NA	NA
LOW MOLECULAR WEIGHT PAHS	35	0.24	0.24	0.24	NA	NA	NA
NAPHTHALENE	10 UR	0.05 U	0.05 U	0.05 U	NA	NA	NA
PHENANTHRENE	10 UR	0.08 U	0.08 U	0.08 U	NA	NA	NA
PYRENE	10 UR	0.08 U	0.085 U	0.09 U	NA	NA	NA
SEMIVOLATILES (UG/L)							
1,2,4-TRICHLOROBENZENE	10 UR	0.9 U	0.9 U	0.9 U	NA	NA	NA
1,2-DICHLOROBENZENE	10 UR	0.7 U	0.7 U	0.7 U	NA	NA	NA
1,3-DICHLOROBENZENE	10 UR	0.6 U	0.6 U	0.6 U	NA	NA	NA
1,4-DICHLOROBENZENE	10 UR	0.8 U	0.8 U	0.8 U	NA	NA	NA
2,2'-OXYBIS(1-CHLOROPROPANE)	10 UR	1 U	1 U	1 U	NA	NA	NA
2,4,5-TRICHLOROPHENOL	25 UR	2 U	2 U	2 U	NA	NA	NA
2,4,6-TRICHLOROPHENOL	10 UR	2 U	2 U	2 U	NA	NA	NA
2,4-DICHLOROPHENOL	10 UR	2 U	2 U	2 U	NA	NA	NA
2,4-DIMETHYLPHENOL	10 UR	2 U	2 U	2 U	NA	NA	NA
2,4-DINITROPHENOL	25 UR	5 U	5 U	5 U	NA	NA	NA
2,4-DINITROTOLUENE	10 UR	0.7 U	0.7 U	0.7 U	NA	NA	NA
2,6-DINITROTOLUENE	10 UR	2 U	2 U	2 U	NA	NA	NA
2-CHLORONAPHTHALENE	10 UR	3 U	3 U	3 U	NA	NA	NA
2-CHLOROPHENOL	10 UR	2 U	2 U	2 U	NA	NA	NA

LOCATION		TP-MW07					
SAMPLE ID	TP-MW-06-11	TPGWMW070503	TPGWMW070503-AVG	TPGWMW070503-D	TPGWMW070503-F	TPGWMW070503-F-AVG	TPGWMW070503-F-D
SAMPLE DATE	19980730	20030509	20030509	20030509	20030509	20030509	20030509
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	ORIG	AVG	DUP
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	4.5	4	4	4	4	4	4
BOTTOM DEPTH	14.5	14	14	14	14	14	14
2-METHYLNAPHTHALENE	10 UR	0.08 U	0.08 U	0.08 U	NA	NA	NA
2-METHYLPHENOL	10 UR	1 U	1 U	1 U	NA	NA	NA
2-NITROANILINE	25 UR	0.8 U	0.8 U	0.8 U	NA	NA	NA
2-NITROPHENOL	10 UR	2 U	2 U	2 U	NA	NA	NA
3,3'-DICHLOROBENZIDINE	10 UR	2 U	2 U	2 U	NA	NA	NA
3-NITROANILINE	25 UR	2 U	2 U	2 U	NA	NA	NA
4,6-DINITRO-2-METHYLPHENOL	25 UR	7 U	7 U	7 U	NA	NA	NA
4-BROMOPHENYL PHENYL ETHER	10 UR	1 U	1 U	1 U	NA	NA	NA
4-CHLORO-3-METHYLPHENOL	10 UR	1 U	1 U	1 U	NA	NA	NA
4-CHLOROANILINE	10 UR	1 U	1 U	1 U	NA	NA	NA
4-CHLOROPHENYL PHENYL ETHER	10 UR	1 U	1 U	1 U	NA	NA	NA
4-METHYLPHENOL	10 UR	2 U	2 U	2 U	NA	NA	NA
4-NITROANILINE	25 UR	2 U	2 U	2 U	NA	NA	NA
4-NITROPHENOL	25 UR	3 U	3 U	3 U	NA	NA	NA
BIS(2-CHLOROETHOXY)METHANE	10 UR	0.8 U	0.8 U	0.8 U	NA	NA	NA
BIS(2-CHLOROETHYL)ETHER	10 UR	1 U	1 U	1 U	NA	NA	NA
BIS(2-ETHYLHEXYL)PHTHALATE	10 U	9 U	9 U	9 U	NA	NA	NA
BUTYL BENZYL PHTHALATE	10 UR	0.7 U	0.75 U	0.8 U	NA	NA	NA
CARBAZOLE	10 UR	0.8 U	0.85 U	0.9 U	NA	NA	NA
CHRYSENE	10 UR	0.07 U	0.07 U	0.07 U	NA	NA	NA
DIETHYL PHTHALATE	10 UR	0.6 U	0.65 U	0.7 U	NA	NA	NA
DIMETHYL PHTHALATE	10 UR	0.7 U	0.75 U	0.8 U	NA	NA	NA
DI-N-BUTYL PHTHALATE	10 UR	2 U	2.5 U	3 U	NA	NA	NA
DI-N-OCTYL PHTHALATE	10 UR	1 U	1 U	1 U	NA	NA	NA
HEXACHLOROBENZENE	10 UR	0.7 U	0.7 U	0.7 U	NA	NA	NA
HEXACHLOROBUTADIENE	10 UR	2 U	2 U	2 U	NA	NA	NA
HEXACHLOROCYCLOPENTADIENE	10 UR	1 U	1 U	1 U	NA	NA	NA
HEXACHLOROETHANE	10 UR	2 U	2 U	2 U	NA	NA	NA
ISOPHORONE	10 UR	0.8 U	0.8 U	0.8 U	NA	NA	NA
NITROBENZENE	10 UR	1 U	1 U	1 U	NA	NA	NA
N-NITROSO-DI-N-PROPYLAMINE	10 UR	2 U	2 U	2 U	NA	NA	NA
N-NITROSODIPHENYLAMINE	10 UR	2 U	2 U	2 U	NA	NA	NA
PENTACHLOROPHENOL	25 UR	5 U	5 U	5 U	NA	NA	NA
PHENOL	10 UR	2 U	2 U	2 U	NA	NA	NA
VOLATILES (UG/L)							
1,1,1-TRICHLOROETHANE	10 U	NA	NA	NA	NA	NA	NA
1,1,2,2-TETRACHLOROETHANE	10 U	NA	NA	NA	NA	NA	NA
1,1,2-TRICHLOROETHANE	10 U	NA	NA	NA	NA	NA	NA
1,1,2-TRICHLOROTRIFLUOROETHANE	10 U	NA	NA	NA	NA	NA	NA

LOCATION		TP-MW07					
SAMPLE ID	TP-MW-06-11	TPGWMW070503	TPGWMW070503-AVG	TPGWMW070503-D	TPGWMW070503-F	TPGWMW070503-F-AVG	TPGWMW070503-F-D
SAMPLE DATE	19980730	20030509	20030509	20030509	20030509	20030509	20030509
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	ORIG	AVG	DUP
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	4.5	4	4	4	4	4	4
BOTTOM DEPTH	14.5	14	14	14	14	14	14
1,1-DICHLOROETHANE	10 U	NA	NA	NA	NA	NA	NA
1,1-DICHLOROETHENE	10 U	NA	NA	NA	NA	NA	NA
1,2-DICHLOROETHANE	10 U	NA	NA	NA	NA	NA	NA
1,2-DICHLOROPROPANE	10 U	NA	NA	NA	NA	NA	NA
2-BUTANONE	10 U	NA	NA	NA	NA	NA	NA
2-HEXANONE	10 U	NA	NA	NA	NA	NA	NA
4-METHYL-2-PENTANONE	10 U	NA	NA	NA	NA	NA	NA
ACETONE	10 U	NA	NA	NA	NA	NA	NA
BENZENE	10 U	NA	NA	NA	NA	NA	NA
BROMODICHLOROMETHANE	10 U	NA	NA	NA	NA	NA	NA
BROMOFORM	10 U	NA	NA	NA	NA	NA	NA
BROMOMETHANE	10 U	NA	NA	NA	NA	NA	NA
CARBON DISULFIDE	10 U	NA	NA	NA	NA	NA	NA
CARBON TETRACHLORIDE	10 U	NA	NA	NA	NA	NA	NA
CHLOROBENZENE	10 U	NA	NA	NA	NA	NA	NA
CHLORODIBROMOMETHANE	10 U	NA	NA	NA	NA	NA	NA
CHLOROETHANE	10 U	NA	NA	NA	NA	NA	NA
CHLOROFORM	10 U	NA	NA	NA	NA	NA	NA
CHLOROMETHANE	10 U	NA	NA	NA	NA	NA	NA
CIS-1,3-DICHLOROPROPENE	10 U	NA	NA	NA	NA	NA	NA
ETHYLBENZENE	10 U	NA	NA	NA	NA	NA	NA
METHYLENE CHLORIDE	10 U	NA	NA	NA	NA	NA	NA
STYRENE	10 U	NA	NA	NA	NA	NA	NA
TETRACHLOROETHENE	10 U	NA	NA	NA	NA	NA	NA
TOLUENE	10 U	NA	NA	NA	NA	NA	NA
TOTAL 1,2-DICHLOROETHENE	10 U	NA	NA	NA	NA	NA	NA
TOTAL XYLENES	10 U	NA	NA	NA	NA	NA	NA
TRANS-1,3-DICHLOROPROPENE	10 U	NA	NA	NA	NA	NA	NA
TRICHLOROETHENE	10 U	NA	NA	NA	NA	NA	NA
VINYL CHLORIDE	10 U	NA	NA	NA	NA	NA	NA

LOCATION					TP-MW08		
SAMPLE ID	TPGWMW071208	TPGWMW071208-AVG	TPGWMW071208-D	TP-MW-07-11	TPGWMW080503	TPGWMW080503-F	TPGWMW081208
SAMPLE DATE	20081219	20081219	20081215	19980730	20030507	20030507	20081216
SAMPLE CODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	4	4	4	4	6	6	6
BOTTOM DEPTH	14	14	14	14	13	13	13
DISSOLVED METALS (UG/L)							
ALUMINUM	56 U	56 U	56 U	NA	NA	121 U	56 U
ANTIMONY	4.6 U	4.6 U	4.6 U	NA	NA	6.7 U	4.6 U
ARSENIC	5.3 U	5.3 U	5.3 U	NA	NA	9 U	5.3 U
BARIUM	18.7 J	15.3	11.9 J	NA	NA	570	35.7 J
BERYLLIUM	0.13 U	0.13 U	0.13 U	NA	NA	1.2 U	0.13 U
CADMIUM	0.14 U	0.125	0.18 J	NA	NA	1.4 U	0.14 U
CALCIUM	270000	252500	235000	NA	NA	268000	285000
CHROMIUM	1.1 U	1.1 U	1.1 U	NA	NA	2.9 U	1.1 U
COBALT	1.2 U	1.05	1.5 J	NA	NA	7.1 U	1.2 U
COPPER	6.6 U	5.8 U	5 U	NA	NA	12 U	5 U
IRON	61 U	61 U	61 U	NA	NA	3710	61 U
LEAD	3.4 J	2.25	2.2 UJ	NA	NA	4.6 UJ	2.2 UJ
MAGNESIUM	962000	934500	907000	NA	NA	856000	953000
MANGANESE	0.96 UJ	0.96 U	0.96 U	NA	NA	1380	38 J
MERCURY	0.036	0.026	0.032 U	NA	NA	0.03 U	0.032 U
NICKEL	8.6	10	11.4 J	NA	NA	6 J	3.8
POTASSIUM	273000	274500	276000	NA	NA	311000	275000
SELENIUM	21.8	12.55	6.6 U	NA	NA	10.5 U	24.8
SILICON	NA	NA	NA	NA	NA	2490	NA
SILVER	0.59 U	0.59 U	0.59 UJ	NA	NA	2.9 U	0.59 UJ
SODIUM	7990000	7995000	8000000	NA	NA	8170000	7920000
THALLIUM	8.9 U	4.7 J	4.7 J	NA	NA	0.4 U	5.3 U
VANADIUM	0.96 UJ	0.96 U	0.96 U	NA	NA	1.8 U	0.96 UJ
ZINC	60.9	55.65	50.4	NA	NA	14.1 U	19.2 U
FIELD (C)							
TEMPERATURE	8.19	8.19	8.19	NA	NA	NA	7.04
FIELD (MG/L)							
DISSOLVED OXYGEN	8.4	8.4	8.4	NA	NA	NA	6.25
FIELD (MS/CM)							
SPECIFIC CONDUCTANCE	39.152	39.152	39.152	NA	NA	NA	38.895
FIELD (MV)							
OXIDATION REDUCTION POTENTIAL	182.5	182.5	182.5	NA	NA	NA	40.8
FIELD (NTU)							
TURBIDITY	0.55	0.55	0.55	NA	NA	NA	0
FIELD (PPT)							
SALINITY	24.73	24.73	24.73	NA	NA	NA	24.5
FIELD (S.U.)							
PH	7.57	7.57	7.57	NA	NA	NA	7.7

LOCATION					TP-MW08		
SAMPLE ID	TPGWMW071208	TPGWMW071208-AVG	TPGWMW071208-D	TP-MW-07-11	TPGWMW080503	TPGWMW080503-F	TPGWMW081208
SAMPLE DATE	20081219	20081219	20081215	19980730	20030507	20030507	20081216
SAMPLE CODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	4	4	4	4	6	6	6
BOTTOM DEPTH	14	14	14	14	13	13	13
METALS (UG/L)							
ALUMINUM	56 U	56 U	56 U	154 U	14500	NA	56 U
ANTIMONY	4.6 U	4.6 U	4.6 U	39.6 U	8.5 U	NA	4.6 U
ARSENIC	5.3 U	5.3 U	5.3 U	37 U	27.4	NA	5.3 U
BARIUM	19.7 J	18.45	17.2	16.6 U	556	NA	30.5 J
BERYLLIUM	0.13 U	0.13 U	0.13 U	1.6 U	2.4 U	NA	0.13 U
CADMIUM	0.14 U	0.295 U	0.45 U	2.3 UJ	1.5 J	NA	0.14 U
CALCIUM	265000	261000	257000	376000	248000	NA	275000
CHROMIUM	1.1 U	1.1 U	1.1 U	11.6 U	27.4	NA	1.1 U
COBALT	1.2 U	1.2 U	1.2 UJ	2.7 U	12 U	NA	1.2 U
COPPER	5 U	5 U	5 U	28.2 U	333	NA	5 U
IRON	61 U	61 U	61 U	199 U	21800	NA	61 U
LEAD	2.2 UJ	2.2 U	2.2 U	26.2 UJ	99.6	NA	2.2 UJ
MAGNESIUM	917000	878000	839000	1230000	776000	NA	911000
MANGANESE	0.96 U	0.96 U	0.96 U	3 UJ	1600	NA	42.7 J
MERCURY	0.032 UJ	0.032 U	0.032 UJ	0.03 J	0.17	NA	0.032 UJ
NICKEL	8.4	6.175	7.9 U	42.9 U	31.5	NA	4.3
POTASSIUM	279000	278500	278000	448000	269000	NA	286000
SELENIUM	8 J	13.8	19.6 J	63.8 U	10.5 U	NA	6.6 UJ
SILICON	NA	NA	NA	NA	20600	NA	NA
SILVER	0.59 U	0.59 U	0.59 UJ	2.7 U	2.9 U	NA	0.59 U
SODIUM	7780000	7770000	7760000	9580000	7350000	NA	8070000
THALLIUM	6 J	17.15	28.3 J	66.1 J	0.59 U	NA	5.4 J
VANADIUM	0.96 UJ	0.96 U	0.96 UJ	6.1 U	25.8	NA	0.96 UJ
ZINC	52.3	52.3	52.7 U	92.8 U	179	NA	21.6
MISCELLANEOUS PARAMETERS (MG/L)							
ALKALINITY	NA	NA	NA	NA	NA	NA	NA
BROMIDE	NA	NA	NA	51	NA	NA	NA
CARBONATE ALKALINITY	NA	NA	NA	110	NA	NA	NA
CHLORIDE	NA	NA	NA	14000 J	NA	NA	NA
NITRATE	NA	NA	NA	0.24 J	NA	NA	NA
SULFATE	NA	NA	NA	2200	NA	NA	NA
TOTAL DISSOLVED SOLIDS	NA	NA	NA	NA	25000	NA	NA
TOTAL ORGANIC CARBON	NA	NA	NA	1.7	NA	NA	NA
TOTAL ORGANIC HALIDES	NA	NA	NA	NA	NA	NA	NA
TOTAL SUSPENDED SOLIDS	42	35	28	NA	440 J	NA	35
MISCELLANEOUS PARAMETERS (PPT)							
SALINITY	NA	NA	NA	24	NA	NA	NA

LOCATION					TP-MW08		
SAMPLE ID	TPGWMW071208	TPGWMW071208-AVG	TPGWMW071208-D	TP-MW-07-11	TPGWMW080503	TPGWMW080503-F	TPGWMW081208
SAMPLE DATE	20081219	20081219	20081215	19980730	20030507	20030507	20081216
SAMPLE CODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	4	4	4	4	6	6	6
BOTTOM DEPTH	14	14	14	14	13	13	13
MISCELLANEOUS PARAMETERS (S.U.)							
PH	NA	NA	NA	7.4	NA	NA	NA
MISCELLANEOUS PARAMETERS (UG/L)							
CYANIDE	NA	NA	NA	20 U	NA	NA	NA
PESTICIDES/PCBS (UG/L)							
4,4'-DDD	NA	NA	NA	0.1 U	0.026 U	NA	NA
4,4'-DDE	NA	NA	NA	0.1 U	0.026 U	NA	NA
4,4'-DDT	NA	NA	NA	0.1 U	0.028 U	NA	NA
ALDRIN	NA	NA	NA	0.052 U	0.021 U	NA	NA
ALPHA-BHC	NA	NA	NA	0.052 U	0.024 U	NA	NA
ALPHA-CHLORDANE	NA	NA	NA	0.052 U	0.018 U	NA	NA
AROCLOR-1016	NA	NA	NA	1 U	0.11 U	NA	NA
AROCLOR-1221	NA	NA	NA	2.1 U	0.28 U	NA	NA
AROCLOR-1232	NA	NA	NA	1 U	0.3 U	NA	NA
AROCLOR-1242	NA	NA	NA	1 U	0.24 U	NA	NA
AROCLOR-1248	NA	NA	NA	1 U	0.12 U	NA	NA
AROCLOR-1254	NA	NA	NA	1 U	0.15 U	NA	NA
AROCLOR-1260	NA	NA	NA	1 U	0.11 U	NA	NA
BETA-BHC	NA	NA	NA	0.052 U	0.04 U	NA	NA
DELTA-BHC	NA	NA	NA	0.052 U	0.027 U	NA	NA
DIELDRIN	NA	NA	NA	0.1 U	0.016 U	NA	NA
ENDOSULFAN I	NA	NA	NA	0.052 U	0.017 U	NA	NA
ENDOSULFAN II	NA	NA	NA	0.1 U	0.015 U	NA	NA
ENDOSULFAN SULFATE	NA	NA	NA	0.1 U	0.022 U	NA	NA
ENDRIN	NA	NA	NA	0.1 U	0.017 U	NA	NA
ENDRIN ALDEHYDE	NA	NA	NA	0.1 U	0.02 U	NA	NA
ENDRIN KETONE	NA	NA	NA	0.1 U	0.019 U	NA	NA
GAMMA-BHC (LINDANE)	NA	NA	NA	0.052 U	0.021 U	NA	NA
GAMMA-CHLORDANE	NA	NA	NA	0.052 U	0.018 U	NA	NA
HEPTACHLOR	NA	NA	NA	0.052 U	0.023 U	NA	NA
HEPTACHLOR EPOXIDE	NA	NA	NA	0.052 U	0.022 U	NA	NA
METHOXYCHLOR	NA	NA	NA	0.52 U	0.042 U	NA	NA
TOTAL AROCLOR HALFND	NA	NA	NA	4.05	0.66	NA	NA
TOTAL AROCLOR ZEROND	NA	NA	NA	0 U	0 U	NA	NA
TOXAPHENE	NA	NA	NA	5.2 U	0.87 U	NA	NA
PETROLEUM HYDROCARBONS (UG/L)							
DIESEL RANGE ORGANICS	NA	NA	NA	50 U	NA	NA	NA
GASOLINE RANGE ORGANICS	NA	NA	NA	10 U	NA	NA	NA

LOCATION					TP-MW08		
SAMPLE ID	TPGWMW071208	TPGWMW071208-AVG	TPGWMW071208-D	TP-MW-07-11	TPGWMW080503	TPGWMW080503-F	TPGWMW081208
SAMPLE DATE	20081219	20081219	20081215	19980730	20030507	20030507	20081216
SAMPLE CODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	4	4	4	4	6	6	6
BOTTOM DEPTH	14	14	14	14	13	13	13
POLYCYCLIC AROMATIC HYDROCARBONS (UG/L)							
2-METHYLNAPHTHALENE	0.1 U	0.1 U	0.1 U	NA	NA	NA	0.1 U
ACENAPHTHENE	0.1 U	0.1 U	0.1 U	10 U	0.07 U	NA	0.1 U
ACENAPHTHYLENE	0.1 U	0.1 U	0.1 U	10 U	0.05 U	NA	0.1 U
ANTHRACENE	0.1 U	0.1 U	0.1 U	10 U	0.07 U	NA	0.1 U
BAP EQUIVALENT-HALFND	0.1 U	0.1 U	0.1 U	10 U	0.08 U	NA	0.1 U
BAP EQUIVALENT-POS	0 U	0 U	0 U	0 U	0 U	NA	0 U
BENZO(A)ANTHRACENE	0.1 U	0.1 U	0.1 U	10 U	0.1 U	NA	0.1 U
BENZO(A)PYRENE	0.1 U	0.1 U	0.1 U	10 U	0.08 U	NA	0.1 U
BENZO(B)FLUORANTHENE	0.1 U	0.1 U	0.1 U	10 U	0.08 U	NA	0.1 U
BENZO(G,H,I)PERYLENE	0.1 U	0.1 U	0.1 U	10 U	0.07 U	NA	0.1 U
BENZO(K)FLUORANTHENE	0.1 U	0.1 U	0.1 U	10 U	0.07 U	NA	0.1 U
CHRYSENE	0.1 U	0.1 U	0.1 U	NA	NA	NA	0.1 U
DIBENZO(A,H)ANTHRACENE	0.1 U	0.1 U	0.1 U	10 U	0.1 U	NA	0.1 U
DIBENZOFURAN	NA	NA	NA	10 U	1 U	NA	NA
FLUORANTHENE	0.1 U	0.1 U	0.1 U	10 U	0.1 U	NA	0.1 U
FLUORENE	0.1 U	0.1 U	0.1 U	10 U	0.06 U	NA	0.1 U
HIGH MOLECULAR WEIGHT PAHS	0.3 U	0.3 U	0.3 U	30	0.26	NA	0.3 U
INDENO(1,2,3-CD)PYRENE	0.1 U	0.1 U	0.1 U	10 U	0.09 U	NA	0.1 U
LOW MOLECULAR WEIGHT PAHS	0.35	0.35	0.35	35	0.22	NA	0.35
NAPHTHALENE	0.1 U	0.1 U	0.1 U	10 U	0.05 U	NA	0.1 U
PHENANTHRENE	0.1 U	0.1 U	0.1 U	10 U	0.07 U	NA	0.1 U
PYRENE	0.1 U	0.1 U	0.1 U	10 U	0.08 U	NA	0.1 U
SEMIVOLATILES (UG/L)							
1,2,4-TRICHLOROBENZENE	NA	NA	NA	10 U	0.8 U	NA	NA
1,2-DICHLOROBENZENE	NA	NA	NA	10 U	0.7 U	NA	NA
1,3-DICHLOROBENZENE	NA	NA	NA	10 U	0.6 U	NA	NA
1,4-DICHLOROBENZENE	NA	NA	NA	10 U	0.8 U	NA	NA
2,2'-OXYBIS(1-CHLOROPROPANE)	NA	NA	NA	10 U	1 U	NA	NA
2,4,5-TRICHLOROPHENOL	NA	NA	NA	25 U	2 UJ	NA	NA
2,4,6-TRICHLOROPHENOL	NA	NA	NA	10 U	2 UJ	NA	NA
2,4-DICHLOROPHENOL	NA	NA	NA	10 U	2 UJ	NA	NA
2,4-DIMETHYLPHENOL	NA	NA	NA	10 U	2 UJ	NA	NA
2,4-DINITROPHENOL	NA	NA	NA	25 UJ	5 UJ	NA	NA
2,4-DINITROTOLUENE	NA	NA	NA	10 U	0.7 U	NA	NA
2,6-DINITROTOLUENE	NA	NA	NA	10 U	1 U	NA	NA
2-CHLORONAPHTHALENE	NA	NA	NA	10 U	3 U	NA	NA
2-CHLOROPHENOL	NA	NA	NA	10 UJ	2 UJ	NA	NA

LOCATION					TP-MW08		
SAMPLE ID	TPGWMW071208	TPGWMW071208-AVG	TPGWMW071208-D	TP-MW-07-11	TPGWMW080503	TPGWMW080503-F	TPGWMW081208
SAMPLE DATE	20081219	20081219	20081215	19980730	20030507	20030507	20081216
SAMPLE CODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	4	4	4	4	6	6	6
BOTTOM DEPTH	14	14	14	14	13	13	13
2-METHYLNAPHTHALENE	NA	NA	NA	10 UJ	0.07 U	NA	NA
2-METHYLPHENOL	NA	NA	NA	10 U	1 UJ	NA	NA
2-NITROANILINE	NA	NA	NA	25 U	0.8 U	NA	NA
2-NITROPHENOL	NA	NA	NA	10 U	2 UJ	NA	NA
3,3'-DICHLOROBENZIDINE	NA	NA	NA	10 UJ	2 U	NA	NA
3-NITROANILINE	NA	NA	NA	25 U	2 U	NA	NA
4,6-DINITRO-2-METHYLPHENOL	NA	NA	NA	25 U	7 UJ	NA	NA
4-BROMOPHENYL PHENYL ETHER	NA	NA	NA	10 U	1 U	NA	NA
4-CHLORO-3-METHYLPHENOL	NA	NA	NA	10 U	1 UJ	NA	NA
4-CHLOROANILINE	NA	NA	NA	10 U	1 U	NA	NA
4-CHLOROPHENYL PHENYL ETHER	NA	NA	NA	10 U	1 U	NA	NA
4-METHYLPHENOL	NA	NA	NA	10 U	2 UJ	NA	NA
4-NITROANILINE	NA	NA	NA	25 U	2 U	NA	NA
4-NITROPHENOL	NA	NA	NA	25 U	2 UJ	NA	NA
BIS(2-CHLOROETHOXY)METHANE	NA	NA	NA	10 U	0.8 U	NA	NA
BIS(2-CHLOROETHYL)ETHER	NA	NA	NA	10 U	1 U	NA	NA
BIS(2-ETHYLHEXYL)PHTHALATE	NA	NA	NA	10 U	8 U	NA	NA
BUTYL BENZYL PHTHALATE	NA	NA	NA	10 U	0.7 U	NA	NA
CARBAZOLE	NA	NA	NA	10 U	0.8 U	NA	NA
CHRYSENE	NA	NA	NA	10 U	0.06 U	NA	NA
DIETHYL PHTHALATE	NA	NA	NA	10 U	0.6 U	NA	NA
DIMETHYL PHTHALATE	NA	NA	NA	10 U	0.7 U	NA	NA
DI-N-BUTYL PHTHALATE	NA	NA	NA	10 U	2 U	NA	NA
DI-N-OCTYL PHTHALATE	NA	NA	NA	10 U	1 U	NA	NA
HEXACHLOROBENZENE	NA	NA	NA	10 U	0.7 U	NA	NA
HEXACHLOROBUTADIENE	NA	NA	NA	10 U	2 U	NA	NA
HEXACHLOROCYCLOPENTADIENE	NA	NA	NA	10 U	1 U	NA	NA
HEXACHLOROETHANE	NA	NA	NA	10 U	2 U	NA	NA
ISOPHORONE	NA	NA	NA	10 U	0.8 U	NA	NA
NITROBENZENE	NA	NA	NA	10 U	1 U	NA	NA
N-NITROSO-DI-N-PROPYLAMINE	NA	NA	NA	10 U	2 U	NA	NA
N-NITROSODIPHENYLAMINE	NA	NA	NA	10 U	2 U	NA	NA
PENTACHLOROPHENOL	NA	NA	NA	25 UJ	5 UJ	NA	NA
PHENOL	NA	NA	NA	10 U	2 UJ	NA	NA
VOLATILES (UG/L)							
1,1,1-TRICHLOROETHANE	NA	NA	NA	10 U	NA	NA	NA
1,1,2,2-TETRACHLOROETHANE	NA	NA	NA	10 U	NA	NA	NA
1,1,2-TRICHLOROETHANE	NA	NA	NA	10 U	NA	NA	NA
1,1,2-TRICHLOROTRIFLUOROETHANE	NA	NA	NA	10 U	NA	NA	NA

LOCATION					TP-MW08		
SAMPLE ID	TPGWMW071208	TPGWMW071208-AVG	TPGWMW071208-D	TP-MW-07-11	TPGWMW080503	TPGWMW080503-F	TPGWMW081208
SAMPLE DATE	20081219	20081219	20081215	19980730	20030507	20030507	20081216
SAMPLE CODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	4	4	4	4	6	6	6
BOTTOM DEPTH	14	14	14	14	13	13	13
1,1-DICHLOROETHANE	NA	NA	NA	10 U	NA	NA	NA
1,1-DICHLOROETHENE	NA	NA	NA	10 U	NA	NA	NA
1,2-DICHLOROETHANE	NA	NA	NA	10 U	NA	NA	NA
1,2-DICHLOROPROPANE	NA	NA	NA	10 U	NA	NA	NA
2-BUTANONE	NA	NA	NA	10 U	NA	NA	NA
2-HEXANONE	NA	NA	NA	10 U	NA	NA	NA
4-METHYL-2-PENTANONE	NA	NA	NA	10 U	NA	NA	NA
ACETONE	NA	NA	NA	10 UJ	NA	NA	NA
BENZENE	NA	NA	NA	10 U	NA	NA	NA
BROMODICHLOROMETHANE	NA	NA	NA	10 U	NA	NA	NA
BROMOFORM	NA	NA	NA	10 U	NA	NA	NA
BROMOMETHANE	NA	NA	NA	10 U	NA	NA	NA
CARBON DISULFIDE	NA	NA	NA	10 U	NA	NA	NA
CARBON TETRACHLORIDE	NA	NA	NA	10 U	NA	NA	NA
CHLOROBENZENE	NA	NA	NA	10 U	NA	NA	NA
CHLORODIBROMOMETHANE	NA	NA	NA	10 U	NA	NA	NA
CHLOROETHANE	NA	NA	NA	10 U	NA	NA	NA
CHLOROFORM	NA	NA	NA	10 U	NA	NA	NA
CHLOROMETHANE	NA	NA	NA	10 U	NA	NA	NA
CIS-1,3-DICHLOROPROPENE	NA	NA	NA	10 U	NA	NA	NA
ETHYLBENZENE	NA	NA	NA	10 U	NA	NA	NA
METHYLENE CHLORIDE	NA	NA	NA	10 U	NA	NA	NA
STYRENE	NA	NA	NA	10 U	NA	NA	NA
TETRACHLOROETHENE	NA	NA	NA	10 U	NA	NA	NA
TOLUENE	NA	NA	NA	10 U	NA	NA	NA
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA	10 U	NA	NA	NA
TOTAL XYLENES	NA	NA	NA	10 U	NA	NA	NA
TRANS-1,3-DICHLOROPROPENE	NA	NA	NA	10 U	NA	NA	NA
TRICHLOROETHENE	NA	NA	NA	10 U	NA	NA	NA
VINYL CHLORIDE	NA	NA	NA	10 U	NA	NA	NA

LOCATION	TP-MW09					
SAMPLE ID	TPGWMW090503	TPGWMW090503-F	TPGWMW091208	TPGWMW091208-AVG	TPGWMW091208-D	TPGWMW100503
SAMPLE DATE	20030507	20030507	20081215	20081215	20081215	20030509
SAMPLE CODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA
TOP DEPTH	4	4	4	4	4	6
BOTTOM DEPTH	14	14	14	14	14	13
DISSOLVED METALS (UG/L)						
ALUMINUM	NA	101 U	56 U	56 U	56 U	NA
ANTIMONY	NA	1.3 U	4.6 U	4.6 U	4.6 U	NA
ARSENIC	NA	7.2	5.3 U	5.3 U	5.3 U	NA
BARIUM	NA	145	138 J	134	130	NA
BERYLLIUM	NA	0.48 U	0.13 U	0.13 U	0.13 U	NA
CADMIUM	NA	0.28 U	0.14 U	0.105	0.14 J	NA
CALCIUM	NA	96000	69500	71000	72500	NA
CHROMIUM	NA	0.93 U	1.1 U	1.1 U	1.1 U	NA
COBALT	NA	1.5 U	1.2 U	1.2 U	1.2 U	NA
COPPER	NA	2.3 U	5 U	5 U	5 U	NA
IRON	NA	880	954	878.5	803	NA
LEAD	NA	0.91 UJ	2.2 U	2.2 U	2.2 U	NA
MAGNESIUM	NA	33700	79200	78800	78400	NA
MANGANESE	NA	994	522	531	540	NA
MERCURY	NA	0.08 U	0.032 U	0.032 U	0.032 U	NA
NICKEL	NA	4.5	2.5 J	3.25	4	NA
POTASSIUM	NA	14800	30000	30350	30700	NA
SELENIUM	NA	2.2 J	10.4 J	6.85	6.6 U	NA
SILICON	NA	2400	NA	NA	NA	NA
SILVER	NA	0.57 U	0.59 U	0.59 U	0.59 U	NA
SODIUM	NA	446000	998000	985000	972000	NA
THALLIUM	NA	0.1 U	4.2 UJ	4.2 U	4.2 U	NA
VANADIUM	NA	0.39 U	0.96 U	0.96 U	0.96 U	NA
ZINC	NA	6.9	11.4 U	11	16.3	NA
FIELD (C)						
TEMPERATURE	NA	NA	12.76	12.76	12.76	NA
FIELD (MG/L)						
DISSOLVED OXYGEN	NA	NA	0.65	0.65	0.65	NA
FIELD (MS/CM)						
SPECIFIC CONDUCTANCE	NA	NA	5.315	5.315	5.315	NA
FIELD (MV)						
OXIDATION REDUCTION POTENTIAL	NA	NA	169.8	169.8	169.8	NA
FIELD (NTU)						
TURBIDITY	NA	NA	0	0	0	NA
FIELD (PPT)						
SALINITY	NA	NA	2.89	2.89	2.89	NA
FIELD (S.U.)						
PH	NA	NA	7.64	7.64	7.64	NA

LOCATION	TP-MW09					
SAMPLE ID	TPGWMW090503	TPGWMW090503-F	TPGWMW091208	TPGWMW091208-AVG	TPGWMW091208-D	TPGWMW100503
SAMPLE DATE	20030507	20030507	20081215	20081215	20081215	20030509
SAMPLE CODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA
TOP DEPTH	4	4	4	4	4	6
BOTTOM DEPTH	14	14	14	14	14	13
METALS (UG/L)						
ALUMINUM	101 U	NA	56 U	56 U	56 U	86.1 U
ANTIMONY	1.3 U	NA	4.6 U	4.6 U	4.6 U	6.7 U
ARSENIC	6.7	NA	5.3 U	5.3 U	5.3 U	9 U
BARIUM	141	NA	150 J	145.5	141	32.4
BERYLLIUM	0.72 U	NA	0.13 U	0.13 U	0.13 U	1.2 U
CADMIUM	0.28 U	NA	0.14 U	0.15 U	0.16 U	1.4 U
CALCIUM	93500	NA	74000	72750	71500	297000
CHROMIUM	2.1 U	NA	1.1 U	1.1 U	1.1 U	2.9 U
COBALT	1.4 U	NA	1.2 U	1.2 U	1.2 U	2.2 U
COPPER	12.8 U	NA	5 U	5 U	5 U	4.6 U
IRON	886	NA	862 J	627.75	787 U	34.3 U
LEAD	0.91 UJ	NA	2.2 U	2.2 U	2.2 U	4.6 U
MAGNESIUM	32200	NA	84600	82750	80900	776000
MANGANESE	1000	NA	561	537.5	514	25.8 U
MERCURY	0.1 U	NA	0.032 UJ	0.032 U	0.032 UJ	0.12 U
NICKEL	4.3	NA	2.8 J	2.8 J	3 U	11.7 U
POTASSIUM	14300	NA	31400	31000	30600	280000
SELENIUM	2.1 U	NA	6.6 U	5.3	7.3 J	10.5 U
SILICON	2320	NA	NA	NA	NA	1890 J
SILVER	0.57 U	NA	0.59 U	0.59 U	0.59 U	2.9 U
SODIUM	433000	NA	1000000	956000	912000	6840000
THALLIUM	0.11 U	NA	4.2 UJ	4.2 U	4.2 U	9.6 U
VANADIUM	0.48 U	NA	0.96 U	0.96 U	0.96 U	1.8 U
ZINC	12.6	NA	18.7	13.425	16.3 U	63.7 J
MISCELLANEOUS PARAMETERS (MG/L)						
ALKALINITY	NA	NA	NA	NA	NA	NA
BROMIDE	NA	NA	NA	NA	NA	NA
CARBONATE ALKALINITY	NA	NA	NA	NA	NA	NA
CHLORIDE	NA	NA	NA	NA	NA	NA
NITRATE	NA	NA	NA	NA	NA	NA
SULFATE	NA	NA	NA	NA	NA	NA
TOTAL DISSOLVED SOLIDS	1600	NA	NA	NA	NA	13000
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA
TOTAL ORGANIC HALIDES	NA	NA	NA	NA	NA	NA
TOTAL SUSPENDED SOLIDS	5 J	NA	10 U	10 U	10 U	12
MISCELLANEOUS PARAMETERS (PPT)						
SALINITY	NA	NA	NA	NA	NA	NA

LOCATION	TP-MW09					
SAMPLE ID	TPGWMW090503	TPGWMW090503-F	TPGWMW091208	TPGWMW091208-AVG	TPGWMW091208-D	TPGWMW100503
SAMPLE DATE	20030507	20030507	20081215	20081215	20081215	20030509
SAMPLE CODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA
TOP DEPTH	4	4	4	4	4	6
BOTTOM DEPTH	14	14	14	14	14	13
MISCELLANEOUS PARAMETERS (S.U.)						
PH	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (UG/L)						
CYANIDE	NA	NA	NA	NA	NA	NA
PESTICIDES/PCBS (UG/L)						
4,4'-DDD	0.026 U	NA	NA	NA	NA	0.026 UJ
4,4'-DDE	0.026 U	NA	NA	NA	NA	0.026 U
4,4'-DDT	0.028 U	NA	NA	NA	NA	0.028 UJ
ALDRIN	0.021 U	NA	NA	NA	NA	0.02 U
ALPHA-BHC	0.024 U	NA	NA	NA	NA	0.023 U
ALPHA-CHLORDANE	0.018 U	NA	NA	NA	NA	0.018 U
AROCLOR-1016	0.11 U	NA	NA	NA	NA	0.11 U
AROCLOR-1221	0.28 U	NA	NA	NA	NA	0.28 U
AROCLOR-1232	0.3 U	NA	NA	NA	NA	0.3 U
AROCLOR-1242	0.24 U	NA	NA	NA	NA	0.23 U
AROCLOR-1248	0.12 U	NA	NA	NA	NA	0.12 U
AROCLOR-1254	0.15 U	NA	NA	NA	NA	0.15 U
AROCLOR-1260	0.11 U	NA	NA	NA	NA	0.11 UJ
BETA-BHC	0.04 U	NA	NA	NA	NA	0.039 U
DELTA-BHC	0.027 U	NA	NA	NA	NA	0.027 UJ
DIELDRIN	0.016 U	NA	NA	NA	NA	0.016 U
ENDOSULFAN I	0.017 U	NA	NA	NA	NA	0.017 U
ENDOSULFAN II	0.015 U	NA	NA	NA	NA	0.015 U
ENDOSULFAN SULFATE	0.022 U	NA	NA	NA	NA	0.021 UJ
ENDRIN	0.017 U	NA	NA	NA	NA	0.017 U
ENDRIN ALDEHYDE	0.02 U	NA	NA	NA	NA	0.02 UJ
ENDRIN KETONE	0.019 U	NA	NA	NA	NA	0.019 UJ
GAMMA-BHC (LINDANE)	0.021 U	NA	NA	NA	NA	0.02 U
GAMMA-CHLORDANE	0.018 U	NA	NA	NA	NA	0.018 U
HEPTACHLOR	0.023 U	NA	NA	NA	NA	0.022 U
HEPTACHLOR EPOXIDE	0.022 U	NA	NA	NA	NA	0.021 U
METHOXYCHLOR	0.042 U	NA	NA	NA	NA	0.042 U
TOTAL AROCLOR HALFND	0.66	NA	NA	NA	NA	0.65
TOTAL AROCLOR ZEROND	0 U	NA	NA	NA	NA	0 U
TOXAPHENE	0.87 U	NA	NA	NA	NA	0.86 U
PETROLEUM HYDROCARBONS (UG/L)						
DIESEL RANGE ORGANICS	NA	NA	NA	NA	NA	NA
GASOLINE RANGE ORGANICS	NA	NA	NA	NA	NA	NA

LOCATION	TP-MW09					
SAMPLE ID	TPGWMW090503	TPGWMW090503-F	TPGWMW091208	TPGWMW091208-AVG	TPGWMW091208-D	TPGWMW100503
SAMPLE DATE	20030507	20030507	20081215	20081215	20081215	20030509
SAMPLE CODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA
TOP DEPTH	4	4	4	4	4	6
BOTTOM DEPTH	14	14	14	14	14	13
POLYCYCLIC AROMATIC HYDROCARBONS (UG/L)						
2-METHYLNAPHTHALENE	NA	NA	0.1 U	0.1 U	0.1 U	NA
ACENAPHTHENE	0.4	NA	0.1 U	0.1 U	0.1 U	0.08 U
ACENAPHTHYLENE	0.1 J	NA	0.1 U	0.1 U	0.1 U	0.05 U
ANTHRACENE	0.6	NA	0.1 U	0.1 U	0.1 U	0.08 U
BAP EQUIVALENT-HALFND	0.08 U	NA	0.1 U	0.1 U	0.1 U	0.08 U
BAP EQUIVALENT-POS	0 U	NA	0 U	0 U	0 U	0 U
BENZO(A)ANTHRACENE	0.1 U	NA	0.1 U	0.1 U	0.1 U	0.1 U
BENZO(A)PYRENE	0.08 U	NA	0.1 U	0.1 U	0.1 U	0.08 U
BENZO(B)FLUORANTHENE	0.08 U	NA	0.1 U	0.1 U	0.1 UJ	0.08 U
BENZO(G,H,I)PERYLENE	0.08 U	NA	0.1 U	0.1 U	0.1 U	0.08 U
BENZO(K)FLUORANTHENE	0.08 U	NA	0.1 U	0.1 U	0.1 U	0.08 U
CHRYSENE	NA	NA	0.1 U	0.1 U	0.1 U	NA
DIBENZO(A,H)ANTHRACENE	0.1 U	NA	0.1 U	0.1 U	0.1 U	0.1 U
DIBENZOFURAN	1 U	NA	NA	NA	NA	1 U
FLUORANTHENE	0.9	NA	0.1 U	0.1 U	0.1 U	0.1 U
FLUORENE	0.9	NA	0.1 U	0.1 U	0.1 U	0.06 U
HIGH MOLECULAR WEIGHT PAHS	1.48	NA	0.3 U	0.3 U	0.3 U	0.27
INDENO(1,2,3-CD)PYRENE	0.1 U	NA	0.1 U	0.1 U	0.1 U	0.1 U
LOW MOLECULAR WEIGHT PAHS	4.5	NA	0.32	0.32	0.32	0.24
NAPHTHALENE	0.3	NA	0.022 J	0.0215	0.021 J	0.05 U
PHENANTHRENE	2	NA	0.1 U	0.1 U	0.1 U	0.08 U
PYRENE	0.4	NA	0.1 U	0.1 U	0.1 U	0.08 U
SEMIVOLATILES (UG/L)						
1,2,4-TRICHLOROBENZENE	0.9 U	NA	NA	NA	NA	0.9 U
1,2-DICHLOROBENZENE	0.7 U	NA	NA	NA	NA	0.7 U
1,3-DICHLOROBENZENE	0.6 U	NA	NA	NA	NA	0.6 U
1,4-DICHLOROBENZENE	0.8 U	NA	NA	NA	NA	0.8 U
2,2'-OXYBIS(1-CHLOROPROPANE)	1 U	NA	NA	NA	NA	1 U
2,4,5-TRICHLOROPHENOL	2 U	NA	NA	NA	NA	2 U
2,4,6-TRICHLOROPHENOL	2 U	NA	NA	NA	NA	2 U
2,4-DICHLOROPHENOL	2 U	NA	NA	NA	NA	2 U
2,4-DIMETHYLPHENOL	2 U	NA	NA	NA	NA	2 U
2,4-DINITROPHENOL	5 UJ	NA	NA	NA	NA	5 U
2,4-DINITROTOLUENE	0.7 U	NA	NA	NA	NA	0.7 U
2,6-DINITROTOLUENE	2 U	NA	NA	NA	NA	2 U
2-CHLORONAPHTHALENE	3 U	NA	NA	NA	NA	3 U
2-CHLOROPHENOL	2 U	NA	NA	NA	NA	2 U

LOCATION	TP-MW09					
SAMPLE ID	**TPGWMW090503**	**TPGWMW090503-F**	**TPGWMW091208**	**TPGWMW091208-AVG**	**TPGWMW091208-D**	**TPGWMW100503**
SAMPLE DATE	**20030507**	**20030507**	**20081215**	**20081215**	**20081215**	**20030509**
SAMPLE CODE	**NORMAL**	**NORMAL**	**ORIG**	**AVG**	**DUP**	**NORMAL**
MATRIX	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**4**	**4**	**4**	**4**	**4**	**6**
BOTTOM DEPTH	**14**	**14**	**14**	**14**	**14**	**13**
2-METHYLNAPHTHALENE	0.2 J	NA	NA	NA	NA	0.08 U
2-METHYLPHENOL	1 U	NA	NA	NA	NA	1 U
2-NITROANILINE	0.8 U	NA	NA	NA	NA	0.8 U
2-NITROPHENOL	2 U	NA	NA	NA	NA	2 U
3,3'-DICHLOROBENZIDINE	2 U	NA	NA	NA	NA	2 U
3-NITROANILINE	2 U	NA	NA	NA	NA	2 U
4,6-DINITRO-2-METHYLPHENOL	7 UJ	NA	NA	NA	NA	7 U
4-BROMOPHENYL PHENYL ETHER	1 U	NA	NA	NA	NA	1 U
4-CHLORO-3-METHYLPHENOL	1 U	NA	NA	NA	NA	1 U
4-CHLOROANILINE	1 U	NA	NA	NA	NA	1 U
4-CHLOROPHENYL PHENYL ETHER	1 U	NA	NA	NA	NA	1 U
4-METHYLPHENOL	2 U	NA	NA	NA	NA	2 U
4-NITROANILINE	2 U	NA	NA	NA	NA	2 U
4-NITROPHENOL	3 U	NA	NA	NA	NA	3 U
BIS(2-CHLOROETHOXY)METHANE	0.8 U	NA	NA	NA	NA	0.8 U
BIS(2-CHLOROETHYL)ETHER	1 U	NA	NA	NA	NA	1 U
BIS(2-ETHYLHEXYL)PHTHALATE	9 U	NA	NA	NA	NA	9 U
BUTYL BENZYL PHTHALATE	0.7 U	NA	NA	NA	NA	0.7 U
CARBAZOLE	0.8 U	NA	NA	NA	NA	0.8 U
CHRYSENE	0.07 U	NA	NA	NA	NA	0.07 U
DIETHYL PHTHALATE	0.6 U	NA	NA	NA	NA	0.6 U
DIMETHYL PHTHALATE	0.7 U	NA	NA	NA	NA	0.7 U
DI-N-BUTYL PHTHALATE	2 U	NA	NA	NA	NA	2 U
DI-N-OCTYL PHTHALATE	1 U	NA	NA	NA	NA	1 U
HEXACHLOROBENZENE	0.7 U	NA	NA	NA	NA	0.7 U
HEXACHLOROBUTADIENE	2 U	NA	NA	NA	NA	2 U
HEXACHLOROCYCLOPENTADIENE	1 U	NA	NA	NA	NA	1 U
HEXACHLOROETHANE	2 U	NA	NA	NA	NA	2 U
ISOPHORONE	0.8 U	NA	NA	NA	NA	0.8 U
NITROBENZENE	1 U	NA	NA	NA	NA	1 U
N-NITROSO-DI-N-PROPYLAMINE	2 U	NA	NA	NA	NA	2 U
N-NITROSODIPHENYLAMINE	2 U	NA	NA	NA	NA	2 U
PENTACHLOROPHENOL	5 U	NA	NA	NA	NA	5 U
PHENOL	2 U	NA	NA	NA	NA	2 U
VOLATILES (UG/L)						
1,1,1-TRICHLOROETHANE	NA	NA	NA	NA	NA	NA
1,1,2,2-TETRACHLOROETHANE	NA	NA	NA	NA	NA	NA
1,1,2-TRICHLOROETHANE	NA	NA	NA	NA	NA	NA
1,1,2-TRICHLOROTRIFLUOROETHANE	NA	NA	NA	NA	NA	NA

LOCATION	TP-MW09					
SAMPLE ID	TPGWMW090503	TPGWMW090503-F	TPGWMW091208	TPGWMW091208-AVG	TPGWMW091208-D	TPGWMW100503
SAMPLE DATE	20030507	20030507	20081215	20081215	20081215	20030509
SAMPLE CODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA
TOP DEPTH	4	4	4	4	4	6
BOTTOM DEPTH	14	14	14	14	14	13
1,1-DICHLOROETHANE	NA	NA	NA	NA	NA	NA
1,1-DICHLOROETHENE	NA	NA	NA	NA	NA	NA
1,2-DICHLOROETHANE	NA	NA	NA	NA	NA	NA
1,2-DICHLOROPROPANE	NA	NA	NA	NA	NA	NA
2-BUTANONE	NA	NA	NA	NA	NA	NA
2-HEXANONE	NA	NA	NA	NA	NA	NA
4-METHYL-2-PENTANONE	NA	NA	NA	NA	NA	NA
ACETONE	NA	NA	NA	NA	NA	NA
BENZENE	NA	NA	NA	NA	NA	NA
BROMODICHLOROMETHANE	NA	NA	NA	NA	NA	NA
BROMOFORM	NA	NA	NA	NA	NA	NA
BROMOMETHANE	NA	NA	NA	NA	NA	NA
CARBON DISULFIDE	NA	NA	NA	NA	NA	NA
CARBON TETRACHLORIDE	NA	NA	NA	NA	NA	NA
CHLOROBENZENE	NA	NA	NA	NA	NA	NA
CHLORODIBROMOMETHANE	NA	NA	NA	NA	NA	NA
CHLOROETHANE	NA	NA	NA	NA	NA	NA
CHLOROFORM	NA	NA	NA	NA	NA	NA
CHLOROMETHANE	NA	NA	NA	NA	NA	NA
CIS-1,3-DICHLOROPROPENE	NA	NA	NA	NA	NA	NA
ETHYLBENZENE	NA	NA	NA	NA	NA	NA
METHYLENE CHLORIDE	NA	NA	NA	NA	NA	NA
STYRENE	NA	NA	NA	NA	NA	NA
TETRACHLOROETHENE	NA	NA	NA	NA	NA	NA
TOLUENE	NA	NA	NA	NA	NA	NA
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA	NA	NA	NA
TOTAL XYLENES	NA	NA	NA	NA	NA	NA
TRANS-1,3-DICHLOROPROPENE	NA	NA	NA	NA	NA	NA
TRICHLOROETHENE	NA	NA	NA	NA	NA	NA
VINYL CHLORIDE	NA	NA	NA	NA	NA	NA

LOCATION	TP-MW10		TP-MW12
SAMPLE ID	TPGWMW100503-F	TPGWMW1012008	TPGWMW121208
SAMPLE DATE	20030509	20081218	20081218
SAMPLE CODE	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA
TOP DEPTH	6	6	8
BOTTOM DEPTH	13	13	18
DISSOLVED METALS (UG/L)			
ALUMINUM	28.2 U	56 U	56 U
ANTIMONY	6.7 U	4.6 U	4.6 U
ARSENIC	9 U	5.3 U	5.3 U
BARIUM	31.9	19.9 J	14.2 J
BERYLLIUM	1.2 U	0.13 U	0.13 U
CADMIUM	1.4 U	0.16 J	0.14 U
CALCIUM	284000	219000	304000
CHROMIUM	2.9 U	1.1 U	1.1 U
COBALT	2.2 U	1.2 U	1.2 U
COPPER	4.6 U	5 U	5 U
IRON	6.1 U	61 U	61 U
LEAD	4.6 U	2.2 UJ	2.2 UJ
MAGNESIUM	759000	739000	1030000
MANGANESE	23.4 U	0.96 U	0.96 U
MERCURY	0.12 U	0.032 U	0.032 U
NICKEL	11.7 U	3.5	1.5 U
POTASSIUM	276000	210000	296000
SELENIUM	10.5 U	21.5	23.6
SILICON	1790 J	NA	NA
SILVER	2.9 U	0.59 UJ	0.59 UJ
SODIUM	6520000	6040000	8630000
THALLIUM	9.6 U	7.3 U	13.4 U
VANADIUM	1.8 U	0.96 UJ	0.96 UJ
ZINC	66.8	66.5	20.6 U
FIELD (C)			
TEMPERATURE	NA	9.77	7.02
FIELD (MG/L)			
DISSOLVED OXYGEN	NA	5.99	4.39
FIELD (MS/CM)			
SPECIFIC CONDUCTANCE	NA	29.923	41.186
FIELD (MV)			
OXIDATION REDUCTION POTENTIAL	NA	153.9	60.6
FIELD (NTU)			
TURBIDITY	NA	0	4.61
FIELD (PPT)			
SALINITY	NA	18.46	26.06
FIELD (S.U.)			
PH	NA	7.6	7.63

LOCATION	TP-MW10		TP-MW12
SAMPLE ID	TPGWMW100503-F	TPGWMW1012008	TPGWMW121208
SAMPLE DATE	20030509	20081218	20081218
SAMPLE CODE	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA
TOP DEPTH	6	6	8
BOTTOM DEPTH	13	13	18
METALS (UG/L)			
ALUMINUM	NA	56 U	56 U
ANTIMONY	NA	4.6 U	4.6 U
ARSENIC	NA	5.3 U	5.3 U
BARIUM	NA	20.2 J	15.9 J
BERYLLIUM	NA	0.13 U	0.13 U
CADMIUM	NA	0.18 J	0.14 U
CALCIUM	NA	212000	283000
CHROMIUM	NA	1.1 U	1.1 U
COBALT	NA	1.2 U	1.2 U
COPPER	NA	5 U	5 U
IRON	NA	61 U	61 U
LEAD	NA	2.2 UJ	2.2 UJ
MAGNESIUM	NA	727000	1020000
MANGANESE	NA	0.96 U	0.96 U
MERCURY	NA	0.032 UJ	0.032 UJ
NICKEL	NA	3.5	1.5 U
POTASSIUM	NA	218000	309000
SELENIUM	NA	11.7 J	6.6 UJ
SILICON	NA	NA	NA
SILVER	NA	0.59 U	0.59 U
SODIUM	NA	6060000	8740000
THALLIUM	NA	4.2 UJ	7.5 J
VANADIUM	NA	0.96 UJ	1.1 U
ZINC	NA	61	21.3
MISCELLANEOUS PARAMETERS (MG/L)			
ALKALINITY	NA	NA	NA
BROMIDE	NA	NA	NA
CARBONATE ALKALINITY	NA	NA	NA
CHLORIDE	NA	NA	NA
NITRATE	NA	NA	NA
SULFATE	NA	NA	NA
TOTAL DISSOLVED SOLIDS	NA	NA	NA
TOTAL ORGANIC CARBON	NA	NA	NA
TOTAL ORGANIC HALIDES	NA	NA	NA
TOTAL SUSPENDED SOLIDS	NA	27	36
MISCELLANEOUS PARAMETERS (PPT)			
SALINITY	NA	NA	NA

LOCATION	TP-MW10		TP-MW12
SAMPLE ID	TPGWMW100503-F	TPGWMW1012008	TPGWMW121208
SAMPLE DATE	20030509	20081218	20081218
SAMPLE CODE	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA
TOP DEPTH	6	6	8
BOTTOM DEPTH	13	13	18
MISCELLANEOUS PARAMETERS (S.U.)			
PH	NA	NA	NA
MISCELLANEOUS PARAMETERS (UG/L)			
CYANIDE	NA	NA	NA
PESTICIDES/PCBS (UG/L)			
4,4'-DDD	NA	NA	NA
4,4'-DDE	NA	NA	NA
4,4'-DDT	NA	NA	NA
ALDRIN	NA	NA	NA
ALPHA-BHC	NA	NA	NA
ALPHA-CHLORDANE	NA	NA	NA
AROCLOR-1016	NA	NA	NA
AROCLOR-1221	NA	NA	NA
AROCLOR-1232	NA	NA	NA
AROCLOR-1242	NA	NA	NA
AROCLOR-1248	NA	NA	NA
AROCLOR-1254	NA	NA	NA
AROCLOR-1260	NA	NA	NA
BETA-BHC	NA	NA	NA
DELTA-BHC	NA	NA	NA
DIELDRIN	NA	NA	NA
ENDOSULFAN I	NA	NA	NA
ENDOSULFAN II	NA	NA	NA
ENDOSULFAN SULFATE	NA	NA	NA
ENDRIN	NA	NA	NA
ENDRIN ALDEHYDE	NA	NA	NA
ENDRIN KETONE	NA	NA	NA
GAMMA-BHC (LINDANE)	NA	NA	NA
GAMMA-CHLORDANE	NA	NA	NA
HEPTACHLOR	NA	NA	NA
HEPTACHLOR EPOXIDE	NA	NA	NA
METHOXYCHLOR	NA	NA	NA
TOTAL AROCLOR HALFND	NA	NA	NA
TOTAL AROCLOR ZEROND	NA	NA	NA
TOXAPHENE	NA	NA	NA
PETROLEUM HYDROCARBONS (UG/L)			
DIESEL RANGE ORGANICS	NA	NA	NA
GASOLINE RANGE ORGANICS	NA	NA	NA

LOCATION	TP-MW10		TP-MW12
SAMPLE ID	TPGWMW100503-F	TPGWMW1012008	TPGWMW121208
SAMPLE DATE	20030509	20081218	20081218
SAMPLE CODE	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA
TOP DEPTH	6	6	8
BOTTOM DEPTH	13	13	18
POLYCYCLIC AROMATIC HYDROCARBONS (UG/L)			
2-METHYLNAPHTHALENE	NA	0.1 U	0.1 U
ACENAPHTHENE	NA	0.1 U	0.1 U
ACENAPHTHYLENE	NA	0.1 U	0.1 U
ANTHRACENE	NA	0.1 U	0.1 U
BAP EQUIVALENT-HALFND	NA	0.1 U	0.1 U
BAP EQUIVALENT-POS	NA	0 U	0 U
BENZO(A)ANTHRACENE	NA	0.1 U	0.1 U
BENZO(A)PYRENE	NA	0.1 U	0.1 U
BENZO(B)FLUORANTHENE	NA	0.1 U	0.1 U
BENZO(G,H,I)PERYLENE	NA	0.1 U	0.1 U
BENZO(K)FLUORANTHENE	NA	0.1 U	0.1 U
CHRYSENE	NA	0.1 U	0.1 U
DIBENZO(A,H)ANTHRACENE	NA	0.1 U	0.1 U
DIBENZOFURAN	NA	NA	NA
FLUORANTHENE	NA	0.1 U	0.1 U
FLUORENE	NA	0.1 U	0.1 U
HIGH MOLECULAR WEIGHT PAHS	NA	0.3 U	0.3 U
INDENO(1,2,3-CD)PYRENE	NA	0.1 U	0.1 U
LOW MOLECULAR WEIGHT PAHS	NA	0.35	0.35
NAPHTHALENE	NA	0.1 U	0.1 U
PHENANTHRENE	NA	0.1 U	0.1 U
PYRENE	NA	0.1 U	0.1 U
SEMIVOLATILES (UG/L)			
1,2,4-TRICHLOROBENZENE	NA	NA	NA
1,2-DICHLOROBENZENE	NA	NA	NA
1,3-DICHLOROBENZENE	NA	NA	NA
1,4-DICHLOROBENZENE	NA	NA	NA
2,2'-OXYBIS(1-CHLOROPROPANE)	NA	NA	NA
2,4,5-TRICHLOROPHENOL	NA	NA	NA
2,4,6-TRICHLOROPHENOL	NA	NA	NA
2,4-DICHLOROPHENOL	NA	NA	NA
2,4-DIMETHYLPHENOL	NA	NA	NA
2,4-DINITROPHENOL	NA	NA	NA
2,4-DINITROTOLUENE	NA	NA	NA
2,6-DINITROTOLUENE	NA	NA	NA
2-CHLORONAPHTHALENE	NA	NA	NA
2-CHLOROPHENOL	NA	NA	NA

LOCATION	TP-MW10		TP-MW12
SAMPLE ID	TPGWMW100503-F	TPGWMW1012008	TPGWMW121208
SAMPLE DATE	20030509	20081218	20081218
SAMPLE CODE	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA
TOP DEPTH	6	6	8
BOTTOM DEPTH	13	13	18
2-METHYLNAPHTHALENE	NA	NA	NA
2-METHYLPHENOL	NA	NA	NA
2-NITROANILINE	NA	NA	NA
2-NITROPHENOL	NA	NA	NA
3,3'-DICHLOROBENZIDINE	NA	NA	NA
3-NITROANILINE	NA	NA	NA
4,6-DINITRO-2-METHYLPHENOL	NA	NA	NA
4-BROMOPHENYL PHENYL ETHER	NA	NA	NA
4-CHLORO-3-METHYLPHENOL	NA	NA	NA
4-CHLOROANILINE	NA	NA	NA
4-CHLOROPHENYL PHENYL ETHER	NA	NA	NA
4-METHYLPHENOL	NA	NA	NA
4-NITROANILINE	NA	NA	NA
4-NITROPHENOL	NA	NA	NA
BIS(2-CHLOROETHOXY)METHANE	NA	NA	NA
BIS(2-CHLOROETHYL)ETHER	NA	NA	NA
BIS(2-ETHYLHEXYL)PHTHALATE	NA	NA	NA
BUTYL BENZYL PHTHALATE	NA	NA	NA
CARBAZOLE	NA	NA	NA
CHRYSENE	NA	NA	NA
DIETHYL PHTHALATE	NA	NA	NA
DIMETHYL PHTHALATE	NA	NA	NA
DI-N-BUTYL PHTHALATE	NA	NA	NA
DI-N-OCTYL PHTHALATE	NA	NA	NA
HEXACHLOROBENZENE	NA	NA	NA
HEXACHLOROBUTADIENE	NA	NA	NA
HEXACHLOROCYCLOPENTADIENE	NA	NA	NA
HEXACHLOROETHANE	NA	NA	NA
ISOPHORONE	NA	NA	NA
NITROBENZENE	NA	NA	NA
N-NITROSO-DI-N-PROPYLAMINE	NA	NA	NA
N-NITROSODIPHENYLAMINE	NA	NA	NA
PENTACHLOROPHENOL	NA	NA	NA
PHENOL	NA	NA	NA
VOLATILES (UG/L)			
1,1,1-TRICHLOROETHANE	NA	NA	NA
1,1,2,2-TETRACHLOROETHANE	NA	NA	NA
1,1,2-TRICHLOROETHANE	NA	NA	NA
1,1,2-TRICHLOROTRIFLUOROETHANE	NA	NA	NA

LOCATION	TP-MW10		TP-MW12
SAMPLE ID	TPGWMW100503-F	TPGWMW1012008	TPGWMW121208
SAMPLE DATE	20030509	20081218	20081218
SAMPLE CODE	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA
TOP DEPTH	6	6	8
BOTTOM DEPTH	13	13	18
1,1-DICHLOROETHANE	NA	NA	NA
1,1-DICHLOROETHENE	NA	NA	NA
1,2-DICHLOROETHANE	NA	NA	NA
1,2-DICHLOROPROPANE	NA	NA	NA
2-BUTANONE	NA	NA	NA
2-HEXANONE	NA	NA	NA
4-METHYL-2-PENTANONE	NA	NA	NA
ACETONE	NA	NA	NA
BENZENE	NA	NA	NA
BROMODICHLOROMETHANE	NA	NA	NA
BROMOFORM	NA	NA	NA
BROMOMETHANE	NA	NA	NA
CARBON DISULFIDE	NA	NA	NA
CARBON TETRACHLORIDE	NA	NA	NA
CHLOROBENZENE	NA	NA	NA
CHLORODIBROMOMETHANE	NA	NA	NA
CHLOROETHANE	NA	NA	NA
CHLOROFORM	NA	NA	NA
CHLOROMETHANE	NA	NA	NA
CIS-1,3-DICHLOROPROPENE	NA	NA	NA
ETHYLBENZENE	NA	NA	NA
METHYLENE CHLORIDE	NA	NA	NA
STYRENE	NA	NA	NA
TETRACHLOROETHENE	NA	NA	NA
TOLUENE	NA	NA	NA
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA
TOTAL XYLENES	NA	NA	NA
TRANS-1,3-DICHLOROPROPENE	NA	NA	NA
TRICHLOROETHENE	NA	NA	NA
VINYL CHLORIDE	NA	NA	NA

LOCATION	1016	1016	1016	1016	1016	1016	1017	1017	1017	1017	1018	1018
SAMPLE ID	BC-1016-SD-0497	BC-1016-SD-0897	BC-1016-SD-1197	BC-1016-SD-1197-AVG	BC-1016-SD-1197-D	BC-1016-SD-1296	BC-1017-SD-0497	BC-1017-SD-	BC-1017-SD-1197	BC-1017-SD-1296	BC-1018-SD-0497	BC-1018-SD-0897
SAMPLE DATE	19970410	19970819	19971113	19971113	19971113	19961224	19970409	19970819	19971115	19970115	19970409	19970818
SAMPLE CODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0	0.17	0	0	-9999	0	0
BOTTOM DEPTH	0.33	0.17	0.33	0.33	0.33	0.33	0.25	0	0.25	-9999	0.33	0.33
ALKYLATED PAHS (UG/KG)												
C1-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-DIBENZOTHIOPHENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-FLUORANTHENES/PYRENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-FLUORENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-DIBENZOTHIOPHENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-FLUORENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-DIBENZOTHIOPHENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-FLUORENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AVS/SEM (MG/KG)												
ACID VOLATILE SULFIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	0.29	0.24	0.2	0.25	0.3	0.41071	0.33	0.25	0.2	0.33684	0.36	0.22
COPPER	272.1 J	211 J	102 J	108.5	115 J	114.643 J	34.5 J	98.8 J	27.7 J	9.82456 U	0.625 U	125 J
LEAD	121	63 J	78.2 U	71.6 U	65 U	102.857 J	57.9	42.1 J	42.8 U	48.73684 J	84.6	67.9 J
NICKEL	32.4 U	20.6 U	18.1 U	19.1 U	20.1 U	33.5714 U	16.8 U	9.8 U	6.2 U	12.63158 U	8.5 U	19.9 U
ZINC	248 U	151	330 U	375.5 U	421 U	389.397	153 U	99	298 U	289.3333	129.3 U	222
HF INORGANICS (MG/KG)												
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
INORGANICS (MG/KG)												
ALUMINUM	20920	39200 J	22379 J	21332.5	20286 J	28591.9	15602.7	37200 J	11891 J	34437.1	12793.3	28700 J
ARSENIC	11.3	13.1 J	13.8 J	12.15	10.5 J	13.9	10.7	7.5 J	9.2 J	9.6	10.5	13 J
CADMIUM	0.46 J	0.7 J	0.35	0.365	0.38	0.84	0.65 J	0.27 J	0.38	0.45	0.99 J	0.46 J
CHROMIUM	81.6 J	134	150 J	142	134 J	208.8	184.1 J	109	137 J	192.2	89.9 J	109
COPPER	452 J	388 J	308 J	566	824 J	457.5 J	241 J	162 J	98 J	222.6 J	198.9 J	238 J
IRON	30240.6	36900	28149 J	27816.5	27484 J	31667.1	23911.4	27800	24937 J	33480.9	25819.2	33200
LEAD	135 J	214 J	82.9 J	73.35	63.8 J	194.1	103.5 J	124 J	49 J	67.7	193.2 J	344 J
MANGANESE	381.2	467	397	393	389	379.3 J	373.2	445	412	535.1 J	332.1 J	404
MERCURY	0.808 J	1.8 J	1.9 J	1.43	0.96 J	2.975	0.343 U	0.4 U	0.46 J	0.496	0.589 J	1.3 J
NICKEL	86.3 J	89 U	81.8 U	72.4 U	63 U	80.1 J	85.3 J	45.8 U	38.3 U	36.8 J	51.6 U	57.9 U
SILVER	0.36 J	0.24 J	0.85 U	0.82 U	0.79 U	2.12	0.17 J	0.14 J	0.39 U	0.42	0.2 J	0.17 J
ZINC	416 U	558 U	424 U	425 U	426 U	715.9	275 U	266 U	275 U	506.9	444.8 U	320 U
MISCELLANEOUS PARAMETERS (%)												
ORGANIC MATTER	7.5	9.4	NA	NA	NA	NA	5.2	6.4	6.1	NA	13.1	8.4
PERCENT CLAY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCENT GRAVEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	1016	1016	1016	1016	1016	1016	1017	1017	1017	1017	1018	1018
SAMPLE ID	BC-1016-SD-0497	BC-1016-SD-0897	BC-1016-SD-1197	BC-1016-SD-1197-AVG	BC-1016-SD-1197-D	BC-1016-SD-1296	BC-1017-SD-0497	BC-1017-SD-	BC-1017-SD-1197	BC-1017-SD-1296	BC-1018-SD-0497	BC-1018-SD-0897
SAMPLE DATE	19970410	19970819	19971113	19971113	19971113	19961224	19970409	19970819	19971115	19970115	19970409	19970818
SAMPLE CODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0	0.17	0	0	-9999	0	0
BOTTOM DEPTH	0.33	0.17	0.33	0.33	0.33	0.33	0.25	0	0.25	-9999	0.33	0.33
PERCENT SAND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCENT SILT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL ORGANIC CARBON	3.2	4.1	7.7	7.4	7.1	NA	2.2	2.7	2.6	NA	5.7	3.6
MISCELLANEOUS PARAMETERS (MG/KG)												
CYANIDE	1 U	2 U	2 U	2 U	2 U	1 U	1 U	2 U	2 U	1 U	1 U	2 U
MISCELLANEOUS PARAMETERS (S.U.)												
PH	8.1	8	8.2	8.2	8.2	8	8.2	8.05	8.2	8.1	8.1	7.9
PESTICIDES/PCBS (UG/KG)												
1,2,3,4-TETRACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-TETRACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	2	0.8 U
2,4'-DDT	11	4.1	2	1.3	0.6	2	1 U	1.8	1 U	1 U	1 U	4.7
4,4'-DDD	99	24.7	15.7	14.7	13.7	104	4.4	8.4	5.1	11.2	1060	134
4,4'-DDE	8.5	10.2	4.5	3.7	2.9	14	3	7.8	3.5	5.8	22	15.6
4,4'-DDT	17	16	135	70.3	5.6	17.6	0.6 U	0.6 U	9.7	24.8	0.6 U	18.4
ALDRIN	0.7 U	0.3 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.2 U	0.7 U	0.7 U	0.7 U	0.7 U
ALPHA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALPHA-CHLORDANE	1.5	0.9	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	1	0.8 U	0.8 U	1.9	1.3
BETA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHLORPYRIFOS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CIS-NONACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DELTA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIELDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN II	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GAMMA-BHC (LINDANE)	0.6 U	0.2 J	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.2 J
GAMMA-CHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR	0.5 U	1.2	1.5	1.85	2.2	0.5 U	4.5	1 J	0.9 J	4.2 J	1.7	0.7
HEPTACHLOR EPOXIDE	0.5 U	0.2 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.2 J	0.5 U	0.5 U	0.5 U	0.4 J
HEXACHLOROBENZENE	1.3	0.1 J	0.1 J	0.1	0.1 J	0.1 J	0.4 U	0.1 J	0.2 J	0.1 J	0.6 U	0.1 J
MIREX	2.6	0.9 J	1.5	1.15	0.8	2.7	8	5.9	5	6.7 J	6.5	2.8
OXYCHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-101	7.1	5.5	6.4	5.7	5	10.6	22	16.5	12.3	26.2	23	8.7
PCB-101/90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-105	0.6 U	1.3	1.1 U	1.1 U	1.1 U	4.5	0.6 U	0.6 U	1.8 U	0.6 U	0.6 U	0.6 U
PCB-114	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-118	2.6	4.5 U	3.9	3.65	3.4	7.9	6.3	4.1 U	3.4	13.6	9.7	5 U
PCB-126	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-128	3.8	2.1	2.4	2.6	2.8	5.7	11	7.6	4.1	13.9	6.8	3.8
PCB-138	18	11.6	14.4	13.2	12	32.4	83	52.4	40.1	98.6	68	27.5
PCB-138/160	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-149/123	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-153	16	14	16	14.55	13.1	31.5	74	52.4	41.4	93.4	70	25.7
PCB-153/132	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-156	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-167	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-169	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-170	6	6	5.1	4.5	3.9	12.5	36	38	17.7	45.6	29	15
PCB-170/190	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-18	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.2 J	0.7 U	0.1 J	0.7 U	0.3 J	0.7 U	0.7 U
PCB-18/17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-180	19	12.4	12.2	11.25	10.3	34.9	77	55.7	37.3	92.1	68	26
PCB-185	14	7.3	8.6	7.75	6.9	16	37	23.3	18.9	36.7	34	13
PCB-187	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-189	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-195	3.9	1.6 U	1.3	1.15	1	3.9	7	5.5	3.6	8.3	7.6	3

LOCATION	1016	1016	1016	1016	1016	1016	1017	1017	1017	1017	1018	1018
SAMPLE ID	BC-1016-SD-0497	BC-1016-SD-0897	BC-1016-SD-1197	BC-1016-SD-1197-AVG	BC-1016-SD-1197-D	BC-1016-SD-1296	BC-1017-SD-0497	BC-1017-SD-	BC-1017-SD-1197	BC-1017-SD-1296	BC-1018-SD-0497	BC-1018-SD-0897
SAMPLE DATE	19970410	19970819	19971113	19971113	19971113	19961224	19970409	19970819	19971115	19970115	19970409	19970818
SAMPLE CODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0	0.17	0	0	-9999	0	0
BOTTOM DEPTH	0.33	0.17	0.33	0.33	0.33	0.33	0.25	0	0.25	-9999	0.33	0.33
PCB-195/208	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-201	3.3	1.2	1.6 U	1.45 U	1.3 U	2	3.4	2.5	1.8 U	3.3	3	2.3
PCB-201/157/173	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-206	24	5.5	3.9	3.9	3.9	10.7	7.1	4.5	4	8.8	7.4	6.4
PCB-209	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-28	2.9 U	0.4 J	0.7 U	0.7 U	0.7 U	0.5 J	0.7 U	0.2 J	0.7 U	0.9	0.9 U	0.3 J
PCB-29	0.7 U	0.1 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.1 J	0.7 U	0.7 U
PCB-44	0.9	0.6	0.6	0.55	0.5 J	0.7	0.7	0.4 J	0.5	0.9	1.6	0.5
PCB-50	4.7	0.3 J	0.4 U	0.4 U	0.4 U	0.2 J	0.5 U	0.2 J	0.4 U	0.4 J	0.6	0.2 J
PCB-52	10	1.3	1.1 U	1.05 U	1 U	3.1	2.8	0.9 U	1.3 U	3.1	3.5	1.1 U
PCB-66	5.8	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2.3	0.5 U	19	0.5 U
PCB-77	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-8	0.3 U	0.3 U	0.7	0.6	0.5	0.3 J	0.4 U	0.3 U	0.5	0.8	0.3 U	0.3 U
PCB-8/5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-81	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-87	5.4	1.9	1.4	1.3	1.2	3.3	4.4	3.3	2.1	4.7	5	2.6
PENTACHLOROANISOLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB BIRD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB BIRD HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB FISH	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB FISH HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB-HH-HALFND	8.7E-05	0.00011	0.00013	0.00013	0.00012	0.00037	0.0002	7.1E-05 U	0.00013	0.00042	0.0003	0.000084 U
TOTAL AROCLOR	321.6	154.4	169	165	161	398.2	776.8	528.4	392.6	1001.2	737	273.2
TOTAL DDT HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	1016	1016	1016	1016	1016	1016	1017	1017	1017	1017	1018	1018
SAMPLE ID	BC-1016-SD-0497	BC-1016-SD-0897	BC-1016-SD-1197	BC-1016-SD-1197-AVG	BC-1016-SD-1197-D	BC-1016-SD-1296	BC-1017-SD-0497	BC-1017-SD-	BC-1017-SD-1197	BC-1017-SD-1296	BC-1018-SD-0497	BC-1018-SD-0897
SAMPLE DATE	19970410	19970819	19971113	19971113	19971113	19961224	19970409	19970819	19971115	19970115	19970409	19970818
SAMPLE CODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0	0.17	0	0	-9999	0	0
BOTTOM DEPTH	0.33	0.17	0.33	0.33	0.33	0.33	0.25	0	0.25	-9999	0.33	0.33
TOTAL DDT POS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PCB CONGENERS	160.8	77.2	84.4	82.45	80.5	199.1	388.4	264.2	196.3	500.6	368.5	136.6
TOTAL PCB CONGENERS-HH-HALFND	294.2	150.5	160.6	148	135.4	363	747.5	532.3	383.8	904.5	715.6	278.9
TRANS-NONACHLOR	0.3 J	0.5 J	0.8 U	0.8 U	0.8 U	0.5 J	0.9	0.4 J	0.8 U	0.7 J	1.6	0.7 J
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)												
1,1-BIPHENYL	7 U	11.9	9	9.4	9.8	16.5	6.4 U	9.3	10.9	7	10.4 U	16.8
ACENAPHTHENE	23.5	23.3	17.1	19	20.9	42.3	18.5	31	30.3	24.8	126	48.4
ACENAPHTHYLENE	44.7	76.3	57.8	57.4	57	82.7	52.8	52.9	49.4	61.3	93	116
ANTHRACENE	185	159	140	148	156	276	157	148	120	196	811	293
BAP EQUIVALENT-HALFND	890.07	867.684	786.5	812.499	838.497	1113.93	640.205	606.383	637.89	799.409	1526.75	1394.49
BAP EQUIVALENT-POS	890.07	867.684	786.5	812.499	838.497	1113.93	640.205	606.383	637.89	799.409	1526.75	1394.49
BENZO(A)ANTHRACENE	570	496	412	393.5	375	795 J	583	382	362	432	1710	1150
BENZO(A)PYRENE	426	549	502	520.5	539	713	389	374	401	535	918	839
BENZO(B)FLUORANTHENE	847	1110	1030	1030	1030	1400	895	878	851	997	2240	2180
BENZO(E)PYRENE	326	450	388	393.5	399	532	329	317	305	377	825	768
BENZO(G,H,I)PERYLENE	289	375	386	413	440 J	407	274	247	310 J	289 J	567	499
DIBENZO(A,H)ANTHRACENE	82.7	118	98.5	105.75	113	133	74.1	79.3	82.2	88.4 J	155	166
FLUORANTHENE	1080	892	789	775	761	1140	916	746	603	739	5660	3890
FLUORENE	33.4	37.7	24.7	27.15	29.6	42.7	24.7	37.2	35.8	31.3	262	61.6
INDENO(1,2,3-CD)PYRENE	2364	359	376	394	412	437	262	242	300 J	298	521	504
NAPHTHALENE	29.5	37.2	44.4	45.6	46.8	95.5	29.3	25.3	44.6	35.8	41	49.7
PERYLENE	111	161	135	140	145	210	112	107	113	200	232	224
PHENANTHRENE	449	382	360	361.5	363	583	344	345	363	400	1140	986
PYRENE	951	775	769	745	721	1140	932	665	593	740	4220	2840
SEMIVOLATILES (UG/KG)												
1,1-BIPHENYL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-METHYLNAPHTHALENE	27.1	18.1	27.2	26.1	25	56.4	19.2	20.1	26.7	25.9	32.4	19.3
1-METHYLPHENANTHRENE	75.8	49.7	45.7	53.7	61.7	54.4	66.1	41.4	31.9	38.3	203	123
2,3,5-TRIMETHYLNAPHTHALENE	7.4	5.8	5.1	6.3	7.5	11.3	4.9	5.9	7	5.6	12	5
2,6-DIMETHYLNAPHTHALENE	22.7	35.1	30	30.7	31.4	41.3	24	27.4	35.8	21.3	25.7	35.9
2-METHYLNAPHTHALENE	23.3	31.1	37.6	36	34.4	79.7	23.1	25.2	37.3	29.5	28	35.6
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(E)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHRYSENE	380	434	340	368.5	397	662 J	365	413	290	419	978	1100
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZOTHIOPHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HIGH MOLECULAR WEIGHT PAHS	3489.7	3264	2910	2908	2906	4583	3259.1	2659.3	2331.2	2953.4	13641	9985
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LOW MOLECULAR WEIGHT PAHS	788.4	746.6	682	695	708	1201.9	649.4	664.6	680.4	778.7	2501	1590.3
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PAHS	8348.1	6586.2	6024	6099.5	6175	8950.8	5894.7	5219	5002.9	5991.2	20800.1	15950.3
TOTAL PAHS ECO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	1018	1018	1018	1018	1020
SAMPLE ID	BC-1018-SD-1197	BC-1018-SD-1296	BC-1018-SD-1296-AVG	BC-1018-SD-1296-D	BC-1020-SD-0497
SAMPLE DATE	19971113	19970115	19970115	19970115	19970409
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL
MATRIX	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0.17
BOTTOM DEPTH	0.5	0.33	0.33	0.33	0.25
ALKYLATED PAHS (UG/KG)					
C1-CHRYSENES	NA	NA	NA	NA	NA
C1-DIBENZOTHIOPHENES	NA	NA	NA	NA	NA
C1-FLUORANTHENES/PYRENES	NA	NA	NA	NA	NA
C1-FLUORENES	NA	NA	NA	NA	NA
C1-NAPHTHALENES	NA	NA	NA	NA	NA
C1-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA
C2-CHRYSENES	NA	NA	NA	NA	NA
C2-DIBENZOTHIOPHENES	NA	NA	NA	NA	NA
C2-FLUORENES	NA	NA	NA	NA	NA
C2-NAPHTHALENES	NA	NA	NA	NA	NA
C2-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA
C3-CHRYSENES	NA	NA	NA	NA	NA
C3-DIBENZOTHIOPHENES	NA	NA	NA	NA	NA
C3-FLUORENES	NA	NA	NA	NA	NA
C3-NAPHTHALENES	NA	NA	NA	NA	NA
C3-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA
C4-CHRYSENES	NA	NA	NA	NA	NA
C4-NAPHTHALENES	NA	NA	NA	NA	NA
C4-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA
AVS/SEM (MG/KG)					
ACID VOLATILE SULFIDE	NA	NA	NA	NA	NA
CADMIUM	0.3	0.25243	0.29632	0.34021	0.38
COPPER	3 J	79.5146 J	91.484085	103.45361 J	190.2 J
LEAD	79.4 U	81.2945 J	87.99261	94.69072 J	112.7
NICKEL	12.3 U	14.2071 U	17.619025 U	21.03093 U	27.2 U
ZINC	265 U	140.68	168.329495	195.97938	374.5 J
HF INORGANICS (MG/KG)					
ALUMINUM	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA
INORGANICS (MG/KG)					
ALUMINUM	25525 J	42364.3	42083.75	41803.2	16466.7
ARSENIC	11.2 J	10.2	11.6	13	10.4
CADMIUM	0.65	0.42	0.405	0.39	0.91 J
CHROMIUM	154 J	109.3	142.8	176.3	66.8 J
COPPER	158 J	18.8 J	130.65	242.5 J	528.7 J
IRON	31934 J	34680.6	34881.6	35082.6	28482.2
LEAD	97.7 J	94.3	98.85	103.4	200.5 J
MANGANESE	377	487 J	475.95	464.9 J	385
MERCURY	0.61 J	0.473	0.555	0.637	0.302 U
NICKEL	51.8 U	34.1 J	35.85	37.6 J	72.1 J
SILVER	0.51 U	0.36	0.46	0.56	0.3 J
ZINC	346 U	469.4	471.35	473.3	777 J
MISCELLANEOUS PARAMETERS (%)					
ORGANIC MATTER	8.7	NA	NA	NA	3.9
PERCENT CLAY	NA	NA	NA	NA	NA
PERCENT GRAVEL	NA	NA	NA	NA	NA

LOCATION	1018	1018	1018	1018	1020
SAMPLE ID	BC-1018-SD-1197	BC-1018-SD-1296	BC-1018-SD-1296-AVG	BC-1018-SD-1296-D	BC-1020-SD-0497
SAMPLE DATE	19971113	19970115	19970115	19970115	19970409
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL
MATRIX	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0.17
BOTTOM DEPTH	0.5	0.33	0.33	0.33	0.25
PERCENT SAND	NA	NA	NA	NA	NA
PERCENT SILT	NA	NA	NA	NA	NA
TOTAL ORGANIC CARBON	3.8	NA	NA	NA	1.7
MISCELLANEOUS PARAMETERS (MG/KG)					
CYANIDE	2 U	NA	NA	NA	1 U
MISCELLANEOUS PARAMETERS (S.U.)					
PH	8	NA	NA	NA	8.3
PESTICIDES/PCBS (UG/KG)					
1,2,3,4-TETRACHLOROBENZENE	NA	NA	NA	NA	NA
1,2,4,5-TETRACHLOROBENZENE	NA	NA	NA	NA	NA
2,4'-DDD	NA	NA	NA	NA	NA
2,4'-DDE	0.8 U	0.4 J	0.4	0.4 J	0.8 U
2,4'-DDT	7.3 J	2.6	10.1	17.6	2.6 J
4,4'-DDD	81	99	136.5	174	7.7 J
4,4'-DDE	11.6	7.9	12.55	17.2	2.8 J
4,4'-DDT	22.8	23.5	63.75	104	11 J
ALDRIN	0.7 U	0.7 U	0.7 U	0.7 U	0.7 UR
ALPHA-BHC	NA	NA	NA	NA	NA
ALPHA-CHLORDANE	0.8 U	0.7 J	0.7 J	0.8 U	1.5 J
BETA-BHC	NA	NA	NA	NA	NA
CHLORPYRIFOS	NA	NA	NA	NA	NA
CIS-NONACHLOR	NA	NA	NA	NA	NA
DELTA-BHC	NA	NA	NA	NA	NA
DIELDRIN	NA	NA	NA	NA	NA
ENDOSULFAN II	NA	NA	NA	NA	NA
ENDRIN	NA	NA	NA	NA	NA
GAMMA-BHC (LINDANE)	0.6 U	0.6 U	0.45	0.6 J	0.6 U
GAMMA-CHLORDANE	NA	NA	NA	NA	NA
HEPTACHLOR	2.7	3.9 J	4.95	6 J	1.6 J
HEPTACHLOR EPOXIDE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
HEXACHLOROBENZENE	0.3 J	0.5	0.5	0.5	0.4 U
MIREX	2.9	2.7 J	2.35	2 J	0.8 J
OXYCHLORDANE	NA	NA	NA	NA	NA
PCB-101	15	11.2	11.9	12.6	2.4 U
PCB-101/90	NA	NA	NA	NA	NA
PCB-105	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
PCB-114	NA	NA	NA	NA	NA
PCB-118	9.3	3.8	4.55	5.3	2.1 J
PCB-126	NA	NA	NA	NA	NA
PCB-128	6.1	7.5	3.85	0.4 U	4.6 J
PCB-138	41.6	50.3	48.35	46.4	9.2 J
PCB-138/160	NA	NA	NA	NA	NA
PCB-149/123	NA	NA	NA	NA	NA
PCB-153	45.5	50.5	48.85	47.2	8.1 J
PCB-153/132	NA	NA	NA	NA	NA
PCB-156	NA	NA	NA	NA	NA
PCB-167	NA	NA	NA	NA	NA
PCB-169	NA	NA	NA	NA	NA
PCB-170	18	23.8	21.2	18.6	3.2 J
PCB-170/190	NA	NA	NA	NA	NA
PCB-18	0.7 U	0.7 U	0.5 J	0.5 J	0.7 U
PCB-18/17	NA	NA	NA	NA	NA
PCB-180	39.6	58.1	52.2	46.3	12 J
PCB-185	21.1	23.4	21.65	19.9	7.6 J
PCB-187	NA	NA	NA	NA	NA
PCB-189	NA	NA	NA	NA	NA
PCB-195	3.6	5.3	4.75	4.2	1.2 J

LOCATION	1018	1018	1018	1018	1020
SAMPLE ID	BC-1018-SD-1197	BC-1018-SD-1296	BC-1018-SD-1296-AVG	BC-1018-SD-1296-D	BC-1020-SD-0497
SAMPLE DATE	19971113	19970115	19970115	19970115	19970409
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL
MATRIX	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0.17
BOTTOM DEPTH	0.5	0.33	0.33	0.33	0.25
PCB-195/208	NA	NA	NA	NA	NA
PCB-201	2.4 U	2.7	2.4	2.1	1.1 J
PCB-201/157/173	NA	NA	NA	NA	NA
PCB-206	5.6	9.9	8.45	7	4.8 J
PCB-209	NA	NA	NA	NA	NA
PCB-28	0.7 U	0.7 J	0.8	0.9	0.7 U
PCB-29	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
PCB-44	0.6	0.4 J	0.5	0.6	0.2 J
PCB-50	0.4 U	0.4 J	0.45	0.5	0.5 U
PCB-52	1.6 U	2	2.1	2.2	0.7 U
PCB-66	0.5 U	0.5 U	0.5 U	0.5 U	2.8 J
PCB-77	NA	NA	NA	NA	NA
PCB-8	1.3	1.1	1.4	1.7	0.3 U
PCB-8/5	NA	NA	NA	NA	NA
PCB-81	NA	NA	NA	NA	NA
PCB-87	3.4	1.8	2.1	2.4	1.6 J
PENTACHLOROANISOLE	NA	NA	NA	NA	NA
PENTACHLOROBENZENE	NA	NA	NA	NA	NA
TEQ PCB	NA	NA	NA	NA	NA
TEQ PCB BIRD	NA	NA	NA	NA	NA
TEQ PCB BIRD HALFND	NA	NA	NA	NA	NA
TEQ PCB FISH	NA	NA	NA	NA	NA
TEQ PCB FISH HALFND	NA	NA	NA	NA	NA
TEQ PCB HALFND	NA	NA	NA	NA	NA
TEQ PCB-HH-HALFND	0.00029	0.00012	0.000145	0.00017	0.000072
TOTAL AROCLOR	451.4	540	496	452	121.6
TOTAL DDT HALFND	NA	NA	NA	NA	NA

LOCATION	1018	1018	1018	1018	1020
SAMPLE ID	BC-1018-SD-1197	BC-1018-SD-1296	BC-1018-SD-1296-AVG	BC-1018-SD-1296-D	BC-1020-SD-0497
SAMPLE DATE	19971113	19970115	19970115	19970115	19970409
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL
MATRIX	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0.17
BOTTOM DEPTH	0.5	0.33	0.33	0.33	0.25
TOTAL DDT POS	NA	NA	NA	NA	NA
TOTAL PCB CONGENERS	225.7	270	248	226	60.8
TOTAL PCB CONGENERS-HH-HALFND	429	508.3	473.65	439	123.6
TRANS-NONACHLOR	2.9	0.8	0.85	0.9	0.4 J
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)					
1,1-BIPHENYL	10	6.4	7	7.6	6.4 U
ACENAPHTHENE	28.6	32.5	32	31.5	13.1
ACENAPHTHYLENE	60.4	66.7	63.95	61.2	39.2
ANTHRACENE	283	222	216	210	169 J
BAP EQUIVALENT-HALFND	1107.976	829.964	766.517	703.07	490.664
BAP EQUIVALENT-POS	1107.976	829.964	766.517	703.07	490.664
BENZO(A)ANTHRACENE	568	415 J	407.5	400	557
BENZO(A)PYRENE	700	548	497.5	447	289
BENZO(B)FLUORANTHENE	1630	1190	1049.5	909	747
BENZO(E)PYRENE	576	418	391.5	365	305
BENZO(G,H,I)PERYLENE	463	323	315	307 J	212
DIBENZO(A,H)ANTHRACENE	135	84.8	87.95	91.1 J	50.4
FLUORANTHENE	1400	1190	1013.5	837	1280 J
FLUORENE	50.3	38.6	35.55	32.5	18.3
INDENO(1,2,3-CD)PYRENE	479	329	317.5	306	181
NAPHTHALENE	33.1	32.6	32.5	32.4	94.3
PERYLENE	199	163	153.5	144	76.8
PHENANTHRENE	526	681	609.5	538	335 J
PYRENE	1130	938	839	740	974
SEMIVOLATILES (UG/KG)					
1,1-BIPHENYL	NA	NA	NA	NA	NA
1-METHYLNAPHTHALENE	16.2	26.6	26.85	27.1	26.4
1-METHYLPHENANTHRENE	74	58.9	53.15	47.4	69.8
2,3,5-TRIMETHYLNAPHTHALENE	4.2 J	7.4	7.2	7	4.5
2,6-DIMETHYLNAPHTHALENE	94.8	20.3	24.2	28.1	8.8
2-METHYLNAPHTHALENE	26.1	29.3	29.15	29	19.3
ACENAPHTHENE	NA	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA
BENZO(A)PYRENE	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA
BENZO(E)PYRENE	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA
CHRYSENE	646	534 J	467	400	644 J
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA
DIBENZOTHIOPHENE	NA	NA	NA	NA	NA
FLUORANTHENE	NA	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA	NA
HIGH MOLECULAR WEIGHT PAHS	4579	3240	3080	2920	3794.4
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA
LOW MOLECULAR WEIGHT PAHS	1007.5	888	911.5	935	688.2
NAPHTHALENE	NA	NA	NA	NA	NA
PERYLENE	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA
PYRENE	NA	NA	NA	NA	NA
TOTAL PAHS	9132.7	7360	6680	6000	6113.9
TOTAL PAHS ECO	NA	NA	NA	NA	NA

LOCATION	1020	1020	1020	1020	1020	MS-3 LOC.1	MS-3 LOC.1	MS-3 LOC.1	MS-3 LOC.1
SAMPLE ID	BC-1020-SD-0897	BC-1020-SD-0897-AVG	BC-1020-SD-0897-D	BC-1020-SD-1197	BC-1020-SD-1296	OU4-SD-M03-100A	OU4-SD-M03-100B	OU4-SD-M03-101A	OU4-SD-M03-101B
SAMPLE DATE	19970819	19970819	19970819	19971114	19961224	20000827	20000504	20010819	20010506
SAMPLE CODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0	0	0	0.33	0.33	0.33	0.33	0.33	0.33
ALKYLATED PAHS (UG/KG)									
C1-CHRYSENES	NA	NA	NA	NA	NA	370	517	543.9	404.5
C1-DIBENZOTHIOPHENES	NA	NA	NA	NA	NA	20	29.7	21.8	28.7
C1-FLUORANTHENES/PYRENES	NA	NA	NA	NA	NA	537	763	658.7	666.2
C1-FLUORENES	NA	NA	NA	NA	NA	40.7	74.8	50.2	53.8
C1-NAPHTHALENES	NA	NA	NA	NA	NA	69.2	61.8	42.3	68.9
C1-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	182	413	242.9	297.9
C2-CHRYSENES	NA	NA	NA	NA	NA	151	187	218.6	201.2
C2-DIBENZOTHIOPHENES	NA	NA	NA	NA	NA	32.3	40.4	33.3	35.3
C2-FLUORENES	NA	NA	NA	NA	NA	56	67.8	68.5	48.5
C2-NAPHTHALENES	NA	NA	NA	NA	NA	67.5	64.5	40.2	51.8
C2-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	127	239	203.6	198.5
C3-CHRYSENES	NA	NA	NA	NA	NA	15	16.7	23.1	37.1
C3-DIBENZOTHIOPHENES	NA	NA	NA	NA	NA	38.4	37.2	44.3	29
C3-FLUORENES	NA	NA	NA	NA	NA	28.2	43.3	45	39.3
C3-NAPHTHALENES	NA	NA	NA	NA	NA	52.3	56	37.6	51.2
C3-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	90.4	136	124.5	109.7
C4-CHRYSENES	NA	NA	NA	NA	NA	38.2	6.32	2.5 J	91.1
C4-NAPHTHALENES	NA	NA	NA	NA	NA	34.7	16.5	27.4	36
C4-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	78	25.6	72.9	42.4
AVS/SEM (MG/KG)									
ACID VOLATILE SULFIDE	NA	NA	NA	NA	NA	250 J	1670	331.119 J	462.48 J
CADMIUM	0.29	0.3	0.31	0.4	0.39535	0.25 J	0.194	0.4 J	0.42 J
COPPER	132 J	66.1575	0.63 U	202 J	147.5 J	1.27 J	3.18 U	48.48	83.3 J
LEAD	70 J	35.1825	0.73 U	100 U	81.9767 J	96.64 J	34.3 J	98.11	101
NICKEL	13.1 U	12.2 U	11.3 U	11.2 U	20.8721 U	8.65 J	3.53	13.03	10.6
ZINC	132	153	174	332 U	248.372	141.61 J	101	160.62 J	169
HF INORGANICS (MG/KG)									
ALUMINUM	NA	NA	NA	NA	NA	60547	64600	50614.6	55126.55
ARSENIC	NA	NA	NA	NA	NA	19.9	17.2	15.66	17.15
CADMIUM	NA	NA	NA	NA	NA	0.66	0.6	0.57 J	0.1834 U
CHROMIUM	NA	NA	NA	NA	NA	110	135	100.71	116.41
COPPER	NA	NA	NA	NA	NA	186 J	185	308.67	182.44
IRON	NA	NA	NA	NA	NA	35582 J	32900	29948.9	33216.49
LEAD	NA	NA	NA	NA	NA	164	133	127.26	126.69
MANGANESE	NA	NA	NA	NA	NA	354	451	336.36	387.63
MERCURY	NA	NA	NA	NA	NA	0.52	0.62	0.5555 J	0.49 J
NICKEL	NA	NA	NA	NA	NA	39.4 J	45.3	40.92	43.13
SILVER	NA	NA	NA	NA	NA	4.56 J	1.1	1.08 J	1.4
ZINC	NA	NA	NA	NA	NA	196 J	234	243.03 J	216.68
INORGANICS (MG/KG)									
ALUMINUM	24200 J	26350	28500 J	22726 J	30412.6	NA	NA	NA	NA
ARSENIC	13.6 J	14.3	15 J	11.3 J	17.9	NA	NA	NA	NA
CADMIUM	0.55 J	0.52	0.49 J	0.48	0.61	NA	NA	NA	NA
CHROMIUM	134	127.5	121	142 J	170	NA	NA	NA	NA
COPPER	545 J	519.5	494 J	253 J	460.8 J	NA	NA	NA	NA
IRON	38600	37100	35600	29426 J	58088.6	NA	NA	NA	NA
LEAD	349 J	354	359 J	106 J	137.7	NA	NA	NA	NA
MANGANESE	523	478	433	375	684.4 J	NA	NA	NA	NA
MERCURY	0.52 U	0.55 U	0.58 U	0.57 J	0.493	NA	NA	NA	NA
NICKEL	58.5 U	69.15 U	79.8 U	45.9 U	78.7 J	NA	NA	NA	NA
SILVER	0.5 J	0.45	0.4 J	0.5 U	0.48	NA	NA	NA	NA
ZINC	443 U	425 U	407 U	362 U	804.1	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (%)									
ORGANIC MATTER	NA	NA	NA	9.7	NA	NA	NA	NA	NA
PERCENT CLAY	NA	NA	NA	NA	NA	47.9	26.66	16	19.9
PERCENT GRAVEL	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	1020	1020	1020	1020	1020	MS-3 LOC.1	MS-3 LOC.1	MS-3 LOC.1	MS-3 LOC.1
SAMPLE ID	BC-1020-SD-0897	BC-1020-SD-0897-AVG	BC-1020-SD-0897-D	BC-1020-SD-1197	BC-1020-SD-1296	OU4-SD-M03-100A	OU4-SD-M03-100B	OU4-SD-M03-101A	OU4-SD-M03-101B
SAMPLE DATE	19970819	19970819	19970819	19971114	19961224	20000827	20000504	20010819	20010506
SAMPLE CODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0	0	0	0.33	0.33	0.33	0.33	0.33	0.33
PERCENT SAND	NA	NA	NA	NA	NA	29.4	30.43	53.6	37
PERCENT SILT	NA	NA	NA	NA	NA	22.8	42.91	30.5	43.1
TOTAL ORGANIC CARBON	7.7	7.9	8.1	4.2	NA	2.5 J	3.12	3.16	2.21 J
MISCELLANEOUS PARAMETERS (MG/KG)									
CYANIDE	NA	NA	NA	2 U	1 U	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)									
PH	NA	NA	NA	8.1	8.2	NA	NA	NA	NA
PESTICIDES/PCBS (UG/KG)									
1,2,3,4-TETRACHLOROBENZENE	NA	NA	NA	NA	NA	0.44 U	0.9	0.63	0.54
1,2,4,5-TETRACHLOROBENZENE	NA	NA	NA	NA	NA	3 U	1.8	1.5 U	0.91
2,4'-DDD	NA	NA	NA	NA	NA	11	7.8	10.84	13
2,4'-DDE	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.23	0.14 U	0.17	0.12 U
2,4'-DDT	1.3	1.45	1.6	1.4	0.8 J	1.1	2.7	1.41	1.3
4,4'-DDD	8.9	9.05	9.2	14.4	12.3	24	20	27.5	31
4,4'-DDE	7.5	7.25	7	3.8	3.8	6.9	5.3	5.64	6.6
4,4'-DDT	1.6	2.5	3.4	6.7	0.6 U	4	6	10.3	5.1
ALDRIN	0.2 J	0.2	0.2 J	0.7 U	0.7 U	0.05 J	0.1 U	0.1 U	0.11
ALPHA-BHC	NA	NA	NA	NA	NA	0.18	0.2	0.07 J	0.06 J
ALPHA-CHLORDANE	1.1	1	0.9	0.8 U	0.6 J	0.66	0.56	1.05	0.99
BETA-BHC	NA	NA	NA	NA	NA	1.3	3.1	0.35	0.32
CHLORPYRIFOS	NA	NA	NA	NA	NA	1.2 U	0.5 U	0.58	0.12 U
CIS-NONACHLOR	NA	NA	NA	NA	NA	0.97	1.7	1.37	1.1
DELTA-BHC	NA	NA	NA	NA	NA	0.07 J	0.079 U	0.03 J	0.44
DIELDRIN	NA	NA	NA	NA	NA	2.6	1.3	0.34	0.11 U
ENDOSULFAN II	NA	NA	NA	NA	NA	1.2	2.1	1.08	1.6
ENDRIN	NA	NA	NA	NA	NA	0.21 U	0.24 U	0.1 U	0.11 U
GAMMA-BHC (LINDANE)	0.2 J	0.2 J	0.6 U	0.6 U	0.6 U	0.38 U	0.48	0.17 J	0.72 U
GAMMA-CHLORDANE	NA	NA	NA	NA	NA	0.11 U	0.44	0.26	0.69
HEPTACHLOR	0.9	0.575	0.5 U	1.8	0.5 U	0.97	0.68	0.38	1.9
HEPTACHLOR EPOXIDE	0.2 J	0.2	0.2 J	0.5 U	0.5 U	0.047 U	0.052 U	0.08 U	0.08 J
HEXACHLOROBENZENE	0.3 J	0.2	0.1 J	0.5	0.5	8.5	0.04 J	0.11	0.088 U
MIREX	1.4	1.3	1.2	1.5	0.6 U	0.047 U	0.06	0.14 U	0.12
OXYCHLORDANE	NA	NA	NA	NA	NA	0.04	0.13 J	0.03 J	0.07
PCB-101	4.2	4.35	4.5	4.7	5.2	NA	NA	NA	NA
PCB-101/90	NA	NA	NA	NA	NA	10	38	15.49	17
PCB-105	1.3	1.25	1.2	1.3 U	0.6 U	4.9	9.5	0.41 J	5.2
PCB-114	NA	NA	NA	NA	NA	0.28 U	0.31 U	0.64 U	0.12 U
PCB-118	3.4 U	3.5 U	3.6 U	3.4	3.4	2.6	4.3	3.04	3.4
PCB-126	NA	NA	NA	NA	NA	3.9	9.8	2.27	1.1
PCB-128	2	2.35	2.7	3.3	3.2	2.9	4.1	3.68	3.8
PCB-138	11.2	11.35	11.5	12.9	30.3	NA	NA	NA	NA
PCB-138/160	NA	NA	NA	NA	NA	26	89	45.09	52
PCB-149/123	NA	NA	NA	NA	NA	20	47	32.11	37
PCB-153	12.4	12.15	11.9	13.9	30.7	NA	NA	NA	NA
PCB-153/132	NA	NA	NA	NA	NA	30	97	50.48	68
PCB-156	NA	NA	NA	NA	NA	4.1	4.6	3.39	3.6
PCB-167	NA	NA	NA	NA	NA	1.6	2.2	1.7	0.12 U
PCB-169	NA	NA	NA	NA	NA	0.23 U	2.4	0.72 U	0.42 U
PCB-170	5.7	5.9	6.1	5.4	19	NA	NA	NA	NA
PCB-170/190	NA	NA	NA	NA	NA	6.1 J	47 J	1.35 U	27
PCB-18	0.5 J	0.35	0.2 J	0.7 U	0.6 J	NA	NA	NA	NA
PCB-18/17	NA	NA	NA	NA	NA	0.86	0.16 U	0.13 U	0.23 U
PCB-180	12.9	13.2	13.5	13.1	42	26	45 J	39.61	53
PCB-185	7.1	7.55	8	8.9	16.3	NA	NA	NA	NA
PCB-187	NA	NA	NA	NA	NA	19	25	25.33	32
PCB-189	NA	NA	NA	NA	NA	0.93	0.78	1.15	1
PCB-195	1.5 U	1.675	2.6	1.4	4.1	NA	NA	NA	NA

LOCATION	1020	1020	1020	1020	1020	MS-3 LOC.1	MS-3 LOC.1	MS-3 LOC.1	MS-3 LOC.1
SAMPLE ID	BC-1020-SD-0897	BC-1020-SD-0897-AVG	BC-1020-SD-0897-D	BC-1020-SD-1197	BC-1020-SD-1296	OU4-SD-M03-100A	OU4-SD-M03-100B	OU4-SD-M03-101A	OU4-SD-M03-101B
SAMPLE DATE	19970819	19970819	19970819	19971114	19961224	20000827	20000504	20010819	20010506
SAMPLE CODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0	0	0	0.33	0.33	0.33	0.33	0.33	0.33
PCB-195/208	NA	NA	NA	NA	NA	4.9	3.5	4.68	5.5
PCB-201	1.7	1.3	0.9	1.7 U	1.9	NA	NA	NA	NA
PCB-201/157/173	NA	NA	NA	NA	NA	2.89	2.62	1.79	1.9
PCB-206	4.8	8.65	12.5	8.7 J	6	4.5	2.2	3.52	4.4
PCB-209	NA	NA	NA	NA	NA	2.5	1.7	2.39	1.9 J
PCB-28	0.9	0.8	0.7 J	0.7 U	0.4 J	0.96	1.4	0.26 J	0.16 U
PCB-29	0.1 U	0.4 U	0.7 U	0.7 U	0.7 U	NA	NA	NA	NA
PCB-44	0.9	0.85	0.8	0.8	0.5	0.67	0.6	0.46	0.33
PCB-50	0.3 J	0.25	0.2 J	0.5 U	0.2 J	NA	NA	NA	NA
PCB-52	1.2	1.2	1.2	1.6 U	1.5	0.21 U	10	15.44	5.9
PCB-66	0.5 U	2.725	5.2	4.7	0.5 U	2.1	0.35	0.52	0.64
PCB-77	NA	NA	NA	NA	NA	0.14 J	5	0.72 U	0.42 U
PCB-8	0.3 U	0.3 U	0.3 U	0.8	0.4	NA	NA	NA	NA
PCB-8/5	NA	NA	NA	NA	NA	0.52 U	0.14 J	0.35	0.41
PCB-81	NA	NA	NA	NA	NA	1.8	6	0.89	0.5
PCB-87	1.4	1.85	2.3	1 U	1.2	NA	NA	NA	NA
PENTACHLOROANISOLE	NA	NA	NA	NA	NA	0.16 U	0.21 J	0.19	0.28 J
PENTACHLOROBENZENE	NA	NA	NA	NA	NA	0.24 U	0.27	0.1 U	0.08 J
TEQ PCB	NA	NA	NA	NA	NA	0.391665	1.05643	0.22857	0.111713
TEQ PCB BIRD	NA	NA	NA	NA	NA	0.57844	1.834615	0.31694	0.161484
TEQ PCB BIRD HALFND	NA	NA	NA	NA	NA	0.578569	1.834631	0.33533	0.172201
TEQ PCB FISH	NA	NA	NA	NA	NA	0.020598	0.052976	0.01201	0.006011
TEQ PCB FISH HALFND	NA	NA	NA	NA	NA	0.020605	0.052977	0.01207	0.006042
TEQ PCB HALFND	NA	NA	NA	NA	NA	0.395119	1.056435	0.23942	0.118038
TEQ PCB-HH-HALFND	0.00009	0.00009	0.00009	0.00012	0.00011	0.39	1.1	0.24	0.12
TOTAL AROCLOR	150	176	202	217.8	359.6	NA	NA	NA	NA
TOTAL DDT HALFND	NA	NA	NA	NA	NA	47.23	41.87	55.86	57.06

LOCATION	1020	1020	1020	1020	1020	MS-3 LOC.1	MS-3 LOC.1	MS-3 LOC.1	MS-3 LOC.1
SAMPLE ID	BC-1020-SD-0897	BC-1020-SD-0897-AVG	BC-1020-SD-0897-D	BC-1020-SD-1197	BC-1020-SD-1296	OU4-SD-M03-100A	OU4-SD-M03-100B	OU4-SD-M03-101A	OU4-SD-M03-101B
SAMPLE DATE	19970819	19970819	19970819	19971114	19961224	20000827	20000504	20010819	20010506
SAMPLE CODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0	0	0	0.33	0.33	0.33	0.33	0.33	0.33
TOTAL DDT POS	NA	NA	NA	NA	NA	47.23	41.8	55.86	57
TOTAL PCB CONGENERS	75	88	101	108.9	179.8	288.71	757.74	422.98	561.35
TOTAL PCB CONGENERS-HH-HALFND	142.8	159.7	176.6	172.2	335.6	359.94	918.85	511.66	652.63
TRANS-NONACHLOR	0.4 J	0.4	0.4 J	0.8 U	0.4 J	0.27	0.4	0.36	0.34
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)									
1,1-BIPHENYL	9.3	9.45	9.6	7.5	14.2	NA	NA	NA	NA
ACENAPHTHENE	38	38.7	39.4	40	21.4	NA	NA	NA	NA
ACENAPHTHYLENE	77	72.15	67.3	71.1	55.7	NA	NA	NA	NA
ANTHRACENE	164	167	170	255	190	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	929.166	984.6425	1040.119	1091.445	704.051	NA	NA	NA	NA
BAP EQUIVALENT-POS	929.166	984.6425	1040.119	1091.445	704.051	NA	NA	NA	NA
BENZO(A)ANTHRACENE	554	609.5	665	658	540 J	NA	NA	NA	NA
BENZO(A)PYRENE	578	615	652	769	449	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	1400	1425	1450	1660	924	NA	NA	NA	NA
BENZO(E)PYRENE	501	511.5	522	595	359	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	354	364	374	520	248	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	116	125.5	135	33.6	78.8	NA	NA	NA	NA
FLUORANTHENE	1410	1315	1220	1440	974	NA	NA	NA	NA
FLUORENE	53.7	51.8	49.9	55.2	30.3	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	356	364	372	513	267	NA	NA	NA	NA
NAPHTHALENE	34.5	39.45	44.4	41	38.9	NA	NA	NA	NA
PERYLENE	172	178	184	204	159	NA	NA	NA	NA
PHENANTHRENE	690	579.5	469	727	410	NA	NA	NA	NA
PYRENE	1100	1125	1150	1210	831	NA	NA	NA	NA
SEMIVOLATILES (UG/KG)									
1,1-BIPHENYL	NA	NA	NA	NA	NA	8.71 J	10.2 J	8.1	10.7
1-METHYLNAPHTHALENE	15.9	16.8	17.7	25.4	26.9	27.1 J	25.6	15.2	26.4
1-METHYLPHENANTHRENE	66.9	65.65	64.4	77.5	71.8	41.3	116	66.2	81.1
2,3,5-TRIMETHYLNAPHTHALENE	5.8	5.3	4.8	8.2	8.5	10.7	16.2	9.6	10.9
2,6-DIMETHYLNAPHTHALENE	42.2	36.15	30.1	39.5	21.7	16.8	17.3	13.6	19.5
2-METHYLNAPHTHALENE	26.5	27.75	29	29.2	34.1	42.1 J	36.2	27.1	42.5
ACENAPHTHENE	NA	NA	NA	NA	NA	46.3 J	113	28.6	69.7
ACENAPHTHYLENE	NA	NA	NA	NA	NA	153	143	97	151.6
ANTHRACENE	NA	NA	NA	NA	NA	274 J	621	500.3 J	575.9
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA	365.511	1430.542	1670.42	1381.14
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA	365.511	1430.542	1670.42	1381.14
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	408	944	782.2	753.5
BENZO(A)PYRENE	NA	NA	NA	NA	NA	96.9 J	1005	1208.8 J	1028.3
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	814	1002	1306.5 J	1162.4
BENZO(E)PYRENE	NA	NA	NA	NA	NA	420	529 J	715.2	515.7
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	386 J	496	539 J	437.5
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA	214	421	435.7	332.8
CHRYSENE	626	652.5	679	545	671 J	611	972	821.7	986.8 J
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	94.4 J	165	173.4 J	101.9 J
DIBENZOTHIOPHENE	NA	NA	NA	NA	NA	20.4	45.6 J	20.6	32.8 J
FLUORANTHENE	NA	NA	NA	NA	NA	1089 J	1810	1298.7	1566.1
FLUORENE	NA	NA	NA	NA	NA	62 J	176 J	64.5 J	83 J
HIGH MOLECULAR WEIGHT PAHS	4380	4440	4500	4655.6	3543.8	3322.3	6416	5468.1	5897.9
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	454 J	558	687.8 J	506.6 J
LOW MOLECULAR WEIGHT PAHS	1080	974.5	869	1218.5	780.4	983.4	2039.6	1212.4	1676.4
NAPHTHALENE	NA	NA	NA	NA	NA	63	65.4	36.8	66.8
PERYLENE	NA	NA	NA	NA	NA	122	188 J	72.8 J	137.9 J
PHENANTHRENE	NA	NA	NA	NA	NA	343	885 J	458.1	686.9
PYRENE	NA	NA	NA	NA	NA	1023	1520	1183.3	1461.3
TOTAL PAHS	8390	8395	8400	9524.2	6424.3	NA	NA	NA	NA
TOTAL PAHS ECO	NA	NA	NA	NA	NA	4305.7	8455.6	6680.5	7574.3

LOCATION	MS-3 LOC.1	MS-3 LOC.1	MS-3 LOC.1	MS-3 LOC.1	MS-3 LOC.2	MS-3 LOC.2	MS-3 LOC.2	MS-3 LOC.2	MS-3 LOC.2
SAMPLE ID	OU4-SD-M03-102A	OU4-SD-M03-199A	OU4-SD-M03-199A-AVG	OU4-SD-M03-199A-D	OU4-SD-M03-200A	OU4-SD-M03-200B	OU4-SD-M03-201A	OU4-SD-M03-201B	OU4-SD-M03-202A
SAMPLE DATE	20020810	19990910	19990910	19990909	20000827	20000504	20010819	20010506	20020810
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
ALKYLATED PAHS (UG/KG)									
C1-CHRYSENES	552.8	387	390.5	394	168	321	513.3	155	496.5
C1-DIBENZOTHIOPHENES	34.1	24.5	27.9	31.3	15.9	25.4	17.7	29.5	62.6
C1-FLUORANTHENES/PYRENES	726.5	573	566.5	560	293	422	434.1	314.5	2273.3
C1-FLUORENES	34 J	78.1	57.65	37.2	21.9	56.2	36.5	42.7	56
C1-NAPHTHALENES	41 J	81.3 U	75.35 U	69.4 U	49.5	47.2	49.2	34.2	77.7
C1-PHENANTHRENES/ANTHRACENES	339.4	338	302.5	267	111	231	187.7	225.7	497.3
C2-CHRYSENES	294.7	185	172	159	68.9	124	176.1	73.6	217.8
C2-DIBENZOTHIOPHENES	41.7	38.3	39	39.7	19.5	31.4	22.1	24.8	101.5
C2-FLUORENES	32.7 J	62.5	55.2	47.9	32.9	63.6	36.8	31	53.1
C2-NAPHTHALENES	25.7	42.5 U	50 U	57.5 U	43.1	65	37.2	35.2	51.7
C2-PHENANTHRENES/ANTHRACENES	198.8	233	205.5	178	69.7	142	118.7	111	522.9
C3-CHRYSENES	40.9 J	11.5	14	16.5	8.64	10.6	10.4	13.1	27.8 J
C3-DIBENZOTHIOPHENES	53	64.5	48.1	31.7	20.2	24	30.2	15.2	162.7
C3-FLUORENES	31 J	144	89.1	34.2	18.8	50.9	28.5	23.3	87.7
C3-NAPHTHALENES	20.2	69.1	72.4	75.7	41.7	69	32.5	39.9	68.4
C3-PHENANTHRENES/ANTHRACENES	136	180	155	130	48.2	93.4	82.3	53	429.5
C4-CHRYSENES	18.3 J	15	19.7	24.4	7.16	3.12	0.3 J	45.9	16.1 J
C4-NAPHTHALENES	11.7 J	48.7	50.75	52.8	20.4	28	20.9	20.2	47.7
C4-PHENANTHRENES/ANTHRACENES	64	73.5	70.05	66.6	47.9	49.3	30.2	16	309.1
AVS/SEM (MG/KG)									
ACID VOLATILE SULFIDE	NA	1435 J	1357	1279 J	71.7 J	588	262.271 J	306.917 J	NA
CADMIUM	NA	0.25	0.265	0.28	0.12 J	0.147	0.57	0.28 J	NA
COPPER	NA	4.3 U	6.2 U	8.1 U	468.49 J	9.51 U	273.95	318 J	NA
LEAD	NA	44.6 J	50.4	56.2 J	113.72 J	28.1 J	132.31	88.4	NA
NICKEL	NA	3.8	4.4	5	20.05 J	6.68	40.03	17.4	NA
ZINC	NA	91.3	93.65	96	375.4 J	139	363.38	429	NA
HF INORGANICS (MG/KG)									
ALUMINUM	43345	64051	65615	67179	39791	60600	49316.8	47522.36	44593
ARSENIC	16.5	11.7	14.5	17.3	19.9	18.6	17.13	15.56	17
CADMIUM	3.5	0.6	0.57	0.54	0.64	0.79	0.49 J	0.84	2.4
CHROMIUM	96.4	124	124.5	125	125	137	110.22	93.57	100
COPPER	231	173 J	204.5	236 J	1902 J	1090	663.81	564.18	975
IRON	30864	31809	32203.5	32598	44337 J	39900	40929.1	38680.8	40639
LEAD	168	128 J	127	126 J	292	229	180.25	183.83	272
MANGANESE	348	439	442.5	446	446	469	400.22	338.61	380
MERCURY	0.47 J	0.63 J	0.915	1.2 J	0.52	0.75	1.3338 J	0.39 J	0.45 J
NICKEL	47.3 J	43.2	45.55	47.9	102 J	79	72.17	62.66	110
SILVER	2	1.1	1.1	1.1	3.77 J	1.7	1.65 J	14.4	2.4
ZINC	280	225	237	249	647 J	650	469.71 J	472.93	628
INORGANICS (MG/KG)									
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (%)									
ORGANIC MATTER	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCENT CLAY	24.5	30.6	29.485	28.37	9.3	15.41	12.7	8.7	10.1
PERCENT GRAVEL	0	NA	NA	NA	NA	NA	NA	NA	0

LOCATION	MS-3 LOC.1	MS-3 LOC.1	MS-3 LOC.1	MS-3 LOC.1	MS-3 LOC.2	MS-3 LOC.2	MS-3 LOC.2	MS-3 LOC.2	MS-3 LOC.2
SAMPLE ID	OU4-SD-M03-102A	OU4-SD-M03-199A	OU4-SD-M03-199A-AVG	OU4-SD-M03-199A-D	OU4-SD-M03-200A	OU4-SD-M03-200B	OU4-SD-M03-201A	OU4-SD-M03-201B	OU4-SD-M03-202A
SAMPLE DATE	20020810	19990910	19990910	19990909	20000827	20000504	20010819	20010506	20020810
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
PERCENT SAND	46.4	17.46	20.28	23.1	77.6	57.46	58.7	75.5	75.5
PERCENT SILT	29.1	51.94	50.235	48.53	13.1	27.13	28.5	15.7	14.4
TOTAL ORGANIC CARBON	1.4 J	2.38	2.63	2.88	0.64 J	2.09	1.86	0.93 J	0.62 J
MISCELLANEOUS PARAMETERS (MG/KG)									
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)									
PH	NA	NA	NA	NA	NA	NA	NA	NA	NA
PESTICIDES/PCBS (UG/KG)									
1,2,3,4-TETRACHLOROBENZENE	2.14	0.72	0.68	0.64	0.2 U	0.51	0.77	0.13	0.2 J
1,2,4,5-TETRACHLOROBENZENE	1.57	1.8	1.65	1.5	1.2 U	0.64	2.84 U	1.1	0.47
2,4'-DDD	15.05	10	9.85	9.7	1.9	3.2	3.22	2.6	2.99
2,4'-DDE	3.28	0.45	0.465	0.48	0.1	0.11 U	36.81	0.081 U	1.81
2,4'-DDT	2.73	1.6	1.95	2.3	0.75	0.49	0.7	0.26	0.65
4,4'-DDD	32.8	27	26	25	3.7	5.1	4.81	3.1	6.97
4,4'-DDE	10.34	6.9	6.3	5.7	1.9	3	3.2	1.7	3.16
4,4'-DDT	19.71	4.9	4.35	3.8	1.7	1.3	6.02	1.4	6.46
ALDRIN	0.6	0.094 U	0.096 U	0.098 U	0.01 J	0.079 U	0.08 U	0.07	0.27
ALPHA-BHC	0.06 J	0.083 U	0.0915 U	0.1 U	0.1	0.58	0.04 J	0.081 U	0.07
ALPHA-CHLORDANE	1.34	1.6	1.45	1.3	0.98	0.65	8.89	0.64	0.77
BETA-BHC	1.67	0.32 U	0.325 U	0.33 U	0.18 U	0.91	1.53	0.14 U	0.21 J
CHLORPYRIFOS	1.06	0.017 J	0.017 J	0.47 U	3.2 U	0.38 U	0.14 U	0.081 U	0.32
CIS-NONACHLOR	2.2	1	0.905	0.81	0.41	0.38	0.61	0.22	0.49
DELTA-BHC	0.09 U	0.07 U	0.048 J	0.048 J	0.039 U	0.15	0.04 J	0.1	0.08 U
DIELDRIN	3.19	0.11 U	0.03 J	0.03 J	1	1.5	33.29	0.07 U	2.16
ENDOSULFAN II	0.21 U	1.8	1.85	1.9	0.68	0.85	1.07	0.67	0.1 J
ENDRIN	0.1 U	0.041 J	0.041 J	0.22 U	0.12 U	0.18 U	0.08 U	0.07 U	0.45
GAMMA-BHC (LINDANE)	0.52	0.37 U	0.735 U	1.1 U	0.21 U	0.37	0.44	0.47 U	0.17 U
GAMMA-CHLORDANE	0.28	0.42	0.42	0.42	0.059 U	0.26	0.037 U	0.16	0.43
HEPTACHLOR	1.32	2.2	2.6	3	0.37	0.51	28.79	0.76	1.58
HEPTACHLOR EPOXIDE	0.08 U	0.047 U	0.048 U	0.049 U	0.026 U	0.04 U	0.07 U	0.12	0.07 U
HEXACHLOROBENZENE	0.1	0.095 U	0.1275 U	0.16 U	0.05	0.09	0.22	0.03 J	0.07
MIREX	0.13 U	0.41	0.21725	0.049 U	0.026 U	0.29	0.24	0.035 U	0.11 U
OXYCHLORDANE	0.28	0.094	0.172	0.25	0.013 U	0.32 J	0.1	0.023 U	0.16
PCB-101	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-101/90	22.71	29	23	17	5.5	5.8	50.6	4	7.01
PCB-105	1.44	5.5 J	6.95	8.4 J	2.7	2.8	0.8	1.2	0.4 J
PCB-114	0.59 U	0.28 U	0.285 U	0.29 U	0.16 U	0.24 U	0.49 U	0.081 U	0.49 U
PCB-118	6.04	3.9	4.4	4.9	1.8	3.1	2.43	1.3	2.6
PCB-126	0.01 J	1.1 U	1.15 U	1.2 U	0.16 U	8.7	69.55	0.28	0.01 J
PCB-128	5.05	5.6 J	5.05	4.5 J	1.3	1.4	4.13	0.91	1.03
PCB-138	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-138/160	63.14	73	55.5	38	10	20	508.1	9.3	18.03
PCB-149/123	54.37	41	35.5	30	8.2	8.6	17.14	5.3	8.31
PCB-153	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-153/132	71.74	65	52.5	40	12	17	48.69	8.2	20.7
PCB-156	4.65	0.28 U	2.97	5.8	1.5	2.5	1.45	0.83	0.94
PCB-167	1.61	17	11	5	0.62	1	0.49 U	0.081 U	0.33 J
PCB-169	0.01 J	1.1 U	1.15 U	1.2 U	0.04 U	0.46	0.03 J	0.02 J	0.01 J
PCB-170	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-170/190	23.19 J	37 J	35.5	34 J	2.6 J	37 J	1.05 U	12	4.76 J
PCB-18	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-18/17	0.16	0.14 U	0.145 U	0.15 U	0.078 U	0.12 U	0.1 U	0.15 U	0.44
PCB-180	59.09	53 J	48.5	44 J	10	20 J	103.53	9.3	15.63
PCB-185	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-187	36.71	39	35	31	11	16	352.57	8	12.02
PCB-189	1.12	1.1	1.15	1.2	0.33	0.44	0.9	0.2	0.22 J
PCB-195	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	MS-3 LOC.1	MS-3 LOC.1	MS-3 LOC.1	MS-3 LOC.1	MS-3 LOC.2	MS-3 LOC.2	MS-3 LOC.2	MS-3 LOC.2	MS-3 LOC.2
SAMPLE ID	OU4-SD-M03-102A	OU4-SD-M03-199A	OU4-SD-M03-199A-AVG	OU4-SD-M03-199A-D	OU4-SD-M03-200A	OU4-SD-M03-200B	OU4-SD-M03-201A	OU4-SD-M03-201B	OU4-SD-M03-202A
SAMPLE DATE	20020810	19990910	19990910	19990909	20000827	20000504	20010819	20010506	20020810
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
PCB-195/208	7.56	7	9	11	2.6	3.9	30.59	1.9	4.28
PCB-201	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-201/157/173	2.98	2.6	3.035	3.47	1.11	1.99	10.84	0.83	1.16
PCB-206	5.12	7.1	14.05	21	3.5	6.6	91.58	3	9.14
PCB-209	1.66	3.6 J	3.5	3.4 J	1.2	2.6	12.08	0.92 J	3.66
PCB-28	0.78	0.32 U	0.58	1	0.43	2.2	0.56	0.1 U	1.87
PCB-29	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-44	0.57	0.48	0.48	0.48	0.23	0.62	0.45	0.2	0.74
PCB-50	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-52	8.98	5.3	3.85	2.4	2	3.6	30.8	1.8	3.22
PCB-66	3.72	0.68	0.81	0.94	0.47	0.5	0.54	0.36	0.49
PCB-77	0.07 J	0.032 J	0.031	0.03 J	0.16 U	0.67	0.55 U	0.28 U	0.05 J
PCB-8	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-8/5	0.22 J	1 J	0.615	0.23 J	0.12 J	0.04 J	1	0.43	0.97
PCB-81	1.72	4.8	2.95	1.1 J	1.5	3.5	14.06	0.33	0.88 J
PCB-87	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLOROANISOLE	0.12 J	0.15 J	0.135	0.12 J	0.16 U	0.18 J	0.18	0.13 U	0.04 J
PENTACHLOROBENZENE	1.09	0.15	0.18	0.21	0.12 U	0.15	0.59 U	0.08	0.09 J
TEQ PCB	0.003989	0.00358	0.002836	0.002096	0.000938	0.88553	6.961125	0.028989	0.001988
TEQ PCB BIRD	0.178048	0.48304	0.298359	0.113678	0.15064	1.25482	8.362543	0.061374	0.091874
TEQ PCB BIRD HALFND	0.178078	0.53862	0.356455	0.174292	0.162668	1.254832	8.376319	0.068378	0.091898
TEQ PCB FISH	0.001278	0.00276	0.001803	0.000846	0.000833	0.045442	0.354949	0.001613	0.000566
TEQ PCB FISH HALFND	0.001279	0.00554	0.0047085	0.003877	0.001242	0.045443	0.354979	0.001627	0.000567
TEQ PCB HALFND	0.003998	0.07508	0.077592	0.0801	0.009548	0.885534	6.961167	0.029005	0.001995
TEQ PCB-HH-HALFND	0.0023	0.074	0.0765	0.079	0.0093	0.89	7	0.029	0.0017
TOTAL AROCLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL DDT HALFND	83.91	50.85	48.915	46.98	10.05	13.145	54.76	9.1005	22.04

LOCATION	MS-3 LOC.1	MS-3 LOC.1	MS-3 LOC.1	MS-3 LOC.1	MS-3 LOC.2	MS-3 LOC.2	MS-3 LOC.2	MS-3 LOC.2	MS-3 LOC.2
SAMPLE ID	OU4-SD-M03-102A	OU4-SD-M03-199A	OU4-SD-M03-199A-AVG	OU4-SD-M03-199A-D	OU4-SD-M03-200A	OU4-SD-M03-200B	OU4-SD-M03-201A	OU4-SD-M03-201B	OU4-SD-M03-202A
SAMPLE DATE	20020810	19990910	19990910	19990909	20000827	20000504	20010819	20010506	20020810
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
TOTAL DDT POS	83.91	50.85	48.915	46.98	10.05	13.09	54.76	9.06	22.04
TOTAL PCB CONGENERS	635.76	672.78	598.715	524.65	134.978	286.44	2478.05	125.89	213.98
TOTAL PCB CONGENERS-HH-HALFND	769.43	808.604	714.572	620.54	162.018	342.4	2707.52	141.912	238.29
TRANS-NONACHLOR	0.45	0.23	0.415	0.6	0.12	0.2	0.2	0.13	0.35
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)									
1,1-BIPHENYL	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(E)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
SEMIVOLATILES (UG/KG)									
1,1-BIPHENYL	10.8	12.9 U	11.8 U	10.7 U	6.48 J	6.86 J	7.9	5.2	12.6
1-METHYLNAPHTHALENE	15.1 J	30.6 U	28.45 U	26.3 U	16.8 J	17.5	14.3	12.3	26.6 J
1-METHYLPHENANTHRENE	84.9	93.8	75.1	56.4	33.7	70.9	45.5	60.7	171.4
2,3,5-TRIMETHYLNAPHTHALENE	12.1 J	16.6	14.9	13.2	6.61	15.5	8	8.2	15.9 J
2,6-DIMETHYLNAPHTHALENE	21.6	21.6	19.6	17.6	13.1	17	13.5	13	18.1
2-METHYLNAPHTHALENE	26 J	50.7 U	46.9 U	43.1 U	32.6 J	29.6	34.9	21.8	51.1
ACENAPHTHENE	51.9	32.8	37.15	41.5	22.1 J	47.2	18.9	21.7	57.7
ACENAPHTHYLENE	88 J	107 J	111.5	116 J	63.2	78	117.9	74	134.3 J
ANTHRACENE	388.1	248	281	314	126 J	281	774.3 J	265.8	668
BAP EQUIVALENT-HALFND	1352.154	864.558	929.4895	994.421	428.604	878.422	1532.672	708.0197	1307.419
BAP EQUIVALENT-POS	1352.154	864.558	929.4895	994.421	428.604	878.422	1532.672	708.0197	1307.419
BENZO(A)ANTHRACENE	600.4	514	542.5	571	273	520	606.9	366.4	1212.8
BENZO(A)PYRENE	1069 J	587	639	691	228 J	591 J	1066.2	531.8 J	974 J
BENZO(B)FLUORANTHENE	1267.2	765	787	809	536	682	1039.1	509.4	1235.3
BENZO(E)PYRENE	788.6 J	396	405	414	297	332	533.4	250.9	608.4 J
BENZO(G,H,I)PERYLENE	586.2 J	378	386	394	338 J	381	619.4 J	255.6	446.7 J
BENZO(K)FLUORANTHENE	148.7 J	241	261	281	162	158	297.9	164.7	49.8 J
CHRYSENE	905.4	668	669.5	671	304	532	549.3	376.7 J	1413.6
DIBENZO(A,H)ANTHRACENE	63.1 J	102	108.5	115	77.4 J	120 J	217.3 J	56.1 J	55.1 J
DIBENZOTHIOPHENE	42.9	39.6	38.7	37.8	12.3	25.1 J	16.4	22 J	36.4
FLUORANTHENE	2003.4	1010	968.5	927	468 J	952	653.4	762.1	4322.1
FLUORENE	61.7 J	50.7	55.5	60.3	33.5 J	78.6 J	86.7 J	51.1 J	66.5 J
HIGH MOLECULAR WEIGHT PAHS	6628.2	3867	3879	3891	1841.4	3556	3712.7	2858.2	12055.1
INDENO(1,2,3-CD)PYRENE	250.4 J	408	419	430	370 J	413	748.5 J	279.6 J	271.3 J
LOW MOLECULAR WEIGHT PAHS	1728.1	1000	1035.725	1071.45	510.6	977	1405.9	852.5	1662.6
NAPHTHALENE	43.1	68.3 U	65.25 U	62.2 U	37.2	39.6	40.8	29.4	95.2
PERYLENE	160	111	111	111	91	134	79.2	71.4 J	159.2
PHENANTHRENE	1069.3	502	494.5	487	196	423 J	332.4	388.7	589.8
PYRENE	1986.9	986	951	916	491	841	619.6	765.1	4077.5
TOTAL PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PAHS ECO	8356.3	4867	4914.725	4962.45	2352	4533	5118.6	3710.7	13717.7

LOCATION	MS-3 LOC.2	MS-3 LOC.3	MS-3 LOC.3	MS-3 LOC.3	MS-3 LOC.3	MS-3 LOC.3	MS-3 LOC.3	MS-4 LOC.1	MS-4 LOC.1
SAMPLE ID	OU4-SD-M03-299A	OU4-SD-M03-300A	OU4-SD-M03-300B	OU4-SD-M03-301A	OU4-SD-M03-301B	OU4-SD-M03-302A	OU4-SD-M03-399A	OU4-SD-M04-100A	OU4-SD-M04-100B
SAMPLE DATE	19990910	20000827	20000504	20010819	20010506	20020810	19990910	20000827	20000504
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
ALKYLATED PAHS (UG/KG)									
C1-CHRYSENES	325	242	316	443.1	131.2	165.4	239	712	682
C1-DIBENZOTHIOPHENES	44.2	19	18.4	21.6	10.2	21.2	21	46.9	61.2
C1-FLUORANTHENES/PYRENES	728	393	412	488.1	193.7	272.3	347	1002	818
C1-FLUORENES	56	37.3	45.4	48	22.9	23.9 J	25.7	64.9	221
C1-NAPHTHALENES	83.7 U	65.4	42.3	62.7	27.4 J	16.8 J	46.6 U	139	202
C1-PHENANTHRENES/ANTHRACENES	384	190	201	224.9	99.9	162.9	189	479	536
C2-CHRYSENES	103	87	133	157.6	66.7	74.8	106	224	310
C2-DIBENZOTHIOPHENES	57	21.6	25.9	29.4	13.3	20.3	30.4	51.8	74.9
C2-FLUORENES	48.8	41.7	41.2	55.5	20.2	17.9 J	37.1	75.2	96.4
C2-NAPHTHALENES	78.2 U	52.2	43.1	50	23.9	12 J	45.5 U	161	178
C2-PHENANTHRENES/ANTHRACENES	222	136	138	183	74.7	97.1	129	271	335
C3-CHRYSENES	7.75	5.69	10.5	12.1	8.5	7.3 J	8.7	26.8	18.7
C3-DIBENZOTHIOPHENES	73.1	16	23.7	24.7	9.8	15.9	44.1	35.1	38.8
C3-FLUORENES	78	24.2	37.2	37.3	15.7	20 J	24.9	35.2	78.9
C3-NAPHTHALENES	106	56.6	45	44.7	23.7	9.3 J	57.5	139	157
C3-PHENANTHRENES/ANTHRACENES	150	80.2	92.6	101.6	39	55.2	102	133	166
C4-CHRYSENES	22.6	4	3.02	0.9 J	27.3	6.7 J	19.3	28.9	12.9
C4-NAPHTHALENES	72.9	26	15.7	28.1	16.6	7.3 J	38.8	56.5	45.3
C4-PHENANTHRENES/ANTHRACENES	69.5	41	34.8	28.7	20.6	18.1	24.1	106	74.4
AVS/SEM (MG/KG)									
ACID VOLATILE SULFIDE	1251 J	125 J	604	325.815 J	418.364 J	NA	589 J	5.06 U	225
CADMIUM	0.22	0.1368 U	0.141	0.44	0.25 J	NA	0.24	0.1069 U	0.182
COPPER	25.2	0.0889 UR	1.52 U	40.18	12.9 J	NA	8.8 U	9282.11 J	93.3
LEAD	53.2 J	23.25 J	19.7 J	63.73	26.2	NA	37.6 J	414.88 J	64.6
NICKEL	13.2	2.6 J	1.43	5.24	3.68	NA	3.5	132.04 J	32.6
ZINC	187	46.39 J	43.9	135.77	67	NA	93.9	906.64 J	271
HF INORGANICS (MG/KG)									
ALUMINUM	56680	51612	58500	51452.31	52640.4	38110	58174	36081	40900
ARSENIC	17.9	11.5	10.7	13.15	10.41	9.3	18	27.6	19.7
CADMIUM	0.65	0.45	0.46	0.4622 U	0.85	0.9 U	0.38	0.91	1
CHROMIUM	108 J	57.6	87.4	108.46	70.34	63.2	91.6 J	107	132
COPPER	3720	27.2 J	106	114.86	29.96	23.2	125	20507 J	1780
IRON	44051	19576 J	21100	25337.64	21368.34	19539	22327	89742 J	48700
LEAD	206 J	51.5	80.6	92.8	50.93	51.6	79.2 J	788	316
MANGANESE	524	331	409	346.72	307.95	319	414	665	505
MERCURY	0.45 J	0.17	0.48	0.5064 J	0.19 J	0.16 J	0.35 J	2.41	3.6
NICKEL	85.8 J	14.5 J	26.5	30.09	19.07	20.1 J	29.5 J	197 J	193
SILVER	2.4	3.34 J	0.98	1.56 J	0.51	0.85	0.97	8.11 J	3.2 J
ZINC	2324	63.7 J	138	178.46 J	83.51	73.2	154	2633 J	1510
INORGANICS (MG/KG)									
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (%)									
ORGANIC MATTER	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCENT CLAY	15.98	13.3	14.8	15.4	10.7	13.9	11.51	1.8	1.41
PERCENT GRAVEL	NA	NA	NA	NA	NA	0	NA	NA	NA

LOCATION	MS-3 LOC.2	MS-3 LOC.3	MS-3 LOC.3	MS-3 LOC.3	MS-3 LOC.3	MS-3 LOC.3	MS-3 LOC.3	MS-4 LOC.1	MS-4 LOC.1
SAMPLE ID	OU4-SD-M03-299A	OU4-SD-M03-300A	OU4-SD-M03-300B	OU4-SD-M03-301A	OU4-SD-M03-301B	OU4-SD-M03-302A	OU4-SD-M03-399A	OU4-SD-M04-100A	OU4-SD-M04-100B
SAMPLE DATE	19990910	20000827	20000504	20010819	20010506	20020810	19990910	20000827	20000504
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
PERCENT SAND	56.18	63.9	57.05	49.2	65.1	60	61.07	96	89.41
PERCENT SILT	27.84	22.7	28.15	35.3	24.2	26.2	27.42	2.2	9.18
TOTAL ORGANIC CARBON	1.7	1.31 J	1.81	2.12	1.25 J	0.88 J	1.36	1.84 J	1.13
MISCELLANEOUS PARAMETERS (MG/KG)									
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)									
PH	NA	NA	NA	NA	NA	NA	NA	NA	NA
PESTICIDES/PCBS (UG/KG)									
1,2,3,4-TETRACHLOROBENZENE	0.17 J	0.14 U	1.5	1.14	0.34	0.26 U	0.2 J	0.49 U	0.32
1,2,4,5-TETRACHLOROBENZENE	0.81	1.1 U	1.6	4.67	0.34 U	0.62	1.1	1.2 U	1.2
2,4'-DDD	3.9	2	3	3.75	2.7	1.04	3.6	9.5	16
2,4'-DDE	0.34	0.096 U	0.1 U	0.43	0.93	0.14	0.23	0.81	0.63
2,4'-DDT	0.64	0.13	0.21	0.32	0.04 J	0.1	0.15	23	1.9
4,4'-DDD	5.6	1.5	4.5	6.09	1.7	1.09	5.6	30	38
4,4'-DDE	2.8	0.93	1.8	2.65	1	0.95	2.5	20	11
4,4'-DDT	6.7	0.66	1.2	1.67	0.67	0.43	2.1	104	4.1 U
ALDRIN	0.074 U	0.02 J	0.075 U	0.1 U	0.06	0.16	0.073 U	0.055 U	0.055 U
ALPHA-BHC	0.081 U	0.04 J	0.24	0.11	0.1	0.08	0.046 U	0.12	0.18
ALPHA-CHLORDANE	1.1	0.22	0.53	0.99	0.35	0.15 U	0.7	1.2	1.4
BETA-BHC	0.25 U	0.24 U	1	0.71	0.1 U	0.11 J	0.25 U	0.19 U	0.19 U
CHLORPYRIFOS	0.35 U	0.31 U	0.36 U	0.73	0.095 U	0.16 U	0.017 J	0.59 U	0.26 U
CIS-NONACHLOR	0.89	0.21	0.25	0.46	0.14	0.13	0.27	0.41	0.54
DELTA-BHC	0.004 J	0.03 J	0.13	0.07 J	0.068 U	0.04 J	0.25	0.042 U	0.041 U
DIELDRIN	0.083 U	0.1	0.21	0.05 U	0.082 U	0.04 J	0.16	4.2	0.062 U
ENDOSULFAN II	1.9	1.2	1.6	1.39	0.57	0.2 U	1.7	2.2	1.7
ENDRIN	0.16 J	0.16 U	0.17 U	0.1 U	0.1	0.09 U	0.077 J	0.12 U	0.12 U
GAMMA-BHC (LINDANE)	0.58 U	0.28 U	0.22 J	0.36	0.56 U	0.19 U	0.73 U	0.22 U	0.13 J
GAMMA-CHLORDANE	0.13	0.078 U	0.24	0.25	0.18	0.1	0.083 U	0.062 U	0.54
HEPTACHLOR	0.37	0.2 U	0.27	0.13 J	0.19	0.17 J	0.25	0.63	0.61
HEPTACHLOR EPOXIDE	0.037 U	0.035 U	0.037 U	0.08 U	0.03 J	0.08 U	0.037 U	0.028 U	0.028 U
HEXACHLOROBENZENE	0.31 U	0.052 U	0.05 J	0.08 U	0.068 U	0.05 J	0.044 U	0.12	0.08
MIREX	0.24	0.035 U	0.04	0.13 U	0.07	0.12 U	0.037 U	0.16	0.16
OXYCHLORDANE	0.17	0.07	0.08 J	0.07 J	0.027 U	0.09	0.068	0.08	0.65 J
PCB-101	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-101/90	4.5	2.4	4.6	5.71	2.9	0.61 U	4.2	5.6	22
PCB-105	1.8 J	1.3	1.9	1.15	1.2	0.37 J	2 J	0.71 J	5.1
PCB-114	0.22 U	0.21 U	0.23 U	0.59 U	0.095 U	0.57 U	0.22 U	0.17 U	0.17 U
PCB-118	1.9	2.2	2.9	3.06	1.1	1.01	2.6	2	7.1
PCB-126	0.89 U	0.21 U	1	0.4 J	0.33 U	0.03 J	0.88 U	6.5	4.1
PCB-128	1.4 J	0.94	1.6	1.78	0.66	0.4	1.5 J	1.7	2.3
PCB-138	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-138/160	12	5.1	9.2	11.95	4.1	2.4	10	19	33
PCB-149/123	6.5	2.3	4.8	7.53	3	1.36	5.2	6.3	22
PCB-153	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-153/132	11	4	9.2	15.6	4.4	3.04	9.7	11	31
PCB-156	2.02	0.92	3	0.59 U	0.67	0.38 J	1.91	1.5	6.4
PCB-167	4.3	0.23	0.92	0.72	1.2	0.19 J	2.2	0.77	0.33
PCB-169	0.039 J	0.06 U	0.34	0.02 J	0.03 J	0.57 U	0.88 U	0.03 U	0.12 J
PCB-170	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-170/190	20 J	1.1 J	18 J	1.25 U	7.1	0.78 J	15 J	2.3 J	5.9 J
PCB-18	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-18/17	0.2 J	0.65	0.11 U	0.12 U	0.64	0.12 U	0.11 U	0.083 U	0.13
PCB-180	12 J	3.1	7 J	10.73	3.2	1.72 J	7.9 J	11	27
PCB-185	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-187	11	1.6	4.2	6.13	2.3	0.96 J	5.7	11	22
PCB-189	0.31	0.23	0.29	0.41 J	0.07 J	0.57 U	0.4	0.45	0.71
PCB-195	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	MS-3 LOC.2	MS-3 LOC.3	MS-3 LOC.3	MS-3 LOC.3	MS-3 LOC.3	MS-3 LOC.3	MS-3 LOC.3	MS-4 LOC.1	MS-4 LOC.1
SAMPLE ID	OU4-SD-M03-299A	OU4-SD-M03-300A	OU4-SD-M03-300B	OU4-SD-M03-301A	OU4-SD-M03-301B	OU4-SD-M03-302A	OU4-SD-M03-399A	OU4-SD-M04-100A	OU4-SD-M04-100B
SAMPLE DATE	19990910	20000827	20000504	20010819	20010506	20020810	19990910	20000827	20000504
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
PCB-195/208	3	0.55	1	1.77	0.4	0.35	1.3	5.1	5.3
PCB-201	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-201/157/173	1.3	0.32	0.75	0.9	0.27	0.26 J	0.54	1.34	1.95
PCB-206	6.6	0.69	0.92	1.68	0.73	0.51	1.9	8.9	11
PCB-209	2.6 J	0.83	0.77	3.32	0.32 J	0.35	0.8 J	11	13
PCB-28	0.25 U	0.57	1.4	0.32 J	0.29	0.46	1	0.21 U	1
PCB-29	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-44	2.1	0.47	0.32	0.42	0.06 J	0.19 J	0.31	0.11 J	1.7
PCB-50	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-52	2.6	1.6	1.7	2.24	0.48	0.91	1.1	5.4	5
PCB-66	0.43	0.48	0.51	0.59	0.21	0.16	0.63	0.12 U	1.3
PCB-77	0.057 J	0.06 J	0.66	0.07 J	0.33 U	0.01 J	0.075 J	0.15 J	0.17 U
PCB-8	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-8/5	0.44 J	0.38 U	0.13 J	0.47	0.5	0.43	0.33 J	0.31 U	1.5
PCB-81	1.2	0.11 U	0.91	0.17 J	0.01 U	0.04 J	0.12 J	3.6	2.6
PCB-87	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLOROANISOLE	0.15 J	0.11 U	0.15 J	0.18	0.14 U	0.03 J	0.11 J	0.2 U	0.17 J
PENTACHLOROBENZENE	0.13	0.087 U	0.29	0.54 U	0.06 J	0.15	0.11	0.2 U	0.11
TEQ PCB	0.00208	0.000232	0.110976	0.041071	0.001125	0.00312	0.000489	0.651487	0.415687
TEQ PCB BIRD	0.123531	0.003303	0.224994	0.060842	0.000298	0.007627	0.016299	1.01795	0.671766
TEQ PCB BIRD HALFND	0.168042	0.019343	0.225006	0.060902	0.025553	0.007943	0.06075	1.017973	0.676024
TEQ PCB FISH	0.000699	0.000044	0.005611	0.002162	0.000039	0.000189	0.000143	0.034382	0.022026
TEQ PCB FISH HALFND	0.002925	0.0006	0.005612	0.002164	0.000882	0.000205	0.002366	0.034383	0.022034
TEQ PCB HALFND	0.046583	0.011651	0.110979	0.041089	0.017644	0.011688	0.057692	0.65194	0.415698
TEQ PCB-HH-HALFND	0.046	0.012	0.11	0.041	0.018	0.012	0.058	0.65	0.41
TOTAL AROCLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL DDT HALFND	19.98	5.268	10.76	14.91	7.04	3.75	14.18	187.31	69.58

LOCATION	MS-3 LOC.2	MS-3 LOC.3	MS-3 LOC.3	MS-3 LOC.3	MS-3 LOC.3	MS-3 LOC.3	MS-3 LOC.3	MS-4 LOC.1	MS-4 LOC.1
SAMPLE ID	OU4-SD-M03-299A	OU4-SD-M03-300A	OU4-SD-M03-300B	OU4-SD-M03-301A	OU4-SD-M03-301B	OU4-SD-M03-302A	OU4-SD-M03-399A	OU4-SD-M04-100A	OU4-SD-M04-100B
SAMPLE DATE	19990910	20000827	20000504	20010819	20010506	20020810	19990910	20000827	20000504
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
TOTAL DDT POS	19.98	5.22	10.71	14.91	7.04	3.75	14.18	187.31	67.53
TOTAL PCB CONGENERS	187.39	55.54	130.81	135.21	61.18	28.81	132.05	190.363	390.66
TOTAL PCB CONGENERS-HH-HALFND	219.952	64.25	156.38	156.83	72.425	35.06	154.92	231.783	467.42
TRANS-NONACHLOR	0.12	0.06	0.06	0.32	0.17	0.19	0.22	0.06	0.46
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)									
1,1-BIPHENYL	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(E)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
SEMIVOLATILES (UG/KG)									
1,1-BIPHENYL	12.5 U	7.58 J	8.15 J	11.3	4.6	6.3 J	6.8 U	13.3 J	17.9 J
1-METHYLNAPHTHALENE	30.8 U	27.3 J	16	22.9	10.8 J	6.6 J	17.1 U	48.7 J	75.1
1-METHYLPHENANTHRENE	108	59	62.6	57.2	27.8	44.5	38.6	148	112 J
2,3,5-TRIMETHYLNAPHTHALENE	20	10.5	12.2	12.6	5.7	8.2 J	11.3	21.4	27.9
2,6-DIMETHYLNAPHTHALENE	28.1	13.5	15.9	19.6	8.4	11.2	16.8	38	46.4
2-METHYLNAPHTHALENE	52.8 U	38.1 J	26.4	39.8	16.6 J	10.3	29.4 U	90.6 J	127
ACENAPHTHENE	85.3	65.3 J	45.3	36.4	13.8	31.1	18.8	77.4 J	59.5
ACENAPHTHYLENE	77.3 J	62	88.4	112.6	54.1	43.7 J	62.1 J	216	345
ANTHRACENE	353	182 J	247	407.8 J	141.6	189.7	150	621 J	715
BAP EQUIVALENT-HALFND	930.481	298.742	813.8	1457.679	491.6386	441.8635	598.828	2615.481	1736.911
BAP EQUIVALENT-POS	930.481	298.742	813.8	1457.679	491.6386	441.8635	598.828	2615.481	1736.911
BENZO(A)ANTHRACENE	619	298	460	608	234.2	332	313	1430	1190
BENZO(A)PYRENE	626	142 J	567 J	1061.5	378.5 J	360.9 J	409	1874 J	1120
BENZO(B)FLUORANTHENE	769	445	563	913.3	332.3	278.7	489	2182	1260
BENZO(E)PYRENE	385	214	311	464.5	160.5	188.1 J	262	1054	624
BENZO(G,H,I)PERYLENE	402	210 J	321	621.9 J	156.5	147.8 J	277	1047 J	772
BENZO(K)FLUORANTHENE	230	127	212	265.2	111.6	5.8 J	165	686	274
CHRYSENE	661	272	470	547.7	247.6 J	297.5	408	1251	1151
DIBENZO(A,H)ANTHRACENE	115	56 J	104 J	162.2 J	36 J	14.7 J	75.6	334 J	272
DIBENZOTHIOPHENE	59.7	17.6	18.8 J	20.3	9 J	21	19.3	47.7	45.7 J
FLUORANTHENE	1280	591 J	697	748.2	363.7	499.8	621	2632 J	1820 J
FLUORENE	126	73.1 J	74.3 J	73.2 J	30.6 J	39.3 J	33.2	137 J	157
HIGH MOLECULAR WEIGHT PAHS	4442	1909	2989	3848.2	1611.8	2013.7	2406.6	9530	7053
INDENO(1,2,3-CD)PYRENE	437	228 J	347	724.3 J	175.6 J	33.6 J	292	277 J	883 J
LOW MOLECULAR WEIGHT PAHS	1600.9	839.2	841.4	1118.8	453.1	617.9	571.8	2301	2264.5
NAPHTHALENE	61.8 U	82.7	49	69.6	27.9 J	22.5 J	40 U	129	164
PERYLENE	123	102	106	84	59.5 J	99.2	73.8	154	149 J
PHENANTHRENE	902	336	311 J	379.4	168.5	281.3	273	1030	697
PYRENE	1141	550	691	720.6	351.8	508.8	580	2009	1500 J
TOTAL PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PAHS ECO	6042.9	2748.2	3830.4	4967	2064.9	2631.6	2978.4	11831	9317.5

LOCATION	MS-4 LOC.1	MS-4 LOC.1	MS-4 LOC.1	MS-4 LOC.1	MS-4 LOC.1	MS-4 LOC.1	MS-4 LOC.1	MS-4 LOC.1	MS-4 LOC.1
SAMPLE ID	OU4-SD-M04-101A	OU4-SD-M04-101A-AVG	OU4-SD-M04-101A-D	OU4-SD-M04-101B	OU4-SD-M04-101B-AVG	OU4-SD-M04-101B-D	OU4-SD-M04-102A	OU4-SD-M04-102A-AVG	OU4-SD-M04-102A-D
SAMPLE DATE	20010819	20010819	20010819	20010506	20010506	20010506	20020810	20020810	20020810
SAMPLE CODE	ORIG	AVG	DUP	ORIG	AVG	DUP	ORIG	AVG	DUP
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
ALKYLATED PAHS (UG/KG)									
C1-CHRYSENES	817.8	709.7	601.6	750.8 J	1229.85	1708.9 J	912.5 J	698.85	485.2 J
C1-DIBENZOTHIOPHENES	70.3	60.25	50.2	98.4 J	136.05	173.7 J	171.9 J	118.3	64.7 J
C1-FLUORANTHENES/PYRENES	1081.6	1022.4	963.2	1534.9 J	2850.8	4166.7 J	2736 J	1846.6	957.2 J
C1-FLUORENES	86.7	80.65	74.6 J	190 J	263.2	336.4 J	75.7	80.1	84.5
C1-NAPHTHALENES	237.4	167.3	97.2 J	228.3 J	268.55	308.8	99.2 J	133.5	167.8 J
C1-PHENANTHRENES/ANTHRACENES	775.2	614.25	453.3 J	1083.3 J	1730.65	2378 J	1028.4 J	750	471.6 J
C2-CHRYSENES	297.1	254.7	212.3 J	355	455.85	556.7	526.7 J	380.05	233.4 J
C2-DIBENZOTHIOPHENES	64.3	52.3	40.3 J	76.2 J	108.35	140.5 J	136.4 J	95.5	54.6 J
C2-FLUORENES	81.5	69.2	56.9 J	131.9 J	227.15	322.4 J	113.3	112.5	111.7
C2-NAPHTHALENES	169.4	130.1	90.8 J	189.7 J	268.95	348.2 J	70.1 J	109.85	149.6 J
C2-PHENANTHRENES/ANTHRACENES	420.6	331.8	243 J	523.8 J	789.05	1054.3 J	527.3 J	421.4	315.5 J
C3-CHRYSENES	29.6	16.25	2.9 J	37.2	45.4	53.6 J	94.7 J	73.9	53.1 J
C3-DIBENZOTHIOPHENES	29	29.65	30.3 J	27.6 J	42.7	57.8 J	87.2 J	65.8	44.4 J
C3-FLUORENES	59.7	47.35	35 J	109.9 J	169.3	228.7 J	84.4	110.5	136.6
C3-NAPHTHALENES	127.6	105.2	82.8 J	157.7 J	236.35	315 J	68.7 J	112.65	156.6 J
C3-PHENANTHRENES/ANTHRACENES	199.4	155.6	111.8 J	223.8 J	329.5	435.2 J	329	244	159 J
C4-CHRYSENES	0.8 J	16.5	32.2 J	215.8 J	339.25	462.7 J	29.5 J	64.8	100.1 J
C4-NAPHTHALENES	70.7	59.75	48.8	99.3	131.95	164.6	37.3 J	60.3	83.3 J
C4-PHENANTHRENES/ANTHRACENES	67.5	52.35	37.2 J	82 J	113.65	145.3 J	61.5 J	61	60.5
AVS/SEM (MG/KG)									
ACID VOLATILE SULFIDE	41.543 J	26.003	10.463 J	0.708 J	0.389	0.14 UJ	NA	NA	NA
CADMIUM	1.01	1.055	1.1	0.39	0.33	0.27	NA	NA	NA
COPPER	2275.18	2178.07	2080.96	2070 J	2059	2048 J	NA	NA	NA
LEAD	290.58	285.75	280.92	367	310.5	254	NA	NA	NA
NICKEL	211.2 J	161.285	111.37 J	203 J	151.25	99.5 J	NA	NA	NA
ZINC	1055.15	923.48	791.81	1126	997	868	NA	NA	NA
HF INORGANICS (MG/KG)									
ALUMINUM	27642.29	29473.575	31304.86 J	34118.02	34143.115	34168.21	34028	33454	32880
ARSENIC	27.13	25.095	23.06	22.559	23.4845	24.41	30.6	28.45	26.3
CADMIUM	2.42 J	3.615	4.81 J	1.46	1.265	1.07	4.3	4.15	4
CHROMIUM	152.07	195.795	239.52 J	178.91	173.865	168.82	169	154.5	140
COPPER	2697.32	2450.1	2202.88	2224.58	2452.105	2679.63	3100	3465.5	3831
IRON	90162.91	81667.495	73172.08	62912.57	67741.31	72570.05	78719	75295	71871
LEAD	450.07	565.935	681.8	521.56	461.95	402.34	510	519	528 J
MANGANESE	577.79	522.14	466.49	408.65	420.27	431.89	356	359	362
MERCURY	2.6415 J	2.8936	3.1457 J	3.69 J	4.215	4.74 J	2.1 J	3	3.9 J
NICKEL	389.1	422	454.9	281.72	297.27	312.82	591 J	480	369
SILVER	2.43 J	3.985	5.54 J	5.6 J	4.05	2.5 J	5.6	5.2	4.8
ZINC	1794.34 J	1824.205	1854.07	1988.29	1977.91	1967.53 J	2252	2161	2070
INORGANICS (MG/KG)									
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (%)									
ORGANIC MATTER	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCENT CLAY	2	2.2	2.4	2.2 J	3.1	4 J	3.6	2.7	1.8
PERCENT GRAVEL	NA	NA	NA	NA	NA	NA	0	12.45	24.9

LOCATION	MS-4 LOC.1	MS-4 LOC.1	MS-4 LOC.1	MS-4 LOC.1	MS-4 LOC.1	MS-4 LOC.1	MS-4 LOC.1	MS-4 LOC.1	MS-4 LOC.1
SAMPLE ID	OU4-SD-M04-101A	OU4-SD-M04-101A-AVG	OU4-SD-M04-101A-D	OU4-SD-M04-101B	OU4-SD-M04-101B-AVG	OU4-SD-M04-101B-D	OU4-SD-M04-102A	OU4-SD-M04-102A-AVG	OU4-SD-M04-102A-D
SAMPLE DATE	20010819	20010819	20010819	20010506	20010506	20010506	20020810	20020810	20020810
SAMPLE CODE	ORIG	AVG	DUP	ORIG	AVG	DUP	ORIG	AVG	DUP
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
PERCENT SAND	94.8	94.1	93.4	91.9	90.4	88.9	88.4	77.4	66.4
PERCENT SILT	3.3	3.75	4.2	5.9	6.5	7.1	8	7.45	6.9
TOTAL ORGANIC CARBON	1.47	1.22	0.97	1.78 J	2.975	4.17 J	0.78 J	0.93	1.08 J
MISCELLANEOUS PARAMETERS (MG/KG)									
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)									
PH	NA	NA	NA	NA	NA	NA	NA	NA	NA
PESTICIDES/PCBS (UG/KG)									
1,2,3,4-TETRACHLOROBENZENE	0.14 J	2.08	4.02 J	0.02 J	0.065	0.11 J	0.39 J	0.255	0.12 J
1,2,4,5-TETRACHLOROBENZENE	1.24 U	3.065	5.51 J	0.51	0.51	0.8 U	0.57 J	0.89	1.21 J
2,4'-DDD	12.73	14.365	16	27	25	23 J	14.94	14.095	13.25
2,4'-DDE	21.42	11.825	2.23 J	0.076 UJ	2.669	5.3 J	3.78	3.78	3.78
2,4'-DDT	2.94	4.995	7.05 J	5.8 J	8.4	11 J	3.18 J	2.95	2.72
4,4'-DDD	32.75	27.75	22.75	31	33	35 J	50.57 J	39.925	29.28 J
4,4'-DDE	15.49	12.87	10.25	9 J	12	15 J	12.59	10.28	7.97
4,4'-DDT	11.43	17.735	24.04 J	28	34.5	41 J	15.13 J	13.75	12.37
ALDRIN	0.07 U	0.07 U	0.07 U	0.022 UJ	5.0055	10	0.11 J	0.325	0.54 J
ALPHA-BHC	0.03 J	0.04	0.05	0.1	0.08	0.06	0.12 J	0.075	0.03 J
ALPHA-CHLORDANE	4.87	3.1	1.33 J	1.1	1.2	1.3 J	1.4	1.295	1.19 J
BETA-BHC	0.73	0.44	0.15 J	0.15 UJ	0.1925	0.31	0.41 J	0.27	0.13 J
CHLORPYRIFOS	0.11 U	0.11 U	0.11 U	0.076 UJ	0.234	0.43	0.11 UJ	0.1825	0.31 J
CIS-NONACHLOR	0.78	1.035	1.29	0.51 J	0.71	0.91 J	0.72	0.675	0.63
DELTA-BHC	0.03 J	0.03 J	0.063 U	0.1	0.06575	0.063 U	0.07 U	0.03 J	0.03 J
DIELDRIN	17.66	9.66	1.66 J	2.4 J	3.25	4.1	3.46 J	2.7	1.94 J
ENDOSULFAN II	2.21	1.87	1.53	2.2 J	1.1375	0.15 UJ	0.75 J	0.575	0.4 J
ENDRIN	0.07 U	0.07 U	0.07 U	0.065 U	0.064 U	0.063 U	0.07 UJ	0.06 J	0.06 J
GAMMA-BHC (LINDANE)	0.12 J	0.12 J	0.14 U	0.45 U	0.295 U	0.14 U	0.25 J	0.135	0.02 J
GAMMA-CHLORDANE	0.03 U	0.0825	0.15	0.25	0.24	0.23 J	0.34	0.355	0.37 J
HEPTACHLOR	1.75	0.995	0.24 J	1.1 J	0.705	0.31 J	0.55 J	0.42	0.29 J
HEPTACHLOR EPOXIDE	0.05	0.13	0.21	0.065 U	0.0585 U	0.052 UJ	0.19	0.155	0.12
HEXACHLOROBENZENE	0.05	0.06	0.07	0.24	0.195	0.15	0.13 J	0.1	0.07 J
MIREX	0.25	0.165	0.08 J	0.19 J	0.265	0.34	0.09 U	0.03 J	0.03 J
OXYCHLORDANE	0.33	0.31	0.29	0.13 J	0.075	0.02 J	0.25 J	0.43	0.61 J
PCB-101	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-101/90	26.4	23.99	21.58	6.9	6.25	5.6 J	13.31	10.935	8.56
PCB-105	1.48	1.92	2.36	2.6 J	1.85	1.1 J	0.97	1.2	1.43
PCB-114	0.41 U	0.41 U	0.41 U	0.076 U	0.243 U	0.41 U	0.42 U	0.41 U	0.4 U
PCB-118	6.48	6.27	6.06	4.1	3.45	2.8 J	4.32	4.385	4.45
PCB-126	50.06	25.795	1.53 J	0.73 J	1.865	3 J	0.03 J	1.225	2.42 J
PCB-128	2.67	4.465	6.26 J	2.3	1.95	1.6 J	1.63	1.505	1.38
PCB-138	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-138/160	150.79	105.665	60.54 J	24	28	32	16.95	15.63	14.31
PCB-149/123	9.09	26.005	42.92 J	12	13.5	15 J	13.03	11.21	9.39
PCB-153	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-153/132	21.19	52.58	83.97 J	22	23	24 J	15.92	14.195	12.47
PCB-156	1.79	4.49	7.19 J	3.6	3.35	3.1 J	2.4 J	1.3	0.4 UJ
PCB-167	0.41 U	4.8475	9.49	5.2	6.35	7.5 J	1.27	1.265	1.26
PCB-169	0.01 J	0.01 J	0.46 U	0.01 J	0.05	0.09 J	0.01 J	0.01	0.01 J
PCB-170	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-170/190	13.65	25.72	37.79 J	22	21	20 J	8.26 J	10.83	13.4 J
PCB-18	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-18/17	0.09 U	0.09 U	0.09 U	0.14 U	0.112 U	0.084 UJ	0.09 U	0.08 J	0.08 J
PCB-180	16.27	45.94	75.61 J	18	17.5	17 J	13.16	11.93	10.7
PCB-185	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-187	57.17	47.5	37.83	16	17.5	19	11.28	10.82	10.36
PCB-189	0.34 J	1.345	2.35 J	0.6	0.56	0.52 J	0.16 J	0.45	0.74 J
PCB-195	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	MS-4 LOC.1	MS-4 LOC.1	MS-4 LOC.1	MS-4 LOC.1	MS-4 LOC.1	MS-4 LOC.1	MS-4 LOC.1	MS-4 LOC.1	MS-4 LOC.1
SAMPLE ID	OU4-SD-M04-101A	OU4-SD-M04-101A-AVG	OU4-SD-M04-101A-D	OU4-SD-M04-101B	OU4-SD-M04-101B-AVG	OU4-SD-M04-101B-D	OU4-SD-M04-102A	OU4-SD-M04-102A-AVG	OU4-SD-M04-102A-D
SAMPLE DATE	20010819	20010819	20010819	20010506	20010506	20010506	20020810	20020810	20020810
SAMPLE CODE	ORIG	AVG	DUP	ORIG	AVG	DUP	ORIG	AVG	DUP
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
PCB-195/208	4.87	7.64	10.41 J	4.4	4.15	3.9	3.05	3.73	4.41
PCB-201	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-201/157/173	2.34	2.73	3.12	1.4	1.195	0.99 J	1.21	1.345	1.48
PCB-206	10.18	8.41	6.64	6.4	6.85	7.3	5.06	6.025	6.99
PCB-209	4.42	3.84	3.26	6.53 J	7.84	9.15	5.38 J	9.825	14.27 J
PCB-28	0.28 U	0.215	0.29	0.04 J	0.04 J	0.28 U	0.45	0.455	0.46
PCB-29	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-44	0.38	0.48	0.58	0.36 J	0.235	0.11 J	1.25 J	0.955	0.66 J
PCB-50	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-52	9.69	6.31	2.93 J	2.5	2.15	1.8	4.14	3.455	2.77
PCB-66	0.67	0.485	0.3 J	0.67	0.54	0.41 J	0.86 J	0.665	0.47 J
PCB-77	0.47 U	0.465 U	0.46 U	0.26 U	0.23 J	0.23 J	0.06 J	0.64	1.22 J
PCB-8	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-8/5	0.12 J	0.63	1.14 J	0.44 J	0.2625	0.17 U	1.07 J	0.685	0.3 J
PCB-81	15.39	8.14	0.89 J	0.41 J	1.105	1.8	1.37	1.225	1.08
PCB-87	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLOROANISOLE	0.23	0.19	0.15	0.22 J	0.2	0.18 J	0.32 J	0.245	0.17 J
PENTACHLOROBENZENE	0.57 U	0.14 J	0.14 J	0.18	0.15	0.12	0.28 J	0.245	0.21
TEQ PCB	5.011562	2.5835175	0.155473	0.074308	0.189251	0.304194	0.004418	0.1238635	0.243309
TEQ PCB BIRD	6.54573	3.394803	0.243876	0.114989	0.303678	0.492367	0.143656	0.2775575	0.411459
TEQ PCB BIRD HALFND	6.557502	3.406564	0.255626	0.121493	0.30694	0.492387	0.143677	0.277588	0.411499
TEQ PCB FISH	0.258102	0.1332825	0.008463	0.004002	0.010043	0.016084	0.000958	0.0069065	0.012855
TEQ PCB FISH HALFND	0.258128	0.1333135	0.008499	0.004015	0.01005	0.016085	0.000959	0.006908	0.012857
TEQ PCB HALFND	5.011598	2.587	0.162402	0.074322	0.189261	0.3042	0.004424	0.1238725	0.243321
TEQ PCB-HH-HALFND	5	2.58	0.16	0.074	0.187	0.3	0.004	0.122	0.24
TOTAL AROCLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL DDT HALFND	96.76	89.54	82.32	100.838	115.569	130.3	100.19	84.78	69.37

LOCATION	MS-4 LOC.1	MS-4 LOC.1	MS-4 LOC.1	MS-4 LOC.1	MS-4 LOC.1	MS-4 LOC.1	MS-4 LOC.1	MS-4 LOC.1	MS-4 LOC.1
SAMPLE ID	OU4-SD-M04-101A	OU4-SD-M04-101A-AVG	OU4-SD-M04-101A-D	OU4-SD-M04-101B	OU4-SD-M04-101B-AVG	OU4-SD-M04-101B-D	OU4-SD-M04-102A	OU4-SD-M04-102A-AVG	OU4-SD-M04-102A-D
SAMPLE DATE	20010819	20010819	20010819	20010506	20010506	20010506	20020810	20020810	20020810
SAMPLE CODE	ORIG	AVG	DUP	ORIG	AVG	DUP	ORIG	AVG	DUP
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
TOTAL DDT POS	96.76	89.54	82.32	100.8	115.55	130.3	100.19	84.78	69.37
TOTAL PCB CONGENERS	653.23	684.21	715.19	278.62	285.347	292.074	214.21	214.575	214.94
TOTAL PCB CONGENERS-HH-HALFND	812.56	832.03	851.5	326.856	341.9	356.944	253.71	252.325	250.94
TRANS-NONACHLOR	0.14	0.195	0.25 J	0.29	0.24	0.19 J	0.24	0.23	0.22
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)									
1,1-BIPHENYL	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(E)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
SEMIVOLATILES (UG/KG)									
1,1-BIPHENYL	19.8	15	10.2 J	25.8 J	38.65	51.5 J	13.4	16.55	19.7
1-METHYLNAPHTHALENE	93	64.95	36.9 J	88.6 J	99.1	109.6 J	31.1 J	42.4	53.7 J
1-METHYLPHENANTHRENE	206	177.1	148.2	282.2 J	378.55	474.9 J	393 J	253.55	114.1 J
2,3,5-TRIMETHYLNAPHTHALENE	23.9	20.7	17.5	25.6 J	49.55	73.5 J	22.6 J	23.85	25.1
2,6-DIMETHYLNAPHTHALENE	43.9	34.2	24.5 J	61.3 J	94.1	126.9 J	33.4	39.9	46.4
2-METHYLNAPHTHALENE	144.4	102.35	60.3 J	139.7 J	169.45	199.2	68.1 J	91.1	114.1 J
ACENAPHTHENE	84.2	85.5	86.8	384.8	422.5	460.2	108.1	89.35	70.6
ACENAPHTHYLENE	162.2	155.55	148.9	217.1 J	386.95	556.8 J	216.3 J	140.5	64.7 J
ANTHRACENE	1398.9 J	1136.2	873.5	2408 J	4164.65	5921.3 J	2304.7 J	1483.15	661.6 J
BAP EQUIVALENT-HALFND	2547.434	2734.91165	2922.389	4054.42	6152.10585	8249.792	4369.953	3275.8856	2181.8186
BAP EQUIVALENT-POS	2547.434	2734.91165	2922.389	4054.42	6152.10585	8249.792	4369.953	3275.8856	2181.8186
BENZO(A)ANTHRACENE	1453.9	1618.75	1783.6 J	2483.9 J	3648.15	4812.4 J	3427.2 J	2351.8	1276.4 J
BENZO(A)PYRENE	1850.1	1986.6	2123.1 J	3059.2 J	4533.75	6008.3 J	3217.4 J	2403.7	1590 J
BENZO(B)FLUORANTHENE	1483.8	1740.6	1997.4	2692.2 J	4091.55	5490.9 J	3735.3 J	2635.9	1536.5 J
BENZO(E)PYRENE	763.3	901.05	1038.8	1136.7 J	1861.9	2587.1 J	1433.4 J	1122	810.6 J
BENZO(G,H,I)PERYLENE	896.4 J	1013.65	1130.9 J	1133.9 J	1873	2612.1 J	1277.1 J	1027	776.9
BENZO(K)FLUORANTHENE	493.2	622.8	752.4 J	743.2 J	1297.15	1851.1 J	540.5 J	516	491.5 J
CHRYSENE	1078.3	1227.15	1376 J	1848.8 J	2884.35	3919.9 J	2286.6 J	1720.6	1154.6 J
DIBENZO(A,H)ANTHRACENE	276.2 J	275.25	274.3 J	319 J	565.35	811.7 J	255 J	232.8	210.6
DIBENZOTHIOPHENE	73.2	72.85	72.5 J	158 J	251.3	344.6 J	103.8 J	81.15	58.5 J
FLUORANTHENE	2130.3	2621.2	3112.1 J	5850.4 J	10974.3	16098.2 J	9155.8 J	5733.95	2312.1 J
FLUORENE	179.4 J	170.8	162.2 J	556.5 J	888.8	1221.1 J	176.1 J	151.55	127
HIGH MOLECULAR WEIGHT PAHS	8604.4	9854.05	11103.7	17894.2	30823.45	43752.7	25264.3	16873.1	8481.9
INDENO(1,2,3-CD)PYRENE	1123.9 J	1195.35	1266.8 J	1379.9 J	2444.5	3509.1 J	1608.4 J	1234.65	860.9 J
LOW MOLECULAR WEIGHT PAHS	3452	3142.75	2833.5	7358.9	12473.7	17588.5	6357	4269.8	2182.6
NAPHTHALENE	118.2	104.6	91	197.9 J	233.25	268.6	116.2	139.25	162.3
PERYLENE	138.2	267.15	396.1 J	226.3 J	330.7	435.1 J	293	297.85	302.7
PHENANTHRENE	1364.7	1387.75	1410.8	3454.9 J	6208.1	8961.3 J	3367.5 J	2174.9	982.3 J
PYRENE	1815.6	2125.1	2434.6 J	4332.9 J	8217.55	12102.2 J	6922.3 J	4430.25	1938.2 J
TOTAL PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PAHS ECO	12056.4	12996.8	13937.2	25253.1	43297.15	61341.2	31621.3	21142.9	10664.5

LOCATION	MS-4 LOC.1	MS-4 LOC.2	MS-4 LOC.2	MS-4 LOC.2	MS-4 LOC.2	MS-4 LOC.2	MS-4 LOC.2	MS-4 LOC.3	MS-4 LOC.3	MS-4 LOC.3
SAMPLE ID	OU4-SD-M04-199A	OU4-SD-M04-200A	OU4-SD-M04-200B	OU4-SD-M04-201A	OU4-SD-M04-201B	OU4-SD-M04-202A	OU4-SD-M04-299A	OU4-SD-M04-300A	OU4-SD-M04-300B	OU4-SD-M04-301A
SAMPLE DATE	19990910	20000827	20000504	20010819	20010506	20020810	19990909	20000827	20000504	20010819
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
ALKYLATED PAHS (UG/KG)										
C1-CHRYSENES	250	227	221	298	138.1	145.2	131	93.2	21.5	20.3
C1-DIBENZOTHIOPHENES	27.1	16.1	13.1	19.1	12.1	16	15.1	4.64 U	2.7	2.1
C1-FLUORANTHENES/PYRENES	392	313	322	451.3	213.4	193.7	258	127	34.2	33
C1-FLUORENES	33.5	29.7	34.5	38.1	24.5	22.5	18.4 U	5.66	4.1	4.5
C1-NAPHTHALENES	85.5 U	38.8	26.5	33.6	29.8	24.8	27 U	7.95	5.2	4 J
C1-PHENANTHRENES/ANTHRACENES	220	134	144	222.2	112.4	105.7	116	45.5	22.5	17.5
C2-CHRYSENES	110	99.9	101	146.3	75.8	69.6	58.6	28.7	10.9	7.3
C2-DIBENZOTHIOPHENES	32.9	19.6	20.5	23.1	14.9	21	22.9	5.93	5.4	3.8
C2-FLUORENES	52.8	33.4	56.1	59.2	27.9	16.6	31.6	9.65	4.3	10.7
C2-NAPHTHALENES	59 U	44.6	24.8	32.1	25.3	20.2	42.1 U	11.2	6.6	3.9
C2-PHENANTHRENES/ANTHRACENES	159	94.3	122	193.8	93.8	94.9	107	32.6	20.2	13.7
C3-CHRYSENES	6.9	6.35	7.57	5.1 J	10.1	11.4	5.2	2.63	0.8	0.2 J
C3-DIBENZOTHIOPHENES	24.4	18.2	17.5	16.7	11.7	17.2	19.9	4.95	5.8	3.7
C3-FLUORENES	45.3	20.7	33.5	26.9	19.6	16.9	15.7	7.6	4.6	5.4
C3-NAPHTHALENES	66.4	53	27.9	30.1	25.7	20.7	42.3 J	9.42	6.2	3.9
C3-PHENANTHRENES/ANTHRACENES	98.9	60.2	81.8	113.3	56.2	45	64.5	15.5	16.3	7.2
C4-CHRYSENES	12.4	5.14	2.58	0.5 J	24.1	3.4 J	12.5	4.83	0.5	4.7 U
C4-NAPHTHALENES	51.3	26.5	8.05	22.4	17.1	10.2	17.6	6.84	2.3 J	2.9
C4-PHENANTHRENES/ANTHRACENES	44.4	44.4	16.7	43.4	18.1	13.8	32.7	17.7	4.1	1.8
AVS/SEM (MG/KG)										
ACID VOLATILE SULFIDE	786 J	20.5 U	361	339.096 J	529.891 J	NA	788 J	7.91 U	0.137 U	1.949 J
CADMIUM	0.21	0.1789 U	0.0742	0.3 J	0.25 J	NA	0.16	0.1165 U	0.0188	0.1289 U
COPPER	20.2	10.2 J	0.589 U	10.31	13.6 J	NA	1.9 U	387.97 J	52.3	62.68
LEAD	41.5 J	30.66 J	10.6 J	33.55	39.8	NA	19.5 J	78.5 J	25	41.83
NICKEL	17	3.71 J	0.96	3.94	4.33	NA	2	4.45 J	1.65	4.7
ZINC	199	42.67 J	20.4	53.2	64	NA	29.5	36.43 J	14.1	37.89 J
HF INORGANICS (MG/KG)										
ALUMINUM	51890	56241	60300	52488.49 J	53787.01	52861	58081	44541	46600	34998.9
ARSENIC	16.8	14.3	9.2	12.3	11.374	9.6	8.7	17.9	13.7	12.69
CADMIUM	0.38	0.56	0.25	0.469 U	0.188 U	0.64 U	0.35	0.13	0.06	0.4426 U
CHROMIUM	101 J	67.6	74.9	90.06 J	91.96	74.5	69.7 J	56.6	67.8	68.71
COPPER	565	33.1 J	59.5	26.5	34.15	24.4	22.4	118 J	393	149.03
IRON	29057	23080 J	20500	22859.24	23568.69	22742	19262	24920 J	23800	20253.9
LEAD	110 J	58.2	46.5	54.44	62.28	51.4	47.4 J	123	145	75.11
MANGANESE	374	313	400	341.27	347.94	323	379	556	810	246.84
MERCURY	1.6 J	0.38	0.27	0.2332 J	0.34 J	0.16 J	0.48 J	0.1749 U	0.39	0.1582 U
NICKEL	60.6 J	16.6 J	23.3	20.52	22.26	21 J	19.4 J	25.1 J	158	31.52
SILVER	3.1	3.13 J	0.31	0.35 J	0.47 J	0.41 U	0.3	3.19 J	0.09 J	0.27 J
ZINC	427	63.4 J	79.9	84.78	95.85	70.9	80.6	42.1 J	138	88.57 J
INORGANICS (MG/KG)										
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (%)										
ORGANIC MATTER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCENT CLAY	22.19	15.4	16.01	13	14	17.9	14.58	2.7	0.37	0.6
PERCENT GRAVEL	NA	NA	NA	NA	NA	0	NA	NA	NA	NA

LOCATION	MS-4 LOC.1	MS-4 LOC.2	MS-4 LOC.2	MS-4 LOC.2	MS-4 LOC.2	MS-4 LOC.2	MS-4 LOC.2	MS-4 LOC.3	MS-4 LOC.3	MS-4 LOC.3
SAMPLE ID	OU4-SD-M04-199A	OU4-SD-M04-200A	OU4-SD-M04-200B	OU4-SD-M04-201A	OU4-SD-M04-201B	OU4-SD-M04-202A	OU4-SD-M04-299A	OU4-SD-M04-300A	OU4-SD-M04-300B	OU4-SD-M04-301A
SAMPLE DATE	19990910	20000827	20000504	20010819	20010506	20020810	19990909	20000827	20000504	20010819
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
PERCENT SAND	39.1	51.6	56.9	46.9	58.5	50.8	53.14	92.4	97.07	97.8
PERCENT SILT	38.71	33	27.09	40	27.5	31.3	32.28	4.9	2.56	1.7
TOTAL ORGANIC CARBON	1.46	1.83 J	1.92	1.98	1.89 J	1.82 J	1.62	0.62 J	0.69	0.73
MISCELLANEOUS PARAMETERS (MG/KG)										
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)										
PH	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PESTICIDES/PCBS (UG/KG)										
1,2,3,4-TETRACHLOROBENZENE	0.25 J	0.12 U	0.11 J	0.15 J	0.08	0.26 J	0.37	0.35 U	0.42	0.26 U
1,2,4,5-TETRACHLOROBENZENE	1.5	1.3 U	1.2	2.66 U	1.1	0.28	0.66	0.86 U	0.16 J	1.26 U
2,4'-DDD	6.4	1.4	1.7	1.84	2.3	0.73	0.87	12	13	7.75
2,4'-DDE	0.34	0.15	0.71	0.36	0.53	0.42	0.86	1.9	3.4	1.84
2,4'-DDT	0.56	0.05	0.033 U	0.15	0.063 U	0.11	0.11	18	34	7.24
4,4'-DDD	14	1.3	1.1	1.55	1.1	0.73	0.75	41	28	18.65
4,4'-DDE	4.3	1.1	0.51	1.07	0.74	0.87	0.77	114	138	68.63
4,4'-DDT	4.9	0.74	0.59	0.6	0.61	0.38	0.68 J	77	174	35.43
ALDRIN	0.08 U	0.05 J	0.089 U	0.1 U	0.1	0.11 U	2.1	0.049 U	0.05 U	0.07 U
ALPHA-BHC	0.059 U	0.14	0.27	0.06 J	0.09 J	0.07 J	0.058 U	0.05 J	0.08	0.05 J
ALPHA-CHLORDANE	0.95	0.42	0.12	0.97	0.21	0.18 U	0.17	0.24	0.13	0.33
BETA-BHC	0.27 U	0.29 U	3.1	0.24 J	0.15 U	0.13 J	0.069 J	0.17 U	0.41	0.33
CHLORPYRIFOS	0.006 J	1.8 U	0.42 U	0.17 J	0.11 U	0.08 J	0.22 J	0.37 U	0.24 U	0.11 U
CIS-NONACHLOR	0.57	0.23	0.16	0.28	0.23	0.16	0.16	1.1	1	1.41
DELTA-BHC	0.035 J	0.09	0.32	0.06 J	0.16	0.04 J	0.043 J	0.05	0.05	0.08
DIELDRIN	0.09 U	0.04 J	0.06 J	0.05 J	0.094 U	0.04 J	0.11	0.2	0.11	0.18
ENDOSULFAN II	1.3	0.69	0.69	1.21	0.31	0.24 U	0.12 U	0.37	0.16	0.11 J
ENDRIN	0.18 U	0.19 U	0.2 U	0.11 U	0.094 U	0.11 U	0.18 U	0.11 U	0.11 U	0.07 U
GAMMA-BHC (LINDANE)	0.32 U	0.35	0.07 J	0.22 U	0.64 U	0.23 U	0.3 U	0.07 J	0.2 U	0.06 J
GAMMA-CHLORDANE	0.15	0.096 U	0.15	0.08	0.08	0.12	0.18	0.055 U	0.06	0.04
HEPTACHLOR	1	0.25 U	0.26 U	0.25 U	0.42	0.07 J	0.18 J	0.14 U	0.02 J	0.09 J
HEPTACHLOR EPOXIDE	0.04 U	0.043 U	0.045 U	0.09 U	0.04 J	0.09 U	0.24	0.025 U	0.025 U	0.06 U
HEXACHLOROBENZENE	0.041 U	0.16	0.067 U	0.08 U	0.078 U	0.14	0.17 U	0.05	0.1	0.05 U
MIREX	0.088	0.043 U	0.04 J	0.14 U	0.11	0.15 U	0.031 J	0.06	0.025 U	0.09 U
OXYCHLORDANE	0.02 U	0.07	0.27 J	0.08 U	0.031 U	0.04 J	0.02 U	0.03	0.013 UJ	0.05 U
PCB-101	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-101/90	7.3	1.3	1.4	2.68	2.2	0.73 U	1	0.99	1.1	1.44
PCB-105	3 J	0.44 J	0.57 J	0.44 J	2.3	0.23 J	0.53 J	0.48 J	1.7	0.16 J
PCB-114	0.24 U	0.26 U	0.27 U	0.65 U	0.11 U	0.68 U	0.24 U	0.15 U	0.15 U	0.42 U
PCB-118	4	1.7	1.2	1.46	1.1	0.94	0.68	0.45	1.4	0.41
PCB-126	0.96 U	0.26 U	0.42	0.09 J	0.38 U	0.01 J	0.13 J	0.34 J	0.08 J	0.52
PCB-128	1.8 J	0.55	0.39	0.96	0.92	0.4	0.44	1.1	0.89	0.58
PCB-138	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-138/160	17	3	1.7	2.92	9.9	2.24	1.9	7.7	8.2	5.78
PCB-149/123	9.3	1.2	0.9	1.79	6	1.23	1	4.9	4.9	3.27
PCB-153	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-153/132	18	2.9	1.7	3	12	2.94	1.7	9.7	9.6	5.66
PCB-156	1.31	0.59	0.41	0.65 U	1.2	0.47 J	0.55	0.92	2	0.22 J
PCB-167	3.4	0.21 J	0.28	0.65 U	1.3	0.08 J	0.074 J	0.49	0.45	0.23 J
PCB-169	0.96 U	0.17 U	0.38	0.73 U	0.01 J	0.68 U	0.24 U	0.07 U	0.07 J	0.47 U
PCB-170	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-170/190	17 J	0.98 J	6.2 U	1.38 U	8.7	0.83 J	0.31 J	3.9 J	6 J	4.95
PCB-18	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-18/17	0.44 J	1.1	0.13 U	0.14 U	0.2 U	0.14 U	0.12 U	0.074 U	0.076 U	0.09 U
PCB-180	17 J	2.2	1.2 J	2.18 J	15	1.53 J	1.4 J	9.1	10	5.44
PCB-185	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-187	12	1.2	0.74	1.29	7.4	0.86 J	1	5.4	5.7	3.85
PCB-189	0.32	0.29	0.17 J	0.65 U	0.22	0.68 U	0.24 U	0.42	0.22	0.25 J
PCB-195	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	MS-4 LOC.1	MS-4 LOC.2	MS-4 LOC.2	MS-4 LOC.2	MS-4 LOC.2	MS-4 LOC.2	MS-4 LOC.2	MS-4 LOC.3	MS-4 LOC.3	MS-4 LOC.3
SAMPLE ID	OU4-SD-M04-199A	OU4-SD-M04-200A	OU4-SD-M04-200B	OU4-SD-M04-201A	OU4-SD-M04-201B	OU4-SD-M04-202A	OU4-SD-M04-299A	OU4-SD-M04-300A	OU4-SD-M04-300B	OU4-SD-M04-301A
SAMPLE DATE	19990910	20000827	20000504	20010819	20010506	20020810	19990909	20000827	20000504	20010819
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
PCB-195/208	3.9	0.48	0.16	0.4	1.7	0.92	0.59	1.5	1.1	0.8
PCB-201	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-201/157/173	1.37	0.44	0.35	0.39 J	0.66	0.35 J	0.21	0.68	0.39	0.3 J
PCB-206	5.7	0.59	0.05 J	0.54	1.2	1.99	1.2	1.7	1.1	1.03
PCB-209	7 J	0.8	0.37	0.64	0.44 J	1.96	0.7 J	0.74	0.41 U	0.49
PCB-28	0.27 U	0.53 U	2.1	0.39 J	0.23	0.52	0.4	0.28 U	0.14 J	0.06 J
PCB-29	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-44	0.61	0.49	0.39	0.24	0.25 U	0.1 J	0.13 J	0.14	0.09 J	0.15
PCB-50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-52	5.2	1.6	1.1	1.77	0.62	1.27	0.73	0.43	0.19	0.48
PCB-66	1.1	0.22	0.2	0.43	0.31	0.14	0.43	0.06 J	0.11 U	0.03 J
PCB-77	0.043 J	0.06 J	1.1	0.73 U	0.06 U	0.03 J	0.083 J	0.03 J	0.19 U	0.47 U
PCB-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-8/5	0.6 J	0.4 J	0.79	0.36	0.35	0.43	0.22 J	0.32	0.43	0.24
PCB-81	0.94 J	0.26 U	0.56	0.04 J	0.38 U	0.07 J	0.007 J	0.14 U	0.17	0.1 J
PCB-87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLOROANISOLE	0.093 J	0.12 U	0.14 J	0.17 J	0.09 U	0.04 J	0.13 J	0.07 U	0.06 J	0.07 J
PENTACHLOROBENZENE	0.22	0.24 U	0.2	0.84 U	0.06 J	0.07 J	0.18	0.1 U	0.08	0.26 U
TEQ PCB	0.000967	0.00015	0.053793	0.009135	0.000684	0.001122	0.0131	0.034254	0.010484	0.05218
TEQ PCB BIRD	0.096888	0.00318	0.153539	0.013116	0.000512	0.009627	0.017997	0.03577	0.025548	0.06211
TEQ PCB BIRD HALFND	0.14538	0.02928	0.153553	0.031801	0.040018	0.010004	0.01813	0.042813	0.030306	0.07412
TEQ PCB FISH	0.000588	2.9E-05	0.002528	0.00049	0.000064	0.000104	0.000677	0.001743	0.000543	0.00267
TEQ PCB FISH HALFND	0.003013	0.00075	0.002529	0.000552	0.001112	0.000125	0.000685	0.00178	0.000553	0.00271
TEQ PCB HALFND	0.063371	0.01575	0.053797	0.020161	0.019746	0.011342	0.016708	0.035327	0.010496	0.05926
TEQ PCB-HH-HALFND	0.063	0.016	0.054	0.02	0.02	0.011	0.017	0.035	0.01	0.059
TOTAL AROCLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL DDT HALFND	30.5	4.74	4.6265	5.57	5.3115	3.24	4.04	263.9	390.4	139.54

LOCATION	MS-4 LOC.1	MS-4 LOC.2	MS-4 LOC.2	MS-4 LOC.2	MS-4 LOC.2	MS-4 LOC.2	MS-4 LOC.2	MS-4 LOC.3	MS-4 LOC.3	MS-4 LOC.3
SAMPLE ID	OU4-SD-M04-199A	OU4-SD-M04-200A	OU4-SD-M04-200B	OU4-SD-M04-201A	OU4-SD-M04-201B	OU4-SD-M04-202A	OU4-SD-M04-299A	OU4-SD-M04-300A	OU4-SD-M04-300B	OU4-SD-M04-301A
SAMPLE DATE	19990910	20000827	20000504	20010819	20010506	20020810	19990909	20000827	20000504	20010819
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
TOTAL DDT POS	30.5	4.74	4.61	5.57	5.28	3.24	4.04	263.9	390.4	139.54
TOTAL PCB CONGENERS	243.57	40.43	34.45	40.92	129.19	35.47	26.84	87.774	95.876	63.19
TOTAL PCB CONGENERS-HH-HALFND	279.096	46.96	43.86	49.6	148.9	41.99	31.668	103.694	112.776	74.33
TRANS-NONACHLOR	0.1	0.05 J	0.04 J	0.47	0.04 J	0.21	0.025 J	0.16	0.27	0.34
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)										
1,1-BIPHENYL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(E)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SEMIVOLATILES (UG/KG)										
1,1-BIPHENYL	13.2 U	5.67 J	6 J	7.1	6	5.4	4.36 U	1.41 J	1.1 J	1.5
1-METHYLNAPHTHALENE	31.1 U	15.2 J	9.43	13.2	11.1	8.9 J	10.5 U	3 J	1.9	1.4 J
1-METHYLPHENANTHRENE	60.7	26.6	42.4	80.4	33.4	37.9	21.2	9.88	4.8	4.8
2,3,5-TRIMETHYLNAPHTHALENE	16.3	10.1	7.33	10.6	6.2	9.8 J	7.31	1.73	1.5	1.2
2,6-DIMETHYLNAPHTHALENE	28.8	12.8	13.1	13.3	9.7	12.4	7.77	2.33	2.1	1.6
2-METHYLNAPHTHALENE	54.4 U	23.6 J	17.1	20.4	18.7	15.9	16.6 U	4.95 J	3.3	2.6 J
ACENAPHTHENE	27.8	18	14	15.3	11.8	16.5	6.98	2.53	3.9	1.4 J
ACENAPHTHYLENE	79.9 J	78.1	61.4	97.6	53.1	55 J	53 J	17.8	9.4	9.1
ANTHRACENE	197	123 J	160	342.6 J	151.9	137.4	120	28.5 J	24.9	24.8 J
BAP EQUIVALENT-HALFND	728.196	272.763	441.424	816.0538	469.5982	382.9774	364.008	139.83	65.9416	70.454
BAP EQUIVALENT-POS	728.196	272.763	441.424	816.0538	469.5982	382.9774	364.008	139.83	65.9416	70.454
BENZO(A)ANTHRACENE	414	236	252	366.9	218.8	266.2	164	181	36.8	31.2
BENZO(A)PYRENE	495	131 J	321 J	608.6	364.2 J	321.6 J	265	32.9 J	46.7	50.5
BENZO(B)FLUORANTHENE	609	386	276	503	301.6	202.7	242	284	49.1 J	50.9
BENZO(E)PYRENE	308	201	165	253.1	147.9	155.9 J	129	146	26.6 J	25.7
BENZO(G,H,I)PERYLENE	313	209	155	296.6 J	144.4	121.3 J	151 J	149	28	31.8 J
BENZO(K)FLUORANTHENE	170	103	106	130.3	82.1	4.8 J	82.8	94.4	17.7	15.5
CHRYSENE	466	243	214	344.8	203.2 J	236.4	170	196	44.6	31
DIBENZO(A,H)ANTHRACENE	88.9	53.4	48.4 J	83.4 J	34.9 J	10.7 J	39.7 J	40.8	7.4	7.8 J
DIBENZOTHIOPHENE	28.3	12.7	8.88 J	11.6	8.9 J	12.8	9.41 J	2.49	1.6	1.4
FLUORANTHENE	767	415	404	485	313.9	407.2	308	339	89.6	65.9
FLUORENE	41.2	32.2	37.2 J	41.5 J	30.5 J	26.4 J	17	5.04	4.2	3.4 J
HIGH MOLECULAR WEIGHT PAHS	2938.9	1472.4	1695.4	2390.3	1448.9	1638.9	1236.7	1107.7	300.1	242.9
INDENO(1,2,3-CD)PYRENE	367	228	164	324.5 J	159.9 J	22.9 J	162 J	170	27.5 J	34.4 J
LOW MOLECULAR WEIGHT PAHS	762.45	491	444.7	770.1	440.4	473.9	332.08	120.79	73.7	71.2
NAPHTHALENE	60.7 U	37.1	32	29.6	31.6	33.6	29.6 U	6.87	3.4	3.4
PERYLENE	93.8	93.1	86.3	64.7	61.8 J	71.9	45	54.2	9.1 J	7.6
PHENANTHRENE	359	179	123 J	223.1	142.8	189.1	112	55.1	24.6	26.5
PYRENE	708	394	456	501.6	313.9	396.8	290 J	318	75 J	56.5
TOTAL PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PAHS ECO	3701.35	1963.4	2140.1	3160.4	1889.3	2112.8	1568.78	1228.49	373.8	314.1

LOCATION	MS-4 LOC.3	MS-4 LOC.3	MS-4 LOC.3	MS-4 LOC.4	MS-4 LOC.5	MS-4 LOC.6
SAMPLE ID	OU4-SD-M04-301B	OU4-SD-M04-302A	OU4-SD-M04-399A	OU4-SD-M04-401B	OU4-SD-M04-501B	OU4-SD-M04-601B
SAMPLE DATE	20010506	20020810	19990910	20010508	20010508	20010508
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0
BOTTOM DEPTH	0.33	0.33	0.33	0.33	0.33	0.33
ALKYLATED PAHS (UG/KG)						
C1-CHRYSENES	23.2	40.5	108	NA	NA	NA
C1-DIBENZOTHIOPHENES	2.5	3.9	6.74	NA	NA	NA
C1-FLUORANTHENES/PYRENES	34.3	51	167	NA	NA	NA
C1-FLUORENES	4.1	5.5 J	5.6 U	NA	NA	NA
C1-NAPHTHALENES	4.5 J	8 J	7.41 U	NA	NA	NA
C1-PHENANTHRENES/ANTHRACENES	21	22.9	65.1	NA	NA	NA
C2-CHRYSENES	12.9	24.6	36.1	NA	NA	NA
C2-DIBENZOTHIOPHENES	3.3	4.9	8.79	NA	NA	NA
C2-FLUORENES	3.7	1.3 J	12.4	NA	NA	NA
C2-NAPHTHALENES	3.9	4.6	9.3 U	NA	NA	NA
C2-PHENANTHRENES/ANTHRACENES	14.9	19.8	36	NA	NA	NA
C3-CHRYSENES	2.2 J	0.1 J	1.98	NA	NA	NA
C3-DIBENZOTHIOPHENES	2.9	2.6	7.39	NA	NA	NA
C3-FLUORENES	3.6	0.1 J	9.14	NA	NA	NA
C3-NAPHTHALENES	3.9	4.7	24.6 J	NA	NA	NA
C3-PHENANTHRENES/ANTHRACENES	7.9	7.5	24.1	NA	NA	NA
C4-CHRYSENES	7.4	0.2 J	9.67	NA	NA	NA
C4-NAPHTHALENES	4.3	0.3 J	43.8 J	NA	NA	NA
C4-PHENANTHRENES/ANTHRACENES	3.4	0.1 J	7.96	NA	NA	NA
AVS/SEM (MG/KG)						
ACID VOLATILE SULFIDE	1.424 J	NA	1.6 U	NA	NA	NA
CADMIUM	0.11 U	NA	0.02	NA	NA	NA
COPPER	70.9 J	NA	68.3	NA	NA	NA
LEAD	74.3	NA	33.5 J	NA	NA	NA
NICKEL	5.85	NA	3	NA	NA	NA
ZINC	34.9	NA	20	NA	NA	NA
HF INORGANICS (MG/KG)						
ALUMINUM	43057.59	43927	48353	58479.27	36606.01	34731.78
ARSENIC	12.36	10.7	9.8	14.45	25.02	22.17
CADMIUM	0.186 U	0.79 U	0.05	0.185 U	1.42	1.42
CHROMIUM	85.57	50.3	68.5 J	125.92	475.05	167.12
COPPER	242.88	176	140	121.33	4280.94	3728.15
IRON	22868.18	25865	23498	32942.94	79704.6	58075.33
LEAD	156.07	71	67.4 J	80.03	588.89	400.96
MANGANESE	531.65	251	682	392.31	615.99	347.68
MERCURY	0.33 J	0.18 J	0.34 J	0.48 J	0.81 J	7.93 J
NICKEL	38.72	27.5	38.9 J	34.83	507.89	285.78
SILVER	0.11 J	0.08 U	0.05	1.1	1.9	3.6
ZINC	115.59	59.4	84.6	182.02 J	1986.75 J	1720.04 J
INORGANICS (MG/KG)						
ALUMINUM	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (%)						
ORGANIC MATTER	NA	NA	NA	NA	NA	NA
PERCENT CLAY	0.8 J	0.8	1.43	22.2	2.3	3.6
PERCENT GRAVEL	NA	0	NA	NA	NA	NA

LOCATION	MS-4 LOC.3	MS-4 LOC.3	MS-4 LOC.3	MS-4 LOC.4	MS-4 LOC.5	MS-4 LOC.6
SAMPLE ID	OU4-SD-M04-301B	OU4-SD-M04-302A	OU4-SD-M04-399A	OU4-SD-M04-401B	OU4-SD-M04-501B	OU4-SD-M04-601B
SAMPLE DATE	20010506	20020810	19990910	20010508	20010508	20010508
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0
BOTTOM DEPTH	0.33	0.33	0.33	0.33	0.33	0.33
PERCENT SAND	94.9	96.1	93.56	33.5	94.8	88.7
PERCENT SILT	4.2	3.1	5.01	44.3	3	7.7
TOTAL ORGANIC CARBON	0.37 J	1.03 J	0.48	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)						
CYANIDE	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)						
PH	NA	NA	NA	NA	NA	NA
PESTICIDES/PCBS (UG/KG)						
1,2,3,4-TETRACHLOROBENZENE	0.04 J	0.3 U	0.11 J	NA	NA	NA
1,2,4,5-TETRACHLOROBENZENE	0.22 U	0.19 J	0.69	NA	NA	NA
2,4'-DDD	13	10.16	8.2	NA	NA	NA
2,4'-DDE	2.6	19.26	3.3	NA	NA	NA
2,4'-DDT	21	9.92	22	NA	NA	NA
4,4'-DDD	30	22.19	15	NA	NA	NA
4,4'-DDE	95	56.36	38	NA	NA	NA
4,4'-DDT	71	34.67	89	NA	NA	NA
ALDRIN	0.01 J	0.11 U	0.049 U	NA	NA	NA
ALPHA-BHC	0.065 U	0.1	0.033 U	NA	NA	NA
ALPHA-CHLORDANE	0.12	0.18 U	0.27	NA	NA	NA
BETA-BHC	0.04 U	0.3 U	0.028 J	NA	NA	NA
CHLORPYRIFOS	0.065 U	0.18 U	0.079 J	NA	NA	NA
CIS-NONACHLOR	0.046 U	0.98	0.36	NA	NA	NA
DELTA-BHC	0.01 J	0.1 U	0.037 U	NA	NA	NA
DIELDRIN	0.5	1.03	0.055 U	NA	NA	NA
ENDOSULFAN II	0.12	0.23 U	0.4	NA	NA	NA
ENDRIN	0.055 U	0.11 U	0.057 J	NA	NA	NA
GAMMA-BHC (LINDANE)	0.03 J	0.22 U	0.2 U	NA	NA	NA
GAMMA-CHLORDANE	0.06	0.2	0.089	NA	NA	NA
HEPTACHLOR	0.09	0.14 J	0.031 J	NA	NA	NA
HEPTACHLOR EPOXIDE	0.055 U	0.09 U	0.024 U	NA	NA	NA
HEXACHLOROBENZENE	0.046 U	0.08 U	0.079 U	NA	NA	NA
MIREX	0.028 U	0.14 U	0.024 U	NA	NA	NA
OXYCHLORDANE	0.018 U	0.08 U	0.17	NA	NA	NA
PCB-101	NA	NA	NA	NA	NA	NA
PCB-101/90	1.4	6.24	1.1	NA	NA	NA
PCB-105	1.7	1.02	1.9 J	NA	NA	NA
PCB-114	0.065 U	0.65 U	0.15 U	NA	NA	NA
PCB-118	0.51	1.73	0.69	NA	NA	NA
PCB-126	0.22 U	0.01 J	0.59 U	NA	NA	NA
PCB-128	1	3.56	1.2 J	NA	NA	NA
PCB-138	NA	NA	NA	NA	NA	NA
PCB-138/160	11	4.6	11	NA	NA	NA
PCB-149/123	6.5	36.65	6.4	NA	NA	NA
PCB-153	NA	NA	NA	NA	NA	NA
PCB-153/132	10	12.87	11	NA	NA	NA
PCB-156	0.64	3.92	0.78	NA	NA	NA
PCB-167	0.55	2.98	1.2	NA	NA	NA
PCB-169	0.01 J	0.01 J	0.59 U	NA	NA	NA
PCB-170	NA	NA	NA	NA	NA	NA
PCB-170/190	6.6	40.27 J	12 J	NA	NA	NA
PCB-18	NA	NA	NA	NA	NA	NA
PCB-18/17	0.12 U	0.14 U	0.19 J	NA	NA	NA
PCB-180	12	7.75	14 J	NA	NA	NA
PCB-185	NA	NA	NA	NA	NA	NA
PCB-187	6.6	3.47	7.2	NA	NA	NA
PCB-189	0.35	2.03	0.53	NA	NA	NA
PCB-195	NA	NA	NA	NA	NA	NA

LOCATION	MS-4 LOC.3	MS-4 LOC.3	MS-4 LOC.3	MS-4 LOC.4	MS-4 LOC.5	MS-4 LOC.6
SAMPLE ID	OU4-SD-M04-301B	OU4-SD-M04-302A	OU4-SD-M04-399A	OU4-SD-M04-401B	OU4-SD-M04-501B	OU4-SD-M04-601B
SAMPLE DATE	20010506	20020810	19990910	20010508	20010508	20010508
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0
BOTTOM DEPTH	0.33	0.33	0.33	0.33	0.33	0.33
PCB-195/208	1.6	9.15	2.7	NA	NA	NA
PCB-201	NA	NA	NA	NA	NA	NA
PCB-201/157/173	0.48	2.83	0.73	NA	NA	NA
PCB-206	1.3	5.02	3	NA	NA	NA
PCB-209	0.75 J	1.21	1.4 J	NA	NA	NA
PCB-28	0.07 J	0.44 U	0.097 J	NA	NA	NA
PCB-29	NA	NA	NA	NA	NA	NA
PCB-44	0.04 J	0.23 U	0.086 J	NA	NA	NA
PCB-50	NA	NA	NA	NA	NA	NA
PCB-52	0.08	0.16 U	0.22	NA	NA	NA
PCB-66	0.05	0.33	0.13	NA	NA	NA
PCB-77	0.22 U	0.02 J	0.009 J	NA	NA	NA
PCB-8	NA	NA	NA	NA	NA	NA
PCB-8/5	0.23	0.28 U	0.14 J	NA	NA	NA
PCB-81	0.22 U	0.05 J	0.054 J	NA	NA	NA
PCB-87	NA	NA	NA	NA	NA	NA
PENTACHLOROANISOLE	0.04 U	0.17 U	0.033 J	NA	NA	NA
PENTACHLOROBENZENE	0.04 J	0.16 U	0.12	NA	NA	NA
TEQ PCB	0.00062	0.002853	0.000384	NA	NA	NA
TEQ PCB BIRD	0.000372	0.00822	0.006279	NA	NA	NA
TEQ PCB BIRD HALFND	0.027875	0.008252	0.036082	NA	NA	NA
TEQ PCB FISH	0.000053	0.000333	0.00009	NA	NA	NA
TEQ PCB FISH HALFND	0.000669	0.000335	0.00158	NA	NA	NA
TEQ PCB HALFND	0.011665	0.002863	0.038736	NA	NA	NA
TEQ PCB-HH-HALFND	0.011	0.0017	0.039	NA	NA	NA
TOTAL AROCLOR	NA	NA	NA	NA	NA	NA
TOTAL DDT HALFND	232.6	152.56	175.5	NA	NA	NA

LOCATION	MS-4 LOC.3	MS-4 LOC.3	MS-4 LOC.3	MS-4 LOC.4	MS-4 LOC.5	MS-4 LOC.6
SAMPLE ID	OU4-SD-M04-301B	OU4-SD-M04-302A	OU4-SD-M04-399A	OU4-SD-M04-401B	OU4-SD-M04-501B	OU4-SD-M04-601B
SAMPLE DATE	20010506	20020810	19990910	20010508	20010508	20010508
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0
BOTTOM DEPTH	0.33	0.33	0.33	0.33	0.33	0.33
TOTAL DDT POS	232.6	152.56	175.5	NA	NA	NA
TOTAL PCB CONGENERS	109.98	195.69	136.106	NA	NA	NA
TOTAL PCB CONGENERS-HH-HALFND	127.765	293.34	156.842	NA	NA	NA
TRANS-NONACHLOR	0.12	0.15 U	0.091	NA	NA	NA
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)						
1,1-BIPHENYL	NA	NA	NA	NA	NA	NA
ACENAPHTHENE	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA
BENZO(E)PYRENE	NA	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA
FLUORANTHENE	NA	NA	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA
PERYLENE	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA
PYRENE	NA	NA	NA	NA	NA	NA
SEMIVOLATILES (UG/KG)						
1,1-BIPHENYL	0.9	2.6	1.26 U	NA	NA	NA
1-METHYLNAPHTHALENE	1.8 J	3.2 J	3 U	NA	NA	NA
1-METHYLPHENANTHRENE	5.8	8.4	18.4	NA	NA	NA
2,3,5-TRIMETHYLNAPHTHALENE	0.9	2.2 J	2.43	NA	NA	NA
2,6-DIMETHYLNAPHTHALENE	1.5	3.3	1.89	NA	NA	NA
2-METHYLNAPHTHALENE	2.7 J	4.8 J	4.45 U	NA	NA	NA
ACENAPHTHENE	2.6	7.2	7.97	NA	NA	NA
ACENAPHTHYLENE	7.7	16.8 J	25.5 J	NA	NA	NA
ANTHRACENE	22.2	26.9	61.1	NA	NA	NA
BAP EQUIVALENT-HALFND	110.6111	117.3196	574.104	NA	NA	NA
BAP EQUIVALENT-POS	110.6111	117.3196	574.104	NA	NA	NA
BENZO(A)ANTHRACENE	52.9	103.3	291	NA	NA	NA
BENZO(A)PYRENE	82.5 J	94.5 J	399	NA	NA	NA
BENZO(B)FLUORANTHENE	80.9	66.1	420	NA	NA	NA
BENZO(E)PYRENE	38.4	61.4 J	233	NA	NA	NA
BENZO(G,H,I)PERYLENE	42	51 J	267	NA	NA	NA
BENZO(K)FLUORANTHENE	24.9	3.7 J	154	NA	NA	NA
CHRYSENE	52.1 J	92.6	294	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	9.4 J	4.7 J	69.8	NA	NA	NA
DIBENZOTHIOPHENE	1.8 J	3.4	6.8	NA	NA	NA
FLUORANTHENE	98.7	136.6	459	NA	NA	NA
FLUORENE	4.2 J	5.7 J	9.45	NA	NA	NA
HIGH MOLECULAR WEIGHT PAHS	375.5	549.4	1902.8	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	46.1 J	5.4 J	297	NA	NA	NA
LOW MOLECULAR WEIGHT PAHS	81	121.5	242.205	NA	NA	NA
NAPHTHALENE	3.3	9.4	5.92 U	NA	NA	NA
PERYLENE	13.1 J	23.4	76	NA	NA	NA
PHENANTHRENE	38.3	50.7	133	NA	NA	NA
PYRENE	79.9	117.7	390	NA	NA	NA
TOTAL PAHS	NA	NA	NA	NA	NA	NA
TOTAL PAHS ECO	456.5	670.9	2145.005	NA	NA	NA

LOCATION	MS-3 LOC.1	MS-3 LOC.2	MS-3 LOC.3	MS-4 LOC.1			MS-4 LOC.2	MS-4 LOC.3
SAMPLE ID	OU4-SD-M03-103A	OU4-SD-M03-203A	OU4-SD-M03-303A	OU4-SD-M04-103A	OU4-SD-M04-103A-	OU4-SD-M04-103A-D	OU4-SD-M04-203A	OU4-SD-M04-303A
SAMPLE DATE	20030809	20030809	20030809	20030809	20030809	20030809	20030810	20030809
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
ALKYLATED PAHS (UG/KG)								
C1-CHRYSENES	515.7	283	145.2	730.5 J	1104.05	1477.6 J	193.3	41.4
C1-DIBENZOTHIOPHENES	54.7	38.8	13.4	108.6 J	152.4	196.2 J	20.5	4.4
C1-FLUORANTHENES/PYRENES	1007.4	497.8	232	1115.7 J	1651.2	2186.7 J	299.4	58
C1-FLUORENES	113.3	44.8	22.1	85.4 J	158.35	231.3 J	35.1	6.2
C1-NAPHTHALENES	106.5	51.6	25.4	67.2	88.45	109.7	36.9	5.3
C1-PHENANTHRENES/ANTHRACENES	572.6	271.5	100.5	912.9 J	1431.05	1949.2 J	140.8	31.6
C2-CHRYSENES	184	125.9	60.9	266.2 J	404.5	542.8 J	80.4	15.5
C2-DIBENZOTHIOPHENES	45.5	50.2	19.5	105.4 J	141	176.6 J	29.5	6.9
C2-FLUORENES	68	47.2	22.8	107.6	138.7	169.8	46.9	5.7
C2-NAPHTHALENES	74.6	45.2	25.6	78.6 J	128.35	178.1 J	31	4.6
C2-PHENANTHRENES/ANTHRACENES	279.5	196.1	83.3	550.3 J	822.8	1095.3 J	117.3	23.3
C3-CHRYSENES	36.6	27.2	9.7	52.3	68.05	83.8	16.2	3.9
C3-DIBENZOTHIOPHENES	40.3	36.1	13.6	50.9 J	70.25	89.6 J	26.2	5.4
C3-FLUORENES	52.9	36.4	12.6	183.7	187.4	191.1	42.9	10.9
C3-NAPHTHALENES	56.8	44.2	23	107.3 J	187.65	268 J	27.9	6.1
C3-PHENANTHRENES/ANTHRACENES	118.8	96.9	55.8	250.5 J	343.35	436.2 J	70.1	14
C4-CHRYSENES	4.7 J	1.8 J	0.4 J	2.9 J	4.1	5.3 J	1 J	0.2 J
C4-NAPHTHALENES	30	31.7	16.1	79.1 J	116.7	154.3 J	18.8	5.1
C4-PHENANTHRENES/ANTHRACENES	59.2	49.3	29.2	82.8	107.75	132.7	46.4	6.9
HF METALS (MG/KG)								
ALUMINUM	63235.01	64801.34	56218.06	38230.71	38815.51	39400.31	58267.57	48176.94
ARSENIC	19.28	17.67	9.94	26.25	25.82	25.39	11.04	11.06
CADMIUM	0.49 U	0.46 U	0.47 U	0.57 J	0.795	1.02	0.47 U	0.46 U
CHROMIUM	121.9	925.01	92.03	205.57	207.635	209.7	103.34	107.9
COPPER	215.47	732.33	61.14	6420.5	7072.93	7725.36	59.11	138.81
IRON	24809.53	34918.86	14272.19	76870.62	76107.2	75343.77	17718.9	20932.82
LEAD	134.79	179.6	41.23	746.9	790.45	834	65.58	63.33
MANGANESE	396.56	459.62	346.77	1576.38	1271.385	966.39	364.15	562.47
MERCURY	0.5033	0.4446	0.2144	3.998	3.71505	3.4321	0.4299	0.125
NICKEL	25.92 J	315.24 J	11.83 U	385.42 J	336.045	286.67 J	7.37 U	34.43 J
SILVER	0.8	1.41	0.26	1.35	1.32	1.29	0.36	0.09 U
ZINC	232.66	534.6	91.5	1628.99	1692.075	1755.16	106.54	99.02
METALS (MG/KG)								
ALUMINUM	NA	9060 J	NA	7870 J	8985	10100 J	NA	NA
ARSENIC	NA	10.6 J	NA	36.2 J	30	23.8 J	NA	NA
CADMIUM	NA	0.8 J	NA	1.2 J	1.1	1 J	NA	NA
CHROMIUM	NA	58.1 J	NA	157 J	134	111 J	NA	NA
COPPER	NA	1580 J	NA	6070 J	6280	6490 J	NA	NA
IRON	NA	31500 J	NA	141000 J	114000	87000 J	NA	NA
LEAD	NA	229 J	NA	521 J	548	575 J	NA	NA
MANGANESE	NA	185 J	NA	522 J	568.5	615 J	NA	NA
NICKEL	NA	103 J	NA	500 J	392	284 J	NA	NA
SILVER	NA	1.4 J	NA	0.62 J	0.72	0.82 J	NA	NA
ZINC	NA	629 J	NA	1520 J	1530	1540 J	NA	NA

LOCATION	MS-3 LOC.1	MS-3 LOC.2	MS-3 LOC.3	MS-4 LOC.1			MS-4 LOC.2	MS-4 LOC.3
SAMPLE ID	OU4-SD-M03-103A	OU4-SD-M03-203A	OU4-SD-M03-303A	OU4-SD-M04-103A	OU4-SD-M04-103A-	OU4-SD-M04-103A-D	OU4-SD-M04-203A	OU4-SD-M04-303A
SAMPLE DATE	20030809	20030809	20030809	20030809	20030809	20030809	20030810	20030809
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
MISCELLANEOUS PARAMETERS (%)								
PERCENT CLAY	10.9	12.3	10.1	2.1 J	1.65	1.2 J	12	0
PERCENT GRAVEL	13.5	15.4	0	41.2	44.35	47.5	0	25
PERCENT SAND	58.5	47.1	67.8	51.9	49.8	47.7	50.7	67.7
PERCENT SILT	17.2	25.1	22.1	4.7	4.15	3.6	37.3	7.2
TOTAL ORGANIC CARBON	1.77	1.28	0.8	0.56 J	0.835	1.11 J	1.66	0.5
TOTAL SOLIDS	NA	58	NA	76	70	64	NA	NA
PESTICIDES/PCBS (UG/KG)								
1,2,3,4-TETRACHLOROBENZENE	0.61	0.46	0.18 J	0.39	0.275	0.16 J	0.04 J	0.32
1,2,4,5-TETRACHLOROBENZENE	0.76	1.91	0.62	1.24	1.085	0.93	1.79	0.58
2,4'-DDD	18.52	3.61	0.99	5.98	7.075	8.17	1.3	12.77
2,4'-DDE	2.04	1.35	0.32	3.06	2.74	2.42	0.18	1.87
2,4'-DDT	3.19	1	0.06 J	9.21	10.085	10.96	0.16	6.55
4,4'-DDD	54.85	5.2	0.97	13.3	17.635	21.97	2.2	25.81
4,4'-DDE	7.57	3.04	0.88	8.91	9.56	10.21	1.23	91.19
4,4'-DDT	18.61	8.09	0.94	34.33	38.55	42.77	0.73	37.98
ALDRIN	24.26	0.084 U	1.3	0.065 UJ	11.96125	23.89 J	0.098 U	0.01 J
ALPHA-BHC	0.06	0.05 J	0.05 J	0.05 U	0.02 J	0.02 J	0.03 J	0.01 J
ALPHA-CHLORDANE	1.07	1.12	0.1 J	1.94	2.405	2.87	0.36	0.25
BETA-BHC	0.33	0.39	0.06 J	0.15 J	0.16	0.17 J	0.06 J	0.03 J
CHLORPYRIFOS	0.32	0.27	0.02 J	0.24	0.225	0.21	0.09 J	0.22
CIS-NONACHLOR	1.16 J	0.36 J	0.11 J	0.63 J	0.74	0.85 J	0.16 J	0.22 J
DELTA-BHC	0.05 J	0.02 J	0.07 J	0.03 J	0.06	0.09	0.098 U	0.01 J
DIELDRIN	2.57	1.73	0.041 U	2.37	2.12	1.87	0.16	0.26
ENDOSULFAN II	0.97	1.16	0.19 U	1.01 J	0.541	0.144 U	0.49	0.08 J
ENDRIN	0.071 U	0.084 U	0.081 U	0.05 J	0.11	0.17	0.098 U	0.056 U
GAMMA-BHC (LINDANE)	0.3	0.19	0.09 J	0.02 J	0.03	0.04 J	0.14 J	0.1 J
GAMMA-CHLORDANE	0.33	0.26	0.09	0.02 J	0.305	0.59 J	0.1	0.1
HEPTACHLOR	0.177 U	0.211 U	0.32	2.43	2.14	1.85	0.22 J	0.17
HEPTACHLOR EPOXIDE	0.059 U	0.07 U	0.068 U	0.054 U	0.05	0.05	0.082 U	0.047 U
HEXACHLOROBENZENE	0.09	0.05 J	0.07	0.08	0.075	0.07	0.3	0.12
MIREX	0.094 U	0.113 U	0.108 U	0.086 UJ	0.2915	0.54 J	0.131 U	0.075 U
OXYCHLORDANE	0.059 U	0.06 J	0.068 U	0.054 UJ	0.9335	1.84 J	0.09	0.04 U
PCB-101/90	19.55	4.75	2.02	5.01	4.32	3.63	2.35	0.92
PCB-105	3.14	0.78	0.55 J	0.43 J	0.365	0.3 J	0.69 J	0.51
PCB-114	0.459 U	0.549 U	0.529 U	0.421 U	0.411 U	0.401 U	0.639 U	0.364 U
PCB-118	3.54	2.03	1.28	2.77	3.025	3.28	2.15	0.32 J
PCB-126	7.19	4.11	0.73 J	2.75	2.995	3.24	0.02 J	0.53 J
PCB-128	2.73	1.1	0.54	0.68 J	1.245	1.81 J	0.74	0.54
PCB-138/160	49.25	12.58	4.01	13.99 J	9.72	5.45 J	3.3	5.07
PCB-149/123	33.76	6.48	1.93	5.79	4.81	3.83	1.96	3.44
PCB-153/132	56.55	15.99	3.28	11.22	9.315	7.41	3.87	6.84
PCB-156	3.11 J	0.92 J	0.97 J	10.75 J	12.33	13.91 J	1.35 J	0.37 J
PCB-167	8.32	0.35 J	0.91	6.22	7.215	8.21	1.98	0.3 J
PCB-169	0.15 J	0.07 J	0.05 J	0.05 J	0.055	0.06 J	0.05 J	0.04 J
PCB-170/190	42.91 J	78.28 J	7.44 J	28.85 J	34.795	40.74 J	8.41 J	7.08 J
PCB-18/17	0.35	0.46	0.17	0.42	0.43	0.44	0.31	0.23
PCB-180	41.01	14.16	2.23	9.02	8.32	7.62	2.39 J	11.87
PCB-187	28.85	11.29	1.78	5.43 J	17.405	29.38 J	1.29	4.15
PCB-189	0.8	0.38 J	0.14 J	0.91	1.16	1.41	0.18 J	0.29 J
PCB-195/208	3.95	2.74	0.38	16.08 J	9.55	3.02 J	0.56	1.21

LOCATION	MS-3 LOC.1	MS-3 LOC.2	MS-3 LOC.3	MS-4 LOC.1			MS-4 LOC.2	MS-4 LOC.3
SAMPLE ID	OU4-SD-M03-103A	OU4-SD-M03-203A	OU4-SD-M03-303A	OU4-SD-M04-103A	OU4-SD-M04-103A-	OU4-SD-M04-103A-D	OU4-SD-M04-203A	OU4-SD-M04-303A
SAMPLE DATE	20030809	20030809	20030809	20030809	20030809	20030809	20030810	20030809
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0	0	0
BOTTOM DEPTH	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
PCB-201/157/173	1.65	1.36	0.13 J	1.53	1.775	2.02	0.31 J	0.43
PCB-206	3.66	4.17	0.61	32.28 J	19.515	6.75 J	0.77	1.11
PCB-209	1.29	1.5	0.25	47.02 J	29.6	12.18 J	0.74	0.69
PCB-28	1.14	1.59	0.62	0.44 J	0.3	0.16 J	2.57	0.3
PCB-44	0.69 U	0.77 U	0.58 U	0.51 U	0.505 U	0.5 U	0.96 U	0.37 U
PCB-52	6.44	3.57	1.12	2.69 J	2.1	1.51 J	1.92	0.46
PCB-66	1.13	0.39	0.57	0.6 J	2.41	4.22 J	0.39	0.05 J
PCB-77	4.23	0.22 J	0.33 J	0.19 J	0.215	0.24 J	0.04 J	0.19 J
PCB-8/5	0.99	0.92	0.74	0.07 J	0.225	0.38 J	0.94	0.59
PCB-81	2.62	2.21	0.33 J	1.63	1.88	2.13	0.15 J	0.19 J
PENTACHLOROANISOLE	0.24	0.3	0.21	0.26	0.24	0.22	0.22	0.33
PENTACHLOROBENZENE	0.32	0.39	0.19	0.38	0.34	0.3	0.45	0.2
TEQ PCB	0.726339	0.414153	0.074808	0.27786	0.302656	0.327451	0.003806	0.054446
TEQ PCB BIRD	1.193904	0.643469	0.122757	0.448978	0.499914	0.55085	0.019349	0.081714
TEQ PCB BIRD HALFND	1.193927	0.643496	0.122783	0.448999	0.499935	0.55087	0.019381	0.081732
TEQ PCB FISH	0.037964	0.021743	0.003881	0.014729	0.016093	0.017457	0.000225	0.002795
TEQ PCB FISH HALFND	0.037965	0.021744	0.003882	0.01473	0.016094	0.017458	0.000227	0.002796
TEQ PCB HALFND	0.726346	0.414161	0.074816	0.277866	0.302662	0.327457	0.003816	0.054451
TEQ PCB-HH-HALFND	0.73	0.41	0.075	0.28	0.305	0.33	0.0037	0.054
TOTAL DDT HALFND	104.78	22.29	4.16	74.79	85.645	96.5	5.8	176.17
TOTAL DDT POS	104.78	22.29	4.16	74.79	85.645	96.5	5.8	176.17
TOTAL PCB CONGENERS	533.65	313.37	55.76	354.51	305.785	257.06	67.74	84.25
TOTAL PCB CONGENERS-HH-HALFND	657.769	346.119	67.329	414.571	371.066	327.561	80.459	96.174
TRANS-NONACHLOR	0.34	0.19	0.17	0.06 J	0.04	0.02 J	0.13 J	0.3
SEMIVOLATILES (UG/KG)								
1,1-BIPHENYL	17.5	10.7	6.9	12.1	15.4	18.7	9.2	1.1 U
1-METHYLNAPHTHALENE	49.5	19.4	10	21.8 J	32.5	43.2 J	14.6	2
1-METHYLPHENANTHRENE	152.6	81	25.5	236.5 J	380.95	525.4 J	41.1	8
2,3,5-TRIMETHYLNAPHTHALENE	18.6	14	7.8	34.6 J	64.55	94.5 J	10	2
2,6-DIMETHYLNAPHTHALENE	28.5	19.8	11.5	36.4 J	51.1	65.8 J	15	1.9
2-METHYLNAPHTHALENE	57	32.2	15.3	45.3	55.85	66.4	22.3	3.3
ACENAPHTHENE	377.5	56.4	16	65.8 J	137.95	210.1 J	18.8	3.8
ACENAPHTHYLENE	70.2	66.2	42	131.3	156.9	182.5	55.8	12.8
ANTHRACENE	912.2	241.8	124.1	1008.5 J	1465.5	1922.5 J	149.9	28.5
BAP EQUIVALENT-HALFND	1725.326	815.0384	331.6121	2698.749	3794.211	4889.674	542.1571	111.564
BAP EQUIVALENT-POS	1725.326	815.0384	331.6121	2698.749	3794.211	4889.674	542.1571	111.564
BENZO(A)ANTHRACENE	1074.9	418.9	204.9	1676.2 J	2436.15	3196.1 J	262.1	69.8
BENZO(A)PYRENE	1258.4	569.5	243.8	1930.9 J	2754.9	3578.9 J	404.9	79.9
BENZO(B)FLUORANTHENE	1319.9	660.3	266.2	1927.9 J	2649.4	3370.9 J	378.5	97.7
BENZO(E)PYRENE	642.8	353	128.5	961.3 J	1289	1616.7 J	223.1	45
BENZO(G,H,I)PERYLENE	609.1	410.1	95.7	1111.4	1429.95	1748.5	223.6	36.6
BENZO(K)FLUORANTHENE	447.7	239.3	82.4	676.4 J	947.9	1219.4 J	140.3	28.5
CHRYSENE	1048.1	484.4	251.1	1510.7 J	2082.9	2655.1 J	238.1	83
DIBENZO(A,H)ANTHRACENE	146.9 J	87.9	27.4	263	335.9	408.8	45.4	10.1
DIBENZOTHIOPHENE	113.4	29.4	11	99 J	150.15	201.3 J	16.5	3
FLUORANTHENE	2983	941.2	355	3860.3 J	5438.9	7017.5 J	431	133.4
FLUORENE	479.1	69.4	25.8	124.9 J	240.05	355.2 J	41.4	5.8
HIGH MOLECULAR WEIGHT PAHS	8821.2	3412.3	1419.6	12126.4	17231.65	22336.9	1820.6	488.3
INDENO(1,2,3-CD)PYRENE	689.3	427.4	112.7	1250.5 J	1689.95	2129.4 J	239.2	40.8
LOW MOLECULAR WEIGHT PAHS	4103	951.9	399.4	3382.6	5075.4	6768.2	521	113.1
NAPHTHALENE	69.4	43.2	26.1	74.1	93.05	112	37.5	5.1

LOCATION	**MS-3 LOC.1**	**MS-3 LOC.2**	**MS-3 LOC.3**	**MS-4 LOC.1**			**MS-4 LOC.2**	**MS-4 LOC.3**
SAMPLE ID	**OU4-SD-M03-103A**	**OU4-SD-M03-203A**	**OU4-SD-M03-303A**	**OU4-SD-M04-103A**	**OU4-SD-M04-103A-**	**OU4-SD-M04-103A-D**	**OU4-SD-M04-203A**	**OU4-SD-M04-303A**
SAMPLE DATE	**20030809**	**20030809**	**20030809**	**20030809**	**20030809**	**20030809**	**20030810**	**20030809**
SAMPLE CODE	**NORMAL**	**NORMAL**	**NORMAL**	**ORIG**	**AVG**	**DUP**	**NORMAL**	**NORMAL**
MATRIX	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
BOTTOM DEPTH	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**
PERYLENE	227.1	110.6	72.6	360 J	515.15	670.3 J	90.5	19.3
PHENANTHRENE	2137.6	442.7	150.1	1932.7 J	2926.1	3919.5 J	195.3	53.8
PYRENE	2309.9	910.4	337.4	2885.3 J	4182.9	5480.5 J	439.1	112.1
TOTAL PAHS ECO	12924.2	4364.2	1819	15509	22307.05	29105.1	2341.6	601.4

LOCATION	TP-SD01				TP-SD02	TP-SD03				TP-SD04		TP-SD05	
SAMPLE ID	TPSD010006	TPSD010612	TPSD010612-AVG	TPSD010612-D	TPSD020006	TPSD030006	TPSD030006-AVG	TPSD030006-D	TPSD030612	TPSD040006	TPSD040612	TPSD050006	TPSD050612
SAMPLE DATE	20030522	20030522	20030522	20030522	20030522	20030813	20030813	20030813	20030813	20030522	20030522	20030522	20030522
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0.5	0.5	0.5	0	0	0	0	0.5	0	0.5	0	0.5
BOTTOM DEPTH	0.5	1	1	1	0.5	0.5	0.5	0.5	1	0.5	1	0.5	1
ALKYLATED PAHS (UG/KG)													
C1-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-DIBENZOTHIOPHENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-FLUORANTHENES/PYRENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-FLUORENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-DIBENZOTHIOPHENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-FLUORENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-DIBENZOTHIOPHENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-FLUORENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HF METALS (MG/KG)													
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
METALS (MG/KG)													
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	174 J	159 J	166	173 J	78.6 J	140	155	170	184	1840 J	1660 J	115 J	101 J
IRON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	41	38.8	39.1	39.4	26.1	31.9	33.65	35.4	40.1	352	66.6	28	25.7
SILVER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SD01				TP-SD02	TP-SD03				TP-SD04		TP-SD05	
SAMPLE ID	TPSD010006	TPSD010612	TPSD010612-AVG	TPSD010612-D	TPSD020006	TPSD030006	TPSD030006-AVG	TPSD030006-D	TPSD030612	TPSD040006	TPSD040612	TPSD050006	TPSD050612
SAMPLE DATE	20030522	20030522	20030522	20030522	20030522	20030813	20030813	20030813	20030813	20030522	20030522	20030522	20030522
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0.5	0.5	0.5	0	0	0	0	0.5	0	0.5	0	0.5
BOTTOM DEPTH	0.5	1	1	1	0.5	0.5	0.5	0.5	1	0.5	1	0.5	1
MISCELLANEOUS PARAMETERS (%)													
PERCENT CLAY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCENT GRAVEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCENT SAND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCENT SILT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL SOLIDS	46	68	68	68	70	36	36	36	46	64	61	58	50
PESTICIDES/PCBS (UG/KG)													
1,2,3,4-TETRACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-TETRACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALPHA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALPHA-CHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BETA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHLORPYRIFOS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CIS-NONACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DELTA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIELDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN II	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GAMMA-BHC (LINDANE)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GAMMA-CHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR EPOXIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MIREX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OXYCHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-101/90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-105	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-114	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-118	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-126	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-128	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-138/160	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-149/123	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-153/132	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-156	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-167	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-169	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-170/190	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-18/17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-180	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-187	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-189	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-195/208	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SD01				TP-SD02	TP-SD03				TP-SD04		TP-SD05	
SAMPLE ID	**TPSD010006**	**TPSD010612**	**TPSD010612-AVG**	**TPSD010612-D**	**TPSD020006**	**TPSD030006**	**TPSD030006-AVG**	**TPSD030006-D**	**TPSD030612**	**TPSD040006**	**TPSD040612**	**TPSD050006**	**TPSD050612**
SAMPLE DATE	**20030522**	**20030522**	**20030522**	**20030522**	**20030522**	**20030813**	**20030813**	**20030813**	**20030813**	**20030522**	**20030522**	**20030522**	**20030522**
SAMPLE CODE	**NORMAL**	**ORIG**	**AVG**	**DUP**	**NORMAL**	**ORIG**	**AVG**	**DUP**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**0**	**0.5**	**0.5**	**0.5**	**0**	**0**	**0**	**0**	**0.5**	**0**	**0.5**	**0**	**0.5**
BOTTOM DEPTH	**0.5**	**1**	**1**	**1**	**0.5**	**0.5**	**0.5**	**0.5**	**1**	**0.5**	**1**	**0.5**	**1**
PCB-201/157/173	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-206	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-209	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-44	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-52	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-66	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-77	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-8/5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-81	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLOROANISOLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB BIRD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB BIRD HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB FISH	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB FISH HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB-HH-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL DDT HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL DDT POS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PCB CONGENERS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PCB CONGENERS-HH-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TRANS-NONACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SEMIVOLATILES (UG/KG)													
1,1-BIPHENYL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-METHYLPHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,5-TRIMETHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-DIMETHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(E)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHRYSENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZOTHIOPHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HIGH MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LOW MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SD01				TP-SD02	TP-SD03				TP-SD04		TP-SD05	
SAMPLE ID	**TPSD010006**	**TPSD010612**	**TPSD010612-AVG**	**TPSD010612-D**	**TPSD020006**	**TPSD030006**	**TPSD030006-AVG**	**TPSD030006-D**	**TPSD030612**	**TPSD040006**	**TPSD040612**	**TPSD050006**	**TPSD050612**
SAMPLE DATE	**20030522**	**20030522**	**20030522**	**20030522**	**20030522**	**20030813**	**20030813**	**20030813**	**20030813**	**20030522**	**20030522**	**20030522**	**20030522**
SAMPLE CODE	**NORMAL**	**ORIG**	**AVG**	**DUP**	**NORMAL**	**ORIG**	**AVG**	**DUP**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**0**	**0.5**	**0.5**	**0.5**	**0**	**0**	**0**	**0**	**0.5**	**0**	**0.5**	**0**	**0.5**
BOTTOM DEPTH	**0.5**	**1**	**1**	**1**	**0.5**	**0.5**	**0.5**	**0.5**	**1**	**0.5**	**1**	**0.5**	**1**
PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PAHS ECO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SD06				TP-SD07		TP-SD09				TP-SD10	
SAMPLE ID	TPSD060006	TPSD060006-AVG	TPSD060006-D	TPSD060612	TPSD070006	TPSD070612	TPSD090006	TPSD090612	TPSD090612-AVG	TPSD090612-D	TPSD100006	TPSD100612
SAMPLE DATE	20030522	20030522	20030522	20030522	20030522	20030522	20030522	20030522	20030522	20030522	20030522	20030522
SAMPLE CODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0.5	0	0.5	0	0.5	0.5	0.5	0	0.5
BOTTOM DEPTH	0.5	0.5	0.5	1	0.5	1	0.5	1	1	1	0.5	1
ALKYLATED PAHS (UG/KG)												
C1-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-DIBENZOTHIOPHENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-FLUORANTHENES/PYRENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-FLUORENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-DIBENZOTHIOPHENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-FLUORENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-DIBENZOTHIOPHENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-FLUORENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HF METALS (MG/KG)												
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
METALS (MG/KG)												
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	169 J	131.5	94 J	64.9 J	231 J	469 J	72 J	9.1 J	57.05	105 J	206 J	195 J
IRON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	25.1	23.9	22.7	19.8	34.1	50.6	18.3 J	12.9 J	17.15	21.4	25.9	27.2
SILVER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SD06				TP-SD07		TP-SD09				TP-SD10	
SAMPLE ID	TPSD060006	TPSD060006-AVG	TPSD060006-D	TPSD060612	TPSD070006	TPSD070612	TPSD090006	TPSD090612	TPSD090612-AVG	TPSD090612-D	TPSD100006	TPSD100612
SAMPLE DATE	20030522	20030522	20030522	20030522	20030522	20030522	20030522	20030522	20030522	20030522	20030522	20030522
SAMPLE CODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0.5	0	0.5	0	0.5	0.5	0.5	0	0.5
BOTTOM DEPTH	0.5	0.5	0.5	1	0.5	1	0.5	1	1	1	0.5	1
MISCELLANEOUS PARAMETERS (%)												
PERCENT CLAY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCENT GRAVEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCENT SAND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCENT SILT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL SOLIDS	61	63.5	66	69	53	60	58	65	62.5	60	58	61
PESTICIDES/PCBS (UG/KG)												
1,2,3,4-TETRACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-TETRACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALPHA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALPHA-CHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BETA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHLORPYRIFOS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CIS-NONACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DELTA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIELDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN II	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GAMMA-BHC (LINDANE)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GAMMA-CHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR EPOXIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MIREX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OXYCHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-101/90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-105	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-114	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-118	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-126	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-128	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-138/160	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-149/123	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-153/132	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-156	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-167	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-169	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-170/190	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-18/17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-180	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-187	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-189	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-195/208	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SD06				TP-SD07		TP-SD09				TP-SD10	
SAMPLE ID	TPSD060006	TPSD060006-AVG	TPSD060006-D	TPSD060612	TPSD070006	TPSD070612	TPSD090006	TPSD090612	TPSD090612-AVG	TPSD090612-D	TPSD100006	TPSD100612
SAMPLE DATE	20030522	20030522	20030522	20030522	20030522	20030522	20030522	20030522	20030522	20030522	20030522	20030522
SAMPLE CODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0.5	0	0.5	0	0.5	0.5	0.5	0	0.5
BOTTOM DEPTH	0.5	0.5	0.5	1	0.5	1	0.5	1	1	1	0.5	1
PCB-201/157/173	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-206	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-209	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-44	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-52	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-66	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-77	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-8/5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-81	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLOROANISOLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB BIRD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB BIRD HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB FISH	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB FISH HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB-HH-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL DDT HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL DDT POS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PCB CONGENERS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PCB CONGENERS-HH-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TRANS-NONACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SEMIVOLATILES (UG/KG)												
1,1-BIPHENYL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-METHYLPHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,5-TRIMETHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-DIMETHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(E)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHRYSENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZOTHIOPHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HIGH MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LOW MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SD06				TP-SD07		TP-SD09				TP-SD10	
SAMPLE ID	**TPSD060006**	**TPSD060006-AVG**	**TPSD060006-D**	**TPSD060612**	**TPSD070006**	**TPSD070612**	**TPSD090006**	**TPSD090612**	**TPSD090612-AVG**	**TPSD090612-D**	**TPSD100006**	**TPSD100612**
SAMPLE DATE	**20030522**	**20030522**	**20030522**	**20030522**	**20030522**	**20030522**	**20030522**	**20030522**	**20030522**	**20030522**	**20030522**	**20030522**
SAMPLE CODE	**ORIG**	**AVG**	**DUP**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**ORIG**	**AVG**	**DUP**	**NORMAL**	**NORMAL**
MATRIX	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**0**	**0**	**0**	**0.5**	**0**	**0.5**	**0**	**0.5**	**0.5**	**0.5**	**0**	**0.5**
BOTTOM DEPTH	**0.5**	**0.5**	**0.5**	**1**	**0.5**	**1**	**0.5**	**1**	**1**	**1**	**0.5**	**1**
PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PAHS ECO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SD12							TP-SD13		TP-SD14		
SAMPLE ID	TPSD120006	TPSD120612	TPSD120612-AVG	TPSD120612-D	TPSD120612-RE	TPSD120612-RE-AVG	TPSD120612-RE-D	TPSD130006	TPSD130612	TPSD140006	TPSD140612	TPSD150006
SAMPLE DATE	20030521	20030521	20030521	20030521	20030521	20030521	20030521	20030522	20030522	20030521	20030521	20030522
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0.5	0.5	0.5	0.5	0.5	0.5	0	0.5	0	0.5	0
BOTTOM DEPTH	0.5	1	1	1	1	1	1	0.5	1	0.5	1	0.5
ALKYLATED PAHS (UG/KG)												
C1-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-DIBENZOTHIOPHENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-FLUORANTHENES/PYRENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-FLUORENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-DIBENZOTHIOPHENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-FLUORENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-DIBENZOTHIOPHENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-FLUORENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HF METALS (MG/KG)												
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
METALS (MG/KG)												
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	270 J	228 J	1174	2120 J	320	381.5	443	55.8 J	12.6 J	104 J	88.4 J	58.6 J
IRON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	22.9	36.9	30.55	24.2	23.8	23.85	23.9	20.1 J	14.2 J	21.6	19.3	24.7
SILVER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SD12							TP-SD13		TP-SD14		
SAMPLE ID	TPSD120006	TPSD120612	TPSD120612-AVG	TPSD120612-D	TPSD120612-RE	TPSD120612-RE-AVG	TPSD120612-RE-D	TPSD130006	TPSD130612	TPSD140006	TPSD140612	TPSD150006
SAMPLE DATE	20030521	20030521	20030521	20030521	20030521	20030521	20030521	20030522	20030522	20030521	20030521	20030522
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0.5	0.5	0.5	0.5	0.5	0.5	0	0.5	0	0.5	0
BOTTOM DEPTH	0.5	1	1	1	1	1	1	0.5	1	0.5	1	0.5
MISCELLANEOUS PARAMETERS (%)												
PERCENT CLAY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCENT GRAVEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCENT SAND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCENT SILT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL SOLIDS	62	60	61	62	64	64	64	59	64	60	65	57
PESTICIDES/PCBS (UG/KG)												
1,2,3,4-TETRACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-TETRACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALPHA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALPHA-CHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BETA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHLORPYRIFOS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CIS-NONACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DELTA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIELDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN II	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GAMMA-BHC (LINDANE)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GAMMA-CHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR EPOXIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MIREX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OXYCHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-101/90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-105	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-114	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-118	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-126	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-128	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-138/160	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-149/123	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-153/132	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-156	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-167	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-169	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-170/190	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-18/17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-180	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-187	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-189	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-195/208	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION				TP-SD12				TP-SD13		TP-SD14		
SAMPLE ID	**TPSD120006**	**TPSD120612**	**TPSD120612-AVG**	**TPSD120612-D**	**TPSD120612-RE**	**TPSD120612-RE-AVG**	**TPSD120612-RE-D**	**TPSD130006**	**TPSD130612**	**TPSD140006**	**TPSD140612**	**TPSD150006**
SAMPLE DATE	**20030521**	**20030521**	**20030521**	**20030521**	**20030521**	**20030521**	**20030521**	**20030522**	**20030522**	**20030521**	**20030521**	**20030522**
SAMPLE CODE	**NORMAL**	**ORIG**	**AVG**	**DUP**	**ORIG**	**AVG**	**DUP**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**ORIG**
MATRIX	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**0**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0**	**0.5**	**0**	**0.5**	**0**
BOTTOM DEPTH	**0.5**	**1**	**1**	**1**	**1**	**1**	**1**	**0.5**	**1**	**0.5**	**1**	**0.5**
PCB-201/157/173	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-206	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-209	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-44	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-52	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-66	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-77	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-8/5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-81	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLOROANISOLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB BIRD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB BIRD HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB FISH	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB FISH HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB-HH-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL DDT HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL DDT POS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PCB CONGENERS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PCB CONGENERS-HH-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TRANS-NONACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SEMIVOLATILES (UG/KG)												
1,1-BIPHENYL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-METHYLPHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,5-TRIMETHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-DIMETHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(E)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHRYSENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZOTHIOPHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HIGH MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LOW MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SD12							TP-SD13		TP-SD14		
SAMPLE ID	**TPSD120006**	**TPSD120612**	**TPSD120612-AVG**	**TPSD120612-D**	**TPSD120612-RE**	**TPSD120612-RE-AVG**	**TPSD120612-RE-D**	**TPSD130006**	**TPSD130612**	**TPSD140006**	**TPSD140612**	**TPSD150006**
SAMPLE DATE	**20030521**	**20030521**	**20030521**	**20030521**	**20030521**	**20030521**	**20030521**	**20030522**	**20030522**	**20030521**	**20030521**	**20030522**
SAMPLE CODE	**NORMAL**	**ORIG**	**AVG**	**DUP**	**ORIG**	**AVG**	**DUP**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**ORIG**
MATRIX	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**0**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0**	**0.5**	**0**	**0.5**	**0**
BOTTOM DEPTH	**0.5**	**1**	**1**	**1**	**1**	**1**	**1**	**0.5**	**1**	**0.5**	**1**	**0.5**
PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PAHS ECO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SD15			TP-SD16		TP-SD17		TP-SD18		TP-SD19			
SAMPLE ID	TPSD150006-AVG	TPSD150006-D	TPSD150612	TPSD160006	TPSD160612	TPSD170006	TPSD170612	TPSD180006	TPSD180612	TPSD190006	TPSD190612	TPSD190612-AVG	TPSD190612-D
SAMPLE DATE	20030522	20030522	20030522	20030521	20030521	20030521	20030521	20030521	20030521	20030521	20030521	20030521	20030521
SAMPLE CODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0.5	0.5
BOTTOM DEPTH	0.5	0.5	1	0.5	1	0.5	1	0.5	1	0.5	1	1	1
ALKYLATED PAHS (UG/KG)													
C1-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-DIBENZOTHIOPHENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-FLUORANTHENES/PYRENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-FLUORENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-DIBENZOTHIOPHENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-FLUORENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-DIBENZOTHIOPHENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-FLUORENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HF METALS (MG/KG)													
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
METALS (MG/KG)													
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	34.4	10.2 J	16.9 J	320 J	85.6	60.9	65.3	113	69.8	59.5	56 J	118.5	181 J
IRON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	19.55	14.4 J	16.2 J	24.3	22.6	22.4	23.8	25.3	24.5	26.6	22	26.3	30.6
SILVER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SD15			TP-SD16		TP-SD17		TP-SD18		TP-SD19			
SAMPLE ID	**TPSD150006-AVG**	**TPSD150006-D**	**TPSD150612**	**TPSD160006**	**TPSD160612**	**TPSD170006**	**TPSD170612**	**TPSD180006**	**TPSD180612**	**TPSD190006**	**TPSD190612**	**TPSD190612-AVG**	**TPSD190612-D**
SAMPLE DATE	**20030522**	**20030522**	**20030522**	**20030521**	**20030521**	**20030521**	**20030521**	**20030521**	**20030521**	**20030521**	**20030521**	**20030521**	**20030521**
SAMPLE CODE	**AVG**	**DUP**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**ORIG**	**AVG**	**DUP**
MATRIX	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**0**	**0**	**0.5**	**0**	**0.5**	**0**	**0.5**	**0**	**0.5**	**0**	**0.5**	**0.5**	**0.5**
BOTTOM DEPTH	**0.5**	**0.5**	**1**	**0.5**	**1**	**0.5**	**1**	**0.5**	**1**	**0.5**	**1**	**1**	**1**
MISCELLANEOUS PARAMETERS (%)													
PERCENT CLAY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCENT GRAVEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCENT SAND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCENT SILT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL SOLIDS	62.5	68	64	56	64	47	55	58	66	54	59	57	55
PESTICIDES/PCBS (UG/KG)													
1,2,3,4-TETRACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-TETRACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALPHA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALPHA-CHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BETA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHLORPYRIFOS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CIS-NONACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DELTA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIELDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN II	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GAMMA-BHC (LINDANE)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GAMMA-CHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR EPOXIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MIREX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OXYCHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-101/90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-105	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-114	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-118	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-126	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-128	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-138/160	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-149/123	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-153/132	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-156	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-167	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-169	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-170/190	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-18/17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-180	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-187	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-189	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-195/208	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SD15			TP-SD16		TP-SD17		TP-SD18		TP-SD19			
SAMPLE ID	**TPSD150006-AVG**	**TPSD150006-D**	**TPSD150612**	**TPSD160006**	**TPSD160612**	**TPSD170006**	**TPSD170612**	**TPSD180006**	**TPSD180612**	**TPSD190006**	**TPSD190612**	**TPSD190612-AVG**	**TPSD190612-D**
SAMPLE DATE	**20030522**	**20030522**	**20030522**	**20030521**	**20030521**	**20030521**	**20030521**	**20030521**	**20030521**	**20030521**	**20030521**	**20030521**	**20030521**
SAMPLE CODE	**AVG**	**DUP**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**ORIG**	**AVG**	**DUP**
MATRIX	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**0**	**0**	**0.5**	**0**	**0.5**	**0**	**0.5**	**0**	**0.5**	**0**	**0.5**	**0.5**	**0.5**
BOTTOM DEPTH	**0.5**	**0.5**	**1**	**0.5**	**1**	**0.5**	**1**	**0.5**	**1**	**0.5**	**1**	**1**	**1**
PCB-201/157/173	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-206	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-209	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-44	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-52	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-66	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-77	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-8/5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-81	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLOROANISOLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB BIRD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB BIRD HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB FISH	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB FISH HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB-HH-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL DDT HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL DDT POS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PCB CONGENERS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PCB CONGENERS-HH-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TRANS-NONACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SEMIVOLATILES (UG/KG)													
1,1-BIPHENYL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-METHYLPHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,5-TRIMETHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-DIMETHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(E)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHRYSENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZOTHIOPHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HIGH MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LOW MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SD15			TP-SD16		TP-SD17		TP-SD18		TP-SD19			
SAMPLE ID	**TPSD150006-AVG**	**TPSD150006-D**	**TPSD150612**	**TPSD160006**	**TPSD160612**	**TPSD170006**	**TPSD170612**	**TPSD180006**	**TPSD180612**	**TPSD190006**	**TPSD190612**	**TPSD190612-AVG**	**TPSD190612-D**
SAMPLE DATE	**20030522**	**20030522**	**20030522**	**20030521**	**20030521**	**20030521**	**20030521**	**20030521**	**20030521**	**20030521**	**20030521**	**20030521**	**20030521**
SAMPLE CODE	**AVG**	**DUP**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**ORIG**	**AVG**	**DUP**
MATRIX	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**0**	**0**	**0.5**	**0**	**0.5**	**0**	**0.5**	**0**	**0.5**	**0**	**0.5**	**0.5**	**0.5**
BOTTOM DEPTH	**0.5**	**0.5**	**1**	**0.5**	**1**	**0.5**	**1**	**0.5**	**1**	**0.5**	**1**	**1**	**1**
PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PAHS ECO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SD20		TP-SD21		TP-SD22		TP-SD23		TP-SD24		TP-SD25			
SAMPLE ID	TPSD200006	TPSD200612	TPSD210006	TPSD210612	TPSD220006	TPSD220612	TPSD230006	TPSD230612	TPSD240006	TPSD240612	TPSD250006	TPSD250612	TPSD250612-AVG	TPSD250612-D
SAMPLE DATE	20030521	20030521	20030521	20030521	20030520	20030520	20030521	20030521	20030520	20030520	20030521	20030521	20030521	20030521
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0.5	0.5
BOTTOM DEPTH	0.5	1	0.5	1	0.5	1	0.5	1	0.5	1	0.5	1	1	1
ALKYLATED PAHS (UG/KG)														
C1-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-DIBENZOTHIOPHENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-FLUORANTHENES/PYRENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-FLUORENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-DIBENZOTHIOPHENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-FLUORENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-DIBENZOTHIOPHENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-FLUORENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HF METALS (MG/KG)														
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
METALS (MG/KG)														
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	103	135	50.9	97.6	127 J	125 J	82.1	157	99.8 J	195 J	124	234	216.5	199
IRON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	28.3	32.6	24.2	17.8	31	29.5	27.4	30.9	31.4	27.7	33.4	29.5	29.35	29.2
SILVER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SD20		TP-SD21		TP-SD22		TP-SD23		TP-SD24		TP-SD25			
SAMPLE ID	TPSD200006	TPSD200612	TPSD210006	TPSD210612	TPSD220006	TPSD220612	TPSD230006	TPSD230612	TPSD240006	TPSD240612	TPSD250006	TPSD250612	TPSD250612-AVG	TPSD250612-D
SAMPLE DATE	20030521	20030521	20030521	20030521	20030520	20030520	20030521	20030521	20030520	20030520	20030521	20030521	20030521	20030521
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0.5	0.5
BOTTOM DEPTH	0.5	1	0.5	1	0.5	1	0.5	1	0.5	1	0.5	1	1	1
MISCELLANEOUS PARAMETERS (%)														
PERCENT CLAY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCENT GRAVEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCENT SAND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCENT SILT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL SOLIDS	54	58	49	62	57	60	54	58	57	65	49	60	60	60
PESTICIDES/PCBS (UG/KG)														
1,2,3,4-TETRACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-TETRACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALPHA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALPHA-CHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BETA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHLORPYRIFOS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CIS-NONACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DELTA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIELDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN II	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GAMMA-BHC (LINDANE)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GAMMA-CHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR EPOXIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MIREX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OXYCHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-101/90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-105	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-114	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-118	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-126	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-128	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-138/160	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-149/123	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-153/132	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-156	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-167	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-169	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-170/190	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-18/17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-180	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-187	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-189	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-195/208	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SD20		TP-SD21		TP-SD22		TP-SD23		TP-SD24		TP-SD25			
SAMPLE ID	TPSD200006	TPSD200612	TPSD210006	TPSD210612	TPSD220006	TPSD220612	TPSD230006	TPSD230612	TPSD240006	TPSD240612	TPSD250006	TPSD250612	TPSD250612-AVG	TPSD250612-D
SAMPLE DATE	20030521	20030521	20030521	20030521	20030520	20030520	20030521	20030521	20030520	20030520	20030521	20030521	20030521	20030521
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0.5	0.5
BOTTOM DEPTH	0.5	1	0.5	1	0.5	1	0.5	1	0.5	1	0.5	1	1	1
PCB-201/157/173	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-206	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-209	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-44	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-52	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-66	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-77	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-8/5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-81	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLOROANISOLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB BIRD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB BIRD HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB FISH	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB FISH HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB-HH-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL DDT HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL DDT POS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PCB CONGENERS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PCB CONGENERS-HH-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TRANS-NONACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SEMIVOLATILES (UG/KG)														
1,1-BIPHENYL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-METHYLPHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,5-TRIMETHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-DIMETHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(E)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHRYSENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZOTHIOPHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HIGH MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LOW MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SD20		TP-SD21		TP-SD22		TP-SD23		TP-SD24		TP-SD25			
SAMPLE ID	TPSD200006	TPSD200612	TPSD210006	TPSD210612	TPSD220006	TPSD220612	TPSD230006	TPSD230612	TPSD240006	TPSD240612	TPSD250006	TPSD250612	TPSD250612-AVG	TPSD250612-D
SAMPLE DATE	20030521	20030521	20030521	20030521	20030520	20030520	20030521	20030521	20030520	20030520	20030521	20030521	20030521	20030521
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0.5	0.5
BOTTOM DEPTH	0.5	1	0.5	1	0.5	1	0.5	1	0.5	1	0.5	1	1	1
PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PAHS ECO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SD26		TP-SD27		TP-SD28		TP-SD29		TP-SD30		TP-SD33		TP-SD34	
SAMPLE ID	TPSD260006	TPSD260612	TPSD270006	TPSD270612	TPSD280006	TPSD280612	TPSD290006	TPSD290612	TPSD300006	TPSD300612	TPSD330006	TPSD330612	TPSD340006	TPSD340612
SAMPLE DATE	20030520	20030520	20030521	20030521	20030520	20030520	20030521	20030521	20030520	20030520	20030521	20030521	20030520	20030520
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5
BOTTOM DEPTH	0.5	1	0.5	1	0.5	1	0.5	1	0.5	1	0.5	1	0.5	1
ALKYLATED PAHS (UG/KG)														
C1-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-DIBENZOTHIOPHENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-FLUORANTHENES/PYRENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-FLUORENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-DIBENZOTHIOPHENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-FLUORENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-DIBENZOTHIOPHENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-FLUORENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HF METALS (MG/KG)														
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
METALS (MG/KG)														
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	111 J	182 J	85	98.4	267 J	274 J	101	120 J	282 J	342 J	111 J	59.2 J	317 J	34.8 J
IRON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	31.6	29.2	26.1	25.3	43.8	33.6	28.2	35.4	49	34.6	30.7	21.8	46.9	16.7
SILVER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SD26		TP-SD27		TP-SD28		TP-SD29		TP-SD30		TP-SD33		TP-SD34	
SAMPLE ID	TPSD260006	TPSD260612	TPSD270006	TPSD270612	TPSD280006	TPSD280612	TPSD290006	TPSD290612	TPSD300006	TPSD300612	TPSD330006	TPSD330612	TPSD340006	TPSD340612
SAMPLE DATE	20030520	20030520	20030521	20030521	20030520	20030520	20030521	20030521	20030520	20030520	20030521	20030521	20030520	20030520
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5
BOTTOM DEPTH	0.5	1	0.5	1	0.5	1	0.5	1	0.5	1	0.5	1	0.5	1
MISCELLANEOUS PARAMETERS (%)														
PERCENT CLAY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCENT GRAVEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCENT SAND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCENT SILT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL SOLIDS	53	66	54	58	52	60	53	54	56	63	56	66	58	72
PESTICIDES/PCBS (UG/KG)														
1,2,3,4-TETRACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-TETRACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALPHA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALPHA-CHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BETA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHLORPYRIFOS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CIS-NONACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DELTA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIELDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN II	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GAMMA-BHC (LINDANE)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GAMMA-CHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR EPOXIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MIREX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OXYCHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-101/90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-105	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-114	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-118	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-126	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-128	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-138/160	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-149/123	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-153/132	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-156	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-167	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-169	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-170/190	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-18/17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-180	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-187	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-189	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-195/208	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SD26		TP-SD27		TP-SD28		TP-SD29		TP-SD30		TP-SD33		TP-SD34	
SAMPLE ID	**TPSD260006**	**TPSD260612**	**TPSD270006**	**TPSD270612**	**TPSD280006**	**TPSD280612**	**TPSD290006**	**TPSD290612**	**TPSD300006**	**TPSD300612**	**TPSD330006**	**TPSD330612**	**TPSD340006**	**TPSD340612**
SAMPLE DATE	**20030520**	**20030520**	**20030521**	**20030521**	**20030520**	**20030520**	**20030521**	**20030521**	**20030520**	**20030520**	**20030521**	**20030521**	**20030520**	**20030520**
SAMPLE CODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**0**	**0.5**	**0**	**0.5**	**0**	**0.5**	**0**	**0.5**	**0**	**0.5**	**0**	**0.5**	**0**	**0.5**
BOTTOM DEPTH	**0.5**	**1**	**0.5**	**1**	**0.5**	**1**	**0.5**	**1**	**0.5**	**1**	**0.5**	**1**	**0.5**	**1**
PCB-201/157/173	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-206	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-209	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-44	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-52	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-66	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-77	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-8/5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-81	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLOROANISOLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB BIRD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB BIRD HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB FISH	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB FISH HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB-HH-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL DDT HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL DDT POS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PCB CONGENERS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PCB CONGENERS-HH-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TRANS-NONACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SEMIVOLATILES (UG/KG)														
1,1-BIPHENYL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-METHYLPHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,5-TRIMETHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-DIMETHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(E)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHRYSENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZOTHIOPHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HIGH MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LOW MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SD26		TP-SD27		TP-SD28		TP-SD29		TP-SD30		TP-SD33		TP-SD34	
SAMPLE ID	**TPSD260006**	**TPSD260612**	**TPSD270006**	**TPSD270612**	**TPSD280006**	**TPSD280612**	**TPSD290006**	**TPSD290612**	**TPSD300006**	**TPSD300612**	**TPSD330006**	**TPSD330612**	**TPSD340006**	**TPSD340612**
SAMPLE DATE	**20030520**	**20030520**	**20030521**	**20030521**	**20030520**	**20030520**	**20030521**	**20030521**	**20030520**	**20030520**	**20030521**	**20030521**	**20030520**	**20030520**
SAMPLE CODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**0**	**0.5**	**0**	**0.5**	**0**	**0.5**	**0**	**0.5**	**0**	**0.5**	**0**	**0.5**	**0**	**0.5**
BOTTOM DEPTH	**0.5**	**1**	**0.5**	**1**	**0.5**	**1**	**0.5**	**1**	**0.5**	**1**	**0.5**	**1**	**0.5**	**1**
PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PAHS ECO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SD35				TP-SD36	TP-SD37		TP-SD38	
SAMPLE ID	**TPSD350006**	**TPSD350612**	**TPSD350612-AVG**	**TPSD350612-D**	**TPSD360006**	**TPSD370006**	**TPSD370612**	**TPSD380006**	**TPSD380612**
SAMPLE DATE	**20030521**	**20030521**	**20030521**	**20030521**	**20030520**	**20030521**	**20030521**	**20030521**	**20030521**
SAMPLE CODE	**NORMAL**	**ORIG**	**AVG**	**DUP**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**0**	**0.5**	**0.5**	**0.5**	**0**	**0**	**0.5**	**0**	**0.5**
BOTTOM DEPTH	**0.5**	**1**	**1**	**1**	**0.5**	**0.5**	**1**	**0.5**	**1**
ALKYLATED PAHS (UG/KG)									
C1-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-DIBENZOTHIOPHENES	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-FLUORANTHENES/PYRENES	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-FLUORENES	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-DIBENZOTHIOPHENES	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-FLUORENES	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-DIBENZOTHIOPHENES	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-FLUORENES	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-CHRYSENES	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-NAPHTHALENES	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4-PHENANTHRENES/ANTHRACENES	NA	NA	NA	NA	NA	NA	NA	NA	NA
HF METALS (MG/KG)									
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA	NA	NA	NA	NA
METALS (MG/KG)									
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	135 J	189 J	204.5	220 J	150 J	126 J	263 J	89.9 J	191 J
IRON	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	30.7	32.6	32.7	32.8	30.1	33.1	36.5	25.9	35.2
SILVER	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SD35				TP-SD36	TP-SD37		TP-SD38	
SAMPLE ID	TPSD350006	TPSD350612	TPSD350612-AVG	TPSD350612-D	TPSD360006	TPSD370006	TPSD370612	TPSD380006	TPSD380612
SAMPLE DATE	20030521	20030521	20030521	20030521	20030520	20030521	20030521	20030521	20030521
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0.5	0.5	0.5	0	0	0.5	0	0.5
BOTTOM DEPTH	0.5	1	1	1	0.5	0.5	1	0.5	1
MISCELLANEOUS PARAMETERS (%)									
PERCENT CLAY	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCENT GRAVEL	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCENT SAND	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCENT SILT	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL SOLIDS	46	53	54	55	65	51	53	59	61
PESTICIDES/PCBS (UG/KG)									
1,2,3,4-TETRACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-TETRACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALPHA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA
ALPHA-CHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BETA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHLORPYRIFOS	NA	NA	NA	NA	NA	NA	NA	NA	NA
CIS-NONACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA
DELTA-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIELDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN II	NA	NA	NA	NA	NA	NA	NA	NA	NA
ENDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
GAMMA-BHC (LINDANE)	NA	NA	NA	NA	NA	NA	NA	NA	NA
GAMMA-CHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR EPOXIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
MIREX	NA	NA	NA	NA	NA	NA	NA	NA	NA
OXYCHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-101/90	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-105	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-114	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-118	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-126	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-128	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-138/160	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-149/123	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-153/132	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-156	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-167	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-169	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-170/190	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-18/17	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-180	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-187	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-189	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-195/208	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SD35				TP-SD36	TP-SD37		TP-SD38	
SAMPLE ID	**TPSD350006**	**TPSD350612**	**TPSD350612-AVG**	**TPSD350612-D**	**TPSD360006**	**TPSD370006**	**TPSD370612**	**TPSD380006**	**TPSD380612**
SAMPLE DATE	**20030521**	**20030521**	**20030521**	**20030521**	**20030520**	**20030521**	**20030521**	**20030521**	**20030521**
SAMPLE CODE	**NORMAL**	**ORIG**	**AVG**	**DUP**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**0**	**0.5**	**0.5**	**0.5**	**0**	**0**	**0.5**	**0**	**0.5**
BOTTOM DEPTH	**0.5**	**1**	**1**	**1**	**0.5**	**0.5**	**1**	**0.5**	**1**
PCB-201/157/173	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-206	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-209	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-28	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-44	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-52	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-66	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-77	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-8/5	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-81	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLOROANISOLE	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLOROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB BIRD	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB BIRD HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB FISH	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB FISH HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB-HH-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL DDT HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL DDT POS	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PCB CONGENERS	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PCB CONGENERS-HH-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA
TRANS-NONACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA
SEMIVOLATILES (UG/KG)									
1,1-BIPHENYL	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-METHYLPHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,5-TRIMETHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-DIMETHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(E)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHRYSENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZOTHIOPHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
HIGH MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
LOW MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SD35				TP-SD36	TP-SD37		TP-SD38	
SAMPLE ID	**TPSD350006**	**TPSD350612**	**TPSD350612-AVG**	**TPSD350612-D**	**TPSD360006**	**TPSD370006**	**TPSD370612**	**TPSD380006**	**TPSD380612**
SAMPLE DATE	**20030521**	**20030521**	**20030521**	**20030521**	**20030520**	**20030521**	**20030521**	**20030521**	**20030521**
SAMPLE CODE	**NORMAL**	**ORIG**	**AVG**	**DUP**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**	**SD**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**0**	**0.5**	**0.5**	**0.5**	**0**	**0**	**0.5**	**0**	**0.5**
BOTTOM DEPTH	**0.5**	**1**	**1**	**1**	**0.5**	**0.5**	**1**	**0.5**	**1**
PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PAHS ECO	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SD101		TP-SD102		TP-SD103		TP-SD104		TP-SD105		TP-SD106	
SAMPLE ID	TPSD1010004	TPSD1011216	TPSD1020004	TPSD1021216	TPSD1030004	TPSD1031216	TPSD1040004	TPSD1041216	TPSD1050004	TPSD1051216	TPSD1060004	TPSD1061216
SAMPLE DATE	20081216	20081216	20081216	20081216	20081216	20081216	20081216	20081216	20081216	20081216	20081216	20081216
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	1	0	1	0	1	0	1	0	1	0	1
BOTTOM DEPTH	0.33	1.33	0.33	1.33	0.33	1.33	0.33	1.33	0.33	1.33	0.33	1.33
METALS (MG/KG)												
COPPER	585	969	521	1140	914	68	438	68.4	710	946	1120	1160
SEMIVOLATILES (UG/KG)												
2-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHRYSENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HIGH MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LOW MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SD107		TP-SD108		TP-SD109		TP-SD110		TP-SD111		TP-SD112	
SAMPLE ID	TPSD1070004	TPSD1071216	TPSD1080004	TPSD1081216	TPSD1090004	TPSD1091216	TPSD1100004	TPSD1101216	TPSD1110004	TPSD1111216	TPSD1120004	TPSD1
SAMPLE DATE	20081216	20081216	20081216	20081216	20081216	20081216	20081216	20081216	20081216	20081216	20081216	2008
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NOR
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	S
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NOR
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	N
TOP DEPTH	0	1	0	1	0	1	0	1	0	1	0	1
BOTTOM DEPTH	0.33	1.33	0.33	1.33	0.33	1.33	0.33	1.33	0.33	1.33	0.33	1.
METALS (MG/KG)												
COPPER	442	599	229	14.4	675	20.5	1130	13.8	340	10.8	1120	11.5
SEMIVOLATILES (UG/KG)												
2-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	19 J	3.8
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	23 J	1.7
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	83 J	3.8
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	160 J	1.4
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	714.2	11.97
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	714.2	11.97
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	380 J	5.3
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	460 J	7.2
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	820 J	14
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	270 J	6.6
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	210 J	4.6
CHRYSENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	400 J	5.5
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	100 J	2.2
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	740 J	7.1
FLUORENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	44 J	3.8
HIGH MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2760	35.1
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	290 J	5.9
LOW MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	685	13.6
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	26 J	3.8
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	330 J	2.9
PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	680 J	7.8

LOCATION		TP-SD113		TP-SD114		TP-SD115		TP-SD116			
SAMPLE ID	121216	TPSD1130004	TPSD1131216	TPSD1140004	TPSD1141216	TPSD1150004	TPSD1151216	TPSD1160004	TPSD1160004-AVG	TPSD1160004-D	TPSD1161216
SAMPLE DATE	1216	20081216	20081216	20081216	20081216	20081216	20081216	20081216	20081216	20081216	20081216
SAMPLE CODE	MAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
MATRIX	D	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	MAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	1	0	1	0	1	0	1	0	0	0	1
BOTTOM DEPTH	33	0.33	1.33	0.33	1.33	0.33	1.33	0.33	0.33	0.33	1.33
METALS (MG/KG)											
COPPER		407	115	175	4.8	113	26	118	119	120	46.8
SEMIVOLATILES (UG/KG)											
2-METHYLNAPHTHALENE	UJ	23	2.6 J	100	4.2 U	9.7	1.9 J	8.4 J	16.2	24 J	8.3
ACENAPHTHENE	J	36	12	46	4.2 U	12	2.4 J	10 J	14	18 J	6.4
ACENAPHTHYLENE	UJ	64	15	38	5.8	72	10	63	59	55	59
ANTHRACENE	J	150	52	74	7.2	91	12	75	74	73	68
BAP EQUIVALENT-HALFND		624.4	181.29	294.9	57.09	418.73	56.6	402	365.68	329.36	358.06
BAP EQUIVALENT-POS		624.4	181.29	294.9	57.09	418.73	56.6	402	365.68	329.36	358.06
BENZO(A)ANTHRACENE	J	320	110	150	25	210	26	200	180	160	170
BENZO(A)PYRENE	J	410	120	200	38	280	37	270	245	220	240
BENZO(B)FLUORANTHENE	J	650	160 J	330 J	49 J	500 J	55 J	410 J	400	390 J	380 J
BENZO(G,H,I)PERYLENE	J	250	78	93	28	140	23	150	135	120	130
BENZO(K)FLUORANTHENE	J	160	69	81	16	110	17	130	114.5	99	88
CHRYSENE	J	300	95	160	25	230	27	200	185	170	180
DIBENZO(A,H)ANTHRACENE	J	88	26	35	9.1	50	9.1	52	45.5	39	49
FLUORANTHENE	J	720	240	350	33	380	36	360	340	320	230
FLUORENE	UJ	65	24	29	2.4 J	24	4.5 J	17	19	21	17
HIGH MOLECULAR WEIGHT PAHS		2498	781	1195	178.1	1530	180.1	1432	1325.5	1219	1149
INDENO(1,2,3-CD)PYRENE	J	250	75	100	24	150	22	160	145	130	130
LOW MOLECULAR WEIGHT PAHS		757	258.8	466	38.1	391.7	48.8	325.4	332.2	339	279.7
NAPHTHALENE	UJ	39	3.2 J	19	2.5 J	13	2 J	12	15	18	11
PHENANTHRENE	J	380	150	160	16	170	16	140	135	130	110
PYRENE	J	660	190	300	48	380	45	350	330	310	280

LOCATION	TP-SD117		TP-SD118		TP-SD119					
SAMPLE ID	TPSD1170004	TPSD1171216	TPSD1180004	TPSD1181216	TPSD1190004	TPSD1190004-AVG	TPSD1190004-D	TPSD1191216	TPSD1191216-AVG	TPSD1191216-D
SAMPLE DATE	20081216	20081216	20081216	20081216	20081216	20081216	20081216	20081216	20081216	20081216
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	ORIG	AVG	DUP
MATRIX	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	1	0	1	0	0	0	1	1	1
BOTTOM DEPTH	0.33	1.33	0.33	1.33	0.33	0.33	0.33	1.33	1.33	1.33
METALS (MG/KG)										
COPPER	64.1	96.9	281	13.8	114	99.65	85.3	16.5 J	24.65	32.8 J
SEMIVOLATILES (UG/KG)										
2-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAP EQUIVALENT-POS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHRYSENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HIGH MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LOW MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	TP-SD120			
SAMPLE ID	**TPSD1200004**	**TPSD1201216**	**TPSD1201216-AVG**	**TPSD1201216-D**
SAMPLE DATE	**20081216**	**20081216**	**20081216**	**20081216**
SAMPLE CODE	**NORMAL**	**ORIG**	**AVG**	**DUP**
MATRIX	**SD**	**SD**	**SD**	**SD**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**0**	**1**	**1**	**1**
BOTTOM DEPTH	**0.33**	**1.33**	**1.33**	**1.33**
METALS (MG/KG)				
COPPER	147	181	181.5	182
SEMIVOLATILES (UG/KG)				
2-METHYLNAPHTHALENE	NA	NA	NA	NA
ACENAPHTHENE	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA
BAP EQUIVALENT-HALFND	NA	NA	NA	NA
BAP EQUIVALENT-POS	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	NA	NA	NA
BENZO(A)PYRENE	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	NA	NA	NA	NA
CHRYSENE	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA
FLUORANTHENE	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA
HIGH MOLECULAR WEIGHT PAHS	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA
LOW MOLECULAR WEIGHT PAHS	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA
PYRENE	NA	NA	NA	NA

LOCATION	OF-60		OF-61						OF-63	
SAMPLE ID	TPOF600503	TPOF600503-F	TPOF610503	TPOF610503-AVG	TPOF610503-D	TPOF610503-F	TPOF610503-F-AVG	TPOF610503-F-D	TPOF630503	TPOF630503-F
SAMPLE DATE	20030512	20030512	20030512	20030512	20030512	20030512	20030512	20030512	20030512	20030512
SAMPLE CODE	NORMAL	NORMAL	ORIG	AVG	DUP	ORIG	AVG	DUP	NORMAL	NORMAL
MATRIX	ST	ST	ST	ST	ST	ST	ST	ST	ST	ST
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999
BOTTOM DEPTH	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999
DISSOLVED METALS (UG/L)										
ALUMINUM	NA	29.9 U	NA	NA	NA	27.4 U	31.35 U	35.3 U	NA	28.6 U
ANTIMONY	NA	6.7 U	NA	NA	NA	6.7 U	6.7 U	6.7 U	NA	6.7 U
ARSENIC	NA	9 U	NA	NA	NA	9 U	9 U	9 U	NA	9 U
BARIUM	NA	11.3	NA	NA	NA	12.7	12.3	11.9	NA	21.8
BERYLLIUM	NA	1.2 U	NA	NA	NA	1.2 U	1.2 U	1.2 U	NA	1.2 U
CADMIUM	NA	1.4 U	NA	NA	NA	1.4 U	1.4 U	1.4 U	NA	1.4 U
CALCIUM	NA	324000	NA	NA	NA	375000	376500	378000	NA	333000
CHROMIUM	NA	3.8 U	NA	NA	NA	2.9 U	2.9 U	2.9 U	NA	2.9 U
COBALT	NA	3.1 U	NA	NA	NA	2.2 U	2.2 U	2.2 U	NA	2.2 U
COPPER	NA	4.6 U	NA	NA	NA	4.6 U	8 U	11.4 U	NA	4.6 U
IRON	NA	75.6 U	NA	NA	NA	6.1 U	6.1 U	6.1 U	NA	6.4 U
LEAD	NA	4.6 U	NA	NA	NA	4.6 U	4.6 U	4.6 U	NA	4.6 U
MAGNESIUM	NA	1E+06	NA	NA	NA	1120000	1026000	932000	NA	835000
MANGANESE	NA	3 U	NA	NA	NA	1.6 U	1.45 U	1.3 U	NA	4.8 U
MERCURY	NA	0.05 U	NA	NA	NA	0.03 U	0.03 U	0.03 U	NA	0.03 U
NICKEL	NA	11.7 U	NA	NA	NA	17 U	15.5 U	14 U	NA	28 U
POTASSIUM	NA	362000	NA	NA	NA	416000	407000	398000	NA	336000
SELENIUM	NA	10.5 U	NA	NA	NA	10.5 U	10.5 U	10.5 U	NA	10.5 U
SILICON	NA	785 J	NA	NA	NA	748 J	731.5	715 J	NA	1100 J
SILVER	NA	2.9 U	NA	NA	NA	2.9 U	2.9 U	2.9 U	NA	2.9 U
SODIUM	NA	8E+06	NA	NA	NA	8590000	8015000	7440000	NA	6560000
THALLIUM	NA	9.6 U	NA	NA	NA	9.6 U	9.6 U	9.6 U	NA	9.6 U
VANADIUM	NA	1.8 U	NA	NA	NA	1.8 U	1.8 U	1.8 U	NA	1.8 U
ZINC	NA	32.6 U	NA	NA	NA	56.8	53.6	50.4	NA	48.5
METALS (UG/L)										
ALUMINUM	93.5 U	NA	82.2 U	69.25 U	56.3 U	NA	NA	NA	170 U	NA
ANTIMONY	6.7 U	NA	6.7 U	6.7 U	6.7 U	NA	NA	NA	6.7 U	NA
ARSENIC	9 U	NA	9 U	9 U	9 U	NA	NA	NA	9 U	NA
BARIUM	10.2	NA	12.2	12.25	12.3	NA	NA	NA	21.6	NA
BERYLLIUM	1.2 U	NA	1.2 U	1.2 U	1.2 U	NA	NA	NA	1.2 U	NA
CADMIUM	1.4 U	NA	1.4 U	1.4 U	1.4 U	NA	NA	NA	1.4 U	NA
CALCIUM	3E+05	NA	4E+05	372500	379000	NA	NA	NA	3E+05	NA
CHROMIUM	2.9 U	NA	2.9 U	2.9 U	2.9 U	NA	NA	NA	2.9 U	NA
COBALT	2.2 U	NA	2.2 U	2.2 U	2.2 U	NA	NA	NA	2.2 U	NA
COPPER	4.6 U	NA	4.6 U	6 U	7.4 U	NA	NA	NA	4.6 U	NA
IRON	236 U	NA	52.5 U	56.6 U	60.7 U	NA	NA	NA	261 U	NA
LEAD	4.6 U	NA	4.6 U	4.6 U	4.6 U	NA	NA	NA	4.6 U	NA
MAGNESIUM	1E+06	NA	1E+06	1024500	959000	NA	NA	NA	9E+05	NA
MANGANESE	3.6 U	NA	2.3 U	2.15 U	2 U	NA	NA	NA	7.9 U	NA

LOCATION	OF-60		OF-61						OF-63	
SAMPLE ID	**TPOF600503**	**TPOF600503-F**	**TPOF610503**	**TPOF610503-AVG**	**TPOF610503-D**	**TPOF610503-F**	**TPOF610503-F-AVG**	**TPOF610503-F-D**	**TPOF630503**	**TPOF630503-F**
SAMPLE DATE	**20030512**	**20030512**	**20030512**	**20030512**	**20030512**	**20030512**	**20030512**	**20030512**	**20030512**	**20030512**
SAMPLE CODE	**NORMAL**	**NORMAL**	**ORIG**	**AVG**	**DUP**	**ORIG**	**AVG**	**DUP**	**NORMAL**	**NORMAL**
MATRIX	**ST**	**ST**	**ST**	**ST**	**ST**	**ST**	**ST**	**ST**	**ST**	**ST**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**
BOTTOM DEPTH	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**
MERCURY	0.05 U	NA	0.05 U	0.04 U	0.03 U	NA	NA	NA	0.04 U	NA
NICKEL	11.7 U	NA	11.7 U	12.8 U	13.9 U	NA	NA	NA	27.4 U	NA
POTASSIUM	4E+05	NA	4E+05	399500	392000	NA	NA	NA	3E+05	NA
SELENIUM	10.5 U	NA	10.5 U	10.5 U	10.5 U	NA	NA	NA	10.5 U	NA
SILICON	853 J	NA	767 J	763.5	760 J	NA	NA	NA	1390 J	NA
SILVER	2.9 U	NA	2.9 U	2.9 U	2.9 U	NA	NA	NA	2.9 U	NA
SODIUM	8E+06	NA	8E+06	7870000	7280000	NA	NA	NA	7E+06	NA
THALLIUM	9.6 U	NA	9.6 U	9.6 U	9.6 U	NA	NA	NA	9.6 U	NA
VANADIUM	1.8 U	NA	1.8 U	1.8 U	1.8 U	NA	NA	NA	1.8 U	NA
ZINC	35.9 U	NA	55.2 J	53.5	51.8 J	NA	NA	NA	50.6 J	NA
MISCELLANEOUS PARAMETERS (MG/L)										
TOTAL DISSOLVED SOLIDS	26000	NA	20000	20500	21000	NA	NA	NA	33000	NA
TOTAL SUSPENDED SOLIDS	100	NA	80	60	40	NA	NA	NA	34	NA
PESTICIDES/PCBS (UG/L)										
4,4'-DDD	0.027 UJ	NA	0.028 UJ	0.0275 U	0.027 UJ	NA	NA	NA	0.026 UJ	NA
4,4'-DDE	0.027 U	NA	0.028 U	0.0275 U	0.027 U	NA	NA	NA	0.026 UJ	NA
4,4'-DDT	0.029 UJ	NA	0.03 UJ	0.029 U	0.028 UJ	NA	NA	NA	0.028 UJ	NA
ALDRIN	0.022 U	NA	0.022 U	0.0215 U	0.021 U	NA	NA	NA	0.021 UJ	NA
ALPHA-BHC	0.024 U	NA	0.025 U	0.0245 U	0.024 U	NA	NA	NA	0.024 UJ	NA
ALPHA-CHLORDANE	0.019 U	NA	0.019 U	0.0185 U	0.018 U	NA	NA	NA	0.018 UJ	NA
AROCLOR-1016	0.12 U	NA	0.12 U	0.115 U	0.11 U	NA	NA	NA	0.11 U	NA
AROCLOR-1221	0.29 U	NA	0.3 U	0.29 U	0.28 U	NA	NA	NA	0.28 U	NA
AROCLOR-1232	0.31 U	NA	0.32 U	0.31 U	0.3 U	NA	NA	NA	0.3 U	NA
AROCLOR-1242	0.24 U	NA	0.25 U	0.245 U	0.24 U	NA	NA	NA	0.24 U	NA
AROCLOR-1248	0.13 U	NA	0.13 U	0.125 U	0.12 U	NA	NA	NA	0.12 U	NA
AROCLOR-1254	0.16 U	NA	0.16 U	0.155 U	0.15 U	NA	NA	NA	0.15 U	NA
AROCLOR-1260	0.12 U	NA	0.12 U	0.115 U	0.11 U	NA	NA	NA	0.11 U	NA
BETA-BHC	0.041 U	NA	0.042 U	0.041 U	0.04 U	NA	NA	NA	0.04 UJ	NA
DELTA-BHC	0.028 U	NA	0.029 U	0.0285 U	0.028 U	NA	NA	NA	0.027 UJ	NA
DIELDRIN	0.017 U	NA	0.017 U	0.0165 U	0.016 U	NA	NA	NA	0.016 UJ	NA
ENDOSULFAN I	0.018 U	NA	0.018 U	0.0175 U	0.017 U	NA	NA	NA	0.017 UJ	NA
ENDOSULFAN II	0.016 U	NA	0.016 U	0.0155 U	0.015 U	NA	NA	NA	0.015 UJ	NA
ENDOSULFAN SULFATE	0.022 UJ	NA	0.023 UJ	0.0225 U	0.022 UJ	NA	NA	NA	0.022 UJ	NA
ENDRIN	0.018 U	NA	0.018 U	0.0175 U	0.017 U	NA	NA	NA	0.017 UJ	NA
ENDRIN ALDEHYDE	0.02 UJ	NA	0.021 UJ	0.0205 U	0.02 UJ	NA	NA	NA	0.02 UJ	NA
ENDRIN KETONE	0.02 UJ	NA	0.02 UJ	0.0195 U	0.019 UJ	NA	NA	NA	0.019 UJ	NA
GAMMA-BHC (LINDANE)	0.022 U	NA	0.022 U	0.0215 U	0.021 U	NA	NA	NA	0.021 UJ	NA
GAMMA-CHLORDANE	0.019 U	NA	0.019 U	0.0185 U	0.018 U	NA	NA	NA	0.018 UJ	NA
HEPTACHLOR	0.024 U	NA	0.024 U	0.0235 U	0.023 U	NA	NA	NA	0.023 UJ	NA
HEPTACHLOR EPOXIDE	0.022 U	NA	0.023 U	0.0225 U	0.022 U	NA	NA	NA	0.022 UJ	NA

LOCATION	OF-60		OF-61						OF-63	
SAMPLE ID	TPOF600503	TPOF600503-F	TPOF610503	TPOF610503-AVG	TPOF610503-D	TPOF610503-F	TPOF610503-F-AVG	TPOF610503-F-D	TPOF630503	TPOF630503-F
SAMPLE DATE	20030512	20030512	20030512	20030512	20030512	20030512	20030512	20030512	20030512	20030512
SAMPLE CODE	NORMAL	NORMAL	ORIG	AVG	DUP	ORIG	AVG	DUP	NORMAL	NORMAL
MATRIX	ST	ST	ST	ST	ST	ST	ST	ST	ST	ST
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999
BOTTOM DEPTH	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999
METHOXYCHLOR	0.044 U	NA	0.044 U	0.0435 U	0.043 U	NA	NA	NA	0.042 UJ	NA
TOTAL AROCLOR HALFND	0.69	NA	0.7	0.68	0.66	NA	NA	NA	0.66	NA
TOTAL AROCLOR ZEROND	0 U	NA	0 U	0 U	0 U	NA	NA	NA	0 U	NA
TOXAPHENE	0.9 U	NA	0.91 U	0.895 U	0.88 U	NA	NA	NA	0.87 UJ	NA
POLYCYCLIC AROMATIC HYDROCARBONS (UG/L)										
ACENAPHTHENE	0.08 U	NA	0.08 U	0.08 U	0.08 U	NA	NA	NA	0.08 U	NA
ACENAPHTHYLENE	0.05 U	NA	0.05 U	0.05 U	0.05 U	NA	NA	NA	0.05 UJ	NA
ANTHRACENE	0.08 U	NA	0.08 U	0.08 U	0.08 U	NA	NA	NA	0.08 U	NA
BAP EQUIVALENT-HALFND	0.09 U	NA	0.08 U	0.08 U	0.08 U	NA	NA	NA	0.09 U	NA
BAP EQUIVALENT-POS	0 U	NA	0 U	0 U	0 U	NA	NA	NA	0 U	NA
BENZO(A)ANTHRACENE	0.1 U	NA	0.1 U	0.1 U	0.1 U	NA	NA	NA	0.1 U	NA
BENZO(A)PYRENE	0.09 U	NA	0.08 UJ	0.08 U	0.08 U	NA	NA	NA	0.09 U	NA
BENZO(B)FLUORANTHENE	0.09 U	NA	0.08 UJ	0.08 U	0.08 U	NA	NA	NA	0.09 U	NA
BENZO(G,H,I)PERYLENE	0.08 U	NA	0.08 UJ	0.08 U	0.08 U	NA	NA	NA	0.08 U	NA
BENZO(K)FLUORANTHENE	0.08 U	NA	0.08 UJ	0.08 U	0.08 U	NA	NA	NA	0.08 U	NA
DIBENZO(A,H)ANTHRACENE	0.1 U	NA	0.1 UJ	0.1 U	0.1 U	NA	NA	NA	0.1 U	NA
DIBENZOFURAN	1 U	NA	1 U	1 U	1 U	NA	NA	NA	1 U	NA
FLUORANTHENE	0.1 U	NA	0.1 U	0.1 U	0.1 U	NA	NA	NA	0.1 U	NA
FLUORENE	0.06 U	NA	0.06 U	0.06 U	0.06 U	NA	NA	NA	0.06 U	NA
HIGH MOLECULAR WEIGHT PAHS	0.28	NA	0.27	0.27	0.27	NA	NA	NA	0.28	NA
INDENO(1,2,3-CD)PYRENE	0.1 U	NA	0.09 UJ	0.09 U	0.09 U	NA	NA	NA	0.1 U	NA
LOW MOLECULAR WEIGHT PAHS	0.24	NA	0.24	0.24	0.24	NA	NA	NA	0.24	NA
NAPHTHALENE	0.05 U	NA	0.05 U	0.05 U	0.05 UJ	NA	NA	NA	0.05 U	NA
PHENANTHRENE	0.08 U	NA	0.08 U	0.08 U	0.08 U	NA	NA	NA	0.08 U	NA
PYRENE	0.09 U	NA	0.08 U	0.08 U	0.08 U	NA	NA	NA	0.09 U	NA
SEMIVOLATILES (UG/L)										
1,2,4-TRICHLOROBENZENE	0.9 U	NA	0.9 U	0.9 U	0.9 U	NA	NA	NA	0.9 U	NA
1,2-DICHLOROBENZENE	0.7 U	NA	0.7 U	0.7 U	0.7 U	NA	NA	NA	0.7 UJ	NA
1,3-DICHLOROBENZENE	0.6 U	NA	0.6 U	0.6 U	0.6 U	NA	NA	NA	0.6 UJ	NA
1,4-DICHLOROBENZENE	0.8 U	NA	0.8 U	0.8 U	0.8 U	NA	NA	NA	0.8 U	NA
2,2'-OXYBIS(1-CHLOROPROPANE)	1 UJ	NA	1 UJ	1 U	1 U	NA	NA	NA	1 UJ	NA
2,4,5-TRICHLOROPHENOL	2 U	NA	2 U	2 U	2 U	NA	NA	NA	2 UJ	NA
2,4,6-TRICHLOROPHENOL	2 U	NA	2 U	2 U	2 U	NA	NA	NA	2 UJ	NA
2,4-DICHLOROPHENOL	2 U	NA	2 U	2 U	2 U	NA	NA	NA	2 UJ	NA
2,4-DIMETHYLPHENOL	2 U	NA	2 U	2 U	2 U	NA	NA	NA	2 U	NA
2,4-DINITROPHENOL	5 U	NA	5 U	5 U	5 U	NA	NA	NA	5 UR	NA
2,4-DINITROTOLUENE	0.7 U	NA	0.7 U	0.7 U	0.7 U	NA	NA	NA	0.7 UJ	NA
2,6-DINITROTOLUENE	2 U	NA	2 U	2 U	2 U	NA	NA	NA	2 U	NA
2-CHLORONAPHTHALENE	3 U	NA	3 U	3 U	3 U	NA	NA	NA	3 U	NA
2-CHLOROPHENOL	2 U	NA	2 U	2 U	2 U	NA	NA	NA	2 UJ	NA

LOCATION	OF-60		OF-61						OF-63	
SAMPLE ID	TPOF600503	TPOF600503-F	TPOF610503	TPOF610503-AVG	TPOF610503-D	TPOF610503-F	TPOF610503-F-AVG	TPOF610503-F-D	TPOF630503	TPOF630503-F
SAMPLE DATE	20030512	20030512	20030512	20030512	20030512	20030512	20030512	20030512	20030512	20030512
SAMPLE CODE	NORMAL	NORMAL	ORIG	AVG	DUP	ORIG	AVG	DUP	NORMAL	NORMAL
MATRIX	ST	ST	ST	ST	ST	ST	ST	ST	ST	ST
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999
BOTTOM DEPTH	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999
2-METHYLNAPHTHALENE	0.08 U	NA	0.08 U	0.08 U	0.08 UJ	NA	NA	NA	0.08 U	NA
2-METHYLPHENOL	1 U	NA	1 U	1 U	1 U	NA	NA	NA	1 U	NA
2-NITROANILINE	0.8 U	NA	0.8 U	0.8 U	0.8 U	NA	NA	NA	0.8 U	NA
2-NITROPHENOL	2 U	NA	2 U	2 U	2 U	NA	NA	NA	2 UJ	NA
3,3'-DICHLOROBENZIDINE	2 U	NA	2 U	2 U	2 U	NA	NA	NA	2 U	NA
3-NITROANILINE	2 U	NA	2 U	2 U	2 U	NA	NA	NA	2 U	NA
4,6-DINITRO-2-METHYLPHENOL	7 U	NA	7 U	7 U	7 U	NA	NA	NA	7 UR	NA
4-BROMOPHENYL PHENYL ETHER	1 U	NA	1 U	1 U	1 U	NA	NA	NA	1 U	NA
4-CHLORO-3-METHYLPHENOL	1 U	NA	1 U	1 U	1 U	NA	NA	NA	1 UJ	NA
4-CHLOROANILINE	1 U	NA	1 U	1 U	1 U	NA	NA	NA	1 U	NA
4-CHLOROPHENYL PHENYL ETHER	1 U	NA	1 U	1 U	1 U	NA	NA	NA	1 U	NA
4-METHYLPHENOL	2 U	NA	2 U	2 U	2 U	NA	NA	NA	2 U	NA
4-NITROANILINE	2 U	NA	2 U	2 U	2 U	NA	NA	NA	2 U	NA
4-NITROPHENOL	3 U	NA	3 U	3 U	3 U	NA	NA	NA	3 UR	NA
BIS(2-CHLOROETHOXY)METHANE	0.8 U	NA	0.8 U	0.8 U	0.8 U	NA	NA	NA	0.8 U	NA
BIS(2-CHLOROETHYL)ETHER	1 U	NA	1 U	1 U	1 U	NA	NA	NA	1 U	NA
BIS(2-ETHYLHEXYL)PHTHALATE	9 U	NA	9 U	9 U	9 U	NA	NA	NA	9 UJ	NA
BUTYL BENZYL PHTHALATE	0.8 U	NA	0.7 U	0.7 U	0.7 U	NA	NA	NA	0.8 UJ	NA
CARBAZOLE	0.9 U	NA	0.8 U	0.8 U	0.8 U	NA	NA	NA	0.8 U	NA
CHRYSENE	0.07 U	NA	0.07 U	0.07 U	0.07 U	NA	NA	NA	0.07 U	NA
DIETHYL PHTHALATE	0.7 U	NA	0.6 U	0.6 U	0.6 U	NA	NA	NA	0.6 U	NA
DIMETHYL PHTHALATE	0.8 U	NA	0.7 U	0.7 U	0.7 U	NA	NA	NA	0.8 U	NA
DI-N-BUTYL PHTHALATE	3 U	NA	2 U	2 U	2 U	NA	NA	NA	2 U	NA
DI-N-OCTYL PHTHALATE	1 U	NA	1 U	1 U	1 U	NA	NA	NA	1 U	NA
HEXACHLOROBENZENE	0.7 U	NA	0.7 U	0.7 U	0.7 U	NA	NA	NA	0.7 U	NA
HEXACHLOROBUTADIENE	2 U	NA	2 U	2 U	2 U	NA	NA	NA	2 UJ	NA
HEXACHLOROCYCLOPENTADIENE	1 U	NA	1 U	1 U	1 U	NA	NA	NA	1 UJ	NA
HEXACHLOROETHANE	2 U	NA	2 U	2 U	2 U	NA	NA	NA	2 UJ	NA
ISOPHORONE	0.8 U	NA	0.8 U	0.8 U	0.8 U	NA	NA	NA	0.8 U	NA
NITROBENZENE	1 U	NA	1 U	1 U	1 U	NA	NA	NA	1 U	NA
N-NITROSO-DI-N-PROPYLAMINE	2 U	NA	2 U	2 U	2 U	NA	NA	NA	2 U	NA
N-NITROSODIPHENYLAMINE	2 U	NA	2 U	2 U	2 U	NA	NA	NA	2 U	NA
PENTACHLOROPHENOL	5 U	NA	5 U	5 U	5 U	NA	NA	NA	5 U	NA
PHENOL	2 U	NA	2 U	2 U	2 U	NA	NA	NA	2 UJ	NA

LOCATION	TP-SW01		TP-SW02		TP-SW03	
SAMPLE ID	TPSW010503	TPSW010503-F	TPSW020503	TPSW020503-F	TPSW030503	TPSW030503-F
SAMPLE DATE	20030512	20030512	20030512	20030512	20030512	20030512
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SW	SW	SW	SW	SW	SW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA
TOP DEPTH	-9999	-9999	-9999	-9999	-9999	-9999
BOTTOM DEPTH	-9999	-9999	-9999	-9999	-9999	-9999
DISSOLVED METALS (UG/L)						
ALUMINUM	NA	43.9 U	NA	45.2 U	NA	20.2 U
ANTIMONY	NA	8.2 U	NA	6.7 U	NA	6.7 U
ARSENIC	NA	9 U	NA	9 U	NA	9 U
BARIUM	NA	10.4	NA	10.5	NA	19.9
BERYLLIUM	NA	1.2 U	NA	1.2 U	NA	1.2 U
CADMIUM	NA	1.4 U	NA	1.4 U	NA	1.4 U
CALCIUM	NA	349000	NA	354000	NA	332000
CHROMIUM	NA	2.9 U	NA	2.9 U	NA	2.9 U
COBALT	NA	2.2 U	NA	2.2 U	NA	2.2 U
COPPER	NA	4.6 U	NA	4.6 U	NA	4.6 U
IRON	NA	53.6 U	NA	62.2 U	NA	8.2 U
LEAD	NA	4.6 U	NA	4.6 U	NA	4.6 U
MAGNESIUM	NA	882000	NA	898000	NA	796000
MANGANESE	NA	4.3 U	NA	6.9 U	NA	5.3 U
MERCURY	NA	0.03 U	NA	0.03 U	NA	0.05 U
NICKEL	NA	3.3 U	NA	3.3 U	NA	22.3 U
POTASSIUM	NA	368000	NA	367000	NA	333000
SELENIUM	NA	10.5 U	NA	10.5 U	NA	10.5 U
SILICON	NA	732 J	NA	783 J	NA	1070 J
SILVER	NA	2.9 U	NA	2.9 U	NA	2.9 U
SODIUM	NA	7E+06	NA	7E+06	NA	6E+06
THALLIUM	NA	9.6 U	NA	9.6 U	NA	9.6 U
VANADIUM	NA	1.8 U	NA	1.8 U	NA	1.8 U
ZINC	NA	29.2 U	NA	25.9 U	NA	40.4
METALS (UG/L)						
ALUMINUM	176 U	NA	1800	NA	337 U	NA
ANTIMONY	6.7 U	NA	6.7 U	NA	6.7 U	NA
ARSENIC	9 U	NA	9 U	NA	9 U	NA
BARIUM	11	NA	16.3	NA	21	NA
BERYLLIUM	1.2 U	NA	1.2 U	NA	1.2 U	NA
CADMIUM	1.4 U	NA	1.4 U	NA	1.4 U	NA
CALCIUM	3E+05	NA	317000	NA	334000	NA
CHROMIUM	2.9 U	NA	7.8 U	NA	2.9 U	NA
COBALT	2.2 U	NA	2.2 U	NA	2.2 U	NA
COPPER	4.6 U	NA	28.8 U	NA	4.6 U	NA
IRON	369 U	NA	2910	NA	269 U	NA
LEAD	4.6 U	NA	4.6 U	NA	4.6 U	NA
MAGNESIUM	9E+05	NA	865000	NA	836000	NA
MANGANESE	6.9 U	NA	32.1 J	NA	8.6 U	NA

LOCATION	TP-SW01		TP-SW02		TP-SW03	
SAMPLE ID	**TPSW010503**	**TPSW010503-F**	**TPSW020503**	**TPSW020503-F**	**TPSW030503**	**TPSW030503-F**
SAMPLE DATE	**20030512**	**20030512**	**20030512**	**20030512**	**20030512**	**20030512**
SAMPLE CODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**SW**	**SW**	**SW**	**SW**	**SW**	**SW**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**
BOTTOM DEPTH	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**
MERCURY	0.03 U	NA	0.04 U	NA	0.07 U	NA
NICKEL	3.3 U	NA	6.6 U	NA	25.2 U	NA
POTASSIUM	4E+05	NA	329000	NA	335000	NA
SELENIUM	10.5 U	NA	10.5 U	NA	10.5 U	NA
SILICON	1080 J	NA	4490 J	NA	1410 J	NA
SILVER	2.9 U	NA	2.9 U	NA	2.9 U	NA
SODIUM	7E+06	NA	7E+06	NA	7E+06	NA
THALLIUM	9.6 U	NA	9.6 U	NA	9.6 U	NA
VANADIUM	1.8 U	NA	5	NA	1.8 U	NA
ZINC	34.5 U	NA	48.8 J	NA	44 J	NA
MISCELLANEOUS PARAMETERS (MG/L)						
TOTAL DISSOLVED SOLIDS	34000	NA	34000	NA	23000	NA
TOTAL SUSPENDED SOLIDS	42	NA	210	NA	42	NA
PESTICIDES/PCBS (UG/L)						
4,4'-DDD	0.027 UJ	NA	0.028 UJ	NA	0.027 UJ	NA
4,4'-DDE	0.027 U	NA	0.028 U	NA	0.027 U	NA
4,4'-DDT	0.029 UJ	NA	0.03 UJ	NA	0.029 UJ	NA
ALDRIN	0.021 U	NA	0.022 U	NA	0.021 U	NA
ALPHA-BHC	0.024 U	NA	0.025 U	NA	0.024 U	NA
ALPHA-CHLORDANE	0.018 U	NA	0.019 U	NA	0.018 U	NA
AROCLOR-1016	0.12 U	NA	0.12 U	NA	0.12 U	NA
AROCLOR-1221	0.29 U	NA	0.3 U	NA	0.29 U	NA
AROCLOR-1232	0.31 U	NA	0.32 U	NA	0.31 U	NA
AROCLOR-1242	0.24 U	NA	0.25 U	NA	0.24 U	NA
AROCLOR-1248	0.12 U	NA	0.13 U	NA	0.13 U	NA
AROCLOR-1254	0.15 U	NA	0.16 U	NA	0.16 U	NA
AROCLOR-1260	0.12 U	NA	0.12 U	NA	0.12 U	NA
BETA-BHC	0.04 U	NA	0.042 U	NA	0.041 U	NA
DELTA-BHC	0.028 U	NA	0.029 U	NA	0.028 U	NA
DIELDRIN	0.016 U	NA	0.017 U	NA	0.016 U	NA
ENDOSULFAN I	0.017 U	NA	0.018 U	NA	0.017 U	NA
ENDOSULFAN II	0.015 U	NA	0.016 U	NA	0.016 U	NA
ENDOSULFAN SULFATE	0.022 UJ	NA	0.023 UJ	NA	0.022 UJ	NA
ENDRIN	0.017 U	NA	0.018 U	NA	0.017 U	NA
ENDRIN ALDEHYDE	0.02 UJ	NA	0.021 UJ	NA	0.02 UJ	NA
ENDRIN KETONE	0.019 UJ	NA	0.02 UJ	NA	0.019 UJ	NA
GAMMA-BHC (LINDANE)	0.021 U	NA	0.022 U	NA	0.021 U	NA
GAMMA-CHLORDANE	0.018 U	NA	0.019 U	NA	0.018 U	NA
HEPTACHLOR	0.023 U	NA	0.024 U	NA	0.023 U	NA
HEPTACHLOR EPOXIDE	0.022 U	NA	0.023 U	NA	0.022 U	NA

LOCATION	TP-SW01		TP-SW02		TP-SW03	
SAMPLE ID	**TPSW010503**	**TPSW010503-F**	**TPSW020503**	**TPSW020503-F**	**TPSW030503**	**TPSW030503-F**
SAMPLE DATE	**20030512**	**20030512**	**20030512**	**20030512**	**20030512**	**20030512**
SAMPLE CODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**SW**	**SW**	**SW**	**SW**	**SW**	**SW**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**
BOTTOM DEPTH	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**
METHOXYCHLOR	0.043 U	NA	0.044 U	NA	0.044 U	NA
TOTAL AROCLOR HALFND	0.68	NA	0.7	NA	0.69	NA
TOTAL AROCLOR ZEROND	0 U	NA	0 U	NA	0 U	NA
TOXAPHENE	0.88 U	NA	0.91 U	NA	0.89 U	NA
POLYCYCLIC AROMATIC HYDROCARBONS (UG/L)						
ACENAPHTHENE	0.08 U	NA	0.08 U	NA	0.08 U	NA
ACENAPHTHYLENE	0.05 UJ	NA	0.05 U	NA	0.05 U	NA
ANTHRACENE	0.08 U	NA	0.08 U	NA	0.08 U	NA
BAP EQUIVALENT-HALFND	0.09 U	NA	0.09 U	NA	0.08 U	NA
BAP EQUIVALENT-POS	0 U	NA	0 U	NA	0 U	NA
BENZO(A)ANTHRACENE	0.1 U	NA	0.1 U	NA	0.1 U	NA
BENZO(A)PYRENE	0.09 U	NA	0.09 U	NA	0.08 U	NA
BENZO(B)FLUORANTHENE	0.09 U	NA	0.09 U	NA	0.08 U	NA
BENZO(G,H,I)PERYLENE	0.08 U	NA	0.08 U	NA	0.08 U	NA
BENZO(K)FLUORANTHENE	0.08 U	NA	0.08 U	NA	0.08 U	NA
DIBENZO(A,H)ANTHRACENE	0.1 U	NA	0.1 U	NA	0.1 U	NA
DIBENZOFURAN	1 U	NA	1 U	NA	1 U	NA
FLUORANTHENE	0.1 U	NA	0.1 U	NA	0.1 U	NA
FLUORENE	0.06 U	NA	0.06 U	NA	0.06 U	NA
HIGH MOLECULAR WEIGHT PAHS	0.28	NA	0.28	NA	0.27	NA
INDENO(1,2,3-CD)PYRENE	0.1 U	NA	0.1 U	NA	0.1 U	NA
LOW MOLECULAR WEIGHT PAHS	0.24	NA	0.24	NA	0.24	NA
NAPHTHALENE	0.05 U	NA	0.05 U	NA	0.05 U	NA
PHENANTHRENE	0.08 U	NA	0.08 U	NA	0.08 U	NA
PYRENE	0.09 U	NA	0.09 U	NA	0.08 U	NA
SEMIVOLATILES (UG/L)						
1,2,4-TRICHLOROBENZENE	0.9 U	NA	0.9 U	NA	0.9 U	NA
1,2-DICHLOROBENZENE	0.7 U	NA	0.7 U	NA	0.7 U	NA
1,3-DICHLOROBENZENE	0.6 U	NA	0.6 U	NA	0.6 U	NA
1,4-DICHLOROBENZENE	0.8 U	NA	0.8 U	NA	0.8 U	NA
2,2'-OXYBIS(1-CHLOROPROPANE)	1 U	NA	1 U	NA	1 U	NA
2,4,5-TRICHLOROPHENOL	2 U	NA	2 U	NA	2 U	NA
2,4,6-TRICHLOROPHENOL	2 U	NA	2 U	NA	2 U	NA
2,4-DICHLOROPHENOL	2 U	NA	2 U	NA	2 U	NA
2,4-DIMETHYLPHENOL	2 U	NA	2 U	NA	2 U	NA
2,4-DINITROPHENOL	5 U	NA	5 U	NA	5 U	NA
2,4-DINITROTOLUENE	0.7 U	NA	0.7 U	NA	0.7 U	NA
2,6-DINITROTOLUENE	2 U	NA	2 U	NA	2 U	NA
2-CHLORONAPHTHALENE	3 U	NA	3 U	NA	3 U	NA
2-CHLOROPHENOL	2 U	NA	2 U	NA	2 U	NA

LOCATION	TP-SW01		TP-SW02		TP-SW03	
SAMPLE ID	**TPSW010503**	**TPSW010503-F**	**TPSW020503**	**TPSW020503-F**	**TPSW030503**	**TPSW030503-F**
SAMPLE DATE	**20030512**	**20030512**	**20030512**	**20030512**	**20030512**	**20030512**
SAMPLE CODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**SW**	**SW**	**SW**	**SW**	**SW**	**SW**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**
BOTTOM DEPTH	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**
2-METHYLNAPHTHALENE	0.08 U	NA	0.08 U	NA	0.08 U	NA
2-METHYLPHENOL	1 U	NA	1 U	NA	1 U	NA
2-NITROANILINE	0.8 U	NA	0.8 U	NA	0.8 U	NA
2-NITROPHENOL	2 U	NA	2 U	NA	2 U	NA
3,3'-DICHLOROBENZIDINE	2 U	NA	2 U	NA	2 U	NA
3-NITROANILINE	2 U	NA	2 U	NA	2 U	NA
4,6-DINITRO-2-METHYLPHENOL	7 U	NA	7 U	NA	7 U	NA
4-BROMOPHENYL PHENYL ETHER	1 U	NA	1 U	NA	1 U	NA
4-CHLORO-3-METHYLPHENOL	1 U	NA	1 U	NA	1 U	NA
4-CHLOROANILINE	1 U	NA	1 U	NA	1 U	NA
4-CHLOROPHENYL PHENYL ETHER	1 U	NA	1 U	NA	1 U	NA
4-METHYLPHENOL	2 U	NA	2 U	NA	2 U	NA
4-NITROANILINE	2 U	NA	2 U	NA	2 U	NA
4-NITROPHENOL	3 U	NA	3 U	NA	3 U	NA
BIS(2-CHLOROETHOXY)METHANE	0.8 U	NA	0.8 U	NA	0.8 U	NA
BIS(2-CHLOROETHYL)ETHER	1 U	NA	1 U	NA	1 U	NA
BIS(2-ETHYLHEXYL)PHTHALATE	9 U	NA	9 U	NA	9 U	NA
BUTYL BENZYL PHTHALATE	0.8 U	NA	0.8 U	NA	0.7 U	NA
CARBAZOLE	0.9 U	NA	0.8 U	NA	0.8 U	NA
CHRYSENE	0.07 U	NA	0.07 U	NA	0.07 U	NA
DIETHYL PHTHALATE	0.7 U	NA	0.6 U	NA	0.6 U	NA
DIMETHYL PHTHALATE	0.8 U	NA	0.8 U	NA	0.7 U	NA
DI-N-BUTYL PHTHALATE	3 U	NA	2 U	NA	2 U	NA
DI-N-OCTYL PHTHALATE	1 U	NA	1 U	NA	1 U	NA
HEXACHLOROBENZENE	0.7 U	NA	0.7 U	NA	0.7 U	NA
HEXACHLOROBUTADIENE	2 U	NA	2 U	NA	2 U	NA
HEXACHLOROCYCLOPENTADIENE	1 U	NA	1 U	NA	1 U	NA
HEXACHLOROETHANE	2 U	NA	2 U	NA	2 U	NA
ISOPHORONE	0.8 U	NA	0.8 U	NA	0.8 U	NA
NITROBENZENE	1 U	NA	1 U	NA	1 U	NA
N-NITROSO-DI-N-PROPYLAMINE	2 U	NA	2 U	NA	2 U	NA
N-NITROSODIPHENYLAMINE	2 U	NA	2 U	NA	2 U	NA
PENTACHLOROPHENOL	5 U	NA	5 U	NA	5 U	NA
PHENOL	2 U	NA	2 U	NA	2 U	NA

LOCATION	**1016**	**1016**	**1016**	**1016**	**1016**	**1016**	**1016**	**1016**
SAMPLE ID	**BC-1016-SP-0497**	**BC-1016-SP-0897**	**BC-1016-SP-1197**	**BC-1016-SP-1197-AVG**	**BC-1016-SP-1197-D**	**BC-1016-SP-1197-F**	**BC-1016-SP-1197-F-AVG**	**BC-1016-SP-1197-F-D**
SAMPLE DATE	**19970410**	**19970819**	**19971113**	**19971113**	**19971113**	**19971113**	**19971113**	**19971113**
SAMPLE CODE	**NORMAL**	**NORMAL**	**ORIG**	**AVG**	**DUP**	**ORIG**	**AVG**	**DUP**
MATRIX	**SP**	**SP**	**SP**	**SP**	**SP**	**SP**	**SP**	**SP**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**
BOTTOM DEPTH	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**
DISSOLVED INORGANICS (UG/L)								
ALUMINUM	41.8	14.3 J	NA	NA	NA	3 UJ	3 U	3 UJ
ARSENIC	5 U	5 U	NA	NA	NA	5 UJ	5 U	5 UJ
CADMIUM	0.2 U	0.4 J	NA	NA	NA	0.3 J	0.25	0.2 J
CHROMIUM	0.8 U	2.3	NA	NA	NA	2.8 J	2.6	2.4 J
COPPER	13.3	29.6 J	NA	NA	NA	22.4 J	22	21.6 J
IRON	645	69 J	NA	NA	NA	39.5	35.25	31
LEAD	2.9 U	2.9 U	NA	NA	NA	32.1 J	19.05	6 J
MANGANESE	7.5	11.4	NA	NA	NA	4.3	3.95	3.6
MERCURY	0.42 U	0.42 U	NA	NA	NA	0.42 UJ	0.42 U	0.42 UJ
NICKEL	12	84.1	NA	NA	NA	33.3 J	32.45	31.6 J
SILVER	0.5 U	1.2 J	NA	NA	NA	0.5 U	0.5 U	0.5 U
ZINC	105	92 J	NA	NA	NA	162 J	130	98 J
TOTAL INORGANICS (UG/L)								
ALUMINUM	90.2 J	51 J	3 UJ	3 U	3 UJ	NA	NA	NA
ARSENIC	5 U	5 U	5 UJ	5 U	5 UJ	NA	NA	NA
CADMIUM	0.2 J	0.2 J	0.2	0.15	0.2 U	NA	NA	NA
CHROMIUM	1.7	65	25.9	25.25	24.6	NA	NA	NA
COPPER	13.8 J	34 J	25 J	25.8	26.6 J	NA	NA	NA
IRON	773.8 J	436	154 J	146.5	139 J	NA	NA	NA
LEAD	3.2 J	2.9 U	4.4 J	5.15	5.9 J	NA	NA	NA
MANGANESE	6	11.1	3.4 J	3.55	3.7 J	NA	NA	NA
MERCURY	0.42 U	0.42 U	0.42 UJ	0.42 U	0.42 UJ	NA	NA	NA
NICKEL	9.4 J	89.8	32	31.75	31.5	NA	NA	NA
SILVER	0.5 U	1.2	0.5 U	0.5 U	0.5 U	NA	NA	NA
ZINC	92.5 U	155 J	131 J	109	87 J	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/L)								
ALKALINITY	NA	NA	100	100	100	NA	NA	NA
BIOCHEMICAL OXYGEN DEMAND	6 U	NA	6 U	6 U	6 U	NA	NA	NA
BROMIDE	46	60	57	56.5	56	NA	NA	NA
CARBONATE ALKALINITY	95	120	NA	NA	NA	NA	NA	NA
CHLORIDE	14000	19000	18000	18500	19000	NA	NA	NA
NITRATE	0.26	0.25	0.33 J	0.32	0.31 J	NA	NA	NA
SULFATE	1900	2300	2200	2400	2600	NA	NA	NA
TOTAL DISSOLVED SOLIDS	34000	13000	27000	29000	31000	NA	NA	NA
TOTAL ORGANIC CARBON	1.8	1.7	2.6	2.8	3	NA	NA	NA
TOTAL SUSPENDED SOLIDS	60	100	25 J	23.5	22 J	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)								
PH	7.5	7.3	7.4	7.45	7.5	NA	NA	NA
MISCELLANEOUS PARAMETERS (UG/L)								

LOCATION	**1016**	**1016**	**1016**	**1016**	**1016**	**1016**	**1016**	**1016**
SAMPLE ID	**BC-1016-SP-0497**	**BC-1016-SP-0897**	**BC-1016-SP-1197**	**BC-1016-SP-1197-AVG**	**BC-1016-SP-1197-D**	**BC-1016-SP-1197-F**	**BC-1016-SP-1197-F-AVG**	**BC-1016-SP-1197-F-D**
SAMPLE DATE	**19970410**	**19970819**	**19971113**	**19971113**	**19971113**	**19971113**	**19971113**	**19971113**
SAMPLE CODE	**NORMAL**	**NORMAL**	**ORIG**	**AVG**	**DUP**	**ORIG**	**AVG**	**DUP**
MATRIX	**SP**	**SP**	**SP**	**SP**	**SP**	**SP**	**SP**	**SP**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**
BOTTOM DEPTH	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**
CYANIDE	10 U	20 U	20 U	20 U	20 U	NA	NA	NA
PESTICIDES/PCBS (NG/L)								
2,4'-DDE	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	NA	NA	NA
2,4'-DDT	2.9 U	2.9 U	0.1 J	0.1	0.1 J	NA	NA	NA
4,4'-DDD	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	NA	NA	NA
4,4'-DDE	2.4 U	0.5 U	2.4 U	2.4 U	2.4 U	NA	NA	NA
4,4'-DDT	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	NA	NA	NA
ALDRIN	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	NA	NA	NA
ALPHA-CHLORDANE	1.9 U	0.2 U	0.1 J	0.15	0.2 J	NA	NA	NA
GAMMA-BHC (LINDANE)	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	NA	NA	NA
HEPTACHLOR	0.1 J	0.2 J	0.1 J	0.65	1.2 J	NA	NA	NA
HEPTACHLOR EPOXIDE	0.1 J	0.9 J	2.9 U	2.9 U	2.9 U	NA	NA	NA
HEXACHLOROBENZENE	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	NA	NA	NA
MIREX	2.1 U	2.1 U	0.1 J	0.1 J	2.1 U	NA	NA	NA
PCB-101	1.7 U	1 U	1.7 U	1.7 U	1.7 U	NA	NA	NA
PCB-105	1 U	0.4 J	1 U	1 U	1 U	NA	NA	NA
PCB-118	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
PCB-128	6 U	1.1 U	1.1 U	1.1 U	1.1 U	NA	NA	NA
PCB-138	0.9 U	0.4 U	1 U	1 U	1 U	NA	NA	NA
PCB-153	1.2 U	0.6 U	1.2 U	1.2 U	1.2 U	NA	NA	NA
PCB-170	1.2 U	0.1 J	1.2 U	1.2 U	1.2 U	NA	NA	NA
PCB-18	2.9 U	0.1 U	2.9 U	2.9 U	2.9 U	NA	NA	NA
PCB-180	0.7 U	0.2 U	0.1 J	0.1	0.1 J	NA	NA	NA
PCB-185	6 J	0.3 U	0.1 J	0.1	0.1 J	NA	NA	NA
PCB-195	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	NA	NA	NA
PCB-201	0.6 U	0.3 U	0.6 U	0.6 U	0.6 U	NA	NA	NA
PCB-206	1.4 U	0.5 U	1.4 U	1.4 U	1.4 U	NA	NA	NA
PCB-28	1.5 U	0.6 J	0.2 J	0.35	0.5 J	NA	NA	NA
PCB-29	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	NA	NA	NA
PCB-44	1.6 U	0.4 U	0.1 J	0.25	0.4 J	NA	NA	NA
PCB-50	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	NA	NA	NA
PCB-52	2.7 U	1 U	2.7 U	2.7 U	2.7 U	NA	NA	NA
PCB-66	1.4 U	0.5 U	1.4 U	1.4 U	1.4 U	NA	NA	NA
PCB-8	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	NA	NA	NA
PCB-87	0.1 J	0.5 U	1.2 U	1.2 U	1.2 U	NA	NA	NA
TEQ PCB-HH-HALFND	0.00003 U	2.7E-05	0.00003 U	0.00003 U	0.00003 U	NA	NA	NA
TOTAL AROCLOR	12.2	3.8	1	1.6	2.2	NA	NA	NA
TOTAL PCB CONGENERS	6.1	1.9	0.5	0.8	1.1	NA	NA	NA
TOTAL PCB CONGENERS-HH-HALFND	46.7	18.8	28.1	28.7	29.3	NA	NA	NA
TRANS-NONACHLOR	1.7 U	1.7 U	1.7 U	0.1 J	0.1 J	NA	NA	NA

LOCATION	1016	1016	1016	1016	1016	1016	1016	1016
SAMPLE ID	BC-1016-SP-0497	BC-1016-SP-0897	BC-1016-SP-1197	BC-1016-SP-1197-AVG	BC-1016-SP-1197-D	BC-1016-SP-1197-F	BC-1016-SP-1197-F-AVG	BC-1016-SP-1197-F-D
SAMPLE DATE	19970410	19970819	19971113	19971113	19971113	19971113	19971113	19971113
SAMPLE CODE	NORMAL	NORMAL	ORIG	AVG	DUP	ORIG	AVG	DUP
MATRIX	SP	SP	SP	SP	SP	SP	SP	SP
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999
BOTTOM DEPTH	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999
POLYCYCLIC AROMATIC HYDROCARBONS (NG/L)								
1,1-BIPHENYL	10.6 U	10.6 U	11 U	11 U	11 U	NA	NA	NA
ACENAPHTHENE	8.1 U	8.1 U	8.1 U	8.1 U	8.1 U	NA	NA	NA
ACENAPHTHYLENE	8.3 U	8.3 U	8.3 U	8.3 U	8.3 U	NA	NA	NA
ANTHRACENE	0.7 J	0.8 J	1.9 U	1.9 U	1.9 U	NA	NA	NA
BAP EQUIVALENT-HALFND	8.0336	5.7 U	5.7 U	5.7 U	5.7 U	NA	NA	NA
BAP EQUIVALENT-POS	0.0406	0 U	0 U	0 U	0 U	NA	NA	NA
BENZO(A)ANTHRACENE	0.1 J	7 U	7 U	7 U	7 UJ	NA	NA	NA
BENZO(A)PYRENE	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	NA	NA	NA
BENZO(B)FLUORANTHENE	0.3 J	1.9 U	13 U	13 U	13 U	NA	NA	NA
BENZO(E)PYRENE	0.2 J	8.5 U	8.5 U	8.5 U	8.5 UJ	NA	NA	NA
BENZO(G,H,I)PERYLENE	4.6 U	4.6 U	4.6 U	4.6 U	4.6 U	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	9.5 U	9.5 U	9.5 U	9.5 U	9.5 UJ	NA	NA	NA
FLUORANTHENE	4.4 U	2 J	4.4 U	4.4 U	4.4 UJ	NA	NA	NA
FLUORENE	4.2 U	4.2 U	4.2 U	4.2 U	4.2 U	NA	NA	NA
HIGH MOLECULAR WEIGHT PAHS	NA	NA	21.5	21.5	21.5	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	7.4 U	7.4 U	7.4 U	7.4 U	7.4 U	NA	NA	NA
LOW MOLECULAR WEIGHT PAHS	NA	NA	20.3	20.3	20.3	NA	NA	NA
NAPHTHALENE	6.6 U	6.6 U	6.6 U	6.6 U	6.6 U	NA	NA	NA
PERYLENE	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	NA	NA	NA
PHENANTHRENE	2.8 U	2.9 U	2.8 U	2.8 U	2.8 U	NA	NA	NA
PYRENE	5.4 U	1.9 J	5.4 U	5.4 U	5.4 U	NA	NA	NA
SEMIVOLATILES (NG/L)								
1-METHYLNAPHTHALENE	15.9 U	15.9 U	15.9 U	11.925	15.9	NA	NA	NA
1-METHYLPHENANTHRENE	0.1 J	4.5 U	4.5 U	4.5 U	4.5 U	NA	NA	NA
2,3,5-TRIMETHYLNAPHTHALENE	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	NA	NA	NA
2,6-DIMETHYLNAPHTHALENE	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	NA	NA	NA
2-METHYLNAPHTHALENE	8.7 U	8.7 U	8.7 U	8.7 U	8.7 U	NA	NA	NA
CHRYSENE	0.6 J	10.7 U	11 U	11 U	11 UJ	NA	NA	NA
HIGH MOLECULAR WEIGHT PAHS	0.7 U	3.9 U	NA	NA	NA	NA	NA	NA
LOW MOLECULAR WEIGHT PAHS	0.7	0.8	NA	NA	NA	NA	NA	NA
TOTAL PAHS	2 U	4.7 U	NA	NA	NA	NA	NA	NA

LOCATION	1016	1016	1017	1017	1017	1017	1017	1017
SAMPLE ID	BC-1016-SP-1296	BC-1016-SP-1296-F	BC-1017-SP-0497	BC-1017-SP-0897	BC-1017-SP-1197	BC-1017-SP-1197-F	BC-1017-SP-1296	BC-1017-SP-1296-F
SAMPLE DATE	19961216	19961213	19970409	19970819	19971115	19971115	19961216	19961213
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SP	SP	SP	SP	SP	SP	SP	SP
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999
BOTTOM DEPTH	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999
DISSOLVED INORGANICS (UG/L)								
ALUMINUM	NA	19.1	105.9	44.5 J	NA	3 UJ	NA	14.5
ARSENIC	NA	5 U	5 U	5 U	NA	5 UJ	NA	9.7
CADMIUM	NA	1	0.2	0.2 J	NA	0.2 J	NA	0.2 UJ
CHROMIUM	NA	0.8 U	0.8 U	1	NA	2.2 J	NA	0.8 U
COPPER	NA	16.4	5.5	14.6 J	NA	8.7 J	NA	2.5 U
IRON	NA	3 U	428	76.5 J	NA	73.8	NA	38.2
LEAD	NA	2.9 UJ	2.9 U	2.9 U	NA	3.3 J	NA	2.9 UJ
MANGANESE	NA	6	17.1	19.9	NA	6.8	NA	29
MERCURY	NA	0.42 UJ	0.42 U	0.42 U	NA	0.42 UJ	NA	0.42 UJ
NICKEL	NA	11.4	8 U	103	NA	29.4 J	NA	8 UR
SILVER	NA	0.5 U	0.5 U	0.7 J	NA	0.5 U	NA	0.5 U
ZINC	NA	133	33	18 J	NA	22 J	NA	32.8
TOTAL INORGANICS (UG/L)								
ALUMINUM	5 J	NA	343 J	175 J	31.6 J	NA	59.2 J	NA
ARSENIC	5 UJ	NA	5.2 J	5 U	5 UJ	NA	11.7 J	NA
CADMIUM	0.2 UJ	NA	0.2 U	0.2 U	0.2 U	NA	0.2 UJ	NA
CHROMIUM	0.8 U	NA	4	68	33.8	NA	0.8 U	NA
COPPER	18.8	NA	42.5 J	17.3 J	7.6 J	NA	4.3	NA
IRON	67.5 J	NA	2175 J	536	234 J	NA	411 J	NA
LEAD	2.9 UJ	NA	9.3 J	5.6 J	3.4 J	NA	2.9 UJ	NA
MANGANESE	4.6	NA	40	21.9	6.9 J	NA	26.9	NA
MERCURY	0.42 UJ	NA	0.42 U	0.42 U	0.42 UJ	NA	0.42 UJ	NA
NICKEL	9.3 J	NA	8 U	103	26.6	NA	8 UR	NA
SILVER	0.5 U	NA	0.5 U	1	0.5 U	NA	0.5 U	NA
ZINC	129 J	NA	64 U	85 J	37 J	NA	95 J	NA
MISCELLANEOUS PARAMETERS (MG/L)								
ALKALINITY	100	NA	NA	NA	99	NA	110	NA
BIOCHEMICAL OXYGEN DEMAND	30 U	NA	6 U	6 U	6 U	NA	30 U	NA
BROMIDE	33	NA	53	58	48	NA	37	NA
CARBONATE ALKALINITY	100	NA	98	120	99	NA	110	NA
CHLORIDE	12000	NA	14000	16000	20000	NA	12000	NA
NITRATE	0.36	NA	0.21	0.25	0.2	NA	0.21	NA
SULFATE	1300	NA	1900	2500	2500	NA	1700	NA
TOTAL DISSOLVED SOLIDS	23000	NA	25000	20000	37000	NA	17000	NA
TOTAL ORGANIC CARBON	1.8	NA	2.6	1.4	1.4 J	NA	1.6	NA
TOTAL SUSPENDED SOLIDS	31	NA	88	110	160	NA	24	NA
MISCELLANEOUS PARAMETERS (S.U.)								
PH	7.3	NA	7.7	7.7	7.8	NA	7.8	NA
MISCELLANEOUS PARAMETERS (UG/L)								

LOCATION	**1016**	**1016**	**1017**	**1017**	**1017**	**1017**	**1017**	**1017**
SAMPLE ID	**BC-1016-SP-1296**	**BC-1016-SP-1296-F**	**BC-1017-SP-0497**	**BC-1017-SP-0897**	**BC-1017-SP-1197**	**BC-1017-SP-1197-F**	**BC-1017-SP-1296**	**BC-1017-SP-1296-F**
SAMPLE DATE	**19961216**	**19961213**	**19970409**	**19970819**	**19971115**	**19971115**	**19961216**	**19961213**
SAMPLE CODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**SP**	**SP**	**SP**	**SP**	**SP**	**SP**	**SP**	**SP**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**
BOTTOM DEPTH	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**
CYANIDE	10 U	NA	10 U	20 U	20 UJ	NA	10 U	NA
PESTICIDES/PCBS (NG/L)								
2,4'-DDE	3.2 U	NA	1.8 U	1.8 U	1.8 U	NA	3.2 U	NA
2,4'-DDT	3 U	NA	2.9 U	2.9 U	0.9 J	NA	3 U	NA
4,4'-DDD	3 U	NA	2.4 U	2.4 U	2.4 U	NA	3 U	NA
4,4'-DDE	2.3 U	NA	2	0.5 U	1.8 J	NA	2.3 U	NA
4,4'-DDT	3 U	NA	3.7 U	3.7 U	3.7 U	NA	3 U	NA
ALDRIN	3.2 U	NA	3.3 U	3.3 U	3.3 U	NA	3.2 U	NA
ALPHA-CHLORDANE	3 U	NA	1.9 U	0.3 U	0.2	NA	0.1 J	NA
GAMMA-BHC (LINDANE)	3 U	NA	1.8 U	1.8 U	1.8 U	NA	3 U	NA
HEPTACHLOR	3 U	NA	0.2 J	1.2 U	1 J	NA	3 U	NA
HEPTACHLOR EPOXIDE	3 U	NA	2.9 U	0.3 J	2.8 U	NA	0.1 J	NA
HEXACHLOROBENZENE	1.8 U	NA	3.8 U	3.8 U	3.8 U	NA	1.8 U	NA
MIREX	1.2 U	NA	8	0.7 J	10.9	NA	1.2 U	NA
PCB-101	5.1 U	NA	30	3.3	15.6	NA	7	NA
PCB-105	2.2 J	NA	3.9	1 U	1 U	NA	2 J	NA
PCB-118	2.1 U	NA	6.7	1 U	1 U	NA	25.1 J	NA
PCB-128	4.2 U	NA	11	0.9 J	7.9	NA	2 J	NA
PCB-138	1.8 U	NA	120	8.9	92.7	NA	25.4	NA
PCB-153	2.3 U	NA	101	8.8	60.8	NA	25.3	NA
PCB-170	2.7 U	NA	54	3.4 J	45.2	NA	14.1	NA
PCB-18	2.1 U	NA	2.9 U	2.9 U	2.9 U	NA	2.1 U	NA
PCB-180	2.3 U	NA	106	7.9	96.6	NA	26.1	NA
PCB-185	3.1 U	NA	50	3.9	42.6	NA	9.5	NA
PCB-195	3 U	NA	9.3	0.6	8.5	NA	2 J	NA
PCB-201	2.3 U	NA	4	0.3 U	3.6	NA	2.3 U	NA
PCB-206	2.9 U	NA	4.1	0.7 U	5.5	NA	1.4 J	NA
PCB-28	2.6 U	NA	1.5 U	1.5 U	0.6 J	NA	2.6 U	NA
PCB-29	2.5 U	NA	2.3 U	2.3 U	2.3 U	NA	0.1 J	NA
PCB-44	5.4 U	NA	1.6 U	0.1 U	0.1	NA	5.4 U	NA
PCB-50	1.7 U	NA	2.9 U	2.9 U	2.9 U	NA	1.7 U	NA
PCB-52	3.1 U	NA	2.7 U	0.6 U	2.7 U	NA	3.1 U	NA
PCB-66	7.3 U	NA	1.4 U	1.4 U	3.7	NA	7.3 U	NA
PCB-8	3.7 U	NA	2.4 U	2.4 U	2.4 U	NA	3.7 U	NA
PCB-87	3.2 U	NA	4.9	0.7 U	2.4	NA	3.2 U	NA
TEQ PCB-HH-HALFND	9.8E-05	NA	0.00032	0.00003 U	0.00003 U	NA	0.00081	NA
TOTAL AROCLOR	4.8	NA	1037.8	78	789.2	NA	294.2	NA
TOTAL PCB CONGENERS	2.4	NA	518.9	39	394.6	NA	147.1	NA
TOTAL PCB CONGENERS-HH-HALFND	67.8	NA	1027.5	93.2	786.8	NA	311.4	NA
TRANS-NONACHLOR	3 U	NA	0.2 J	0.1 U	0.2 J	NA	3 U	NA

LOCATION	**1016**	**1016**	**1017**	**1017**	**1017**	**1017**	**1017**	**1017**
SAMPLE ID	**BC-1016-SP-1296**	**BC-1016-SP-1296-F**	**BC-1017-SP-0497**	**BC-1017-SP-0897**	**BC-1017-SP-1197**	**BC-1017-SP-1197-F**	**BC-1017-SP-1296**	**BC-1017-SP-1296-F**
SAMPLE DATE	**19961216**	**19961213**	**19970409**	**19970819**	**19971115**	**19971115**	**19961216**	**19961213**
SAMPLE CODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**SP**	**SP**	**SP**	**SP**	**SP**	**SP**	**SP**	**SP**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**
BOTTOM DEPTH	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**
POLYCYCLIC AROMATIC HYDROCARBONS (NG/L)								
1,1-BIPHENYL	3.1 U	NA	10.6 U	10.6 U	3.1 J	NA	3.1 U	NA
ACENAPHTHENE	0.7 J	NA	5.5 J	2.9 J	3.5 J	NA	0.5 J	NA
ACENAPHTHYLENE	0.5 J	NA	11.6	6 J	20.9	NA	0.8 J	NA
ANTHRACENE	2.9	NA	34	10.8	45.2	NA	2.8	NA
BAP EQUIVALENT-HALFND	14.1931	NA	172.757	51.4395	241.26	NA	17.1739	NA
BAP EQUIVALENT-POS	0.8081	NA	172.72	51.4395	236.51	NA	4.4689	NA
BENZO(A)ANTHRACENE	24.1 U	NA	81.9 J	30.8	170	NA	24.1 U	NA
BENZO(A)PYRENE	0.7 J	NA	105	31.8	172	NA	3.3 J	NA
BENZO(B)FLUORANTHENE	13.6 U	NA	182	68	357	NA	8.1 J	NA
BENZO(E)PYRENE	4.3 U	NA	88.6	29.3	120	NA	3.4 J	NA
BENZO(G,H,I)PERYLENE	0.7 J	NA	143	31	110	NA	3.4 J	NA
DIBENZO(A,H)ANTHRACENE	23 U	NA	29.2	6.8 J	9.5 U	NA	23 U	NA
FLUORANTHENE	2.2 J	NA	140	67.7	272	NA	7.8 J	NA
FLUORENE	0.6 J	NA	6.1	2.1 J	11.7	NA	12.3 U	NA
HIGH MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	1 J	NA	107	26.2	106	NA	3.2 J	NA
LOW MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	6.8 U	NA	22.6 U	12.6	21.4	NA	6.8 U	NA
PERYLENE	3.3 U	NA	37.5	10.8	43.2	NA	1.4 J	NA
PHENANTHRENE	10.3 U	NA	82	36	135	NA	10.3 U	NA
PYRENE	2 J	NA	122	58.1	229	NA	6.6 J	NA
SEMIVOLATILES (NG/L)								
1-METHYLNAPHTHALENE	14.1 U	NA	8.5 J	4.3 J	8 J	NA	14.1 U	NA
1-METHYLPHENANTHRENE	7.1 U	NA	16.7	8.4	16.6	NA	1.1 J	NA
2,3,5-TRIMETHYLNAPHTHALENE	9.9 U	NA	2.9 J	5.7 U	2.9 J	NA	9.9 U	NA
2,6-DIMETHYLNAPHTHALENE	6.4 U	NA	3.6 J	5.7 U	6.7	NA	6.4 U	NA
2-METHYLNAPHTHALENE	1.1 J	NA	9.4	6.3 J	13.8	NA	29.4 U	NA
CHRYSENE	1.1 J	NA	74.6 U	29.5	110	NA	4.9 J	NA
HIGH MOLECULAR WEIGHT PAHS	6	NA	478.1	224.7	953	NA	22.6	NA
LOW MOLECULAR WEIGHT PAHS	5.8	NA	148.6	76.7	251.5	NA	4.1	NA
TOTAL PAHS	13.5	NA	1216.5	479.4 U	1978	NA	47.3	NA

LOCATION	1018	1018	1018	1018	1018	1018	1018	1018
SAMPLE ID	BC-1018-SP-0497	BC-1018-SP-0897	BC-1018-SP-1197	BC-1018-SP-1197-F	BC-1018-SP-1296	BC-1018-SP-1296-AVG	BC-1018-SP-1296-D	BC-1018-SP-1296-F
SAMPLE DATE	19970409	19970818	19971113	19971113	19961212	19961212	19961212	19961211
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	ORIG
MATRIX	SP	SP	SP	SP	SP	SP	SP	SP
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999
BOTTOM DEPTH	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999
DISSOLVED INORGANICS (UG/L)								
ALUMINUM	3 U	11.9 J	NA	3 UJ	NA	NA	NA	3 UJ
ARSENIC	5 U	5 U	NA	5 UJ	NA	NA	NA	5 U
CADMIUM	0.2	0.3 J	NA	0.2 J	NA	NA	NA	0.2 UJ
CHROMIUM	0.8 U	2.2 J	NA	0.8 UJ	NA	NA	NA	0.8 U
COPPER	4.5	6.5 J	NA	7.3 J	NA	NA	NA	5
IRON	11.5	168 J	NA	24.5	NA	NA	NA	3 U
LEAD	2.9 U	2.9 U	NA	3.8 J	NA	NA	NA	2.9 UJ
MANGANESE	2.1	5.4	NA	1.1	NA	NA	NA	2.8
MERCURY	0.42 U	0.42 U	NA	0.42 UJ	NA	NA	NA	0.42 UJ
NICKEL	22.2	32.1	NA	28.1 J	NA	NA	NA	43.6
SILVER	0.5 U	0.6 J	NA	0.5 U	NA	NA	NA	0.5 U
ZINC	86	52 J	NA	170 J	NA	NA	NA	34.2
TOTAL INORGANICS (UG/L)								
ALUMINUM	9.1 U	23.5 J	3 UJ	NA	7.8	66.15	124.5 J	NA
ARSENIC	5 U	5 U	5 UJ	NA	5 UJ	5 U	5 UJ	NA
CADMIUM	0.2 J	0.2 J	0.2 U	NA	0.2 UJ	0.2 U	0.2 UJ	NA
CHROMIUM	0.8 U	0.8 U	0.8 U	NA	0.8 U	0.8 U	0.8 U	NA
COPPER	5.4 J	8.7 J	7.7 J	NA	5.4	5	4.6	NA
IRON	31 J	72.5	54.5 J	NA	20.4	34.2	48 J	NA
LEAD	2.9 U	2.9 U	4.6 J	NA	2.9 UJ	2.9 U	2.9 UJ	NA
MANGANESE	2.6	5.3	0.9 U	NA	3.2	2.75	2.3	NA
MERCURY	0.42 U	0.42 U	0.42 UJ	NA	0.42 UJ	0.42 U	0.42 UJ	NA
NICKEL	21.8 J	35.5	27.7	NA	47.3	41.85	36.4 J	NA
SILVER	0.5 U	0.6	0.5 U	NA	0.5 U	0.5 U	0.5 U	NA
ZINC	74.5 U	44 J	143 J	NA	36.2	73.6	111 J	NA
MISCELLANEOUS PARAMETERS (MG/L)								
ALKALINITY	NA	NA	110	NA	120	120	120	NA
BIOCHEMICAL OXYGEN DEMAND	6 U	6 U	6 U	NA	30 U	30 U	30 U	NA
BROMIDE	46	56	56	NA	34 J	35	36 J	NA
CARBONATE ALKALINITY	100	120	110	NA	120	120	120	NA
CHLORIDE	14000	18000	20000	NA	11000	11500	12000	NA
NITRATE	0.36	0.22	0.23 J	NA	0.48	0.47	0.46	NA
SULFATE	1700	2600	2400	NA	1400	1450	1500	NA
TOTAL DISSOLVED SOLIDS	25000	12000	32000	NA	24000 J	23500	23000	NA
TOTAL ORGANIC CARBON	1.6	1.6	2	NA	1.5	1.5	1.5	NA
TOTAL SUSPENDED SOLIDS	44	170	37 J	NA	42	39	36	NA
MISCELLANEOUS PARAMETERS (S.U.)								
PH	7.4	7.4	7.4	NA	7.5	7.45	7.4	NA
MISCELLANEOUS PARAMETERS (UG/L)								

LOCATION	**1018**	**1018**	**1018**	**1018**	**1018**	**1018**	**1018**	**1018**
SAMPLE ID	**BC-1018-SP-0497**	**BC-1018-SP-0897**	**BC-1018-SP-1197**	**BC-1018-SP-1197-F**	**BC-1018-SP-1296**	**BC-1018-SP-1296-AVG**	**BC-1018-SP-1296-D**	**BC-1018-SP-1296-F**
SAMPLE DATE	**19970409**	**19970818**	**19971113**	**19971113**	**19961212**	**19961212**	**19961212**	**19961211**
SAMPLE CODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**ORIG**	**AVG**	**DUP**	**ORIG**
MATRIX	**SP**	**SP**	**SP**	**SP**	**SP**	**SP**	**SP**	**SP**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**
BOTTOM DEPTH	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**
CYANIDE	10 U	20 U	20 U	NA	10 U	10 U	10 U	NA
PESTICIDES/PCBS (NG/L)								
2,4'-DDE	1.8 U	1.8 U	1.8 U	NA	3.2 U	3.2 U	3.2 U	NA
2,4'-DDT	2.9 U	0.4 U	0.1 J	NA	3 U	3 U	3 U	NA
4,4'-DDD	0.2 U	0.5 U	2.4 U	NA	3 U	3 U	3 U	NA
4,4'-DDE	0.1 U	0.1 U	2.4 U	NA	2.3 U	0.1 J	0.1 J	NA
4,4'-DDT	0.7 U	1.3 J	0.4 J	NA	3 U	3 U	3 U	NA
ALDRIN	3.3 U	3.3 U	3.3 U	NA	3.2 U	3.2 U	3.2 U	NA
ALPHA-CHLORDANE	1.9 U	1.9 U	1.9 U	NA	0.1	0.1	0.1 J	NA
GAMMA-BHC (LINDANE)	1.8 U	0.1 J	1.8 U	NA	3 U	3 U	3 U	NA
HEPTACHLOR	0.1 J	0.1 J	0.2 J	NA	0.2	0.2	3 U	NA
HEPTACHLOR EPOXIDE	2.9 U	2.9 U	0.1 J	NA	3 U	3 U	3 U	NA
HEXACHLOROBENZENE	3.8 U	0.1 J	0.1 J	NA	1.8 U	1.8 U	1.8 U	NA
MIREX	2.1 U	2.1 U	0.2 J	NA	1.2 U	1.2 U	1.2 U	NA
PCB-101	1.7 U	0.4 U	1.7 U	NA	5.1 U	5.15 U	5.2 U	NA
PCB-105	1 U	1 U	1 U	NA	2.2 U	2.2 U	2.2 U	NA
PCB-118	1 U	1 U	1 U	NA	2.1 U	2.1 U	2.1 U	NA
PCB-128	1.1 U	1.1 U	1.1 U	NA	0.1	0.1	4.2 U	NA
PCB-138	0.9 U	0.3 U	1 U	NA	1.8 U	1.8 U	1.8 U	NA
PCB-153	1.2 U	0.3 U	1.2 U	NA	2.3 U	2.3 U	2.3 U	NA
PCB-170	1.2 U	1.2 U	1.2 U	NA	2.7 U	2.7 U	2.7 U	NA
PCB-18	2.9 U	0.1 U	2.9 U	NA	2.1 U	2.1 U	2.1 U	NA
PCB-180	0.7 U	0.2 U	0.1 J	NA	2.3 U	2.3 U	2.3 U	NA
PCB-185	0.9 U	0.2 U	0.1 J	NA	3.1 U	3.1 U	3.1 U	NA
PCB-195	1.1 U	1.1 U	1.1 U	NA	3 U	3 U	3 U	NA
PCB-201	0.6 U	0.2 U	0.6 U	NA	2.3 U	2.3 U	2.3 U	NA
PCB-206	1.4 U	0.3 U	1.4 U	NA	2.9 U	2.9 U	2.9 U	NA
PCB-28	3.7 U	1.5 U	0.2 J	NA	2.6 U	2.6 U	2.6 U	NA
PCB-29	2.3 U	2.3 U	2.3 U	NA	0.1	0.1	2.5 U	NA
PCB-44	1.6 U	0.1 U	0.1 J	NA	5.4 U	5.4 U	5.4 U	NA
PCB-50	2.9 U	2.9 U	2.9 U	NA	1.7 U	1.7 U	1.7 U	NA
PCB-52	2.7 U	0.2 U	2.7 U	NA	3.1 U	3.1 U	3.1 U	NA
PCB-66	1.4 U	0.2 U	1.4 U	NA	7.3 U	7.3 U	7.3 U	NA
PCB-8	2.4 U	2.4 U	2.4 U	NA	3.7 U	3.7 U	3.7 U	NA
PCB-87	0.1 J	1.2 U	1.2 U	NA	3.2 U	3.2 U	3.2 U	NA
TEQ PCB-HH-HALFND	0.00003 U	0.00003 U	0.00003 U	NA	0.000065 U	0.000065 U	0.000065 U	NA
TOTAL AROCLOR	0.2	NA	1	NA	0.6	0.4	0.2	NA
TOTAL PCB CONGENERS	0.1	NA	0.5	NA	0.3	0.2	0.1	NA
TOTAL PCB CONGENERS-HH-HALFND	32.9	18.2	28.1	NA	59.3	62.5	65.7	NA
TRANS-NONACHLOR	1.7 U	1.7 U	1.7 U	NA	3 U	3 U	3 U	NA

LOCATION	1018	1018	1018	1018	1018	1018	1018	1018
SAMPLE ID	BC-1018-SP-0497	BC-1018-SP-0897	BC-1018-SP-1197	BC-1018-SP-1197-F	BC-1018-SP-1296	BC-1018-SP-1296-AVG	BC-1018-SP-1296-D	BC-1018-SP-1296-F
SAMPLE DATE	19970409	19970818	19971113	19971113	19961212	19961212	19961212	19961211
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	ORIG
MATRIX	SP	SP	SP	SP	SP	SP	SP	SP
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999
BOTTOM DEPTH	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999
POLYCYCLIC AROMATIC HYDROCARBONS (NG/L)								
1,1-BIPHENYL	10.6 U	10.6 U	11 U	NA	3.1 U	3.1 U	3.1 U	NA
ACENAPHTHENE	8.1 U	8.1 U	8.1 U	NA	0.2	0.2	6 U	NA
ACENAPHTHYLENE	8.3 U	8.3 U	8.3 U	NA	0.2	0.2	0.2 J	NA
ANTHRACENE	1 J	1.9 U	1.9 U	NA	1.6 U	1.6 U	1.6 U	NA
BAP EQUIVALENT-HALFND	6.2019	6.9748	5.7 U	NA	15.0473	7.59865	0.3 U	NA
BAP EQUIVALENT-POS	1.4519	2.2018	0 U	NA	0.7013	0.35065	0 U	NA
BENZO(A)ANTHRACENE	2 J	1.3 J	7 U	NA	24.1 U	24.1 U	24.1 U	NA
BENZO(A)PYRENE	0.9 J	1.6 J	5.7 U	NA	0.7	0.425	0.3 UJ	NA
BENZO(B)FLUORANTHENE	2.5 J	3.5 J	13 U	NA	13.6 U	13.6 U	13.6 U	NA
BENZO(E)PYRENE	1.1 J	2.1 U	8.5 U	NA	4.3 U	4.3 U	4.3 U	NA
BENZO(G,H,I)PERYLENE	1 J	4.6 U	4.6 U	NA	8.2 U	8.2 U	8.2 U	NA
DIBENZO(A,H)ANTHRACENE	9.5 U	9.5 U	9.5 U	NA	23 U	23 U	23 U	NA
FLUORANTHENE	3.8 J	5.8	4.4 U	NA	2.9	2.3	1.7 J	NA
FLUORENE	4.2 U	4.2 U	4.2 U	NA	12.3 U	12.3 U	12.3 U	NA
HIGH MOLECULAR WEIGHT PAHS	NA	NA	21.5	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	0.9 J	1.2 J	7.4 U	NA	18.4 U	18.4 U	18.4 U	NA
LOW MOLECULAR WEIGHT PAHS	NA	20.85	20.3	NA	NA	NA	NA	NA
NAPHTHALENE	6.6 U	6.6 U	6.6 U	NA	6.8 U	6.8 U	6.8 U	NA
PERYLENE	0.3 J	6.1 J	6.1 U	NA	3.3 U	3.3 U	3.3 U	NA
PHENANTHRENE	3 U	3.9 U	2.8 U	NA	10.3 U	10.3 U	10.3 U	NA
PYRENE	2.9 J	3.8 J	5.4 U	NA	2.6	2.05	1.5 J	NA
SEMIVOLATILES (NG/L)								
1-METHYLNAPHTHALENE	15.9 U	15.9 U	15.9 U	NA	14.1 U	14.1 U	14.1 U	NA
1-METHYLPHENANTHRENE	4.5 U	4.5 U	4.5 U	NA	7.1 U	7.1 U	7.1 U	NA
2,3,5-TRIMETHYLNAPHTHALENE	5.7 U	5.7 U	5.7 U	NA	9.9 U	9.9 U	9.9 U	NA
2,6-DIMETHYLNAPHTHALENE	5.7 U	5.7 U	5.7 U	NA	6.4 U	6.4 U	6.4 U	NA
2-METHYLNAPHTHALENE	8.7 U	8.7 U	8.7 U	NA	29.4 U	29.4 U	29.4 U	NA
CHRYSENE	1.9 J	1.8 J	11 U	NA	1.3	0.95	1.2 UJ	NA
HIGH MOLECULAR WEIGHT PAHS	11.5 U	14.3 U	NA	NA	7.5	6.1	4.7	NA
LOW MOLECULAR WEIGHT PAHS	1	NA	NA	NA	0.4	0.3	0.2	NA
TOTAL PAHS	18.3 U	25.1	NA	NA	7.9	6.4	4.9	NA

LOCATION	1018	1018	1020	1020	1020	1020	1020	1020
SAMPLE ID	BC-1018-SP-1296-F-AVG	BC-1018-SP-1296-F-D	BC-1020-SP-0497	BC-1020-SP-0897	BC-1020-SP-0897-AVG	BC-1020-SP-0897-D	BC-1020-SP-1197	BC-1020-SP-1197-F
SAMPLE DATE	19961211	19961212	19970409	19970819	19970819	19970819	19971114	19971114
SAMPLE CODE	AVG	DUP	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
MATRIX	SP	SP	SP	SP	SP	SP	SP	SP
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999
BOTTOM DEPTH	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999
DISSOLVED INORGANICS (UG/L)								
ALUMINUM	6.05	10.6 J	3 U	22.5 J	32.3	42.1 J	NA	3 UJ
ARSENIC	5 U	5 U	5 U	5 UJ	5 U	5 UJ	NA	9.3 J
CADMIUM	0.3	0.5 J	0.3	0.7 J	0.65	0.6 J	NA	0.4 J
CHROMIUM	0.8 U	0.8 U	0.8 U	1.2 J	1.65	2.1	NA	2.5 J
COPPER	4.9	4.8	15.3	29.3 J	30.75	32.2 J	NA	21 J
IRON	2.5	3.5	9	10 J	5.75	3 U	NA	33.5
LEAD	2.9 U	2.9 UJ	4.5	2.9 UJ	2.9 U	2.9 UJ	NA	3.2 J
MANGANESE	3.05	3.3	2.6	2.3	1.375	0.9 U	NA	2.6
MERCURY	0.42 U	0.42 UJ	0.42 U	0.42 UJ	0.42 U	0.42 UJ	NA	0.42 UJ
NICKEL	29.1	14.6 J	13.8	23.6	23.1	22.6	NA	23.9 J
SILVER	0.5 U	0.5 U	0.5 U	1.1 J	1.15	1.2 J	NA	0.5 U
ZINC	64.6	95 J	155.5	128 J	171	214 J	NA	125 J
TOTAL INORGANICS (UG/L)								
ALUMINUM	NA	NA	3 U	18.4 J	15.15	11.9 J	3 UJ	NA
ARSENIC	NA	NA	5 U	5 UJ	5 U	5 UJ	5 UJ	NA
CADMIUM	NA	NA	0.3 J	0.7 J	0.8	0.9 J	0.3	NA
CHROMIUM	NA	NA	1.2	4.1 J	4.6	5.1	15.2	NA
COPPER	NA	NA	19.4 J	30.2 J	35.85	41.5 J	26.6 J	NA
IRON	NA	NA	121.5 J	77.5	69	60.5	107 J	NA
LEAD	NA	NA	3.9 J	2.9 UJ	2.9 U	2.9 UJ	3.8 J	NA
MANGANESE	NA	NA	2.4	2.1	2.4	2.7	3.4 J	NA
MERCURY	NA	NA	0.42 U	0.42 UJ	0.42 U	0.42 UJ	0.42 UJ	NA
NICKEL	NA	NA	12.7 J	18.6	19.95	21.3	23	NA
SILVER	NA	NA	0.5 U	1.4	1.25	1.1	0.7	NA
ZINC	NA	NA	201.3 J	213 J	205	197 J	125 J	NA
MISCELLANEOUS PARAMETERS (MG/L)								
ALKALINITY	NA	NA	NA	NA	NA	NA	110	NA
BIOCHEMICAL OXYGEN DEMAND	NA	NA	6 U	NA	NA	NA	6 U	NA
BROMIDE	NA	NA	58	NA	NA	NA	57	NA
CARBONATE ALKALINITY	NA	NA	100	NA	NA	NA	110	NA
CHLORIDE	NA	NA	16000	NA	NA	NA	20000	NA
NITRATE	NA	NA	0.18	NA	NA	NA	0.21 J	NA
SULFATE	NA	NA	3400	NA	NA	NA	2600	NA
TOTAL DISSOLVED SOLIDS	NA	NA	28000	NA	NA	NA	34000	NA
TOTAL ORGANIC CARBON	NA	NA	1.2	NA	NA	NA	3.3	NA
TOTAL SUSPENDED SOLIDS	NA	NA	32	NA	NA	NA	460 J	NA
MISCELLANEOUS PARAMETERS (S.U.)								
PH	NA	NA	7.6	NA	NA	NA	7.7	NA
MISCELLANEOUS PARAMETERS (UG/L)								

LOCATION	**1018**	**1018**	**1020**	**1020**	**1020**	**1020**	**1020**	**1020**
SAMPLE ID	**BC-1018-SP-1296-F-AVG**	**BC-1018-SP-1296-F-D**	**BC-1020-SP-0497**	**BC-1020-SP-0897**	**BC-1020-SP-0897-AVG**	**BC-1020-SP-0897-D**	**BC-1020-SP-1197**	**BC-1020-SP-1197-F**
SAMPLE DATE	**19961211**	**19961212**	**19970409**	**19970819**	**19970819**	**19970819**	**19971114**	**19971114**
SAMPLE CODE	**AVG**	**DUP**	**NORMAL**	**ORIG**	**AVG**	**DUP**	**NORMAL**	**NORMAL**
MATRIX	**SP**	**SP**	**SP**	**SP**	**SP**	**SP**	**SP**	**SP**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
TOP DEPTH	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**
BOTTOM DEPTH	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**	**-9999**
CYANIDE	NA	NA	10 U	NA	NA	NA	20 U	NA
PESTICIDES/PCBS (NG/L)								
2,4'-DDE	NA	NA	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	NA
2,4'-DDT	NA	NA	2.9 U	0.3 U	0.4 U	0.5 U	0.1 J	NA
4,4'-DDD	NA	NA	2.4 U	0.5 U	0.5 U	0.5 U	2.4 U	NA
4,4'-DDE	NA	NA	2.4 U	0.3 U	0.25 U	0.2 U	2.4 U	NA
4,4'-DDT	NA	NA	3.7 U	0.9 J	0.8	0.7 J	3.7 U	NA
ALDRIN	NA	NA	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	NA
ALPHA-CHLORDANE	NA	NA	1.9 U	0.2 U	0.15 U	0.1 U	0.1 J	NA
GAMMA-BHC (LINDANE)	NA	NA	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	NA
HEPTACHLOR	NA	NA	0.3 J	1.2 U	1.2 U	1.2 U	0.3	NA
HEPTACHLOR EPOXIDE	NA	NA	0.1 J	0.2 J	0.15	0.1 J	2.9 U	NA
HEXACHLOROBENZENE	NA	NA	3.8 U	0.1	0.1	0.1 J	0.1 J	NA
MIREX	NA	NA	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	NA
PCB-101	NA	NA	1.7 U	0.6 U	0.55 U	0.5 U	1.7 U	NA
PCB-105	NA	NA	1 U	0.1 J	0.1	0.1 J	1 U	NA
PCB-118	NA	NA	1 U	0.2 U	0.2 U	0.2 U	1 U	NA
PCB-128	NA	NA	1.1 U	0.4 J	0.4 J	1.1 U	1.1 U	NA
PCB-138	NA	NA	0.9 U	0.9 U	0.75 U	0.6 U	1 U	NA
PCB-153	NA	NA	1.2 U	1 U	0.85 U	0.7 U	1.2 U	NA
PCB-170	NA	NA	1.2 U	0.4 J	0.35	0.3 J	1.2 U	NA
PCB-18	NA	NA	2.9 U	0.2 U	1.55 U	2.9 U	2.9 U	NA
PCB-180	NA	NA	0.7 U	1.2	0.8	0.8 U	0.1 J	NA
PCB-185	NA	NA	0.9 U	0.9 U	0.8 U	0.7 U	0.1 J	NA
PCB-195	NA	NA	1.1	0.2 U	0.15 U	0.1 U	1.1 U	NA
PCB-201	NA	NA	0.6 U	0.1 U	0.15 U	0.2 U	0.6 U	NA
PCB-206	NA	NA	1.4 U	1.5 U	1.15 U	0.8 U	1.4 U	NA
PCB-28	NA	NA	1.5 U	0.1 J	0.1	0.1 J	0.1 J	NA
PCB-29	NA	NA	0.1 U	2.3 U	2.3 U	2.3 U	2.3 U	NA
PCB-44	NA	NA	1.6 U	0.1 U	0.1 U	0.1 U	0.1 J	NA
PCB-50	NA	NA	2.9 U	0.1 J	0.1	0.1 J	2.9 U	NA
PCB-52	NA	NA	2.7 U	0.3 U	0.3 U	0.3 U	2.7 U	NA
PCB-66	NA	NA	1.4 U	0.4 U	0.4 U	0.4 U	1.4 U	NA
PCB-8	NA	NA	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	NA
PCB-87	NA	NA	0.1 J	0.2 U	0.7 U	1.2 U	1.2 U	NA
TEQ PCB-HH-HALFND	NA	NA	0.00003 U	6E-06	0.000006	0.000006	0.00003 U	NA
TOTAL AROCLOR	NA	NA	2.4	21	17	13	0.8	NA
TOTAL PCB CONGENERS	NA	NA	1.2	10	8	6	0.4	NA
TOTAL PCB CONGENERS-HH-HALFND	NA	NA	29.6	15.9	16.2	16.5	27.9	NA
TRANS-NONACHLOR	NA	NA	1.7 U	0.1 U	0.9 U	1.7 U	1.7 U	NA

LOCATION	1018	1018	1020	1020	1020	1020	1020	1020
SAMPLE ID	BC-1018-SP-1296-F-AVG	BC-1018-SP-1296-F-D	BC-1020-SP-0497	BC-1020-SP-0897	BC-1020-SP-0897-AVG	BC-1020-SP-0897-D	BC-1020-SP-1197	BC-1020-SP-1197-F
SAMPLE DATE	19961211	19961212	19970409	19970819	19970819	19970819	19971114	19971114
SAMPLE CODE	AVG	DUP	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
MATRIX	SP	SP	SP	SP	SP	SP	SP	SP
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999
BOTTOM DEPTH	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999
POLYCYCLIC AROMATIC HYDROCARBONS (NG/L)								
1,1-BIPHENYL	NA	NA	10.6 U	10.6 U	10.6 U	10.6 U	11 U	NA
ACENAPHTHENE	NA	NA	8.1 U	2.6 J	2.6 J	8.1 U	8.1 U	NA
ACENAPHTHYLENE	NA	NA	8.3 U	4.9 J	14.45	24	8.3 U	NA
ANTHRACENE	NA	NA	0.4 J	12.2	10.15	8.1	1.9 U	NA
BAP EQUIVALENT-HALFND	NA	NA	5.7 U	65.88	131.672	197.464	5.7 U	NA
BAP EQUIVALENT-POS	NA	NA	0 U	65.88	131.672	197.464	0 U	NA
BENZO(A)ANTHRACENE	NA	NA	7 U	39.8	107.9	176	7 U	NA
BENZO(A)PYRENE	NA	NA	5.7 U	42.1	83.55	125	5.7 U	NA
BENZO(B)FLUORANTHENE	NA	NA	13.3 U	86.5	202.75	319	13 U	NA
BENZO(E)PYRENE	NA	NA	8.5 U	36.5	75.25	114	8.5 U	NA
BENZO(G,H,I)PERYLENE	NA	NA	4.6 U	39.6	62.6	85.6	4.6 U	NA
DIBENZO(A,H)ANTHRACENE	NA	NA	9.5 U	7.5 J	10.55	13.6	9.5 U	NA
FLUORANTHENE	NA	NA	4.4 U	82.6	95.3	108	4.4 U	NA
FLUORENE	NA	NA	4.2 U	1.6 J	1.6 J	4.2 U	4.2 U	NA
HIGH MOLECULAR WEIGHT PAHS	NA	NA	21.35	NA	NA	NA	21.5	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	7.4 U	32.1	56.2	80.3	7.4 U	NA
LOW MOLECULAR WEIGHT PAHS	NA	NA	NA	NA	NA	NA	20.3	NA
NAPHTHALENE	NA	NA	6.6 U	4 J	4 J	6.6 U	6.6 U	NA
PERYLENE	NA	NA	6.1 U	14.1	30.9	47.7	6.1 U	NA
PHENANTHRENE	NA	NA	2.8 U	29.5	29.1	28.7	2.8 U	NA
PYRENE	NA	NA	5.4 U	92.1	100.05	108	5.4 U	NA
SEMIVOLATILES (NG/L)								
1-METHYLNAPHTHALENE	NA	NA	15.9 U	1.8 J	1.8 J	15.9 U	15.9 U	NA
1-METHYLPHENANTHRENE	NA	NA	4.5 U	12.2	13.35	14.5	4.5 U	NA
2,3,5-TRIMETHYLNAPHTHALENE	NA	NA	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	NA
2,6-DIMETHYLNAPHTHALENE	NA	NA	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	NA
2-METHYLNAPHTHALENE	NA	NA	8.7 U	8.7 U	8.7 U	8.7 U	8.7 U	NA
CHRYSENE	NA	NA	10.7 U	44	261	478	11 U	NA
HIGH MOLECULAR WEIGHT PAHS	NA	NA	NA	308	659	1010	NA	NA
LOW MOLECULAR WEIGHT PAHS	NA	NA	0.4	54.7	53.7	52.7	NA	NA
TOTAL PAHS	NA	NA	0.4 U	586	1153	1720	NA	NA

LOCATION	**1020**	**1020**
SAMPLE ID	**BC-1020-SP-1296**	**BC-1020-SP-1296-F**
SAMPLE DATE	**19961212**	**19961211**
SAMPLE CODE	**NORMAL**	**NORMAL**
MATRIX	**SP**	**SP**
SAMPLE TYPE	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**
TOP DEPTH	**-9999**	**-9999**
BOTTOM DEPTH	**-9999**	**-9999**
DISSOLVED INORGANICS (UG/L)		
ALUMINUM	NA	3.5
ARSENIC	NA	5 U
CADMIUM	NA	0.4
CHROMIUM	NA	0.8 U
COPPER	NA	16.3
IRON	NA	3 U
LEAD	NA	2.9 UJ
MANGANESE	NA	10.5
MERCURY	NA	0.42 UJ
NICKEL	NA	25.8
SILVER	NA	0.5 U
ZINC	NA	115
TOTAL INORGANICS (UG/L)		
ALUMINUM	16.2 J	NA
ARSENIC	5 UJ	NA
CADMIUM	0.2 UJ	NA
CHROMIUM	0.8 U	NA
COPPER	18.9	NA
IRON	29 J	NA
LEAD	2.9 UJ	NA
MANGANESE	9.8	NA
MERCURY	0.42 UJ	NA
NICKEL	20.8 J	NA
SILVER	0.5 U	NA
ZINC	119 J	NA
MISCELLANEOUS PARAMETERS (MG/L)		
ALKALINITY	110	NA
BIOCHEMICAL OXYGEN DEMAND	30 U	NA
BROMIDE	36 J	NA
CARBONATE ALKALINITY	110	NA
CHLORIDE	15000	NA
NITRATE	0.24	NA
SULFATE	1700	NA
TOTAL DISSOLVED SOLIDS	27000	NA
TOTAL ORGANIC CARBON	1.4	NA
TOTAL SUSPENDED SOLIDS	28	NA
MISCELLANEOUS PARAMETERS (S.U.)		
PH	7.6	NA
MISCELLANEOUS PARAMETERS (UG/L)		

LOCATION	**1020**	**1020**
SAMPLE ID	**BC-1020-SP-1296**	**BC-1020-SP-1296-F**
SAMPLE DATE	**19961212**	**19961211**
SAMPLE CODE	**NORMAL**	**NORMAL**
MATRIX	**SP**	**SP**
SAMPLE TYPE	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**
TOP DEPTH	**-9999**	**-9999**
BOTTOM DEPTH	**-9999**	**-9999**
CYANIDE	10 U	NA
PESTICIDES/PCBS (NG/L)		
2,4'-DDE	3.2 U	NA
2,4'-DDT	3 U	NA
4,4'-DDD	3 U	NA
4,4'-DDE	2.3 U	NA
4,4'-DDT	3 U	NA
ALDRIN	3.2 U	NA
ALPHA-CHLORDANE	0.1 J	NA
GAMMA-BHC (LINDANE)	3 U	NA
HEPTACHLOR	0.2 J	NA
HEPTACHLOR EPOXIDE	3 U	NA
HEXACHLOROBENZENE	1.8 U	NA
MIREX	1.2 U	NA
PCB-101	5.1 U	NA
PCB-105	2.2 U	NA
PCB-118	2.1 U	NA
PCB-128	0.1 J	NA
PCB-138	1.8 U	NA
PCB-153	2.3 U	NA
PCB-170	2.7 U	NA
PCB-18	2.1 U	NA
PCB-180	2.3 U	NA
PCB-185	3.1 U	NA
PCB-195	3 U	NA
PCB-201	2.3 U	NA
PCB-206	0.8 J	NA
PCB-28	2.6 U	NA
PCB-29	2.5 U	NA
PCB-44	5.4 U	NA
PCB-50	1.7 U	NA
PCB-52	3.1 U	NA
PCB-66	7.3 U	NA
PCB-8	3.7 U	NA
PCB-87	3.2 U	NA
TEQ PCB-HH-HALFND	6.5E-05 U	NA
TOTAL AROCLOR	2	NA
TOTAL PCB CONGENERS	1	NA
TOTAL PCB CONGENERS-HH-HALFND	60.3	NA
TRANS-NONACHLOR	3 U	NA

LOCATION	**1020**	**1020**
SAMPLE ID	**BC-1020-SP-1296**	**BC-1020-SP-1296-F**
SAMPLE DATE	**19961212**	**19961211**
SAMPLE CODE	**NORMAL**	**NORMAL**
MATRIX	**SP**	**SP**
SAMPLE TYPE	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**
TOP DEPTH	**-9999**	**-9999**
BOTTOM DEPTH	**-9999**	**-9999**
POLYCYCLIC AROMATIC HYDROCARBONS (NG/L)		
1,1-BIPHENYL	3.1 U	NA
ACENAPHTHENE	6 U	NA
ACENAPHTHYLENE	0.3 J	NA
ANTHRACENE	2.5 U	NA
BAP EQUIVALENT-HALFND	14.5522	NA
BAP EQUIVALENT-POS	0.2	NA
BENZO(A)ANTHRACENE	24.1 U	NA
BENZO(A)PYRENE	0.2 J	NA
BENZO(B)FLUORANTHENE	13.6 U	NA
BENZO(E)PYRENE	4.3 U	NA
BENZO(G,H,I)PERYLENE	8.2 U	NA
DIBENZO(A,H)ANTHRACENE	23 U	NA
FLUORANTHENE	10.5 U	NA
FLUORENE	12.3 U	NA
HIGH MOLECULAR WEIGHT PAHS	NA	NA
INDENO(1,2,3-CD)PYRENE	18.4 U	NA
LOW MOLECULAR WEIGHT PAHS	NA	NA
NAPHTHALENE	6.8 U	NA
PERYLENE	3.3 U	NA
PHENANTHRENE	10.3 U	NA
PYRENE	0.7 J	NA
SEMIVOLATILES (NG/L)		
1-METHYLNAPHTHALENE	14.1 U	NA
1-METHYLPHENANTHRENE	7.1 U	NA
2,3,5-TRIMETHYLNAPHTHALENE	9.9 U	NA
2,6-DIMETHYLNAPHTHALENE	6.4 U	NA
2-METHYLNAPHTHALENE	29.4 U	NA
CHRYSENE	12.3 U	NA
HIGH MOLECULAR WEIGHT PAHS	0.9	NA
LOW MOLECULAR WEIGHT PAHS	0.3	NA
TOTAL PAHS	1.2	NA

B.2 STATISTICAL EVALUATIONS

B.2.1 AREA WITH NO DEBRIS EVALUATIONS

Area with No Debris Evaluation

Statistical analyses were computed to determine if the area with no debris filled before 1910 around the former location of Building 237 is sufficiently different from the rest of OU7. Surface and subsurface soil concentrations for copper, lead, and BAP equivalents were used in the statistical evaluation.

The comparison of the area with no debris with the rest of OU7 data was performed using summary statistics, probability plots, box and whisker plots, histograms, and the Wilcox Rank Sum (WRS) test. Due to the limited number of samples in the area with no debris there may be low power associated with the results of the WRS and differences may not be detected by the test even when real differences exist between the two datasets. Therefore for the final conclusion more weight was placed on the visual inspection of the normal probability plots, boxplots, histograms, and summary statistics than the WRS test.

Probability Plots

Probability plots are a useful first set for visually comparing two data sets in a single graph. The probability plot is useful because it provides a direct visual comparison of the two data sets. If the area with no debris and OU7 data distributions were exactly identical, the plotted values would lie on a straight line through the origin. Deviations from this line show the differences between the two distributions. If the area with no debris and OU7 data distributions are similar the scattering of the two data sets will be mixed. If there is grouping of the two data sets then data sets are most likely different.

Box and Whisker Plots

As an additional aid for the population analysis, box and whisker plots were generated for the area with on debris and OU7 data.

Box and whisker plots show the central tendency, degree of symmetry, range of variation, and potential outliers of a data set. The data set is shown as a rectangular box that represents the middle 50 percent of the data. The upper value of the box (75% percentile) and the lower value of the box (25th percentile) define the top and bottom of the rectangle respectively. The median is represented by the middle line in the box.

Box and whisker plots for the same analyte in the two data sets were plotted on the same graph. The plots were visually inspected to see which data sets look similar and which ones differed. Particular attention was paid to see if the median from one data set fell within the 75th and 25th percentile range of the other data sets.

Histograms

Histograms are a visual representation of the data collected into groups. The data range is divide into several bins or classes and the data is sorted into the bins. The x-axis displays the range of the bins and the y-axis shows the number of observations that fall within the bin. The histograms of the site and background datasets were plotted on top of each other to able to compare the range of concentrations and the ranges of concentrations that have the most samples.

Wilcoxon Rank Sum Test

As stated above, the data were analyzed to determine whether they are similar. The Wilcoxon Rank-Sum (WRS) nonparametric test is used to test for a shift in location between two independent populations. When computing the WRS the data sets need not be drawn from the normal distribution and the WRS test can handle a moderate number of nondetected values by treated them as ties. The Wilcoxon Rank Sum test was performed using the R software.

H_o: Average Area with no debris concentration ≥ Average OU7 concentration
H_A: Average Area with no debris concentration < Average OU7 concentration

Copper Surface Soil
From inspection of the boxplots it can be seen that the upper whisker of the area with no debris data is approximately equal to the median OU7 concentration. The p-value for the WRS test appears beneath the box plots. The p-value is 0.03 and therefore it is concluded that the average area with on debris concentrations are less than the OU7 concentrations. From inspection of the normal probability plot it can be seen that the area with no debris concentrations only appear in the lower tail of the mixed data sets. The area with no debris histogram is found in the first bin of the OU7 histogram indicating that the area with no debris concentrations are not shifted above the OU7 concentrations. The summary statistics show that the maximum area with no debris concentration is less than the 75th OU7 percentile. From visual inspection of the graphical displays and the results of the WRS test it can be concluded that the area with no debris copper concentrations are less than the OU7 copper concentrations.

Copper Subsurface Soil
From inspection of the boxplots it can be seen that the data from the area with no debris have vary little variability and the data from OU7 appears to be shifted above the area with no debris data. The p-value for the WRS test appears beneath the box plots. The p-value for the WRS test is 0.02 and therefore it can be concluded that the average area with no debris concentrations are less than the OU7 concentrations. By examining the normal probability plot it can be seen that the area with no debris concentrations occur in the lower tail and only OU7 data appear in the upper half of the combined data set. The area with no debris histogram is found in the first bin of the OU7 histogram indicating that the area with no debris concentrations are not shifted above the OU7 concentrations. From examination of the summary statistics the maximum area with no debris concentration is less than the OU7 25th percentile. From visual inspection of the graphical displays and the results of the WRS it can be concluded that the area with no debris copper subsurface concentrations are less than the OU7 copper concentrations.

Lead Surface Soil
From inspection of the boxplots, it can be seen that the data from the area with no debris have very little variability and the data from OU7 appears to be shifted above the area with no debris data. The shift is evident by the area with no debris maximum concentration being less than the OU7 75th percentile. The p-value for the WRS is presented beneath the boxplots. The p-value is 0.03, and therefore it can be concluded that the average area with no debris concentrations are less than the average OU7 concentrations. By examining the normal probability plot it can be seen that the area with no debris concentrations occur in the lower tail of the data distribution and only the OU7 concentrations appear in the upper tail of the data distribution. The area with no debris histogram is found in the first bin of the OU7 histogram indicating that the area with no debris concentrations are not shifted above the OU7 concentrations. By examining the summary statistics it can be seen that the maximum concentration is less than the 75th percentile of the OU7 concentrations. From visual inspection of the graphical displays and the results of the WRS test it can be concluded that the area with no debris lead surface soil concentrations are less than the OU7 lead surface soil concentrations.

Lead Subsurface Soil
From inspection of the boxplots, it can be seen that the data from the area with no debris have vary little variability and the data from OU7 appears to be shifted above the area with no debris data. The shift is evident by the area with no debris maximum concentration being less than the OU7 75th percentile. The p-value for the WRS is presented beneath the boxplots. The p-value is 0.03, and therefore it can be concluded that the average area with no debris concentrations are less than the average OU7 concentrations. By examining the normal probability plot it can be seen that the area with no debris concentrations occur in the lower tail of the data distribution and only the OU7 concentrations appear in the upper tail of the data distribution. The area with no debris histogram is found in the first bin of the OU7 histogram indicating that the area with no

debris concentrations are not shifted above the OU7 concentrations. By examining the summary statistics it can be seen that the maximum concentration is less than the 75th percentile and average OU7 concentration. From visual inspection of the graphical displays and the results of the WRS test it can be concluded that the area with no debris lead subsurface soil concentrations are less than the OU7 lead subsurface soil concentrations.

Benzo(a)pyrene equivalents Surface Soil

From inspection of the boxplots, it can be seen that the data from the area with no debris have vary little variability and the data from OU7 appears to be shifted above the area with no debris data. The shift is evident by the area with no debris maximum concentration being less than the OU7 25th percentile. The p-value for the WRS is presented beneath the boxplots. The p-value is 0.0, and therefore it can be concluded that the average area with no debris concentrations are less than the average OU7 concentrations. By examining the normal probability plot it can be seen that the area with no debris concentrations occur in the lower tail of the data distribution and only the OU7 concentrations appear in the upper tail of the data distribution. The area with no debris histogram is found in the first bin of the OU7 histogram indicating that the area with no debris concentrations are not shifted above the OU7 concentrations. By examining the summary statistics it can be seen that the maximum concentration is less than the 25th percentile of the OU7 concentrations and is less than half the OU7 median concentration. From visual inspection of the graphical displays and the results of the WRS test it can be concluded that the area with no debris benzo(a)pyrene equivalents surface soil concentrations are less than the OU7 benzo(a)pyrene surface soil concentrations.

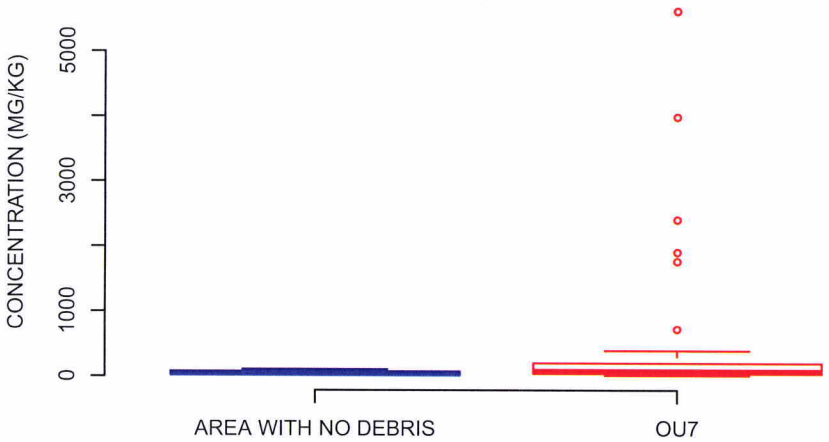
Benzo(a)pyrene equivalents Subsurface Soil

From inspection of the boxplots, it can be seen that the data from the area with no debris have vary little variability and the data from OU7 appears to be shifted above the area with no debris data. The shift is evident by the area with no debris maximum concentration being less than the OU7 median concentration. The p-value for the WRS is presented beneath the boxplots. The p-value is 0.02, and therefore it can be concluded that the average area with no debris concentrations are less than the average OU7 concentrations. By examining the normal probability plot it can be seen that the area with no debris concentrations occur in the lower tail of the data distribution and only the OU7 concentrations appear in the upper tail of the data distribution. The area with no debris histogram is found in the first bin of the OU7 histogram indicating that the area with no debris concentrations are not shifted above the OU7 concentrations. By examining the summary statistics it can be seen that the maximum concentration is less than the median OU7 concentration. From visual inspection of the graphical displays and the results of the WRS test it can be concluded that the area with no debris benzo(a)pyrene equivalents subsurface soil concentrations are less than the OU7 benzo(a)pyrene subsurface soil concentrations.

Based on the statistical analyses comparing the area with no debris filled before 1910 around the former location of Building 237 to the rest of OU7 it can be concluded that the area with no debris is sufficiently different than the rest of OU7..

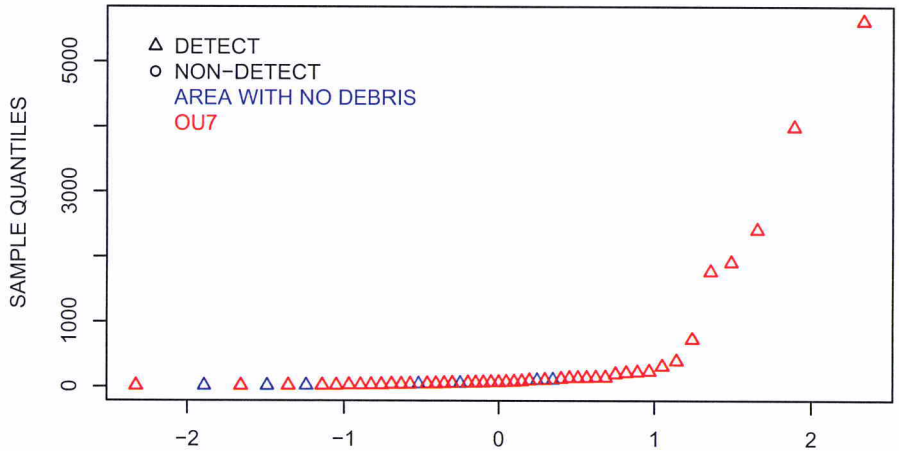
COPPER AREA WITH NO DEBRIS SURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 1 OF 6

BOXPLOT



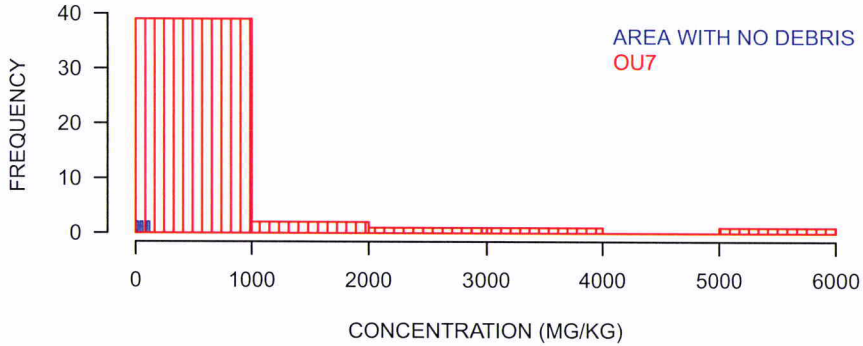
WILCOX RANK SUM P-VALUE 0.03

NORMAL PROBABILITY PLOT



THEORETICAL QUANTILES
SHAPIRO WILK P-VALUE = 0

HISTOGRAMS



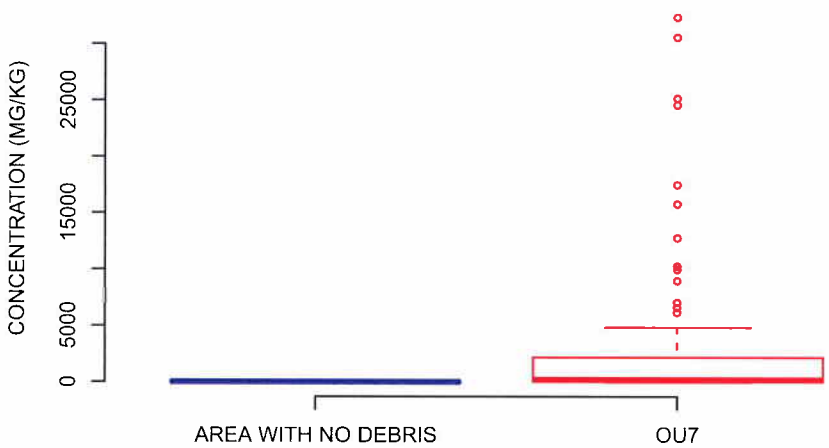
SUMMARY STATISTICS

	AREA WITH NO DEBRIS	OU7
MINIMUM	16	13
25TH PERCENTILE	19	42
MEDIAN	45	74
MEAN	52	460
75TH PERCENTILE	79	200
MAXIMUM	110	5600

UNITS ARE MG/KG
1/2 DETECTION LIMIT USED FOR NON-DETECTS
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

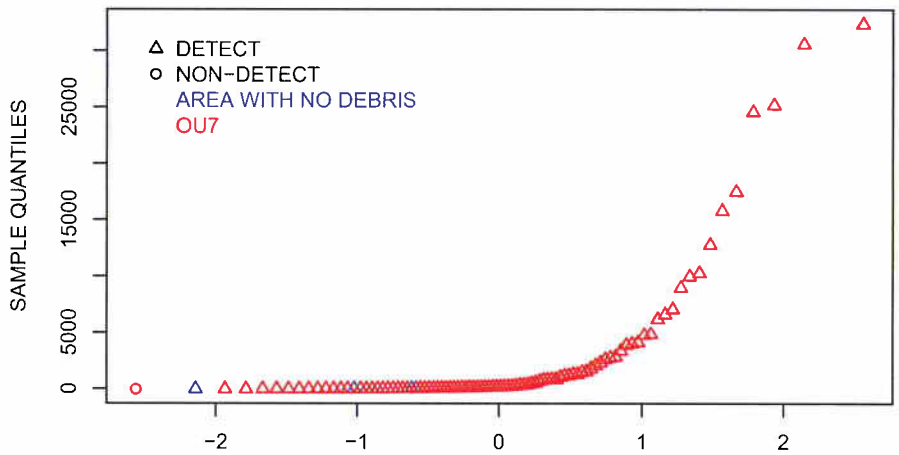
COPPER AREA WITH NO DEBRIS SUBSURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 2 OF 6

BOXPLOT



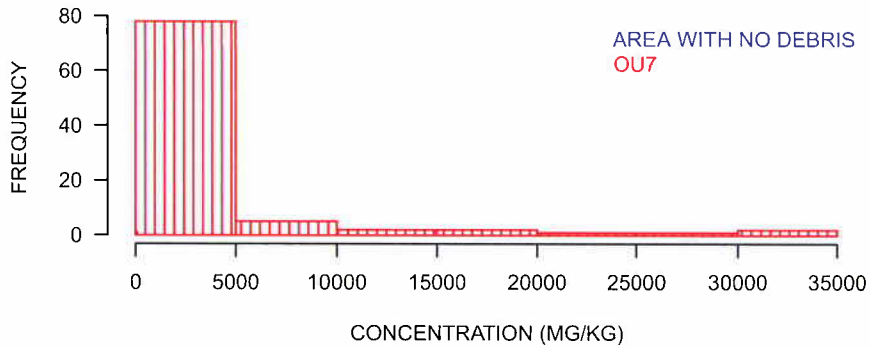
WILCOX RANK SUM P-VALUE 0.02

NORMAL PROBABILITY PLOT



THEORETICAL QUANTILES
SHAPIRO WILK P-VALUE = 0

HISTOGRAMS



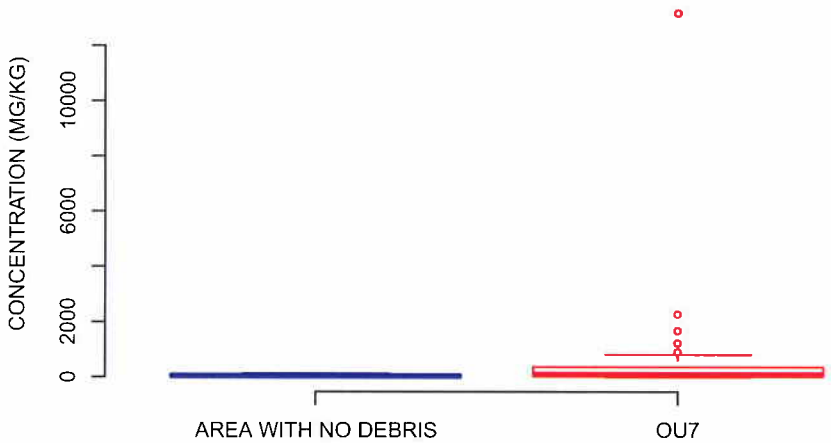
SUMMARY STATISTICS

	AREA WITH NO DEBRIS	OU7
MINIMUM	6.4	2.6
25TH PERCENTILE	17	64
MEDIAN	28	230
MEAN	33	2900
75TH PERCENTILE	46	2200
MAXIMUM	63	32000

UNITS ARE MG/KG
1/2 DETECTION LIMIT USED FOR NON-DETECTS
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

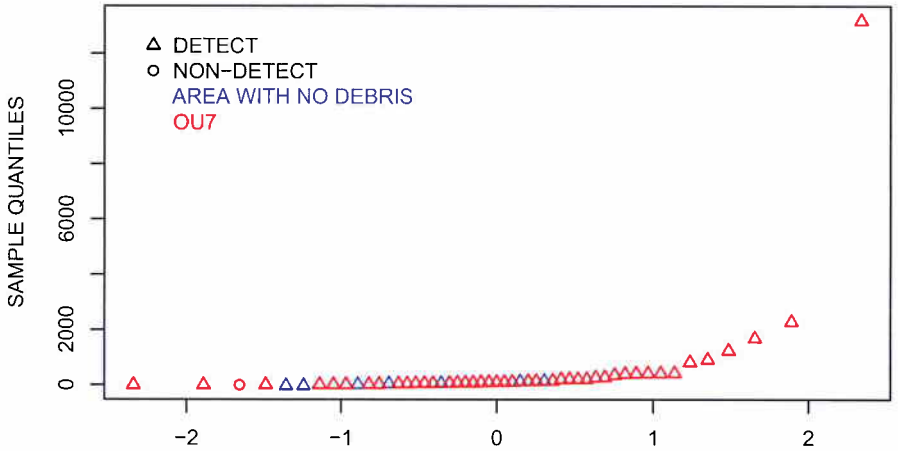
LEAD AREA WITH NO DEBRIS SURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 3 OF 6

BOXPLOT



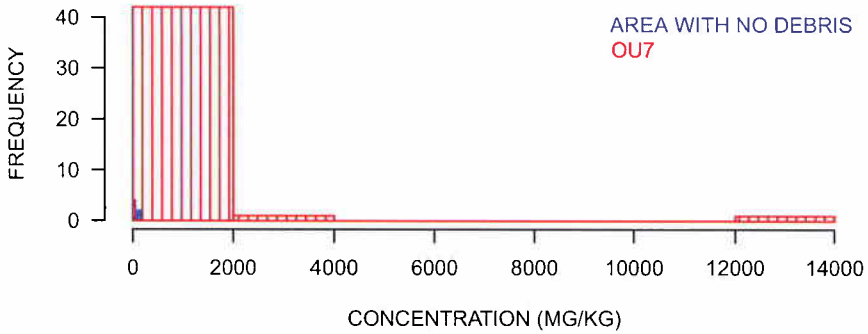
WILCOX RANK SUM P-VALUE 0.03

NORMAL PROBABILITY PLOT



THEORETICAL QUANTILES
SHAPIRO WILK P-VALUE = 0

HISTOGRAMS



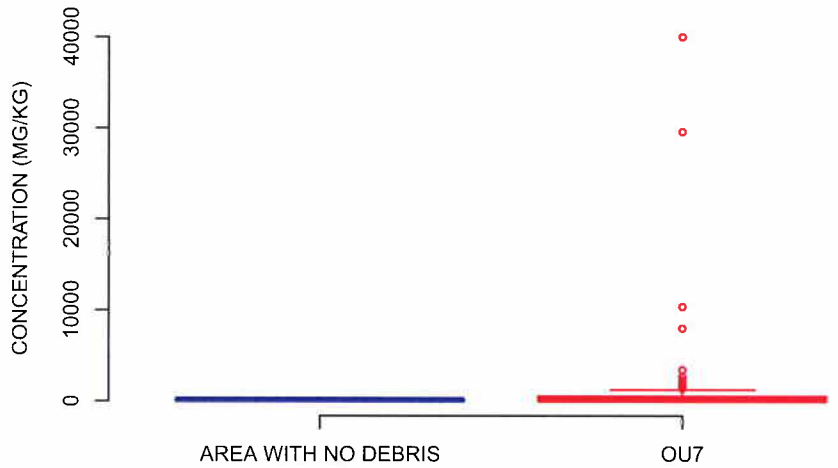
SUMMARY STATISTICS

	AREA WITH NO DEBRIS	OU7
MINIMUM	12	6.1
25TH PERCENTILE	14	57
MEDIAN	48	100
MEAN	59	580
75TH PERCENTILE	94	370
MAXIMUM	140	13000

UNITS ARE MG/KG
1/2 DETECTION LIMIT USED FOR NON-DETECTS
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

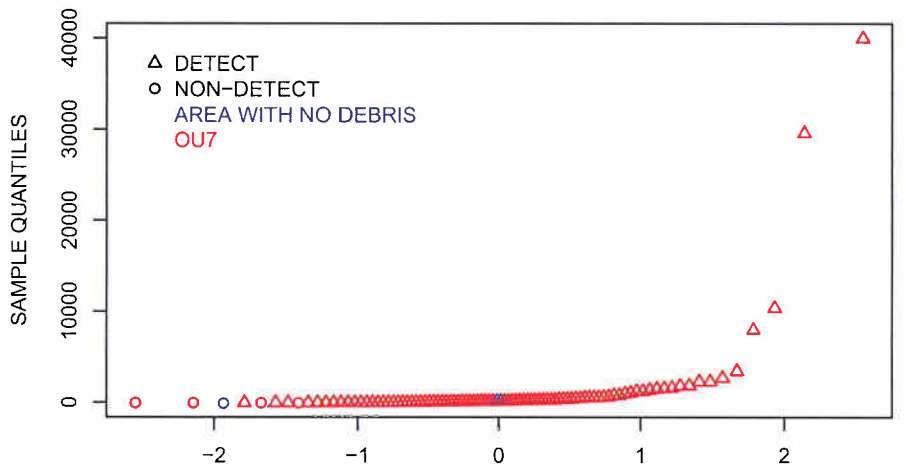
LEAD AREA WITH NO DEBRIS SUBSURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 4 OF 6

BOXPLOT



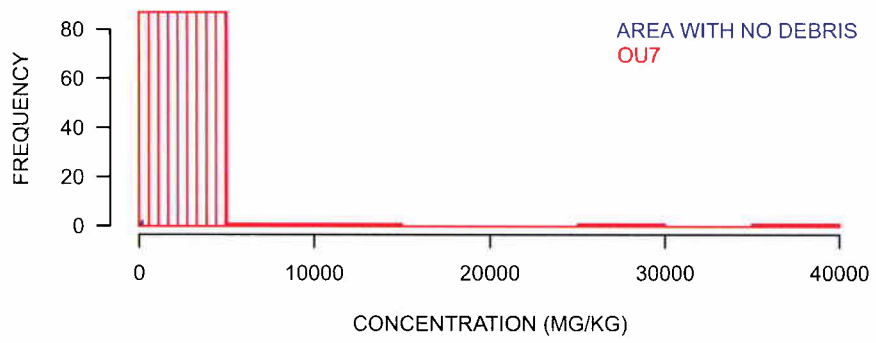
WILCOX RANK SUM P-VALUE 0.17

NORMAL PROBABILITY PLOT



THEORETICAL QUANTILES
SHAPIRO WILK P-VALUE = 0

HISTOGRAMS



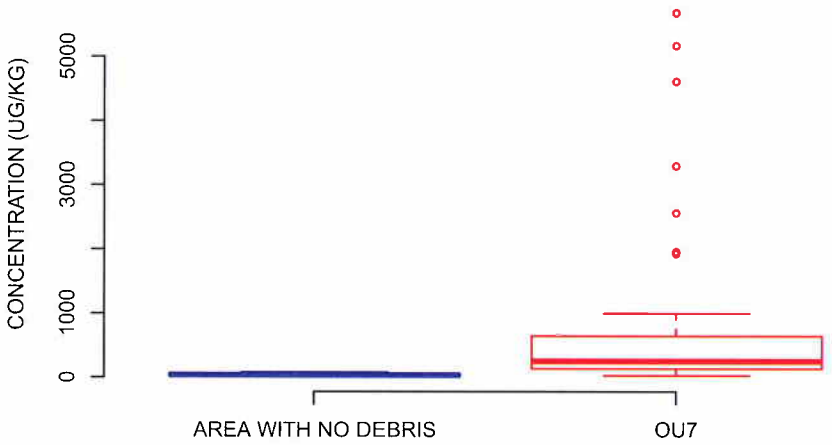
SUMMARY STATISTICS

	AREA WITH NO DEBRIS	OU7
MINIMUM	3.3	1.9
25TH PERCENTILE	92	60
MEDIAN	180	180
MEAN	120	1400
75TH PERCENTILE	180	580
MAXIMUM	180	40000

UNITS ARE MG/KG
1/2 DETECTION LIMIT USED FOR NON-DETECTS
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

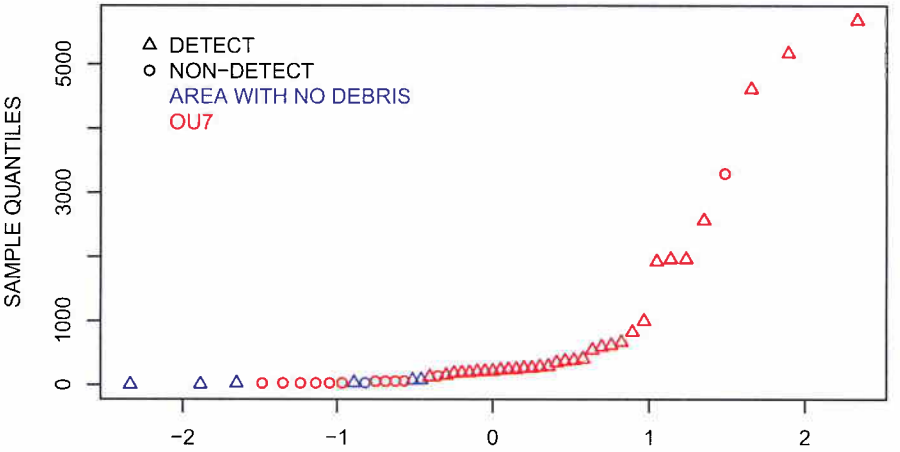
BAP EQUIVALENT-HALFND AREA WITH NO DEBRIS SURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 5 OF 6

BOXPLOT



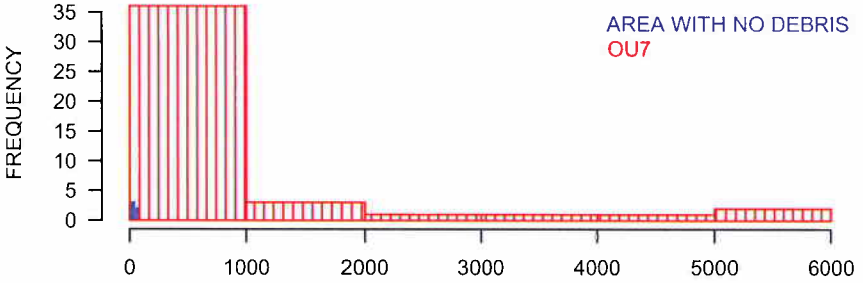
WILCOX RANK SUM P-VALUE 0

NORMAL PROBABILITY PLOT



THEORETICAL QUANTILES
SHAPIRO WILK P-VALUE = 0

HISTOGRAMS



CONCENTRATION (UG/KG)

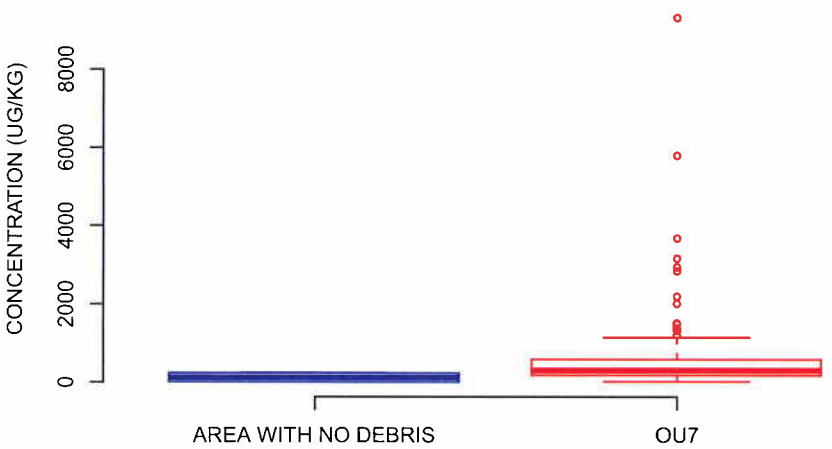
SUMMARY STATISTICS

	AREA WITH NO DEBRIS	OU7
MINIMUM	4.7	26
25TH PERCENTILE	17	140
MEDIAN	32	250
MEAN	36	830
75TH PERCENTILE	52	630
MAXIMUM	78	5700

UNITS ARE UG/KG
1/2 DETECTION LIMIT USED FOR NON-DETECTS
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

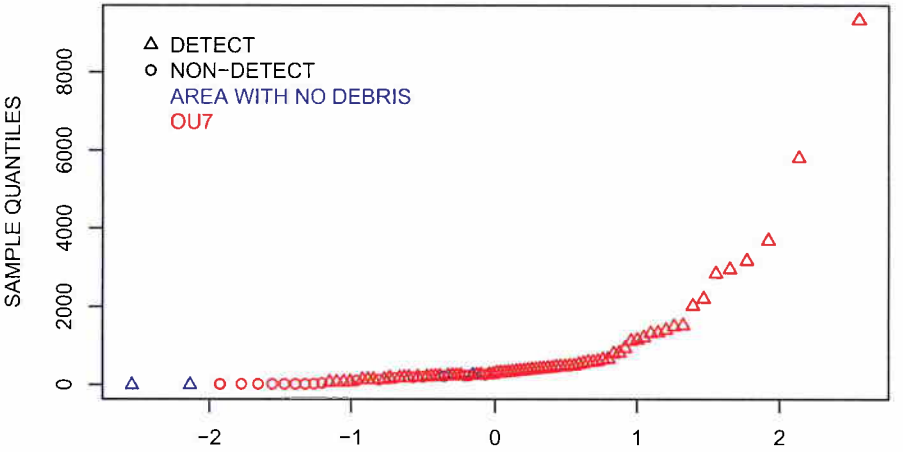
BAP EQUIVALENT-HALFND AREA WITH NO DEBRIS SUBSURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 6 OF 6

BOXPLOT



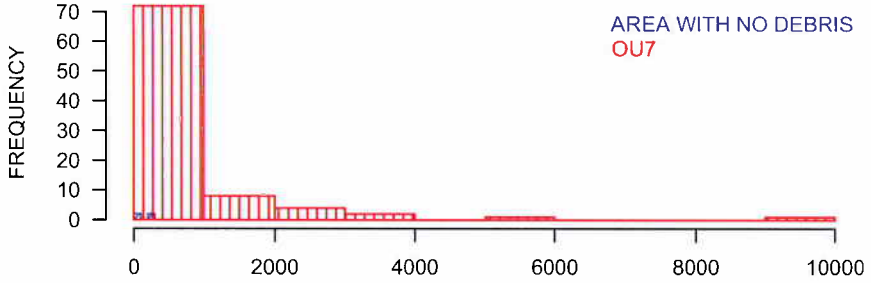
WILCOX RANK SUM P-VALUE 0.02

NORMAL PROBABILITY PLOT



THEORETICAL QUANTILES
SHAPIRO WILK P-VALUE = 0

HISTOGRAMS



CONCENTRATION (UG/KG)

SUMMARY STATISTICS

	AREA WITH NO DEBRIS	OU7
MINIMUM	7.7	28
25TH PERCENTILE	11	190
MEDIAN	120	310
MEAN	130	730
75TH PERCENTILE	240	590
MAXIMUM	250	9300

UNITS ARE UG/KG
1/2 DETECTION LIMIT USED FOR NON-DETECTS
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

B.2.2 BACKGROUND EVALUATIONS

BACKGROUND OUTLIER ANALYSIS

The Portsmouth soil background data was examined to determine if any background concentrations were statistical outliers. Outliers are extreme high or low measurements that are sometimes referred to as "spurious" data because they are highly divergent from the main population of data. Outliers can be identified by visually inspecting graphical representations of the data set and then tested using an appropriate outlier hypothesis test. Box plots, normal probability plots, and histograms were used to identify potential outliers. Visual plots were constructed on the raw data and on the log-transformed data. Visual inspection of the data was first made using the raw data and if the data can not be modeled by a normal distribution then the visual plots of the log transformed data were made. After determining which distribution, if any, can be used to model the data then an appropriate outlier test was computed on any potential outliers.

Box plots show the central tendency, degree of symmetry, range of variation, and potential outliers of a data set. The data set is shown as a rectangular box that represents the middle 50 percent of the data. The 75th percentile and the 25th percentile define the top and bottom of the rectangle respectively. The median is represented by the middle line in the box. Potential outliers are identified as concentrations greater than 1.5 times the difference between the 75th percentile and the 25th percentile.

Normal probability plots are a visual method to roughly determine how well the data set is modeled by a normal distribution and also identify potential outliers. The normal probability plot is a graph of the quantiles of the data set against the quantiles from the normal distribution. If the normal probability plot is approximately linear, then this is an indication that the data are normally distributed and a formal normality test should be performed. Potential outliers on the normal probability plot will appear distant from the other values, which will be concentrated in the center of the graph. If the data follows a log normal distribution then a normal probability plot is constructed using the log-transformed data.

To determine if the data can be modeled by the normal distribution the Shapiro Wilk Test was computed. The null hypothesis is that the underlying data distribution is normally distributed. If the p-value for this test is less than 0.05 it was concluded that the underlying data distribution does not follow a normal distribution. For these analyses the Shapiro Wilk p-value is displayed on the bottom of the normal probability plots. The Shapiro Wilk Test can also be used to determine if the data can be modeled by the lognormal distribution. The test is the same as described above except the test is computed on the log-transformed data.

A histogram is a visual representation of the data collected into groups. This graphical technique provides a visual method of accessing location, shape and spread of the data. Also, extreme values and multiple modes can be identified. The details of the data are lost but an overall picture of the data is obtained.

After determining which distribution the data can be modeled by the appropriate outlier test was computed. The appropriate outlier test was determined by sample size and the data distribution which can be used to model the data.

<u>Aluminum</u>

From examination of the visual plots using the raw data the box plot displays a roughly symmetric distribution with no potential outliers noted. The normal probability plot shows that the data is roughly linear. The Shaprio Wilk P-value is presented below the normal probability plot. The p-value is 1 indicating that the data can be modeled by a normal distribution. The histogram shows that the data are bell-shaped with no concentrations separated from the rest of the data. Based on the symmetry, absence of any separations of concentrations on the visual plots, and the conclusion of the Shaprio Wilk test, it was concluded that the aluminum background

concentrations can be modeled by the normal distribution. From examination of the visual plots no potential outliers were found for aluminum soil concentrations.

Antimony

The box plot constructed using the raw data displays a roughly symmetric distribution with no potential outliers. The normal probability plot shows that the data is roughly linear and no inflection points are observed. The Shapiro Wilk P-value presented below the normal probability plot is greater than 0.05 so it can be concluded that the data can be modeled by a normal distribution. The histogram shows a roughly bell shaped distribution with no concentrations separated from the rest of the data. Based on the symmetry, and absence of any separations of concentrations on the visual plots, along with the conclusions of the Shaprio Wilk test, it can be concluded that the antimony background data can be modeled by a normal distribution. From examination of the visual plots using the raw antimony data no potential outliers were observed.

Aroclor 1248

The box plots constructed using the raw and log transformed concentrations display one potential outlier. Both normal probability plots show that the highest concentration is separated from the rest of the data; however, it can also be seen that all the concentrations are non-detected. Both histograms show a separation between the highest concentrations and the rest of the data. The highest concentration is located at BGS11. From the Facility Background Report, this location is described as a residential area west of Site 32. A formal outlier test was not computed because all the concentrations are non-detect. Based on the fact that all the concentrations are non-detect and the one potential outlier noted on the visual plots is from a non-industrial area, none of the Aroclor 1248 concentrations are suspected to be outliers.

Aroclor 1254

The box plots constructed using the raw and log transformed concentrations display one potential outlier. Both normal probability plots show that the highest concentration is separated from the rest of the data; however, it can also be seen that all the concentrations are non-detected. Both histograms show a separation between the highest concentrations and the rest of the data. The highest concentration is located at BGS11. From the Facility Background Report, this location is described as a residential area west of Site 32. A formal outlier test was not computed because all the concentrations are non-detect. Based on the fact that all the concentrations are non-detect and the one potential outlier noted on the visual plots is from a non-industrial area, none of the Aroclor 1254 concentrations are suspected to be outliers.

Aroclor 1260

The box plots constructed using the raw and log transformed concentrations display one potential outlier. Both normal probability plots show that the highest concentration is separated from the rest of the data; however, it can also be seen that all the concentrations are non-detected. Both histograms show a separation between the highest concentrations and the rest of the data. The highest concentration is located at BGS11. From the Facility Background Report, this location is described as a residential area west of Site 32. A formal outlier test was not computed because all the concentrations are non-detect. Based on the fact that all the concentrations are non-detect and the one potential outlier noted on the visual plots is from a non-industrial area, none of the Aroclor 1260 concentrations are suspected to be outliers.

Arsenic

The boxplots constructed using the raw and log transformed concentrations display one potential outlier. Both normal probability plots show that the highest concentration is separated from the rest of the data. Both histograms show that the highest concentration is separated from the rest

of the concentrations. The highest concentration is location at BGS 07 (residential area/shipyard commander's residence). A formal outlier test was computed on the arsenic concentrations. The dataset without the potential outlier is normally distributed and the sample size is 25 so the Extreme Value Outlier Test was computed. The hypothesis for the outlier test is that there are no outliers and the challenging position is that the maximum concentration is an outlier. The p-value for the Extreme Value Outlier Test is 0.406. Therefore, it can be concluded that the arsenic maximum concentration is not an outlier. Based on the location of the maximum concentration not being in an industrial area and the results of the Extreme Outlier Test, it can be concluded that the highest arsenic concentration is not an outlier.

Barium

From visual inspection of the graphical displays of the raw data there are two possible outliers noted. These outliers are shown on the box plot, and are separated from the rest of the data on the normal probability plot. The Shapiro Wilk p-value is 0 indicating that the data cannot be modeled by the normal distribution. The histogram shows that the raw data are right skewed (denoted by fewer samples occurring in the upper end of the concentration range). The box plot of the log transformed concentrations appears roughly symmetric. The normal probability plot appears roughly linear. The Shapiro Wilk p-value displayed below the probability plot is 0.85 indicating that the data can be modeled by the log-normal distribution. The histogram of the log transformed concentrations is roughly bell shaped. Therefore, based on visual examination of the graphical displays of the log transformed barium concentrations and the result of the Shaprio Wilk test on the log transformed concentrations, it can be concluded that none of the barium background concentrations are outliers.

Benzo(a)anthracene

From visual inspection of the raw concentrations, it appears that there is one elevated. The box plot shows that the concentrations are right skewed (i.e., upper tail is longer than the lower tail). The normal probability plot shows that there appears to be two detected concentrations separated above the rest of the data. The Shaprio Wilk p-value is 0 indicating that the data cannot be modeled by a normal distribution. The histogram shows that one concentration is separated from the rest of the data set. The box plot of the log transformed concentrations is roughly symmetric. The normal probability plot shows one concentration separated from the rest of the data set. The Shapiro Wilk p-value is 0 indicating that the data set cannot be modeled by a log-normal distribution. The histogram shows that the majority of the data set has a log transformed concentration of 5.5-6.0 ug/kg. The maximum concentration is located at BGS 14 (undeveloped area). The benzo(a)anthrancene concentrations without the potential outlier cannot be modeled by a normal or lognormal distribution. A nonparametric outlier test was computed on the dataset and it was determined that the maximum concentration is not an outlier. Based on the location of the maximum benzo(a)anthracene concentration not being located near an area suspected of industrial activity and the result of the non-parametric outlier test, it can be concluded that the maximum benzo(a)anthracene concentration is not an outlier.

Benzo(a)pyrene

From visual inspection of the raw concentrations it appears that one concentration is a potential outlier. The box plot shows that one concentration is an outlier. The normal probability plot shows that there is one detected concentration separated above the rest of the data. The Shaprio Wilk p-value is 0 indicating that the data cannot be modeled by a normal distribution. The histogram shows that one concentration is separated from the rest of the data set. The box plot of the log transformed concentrations is roughly symmetric. The normal probability plot shows one concentration separated from the rest of the data set. The Shapiro Wilk p-value is 0.02 indicating that the data set cannot be modeled by a log-normal distribution. The histogram shows one concentration separated from the rest of the data. The maximum concentration is located at BGS 14 (undeveloped area). The benzo(a)pyrene concentrations, without the

suspected outlier, cannot be modeled by a normal or log-normal distribution. Therefore, a nonparametric outlier test was computed on the dataset and it was determined that the maximum concentration is not an outlier. Based on the location of the maximum benzo(a)pyrene concentration not being located near an area suspected of industrial activity, and the result of the non-parametric outlier test, it can be concluded that the maximum benzo(a)pyrene concentration is not an outlier.

Benzo(b)fluoranthene

From visual inspection of the raw benzo(b)fluoranthene concentrations it appears that one concentration is a potential outlier. The box plot displays one outlier while the normal probability plot displays one concentration elevated above the rest of the data set. The Shaprio Wilk p-value is 0 indicating that the data cannot be modeled by a normal distribution. The histogram displays one concentration separated from the rest of the data set. The box plot of the log transformed concentrations is right skewed (longer upper tail). The normal probability plot shows one concentration separated from the rest of the data set. The Shapiro Wilk p-value is 0.04 indicating that the data set cannot be modeled by a log-normal distribution. The histogram shows one concentration separated from the rest of the data. The maximum concentration is located at BGS 14 (undeveloped area). The benzo(b)fluoranthene concentrations without the suspected outlier cannot be modeled by a normal or log-normal distribution. Therefore, a nonparametric outlier test was computed on the dataset and it was determined that the maximum concentration is an outlier. Based on the outlier test and visual inspection of the graphical displays, the maximum benzo(b)fluoranthene concentration is an outlier.

Benzo(k)fluoranthene

From visual inspection of the raw benzo(k)fluoranthene concentrations it appears that one concentration is a potential outlier. The box plot displays one outlier while the normal probability plot displays one concentration elevated above the rest of the data set. The Shaprio Wilk p-value is 0 indicating that the data cannot be modeled by a normal distribution. The histogram displays one concentration separated from the rest of the data set. The box plot of the log transformed concentrations is roughly symmetric. The normal probability plot shows one concentration separated from the rest of the data set. The Shapiro Wilk p-value is 0.0 indicating that the data set cannot be modeled by a log-normal distribution. The histogram shows the majority of the data set have concentrations between 5.5 and 6 ug/kg. The maximum concentration is located at BGS 14 (undeveloped area). The benzo(k)fluoranthene concentrations without the suspected outlier cannot be modeled by a normal or log-normal distribution. Therefore, a nonparametric outlier test was computed on the dataset and it was determined that the maximum concentration is an outlier. Based on the outlier test and visual inspection of the graphical displays, the maximum benzo(k)fluoranthene concentration is an outlier.

Cadmium

From examination of the visual plots using the raw data the box plot displays a slightly right skewed distribution (longer upper tail) with no potential outliers noted. The normal probability plot shows that the data is roughly linear. The Shaprio Wilk P-value is presented below the normal probability plot. The p-value is 0.02 indicating that the data cannot be modeled by a normal distribution. The histogram shows no separations in concentrations. The box plot of the log transformed concentration is slightly left skewed (longer lower tail) with no outliers. The normal probability plot is roughly linear; however the Shapiro Wilk p-value is 0.02 indicating that the data cannot be modeled by a log-normal distribution. There are no separations between concentrations on the histogram of the log-normal data. Based on the absence of any separations of concentrations on the box plots, no potential outliers were found for cadmium soil concentrations.

Chromium

The box plot constructed using the raw data displays a roughly symmetrical distribution with no potential outliers. The normal probability plot shows that the data is roughly linear and no inflection points are observed. The Shapiro Wilk P-value presented below the normal probability plot is 0.97 indicating that the data set can be modeled by a normal distribution. The histogram shows a roughly bell shaped distribution with no concentrations separated from the rest of the data. Based on the symmetry and absence of any separations of concentrations on the visual plots along with the conclusions of the Shaprio Wilk test, it can be concluded that the chromium background data can be modeled by a normal distribution. From examination of the visual plots using the raw chromium data, no potential outliers were observed.

Cobalt

One outlier is noted on the box plot, and one concentration is separated from the rest of the data on the normal probability plot. The Shapiro Wilk p-value is 0.25 indicating that the data can be modeled by the normal distribution. The histogram is roughly bell shaped with one separation of concentrations. The maximum concentration is from location BGS 13 (football field/residential area). The data can be modeled by the normal distribution and the sample size is 25 so the Extreme Value Outlier test was computed for the one suspected outlier. The outlier test concluded that the maximum concentration is an outlier. Based on the location of the outlier being in an area not suspected of industrial use, the outlier was used in the background data set.

Copper

From visual inspection of the graphical displays of the raw data, there are four possible outliers noted. These outliers are shown on the box plot, and an inflection point is present on the normal probability plot between the four highest concentrations and the rest of the data. The Shapiro Wilk p-value is 0 indicating that the data cannot be modeled by the normal distribution. The histogram shows that the raw data are right skewed (denoted by fewer samples occurring in the upper end of the concentration range). The box plot of the log transformed concentrations appears roughly symmetrical and the normal probability plot appears roughly linear. The Shapiro Wilk p-value displayed below the probability plot is 0.42 indicating that the data can be modeled by the log-normal distribution. The histogram has no separation of concentrations. Therefore, based on visual examination of the graphical displays of the log transformed copper concentrations and the result of the Shaprio Wilk test on the log transformed concentrations, it can be concluded that none of the copper background concentrations are outliers.

Dibenzo(a,h)anthracene

No outliers are present on the box plot of the raw data set. The normal probability plot shows that the two detected concentrations are the two lowest concentrations, and that the majority of the data set is non-detected. The lowest concentrations are separated from the rest of the data set on the histogram. Based on the majority of the data set being non-detected and the two detected concentrations being the lowest values, it can be concluded that none of the dibenzo(a,h)anthracene concentrations are outliers.

Dieldrin

From visual inspection of the raw dieldrin concentrations, it appears that one concentration is a potential outlier. One concentration is plotted as an outlier on the box plot. The highest concentration on the normality plot is separated from the rest of the data set; however, all the concentrations are non-detected. The highest concentration on the histogram is separated from the rest of the data set. The location of the maximum concentration is BGS 11 (residential area west of Site 32). Because the location of the maximum dieldrin concentration is not located near an area suspected of industrial activity and the concentrations are all non-detected, it can be concluded that the maximum dieldrin concentration is not an outlier

Indeno(1,2,3-cd)pyrene

The outliers plotted on the box plot using the raw data are in the lower tail. There are two groupings of concentrations on the normal probability plot; however, the majority of the concentrations in the upper tail are non-detect. Two groupings can be seen on the histogram. Because the majority of the data set is non-detect and the maximum concentration is not separated from the rest of the data in the upper end of the data set, it can be concluded that none of the indeno(1,2,3-cd)pyrene concentrations are outliers.

Iron

One outlier is noted on the box plot, and one concentration is separated from the rest of the data on the normal probability plot. The Shapiro Wilk p-value is 0.05 indicating that the data can be modeled by the normal distribution. The histogram is roughly bell shaped with one separation of concentrations. The maximum concentration is from location BGS 13 (football field/residential area). The data can be modeled by the normal distribution and the sample size is 25 so the Extreme Value Outlier test was computed for the one suspected outlier. The outlier test concluded that the maximum concentration is not an outlier. Based on the location of the maximum concentration being in an area not suspected of industrial use and the result of the Extreme Value Outlier test, it can be concluded that the maximum iron concentration is not an outlier.

Lead

One outlier is plotted on the box plot. The maximum concentration on the normal probability plot is separated from the rest of the data. The Shapiro Wilk p-value is 0 indicating that the data cannot be modeled by a normal distribution. Also, the maximum concentration on the histogram is separated from the rest of the data set. Therefore, based on the raw data set, there appears to be one potential outlier. One outlier is plotted on the box plot of the log transformed concentrations. The maximum concentration on the normal probability plot of the transformed concentrations is separated from the rest of the data set (note however that the separation is not as much as on the normal probability plot of the raw data). The Shapiro Wilk P-value is 0.58 indicating that the data can be modeled by a log-normal distribution. The histogram is roughly symmetric. Because the data can be modeled by a log-normal distribution and the sample size is 25 the Extreme Value Outlier test was computed using the log-transformed concentrations. The results of the Extreme Value Outlier concluded that the maximum concentration is not an outlier.

Manganese

One outlier is plotted on the box plot. The maximum concentration on the normal probability plot is separated from the rest of the data. The Shapiro Wilk p-value is 0.43 indicating that the data can be modeled by a normal distribution. Also, the maximum concentration on the histogram is separated from the rest of the data set. Therefore, based on the raw data set, there appears to be one potential outlier. Because the data can be modeled by a normal distribution and the sample size is 25, the Extreme Value Outlier test was computed. The results of the Extreme Value Outlier concluded that the maximum concentration is not an outlier.

Mercury

Two outliers are plotted on the box plot. The maximum concentration on the normal probability plot is separated from the rest of the data. The Shapiro Wilk p-value is 0 indicating that the data cannot be modeled by a normal distribution. Also, the maximum concentration on the histogram is separated from the rest of the data set. Therefore, based on the raw data set, there appears to be one potential outlier. One outlier is plotted on the box plot of the log transformed concentrations. The maximum concentration on the normal probability plot of the transformed

concentrations is separated from the rest of the data set (note however that the separation is not as much as on the normal probability plot of the raw data). The Shapiro Wilk P-value is 0 indicating that the data cannot be modeled by a log-normal distribution. The maximum concentration on the histogram is separated from the rest of the data set. Because the data can be modeled by a log-normal distribution when the outlier is removed and the sample size is 25, the Extreme Value Outlier test was computed using the log-transformed concentrations. The results of the Extreme Value Outlier concluded that the maximum concentration is not an outlier.

Nickel

One outlier is plotted on the box plot. The maximum concentration on the normal probability plot is separated from the rest of the data. The Shapiro Wilk p-value is 0.94 indicating that the data can be modeled by a normal distribution. The histogram is bell shaped with no separation of concentrations. Based on the box plot and normal probability plot of the raw data set, there appears to be one potential outlier. Because the data can be modeled by a normal distribution when and the sample size is 25, the Extreme Value Outlier test was computed. The results of the Extreme Value Outlier concluded that the maximum concentration is not an outlier.

Thallium

No outliers are plotted on the boxplot. There is a separation of concentrations seen on the normal probability plot. The concentrations in the grouping in the upper tail of the data set are all non-detect. The histogram shows a separation of concentrations. Because the concentrations are mainly non-detect, and the detected concentration is within the ranges of the non-detect, it can be concluded that none of the thallium concentrations are outliers.

Vanadium

No outliers are plotted on the boxplot. The normal probability plot is roughly linear and the Shapiro Wilk p-value is 0.91 indicating that the data can be modeled by the normal distribution. The histogram is roughly symmetrical with no separations of concentrations. Therefore, it can be concluded that the none of the vanadium concentrations are outliers.

Zinc

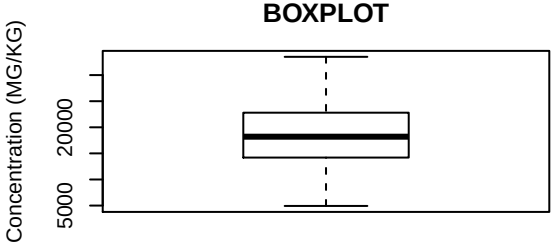
Two outliers are plotted on the box plot, and one concentration is separated from the rest of the data on the normal probability plot. The Shapiro Wilk p-value is 0 indicating that the data cannot be modeled by the normal distribution. The histogram has one concentration separated from the rest of the data set. The maximum concentration is from location BGS 18 (underdeveloped area /adjacent to cemetery). The data can be modeled by the log-normal distribution without the outlier and the sample size is 25, so the Extreme Value Outlier test was computed for the one suspected outlier. The outlier test concluded that the maximum concentration is an outlier. Based on the location of the outlier being in an area not suspected of industrial use, the outlier was used in the background data set.

TEQ

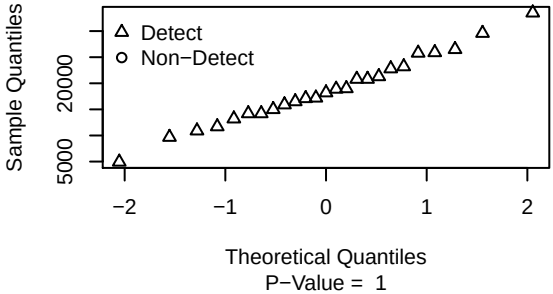
One outlier is plotted on the box plot, and one concentration is separated from the rest of the data on the normal probability plot. The Shapiro Wilk p-value is 0.01 indicating that the data cannot be modeled by the normal distribution. The histogram is right skewed and displays one concentration separated from the rest of the data. The box plot of the log normal concentrations is roughly symmetrical with no outliers plotted. The normal probability plot is roughly linear and the Shapiro Wilk p-value is 0.64 indicating that the data can be modeled by the log-normal distribution. The histogram shows no separation of concentrations. Therefore, it can be concluded that none of the TEQ concentrations are outliers.

ALUMINUM BACKGROUND OUTLIER ANALYSIS
OPERABLE UNIT 7−REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 1 OF 27

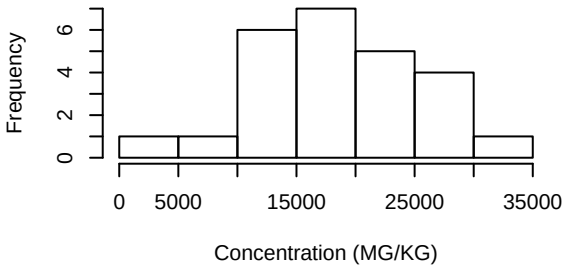
BOXPLOT



NORMAL PROBABILITY PLOT



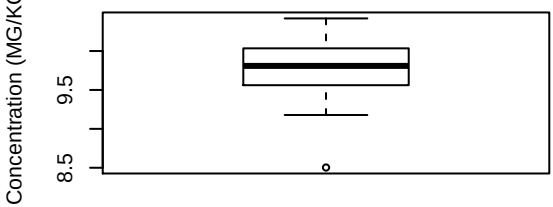
HISTOGRAM



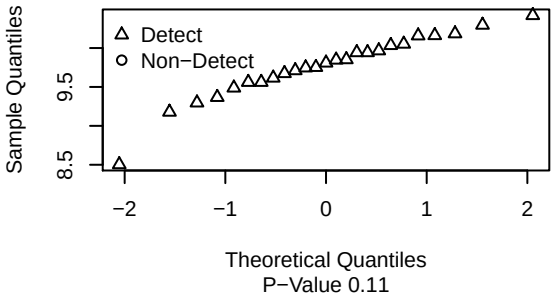
SUMMARY STATISTICS

Minimum	4930
1st Quantile	14200
Median	18200
Mean	18670
3rd Quantile	22800
Maximum	33500

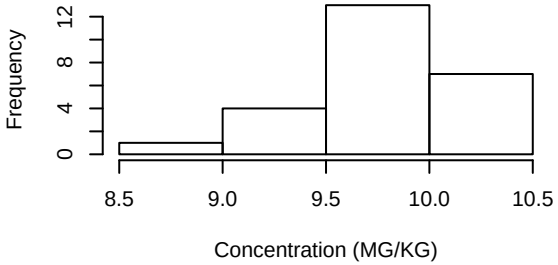
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

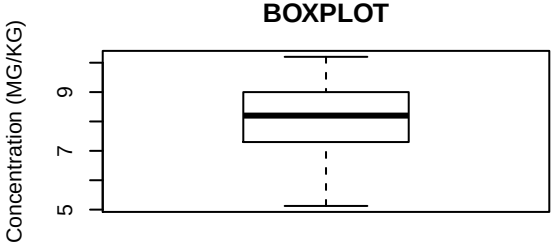


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

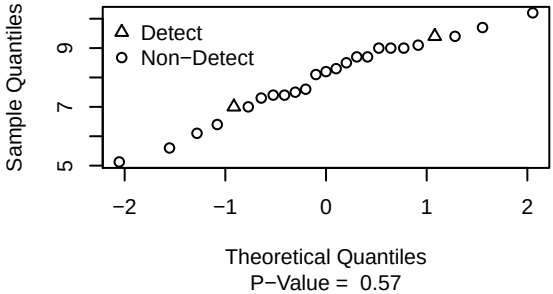
Minimum	8.5
1st Quantile	9.56
Median	9.81
Mean	9.77
3rd Quantile	10.03
Maximum	10.42

ANTIMONY BACKGROUND OUTLIER ANALYSIS
OPERABLE UNIT 7−REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 2 OF 27

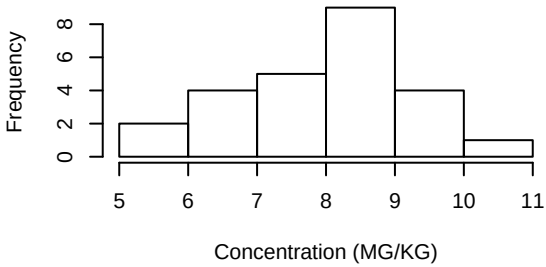
BOXPLOT



NORMAL PROBABILITY PLOT



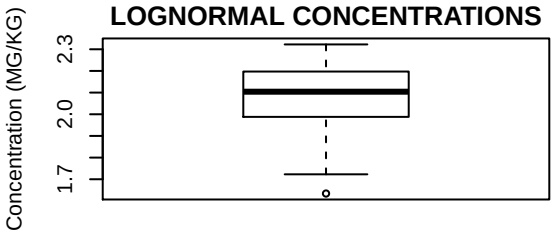
HISTOGRAM



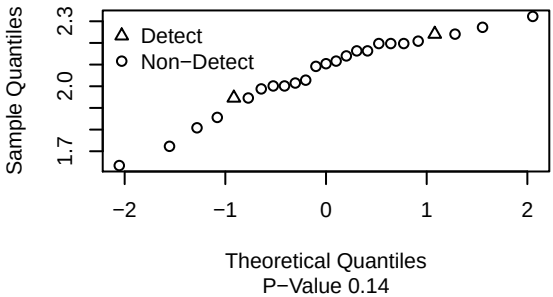
SUMMARY STATISTICS

Minimum	5.12
1st Quantile	7.3
Median	8.2
Mean	7.99
3rd Quantile	9
Maximum	10.2

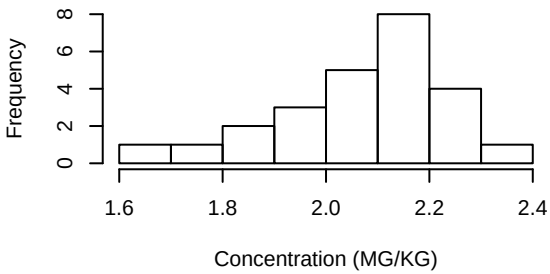
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

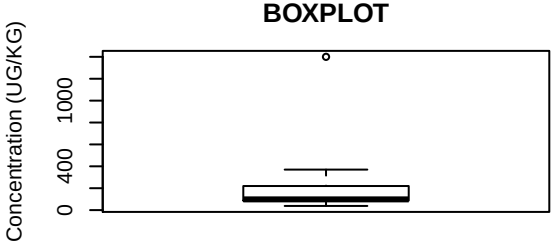


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

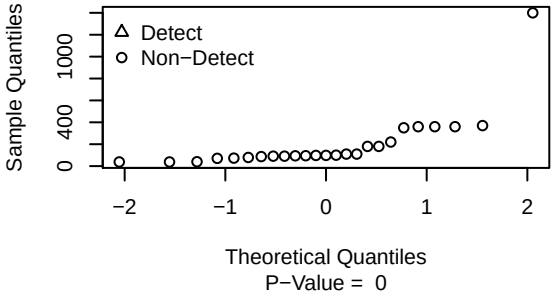
Minimum	1.63
1st Quantile	1.99
Median	2.1
Mean	2.06
3rd Quantile	2.2
Maximum	2.32

AROCLOR−1248 BACKGROUND OUTLIER ANALYSIS
OPERABLE UNIT 7−REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 3 OF 27

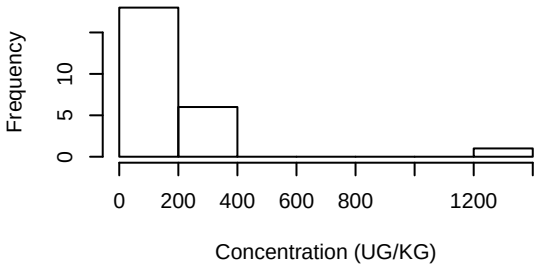
BOXPLOT



NORMAL PROBABILITY PLOT



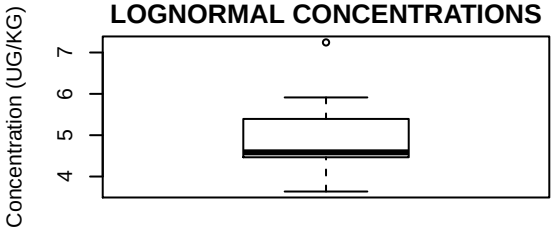
HISTOGRAM



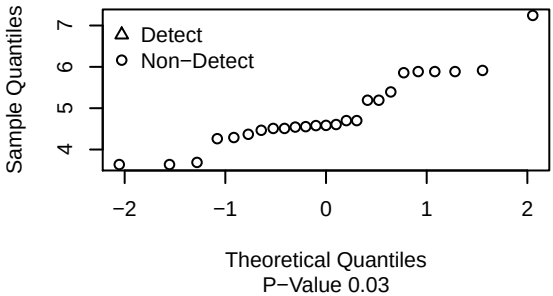
SUMMARY STATISTICS

Minimum	38
1st Quantile	87
Median	98
Mean	203.7
3rd Quantile	220
Maximum	1400

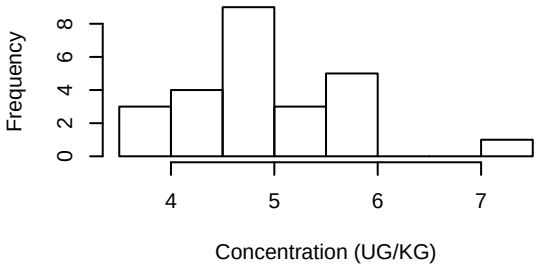
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

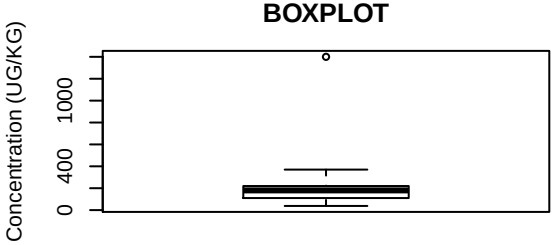


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

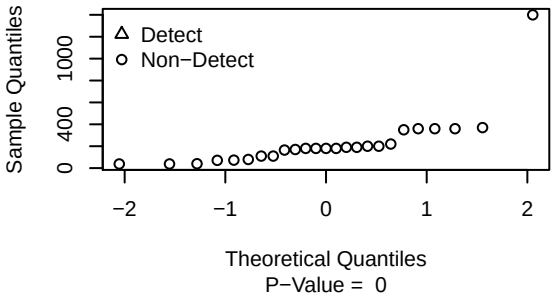
Minimum	3.64
1st Quantile	4.47
Median	4.58
Mean	4.88
3rd Quantile	5.39
Maximum	7.24

AROCLOR−1254 BACKGROUND OUTLIER ANALYSIS
OPERABLE UNIT 7−REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 4 OF 27

BOXPLOT



NORMAL PROBABILITY PLOT



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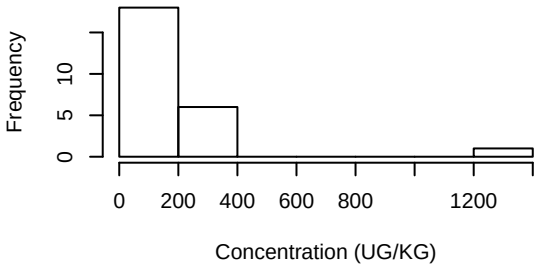
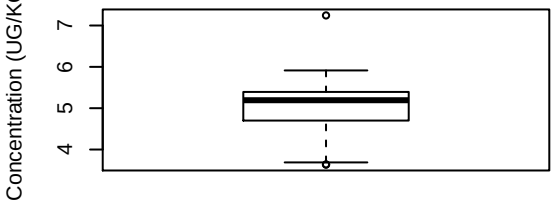


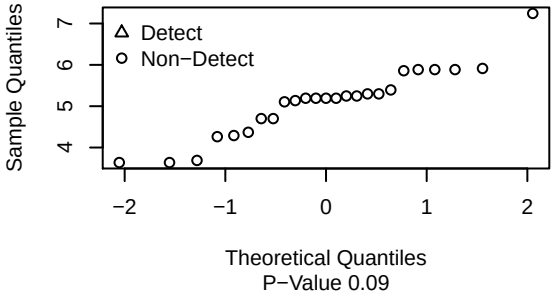
SUMMARY STATISTICS

Minimum	38
1st Quantile	110
Median	180
Mean	232.6
3rd Quantile	220
Maximum	1400

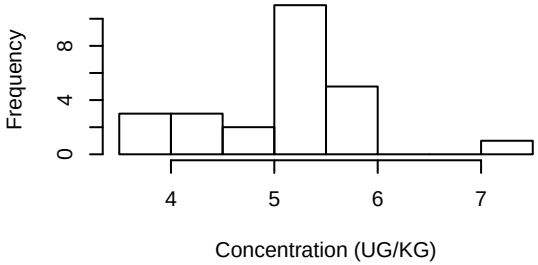
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

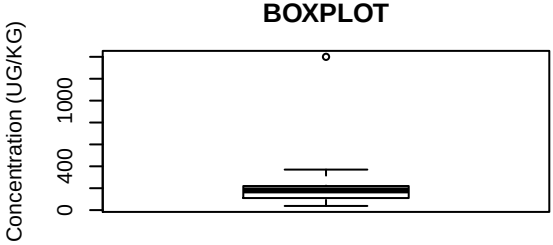


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

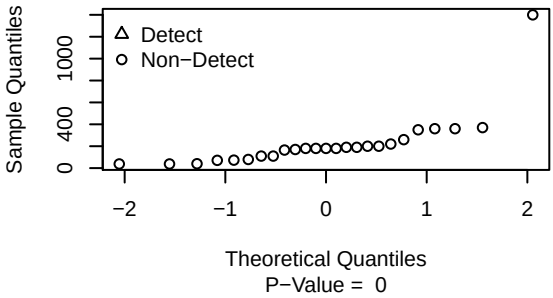
Minimum	3.64
1st Quantile	4.7
Median	5.19
Mean	5.1
3rd Quantile	5.39
Maximum	7.24

AROCLOR−1260 BACKGROUND OUTLIER ANALYSIS
OPERABLE UNIT 7−REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 5 OF 27

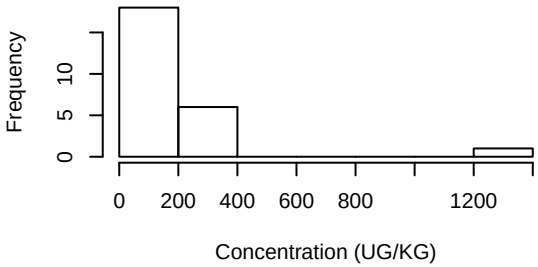
BOXPLOT



NORMAL PROBABILITY PLOT



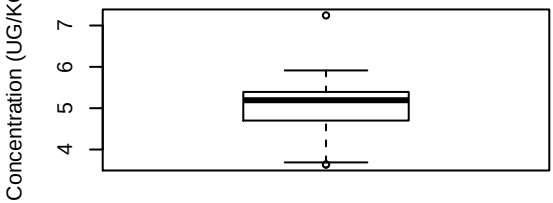
HISTOGRAM



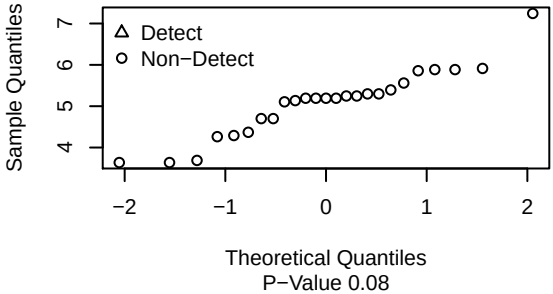
SUMMARY STATISTICS

Minimum	38
1st Quantile	110
Median	180
Mean	228.6
3rd Quantile	220
Maximum	1400

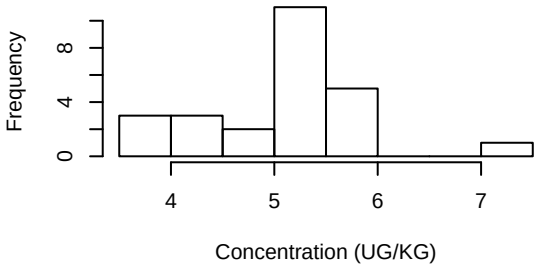
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

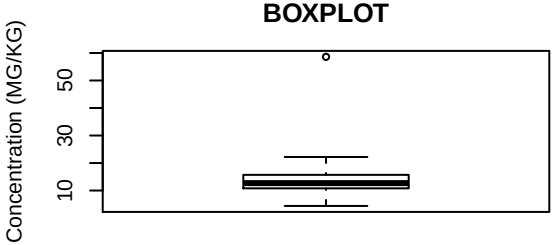


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

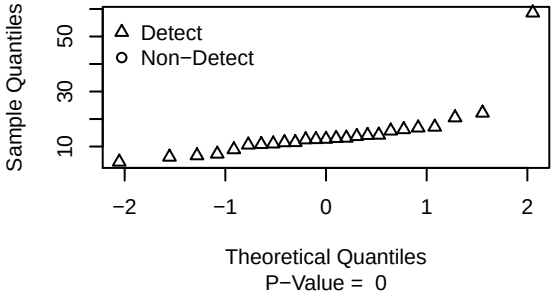
Minimum	3.64
1st Quantile	4.7
Median	5.19
Mean	5.08
3rd Quantile	5.39
Maximum	7.24

ARSENIC BACKGROUND OUTLIER ANALYSIS
OPERABLE UNIT 7−REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 6 OF 27

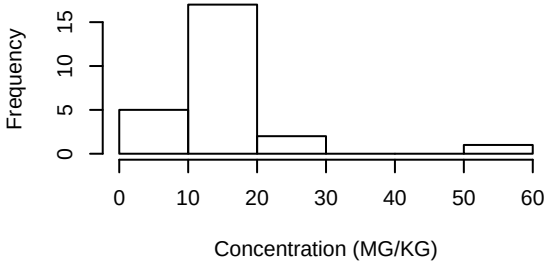
BOXPLOT



NORMAL PROBABILITY PLOT



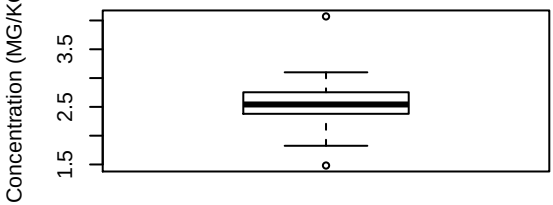
HISTOGRAM



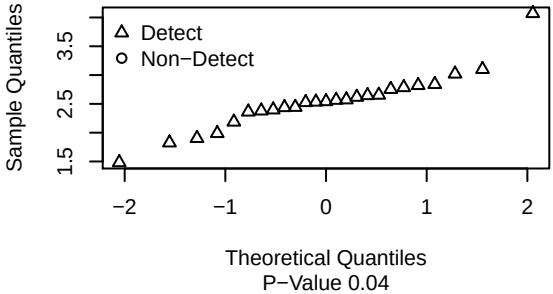
SUMMARY STATISTICS

Minimum	4.4
1st Quantile	10.8
Median	12.7
Mean	14.47
3rd Quantile	15.7
Maximum	58.6

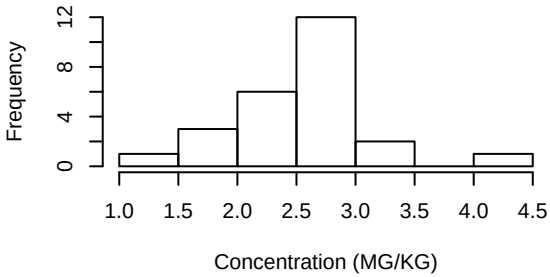
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

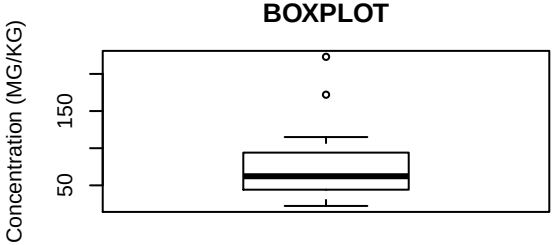


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

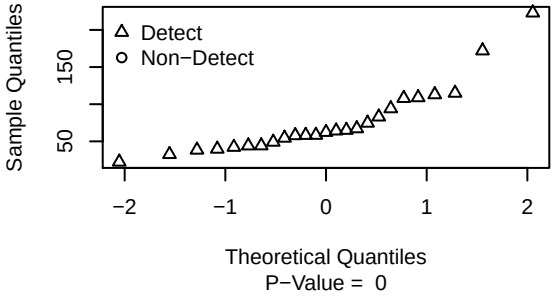
Minimum	1.48
1st Quantile	2.38
Median	2.54
Mean	2.54
3rd Quantile	2.75
Maximum	4.07

BARIUM BACKGROUND OUTLIER ANALYSIS
OPERABLE UNIT 7−REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 7 OF 27

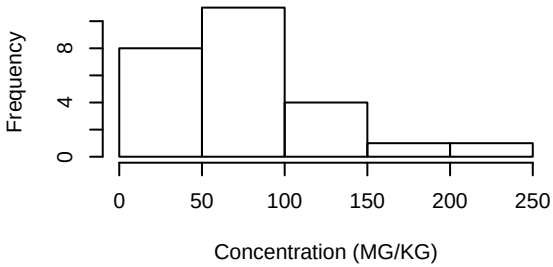
BOXPLOT



NORMAL PROBABILITY PLOT



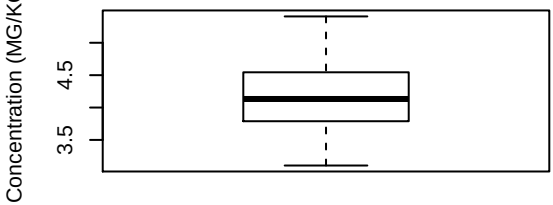
HISTOGRAM



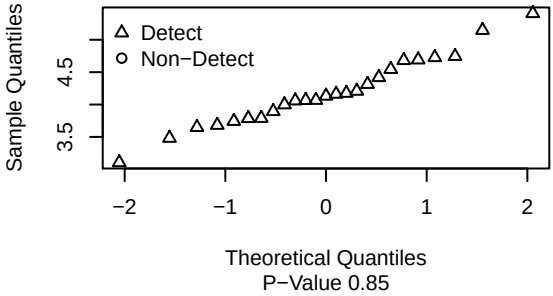
SUMMARY STATISTICS

Minimum	22.3
1st Quantile	44.2
Median	62.3
Mean	75.69
3rd Quantile	94.1
Maximum	223

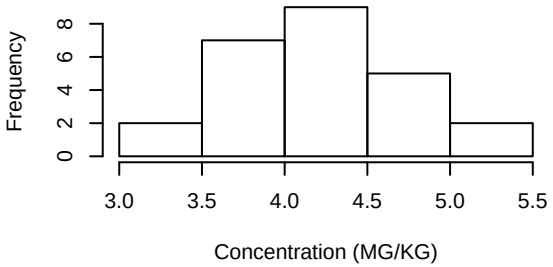
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

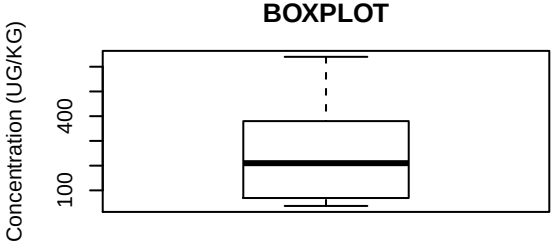


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

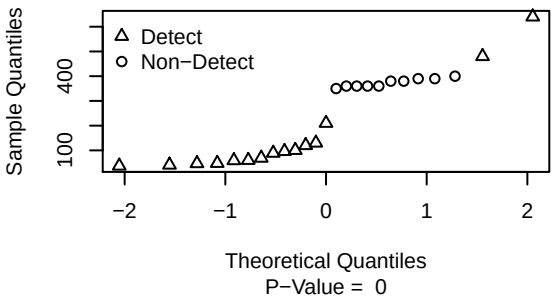
Minimum	3.1
1st Quantile	3.79
Median	4.13
Mean	4.19
3rd Quantile	4.54
Maximum	5.41

BENZO(A)ANTHRACENE BACKGROUND OUTLIER ANALYSIS
OPERABLE UNIT 7−REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 8 OF 27

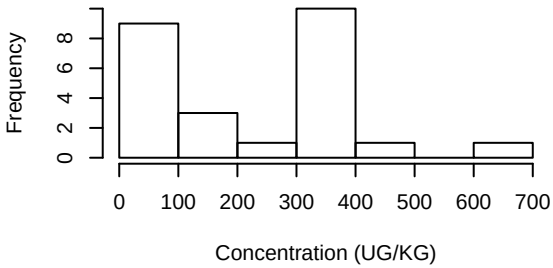
BOXPLOT



NORMAL PROBABILITY PLOT



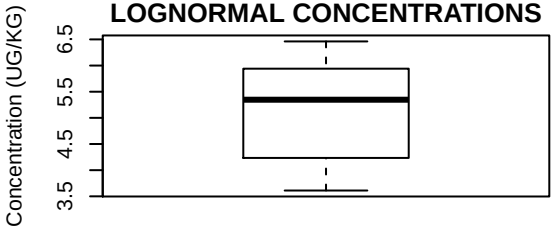
HISTOGRAM



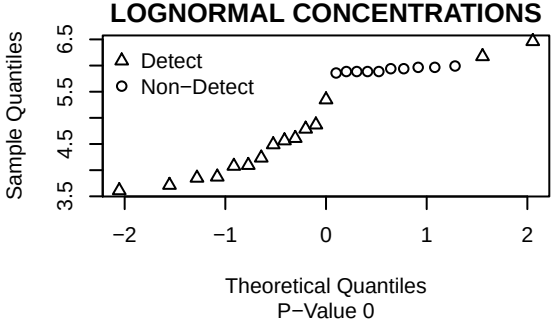
SUMMARY STATISTICS

Minimum	37
1st Quantile	69
Median	210
Mean	238.3
3rd Quantile	380
Maximum	640

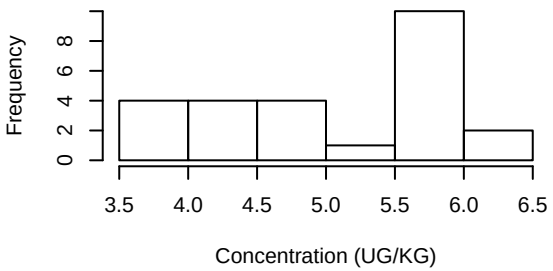
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

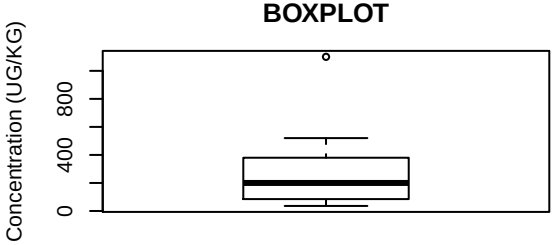


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

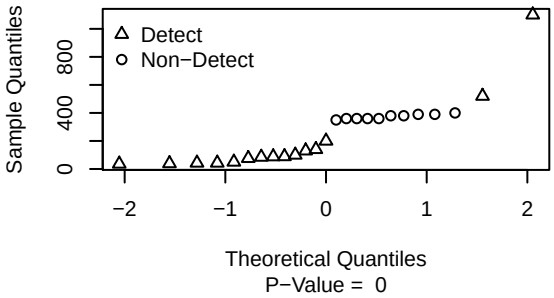
Minimum	3.61
1st Quantile	4.23
Median	5.35
Mean	5.12
3rd Quantile	5.94
Maximum	6.46

BENZO(A)PYRENE BACKGROUND OUTLIER ANALYSIS
OPERABLE UNIT 7−REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 9 OF 27

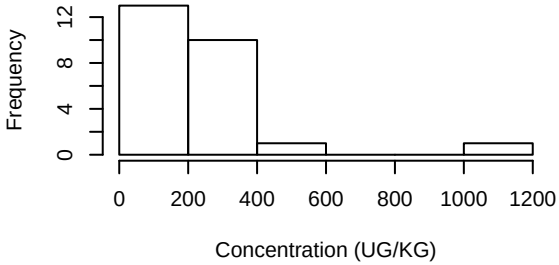
BOXPLOT



NORMAL PROBABILITY PLOT



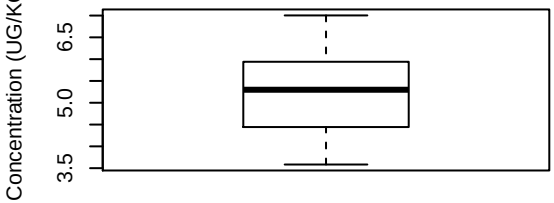
HISTOGRAM



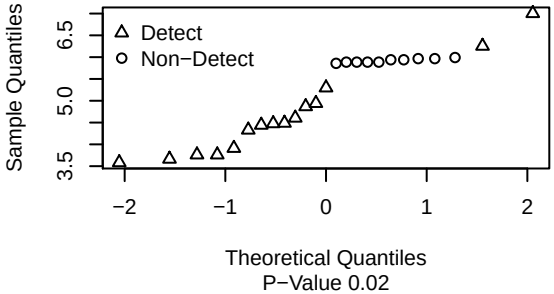
SUMMARY STATISTICS

Minimum	36
1st Quantile	85
Median	200
Mean	258.8
3rd Quantile	380
Maximum	1100

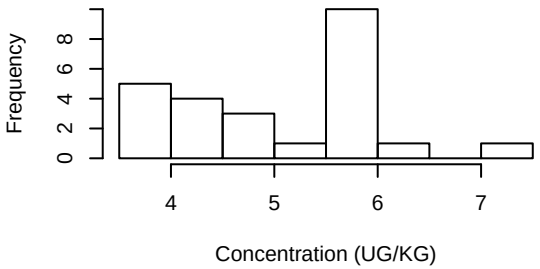
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

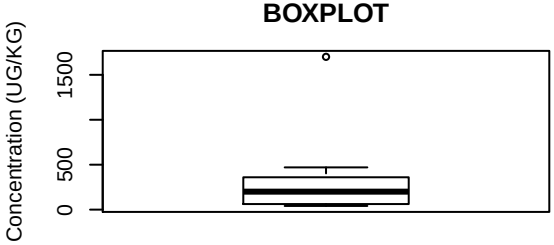


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

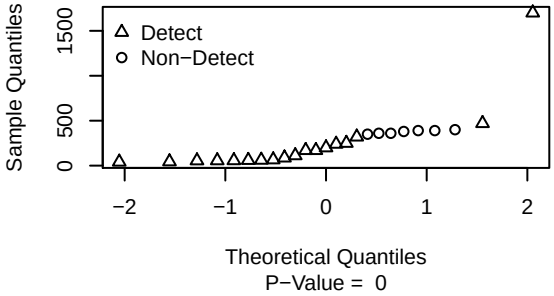
Minimum	3.58
1st Quantile	4.44
Median	5.3
Mean	5.14
3rd Quantile	5.94
Maximum	7

BENZO(B)FLUORANTHENE BACKGROUND OUTLIER ANALYSIS
OPERABLE UNIT 7−REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 10 OF 27

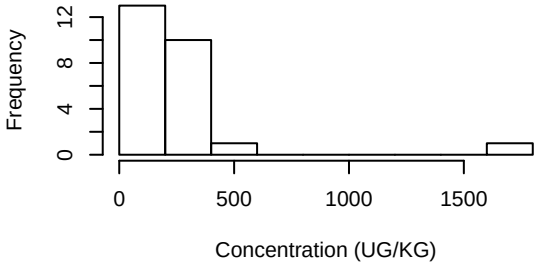
BOXPLOT



NORMAL PROBABILITY PLOT



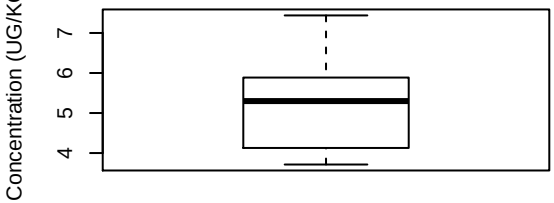
HISTOGRAM



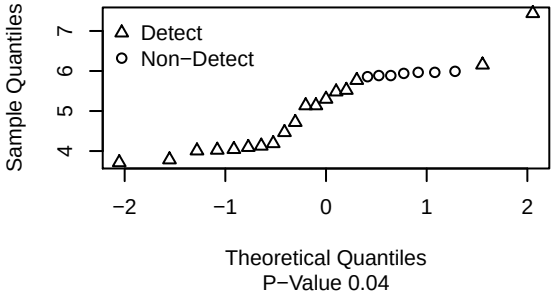
SUMMARY STATISTICS

Minimum	41
1st Quantile	62
Median	200
Mean	271.6
3rd Quantile	360
Maximum	1700

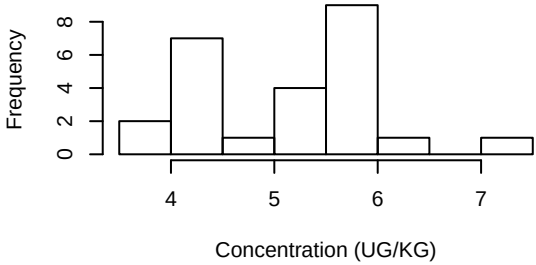
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

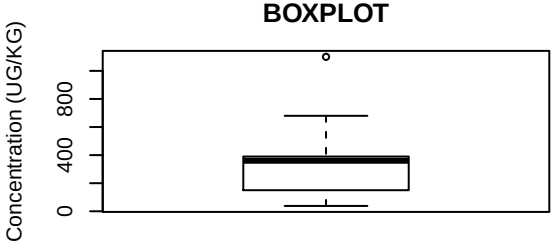


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

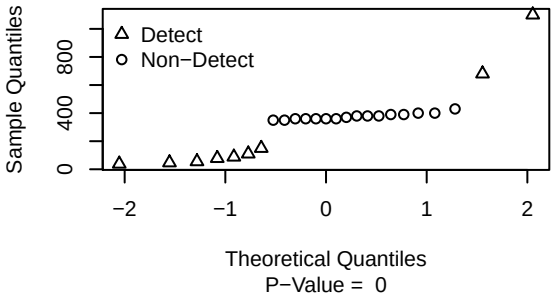
Minimum	3.71
1st Quantile	4.13
Median	5.3
Mean	5.14
3rd Quantile	5.89
Maximum	7.44

BENZO(K)FLUORANTHENE BACKGROUND OUTLIER ANALYSIS
OPERABLE UNIT 7−REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 11 OF 27

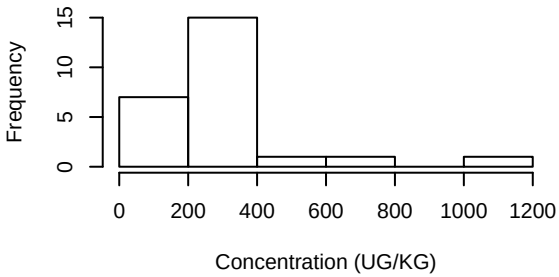
BOXPLOT



NORMAL PROBABILITY PLOT



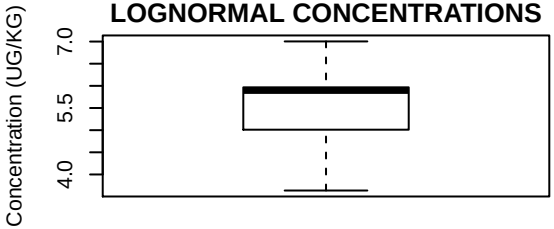
HISTOGRAM



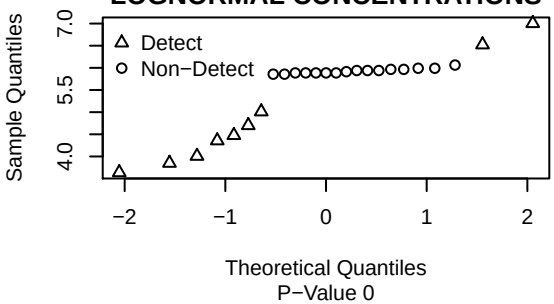
SUMMARY STATISTICS

Minimum	38
1st Quantile	150
Median	360
Mean	334.6
3rd Quantile	390
Maximum	1100

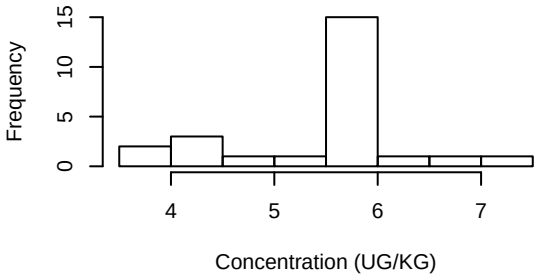
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

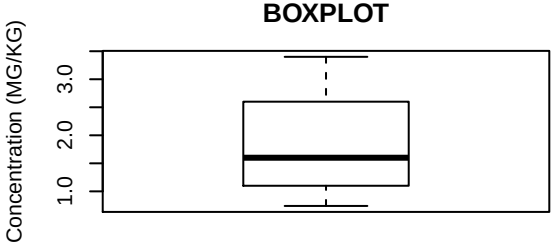


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

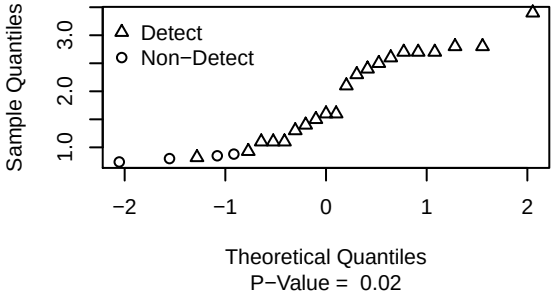
Minimum	3.64
1st Quantile	5.01
Median	5.89
Mean	5.54
3rd Quantile	5.97
Maximum	7

CADMIUM BACKGROUND OUTLIER ANALYSIS
OPERABLE UNIT 7−REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 12 OF 27

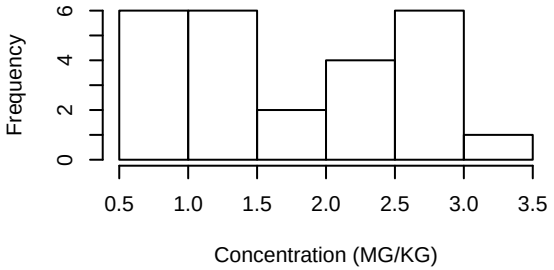
BOXPLOT



NORMAL PROBABILITY PLOT



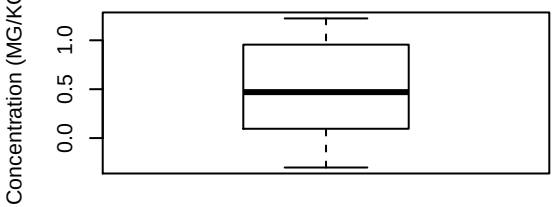
HISTOGRAM



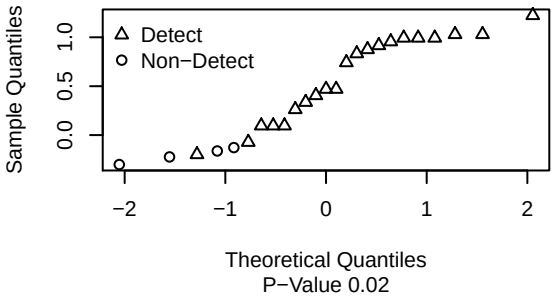
SUMMARY STATISTICS

Minimum	0.74
1st Quantile	1.1
Median	1.6
Mean	1.79
3rd Quantile	2.6
Maximum	3.4

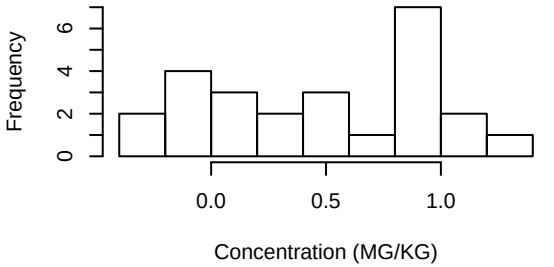
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

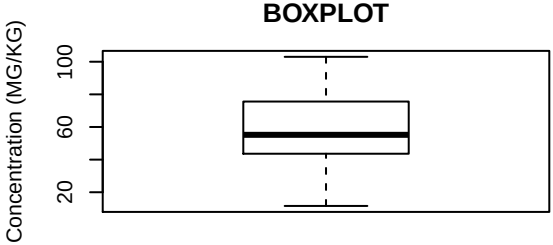


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

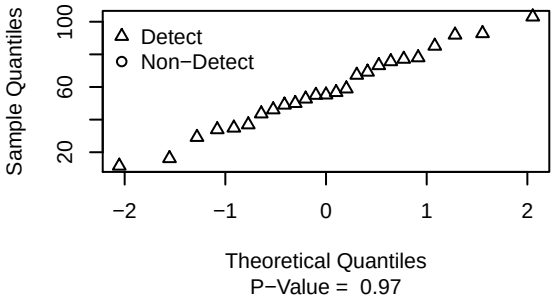
Minimum	−0.3
1st Quantile	0.1
Median	0.47
Mean	0.47
3rd Quantile	0.96
Maximum	1.22

CHROMIUM BACKGROUND OUTLIER ANALYSIS
OPERABLE UNIT 7−REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 13 OF 27

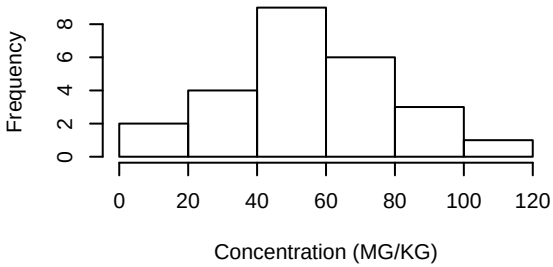
BOXPLOT



NORMAL PROBABILITY PLOT



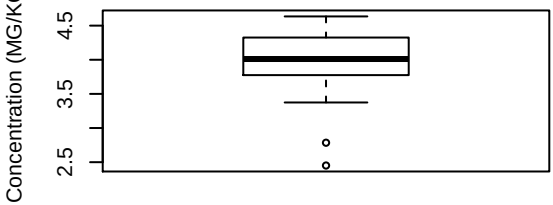
HISTOGRAM



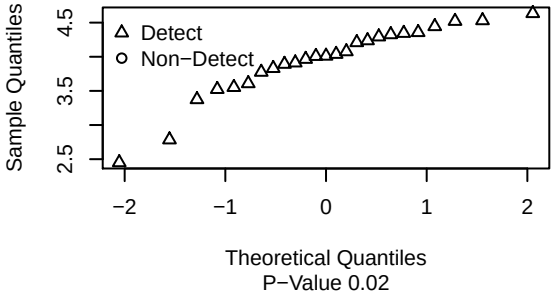
SUMMARY STATISTICS

Minimum	11.6
1st Quantile	43.6
Median	55.2
Mean	57.72
3rd Quantile	75.6
Maximum	103

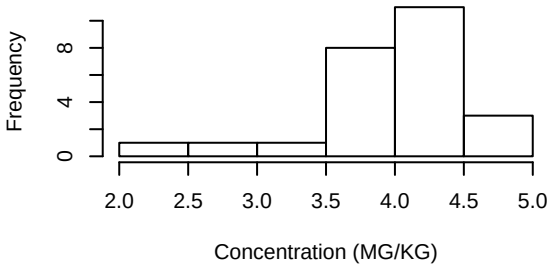
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

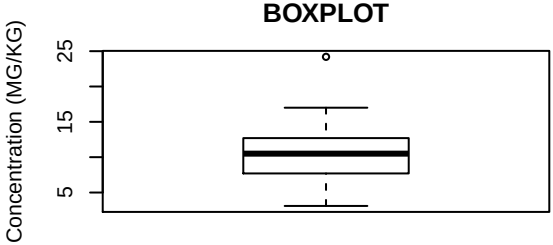


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

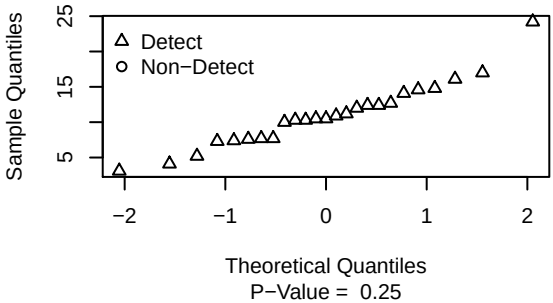
Minimum	2.45
1st Quantile	3.77
Median	4.01
Mean	3.95
3rd Quantile	4.33
Maximum	4.63

COBALT BACKGROUND OUTLIER ANALYSIS
OPERABLE UNIT 7−REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 14 OF 27

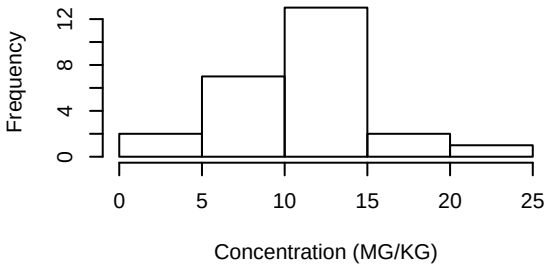
BOXPLOT



NORMAL PROBABILITY PLOT



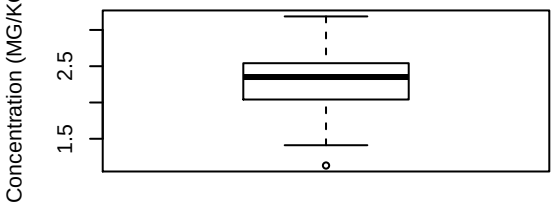
HISTOGRAM



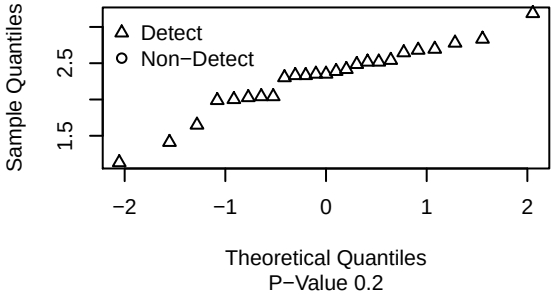
SUMMARY STATISTICS

Minimum	3.1
1st Quantile	7.7
Median	10.5
Mean	10.96
3rd Quantile	12.7
Maximum	24.2

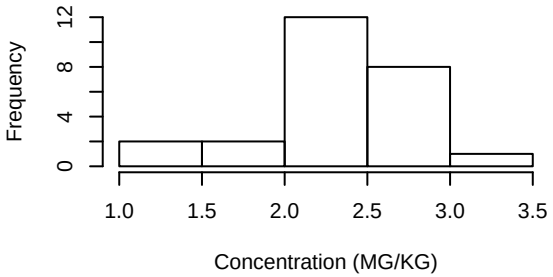
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

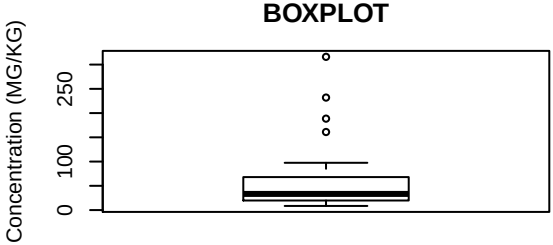


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

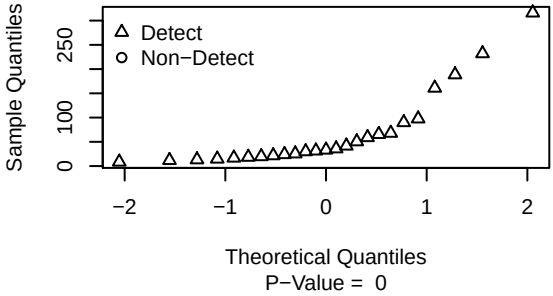
Minimum	1.13
1st Quantile	2.04
Median	2.35
Mean	2.31
3rd Quantile	2.54
Maximum	3.19

COPPER BACKGROUND OUTLIER ANALYSIS
OPERABLE UNIT 7−REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 15 OF 27

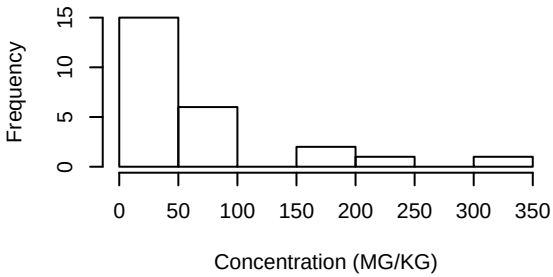
BOXPLOT



NORMAL PROBABILITY PLOT



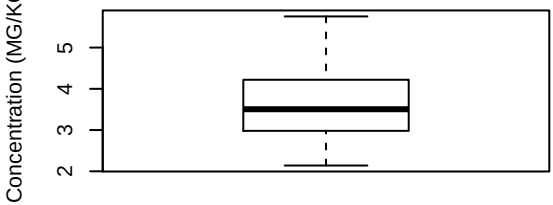
HISTOGRAM



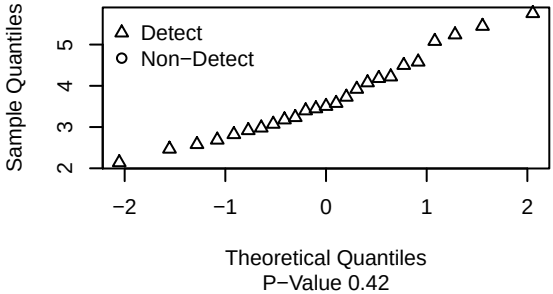
SUMMARY STATISTICS

Minimum	8.5
1st Quantile	19.7
Median	33.3
Mean	66.96
3rd Quantile	68
Maximum	316

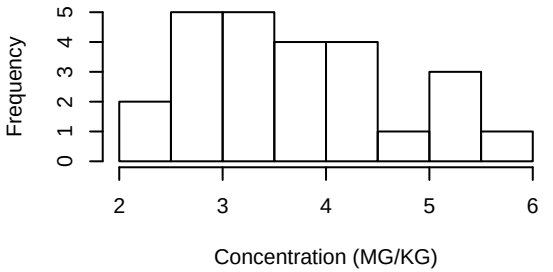
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

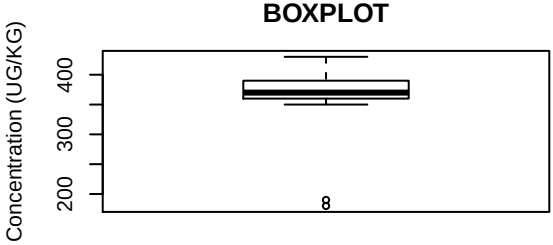


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

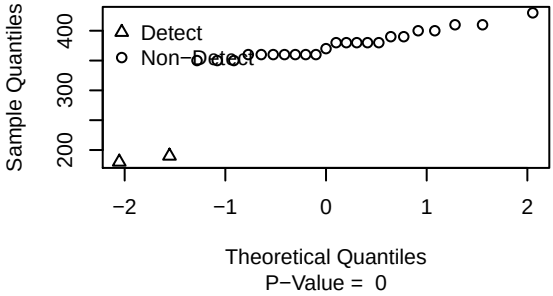
Minimum	2.14
1st Quantile	2.98
Median	3.51
Mean	3.71
3rd Quantile	4.22
Maximum	5.76

DIBENZO(A,H)ANTHRACENE BACKGROUND OUTLIER ANALYSIS
OPERABLE UNIT 7−REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 16 OF 27

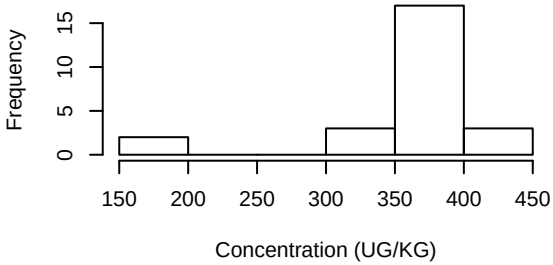
BOXPLOT



NORMAL PROBABILITY PLOT



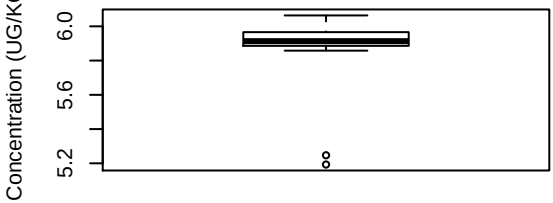
HISTOGRAM



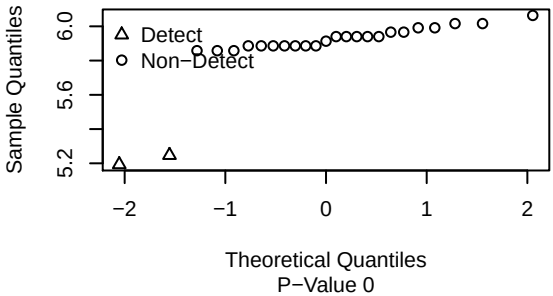
SUMMARY STATISTICS

Minimum	180
1st Quantile	360
Median	370
Mean	361.6
3rd Quantile	390
Maximum	430

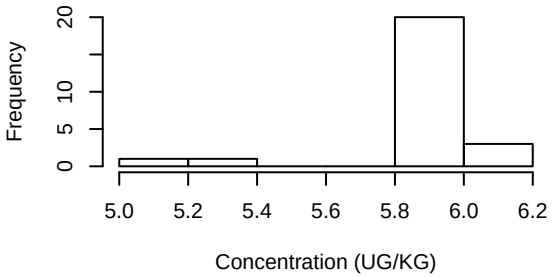
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

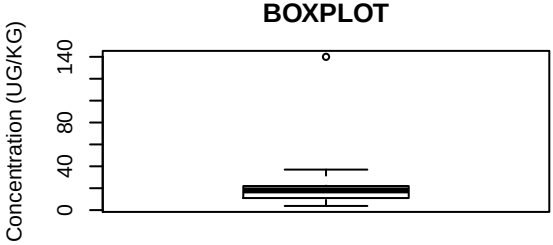


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

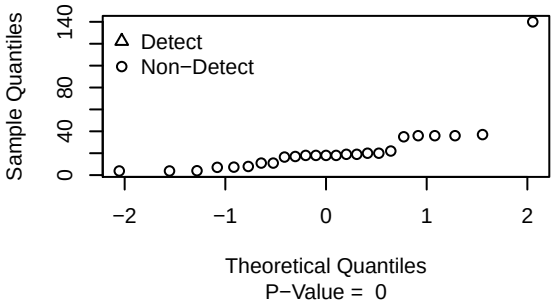
Minimum	5.19
1st Quantile	5.89
Median	5.91
Mean	5.87
3rd Quantile	5.97
Maximum	6.06

DIELDRIN BACKGROUND OUTLIER ANALYSIS
OPERABLE UNIT 7−REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 17 OF 27

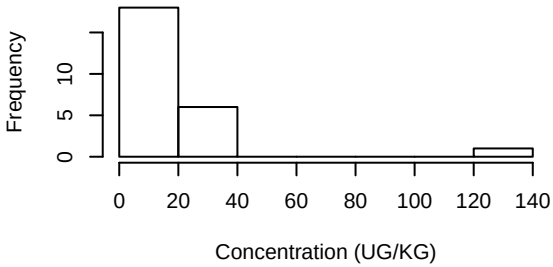
BOXPLOT



NORMAL PROBABILITY PLOT



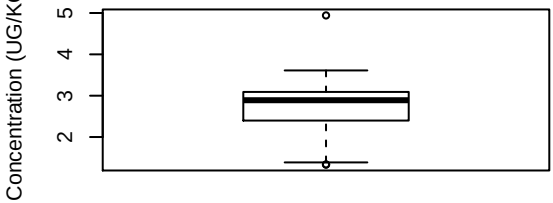
HISTOGRAM



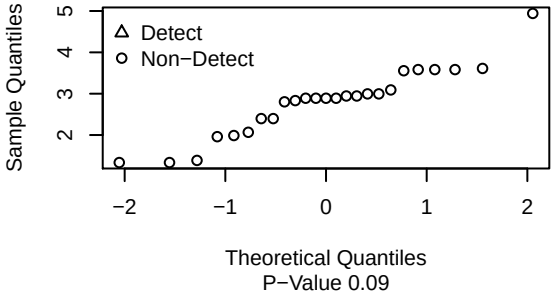
SUMMARY STATISTICS

Minimum	3.8
1st Quantile	11
Median	18
Mean	23.26
3rd Quantile	22
Maximum	140

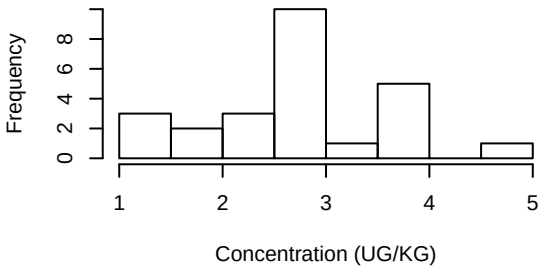
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

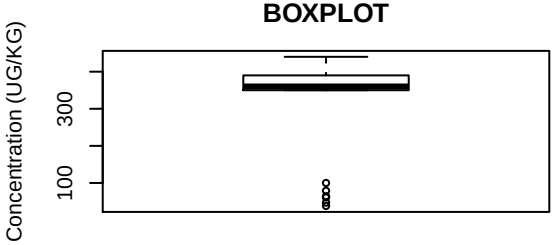


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

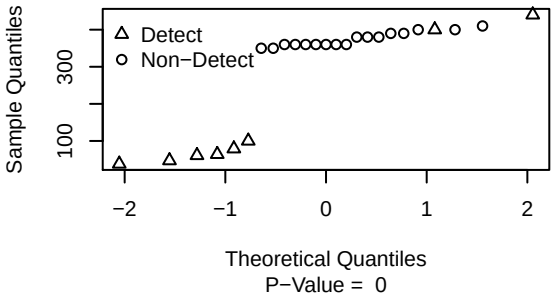
Minimum	1.34
1st Quantile	2.4
Median	2.89
Mean	2.8
3rd Quantile	3.09
Maximum	4.94

INDENO(1,2,3−CD)PYRENE BACKGROUND OUTLIER ANALYSIS
OPERABLE UNIT 7−REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 18 OF 27

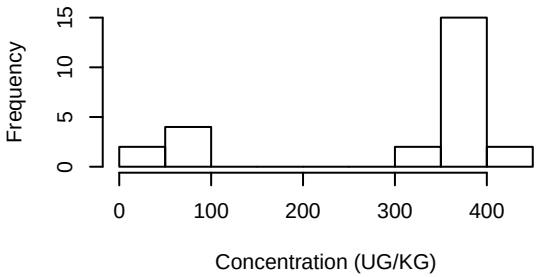
BOXPLOT



NORMAL PROBABILITY PLOT



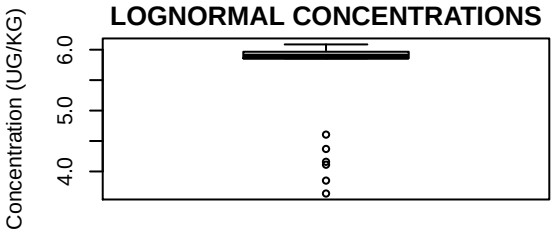
HISTOGRAM



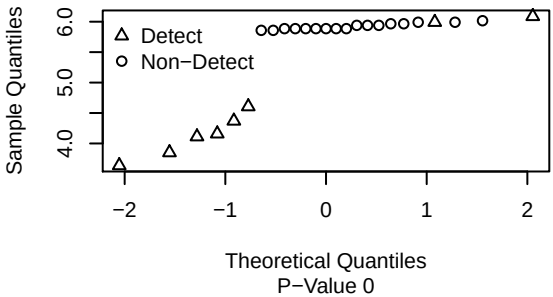
SUMMARY STATISTICS

Minimum	38
1st Quantile	350
Median	360
Mean	303.2
3rd Quantile	390
Maximum	440

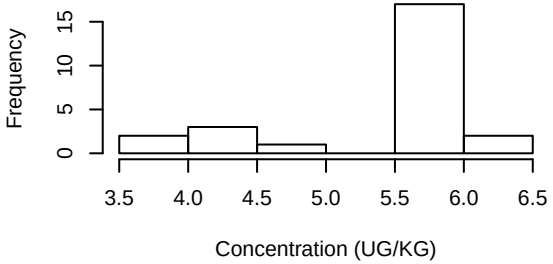
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

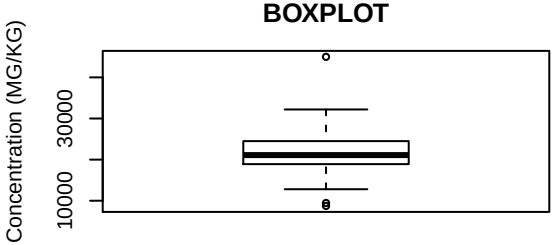


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

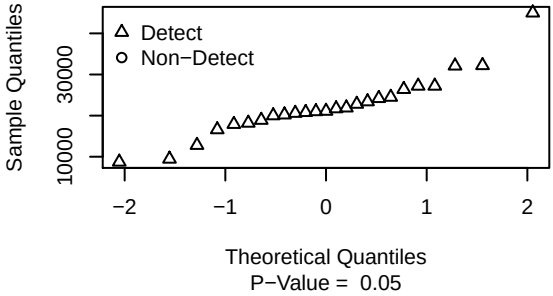
Minimum	3.64
1st Quantile	5.86
Median	5.89
Mean	5.5
3rd Quantile	5.97
Maximum	6.09

IRON BACKGROUND OUTLIER ANALYSIS
OPERABLE UNIT 7−REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 19 OF 27

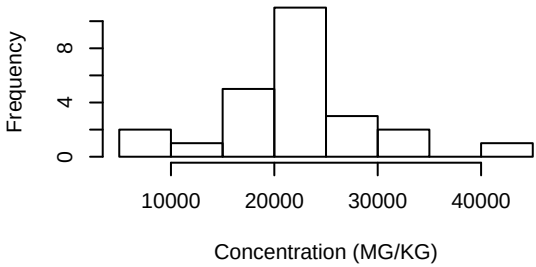
BOXPLOT



NORMAL PROBABILITY PLOT



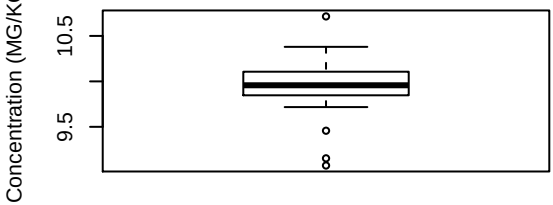
HISTOGRAM



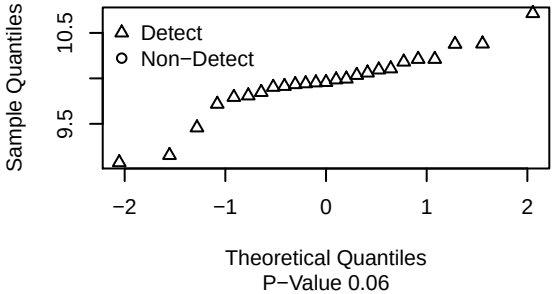
SUMMARY STATISTICS

Minimum	8730
1st Quantile	18900
Median	21100
Mean	22200
3rd Quantile	24500
Maximum	45000

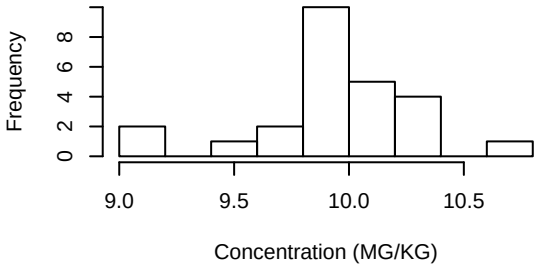
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

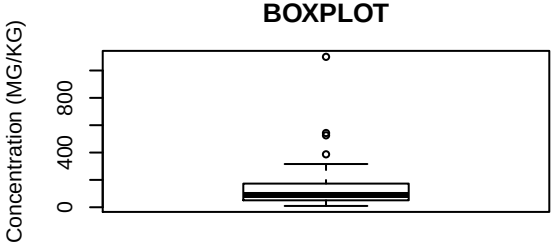


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

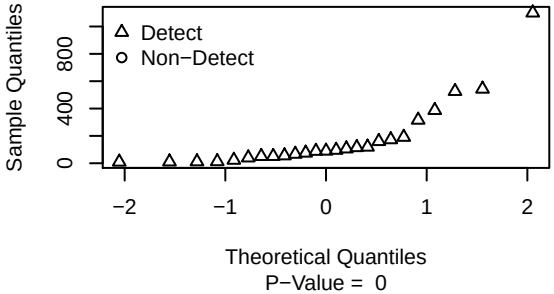
Minimum	9.07
1st Quantile	9.85
Median	9.96
Mean	9.95
3rd Quantile	10.11
Maximum	10.71

LEAD BACKGROUND OUTLIER ANALYSIS
OPERABLE UNIT 7−REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 20 OF 27

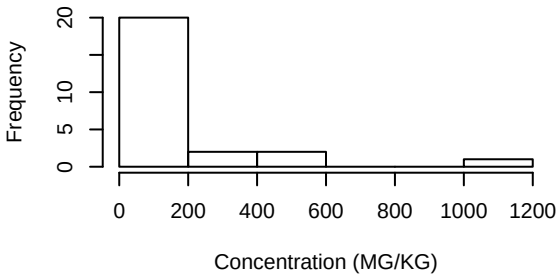
BOXPLOT



NORMAL PROBABILITY PLOT



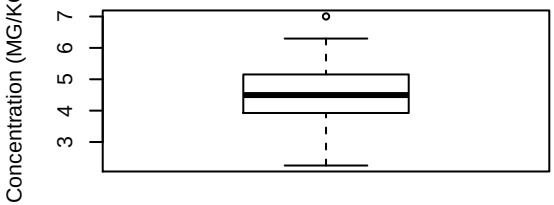
HISTOGRAM



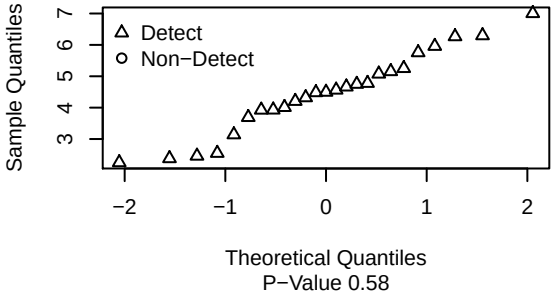
SUMMARY STATISTICS

Minimum	9.5
1st Quantile	50.7
Median	89.7
Mean	176.7
3rd Quantile	173
Maximum	1100

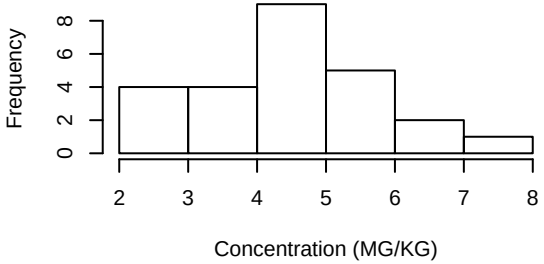
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

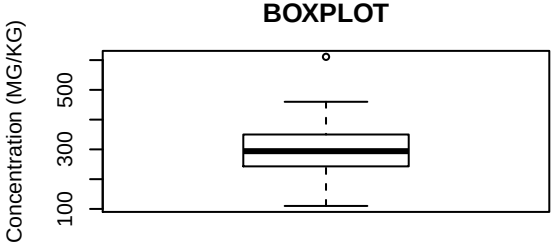


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

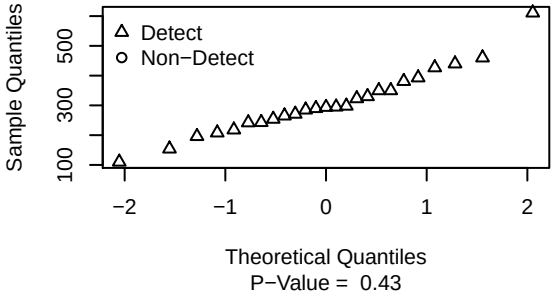
Minimum	2.25
1st Quantile	3.93
Median	4.5
Mean	4.45
3rd Quantile	5.15
Maximum	7

MANGANESE BACKGROUND OUTLIER ANALYSIS
OPERABLE UNIT 7−REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 21 OF 27

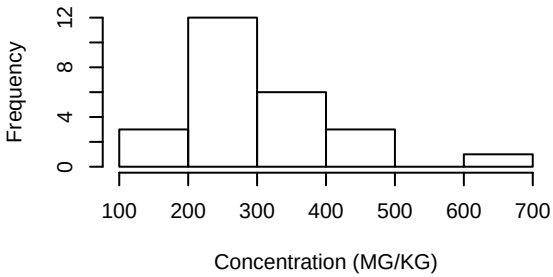
BOXPLOT



NORMAL PROBABILITY PLOT



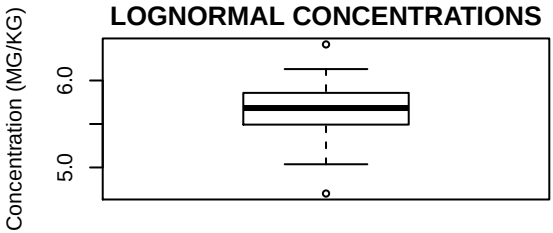
HISTOGRAM



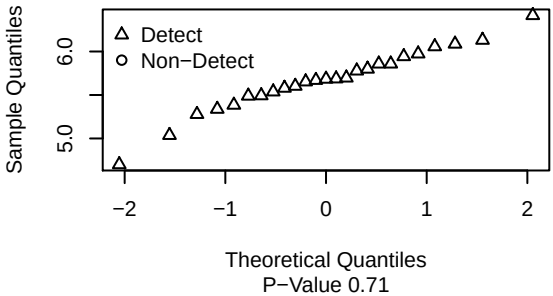
SUMMARY STATISTICS

Minimum	110
1st Quantile	243
Median	294
Mean	307.5
3rd Quantile	350
Maximum	611

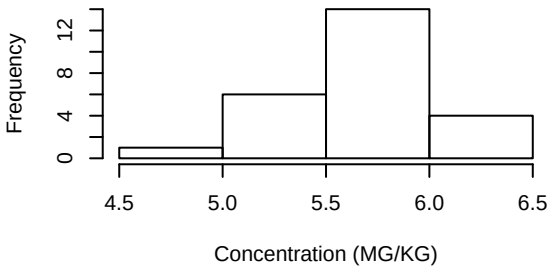
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

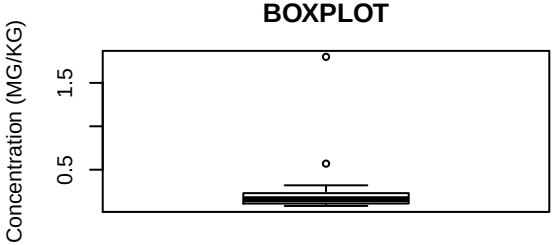


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

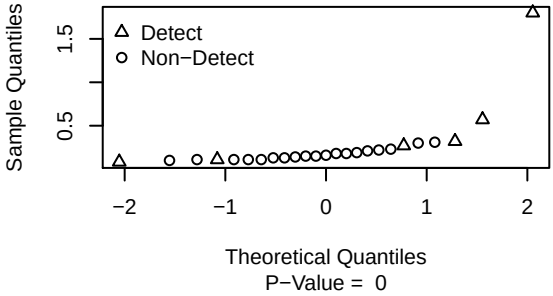
Minimum	4.7
1st Quantile	5.49
Median	5.68
Mean	5.67
3rd Quantile	5.86
Maximum	6.42

MERCURY BACKGROUND OUTLIER ANALYSIS
OPERABLE UNIT 7−REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 22 OF 27

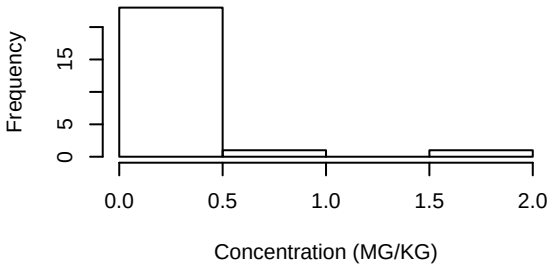
BOXPLOT



NORMAL PROBABILITY PLOT



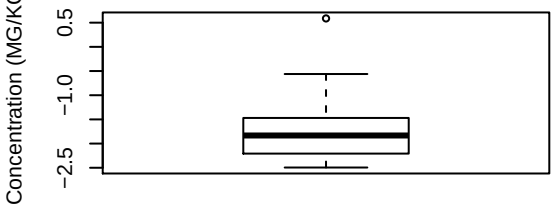
HISTOGRAM



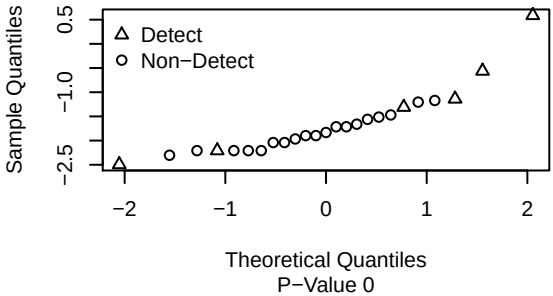
SUMMARY STATISTICS

Minimum	0.08
1st Quantile	0.11
Median	0.16
Mean	0.25
3rd Quantile	0.23
Maximum	1.8

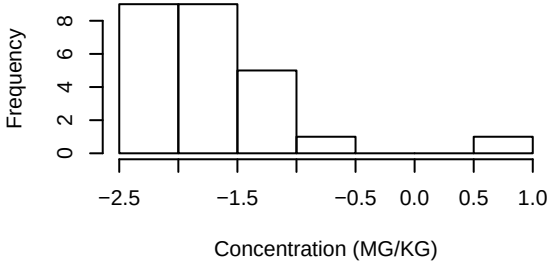
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

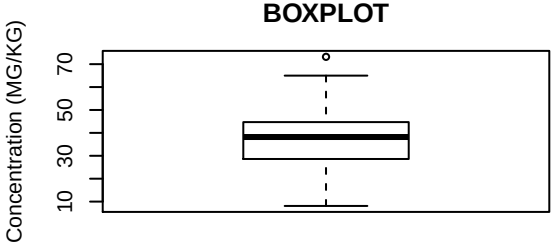


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

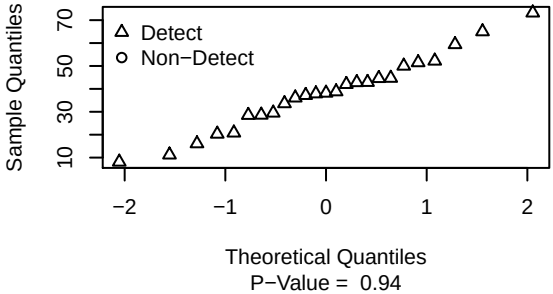
Minimum	−2.5
1st Quantile	−2.21
Median	−1.83
Mean	−1.68
3rd Quantile	−1.47
Maximum	0.59

NICKEL BACKGROUND OUTLIER ANALYSIS
OPERABLE UNIT 7−REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 23 OF 27

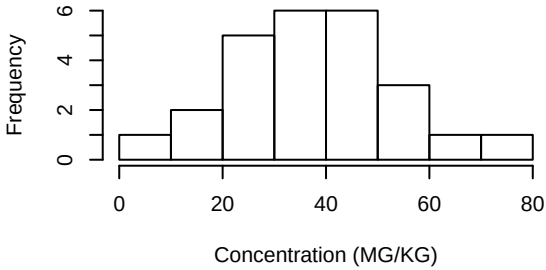
BOXPLOT



NORMAL PROBABILITY PLOT



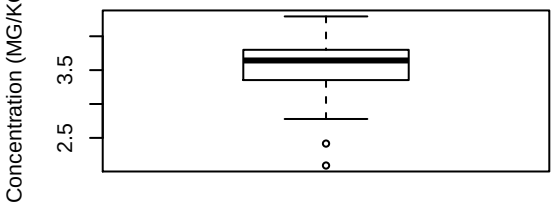
HISTOGRAM



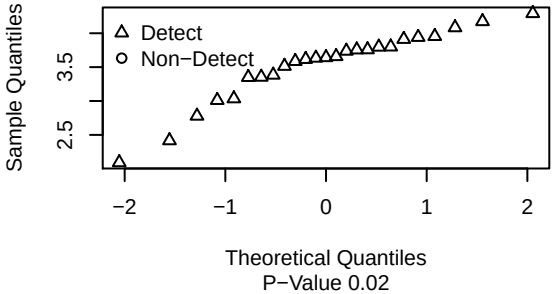
SUMMARY STATISTICS

Minimum	8.1
1st Quantile	28.6
Median	38.2
Mean	38.13
3rd Quantile	44.7
Maximum	73.2

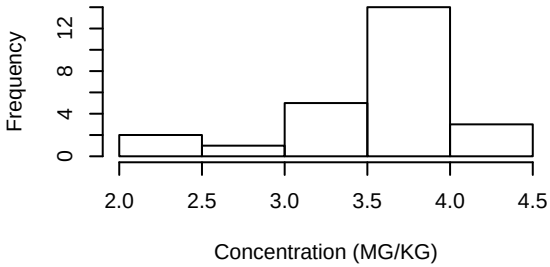
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

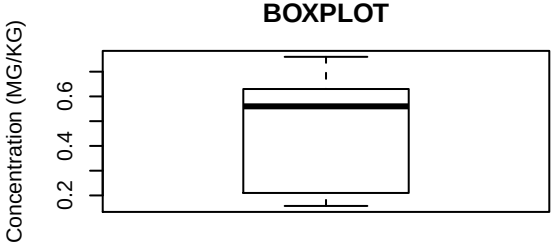


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

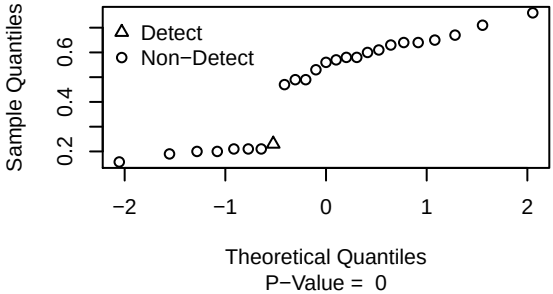
Minimum	2.09
1st Quantile	3.35
Median	3.64
Mean	3.53
3rd Quantile	3.8
Maximum	4.29

THALLIUM BACKGROUND OUTLIER ANALYSIS
OPERABLE UNIT 7−REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 24 OF 27

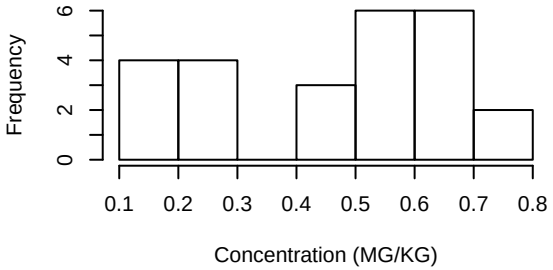
BOXPLOT



NORMAL PROBABILITY PLOT



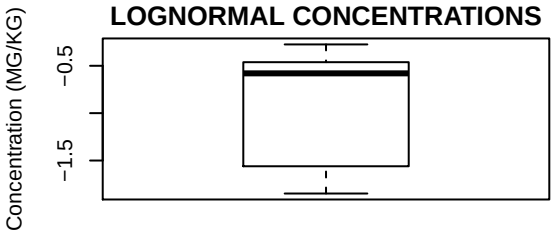
HISTOGRAM



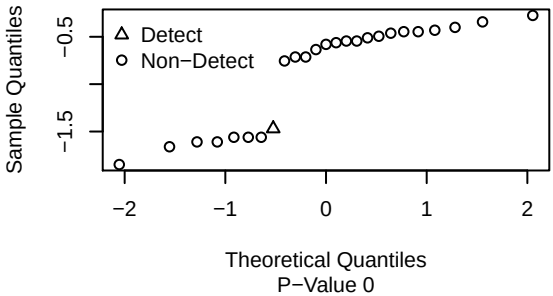
SUMMARY STATISTICS

Minimum	0.16
1st Quantile	0.21
Median	0.56
Mean	0.47
3rd Quantile	0.63
Maximum	0.76

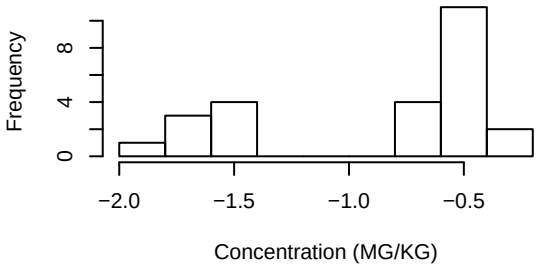
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

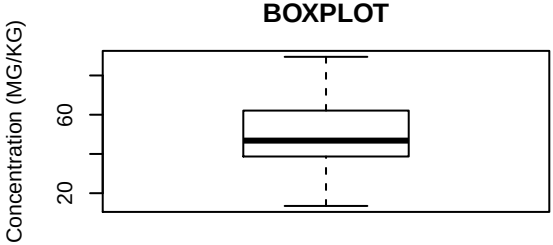


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

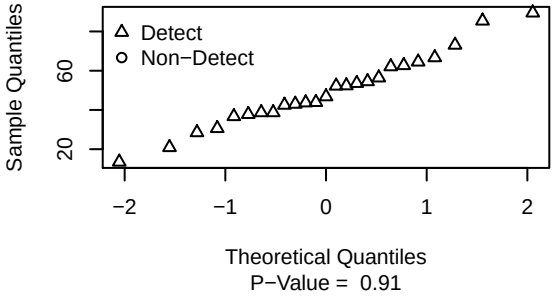
Minimum	−1.85
1st Quantile	−1.56
Median	−0.58
Mean	−0.87
3rd Quantile	−0.46
Maximum	−0.27

VANADIUM BACKGROUND OUTLIER ANALYSIS
OPERABLE UNIT 7−REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 25 OF 27

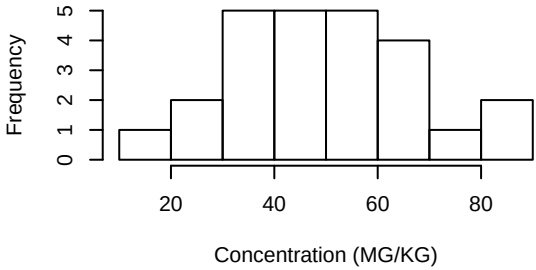
BOXPLOT



NORMAL PROBABILITY PLOT



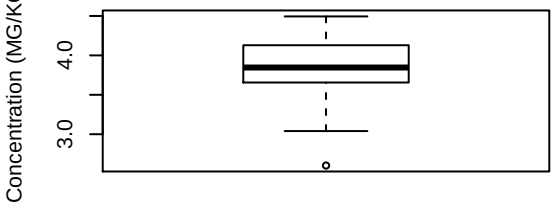
HISTOGRAM



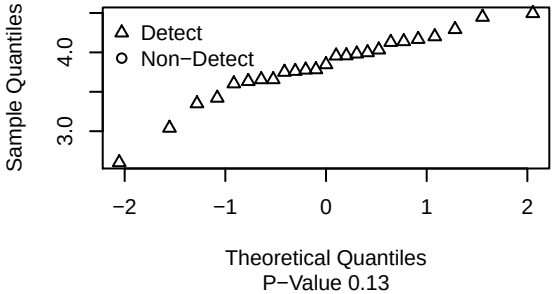
SUMMARY STATISTICS

Minimum	13.5
1st Quantile	38.7
Median	46.8
Mean	49.54
3rd Quantile	62.1
Maximum	89.5

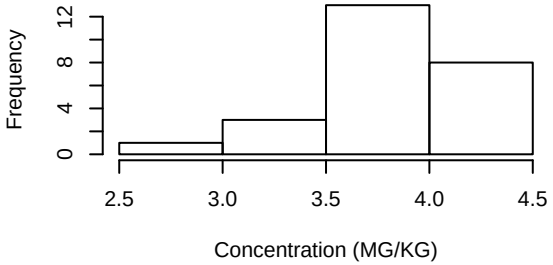
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

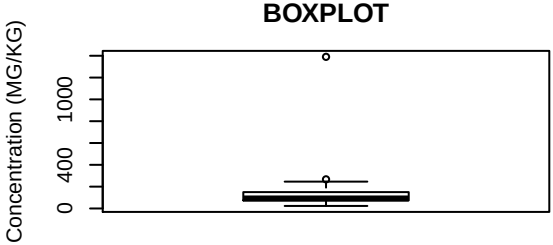


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

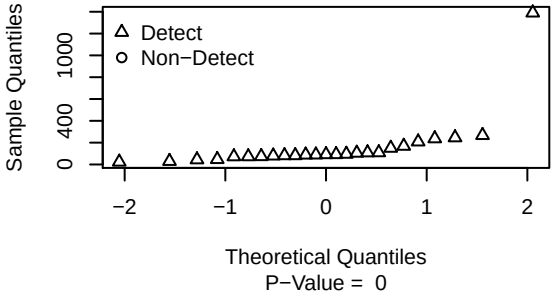
Minimum	2.6
1st Quantile	3.66
Median	3.85
Mean	3.83
3rd Quantile	4.13
Maximum	4.49

ZINC BACKGROUND OUTLIER ANALYSIS
OPERABLE UNIT 7−REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 26 OF 27

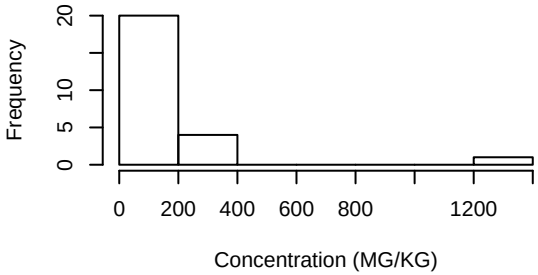
BOXPLOT



NORMAL PROBABILITY PLOT



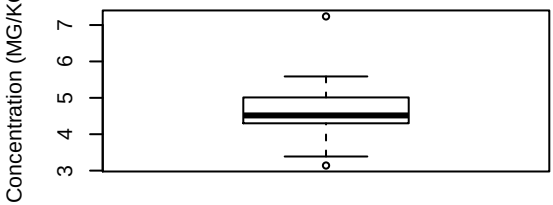
HISTOGRAM



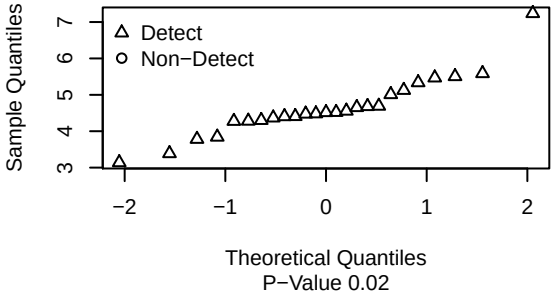
SUMMARY STATISTICS

Minimum	23.1
1st Quantile	73.7
Median	91.5
Mean	161.9
3rd Quantile	150
Maximum	1390

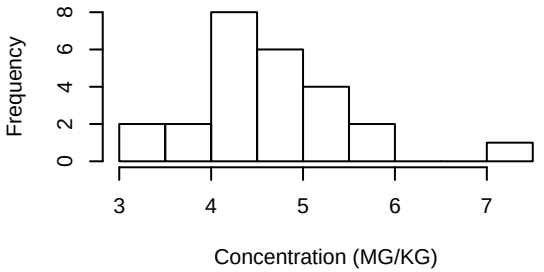
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

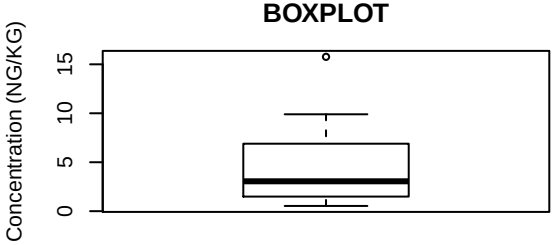


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

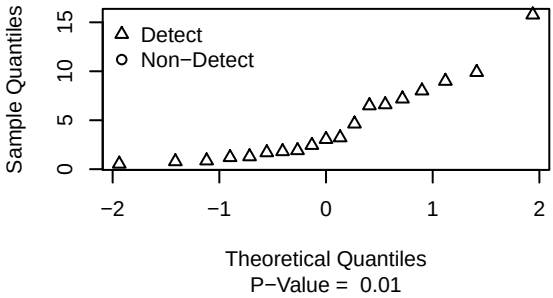
Minimum	3.14
1st Quantile	4.3
Median	4.52
Mean	4.64
3rd Quantile	5.01
Maximum	7.24

TEQ WHO−2005 − HALFND BACKGROUND OUTLIER ANALYSIS
OPERABLE UNIT 7−REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 27 OF 27

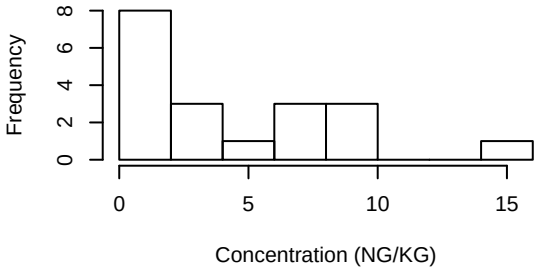
BOXPLOT



NORMAL PROBABILITY PLOT



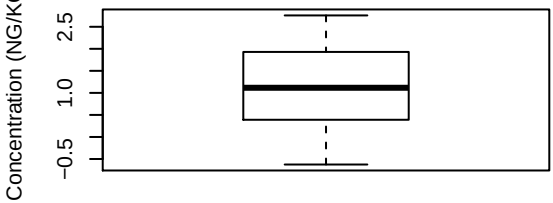
HISTOGRAM



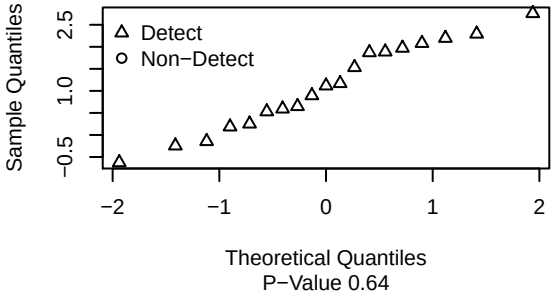
SUMMARY STATISTICS

Minimum	0.54
1st Quantile	1.49
Median	3.05
Mean	4.55
3rd Quantile	6.89
Maximum	15.76

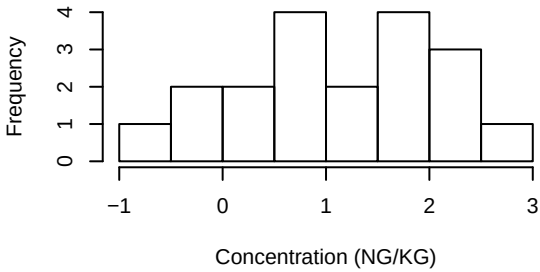
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS



SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

Minimum	−0.63
1st Quantile	0.39
Median	1.12
Mean	1.1
3rd Quantile	1.93
Maximum	2.76

BACKGROUND COMPARISONS

This section describes the statistical methodologies used to compare site data with background data. Statistical analyses were used to compare site surface, subsurface soil, and groundwater concentrations to Facility Background soil and groundwater concentrations to determine if the analytical results obtained from the samples represent site conditions or background/ anthropogenic conditions. The background soil and groundwater data are presented in Tables 1 and 2 and the results of the graphical and statistical tests performed and final recommendations for each constituent tested are presented in Tables 3 through 8.

The comparison of the site data with the background data was performed using summary statistics, probability plots, box plots, and several statistical tests described below. If the combined data sets are greater than 90 percent non-detect then the maximum concentrations were compared. If the site data appear to be obviously below or above background from visual inspection no formal statistical test was performed.

Probability Plots

Probability plots are a useful first step for visually comparing two data sets in a single graph. If the site and background distributions were exactly identical, the plotted values would lie on a straight line through the origin. Deviations from this line show the differences between the two distributions. If the site and background distributions are similar the scattering of the two data sets will be mixed. If there is grouping of the two data sets then data sets are most likely different.

Box Plots

As an additional aid for the population analysis, box plots were generated for the site data and background data.

Box plots show the central tendency, degree of symmetry, range of variation, and potential outliers of a data set. The data set is shown as a rectangular box that represents the middle 50 percent of the data. The upper value of the box represents the 75th percentile and the lower value of the box represents the 25th percentile. The median is represented by the middle line in the box.

Box plots for the same analyte in the two data sets were plotted on the same graph. The plots were visually inspected to see which data sets look similar and which ones differed. Particular attention was paid to see if the median from one data set fell within the 75th and 25th percentile range of the other data sets.

Statistical Tests

As stated above, the data were analyzed to determine whether they are similar. A number of statistical tests can be used to determine if the data sets are similar. If the combined percentage of non-detected concentrations was between 0 and 50 percent then the Two sample T-test, Wilcoxon Rank Sum test, or Gehan test was computed to test if the site data set is greater than the background data set plus one background standard deviation as outlined in Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites (2002).

USEPA's ProUCl 4.00.04 software was used to determine the data distribution of the site and background concentrations and compute the Two sample T-test, Wilcoxon Rank Sum Test, or Gehan Test. If the data were log normally distributed then the statistical tests were performed on the log-transformed concentrations.

Two Sample T-Test

Test for a difference between two populations means when it can be assumed that the data are approximately normally distributed or sample sizes are large enough (m and n at least 30). If the variances of the two data sets are not equal than the Two sample T Test with unequal variance was computed. The Two Sample T Test was computed using USEPA's Pro UCL 4.00.04. The null and alternative hypothesis are:
H_o: The site distribution exceeds the background distribution by more than one background standard deviation.
H_A: The site distribution does not exceed the background distribution by more than one background standard deviation.

Wilcoxon Rank Sum Test

The Wilcoxon Rank-Sum (WRS) nonparametric test is used to test for a shift in location between two independent populations. The WRS test has two main advantages over the independent sample t test: the two data sets need not be drawn from the normal distribution and the WRS test can handle a moderate number of nondetected values by treating them as ties. The Wilcoxon Rank Sum test was computed using USEPA's PRO UCL 4.00.04 software.

H_o: The site distribution exceeds the background distribution by more than one background standard deviation.
H_A: The site distribution does not exceed the background distribution by more than one background standard deviation.

Gehan Test

The Gehan nonparametric test is used to test for a shift in location between two independent populations. The Gehan test can be used when the background or site datasets contain multiple nondetects with different reporting limits. The Gehan test was computed using USEPA's PRO UCL 4.00.04 software.

H_o: The site distribution exceeds the background distribution by more than one background standard deviation.
H_A: The site distribution does not exceed the background distribution by more than one background standard deviation.

Quantile Test

The Quantile test is used to identify the differences in the right tails of the site and background distributions. This may be regarded as detecting if the values in the right-tail of the site population are greater than the right-tail of the background distribution. If the results of the Two Sample T-Test, WRS Test, or Gehan Test found the distributions to not be different then the quantile test was computed. If the quantile test found the right tail of the site data to be larger than the right tail of the background data it was concluded that the site concentrations are greater than background. The test is valid regardless of the underlying distribution of the site and background data sets.

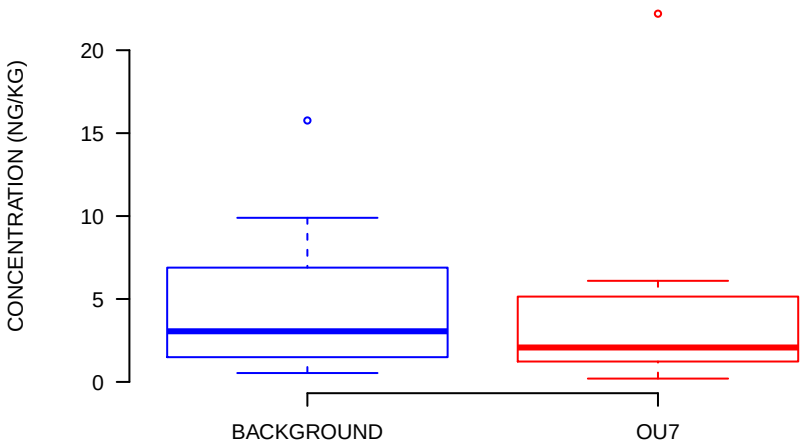
Slippage Test

The Slippage test is used to test for a shift to the right in the extreme right-tail of the site versus the background concentrations. This is equivalent to asking if a set of the largest values of the site distribution are larger than the maximum value of the background distribution. If the results of the Quantile Test were that the right tails of the site and background distributions were not different than the slippage test was computed. If the slippage test found the extreme right tail of the site data to be larger than the background data it was concluded that the site concentrations

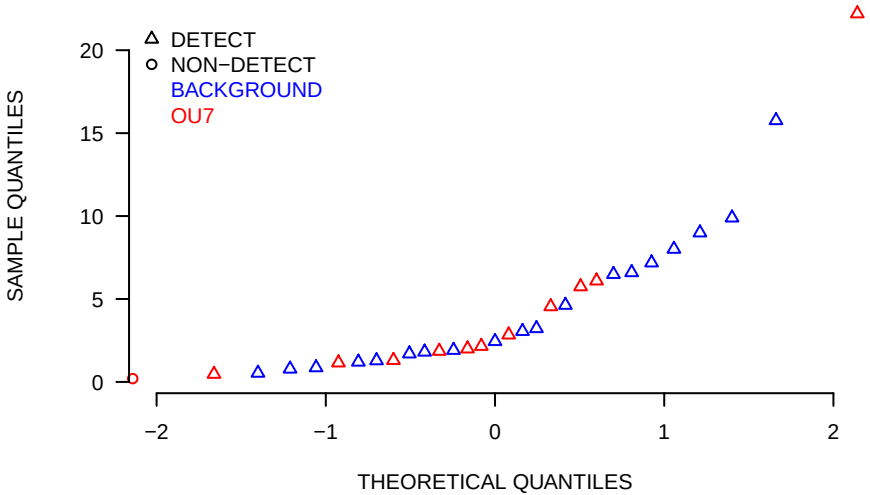
are greater than background. This test can be used regardless of the underlying distribution of the site and background data sets.

TEQ WHO−2005 − HALFND SURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 1 OF 19

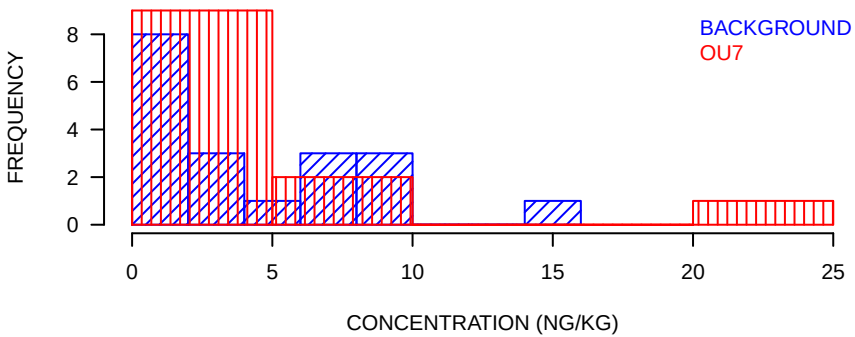
BOXPLOT



NORMAL PROBABILITY PLOT



HISTOGRAMS



SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	0.54	0.1
25TH PERCENTILE	1.5	1.3
MEDIAN	3.1	2.1
MEAN	4.5	4.2
75TH PERCENTILE	6.9	4.8
MAXIMUM	16	22

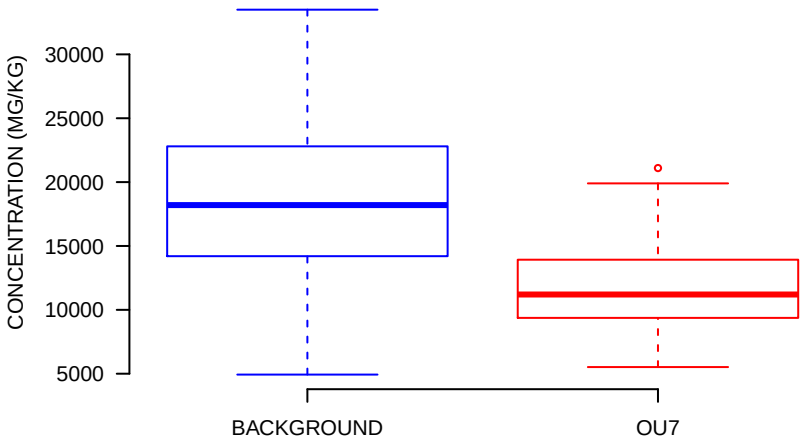
UNITS ARE NG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

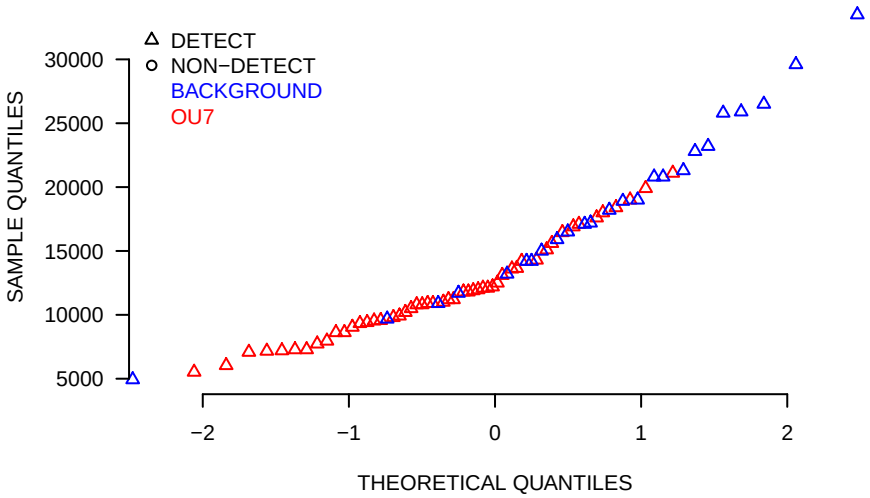
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

ALUMINUM SURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 2 OF 19

BOXPLOT



NORMAL PROBABILITY PLOT



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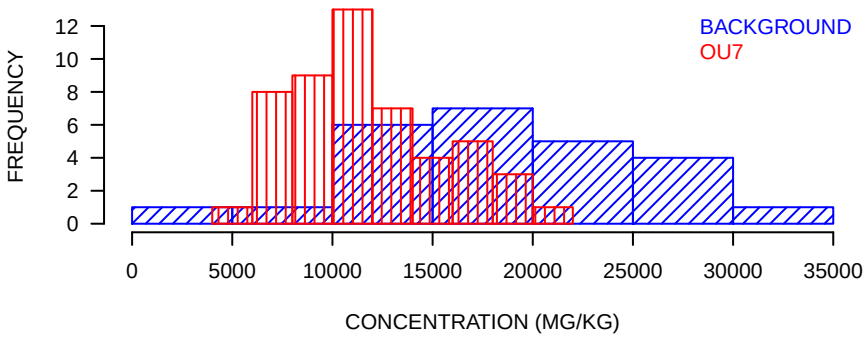


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	4900	5500
25TH PERCENTILE	14000	9400
MEDIAN	18000	11000
MEAN	19000	12000
75TH PERCENTILE	23000	14000
MAXIMUM	34000	21000

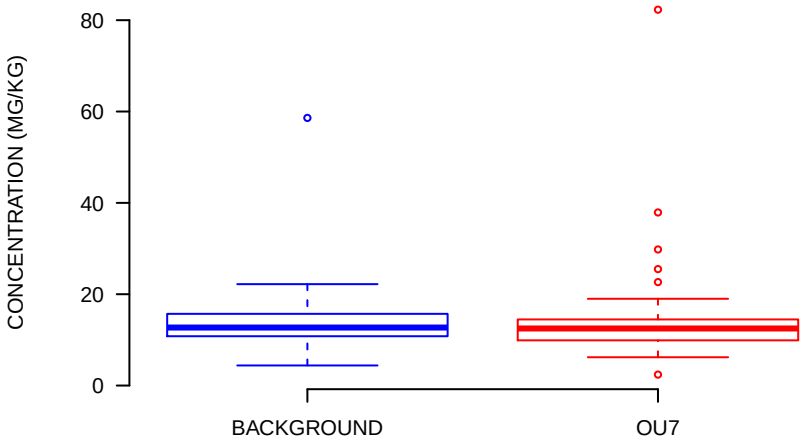
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

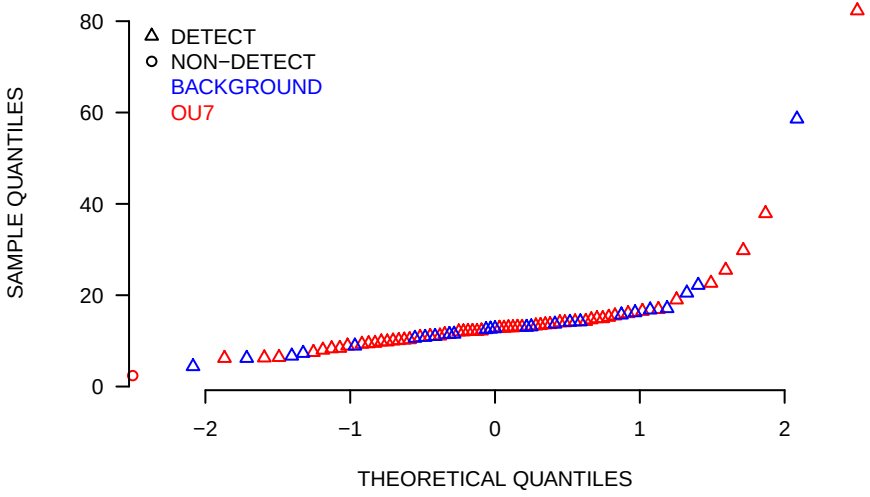
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

ARSENIC SURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 3 OF 19

BOXPLOT



NORMAL PROBABILITY PLOT



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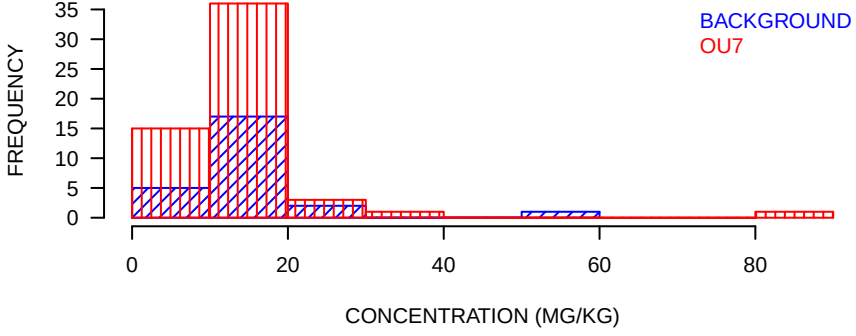


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	4.4	1.2
25TH PERCENTILE	11	10
MEDIAN	13	12
MEAN	14	14
75TH PERCENTILE	16	14
MAXIMUM	59	82

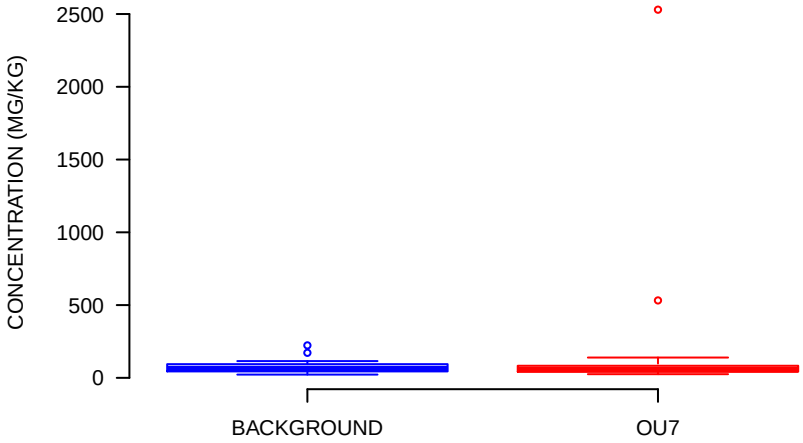
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

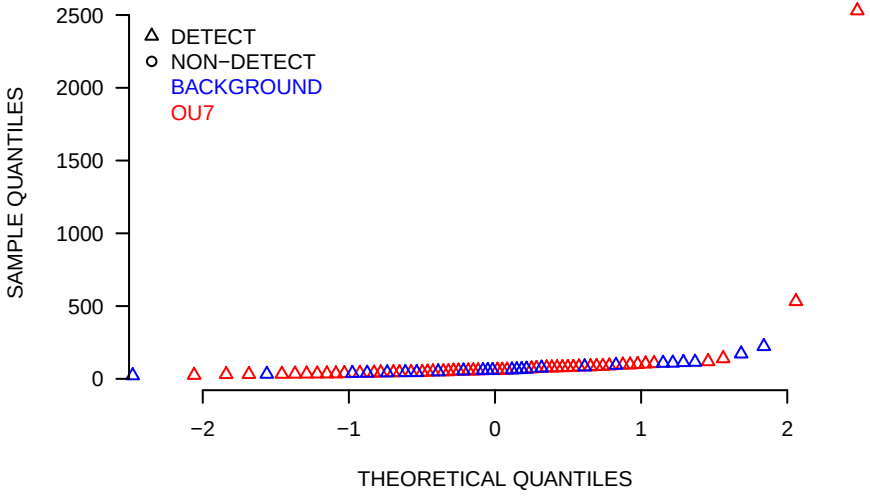
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

BARIUM SURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 4 OF 19

BOXPLOT



NORMAL PROBABILITY PLOT



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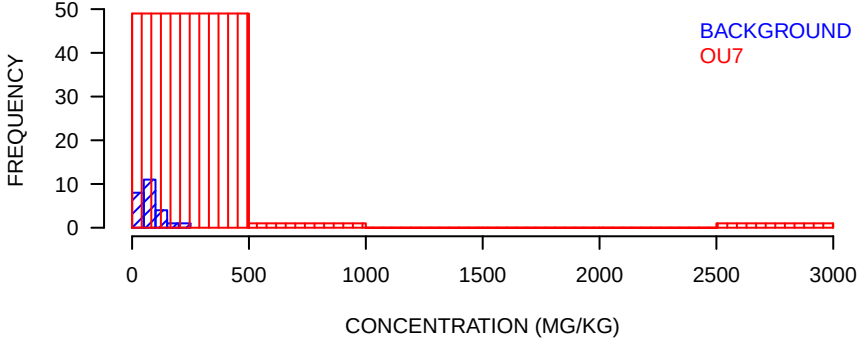


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	22	25
25TH PERCENTILE	44	43
MEDIAN	62	56
MEAN	76	120
75TH PERCENTILE	94	83
MAXIMUM	220	2500

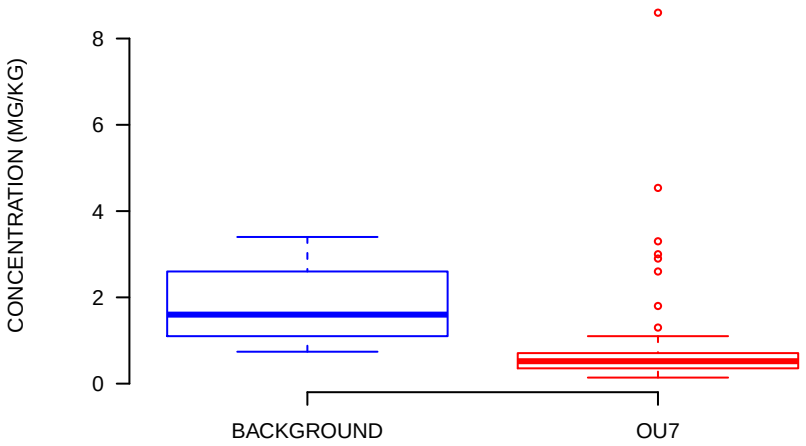
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

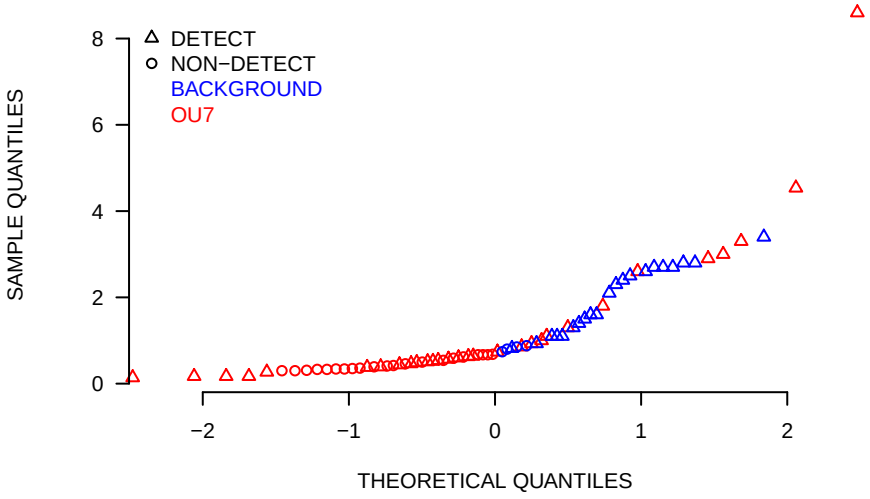
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

CADMIUM SURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 5 OF 19

BOXPLOT



NORMAL PROBABILITY PLOT



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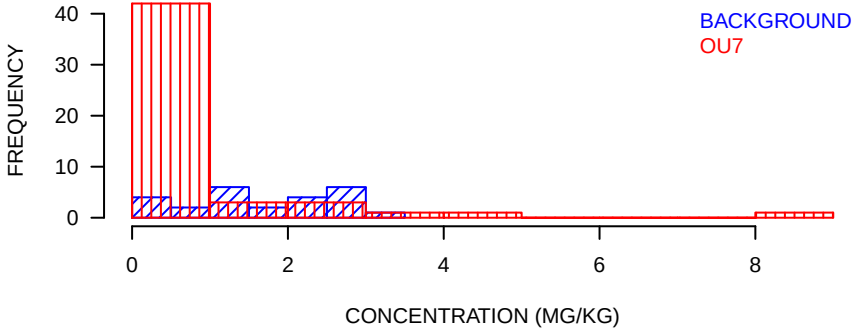


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	0.37	0.14
25TH PERCENTILE	1.1	0.19
MEDIAN	1.6	0.34
MEAN	1.7	0.87
75TH PERCENTILE	2.6	0.69
MAXIMUM	3.4	8.6

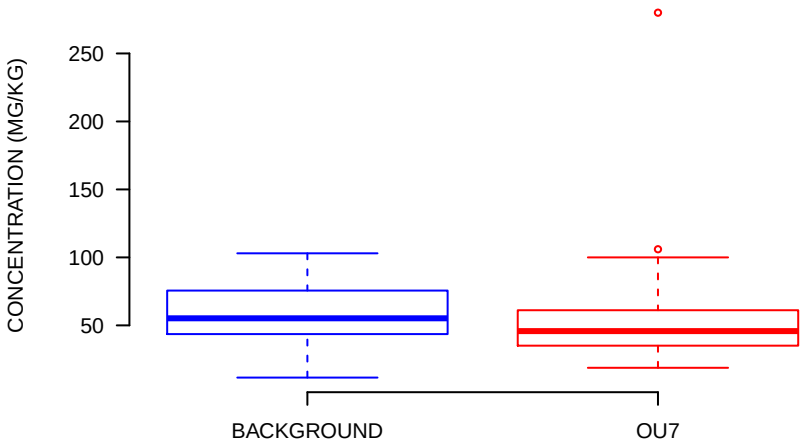
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

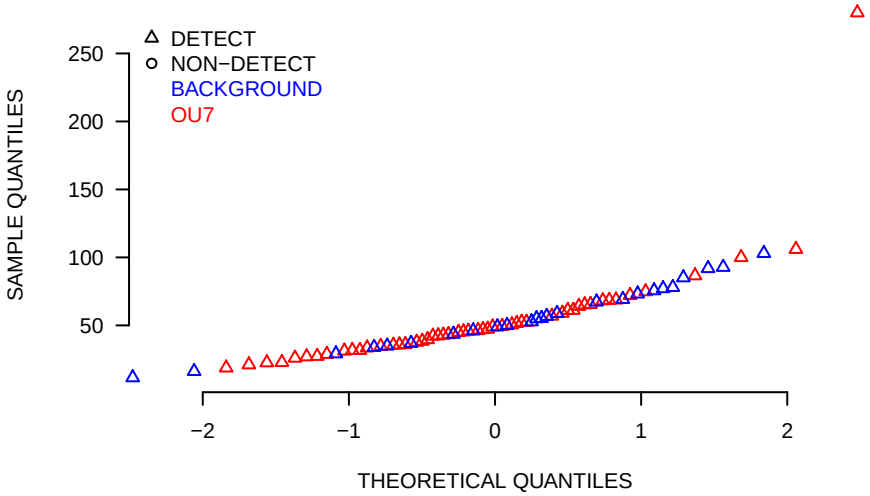
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

CHROMIUM SURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 6 OF 19

BOXPLOT



NORMAL PROBABILITY PLOT



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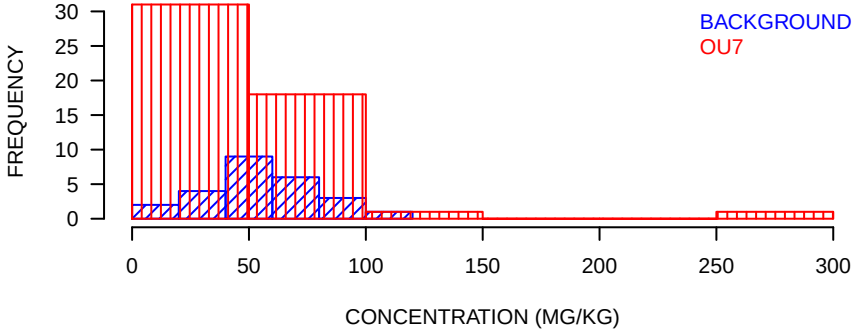


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	12	19
25TH PERCENTILE	44	35
MEDIAN	55	46
MEAN	58	53
75TH PERCENTILE	76	61
MAXIMUM	100	280

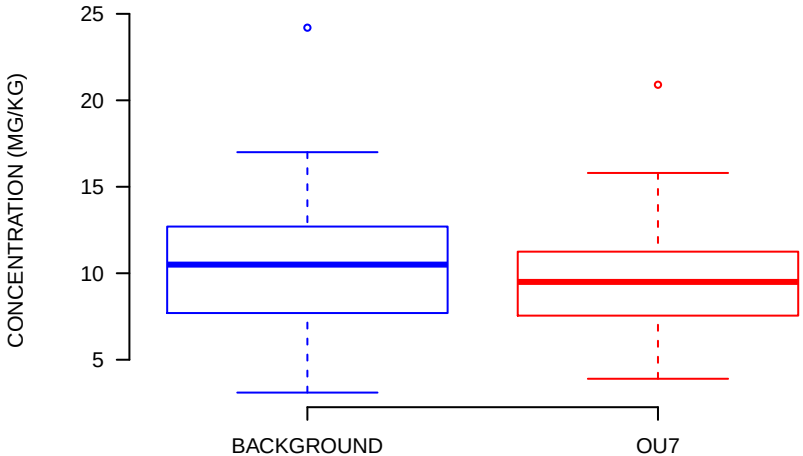
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

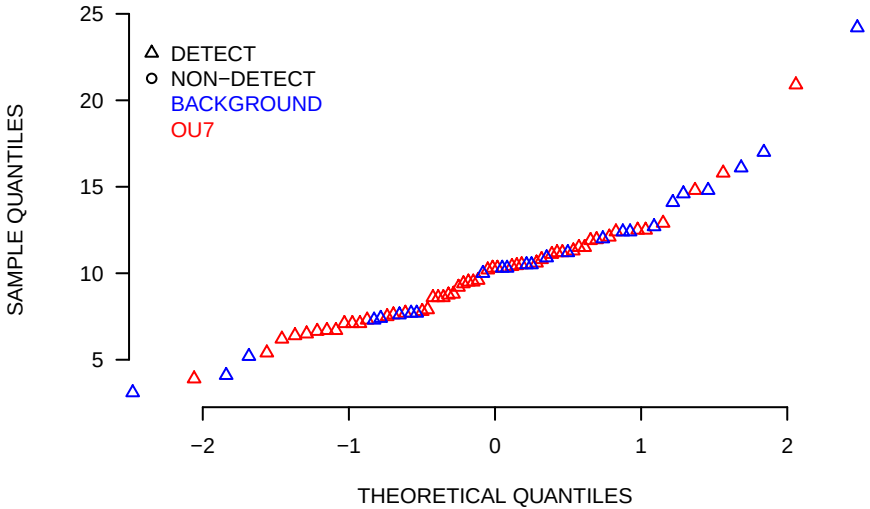
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

COBALT SURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 7 OF 19

BOXPLOT



NORMAL PROBABILITY PLOT



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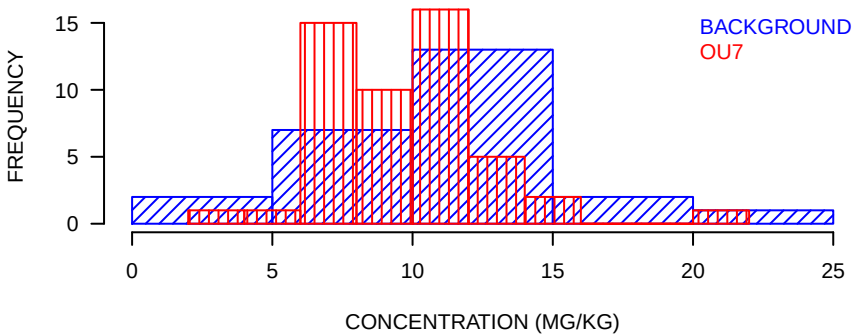


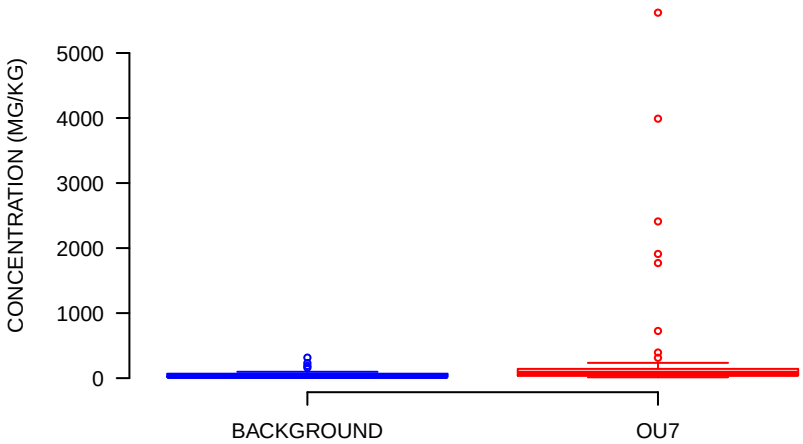
SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	3.1	3.9
25TH PERCENTILE	7.7	7.6
MEDIAN	10	9.5
MEAN	11	9.7
75TH PERCENTILE	13	11
MAXIMUM	24	21

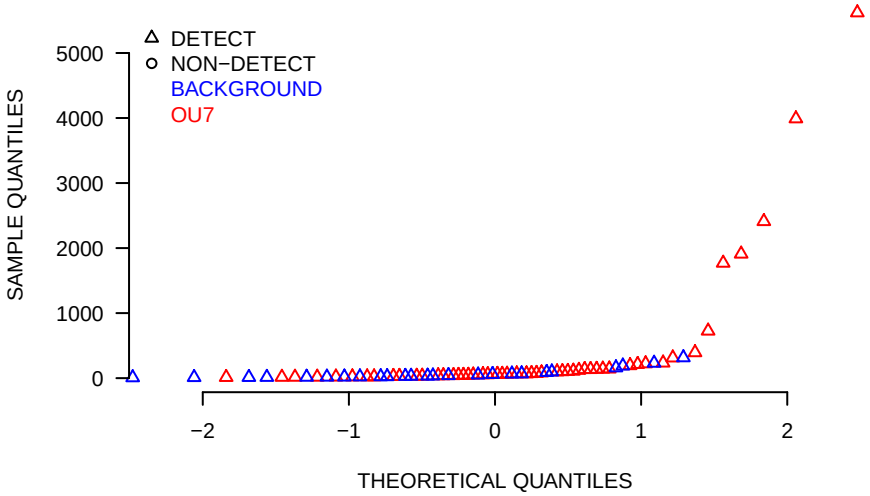
UNITS ARE MG/KG
1/2 DETECTION LIMIT USED FOR NON−DETECTS
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

COPPER SURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 8 OF 19

BOXPLOT



NORMAL PROBABILITY PLOT



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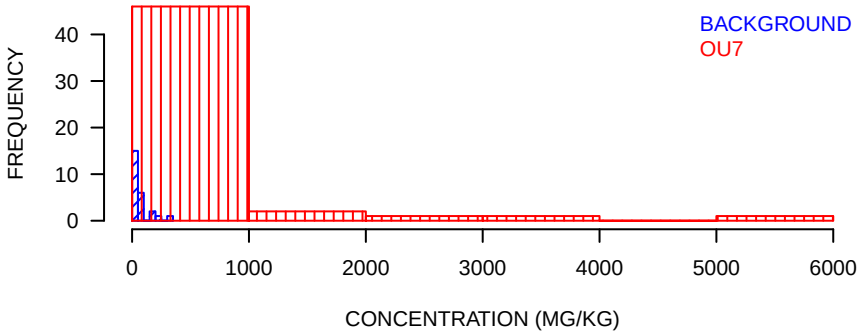


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	8.5	13
25TH PERCENTILE	20	40
MEDIAN	33	68
MEAN	67	400
75TH PERCENTILE	68	140
MAXIMUM	320	5600

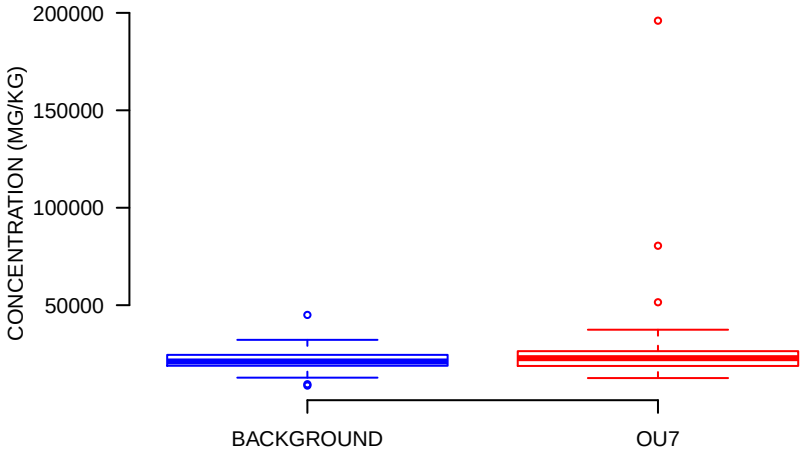
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

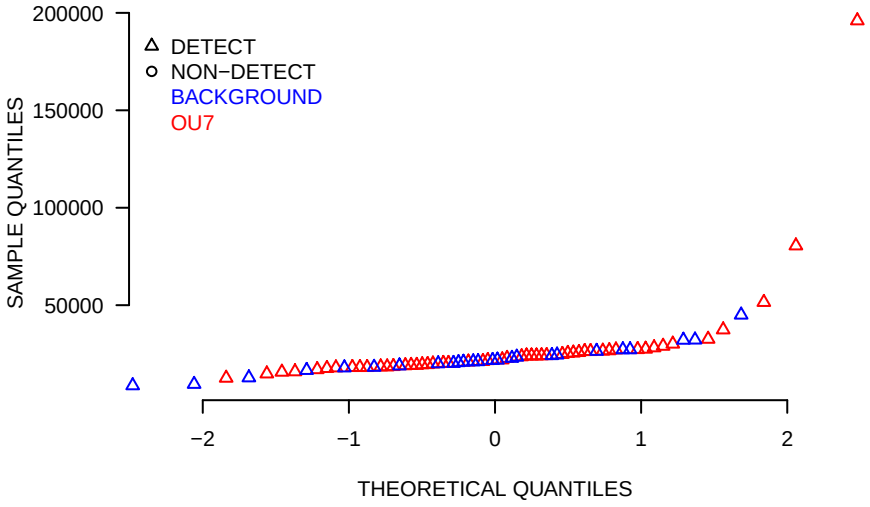
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

IRON SURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 9 OF 19

BOXPLOT



NORMAL PROBABILITY PLOT



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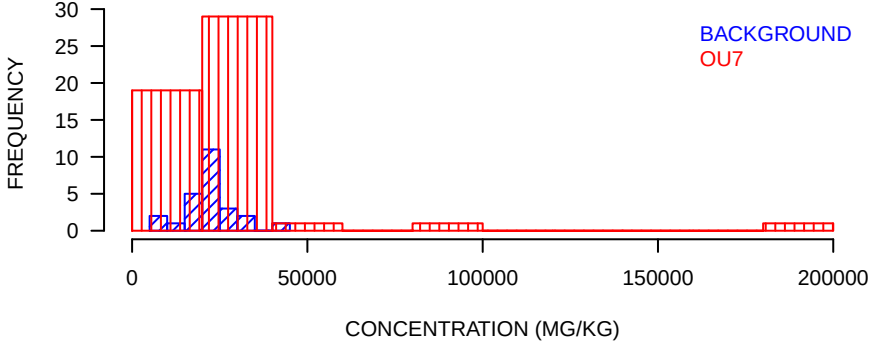


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	8700	13000
25TH PERCENTILE	19000	19000
MEDIAN	21000	23000
MEAN	22000	28000
75TH PERCENTILE	24000	26000
MAXIMUM	45000	2e+05

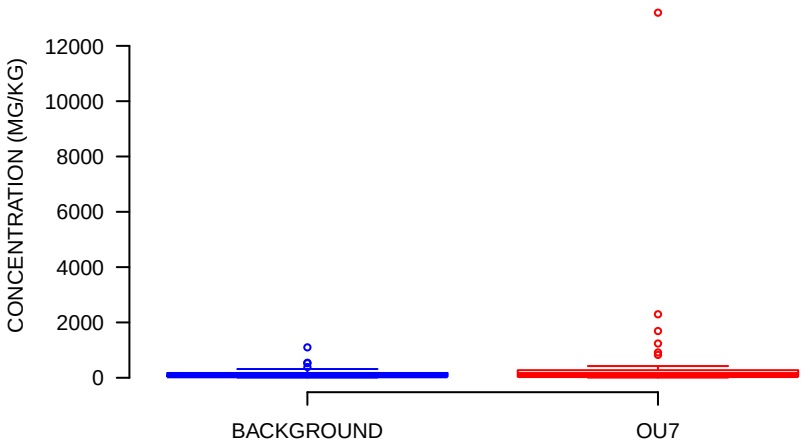
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

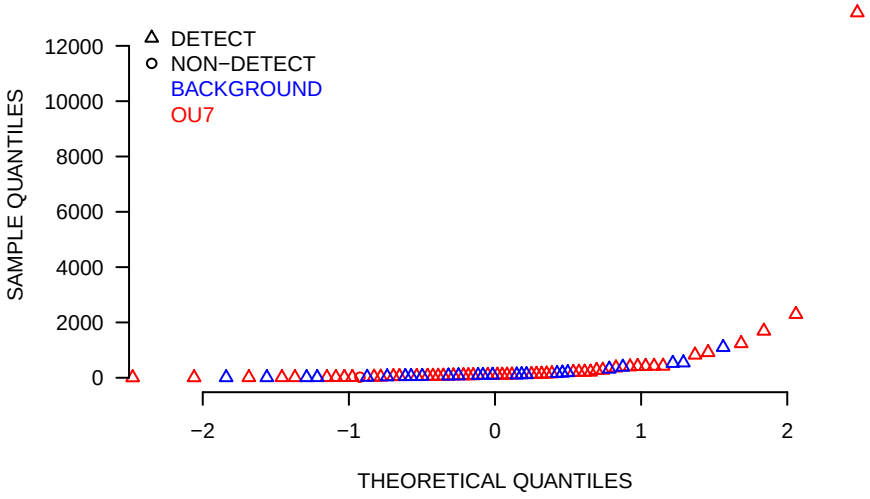
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

LEAD SURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 10 OF 19

BOXPLOT



NORMAL PROBABILITY PLOT



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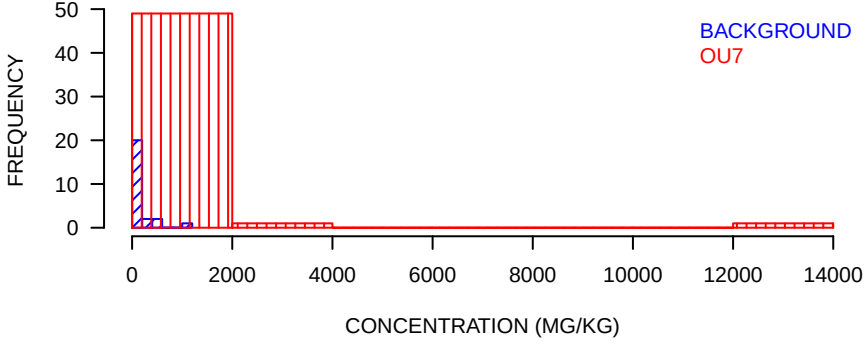


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	9.5	6.1
25TH PERCENTILE	51	49
MEDIAN	90	98
MEAN	180	510
75TH PERCENTILE	170	270
MAXIMUM	1100	13000

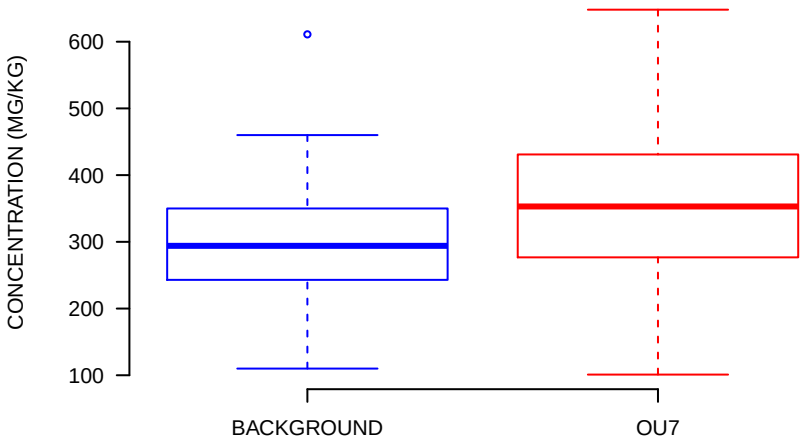
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

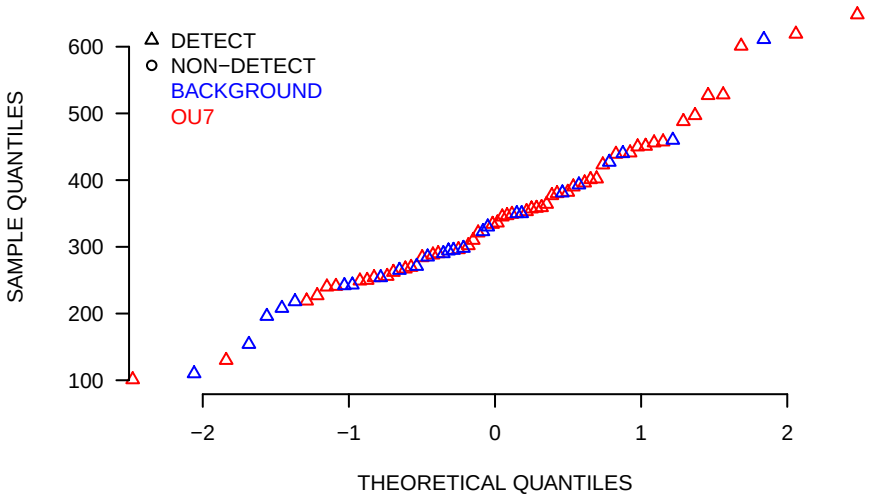
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

MANGANESE SURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 11 OF 19

BOXPLOT



NORMAL PROBABILITY PLOT



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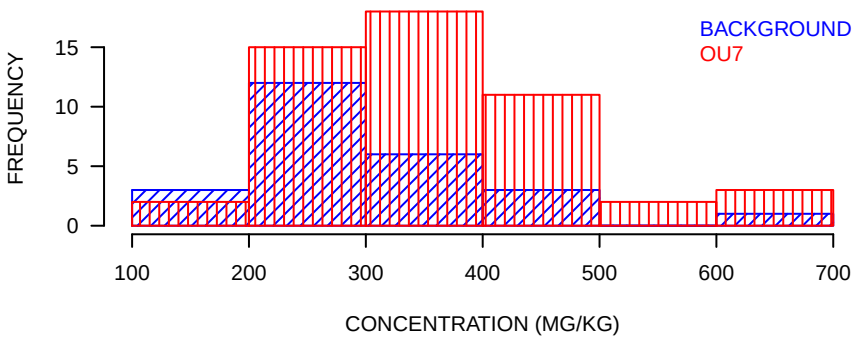


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	110	100
25TH PERCENTILE	240	280
MEDIAN	290	350
MEAN	310	360
75TH PERCENTILE	350	430
MAXIMUM	610	650

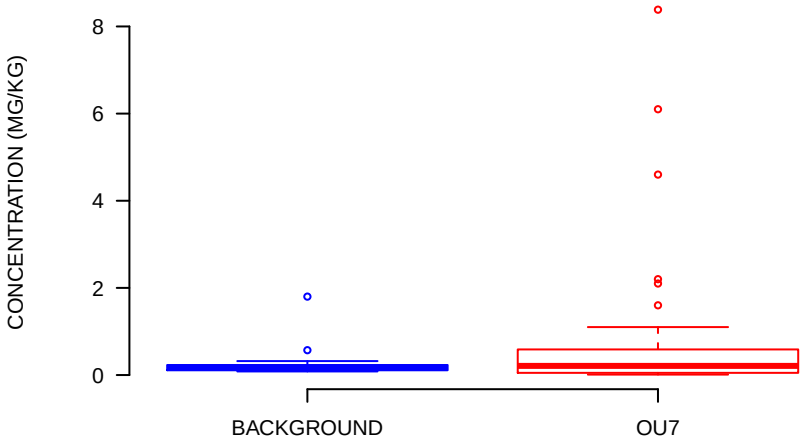
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

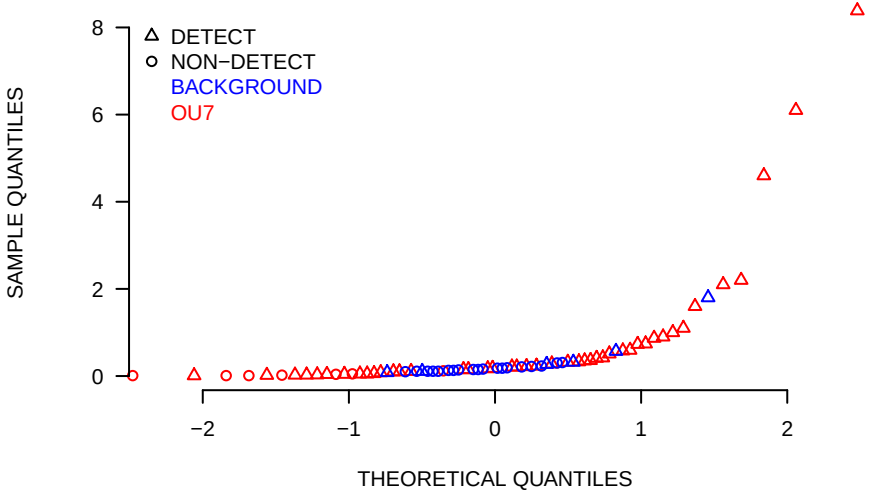
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

MERCURY SURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 12 OF 19

BOXPLOT



NORMAL PROBABILITY PLOT



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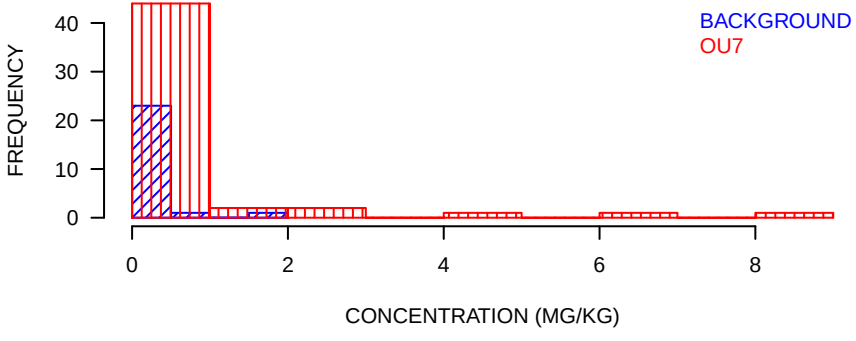


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	0.05	0.005
25TH PERCENTILE	0.065	0.046
MEDIAN	0.09	0.21
MEAN	0.19	0.72
75TH PERCENTILE	0.12	0.59
MAXIMUM	1.8	8.4

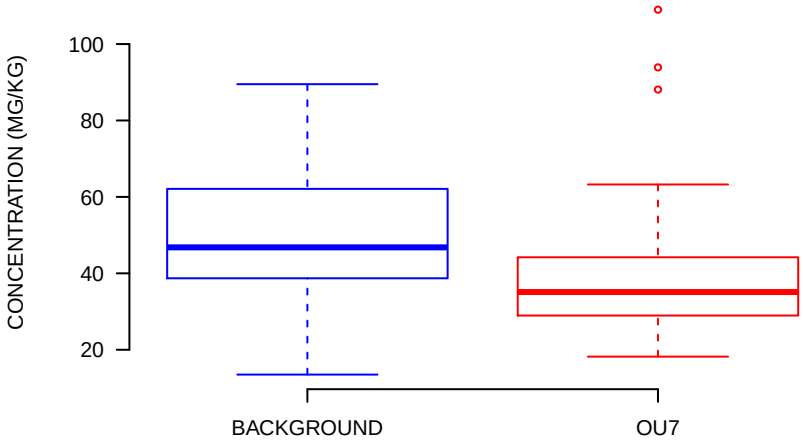
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

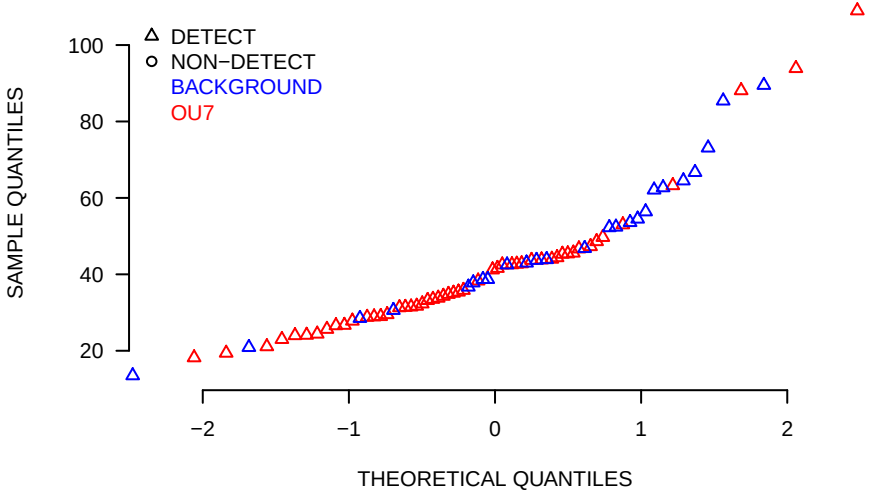
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

VANADIUM SURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 13 OF 19

BOXPLOT



NORMAL PROBABILITY PLOT



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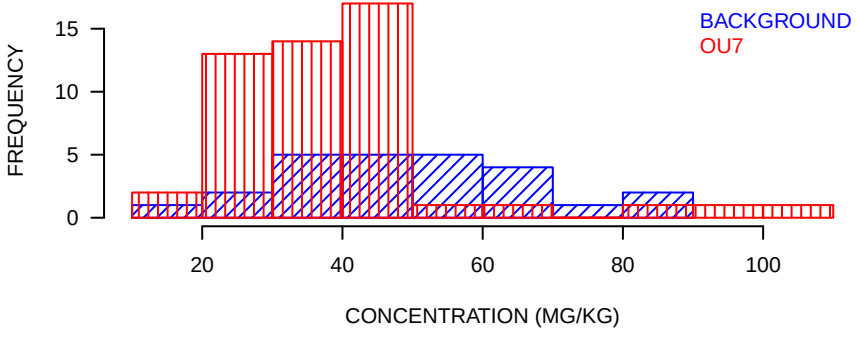


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	14	18
25TH PERCENTILE	39	29
MEDIAN	47	35
MEAN	50	40
75TH PERCENTILE	62	44
MAXIMUM	90	110

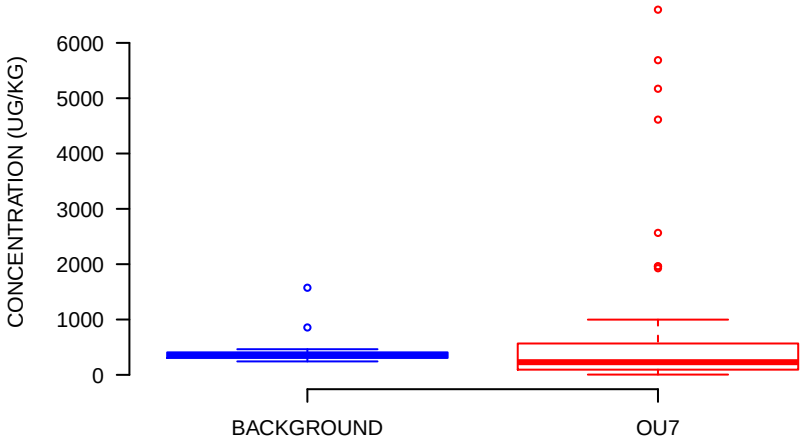
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

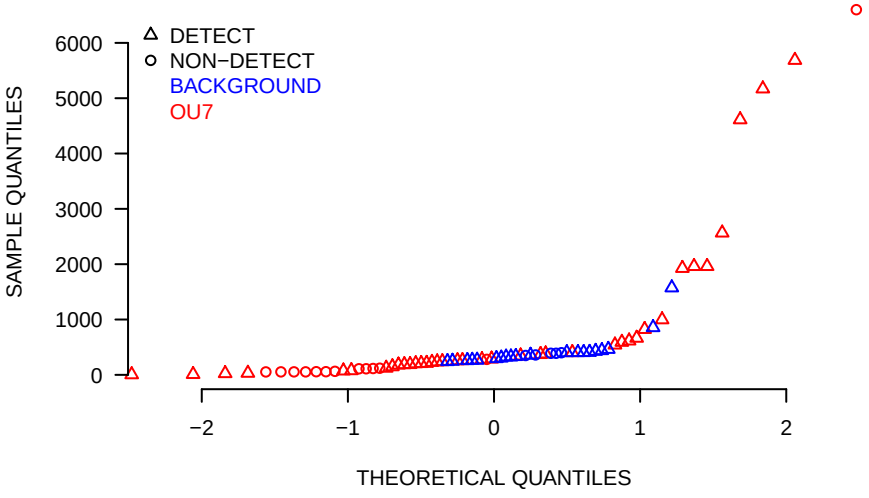
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

BAP EQUIVALENT−HALFND SURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 14 OF 19

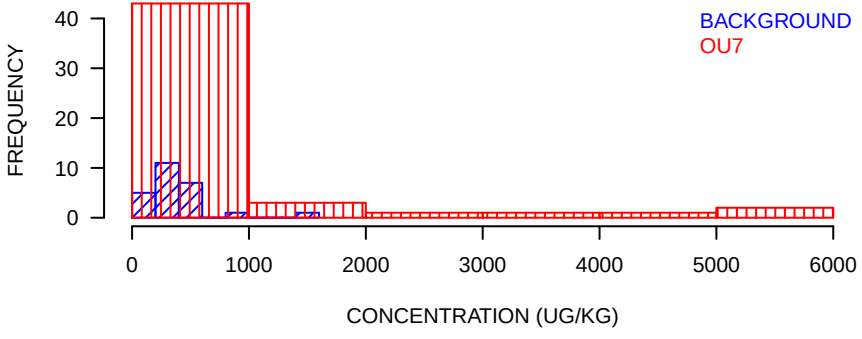
BOXPLOT



NORMAL PROBABILITY PLOT



HISTOGRAMS



SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	180	4.7
25TH PERCENTILE	250	56
MEDIAN	320	210
MEAN	380	720
75TH PERCENTILE	410	570
MAXIMUM	1600	5700

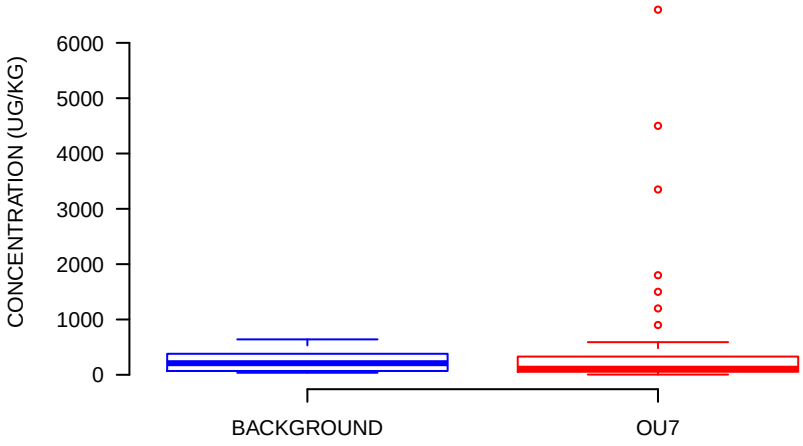
UNITS ARE UG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

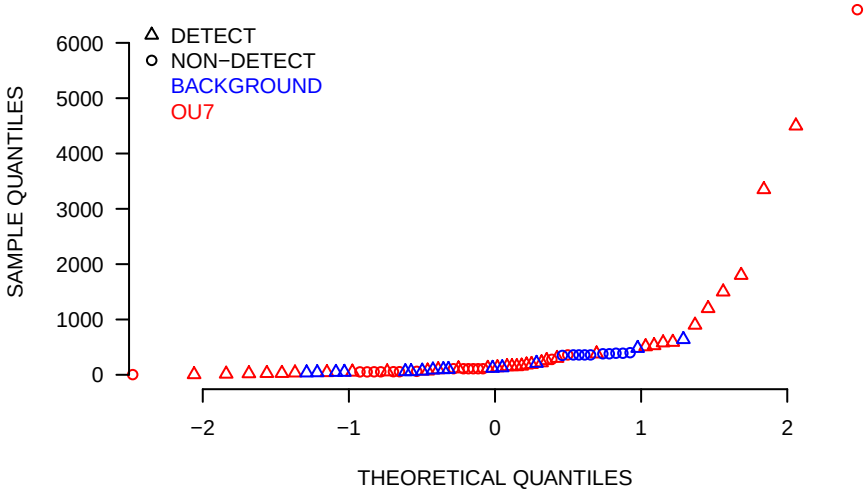
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

BENZO(A)ANTHRACENE SURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 15 OF 19

BOXPLOT



NORMAL PROBABILITY PLOT



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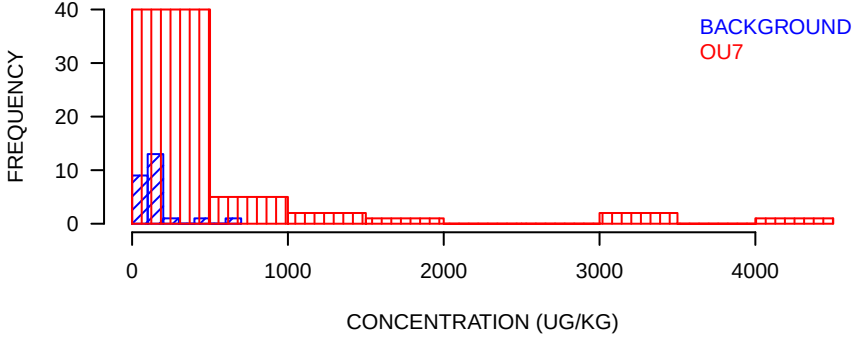


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	37	1.9
25TH PERCENTILE	69	34
MEDIAN	180	110
MEAN	160	440
75TH PERCENTILE	190	280
MAXIMUM	640	4500

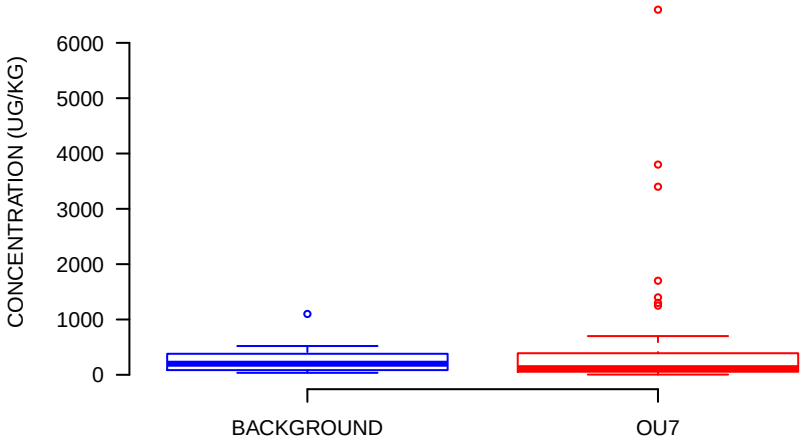
UNITS ARE UG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

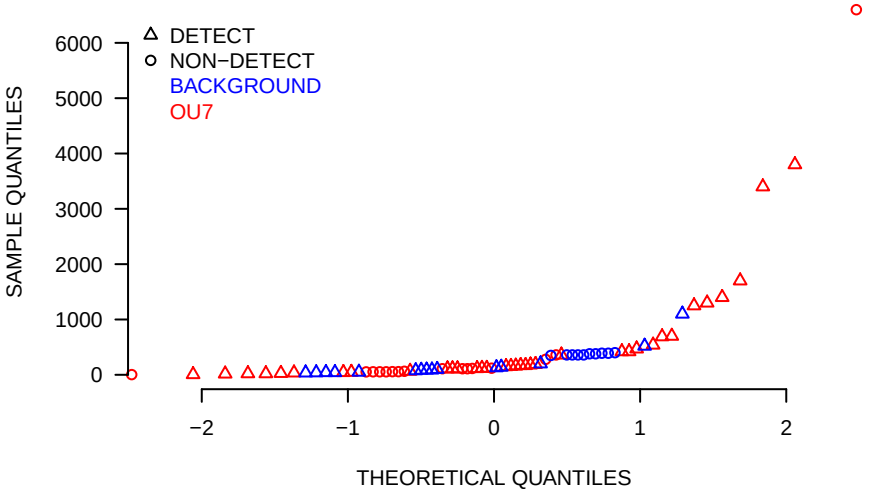
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

BENZO(A)PYRENE SURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 16 OF 19

BOXPLOT



NORMAL PROBABILITY PLOT



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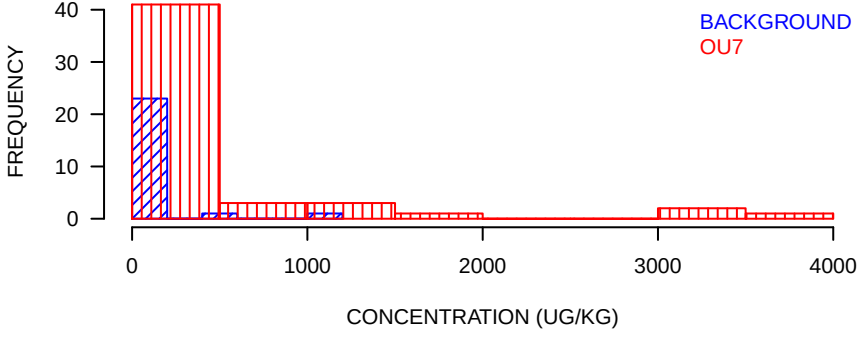


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	36	1.9
25TH PERCENTILE	85	34
MEDIAN	180	120
MEAN	180	450
75TH PERCENTILE	190	390
MAXIMUM	1100	3800

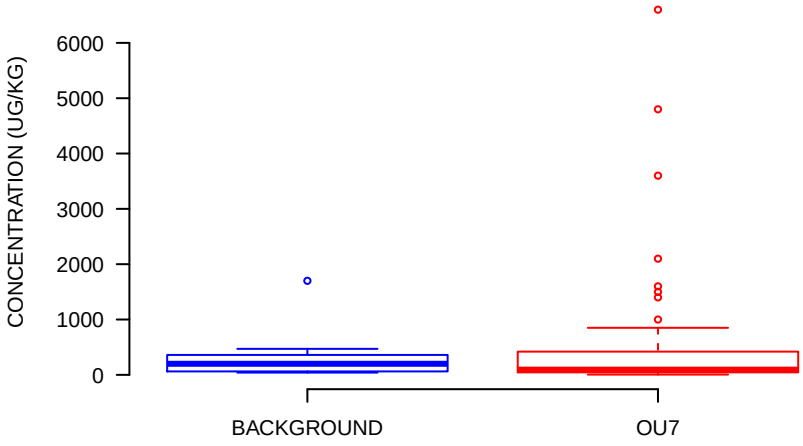
UNITS ARE UG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

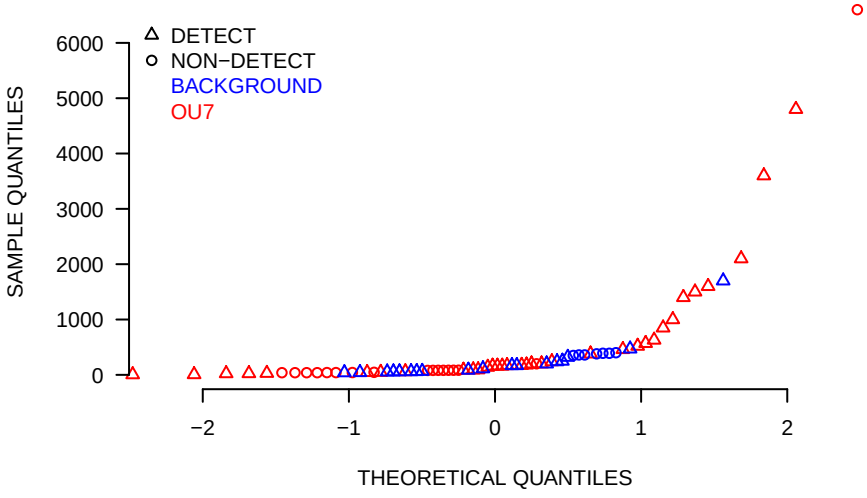
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

BENZO(B)FLUORANTHENE SURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 17 OF 19

BOXPLOT



NORMAL PROBABILITY PLOT



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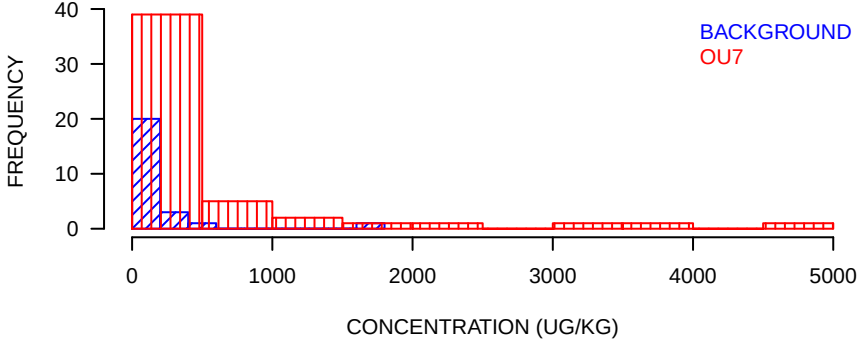


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	41	4.7
25TH PERCENTILE	62	35
MEDIAN	180	94
MEAN	220	500
75TH PERCENTILE	200	420
MAXIMUM	1700	4800

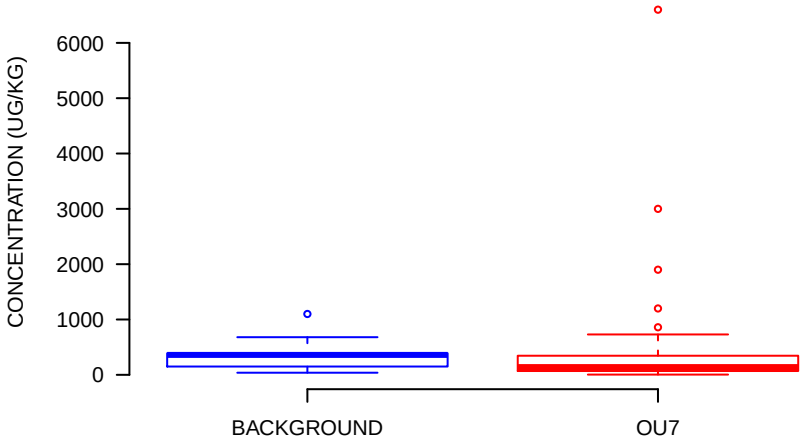
UNITS ARE UG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

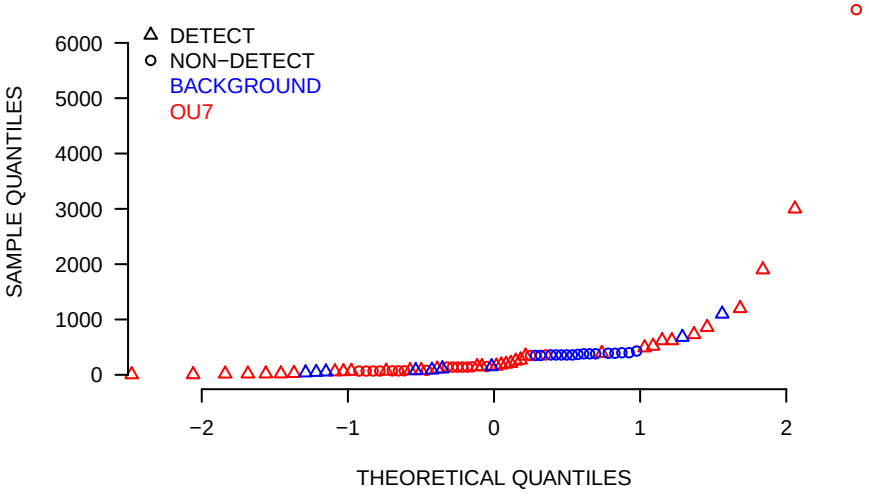
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

BENZO(K)FLUORANTHENE SURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 18 OF 19

BOXPLOT



NORMAL PROBABILITY PLOT



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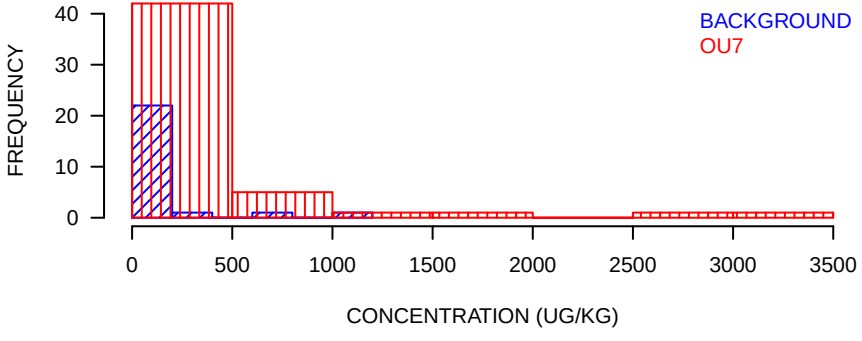


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	38	4.3
25TH PERCENTILE	150	36
MEDIAN	180	75
MEAN	210	340
75TH PERCENTILE	200	260
MAXIMUM	1100	3300

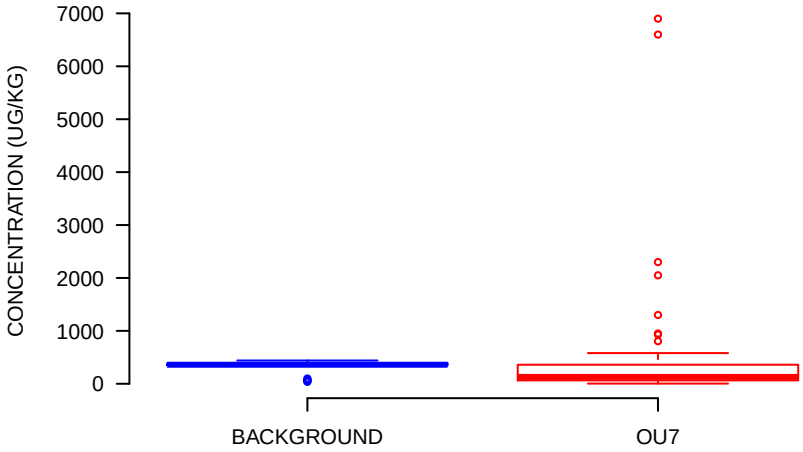
UNITS ARE UG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

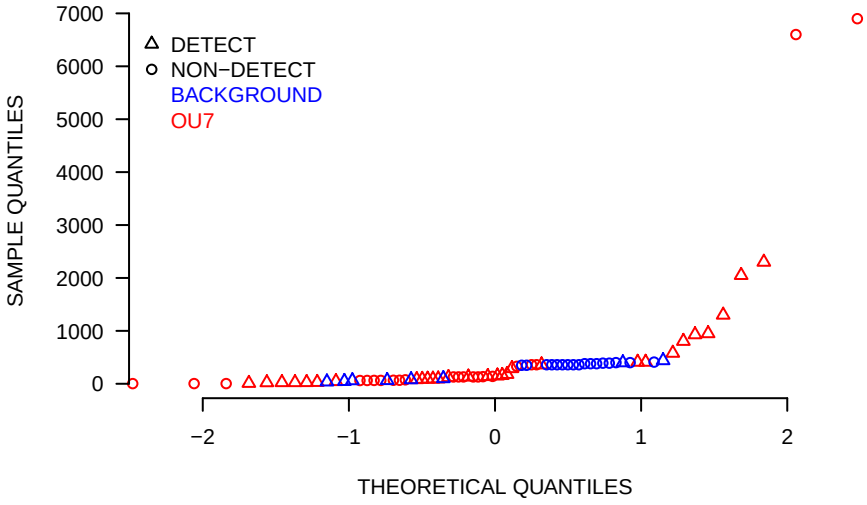
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

INDENO(1,2,3−CD)PYRENE SURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 19 OF 19

BOXPLOT



NORMAL PROBABILITY PLOT



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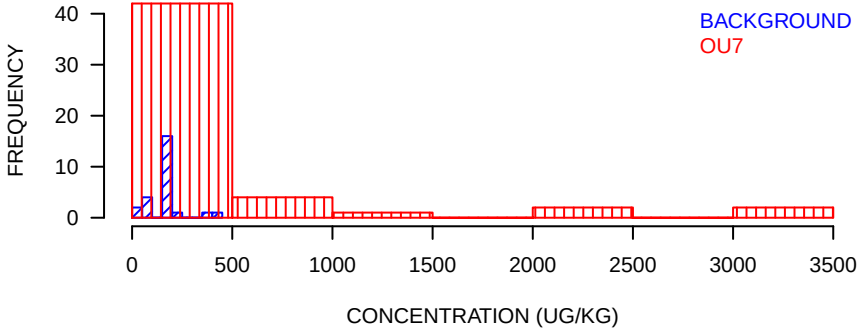


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	38	1.8
25TH PERCENTILE	180	33
MEDIAN	180	87
MEAN	180	390
75TH PERCENTILE	200	240
MAXIMUM	440	3400

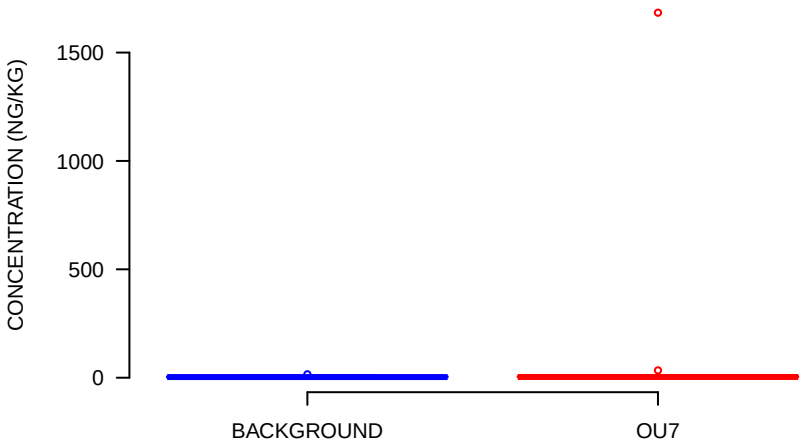
UNITS ARE UG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

TEQ WHO−2005 − HALFND SUBSURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 1 OF 20

BOXPLOT



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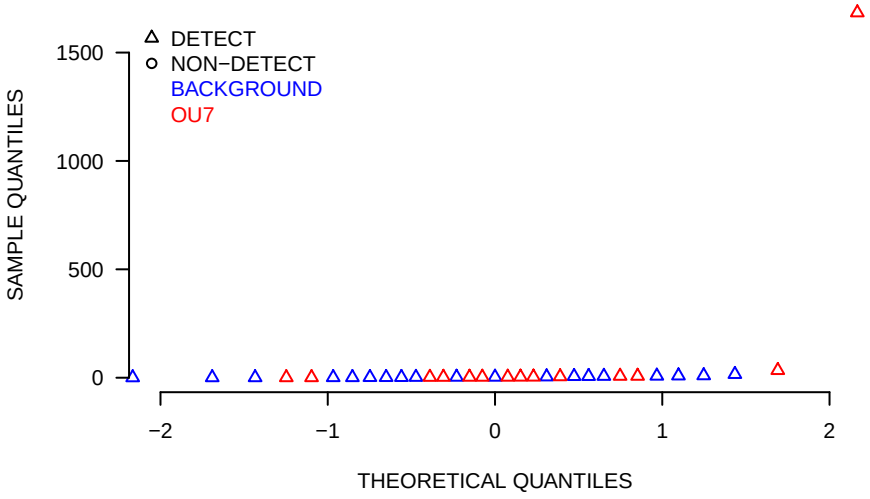

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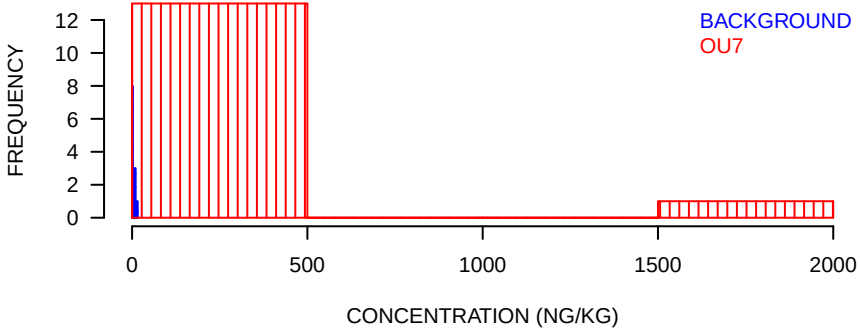


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	0.54	0.88
25TH PERCENTILE	1.5	2.8
MEDIAN	3.1	3.4
MEAN	4.5	130
75TH PERCENTILE	6.9	6.9
MAXIMUM	16	1700

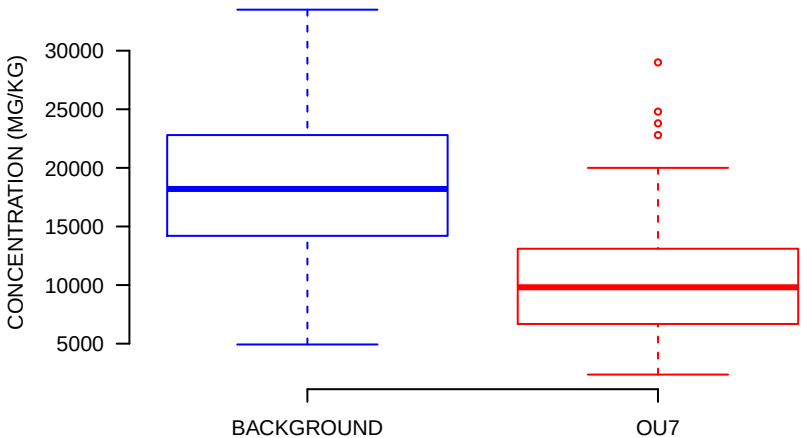
UNITS ARE NG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

ALUMINUM SUBSURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 2 OF 20

BOXPLOT



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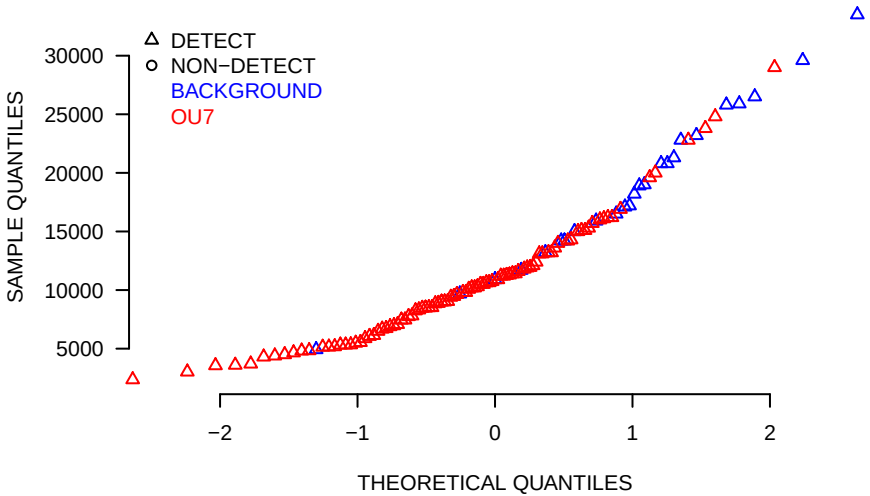

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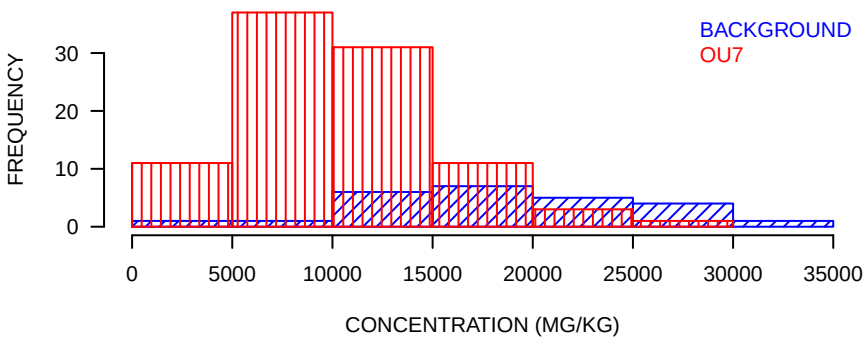


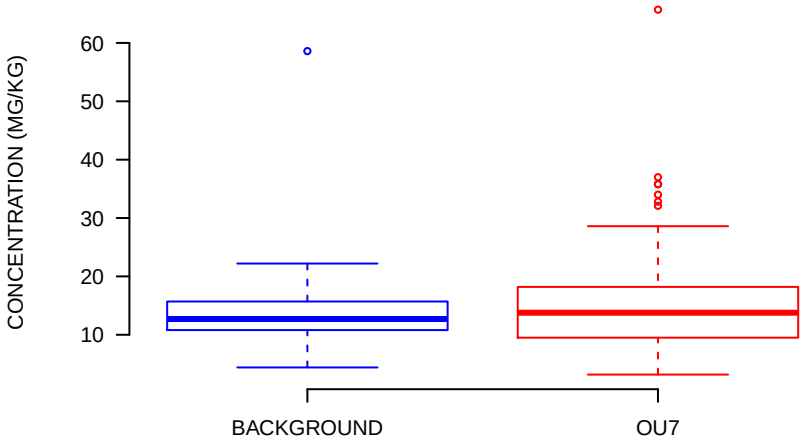
SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	4900	2400
25TH PERCENTILE	14000	6700
MEDIAN	18000	9800
MEAN	19000	10000
75TH PERCENTILE	23000	13000
MAXIMUM	34000	29000

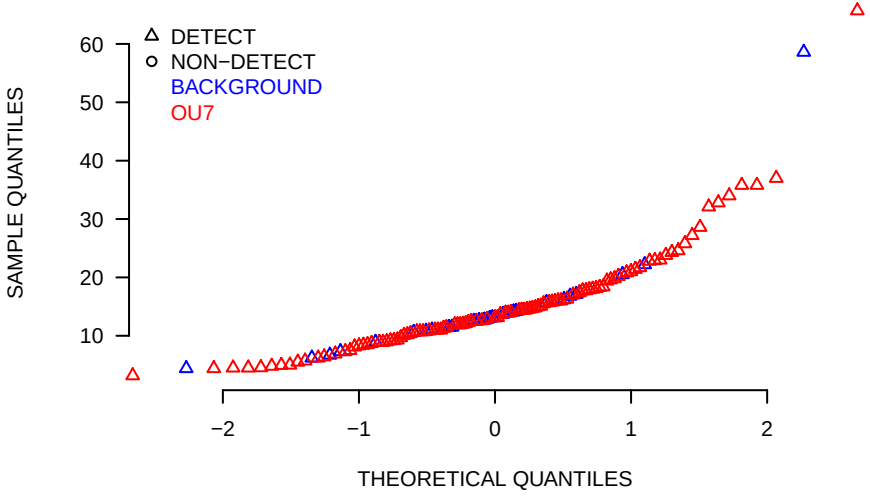
UNITS ARE MG/KG
1/2 DETECTION LIMIT USED FOR NON−DETECTS
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

ARSENIC SUBSURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 3 OF 20

BOXPLOT



NORMAL PROBABILITY PLOT



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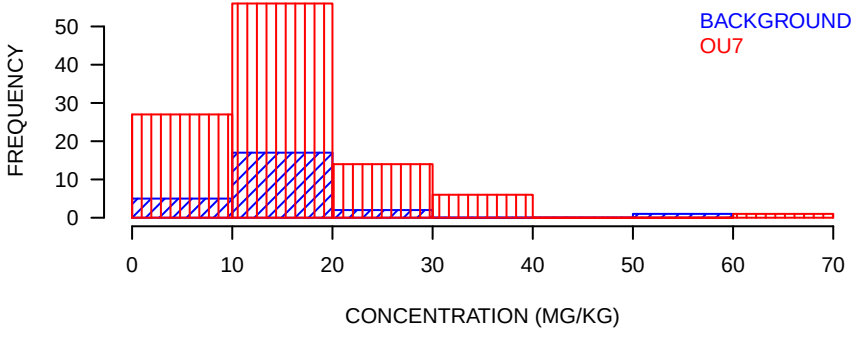


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	4.4	3.2
25TH PERCENTILE	11	9.6
MEDIAN	13	14
MEAN	14	15
75TH PERCENTILE	16	18
MAXIMUM	59	66

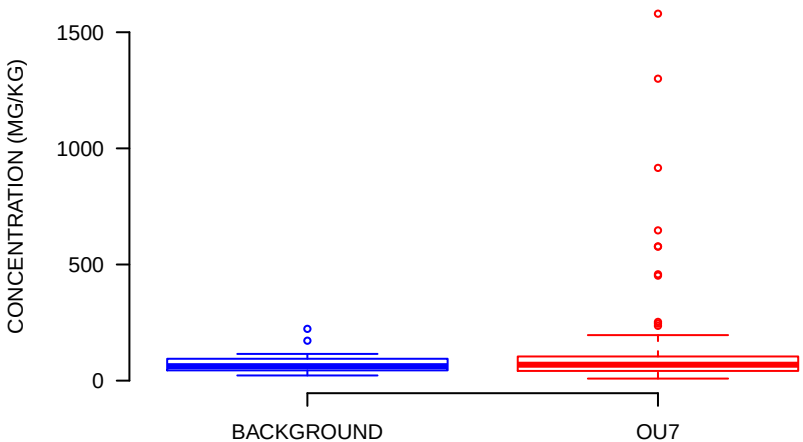
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

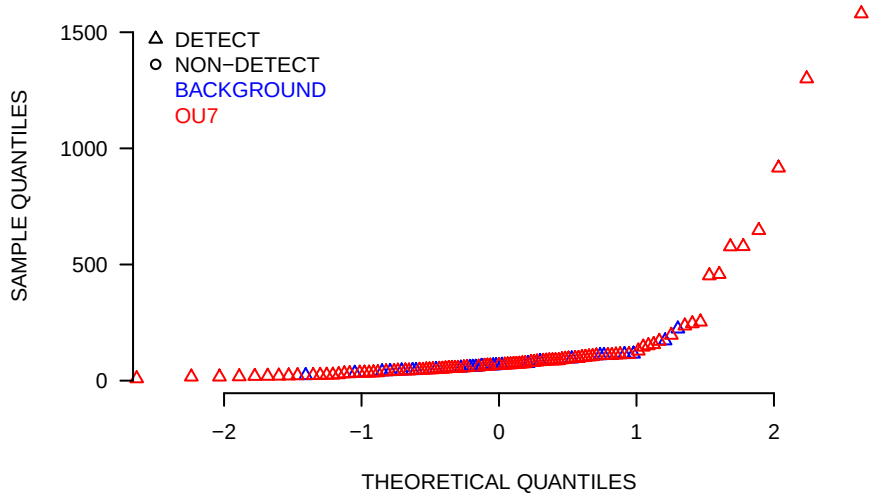
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

BARIUM SUBSURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 4 OF 20

BOXPLOT



NORMAL PROBABILITY PLOT



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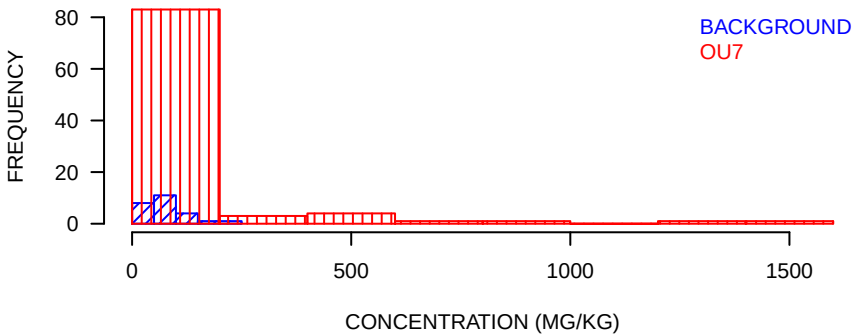


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	22	8.8
25TH PERCENTILE	44	42
MEDIAN	62	69
MEAN	76	140
75TH PERCENTILE	94	100
MAXIMUM	220	1600

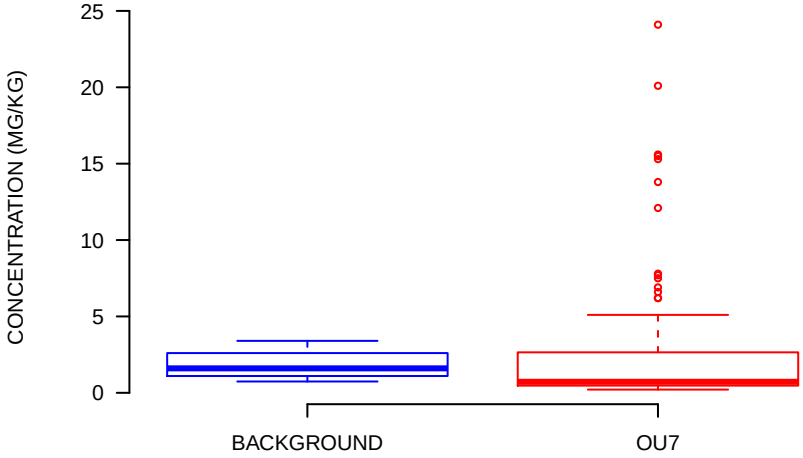
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

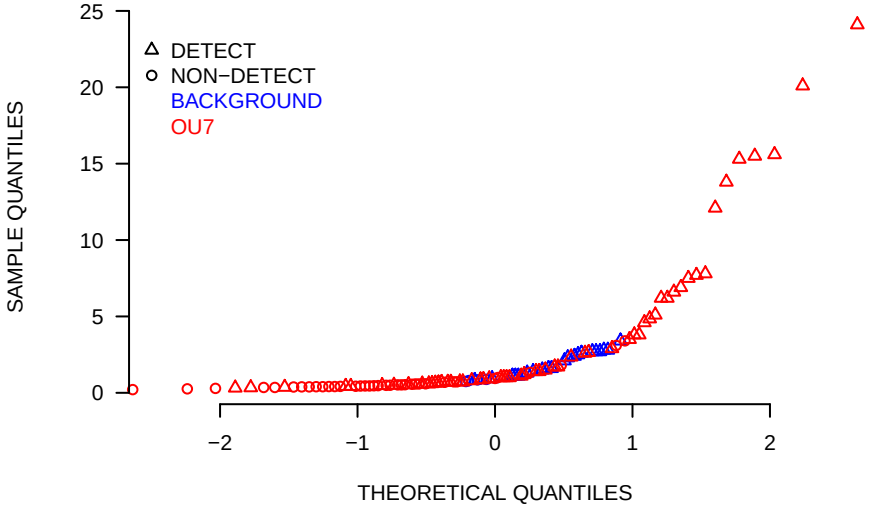
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

CADMIUM SUBSURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 5 OF 20

BOXPLOT



NORMAL PROBABILITY PLOT



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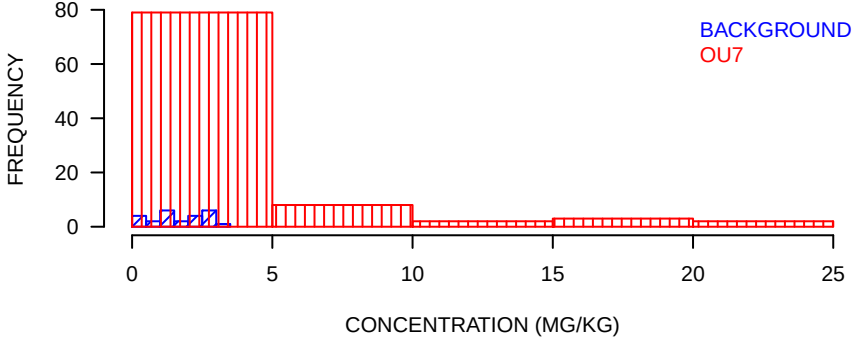


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	0.37	0.1
25TH PERCENTILE	1.1	0.27
MEDIAN	1.6	0.68
MEAN	1.7	2.6
75TH PERCENTILE	2.6	2.2
MAXIMUM	3.4	24

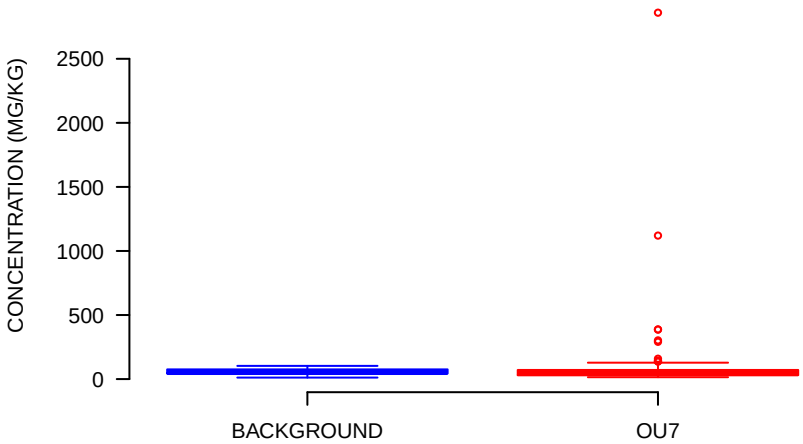
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

CHROMIUM SUBSURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 6 OF 20

BOXPLOT



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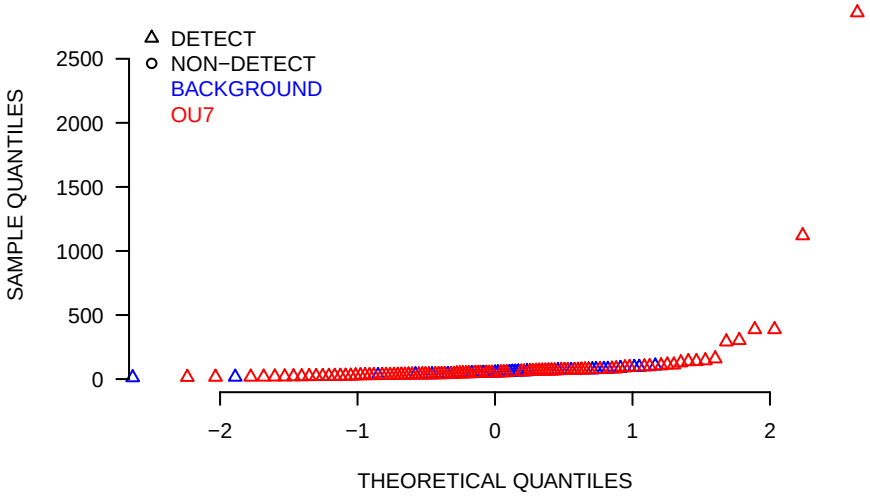

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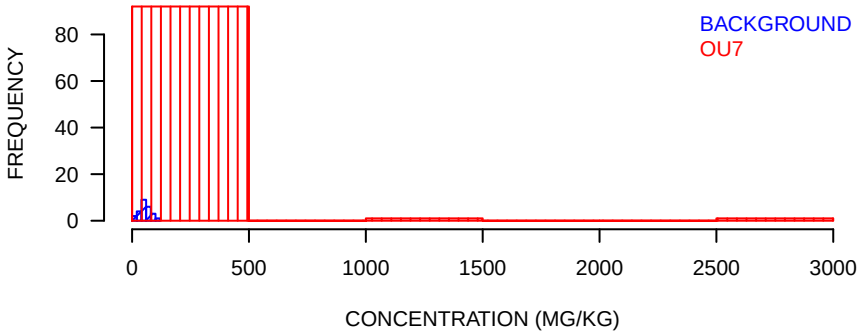


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	12	15
25TH PERCENTILE	44	31
MEDIAN	55	46
MEAN	58	110
75TH PERCENTILE	76	71
MAXIMUM	100	2900

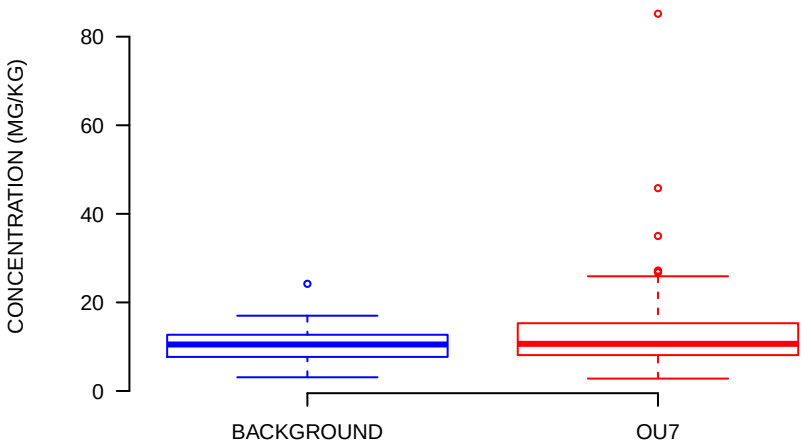
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

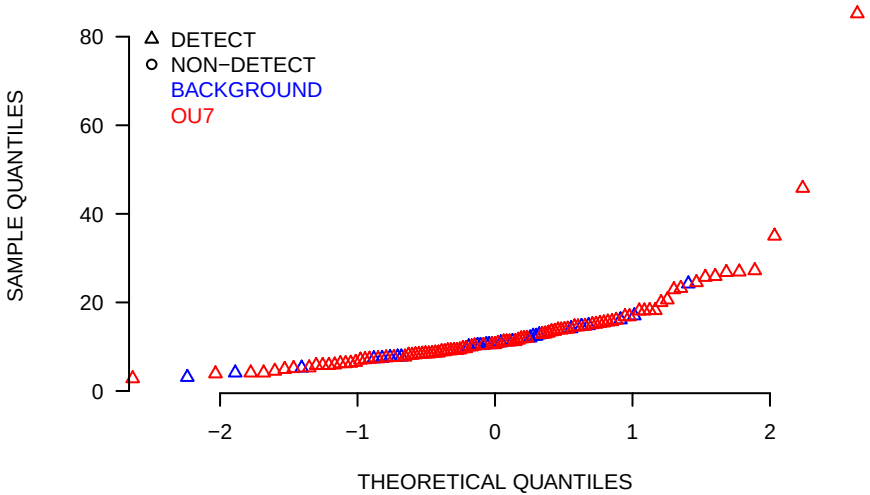
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

COBALT SUBSURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 7 OF 20

BOXPLOT



NORMAL PROBABILITY PLOT



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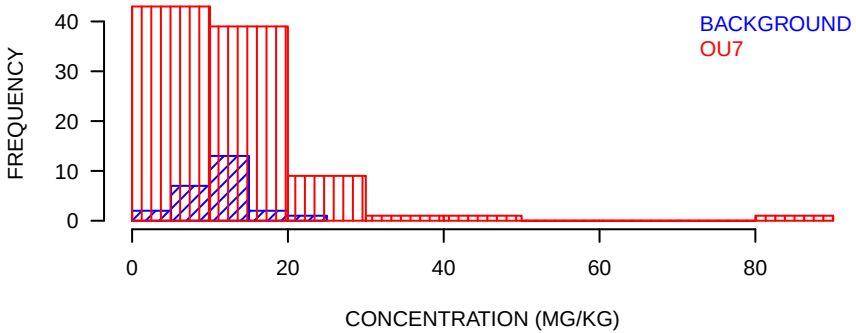


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	3.1	2.8
25TH PERCENTILE	7.7	8.1
MEDIAN	10	11
MEAN	11	13
75TH PERCENTILE	13	15
MAXIMUM	24	85

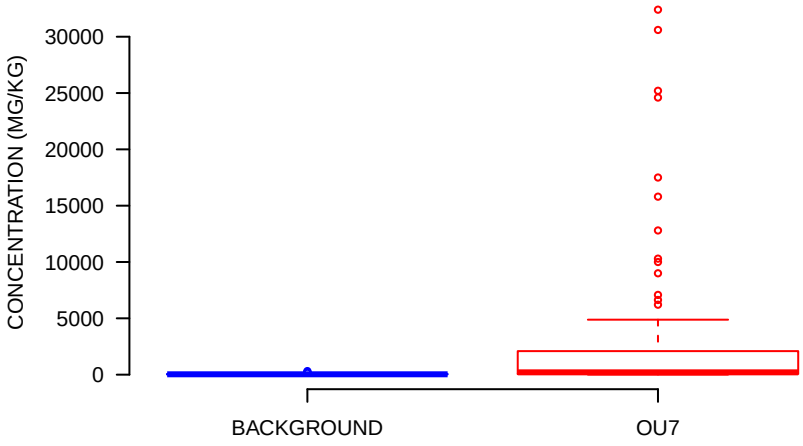
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

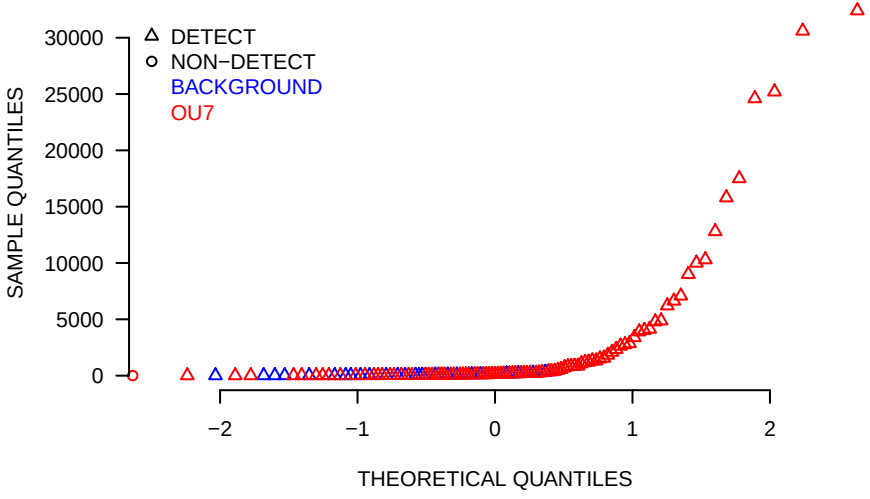
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

COPPER SUBSURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 8 OF 20

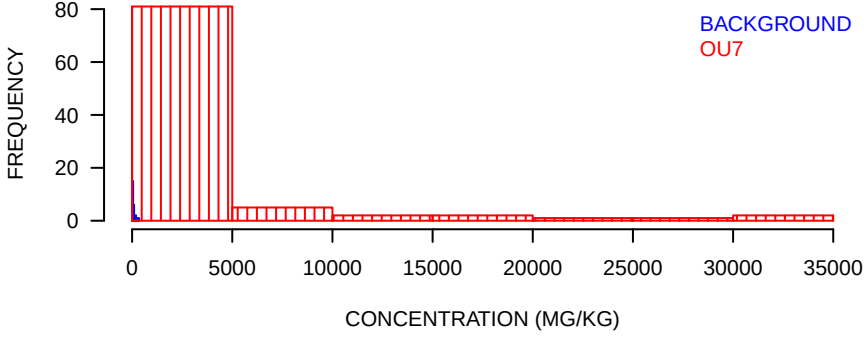
BOXPLOT



NORMAL PROBABILITY PLOT



HISTOGRAMS



SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	8.5	2.6
25TH PERCENTILE	20	60
MEDIAN	33	210
MEAN	67	2800
75TH PERCENTILE	68	2000
MAXIMUM	320	32000

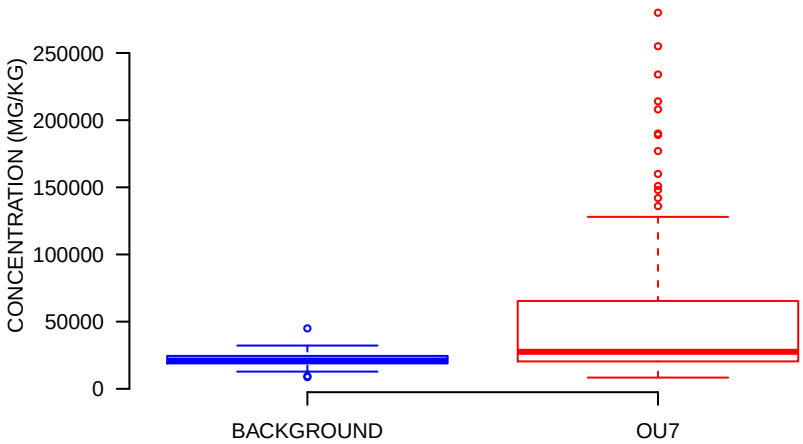
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

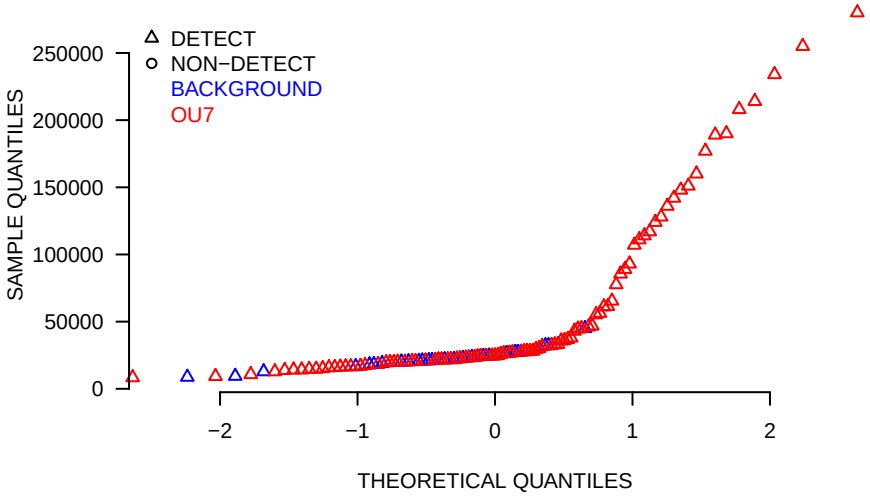
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

IRON SUBSURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 9 OF 20

BOXPLOT



NORMAL PROBABILITY PLOT



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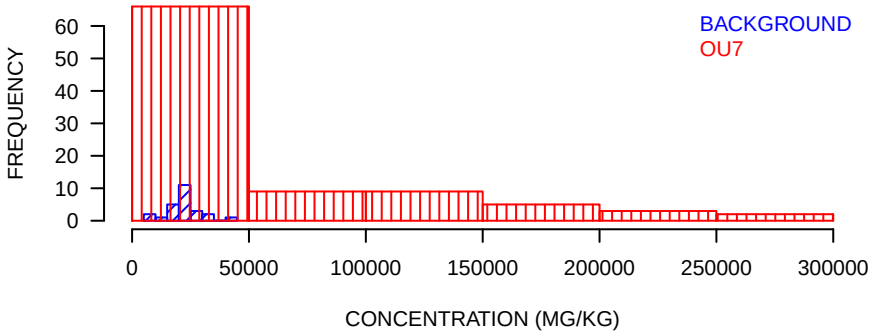


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	8700	8400
25TH PERCENTILE	19000	20000
MEDIAN	21000	28000
MEAN	22000	58000
75TH PERCENTILE	24000	64000
MAXIMUM	45000	280000

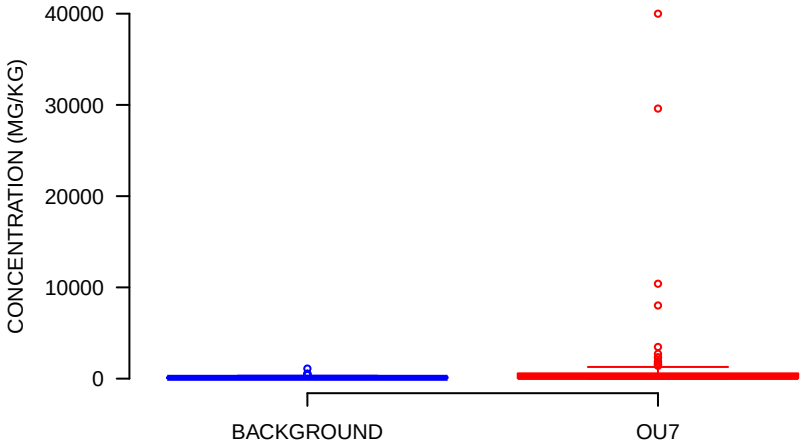
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

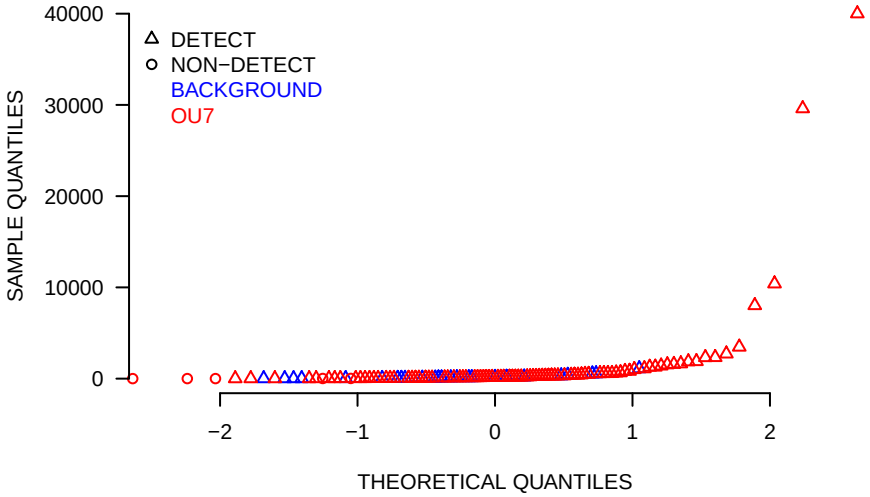
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

LEAD SUBSURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 10 OF 20

BOXPLOT



NORMAL PROBABILITY PLOT



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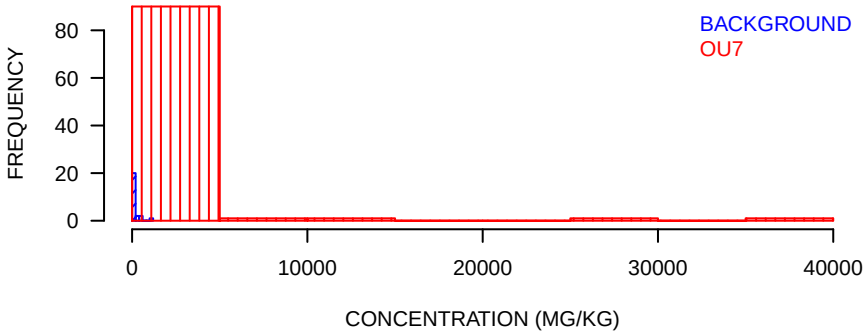


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	9.5	1.9
25TH PERCENTILE	51	60
MEDIAN	90	180
MEAN	180	1400
75TH PERCENTILE	170	580
MAXIMUM	1100	40000

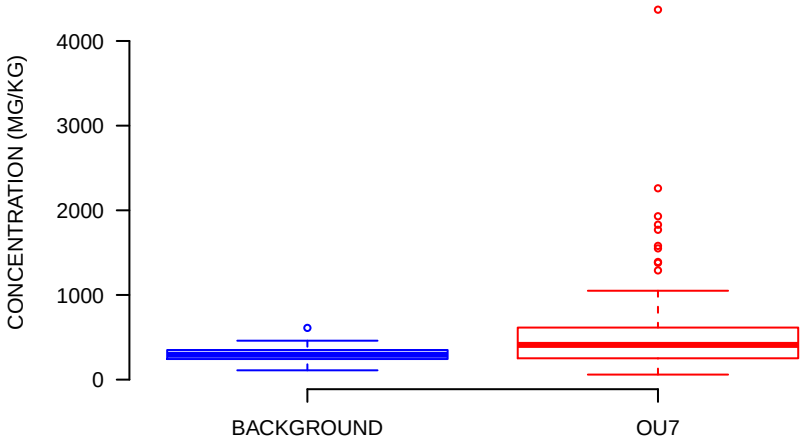
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

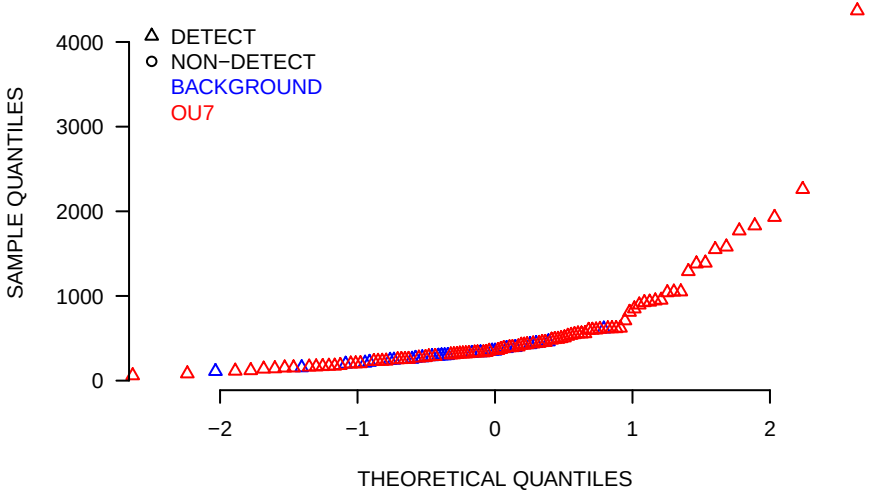
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

MANGANESE SUBSURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 11 OF 20

BOXPLOT



NORMAL PROBABILITY PLOT



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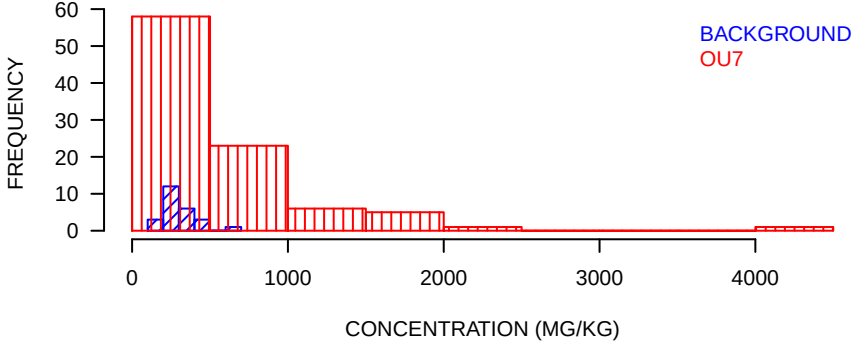


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	110	59
25TH PERCENTILE	240	250
MEDIAN	290	410
MEAN	310	580
75TH PERCENTILE	350	610
MAXIMUM	610	4400

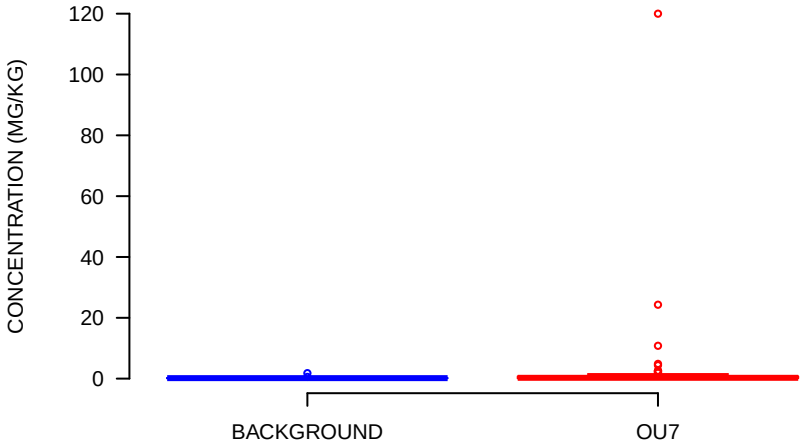
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

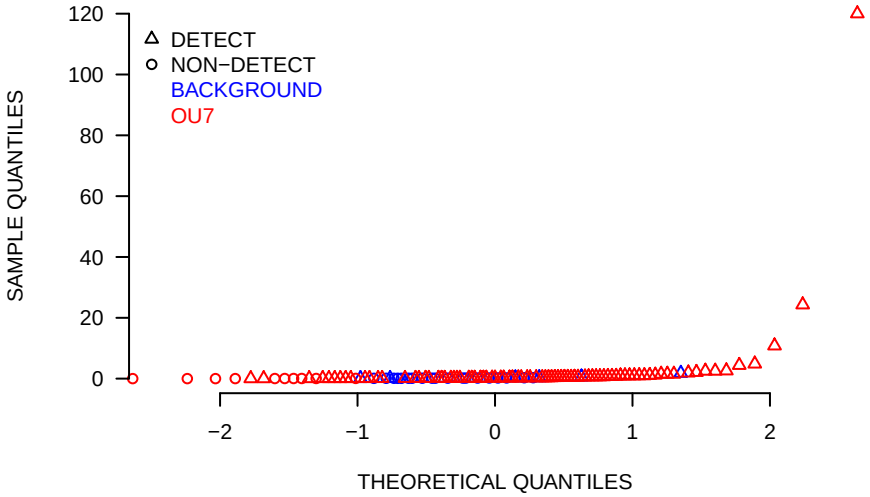
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

MERCURY SUBSURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 12 OF 20

BOXPLOT



NORMAL PROBABILITY PLOT



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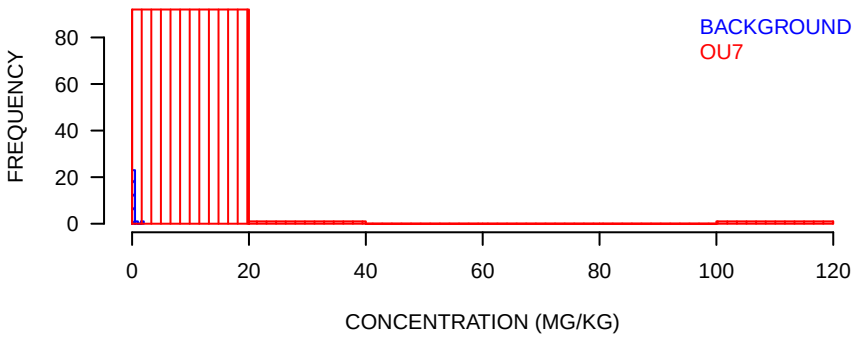


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	0.05	0.005
25TH PERCENTILE	0.065	0.12
MEDIAN	0.09	0.26
MEAN	0.19	2.2
75TH PERCENTILE	0.12	0.75
MAXIMUM	1.8	120

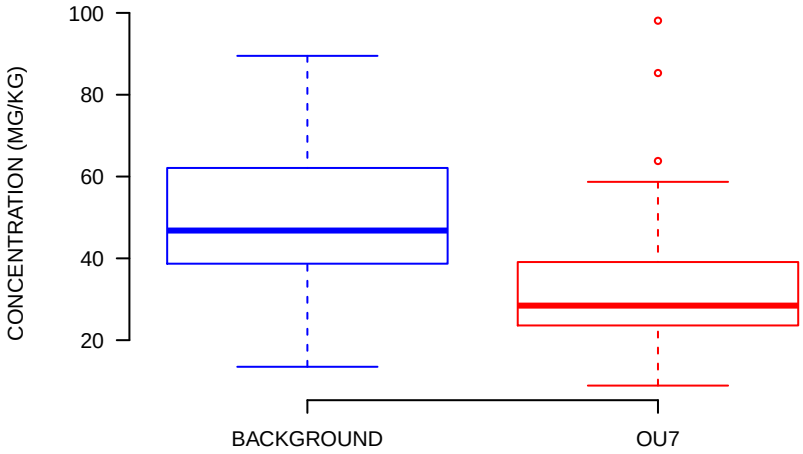
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

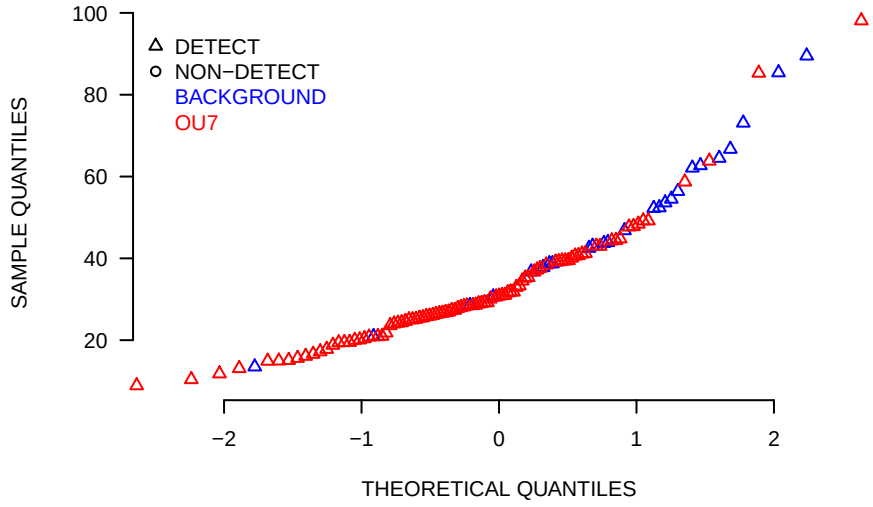
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

VANADIUM SUBSURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 13 OF 20

BOXPLOT



NORMAL PROBABILITY PLOT



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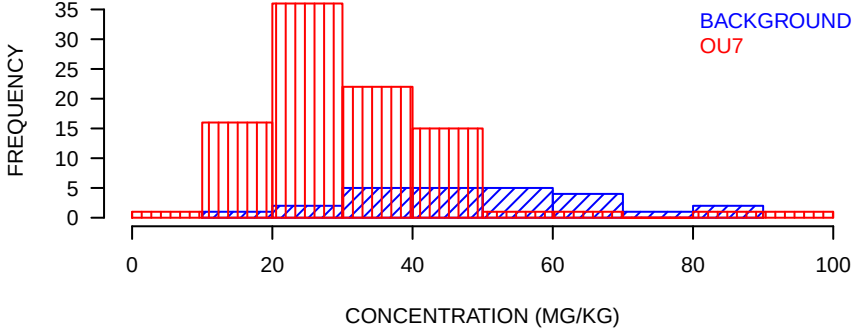


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	14	8.9
25TH PERCENTILE	39	24
MEDIAN	47	28
MEAN	50	31
75TH PERCENTILE	62	39
MAXIMUM	90	98

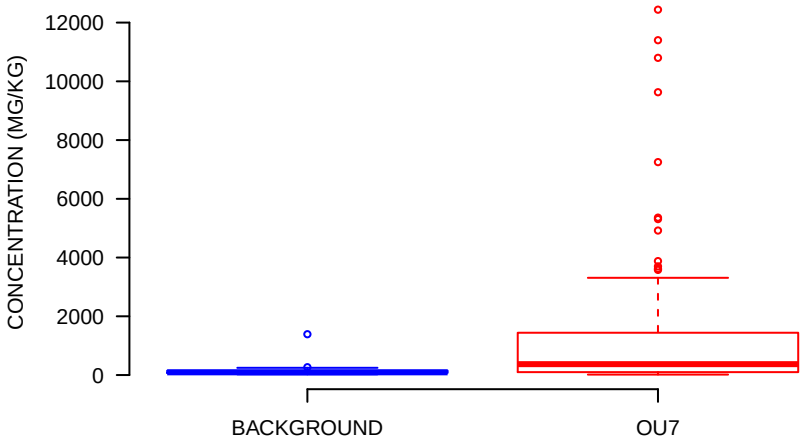
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

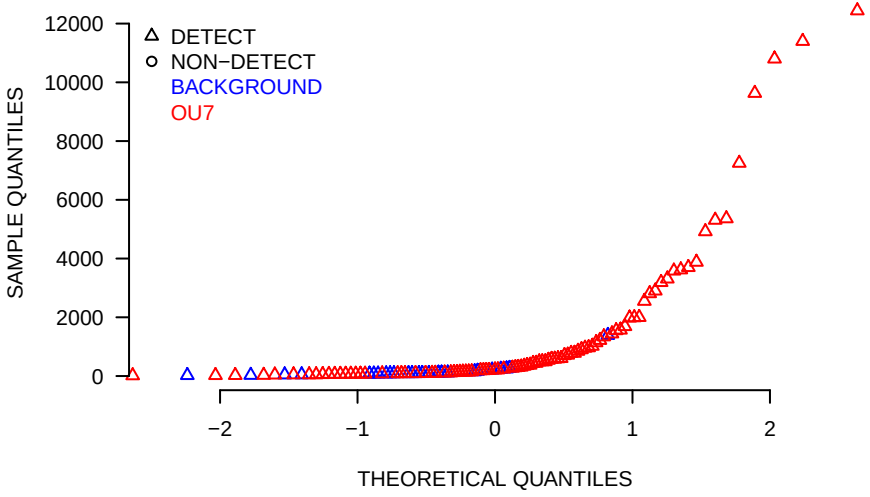
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

ZINC SUBSURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 14 OF 20

BOXPLOT



NORMAL PROBABILITY PLOT



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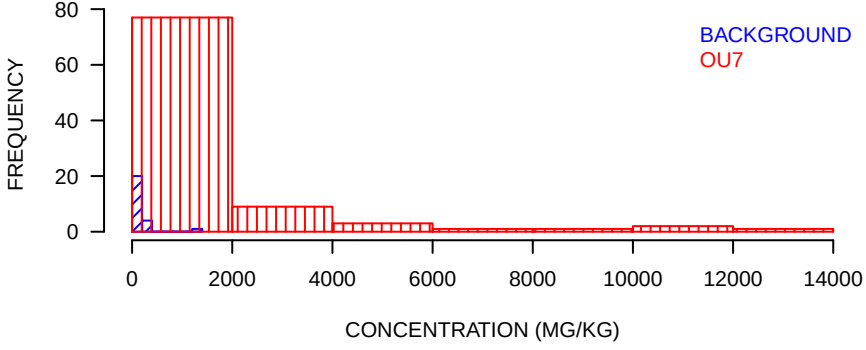


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	23	15
25TH PERCENTILE	74	99
MEDIAN	92	370
MEAN	160	1400
75TH PERCENTILE	150	1400
MAXIMUM	1400	12000

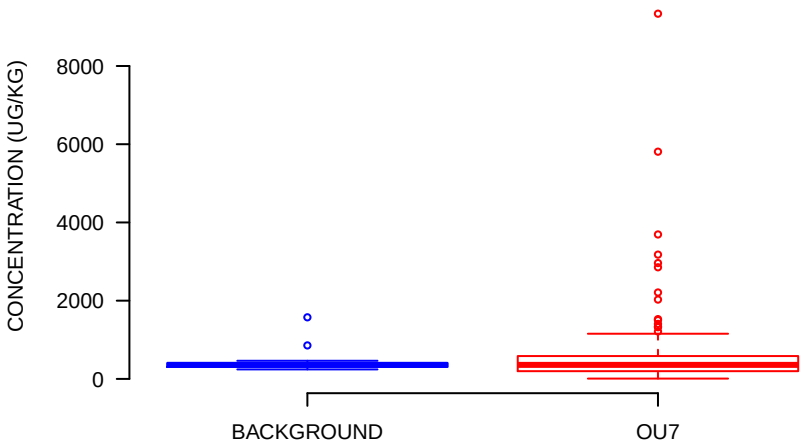
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

BAP EQUIVALENT−HALFND SUBSURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 15 OF 20

BOXPLOT



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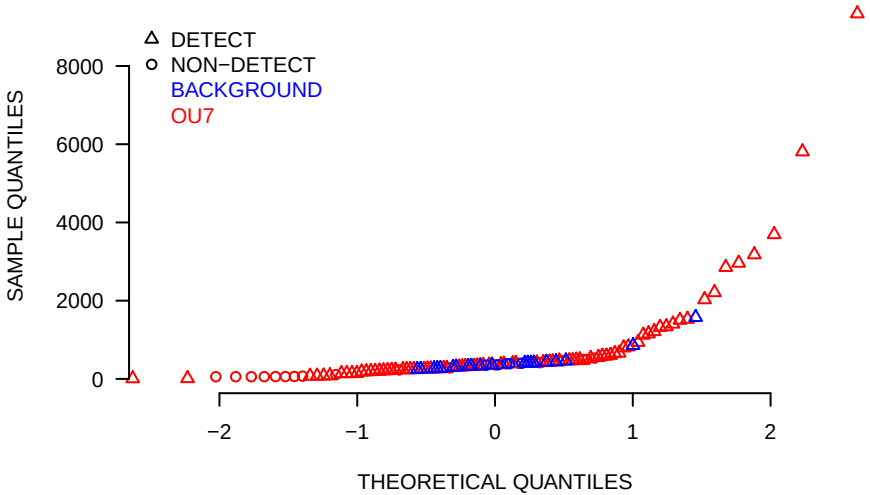

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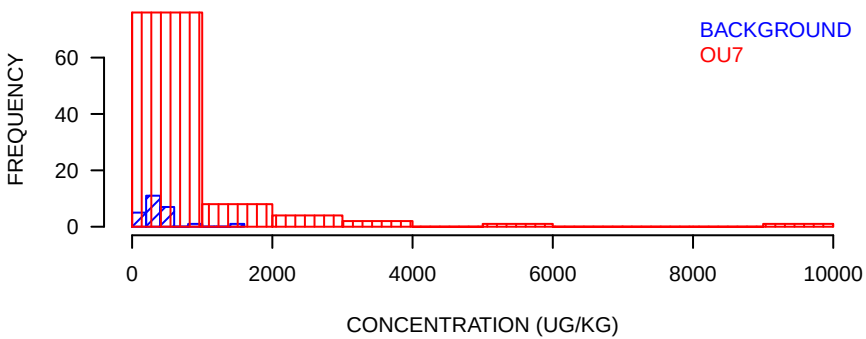


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	180	7.7
25TH PERCENTILE	250	180
MEDIAN	320	290
MEAN	380	700
75TH PERCENTILE	410	580
MAXIMUM	1600	9300

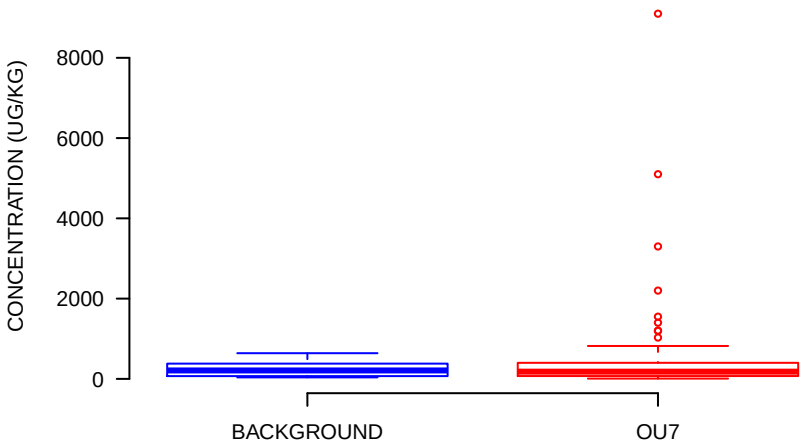
UNITS ARE UG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

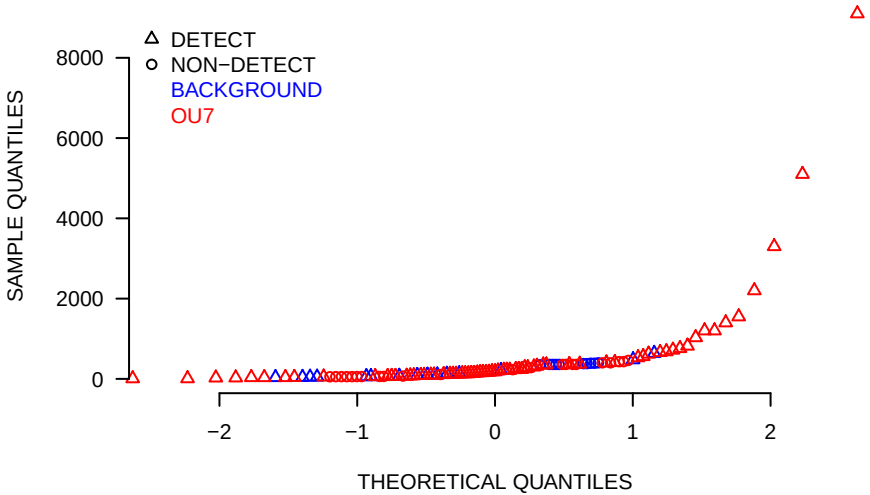
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

BENZO(A)ANTHRACENE SUBSURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 16 OF 20

BOXPLOT



NORMAL PROBABILITY PLOT



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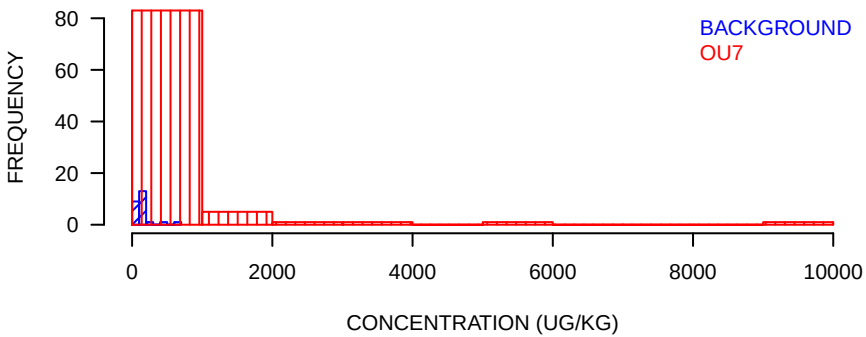


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	37	7
25TH PERCENTILE	69	66
MEDIAN	180	170
MEAN	160	460
75TH PERCENTILE	190	330
MAXIMUM	640	9100

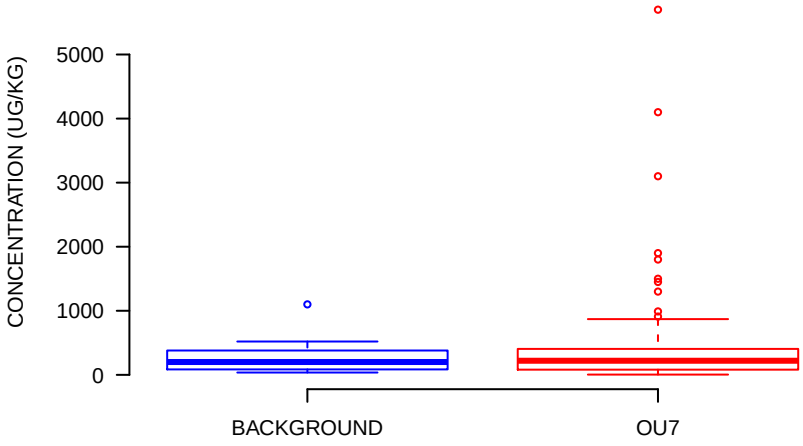
UNITS ARE UG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

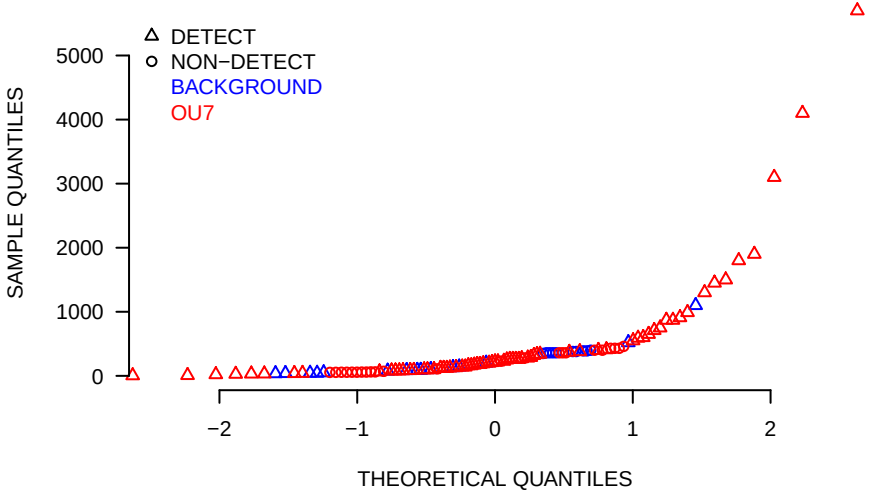
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

BENZO(A)PYRENE SUBSURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 17 OF 20

BOXPLOT



NORMAL PROBABILITY PLOT



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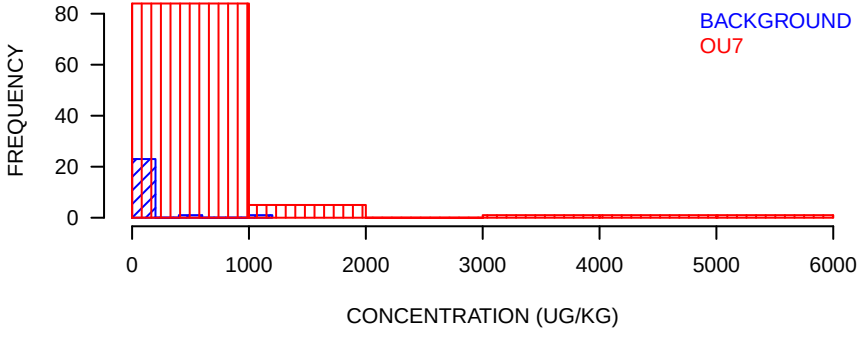


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	36	3.9
25TH PERCENTILE	85	80
MEDIAN	180	180
MEAN	180	430
75TH PERCENTILE	190	340
MAXIMUM	1100	5700

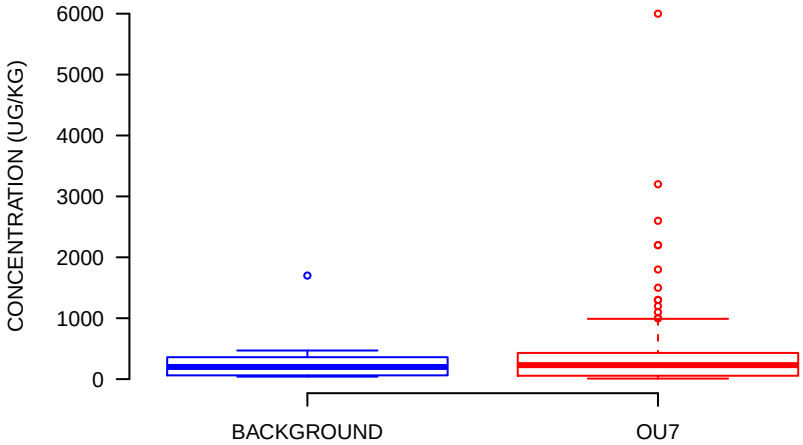
UNITS ARE UG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

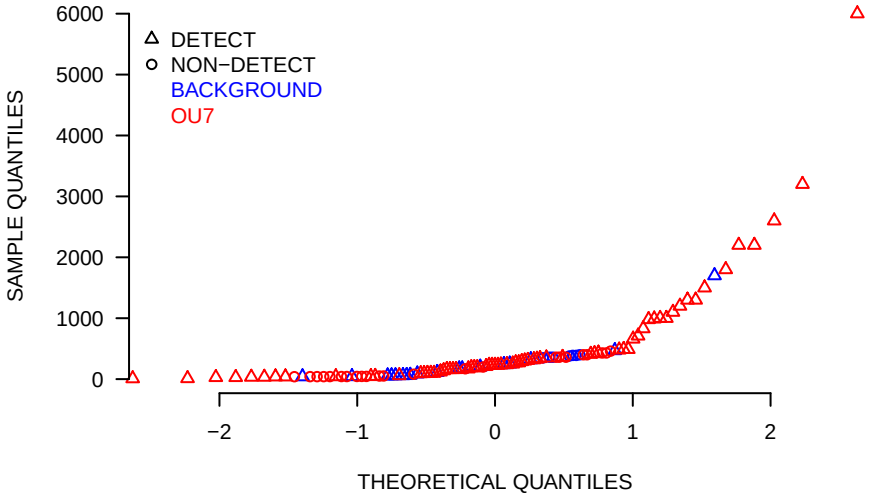
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

BENZO(B)FLUORANTHENE SUBSURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 18 OF 20

BOXPLOT



NORMAL PROBABILITY PLOT



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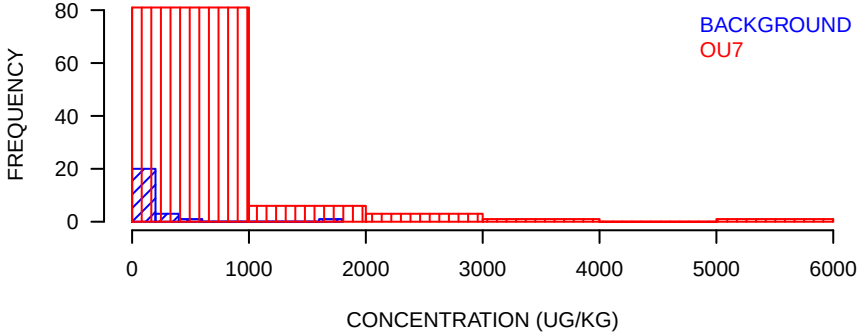


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	41	8.8
25TH PERCENTILE	62	47
MEDIAN	180	200
MEAN	220	470
75TH PERCENTILE	200	410
MAXIMUM	1700	6000

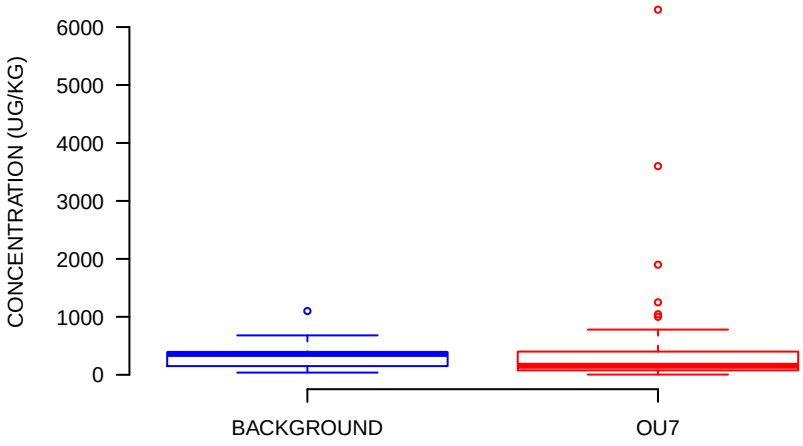
UNITS ARE UG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

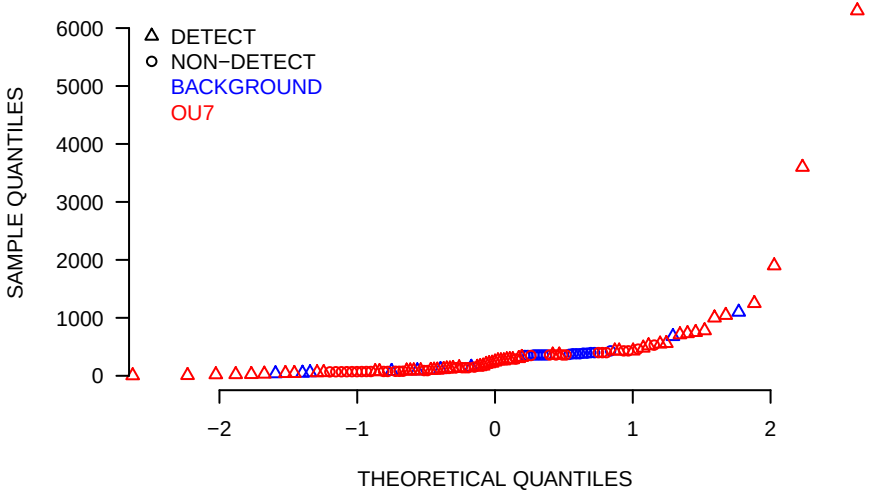
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

BENZO(K)FLUORANTHENE SUBSURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 19 OF 20

BOXPLOT



NORMAL PROBABILITY PLOT



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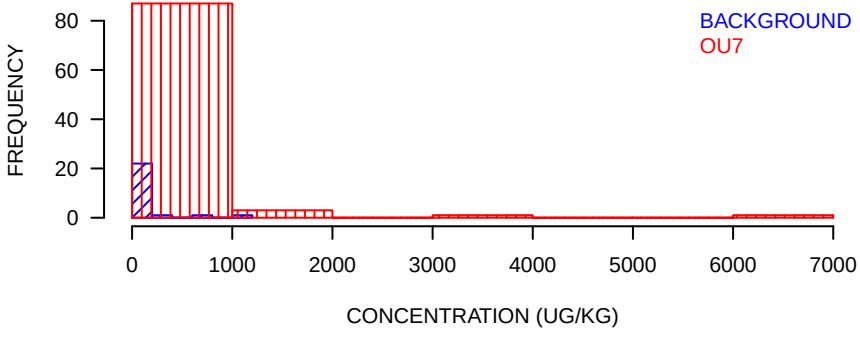


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	38	3.4
25TH PERCENTILE	150	45
MEDIAN	180	150
MEAN	210	340
75TH PERCENTILE	200	280
MAXIMUM	1100	6300

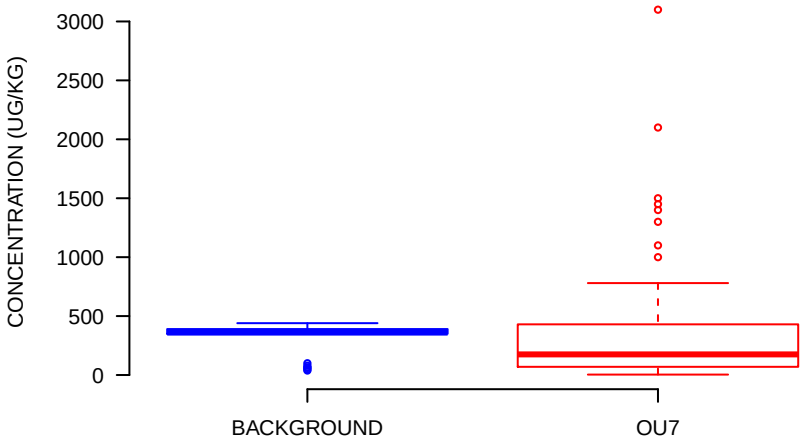
UNITS ARE UG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

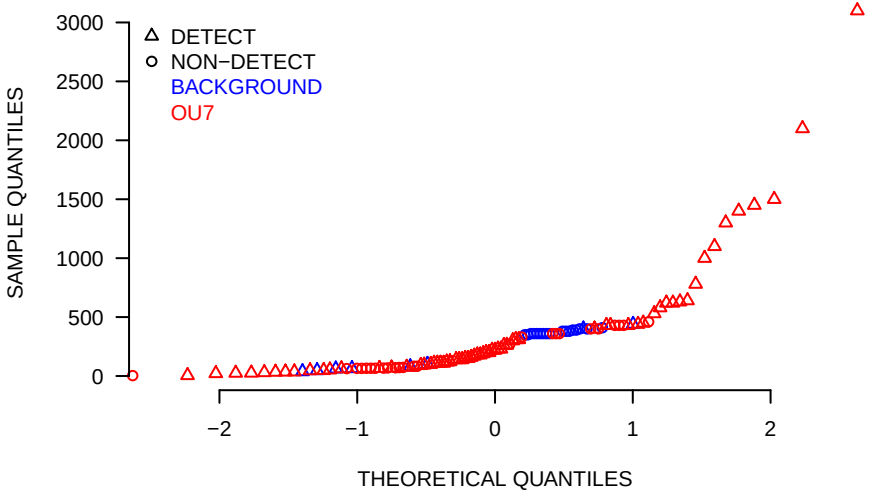
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

INDENO(1,2,3−CD)PYRENE SUBSURFACE SOIL GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 20 OF 20

BOXPLOT



NORMAL PROBABILITY PLOT



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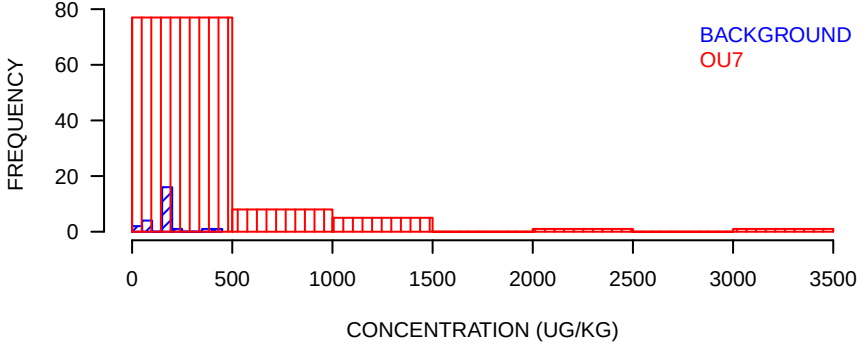


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	38	1.8
25TH PERCENTILE	180	48
MEDIAN	180	160
MEAN	180	310
75TH PERCENTILE	200	300
MAXIMUM	440	3100

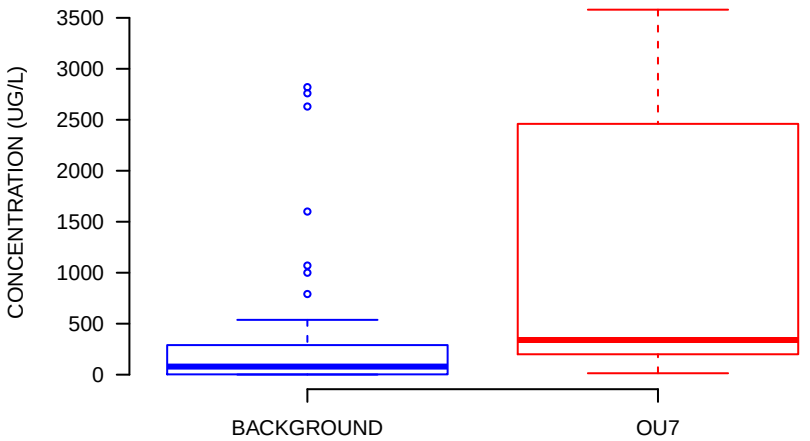
UNITS ARE UG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

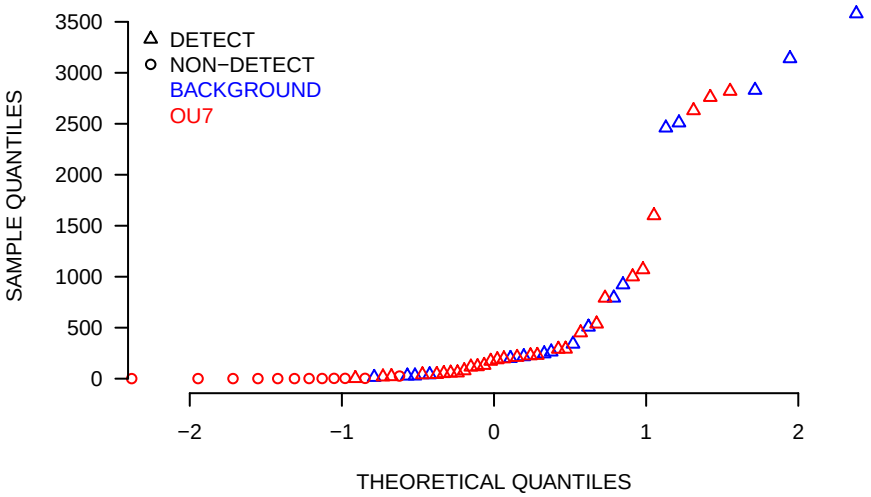
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

MANGANESE GROUNDWATER GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 1 OF 1

BOXPLOT



NORMAL PROBABILITY PLOT



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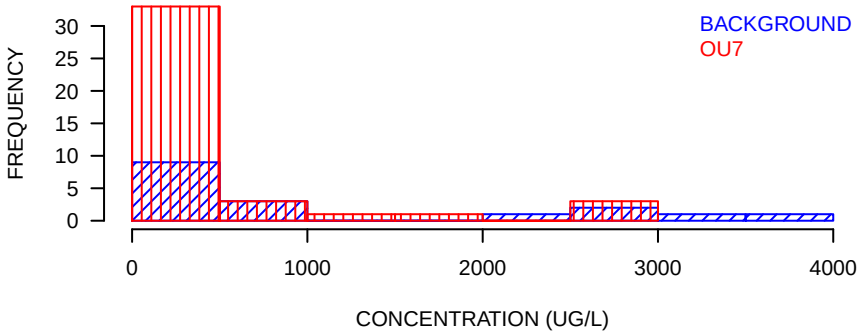


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	14	0.35
25TH PERCENTILE	200	1.6
MEDIAN	340	79
MEAN	1100	400
75TH PERCENTILE	2500	290
MAXIMUM	3600	2800

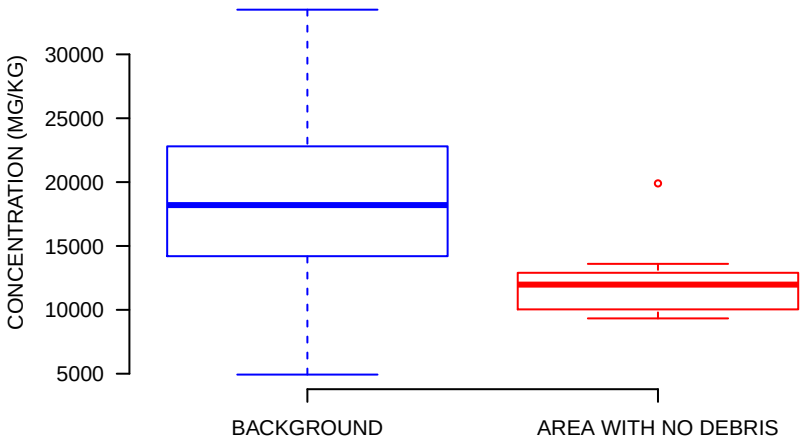
UNITS ARE UG/L

1/2 DETECTION LIMIT USED FOR NON−DETECTS

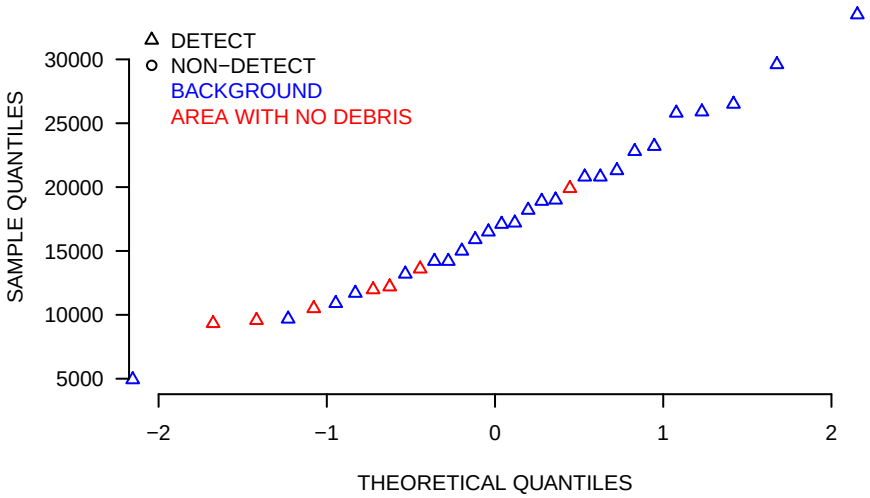
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

ALUMINUM SURFACE SOIL AREA WITH NO DEBRIS GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 1 OF 8

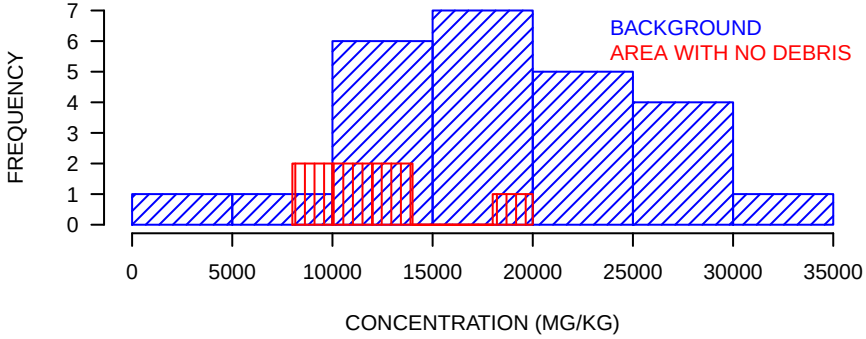
BOXPLOT



NORMAL PROBABILITY PLOT



HISTOGRAMS



SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	4900	9300
25TH PERCENTILE	14000	10000
MEDIAN	18000	12000
MEAN	19000	12000
75TH PERCENTILE	23000	13000
MAXIMUM	34000	20000

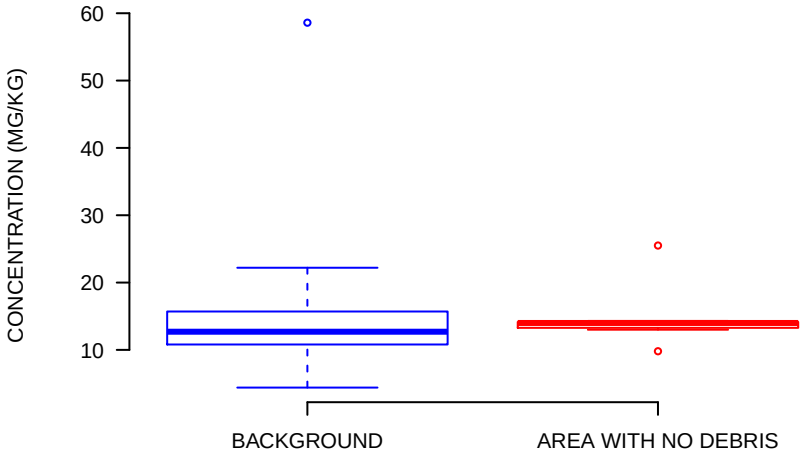
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

ARSENIC SURFACE SOIL AREA WITH NO DEBRIS GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 2 OF 8

BOXPLOT



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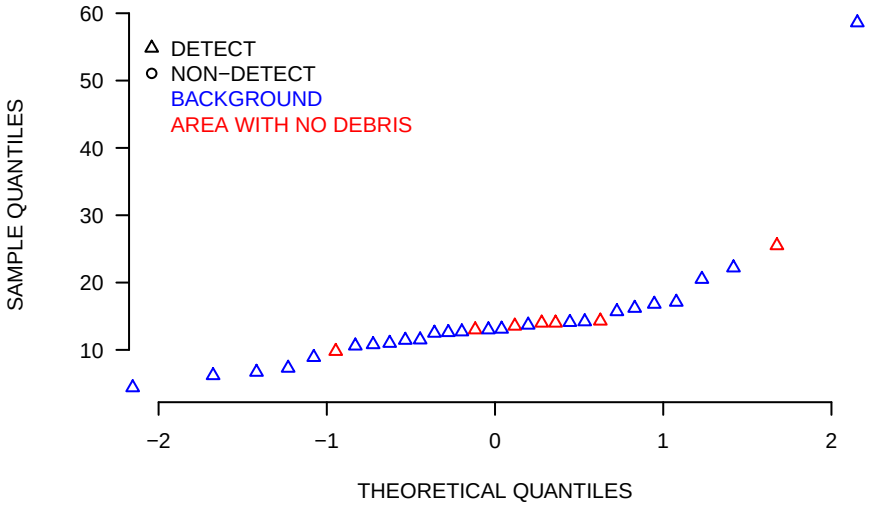

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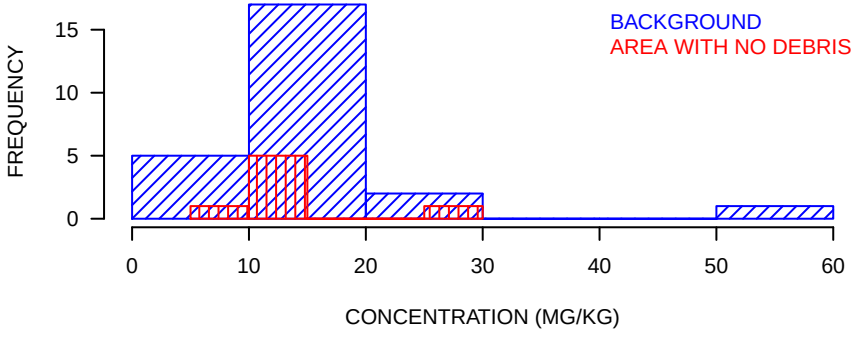


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	4.4	9.8
25TH PERCENTILE	11	13
MEDIAN	13	14
MEAN	14	15
75TH PERCENTILE	16	14
MAXIMUM	59	26

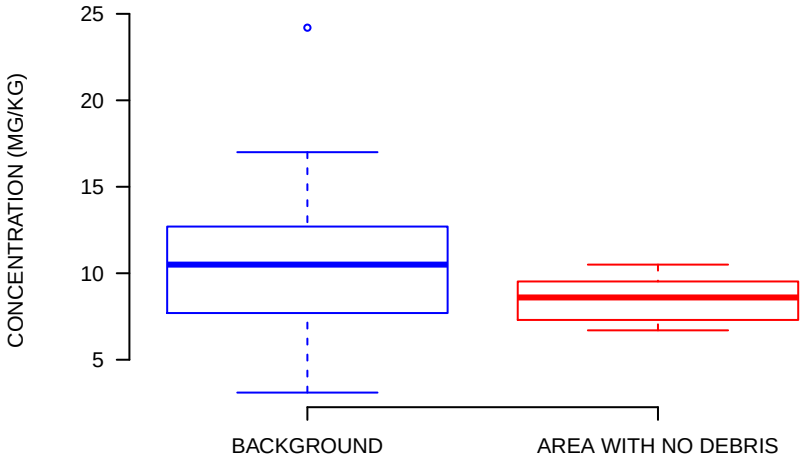
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

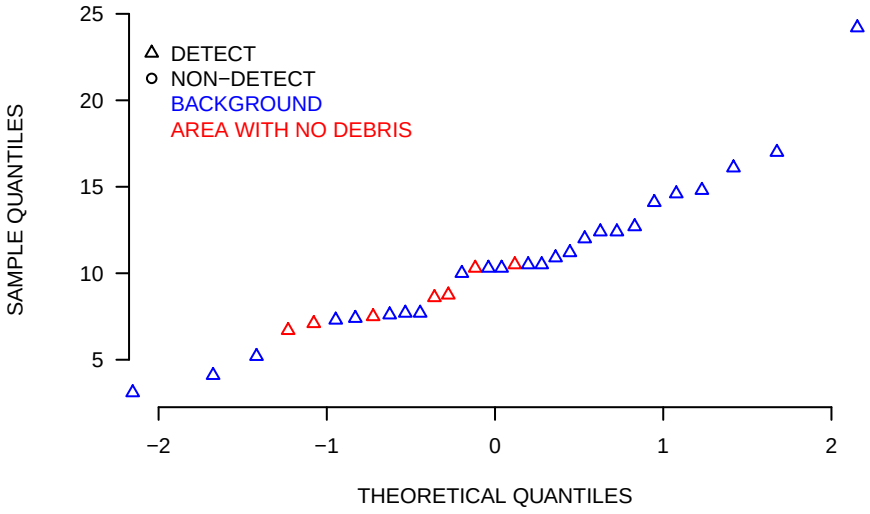
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

COBALT SURFACE SOIL AREA WITH NO DEBRIS GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 3 OF 8

BOXPLOT



NORMAL PROBABILITY PLOT



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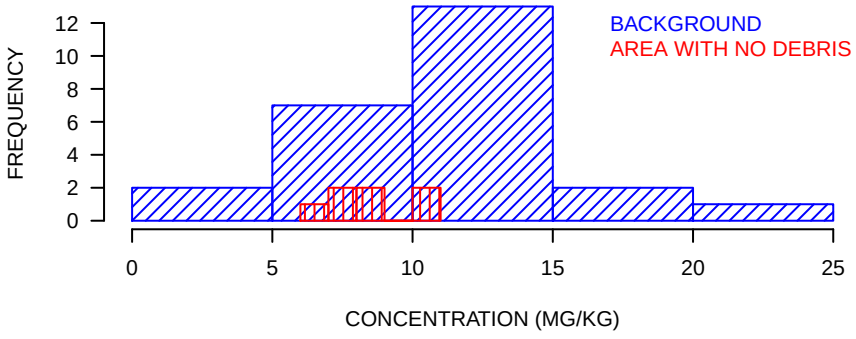


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	3.1	6.7
25TH PERCENTILE	7.7	7.3
MEDIAN	10	8.6
MEAN	11	8.5
75TH PERCENTILE	13	9.5
MAXIMUM	24	10

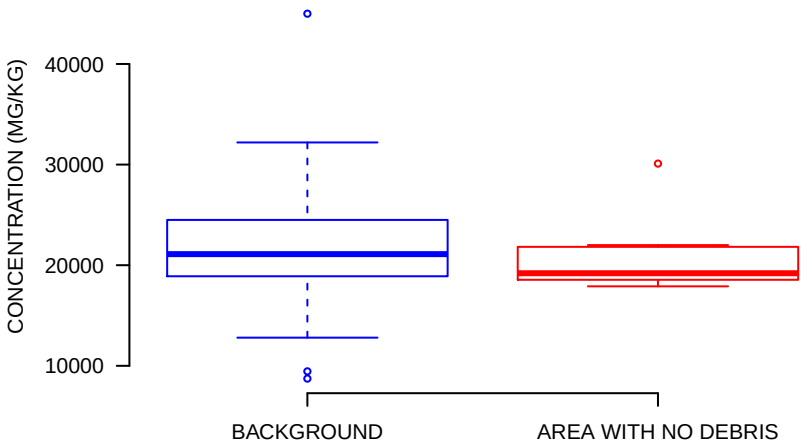
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

IRON SURFACE SOIL AREA WITH NO DEBRIS GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 4 OF 8

BOXPLOT



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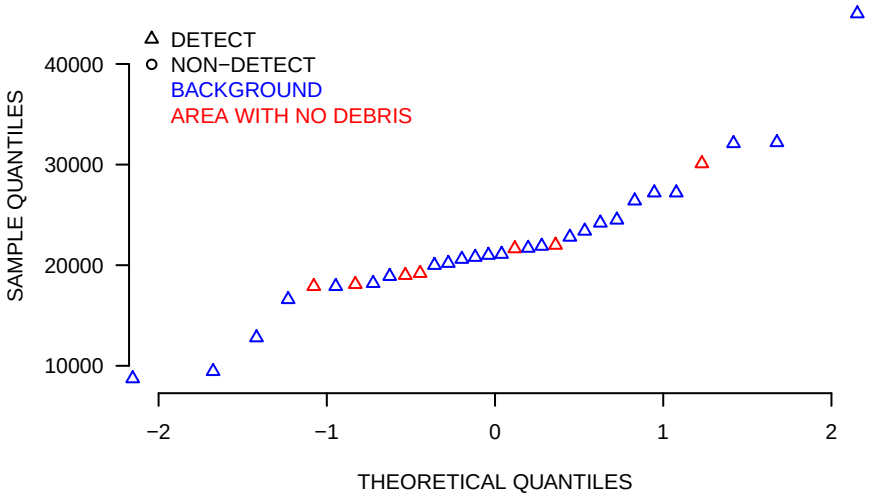

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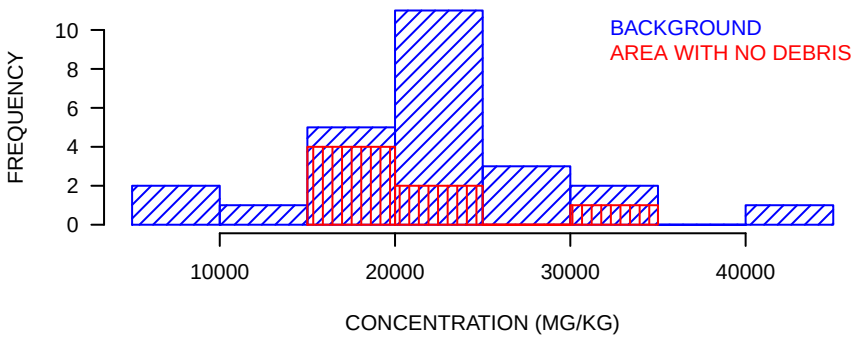


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	8700	18000
25TH PERCENTILE	19000	19000
MEDIAN	21000	19000
MEAN	22000	21000
75TH PERCENTILE	24000	22000
MAXIMUM	45000	30000

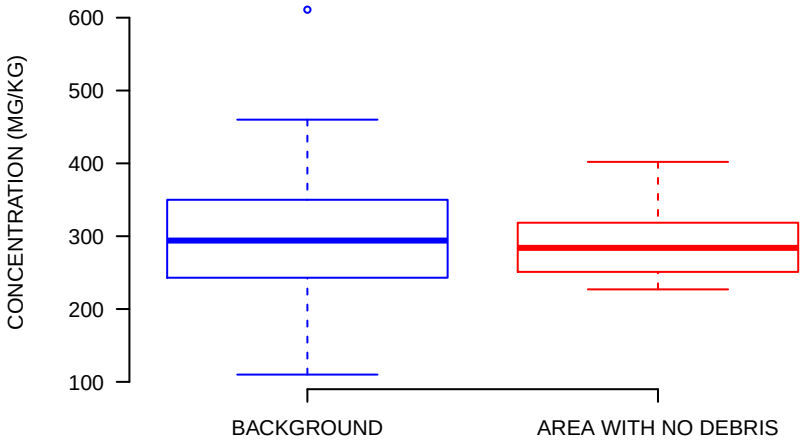
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

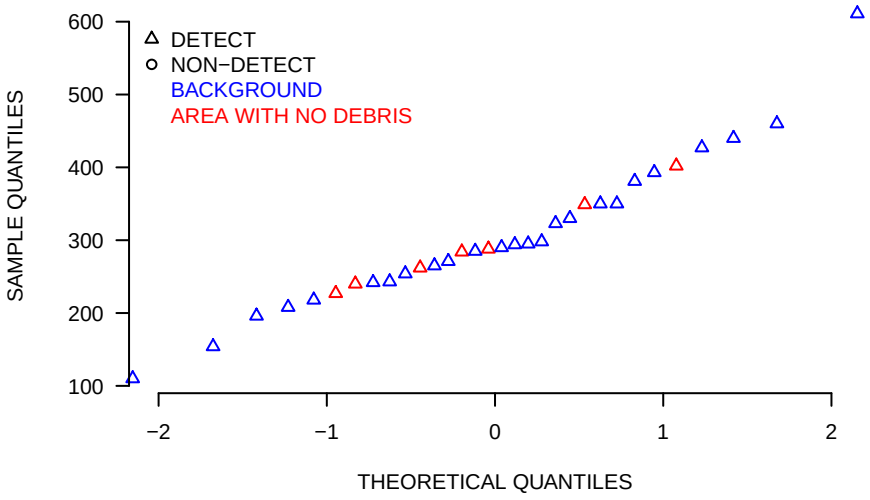
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

MANGANESE SURFACE SOIL AREA WITH NO DEBRIS GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 5 OF 8

BOXPLOT



NORMAL PROBABILITY PLOT



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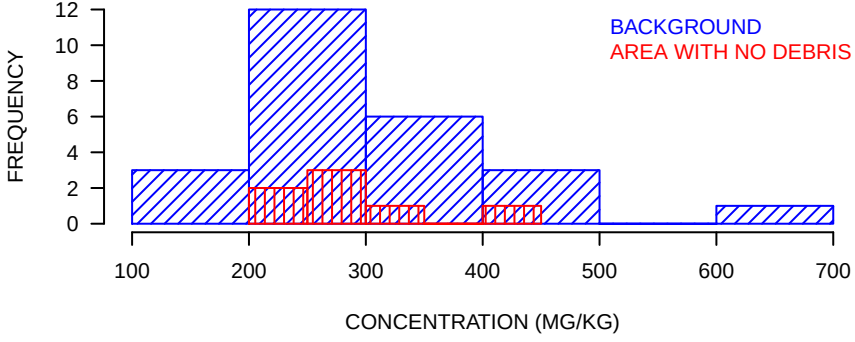


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	110	230
25TH PERCENTILE	240	250
MEDIAN	290	280
MEAN	310	290
75TH PERCENTILE	350	320
MAXIMUM	610	400

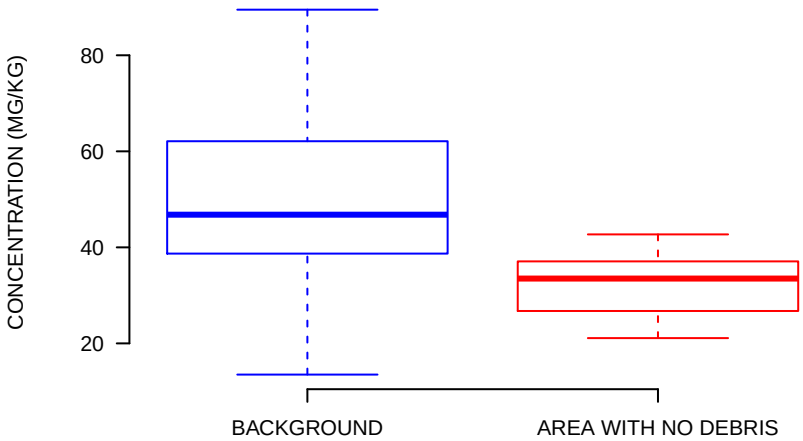
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

VANADIUM SURFACE SOIL AREA WITH NO DEBRIS GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 6 OF 8

BOXPLOT



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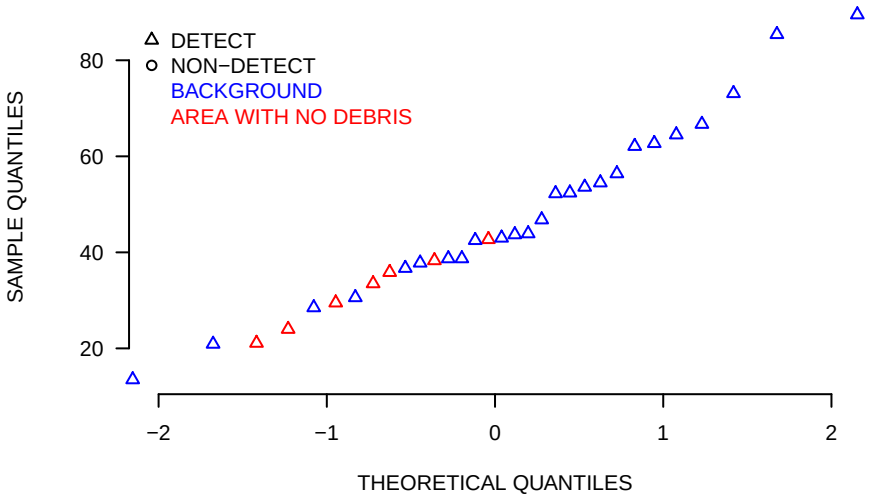

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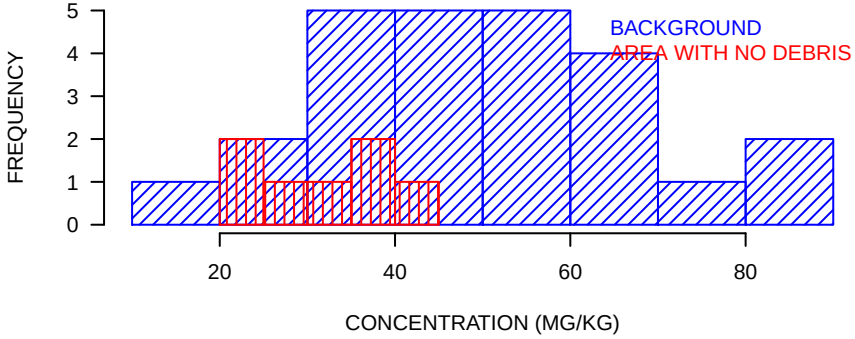


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	14	21
25TH PERCENTILE	39	27
MEDIAN	47	34
MEAN	50	32
75TH PERCENTILE	62	37
MAXIMUM	90	43

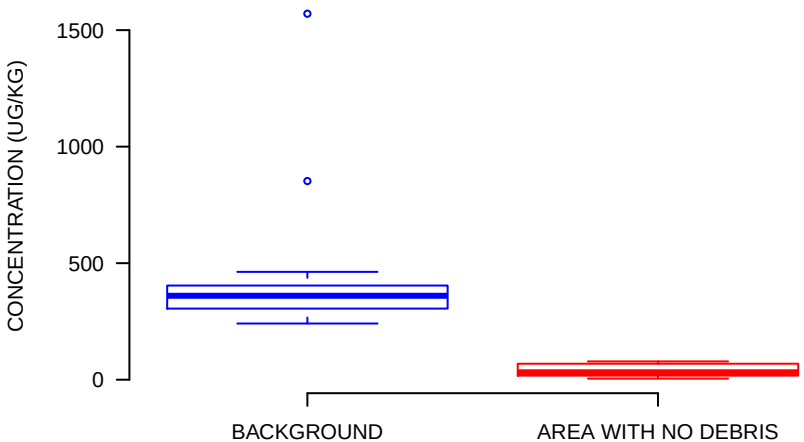
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

BAP EQUIVALENT−HALFND SURFACE SOIL AREA WITH NO DEBRIS GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 7 OF 8

BOXPLOT



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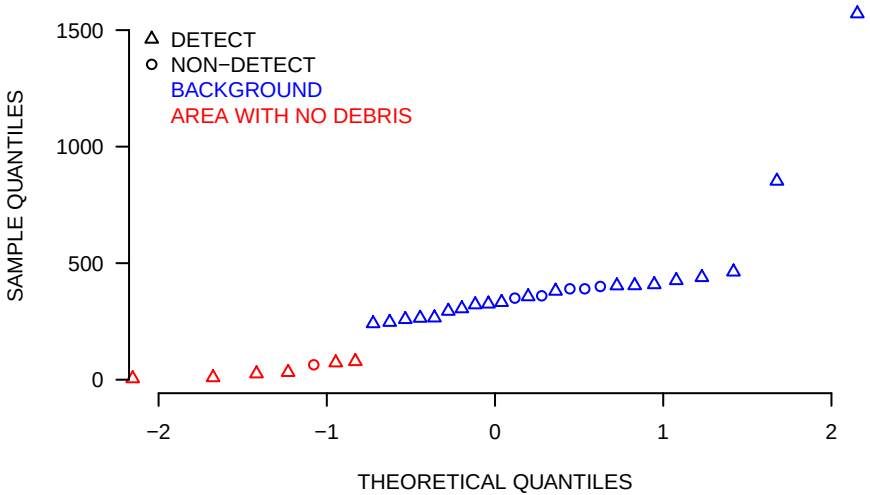

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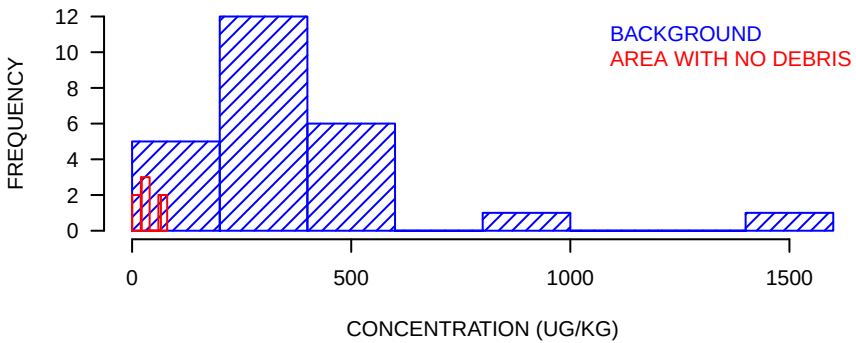


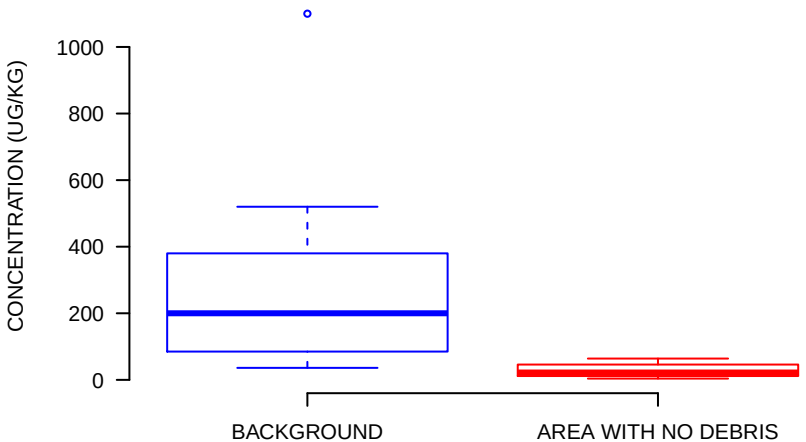
SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	180	4.7
25TH PERCENTILE	250	17
MEDIAN	320	32
MEAN	380	36
75TH PERCENTILE	400	52
MAXIMUM	1600	78

UNITS ARE UG/KG
1/2 DETECTION LIMIT USED FOR NON−DETECTS
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

BENZO(A)PYRENE SURFACE SOIL AREA WITH NO DEBRIS GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 8 OF 8

BOXPLOT



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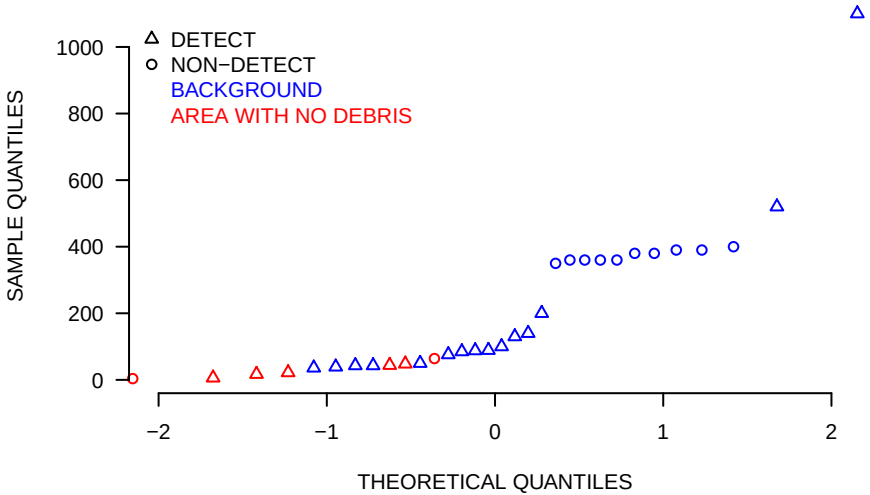

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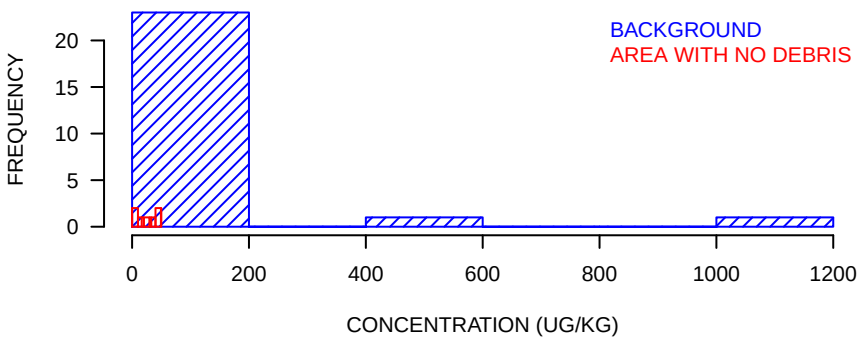


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	36	1.9
25TH PERCENTILE	85	12
MEDIAN	180	22
MEAN	180	24
75TH PERCENTILE	190	38
MAXIMUM	1100	48

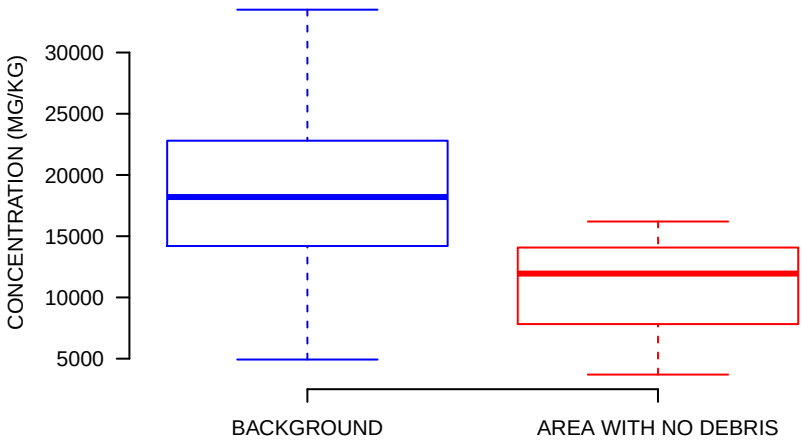
UNITS ARE UG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

ALUMINUM SUBSURFACE SOIL AREA WITH NO DEBRIS GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 1 OF 9

BOXPLOT



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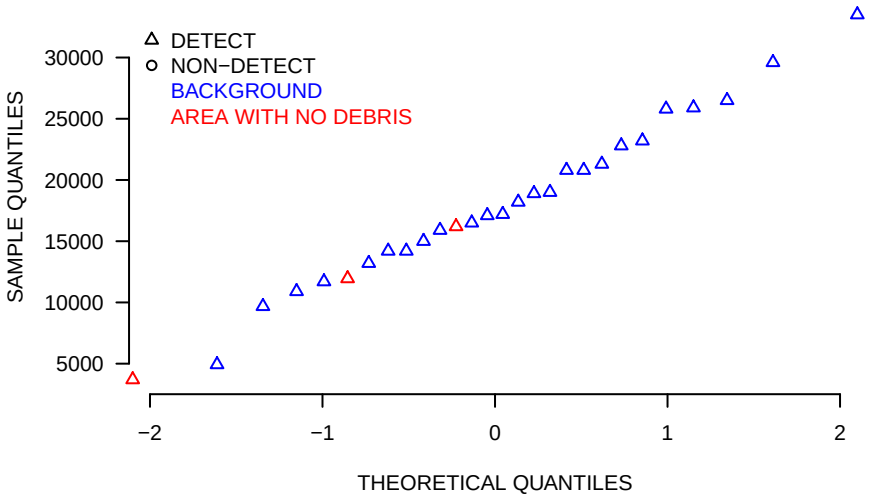

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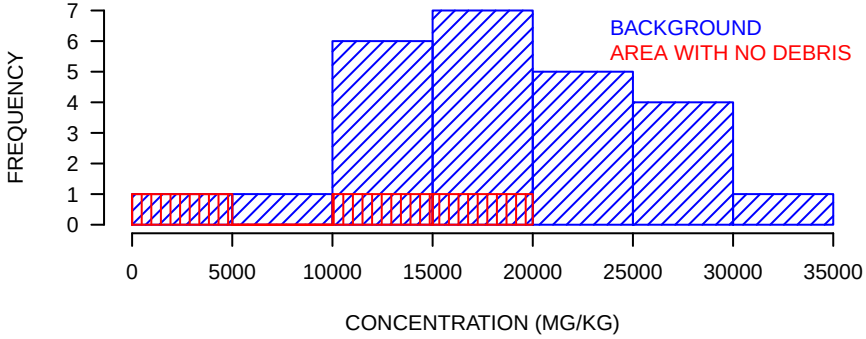


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	4900	3700
25TH PERCENTILE	14000	7800
MEDIAN	18000	12000
MEAN	19000	11000
75TH PERCENTILE	23000	14000
MAXIMUM	34000	16000

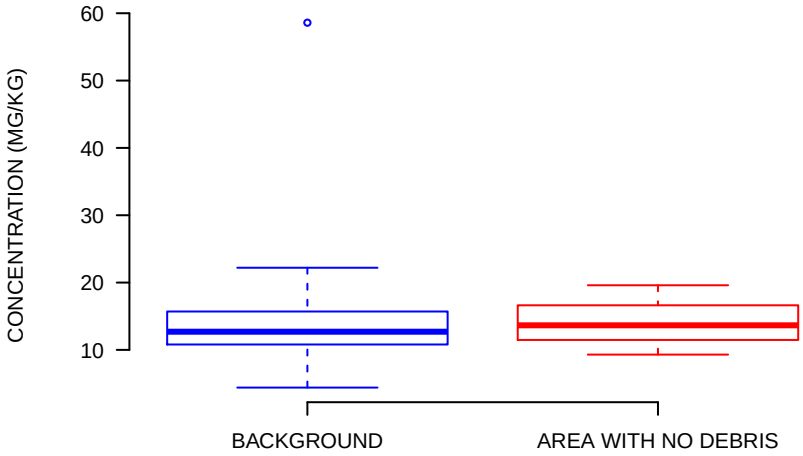
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

ARSENIC SUBSURFACE SOIL AREA WITH NO DEBRIS GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 2 OF 9

BOXPLOT



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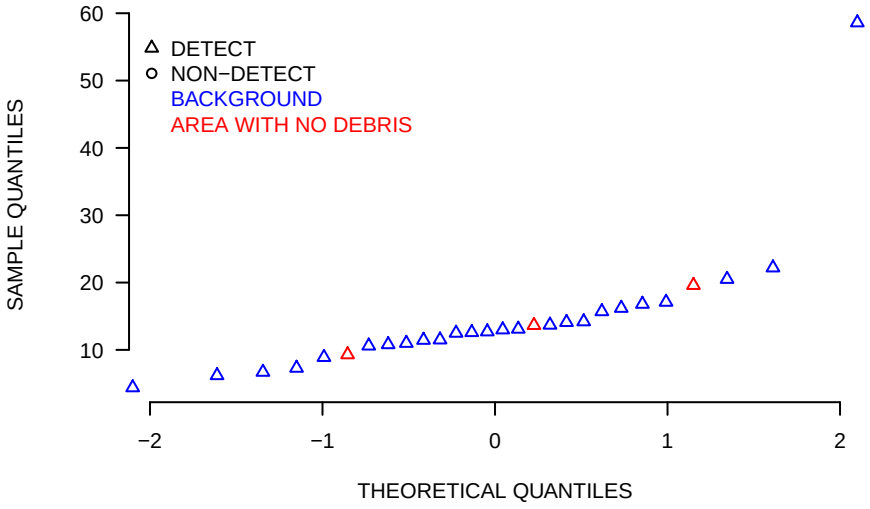

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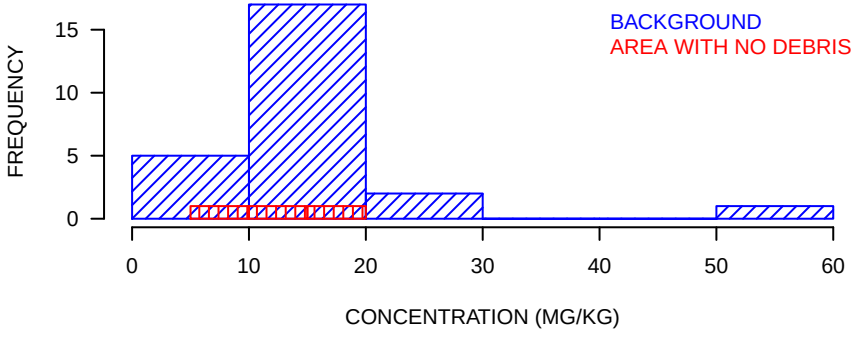


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	4.4	9.3
25TH PERCENTILE	11	11
MEDIAN	13	14
MEAN	14	14
75TH PERCENTILE	16	17
MAXIMUM	59	20

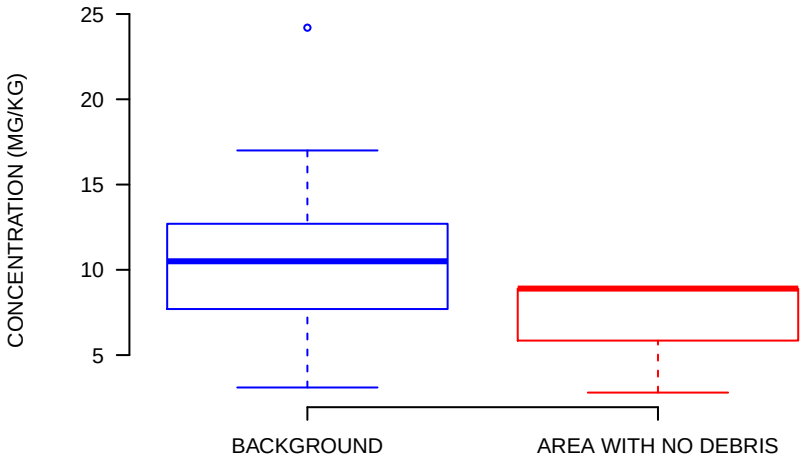
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

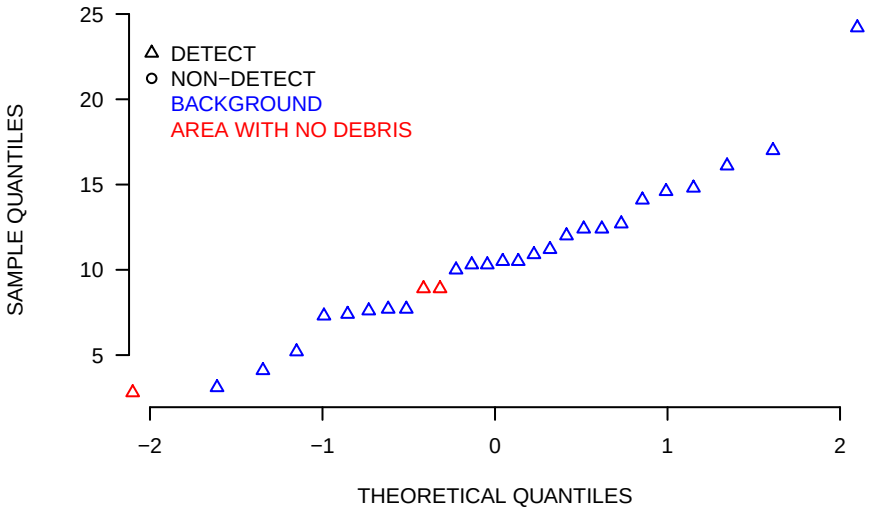
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

COBALT SUBSURFACE SOIL AREA WITH NO DEBRIS GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 3 OF 9

BOXPLOT



NORMAL PROBABILITY PLOT



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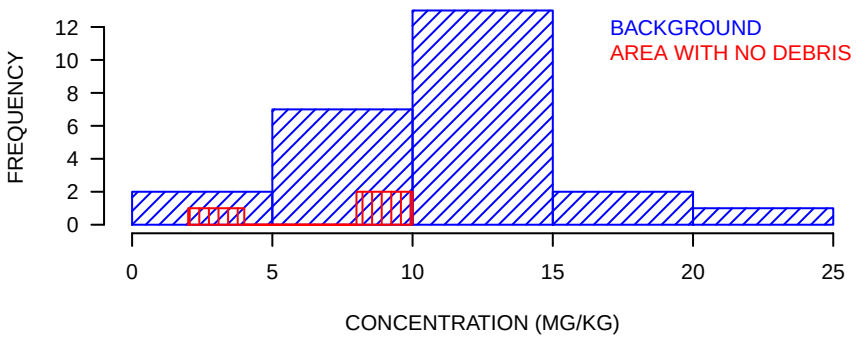


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	3.1	2.8
25TH PERCENTILE	7.7	5.8
MEDIAN	10	8.9
MEAN	11	6.9
75TH PERCENTILE	13	8.9
MAXIMUM	24	8.9

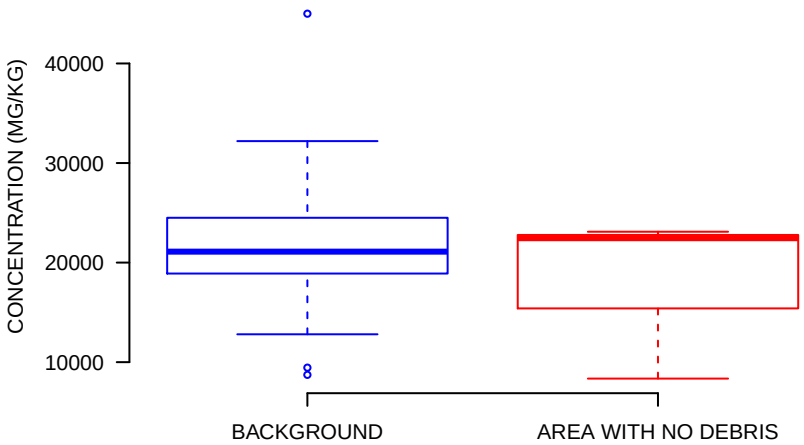
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

IRON SUBSURFACE SOIL AREA WITH NO DEBRIS GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 4 OF 9

BOXPLOT



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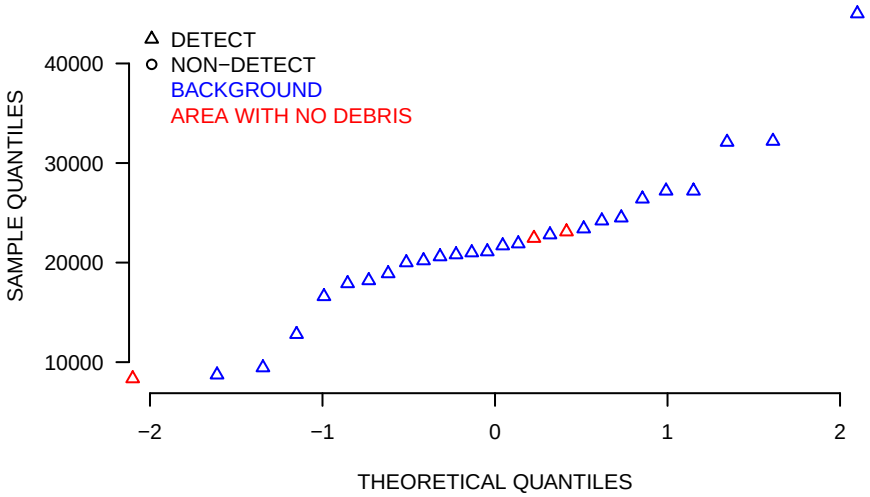

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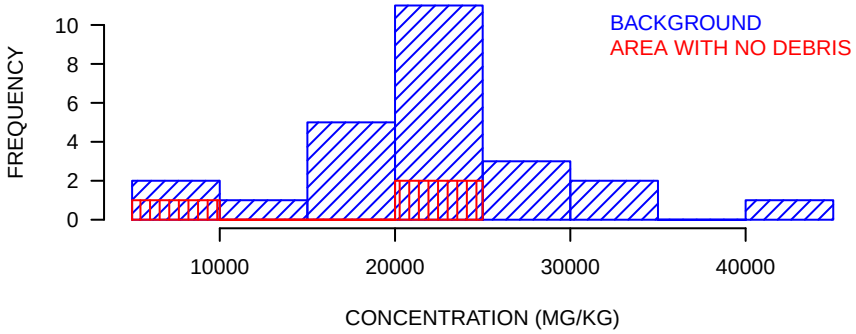


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	8700	8400
25TH PERCENTILE	19000	15000
MEDIAN	21000	22000
MEAN	22000	18000
75TH PERCENTILE	24000	23000
MAXIMUM	45000	23000

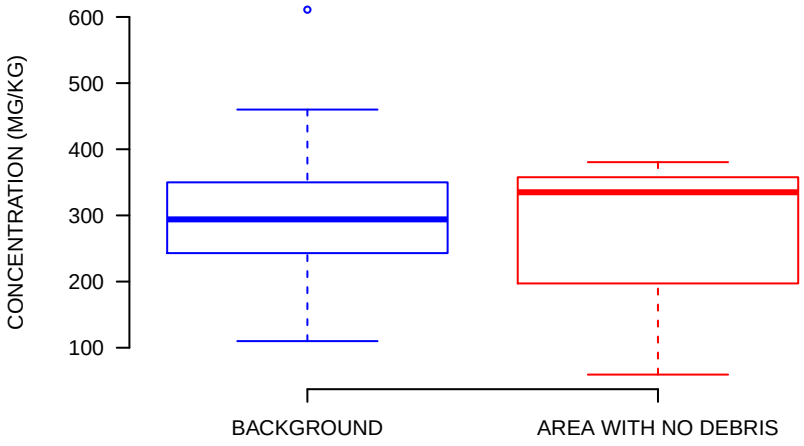
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

MANGANESE SUBSURFACE SOIL AREA WITH NO DEBRIS GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 5 OF 9

BOXPLOT



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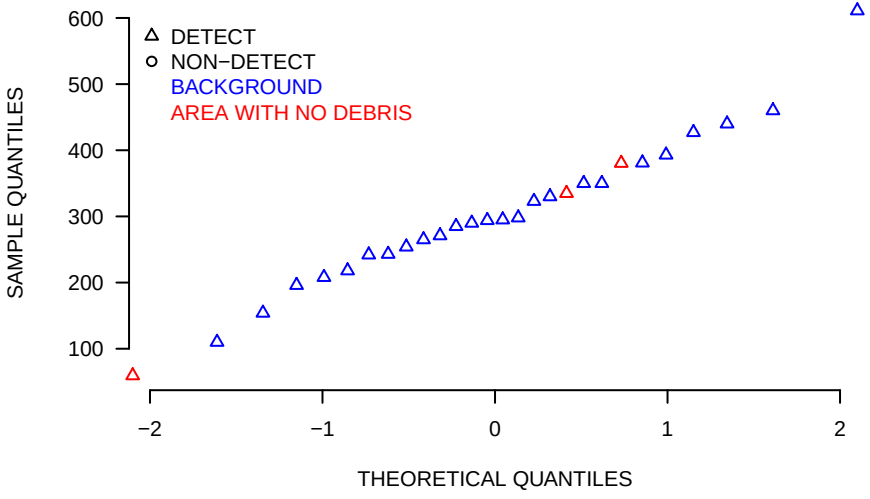

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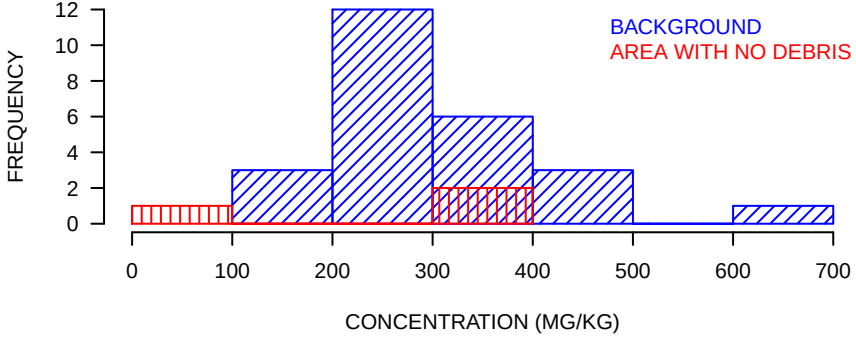


SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	110	59
25TH PERCENTILE	240	200
MEDIAN	290	340
MEAN	310	260
75TH PERCENTILE	350	360
MAXIMUM	610	380

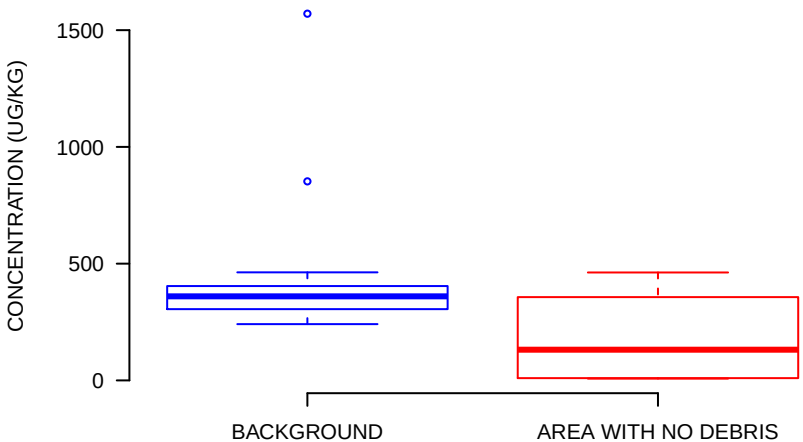
UNITS ARE MG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

BAP Equivalent SUBSURFACE SOIL AREA WITH NO DEBRIS GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 6 OF 9

BOXPLOT



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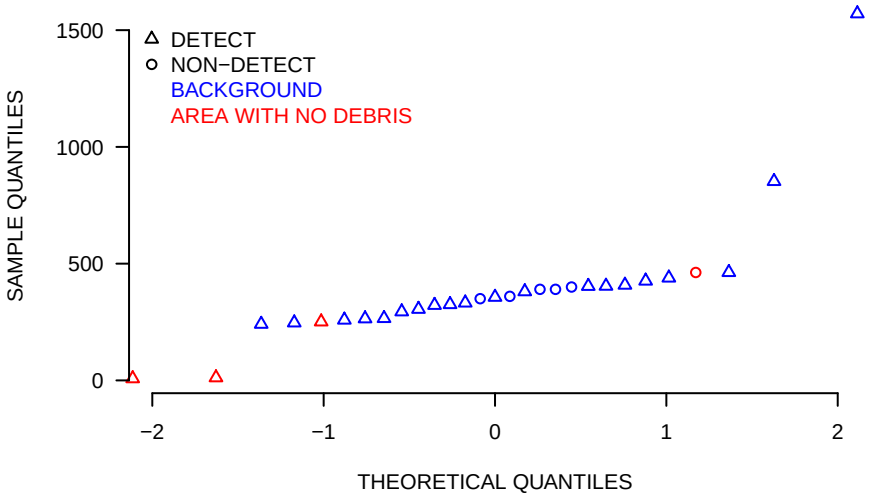
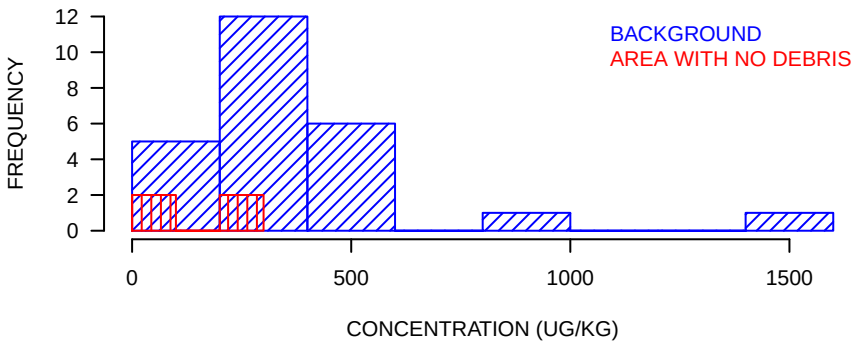


HISTOGRAMS



SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	180	7.7
25TH PERCENTILE	250	11
MEDIAN	320	120
MEAN	380	130
75TH PERCENTILE	400	240
MAXIMUM	1600	250

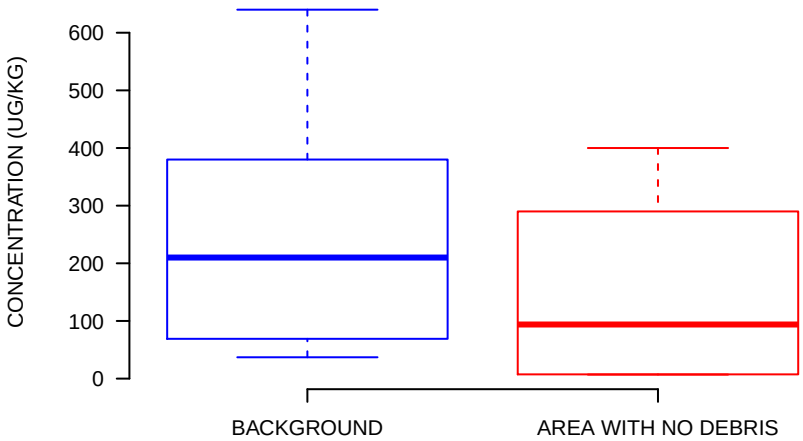
UNITS ARE UG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

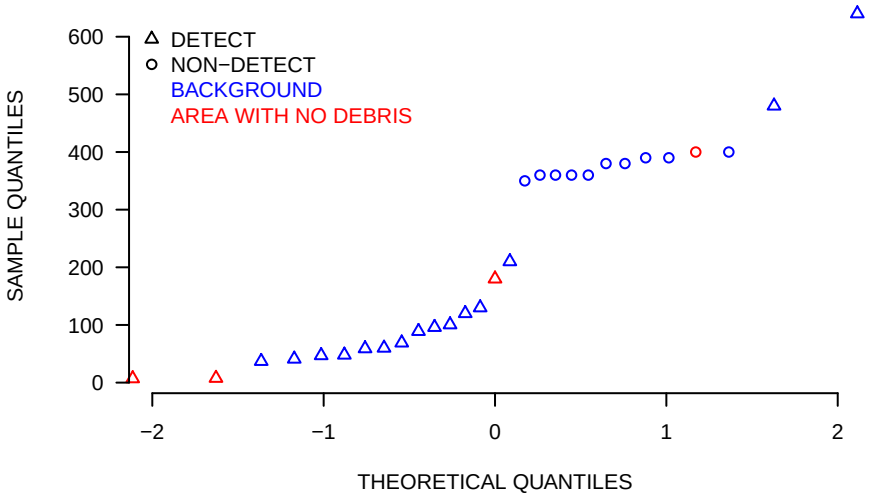
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

BENZO(A)ANTHRACENE SUBSURFACE SOIL AREA WITH NO DEBRIS GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 7 OF 9

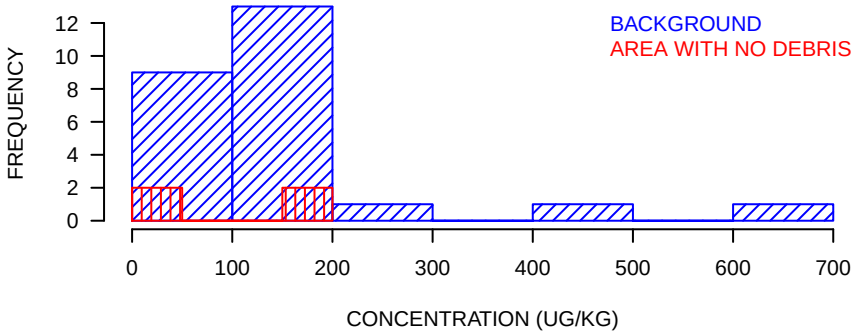
BOXPLOT



NORMAL PROBABILITY PLOT



HISTOGRAMS



SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	37	7
25TH PERCENTILE	69	7.5
MEDIAN	180	94
MEAN	160	99
75TH PERCENTILE	190	180
MAXIMUM	640	200

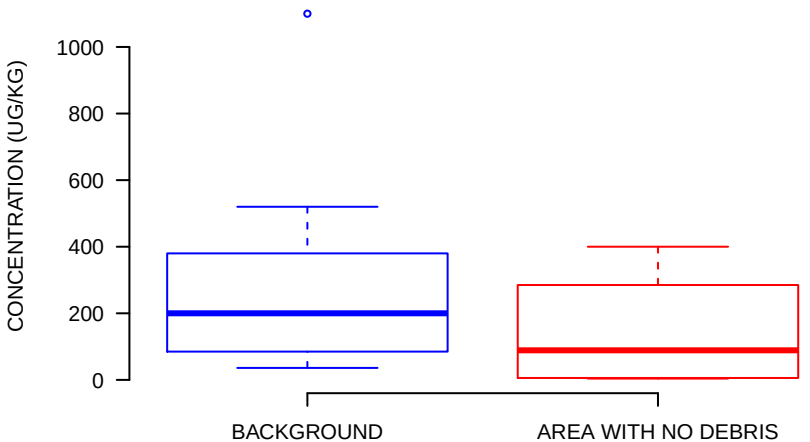
UNITS ARE UG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

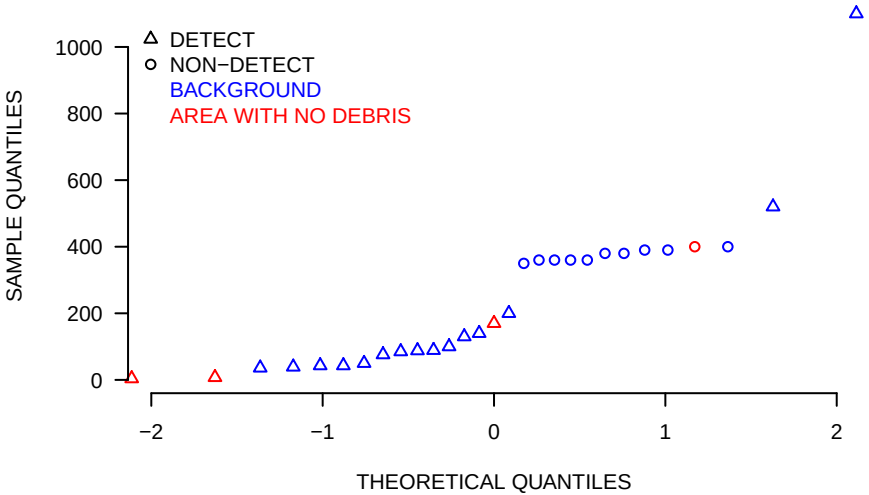
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

BENZO(A)PYRENE SUBSURFACE SOIL AREA WITH NO DEBRIS GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 8 OF 9

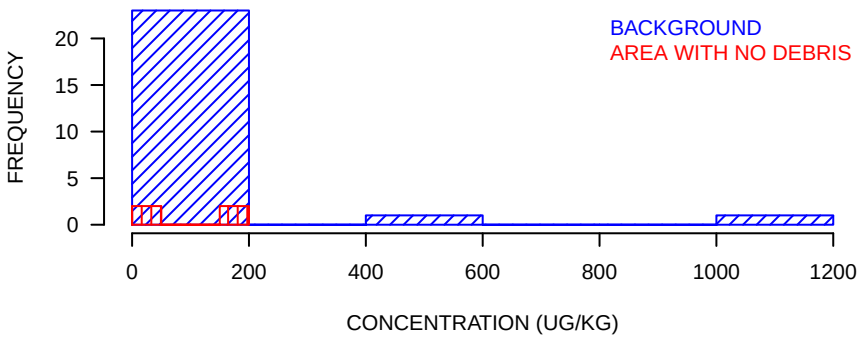
BOXPLOT



NORMAL PROBABILITY PLOT



HISTOGRAMS



SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	36	3.9
25TH PERCENTILE	85	6.7
MEDIAN	180	89
MEAN	180	95
75TH PERCENTILE	190	180
MAXIMUM	1100	200

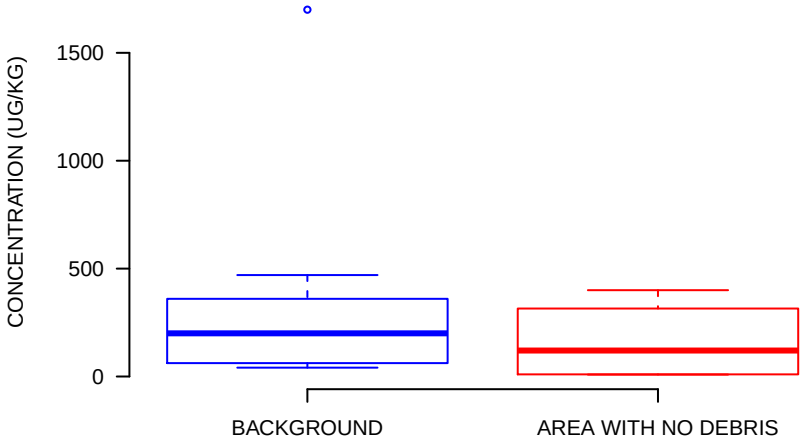
UNITS ARE UG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

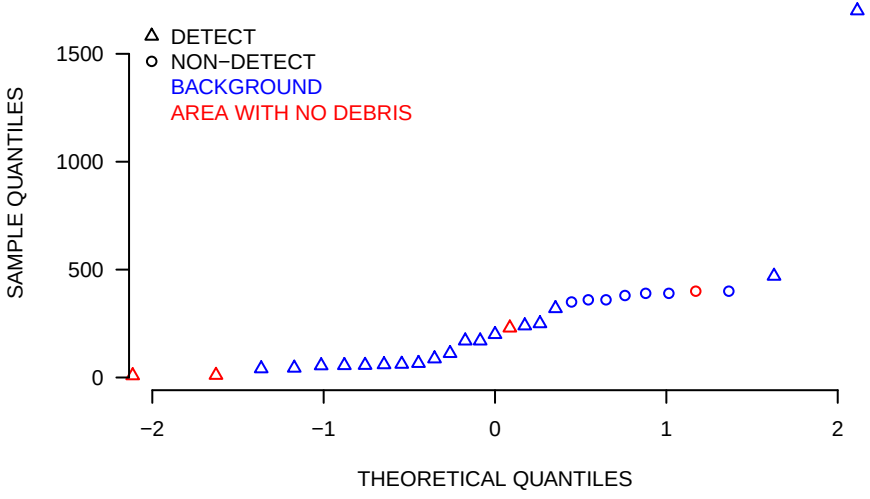
SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

BENZO(B)FLUORANTHENE SUBSURFACE SOIL AREA WITH NO DEBRIS GRAPHICAL DISPLAYS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE
FIGURE 9 OF 9

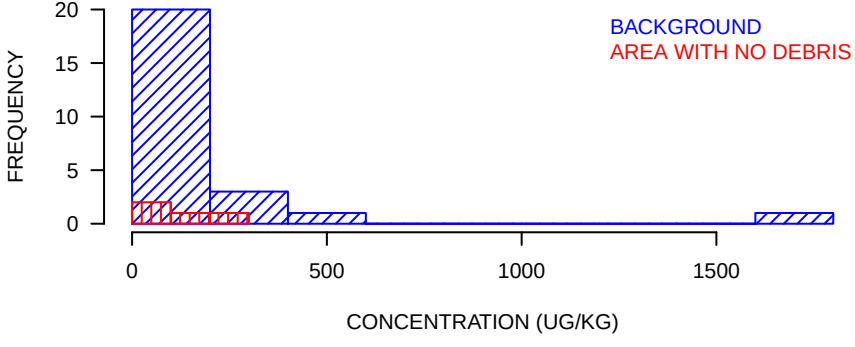
BOXPLOT



NORMAL PROBABILITY PLOT



HISTOGRAMS



SUMMARY STATISTICS

	BACKGROUND	OU7
MINIMUM	41	8.8
25TH PERCENTILE	62	10
MEDIAN	180	110
MEAN	220	110
75TH PERCENTILE	200	210
MAXIMUM	1700	230

UNITS ARE UG/KG

1/2 DETECTION LIMIT USED FOR NON−DETECTS

SUMMARY STATISTICS ROUNDED TO TWO SIGNIFICANT FIGURES

TABLE 1
SOIL BACKGROUND DATA
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

LOCATION	BGS-01				BGS-02		BGS-03	
SAMPLE ID	**BGS-01**	**BGS-01-AVG**	**BGS-01-D**	**TPBGS010001**	**BGS-02**	**TPBGS02000**	**BGS-03**	**TPBGS030001**
SAMPLE DATE	**99990101**	**99990101**	**99990101**	**20030416**	**99990101**	**20030416**	**99990101**	**20030417**
SAMPLE CODE	**ORIG**	**AVG**	**DUP**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**SO**	**SO**	**SO**	**SO**	**SO**	**SO**	**SO**	**SO**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**NA**	**NA**	**SS**	**NA**	**SS**	**NA**	**SS**
TOP DEPTH	**-9999**	**-9999**	**-9999**	**0.5**	**-9999**	**0.5**	**-9999**	**0.5**
BOTTOM DEPTH	**-9999**	**-9999**	**-9999**	**1**	**-9999**	**1**	**-9999**	**1**
DIOXINS/FURANS (NG/KG)								
TEQ WHO-2005 - HALFND	NA	NA	NA	1.20331	NA	0.53502	NA	6.59825
METALS (MG/KG)								
ALUMINUM	19500	21300	23100	NA	26500	NA	25900	NA
ANTIMONY	7 J	5.125 U	6.5 U	NA	9.4 J	NA	7.4 U	NA
ARSENIC	10.6 J	11.45 J	12.3 J	NA	10.8 J	NA	14.1 J	NA
BARIUM	98.3	94.1	89.9	NA	62.3	NA	44.1 J	NA
CADMIUM	2.4	2.7	3	NA	2.7	NA	2.8	NA
CHROMIUM	68.6	75.6	82.6	NA	78	NA	91.9	NA
COBALT	12.8	14.1	15.4	NA	14.6	NA	14.8	NA
COPPER	61.1	188.55	316	NA	16.8	NA	13.2	NA
IRON	22500	24200	25900	NA	27200	NA	24500	NA
LEAD	112 J	115.5	119	NA	9.5 J	NA	10.8 J	NA
MANGANESE	263	294	325	NA	295	NA	196	NA
MERCURY	0.11 U	0.0825	0.11	NA	0.10 U	NA	0.11 U	NA
NICKEL	49.5	51.5	53.5	NA	50	NA	52.2	NA
THALLIUM	0.22 J	0.1575 U	0.19 U	NA	0.23 J	NA	0.21 U	NA
VANADIUM	47.7	52.25	56.8	NA	53.6	NA	52.4	NA
ZINC	187	168.5	150	NA	46.6	NA	43.9	NA
PESTICIDES/PCBS (UG/KG)								
AROCLOR-1248	97 U	97.5 U	98 U	NA	94 U	NA	95 U	NA
AROCLOR-1254	190 U	165 U	140 U	NA	190 U	NA	190 U	NA
AROCLOR-1260	190 U	165 U	140 U	NA	190 U	NA	190 U	NA
DIELDRIN	19 U	16.5 U	14 U	NA	19 U	NA	19 U	NA
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)								
BAP EQUIVALENT-HALFND	347.9	305.66	273.52	NA	390 U	NA	390 U	NA
BENZO(A)ANTHRACENE	140 J	100.5 J	61 J	NA	390 U	NA	390 U	NA
BENZO(A)PYRENE	110 J	85 J	60 J	NA	390 U	NA	390 U	NA
BENZO(B)FLUORANTHENE	140 J	112 J	84 J	NA	390 U	NA	390 U	NA
BENZO(K)FLUORANTHENE	110 J	78 J	46 J	NA	390 U	NA	390 U	NA
DIBENZO(A,H)ANTHRACENE	400 U	380 U	360 U	NA	390 U	NA	390 U	NA
INDENO(1,2,3-CD)PYRENE	79 J	79 J	360 U	NA	390 U	NA	390 U	NA

TABLE 1
SOIL BACKGROUND DATA
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

LOCATION	BGS-04				BGS-06		BGS-07	
SAMPLE ID	BGS-04	TPBGS0400	TPBGS040001-	TPBGS040001-	BGS-06	TPBGS060001	BGS-07	TPBGS070001
SAMPLE DATE	99990101	20030417	20030417	20030417	99990101	20030416	99990101	20030416
SAMPLE CODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	SS	SS	SS	NA	SS	NA	SS
TOP DEPTH	-9999	0.5	0.5	0.5	-9999	0.5	-9999	0.5
BOTTOM DEPTH	-9999	1	1	1	-9999	1	-9999	1
DIOXINS/FURANS (NG/KG)								
TEQ WHO-2005 - HALFND	NA	0.7303	0.78218	0.83406	NA	3.05227	NA	7.18504
METALS (MG/KG)								
ALUMINUM	1170	NA	NA	NA	19000	NA	20800	NA
ANTIMONY	5.6 U	NA	NA	NA	6.4 U	NA	7.5 U	NA
ARSENIC	12.7 J	NA	NA	NA	20.5 J	NA	58.6 J	NA
BARIUM	42.2	NA	NA	NA	109	NA	223	NA
CADMIUM	2.3	NA	NA	NA	2.6	NA	2.8	NA
CHROMIUM	46.1	NA	NA	NA	67.3	NA	73.2	NA
COBALT	12	NA	NA	NA	10.3	NA	12.4	NA
COPPER	89.9	NA	NA	NA	97.5	NA	232	NA
IRON	2190	NA	NA	NA	20600	NA	22800	NA
LEAD	89.7 J	NA	NA	NA	543 J	NA	1100	NA
MANGANESE	381	NA	NA	NA	323	NA	330	NA
MERCURY	0.11	NA	NA	NA	0.32	NA	0.57	NA
NICKEL	42.8	NA	NA	NA	37.2	NA	42.9	NA
THALLIUM	0.20 U	NA	NA	NA	0.20 U	NA	0.19 U	NA
VANADIUM	30.6	NA	NA	NA	46.8	NA	62.7	NA
ZINC	108	NA	NA	NA	246	NA	237	NA
PESTICIDES/PCBS (UG/KG)								
AROCLOR-1248	87 U	NA	NA	NA	98 U	NA	100 U	NA
AROCLOR-1254	170 U	NA	NA	NA	200 U	NA	200 U	NA
AROCLOR-1260	170 U	NA	NA	NA	200 U	NA	200 U	NA
DIELDRIN	17 U	NA	NA	NA	20 U	NA	20 U	NA
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)								
BAP EQUIVALENT-HALFND	260.	NA	NA	NA	334.128	NA	463.46	NA
BENZO(A)ANTHRACENE	59 J	NA	NA	NA	89 J	NA	210 J	NA
BENZO(A)PYRENE	50 J	NA	NA	NA	88 J	NA	200 J	NA
BENZO(B)FLUORANTHENE	44 J	NA	NA	NA	87 J	NA	250 J	NA
BENZO(K)FLUORANTHENE	55 J	NA	NA	NA	88 J	NA	150 J	NA
DIBENZO(A,H)ANTHRACENE	360 U	NA	NA	NA	410 U	NA	410 U	NA
INDENO(1,2,3-CD)PYRENE	360 U	NA	NA	NA	410 U	NA	100 J	NA

TABLE 1
SOIL BACKGROUND DATA
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

LOCATION	BGS-08		BGS-09		BGS-10		BGS-11		BGS-12	
SAMPLE ID	**BGS-08**	**TPBGS080001**	**BGS-09**	**TPBGS090001**	**BGS-10**	**TPBGS100001**	**BGS-11**	**TPBGS110001**	**BGS-12**	**TPBGS120001**
SAMPLE DATE	**99990101**	**20030416**	**99990101**	**20030417**	**99990101**	**20030416**	**99990101**	**20030416**	**99990101**	**20030417**
SAMPLE CODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**SO**	**SO**	**SO**	**SO**	**SO**	**SO**	**SO**	**SO**	**SO**	**SO**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**SS**	**NA**	**SS**	**NA**	**SS**	**NA**	**SS**	**NA**	**SS**
TOP DEPTH	**-9999**	**0.5**	**-9999**	**0.5**	**-9999**	**0.5**	**-9999**	**0.5**	**-9999**	**0.5**
BOTTOM DEPTH	**-9999**	**1**	**-9999**	**1**	**-9999**	**1**	**-9999**	**1**	**-9999**	**1**
DIOXINS/FURANS (NG/KG)										
TEQ WHO-2005 - HALFND	NA	1.69695	NA	1.91216	NA	9.89471	NA	3.22218	NA	15.7637
METALS (MG/KG)										
ALUMINUM	16500	NA	25800	NA	17100	NA	4930	NA	15900	NA
ANTIMONY	6.1 U	NA	7 J	NA	9.1 U	NA	8.2 U	NA	7 U	NA
ARSENIC	11.5 J	NA	11 J	NA	17.1	NA	6.2	NA	13	NA
BARIUM	39.7	NA	49.1	NA	54.5	NA	58.3	NA	65.1	NA
CADMIUM	2.7	NA	3.4	NA	0.93 B	NA	0.80 U	NA	1.5	NA
CHROMIUM	50	NA	103	NA	49	NA	16.2	NA	55	NA
COBALT	12.4	NA	12.7	NA	10.5	NA	4.1 B	NA	10.9	NA
COPPER	59	NA	18.5	NA	33.3	NA	316	NA	50.4	NA
IRON	23400	NA	26400	NA	21700	NA	9450	NA	18900	NA
LEAD	88.5 J	NA	40.1 J	NA	96	NA	119	NA	50.7	NA
MANGANESE	350	NA	460	NA	254	NA	110	NA	298	NA
MERCURY	0.11 U	NA	0.27	NA	0.31 U	NA	0.23 U	NA	0.16 U	NA
NICKEL	38.2	NA	44.6	NA	33.6	NA	11.2	NA	42	NA
THALLIUM	0.21 U	NA	0.21 U	NA	0.49 U	NA	0.58 U	NA	0.47 U	NA
VANADIUM	43.9	NA	66.7	NA	36.7	NA	28.5	NA	62.1	NA
ZINC	88.4	NA	73.7	NA	91.9	NA	150	NA	82.1	NA
PESTICIDES/PCBS (UG/KG)										
AROCLOR-1248	91 U	NA	91 U	NA	360 U	NA	1400 U	NA	38 U	NA
AROCLOR-1254	180 U	NA	180 U	NA	360 U	NA	1400 U	NA	38 U	NA
AROCLOR-1260	180 U	NA	180 U	NA	260 U	NA	1400 U	NA	38 U	NA
DIELDRIN	18 U	NA	18 U	NA	36 U	NA	140 U	NA	3.8 U	NA
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)										
BAP EQUIVALENT-HALFND	266.253	NA	440.84	NA	405.846	NA	248.64	NA	357.26	NA
BENZO(A)ANTHRACENE	47 J	NA	380 U	NA	360 U	NA	37 J	NA	120 J	NA
BENZO(A)PYRENE	43 J	NA	380 U	NA	360 U	NA	39 J	NA	130 J	NA
BENZO(B)FLUORANTHENE	57 J	NA	380 U	NA	62 J	NA	56 J	NA	170 J	NA
BENZO(K)FLUORANTHENE	380 U	NA	380 U	NA	360 U	NA	47 J	NA	110 J	NA
DIBENZO(A,H)ANTHRACENE	380 U	NA	380 U	NA	360 U	NA	360 U	NA	380 U	NA
INDENO(1,2,3-CD)PYRENE	380 U	NA	380 U	NA	360 U	NA	360 U	NA	64 J	NA

TABLE 1
SOIL BACKGROUND DATA
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

LOCATION	BGS-13	BGS-14		BGS-15		BGS-16		BGS-17	
SAMPLE ID	BGS-13	BGS-14	TPBGS140001	BGS-15	TPBGS150001	BGS-16	TPBGS160001	BGS-17	TPBGS170001
SAMPLE DATE	99990101	99990101	20030417	99990101	20030508	99990101	20030416	99990101	20030416
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	SS	NA	SS	NA	SS	NA	SS
TOP DEPTH	-9999	-9999	0.5	-9999	0.5	-9999	0.2	-9999	0.5
BOTTOM DEPTH	-9999	-9999	1	-9999	1	-9999	0.5	-9999	1
DIOXINS/FURANS (NG/KG)									
TEQ WHO-2005 - HALFND	NA	NA	1.80856	NA	1.28597	NA	0.86434	NA	8.0082
METALS (MG/KG)									
ALUMINUM	33500	14200	NA	13200	NA	22800	NA	9680	NA
ANTIMONY	8.5 U	7.3 U	NA	8.7 U	NA	9.4 U	NA	7.6 U	NA
ARSENIC	8.9	16.8	NA	14.2	NA	12.5	NA	6.7	NA
BARIUM	57.9	67.2	NA	44.2	NA	113	NA	22.3 B	NA
CADMIUM	2.4	1.1	NA	1.6	NA	1.6	NA	0.74 U	NA
CHROMIUM	92.8	69.2	NA	36.9	NA	85.1	NA	11.6	NA
COBALT	24.2	10.3	NA	7.6 B	NA	17	NA	3.1 B	NA
COPPER	24	65.5	NA	21.6	NA	31.4	NA	14.7	NA
IRON	45000	20800	NA	17900	NA	32100	NA	8730	NA
LEAD	50.9	173	NA	67	NA	55.2	NA	12.8	NA
MANGANESE	243	242	NA	285	NA	427	NA	154	NA
MERCURY	0.19 U	0.21 U	NA	0.13 U	NA	0.13 U	NA	0.11 U	NA
NICKEL	65	44.7	NA	28.5	NA	73.2	NA	8.1	NA
THALLIUM	0.65 U	0.56 U	NA	0.60 U	NA	0.64 U	NA	0.57 U	NA
VANADIUM	89.5	85.4	NA	42.5	NA	73.1	NA	13.5	NA
ZINC	109	208	NA	72.3	NA	95.2	NA	23.1	NA
PESTICIDES/PCBS (UG/KG)									
AROCLOR-1248	110 U	350 U	NA	110 U	NA	38 U	NA	180 U	NA
AROCLOR-1254	110 U	350 U	NA	110 U	NA	38 U	NA	180 U	NA
AROCLOR-1260	110 U	350 U	NA	110 U	NA	38 U	NA	180 U	NA
DIELDRIN	11 U	35 U	NA	11 U	NA	3.8 U	NA	18 U	NA
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)									
BAP EQUIVALENT-HALFND	267.461	1574.7	NA	242.762	NA	427.85	NA	350 U	NA
BENZO(A)ANTHRACENE	48 J	640	NA	41 J	NA	380 U	NA	350 U	NA
BENZO(A)PYRENE	43 J	1100	NA	36 J	NA	380 U	NA	350 U	NA
BENZO(B)FLUORANTHENE	360 U	1700	NA	66 J	NA	60 J	NA	350 U	NA
BENZO(K)FLUORANTHENE	360 U	1100	NA	350 U	NA	380 U	NA	350 U	NA
DIBENZO(A,H)ANTHRACENE	360 U	180 J	NA	350 U	NA	380 U	NA	350 U	NA
INDENO(1,2,3-CD)PYRENE	360 U	440	NA	350 U	NA	380 U	NA	350 U	NA

TABLE 1
SOIL BACKGROUND DATA
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

LOCATION	BGS-18				BGS-19		BGS-20		BGS-21	
SAMPLE ID	**BGS-18**	**TPBGS180001**	**TPBGS180001-**	**TPBGS180001-**	**BGS-19**	**TPBGS190001**	**BGS-20**	**TPBGS200001**	**BGS-21**	**TPBGS210001**
SAMPLE DATE	**99990101**	**20030416**	**20030416**	**20030416**	**99990101**	**20030416**	**99990101**	**20030416**	**99990101**	**20030416**
SAMPLE CODE	**NORMAL**	**ORIG**	**AVG**	**DUP**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**SO**	**SO**	**SO**	**SO**	**SO**	**SO**	**SO**	**SO**	**SO**	**SO**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**SS**	**SS**	**SS**	**NA**	**SS**	**NA**	**SS**	**NA**	**SS**
TOP DEPTH	**-9999**	**0.5**	**0.5**	**0.5**	**-9999**	**0.5**	**-9999**	**0.5**	**-9999**	**0.5**
BOTTOM DEPTH	**-9999**	**1**	**1**	**1**	**-9999**	**1**	**-9999**	**1**	**-9999**	**0.7**
DIOXINS/FURANS (NG/KG)										
TEQ WHO-2005 - HALFND	NA	2.51533	2.44498	2.37464	NA	8.99349	NA	4.62941	NA	6.49066
METALS (MG/KG)										
ALUMINUM	23200	NA	NA	NA	17200	NA	20800	NA	18200	NA
ANTIMONY	9 U	NA	NA	NA	7.4 U	NA	10.2 U	NA	9 U	NA
ARSENIC	7.3	NA	NA	NA	12.6	NA	15.7	NA	13.1	NA
BARIUM	172	NA	NA	NA	115	NA	108	NA	74.7	NA
CADMIUM	2.1	NA	NA	NA	0.82 B	NA	2.5	NA	1.1 B	NA
CHROMIUM	58.9	NA	NA	NA	34.9	NA	55.2	NA	56.7	NA
COBALT	11.2	NA	NA	NA	7.7 B	NA	10 B	NA	7.3 B	NA
COPPER	41.6	NA	NA	NA	25.4	NA	161	NA	68	NA
IRON	27200	NA	NA	NA	20200	NA	21100	NA	18200	NA
LEAD	316	NA	NA	NA	191	NA	526	NA	387	NA
MANGANESE	271	NA	NA	NA	350	NA	393	NA	208	NA
MERCURY	1.8	NA	NA	NA	0.18 U	NA	0.18 U	NA	0.30 U	NA
NICKEL	29.5	NA	NA	NA	20.3	NA	38.8	NA	37.9	NA
THALLIUM	0.49 U	NA	NA	NA	0.67 U	NA	0.76 U	NA	0.63 U	NA
VANADIUM	54.5	NA	NA	NA	38.7	NA	64.5	NA	43.7	NA
ZINC	1390	NA	NA	NA	105	NA	267	NA	81.8	NA
PESTICIDES/PCBS (UG/KG)										
AROCLOR-1248	71 U	NA	NA	NA	370 U	NA	220 U	NA	79 U	NA
AROCLOR-1254	71 U	NA	NA	NA	370 U	NA	220 U	NA	79 U	NA
AROCLOR-1260	71 U	NA	NA	NA	370 U	NA	220 U	NA	79 U	NA
DIELDRIN	7.1 U	NA	NA	NA	37 U	NA	22 U	NA	7.9 U	NA
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)										
BAP EQUIVALENT-HALFND	405.147	NA	NA	NA	325.69	NA	408.98	NA	324.01	NA
BENZO(A)ANTHRACENE	360 U	NA	NA	NA	96 J	NA	130 J	NA	69 J	NA
BENZO(A)PYRENE	360 U	NA	NA	NA	100 J	NA	140 J	NA	76 J	NA
BENZO(B)FLUORANTHENE	55 J	NA	NA	NA	240 J	NA	320 J	NA	170 J	NA
BENZO(K)FLUORANTHENE	360 U	NA	NA	NA	370 U	NA	430 U	NA	400 U	NA
DIBENZO(A,H)ANTHRACENE	360 U	NA	NA	NA	370 U	NA	430 U	NA	400 U	NA
INDENO(1,2,3-CD)PYRENE	360 U	NA	NA	NA	47 J	NA	61 J	NA	400 U	NA

TABLE 1
SOIL BACKGROUND DATA
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

LOCATION	BGS-22	BGS-23	BGS-24	BGS-25	BGS-26
SAMPLE ID	BGS-22	BGS-23	BGS-24	BGS-25	BGS-26
SAMPLE DATE	99990101	99990101	99990101	99990101	99990101
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA
TOP DEPTH	-9999	-9999	-9999	-9999	-9999
BOTTOM DEPTH	-9999	-9999	-9999	-9999	-9999
DIOXINS/FURANS (NG/KG)					
TEQ WHO-2005 - HALFND	NA	NA	NA	NA	NA
METALS (MG/KG)					
ALUMINUM	15000	14200	10900	29600	18900
ANTIMONY	8.3 U	8.1 U	9 U	9.7 U	8.7 U
ARSENIC	13.7	16.2	4.4 B	22.2	10.6 B
BARIUM	64.2	38.4 B	32.5 B	83	58.4
CADMIUM	1.4	1.1	0.88 U	1.3	0.85 U
CHROMIUM	43.6	29.2	33.9	77.1	52.7
COBALT	7.4 B	7.7	5.2 B	16.1	10.5
COPPER	29.9	11.8	8.5	19.7	35.8
IRON	16600	20000	12800	32200	21000
LEAD	160	75.3	11.7	23.1	106
MANGANESE	290	440	218	611	265
MERCURY	0.22 U	0.14 U	0.15 U	0.11 U	0.15 U
NICKEL	28.6	16.1	20.8	59.4	36.1
THALLIUM	0.61 U	0.53 U	0.58 U	0.71 U	0.64 U
VANADIUM	43	37.8	20.9	56.4	38.7
ZINC	91.5	71.9	29.6	78.9	87.8
PESTICIDES/PCBS (UG/KG)					
AROCLOR-1248	360 U	180 U	73 U	40 U	360 U
AROCLOR-1254	360 U	180 U	73 U	40 U	360 U
AROCLOR-1260	360 U	180 U	73 U	40 U	360 U
DIELDRIN	36 U	18 U	7.3 U	4 U	36 U
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)					
BAP EQUIVALENT-HALFND	856.47	296.06	360 U	400 U	403.737
BENZO(A)ANTHRACENE	480	60 J	360 U	400 U	360 U
BENZO(A)PYRENE	520	89 J	360 U	400 U	360 U
BENZO(B)FLUORANTHENE	470	200 J	360 U	400 U	41 J
BENZO(K)FLUORANTHENE	680	38 J	360 U	400 U	360 U
DIBENZO(A,H)ANTHRACENE	190 J	350 U	360 U	400 U	360 U
INDENO(1,2,3-CD)PYRENE	400	38 J	360 U	400 U	360 U

TABLE 2
GROUNDWATER BACKGROUND DATA
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

LOCATION	GW-1					SI-01B					
SAMPLE ID	GW-01-04	JILF-01-GW-07	JILF-01-GW-08	JILF-01-GW-09	JILF-01-GW-10	SI01BGW	SI-01B-GW-07	SI-01B-GW-08	SI-01B-GW-09	SI-01B-GW-10	SI01BGWF
SAMPLE DATE	99990101	19961203	19970414	19970805	19971031	19940721	19961203	19970412	19970814	19971105	19940721
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOP DEPTH	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999
BOTTOM DEPTH	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999
METALS (UG/L)											
MANGANESE	2830	3580	2510	2460	3140	922	245	217	340	263	792

TABLE 2
GROUNDWATER BACKGROUND DATA
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

LOCATION	SI-01DB					
SAMPLE ID	SI01DBGW	SI-01DB-GW-07	SI-01DB-GW-08	SI-01DB-GW-09	SI-01DB-GW-10	SI01DBGWF
SAMPLE DATE	19940721	19961203	19970412	19970815	19971104	19940721
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	NA	NA	NA	NA	NA
TOP DEPTH	-9999	-9999	-9999	-9999	-9999	-9999
BOTTOM DEPTH	-9999	-9999	-9999	-9999	-9999	-9999
METALS (UG/L)						
MANGANESE	507	27.8	13.9	39.4	27.2	200

TABLE 3
SURFACE SOIL BACKGROUND SUMMARY
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Parameter	Site FOD	Background FOD	Total FOD	Background Maximum Detect[1]	Site Maximum Detect[1]	%ND	Visual Conclusion Site Above Background?	Site Distribution	Background Distribution	Test	Equal Variance?[2]	Test Statistic	P-Value	Quantile Test	Slippage Test	Site Above Background?
Dioxins/Furans																
TEQ	11/12	19/19	30/31	15.7637	22.20363	3	Similar	Lognormal	Lognormal	T-Test	Yes	-3.508	0.001	Pass	Pass	No
Metals																
ALUMINUM	51/51	25/25	76/76	33500	21100	0	No									No
ARSENIC	55/56	25/25	80/81	58.6	82.3	1	Similar	Nonparametric	Nonparametric	WRS		-5.971	1.18E-09	Pass	Pass	No
BARIUM	51/51	25/25	76/76	223	2530	0	Yes									Yes
CADMIUM	30/51	21/25	51/76	3.4	8.6	33	Similar	Normal	Nonparametric	Gehan		-2.721	0.00326	Pass	Pass	No
CHROMIUM	51/51	25/25	76/76	103	280	0	Yes									Yes
COBALT	51/51	25/25	76/76	24.2	20.9	0	Similar	Normal	Normal	T-Test	No	-4.208	0	Pass	Pass	No
COPPER	51/51	25/25	76/76	316	5620	0	Yes									Yes
IRON	51/51	25/25	76/76	45000	196000	0	Yes									Yes
LEAD	50/51	25/25	75/76	1100	13200	1	Yes									Yes
MANGANESE	51/51	25/25	76/76	611	648	0	Similar	Normal	Normal	T-Test	Yes	-2.058	0.023	Pass	Pass	No
MERCURY	44/51	6/25	50/76	1.8	8.385	34	Yes									Yes
VANADIUM	51/51	25/25	76/76	89.5	109	0	Similar	Lognormal	Lognormal	T-Test	Yes	-6.87	0	Pass	Pass	No
Semivolatiles																
BAP Equivalent	38/52	20/25	58/77	1574.7	5686.9	25	Yes									Yes
BENZO(A)ANTHRACENE	34/51	15/25	49/76	640	4500	36	Yes									Yes
BENZO(A)PYRENE	35/51	15/25	50/76	1100	3800	33	Yes									Yes
BENZO(B)FLUORANTHENE	34/51	18/25	52/76	1700	4800	32	Yes									Yes
BENZO(K)FLUORANTHENE	33/51	9/25	42/76	1100	3000	45	Yes									Yes
INDENO(1,2,3-CD)PYRENE	29/51	8/25	37/76	440	2300	53	Yes									Yes

1 Units for dixons/furans are ng/kg, metals are mg/kg, and semivolatiles are ug/kg.
2 F-Test is used to deteremine if the variances are equal.

WRS= Wilcoxon Rank Sum Test

TABLE 4
SUBSURFACE SOIL BACKGROUND SUMMARY
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Parameter	Site FOD	Background FOD	Total FOD	Background Maximum Detect[1]	Site Maximum Detect[1]	%ND	Visual Conclusion Site Above Background?	Site Distribution	Background Distribution	Test	Equal Variance?[2]	Test Statistic	P-Value	Quantile Test	Slippage Test	Site Above Background ?
Dioxins/Furans																
TEQ (HALF ND)	14/14	14/14	33/33	15.7637	1684.057	0	Yes									Yes
Metals																
ALUMINUM	68/68	25/25	93/93	33500	29000	0	No									No
ARSENIC	78/78	25/25	103/103	58.6	65.7	0	Similar	Lognormal	Nonparametric	WRS		-4.631	1.82E-06	Pass	Pass	No
BARIUM	68/68	25/25	93/93	223	1580	0	Yes									Yes
CADMIUM	46/68	21/25	67/93	3.4	24.1	27.95699	Yes									Yes
CHROMIUM	68/68	25/25	93/93	103	2860	0	Yes									Yes
COBALT	68/68	25/25	93/93	24.2	85.2	0	Yes									Yes
COPPER	68/68	25/25	93/93	316	32400	0	Yes									Yes
IRON	68/68	25/25	93/93	45000	280000	0	Yes									Yes
LEAD	67/68	25/25	92/93	1100	40000	1.075269	Yes									Yes
MANGANESE	78/78	25/25	103/103	611	4370	0	Yes									Yes
MERCURY	66/68	6/25	72/93	1.8	120	22.58065	Yes									Yes
NICKEL	67/68	25/25	92/93	73.2	3920	1.075269	Yes									Yes
VANADIUM	68/68	25/25	93/93	89.5	98.1	0	Similar	Lognormal	Lognormal	Pooled T-Test	Yes	-8.518	0	Pass	Pass	No
ZINC	68/68	25/25	93/93	1390	12440	0	Yes									Yes
Semivolatiles																
BAP EQUIVALENTS (HALF ND)	74/92	74/92	94/117	1574.7	9337.9	19.65812	Yes									Yes
BENZO(A)ANTHRACENE	49/65	15/25	64/90	640	5100	28.88889	Yes									Yes
BENZO(A)PYRENE	49/65	15/25	64/90	1100	4100	28.88889	Yes									Yes
BENZO(B)FLUORANTHENE	48/65	18/25	66/90	1700	3200	26.66667	Yes									Yes
BENZO(K)FLUORANTHENE	39/65	9/25	48/90	1100	3600	46.66667	Similar	Nonparametric	Nonparametric	Gehan		-6.035	7.93E-10	Pass	Pass	No
INDENO(1,2,3-CD)PYRENE	46/65	8/25	54/90	440	2100	40	Yes									Yes

WRS= Wilcoxon Rank Sum Test

TABLE 5
GROUNDWATER BACKGROUND SUMMARY
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Parameter	Site FOD	Background FOD	Total FOD	Background Maximum Detect (mg/l)	Site Maximum Detect (mg/l)	%ND	Visual Conclusion Site Above Background?	Site Distribution	Background Distribution	Test	Equal Variance?[1]	Test Statistic	P-Value	Quantile Test	Slippage Test	Site Above Background?
MANGANESE	29/41	17/17	46/58	3580	2820	21	Similar	Nonparametric	Lognormal	Gehan		-2.847	0.00221	Pass	Pass	No

1 F-Test is used to deteremine if the variances are equal.

FOD = Frequency of Detect

TABLE 6
AREA WITH NO DEBRIS SURFACE SOIL BACKGROUND SUMMARY
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Parameter	Site FOD	Background FOD	Total FOD	Background Maximum Detect[1]	Site Maximum Detect[1]	%ND	Visual Conclusion Site Above Background?	Site Distribution	Background Distribution	Test	Equal Variance?[2]	Test Statistic	P-Value	Quantile Test	Slippage Test	Site Above Background?
Metals																
ALUMINUM	7/7	25/25	32/32	33500	19900	0	No									No
ARSENIC	7/7	25/25	32/32	58.6	25.5	0	Similar	Lognormal	Nonparametric	WRS		-3.145	0.0008	Pass	Pass	No
COBALT	7/7	25/25	32/32	24.2	10.5	0	No									No
IRON	7/7	25/25	32/32	45000	30100	0	Similar	Lognormal	Lognormal	T-test	Yes	-2.589	0.007	Pass	Pass	No
MANGANESE	7/7	25/25	32/32	611	402	0	Similar	Normal	Normal	T-test	Yes	-2.857	0.004	Pass	Pass	No
VANADIUM	7/7	25/25	32/32	89.5	42.7	0	No									No
Semivolatiles																
BAP EQUIVALENT-HALFND	6/7	20/25	26/32	1571	78.4095	18.8	No									No
BENZO(A)PYRENE	5/7	15/25	20/32	1100	48	37.5	No									No

1 Units for metals are mg/kg, and semivolatiles are ug/kg.
2 F-Test is used to deteremine if the variances are equal.

FOD = Frequency of Detect
ND = Nondetect
WRS= Wilcoxon Rank Sum Test

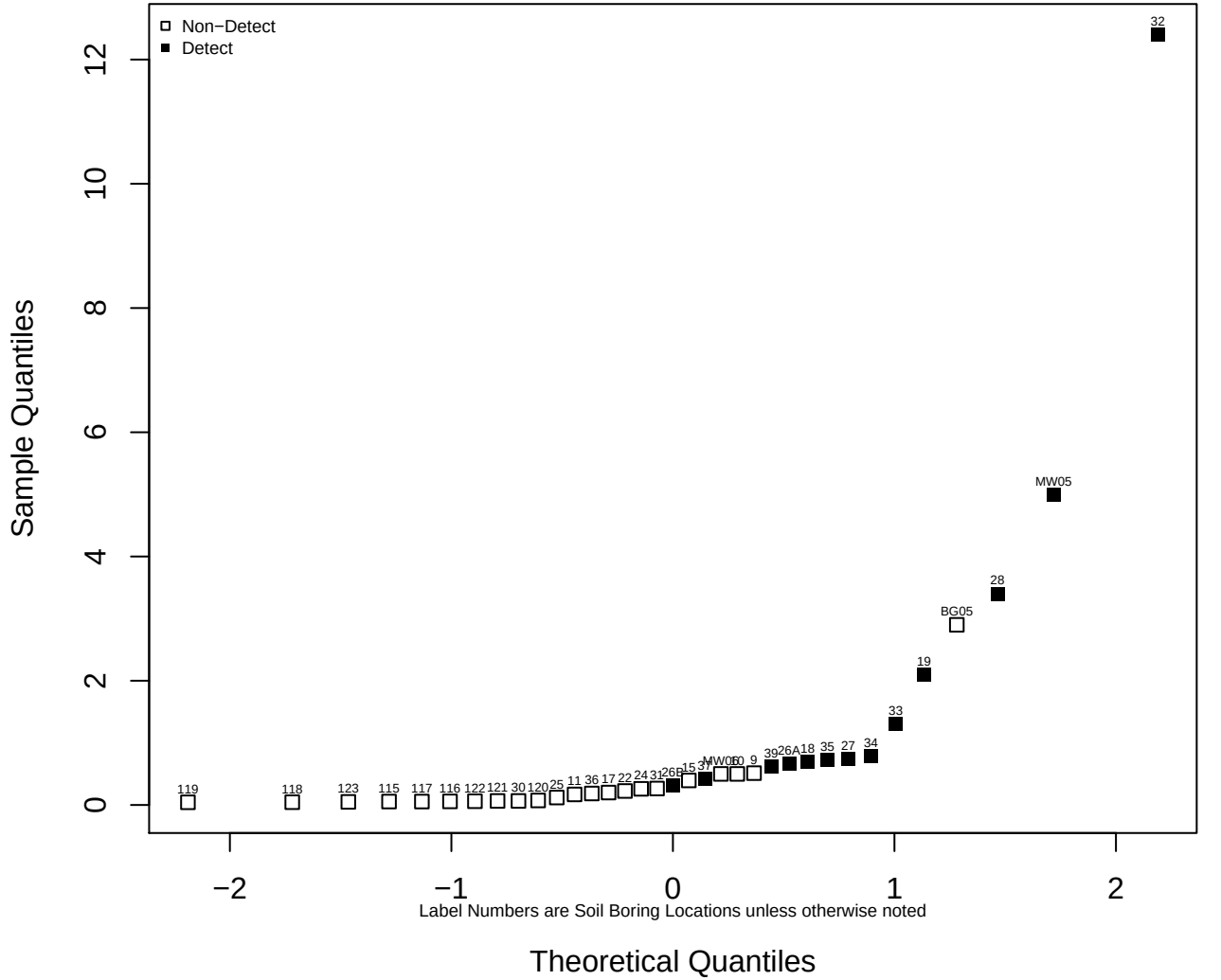
TABLE 7
AREA WITH NO DEBRIS SUBSURFACE BACKGROUND SUMMARY
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Parameter	Site FOD	Background FOD	Total FOD	Background Maximum Detect[1]	Site Maximum Detect[1]	%ND	Visual Conclusion Site Above Background?	Site Distribution	Background Distribution	Test	Test Statistic	P-Value	Quantile Test	Slippage Test	Site Above Background?
Metals															
Aluminum	3/3	25/25	28/28	33500	16200	0	No								No
Arsenic	3/3	25/25	28/28	58.6	19.6	0	Similar	NA[2]	Nonparametric	WRS	-2.377	0.00873	Pass	Pass	No
Cobalt	3/3	25/25	28/28	24.2	8.9	0	No								No
Iron	3/3	25/25	28/28	45000	23100	0	Similar	NA[2]	Normal	WRS	-2.303	0.0107	Pass	Pass	No
Manganese	3/3	25/25	28/28	611	380.5	0	Similar	NA[2]	Normal	WRS	-1.634	0.0511			Yes
Semivolatiles															
BAP Equivalent	3/4	20/25	23/29	1570.6	251.1	20.7	Similar	NA[2]	Nonparametric	Gehan	-1.409	0.0794			Yes
Benzo(a)anthracene	3/4	15/25	18/29	640	180	37.9	Similar	NA[2]	Nonparametric	Gehan	-1.068	0.143			Yes
Benzo(a)pyrene	3/4	15/25	18/29	1100	170	37.9	Similar	NA[2]	Nonparametric	Gehan	-1.111	0.133			Yes
Benzo(b)fluoranthene	3/4	18/25	21/29	1700	230	27.6	Similar	NA[2]	Nonparametric	Gehan	-0.898	0.184			Yes

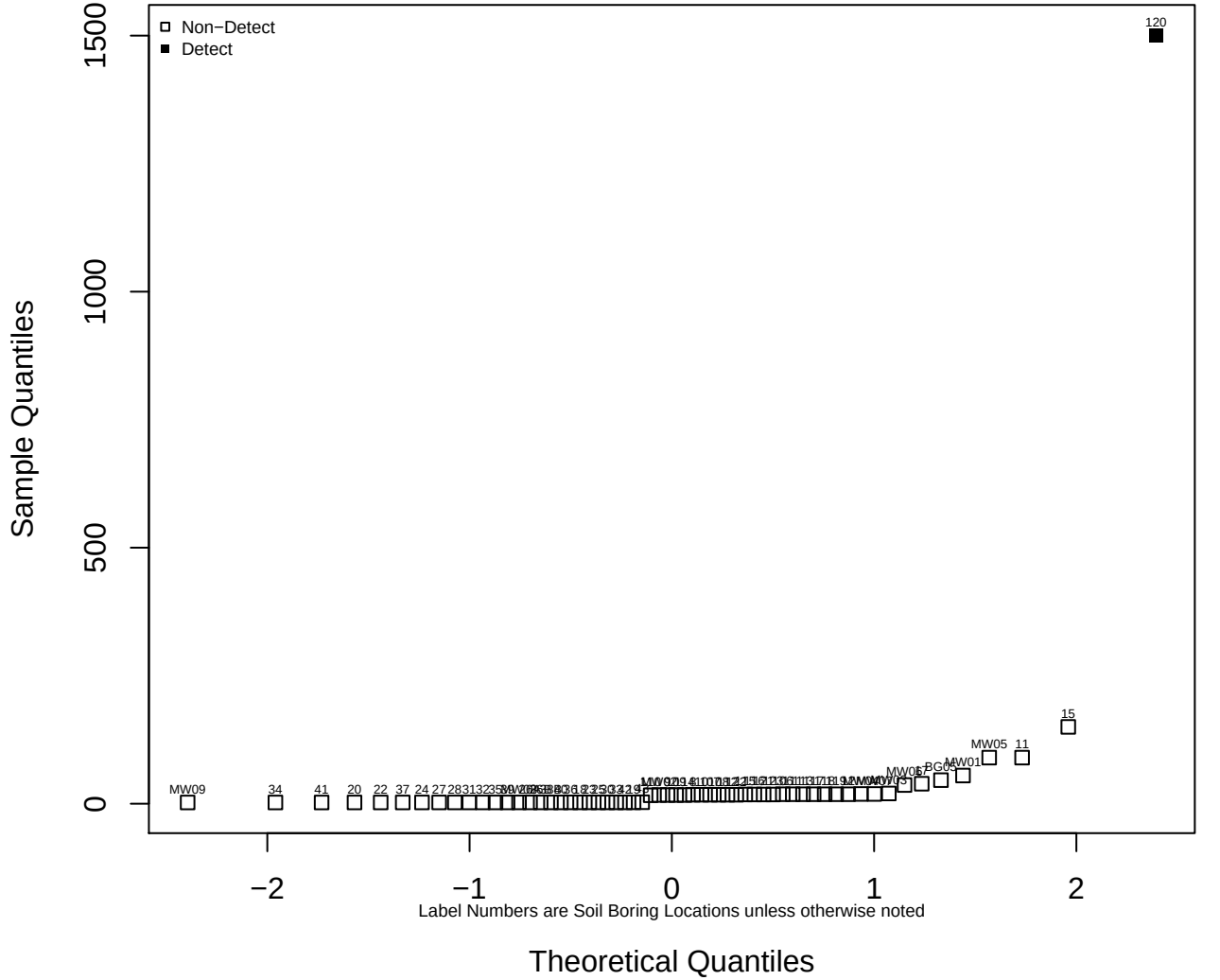
1 Units for metals are mg/kg and semivolatiles are ug/kg.
2 Sample size is less than or equal to 4 and too small to determine data distribution.

FOD = Frequency of Detect
ND = Nondetect
WRS= Wilcoxon Rank Sum Test

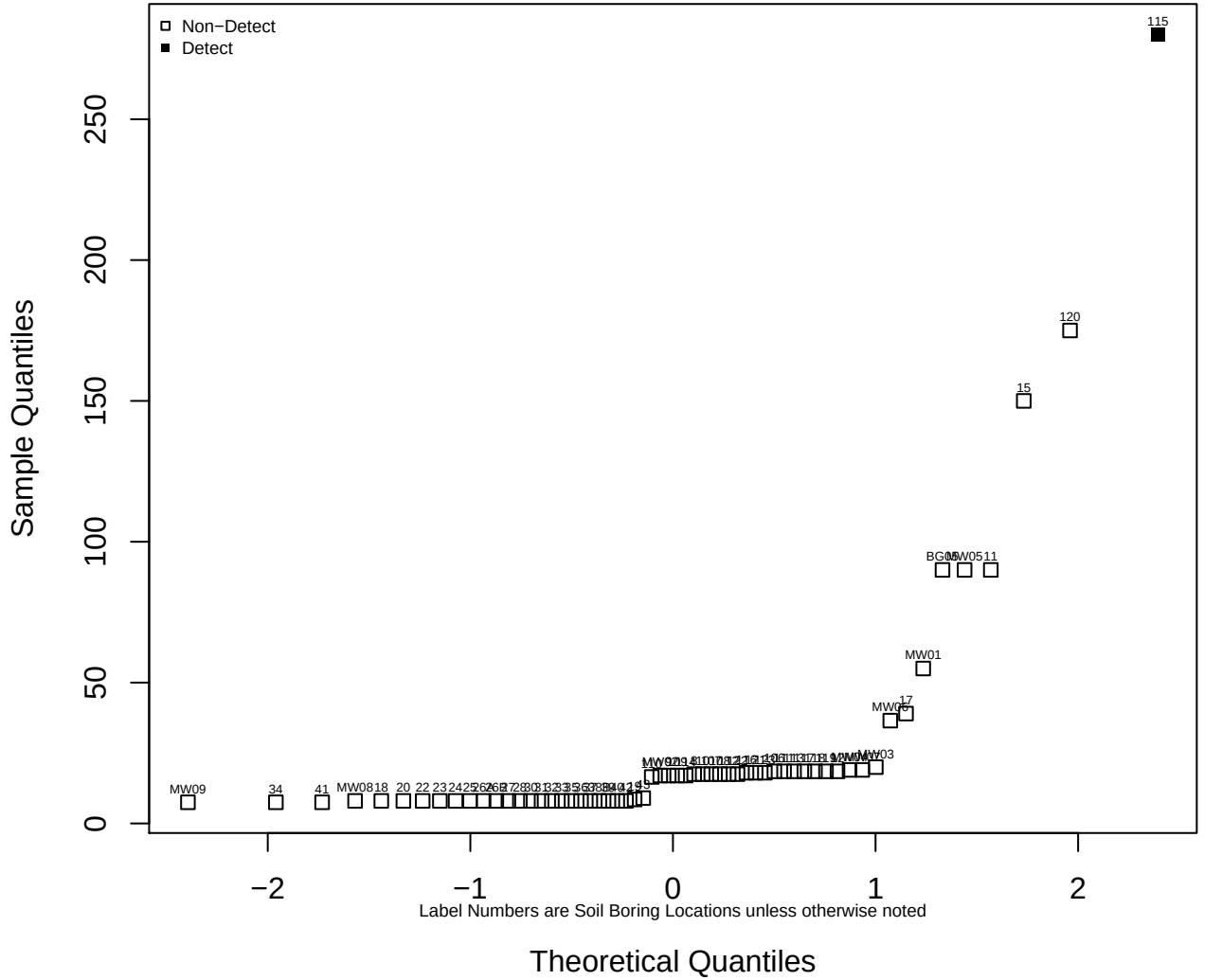
Normal Probability Plot
ANTIMONY
Surface Soil



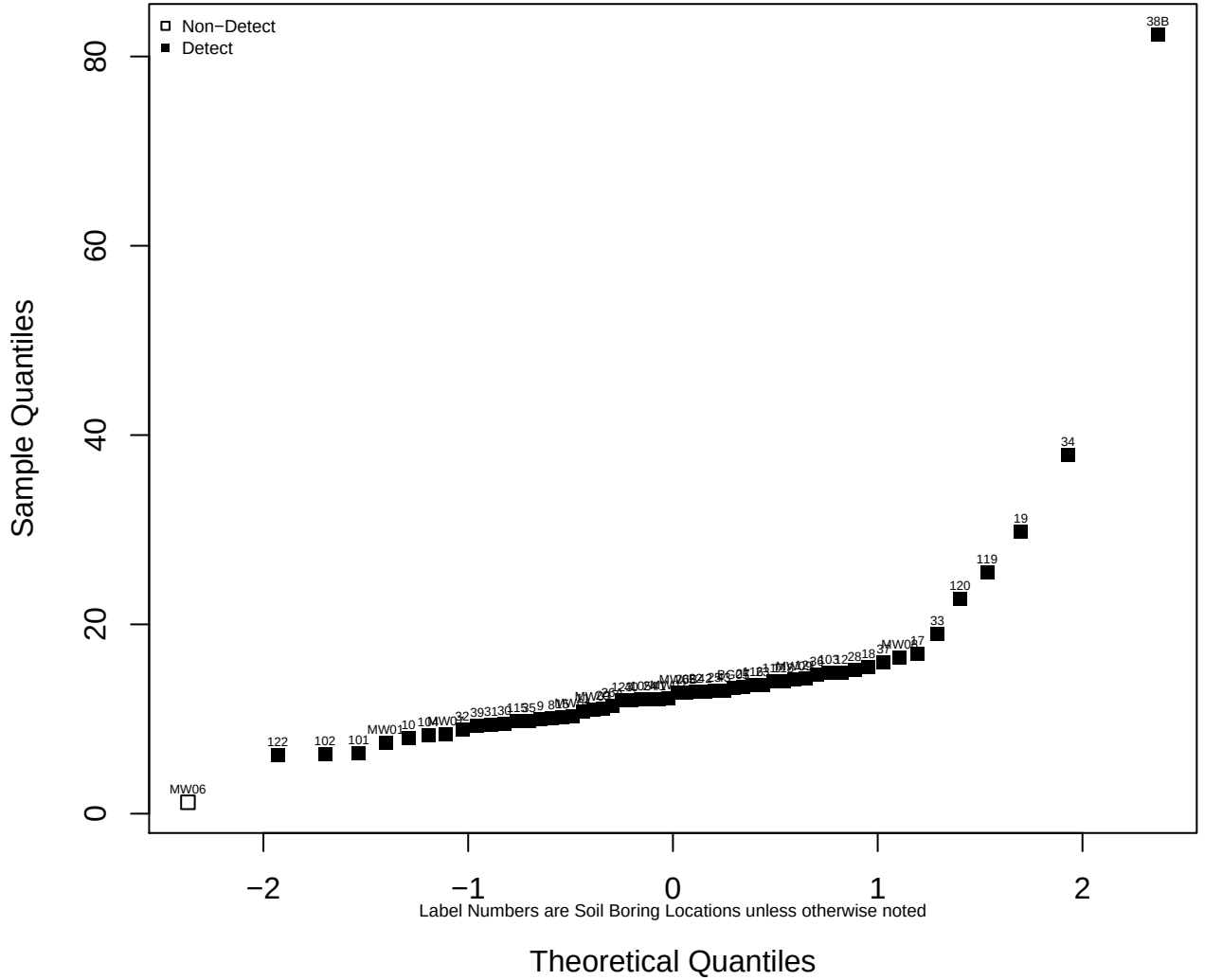
Normal Probability Plot
AROCLOR−1248
Surface Soil



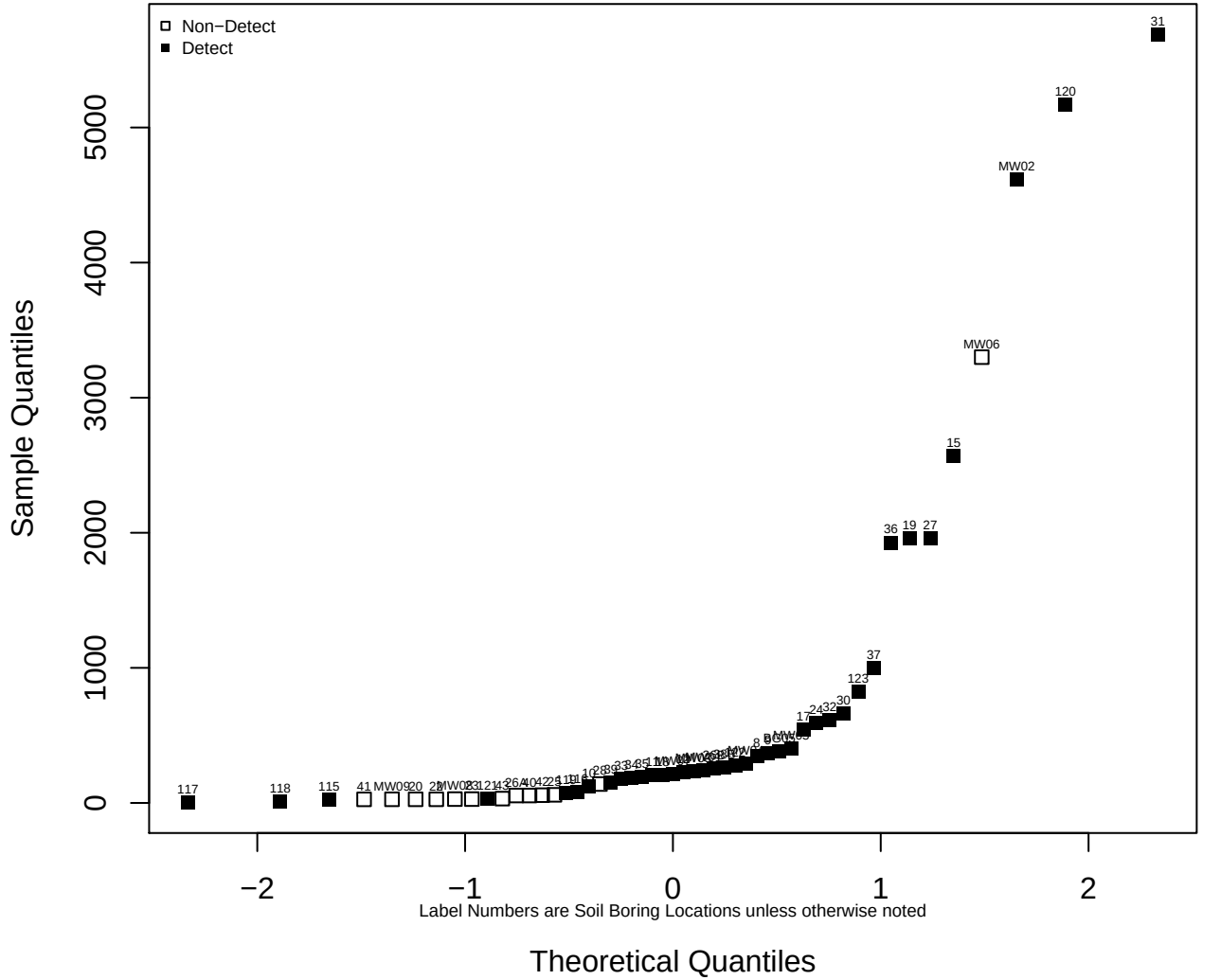
Normal Probability Plot
AROCLOR−1254
Surface Soil



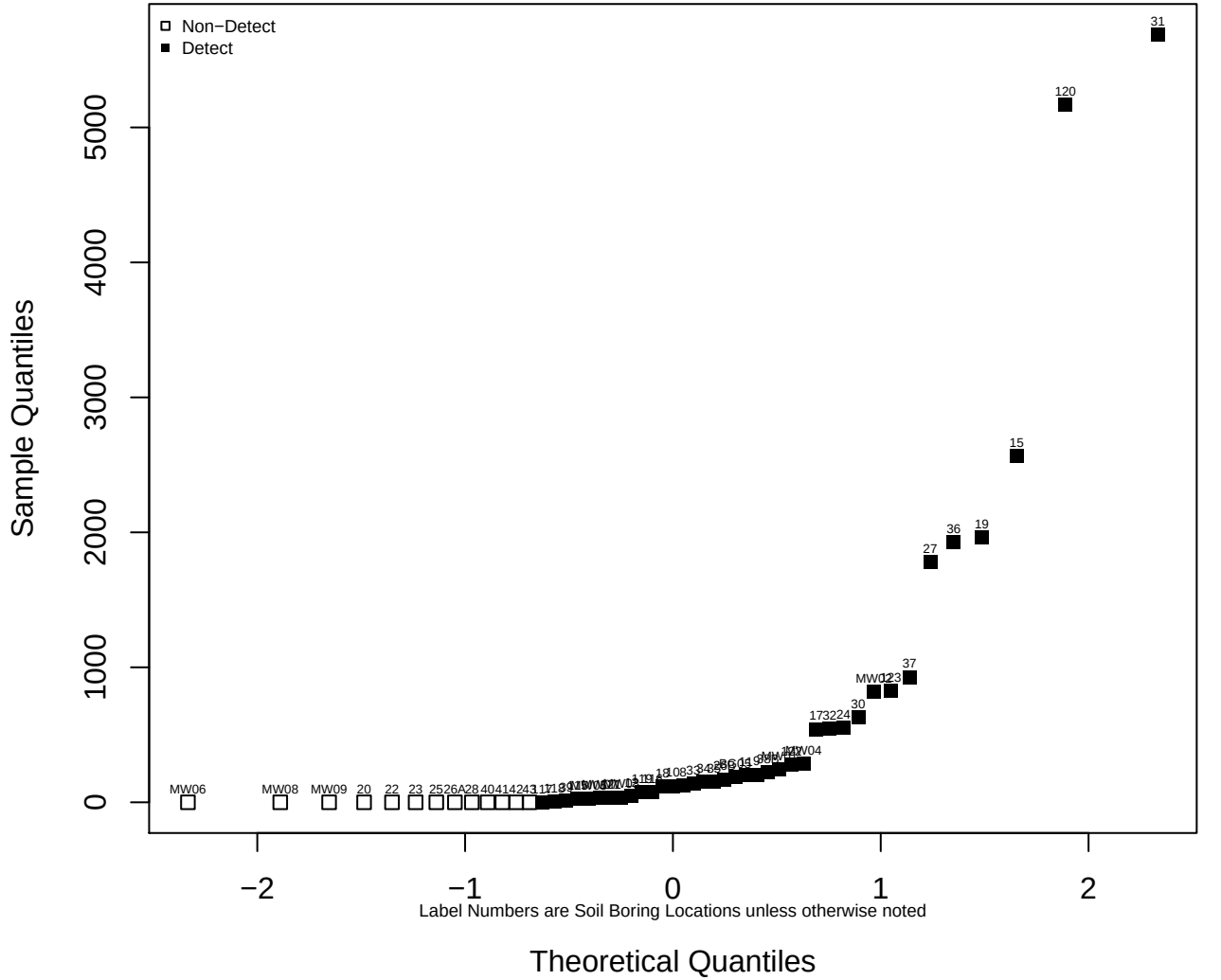
Normal Probability Plot
ARSENIC
Surface Soil



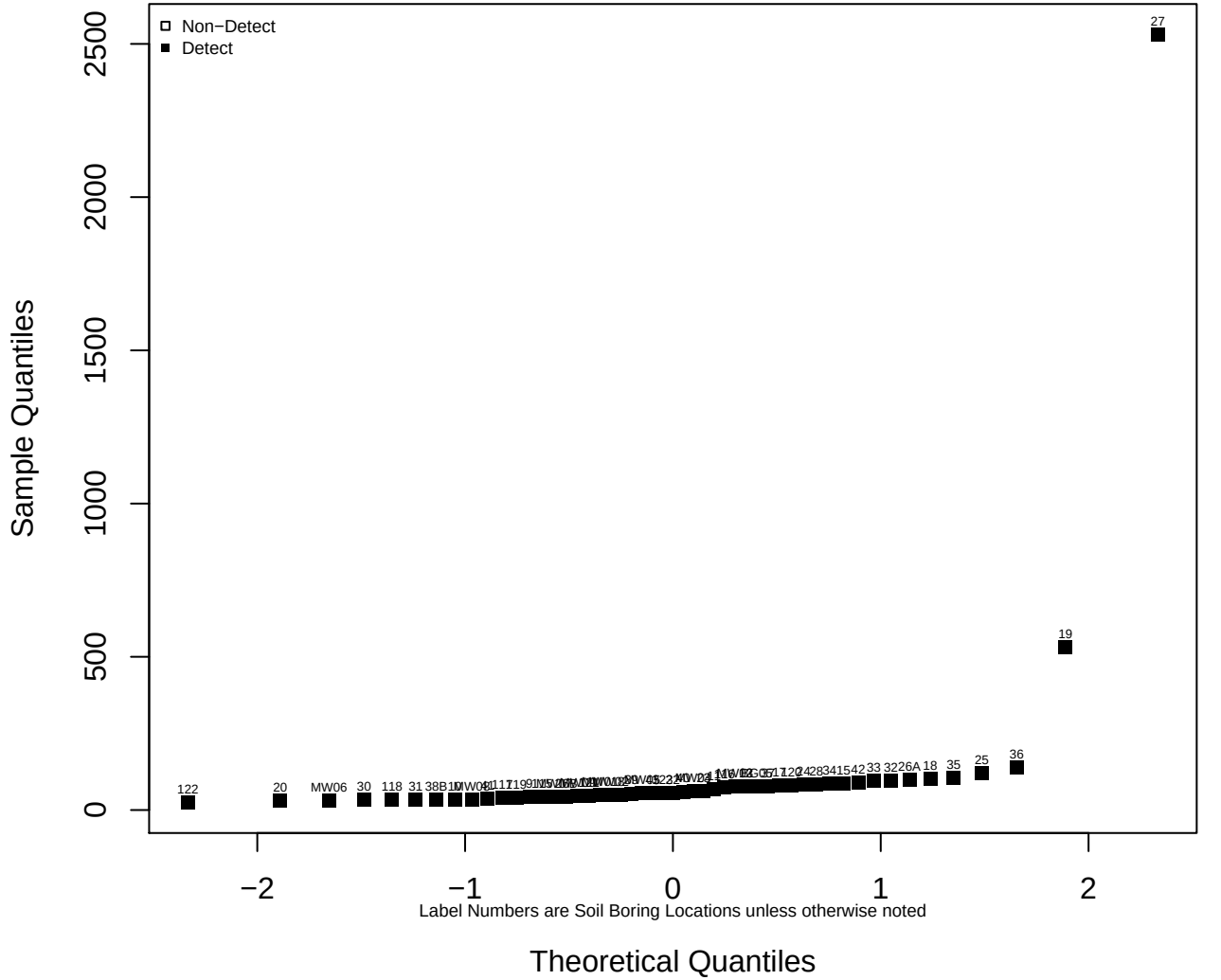
Normal Probability Plot
BAP EQUIVALENT−HALFND
Surface Soil



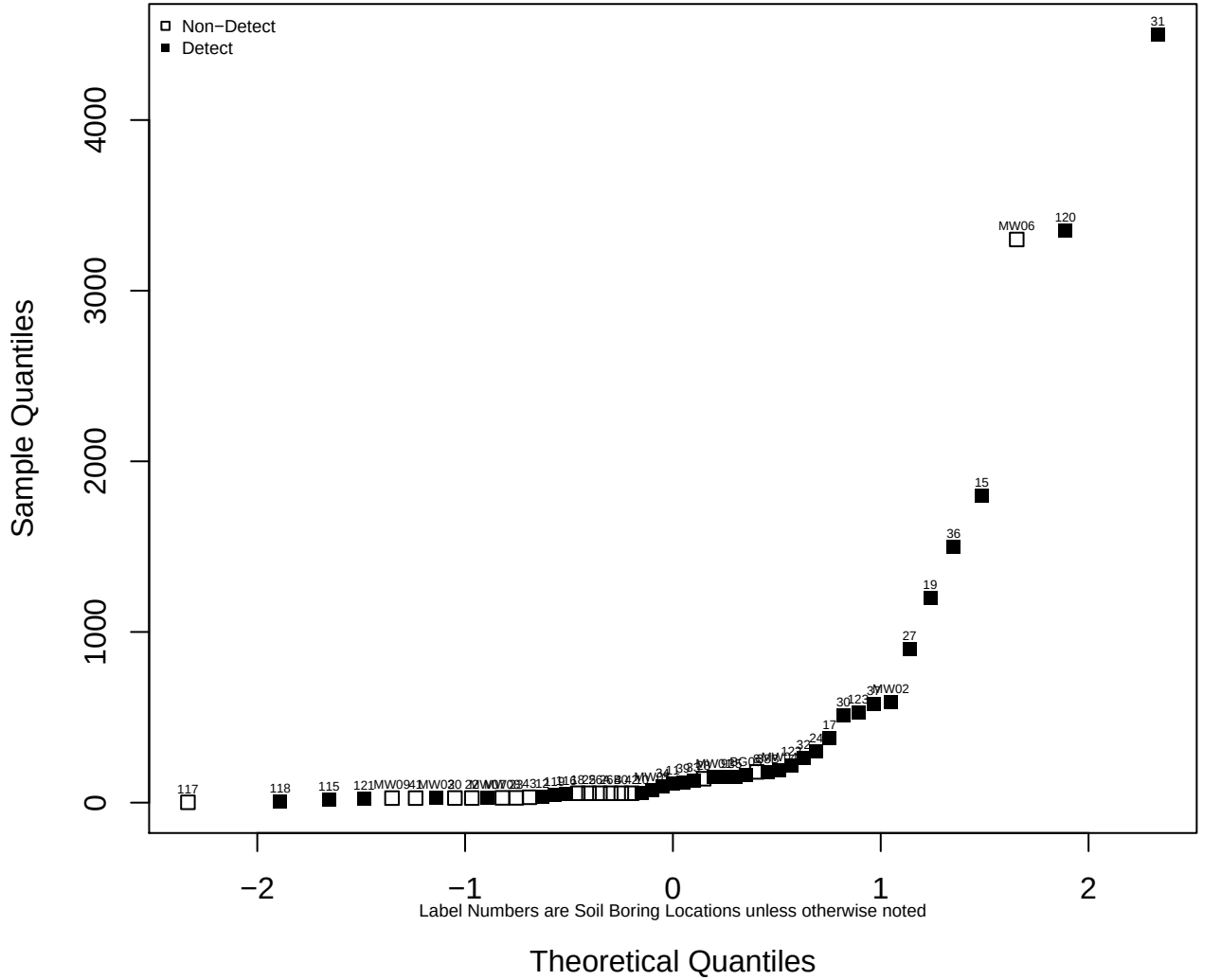
Normal Probability Plot
BAP EQUIVALENT−POS
Surface Soil



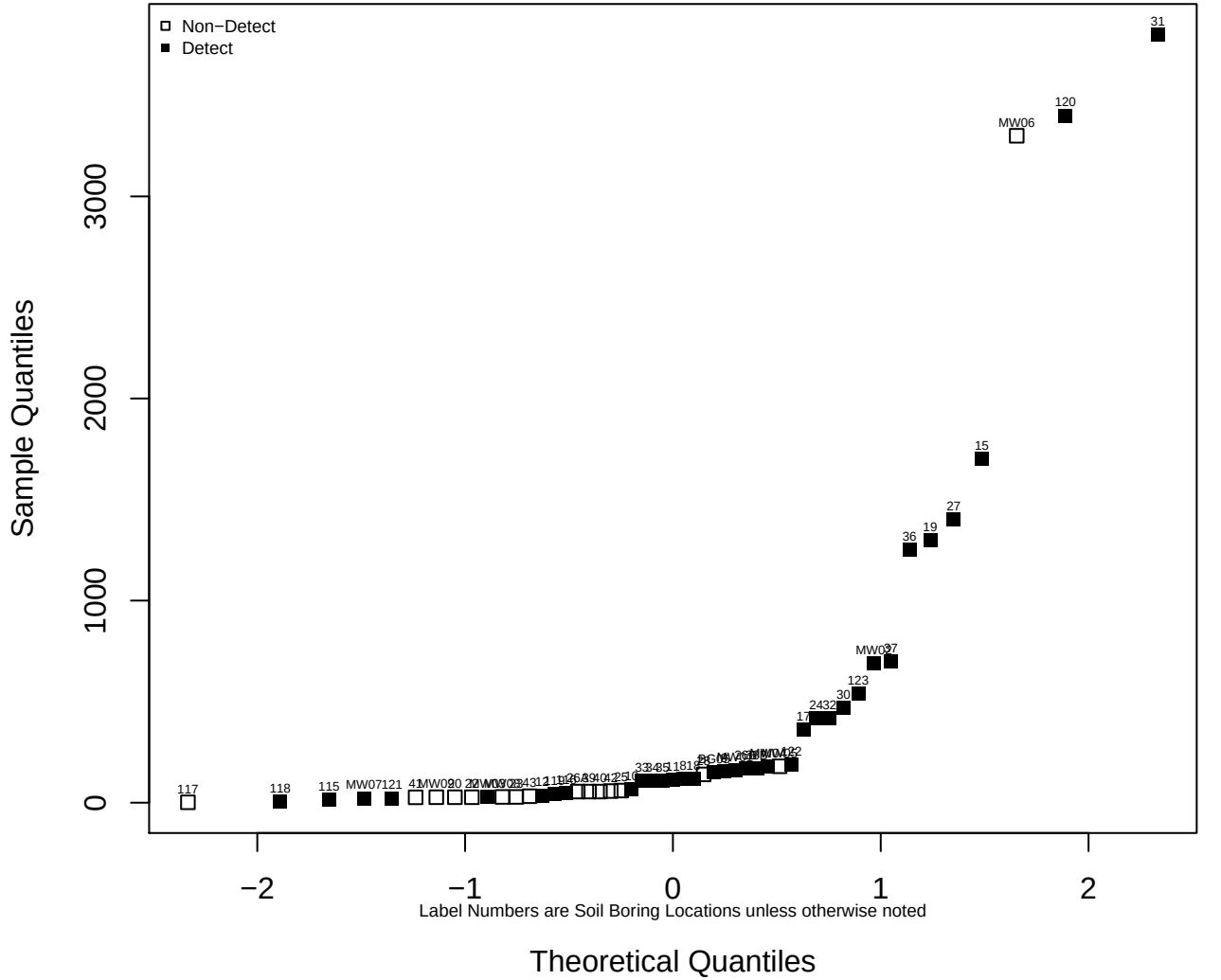
Normal Probability Plot
BARIUM
Surface Soil



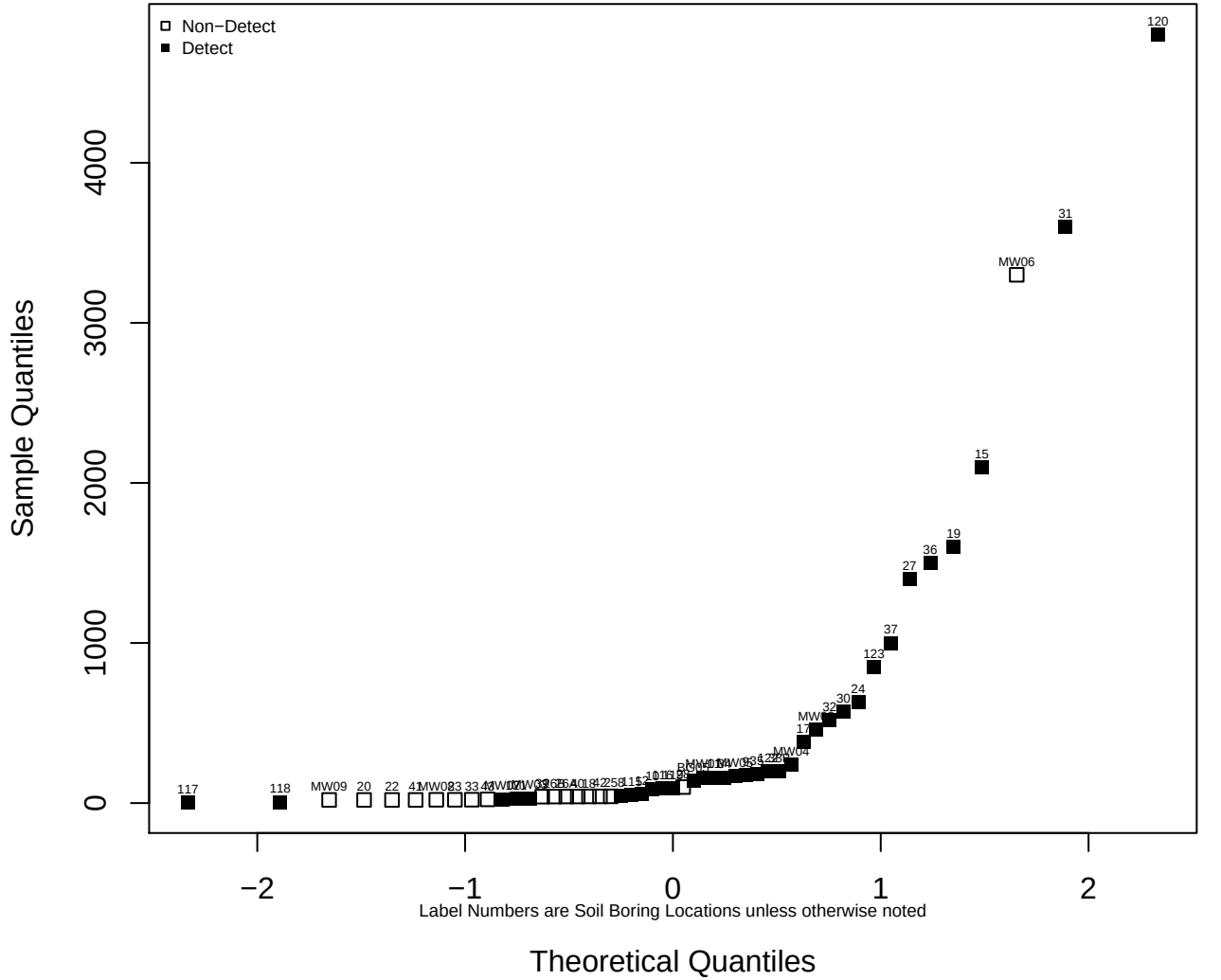
Normal Probability Plot
BENZO(A)ANTHRACENE
Surface Soil



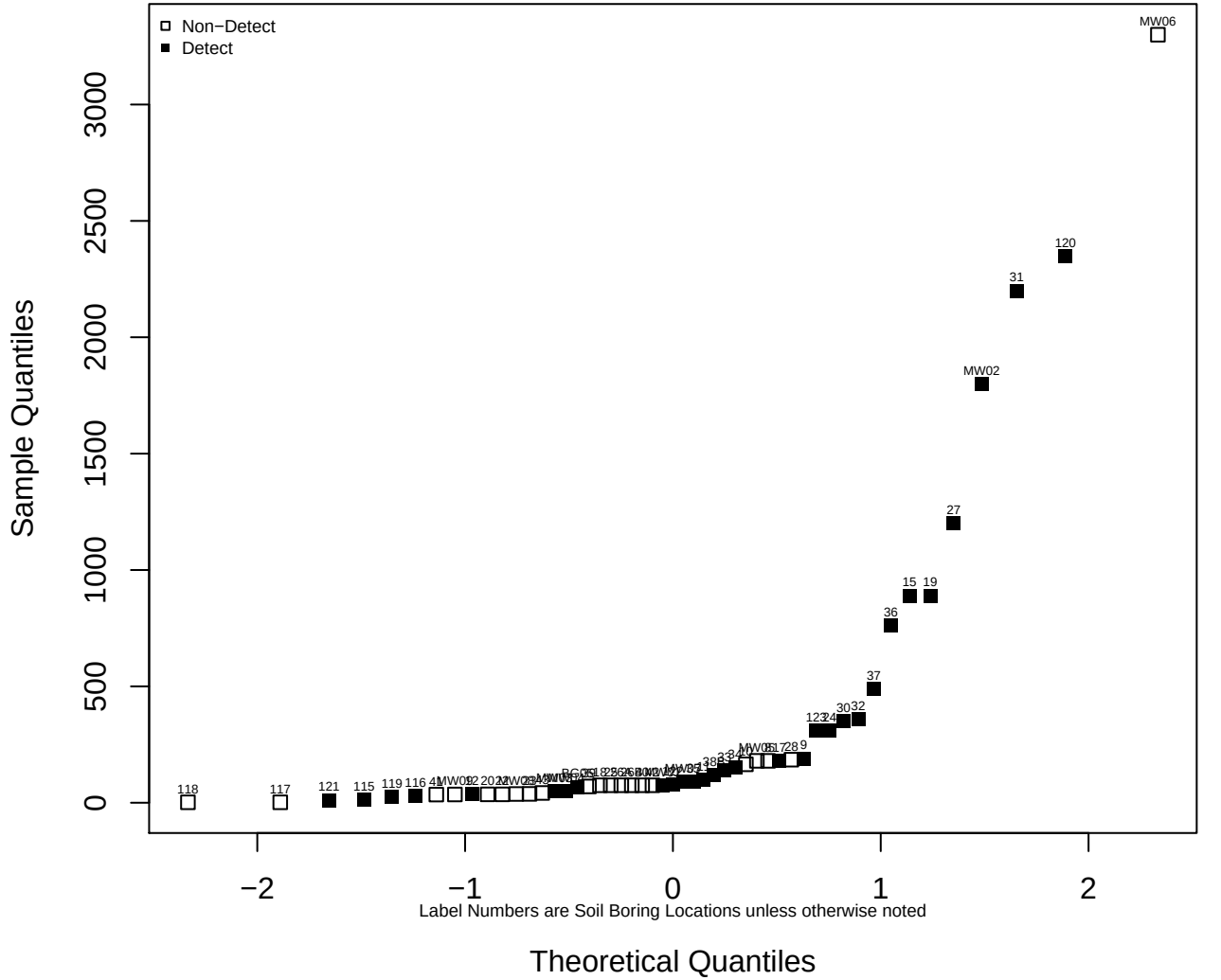
Normal Probability Plot
BENZO(A)PYRENE
Surface Soil



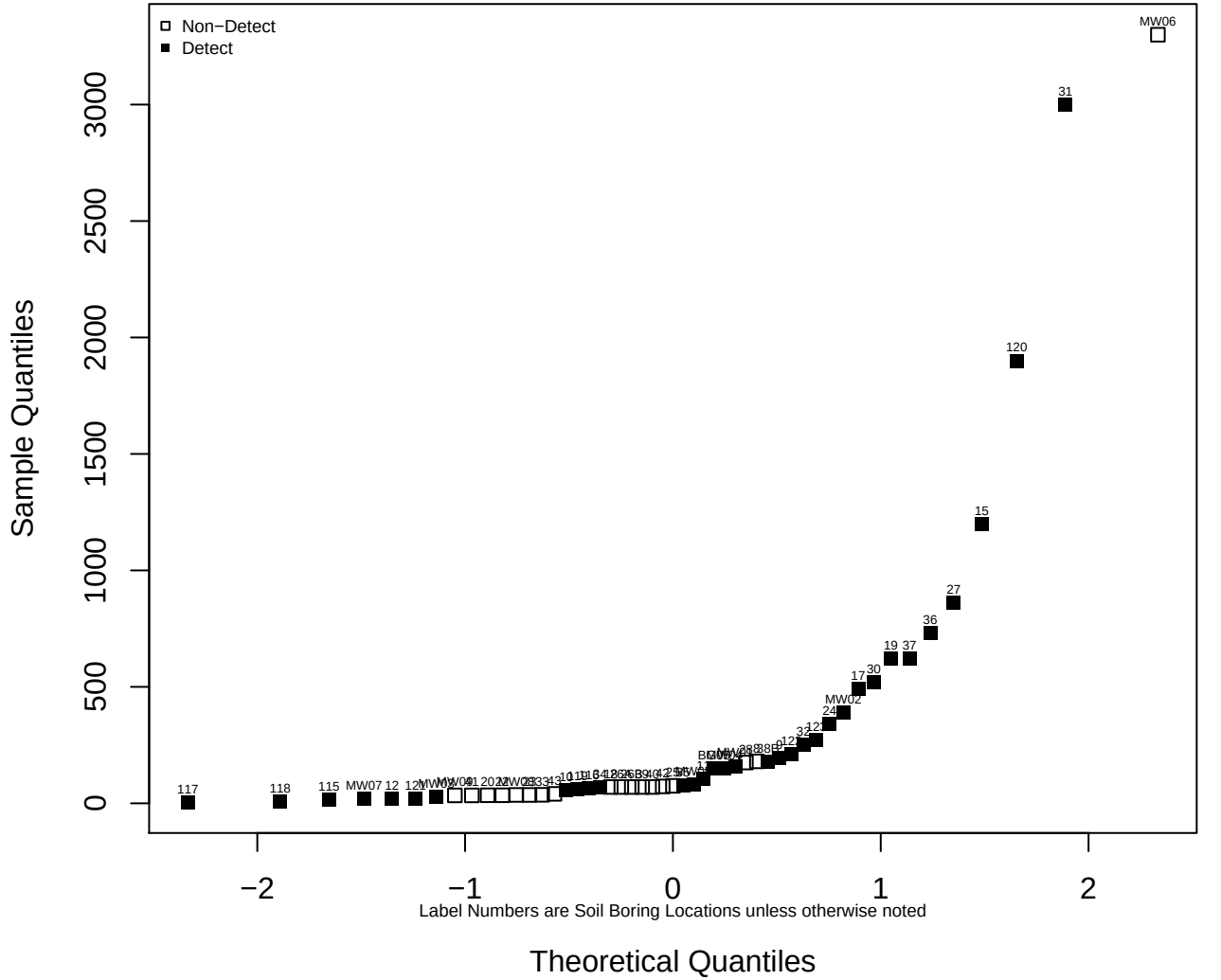
Normal Probability Plot
BENZO(B)FLUORANTHENE
Surface Soil



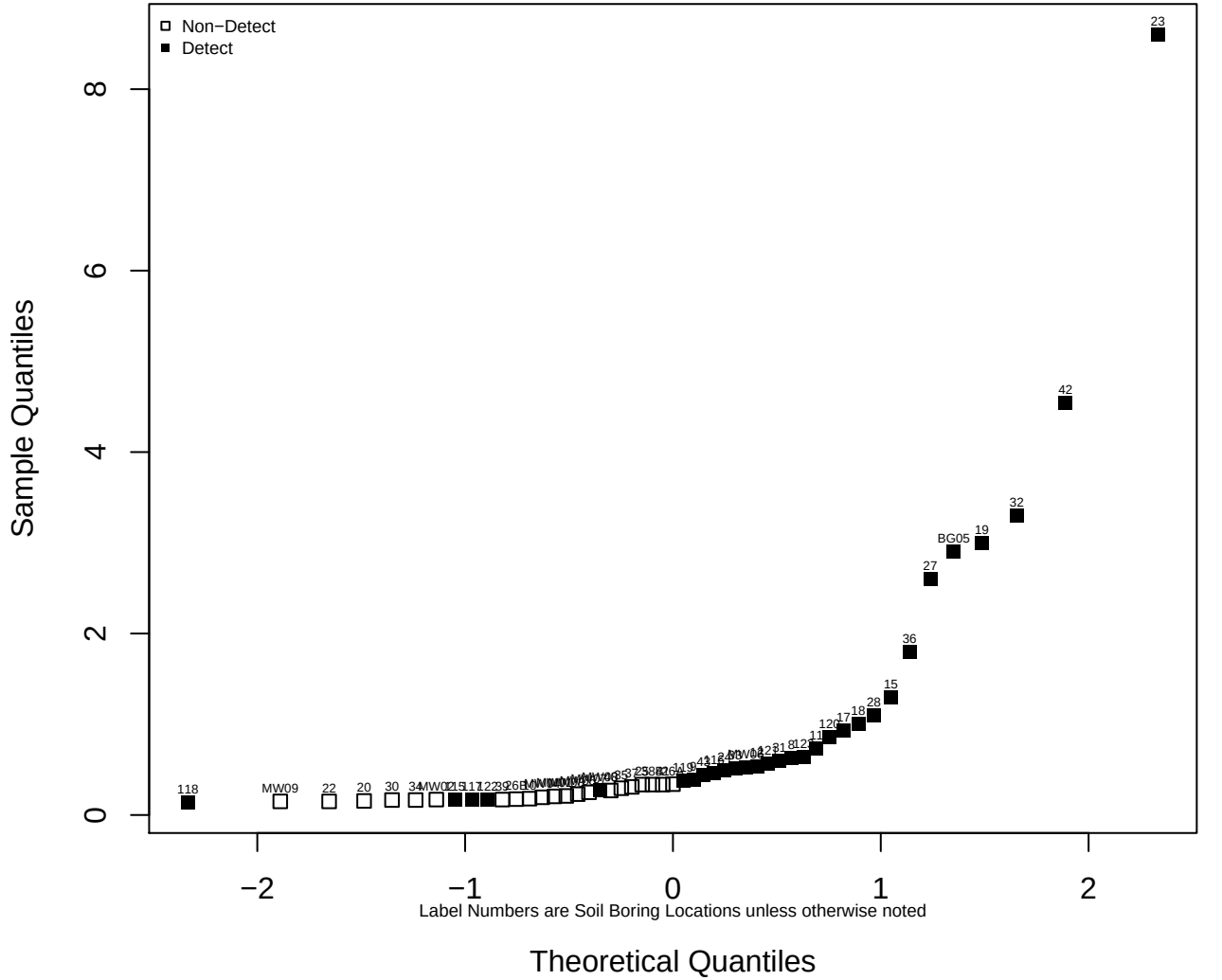
Normal Probability Plot
BENZO(G,H,I)PERYLENE
Surface Soil



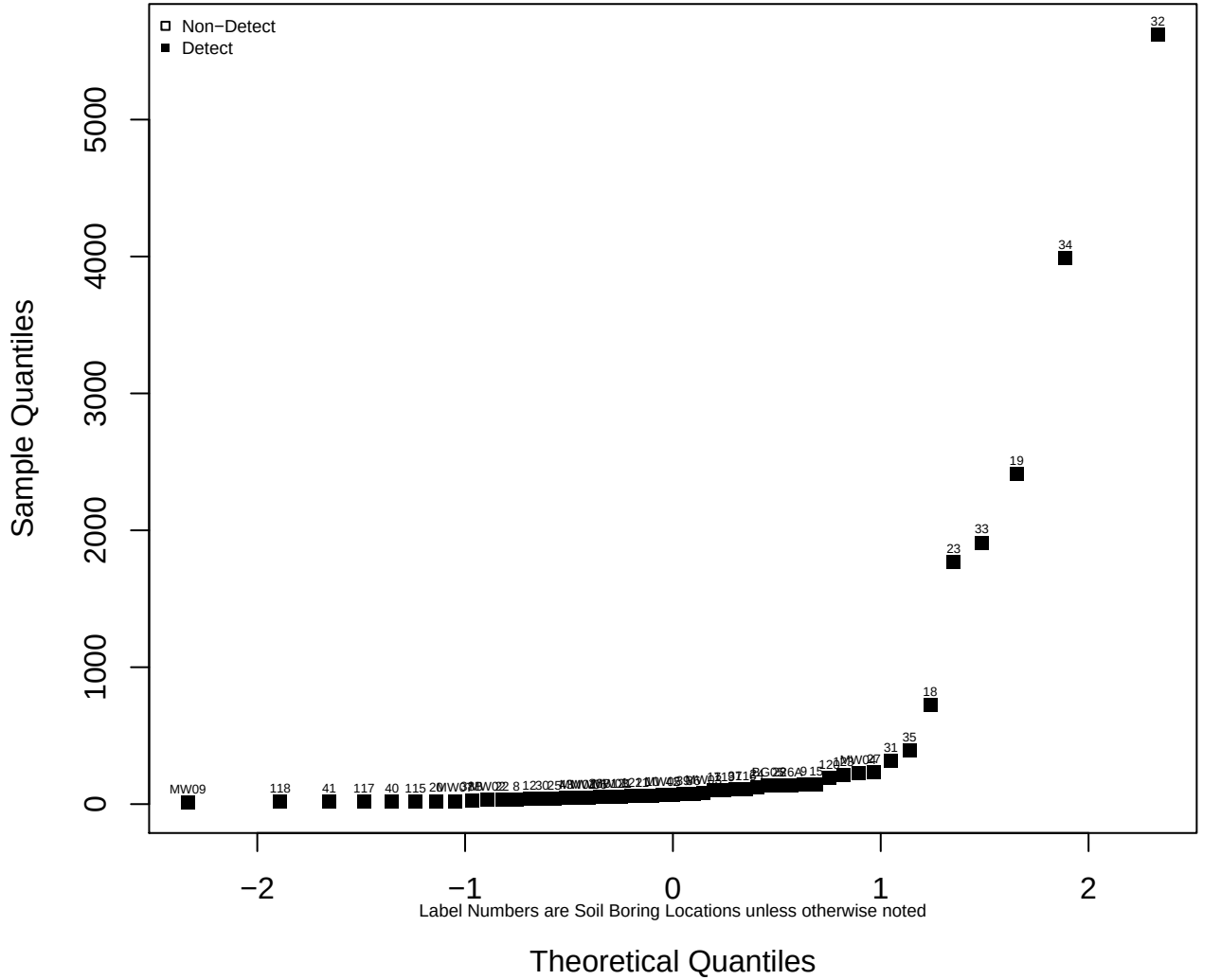
Normal Probability Plot
BENZO(K)FLUORANTHENE
Surface Soil



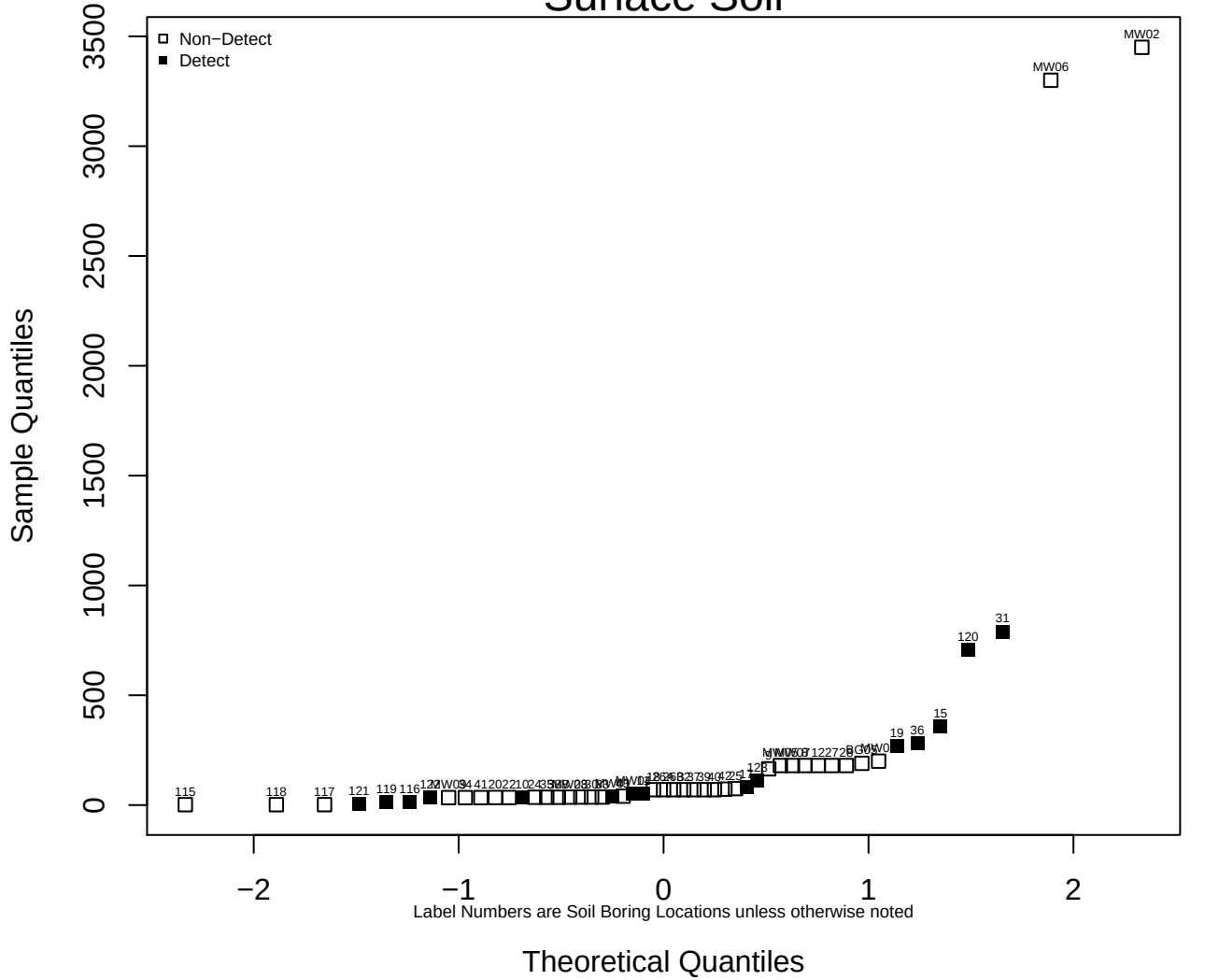
Normal Probability Plot
CADMIUM
Surface Soil



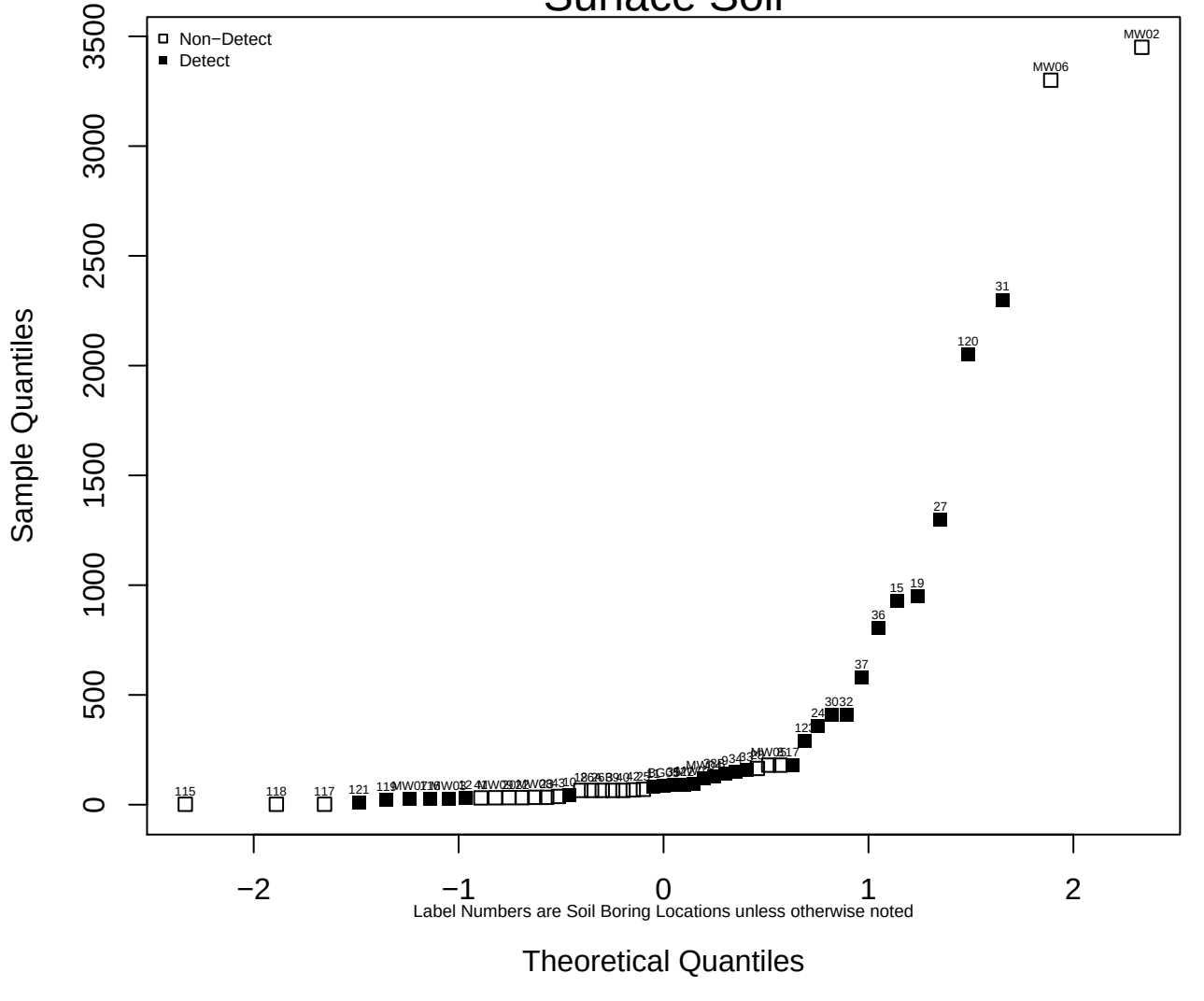
Normal Probability Plot
COPPER
Surface Soil



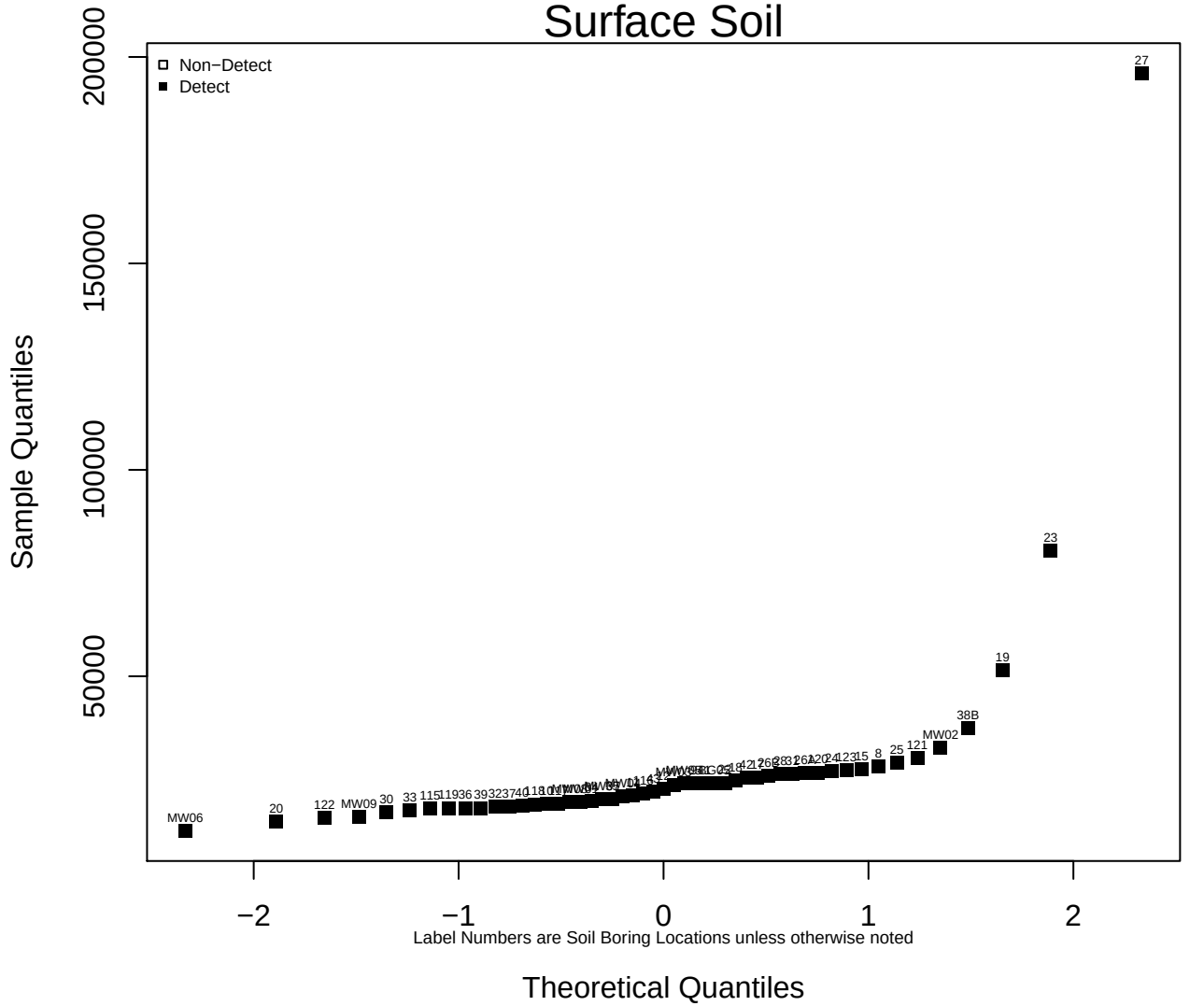
Normal Probability Plot
DIBENZO(A,H)ANTHRACENE
Surface Soil



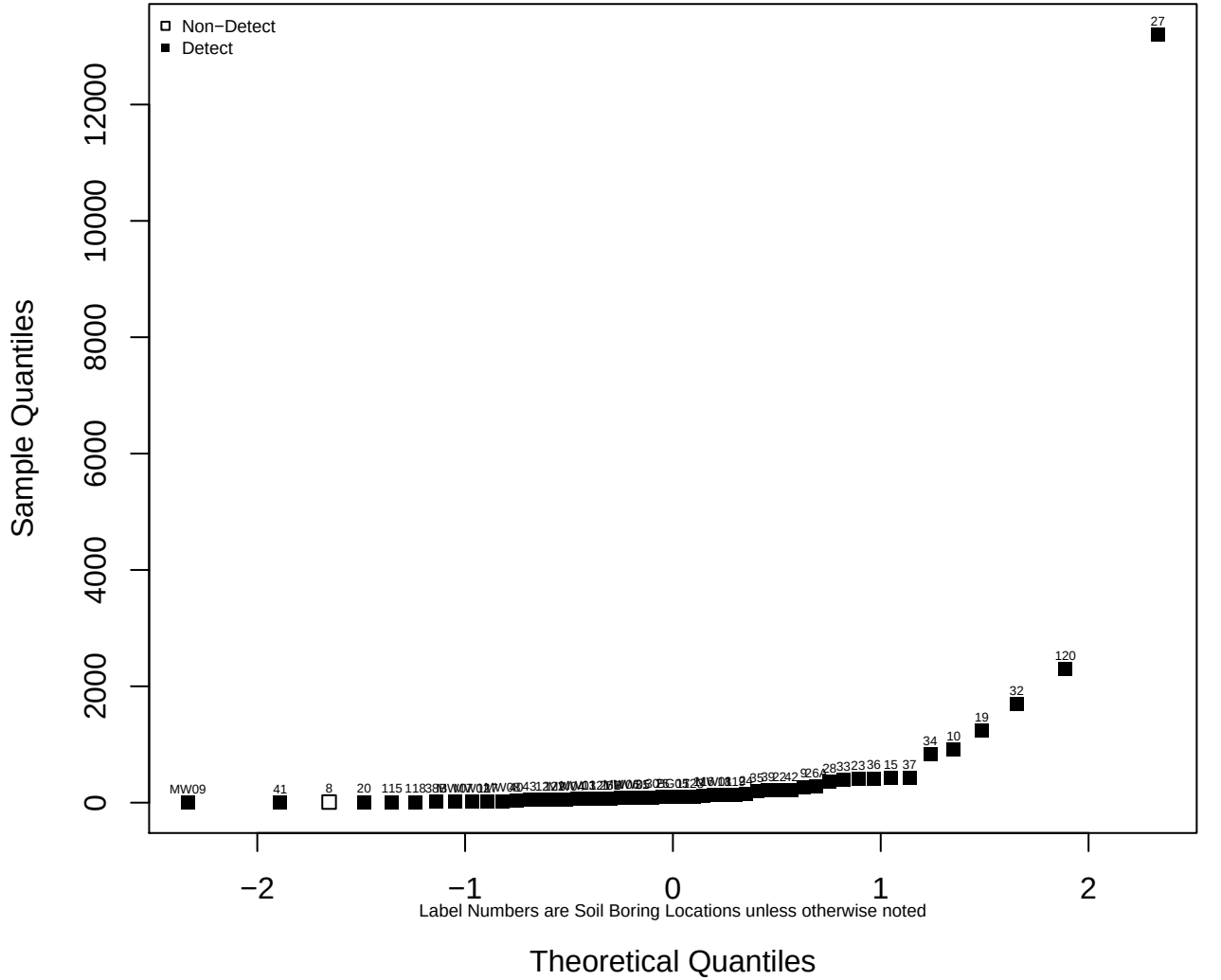
Normal Probability Plot
INDENO(1,2,3−CD)PYRENE
Surface Soil



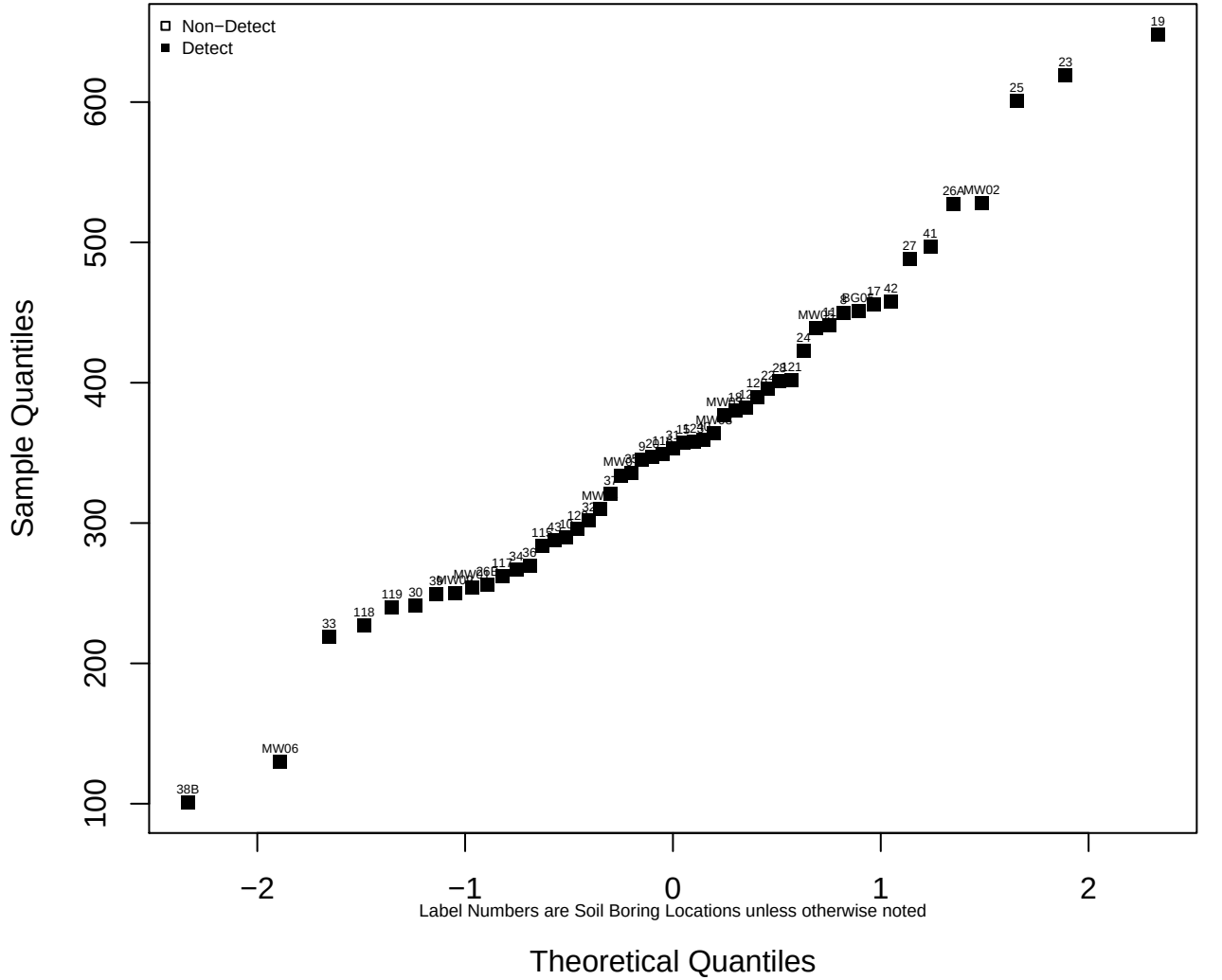
Normal Probability Plot
IRON
Surface Soil



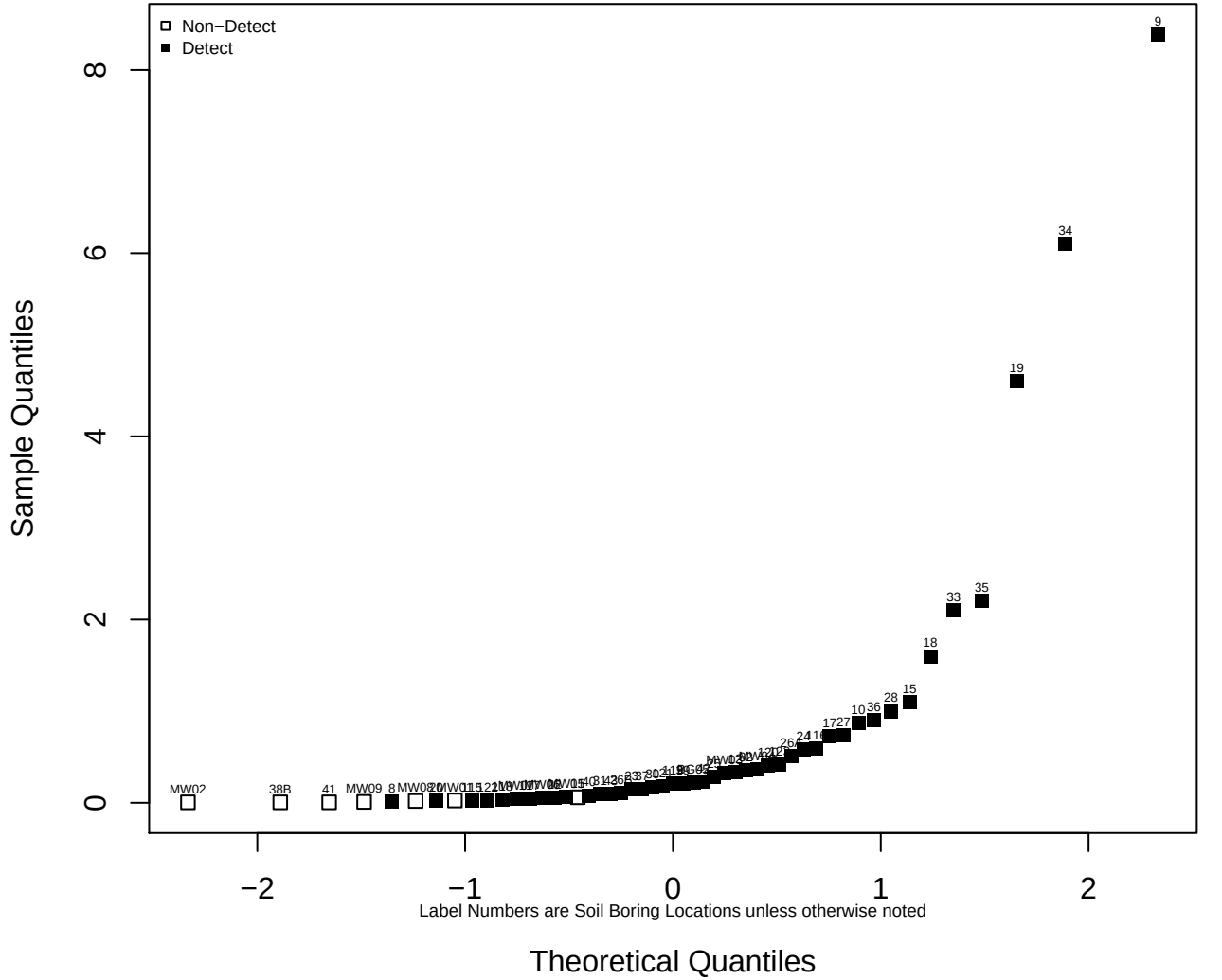
Normal Probability Plot
LEAD
Surface Soil



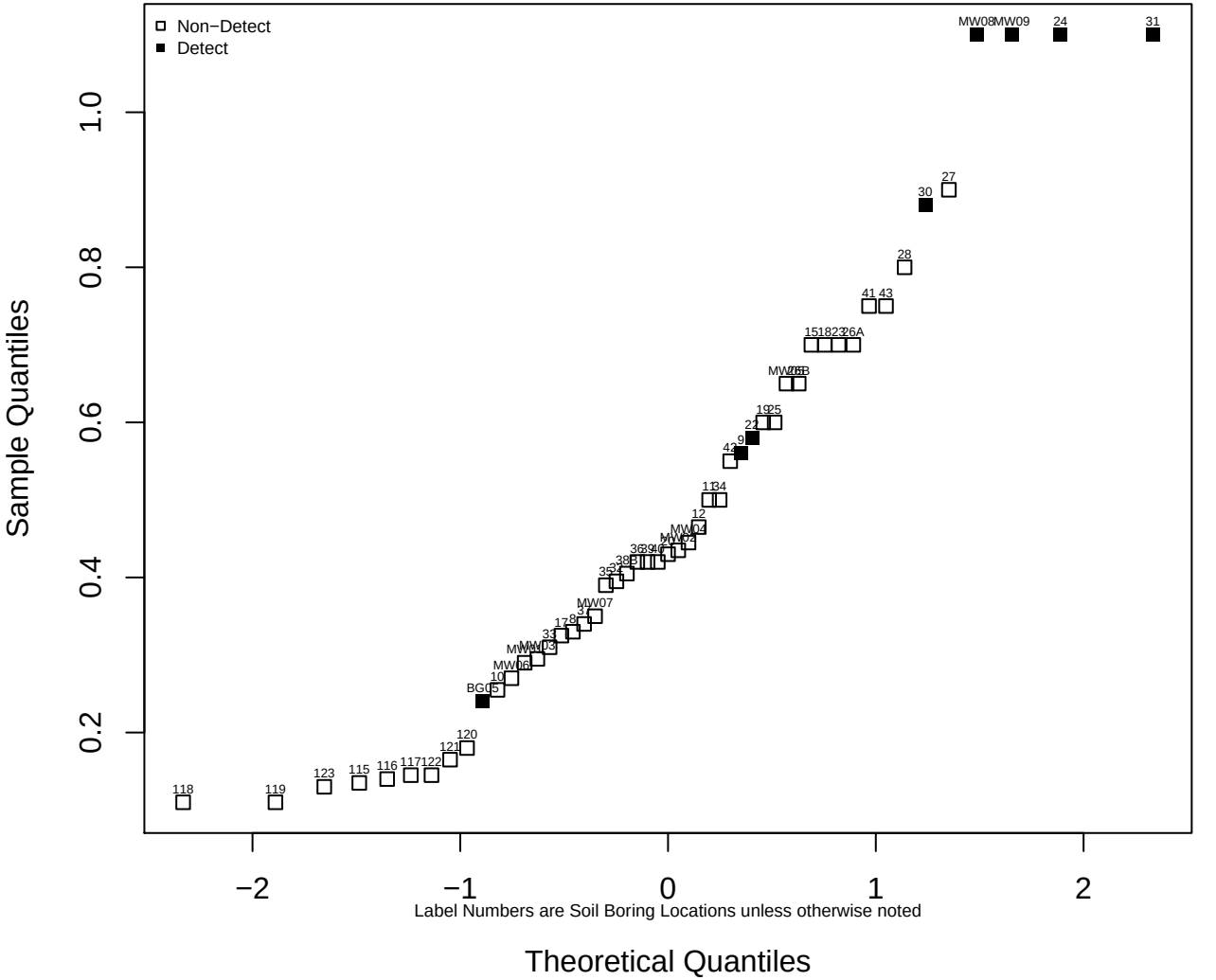
Normal Probability Plot
MANGANESE
Surface Soil



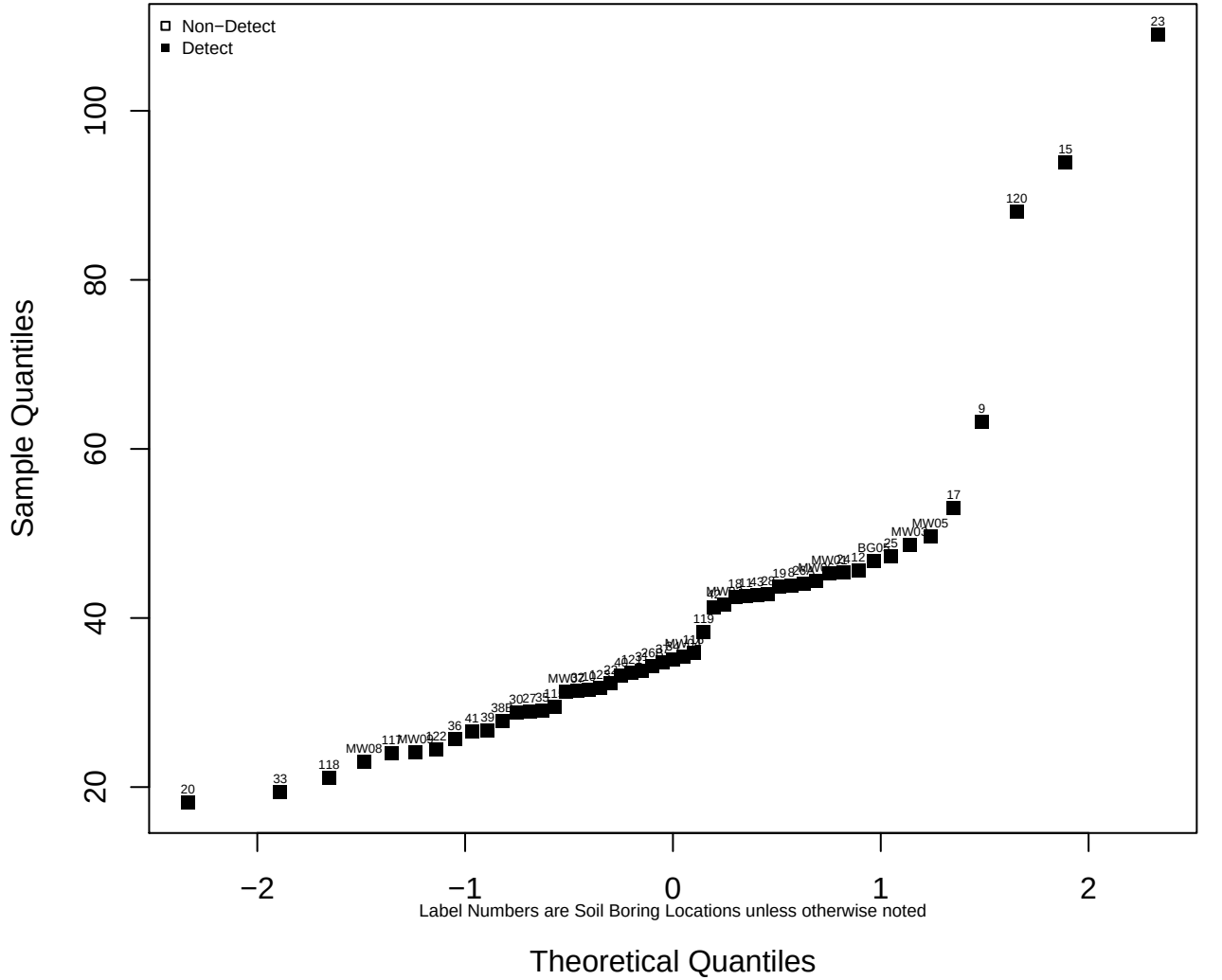
Normal Probability Plot
MERCURY
Surface Soil

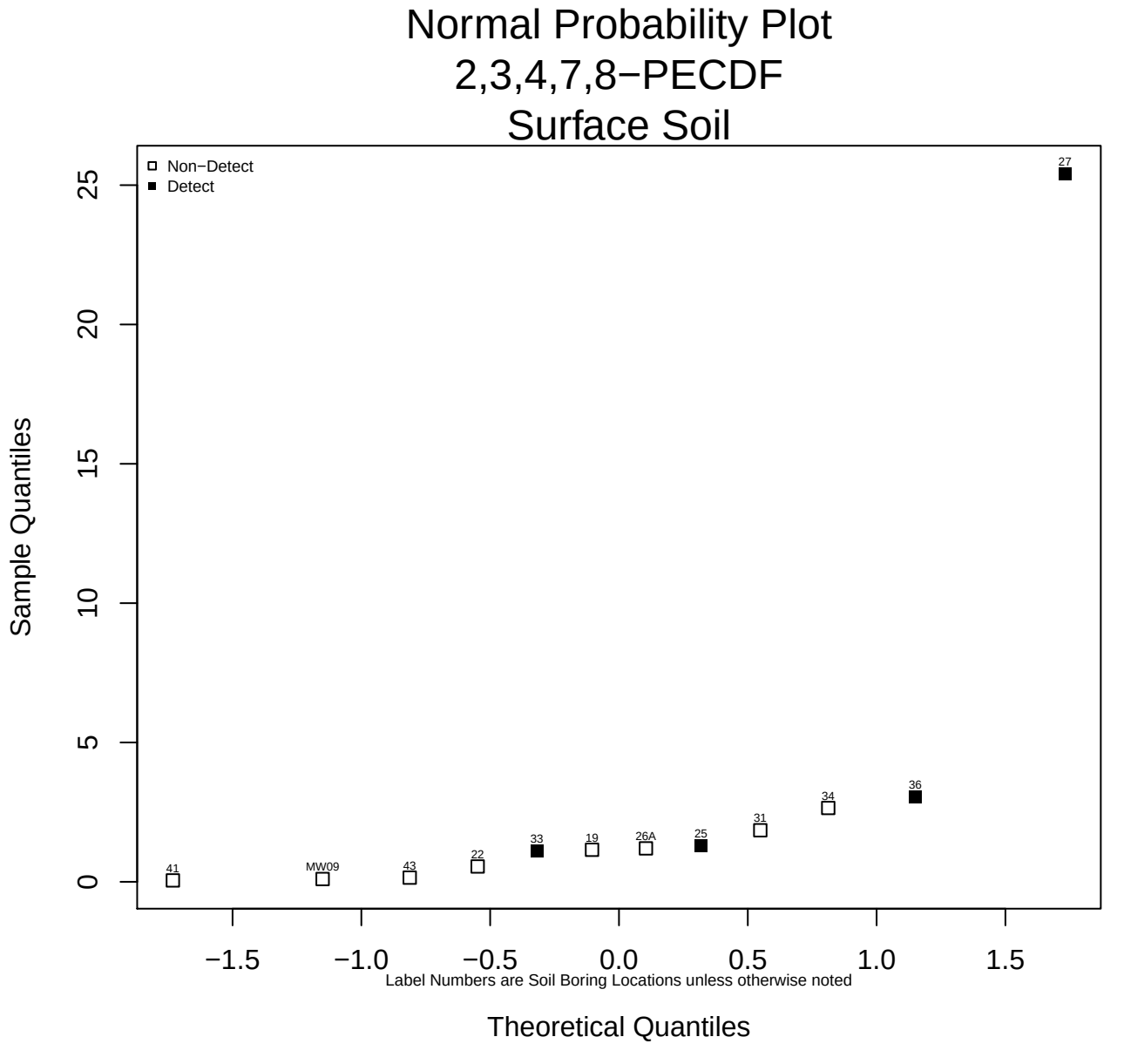


Normal Probability Plot
THALLIUM
Surface Soil

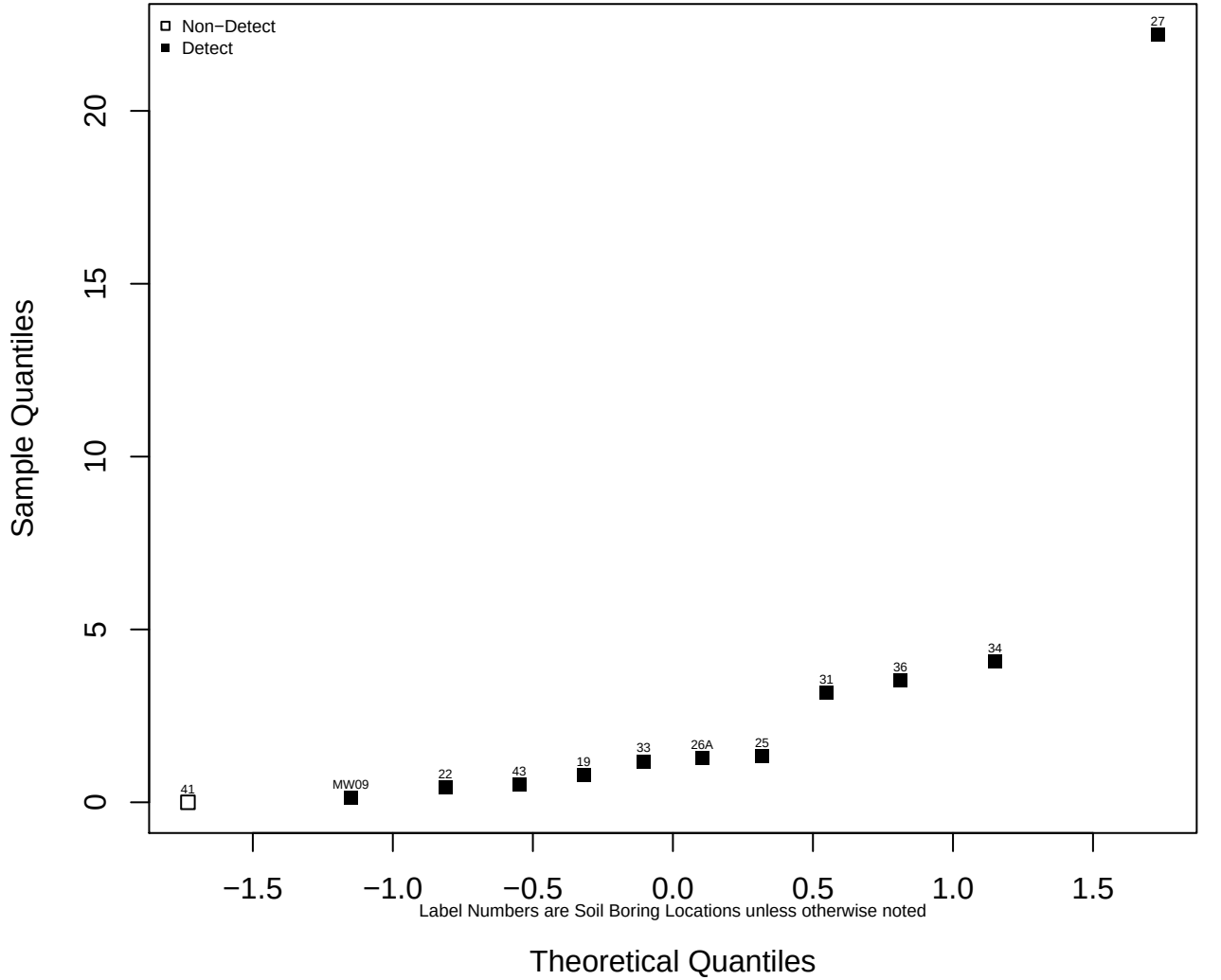


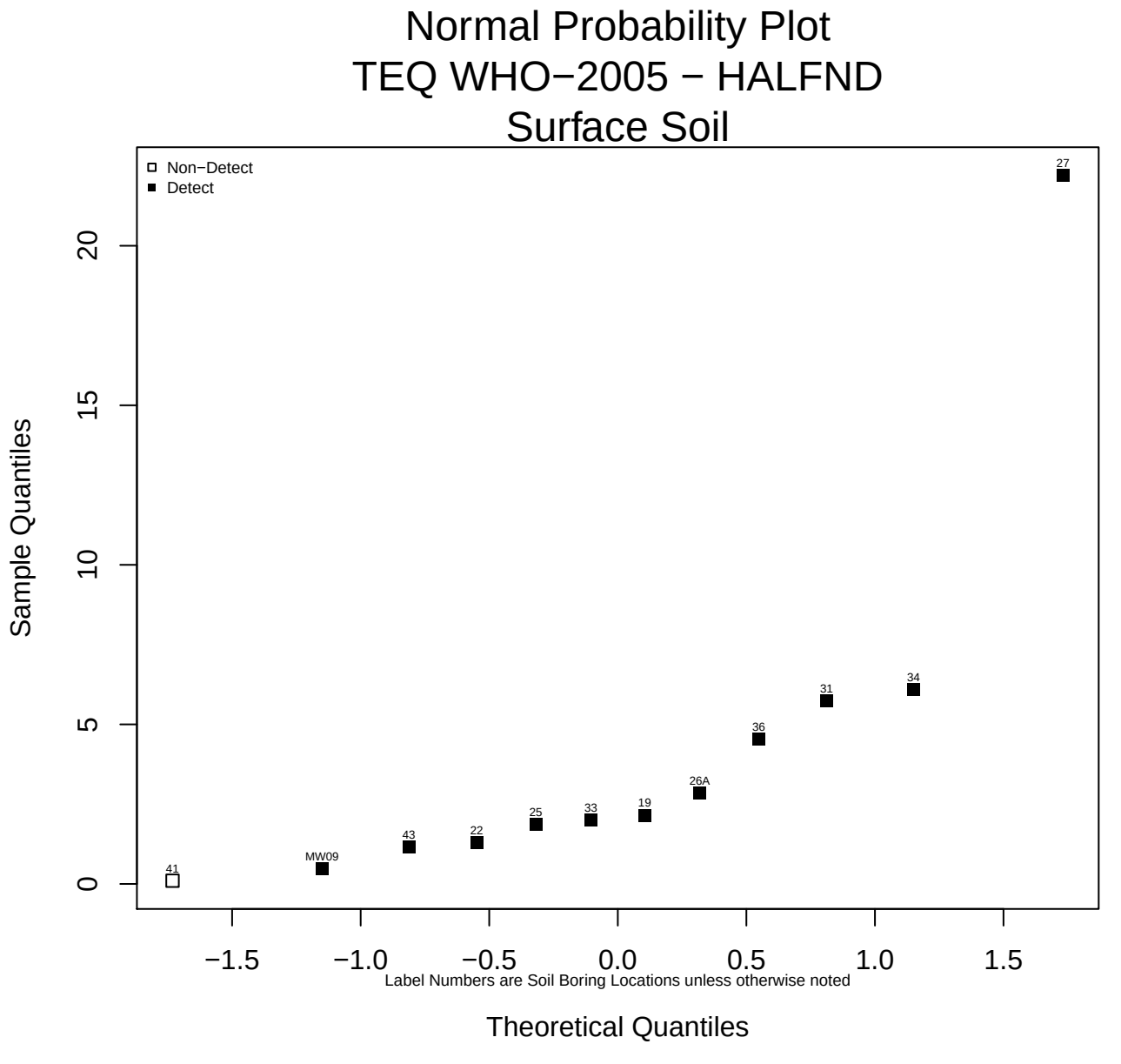
Normal Probability Plot
VANADIUM
Surface Soil



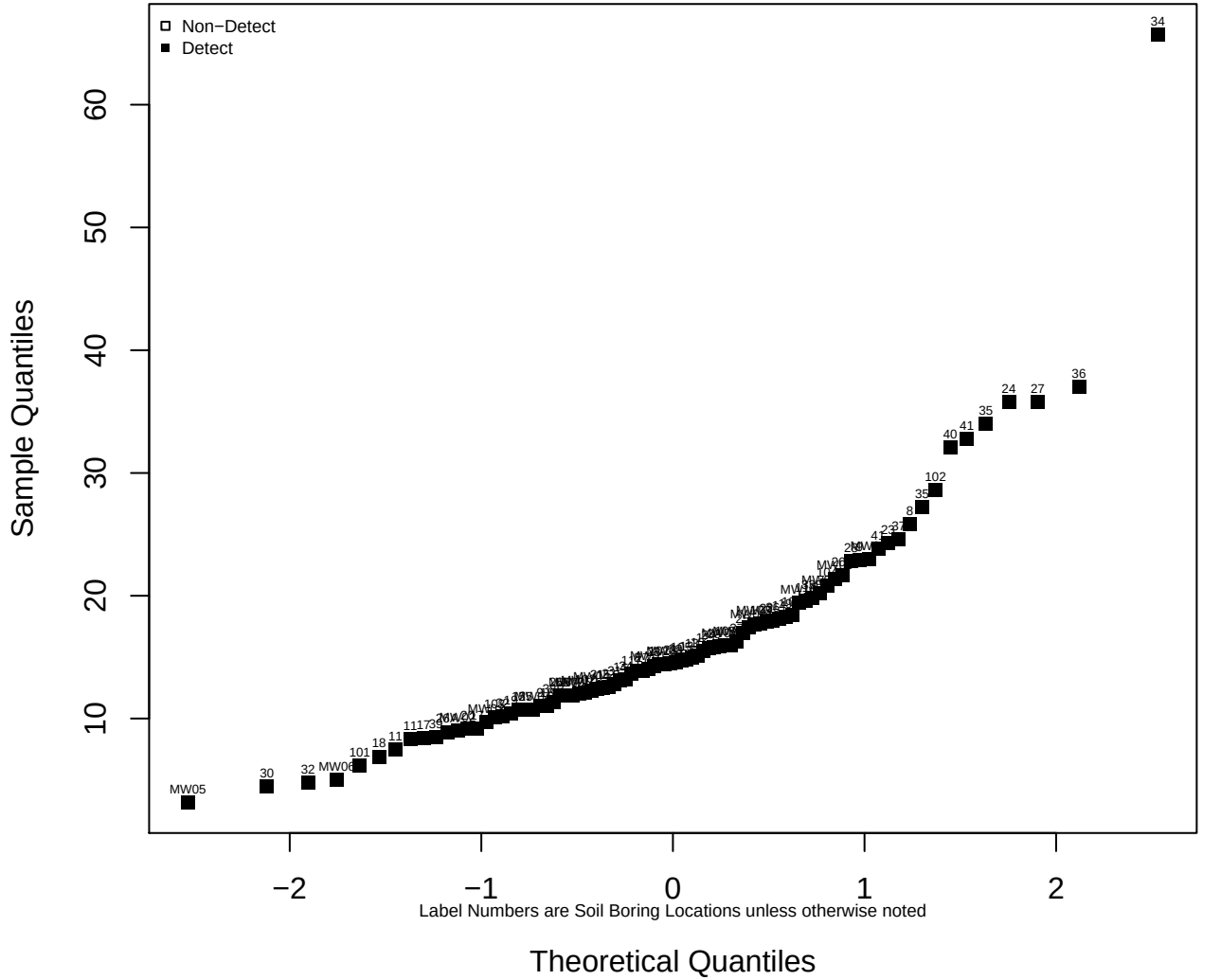

Normal Probability Plot
2,3,4,7,8−PECDF
Surface Soil
Non−Detect
Detect
Sample Quantiles
Theoretical Quantiles
Label Numbers are Soil Boring Locations unless otherwise noted
0
5
10
15
20
25
−1.5
−1.0
−0.5
0.0
0.5
1.0
1.5
41
MW09
43
22
33
19
26A
25
31
34
36
27

Normal Probability Plot
TEQ WHO−2005
Surface Soil

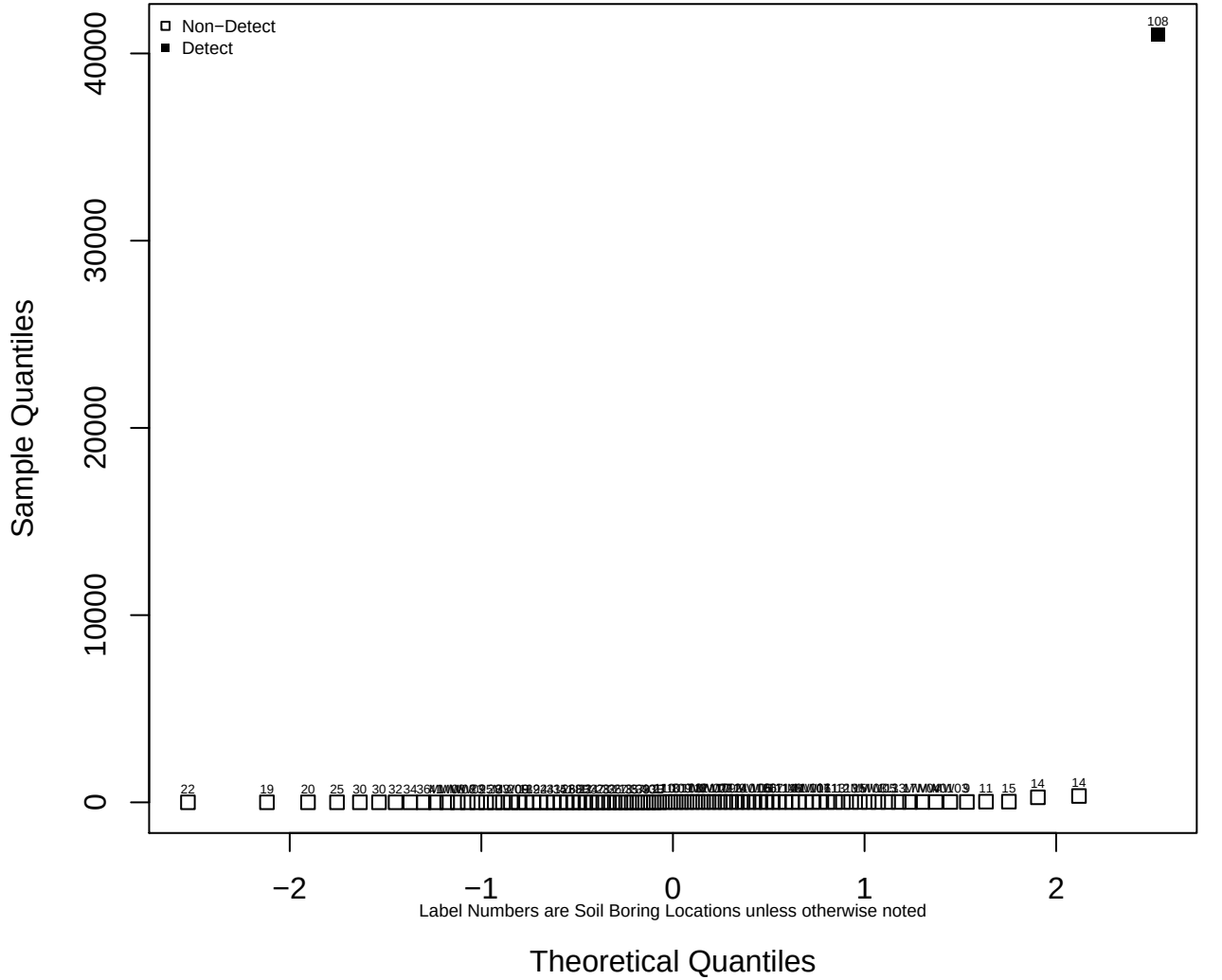


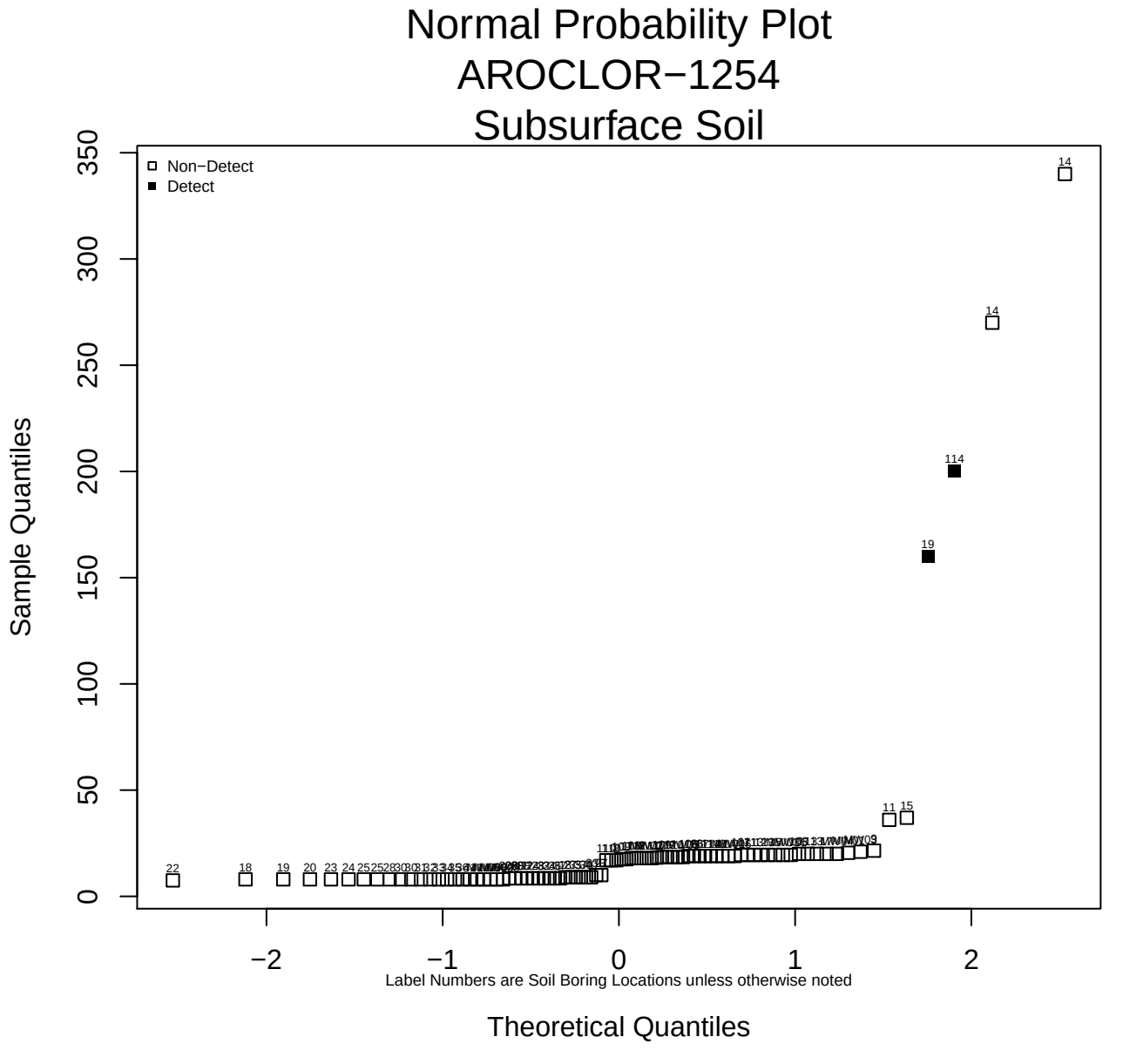

Normal Probability Plot
TEQ WHO−2005 − HALFND
Surface Soil
Non−Detect
Detect
27
34
31
36
26A
19
33
25
22
43
MW09
41
Sample Quantiles
0
5
10
15
20
−1.5
−1.0
−0.5
0.0
0.5
1.0
1.5
Label Numbers are Soil Boring Locations unless otherwise noted
Theoretical Quantiles

Normal Probability Plot
ARSENIC
Subsurface Soil

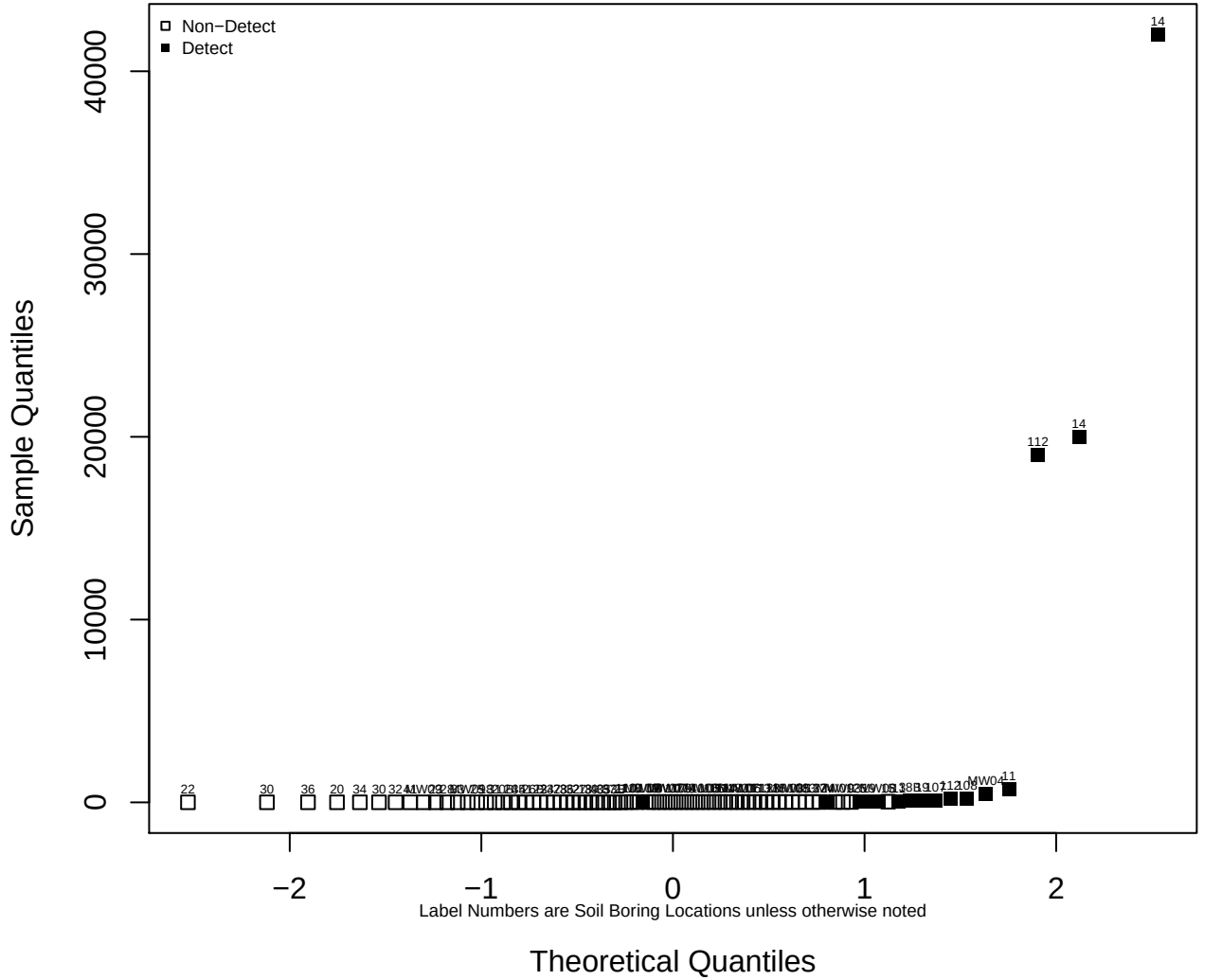


Normal Probability Plot
AROCLOR−1248
Subsurface Soil

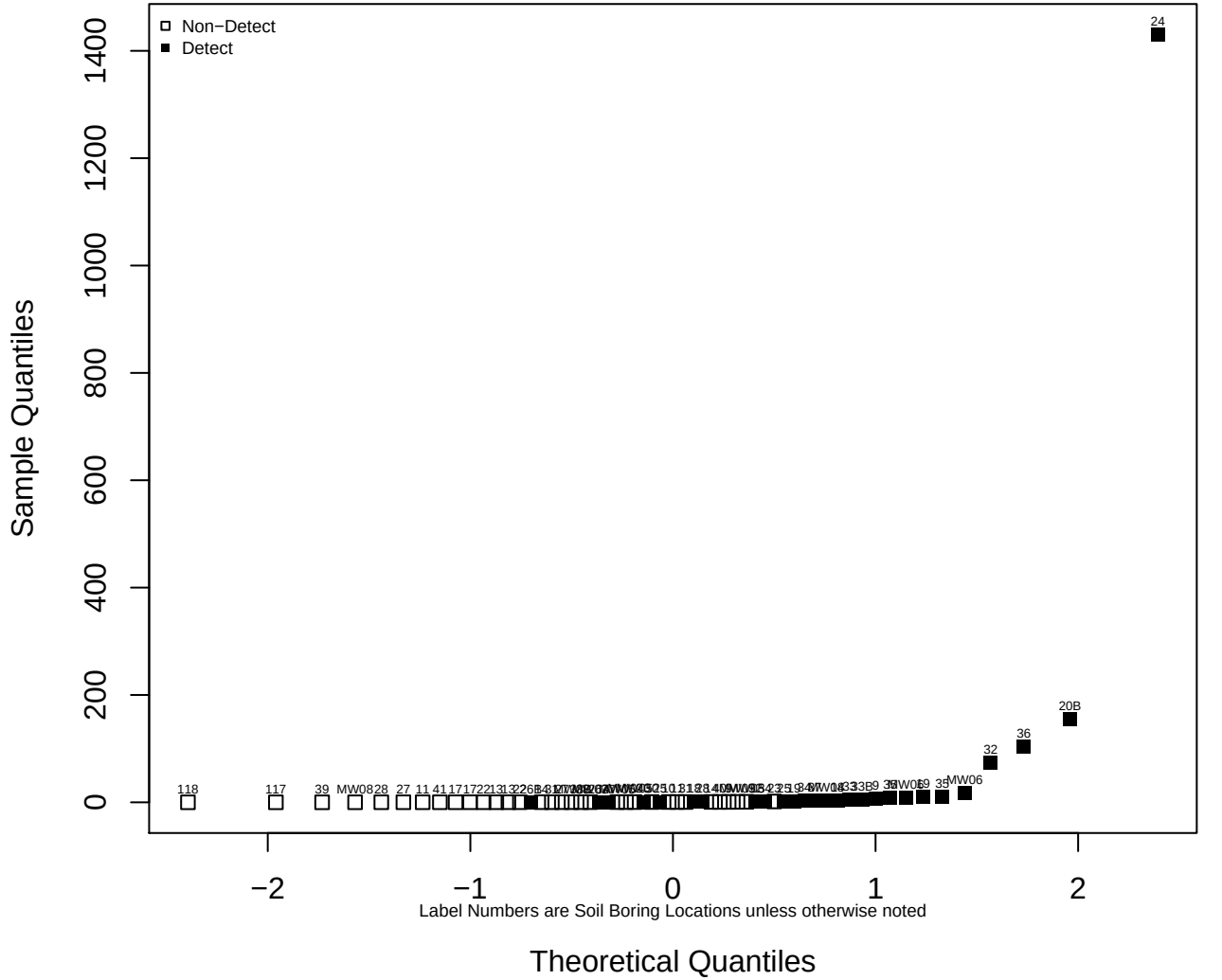


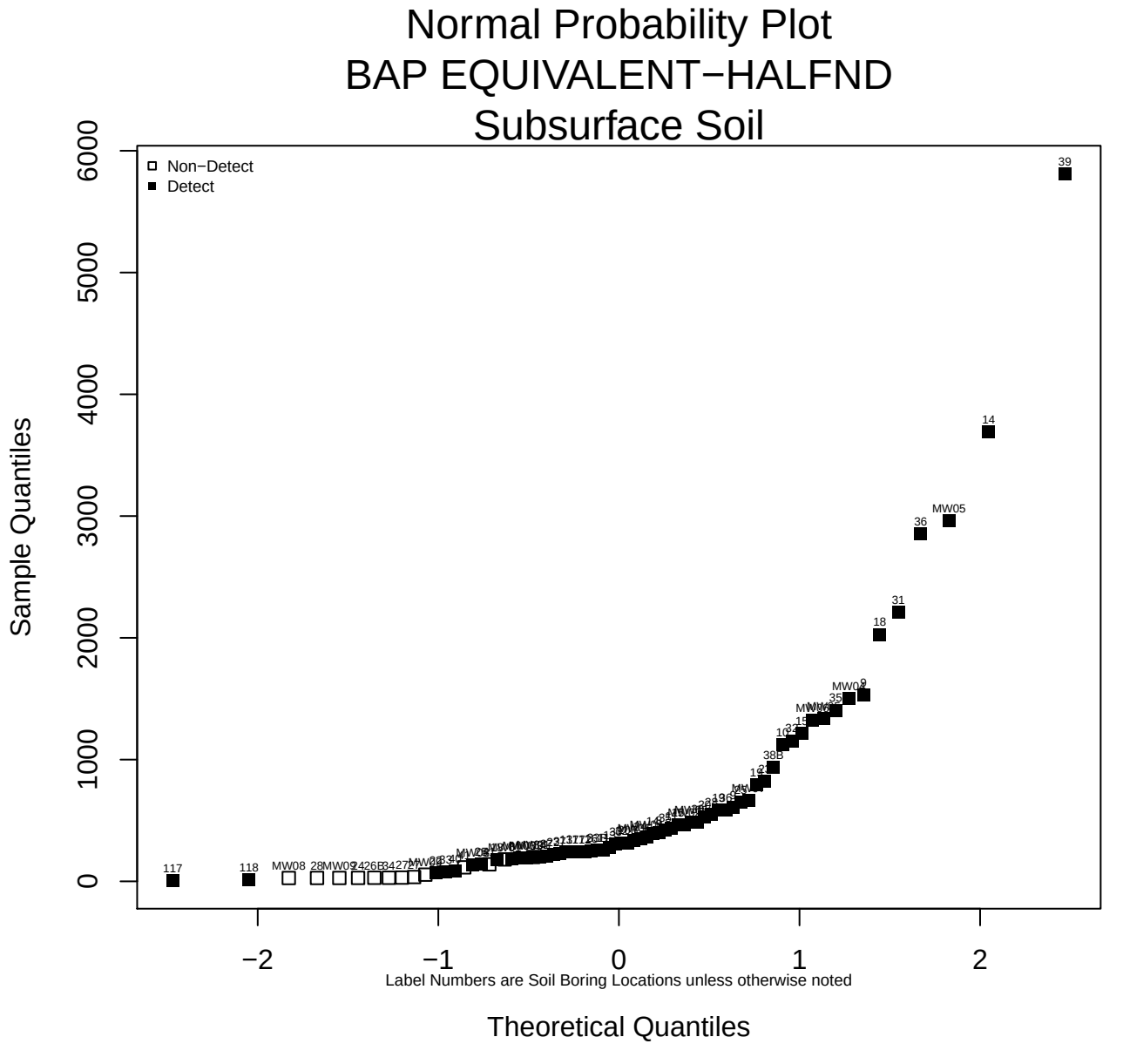

Normal Probability Plot
AROCLOR−1254
Subsurface Soil
Non−Detect
Detect
Sample Quantiles
Theoretical Quantiles
Label Numbers are Soil Boring Locations unless otherwise noted
0
50
100
150
200
250
300
350
−2
−1
0
1
2
14
14
114
19
11
15
22
18
19
20
23
24

Normal Probability Plot
AROCLOR−1260
Subsurface Soil

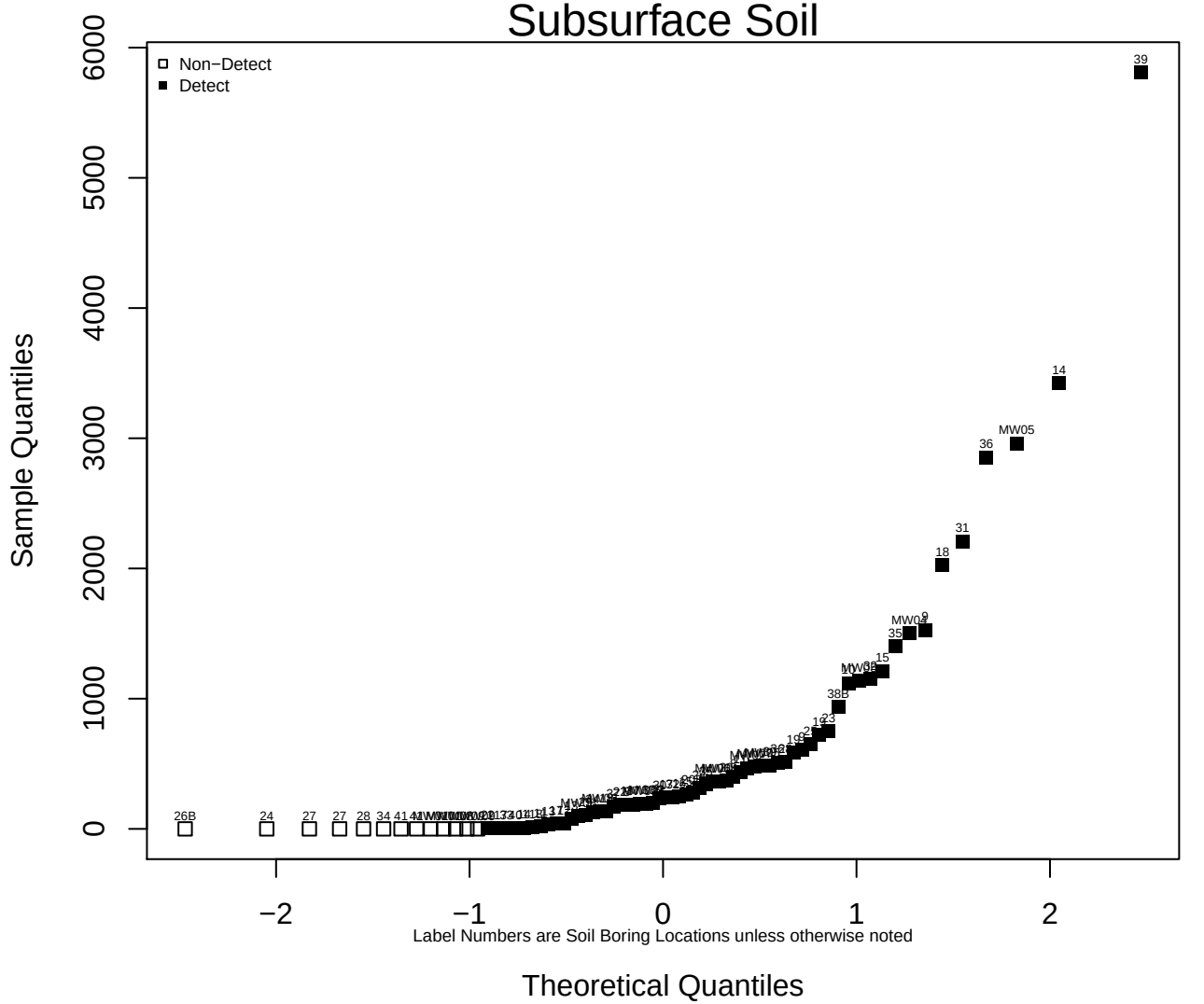


Normal Probability Plot
ANTIMONY
Subsurface Soil

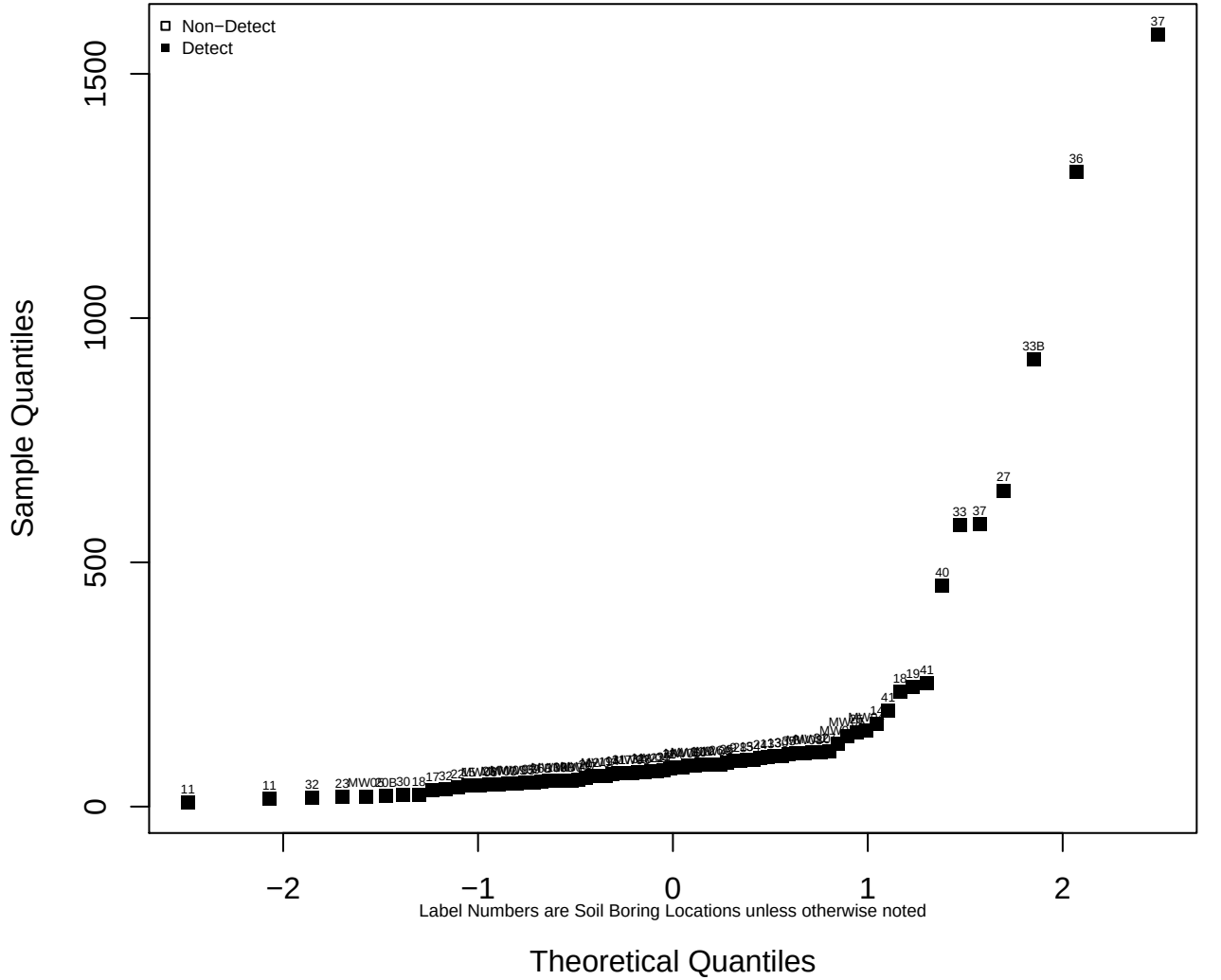



Normal Probability Plot
BAP EQUIVALENT−HALFND
Subsurface Soil
Non−Detect
Detect
Sample Quantiles
Theoretical Quantiles
Label Numbers are Soil Boring Locations unless otherwise noted
0
1000
2000
3000
4000
5000
6000
−2
−1
0
1
2
39
14
MW05
36
31
18
117
118
MW08

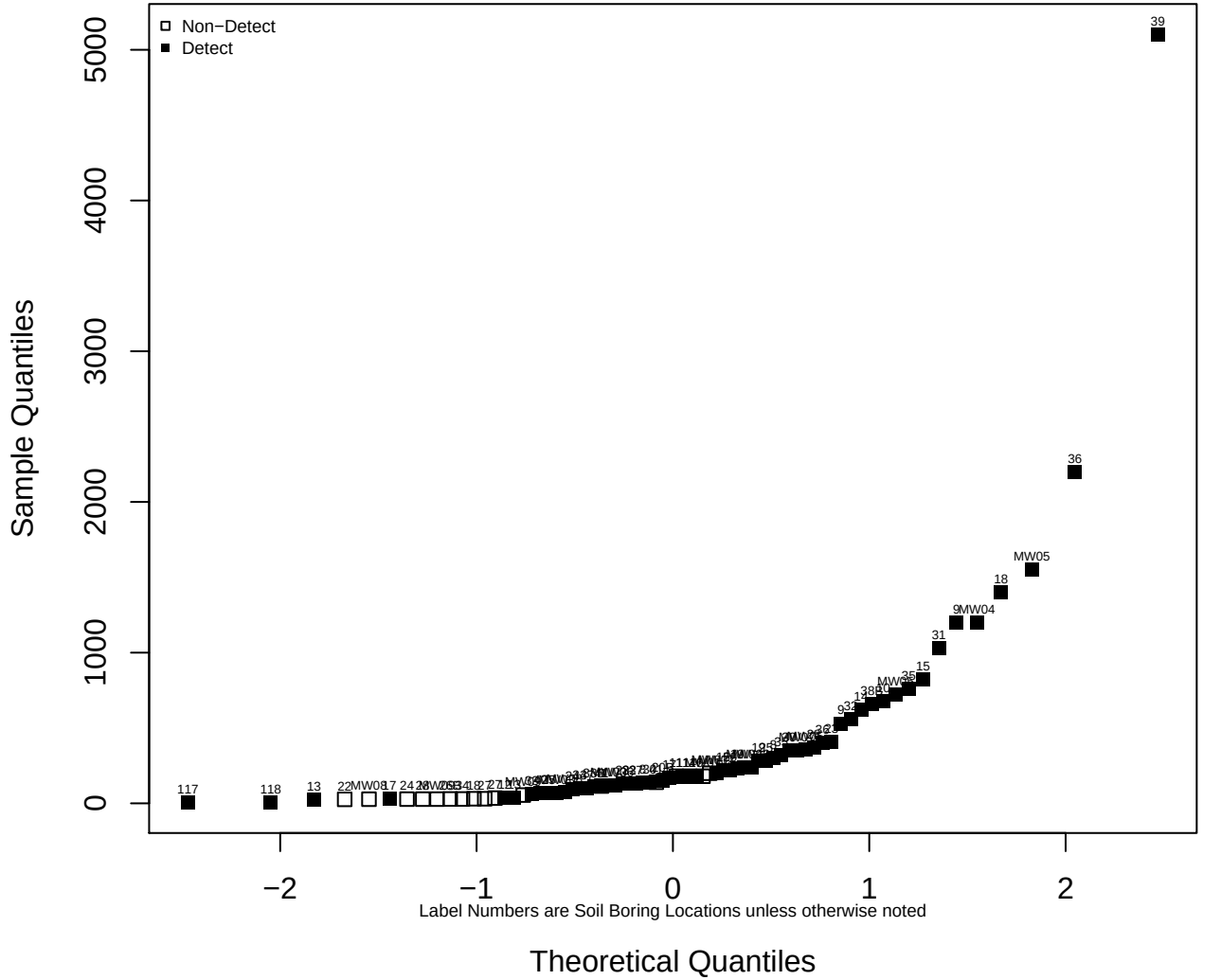
Normal Probability Plot
BAP EQUIVALENT−POS
Subsurface Soil



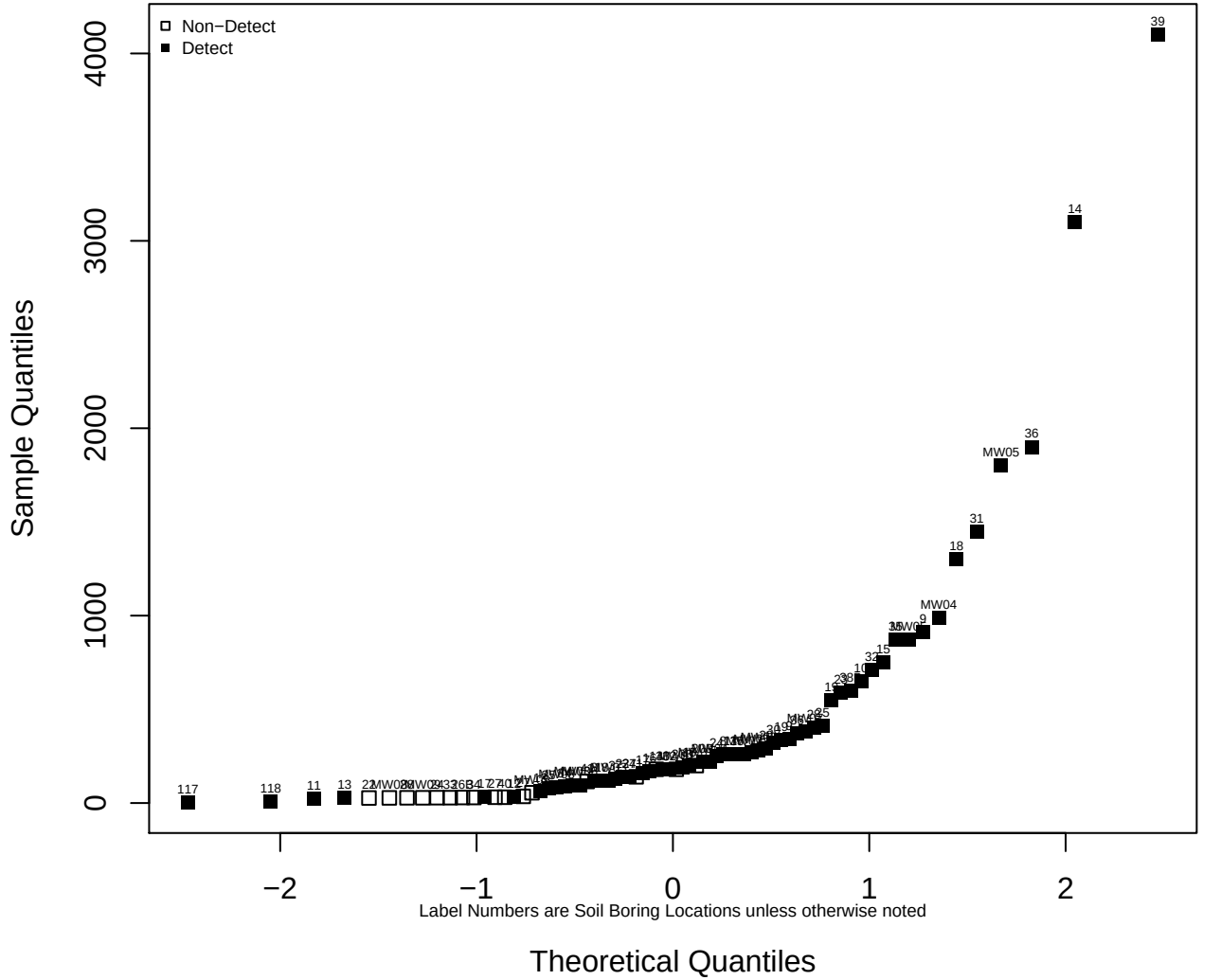
Normal Probability Plot
BARIUM
Subsurface Soil



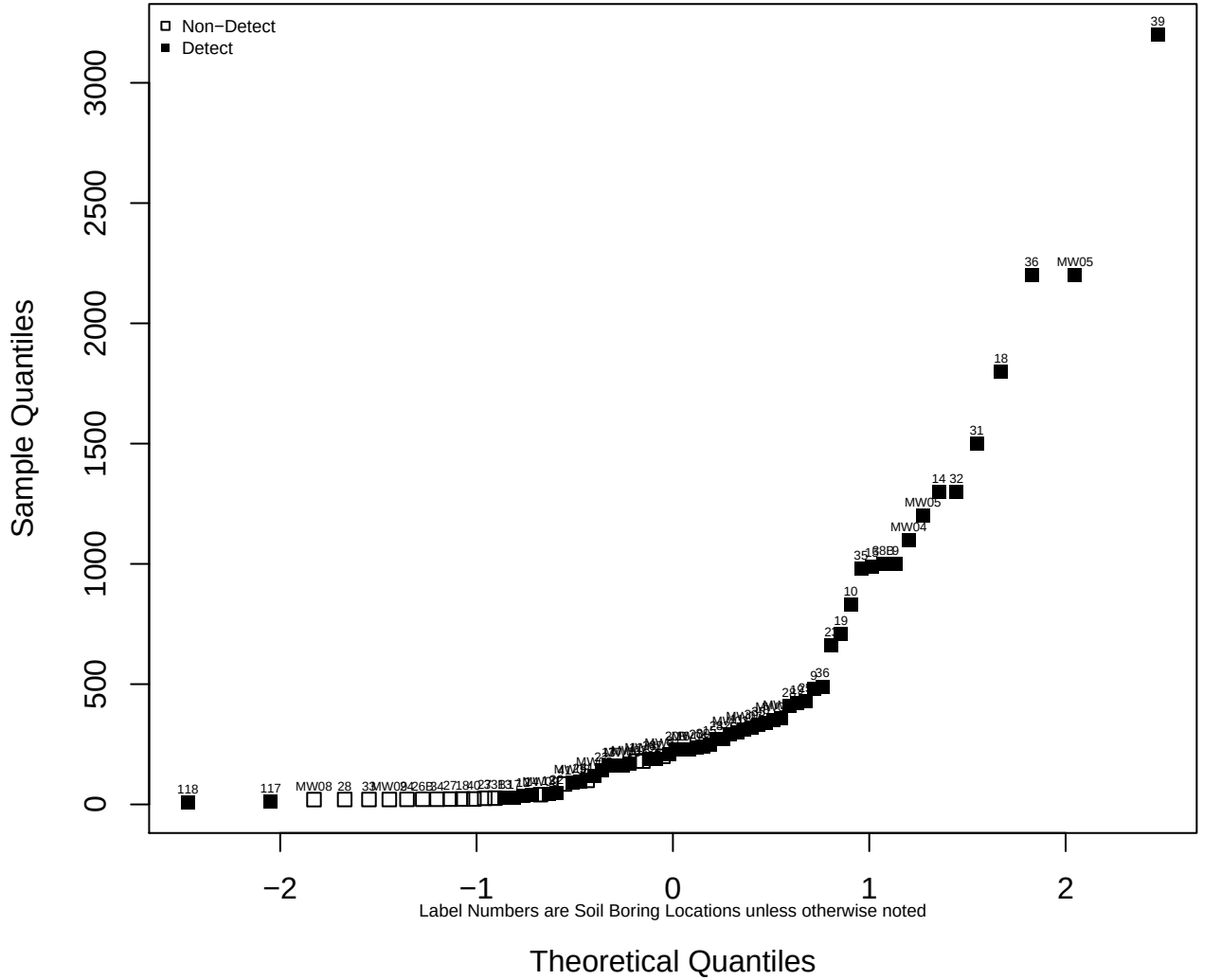
Normal Probability Plot
BENZO(A)ANTHRACENE
Subsurface Soil



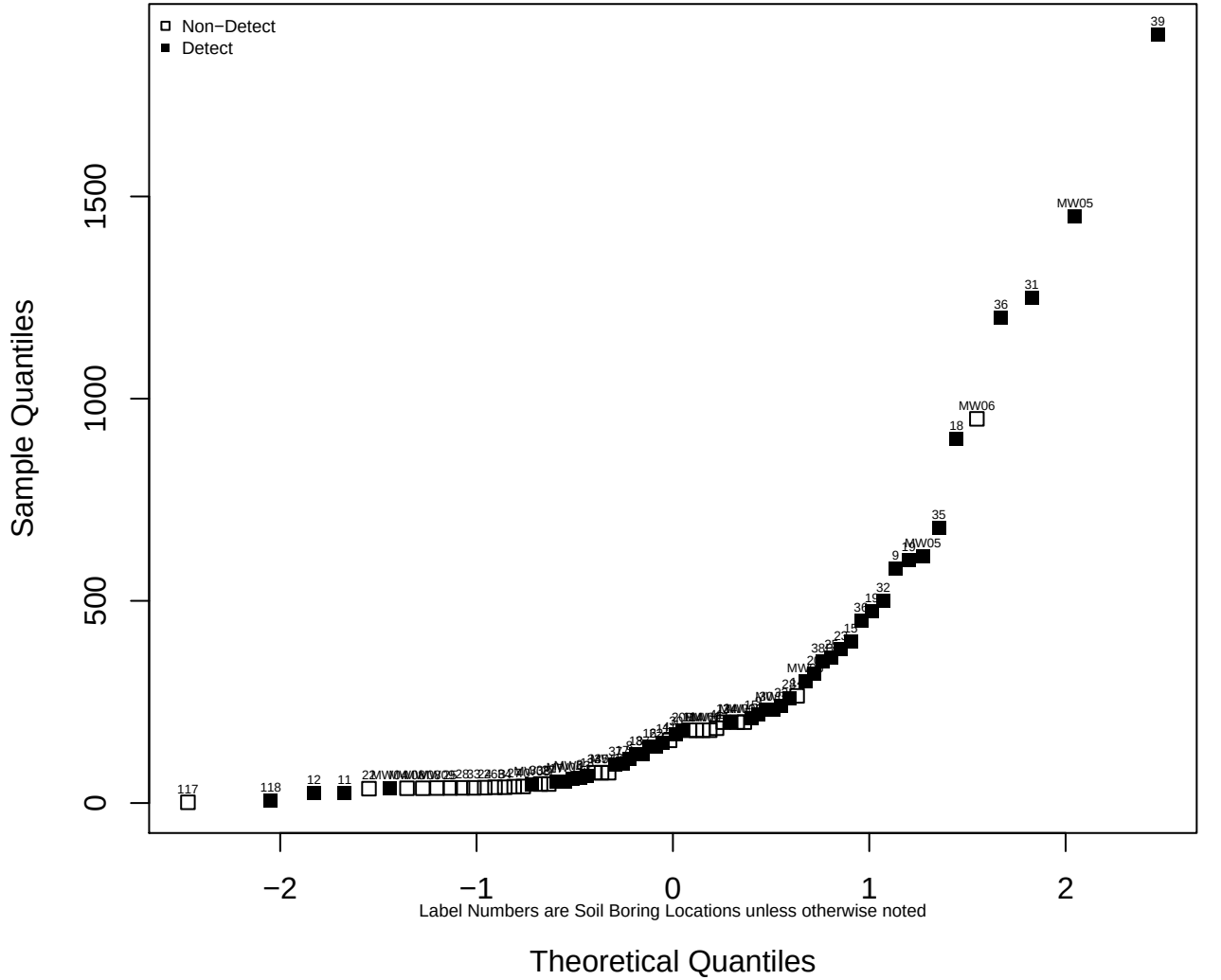
Normal Probability Plot
BENZO(A)PYRENE
Subsurface Soil



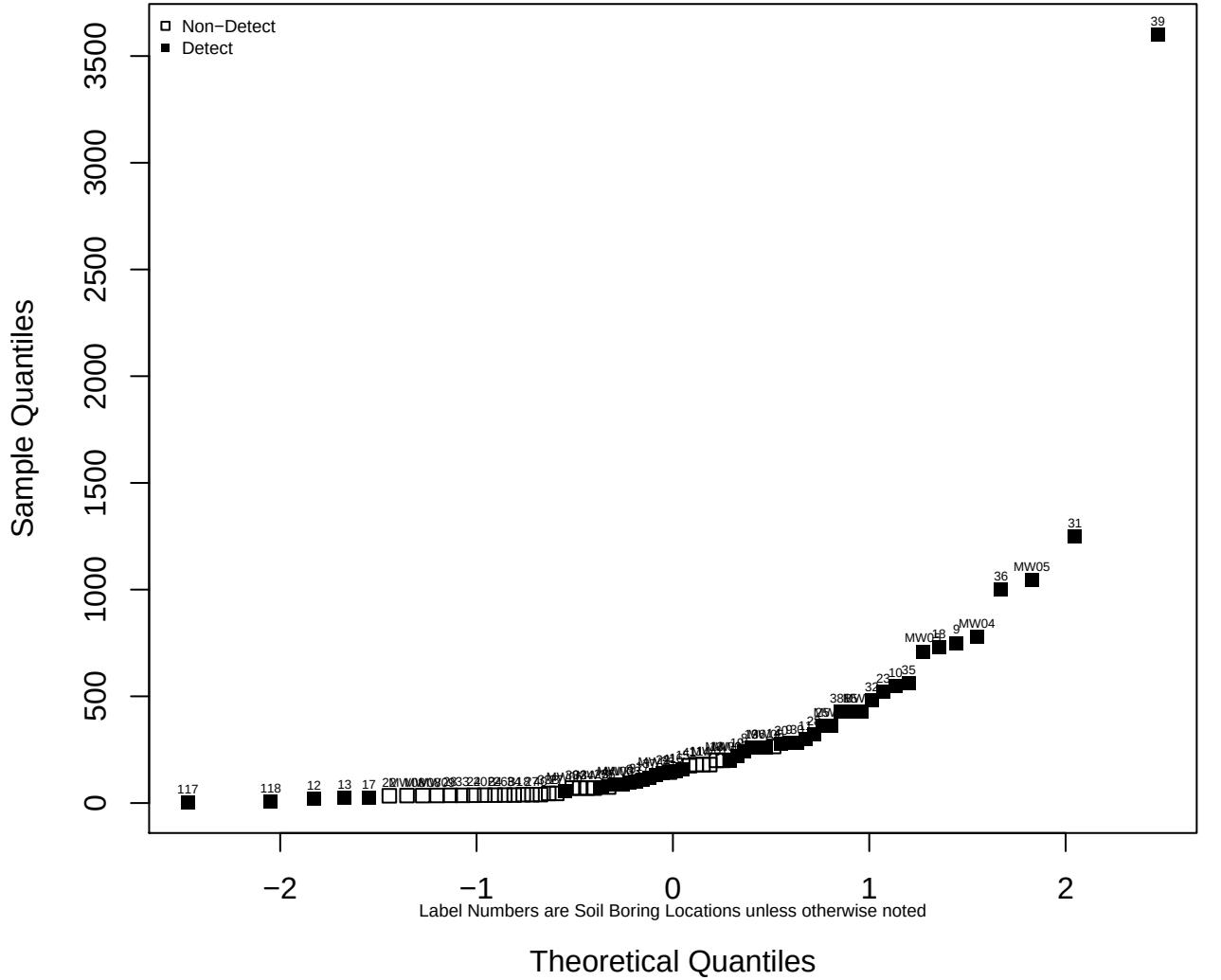
Normal Probability Plot
BENZO(B)FLUORANTHENE
Subsurface Soil



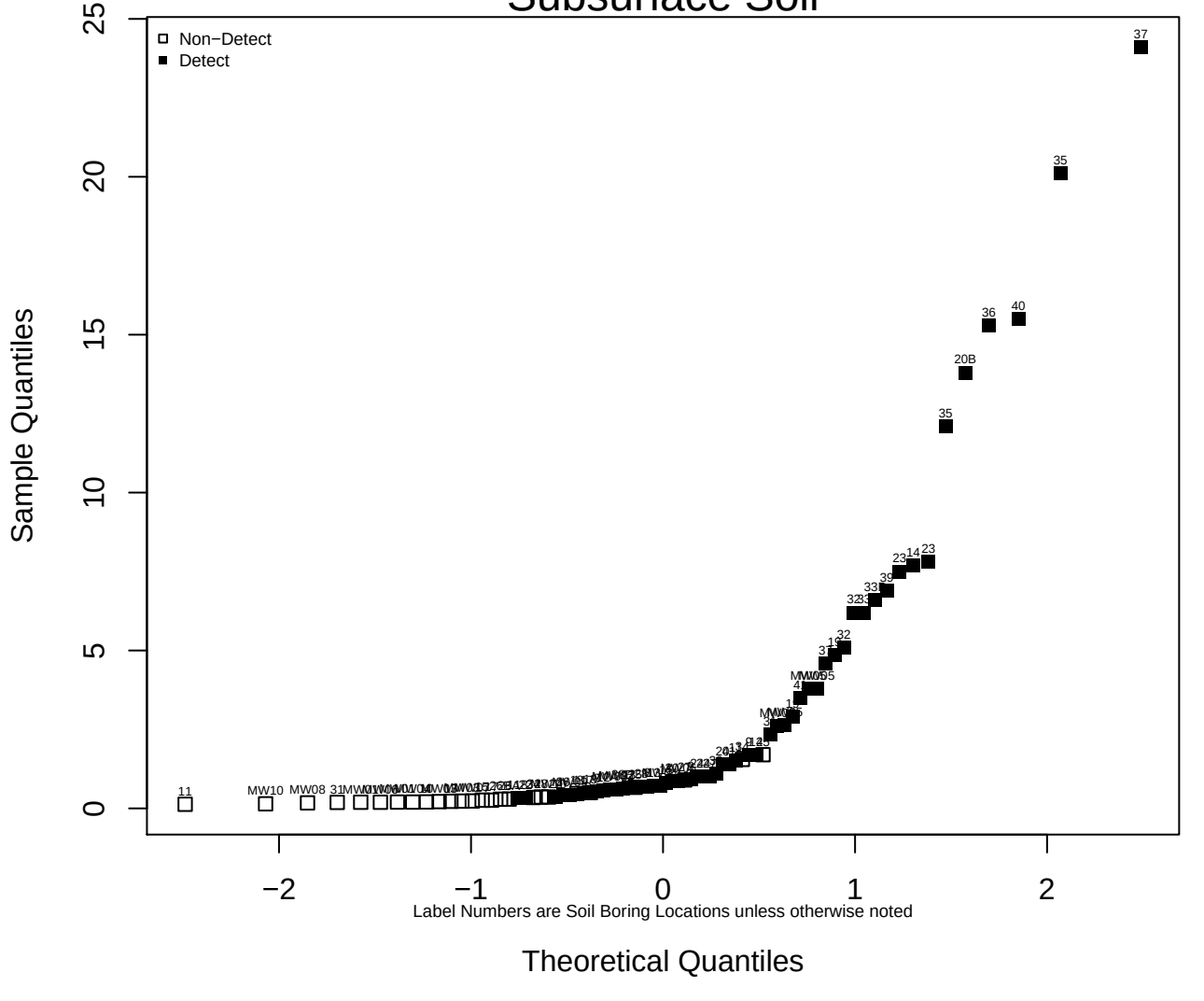
Normal Probability Plot
BENZO(G,H,I)PERYLENE
Subsurface Soil



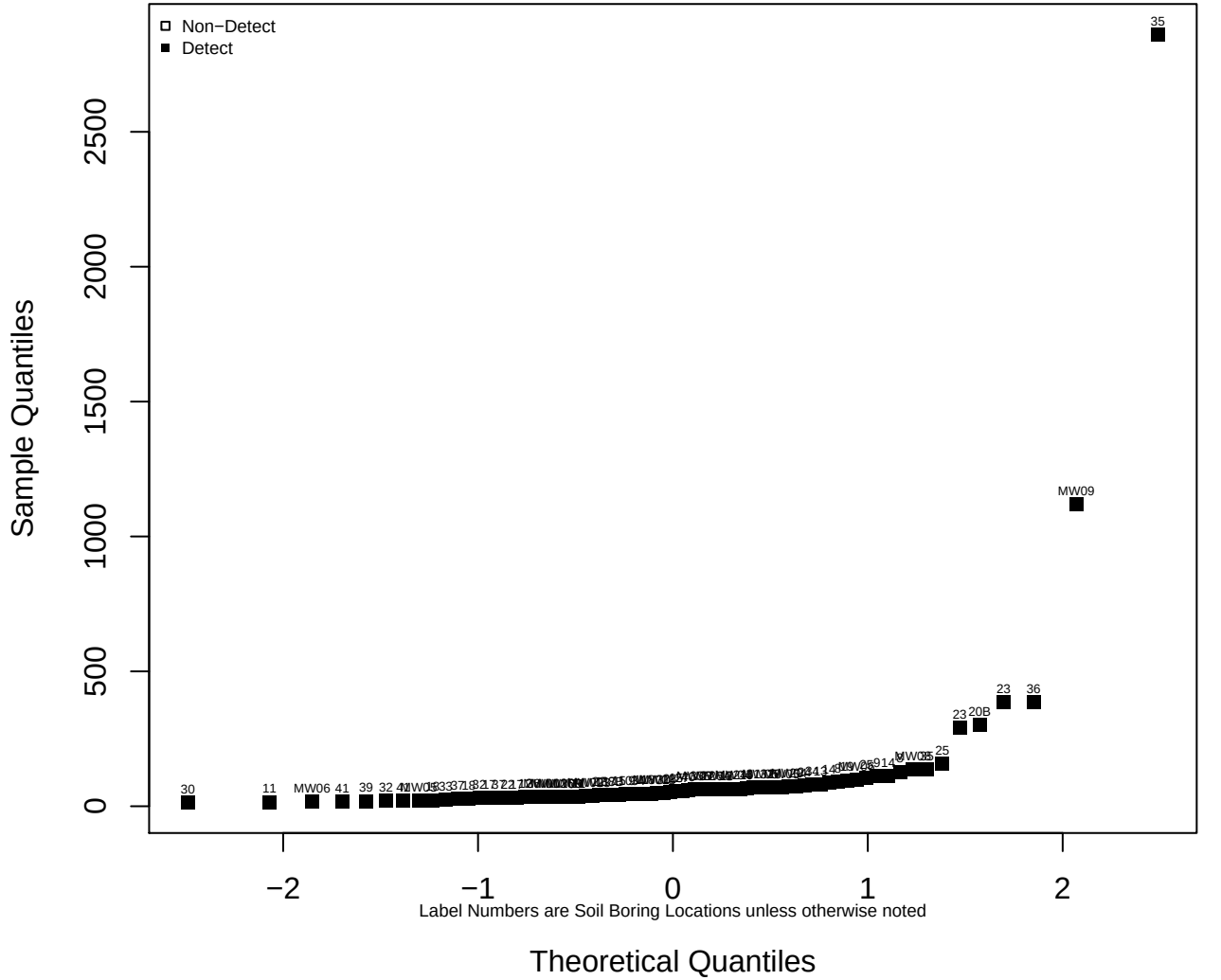
Normal Probability Plot
BENZO(K)FLUORANTHENE
Subsurface Soil



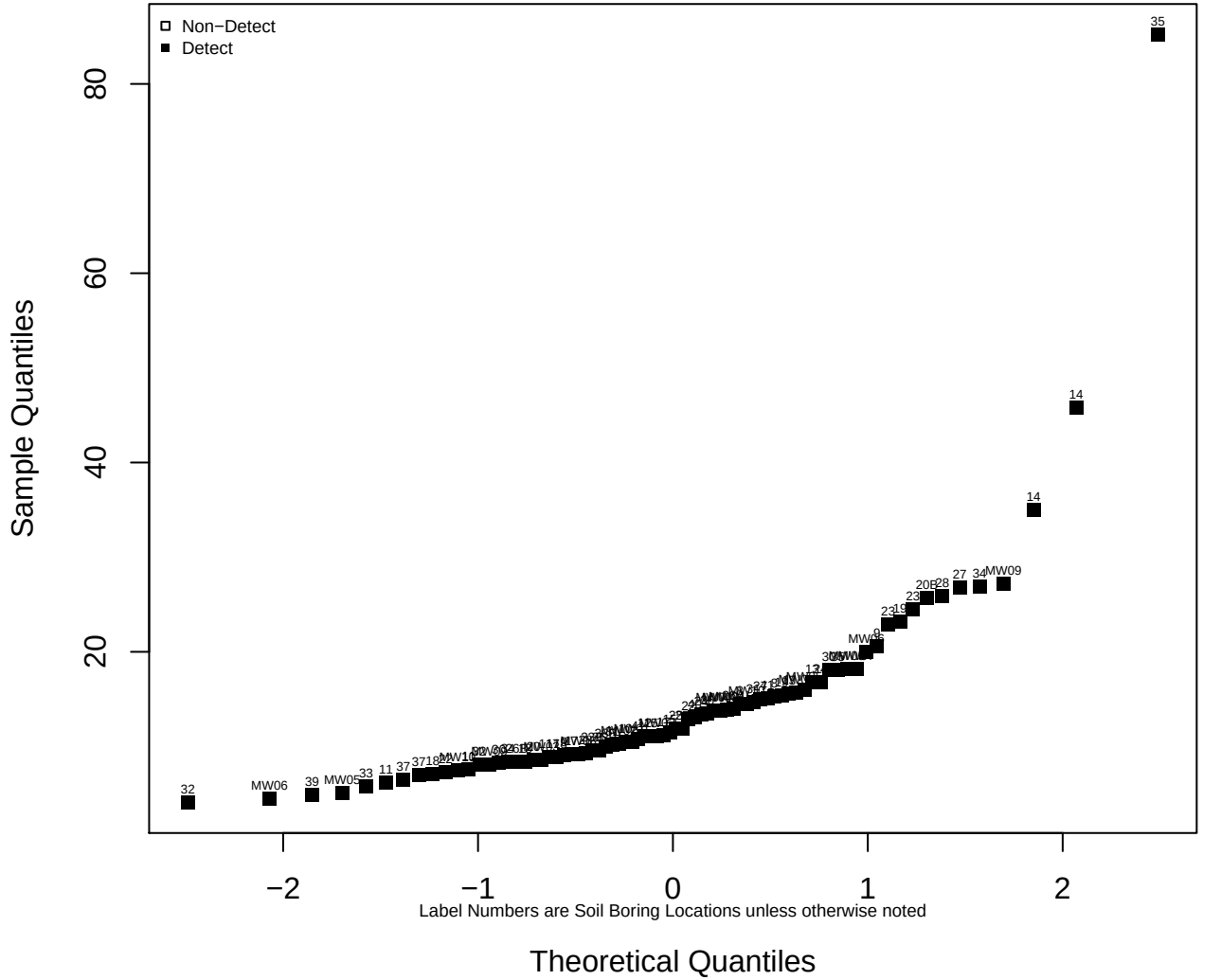
Normal Probability Plot
CADMIUM
Subsurface Soil



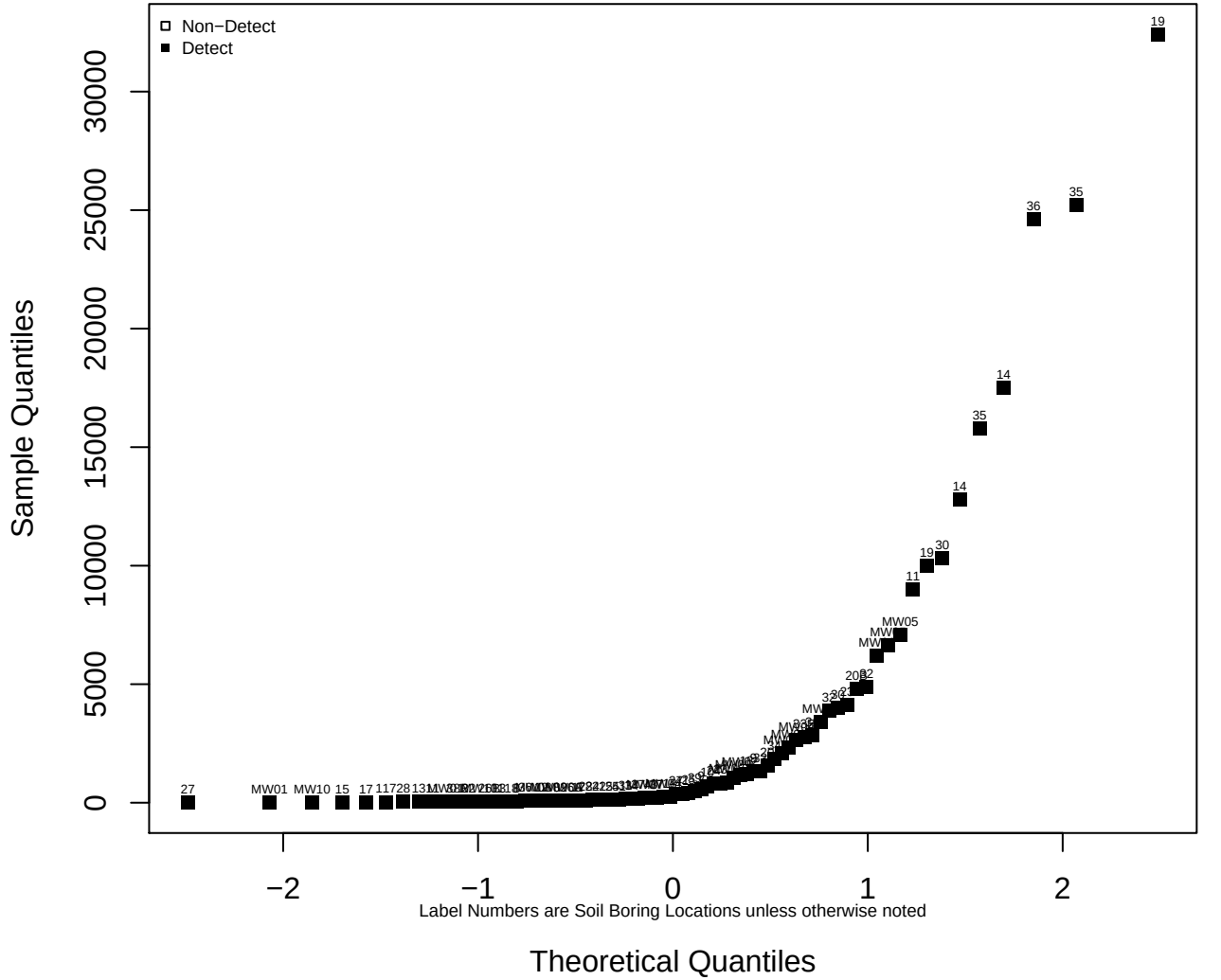
Normal Probability Plot
CHROMIUM
Subsurface Soil



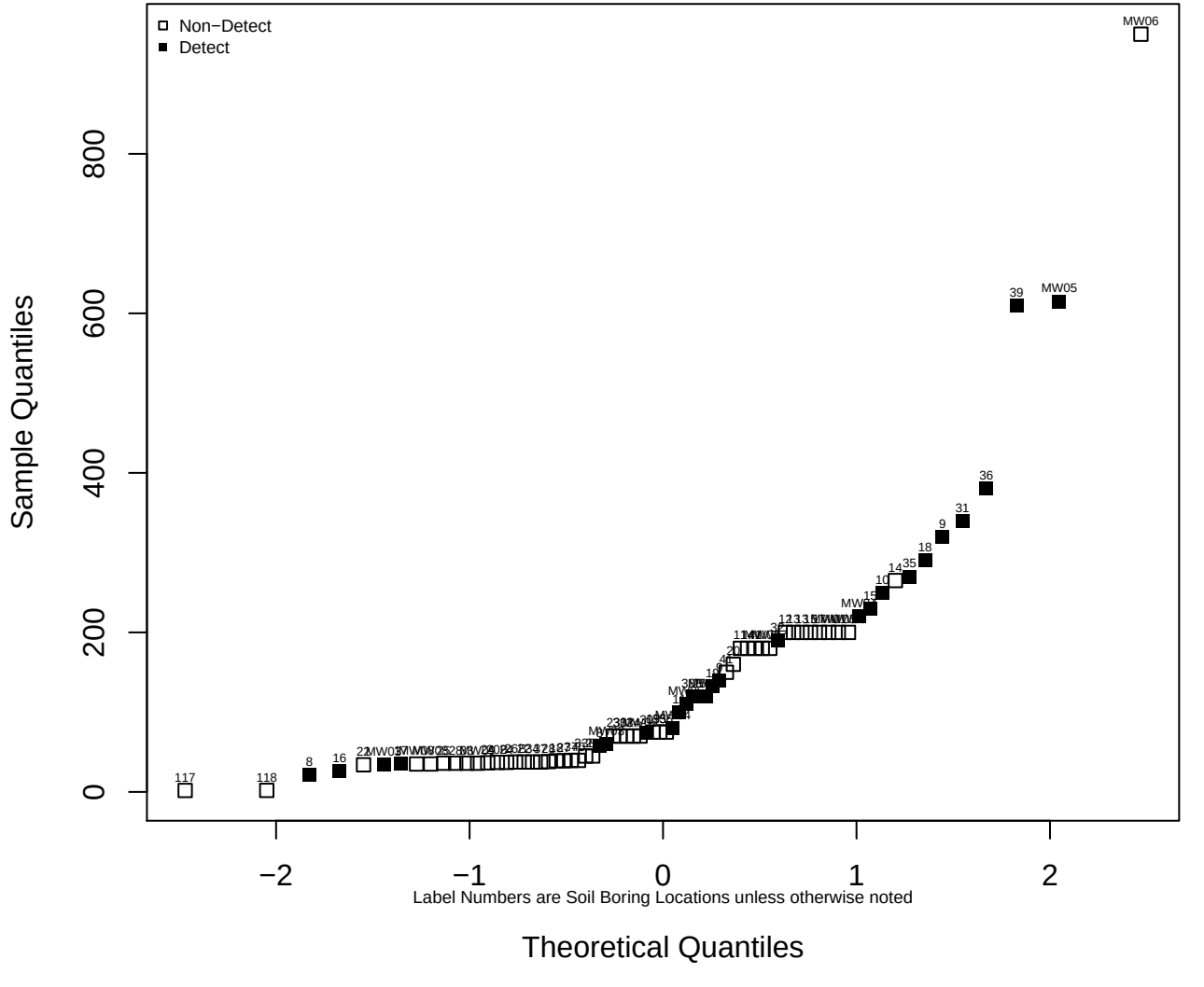
Normal Probability Plot
COBALT
Subsurface Soil



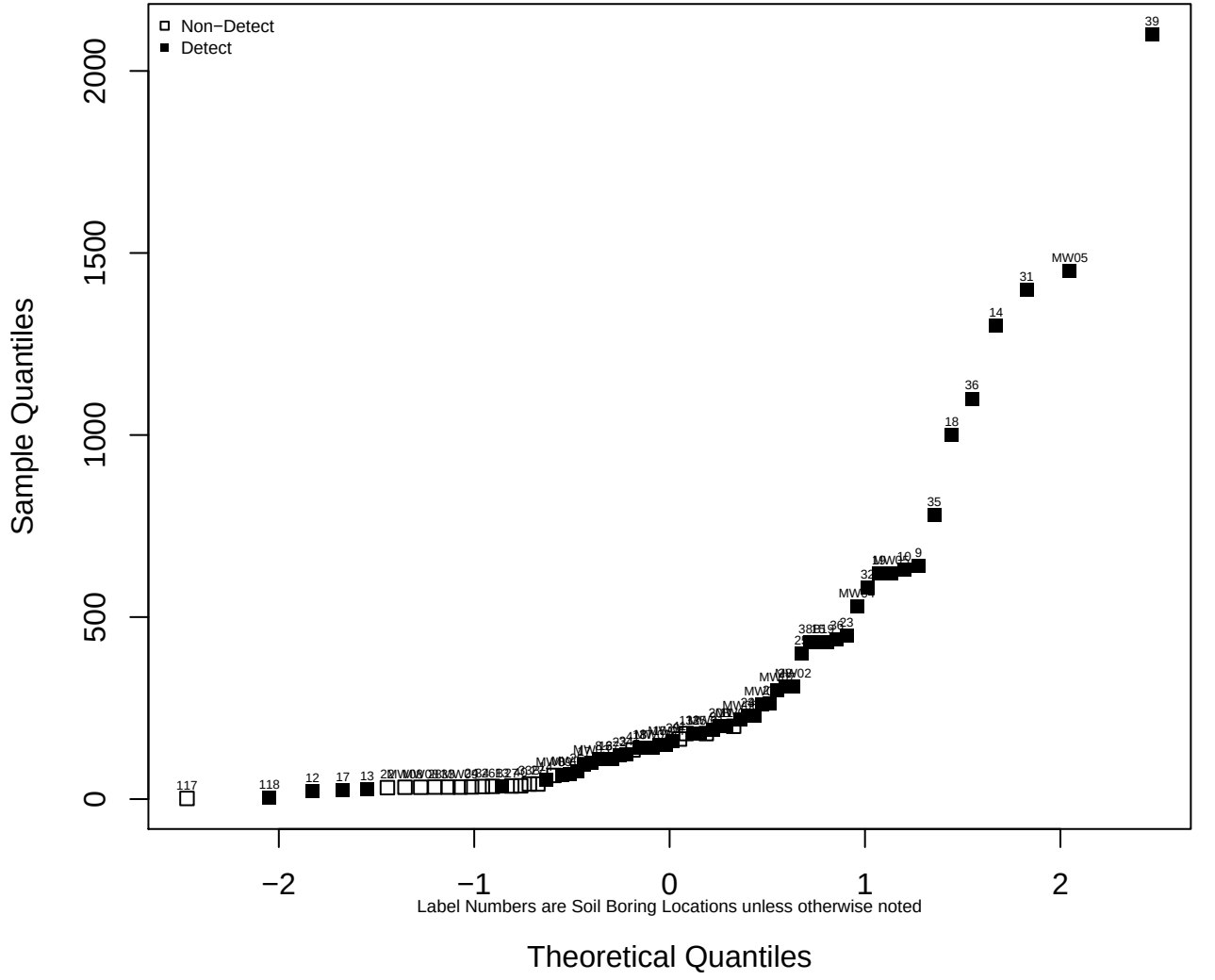
Normal Probability Plot
COPPER
Subsurface Soil



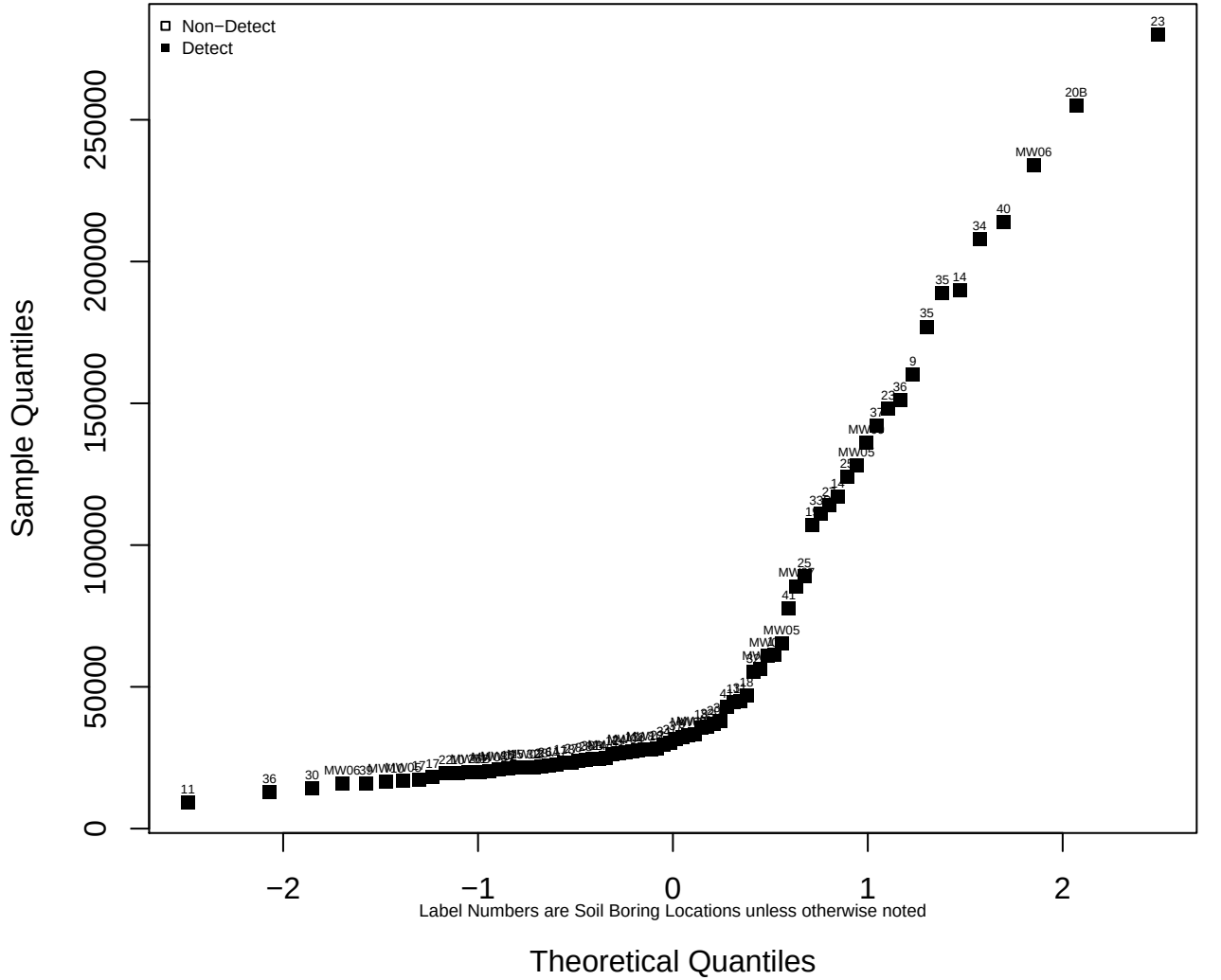
Normal Probability Plot
DIBENZO(A,H)ANTHRACENE
Subsurface Soil



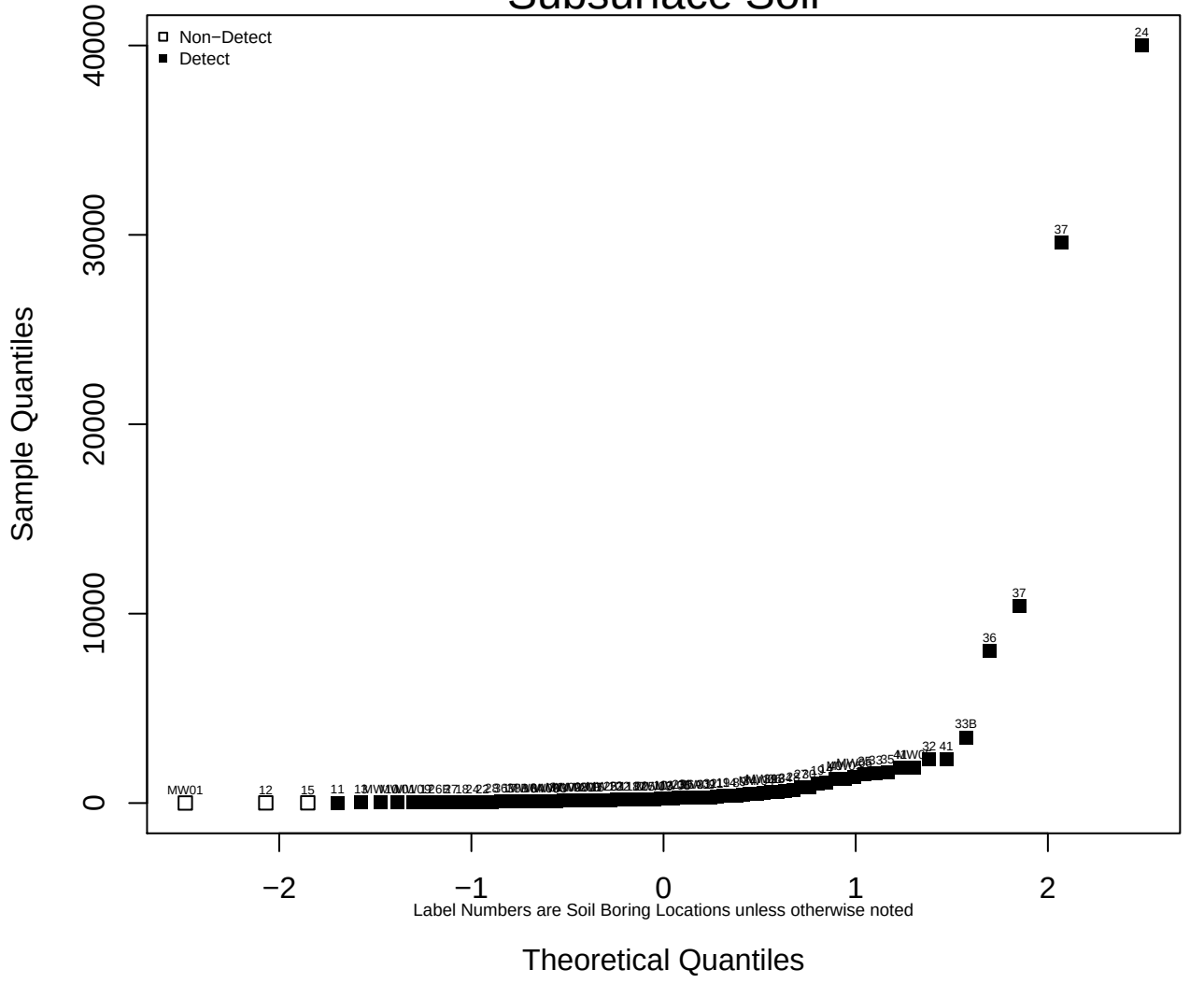
Normal Probability Plot
INDENO(1,2,3−CD)PYRENE
Subsurface Soil



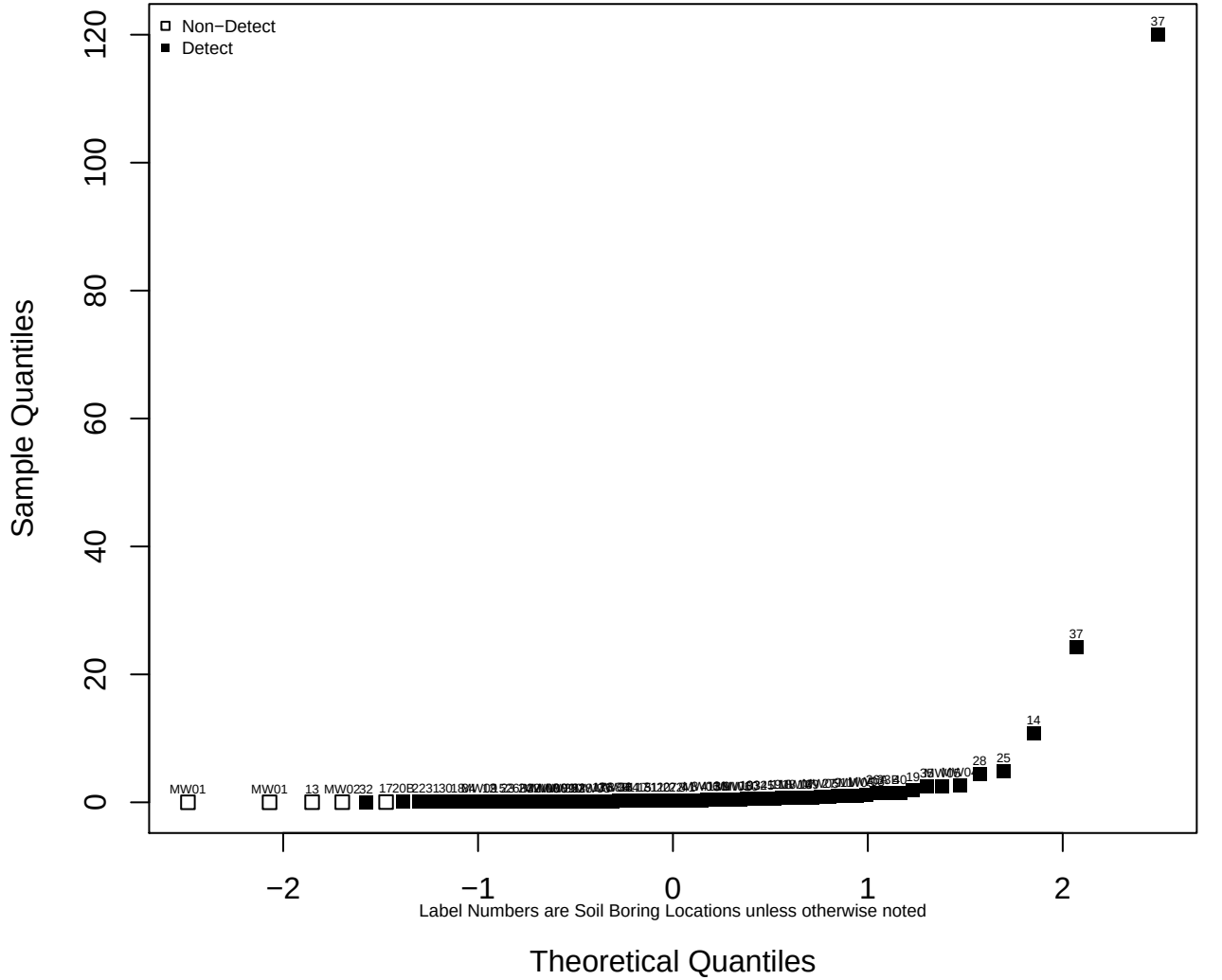
Normal Probability Plot
IRON
Subsurface Soil



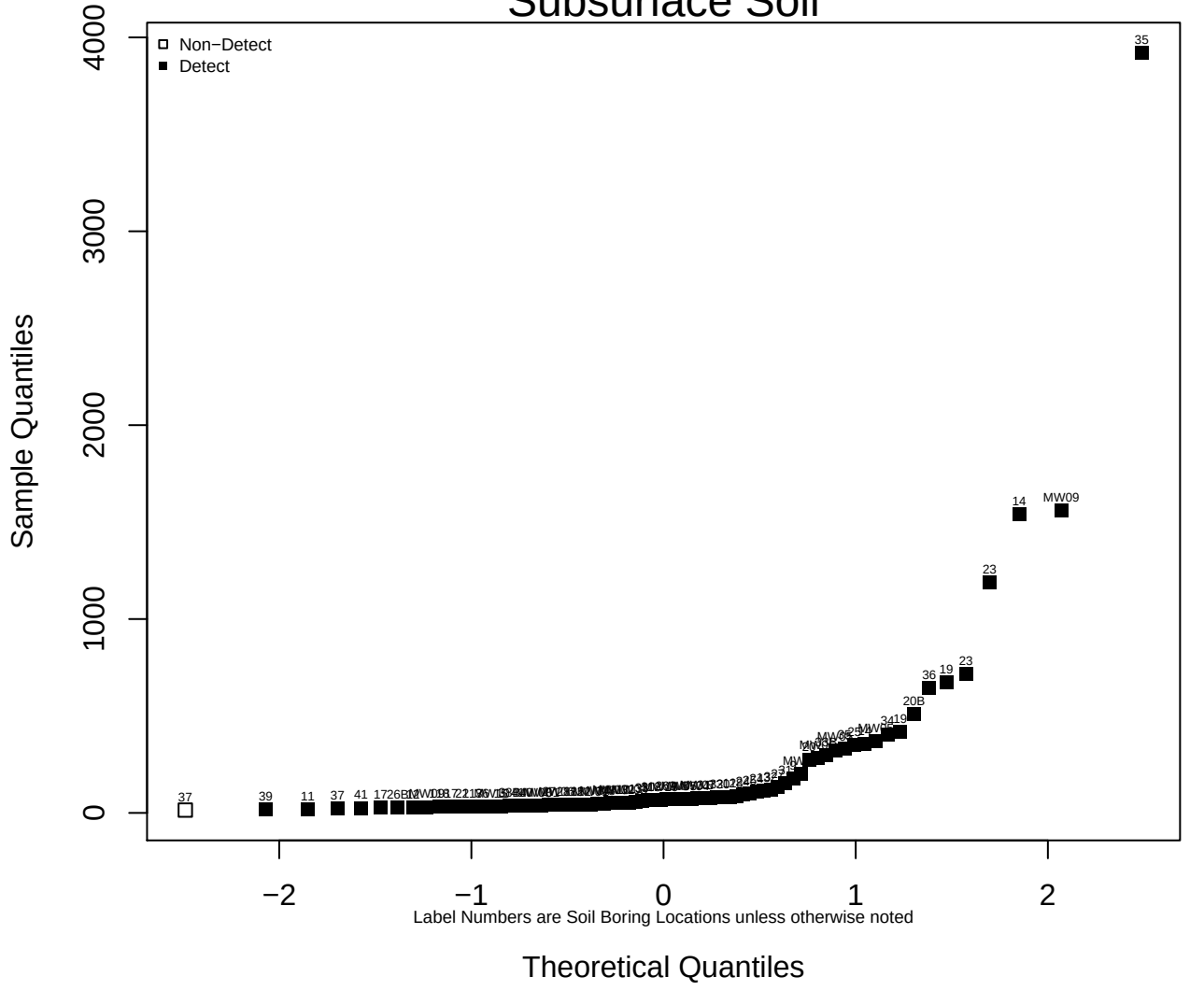
Normal Probability Plot
LEAD
Subsurface Soil



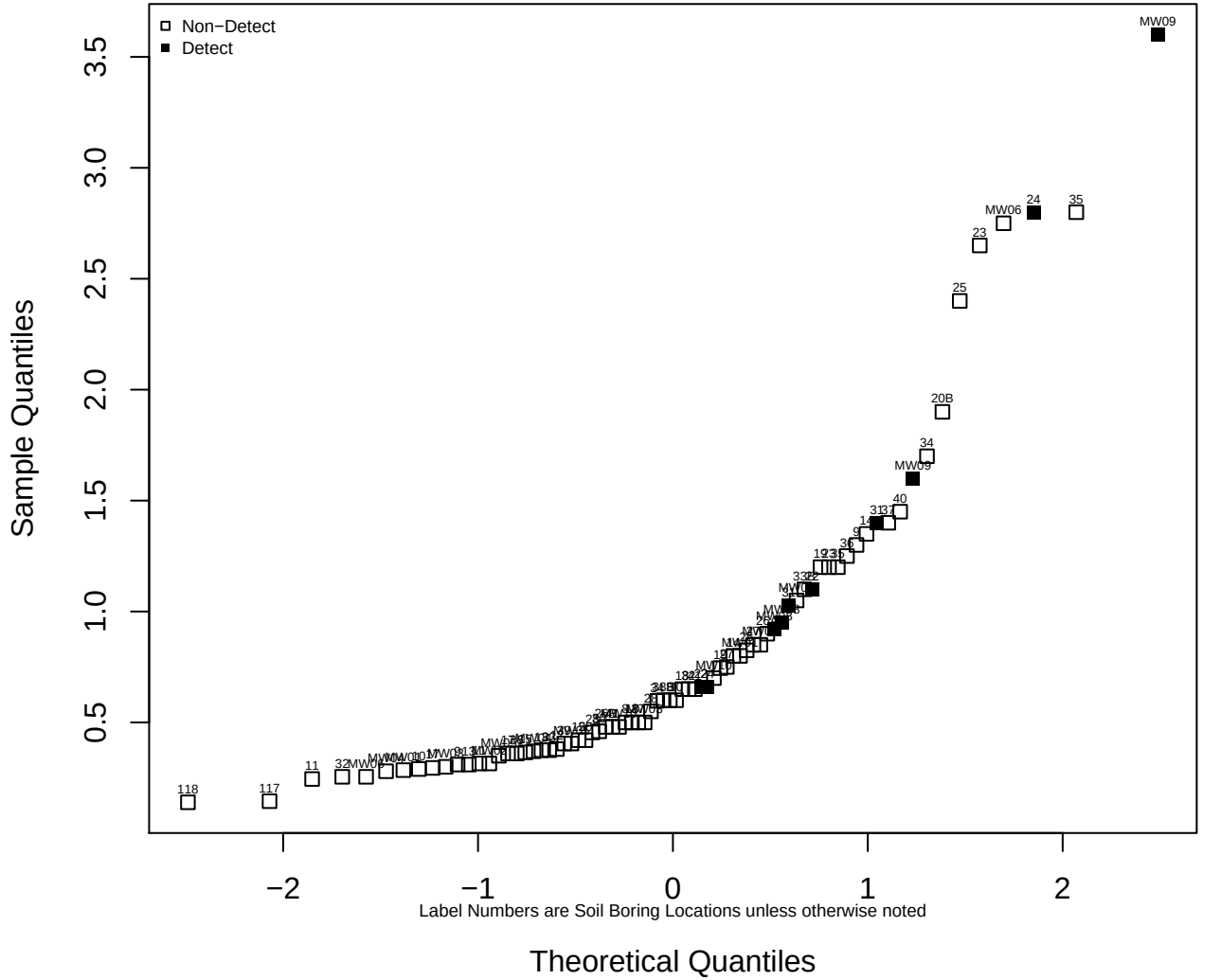
Normal Probability Plot
MERCURY
Subsurface Soil



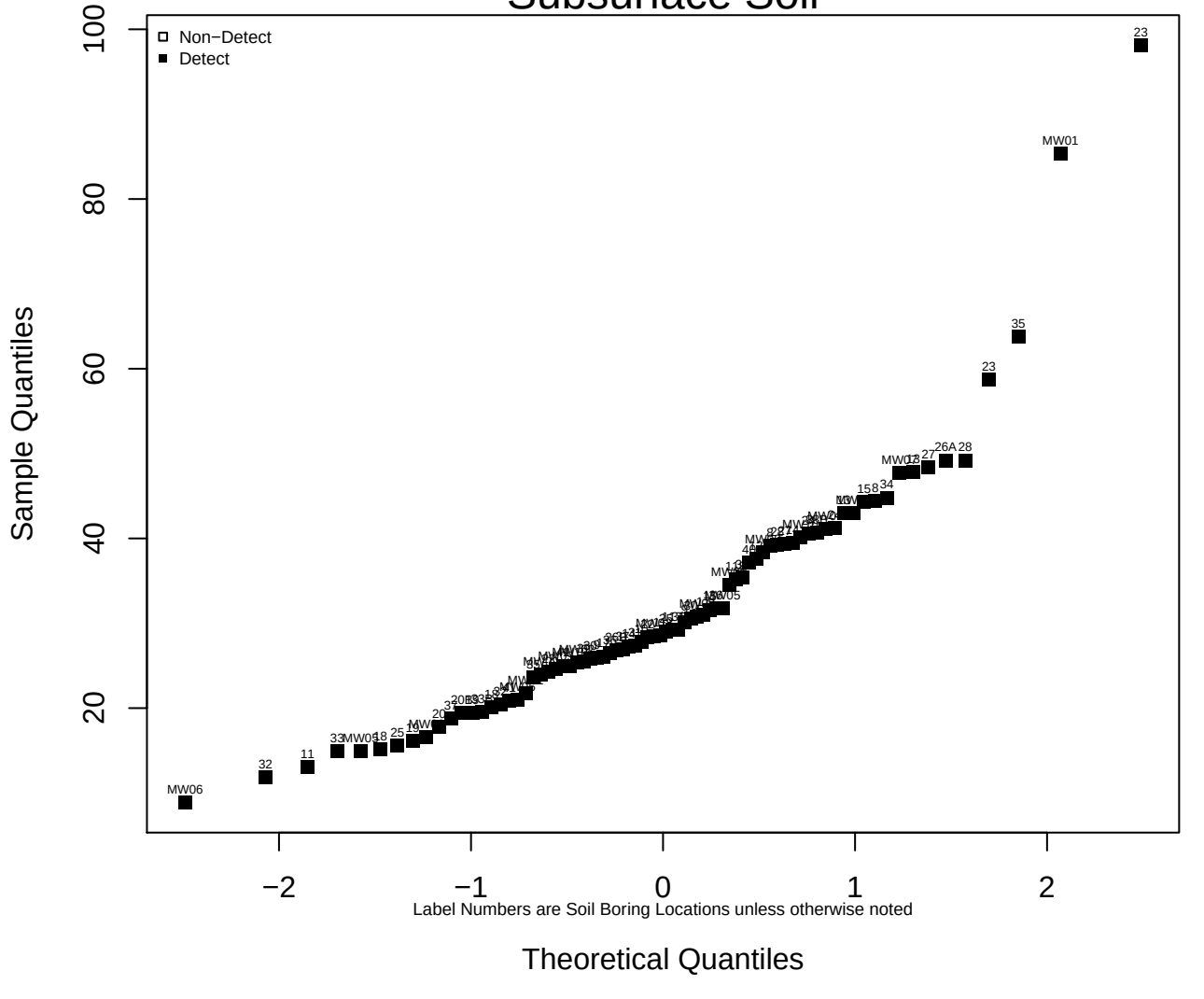
Normal Probability Plot
NICKEL
Subsurface Soil



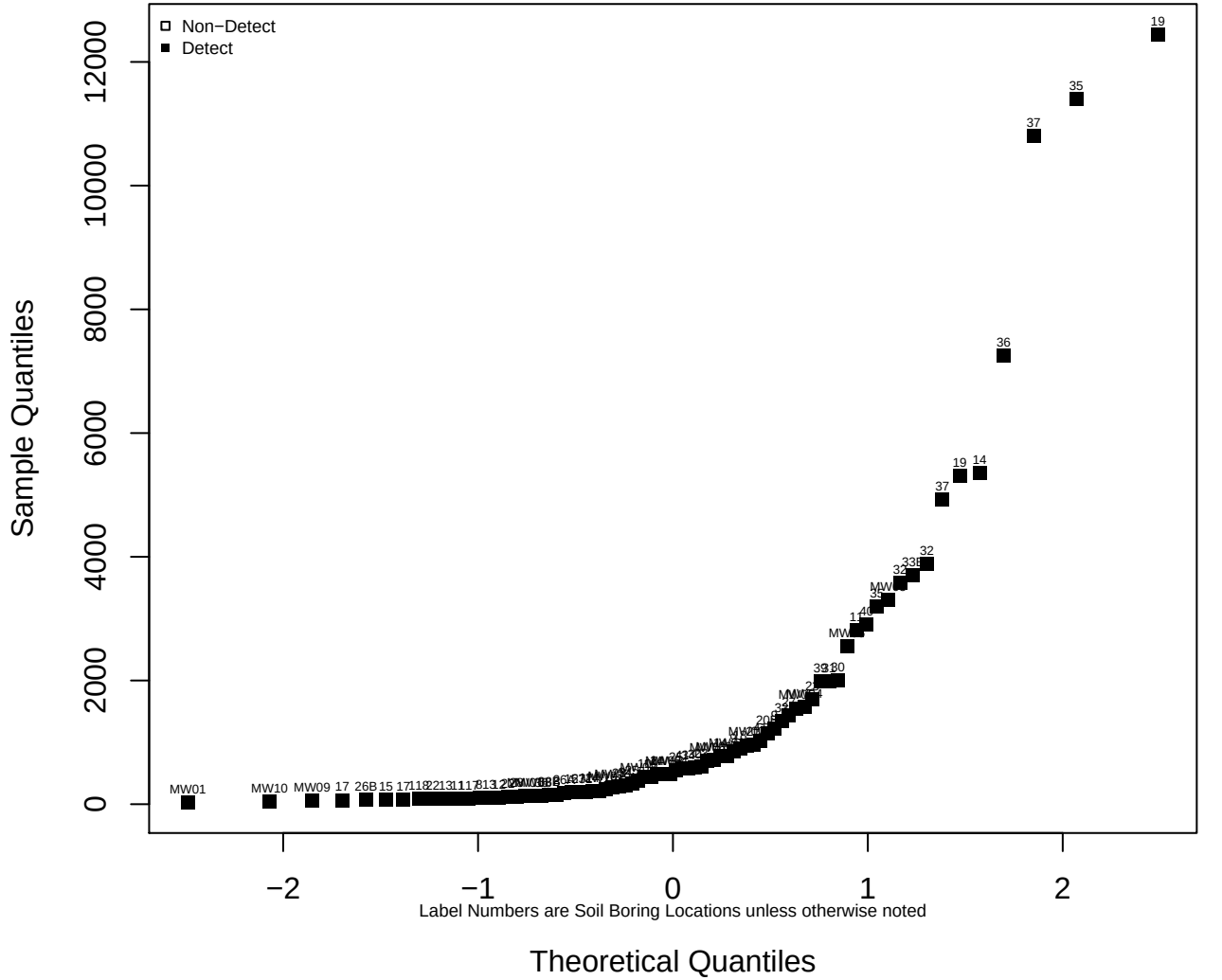
Normal Probability Plot
THALLIUM
Subsurface Soil



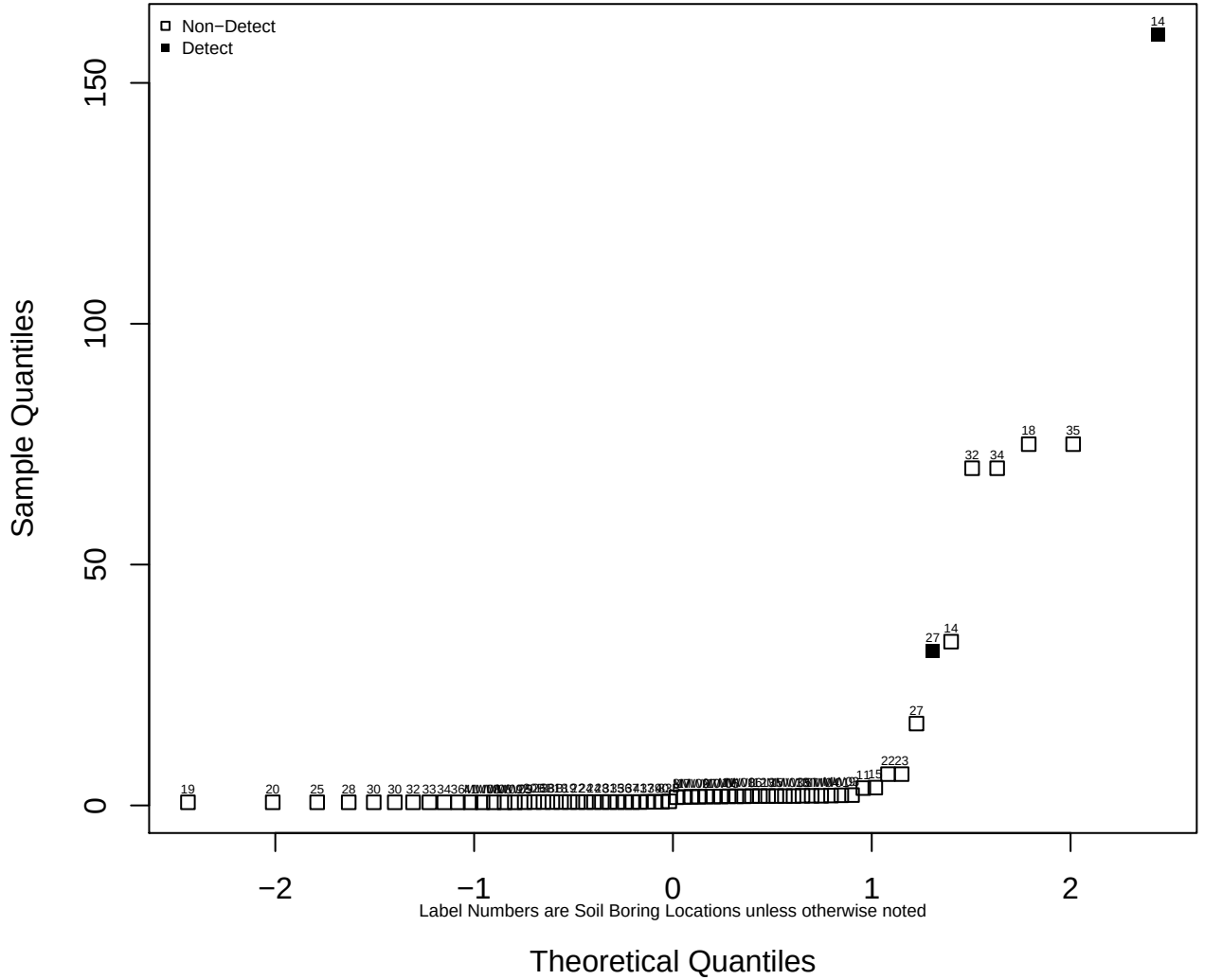
Normal Probability Plot
VANADIUM
Subsurface Soil

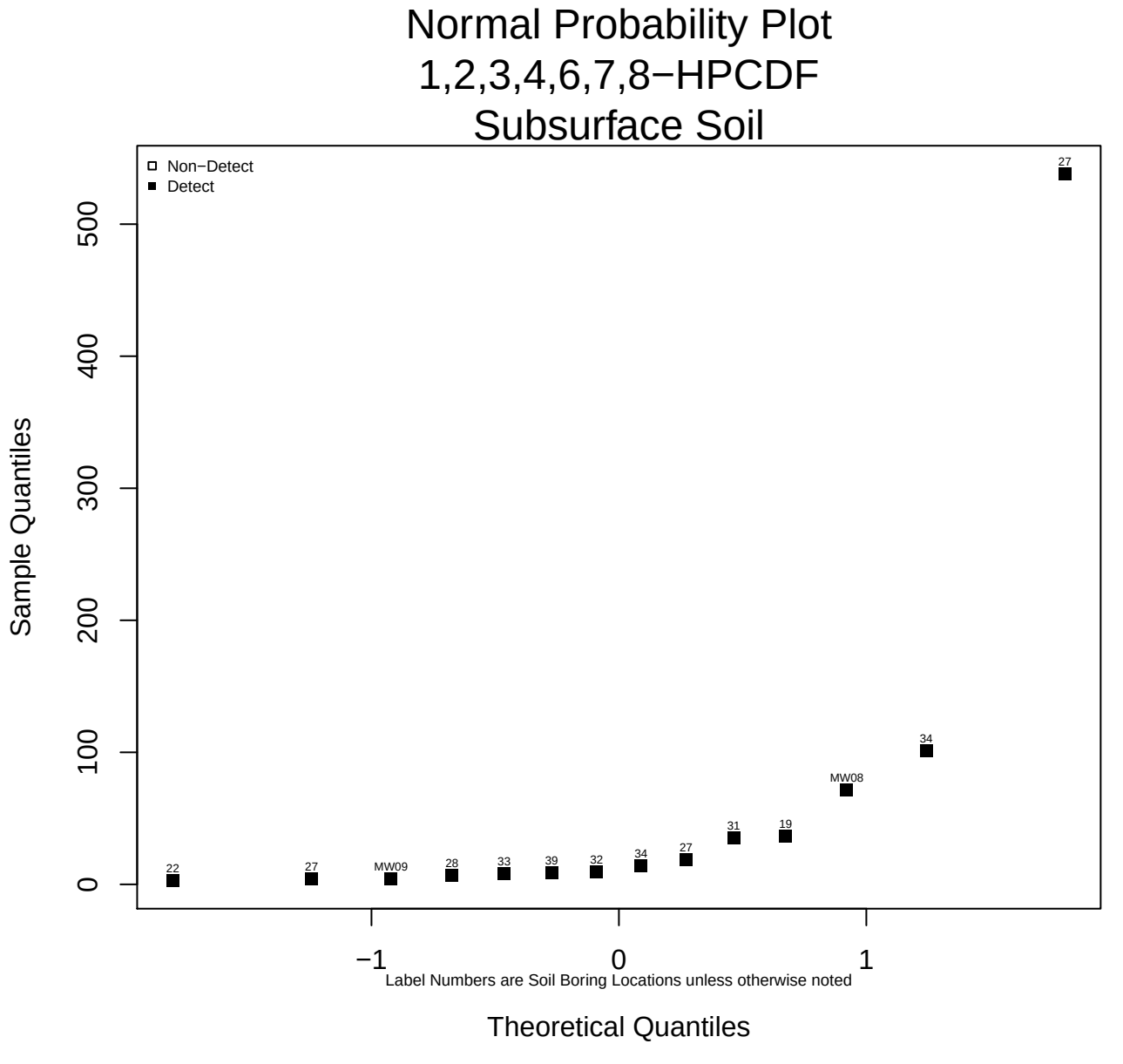


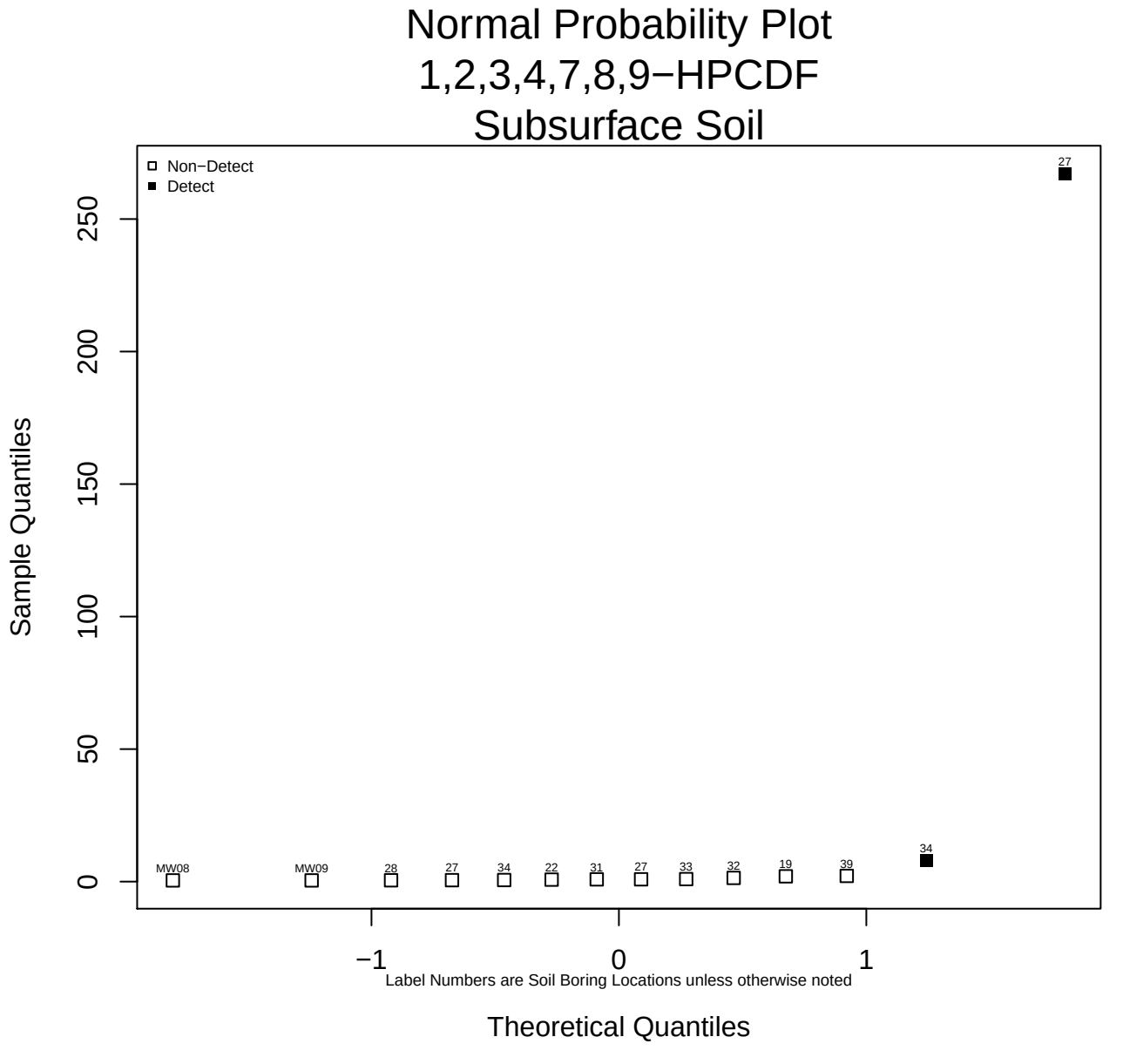
Normal Probability Plot
ZINC
Subsurface Soil

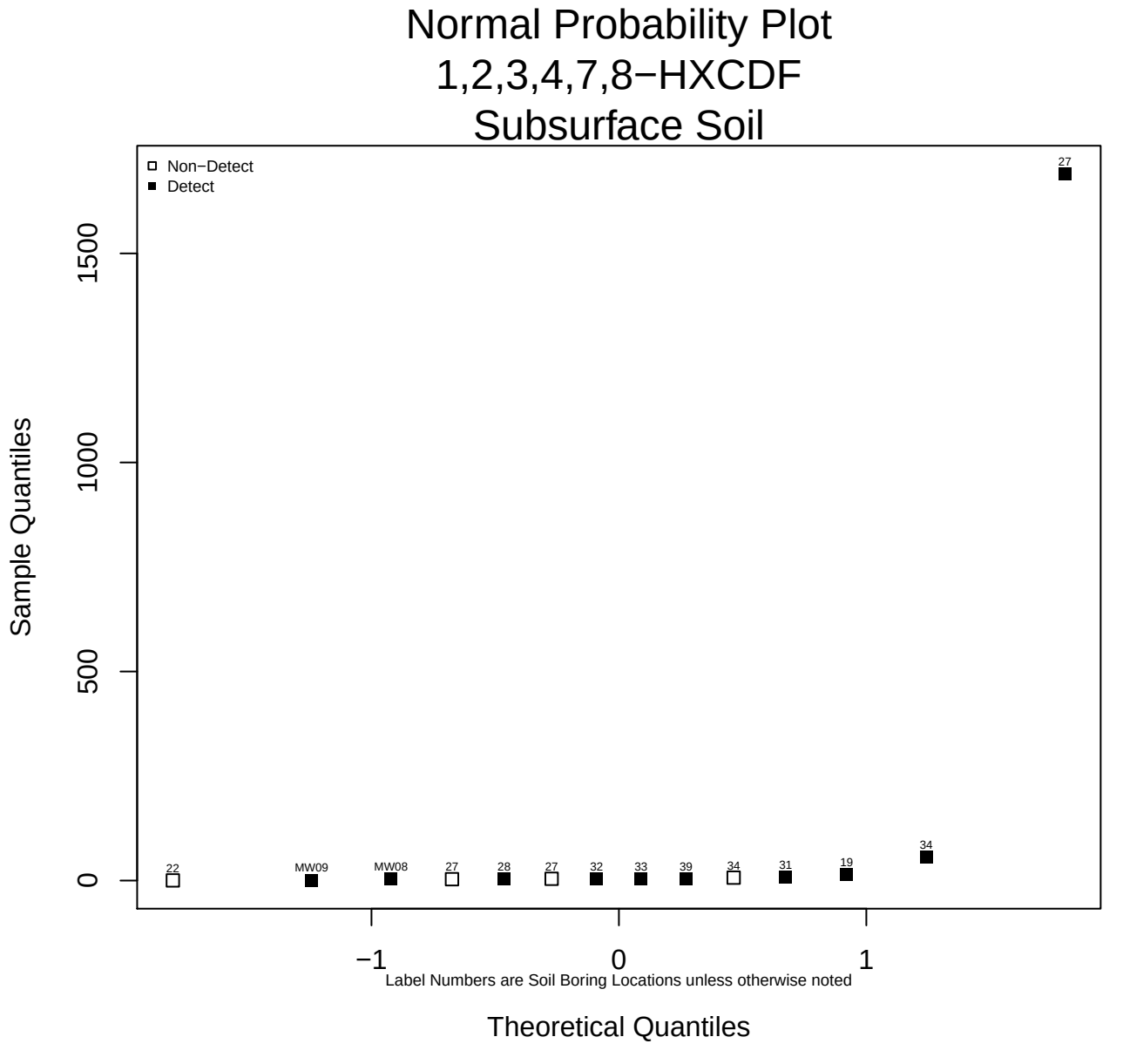


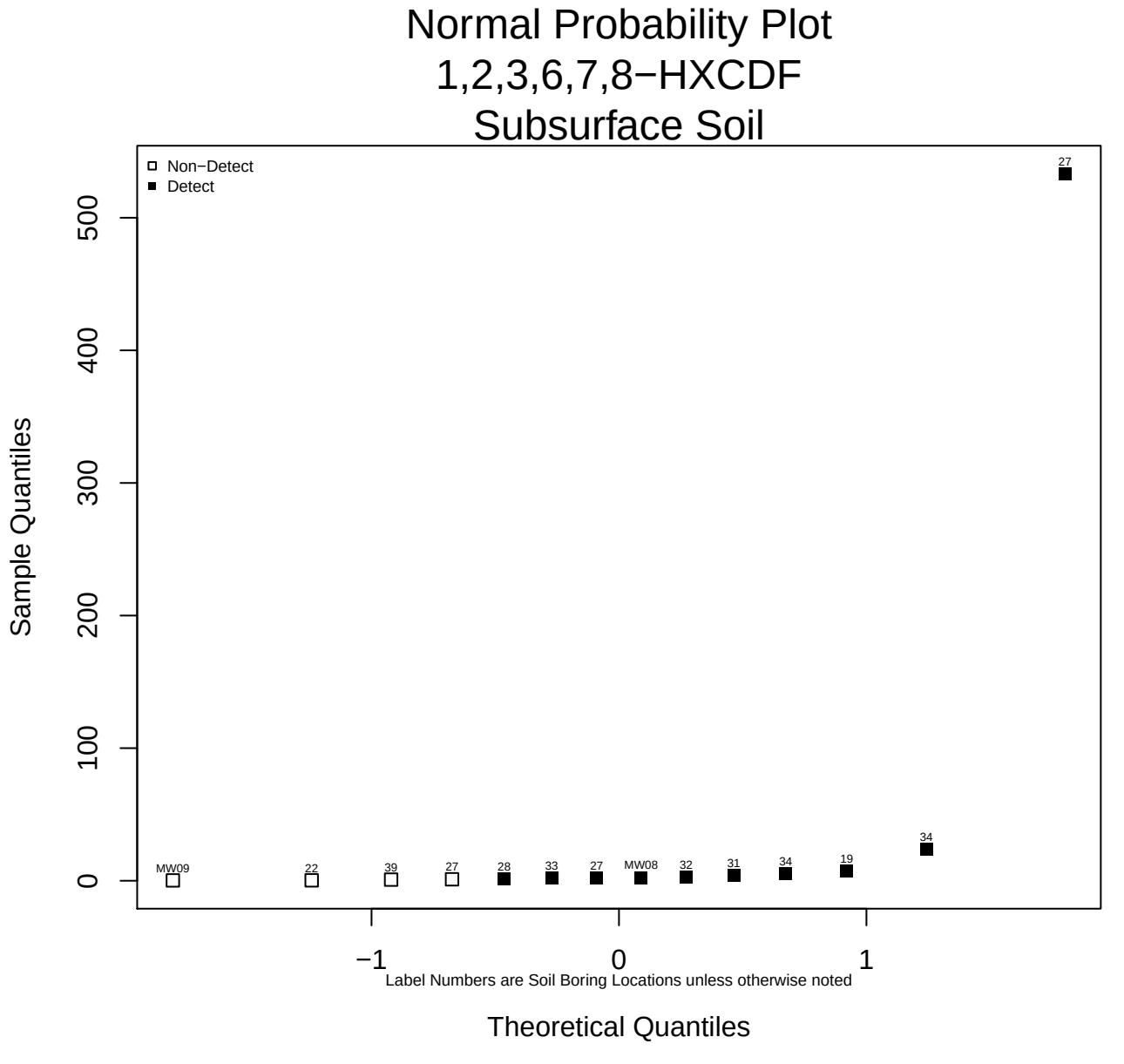
Normal Probability Plot
DIELDRIN
Subsurface Soil



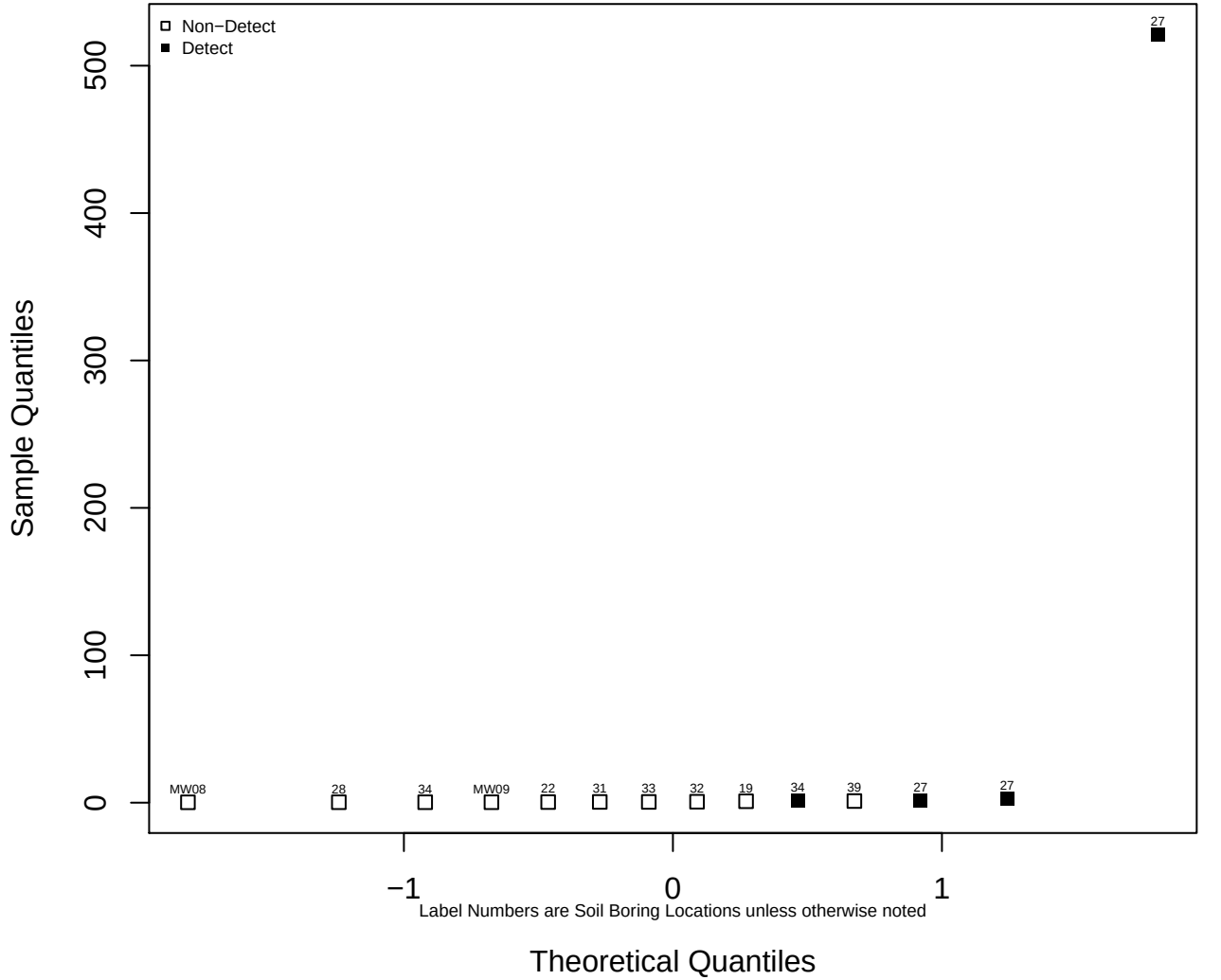

Normal Probability Plot
1,2,3,4,6,7,8−HPCDF
Subsurface Soil
Non−Detect
Detect
Sample Quantiles
0
100
200
300
400
500
22
27
MW09
28
33
39
32
34
27
31
19
MW08
34
27
−1
0
1
Label Numbers are Soil Boring Locations unless otherwise noted
Theoretical Quantiles

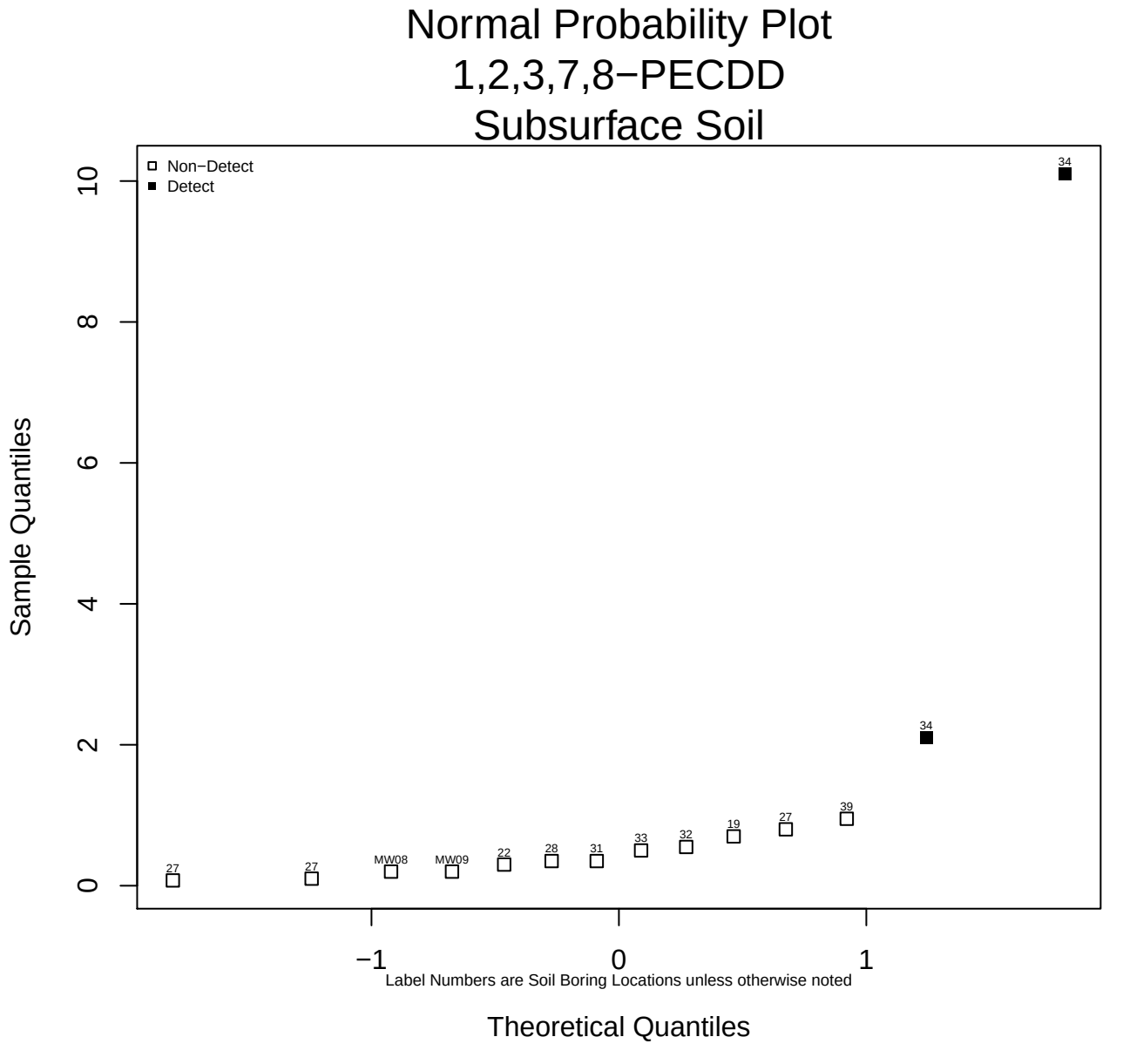

Normal Probability Plot
1,2,3,4,7,8,9−HPCDF
Subsurface Soil
Non−Detect
Detect
Sample Quantiles
0
50
100
150
200
250
MW08
MW09
28
27
34
22
31
27
33
32
19
39
34
27
−1
0
1
Label Numbers are Soil Boring Locations unless otherwise noted
Theoretical Quantiles

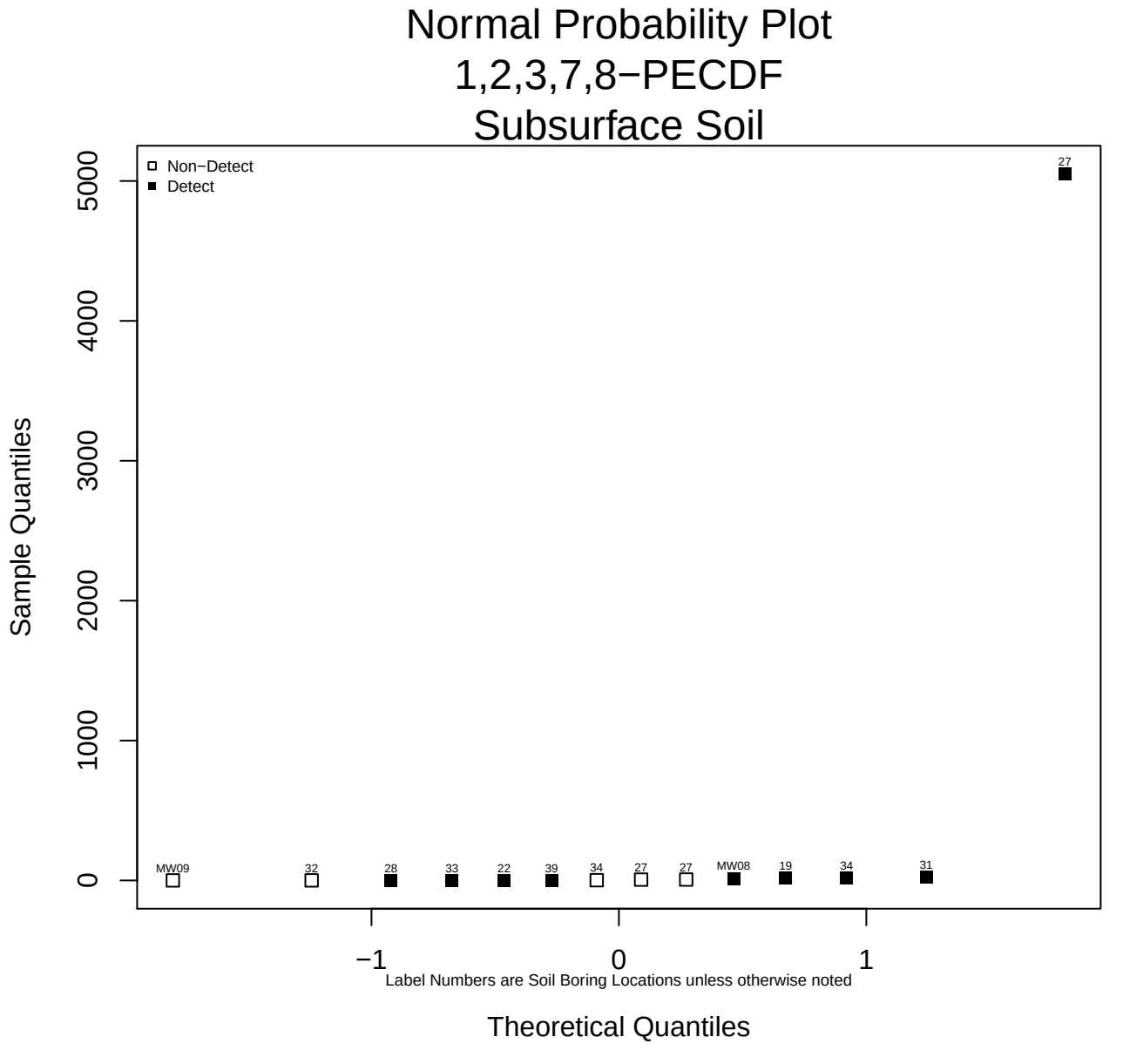

Normal Probability Plot
1,2,3,4,7,8−HXCDF
Subsurface Soil
Non−Detect
Detect
Sample Quantiles
0
500
1000
1500
22
MW09
MW08
27
28
27
32
33
39
34
31
19
34
27
−1
0
1
Label Numbers are Soil Boring Locations unless otherwise noted
Theoretical Quantiles

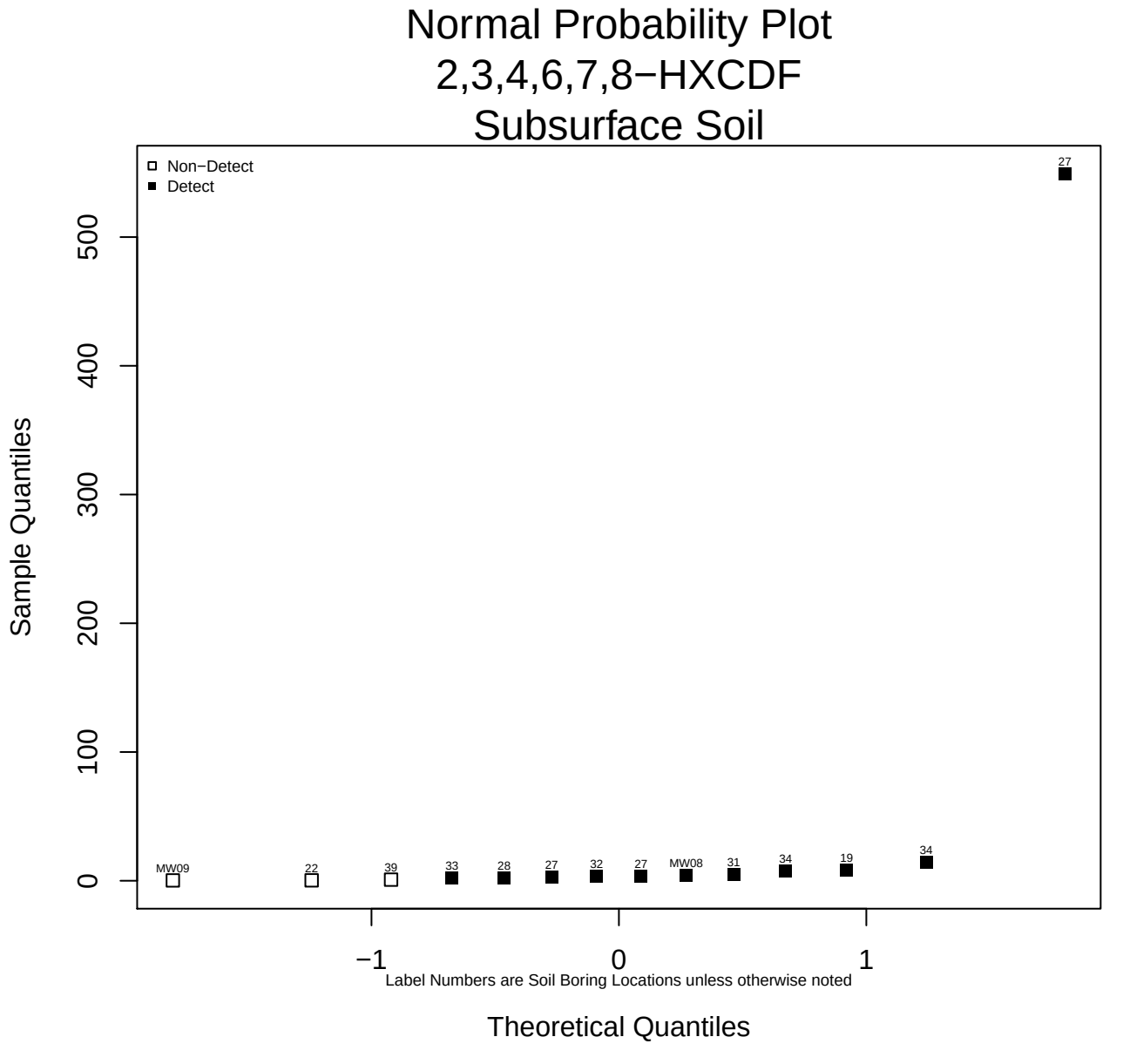

Normal Probability Plot
1,2,3,6,7,8−HXCDF
Subsurface Soil
Non−Detect
Detect
Sample Quantiles
0
100
200
300
400
500
MW09
22
39
27
28
33
27
MW08
32
31
34
19
34
27
−1
0
1
Label Numbers are Soil Boring Locations unless otherwise noted
Theoretical Quantiles

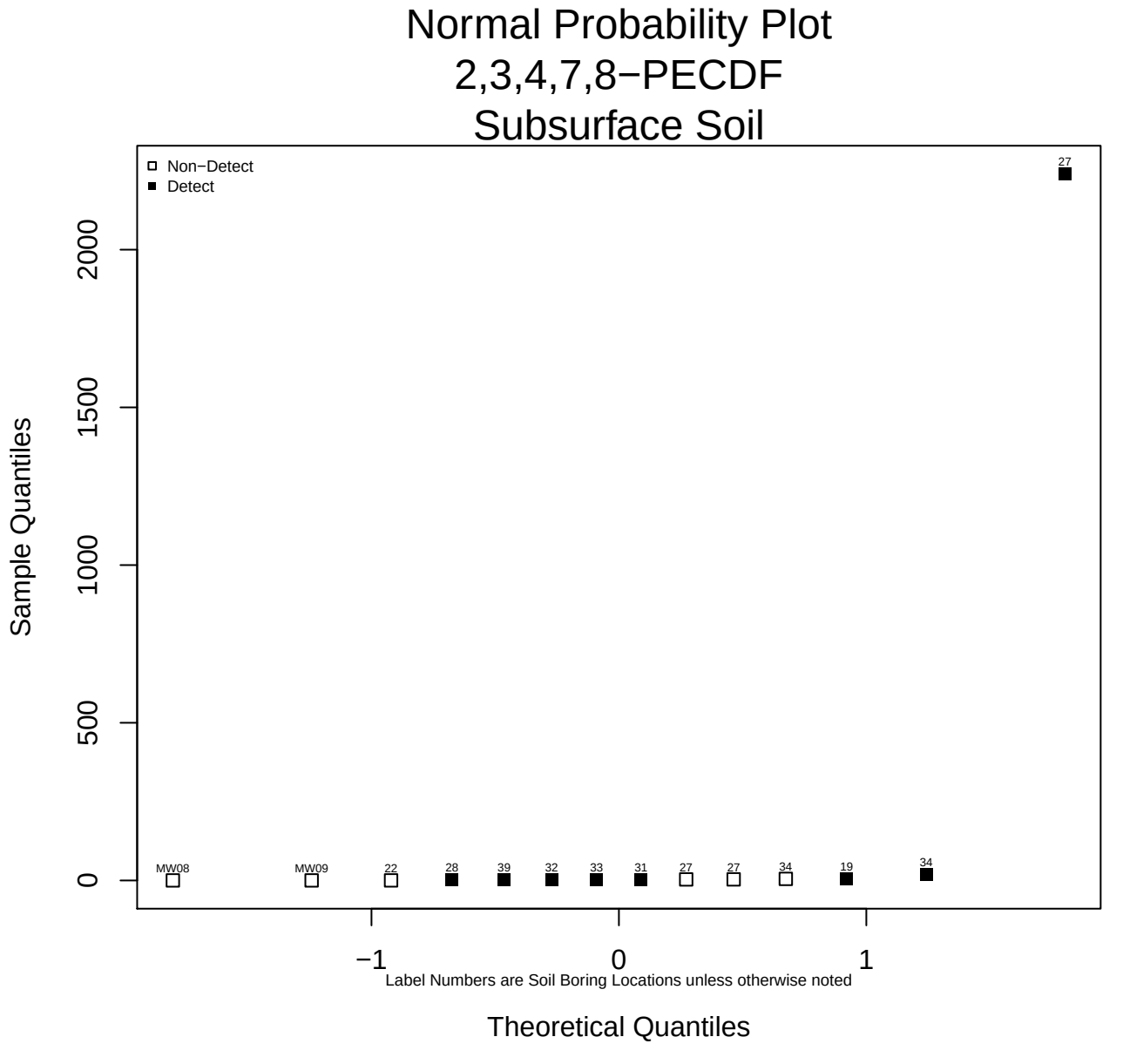
Normal Probability Plot
1,2,3,7,8,9−HXCDF
Subsurface Soil




Normal Probability Plot
1,2,3,7,8−PECDD
Subsurface Soil
Non−Detect
Detect
Sample Quantiles
Theoretical Quantiles
Label Numbers are Soil Boring Locations unless otherwise noted
0
2
4
6
8
10
−1
0
1
27
27
MW08
MW09
22
28
31
33
32
19
27
39
34
34


Normal Probability Plot
1,2,3,7,8−PECDF
Subsurface Soil
Non−Detect
Detect
27
MW09
32
28
33
22
39
34
27
27
MW08
19
34
31
0
1000
2000
3000
4000
5000
Sample Quantiles
−1
0
1
Label Numbers are Soil Boring Locations unless otherwise noted
Theoretical Quantiles


Normal Probability Plot
2,3,4,6,7,8−HXCDF
Subsurface Soil
Non−Detect
Detect
27
MW09
22
39
33
28
27
32
27
MW08
31
34
19
34
0
100
200
300
400
500
Sample Quantiles
−1
0
1
Label Numbers are Soil Boring Locations unless otherwise noted
Theoretical Quantiles


Normal Probability Plot
2,3,4,7,8−PECDF
Subsurface Soil
Non−Detect
Detect
Sample Quantiles
0
500
1000
1500
2000
MW08
MW09
22
28
39
32
33
31
27
27
34
19
34
27
−1
0
1
Label Numbers are Soil Boring Locations unless otherwise noted
Theoretical Quantiles

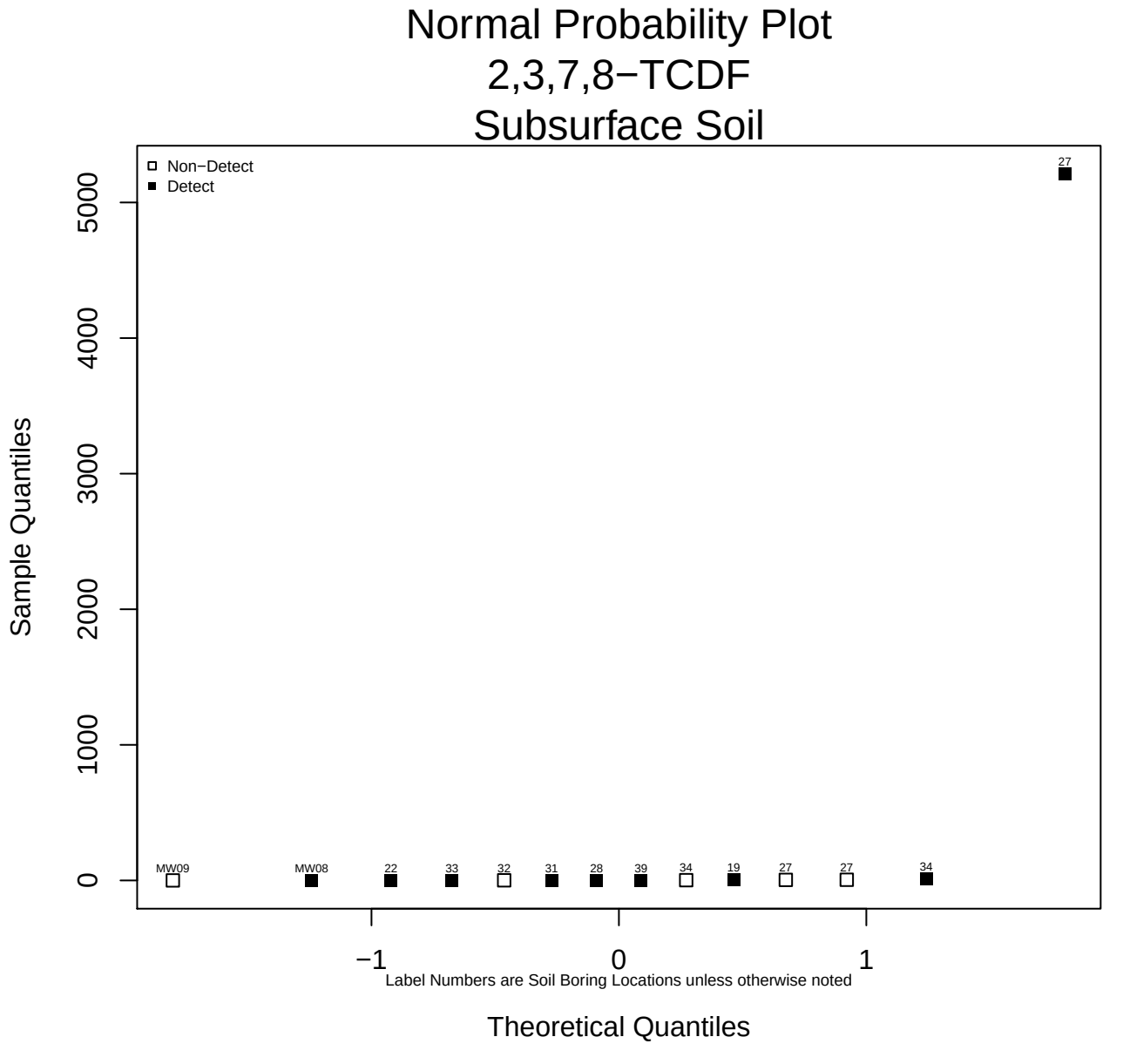

Normal Probability Plot
2,3,7,8−TCDF
Subsurface Soil
Non−Detect
Detect
Sample Quantiles
0
1000
2000
3000
4000
5000
MW09
MW08
22
33
32
31
28
39
34
19
27
27
34
27
−1
0
1
Label Numbers are Soil Boring Locations unless otherwise noted
Theoretical Quantiles

TABLE 8
SUMMARY OF SURFACE SOIL LOCATIONS ABOVE BACKGROUND
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY MAINE

Parameter	Locations in Surface Soil Above Inflection Point
ANTIMONY	TP-SB32, TP-MW05, TP-SB28, BG05
AROCLOR 1248	TP-SB120
AROCLOR 1254	TP-SB115
ARSENIC	TP-SB33,TP-SB120,TP-SB119,TP-SB19,TP-SB34,TP-SB38B
BAP HALF ND	TP-SB36,TP-SB19, TP-SB27, TP-SB15, TP-MW02, TP-SB120, TP-SB31
BAP POS	TP-SB31,TP-SB120,TP-SB15,TP-SB19,TP-SB36,TP-SB27
BARIUM	TP-SB27,TP-SB19
BENZO(A)ANTHRACENE	TP-SB27, TP-SB19,TP-SB36, TP-SB15, TP-SB120,TP-SB31
BENZO(A)PYRENE	TP-SB31, TP-SB120, TP-SB15, TP-SB27, TP-SB19,TP-SB36
BENZO(B)FLUROANTHENE	TP-SB120,TP-SB31,TP-SB15,TP-SB19,TP-SB36,TP-SB27,TP-SB37,TP-SB123
BENZO(G,H,I)PERYLENE	TP-SB120, TP-SB31, TP-MW02, TP-SB27, TP-SB19,TP-SB15, TP-SB36
BENZO(K)FLUORANTHENE	TP-SB31, TP-SB120,TP-SB15
CADMIUM	TP-SB23, TP-SB42,TP-SB32, TP-SB19,BGS-05, TP-SB27
COPPER	TP-SB32, TP-SB34,TP-SB19, TP-SB33,TP-SB23,TP-SB18
DIBENZO(A,H)ANTHRACENE	TP-SB31, TP-SB120
INDENO(1,2,3-CD)PYRENE	TP-SB31,TP-SB120, TP-SB27, TP-SB19, TP-SB15,TP-SB36
IRON	TP-SB27,TP-SB23,TP-SB19
MANGANESE	TP-SB19, TP-SB23, TP-SB25
MERCURY	TP-SB09, TP-SB34, TP-SB19
THALLIUM	TP-MW08,TP-MW09, TP-SB24,TP-SB31
VANADIUM	TP-SB23,TP-SB15,TP-SB120,TP-SB09
2,3,4,7,8-PECDF	TP-SB27
TEQ	TP-SB27

Monitoring well locations refer to the collocated soil sample location

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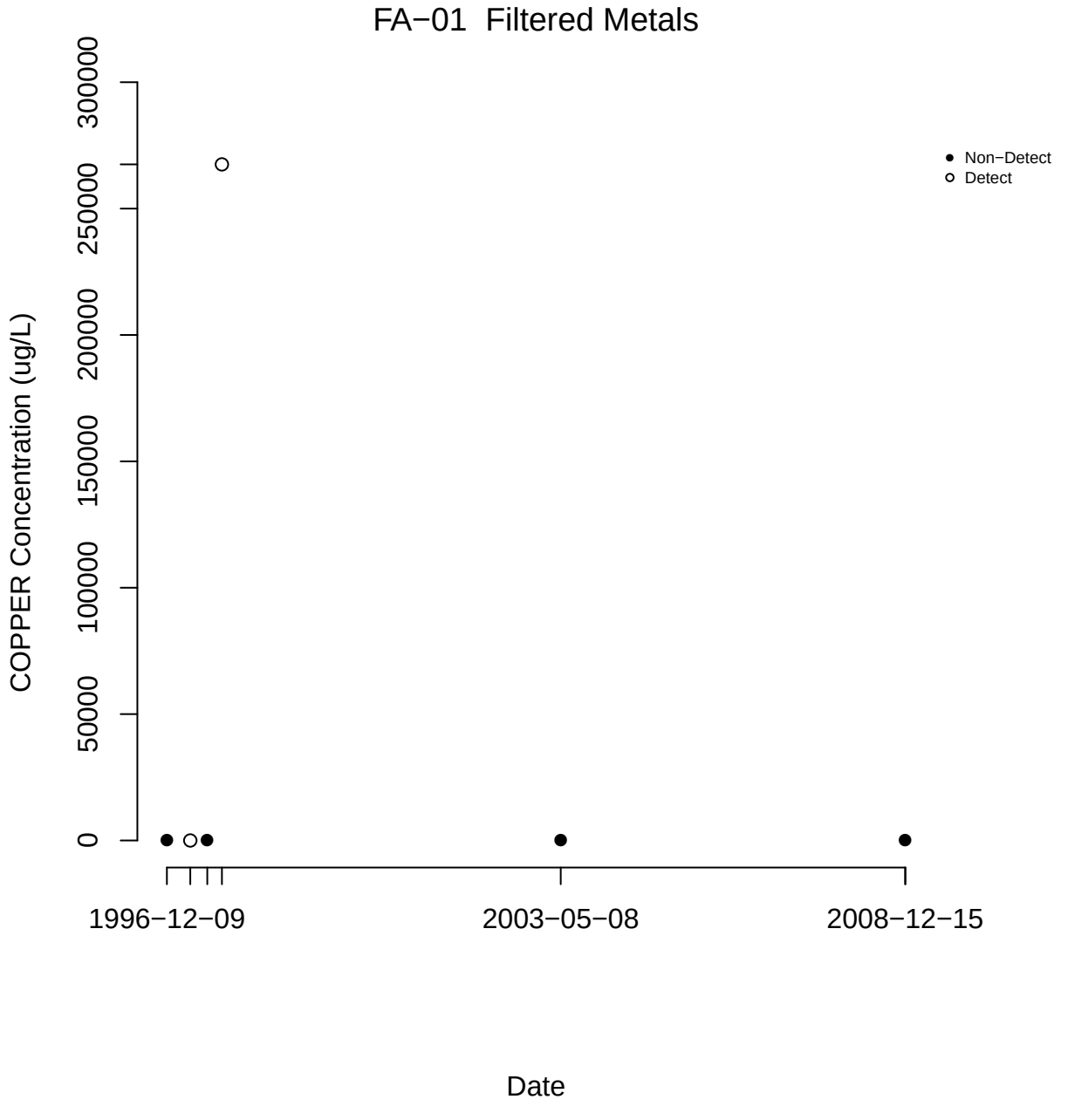
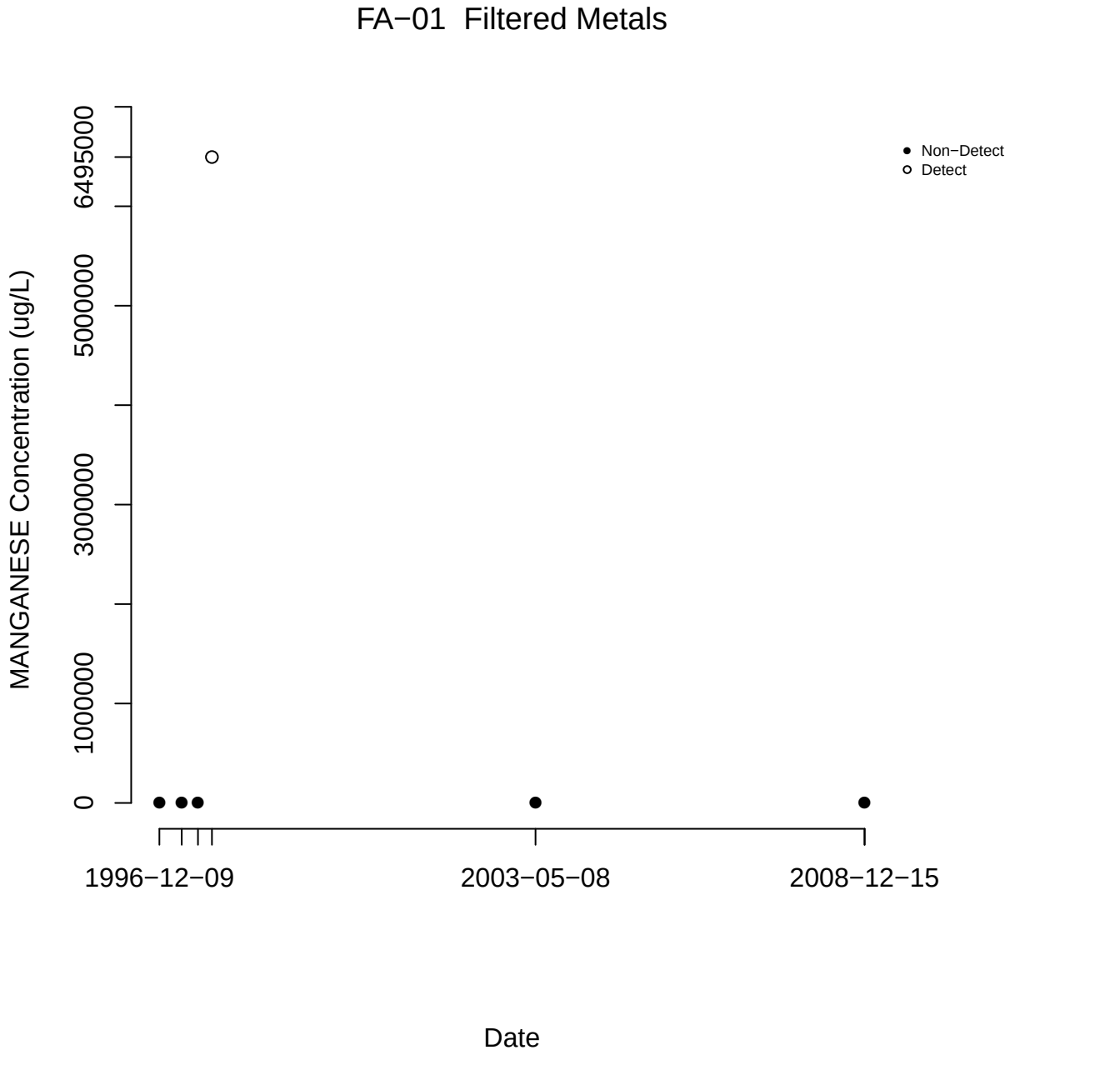
TABLE 9
SUMMARY OF SUBSURFACE SOIL LOCATIONS ABOVE BACKGROUND
OPERABLE UNIT 7 - REMEDIAL INVESTIGATION REPORT
PORTSMOUTH NAVAL SHIPYARD, KITTERY MAINE

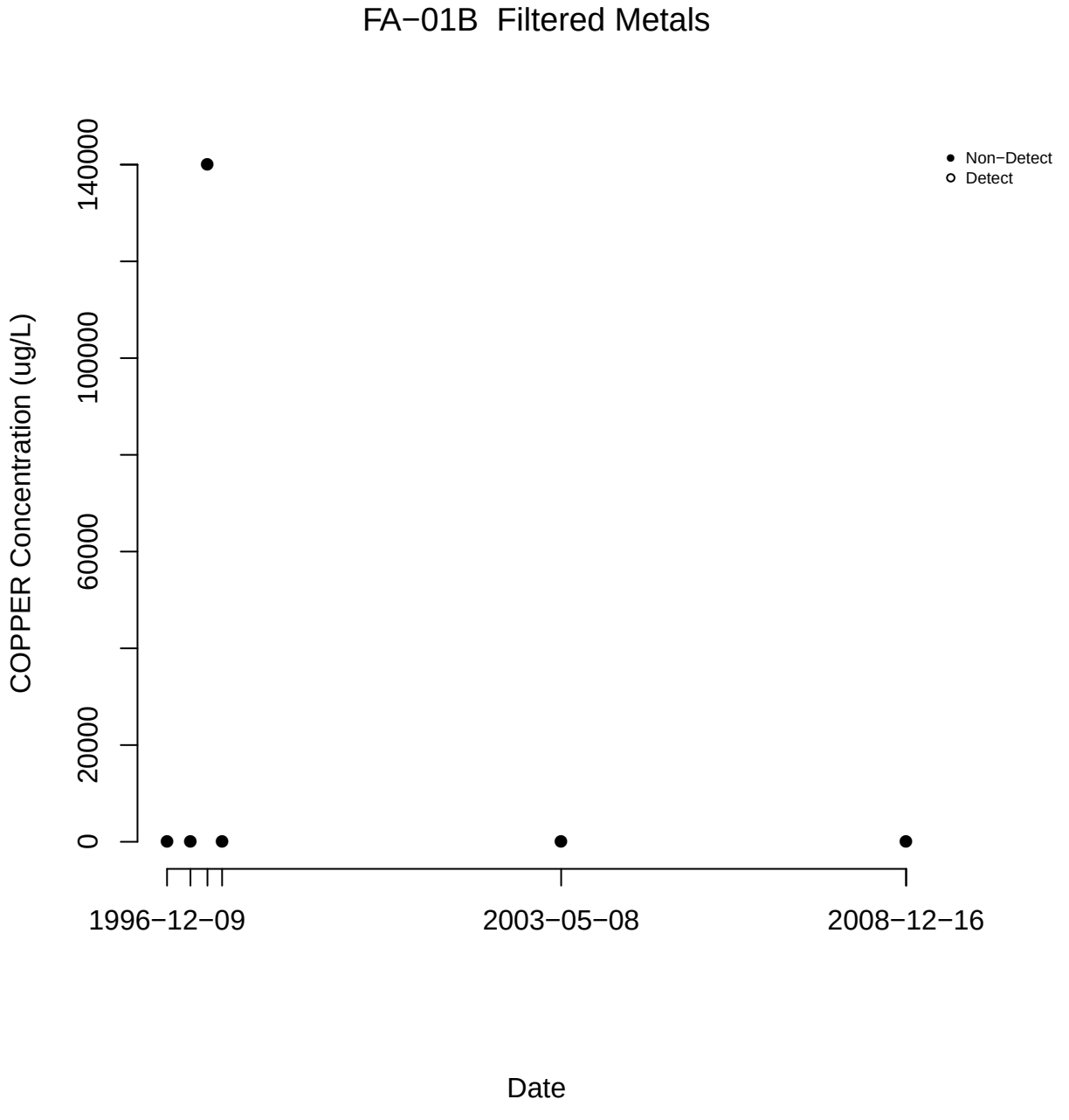
Parameter	Locations in Above Inflection Point
ANTIMONY	TP-SB24, TP-SB20B, TP-SB36,TP-SB32
AROCLOR 1248	TP-SB108
AROCLOR 1254	TP-SB114, TP-SB99
AROCLOR 1260	TP-SB14, TP-SB112
ARSENIC	TP-SB34
BAP HALF ND	TP-SB39, TP-SB14, TP-TP-MW05, TP-SB36,TP-SB31,TP-SB18
BAP POS	TP-SB39, TP-SB14, TP-TP-MW05, TP-SB36, TP-SB31, TP-SB18
BARIUM	TP-SB37, TP-SB36, TP-SB33B, TP-SB27, TP-SB37, TP-SB33, TP-SB40
BENZO(A)ANTHRACENE	TP-SB39, TP-SB36, TP-SB33B, TP-SB27, TP-SB37, TP-SB33, TP-SB40
BENZO(A)PYRENE	TP-SB39,TP-SB14,TP-SB36,TP-MW05,TP-SB31,TP-SB18
BENZO(B)FLUROANTHENE	TP-SB39,TP-MW05, TP-SB36, TP-SB18,TP-SB31
BENZO(G,H,I)PERYLENE	TP-SB39, TP-MW05, TP-SB31,TP-SB36
BENZO(K)FLUORANTHENE	TP-SB39,TP-SB31,TP-MW05, TP-SB36
CADMIUM	TP-SB37, TP-SB35,40,TP-SB36, 20B, TP-SB35
CHROMIUM	TP-SB35,TP-MW09
COBALT	TP-SB35,TP-SB15
COPPER	TP-SB19,TP-SB35,TP-SB36
DIBENZO(A,H)ANTHRACENE	TP-MW05, TP-SB39
INDENO(1,2,3-CD)PYRENE	TP-SB39,TP-MW05, TP-SB31, TP-SB14, TP-SB36, TP-SB18, TP-SB35
IRON	TP-SB23
LEAD	TP-SB24,TP-SB37
MERCURY	TP-SB37, TP-SB14
NICKEL	TP-SB35, TP-MW09, TP-SB14,TP-SB23
THALLIUM	TP-MW09, TP-SB24
VANADIUM	TP-SB23, MW-01, TP-SB35,TP-SB23
ZINC	TP-SB19,TP-SB35,TP-SB37,TP-SB36, TP-SB14,TP-SB37
DIELDRIN	TP-SB14,TP-SB27
1,2,3,4,6,7,8-HPCDF	TP-SB27

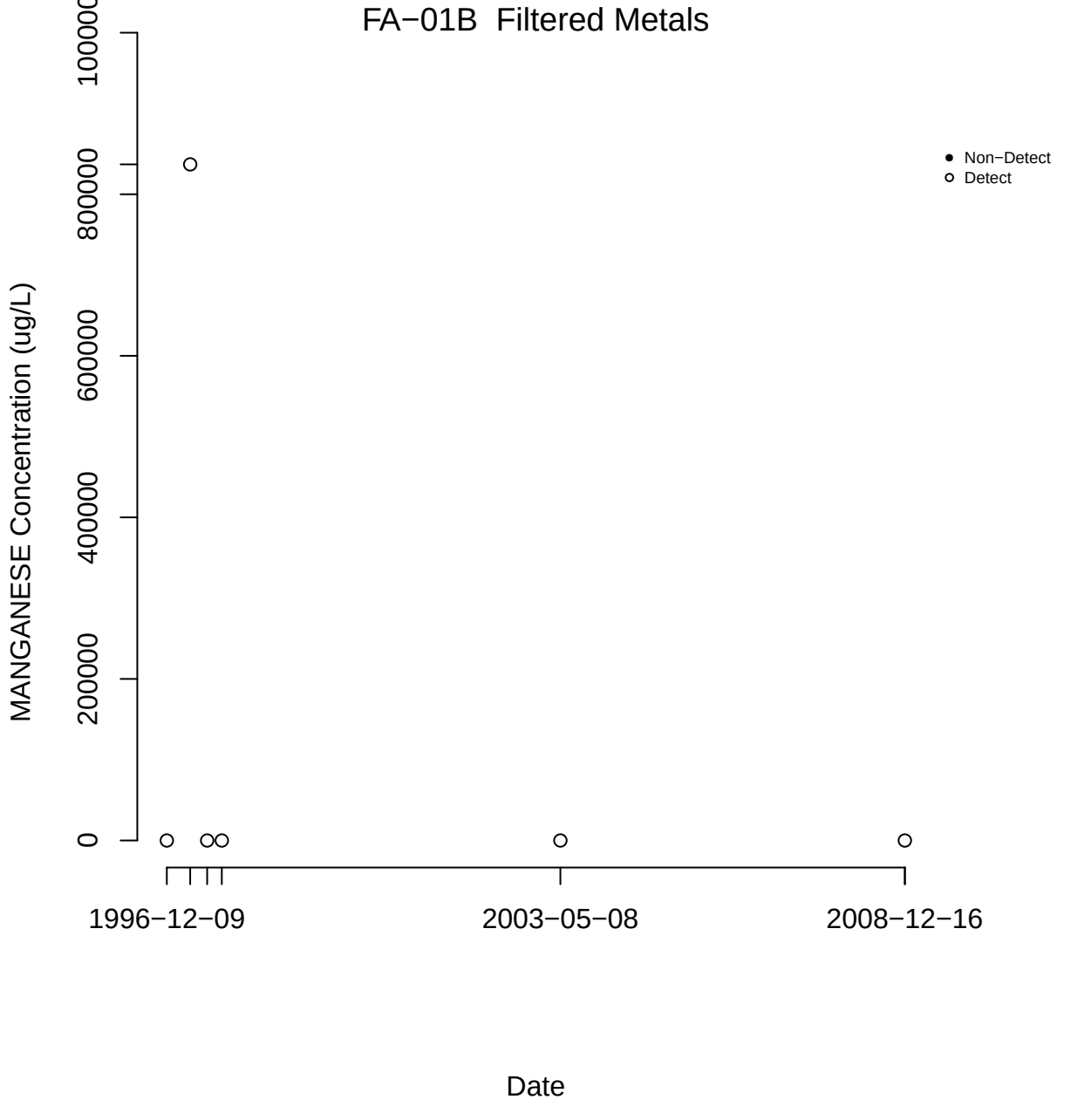
Monitoring well locations refer to the collocated soil sample location

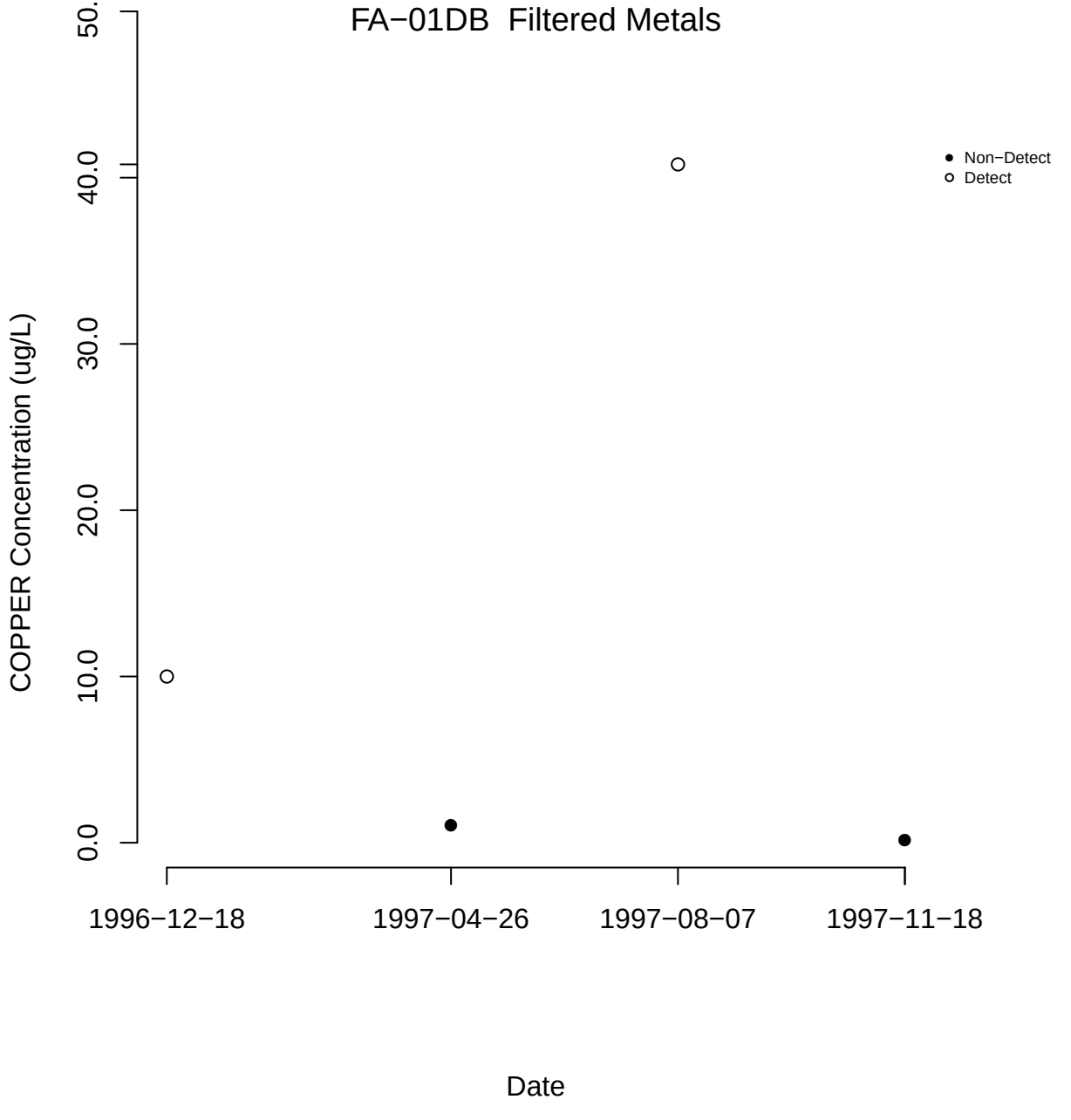
B.3 TREND TESTS

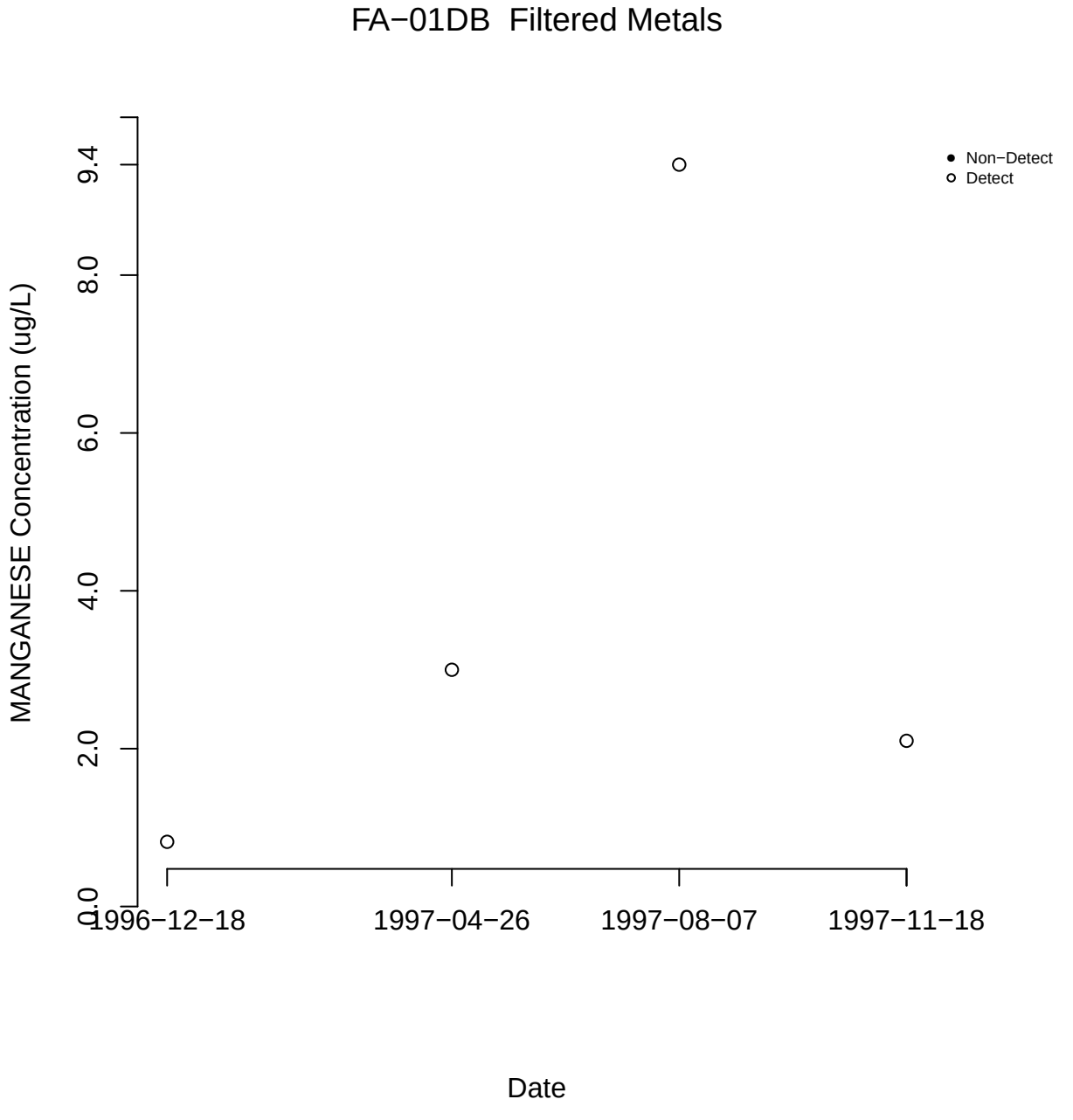

FA−01 Filtered Metals
COPPER Concentration (ug/L)
0
50000
100000
150000
200000
250000
300000
Non−Detect
Detect
1996−12−09
2003−05−08
2008−12−15
Date

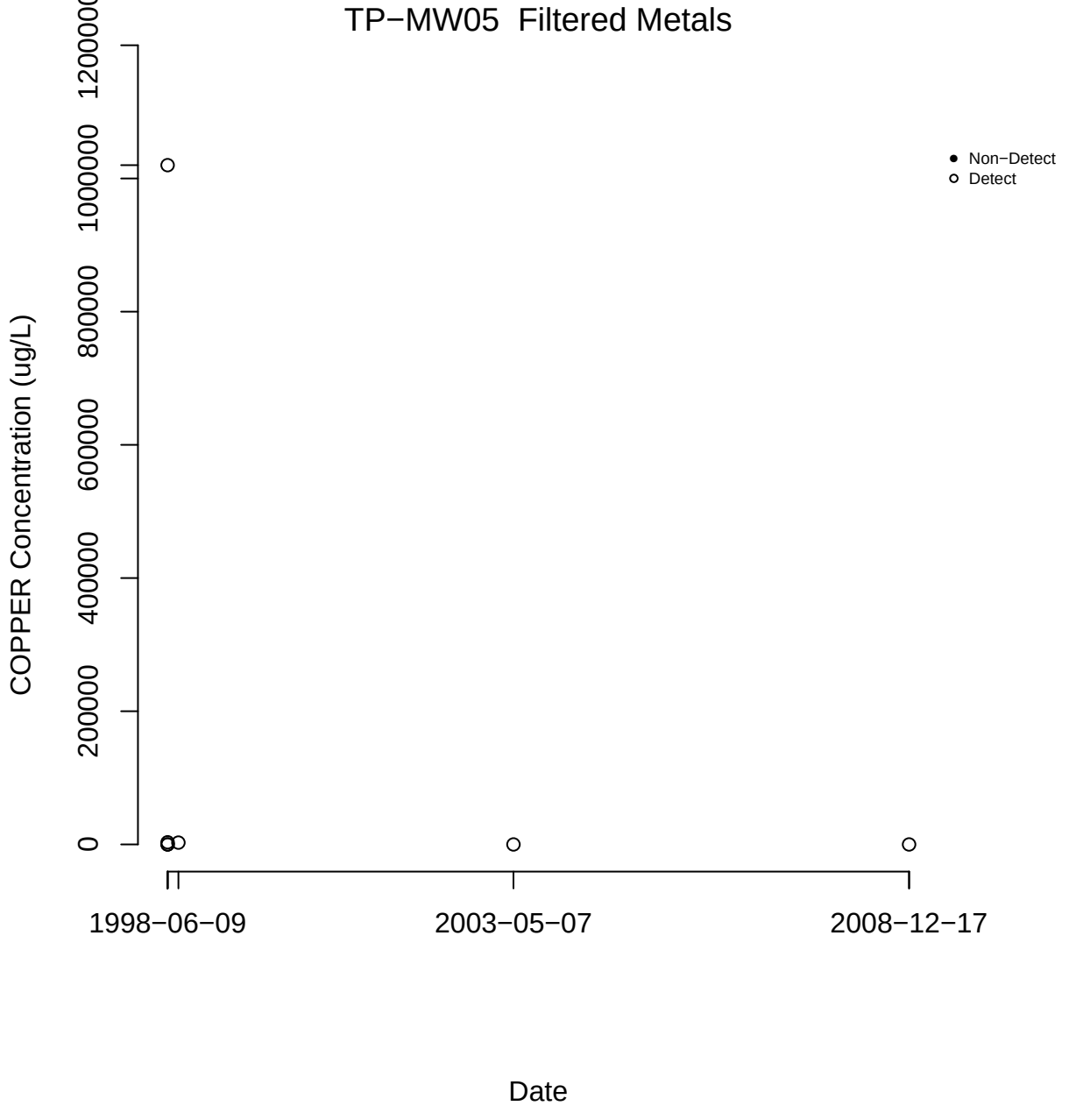

FA−01 Filtered Metals
MANGANESE Concentration (ug/L)
0
1000000
3000000
5000000
6495000
Non−Detect
Detect
1996−12−09
2003−05−08
2008−12−15
Date

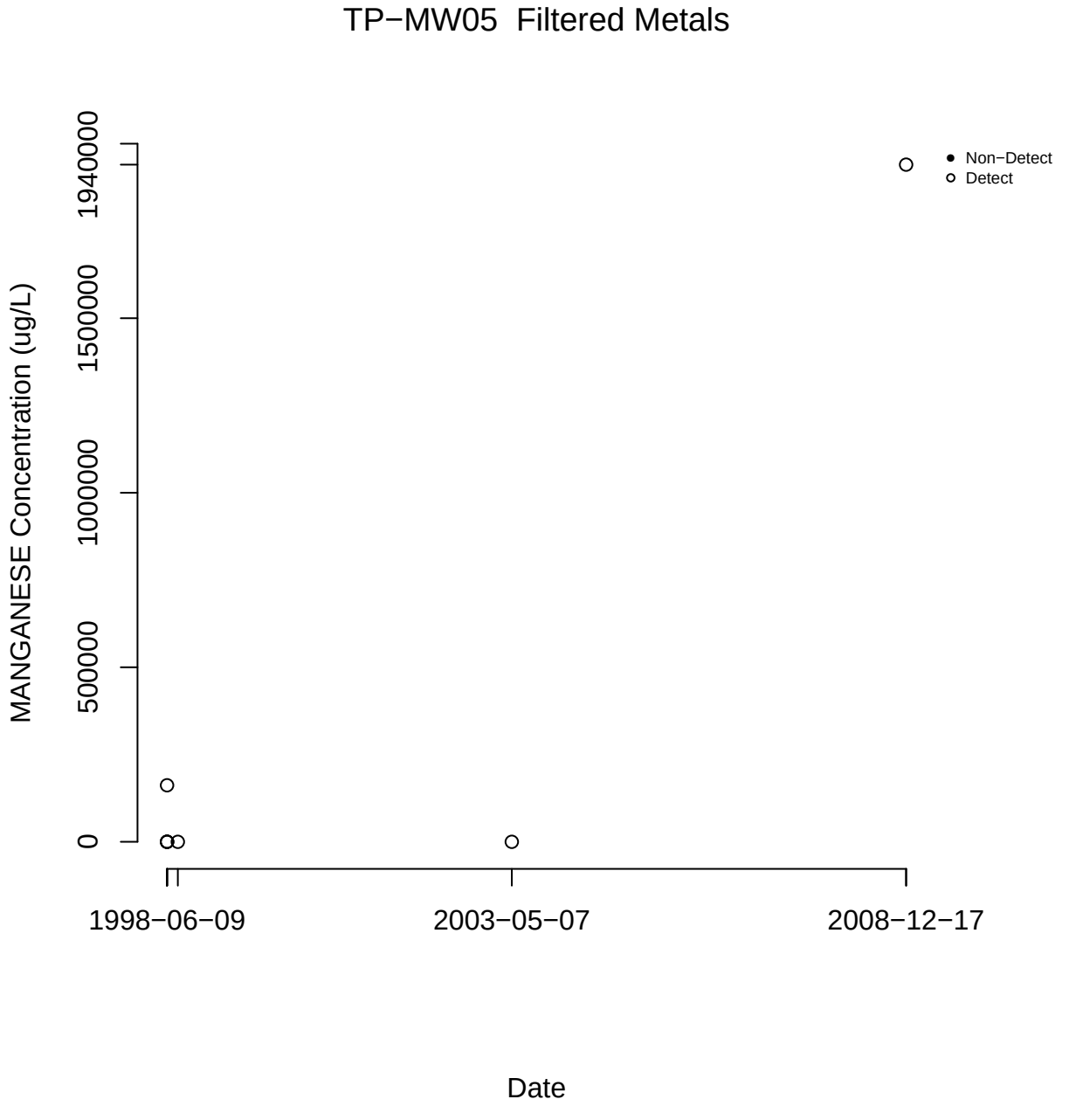

FA−01B Filtered Metals
COPPER Concentration (ug/L)
0
20000
60000
100000
140000
Non−Detect
Detect
1996−12−09
2003−05−08
2008−12−16
Date

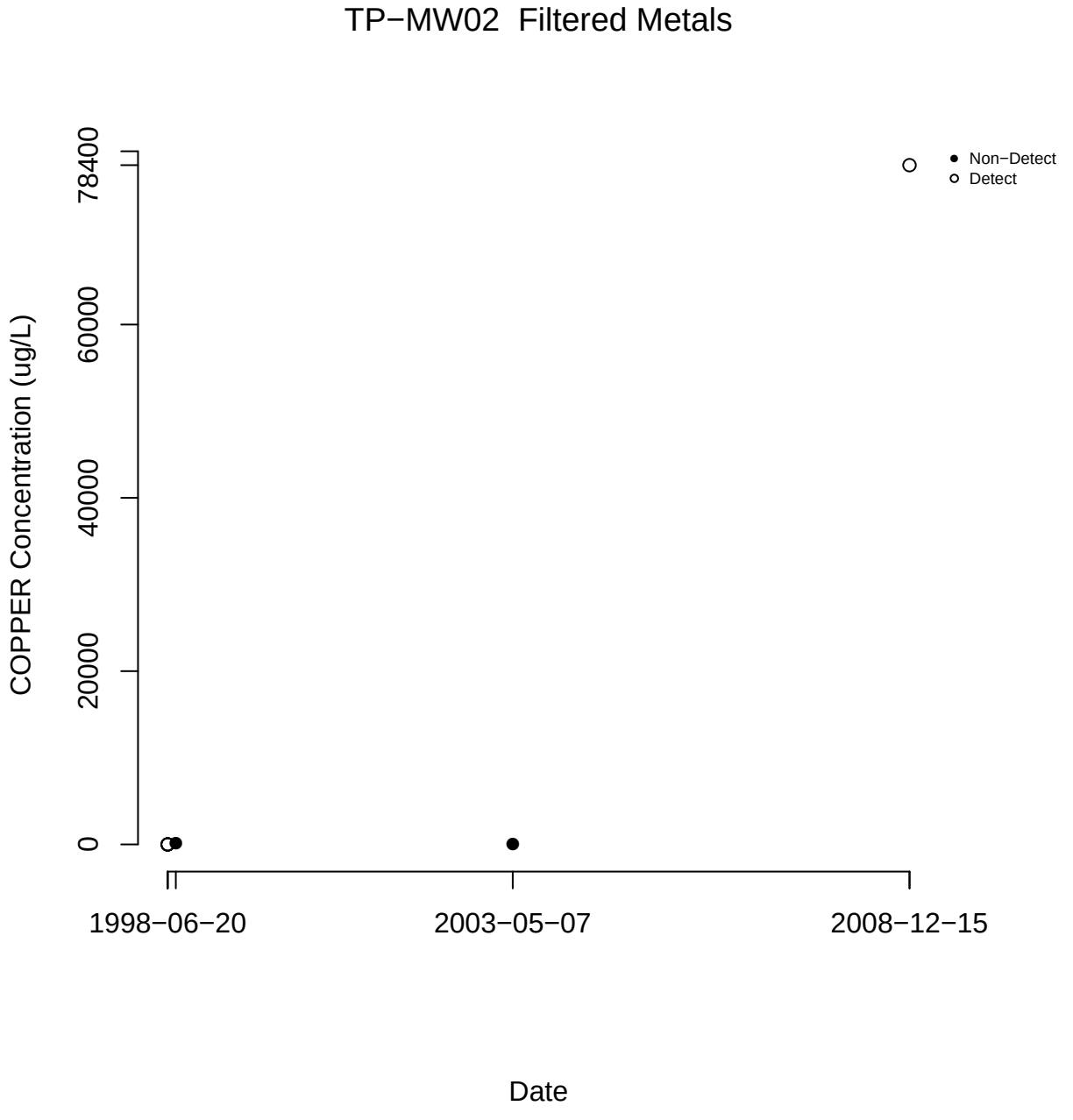

FA−01B Filtered Metals
MANGANESE Concentration (ug/L)
0
200000
400000
600000
800000
1000000
Non−Detect
Detect
1996−12−09
2003−05−08
2008−12−16
Date

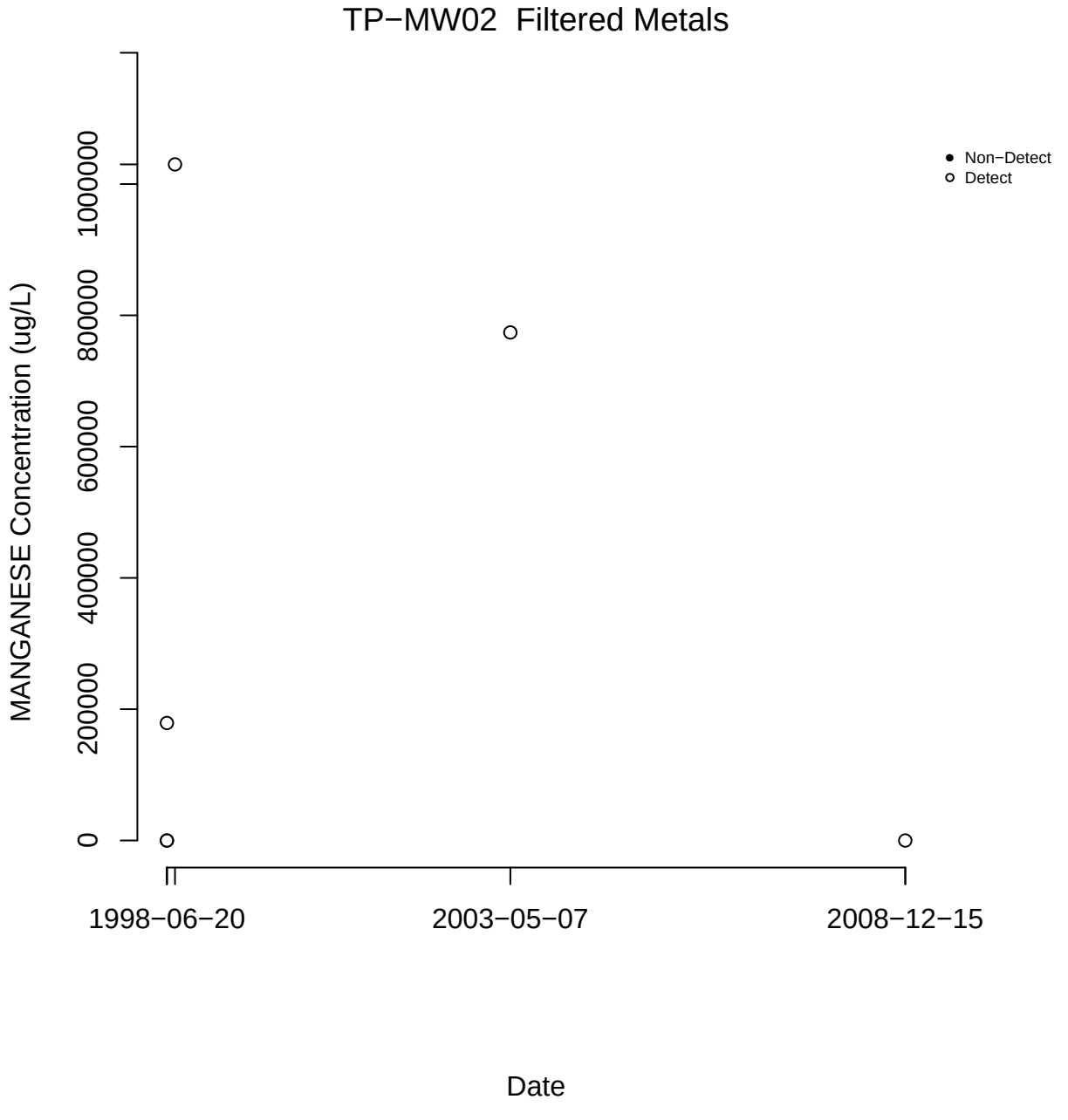

FA−01DB Filtered Metals
COPPER Concentration (ug/L)
0.0
10.0
20.0
30.0
40.0
50.
Non−Detect
Detect
1996−12−18
1997−04−26
1997−08−07
1997−11−18
Date

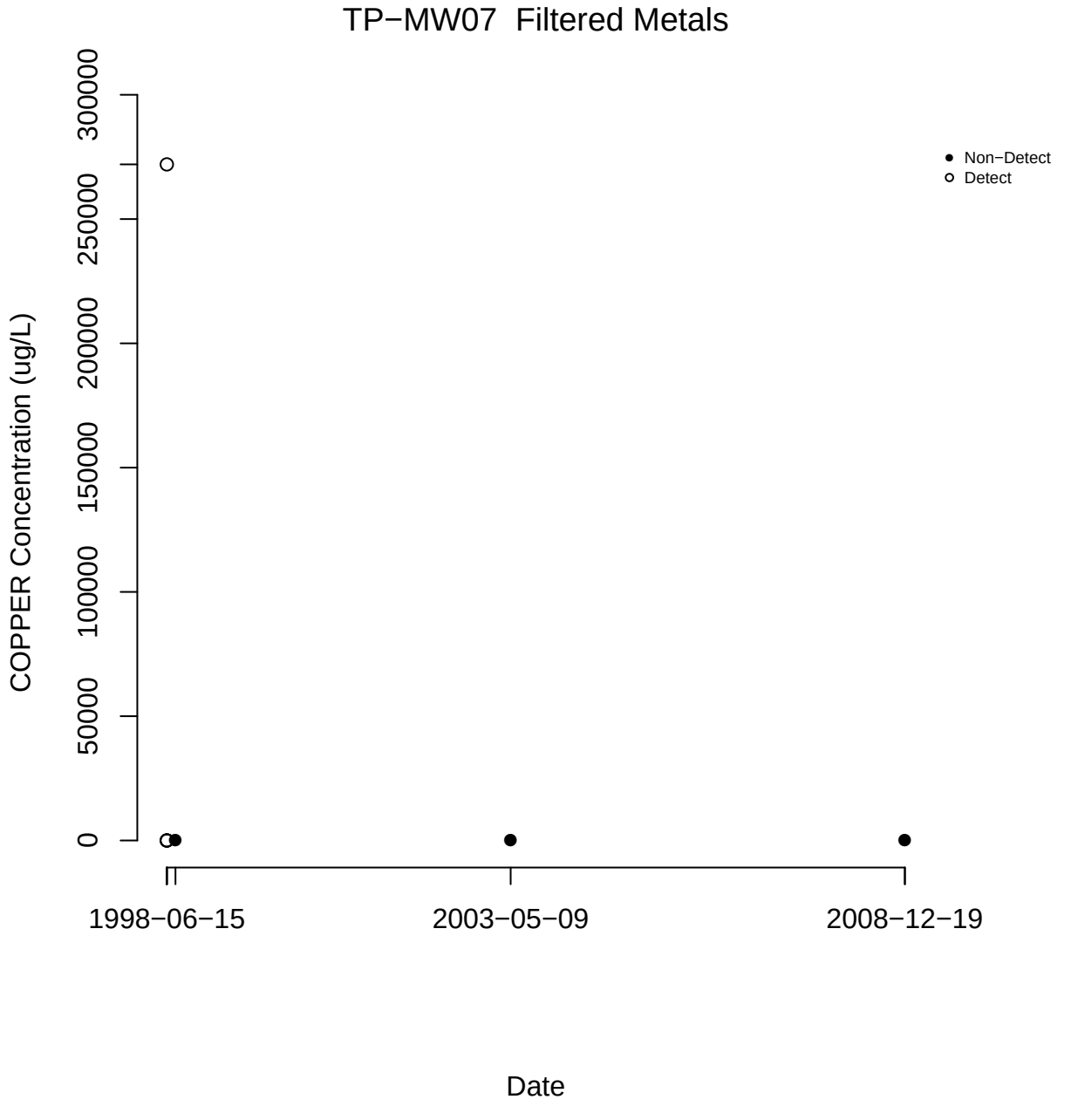

FA−01DB Filtered Metals
MANGANESE Concentration (ug/L)
0.0
2.0
4.0
6.0
8.0
9.4
Non−Detect
Detect
1996−12−18
1997−04−26
1997−08−07
1997−11−18
Date

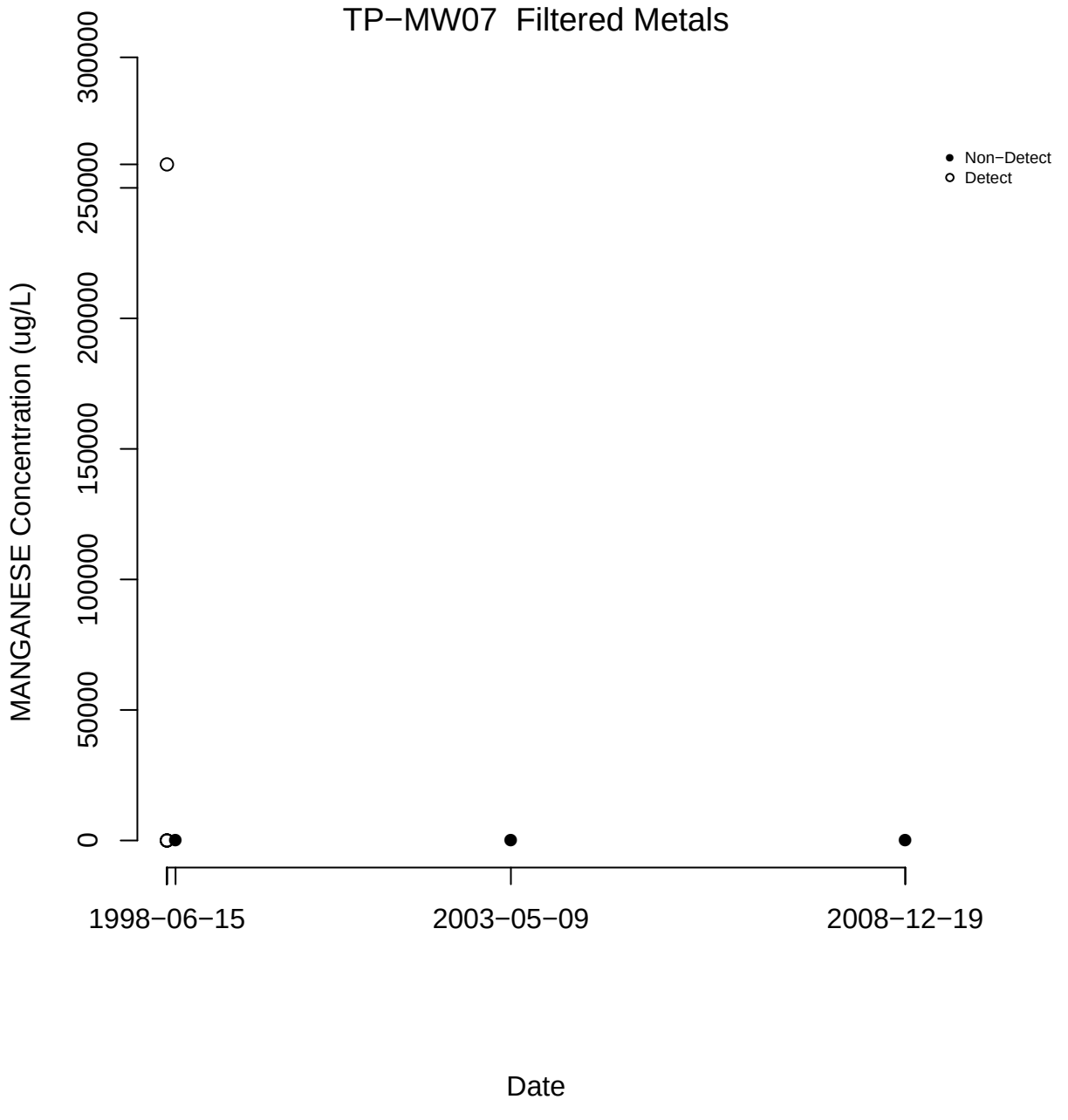

TP−MW05 Filtered Metals
COPPER Concentration (ug/L)
0
200000
400000
600000
800000
1000000
1200000
Non−Detect
Detect
1998−06−09
2003−05−07
2008−12−17
Date

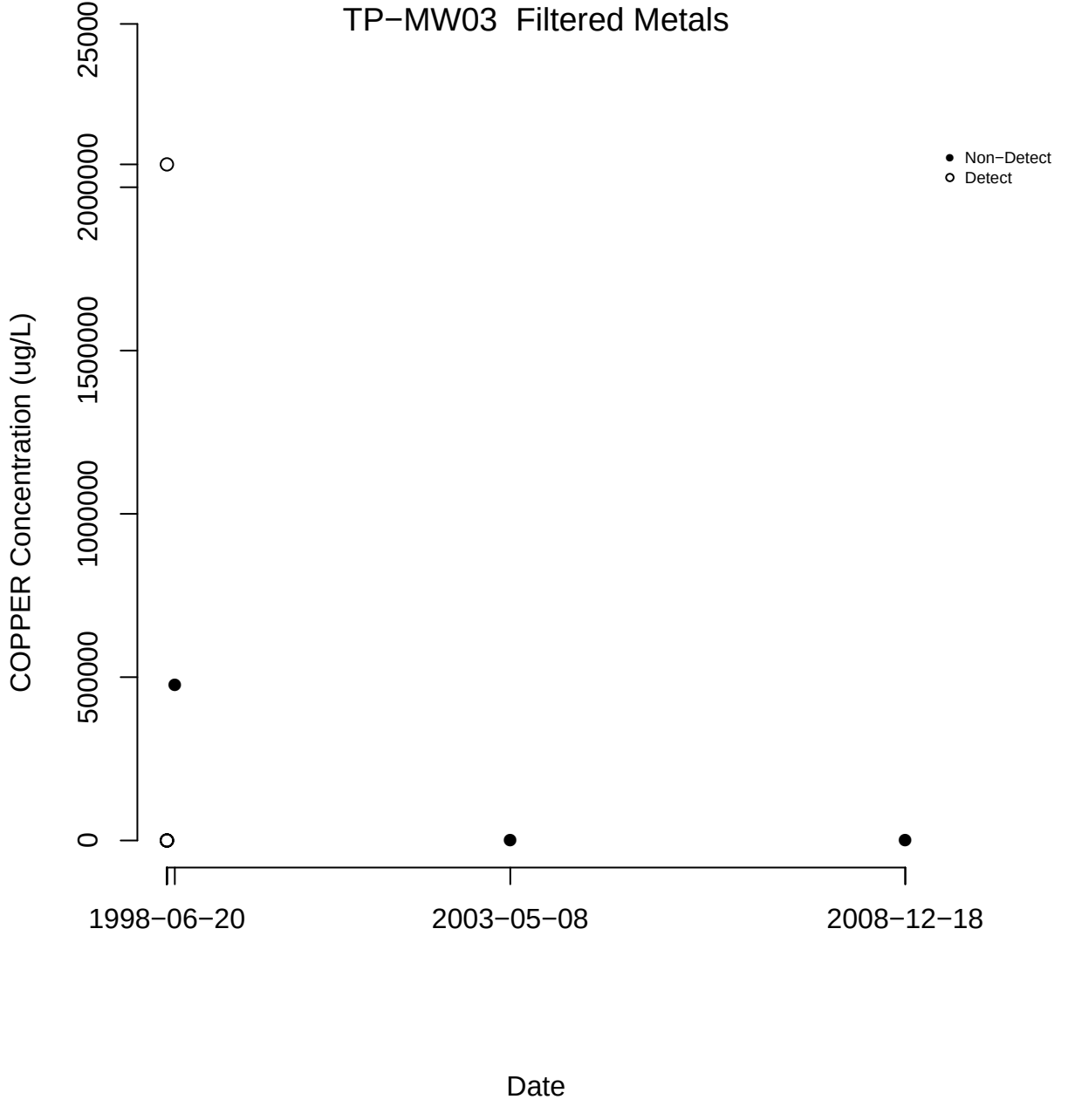

TP−MW05 Filtered Metals
MANGANESE Concentration (ug/L)
0
500000
1000000
1500000
1940000
Non−Detect
Detect
1998−06−09
2003−05−07
2008−12−17
Date

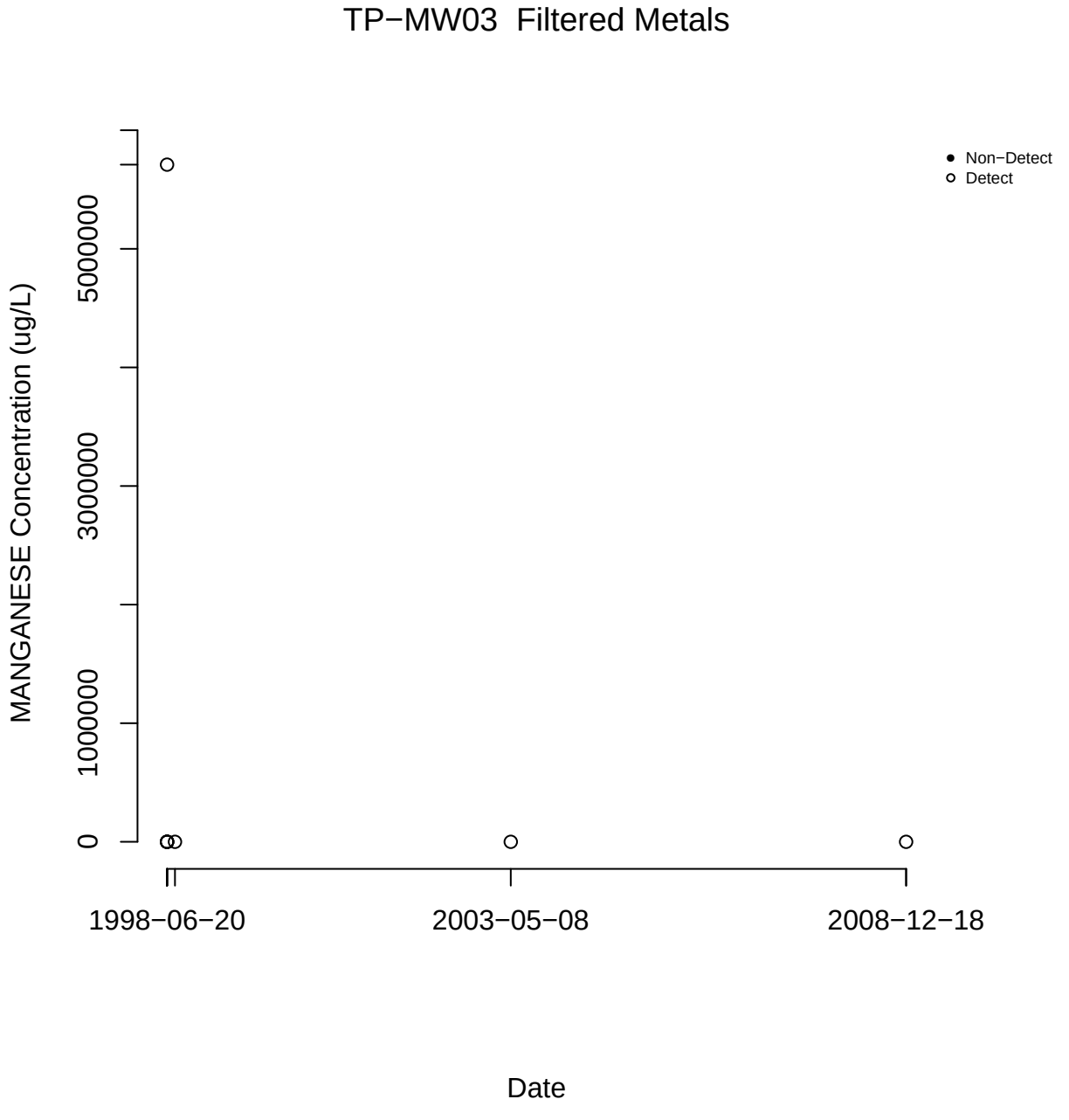

TP−MW02 Filtered Metals
COPPER Concentration (ug/L)
0
20000
40000
60000
78400
Non−Detect
Detect
1998−06−20
2003−05−07
2008−12−15
Date

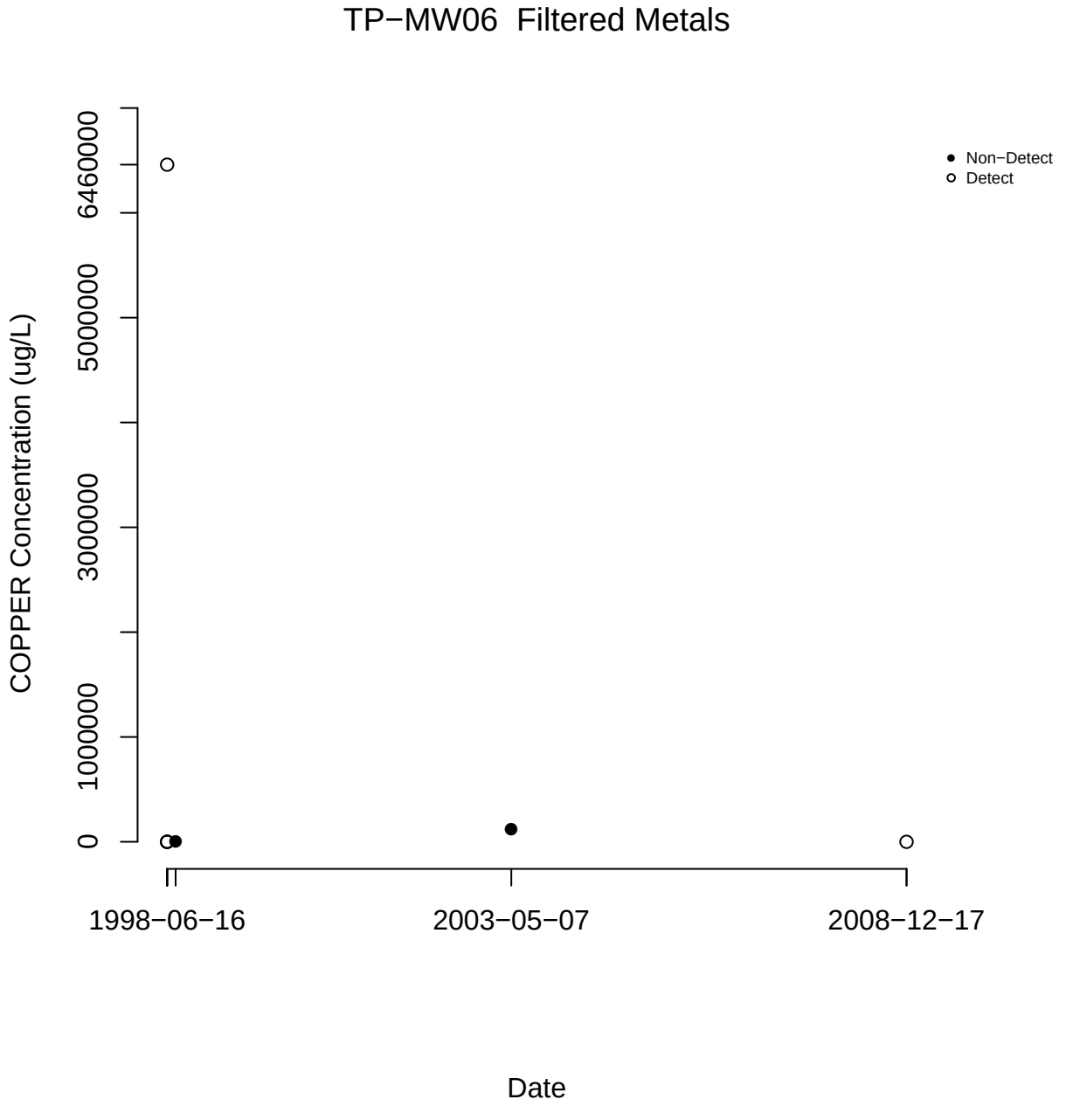

TP−MW02 Filtered Metals
MANGANESE Concentration (ug/L)
0
200000
400000
600000
800000
1000000
Non−Detect
Detect
1998−06−20
2003−05−07
2008−12−15
Date

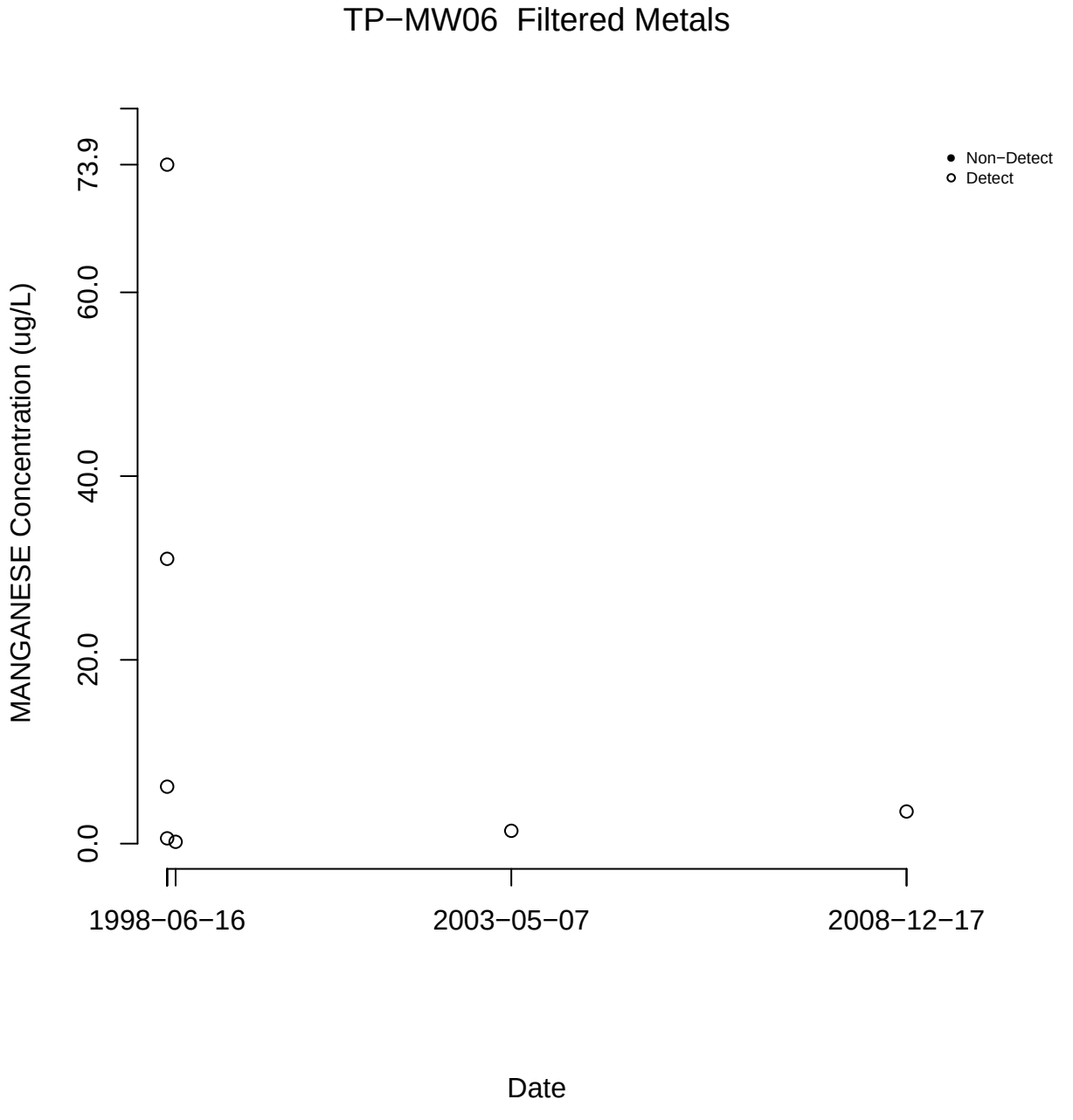

TP−MW07 Filtered Metals
COPPER Concentration (ug/L)
0
50000
100000
150000
200000
250000
300000
Non−Detect
Detect
1998−06−15
2003−05−09
2008−12−19
Date

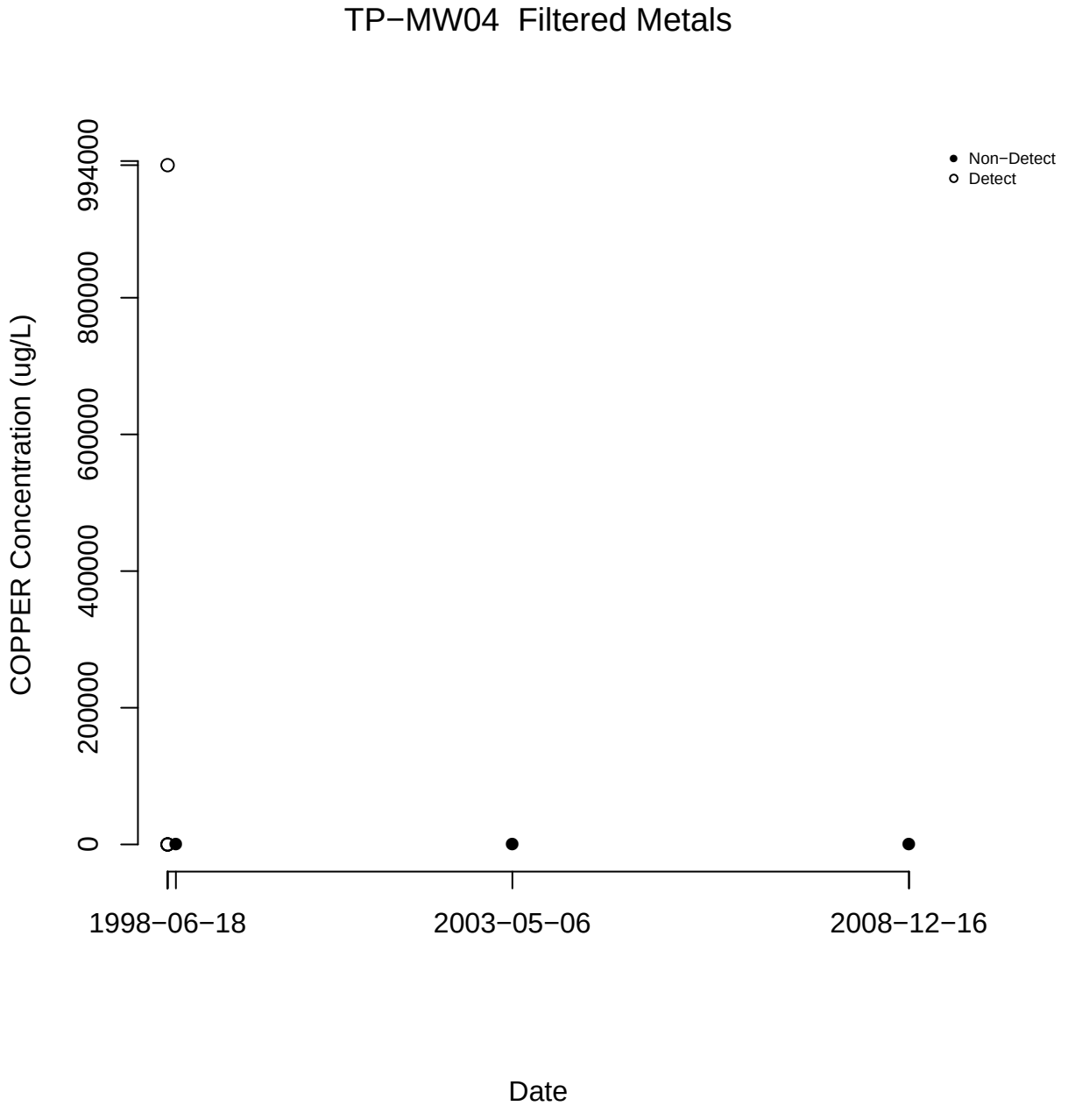

TP−MW07 Filtered Metals
MANGANESE Concentration (ug/L)
0
50000
100000
150000
200000
250000
300000
Non−Detect
Detect
1998−06−15
2003−05−09
2008−12−19
Date

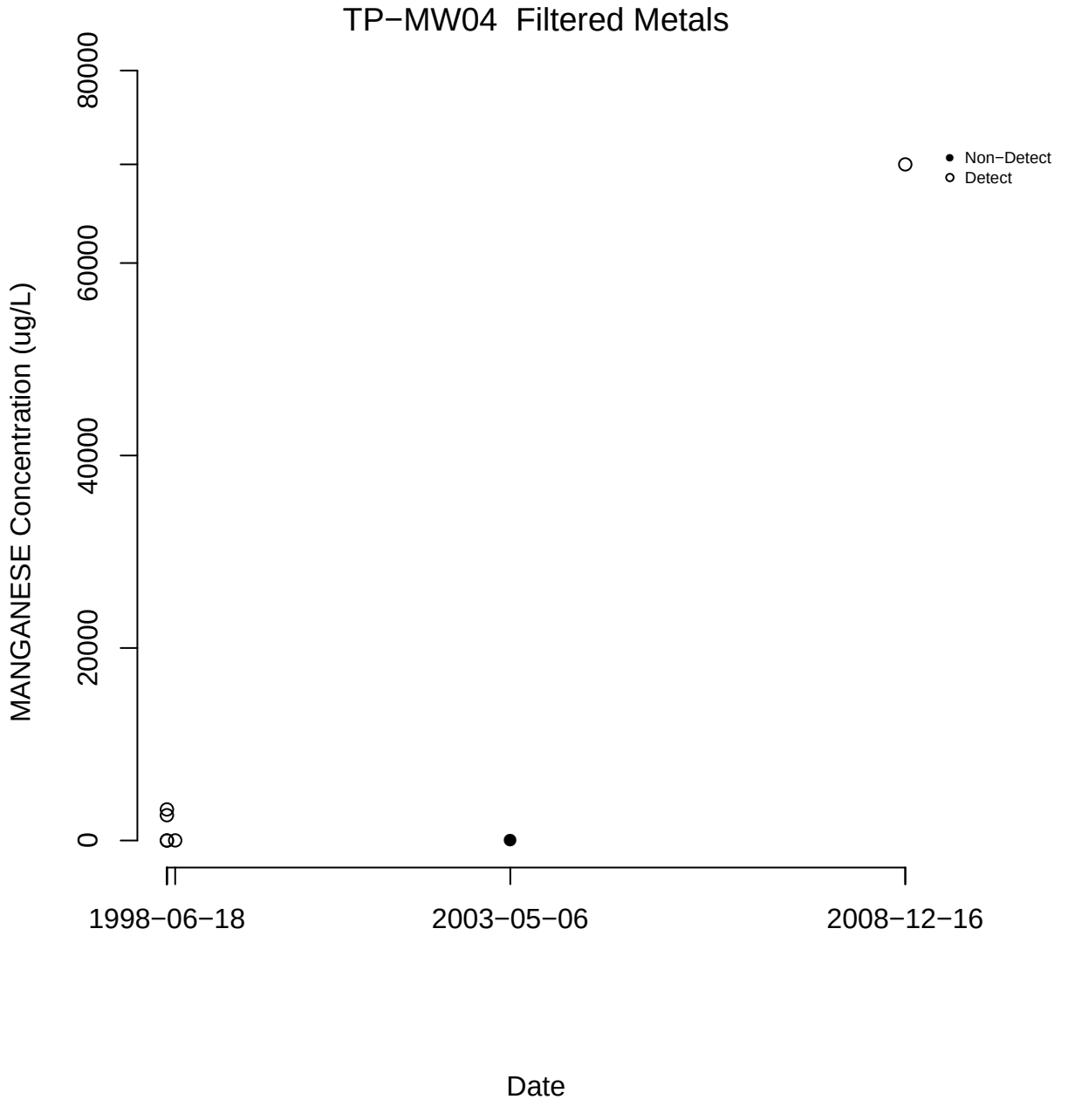

TP−MW03 Filtered Metals
COPPER Concentration (ug/L)
0
500000
1000000
1500000
2000000
2500000
Non−Detect
Detect
1998−06−20
2003−05−08
2008−12−18
Date

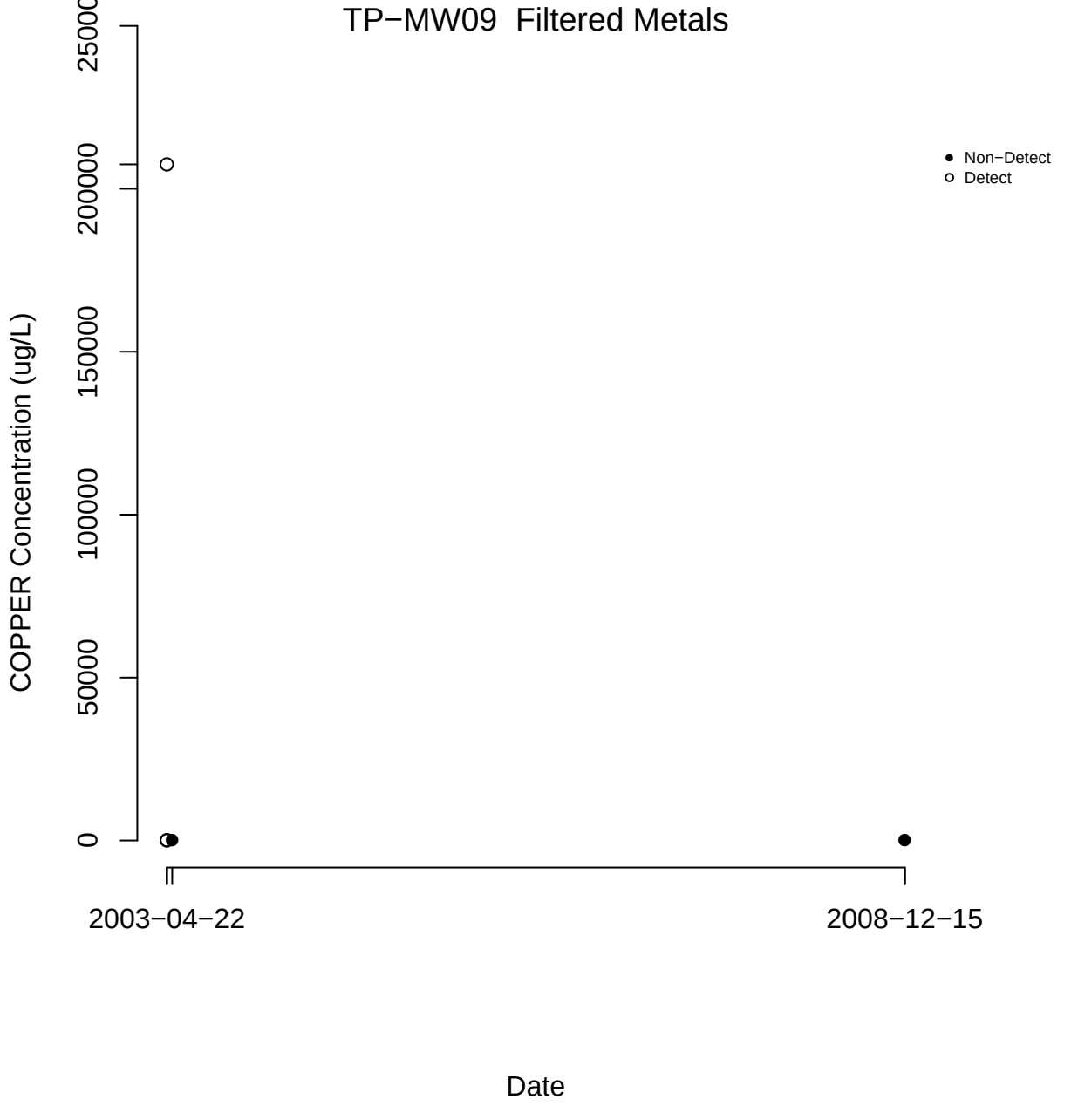

TP−MW03 Filtered Metals
Non−Detect
Detect
MANGANESE Concentration (ug/L)
0
1000000
3000000
5000000
1998−06−20
2003−05−08
2008−12−18
Date

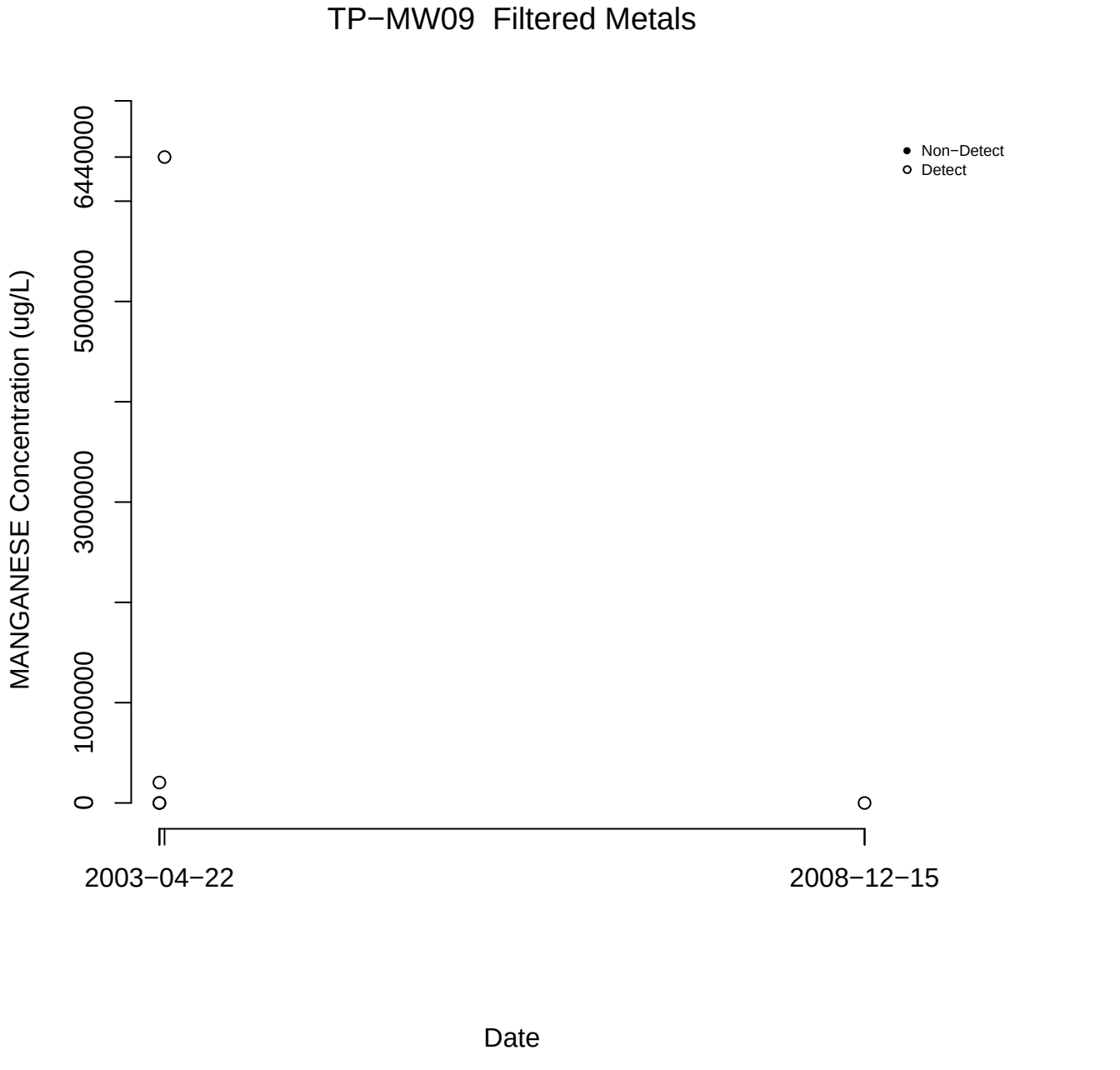

TP−MW06 Filtered Metals
COPPER Concentration (ug/L)
0
1000000
3000000
5000000
6460000
Non−Detect
Detect
1998−06−16
2003−05−07
2008−12−17
Date

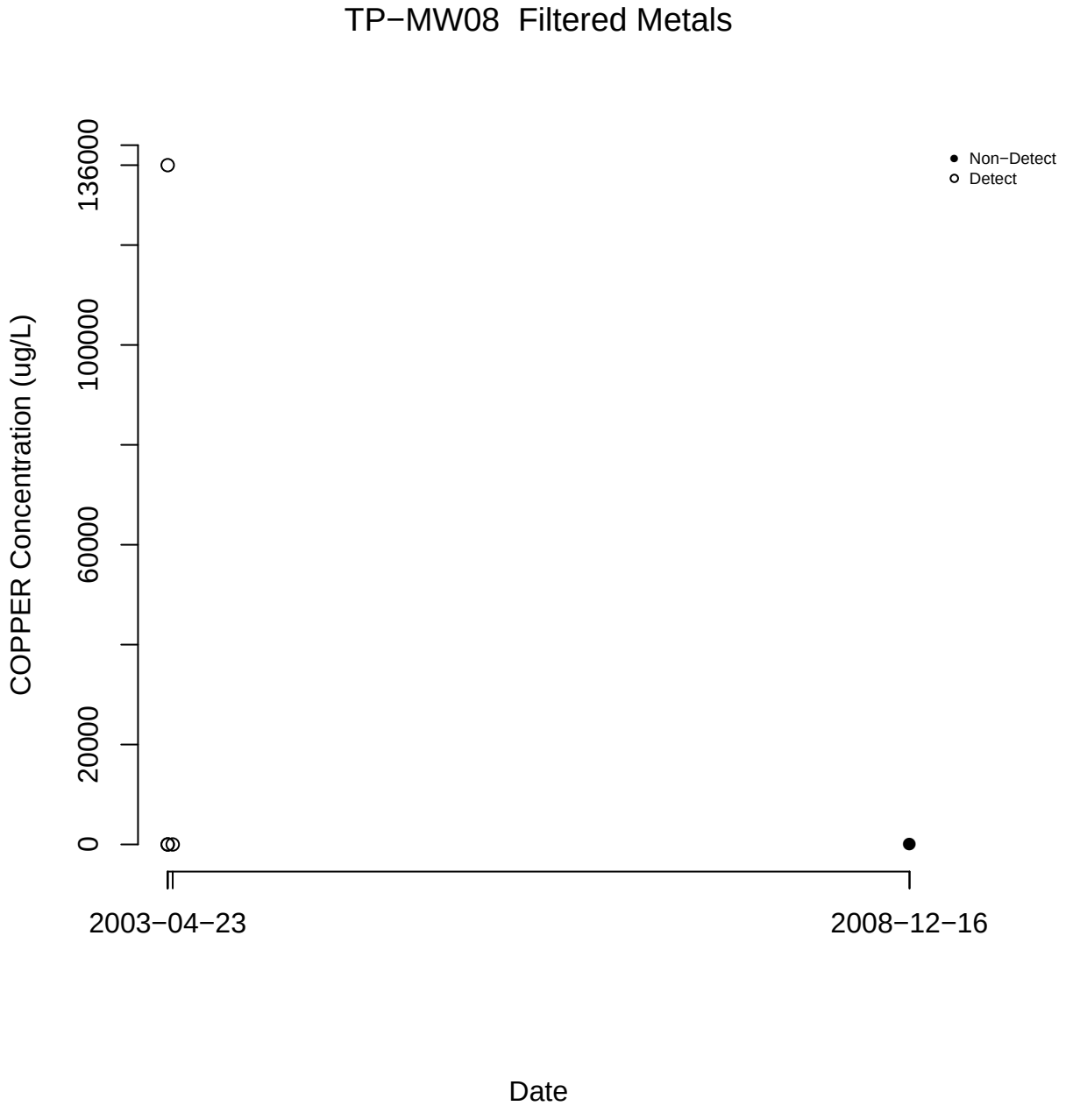

TP−MW06 Filtered Metals
MANGANESE Concentration (ug/L)
0.0
20.0
40.0
60.0
73.9
Non−Detect
Detect
1998−06−16
2003−05−07
2008−12−17
Date

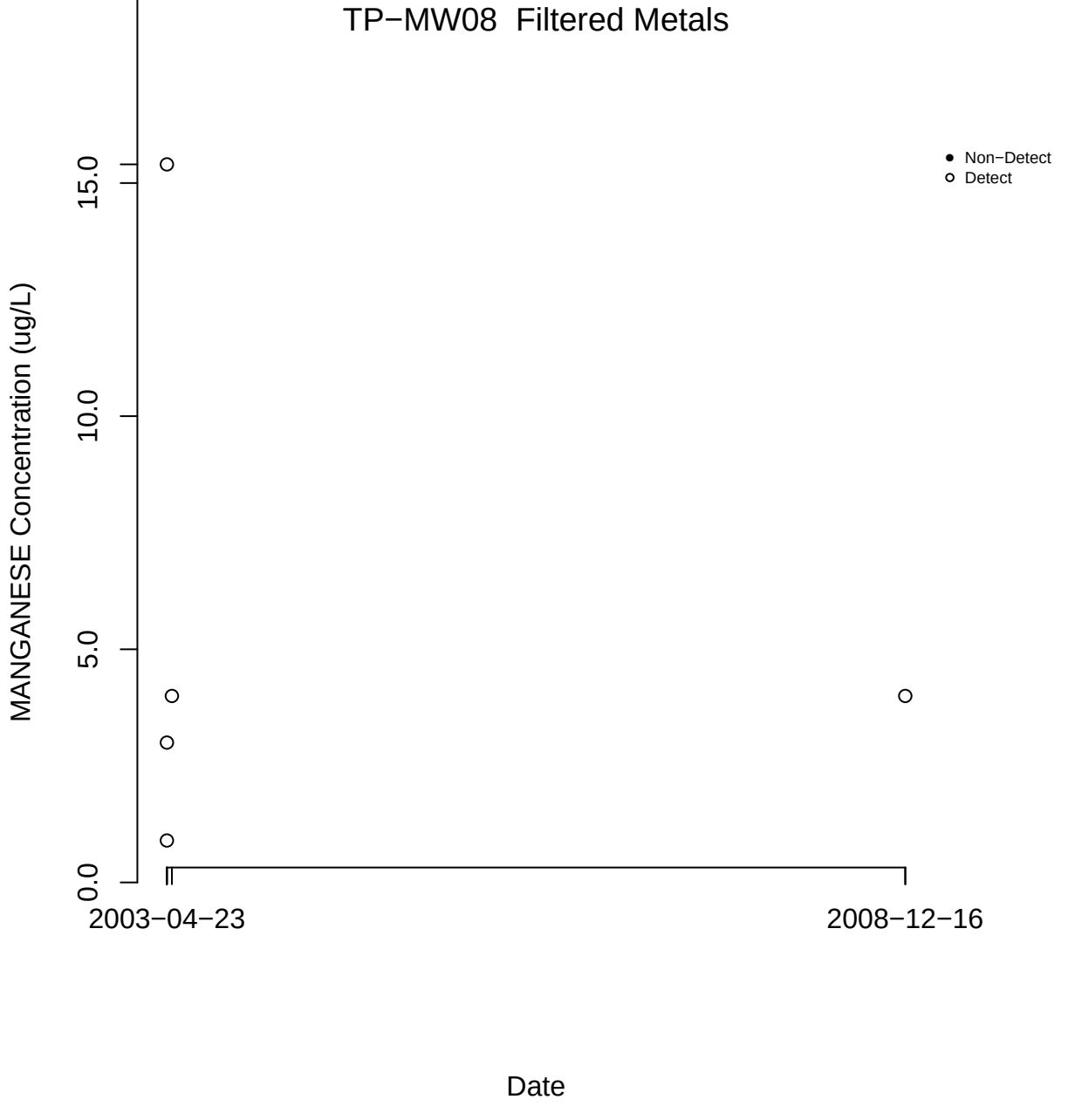

TP−MW04 Filtered Metals
COPPER Concentration (ug/L)
0
200000
400000
600000
800000
994000
Non−Detect
Detect
1998−06−18
2003−05−06
2008−12−16
Date

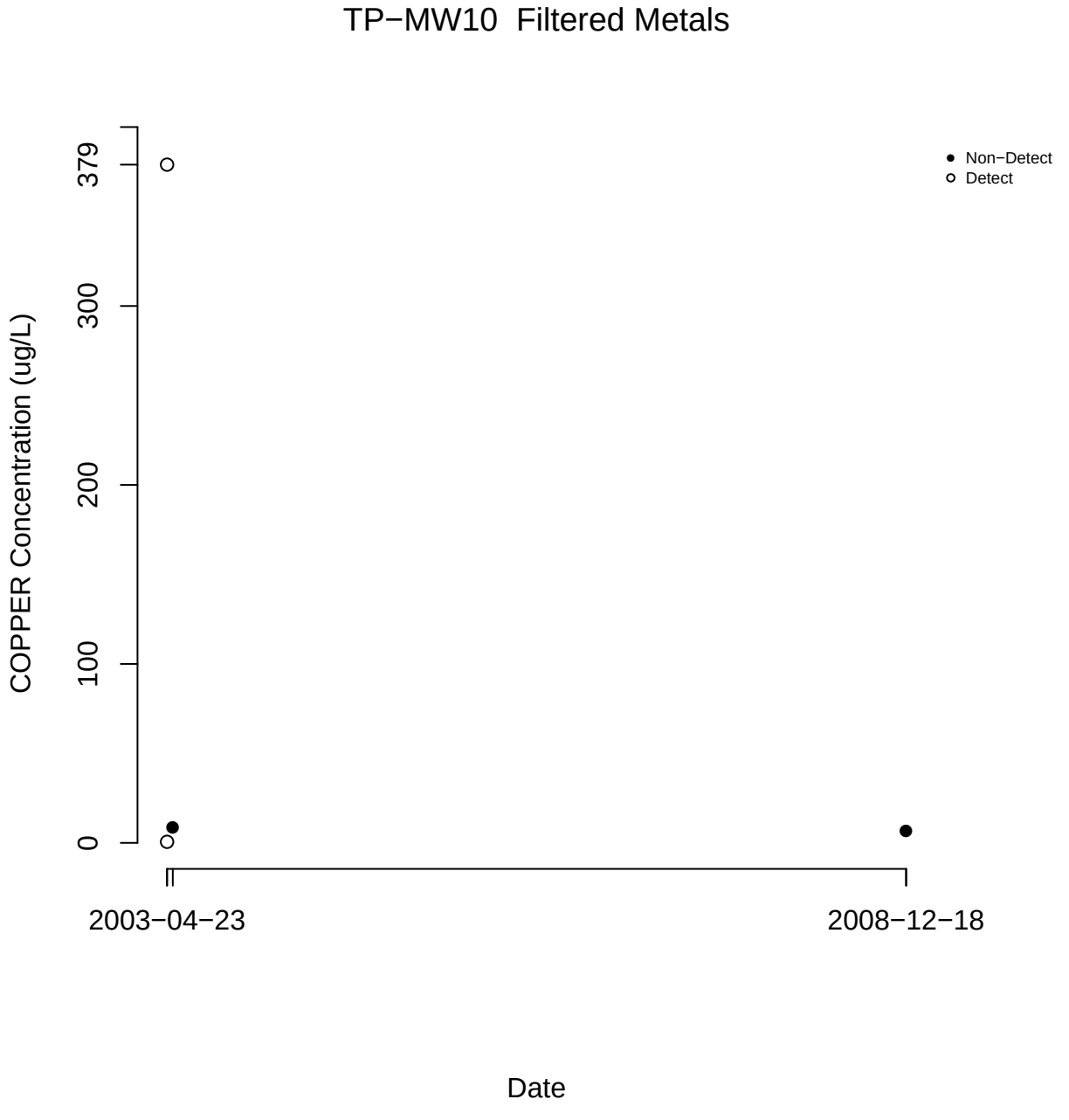

TP−MW04 Filtered Metals
MANGANESE Concentration (ug/L)
0
20000
40000
60000
80000
Non−Detect
Detect
1998−06−18
2003−05−06
2008−12−16
Date

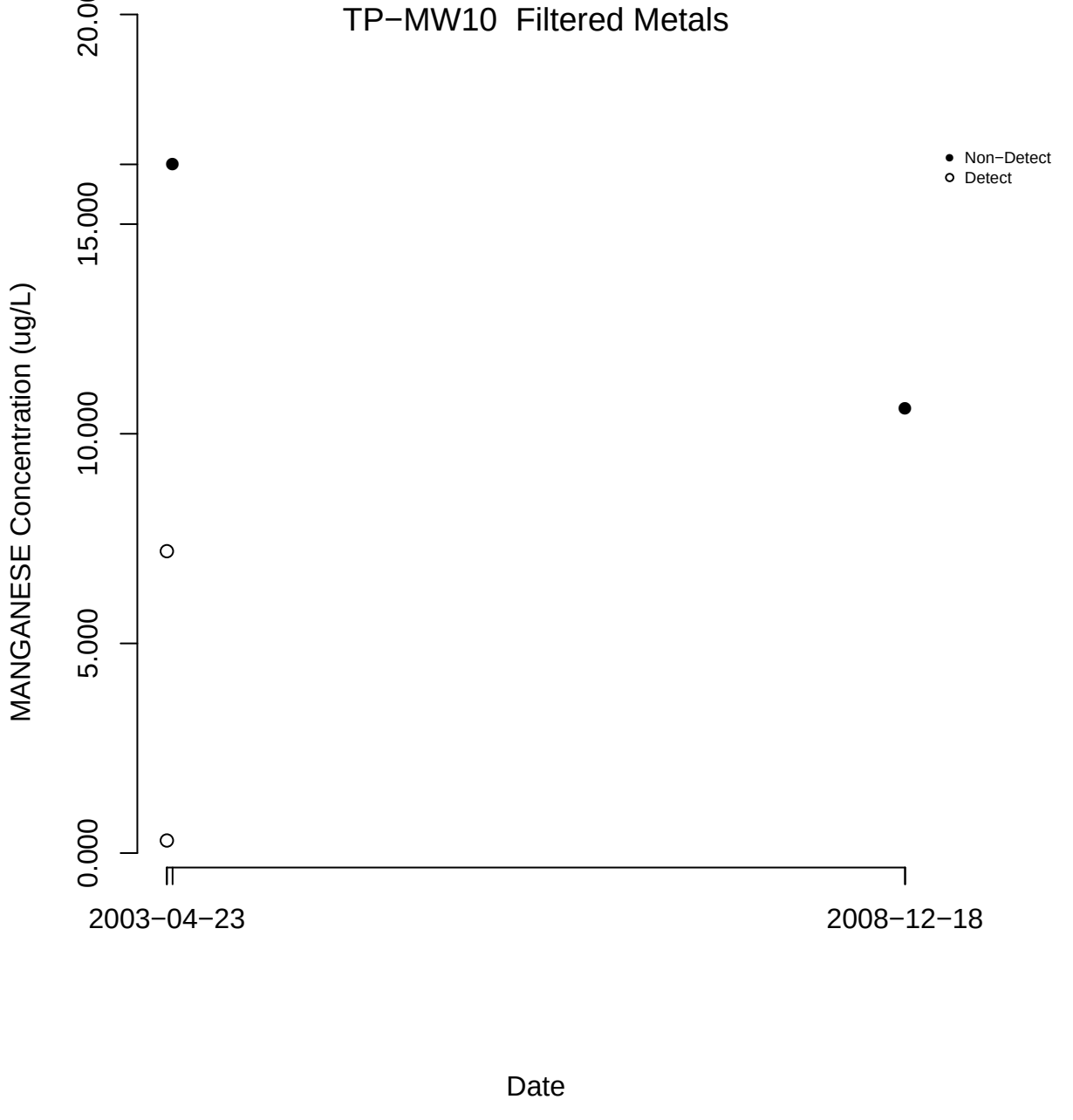

TP−MW09 Filtered Metals
COPPER Concentration (ug/L)
0
50000
100000
150000
200000
250000
Non−Detect
Detect
2003−04−22
2008−12−15
Date


TP−MW09 Filtered Metals
MANGANESE Concentration (ug/L)
0
1000000
3000000
5000000
6440000
Non−Detect
Detect
2003−04−22
2008−12−15
Date


TP−MW08 Filtered Metals
COPPER Concentration (ug/L)
0
20000
60000
100000
136000
Non−Detect
Detect
2003−04−23
2008−12−16
Date


TP−MW08 Filtered Metals
Non−Detect
Detect
MANGANESE Concentration (ug/L)
0.0
5.0
10.0
15.0
2003−04−23
2008−12−16
Date


TP−MW10 Filtered Metals
Non−Detect
Detect
COPPER Concentration (ug/L)
0
100
200
300
379
2003−04−23
2008−12−18
Date


TP−MW10 Filtered Metals
MANGANESE Concentration (ug/L)
0.000
5.000
10.000
15.000
20.000
Non−Detect
Detect
2003−04−23
2008−12−18
Date

B.4 TECHNICAL MEMORANDUM COMPARISON OF ANALYTICAL METHODS FOR THE INTERIM OFFSHORE MONITORING PROGRAM FOR OPERABLE UNIT 4

Technical Memorandum

Comparison of Analytical Methods for the Interim Offshore Monitoring Program for Operable Unit 4

Portsmouth Naval Shipyard, Kittery, Maine

INTRODUCTION

For the first seven rounds of the Interim Offshore Monitoring Program at Portsmouth Naval Shipyard (PNS), Kittery Maine, sediment and tissue samples were analyzed for metals and organic chemicals [i.e., dioxins, polycyclic aromatic hydrocarbons (PAHs), pesticides, and polychlorinated biphenyls (PCBs)] using analytical methods developed for the National Oceanic and Atmospheric Administration (NOAA) Status and Trends program. These methods were selected to be consistent with methods used to analyze samples during previous investigations in the offshore area (TtNUS, 1999). In addition, these methods yield lower detection limits for some chemicals compared to standard U.S. Environmental Protection Agency (USEPA) analytical methods. However, NOAA methods are typically more expensive than standard USEPA methods and can be conducted by only a few laboratories in the United States; therefore, the analysis time is typically twice as long as it is for commercial laboratories. For these reasons, as was discussed during the January 8, 2004 technical meeting for the Round 1 through 7 Interim Offshore Monitoring Program report, and as described in the action item letter from the Navy dated March 16, 2004, the Navy has evaluated the need to continue using NOAA methods for future rounds of interim offshore monitoring.

The following two questions must be answered to determine whether the analytical methods can be changed for future rounds of monitoring:

- Will changing analytical methods yield different results, and if so, are those changes important enough to warrant not changing the methods?
- Will changing analytical methods raise the analytical detection limits so that the project objectives cannot be met?

The remainder of this memorandum answers the two questions first for analysis of metals and second for analysis of organic chemicals.

EVALUATION OF METALS ANALYTICAL METHODS

Background

Based on the analytical methods for metals, differences in the concentrations of some metals are expected by changing the analytical methods. The NOAA analytical method utilizes a complete digestion of the sediment particle using hydrofluoric acid so metals that are incorporated into the sediment matrix are included in the sample results. These typically include metals such as aluminum, iron, and other metals that may be specific to the geologic material in the area where samples were collected. The USEPA analytical method, on the other hand, utilizes a total recoverable digestion, which digests the material bound to the outer portion of the sediment particle. This is done to determine the concentration of chemicals that will be more bioavailable to human and ecological receptors. Therefore, the change in methods will yield different results for metals that are incorporated into the sediment matrix, which are not likely related to site activities.

The more critical issue, however, is whether the concentrations of the primary chemicals of concern in the offshore area [i.e., chemicals for which Interim Remediation Goals (IRGs) were developed such as copper and nickel] or other metals that may be important at some sites (such as lead) change significantly by using USEPA methods. This is an important issue because if much lower or higher concentrations were obtained for these metals using the USEPA methods, it would appear as if there was a decline or increase in the chemical concentrations over time, when the changes may be solely because of the differences in analytical methods.

Approach

To address the concerns raised above and to evaluate the differences in chemical concentrations obtained by the different analytical methods, Texas A&M University (TAMU), the laboratory that analyzed the Round 7 Interim Offshore Monitoring Program samples using the NOAA methods, shipped the Round 7 sediment samples to Katahdin Analytical Services (Katahdin) in January 2004. The samples were collected from August 9 through 13, 2003. Katahdin analyzed the split samples between February 16 and 25, 2004 which is within a few days of the end of the standard six-month holding time. Metals in the sediment are expected to be stable, chemical analysis a few days past the holding time is not expected to affect the sample results for the purpose of this evaluation. Fifteen samples (plus two duplicates) were then selected for analysis by Inductively Coupled Plasma – Mass Spectrometry (ICP-MS) using USEPA Method 6020.

Mercury was not analyzed by Katahdin because the NOAA method does not utilize a complete digestion of the sediment so the mercury results obtained using the USEPA 7471A method are expected to be similar to the results obtained using the NOAA method. Also, the tissue samples were not analyzed using the USEPA method because tissue is completely dissolved using both NOAA and USEPA methods so the results obtained using the USEPA method are also expected to be similar to the results obtained using NOAA methods. TAMU analyzed aluminum, cadmium, chromium, copper, iron, manganese, nickel, and zinc using ICP-MS methodology, arsenic, lead and silver using Graphite Furnace Atomic Absorption (GFAA) methodologies. Katahdin analyzed these metals using ICP-MS.

Results

Table 1 presents the results of the samples analyzed by both the NOAA and USEPA methods. In addition to the sample results, a ratio was calculated by dividing the results from the NOAA method analysis by the results from the USEPA method analysis. Table 2 is a summary of the maximum, minimum, average, and median ratio for each chemical. A ratio of 1.0 indicates that the sample results from both methods were essentially the same. A ratio of 2.0 indicates that the NOAA method result was approximately two times higher than the result obtained using the USEPA method, and so on. Ratios were not calculated for samples where a non-detected value was found for samples analyzed by either the NOAA or USEPA method. As can be seen in Table 1, most ratios ranged from 1.0 to 2.0 indicating that the samples analyzed using the NOAA methods produce detected results approximately one to two times greater than that detected results with the USEPA method.

Figures 1 through 12 present graphically the positive results of the samples that were analyzed by both NOAA and USEPA methods; non-detected data were not included in the figures. NOAA concentrations are plotted on the X-axis and the corresponding USEPA concentration for each sample analyzed is plotted on the Y-axis. The best fit line and equation of the best fit line (including the correlation coefficient, R^2) are also shown. The correlation coefficient ranged from 0 to 1.0 with an R^2 value of 1.0 indicating the best correlation and a value of 0 indicating no correlation.

IRGs have been developed for two metals, copper and nickel. Also, lead has been identified as a metal of concern at several on-shore sites. Therefore, these three metals are the primary focus of this memorandum, although the results for other metals are discussed as well. Figures 1 through 3 present the correlation plots for copper, lead, and nickel, respectively. All three metals have very good correlations, with R^2 values of 0.95, 0.91, and 0.75, for copper, lead, and nickel, respectively. The slightly poorer correlation of nickel is caused by more variability in the sample results with the two greatest nickel concentrations, which may be more indicative of the heterogeneous nature of the samples. Overall, most samples for these three metals fall close to the best fit line, especially for the concentrations close to

the IRGs or Effects-Range Median, which are footnoted on the figures. The ratios of the results using NOAA to USEPA methods for these three metals ranged from 0.5 to 2.6 for copper, 0.4 to 2.6 for lead, and 0.5 to 3.1 for nickel, with average ratios of 1.4, 1.4, and 1.3, respectively. A review of the ratios in Table 1 for the individual samples indicates that most of the ratios for copper and nickel ranged from 1.0 and 1.3, which indicates that very little of these metals are incorporated into the sediment matrix. For lead, the ratios were slightly higher with most of them ranging from 1.2 to 1.4, so slightly more lead may be incorporated into the sediment matrix. Also, in the samples with the greater chemical concentrations, some of the variability may be caused by the heterogeneous nature of the sediment as evident when evaluating the duplicate samples. For example, as seen in Table 1, the copper results at M04-1 using the NOAA methods ranged from 6,421 mg/kg in the original sample and 7,725 mg/kg in the duplicate sample. Using the USEPA methods the concentrations ranged from 6,070 mg/kg in the original sample and 6,490 mg/kg in the duplicate sample, which are similar to the results in the original sample.

Figures 4 through 12 present the correlation plots for the remainder of the metals. These plots were evaluated to understand the differences in the analytical results using these two methods.

The correlation coefficients for aluminum (Figure 4), cadmium, (Figure 6), and manganese (Figure 10) are low (especially aluminum) compared to the R^2 values for the other metals (the low R^2 value for chromium will be discussed in the next paragraph). The NOAA/USEPA ratios are also the greatest for these metals, with average ratios of 4.5 for aluminum, 5.1 for cadmium, and 2.6 for manganese. As discussed above, metals with higher NOAA/USEPA ratios have a larger percentage of these metals are incorporated into the sediment matrix because the NOAA method extracts that portion of the metal from the sediment particle.

For chromium, two correlation plots were generated; one with all the data and one with the data from monitoring station M03-2 removed. The chromium concentration for M03-2 using NOAA methods was 925 mg/kg, which was much higher than the chromium concentrations at that location during the previous six rounds. During previous rounds, chromium concentrations ranged from 94 mg/kg (Round 4) to 137 mg/kg (Round 2). Therefore, there may have been a small piece of metal in the sample aliquot that was analyzed using the NOAA methods but was not present in the aliquot that was analyzed using the USEPA methods which had a chromium concentration of 58.1 mg/kg. If a value of between 94 and 137 mg/kg was used instead of the 925, the NOAA/USEPA ratio for that sample would be 1.6 to 2.4, which is in-line with the NOAA/USEPA ratio for the other samples. After removing that data point, the R^2 values increased to 0.72, which shows relatively good correlation. The average NOAA/USEPA ratio for chromium after removing that sample was 1.8, indicating that a larger amount of chromium is incorporated into the sediment matrix compared to some of the other metals such as copper, lead, and nickel.

Finally, arsenic, iron, silver, and zinc had relatively high R^2 values of 0.88, 0.70, 0.80, and 0.92, respectively. The average NOAA/USEPA ratios for these metals were 1.3, 1.3, 1.4, and 1.2.

Summary

As indicated from Table 1, there were very few non-detections in this data set, but a review of the non-detect values for the USEPA method indicates that any slight difference in the detection limits between the two methods should not impact the project objectives because the detection limits are below the IRGs.

For the primary metals of concern for OU4, copper, nickel, and to a lesser extent lead, the results of this evaluation show that there is a good correlation of sample results between the NOAA and USEPA analytical methods. NOAA results were consistently greater than USEPA results, suggesting, some percentage of these metals are bound up in the sediment matrix, which is extracted in the complete digestion using NOAA method that is not extracted in the recoverable digestion used in the USEPA method.

Although the Navy could realize some cost savings by switching to the USEPA analytical methods for the Interim Offshore Monitoring Program, the cost savings are not significant to warrant changing methods at this time based on the uncertainties in the data as follows:

- If the Navy decided to switch analytical methods for the sampling program, a slight adjustment to the chemical concentrations obtained using the USEPA method would need to be made when conducting a trend analysis, which would slightly increase the chemical concentration in the sediment samples. This adjustment would be done to account for the portion of chemical that is bound to the sediment matrix and not digested using the USEPA method. There would be uncertainty in the adjustment factor because it would only be based on a limited number of samples.

- As presented in the draft Rounds 1 through 7 Interim Offshore Monitoring Program report, metals are only proposed for analysis at three monitoring stations during the next two rounds (Rounds 8 and 9), and at all of the monitoring stations for Round 10. Therefore, compared to the costs for the overall monitoring program, the cost savings involved in switching analytical methods for metals are low, because of the small numbers of samples involved and the lower cost for metals analysis compared to the analysis for the organic chemicals.

Therefore, because of the uncertainty in the adjustment factors that would be needed, and the relatively low cost savings at this time, the Navy is not recommending changing analytical methods for analysis of metals in sediment as part of the Interim Offshore Monitoring Program. The continued use of the NOAA analytical methods for sediment as part of the Interim Offshore Monitoring Program is being recommended primarily because the data are being plotted on trend plots and the first seven rounds were analyzed using NOAA methods. However, the Navy believes that it is appropriate to use USEPA analytical methods for samples that will not be used for trending because of the similarity in the results between the two analytical methods. Also, the Navy is recommending using USEPA analytical methods for the analysis of mussels in future rounds because as discussed above, similar analytical results are expected using the NOAA and USEPA methods.

EVALUATION OF ORGANIC CHEMICAL ANALYTICAL METHODS

Background/Approach

Both NOAA and USEPA methods for analysis of organic chemicals in tissue and sediment samples are similar in instrumentation, technique, and quantification. Therefore, the results obtained using the two methods are expected to yield similar results so chemical analysis for the organic chemicals using the USEPA methods was not conducted for the Round 7 samples. However, an evaluation of the differences in the methods is included herein. The following bullets list the items that were included in this evaluation:

- Method detection limits (MDLs)
- Parameter lists included in analytical methods
- Analytical methods

Results

The following sections present the results of the evaluation of each of the items listed above.

Method Detection Limits

MDLs were obtained from Columbia Analytical Services, Inc. (CAS), Severn Trent Laboratories, Inc. (STL), and TAMU. These MDLs are presented in Tables 3 through 9 for PAHs (Tables 3 and 4), PCBs (Tables 5 and 6), pesticides (Tables 7 and 8), and dioxins in sediment and tissue (Table 9). The target MDLs from the Interim Offshore Monitoring Plan (TtNUS, October 1999) are also presented on the tables. CAS and STL do not have current MDLs for some of the chemical groups that are included in the standard analyte list. The MDLs for sediment and dioxin tissue results are presented on a dry weight

basis; other tissue results are presented on a wet weight basis. The MDLs for the tissue samples from CAS (with the exceptions of dioxins) are presented on a wet weight basis. The MDLs listed in the tables are similar for the three laboratories, indicating the low detections limits that meet the project objectives can be obtained using standard USEPA methods.

Parameter Lists

There are some differences in the compound lists between the laboratories and the analytical methods. The following bullets present a summary of these differences:

- **PAHs:** All of the PAHs and alkylated PAHs can be obtained using the SW-846 8270 SIM analytical method; however, CAS and STL do not have established MDLs for all the parameters as presented in Tables 3 and 4. The MDLs would need to be calculated by the laboratory selected for the chemical analysis before sampling. Also, the Navy is considering eliminating alkylated PAHs from the Interim Offshore Monitoring Program, so MDLs for those parameters may not be needed.

- **PCBs:** All of the 28 PCB congeners being analyzed for as part of the Interim Offshore Monitoring program can be analyzed for using USEPA method SW-846 method 8082.

- **Pesticides:** The majority of the pesticides being analyzed for as part of the Interim Offshore Monitoring program can be analyzed for using USEPA method SW-846 method 8081. STL would analyze chloropyrifos by SW-846 Method 8141 and CAS would analyze pentachloroanisole by SW-846 Method 8151. STL would analyze pentachloroanisole, pentachlorobenzene, 1,2,3,4-tetrachlorobenzene, and 1,2,4,5- tetrachlorobenzene by SW-846 Method 8270, the same method they would use for the PAHs. Therefore, at least two different analytical methods would be needed to obtain results for all of the pesticides, if NOAA methods were not used. However, the five pesticides listed above that are included in "typical" analytical lists were not identified as chemicals of concern (COCs) in the Interim Record of Decision (ROD) for OU4 (Navy, 1999), do not have IRGs established for them, and are not currently being used to make any decisions for OU4. Therefore, the Navy proposes removing those pesticides from the list of analytical procedures for future sampling events if USEPA methods are used.

- **Dioxins/Furans:** All of the dioxins/furans being analyzed for as part of the Interim Offshore Monitoring program can be analyzed for using USEPA Method 1613 with similar detection limits as the NOAA methods.

Analytical Methods

In general, the extraction and analytical methods are similar between the NOAA and USEPA methods. The methods used by TAMU are presented as Standard Operating Procedures (SOPs) adapted from the technical memorandum on the sampling and analytical methods of the Mussel Watch Project (NOAA, 1998). The methods used by STL and CAS are based on Test Methods for Evaluating Solid Waste; Physical/Chemical Methods (SW-846), 3rd edition, up to and including Update III, Office of Solid Waste and Emergency Response, Washington, DC., and Chemical Analyses of Water and Wastewater. The following bullets summarize the USEPA analytical methods and the SOPs for each group of parameters:

- PAHs: TAMU SOP 9733; CAS and STL SW-846 8270 SIM.
- PCBs: TAMU SOP 9810; CAS and STL SW-846 8082.
- Pesticides: TAMU SOP 9810; CAS and STL SW-846 8081.
- Dioxins: TAMU SOP 9722; CAS and STL USEPA 1613.

Summary

The proposed USEPA analytical methods can obtain similar MDLs as the NOAA methods and any differences in the MDLs will not impact the project objectives. Therefore, the impact of MDLs should have no bearing on whether USEPA analytical methods can be used in future sampling rounds.

All of the parameters being analyzed as part of the Interim Offshore Monitoring Program can be analyzed using USEPA methods; however, additional analytical methods will need to be utilized to obtain the current list of pesticides. The Navy proposes removing five pesticides from the parameter list (chloropyrifos, pentachloroanisole, pentachlorobenzene, 1,2,3,4-tetrachlorobenzene, and 1,2,4,5-tetrachlorobenzene) for future rounds because the pesticides are not typically included in the standard SW-846 Method 8081 list, are not listed as COCs in the Interim ROD for OU4, and no decisions for OU4 are being made based on these chemicals:

All of the other parameters can be measured using standard USEPA analytical methods, although laboratory specific MDLs would need to be obtained for some of the parameters before selecting the laboratory for analysis. Also, the Navy is considering eliminating alkylated PAHs from the Interim Offshore Monitoring Program.

The USEPA analytical methods proposed by CAS and STL are similar to the SOPs provided by TAMU. The analytical methods should not impact the quality of data produced and the project objectives will be achieved using USEPA methodology.

OVERALL RECOMMENDATIONS

The following bullets summarize the overall recommendations for this memorandum:

- Use NOAA analytical methods for metals analysis of sediment samples at the monitoring and reference stations as part of the Interim Offshore Monitoring Program stations for data that will be used for chemical trend plots; consider using USEPA analytical methods for sediment samples that will not be included in the trend plots (i.e., extent samples).
- Use USEPA analytical methods for metals analysis of mussel samples at the monitoring and reference stations as part of the Interim Offshore Monitoring Program stations.
- Use USEPA analytical methods for organic chemical analysis of sediment and mussel samples at the monitoring and reference stations as part of the Interim Offshore Monitoring Program stations provided that the detection limits are low enough to meet project objectives.
- Remove chloropyrifos, pentachloroanisole, pentachlorobenzene, 1,2,3,4-tetrachlorobenzene, and 1,2,4,5-tetrachlorobenzene from the parameter list for future Interim Offshore Monitoring Program sampling rounds.

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TABLE 1

METALS RESULTS USING NOAA AND USEPA ANALYTICAL METHODS
EVALUATION OF ANALYTICAL METHODS MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

	Aluminum			Arsenic			Cadmium			Chromium		
Station	NOAA (mg/kg)	USEPA (mg/kg)	Ratio	NOAA (mg/kg)	USEPA (mg/kg)	Ratio	NOAA (mg/kg)	USEPA (mg/kg)	Ratio	NOAA (mg/kg)	USEPA (mg/kg)	Ratio[1]
M01-1	48,335	5,040	9.6	7.2	4.9	1.5	0.45 U	0.08 B	NA	97.4	30.8	3.2
M03-2	64,801	9,060	7.2	17.7	10.6	1.7	0.46 U	0.8	NA	925	58.1	15.9
M04-1	38,231	7,870	4.9	26.3	36.2	0.7	0.57 J	1.2	0.5	206	157	1.3
M04-1D	39,400	10,100	3.9	25.4	23.8	1.1	1.0	1	1.0	210	111	1.9
M05-1	80,242	20,300	4.0	59.6	49	1.2	1.5 J	1.5	1.0	155 J	68.4	2.3
M08-1	39,664 J	19,100	2.1	21.2	17.6	1.2	8.5	3	2.8	188	133	1.4
M08-1D	39,768 J	17,100	2.3	21.5	16.2	1.3	9.0	2.7	3.3	182	118	1.5
M08-2	45,646 J	12,600	3.6	13.6	10.9	1.2	3.1	0.71	4.3	115	74.3	1.5
M09-1	54,927 J	18,400	3.0	24.2	20.6	1.2	5.6	1.2	4.7	138	103	1.3
M09-2	34,866 J	7,960	4.4	13	11.7	1.1	4.3	0.63	6.8	94	47.5	2.0
M09-3	39,764 J	16,600	2.4	21.2	19.2	1.1	5.8	1.2	4.8	138	93	1.5
M11-3	32,113 J	9,460	3.4	22.6	14.2	1.6	8.1	2.4	3.4	215	83.7	2.6
M12-1	45,717 J	10,500	4.4	18.0	11.9	1.5	5.6	0.5	11.2	145	63	2.3
M13-1	62,366	14,200	4.4	15.9	12.1	1.3	0.47 U	0.68	NA	137 J	67.8	2.0
R01-2	30,335 J	3,750	8.1	5.0	3.3	1.5	1.7	0.07 B	NA	31.5	16.2	1.9
R01-4	38,200 J	5,540	6.9	7.2	4.8	1.5	1.9	0.12	15.7	38.3	24.4	1.6
R03-1	23,119 J	13,400	1.7	7.4	8.3	0.9	2.3	0.36	6.3	48.0	43.8	1.1
Minimum	23,119	3,750	1.7	4.99	3.3	0.7	0.45	0.07	0.5	31.5	16.2	1.1
Maximum	80,242	20,300	9.6	59.6	49	1.7	9.0	3.0	15.7	925	157	15.9
Average	44,558	11,822	4.5	19.2	16.2	1.3	3.5	1.1	5.1	180	76.1	1.8
Median	39,764	10,500	4.0	18.0	12.1	1.2	2.3	0.8	4.3	138	68.4	1.7

TABLE 1

METALS RESULTS USING NOAA AND USEPA ANALYTICAL METHODS
EVALUATION OF ANALYTICAL METHODS MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

	Copper			Iron			Lead			Manganese		
Station	NOAA (mg/kg)	USEPA (mg/kg)	Ratio	NOAA (mg/kg)	USEPA (mg/kg)	Ratio	NOAA (mg/kg)	USEPA (mg/kg)	Ratio	NOAA (mg/kg)	USEPA (mg/kg)	Ratio
M01-1	68.3	29.7	2.3	15,562	9,540	1.6	63	53.9	1.2	641	88.6	7.2
M03-2	732	1,580	0.5	34,919	31,500	1.1	180	229	0.8	460	185	2.5
M04-1	6,421	6,070	1.1	76,871	141,000	0.5	747	521	1.4	1,576	522	3.0
M04-1D	7,725	6,490	1.2	75,344	87,000	0.9	834	575	1.5	966	615	1.6
M05-1	685 J	553	1.2	41,758	37,900	1.1	694 J	541	1.3	589	385	1.5
M08-1	1,958	1,880	1.0	56,465	43,300	1.3	2,187	1,690	1.3	554	350	1.6
M08-1D	1,878	1,690	1.1	58,158	40,200	1.4	1,976	1,560	1.3	537	315	1.7
M08-2	446	349	1.3	34,024	21,600	1.6	439	372	1.2	394	175	2.2
M09-1	1,145	1,100	1.0	50,716	36,200	1.4	762	614	1.2	771	595	1.3
M09-2	526	517	1.0	31,909	22,800	1.4	519	382	1.4	720	491	1.5
M09-3	785	608	1.3	39,955	30,700	1.3	704	568	1.2	689	466	1.5
M11-3	2,628	1,020	2.6	56,674	40,300	1.4	1,843	774	2.4	509	262	1.9
M12-1	421	322	1.3	52,818	32,400	1.6	410	372	1.1	492	251	2.0
M13-1	111 J	46.8	2.4	24,602	20,900	1.2	97.7 J	60.4	1.6	408	212	1.9
R01-2	5.1	5.7 U	NA	11,502	5,830	2.0	23.6	9	2.6	417	62.8	6.6
R01-4	6.3	8.1 U	NA	12,855	8,680	1.5	27.2	13.7	2.0	251	68.5	3.7
R03-1	13.1	21.1 U	NA	13,731	16,500	0.8	37.8	95.4	0.4	316	152	2.1
Minimum	5.1	5.7	0.5	11,502	5,830	0.5	23.6	9	0.4	251	62.8	1.3
Maximum	7,725	6,490	2.6	76,871	141,000	2.0	2187	1,690	2.6	1,576	615	7.2
Average	1,503	1,311	1.4	40,462	36,844	1.3	679	496	1.4	605	306	2.6
Median	685	553	1.2	39,955	31,500	1.4	519	382	1.3	537	262	1.9

TABLE 1

METALS RESULTS USING NOAA AND USEPA ANALYTICAL METHODS
EVALUATION OF ANALYTICAL METHODS MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

	Nickel			Silver			Zinc		
Station	NOAA (mg/kg)	USEPA (mg/kg)	Ratio	NOAA (mg/kg)	USEPA (mg/kg)	Ratio	NOAA (mg/kg)	USEPA (mg/kg)	Ratio
M01-1	18.8 J	12	1.6	0.28	0.21	1.3	128	64.2	2.0
M03-2	315 J	103	3.1	1.4	1.4	1.0	535	629	0.8
M04-1	385 J	500	0.8	1.4	0.62	2.2	1,629	1,520	1.1
M04-1D	287 J	284	1.0	1.3	0.82	1.6	1,755	1,540	1.1
M05-1	76.5	75.3	1.0	1.5	1.4	1.1	698	638	1.1
M08-1	197	179	1.1	3.7	3.4	1.1	1581	1530	1.0
M08-1D	190	173	1.1	3.9	3.7	1.0	1506	1290	1.2
M08-2	64.1	51.4	1.2	1.5	1.1	1.3	365	323	1.1
M09-1	228	217	1.0	2.5	2.6	1.0	695	733	0.9
M09-2	140	153	0.9	2.1	1.2	1.7	515	465	1.1
M09-3	208	175	1.2	3.0	2.5	1.2	618	569	1.1
M11-3	172	89.8	1.9	9.4	4.5	2.1	1,659	840	2.0
M12-1	101	98.5	1.0	0.78	0.36	2.2	1,937	1,800	1.1
M13-1	28.0	22.1	1.3	0.33	1.2	0.3	180	116	1.6
R01-2	9.0	6 U	NA	0.09 U	0.06 B	NA	25.9	22.7	1.1
R01-4	11.8	8	1.5	0.09 U	0.1	NA	35.7	33.2	1.1
R03-1	11.7	22.9	0.5	0.12 J	0.08 B	NA	49.9	59.2	0.8
Minimum	9.0	6.0	0.5	0.1	0.1	0.3	25.9	22.7	0.8
Maximum	385	500	3.1	9.4	4.5	2.2	1,937	1,800	2.0
Average	144	128	1.3	2.0	1.5	1.4	818	716	1.2
Median	140	98.5	1.1	1.4	1.2	1.3	618	629	1.1

1 - The average and median ratios for chromium do not include the ratio of 15.9.

NOAA - National Oceanic and Atmospheric Administration (Method referenced in NOS ORCA 130)
USEPA - United States Environmental Protection Agency (Analytical Method SW-846, Method 7471A)
Ratio = [NOAA]/[USEPA]

NA - Ratios were not calculated for samples where one value was not detected
U - Nondetected
B - Validated as nondetected
J - Estimated value

TABLE 2

SUMMARY OF RATIOS OF NOAA/USEPA ANALYTICAL RESULTS
EVALUATION OF ANALYTICAL METHODS MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Metal	*Minimum Ratio*	*Maximum Ratio*	*Average Ratio*	*Median Ratio*
ALUMINUM	1.7	9.6	4.5	4.0
ARSENIC	0.7	1.7	1.3	1.2
CADMIUM	0.5	15.7	5.1	4.3
CHROMIUM(1)	1.1	15.9	1.8	1.7
COPPER	0.5	2.6	1.3	1.1
IRON	0.5	2.0	1.3	1.4
LEAD	0.4	2.6	1.4	1.3
MANGANESE	1.3	7.2	2.6	1.9
NICKEL	0.5	3.1	1.3	1.1
SILVER	0.3	2.2	1.4	1.3
ZINC	0.8	2.0	1.2	1.1

1 - The average and median ratios for chromium do not include the ratio of 15.9.

Ratio = [NOAA]/[USEPA] (see Table 1)
NOAA - National Oceanic and Atmospheric Administration (Method referenced in NOS ORCA 130)
USEPA - United States Environmental Protection Agency (Analytical Method SW-846, Method 7471A)

TABLE 3

MDLs AND LABORATORY REPORTING LIMITS - PAHs IN TISSUE
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
PAGE 1 OF 2

Compound	Target MDL[1] (µg/kg dry weight	TAMU MDL[2] (µg/kg dry weight)	CAS MDL[2,3] (µg/kg wet weight)	STL MDL[2,4] (µg/kg dry weight)
Analytical Method		GERG SOP 9733	SW-846 8270 SIM	SW-846 8270 SIM
1-Methylnaphthalene	20	3.15	0.13	--
1-Methylphenanthrene	20	3.16	0.053	--
2-Methylnaphthalene	20	4.05	0.15	--
2,6-Dimethylnaphthalene	20	2.88	0.11	--
1,6,7-Trimethylnaphthalene	20	3.48	0.074	--
Acenaphthene	20	3.85	0.074	--
Acenaphthylene	20	2.84	0.05	--
Anthracene	20	2.77	0.055	--
Biphenyl	20	3.35	0.068	--
Dibenzothiophene	20	1.88	0.14	--
Fluorene	20	3.88	0.054	--
Naphthalene	20	4.73	0.26	--
Phenanthrene	20	3.07	0.066	--
Benz(a)anthracene	20	2.09	0.054	--
Benzo(a)pyrene	20	4.15	0.076	--
Benzo(b)fluoranthene	20	6.80	0.045	--
Benzo(e)pyrene	20	4.66	0.012	--
Benzo(g,h,i)perylene	20	5.70	0.097	--
Benzo(k)fluoranthene	20	3.83	0.081	--
Chrysene	20	2.75	0.08	--
Dibenz(a,h)anthracene	20	5.90	0.079	--
Fluoranthene	20	2.68	0.053	--
Indeno(1,2,3-c,d)pyrene	20	10.7	0.073	--
Perylene	20	9.50	0.10	--
Pyrene	20	2.61	0.070	--
Alkylated PAHs				
C1-Naphthalenes	20	7.20	--	--
C2-Naphthalenes	20	5.76	--	--
C3-Napthalenes	20	6.96	--	--
C4-Naphthalenes	20	6.96	--	--
C1-Fluorenes	20	7.76	--	--
C2-Fluorenes	20	7.76	--	--
C3-Fluorenes	20	7.76	--	--

TABLE 3

MDLs AND LABORATORY REPORTING LIMITS - PAHs IN TISSUE
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Compound	Target MDL(1) (µg/kg dry weight	TAMU MDL(2) (µg/kg dry weight)	CAS MDL(2,3) (µg/kg wet weight)	STL MDL(2,4) (µg/kg dry weight)
C1-Phenanthrenes/Anthracenes	20	5.54	--	--
C2-Phenanthrenes/Anthracenes	20	5.54	--	--
C3-Phenanthrenes/Anthracenes	20	5.54	--	--
C4-Phenanthrenes/Anthracenes	20	5.54	--	--
C1-Dibenzothiophenes	20	3.76	--	--
C2-Dibenzothiophenes	20	3.76	--	--
C3-Dibenzothiophenes	20	3.76	--	--
C1-Fluoranthenes/Pyrenes	20	5.22	--	--
C1-Chrysenes	20	5.50	--	--
C2-Chrysenes	20	5.50	--	--
C3-Chrysenes	20	5.50	--	--
C4-Chrysenes	20	5.50	--	--

1 The Target MDLs are from the QA/QC Guidance for Sampling and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluations: Chemical Evaluations U.S. EPA, Office of Water, Office of Science and Technology. EPA 823-B-95-001. 1995.
2 All positive results will be reported by the laboratory.
3 CAS does not currently have MDLs for alkylated PAHs by SW-846 Method 8270 SIM.
4 STL does not currently have MDLs for PAHs or alkylated PAHs by SW-846 Method 8270 SIM.

Abbreviations:
TAMU = Texas A&M University
CAS = Columbia Analytical Services
STL = Severn Trent Laboratory
GERG = Geochemical and Environmental Research Group
SOP = Standard Operating Procedure
SIM = Selected Ion Monitoring
MDL = Method Detection Limit
PAH = Polycyclic Aromatic Hydrocarbon

TABLE 4

MDLs AND LABORATORY REPORTING LIMITS - PAHs IN SEDIMENT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
PAGE 1 OF 2

Compound	Target Sediment MDL[1] (µg/kg dry weight)	TAMU MDL[2] (µg/kg dry weight)	CAS MDL[2] (µg/kg dry weight)	STL MDL[2,3] (µg/kg dry weight)
Analytical Method		GERG SOP 9733	SW-846 8270 SIM	SW-846 8270 SIM
1-Methylnaphthalene	20	2.35	0.20	0.0962
1-Methylphenanthrene	20	0.77	0.11	0.120
2-Methylnaphthalene	20	3.21	0.21	0.125
2,6-Dimethylnaphthalene	20	2.09	0.13	0.0822
1,6,7-Trimethylnaphthalene	20	1.30	0.18	0.0941
Acenaphthene	20	0.52	0.21	0.141
Acenaphthylene	20	0.78	0.16	0.0799
Anthracene	20	0.52	0.19	0.132
Biphenyl	20	0.83	0.18	0.0886
Dibenzothiophene	20	0.75	0.19	0.113
Fluorene	20	0.80	0.17	0.157
Naphthalene	20	3.64	0.21	0.111
Phenanthrene	20	2.96	0.15	0.416
Benz(a)anthracene	20	0.94	0.13	0.314
Benzo(a)pyrene	20	2.55	0.14	0.207
Benzo(b)fluoranthene	20	1.31	0.14	0.668
Benzo(e)pyrene	20	1.23	0.12	0.188
Benzo(g,h,i)perylene	20	2.46	0.10	0.680
Benzo(k)fluoranthene	20	0.49	0.15	0.540
Chrysene	20	0.40	0.15	0.634
Dibenz(a,h)anthracene	20	0.99	0.18	1.18
Fluoranthene	20	1.18	0.17	0.558
Indeno(1,2,3-c,d)pyrene	20	1.33	0.15	0.921
Perylene	20	2.46	0.18	0.470
Pyrene	20	1.96	0.11	0.547
Alkylated PAHs				
C1-Naphthalenes	20	5.56	2.5	--
C2-Naphthalenes	20	4.18	2.5	--
C3-Naphthalenes	20	2.60	2.5	--
C4-Naphthalenes	20	2.60	2.5	--
C1-Fluorenes	20	1.60	2.5	--
C2-Fluorenes	20	1.60	2.5	--

TABLE 4

MDLs AND LABORATORY REPORTING LIMITS - PAHs IN SEDIMENT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Compound	Target Sediment MDL(1) (µg/kg dry weight)	TAMU MDL(2) (µg/kg dry weight)	CAS MDL(2) (µg/kg dry weight)	STL MDL(2,3) (µg/kg dry weight)
C3-Fluorenes	20	1.60	2.5	--
C1-Phenanthrenes/Anthracenes	20	1.54	2.5	--
C2-Phenanthrenes/Anthracenes	20	1.54	2.5	--
C3-Phenanthrenes/Anthracenes	20	1.54	2.5	--
C4-Phenanthrenes/Anthracenes	20	1.54	2.5	--
C1-Dibenzothiophenes	20	1.50	2.5	--
C2-Dibenzothiophenes	20	1.50	2.5	--
C3-Dibenzothiophenes	20	1.50	2.5	--
C1-Fluoranthenes/Pyrenes	20	3.14	2.5	--
C1-Chrysenes	20	0.80	2.5	--
C2-Chrysenes	20	0.80	2.5	--
C3-Chrysenes	20	0.80	2.5	--
C4-Chrysenes	20	0.80	2.5	--

1 The Target MDLs are from the QA/QC Guidance for Sampling and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluaitons: Chemical Evaluations U.S. EPA, Office of Water, Office of Science and Technology. EPA 823-B-95-001. 1995
2 All positive results will be reported by the laboratory.
3 STL does not currently have MDLs for alkylated PAHs by SW-846 Method 8270 SIM.

Abbreviations:
TAMU = Texas A&M University
CAS = Columbia Analytical Services
STL = Severn Trent Laboratory
GERG = Geochemical and Environmental Research Group
SOP = Standard Operating Procedure
SIM = Selected Ion Monitoring
MDL = Method Detection Limit
PAH = Polycyclic Aromatic Hydrocarbon

TABLE 5

MDLs AND LABORATORY REPORTING LIMITS - PCBs IN TISSUE
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Compound	Target Tissue MDL(1) (µg/kg dry weight)	TAMU MDL(2) (µg/kg dry weight)	CAS MDL(2) (µg/kg wet weight)	STL MDL(2) (µg/kg dry weight)
Analytical Method		GERG SOP 9810	SW-846 Method 8082	SW-846 Method 8082
PCB 8	2	2.02	0.14	0.4952
PCB 18	2	3.27	0.11	0.4380
PCB 28	2	0.99	0.31	0.4394
PCB 44	2	0.73	0.063	0.3760
PCB 52	2	0.85	0.080	0.4903
PCB 66	2	1.20	0.073	0.3237
PCB 77	2	1.0	0.092	0.3032
PCB 81	2	1	0.082	0.2699
PCB 101	2	1.07	0.065	0.3248
PCB 105	2	0.97	0.21	0.1722
PCB 114	2	1	0.32	0.2167
PCB 118	2	1.77	0.10	0.2117
PCB 123	2	1	0.11	0.3423
PCB 126	2	1.0	0.12	0.1929
PCB 128	2	0.96	0.091	0.3247
PCB 138	2	1.80	0.23	0.1426
PCB 153	2	1.27	0.15	0.3941
PCB 156	2	1	0.13	0.1571
PCB 157	2	1	0.082	0.4841
PCB 167	2	1	0.22	0.2519
PCB 169	2	1.0	0.085	0.0611
PCB 170	2	10.4(3)	0.080	0.1943
PCB 180	2	1.33	0.11	0.4585
PCB 187	2	0.88	0.18	0.2407
PCB 189	2	1	0.089	0.0750
PCB 195	2	1.04	0.095	0.1211
PCB 206	2	1.08	0.077	0.5385
PCB 209	2	1.41	0.095	0.1977

1 The Target MDLs are from the QA/QC Guidance for Sampoing and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluations: Chemical Evaluations U.S. EPA, Office of Water, Office of Science and Technology. EPA 823-B-95-001. 1995.
2 All positive results will be reported by the laboratory.
3 Interference from phthalate.

Abbreviations:
TAMU = Texas A&M University
CAS = Columbia Analytical Services
STL = Severn Trent Laboratory
GERG = Geochemical and Environmental Research Group
SOP = Standard Operating Procedure
SIM = Selected Ion Monitoring
MDL = Method Detection Limit
PCB = Polychlorinated biphenyl

TABLE 6

MDLs AND LABORATORY REPORTING LIMITS - PCBs IN SEDIMENT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Compound	Target Sediment MDL(1) (µg/kg dry weight)	TAMU MDL(2) (µg/kg dry weight)	CAS MDL(2) (µg/kg dry weight)	STL MDL(2) (µg/kg dry weight)
Analytical Method		GERG SOP9810	SW-846 Method 8082	SW-846 Method 8082
PCB 8	1	0.095	0.087	0.0598
PCB 18	1	0.071	0.029	0.0639
PCB 28	1	0.028	0.25	0.0613
PCB 44	1	0.052	0.18	0.0677
PCB 52	1	0.113	0.047	0.1315
PCB 66	1	0.050	0.037	0.0901
PCB 77	1	0.050	0.065	0.0573
PCB 81	1	0.05	0.030	0.0774
PCB 101	1	0.064	0.030	0.0860
PCB 105	1	0.049	0.040	0.3975
PCB 114	1	0.05	0.075	0.0912
PCB 118	1	0.096	0.039	0.0845
PCB 123	1	0.05	0.034	0.0897
PCB 126	1	0.050	0.039	0.0708
PCB 128	1	0.099	0.25	0.1584
PCB 138	1	0.042	0.030	0.0844
PCB 153	1	0.073	0.039	0.0941
PCB 156	1	0.05	0.043	0.0747
PCB 157	1	0.05	0.035	0.0858
PCB 167	1	0.05	0.033	0.0866
PCB 169	1	0.050	0.032	0.0760
PCB 170	1	0.443(3)	0.033	0.1205
PCB 180	1	0.031	0.031	0.0795
PCB 187	1	0.046	0.036	0.0872
PCB 189	1	0.05	0.030	0.0894
PCB 195	1	0.028	0.041	0.0984
PCB 206	1	0.031	0.055	0.0972
PCB 209	1	0.037	0.050	0.0908

1 The Target MDLs are from the QA/QC Guidance for Sampling and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluations: Chemical Evaluations U.S. EPA, Office of Water, Office of Science and Technology. EPA 823-B-95-001. 1995.
2 All positive results will be reported by the laboratory.
3 Interference from phthalate.

Abbreviations:
TAMU = Texas A&M University
CAS = Columbia Analytical Services
STL = Severn Trent Laboratory
GERG = Geochemical and Environmental Research Group
SOP = Standard Operating Procedure
SIM = Selected Ion Monitoring
MDL = Method Detection Limit
PCB = Polychlorinated biphenyl

TABLE 7

MDLs AND LABORATORY REPORTING LIMITS - PESTICIDES IN TISSUE
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Compound	Target Tissue MDL(1) (µg/kg dry weight)	TAMU MDL(2) (µg/kg dry weight)	CAS MDL(2) (µg/kg wet weight)	STL MDL(2) (µg/kg dry weight)
Analytical Method		GERG SOP 9810	SW-846 Method 8081	SW-846 Method 8081
2,4' DDD	10	0.89	0.18	0.2377
2,4' DDE	10	1.38	0.096	0.2818
2,4' DDT	10	1.01	0.22	0.0861
4,4'-DDD	10	1.01	0.13	0.4649
4,4'-DDE	10	1.71	0.12	0.1817
4,4'-DDT	10	1.26	0.38	0.2522
Aldrin	10	1.05	0.20	0.1252
Alpha Chlordane	10	0.90	0.36	0.1809
Alpha HCH	10	1.29	0.16	0.1874
Beta HCH	10	1.58	0.21	0.2192
Chlorpyrifos	10	4.09	0.17	--(5)
Cis-Nonachlor	10	0.76	0.12	0.1618
Delta HCH	10	0.58	0.34	0.1810
Dieldrin	10	1.24	0.11	0.1795
Endosulfan II	10	2.03	0.35	0.0889
Endrin	10	1.95	0.099	0.1480
Gamma Chlordane	10	0.73	0.14	0.1701
Gamma HCH	10	1.15	0.28	0.2997
Heptachlor	10	1.34	0.45	0.1043
Heptachlor Epoxide	10	0.30	0.15	0.1959
Hexachlorobenzene	10	2.13	0.34	0.5389
Mirex	10	0.70	0.27	0.1340
Oxychlordane	10	0.88	0.077	0.2637
Pentachlorobenzene	10	3.33	--(4)	--(6)
Pentachloroanisole	10	1.50	--(3)	--(6)
Tetrachlorobenzene 1,2,3,4	10	2.47	--(4)	--(6)
Tetrachlorobenzene 1,2,4,5	10	8.38	--(4)	--(6)
Trans-Nonachlor	10	0.97	0.051	0.1409

1 The Target MDLs are from the QA/QC Guidance for Sampling and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluations: Chemical Evaluations U.S. EPA, Office of Water, Office of Science and Technology. EPA 823-B-95-001. 1995.
2 All positive results will be reported by the laboratory.
3 CAS proposes analyzing pentachloroanisole by SW-846 Method 8151 but does not currently have MDLs.

4 CAS proposes doing these compounds by SW-846 Method 8081 but does not currently have MDLs.
5 STL proposes doing chlorpyrifos by SW-846 Method 8141 but does not currently have MDLs.
6 STL proposes doing these compounds by SW-846 Method 8270 but does not currently have MDLs.

Abbreviations:
TAMU = Texas A&M University
CAS = Columbia Analytical Services
STL = Severn Trent Laboratory
GERG = Geochemical and Environmental Research Group
SOP = Standard Operating Procedure
SIM = Selected Ion Monitoring
MDL = Method Detection Limit

TABLE 8

MDLs AND LABORATORY REPORTING LIMITS - PESTICIDES IN SEDIMENT
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Compound	Target Sediment MDL[1] (µg/kg dry weight)	TAMU MDL[2] (µg/kg dry weight)	CAS MDL[2] (µg/kg dry weight)	STL MDL[2] (µg/kg dry weight)
Analytical Method		GERG SOP 9810	SW-846 Method 8081	SW-846 Method 8081
2,4' DDD	2	0.032	0.16	0.0307
2,4' DDE	2	0.090	0.069	0.1127
2,4' DDT	2	0.060	0.080	0.0261
4,4'-DDD	2	0.046	0.093	0.0296
4,4'-DDE	2	0.018	0.076	0.0662
4,4'-DDT	2	0.034	0.17	0.0315
Aldrin	2	0.036	0.25	0.0298
Alpha Chlordane	2	0.015	0.062	0.0265
Alpha HCH	2	0.073	0.083	0.1307
Beta HCH	2	0.088	0.22	0.0730
Chlorpyrifos	2	0.127	0.27	--[5]
Cis-Nonachlor	2	0.050	0.13	0.0280
Delta HCH	2	0.036	0.14	0.1026
Dieldrin	2	0.040	0.082	0.0274
Endosulfan II	2	0.101	0.061	0.0499
Endrin	2	0.197	0.24	0.0291
Gamma Chlordane	2	0.062	0.038	0.0297
Gamma HCH	2	0.021	0.099	0.0240
Heptachlor Epoxide	2	0.020	0.14	0.0543
Heptahclor	2	0.077	0.097	0.1134
Hexachlorobenzene	2	0.051	0.16	0.1182
Mirex	2	0.032	0.068	0.0551
Oxychlordane	2	0.019	0.15	0.0175
Pentachloroanisole	2	0.024	50[3]	--[6]
Pentachlorobenzene	2	0.234	--[4]	--[6]
Tetrachlorobenzene 1,2,3,4	2	0.134	--[4]	--[6]
Tetrachlorobenzene 1,2,4,5	2	0.331	--[4]	--[6]
Trans-Nonachlor	2	0.047	0.095	0.0197

1 The Target MDLs are from the QA/QC Guidance for Sampling and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluations: Chemical Evaluations U.S. EPA, Office of Water, Office of Science and Technology. EPA 823-B-95-001. 1995.
2 All positive results will be reported by the laboratory.
3 CAS proposes analyzing pentachloroanisole by SW-846 Method 8151.

4 CAS proposes doing these compounds by SW-846 Method 8081 but does not currently have MDLs.
5 STL proposes doing chlorpyrifos by SW-846 Method 8141 but does not currently have MDLs.
6 STL proposes doing these compounds by SW-846 Method 8270 but does not currently have MDLs.

Abbreviations:
TAMU = Texas A&M University
CAS = Columbia Analytical Services
STL = Severn Trent Laboratory
GERG = Geochemical and Environmental Research Group
SOP = Standard Operating Procedure
SIM = Selected Ion Monitoring
MDL = Method Detection Limit

TABLE 9

MDLs AND LABORATORY REPORTING LIMITS – DIOXINS IN SEDIMENT/TISSUE
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Compound	TAMU MDL[1] (µg/kg dry weight)	CAS MDL[1] (µg/kg dry weight)	STL MDL[1] (µg/kg dry weight)
Analytical Method	GERG SOP 9722	EPA Method 1613	EPA Method 1613
2,3,7,8-TCDD	1.0	1.0	1.0
Total TCDD	1.0	1.0	1.0
2,3,7,8-TCDF	1.0	1.0	1.0
Total TCDF	1.0	1.0	1.0
1,2,3,7,8-PeCDD	5.0	2.5	5.0
Total PeCDD	5.0	2.5	5.0
1,2,3,7,8-PeCDF	5.0	2.5	5.0
2,3,4,7,8-PeCDF	5.0	2.5	5.0
Total PeCDF	5.0	2.5	5.0
1,2,3,4,7,8-HxCDD	5.0	2.5	5.0
1,2,3,6,7,8-HxCDD	5.0	2.5	5.0
1,2,3,7,8,9-HxCDD	5.0	2.5	5.0
Total HxCDD	5.0	2.5	5.0
1,2,3,4,7,8-HxCDF	5.0	2.5	5.0
1,2,3,6,7,8-HxCDF	5.0	2.5	5.0
1,2,3,7,8,9-HxCDF	5.0	2.5	5.0
2,3,4,6,7,8-HxCDF	5.0	2.5	5.0
Total HxCDF	5.0	2.5	5.0
1,2,3,4,6,7,8-HpCDD	5.0	2.5	5.0
Total HpCDD	5.0	2.5	5.0
1,2,3,4,6,7,8-HpCDF	5.0	2.5	5.0
1,2,3,4,7,8,9-HpCDF	5.0	2.5	5.0
Total HpCDF	5.0	2.5	5.0
OCDD	10.0	5.0	10.0
OCDF	10.0	5.0	10.0

1 All positive results will be reported by the laboratory.

Abbreviations:
TAMU = Texas A&M University
CAS = Columbia Analytical Services

STL = Severn Trent Laboratory
GERG = Geochemical and Environmental Research Group
SOP = Standard Operating Procedure
SIM = Selected Ion Monitoring
MDL = Method Detection Limit

Figure 1
Copper Concentrations for Samples Analyzed Using USEPA and NOAA Methods
Evaluation of Analytical Methods Memorandum
Portsmouth Naval Shipyard, Kittery, Maine

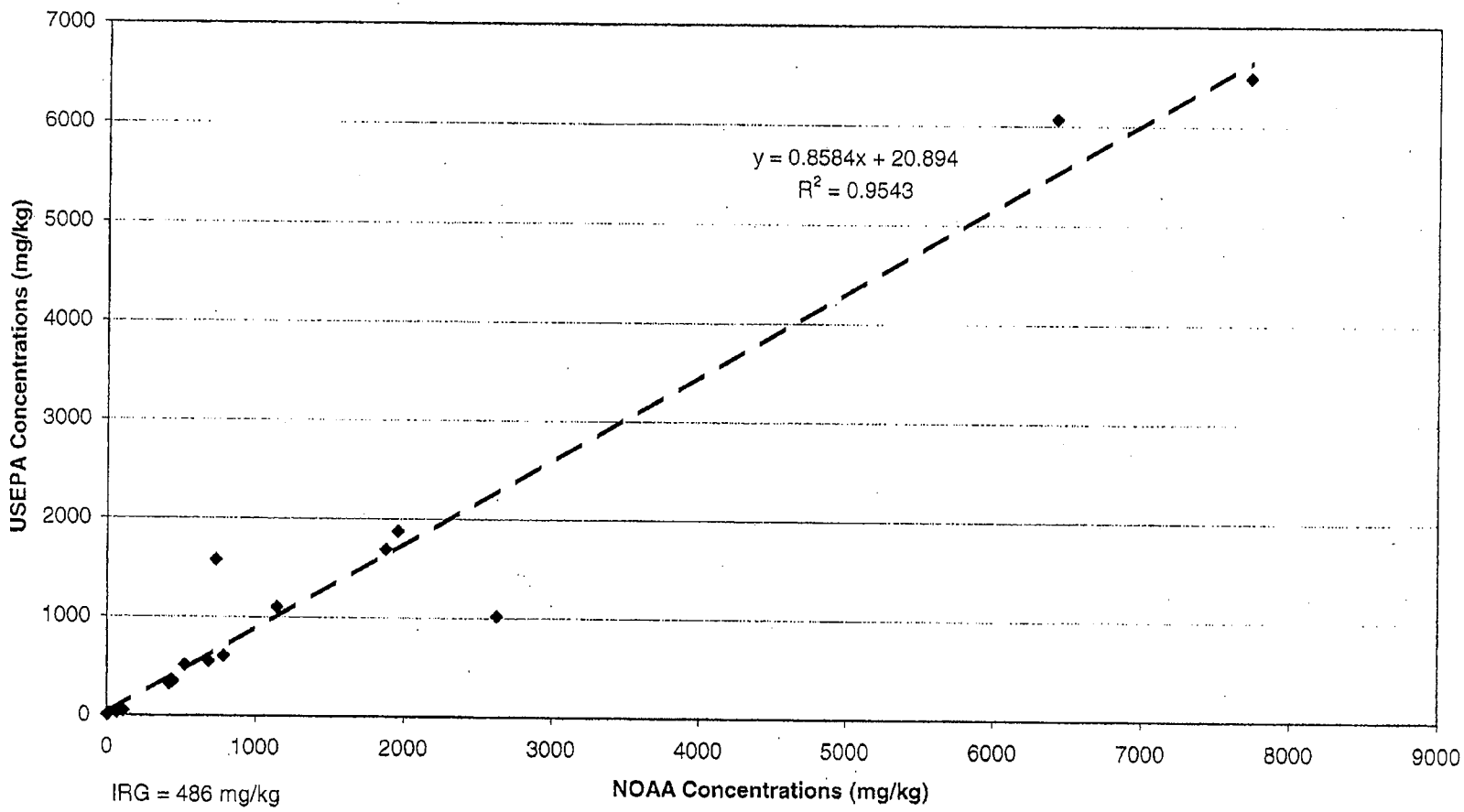


Figure 2
Lead Concentrations for Sample Analyzed Using USEPA and NOAA Methods
Evaluation of Analytical Methods Memorandum
Portsmouth Naval Shipyard, Kittery, Maine

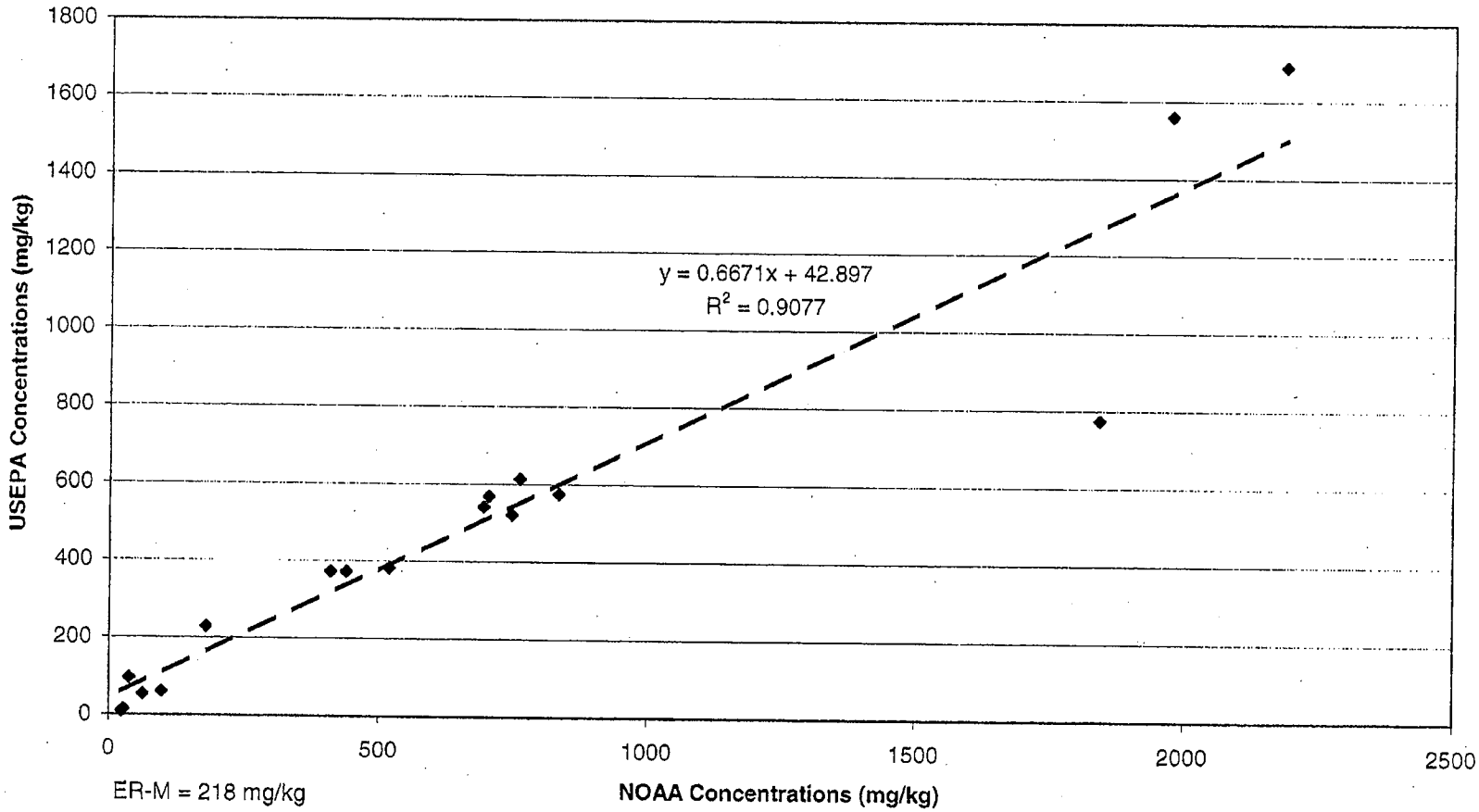


Figure 3
Nickel Concentrations for Samples Analyzed Using USEPA and NOAA Methods
Evaluation of Analytical Methods Memorandum
Portsmouth Naval Shipyard, Kittery, Maine

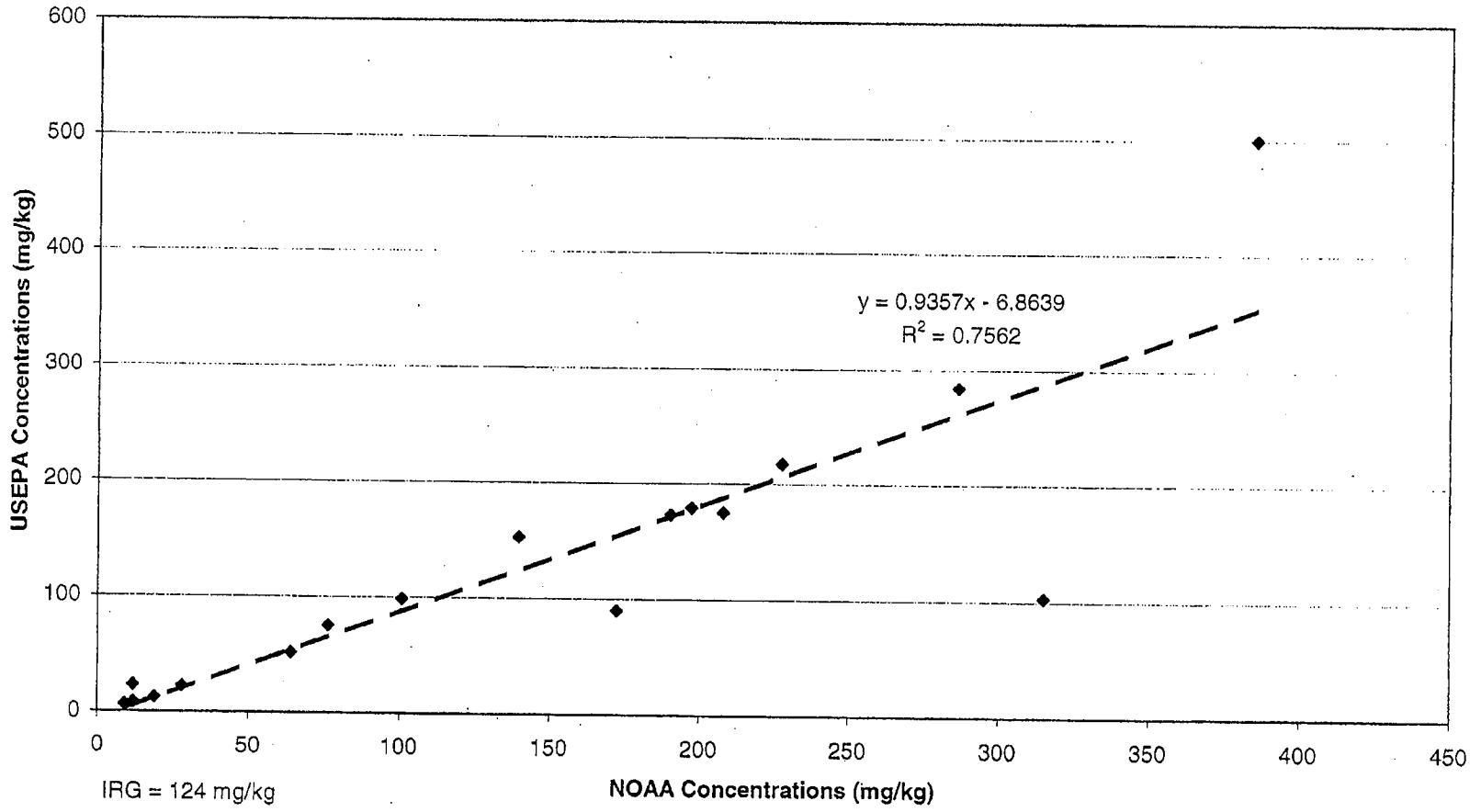


Figure 4
Aluminum Concentrations for Samples Analyzed Using USEPA and NOAA Methods
Evaluation of Analytical Methods Memorandum
Portsmouth Naval Shipyard, Kittery, Maine

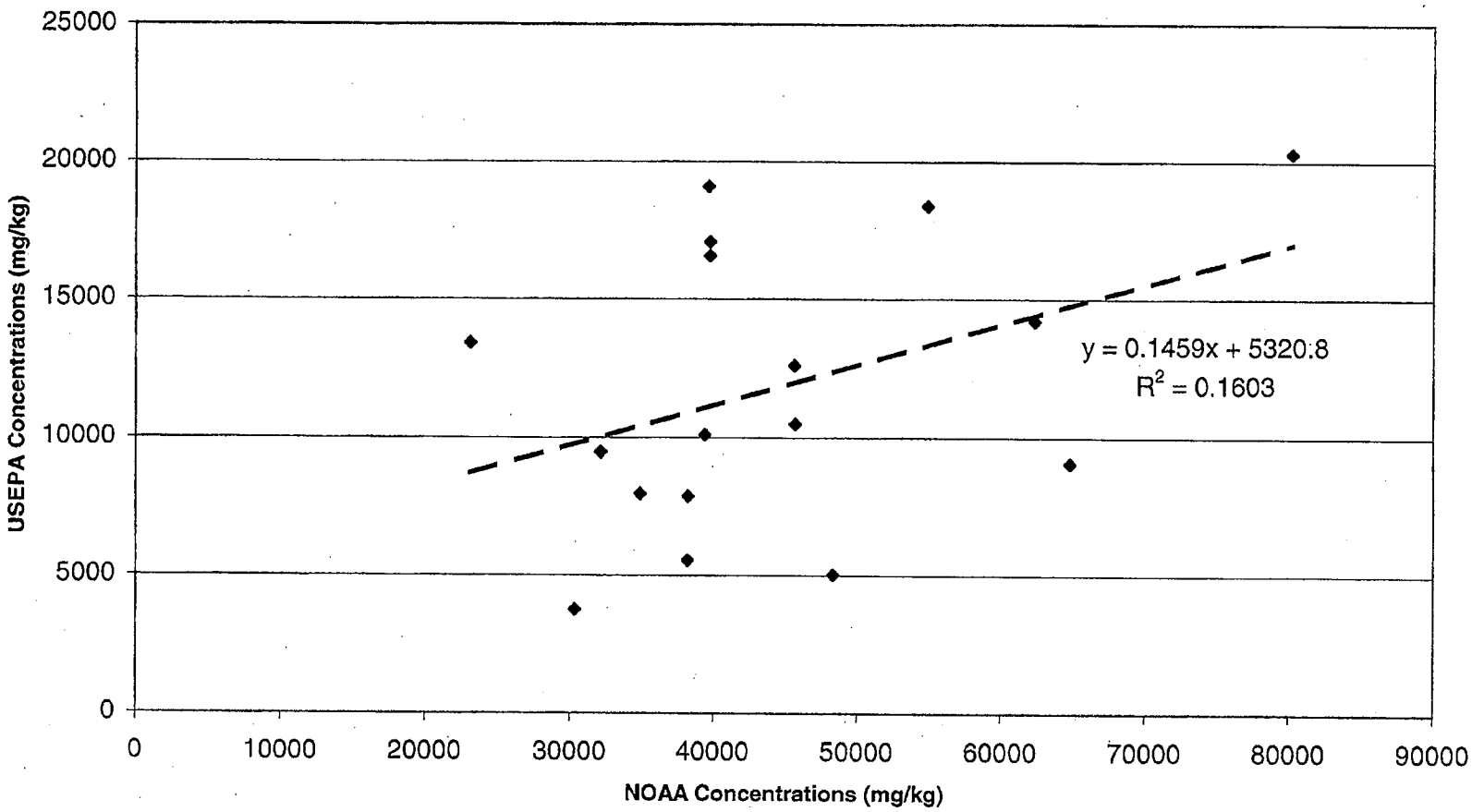


Figure 5
Arsenic Concetrations for Samples Analyzed Using USEPA and NOAA Methods
Evaluation of Analytical Methods Memorandum
Portsmouth Naval Shipyard, Kittery, Maine

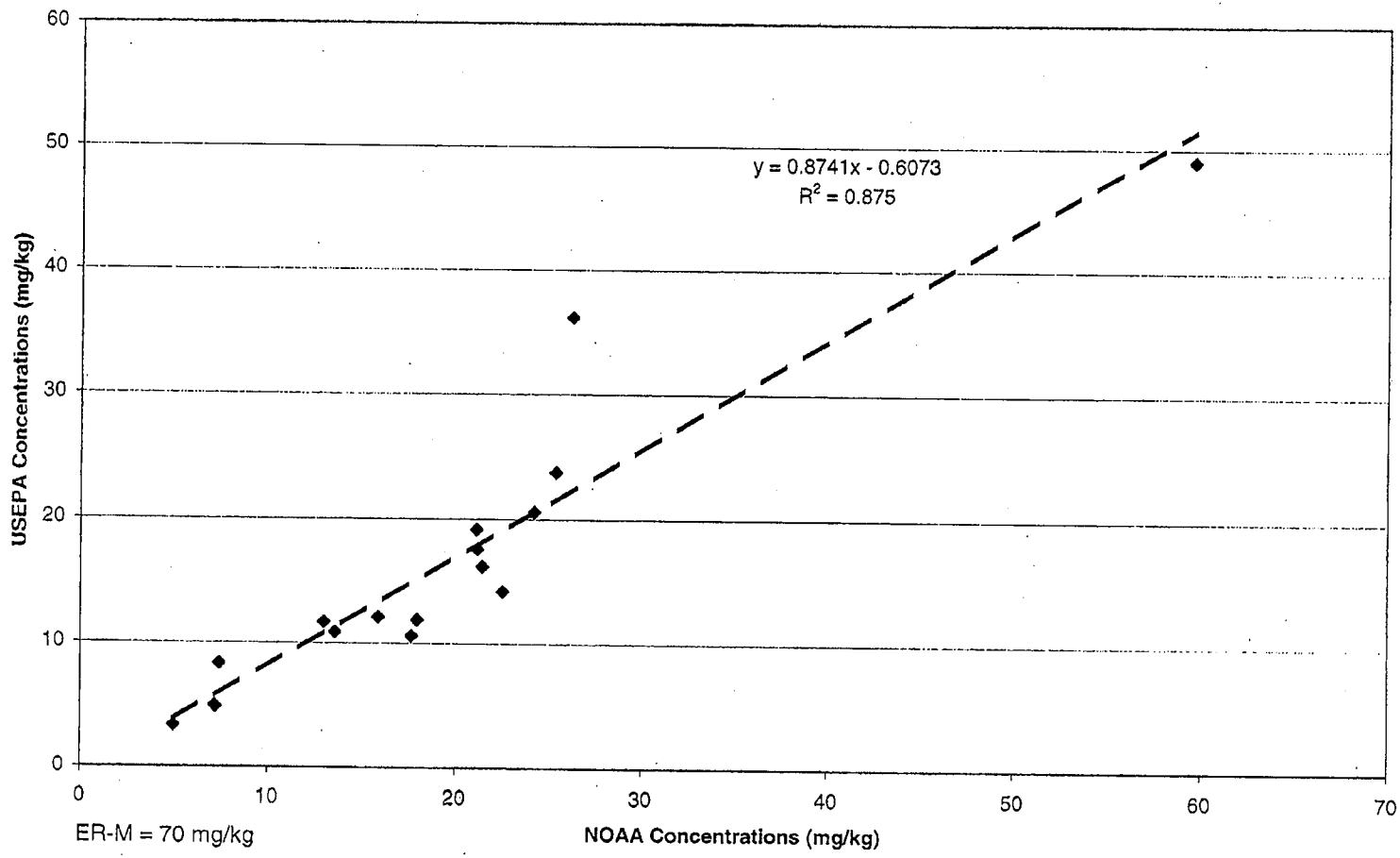


Figure 6
Cadmium Concentrations for Samples Analyzed Using USEPA and NOAA Methods
Evaluation of Analytical Methods Memorandum
Portsmouth Naval Shipyard, Kittery, Maine

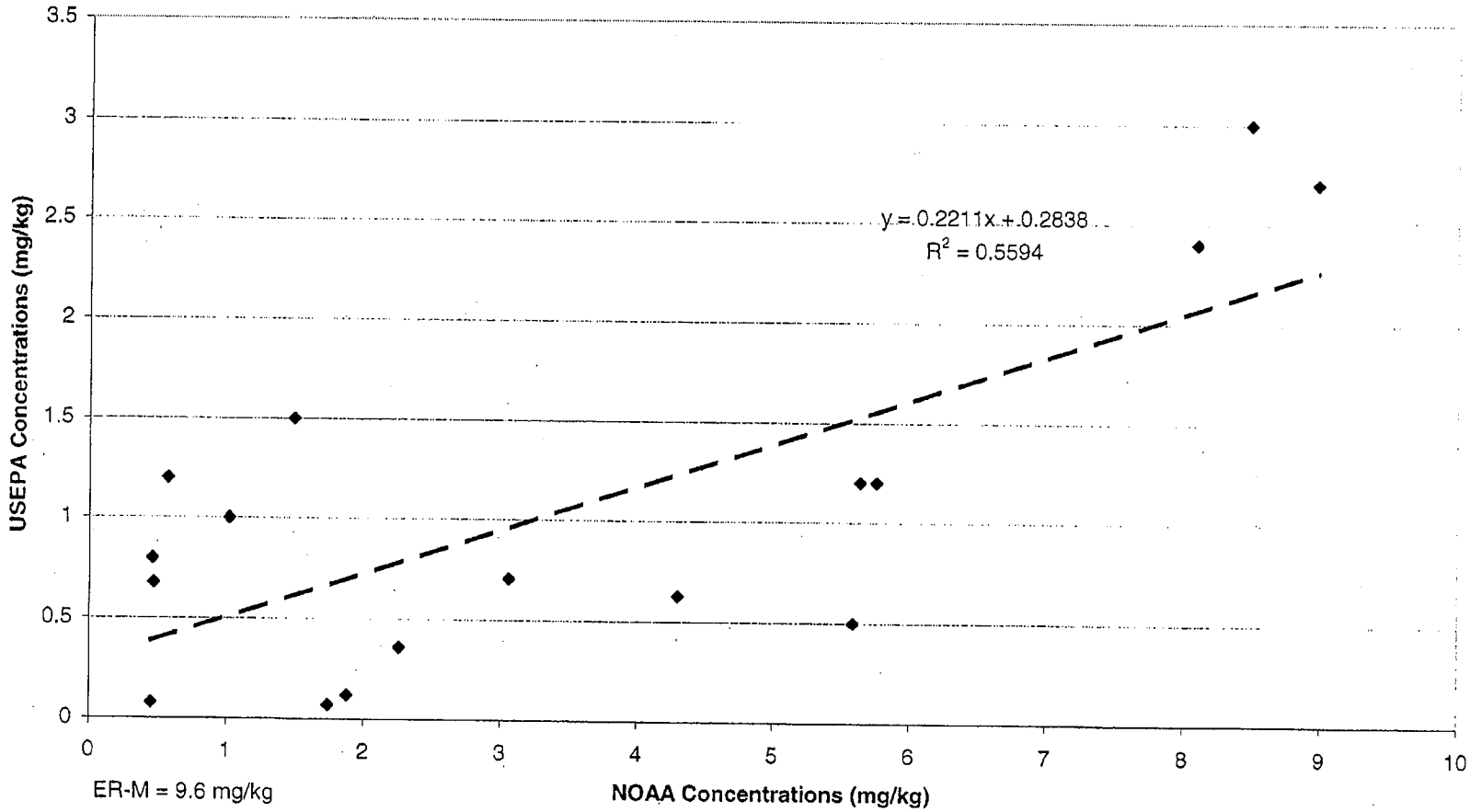


Figure 7
Chromium Concentrations for Samples Analyzed Using USEPA and NOAA Methods
Evaluation of Analytical Methods Memorandum
Portsmouth Naval Shipyard, Kittery, Maine

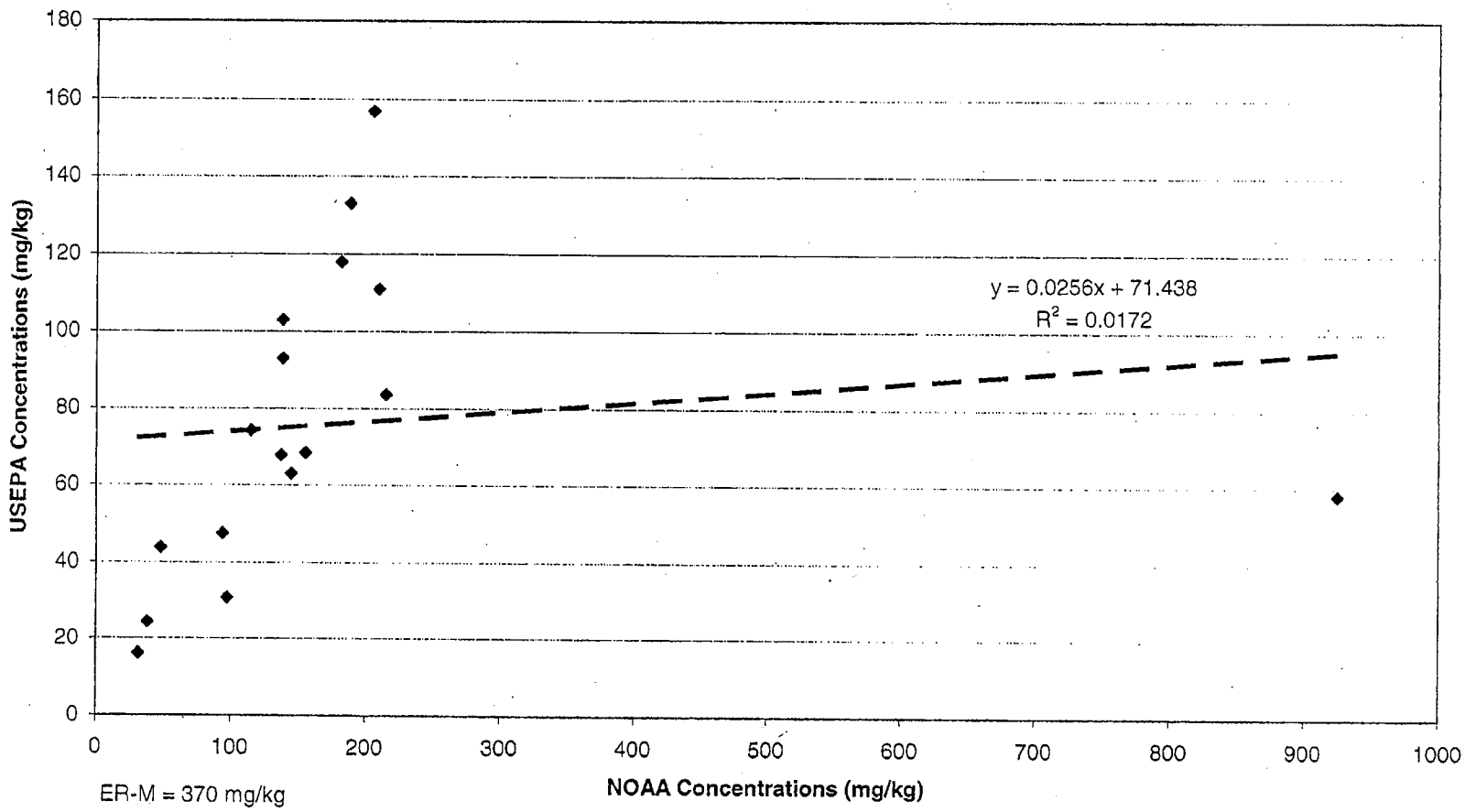


Figure 8
Chromium Concentrations for Samples Analyzed Using USEPA and NOAA Methods
(excluding sample OU4-SD-M03-203A)
Evaluation of Analytical Methods Memorandum
Portsmouth Naval Shipyard, Kittery, Maine

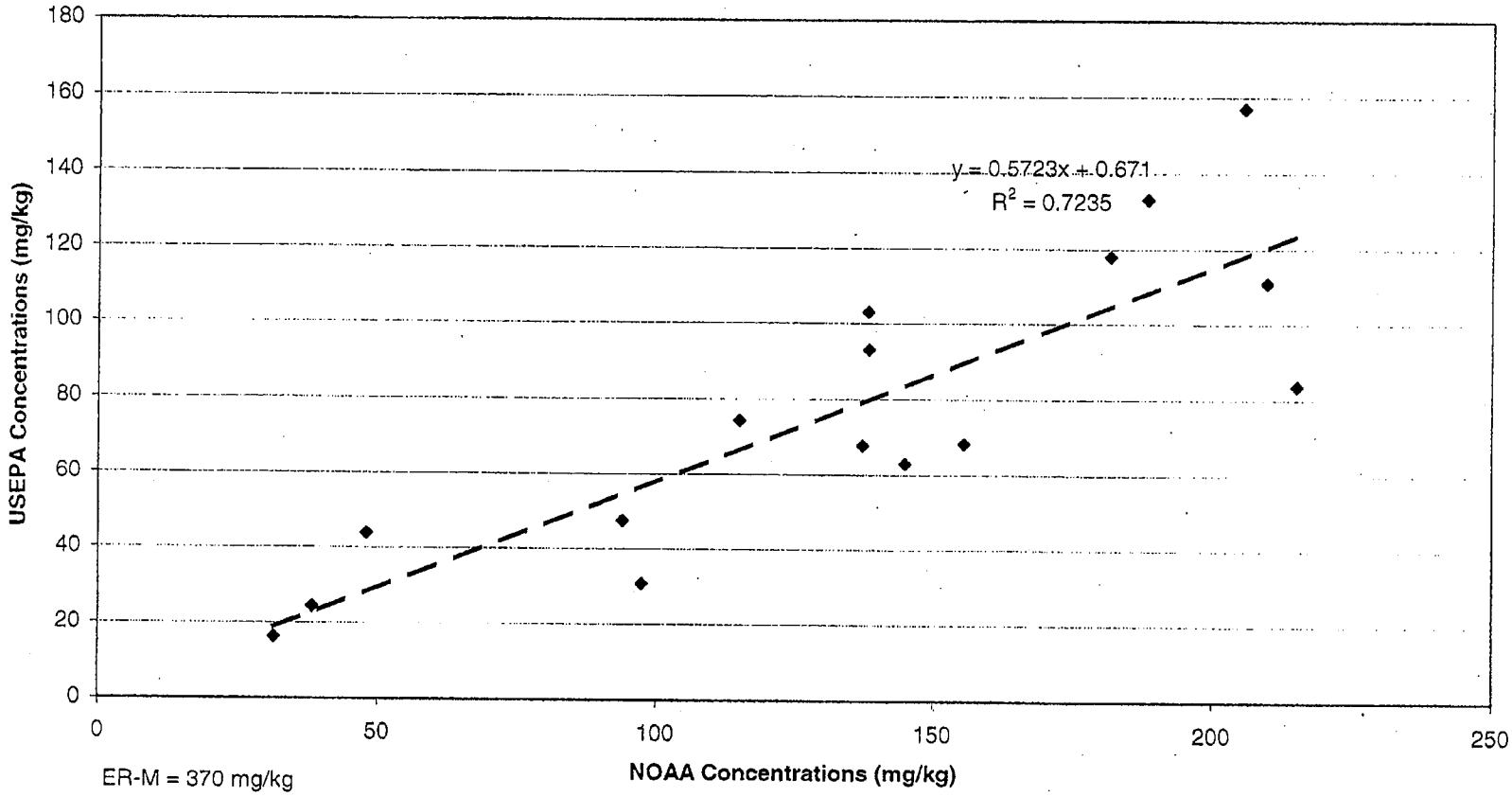


Figure 9
Iron Concentrations for Samples Analyzed Using USEPA and NOAA Methods
Evaluation of Analytical Methods Memorandum
Portsmouth Naval Shipyard, Kittery, Maine

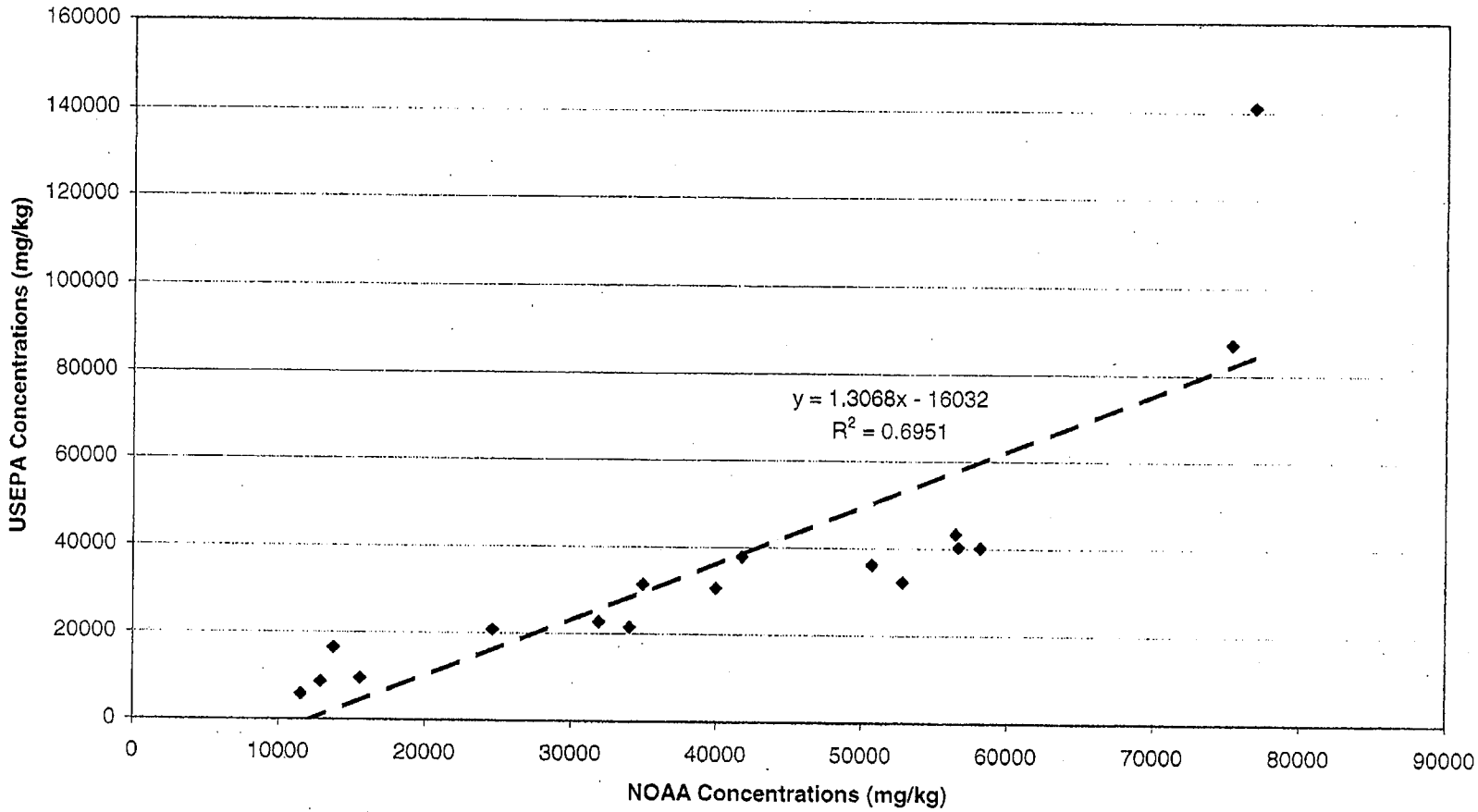


Figure 10
Manganese Concentrations for Samples Analyzed Using USEPA and NOAA Methods
Evaluation of Analytical Methods Memorandum
Portsmouth Naval Shipyard, Kittery, Maine

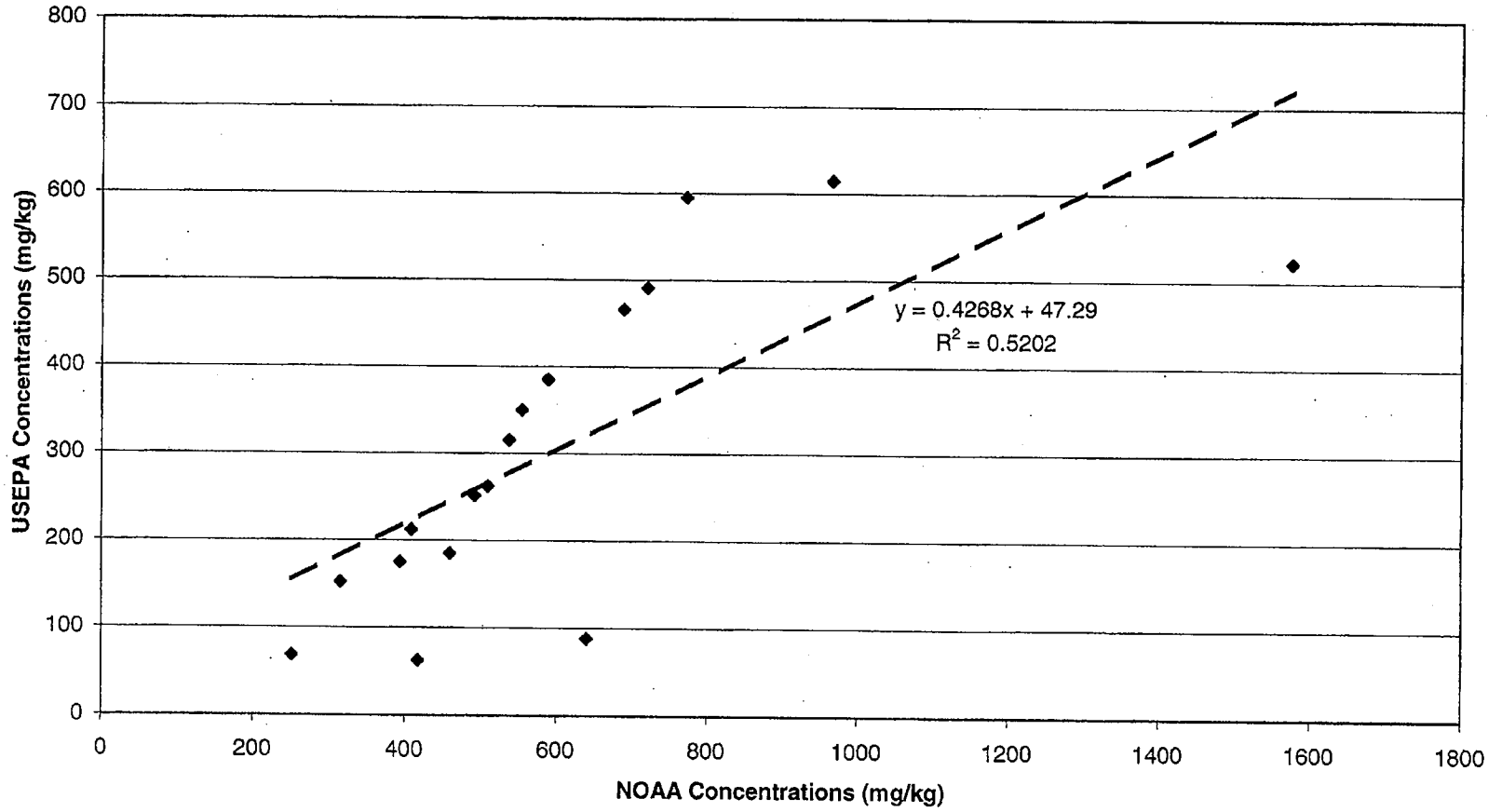


Figure 11
Silver Concentrations for Samples Analyzed Using USEPA and NOAA Methods
Evaluation of Analytical Methods Memorandum
Portsmouth Naval Shipyard, Kittery, Maine

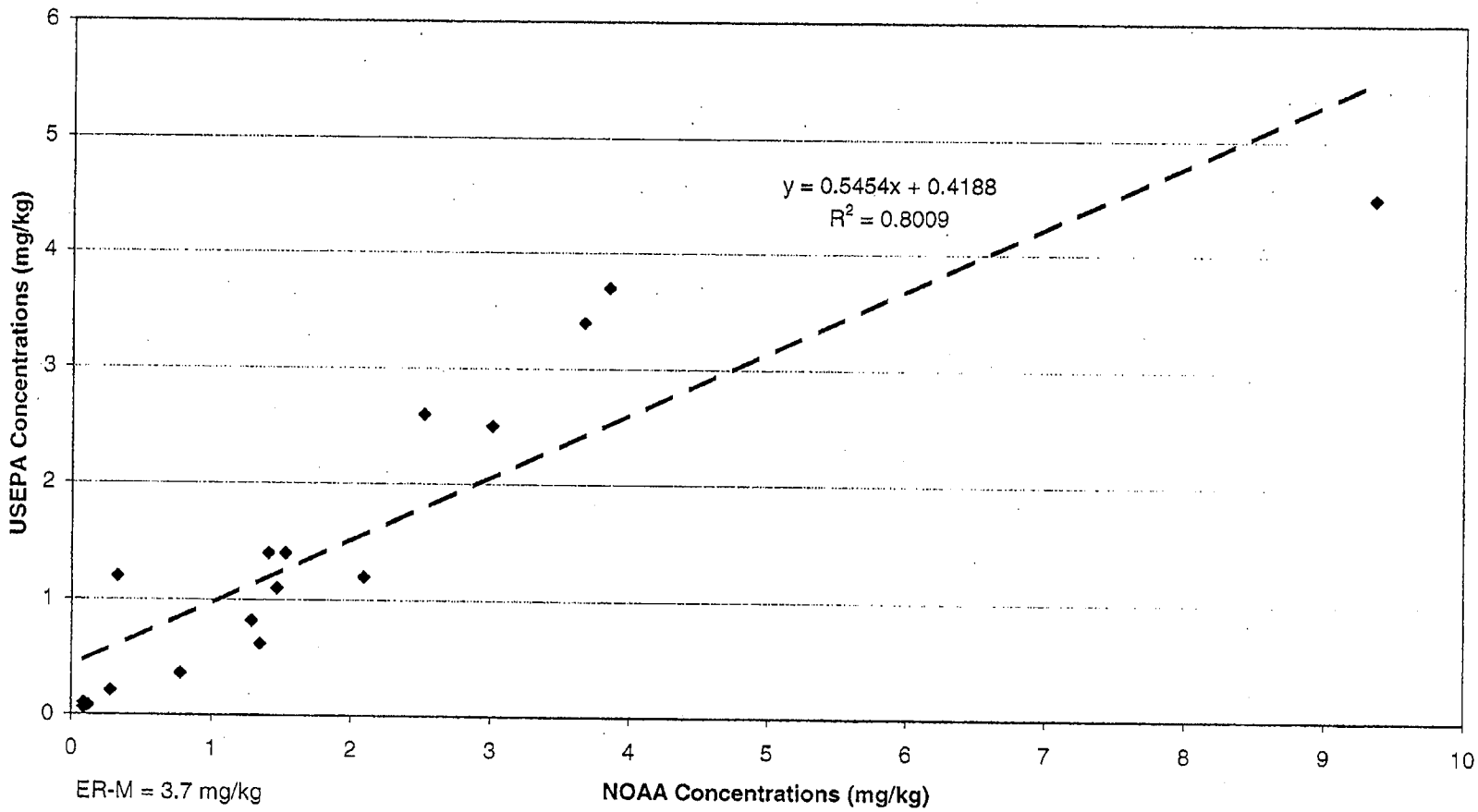
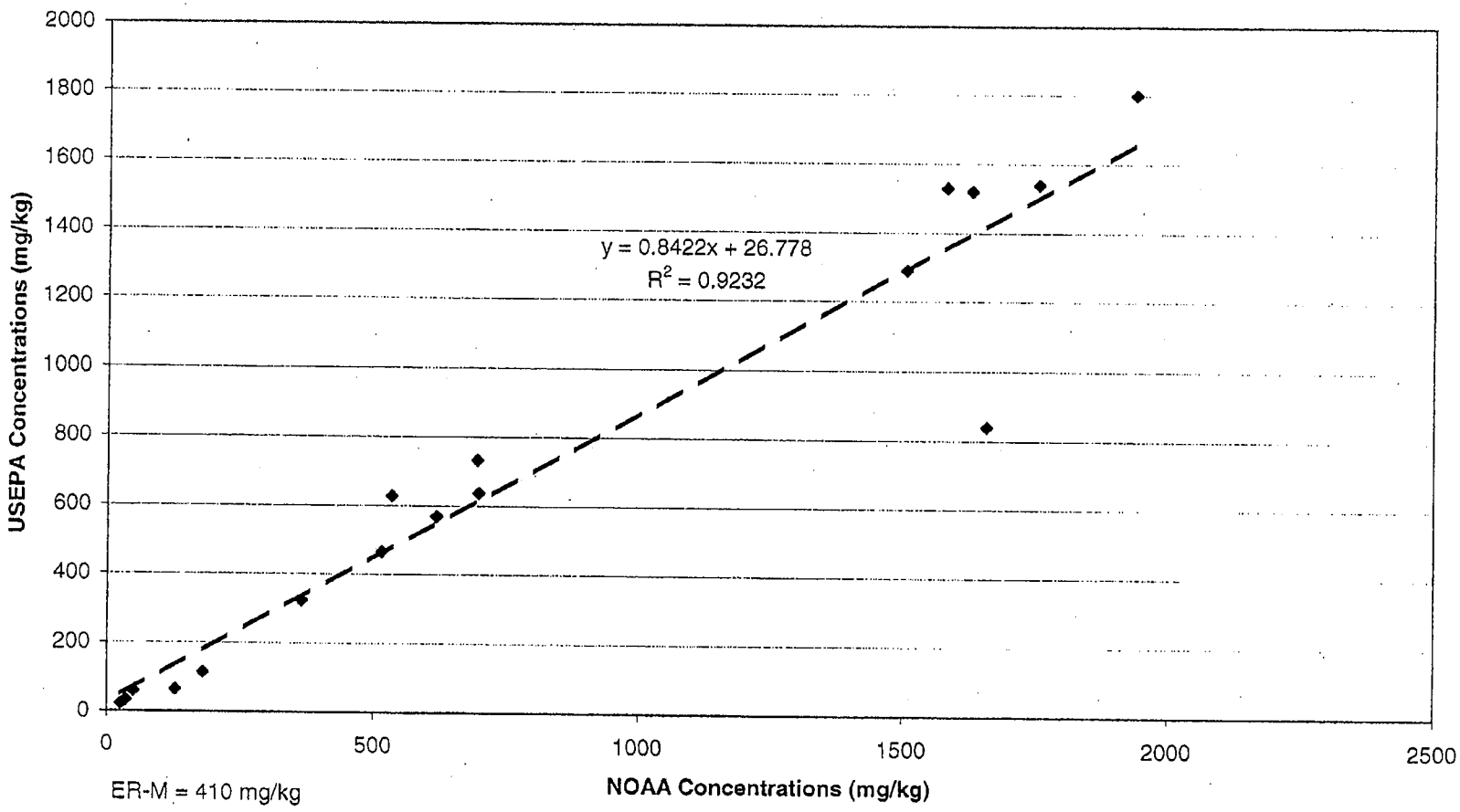


Figure 12
Zinc Concentrations for Samples Analyzed Using USEPA and NOAA Methods
Evaluation of Analytical Methods Memorandum
Portsmouth Naval Shipyard, Kittery, Maine



APPENDIX C

FATE AND TRANSPORT MODELING

C.1 BASELINE MODELING

C.2 UNCERTAINTY ANALYSIS

ON-SHORE/OFF-SHORE CONTAMINANT FATE AND TRANSPORT MODELING
OPERABLE UNIT 7 – SITE 32 TOPEKA PIER
PORTSMOUTH NAVAL SHIPYARD KITTERY, MAINE

1.0 BACKGROUND, OBJECTIVE AND APPROACH

Contaminant migration and their potential environmental impacts were evaluated by mathematical modeling of groundwater flow and chemical transport, consistent with the protocol in Appendix D of the Site 32 RI QAPP (Tetra Tech NUS, 2003). The Stage 1 modeling featured the use of simple analytical models to characterize site complexity relative to contaminant fate and transport; therefore, the Stage 1 modeling was designed to be conservative so that a high level of confidence could be attained.

Fill materials placed at Site 32 in the past contained soil and debris material that may have affected the quality of shallow groundwater beneath portions of Site 32 and seeps and storm sewer outfalls at the north edge of Site 32. These groundwater discharges may affect the water or sediment quality in the Back Channel of the Piscataqua River. Since most of Site 32 is currently paved, significantly reducing the potential for current impacts, the modeling performed to evaluate the potential adverse impact that would result from a future hypothetical scenario where the pavement was removed. Under this scenario, contaminant migration would likely increase due to leaching from increased recharge through the soils. Therefore, the intent of this modeling effort is to evaluate future on-shore contaminant migration to off-shore receptors.

The modeling approach involved the same procedures, equations and evaluations used in previous on-shore/off-shore contaminant fate and transport modeling efforts at other sites at Portsmouth Naval Shipyard (PNS); refer to Appendix D of the Site 32 RI QAPP and the previous Phase I and Phase II modeling reports for other sites at PNS (Brown & Root Environmental, 1997; Tetra Tech NUS, 1999) for details. The Stage 1 modeling involved a number steps. The initial step involved identification for COPCs. The subsequent steps of the Stage 1 modeling consisted of a set of mixing equations, reaction equations, and a one-dimensional transport equation that mathematically describe and link on-shore and off-shore processes affecting contaminant transport in groundwater and simple mixing of seeps with tidal water. The following sections summarize the estimation of the model input parameters for the Stage 1 modeling for Site 32.

2.0 IDENTIFICATION OF CONTAMINANTS OF POTENTIAL CONCERN (COPCs)

The initial step of the Site 32 Stage 1 modeling involved development of a list of COPCs. The list became the starting point for subsequent model evaluations. The list was developed in a three-step screening process, consistent with Section 5 of the On-Shore/Off-Shore Contaminant Fate and Transport Modeling Phase I Report (Brown & Root Environmental, 1997). First, on-shore contaminant maximum positive detections for groundwater, as well as calculated maximum leachate concentrations from maximum concentrations observed in Site 32 soils, were directly compared with established off-shore surface water screening criteria. Second, the potential mobility and degradation of each of the remaining contaminants were then evaluated, and, third, an evaluation occurred based on frequency of detection in both groundwater and soils. Known off-shore COPCs from previous studies, based on either ecological or human health risk assessment, were given special consideration. If these known off-shore COPCs could be attributed to the given on-shore source area by evaluating frequency of detection in both groundwater and soils, these previously determined COPCs were also considered potential COPCs. For this modeling, the third step was not performed, as 100 percent of COPCs were retained following the second step. Output from the screening process is presented in Attachment C.1.

For determination of potential mobility and degradation, several sub-steps were necessary in order to process and prepare the data for the screening process. The first substep involved

determining site-specific fractional organic carbon (foc) for Site 32. Data was divided into surface (less than 2 feet bgs) and subsurface (greater than 2 feet bgs), where the surface data was used for sediment and subsurface data was used for soil foc. The next two substeps involved determination of site-specific soil-water partitioning coefficients (K_d) for inorganics. Site-specific K_d values were calculated for inorganics where soil and groundwater concentration data occurs at equivalent vertical positions (soil samples collected within screened portion of groundwater monitoring wells). Once calculated, site-specific soil K_d values were compared to literature values and, to be conservative, the lower of the two values was selected to be used in the model. The next step involved calculating soil K_d values for organic constituents using the site-specific foc and literature values of Koc. Output from these sub-steps are provided in Attachment C.1

Table C.5 presents the COPCs selected for use in the Stage 1 modeling for Site 32. Table C.6 presents the cumulative rankings for the preliminary COPCs. The identified COPCs account for 100 percent of the cumulative mass based on the screening process. Eighteen metals were selected as inorganic COPCs, and two VOCs (acetone and carbon disulfide), one PAH (pyrene), seven pesticides, and one PCB (Arochlor-1254) were selected as organic COPCs.

3.0 SITE-SPECIFIC MODEL INPUT ESTIMATES

The on-shore portion of the site conceptual model considers processes necessary for estimating contaminant distributions and mass fluxes between on-shore contaminant sources and the shoreline. The most significant pathways include leachate generation from source material to groundwater; groundwater transport directly to surface water; and groundwater transport to sediment. Off-shore receptors include both humans and biota. The off-shore portion of the model considers processes necessary for estimating contaminant concentrations in the surface water and sediment layer from on-shore contaminant discharge and tidal mixing. Because the Stage 1 effort is an analytical model, rather than a complex numerical model, focus is on the intertidal and near-shore areas adjacent to each site, rather than the main channel flow. The on-shore and off-shore conceptual models are integrated such that output values from the on-shore model are considered in developing input values to the off-shore model. Hydraulic connection (in particular, tidal effects) and contaminant loading are the two important factors to be linked between the on-shore and off-shore model.

The development of analytical equations is necessary to represent the site conceptual model in mathematical form and is presented in Sections 6 and 7 of the On-Shore/Off-Shore Contaminant Fate and Transport Modeling Phase I Report (Brown & Root Environmental, 1997). A site-specific preliminary conceptual model is presented in Section 2 of Appendix D of the Site 32 RI QAPP. Equations address the on-shore conceptual model, the off-shore conceptual model, and an integration of the two models. Generally, the conceptual model is represented by simple mathematical equations and modified slightly as necessary to incorporate site-specific considerations. For Site 32, the conceptual model for Operable Unit 3 from the Phase I modeling report was found to be nearly identical (slight variations in overburden thicknesses). Therefore, equations developed relevant to this conceptual model were used for the Site 32 model.

Input values incorporate constituent- and site-specific information and, therefore, can be used to estimate current and future contaminant conditions. Table C.8 summarizes the site-specific physical and hydrogeological input parameters. Table C.9 summarizes the site-specific chemical specific contaminant input parameters. Supporting information for the site-specific input values for the Site 32 modeling are provided in Attachment C.1.

On-shore Analytical Model – Contaminant Source Area

The average infiltration rate was estimated to be 14 inches per year. This value was based on output from the HELP modeling performed during the Phase I On-shore/Off-Shore Contaminant Fate and Transport Model (Brown & Root, 1997) for grass areas. For the grass areas modeled with the HELP model, infiltration ranged from 12.15 to 13.75 inches per year. To be conservative,

a value of 14 inches per year was selected. The contaminant source area was estimated from site figures and encompasses the outer extents of the water elevation maps. The travel distance to the shoreline was assumed to be 1 foot to be conservative.

On-shore Analytical Model – Saturated Zone

The dry bulk density and saturated effective porous space were assumed based on typical values for the types of soils at PNS. Additionally, these values are consistent with the previous modeling preformed at PNS as well as other calculations performed in other PNS investigations. The hydraulic gradient was estimated from gradients observed along the Site 32 shoreline from the December 16, 2008 low tide water elevation map, calculated to be 0.01126 feet/feet. The groundwater plume width is assumed to be the length of the shoreline as the model assumes that contamination occurs along the entire shoreline length. A distance of 1,430 feet was estimated based on site maps.

The Darcy's Law based net groundwater flow rate is based on two components – groundwater discharging from the formation to the shoreline and groundwater discharging from the formation to the storm sewer piping. Based on analysis of the low- and high-tide water elevation maps, it appears that the storm sewers are hydraulically connected to the subsurface groundwater flow system. The addition of groundwater discharge to the storm sewer pipes was included in the model in order to obtain representative modeling results. There are several key input parameters needed to calculate the Darcy's Law based groundwater flow rate – hydraulic conductivity, layer thickness, hydraulic gradient and discharge length. For groundwater discharging from the formation to the shoreline, the geometric mean of the hydraulic conductivities from slug tests was used (200 feet/day) and the geometric mean of the hydraulic gradient was used (0.01126 feet/feet). The layer thickness used was 13 feet and represents an average surface fill thickness across Site 32 (the layer thickness generally increases toward the shoreline). While other overburden and bedrock layers occur at Site 32, it has been assumed that the contamination originates in the surface fill layer and that the silt and clay layer underlying this placed layer prevent effective downward migration of contamination. Based on the estimated shoreline distance of 1430 feet, a resultant Darcy's Law based groundwater flow rate of 15,291,074 ft^3/year was calculated.

For determination of the Darcy's Law based groundwater flow rate for groundwater discharging to the storm sewer pipes, the following input were considered. The same hydraulic conductivity of 200 feet/day was used and hydraulic gradients were calculated specific to the outfall pipes. The discharge length was determined to be the length of the outfall pipe, as estimated from site maps obtained from PNS personnel. The layer thickness was estimated based on percentage of full outfall pipes with flowing water on October 22, 2009 at low-tide. While a comprehensive survey measuring the percentage of water at all locations within the outfall pipes was not performed, based on the two pipes with flowing water, a value of 50% full was assumed for all pipes. Specific pipe diameters were also used, based on data obtained from PNS. A resultant Darcy's Law based groundwater flow rate of 1,477,776 ft^3/year was calculated (approximately 10% of the groundwater to shoreline flow rate). The total net Darcy's Law based groundwater flow rate was then found to be 16,768,850 ft^3/year. The derivations of these calculations are summarized in Table C.7.

The groundwater velocity was determined based on a weighted average approach based on Darcy's Law based groundwater flow. The groundwater salinity of 6 parts per thousands was maintained from the previous modeling performed in the Back Channel area.

Off-shore Analytical Model

Since no appreciable changes were identified from the previous Phase I modeling for the OU3 to Back Channel area, all model inputs were assumed to be appropriate for the Phase I modeling for Site 32. The only input parameter that was modified was seawater salinity, which was changed

to 28 parts per thousand to represent salinity more appropriate of water contained in the Back Channel.

Site-Specific Chemical Specific Input Parameters

Table C.9 summarizes the site-specific chemical specific contaminant input parameters.

4.0 BASELINE RESULTS

The baseline case incorporates conservative site-specific input values. The associated output estimates surface water, porewater and sediment concentrations then compares these results with established surface water and sediment screening criteria. Table C.10 summarizes the estimated surface water, porewater and sediment concentrations compared to screening criteria. Complete baseline results including model input and output is provided in Attachment C.1.

5.0 UNCERTAINTY ANALYSIS

An uncertainty analysis was designed and conducted for the Site 32 Phase I modeling to evaluate the level of conservativeness of the baseline case. Two different technical approaches were used in the uncertainty analysis. A deterministic approach was first applied to evaluate specific combinations of important model input parameter values. These specific combinations represent candidates considered for the baseline case other than the one actually developed. A probabilistic approach was then applied in order to evaluate the effective range of various input parameters. For instance, a deterministic approach of evaluating changes to the infiltration rate was examined in a probabilistic approach of evaluating multiple possible data inputs (varied from 1 inch/year to 24 inches/year).

Results of the uncertainty analyses are summarized in Table C.11 and presented in Attachment C.2.

ATTACHMENT C.1

BASELINE MODELING

Table C.1 foc estimate

Sample ID	TOC Value	Units	Loction ID	Top Depth	Bottom Depth
BGS-05	3.9	%	BGS-05	0	1.2
TP-SS01-0001-98	3	%	TP-MW01	0	1
TP-SS02-0001-98	3.4	%	TP-MW02	0	1
TP-SS03-0001-98	4.5	%	TP-MW03	0	1
TP-SS04-0001-98	2.1	%	TP-MW04	0	1
TP-SS05-0001-98	3.4	%	TP-MW05	0	1
TP-SS06-0001-98	8.1	%	TP-MW06	0	1
TP-SS07-0001-98	1.2	%	TP-MW07	0	1
TP-SS08-0001-98	0.91	%	TP-SB08	0	1
TP-SS09-0001-98-AVG	7	%	TP-SB09	0	1
TP-SS10-0001-98	2.2	%	TP-SB10	0	1
TP-SS11-0001-98-AVG	1.9	%	TP-SB11	0	0.7
TP-SS12-0001-98	2.4	%	TP-SB12	0.2	0.8
TP-SS15-0001-98	6.7	%	TP-SB15	0.3	0.7
TP-SS17-0001-98	1.9	%	TP-SB17	0	1
TPSS26B0001	5.1	%	TP-SB26B	0	1
TPSS33B0001	11	%	TP-SB33	0	1
Minimum	**0.91**	%	**Depths < 2 feet bgs**		
Maximum	**11**	%			
Arithmetic Average	**4.04**	%			
Geomean	**3.27**	%			
TP-SB09-1315-98	1.1	%	TP-SB09	13	15
TP-SB10-0305-98	5.3	%	TP-SB10	3	5
TP-SB10-1315-98	1.1	%	TP-SB10	13	15
TP-SB11-0305-98	0.32	%	TP-SB11	3	5
TP-SB11-0709-98	0.41	%	TP-SB11	7	9
TP-SB11-1315-98	0.41	%	TP-SB11	13	15
TP-SB12-0507-98	0.62	%	TP-SB12	5	7
TP-SB13-0305-98	1	%	TP-SB13	3	5
TP-SB13-0709-98	0.31	%	TP-SB13	7	9
TP-SB13-1315-98	0.25	%	TP-SB13	13	15
TP-SB14-0305-98	0.46	%	TP-SB14	3	5
TP-SB14-0709-98	16	%	TP-SB14	7	9
TP-SB14-1315-98	0.71	%	TP-SB14	13	15
TP-SB15-0305-98	6.7	%	TP-SB15	3	5
TP-SB15-0709-98	1.7	%	TP-SB15	7	9
TP-SB15-1315-98-AVG	0.245	%	TP-SB15	13	15
TP-SB16-1719-98	0.038	%	TP-SB16	17	19
TP-SB17-0305-98	0.77	%	TP-SB17	3	5
TP-SB17-0709-98	0.97	%	TP-SB17	7	9
TPSB200205-AVG	12.5	%	TP-SB20	2	5
TPSB20B0508	1.8	%	TP-SB20B	5	8
TPSB400508	1.6	%	TP-SB40	5	8
TP-SB01-0305-98	0.94	%	TP-MW01	3	5
TP-SB01-0810-98	0.93	%	TP-MW01	8	10
TP-SB01-1214-98	0.87	%	TP-MW01	12	14
TP-SB02-0305-98	1.3	%	TP-MW02	3	5
TP-SB02-1517-98	1	%	TP-MW02	15	17
TP-SB03-0305-98	2.6	%	TP-MW03	3	5

Table C.1 foc estimate

Sample ID	TOC Value	Units	Loction ID	Top Depth	Bottom Depth
TP-SB03-0507-98	2.9	%	TP-MW03	5	7
TP-SB03-1315-98-AVG	1.45	%	TP-MW03	13	15
TP-SB03-2325-98	1.9	%	TP-MW03	23	25
TP-SB04-1315-98-AVG	1.25	%	TP-MW04	13	15
TP-SB05-0305-98-AVG	1.15	%	TP-MW05	3	5
TP-SB05-0507-98	5.9	%	TP-MW05	5	7
TP-SB06-0305-98	10	%	TP-MW06	3	5
TP-SB06-1315-98	2.2	%	TP-MW06	13	15
TP-SB07-0305-98	3.6	%	TP-MW07	3	5
TP-SB07-1315-98-AVG	6.55	%	TP-MW07	13	15
TP-SB07-1820-98	1.9	%	TP-MW07	18	20
TP-SB08-0305-98	1.9	%	TP-SB08	3	5
TP-SB08-0507-98	2.2	%	TP-SB08	5	7
TP-SB08-1820-98	0.28	%	TP-SB08	18	20
TP-SB09-0810-98	1.8	%	TP-SB09	8	10

Minimum	**0.038**	%	**Depths >= 2 feet bgs**
Maximum	**16**	%	
Arithmetic Average	**2.49**	%	
Geomean	**1.30**	%	

Minimum	**0.038**	%	**All Depths**
Maximum	**16**	%	
Arithmetic Average	**2.93**	%	
Geomean	**1.69**	%	

Table C.2 Kd Estimate

Chemical	Groundwater Sample Number	Result	Units	Soil Sample Number	Result	Units	Cacluated KD value (L/kg)	Geometric Mean of Calculated Kd values
Aluminum	TP-MW-02-11	1060 U	UG/L	TP-SB02-0305-98	10200	MG/KG	9623	
	TP-MW-03-11	171 U	UG/L	TP-SB03-0305-98/ TP-SB03-0507-98	12700	MG/KG	74269	
	TP-MW-04-11-AVG	2198.5 U	UG/L	TP-SB04-0305-98/ TP-SB04-0709-98	12570	MG/KG	5718	
	TP-MW-05-11	2770	UG/L	TP-SB05-0305-98-AVG/ TP-SB05-0507-98 / TP-SB05-0810-98	6515	MG/KG	2352	
	TP-MW-06-11	3610 U	UG/L	TP-SB06-0305-98/ TP-SB06-0507-98/ TP-SB06-1315-98	5667	MG/KG	1570	
	TP-MW-07-11	154 U	UG/L	TP-SB07-0305-98/ TP-SB07-1315-98-AVG	10740	MG/KG	69740	
	TPGWMW080503	14500	UG/L	TPSB290508	13100	MG/KG	903	
	TPGWMW090503	101 U	UG/L	TPSB210508	8320	MG/KG	82376	
	TPGWMW100503	86.1 U	UG/L	TPSB38A0709	8990	MG/KG	104413	12629
Antimony	TP-MW-04-11-AVG	39.6 U	UG/L	TP-SB04-0305-98/ TP-SB04-0709-98	1.82	MG/KG	46	
	TP-MW-04-11-AVG	39.6 U	UG/L	TP-SB05-0305-98-AVG/ TP-SB05-0507-98/ TP-SB05-0810-98	1.27	MG/KG	32.1	
	TP-MW-06-11	21.2 U	UG/L	TP-SB06-0305-98	12.5	MG/KG	590	
	TP-MW-07-11	39.6 U	UG/L	TP-SB07-0305-98	0.68 U	MG/KG	17.2	
	TPGWMW080503	8.5 U	UG/L	TPSB290508	0.25 U	MG/KG	29.4	
	TPGWMW090503	1.3 U	UG/L	TPSB210508	1.8 U	MG/KG	1385	92.1
Arsenic	TP-MW-02-11	41.2 J	UG/L	TP-SB02-0305-98/ TP-SB02-1517-98	8.85 J	MG/KG	215	
	TP-MW-03-11	37 U	UG/L	TP-SB03-0305-98/ TP-SB03-0507-98	10.8	MG/KG	292	
	TP-MW-04-11-AVG	37 U	UG/L	TP-SB04-0305-98/ TP-SB04-0709-98	11.5	MG/KG	311	

Table C.2 Kd Estimate

Chemical	Groundwater Sample Number	Result	Units	Soil Sample Number	Result	Units	Cacluated KD value (L/kg)	Geometric Mean of Calculated Kd values
	TP-MW-05-11	37 U	UG/L	TP-SB05-0305-98-AVG/ TP-SB05-0507-98/ TP-SB05-0810-98	12.2	MG/KG	330	
	TP-MW-06-11	19.6 J	UG/L	TP-SB06-0305-98/ TP-SB06-0507-98/ TP-SB06-1315-98	23.1	MG/KG	1179	
	TP-MW-07-11	37 U	UG/L	TP-SB07-0305-98/ TP-SB07-1315-98-AVG	12.45	MG/KG	336	
	TPGWMW080503	27.4	UG/L	TPSB290508	14.4	MG/KG	526	
	TPGWMW090503	6.7	UG/L	TPSB210205/TPSB210508	16.8	MG/KG	2507	
	TPGWMW100503	9 U	UG/L	TPSB38A0709	12 J	MG/KG	1333	548
Barium	TP-MW-02-11	51.9 J	UG/L	TP-SB02-0305-98	63.3 J	MG/KG	1220	
	TP-MW-03-11	128 J	UG/L	TP-SB03-0305-98/ TP-SB03-0507-98	57	MG/KG	445	
	TP-MW-04-11-AVG	17.45 U	UG/L	TP-SB04-0305-98/TP-SB04-0709-98	113.8	MG/KG	6521	
	TP-MW-05-11	76.7 J	UG/L	TP-SB05-0305-98-AVG/TP-SB05-0507-98/TP-SB05-0810-98	71	MG/KG	926	
	TP-MW-06-11	91.9 J	UG/L	TP-SB06-0305-98/TP-SB06-0507-98/TP-SB06-1315-98	193.8	MG/KG	2109	
	TP-MW-07-11	16.6 U	UG/L	TP-SB07-0305-98/TP-SB07-1315-98-AVG	56.3	MG/KG	3392	
	TPGWMW080503	556	UG/L	TPSB290508	86.2 J	MG/KG	155	
	TPGWMW090503	141	UG/L	TPSB210205/TPSB210508	49.9	MG/KG	354	
	TPGWMW100503	32.4	UG/L	TPSB38A0709	83.8	MG/KG	2586	1143
Beryllium	TP-MW-02-11	1.2 U	UG/L	TP-SB02-0305-98	0.45 J	MG/KG	375	

Table C.2 Kd Estimate

Chemical	Groundwater Sample Number	Result	Units	Soil Sample Number	Result	Units	Cacluated KD value (L/kg)	Geometric Mean of Calculated Kd values
	TP-MW-03-11	0.95 U	UG/L	TP-SB03-0305-98/TP-SB03-0507-98	0.64 J	MG/KG	674	
	TP-MW-04-11-AVG	1.45 U	UG/L	TP-SB04-0305-98/TP-SB04-0709-98	0.4	MG/KG	276	
	TP-MW-05-11	1.3 U	UG/L	TP-SB05-0305-98-AVG/TP-SB05-0507-98/TP-SB05-0810-98	0.42	MG/KG	323	
	TP-MW-06-11	0.86 U	UG/L	TP-SB06-0305-98/TP-SB06-0507-98/TP-SB06-1315-98	0.53	MG/KG	616	
	TP-MW-07-11	1.6 U	UG/L	TP-SB07-0305-98/TP-SB07-1315-98-AVG	0.82	MG/KG	513	
	TPGWMW080503	2.4 U	UG/L	TPSB290508	0.37	MG/KG	154	
	TPGWMW090503	0.72 U	UG/L	TPSB210205/TPSB210508	0.8	MG/KG	1111	
	TPGWMW100503	1.2 U	UG/L	TPSB38A0709	0.27 J	MG/KG	225	402
Cadmium	TP-MW-02-11	2.3 UJ	UG/L	TP-SB02-0305-98	0.61 J	MG/KG	265	
	TP-MW-03-11	2.3 UJ	UG/L	TP-SB03-0305-98/TP-SB03-0507-98	0.45	MG/KG	196	
	TP-MW-04-11-AVG	2.3 UJ	UG/L	TP-SB04-0305-98/TP-SB04-0709-98	0.56	MG/KG	243	
	TP-MW-05-11	2.3 UJ	UG/L	TP-SB05-0305-98-AVG/TP-SB05-0507-98/TP-SB05-0810-98	3.4	MG/KG	1478	
	TP-MW-06-11	2.3 U	UG/L	TP-SB06-0305-98/TP-SB06-0507-98/TP-SB06-1315-98	5.62	MG/KG	2443	
	TP-MW-07-11	2.3 UJ	UG/L	TP-SB07-0305-98/TP-SB07-1315-98-AVG	0.48	MG/KG	209	
	TPGWMW080503	1.5 J	UG/L	TPSB290508	0.35 U	MG/KG	233	

Table C.2 Kd Estimate

Chemical	Groundwater Sample Number	Result	Units	Soil Sample Number	Result	Units	Cacluated KD value (L/kg)	Geometric Mean of Calculated Kd values
	TPGWMW090503	0.28 U	UG/L	TPSB210205/TPSB210508	1.5	MG/KG	5357	
	TPGWMW100503	1.4 U	UG/L	TPSB38A0709	0.29 UJ	MG/KG	207	513
Calcium	TP-MW-02-11	254000	UG/L	TP-SB02-0305-98	4670	MG/KG	18.4	
	TP-MW-03-11	323000	UG/L	TP-SB03-0305-98/TP-SB03-0507-98	2315	MG/KG	7.2	
	TP-MW-04-11-AVG	343500	UG/L	TP-SB04-0305-98/TP-SB04-0709-98	4845	MG/KG	14.1	
	TP-MW-05-11	338000	UG/L	TP-SB05-0305-98-AVG/TP-SB05-0507-98/TP-SB05-0810-98	10150	MG/KG	30	
	TP-MW-06-11	122000	UG/L	TP-SB06-0305-98/TP-SB06-0507-98/TP-SB06-1315-98	4190	MG/KG	34.3	
	TP-MW-07-11	376000	UG/L	TP-SB07-0305-98/TP-SB07-1315-98-AVG	6455	MG/KG	17.2	
	TPGWMW080503	248000	UG/L	TPSB290508	37000	MG/KG	149	
	TPGWMW090503	935000	UG/L	TPSB210205/TPSB210508	5760	MG/KG	6.2	
	TPGWMW100503	297000	UG/L	TPSB38A0305/TPSB38A0709	15050	MG/KG	50.7	22.6
Chromium	TP-MW-02-11	3.4 U	UG/L	TP-SB02-0305-98	38 J	MG/KG	11176	
	TP-MW-03-11	9.4 U	UG/L	TP-SB03-0305-98/TP-SB03-0507-98	36.5	MG/KG	3883	
	TP-MW-04-11-AVG	16.9 U	UG/L	TP-SB04-0305-98/TP-SB04-0709-98	68.7	MG/KG	4065	
	TP-MW-05-11	11.5 U	UG/L	TP-SB05-0305-98-AVG/TP-SB05-0507-98/TP-SB05-0810-98	54	MG/KG	4696	

Table C.2 Kd Estimate

Chemical	Groundwater Sample Number	Result	Units	Soil Sample Number	Result	Units	Cacluated KD value (L/kg)	Geometric Mean of Calculated Kd values
	TP-MW-06-11	15 U	UG/L	TP-SB06-0305-98/TP-SB06-0507-98/TP-SB06-1315-98	54.3	MG/KG	3620	
	TP-MW-07-11	11.6 U	UG/L	TP-SB07-0305-98/TP-SB07-1315-98-AVG	34.8	MG/KG	3000	
	TPGWMW080503	27.4	UG/L	TPSB290508	50.2	MG/KG	1832	
	TPGWMW090503	2.1 U	UG/L	TPSB210205/TPSB210508	578	MG/KG	275238	
	TPGWMW100503	2.9 U	UG/L	TPSB38A0709	35.5	MG/KG	12241	7253
Cobalt	TP-MW-02-11	2.7 U	UG/L	TP-SB02-0305-98	10.3	MG/KG	3815	
	TP-MW-03-11	2.7 U	UG/L	TP-SB03-0305-98/TP-SB03-0507-98	9.85	MG/KG	36485	
	TP-MW-04-11-AVG	2.7 U	UG/L	TP-SB04-0305-98/TP-SB04-0709-98	13.9	MG/KG	51485	
	TP-MW-05-11	2.7 U	UG/L	TP-SB05-0305-98-AVG/TP-SB05-0507-98/TP-SB05-0810-98	13.1	MG/KG	4852	
	TP-MW-06-11	5 U	UG/L	TP-SB06-0305-98/TP-SB06-0507-98/TP-SB06-1315-98	12.1	MG/KG	2420	
	TP-MW-07-11	2.7 U	UG/L	TP-SB07-0305-98/TP-SB07-1315-98-AVG	13.7	MG/KG	50742	
	TPGWMW080503	12 U	UG/L	TPSB290508	9.2	MG/KG	767	
	TPGWMW090503	1.4 U	UG/L	TPSB210205/TPSB210508	17.7	MG/KG	12643	
	TPGWMW100503	2.2 U	UG/L	TPSB38A0305/TPSB38A0709	11	MG/KG	5000	8395
Copper	TP-MW-02-11	65.3 U	UG/L	TP-SB02-0305-98	1180 J	MG/KG	18070	
	TP-MW-03-11	42.4 U	UG/L	TP-SB03-0305-98/TP-SB03-0507-98	2740	MG/KG	64623	

Table C.2 Kd Estimate

Chemical	Groundwater Sample Number	Result	Units	Soil Sample Number	Result	Units	Cacluated KD value (L/kg)	Geometric Mean of Calculated Kd values
	TP-MW-04-11-AVG	154.95 U	UG/L	TP-SB04-0305-98/TP-SB04-0709-98	954	MG/KG	6157	
	TP-MW-05-11	496	UG/L	TP-SB05-0305-98-AVG/TP-SB05-0507-98/TP-SB05-0810-98	5350	MG/KG	10786	
	TP-MW-06-11	142 U	UG/L	TP-SB06-0305-98/TP-SB06-0507-98/TP-SB06-1315-98	2859	MG/KG	20134	
	TP-MW-07-11	28.2 U	UG/L	TP-SB07-0305-98/TP-SB07-1315-98-AVG	245	MG/KG	8688	
	TPGWMW080503	333	UG/L	TPSB290508	95.9	MG/KG	288	
	TPGWMW090503	12.8 U	UG/L	TPSB210205/TPSB210508	574	MG/KG	44843	
	TPGWMW100503	4.6 U	UG/L	TPSB38A0709	19.6	MG/KG	4261	9680
Iron	TP-MW-02-11	2360 U	UG/L	TP-SB02-0305-98	20800	MG/KG	8814	
	TP-MW-03-11	1330 J	UG/L	TP-SB03-0305-98/TP-SB03-0507-98	23200	MG/KG	17444	
	TP-MW-04-11-AVG	4320 J	UG/L	TP-SB04-0305-98/TP-SB04-0709-98	44000	MG/KG	10185	
	TP-MW-05-11	7560 J	UG/L	TP-SB05-0305-98-AVG/TP-SB05-0507-98/TP-SB05-0810-98	50450	MG/KG	6673	
	TP-MW-06-11	17000 J	UG/L	TP-SB06-0305-98/TP-SB06-0507-98/TP-SB06-1315-98	114267	MG/KG	6722	
	TP-MW-07-11	199 U	UG/L	TP-SB07-0305-98/TP-SB07-1315-98-AVG	54825	MG/KG	275503	
	TPGWMW080503	21800	UG/L	TPSB290508	20400	MG/KG	936	
	TPGWMW090503	886	UG/L	TPSB210205/TPSB210508	24550	MG/KG	27709	
	TPGWMW100503	34.3 U	UG/L	TPSB38A0709	16400	MG/KG	478134	18385

Table C.2 Kd Estimate

Chemical	Groundwater Sample Number	Result	Units	Soil Sample Number	Result	Units	Cacluated KD value (L/kg)	Geometric Mean of Calculated Kd values
Lead	TP-MW-02-11	13.1 UJ	UG/L	TP-SB02-0305-98	121	MG/KG	9237	
	TP-MW-03-11	26.2 UJ	UG/L	TP-SB03-0305-98/TP-SB03-0507-98	159	MG/KG	6069	
	TP-MW-04-11-AVG	24.75 J	UG/L	TP-SB04-0305-98/TP-SB04-0709-98	293	MG/KG	11838.384	
	TP-MW-05-11	37.2	UG/L	TP-SB05-0305-98-AVG/TP-SB05-0507-98/TP-SB05-0810-98	1142	MG/KG	30699	
	TP-MW-06-11	195 J	UG/L	TP-SB06-0305-98/TP-SB06-0507-98/TP-SB06-1315-98	1560	MG/KG	8000	
	TP-MW-07-11	26.2 UJ	UG/L	TP-SB07-0305-98/TP-SB07-1315-98-AVG	218	MG/KG	8321	
	TPGWMW080503	99.6	UG/L	TPSB290508	126 J	MG/KG	1265	
	TPGWMW090503	0.91 UJ	UG/L	TPSB210205/TPSB210508	172	MG/KG	189011	
	TPGWMW100503	4.6 U	UG/L	TPSB38A0709	25.7	MG/KG	5587	10683
Magnesium	TP-MW-02-11	788000	UG/L	TP-SB02-0305-98	6000	MG/KG	7.6	
	TP-MW-03-11	867000	UG/L	TP-SB03-0305-98/TP-SB03-0507-98	7465	MG/KG	8.6	
	TP-MW-04-11-AVG	1135000	UG/L	TP-SB04-0305-98/TP-SB04-0709-98	9365	MG/KG	8.3	
	TP-MW-05-11	959000	UG/L	TP-SB05-0305-98-AVG/TP-SB05-0507-98/TP-SB05-0810-98	3905	MG/KG	4.1	
	TP-MW-06-11	571000	UG/L	TP-SB06-0305-98/TP-SB06-0507-98/TP-SB06-1315-98	3977	MG/KG	7	
	TP-MW-07-11	1230000	UG/L	TP-SB07-0305-98/TP-SB07-1315-98-AVG	7305	MG/KG	5.9	
	TPGWMW080503	776000	UG/L	TPSB290508	8710 J	MG/KG	11.2	

Table C.2 Kd Estimate

Chemical	Groundwater Sample Number	Result	Units	Soil Sample Number	Result	Units	Cacluated KD value (L/kg)	Geometric Mean of Calculated Kd values
	TPGWMW090503	322000	UG/L	TPSB210205/TPSB210508	5370	MG/KG	16.7	
	TPGWMW100503	776000	UG/L	TPSB38A0709	7500	MG/KG	10	8.2
Manganese	TP-MW-02-11	196 J	UG/L	TP-SB02-0305-98	390	MG/KG	1990	
	TP-MW-03-11	791 J	UG/L	TP-SB03-0305-98/TP-SB03-0507-98	379	MG/KG	479	
	TP-MW-04-11-AVG	210.5 J	UG/L	TP-SB04-0305-98/TP-SB04-0709-98	605	MG/KG	2874	
	TP-MW-05-11	451	UG/L	TP-SB05-0305-98-AVG/TP-SB05-0507-98/TP-SB05-0810-98	601	MG/KG	1333	
	TP-MW-06-11	1070 J	UG/L	TP-SB06-0305-98/TP-SB06-0507-98/TP-SB06-1315-98	523	MG/KG	489	
	TP-MW-07-11	3 UJ	UG/L	TP-SB07-0305-98/TP-SB07-1315-98-AVG	805	MG/KG	268333	
	TPGWMW080503	1600	UG/L	TPSB290508	317	MG/KG	198	
	TPGWMW090503	1000	UG/L	TPSB210205/TPSB210508	626	MG/KG	626	
	TPGWMW100503	25.8 U	UG/L	TPSB38A0709	274	MG/KG	10620	2047
Mercury	TP-MW-02-11	0.46 J	UG/L	TP-SB02-0305-98	0.05 U	MG/KG	109	
	TP-MW-03-11	0.01 UJ	UG/L	TP-SB03-0305-98/TP-SB03-0507-98	0.64	MG/KG	64000	
	TP-MW-04-11-AVG	0.21 J	UG/L	TP-SB04-0305-98/TP-SB04-0709-98	1.4	MG/KG	6667	
	TP-MW-05-11	0.07 U	UG/L	TP-SB05-0305-98-AVG/TP-SB05-0507-98/TP-SB05-0810-98	1.4	MG/KG	20000	
	TP-MW-06-11	0.25 J	UG/L	TP-SB06-0305-98/TP-SB06-0507-98/TP-SB06-1315-98	0.98	MG/KG	3920	

Table C.2 Kd Estimate

Chemical	Groundwater Sample Number	Result	Units	Soil Sample Number	Result	Units	Cacluated KD value (L/kg)	Geometric Mean of Calculated Kd values
	TP-MW-07-11	0.03 J	UG/L	TP-SB07-0305-98/TP-SB07-1315-98-AVG	0.83	MG/KG	27667	
	TPGWMW080503	0.17	UG/L	TPSB290508	0.15 J	MG/KG	882	
	TPGWMW090503	0.1 U	UG/L	TPSB210205/TPSB210508	0.13	MG/KG	1300	
	TPGWMW100503	0.12 U	UG/L	TPSB38A0709	0.16 J	MG/KG	13337	4871
Nickel	TP-MW-02-11	118 J	UG/L	TP-SB02-0305-98/TP-SB02-1517-98	50.8	MG/KG	431	
	TP-MW-03-11	59 U	UG/L	TP-SB03-0305-98/TP-SB03-0507-98	52.2	MG/KG	885	
	TP-MW-04-11-AVG	63.9 U	UG/L	TP-SB04-0305-98	138	MG/KG	2160	
	TP-MW-05-11	48.9 U	UG/L	TP-SB05-0305-98-AVG/TP-SB05-0507-98/TP-SB05-0810-98	354	MG/KG	7239	
	TP-MW-06-11	128	UG/L	TP-SB06-0305-98/TP-SB06-0507-98/TP-SB06-1315-98	136	MG/KG	1063	
	TP-MW-07-11	42.9 U	UG/L	TP-SB07-0305-98/TP-SB07-1315-98-AVG	54.7	MG/KG	1275	
	TPGWMW080503	31.5	UG/L	TPSB290508	38.4 J	MG/KG	1219	
	TPGWMW090503	4.3	UG/L	TPSB210205/TPSB210508	795	MG/KG	184884	
	TPGWMW100503	11.7 U	UG/L	TPSB38A0709	34.5	MG/KG	2949	2597
Potassium	TP-MW-02-11	262000	UG/L	TP-SB02-0305-98	2370	MG/KG	9	
	TP-MW-03-11	331000	UG/L	TP-SB03-0305-98/TP-SB03-0507-98	2605	MG/KG	7.9	
	TP-MW-04-11-AVG	410000	UG/L	TP-SB04-0305-98/TP-SB04-0709-98	3305	MG/KG	8.1	
	TP-MW-05-11	368000	UG/L	TP-SB05-0305-98-AVG/TP-SB05-0507-98/TP-SB05-0810-98	1597	MG/KG	4.31	

Table C.2 Kd Estimate

Chemical	Groundwater Sample Number	Result	Units	Soil Sample Number	Result	Units	Cacluated KD value (L/kg)	Geometric Mean of Calculated Kd values
	TP-MW-06-11	212000	UG/L	TP-SB06-0305-98/TP-SB06-0507-98/TP-SB06-1315-98	1048	MG/KG	4.91	
	TP-MW-07-11	448000	UG/L	TP-SB07-0305-98/TP-SB07-1315-98-AVG	3085	MG/KG	6.9	
	TPGWMW080503	269000	UG/L	TPSB290508	3000 J	MG/KG	11.2	
	TPGWMW090503	14300	UG/L	TPSB210205/TPSB210508	2435	MG/KG	170	
	TPGWMW100503	280000	UG/L	TPSB38A0709	2690 J	MG/KG	9.6	10.5
Selenium	TP-MW-02-11	31.9 U	UG/L	TP-SB02-0305-98	0.62 UJ	MG/KG	19.4	
	TP-MW-03-11	63.8 U	UG/L	TP-SB03-0305-98/TP-SB03-0507-98	0.615 UJ	MG/KG	9.6	
	TP-MW-04-11-AVG	63.8 U	UG/L	TP-SB04-0305-98/TP-SB04-0709-98	0.55 UJ	MG/KG	8.6	
	TP-MW-05-11	63.8 U	UG/L	TP-SB05-0305-98-AVG/TP-SB05-0507-98/TP-SB05-0810-98	3.3 U	MG/KG	51.7	
	TP-MW-06-11	31.9 U	UG/L	TP-SB06-0305-98/TP-SB06-0507-98/TP-SB06-1315-98	2.2 U	MG/KG	69	
	TP-MW-07-11	63.8 U	UG/L	TP-SB07-0305-98/TP-SB07-1315-98-AVG	1.75 U	MG/KG	27.4	
	TPGWMW080503	10.5 U	UG/L	TPSB290508	0.38 U	MG/KG	36.2	
	TPGWMW090503	2.1 U	UG/L	TPSB210205/TPSB210508	0.55 U	MG/KG	262	
	TPGWMW100503	10.5 U	UG/L	TPSB38A0709	0.16 U	MG/KG	15.2	30.5
Silver	TP-MW-02-11	2.7 U	UG/L	TP-SB02-0305-98	0.52 U	MG/KG	193	
	TP-MW-03-11	2.7 U	UG/L	TP-SB03-0305-98/TP-SB03-0507-98	0.52 U	MG/KG	193	
	TP-MW-04-11-AVG	2.7 U	UG/L	TP-SB04-0305-98/TP-SB04-0709-98	3.2	MG/KG	1185	

Table C.2 Kd Estimate

Chemical	Groundwater Sample Number	Result	Units	Soil Sample Number	Result	Units	Cacluated KD value (L/kg)	Geometric Mean of Calculated Kd values
	TP-MW-05-11	2.7 U	UG/L	TP-SB05-0305-98-AVG/TP-SB05-0507-98/TP-SB05-0810-98	3.7	MG/KG	1370	
	TP-MW-06-11	2.7 U	UG/L	TP-SB06-0305-98/TP-SB06-0507-98/TP-SB06-1315-98	1.6	MG/KG	593	
	TP-MW-07-11	2.7 U	UG/L	TP-SB07-0305-98/TP-SB07-1315-98-AVG	0.87	MG/KG	322	
	TPGWMW080503	2.7 U	UG/L	TPSB290508	0.05 UJ	MG/KG	18.5	
	TPGWMW090503	0.57 U	UG/L	TPSB210205/TPSB210508	0.21 UJ	MG/KG	368	
	TPGWMW100503	2.9 U	UG/L	TPSB38A0305/TPSB38A0709	0.79 U	MG/KG	272.4	303
Sodium	TP-MW-02-11	6020000	UG/L	TP-SB02-0305-98	486	MG/KG	0.08	
	TP-MW-03-11	7260000	UG/L	TP-SB03-0305-98/TP-SB03-0507-98	899	MG/KG	0.12	
	TP-MW-04-11-AVG	8775000	UG/L	TP-SB04-0305-98/TP-SB04-0709-98	1360	MG/KG	0.15	
	TP-MW-05-11	7710000	UG/L	TP-SB05-0305-98-AVG/TP-SB05-0507-98/TP-SB05-0810-98	1679	MG/KG	0.22	
	TP-MW-06-11	5160000	UG/L	TP-SB06-0305-98/TP-SB06-0507-98/TP-SB06-1315-98	1573	MG/KG	0.3	
	TP-MW-07-11	9580000	UG/L	TP-SB07-0305-98/TP-SB07-1315-98-AVG	2090	MG/KG	0.22	
	TPGWMW080503	7350000	UG/L	TPSB290508	704 J	MG/KG	0.096	
	TPGWMW090503	433000	UG/L	TPSB210205	217 J	MG/KG	0.5	
	TPGWMW100503	6840000	UG/L	TPSB38A0709	332 J	MG/KG	0.049	0.15
Thallium	TP-MW-02-11	32.2 UJ	UG/L	TP-SB02-0305-98	0.63 UJ	MG/KG	19.6	

Table C.2 Kd Estimate

Chemical	Groundwater Sample Number	Result	Units	Soil Sample Number	Result	Units	Cacluated KD value (L/kg)	Geometric Mean of Calculated Kd values
	TP-MW-03-11	64.4 UJ	UG/L	TP-SB03-0305-98/TP-SB03-0507-98	0.8 U	MG/KG	12.4	
	TP-MW-04-11-AVG	64.4 UJ	UG/L	TP-SB04-0305-98/TP-SB04-0709-98	0.65 U	MG/KG	10.1	
	TP-MW-05-11	64.4 U	UG/L	TP-SB05-0305-98-AVG/TP-SB05-0507-98/TP-SB05-0810-98	1.1 U	MG/KG	17.1	
	TP-MW-06-11	32.2 UJ	UG/L	TP-SB06-0305-98/TP-SB06-0507-98/TP-SB06-1315-98	2.3 U	MG/KG	71.4	
	TP-MW-07-11	66.1 J	UG/L	TP-SB07-0305-98/TP-SB07-1315-98-AVG	1.4 U	MG/KG	21.2	
	TPGWMW080503	0.59 U	UG/L	TPSB290508	0.92	MG/KG	1559	
	TPGWMW090503	0.11 U	UG/L	TPSB210205/TPSB210508	2.5	MG/KG	22727	
	TPGWMW100503	9.6 U	UG/L	TPSB38A0709	0.96 U	MG/KG	100	84.7
Vanadium	TP-MW-02-11	4.9 U	UG/L	TP-SB02-0305-98	25.4	MG/KG	5184	
	TP-MW-03-11	3.2 U	UG/L	TP-SB03-0305-98/TP-SB03-0507-98	31.5 J	MG/KG	9844	
	TP-MW-04-11-AVG	15.6 U	UG/L	TP-SB04-0305-98/TP-SB04-0709-98	42.1 J	MG/KG	2699	
	TP-MW-05-11	10.7 U	UG/L	TP-SB05-0305-98-AVG/TP-SB05-0507-98/TP-SB05-0810-98	22.6	MG/KG	2112	
	TP-MW-06-11	11.5 U	UG/L	TP-SB06-0305-98/TP-SB06-0507-98/TP-SB06-1315-98	17.4 J	MG/KG	1513	
	TP-MW-07-11	6.1 U	UG/L	TP-SB07-0305-98/TP-SB07-1315-98-AVG	39.3	MG/KG	6443	
	TPGWMW080503	25.8	UG/L	TPSB290508	30.8 J	MG/KG	1194	

Table C.2 Kd Estimate

Chemical	Groundwater Sample Number	Result	Units	Soil Sample Number	Result	Units	Cacluated KD value (L/kg)	Geometric Mean of Calculated Kd values
	TPGWMW090503	0.48 U	UG/L	TPSB210205/TPSB210508	24.3 J	MG/KG	50625	
	TPGWMW100503	1.8 U	UG/L	TPSB38A0709	25	MG/KG	13889	5111
Zinc	TP-MW-02-11	56.5 U	UG/L	TP-SB02-0305-98	953 J	MG/KG	16867	
	TP-MW-03-11	117 U	UG/L	TP-SB03-0305-98/TP-SB03-0507-98	579	MG/KG	4949	
	TP-MW-04-11-AVG	122.35 U	UG/L	TP-SB04-0305-98/TP-SB04-0709-98	1032	MG/KG	8435	
	TP-MW-05-11	532	UG/L	TP-SB05-0305-98-AVG/TP-SB05-0507-98/TP-SB05-0810-98	2470	MG/KG	4643	
	TP-MW-06-11	165 U	UG/L	TP-SB06-0305-98/TP-SB06-0507-98/TP-SB06-1315-98	1604	MG/KG	9721	
	TP-MW-07-11	92.8 U	UG/L	TP-SB07-0305-98/TP-SB07-1315-98-AVG	275	MG/KG	2963	
	TPGWMW080503	179	UG/L	TPSB290508	140	MG/KG	782	
	TPGWMW090503	12.6	UG/L	TPSB210205/TPSB210508	390	MG/KG	30952	
	TPGWMW100503	63.7 J	UG/L	TPSB38A0709	48.7	MG/KG	765	4937

Table C.3 Inorganic Kd in Soil

Parameter	Site Specific Calculated Kd	Representative Literature Kd	Reference	Kd use in Screening (4)
Aluminum	12629	1500	1	1500
Antimony	92.1	45	1	45
Arsenic	548	29	1	29
Barium	1143	41	1	41
Beryllium	402	790	1	402
Cadmium	513	75	1	75
Calcium	22.6	4	2	4
Chromium	7253	850	1	850
Cobalt	8395	45	1	45
Copper	9680	35	1	35
Cyanide	NA	9.9	1	9.9
Iron	18385	25	1	25
Lead	10683	900	1	900
Magnesium	8.2	4.5	1	4.5
Manganese	2047	65	1	65
Mercury	4871	52	1	52
Nickel	2597	65	1	65
Potassium	10.5	15	3	10.5
Selenium	30.5	5	1	5
Silver	303	8.3	1	8.3
Sodium	0.15	100	1	0.15
Thallium	84.7	71	1	71
Tin	NA	250	1	250
Vanadium	5111	1000	1	1000
Zinc	4937	62	1	62

(1) EPA Risk Based Screening Tables, May 2009.
(2) Baes & Sharp " A review and analysis of paramters for assessment of transport of evnironmentally related radionuclid's thorugh agriculture." ORNL 1985.
(3) Thibault, " A critical complication and reivew of defualt soil/liquied partition coefficients, kd, for use in environmental assessments," Atomic Energy of Canada Limited, 1990.
(4)Screened Kd is lower of site specific calculated kd and literature kd.

Table C.4 Organic Kd Values in Soil

Parameter	Koc	Ref	Kd (L/kg) Soil	Kd (L/kg) Sediment
1,2,3,4,6,7,8,9-OCDD	NA		--	--
1,2,3,4,6,7,8,9-OCDF	NA		--	--
1,2,3,4,6,7,8-HPCDD	NA		--	--
1,2,3,4,6,7,8-HPCDF	NA		--	--
1,2,3,4,7,8,9-HPCDF	NA		--	--
1,2,3,4,7,8-HXCDD	NA		--	--
1,2,3,4,7,8-HXCDF	NA		--	--
1,2,3,6,7,8-HXCDD	NA		--	--
1,2,3,6,7,8-HXCDF	NA		--	--
1,2,3,7,8,9-HXCDD	NA		--	--
1,2,3,7,8,9-HXCDF	NA		--	--
1,2,3,7,8-PECDD	NA		--	--
1,2,3,7,8-PECDF	NA		--	--
2,3,4,6,7,8-HXCDF	NA		--	--
2,3,4,7,8-PECDF	NA		--	--
2,3,7,8-TCDD	146300	1	1907.1668	4169.55
2,3,7,8-TCDF	NA		--	--
TOTAL HPCDD	NA		--	--
TOTAL HPCDF	NA		--	--
TOTAL HXCDD	NA		--	--
TOTAL HXCDF	NA		--	--
TOTAL PECDD	NA		--	--
TOTAL PECDF	NA		--	--
TOTAL TCDD	146300	1	1907.1668	4169.55
TOTAL TCDF	NA		--	--
1,1,2-TRICHLOROTRIFLUOROETHANE	224.7	1	2.9291892	6.40395
1,2,4-TRICHLOROBENZENE	717.6	1	9.3546336	20.4516
1,2-DICHLOROBENZENE	443.1	1	5.7762516	12.62835
1,3-DICHLOROBENZENE	1510	2	19.68436	43.035
1,4-DICHLOROBENZENE	434	1	5.657624	12.369
2,4-DIMETHYLPHENOL	717.6	1	9.3546336	20.4516
2-BUTANONE	3.827	1	0.049888772	0.1090695
2-HEXANONE	134	3	1.746824	3.819
2-METHYLNAPHTHALENE	4560	2	59.44416	129.96
4,4'-DDD	152500	1	1987.99	4346.25
4,4'-DDE	152500	1	1987.99	4346.25
4,4'-DDT	220300	1	2871.8308	6278.55
4-HYDROXY-4-METHYL-2-PENTANONE	NA	1	--	--
4-METHYLPHENOL	52.4	2	0.6830864	1.4934
ACENAPHTHENE	6123	1	79.819428	174.5055
ACENAPHTHYLENE	7400	2	96.4664	210.9
ACETONE	1.981	1	0.025824316	0.0564585
ALDRIN	105600	1	1376.6016	3009.6
ALPHA-BHC	4070	2	53.05652	115.995
ALPHA-CHLORDANE	86650	1	1129.5694	2469.525
ANTHRACENE	20400	1	265.9344	581.4
AROCLOR-1248	43900	1	572.2804	1251.15
AROCLOR-1254	75640	1	986.04304	2155.74
AROCLOR-1260	206800	1	2695.8448	5893.8
BENZENE	165.5	1	2.157458	4.71675
BENZO(A)ANTHRACENE	231300	1	3015.2268	6592.05
BENZO(A)PYRENE	786800	1	10256.7248	22423.8
BENZO(B)FLUORANTHENE	803100	1	10469.2116	22888.35
BENZO(G,H,I)PERYLENE	10700000	1	139485.2	304950
BENZO(K)FLUORANTHENE	786800	1	10256.7248	22423.8
BIS(2-ETHYLHEXYL)PHTHALATE	165400	1	2156.1544	4713.9
BUTYL BENZYL PHTHALATE	9359	1	122.003924	266.7315
CARBAZOLE	3390	1	44.19204	96.615
CARBON DISULFIDE	1	1	0.013036	0.0285
CHLOROFORM	35.04	1	0.45678144	0.99864
CHRYSENE	236100	1	3077.7996	6728.85
DIBENZO(A,H)ANTHRACENE	2622000	1	34180.392	74727

DIBENZOFURAN	8310	2	108.32916	236.835
DIELDRIN	10600	1	138.1816	302.1
DIESEL RANGE ORGANICS	NA	1	--	--
DIETHYL PHTHALATE	126.2	1	1.6451432	3.5967
DI-N-BUTYL PHTHALATE	33900	1	441.9204	966.15
DI-N-OCTYL PHTHALATE	83200000	1	1084595.2	2371200
ENDOSULFAN I	21900	1	285.4884	624.15
ENDOSULFAN SULFATE	2880	2	37.54368	82.08
ENDRIN ALDEHYDE	45000	2	586.62	1282.5
ETHYLBENZENE	517.8	1	6.7500408	14.7573
FLUORANTHENE	70850	1	923.6006	2019.225
FLUORENE	11290	1	147.17644	321.765
GASOLINE RANGE ORGANICS	NA	1	--	--
INDENO(1,2,3-CD)PYRENE	2676000	1	34884.336	76266
METHYLENE CHLORIDE	23.74	1	0.30947464	0.67659
NAPHTHALENE	1837	1	23.947132	52.3545
PHENANTHRENE	18200	2	237.2552	518.7
PHENOL	268	1	3.493648	7.638
PYRENE	69410	1	904.82876	1978.185
TETRACHLOROETHENE	106.8	1	1.3922448	3.0438
TOLUENE	268	1	3.493648	7.638
TOTAL AROCLOR	206800	1	2695.8448	5893.8
TOTAL XYLENES	443.1	1	5.7762516	12.62835
TRICHLOROETHENE	67.7	1	0.8825372	1.92945

kd=foc*koc
foc=1.3036%
foc is based on geometric mean of site specific subsurface (>=2 ft) soil data.

(1) EPA Risk Based Screening Tables, May 2009.
(2) Handbook of RCRA Ground-water monitoring constituents
(Appendix IX to 40 CFR Part 264). 1992
(3) Spectrum Chemical Fact Sheet, http://www.speclab.com/compound
Null fields indicate that no Koc data is available.

Table C.5 Initial COPC Summary

Detected Chemicals	Fraction	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg (1)	C(leachate) ug/L (2)	C(source) ug/L (3)	Maximum Groundwater Concentration	Units	Location of Maximum	Surface Water Screening Level ug/L	Ref	Retained As COPC?
ALUMINUM	M	29000	MG/KG	TP-MW01	1500	19333.333	2553.941	14500	UG/L	TP-MW08	87	1	Yes
ANTIMONY	M	1430	MG/KG	TP-SB24	45	31777.778	4197.857	34	UG/L	TP-MW06	36.6	2	Yes
ARSENIC	M	82.3	MG/KG	TP-SB38B	29	2837.931	374.892	41.2	UG/L	TP-MW02	4.9	2	Yes
BARIUM	M	2530	MG/KG	TP-SB27	41	61707.317	8151.561	556	UG/L	TP-MW08	13100	2	Yes
BERYLLIUM	M	3.1	MG/KG	TP-MW01	402	7.711	1.019	NA	UG/L	NA	0.53	3	Yes
CADMIUM	M	24.1	MG/KG	TP-SB37	75	321.333	42.448	3.9	UG/L	TP-MW06	8.8	1	Yes
CALCIUM	M	57200	MG/KG	TP-SB08	4	14300000.000	1889035.667	383000	UG/L	FA-01	NA		Yes
CHROMIUM	M	2860	MG/KG	TP-SB35	850	3364.706	444.479	27.4	UG/L	TP-MW08	50	1	Yes
COBALT	M	85.2	MG/KG	TP-SB35	45	1893.333	250.110	1.15	UG/L	FA-01B	23	4	Yes
COPPER	M	40400	MG/KG	TP-SB19	35	1154285.714	152481.600	496	UG/L	TP-MW05	3.1	1	Yes
IRON	M	280000	MG/KG	TP-SB23	25	11200000.000	1479524.439	21800	UG/L	TP-MW08	1000	1	Yes
LEAD	M	40000	MG/KG	TP-SB24	900	44444.444	5871.129	195	UG/L	TP-MW06	8.1	1	Yes
MAGNESIUM	M	13900	MG/KG	TP-SB25	4.5	3088888.889	408043.446	1240000	UG/L	FA-01	NA		Yes
MANGANESE	M	4370	MG/KG	TP-SB25	65	67230.769	8881.211	1600	UG/L	TP-MW08	120	4	Yes
MERCURY	M	120	MG/KG	TP-SB37	52	2307.692	304.847	0.46	UG/L	TP-MW02	0.94	1	Yes
NICKEL	M	3920	MG/KG	TP-SB35	65	60307.692	7966.670	278	UG/L	TP-MW06	8.2	1	Yes
POTASSIUM	M	6330	MG/KG	TP-MW01	10.5	602857.143	79637.667	448000	UG/L	TP-MW07	NA		Yes
SELENIUM	M	7.5	MG/KG	TP-SB35	5	1500.000	198.151	19.8	UG/L	FA-01	71	1	Yes
SILVER	M	25.6	MG/KG	TP-SB31	8.3	3084.337	407.442	6.2	UG/L	FA-01	0.19	1	Yes
SODIUM	M	5740	MG/KG	TP-SB08	0.15	38266666.667	5055041.832	10400000	UG/L	FA-01	NA		Yes
THALLIUM	M	3.6	MG/KG	TP-MW09	71	50.704	6.698	66.1	UG/L	TP-MW07	9.1	2	Yes
VANADIUM	M	109	MG/KG	TP-SB23	1000	109.000	14.399	25.8	UG/L	TP-MW08	20	4	Yes
ZINC	M	15800	MG/KG	TP-SB19	62	254838.710	33664.295	587	UG/L	TP-MW05	81	1	Yes
2,3,7,8-TCDD	Diox	0.001	UG/KG	TP-SB34	1907.167	5.243E-07	6.927E-08	NA		NA	0.000061	2	Yes
TOTAL TCDD	Diox	0.0982	UG/KG	TP-SB34	1907.167	5.149E-05	6.802E-06	NA		NA	0.000061	2	Yes
1,2,4-TRICHLOROBENZENE	OS	51	UG/KG	TP-MW06	9.3546	5.452	0.720	NA		NA	12.9	3	No
1,2-DICHLOROBENZENE	OS	1700	UG/KG	TP-MW06	5.7763	294.306	38.878	NA		NA	12.9	3	Yes
1,3-DICHLOROBENZENE	OS	130	UG/KG	TP-MW06	19.6844	6.604	0.872	NA		NA	NA		Yes
1,4-DICHLOROBENZENE	OS	120	UG/KG	TP-SB14	5.6576	21.210	2.802	NA		NA	12.9	3	Yes
2,4-DIMETHYLPHENOL	OS	240	UG/KG	TP-SB14	9.3546	25.656	3.389	NA		NA	21.2	3	Yes
2-METHYLNAPHTHALENE	OS	1200	UG/KG	TP-SB39	59.4442	20.187	2.667	0.2	UG/L	TP-MW09	3	3	Yes
4-HYDROXY-4-METHYL-2-PENTANONE	OS	26000	UG/KG	BGS-05	--	--	--	NA		NA	NA		No
4-METHYLPHENOL	OS	19	UG/KG	TP-SB15	0.6831	27.814	3.674	NA		NA	13	4	Yes
ACENAPHTHENE	OS	1400	UG/KG	TP-SB31	79.8194	17.540	2.317	0.4	UG/L	TP-MW09	40	5	No
ACENAPHTHYLENE	OS	2700	UG/KG	TP-SB14	96.4664	27.989	3.697	0.1	UG/L	TP-MW09	3	3	Yes
ANTHRACENE	OS	3500	UG/KG	TP-SB39	265.9344	13.161	1.739	0.6	UG/L	TP-MW09	3	3	Yes
BAP EQUIVALENT-POS	OS	6283.9	UG/KG	TP-SB120	10256.72	0.613	0.081	NA		NA	0.5	3	Yes
BENZO(A)ANTHRACENE	OS	5100	UG/KG	TP-SB39	3015.227	1.691	0.223	NA		NA	3	3	No
BENZO(A)PYRENE	OS	4100	UG/KG	TP-SB39	10256.72	0.400	0.053	NA		NA	0.5	3	No
BENZO(B)FLUORANTHENE	OS	6100	UG/KG	TP-SB120	10469.21	0.583	0.077	NA		NA	3	3	No
BENZO(G,H,I)PERYLENE	OS	2800	UG/KG	TP-SB120	139485.2	0.020	0.003	NA		NA	3	3	No
BENZO(K)FLUORANTHENE	OS	3600	UG/KG	TP-SB39	10256.72	0.351	0.046	NA		NA	3	3	No
BIS(2-ETHYLHEXYL)PHTHALATE	OS	7600	UG/KG	TP-SB20	2156.154	3.525	0.466	1	UG/L	TP-MW05	53	3	No
BUTYL BENZYL PHTHALATE	OS	76	UG/KG	TP-SB11	122.0039	0.623	0.082	NA		NA	0.34	3	Yes
CARBAZOLE	OS	1700	UG/KG	TP-MW02	44.192	38.469	5.082	NA		NA	64	2	Yes
CHRYSENE	OS	9600	UG/KG	TP-MW02	3077.8	3.119	0.412	NA		NA	3	3	Yes
DIBENZO(A,H)ANTHRACENE	OS	1000	UG/KG	TP-SB120	34180.39	0.029	0.004	NA		NA	0.5	3	No
DIBENZOFURAN	OS	2000	UG/KG	TP-SB39	108.3292	18.462	2.439	NA		NA	3.7	4	Yes
DIETHYL PHTHALATE	OS	240	UG/KG	TP-SB20	1.6451	145.888	19.272	NA		NA	0.34	3	Yes

Table C.5 Initial COPC Summary

Detected Chemicals	Fraction	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg (1)	C(leachate) ug/L (2)	C(source) ug/L (3)	Maximum Groundwater Concentration	Units	Location of Maximum	Surface Water Screening Level ug/L	Ref	Retained As COPC?
DI-N-BUTYL PHTHALATE	OS	62	UG/KG	TP-SB13	441.9204	0.140	0.019	NA		NA	0.34	3	No
DI-N-OCTYL PHTHALATE	OS	340	UG/KG	TP-SB23	1084595	3.135E-04	4.141E-05	NA		NA	0.34	3	No
FLUORANTHENE	OS	12000	UG/KG	TP-SB39	923.6006	12.993	1.716	0.9	UG/L	TP-MW09	11	5	Yes
FLUORENE	OS	2500	UG/KG	TP-SB39	147.1764	16.986	2.244	0.9	UG/L	TP-MW09	3	3	Yes
INDENO(1,2,3-CD)PYRENE	OS	2500	UG/KG	TP-SB120	34884.34	0.072	0.009	NA		NA	3	3	No
NAPHTHALENE	OS	2300	UG/KG	TP-SB39	23.94713	96.045	12.688	0.3	UG/L	TP-MW09	23.5	3	Yes
PHENANTHRENE	OS	12000	UG/KG	TP-SB39	237.2552	50.578	6.681	2	UG/L	TP-MW09	8.3	5	Yes
PHENOL	OS	200	UG/KG	TP-SB14	3.493648	57.247	7.562	NA		NA	58	3	No
PYRENE	OS	9600	UG/KG	TP-SB31	904.8288	10.610	1.402	0.4	UG/L	TP-MW09	3	3	Yes
1,1,2-TRICHLOROTRIFLUOROETHANE	OV	46	UG/KG	TP-MW05	2.9292	15.704	2.074	NA		NA	1300000	2	Yes
2-BUTANONE	OV	42	UG/KG	TP-MW06	0.04989	841.852	111.209	NA		NA	14000	4	No
2-HEXANONE	OV	1	UG/KG	TP-MW07	1.7468	0.572	0.076	NA		NA	99	4	No
ACETONE	OV	14000	UG/KG	TP-SB13	0.02582	542215.337	71626.861	NA		NA	1500	4	Yes
BENZENE	OV	2	UG/KG	TP-MW05	2.157458	0.927	0.122	NA		NA	60	3	No
CARBON DISULFIDE	OV	22	UG/KG	TP-MW05	0.013036	1687.634	222.937	NA		NA	0.92	4	Yes
CHLOROFORM	OV	8	UG/KG	TP-SB14	0.4568	17.513	2.313	NA		NA	124	3	No
ETHYLBENZENE	OV	18	UG/KG	TP-MW05	6.75	2.667	0.352	NA		NA	4.3	3	No
METHYLENE CHLORIDE	OV	64	UG/KG	TP-SB17	0.3095	206.785	27.316	NA		NA	640	3	No
TETRACHLOROETHENE	OV	9	UG/KG	TP-SB09	1.3922	6.465	0.854	NA		NA	3	3	Yes
TOLUENE	OV	3	UG/KG	TP-MW05	3.4936	0.859	0.113	NA		NA	500	3	No
TOTAL XYLENES	OV	18	UG/KG	TP-SB11	5.77625	3.116	0.412	NA		NA	13	4	No
TRICHLOROETHENE	OV	2	UG/KG	TP-SB15	0.882537	2.266	0.299	NA		NA	9	3	No
ACENAPHTHENE	PAH	2400	UG/KG	TP-MW02	79.8194	30.068	3.972	NA		NA	40	5	No
ACENAPHTHYLENE	PAH	100	UG/KG	TP-MW02	96.4664	1.037	0.137	NA		NA	3	3	No
ANTHRACENE	PAH	7100	UG/KG	TP-MW02	265.9344	26.698	3.527	NA		NA	3	3	Yes
BAP EQUIVALENT-POS	PAH	9328.3	UG/KG	TP-MW02	10256.72	0.909	0.120	NA		NA	0.5	3	Yes
BENZO(A)ANTHRACENE	PAH	9100	UG/KG	TP-MW02	3015.227	3.018	0.399	NA		NA	3	3	Yes
BENZO(A)PYRENE	PAH	5700	UG/KG	TP-MW02	10256.72	0.556	0.073	NA		NA	0.5	3	Yes
BENZO(B)FLUORANTHENE	PAH	6000	UG/KG	TP-MW02	10469.21	0.573	0.076	NA		NA	3	3	No
BENZO(G,H,I)PERYLENE	PAH	830	UG/KG	TP-MW02	139485.2	0.006	0.001	NA		NA	3	3	No
BENZO(K)FLUORANTHENE	PAH	6300	UG/KG	TP-MW02	10256.72	0.614	0.081	NA		NA	3	3	No
DIBENZO(A,H)ANTHRACENE	PAH	1800	UG/KG	TP-MW02	34180.39	0.053	0.007	NA		NA	0.5	3	No
DIBENZOFURAN	PAH	1000	UG/KG	TP-MW02	108.3292	9.231	1.219	NA		NA	3.7	4	Yes
FLUORANTHENE	PAH	16000	UG/KG	TP-MW02	923.6006	17.324	2.288	NA		NA	11	5	Yes
FLUORENE	PAH	2100	UG/KG	TP-MW02	147.1764	14.269	1.885	NA		NA	3	3	Yes
INDENO(1,2,3-CD)PYRENE	PAH	3100	UG/KG	TP-MW02	34884.34	0.089	0.012	NA		NA	3	3	No
NAPHTHALENE	PAH	1400	UG/KG	TP-MW02	23.94713	58.462	7.723	NA		NA	23.5	3	Yes
PHENANTHRENE	PAH	13000	UG/KG	TP-MW02	237.2552	54.793	7.238	NA		NA	8.3	5	Yes
PYRENE	PAH	19000	UG/KG	TP-MW02	904.8288	20.998	2.774	NA		NA	3	3	Yes
4,4'-DDD	PES/PCB	70	UG/KG	TP-MW01	1987.99	0.035	0.005	NA		NA	0.001	1	Yes
4,4'-DDE	PES/PCB	300	UG/KG	TP-SB17	1987.99	0.151	0.020	NA		NA	0.001	1	Yes
4,4'-DDT	PES/PCB	1000	UG/KG	TP-SB27	2871.831	0.348	0.046	NA		NA	0.001	1	Yes
ALDRIN	PES/PCB	2	UG/KG	TP-MW05	1376.602	0.001	0.000	NA		NA	0.13	1	No
ALPHA-BHC	PES/PCB	2.8	UG/KG	TP-SB38B	53.05652	0.053	0.007	NA		NA	0.016	1	Yes
ALPHA-CHLORDANE	PES/PCB	21	UG/KG	TP-SB14	1129.569	0.019	0.002	NA		NA	0.004	1	Yes
AROCLOR-1248	PES/PCB	41000	UG/KG	TP-SB108	572.2804	71.643	9.464	NA		NA	0.028	1	Yes
AROCLOR-1254	PES/PCB	280	UG/KG	TP-SB115	986.043	0.284	0.038	NA		NA	0.03	1	Yes
AROCLOR-1260	PES/PCB	42000	UG/KG	TP-SB14	2695.845	15.580	2.058	NA		NA	0.0029	1	Yes
DIELDRIN	PES/PCB	160	UG/KG	TP-SB14	138.1816	1.158	0.153	NA		NA	0.0019	1	Yes

Table C.5 Initial COPC Summary

Detected Chemicals	Fraction	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg (1)	C(leachate) ug/L (2)	C(source) ug/L (3)	Maximum Groundwater Concentration	Units	Location of Maximum	Surface Water Screening Level ug/L	Ref	Retained As COPC?
ENDOSULFAN I	PES/PCB	2.7	UG/KG	TP-SB40	285.4884	0.009	0.001	NA		NA	0.0087	1	Yes
ENDOSULFAN SULFATE	PES/PCB	22	UG/KG	TP-MW05	37.54368	0.586	0.077	NA		NA	0.034	1	Yes
ENDRIN ALDEHYDE	PES/PCB	9.4	UG/KG	TP-SB27	586.62	0.016	0.002	NA		NA	0.0023	1	Yes
DIESEL RANGE ORGANICS	PET	6200	MG/KG	TP-MW02	--	--	--	200	UG/L	TP-MW05			No
GASOLINE RANGE ORGANICS	PET	61	MG/KG	TP-MW05	--	--	--	NA		NA			No

Footnotes

(1) See Tables C.3 and C.4 for Kd value references.
(2) C(leachate) = soil concentration ÷ Kd (adjusted for units)
(3) C(source) is calculated based on Equation 7-8 of the Phase I Modeling Report for PNS (Brown & Root Environmental, 1997)

References

1. USEPA, 2002. National Recommended Water Quality criteria: 2002. Office of Water. EPA 822-R-02-047. November
2. See Appendix D.5 of OU7 RI Report.
3. Buchman, M.F., 2008. NOAA Screening Quick Reference Tables, NOAA HAZMAT Report 99-1, Seattle, WA, Coastal Protection and Restoration Division, National Oceanic and Atmospheric Administration. http://response.restoration.noaa.gov/cpr/sediment/squirt/squirt.html
4. Suter, G.W. II, and C.L. Tsao, 1996. Toxicological Benchmarks for Screening Potential Constituents of Concern for Effects on Aquatic Biota: 1996 Revision. Environmental Sciences Division, Oak Ridge National Laboratory. ES/ER/TM-96/R2.
5. USEPA, 1996. ECO Update, Ecotox Thresholds. Office of Solid Waste and Emergency Response. Intermittent Bulletin, Volume 3, Number 2. EPA-540/F-95/038. January.

Table C.6 Cumulative Rankings

Detected Chemicals	Fraction	Cgw(shoreline) /Criteria	Rank	Top 25	Cumulative Sum of the Highest Cgw/Criteria to the Ranked Chemical	Cumulative Percentage of the Total Impact	Percent Change from Previous
COPPER	M	49187.613	1	***	49187.613	88.15	88.155
SILVER	M	2144.432559	2	***	51332.04556	92.00	3.843
IRON	M	1479.524439	3	***	52811.57	94.65	2.652
NICKEL	M	971.5451285	4	***	53783.11513	96.39	1.741
LEAD	M	724.8307067	5	***	54507.94583	97.69	1.299
ZINC	M	415.6085746	6	***	54923.55441	98.43	0.745
MERCURY	M	324.3053919	7	***	55247.8598	99.02	0.581
ALUMINUM	M	166.6666667	8	***	55414.52647	99.31	0.299
DIELDRIN	PES/PCB	80.50452375	9	***	55495.03099	99.46	0.144
MANGANESE	M	74.01009383	10	***	55569.04108	99.59	0.133
CARBON DISULFIDE	OV	59.13122839	11	***	55628.17231	99.70	0.106
4,4'-DDT	PES/PCB	45.99866966	12	***	55674.17098	99.78	0.082
ACETONE	OV	39.23917838	13	***	55713.41016	99.85	0.070
4,4'-DDE	PES/PCB	19.93476773	14	***	55733.34493	99.89	0.036
COBALT	M	10.87435146	15	***	55744.21928	99.91	0.019
ARSENIC	M	10.41366151	16	***	55754.63294	99.92	0.019
CHROMIUM	M	8.88957961	17	***	55763.52252	99.94	0.016
ANTIMONY	M	8.395714076	18	***	55771.91823	99.96	0.015
CADMIUM	M	4.823665986	19	***	55776.7419	99.96	0.009
4,4'-DDD	PES/PCB	4.651445803	20	***	55781.39335	99.97	0.008
THALLIUM	M	3.103286385	21	***	55784.49663	99.98	0.006
SELENIUM	M	2.790853443	22	***	55787.28749	99.98	0.005
BERYLLIUM	M	1.922046506	23	***	55789.20953	99.99	0.003
VANADIUM	M	1.29	24	***	55790.49953	99.99	0.002
AROCLOR-1254	PES/PCB	1.250388657	25	***	55791.74992	99.99	0.002
PYRENE	PAH	0.92463445	26		55792.67456	99.99	0.002
ENDRIN ALDEHYDE	PES/PCB	0.920337827	27		55793.59489	99.99	0.002
ENDOSULFAN SULFATE	PES/PCB	0.889755557	28		55794.48465	100.00	0.002
PHENANTHRENE	OS	0.804991944	29		55795.28964	100.00	0.001
ALPHA-CHLORDANE	PES/PCB	0.613974742	30		55795.90362	100.00	0.001
ALPHA-BHC	PES/PCB	0.4357159	31		55796.33933	100.00	0.001
4-METHYLPHENOL	OS	0.242141566	32		55796.58147	100.00	0.000
BARIUM	M	0.163031221	33		55796.7445	100.00	0.000
ENDOSULFAN I	PES/PCB	0.143601893	34		55796.88811	100.00	0.000
1,4-DICHLOROBENZENE	OS	0.053981633	35		55796.94209	100.00	0.000
BAP EQUIVALENT-POS	OS	0.026977607	36		55796.96907	100.00	0.000
2,4-DIMETHYLPHENOL	OS	0.016501944	37		55796.98557	100.00	0.000
NAPHTHALENE	OS	0.007868544	38		55796.99344	100.00	0.000
DIETHYL PHTHALATE	OS	0.005352609	39		55796.99879	100.00	0.000
2-METHYLNAPHTHALENE	OS	2.5873E-05	40		55796.99881	100.00	0.000

Table C.6 Cumulative Rankings

Detected Chemicals	Fraction	Cgw(shoreline) /Criteria	Rank	Top 25	Cumulative Sum of the Highest Cgw/Criteria to the Ranked Chemical	Cumulative Percentage of the Total Impact	Percent Change from Previous
TETRACHLOROETHENE	OV	5.0109E-07	41		55796.99882	100.00	0.000
FLUORENE	OS	1.51204E-16	42		55796.99882	100.00	0.000
DIBENZOFURAN	OS	1.70078E-24	43		55796.99882	100.00	0.000
BUTYL BENZYL PHTHALATE	OS	1.52989E-38	44		55796.99882	100.00	0.000
1,2-DICHLOROBENZENE	OS	9.97548E-42	45		55796.99882	100.00	0.000
ACENAPHTHYLENE	OS	5.93601E-49	46		55796.99882	100.00	0.000
FLUORANTHENE	OS	9.93622E-52	47		55796.99882	100.00	0.000
ANTHRACENE	PAH	1.14346E-81	48		55796.99882	100.00	0.000
AROCLOR-1248	PES/PCB	4.47169E-85	49		55796.99882	100.00	0.000
FLUORANTHENE	PAH	8.7366E-100	50		55796.99882	100.00	0.000
ANTHRACENE	OS	1.8901E-101	51		55796.99882	100.00	0.000
DIBENZOFURAN	PAH	5.9398E-238	52		55796.99882	100.00	0.000
CHRYSENE	OS	0	53		55796.99882	100.00	0.000
PYRENE	OS	0	53		55796.99882	100.00	0.000
BAP EQUIVALENT-POS	PAH	0	53		55796.99882	100.00	0.000
BENZO(A)ANTHRACENE	PAH	0	53		55796.99882	100.00	0.000
BENZO(A)PYRENE	PAH	0	53		55796.99882	100.00	0.000
FLUORENE	PAH	0	53		55796.99882	100.00	0.000
NAPHTHALENE	PAH	0	53		55796.99882	100.00	0.000
PHENANTHRENE	PAH	0	53		55796.99882	100.00	0.000
AROCLOR-1260	PES/PCB	0	53		55796.99882	100.00	0.000
CALCIUM	M	--					
MAGNESIUM	M	--					
POTASSIUM	M	--					
SODIUM	M	--					
1,3-DICHLOROBENZENE	OS	--					
CARBAZOLE	OS	--					
1,1,2-TRICHLOROTRIFLUOROETHANE	OV	--					

Table C.7 Darcy Flow Calculations for Baseline Model

Surface Fill Layer

K (ft/day)	Layer Thickness (ft)	Gradient	Darcy Flow	
200	13	0.01126	29.276	ft3/day/ft

Silt and Clay with Shell Layer

K (ft/day)	Layer Thickness (ft)	Gradient	Darcy Flow	
10	24	0.01126	2.7024	ft3/day/ft

Basal Sand Layer

K (ft/day)	Layer Thickness (ft)	Gradient	Darcy Flow	
20	9	0.01126	2.0268	ft3/day/ft

Weathered Bedrock Layer

K (ft/day)	Layer Thickness (ft)	Gradient	Darcy Flow	
0.06	15	0.01126	0.010134	ft3/day/ft

Deep Bedrock Layer

K (ft/day)	Layer Thickness (ft)	Gradient	Darcy Flow	
0.028	50	0.01126	0.015764	ft3/day/ft

Length of Shoreline 1430 feet

Net Groundwater Flow based on Surface Fill Layer Only **41864.68** ft3/day
15291074.37 ft3/year

Outfall 60 (OF-60) Storm Drains

K (ft/day)	Gradient
200	0.004309

Measured Length	Actual Length (ft)	Pipe Diameter (in)	Pipe Diameter (ft)	Darcy Flow (ft2/day/ft)	Net Groundwater Flow (ft3/day)
23	121.1	15	1.250	0.538625	65.20
37	194.7	15	1.250	0.538625	104.89
19	100.0	12	1.000	0.4309	43.09
12	63.2	8	0.667	0.287266667	18.14
8	42.1	8	0.667	0.287266667	12.10
24	126.3	8	0.667	0.287266667	36.29
35	184.2	8	0.667	0.287266667	52.92
18	94.7	6	0.500	0.21545	20.41
12	63.2	6	0.500	0.21545	13.61
30	157.9	15	1.250	0.538625	85.05
13	68.4	15	1.250	0.538625	36.85
29	152.6	15	1.250	0.538625	82.21

Net GW Flow **570.75** ft3/day
208467.72 ft3/year

Outfall 61 (OF-61) Storm Drains

K (ft/day)	Gradient
200	0.004309

Measured Length	Actual Length (ft)	Pipe Diameter (in)	Pipe Diameter (ft)	Darcy Flow (ft2/day/ft)	Net Groundwater Flow (ft3/day)
20	105.3	15	1.250	0.538625	56.70
18	94.7	12	1.000	0.4309	40.82
16	84.2	12	1.000	0.4309	36.29
14	73.7	12	1.000	0.4309	31.75
35	184.2	8	0.667	0.287266667	52.92
45	236.8	12	1.000	0.4309	102.06
15	78.9	8	0.667	0.287266667	22.68
20	105.3	8	0.667	0.287266667	30.24
2	10.5	8	0.667	0.287266667	3.02
3	15.8	8	0.667	0.287266667	4.54

Net GW Flow **381.01** ft3/day
139162.56 ft3/year

Outfall 62 (OF-62) Storm Drains

K (ft/day)	Gradient
200	0.004309

Measured Length	Actual Length (ft)	Pipe Diameter (in)	Pipe Diameter (ft)	Darcy Flow (ft2/day/ft)	Net Groundwater Flow (ft3/day)
20	105.3	8	0.667	0.287266667	30.24
20	105.3	6	0.500	0.21545	22.68
20	105.3	6	0.500	0.21545	22.68

Net GW Flow **75.60** ft3/day
27611.62 ft3/year

Outfall 68 (OF-68) Storm Drains

K (ft/day)	Gradient
200	0.004309

Measured Length	Actual Length (ft)	Pipe Diameter (in)	Pipe Diameter (ft)	Darcy Flow (ft2/day/ft)	Net Groundwater Flow (ft3/day)

30	157.9	15	1.250	0.538625	85.05	
20	105.3	12	1.000	0.4309	45.36	
25	131.6	6	0.500	0.21545	28.35	
9	47.4	12	1.000	0.4309	20.41	
6	31.6	12	1.000	0.4309	13.61	
20	105.3	12	1.000	0.4309	45.36	
15	78.9	8	0.667	0.287266667	22.68	
5	26.3	6	0.500	0.21545	5.67	
9	47.4	6	0.500	0.21545	10.21	
14	73.7	4	0.333	0.143633333	10.58	
7	36.8	8	0.667	0.287266667	10.58	
2	10.5	6	0.500	0.21545	2.27	
2	10.5	6	0.500	0.21545	2.27	
17	89.5	8	0.667	0.287266667	25.70	
				Net GW Flow	**328.09**	ft3/day
					119834.42	ft3/year

Outfall 63A (OF-63A) Storm Drains

K (ft/day)	Gradient
200	0.012104

Measured Length	Actual Length (ft)	Pipe Diameter (in)	Pipe Diameter (ft)	Darcy Flow (ft2/day/ft)	Net Groundwater Flow (ft3/day)	
10	52.6	6	0.500	0.6052	31.85	
16	84.2	6	0.500	0.6052	50.96	
				Net GW Flow	**82.82**	ft3/day
					30248.85	ft3/year

Outfall 63 (OF-63) Storm Drains

K (ft/day)	Gradient
200	0.012104

Measured Length	Actual Length (ft)	Pipe Diameter (in)	Pipe Diameter (ft)	Darcy Flow (ft2/day/ft)	Net Groundwater Flow (ft3/day)	
24	126.3	30	2.500	3.026	382.23	
10	52.6	30	2.500	3.026	159.26	
2	10.5	8	0.667	0.806933333	8.49	
14	73.7	8	0.667	0.806933333	59.46	
17	89.5	8	0.667	0.806933333	72.20	
6	31.6	30	2.500	3.026	95.56	
3	15.8	8	0.667	0.806933333	12.74	
14	73.7	8	0.667	0.806933333	59.46	
9	47.4	30	2.500	3.026	143.34	
19	100.0	8	0.667	0.806933333	80.69	
16	84.2	30	2.500	3.026	254.82	
10	52.6	8	0.667	0.806933333	42.47	
8	42.1	8	0.667	0.806933333	33.98	
16	84.2	8	0.667	0.806933333	67.95	
5	26.3	8	0.667	0.806933333	21.24	
13	68.4	8	0.667	0.806933333	55.21	
20	105.3	30	2.500	3.026	318.53	
12	63.2	6	0.500	0.6052	38.22	
18	94.7	18	1.500	1.8156	172.00	
16	84.2	6	0.500	0.6052	50.96	
17	89.5	6	0.500	0.6052	54.15	
20	105.3	6	0.500	0.6052	63.71	
34	178.9	8	0.667	0.806933333	144.40	
28	147.4	6	0.500	0.6052	89.19	
8	42.1	6	0.500	0.6052	25.48	
32	168.4	6	0.500	0.6052	101.93	
				Net GW Flow	**2607.67**	ft3/day
					952451.02	ft3/year

Total Discharge from Storm Sewer Drains	**4045.93**	ft3/day
	1477776.189	ft3/year
Total Discharge from Formation and Storm Sewer Drains	**45910.61**	ft3/day
	16768850.56	ft3/year

Weighted Darcy Velocity

Surface Fill Layer	2.054	ft/day
OF-60	0.011	ft/day
OF-61	0.007	ft/day
OF-62	0.001	ft/day
OF-63	0.006	ft/day
OF-63A	0.004	ft/day
OF-68	0.137	ft/day
Total Velocity	**2.221**	**ft/day**

TABLE C.8

SITE-SPECIFIC PHYSICAL AND HYDROLOGICAL INPUT PARAMETERS
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

On-Shore Analytical Model		**Value**	**Units**
Contaminant Source Area	Average Infiltration Rate (Water Balance)[1]	14	in/year
	Contaminant Source Area[2]	1282842	ft^2
	Travel Distance to Shoreline (D)	1	ft
Saturated Zone	Dry Bulk Density[3]	1.5	g/cm^3
	Saturated Effective Porous Space (n)[3]	0.3	
	Hydraulic Gradient (i)[1]	0.01126	ft/ft
	Groundwater Plume Width [2]	1430	ft
	Groundwater Flow Rate (Darcy' Law)[1] - Formation	15291074	ft^3/year
	Groundwater Flow Rate (Darcy' Law)[1] - Storm Sewer's	1477776	ft^3/year
	Net Groundwater Flow Rate (Darcy' Law)[1]	16768850	ft^3/year
	Groundwater Velocity [4]	2.22	ft/day
	Groundwater Salinity (Sgw)	6	ppt
Off-Shore Analytical Model		**Value**	**Units**
Intertidal Zone [5]	Tidal Response Range	8	ft
	Intertidal Zone Width	40	ft
	Shoreline Slope	5	1V:nH
	Intertidal Zone Water Volume	1.28E+05	ft^3
	Seawater Salinity (Ssw)	28	ppt
Near-Shore Mixing Zone	Non-tidal Flow Current (V) [6]	0.206	ft/sec
	Cross Sectional Area of Channel Segment [6]	3326	ft^2
	Shoreline Slope	15	1V:nH
Sediment Layer	Pore Water Salinity (Spw)	12.4	ppt

(1) See Appendix C; Table C-8 of On-Shore/Off-Shore Contaminant Fate and Transport Modeling, Phase I (Brown&Root, 1997).
(2) See Figure 6-5 of On-Shore/Off-Shore Contaminant Fate and Transport Modeling, Phase I (Brown&Root, 1997).
(3) Assumed based on typical values for the types of soils at PNS.
(4) Based on groundwater velocity in the overburden layer.
(5) See the site-specific conceptual models in Section 6.0 of On-Shore/Off-Shore Contaminant Fate and Transport Modeling, Phase I (Brown&Root, 1997).
(6) Based on the model output for channel segment c68 in the UNH WASP model.

TABLE C.9

SITE-SPECIFIC CONTAMINANT INPUT PARAMETERS
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Retained COPC(1)	Fraction	Maximum Groundwater Concentration	Groundwater Units	Maximum Soil Concentration	Soil Units	Kd (soil) L/kg (2)	Kd (sed) L/kg (2)	Half-Life (years) (3)
ALUMINUM	M	14500	UG/L	29000	MG/KG	1500	207113	NA
ANTIMONY	M	34	UG/L	1430	MG/KG	45	45	NA
ARSENIC	M	41.2	UG/L	82.3	MG/KG	29	4617	NA
BERYLLIUM	M	NA	UG/L	3.1	MG/KG	402	402	NA
CADMIUM	M	3.9	UG/L	24.1	MG/KG	75	4849	NA
CHROMIUM	M	27.4	UG/L	2860	MG/KG	850	41971	NA
COBALT	M	1.15	UG/L	85.2	MG/KG	45	45	NA
COPPER	M	496	UG/L	40400	MG/KG	35	51038	NA
IRON	M	21800	UG/L	280000	MG/KG	25	4342	NA
LEAD	M	195	UG/L	40000	MG/KG	900	10811	NA
MANGANESE	M	1600	UG/L	4370	MG/KG	65	2246	NA
MERCURY	M	0.46	UG/L	120	MG/KG	52	3316	NA
NICKEL	M	278	UG/L	3920	MG/KG	65	3960	NA
SELENIUM	M	19.8	UG/L	7.5	MG/KG	5	5	NA
SILVER	M	6.2	UG/L	25.6	MG/KG	8.3	741	NA
THALLIUM	M	66.1	UG/L	3.6	MG/KG	71	71	NA
VANADIUM	M	25.8	UG/L	109	MG/KG	1000	1000	NA
ZINC	M	587	UG/L	15800	MG/KG	62	19197	NA
ACETONE	OV	NA		14000	UG/KG	0.02582	0.05646	0.3808
CARBON DISULFIDE	OV	NA		22	UG/KG	0.013036	0.0285	2.9000
PYRENE	PAH	NA		19000	UG/KG	904.8288	1978.185	NA
4,4'-DDD	PEST/PCB	NA		70	UG/KG	1987.99	4346.25	NA
4,4'-DDE	PES/PCB	NA		300	UG/KG	1987.99	4346.25	NA
4,4'-DDT	PES/PCB	NA		1000	UG/KG	2871.831	6278.55	NA
AROCLOR-1254	PES/PCB	NA		280	UG/KG	986.043	2155.74	NA
DIELDRIN	PES/PCB	NA		160	UG/KG	138.1816	302.1	NA
ENDOSULFAN SULFATE	PES/PCB	NA		22	UG/KG	37.54368	82.08	NA
ENDRIN ALDEHYDE	PES/PCB	NA		9.4	UG/KG	586.62	1282.5	NA

(1) Chemical of Potential Concern (COPC) identification is described in Appendix C.
(2) Kd values selected for soils and sediment are presented in Appendix C.
(3) Inorganic chemicals were assumed not to decay; so a half-life is not applicable (NA) to them. If an organic chemical did not have a half-life from literature, it was conservatively assumed that it did not decay. Organic half-lives from Howard et al., 1991, consistent with Phase I/Phase II modeling at Portsmouth Naval Shipyard.

Table C.10 Baseline Site 32 Modeling - 50% Pipes

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14
ENDOSULFAN SULFATE	PES/PCB	22	NA		NA	22	UG/KG	TP-MW05
ENDRIN ALDEHYDE	PES/PCB	9.4	NA		NA	9.4	UG/KG	TP-SB27

Table C.10 Baseline Site 32 Modeling - 50% Pipes

Detected Chemicals	Kd (soil) L/kg	Source Area ft^2	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)
ALUMINUM	1500	1282842	1	207113	19333.3333	NA	7501
ANTIMONY	45	1282842	1	45	31777.7778	NA	226
ARSENIC	29	1282842	1	4617	2837.9310	NA	146
BERYLLIUM	402	1282842	1	402	7.7114	NA	2011
CADMIUM	75	1282842	1	4849	321.3333	NA	376
CHROMIUM	850	1282842	1	41971	3364.7059	NA	4251
COBALT	45	1282842	1	45	1893.3333	NA	226
COPPER	35	1282842	1	51038	1154285.7143	NA	176
IRON	25	1282842	1	4342	11200000.0000	NA	126
LEAD	900	1282842	1	10811	44444.4444	NA	4501
MANGANESE	65	1282842	1	2246	67230.7692	NA	326
MERCURY	52	1282842	1	3316	2307.6923	NA	261
NICKEL	65	1282842	1	3960	60307.6923	NA	326
SELENIUM	5	1282842	1	5	1500.0000	NA	26
SILVER	8.3	1282842	1	741	3084.3373	NA	42.5
THALLIUM	71	1282842	1	71	50.7042	NA	356
VANADIUM	1000	1282842	1	1000	109.0000	NA	5001
ZINC	62	1282842	1	19197	254838.7097	NA	311
ACETONE	0.02582	1282842	1	0.05646	542215.3369	0.3808	1.1291
CARBON DISULFIDE	0.013036	1282842	1	0.0285	1687.6342	2.9000	1.06518
PYRENE	904.8288	1282842	1	1978.185	20.9984	NA	4525.1438
4,4'-DDD	1987.99	1282842	1	4346.25	0.0352	NA	9940.95
4,4'-DDE	1987.99	1282842	1	4346.25	0.1509	NA	9940.95
4,4'-DDT	2871.831	1282842	1	6278.55	0.3482	NA	14360.154
AROCLOR-1254	986.043	1282842	1	2155.74	0.2840	NA	4931.2152
DIELDRIN	138.1816	1282842	1	302.1	1.1579	NA	691.908
ENDOSULFAN SULFATE	37.54368	1282842	1	82.08	0.5860	NA	188.7184
ENDRIN ALDEHYDE	586.62	1282842	1	1282.5	0.0160	NA	2934.1

Table C.10 Baseline Site 32 Modeling - 50% Pipes

Detected Chemicals	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)
ALUMINUM	14	16768850.56	1584.1458	14500	GW Sample	2.22
ANTIMONY	14	16768850.56	2603.8258	2603.825818	Leach	2.22
ARSENIC	14	16768850.56	232.5360	232.536024	Leach	2.22
BERYLLIUM	14	16768850.56	0.6319	0.631864631	Leach	2.22
CADMIUM	14	16768850.56	26.3296	26.32959533	Leach	2.22
CHROMIUM	14	16768850.56	275.6992	275.6992043	Leach	2.22
COBALT	14	16768850.56	155.1370	155.1370348	Leach	2.22
COPPER	14	16768850.56	94580.5262	94580.52622	Leach	2.22
IRON	14	16768850.56	917712.0366	917712.0366	Leach	2.22
LEAD	14	16768850.56	3641.7144	3641.714431	Leach	2.22
MANGANESE	14	16768850.56	5508.7934	5508.793406	Leach	2.22
MERCURY	14	16768850.56	189.0890	189.0890185	Leach	2.22
NICKEL	14	16768850.56	4941.5264	4941.526351	Leach	2.22
SELENIUM	14	16768850.56	122.9079	122.907862	Leach	2.22
SILVER	14	16768850.56	252.7262	252.7262063	Leach	2.22
THALLIUM	14	16768850.56	4.1546	66.1	GW Sample	2.22
VANADIUM	14	16768850.56	8.9313	25.8	GW Sample	2.22
ZINC	14	16768850.56	20881.1206	20881.12065	Leach	2.22
ACETONE	14	16768850.56	44428.3519	44428.35189	Leach	2.22
CARBON DISULFIDE	14	16768850.56	138.2823	138.2823445	Leach	2.22
PYRENE	14	16768850.56	1.7206	1.72058293	Leach	2.22
4,4'-DDD	14	16768850.56	0.0029	0.002885176	Leach	2.22
4,4'-DDE	14	16768850.56	0.0124	0.012365038	Leach	2.22
4,4'-DDT	14	16768850.56	0.0285	0.028531825	Leach	2.22
AROCLOR-1254	14	16768850.56	0.0233	0.023267545	Leach	2.22
DIELDRIN	14	16768850.56	0.0949	0.094876394	Leach	2.22
ENDOSULFAN SULFATE	14	16768850.56	0.0480	0.048014703	Leach	2.22
ENDRIN ALDEHYDE	14	16768850.56	0.0013	0.001312984	Leach	2.22

Table C.10 Baseline Site 32 Modeling - 50% Pipes

Detected Chemicals	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L
ALUMINUM	NA	14500	0.0346	1035566	0.0050	0.0028
ANTIMONY	NA	2603.825818	0.0346	226	4.1324	2.2958
ARSENIC	NA	232.536024	0.0346	23086	0.0036	0.0020
BERYLLIUM	NA	0.631864631	0.0346	2011	0.0001	0.0001
CADMIUM	NA	26.32959533	0.0346	24246	0.0004	0.0002
CHROMIUM	NA	275.6992043	0.0346	209856	0.0005	0.0003
COBALT	NA	155.1370348	0.0346	226	0.2462	0.1368
COPPER	NA	94580.52622	0.0346	255191	0.1329	0.0739
IRON	NA	917712.0366	0.0346	21711	15.1611	8.4228
LEAD	NA	3641.714431	0.0346	54056	0.0242	0.0134
MANGANESE	NA	5508.793406	0.0346	11231	0.1759	0.0977
MERCURY	NA	189.0890185	0.0346	16581	0.0041	0.0023
NICKEL	NA	4941.526351	0.0346	19801	0.0895	0.0497
SELENIUM	NA	122.907862	0.0346	26	1.6955	0.9420
SILVER	NA	252.7262063	0.0346	3706	0.0245	0.0136
THALLIUM	NA	66.1	0.0346	356	0.0666	0.0370
VANADIUM	NA	25.8	0.0346	5001	0.0019	0.0010
ZINC	NA	20881.12065	0.0346	95986	0.0780	0.0433
ACETONE	0.0004	44421.28492	0.0346	1.2823	12427.2107	6904.0059
CARBON DISULFIDE	0.0004	138.1243952	0.0346	1.1425	43.4124	24.1180
PYRENE	NA	1.72058293	0.0346	9891.925	0.0001	0.0000
4,4'-DDD	NA	0.002885176	0.0346	21732.25	0.0000	0.0000
4,4'-DDE	NA	0.012365038	0.0346	21732.25	0.0000	0.0000
4,4'-DDT	NA	0.028531825	0.0346	31393.75	0.0000	0.0000
AROCLOR-1254	NA	0.023267545	0.0346	10779.7	0.0000	0.0000
DIELDRIN	NA	0.094876394	0.0346	1511.5	0.0000	0.0000
ENDOSULFAN SULFATE	NA	0.048014703	0.0346	411.4	0.0000	0.0000
ENDRIN ALDEHYDE	NA	0.001312984	0.0346	6413.5	0.0000	0.0000

Table C.10 Baseline Site 32 Modeling - 50% Pipes

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L
ALUMINUM	0.0026	0.0025	0.0003	0.0001
ANTIMONY	2.1402	2.0662	0.2296	0.0740
ARSENIC	0.0019	0.0018	0.0002	0.0001
BERYLLIUM	0.0001	0.0001	0.0000	0.0000
CADMIUM	0.0002	0.0002	0.0000	0.0000
CHROMIUM	0.0002	0.0002	0.0000	0.0000
COBALT	0.1275	0.1231	0.0137	0.0044
COPPER	0.0688	0.0665	0.0074	0.0024
IRON	7.8518	7.5805	0.8423	0.2717
LEAD	0.0125	0.0121	0.0013	0.0004
MANGANESE	0.0911	0.0880	0.0098	0.0032
MERCURY	0.0021	0.0020	0.0002	0.0001
NICKEL	0.0464	0.0448	0.0050	0.0016
SELENIUM	0.8781	0.8478	0.0942	0.0304
SILVER	0.0127	0.0122	0.0014	0.0004
THALLIUM	0.0345	0.0333	0.0037	0.0012
VANADIUM	0.0010	0.0009	0.0001	0.0000
ZINC	0.0404	0.0390	0.0043	0.0014
ACETONE	6435.9981	6213.6053	690.4006	222.6855
CARBON DISULFIDE	22.4831	21.7062	2.4118	0.7779
PYRENE	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000

Table C.10 Baseline Site 32 Modeling - 50% Pipes

Detected Chemicals	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	Below	Below	Below	6879528
ANTIMONY	Below	Below	Below	6879528
ARSENIC	Below	Below	Below	6879528
BERYLLIUM	Below	Below	Below	6879528
CADMIUM	Below	Below	Below	6879528
CHROMIUM	Below	Below	Below	6879528
COBALT	Below	Below	Below	6879528
COPPER	Below	Below	Below	6879528
IRON	Below	Below	Below	6879528
LEAD	Below	Below	Below	6879528
MANGANESE	Below	Below	Below	6879528
MERCURY	Below	Below	Below	6879528
NICKEL	Below	Below	Below	6879528
SELENIUM	Below	Below	Below	6879528
SILVER	Below	Below	Below	6879528
THALLIUM	Below	Below	Below	6879528
VANADIUM	Below	Below	Below	6879528
ZINC	Below	Below	Below	6879528
ACETONE	Exceeds	Below	Below	6879528
CARBON DISULFIDE	Exceeds	Exceeds	Below	6879528
PYRENE	Below	Below	Below	6879528
4,4'-DDD	Below	Below	Below	6879528
4,4'-DDE	Below	Below	Below	6879528
4,4'-DDT	Below	Below	Below	6879528
AROCLOR-1254	Below	Below	Below	6879528
DIELDRIN	Below	Below	Below	6879528
ENDOSULFAN SULFATE	Below	Below	Below	6879528
ENDRIN ALDEHYDE	Below	Below	Below	6879528

Table C.10 Baseline Site 32 Modeling - 50% Pipes

Detected Chemicals	Pore Water Conc. in Sediment Layer Cpw (Df=0.5), ug/L	Pore Water Conc. in Sediment Layer Cpw (Df=0.1), ug/L	Pore Water Conc. in Sediment Layer Cpw (Df=0.0346), ug/L	Pore Water Conc. > Surface Water Criteria (Df=0.5)
ALUMINUM	10281.8196	10281.8190	10281.8189	Exceeds
ANTIMONY	1847.5514	1847.0171	1846.9718	Exceeds
ARSENIC	164.8902	164.8898	164.8897	Exceeds
BERYLLIUM	0.4481	0.4481	0.4481	Below
CADMIUM	18.6702	18.6701	18.6701	Exceeds
CHROMIUM	195.4959	195.4959	195.4959	Exceeds
COBALT	110.0779	110.0461	110.0434	Exceeds
COPPER	67066.2300	67066.2128	67066.2113	Exceeds
IRON	650745.6728	650743.7126	650743.5465	Exceeds
LEAD	2582.3136	2582.3105	2582.3102	Exceeds
MANGANESE	3906.2865	3906.2638	3906.2618	Exceeds
MERCURY	134.0825	134.0820	134.0819	Exceeds
NICKEL	3504.0175	3504.0059	3504.0049	Exceeds
SELENIUM	87.6461	87.4269	87.4083	Exceeds
SILVER	179.2130	179.2098	179.2095	Exceeds
THALLIUM	46.8903	46.8817	46.8809	Exceeds
VANADIUM	18.2951	18.2948	18.2948	Below
ZINC	14806.6355	14806.6254	14806.6246	Exceeds
ACETONE	35113.9179	33507.1674	33371.0197	Exceeds
CARBON DISULFIDE	110.5718	104.9589	104.4833	Exceeds
PYRENE	1.2201	1.2201	1.2201	Below
4,4'-DDD	0.0020	0.0020	0.0020	Exceeds
4,4'-DDE	0.0088	0.0088	0.0088	Exceeds
4,4'-DDT	0.0202	0.0202	0.0202	Exceeds
AROCLOR-1254	0.0165	0.0165	0.0165	Below
DIELDRIN	0.0673	0.0673	0.0673	Exceeds
ENDOSULFAN SULFATE	0.0341	0.0341	0.0341	Below
ENDRIN ALDEHYDE	0.0009	0.0009	0.0009	Below

Table C.10 Baseline Site 32 Modeling - 50% Pipes

Detected Chemicals	Pore Water Conc. > Surface Water Criteria (Df=0.1)	Pore Water Conc. > Surface Water Criteria (Df=0.0346)	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	Exceeds	Exceeds	2129498.512	2129498.377	2129498.366
ANTIMONY	Exceeds	Exceeds	83.13981214	83.11576885	83.11373155
ARSENIC	Exceeds	Exceeds	761.2981997	761.296043	761.2958603
BERYLLIUM	Below	Below	0.180129065	0.180123207	0.180122711
CADMIUM	Exceeds	Exceeds	90.53175131	90.53150712	90.53148643
CHROMIUM	Exceeds	Exceeds	8205.159949	8205.157392	8205.157176
COBALT	Exceeds	Exceeds	4.953504891	4.952072382	4.951950998
COPPER	Exceeds	Exceeds	3422926.246	3422925.369	3422925.295
IRON	Exceeds	Exceeds	2825537.711	2825529.2	2825528.479
LEAD	Exceeds	Exceeds	27917.39261	27917.35883	27917.35597
MANGANESE	Exceeds	Exceeds	8773.519489	8773.4684	8773.464071
MERCURY	Exceeds	Exceeds	444.61755	444.6157963	444.6156477
NICKEL	Exceeds	Exceeds	13875.90911	13875.86328	13875.8594
SELENIUM	Exceeds	Exceeds	0.438230486	0.437134376	0.437041497
SILVER	Exceeds	Exceeds	132.7968114	132.794468	132.7942695
THALLIUM	Exceeds	Exceeds	3.329210076	3.328598729	3.328546927
VANADIUM	Below	Below	18.29508375	18.29484451	18.29482424
ZINC	Exceeds	Exceeds	284242.9821	284242.7884	284242.772
ACETONE	Exceeds	Exceeds	1.982531803	1.891814671	1.88412777
CARBON DISULFIDE	Exceeds	Exceeds	0.003151297	0.002991329	0.002977774
PYRENE	Below	Below	2.413519946	2.413503989	2.413502637
4,4'-DDD	Exceeds	Exceeds	0.008891844	0.008891817	0.008891814
4,4'-DDE	Exceeds	Exceeds	0.038107901	0.038107786	0.038107776
4,4'-DDT	Exceeds	Exceeds	0.127026071	0.127025807	0.127025784
AROCLOR-1254	Below	Below	0.035567619	0.035567403	0.035567385
DIELDRIN	Exceeds	Exceeds	0.020326055	0.020325175	0.020325101
ENDOSULFAN SULFATE	Below	Below	0.00279556	0.002795116	0.002795078
ENDRIN ALDEHYDE	Below	Below	0.001194067	0.001194055	0.001194054

ATTACHMENT C.2

UNCERTAINTY ANALYSIS

TABLE C.11

SUMMARY OF UNCERTAINTY ANALYSIS RESULTS
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Description of Uncertainty Analysis	Summary of Results
Groundwater source concentration - assume leached from soil for all	No changes
Groundwater source concentration - assume maximum observed groundwater for all	No changes
Source Area - Larger by 25%	No changes
Source Area - Smaller to conform to historical boundary (fill area only)	***Baseline and carbon disulfide for Df of 0.0346***
Hydraulic Conductivity - Use minimum observed value for fill/flow layer	No changes
Hydraulic Conductivity - Use maximum observed value for fill/flow layer	No changes
Hydraulic Conductivity - Use all overburden and bedrock layers - Geomean	No changes
Hydraulic Conductivity - Use all overburden and bedrock layers - Minimum	No changes
Hydraulic Conductivity - Use all overburden and bedrock layers - Maximum	No changes
Hydraulic Gradients - Outfalls 60 to 62, 68 - Minimum observed	No changes
Hydraulic Gradients - Outfalls 60 to 62, 68 - Maximum observed	No changes
Hydraulic Gradients - Outfall 63, 63A - Minimum observed	No changes
Hydraulic Gradients - Outfall 63, 63A - Maximum observed	No changes
Hydraulic Gradients - Sitewide gradients - Minimum observed	No changes
Hydraulic Gradients - Sitewide gradients - Maximum observed	No changes
Hydraulic Gradients - Sitewide gradients - Smaller Minimum observed	No changes
Hydraulic Gradients - Sitewide gradients - Larger Maximum observed	No changes
Storm Sewer Drains - 10% full under steady state conditions	No changes
Storm Sewer Drains - 25% full under steady state conditions	No changes
Storm Sewer Drains - 100% full under steady state conditions	No changes
Storm Sewer Drains - 50% full under steady state conditions, K of fill 500 feet/day	No changes
Travel distance from source to shoreline - 0.01 feet	No changes
Travel distance from source to shoreline - 0.1 feet	No changes
Travel distance from source to shoreline - 10 feet	No changes
Travel distance from source to shoreline - 100 feet	No changes
Travel distance from source to shoreline - 600 feet	No changes
Infiltration Rate - 1 inch per year	***Exceeds carbon disulfide for Df of 0.5 only***
Infiltration Rate - 6 inches per year	No changes
Infiltration Rate - 9 inches per year	No changes
Infiltration Rate - 12 inches per year	No changes

TABLE C.11

SUMMARY OF UNCERTAINTY ANALYSIS RESULTS
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Description of Uncertainty Analysis	Summary of Results
Infiltration Rate - 16 inches per year	No changes
Infiltration Rate - 18 inches per year	***Baseline and carbon disulfide for Df of 0.0346***
Infiltration Rate - 24 inches per year	***Baseline and carbon disulfide for Df of 0.0346***
Kd for soils - Site-specific data only - Geomean	No changes
Kd for soils - Site-specific data only - Minimum	No changes
Kd for soils - Site-specific data only - Maximum	No changes
Kd for soils - Maximum of site-specific and literature values	No changes
Kd for soils - Minimum of site-specific and literature values	No changes
Kd for sediment equal to Kd for soil under baseline conditions	***Baseline and copper (all Dfs), iron and silver for Df of 0.5***
Kd for sediment equal to site-specific Kd for soil - Geomean	No changes
Kd for sediment equal to site-specific Kd for soil - Minimum	***Baseline and silver for Df of 0.5***
Kd for sediment equal to site-specific Kd for soil - Maximum	No changes
Kd for sediment equal to site-specific Ks for sediment - Minimum	No changes
Kd for sediment equal to site-specific Ks for sediment - Maximum	No changes
Retardation - Soil with retardation of 1 (no retardation)	No changes
Retardation - Sediment with retardation of 1 (no retardation)	***Many***
Retardation - Soil and sediment with retardation of 1 (no retardation)	***Many***
Salinity - Assume groundwater of 0.1 ppt (freshwater)	No changes
Salinity - Assume seawater of 32 ppt (ocean water)	No changes
Sediment Foc - Site-specific minimum	No changes
Sediment Foc - Site-specific maximum	No changes
Sediment Foc - Site-specific geomean of shoreline only locations	No changes
Soil Foc - Site-specific minimum	***Baseline and carbon disulfide for Df of 0.0346***
Soil Foc - Site-specific maximum	***Exceeds carbon disulfide for Df of 0.5 only***
Soil Foc - Site-specific geomean of shoreline only locations	No changes
Use carbon disulfide concentrations from only shoreline locations - Geomean	***Exceeds only Df of 0.5***
Use carbon disulfide concentrations from only shoreline locations - Minimum	***Exceeds only Df of 0.5***
Use carbon disulfide concentrations from only shoreline locations - Maximum	No changes
Use acetone concentrations from only shoreline locations - Geomean	***No exceedances***
Use acetone concentrations from only shoreline locations - Minimum	***No exceedances***

TABLE C.11

SUMMARY OF UNCERTAINTY ANALYSIS RESULTS
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Description of Uncertainty Analysis	Summary of Results
Use acetone concentrations from only shoreline locations - Maximum	No changes
95% UCLs for soil and groundwater - 1/2 ND values	***Exceeds carbon disulfide for Df of 0.5 only***
95% UCLs for soil and groundwater - 1/2 ND values, groundwater as source	***No Exceedances***
95% UCLs for soil and groundwater - maximums retained when no UCL calculated	No changes
95% UCLs for soil and groundwater - maximums retained, groundwater as source	***No Exceedances***
Verification of current site conditions - 2 inches per year infiltration	***Exceeds carbon disulfide for Df of 0.5 only***
Verification of current site conditions - 2 inches per year, groundwater as source	***No Exceedances***

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	16768850.56	1584.1458
ANTIMONY	1	45	31777.7778	NA	226	14	16768850.56	2603.8258
ARSENIC	1	4617	2837.9310	NA	146	14	16768850.56	232.5360
BERYLLIUM	1	402	7.7114	NA	2011	14	16768850.56	0.6319
CADMIUM	1	4849	321.3333	NA	376	14	16768850.56	26.3296
CHROMIUM	1	41971	3364.7059	NA	4251	14	16768850.56	275.6992
COBALT	1	45	1893.3333	NA	226	14	16768850.56	155.1370
COPPER	1	51038	1154285.7143	NA	176	14	16768850.56	94580.5262
IRON	1	4342	11200000.0000	NA	126	14	16768850.56	917712.0366
LEAD	1	10811	44444.4444	NA	4501	14	16768850.56	3641.7144
MANGANESE	1	2246	67230.7692	NA	326	14	16768850.56	5508.7934
MERCURY	1	3316	2307.6923	NA	261	14	16768850.56	189.0890
NICKEL	1	3960	60307.6923	NA	326	14	16768850.56	4941.5264
SELENIUM	1	5	1500.0000	NA	26	14	16768850.56	122.9079
SILVER	1	741	3084.3373	NA	42.5	14	16768850.56	252.7262
THALLIUM	1	71	50.7042	NA	356	14	16768850.56	4.1546
VANADIUM	1	1000	109.0000	NA	5001	14	16768850.56	8.9313
ZINC	1	19197	254838.7097	NA	311	14	16768850.56	20881.1206
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	16768850.56	44428.3519
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	16768850.56	138.2823
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	16768850.56	1.7206
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	16768850.56	0.0029
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	16768850.56	0.0124
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	16768850.56	0.0285
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	1	302.1	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	16768850.56	0.0480
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0013

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	1584.1458	Leach	2.22	NA	1584.145777	0.0346	1035566
ANTIMONY	2603.8258	Leach	2.22	NA	2603.825818	0.0346	226
ARSENIC	232.5360	Leach	2.22	NA	232.536024	0.0346	23086
BERYLLIUM	0.6319	Leach	2.22	NA	0.631864631	0.0346	2011
CADMIUM	26.3296	Leach	2.22	NA	26.32959533	0.0346	24246
CHROMIUM	275.6992	Leach	2.22	NA	275.6992043	0.0346	209856
COBALT	155.1370	Leach	2.22	NA	155.1370348	0.0346	226
COPPER	94580.5262	Leach	2.22	NA	94580.52622	0.0346	255191
IRON	917712.0366	Leach	2.22	NA	917712.0366	0.0346	21711
LEAD	3641.7144	Leach	2.22	NA	3641.714431	0.0346	54056
MANGANESE	5508.7934	Leach	2.22	NA	5508.793406	0.0346	11231
MERCURY	189.0890	Leach	2.22	NA	189.0890185	0.0346	16581
NICKEL	4941.5264	Leach	2.22	NA	4941.526351	0.0346	19801
SELENIUM	122.9079	Leach	2.22	NA	122.907862	0.0346	26
SILVER	252.7262	Leach	2.22	NA	252.7262063	0.0346	3706
THALLIUM	4.1546	Leach	2.22	NA	4.154631956	0.0346	356
VANADIUM	8.9313	Leach	2.22	NA	8.931304642	0.0346	5001
ZINC	20881.1206	Leach	2.22	NA	20881.12065	0.0346	95986
ACETONE	44428.3519	Leach	2.22	0.0004	44421.2881	0.0346	1.2823
CARBON DISULFIDE	138.2823	Leach	2.22	0.0004	138.1244663	0.0346	1.1425
PYRENE	1.7206	Leach	2.22	NA	1.72058293	0.0346	9891.925
4,4'-DDD	0.0029	Leach	2.22	NA	0.002885176	0.0346	21732.25
4,4'-DDE	0.0124	Leach	2.22	NA	0.012365038	0.0346	21732.25
4,4'-DDT	0.0285	Leach	2.22	NA	0.028531825	0.0346	31393.75
AROCLOR-1254	0.0233	Leach	2.22	NA	0.023267545	0.0346	10779.7
DIELDRIN	0.0949	Leach	2.22	NA	0.094876394	0.0346	1511.5
ENDOSULFAN SULFATE	0.0480	Leach	2.22	NA	0.048014703	0.0346	411.4
ENDRIN ALDEHYDE	0.0013	Leach	2.22	NA	0.001312984	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0005	0.0003	0.0003	0.0003	0.0000
ANTIMONY	4.1324	2.2958	2.1402	2.0662	0.2296
ARSENIC	0.0036	0.0020	0.0019	0.0018	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
COBALT	0.2462	0.1368	0.1275	0.1231	0.0137
COPPER	0.1329	0.0739	0.0688	0.0665	0.0074
IRON	15.1611	8.4228	7.8518	7.5805	0.8423
LEAD	0.0242	0.0134	0.0125	0.0121	0.0013
MANGANESE	0.1759	0.0977	0.0911	0.0880	0.0098
MERCURY	0.0041	0.0023	0.0021	0.0020	0.0002
NICKEL	0.0895	0.0497	0.0464	0.0448	0.0050
SELENIUM	1.6955	0.9420	0.8781	0.8478	0.0942
SILVER	0.0245	0.0136	0.0127	0.0122	0.0014
THALLIUM	0.0042	0.0023	0.0022	0.0021	0.0002
VANADIUM	0.0006	0.0004	0.0003	0.0003	0.0000
ZINC	0.0780	0.0433	0.0404	0.0390	0.0043
ACETONE	12427.2107	6904.0059	6435.9981	6213.6053	690.4006
CARBON DISULFIDE	43.4124	24.1180	22.4831	21.7062	2.4118
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0000	Below	Below	Below	6879528
ANTIMONY	0.0740	Below	Below	Below	6879528
ARSENIC	0.0001	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0044	Below	Below	Below	6879528
COPPER	0.0024	Below	Below	Below	6879528
IRON	0.2717	Below	Below	Below	6879528
LEAD	0.0004	Below	Below	Below	6879528
MANGANESE	0.0032	Below	Below	Below	6879528
MERCURY	0.0001	Below	Below	Below	6879528
NICKEL	0.0016	Below	Below	Below	6879528
SELENIUM	0.0304	Below	Below	Below	6879528
SILVER	0.0004	Below	Below	Below	6879528
THALLIUM	0.0001	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0014	Below	Below	Below	6879528
ACETONE	222.6855	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.7779	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	232650.7638	232650.7491	232650.7479
ANTIMONY	83.13981214	83.11576885	83.11373155
ARSENIC	761.2981997	761.296043	761.2958603
BERYLLIUM	0.180129065	0.180123207	0.180122711
CADMIUM	90.53175131	90.53150712	90.53148643
CHROMIUM	8205.159949	8205.157392	8205.157176
COBALT	4.953504891	4.952072382	4.951950998
COPPER	3422926.246	3422925.369	3422925.295
IRON	2825537.711	2825529.2	2825528.479
LEAD	27917.39261	27917.35883	27917.35597
MANGANESE	8773.519489	8773.4684	8773.464071
MERCURY	444.61755	444.6157963	444.6156477
NICKEL	13875.90911	13875.86328	13875.8594
SELENIUM	0.438230486	0.437134376	0.437041497
SILVER	132.7968114	132.794468	132.7942695
THALLIUM	0.209253292	0.209214866	0.20921161
VANADIUM	6.333293273	6.333210453	6.333203435
ZINC	284242.9821	284242.7884	284242.772
ACETONE	1.98253193	1.891814799	1.884127898
CARBON DISULFIDE	0.003151298	0.00299133	0.002977775
PYRENE	2.413519946	2.413503989	2.413502637
4,4'-DDD	0.008891844	0.008891817	0.008891814
4,4'-DDE	0.038107901	0.038107786	0.038107776
4,4'-DDT	0.127026071	0.127025807	0.127025784
AROCLOR-1254	0.035567619	0.035567403	0.035567385
DIELDRIN	0.020326055	0.020325175	0.020325101
ENDOSULFAN SULFATE	0.00279556	0.002795116	0.002795078
ENDRIN ALDEHYDE	0.001194067	0.001194055	0.001194054

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	16768850.56	1584.1458
ANTIMONY	1	45	31777.7778	NA	226	14	16768850.56	2603.8258
ARSENIC	1	4617	2837.9310	NA	146	14	16768850.56	232.5360
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COBALT	1	45	1893.3333	NA	226	14	16768850.56	155.1370
COPPER	1	51038	1154285.7143	NA	176	14	16768850.56	94580.5262
IRON	1	4342	11200000.0000	NA	126	14	16768850.56	917712.0366
LEAD	1	10811	44444.4444	NA	4501	14	16768850.56	3641.7144
MANGANESE	1	2246	67230.7692	NA	326	14	16768850.56	5508.7934
MERCURY	1	3316	2307.6923	NA	261	14	16768850.56	189.0890
NICKEL	1	3960	60307.6923	NA	326	14	16768850.56	4941.5264
SELENIUM	1	5	1500.0000	NA	26	14	16768850.56	122.9079
SILVER	1	741	3084.3373	NA	42.5	14	16768850.56	252.7262
THALLIUM	1	71	50.7042	NA	356	14	16768850.56	4.1546
VANADIUM	1	1000	109.0000	NA	5001	14	16768850.56	8.9313
ZINC	1	19197	254838.7097	NA	311	14	16768850.56	20881.1206
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	16768850.56	44428.3519
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	16768850.56	138.2823
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	16768850.56	1.7206
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	16768850.56	0.0029
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	16768850.56	0.0124
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	16768850.56	0.0285
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	1	302.1	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	16768850.56	0.0480
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0013

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	34	GW Sample	2.22	NA	34	0.0346	226
ARSENIC	41.2	GW Sample	2.22	NA	41.2	0.0346	23086
BERYLLIUM	0.631864631	Leach	2.22	NA	0.631864631	0.0346	2011
CADMIUM	3.9	GW Sample	2.22	NA	3.9	0.0346	24246
CHROMIUM	27.4	GW Sample	2.22	NA	27.4	0.0346	209856
COBALT	1.15	GW Sample	2.22	NA	1.15	0.0346	226
COPPER	496	GW Sample	2.22	NA	496	0.0346	255191
IRON	21800	GW Sample	2.22	NA	21800	0.0346	21711
LEAD	195	GW Sample	2.22	NA	195	0.0346	54056
MANGANESE	1600	GW Sample	2.22	NA	1600	0.0346	11231
MERCURY	0.46	GW Sample	2.22	NA	0.46	0.0346	16581
NICKEL	278	GW Sample	2.22	NA	278	0.0346	19801
SELENIUM	19.8	GW Sample	2.22	NA	19.8	0.0346	26
SILVER	6.2	GW Sample	2.22	NA	6.2	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	587	GW Sample	2.22	NA	587	0.0346	95986
ACETONE	44428.35189	Leach	2.22	0.0004	44421.2881	0.0346	1.2823
CARBON DISULFIDE	138.2823445	Leach	2.22	0.0004	138.1244663	0.0346	1.1425
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	9891.925
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	21732.25
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	21732.25
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	31393.75
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	10779.7
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	1511.5
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	411.4
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	0.0540	0.0300	0.0279	0.0270	0.0030
ARSENIC	0.0006	0.0004	0.0003	0.0003	0.0000
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0001	0.0000	0.0000	0.0000	0.0000
CHROMIUM	0.0000	0.0000	0.0000	0.0000	0.0000
COBALT	0.0018	0.0010	0.0009	0.0009	0.0001
COPPER	0.0007	0.0004	0.0004	0.0003	0.0000
IRON	0.3601	0.2001	0.1865	0.1801	0.0200
LEAD	0.0013	0.0007	0.0007	0.0006	0.0001
MANGANESE	0.0511	0.0284	0.0265	0.0255	0.0028
MERCURY	0.0000	0.0000	0.0000	0.0000	0.0000
NICKEL	0.0050	0.0028	0.0026	0.0025	0.0003
SELENIUM	0.2731	0.1517	0.1415	0.1366	0.0152
SILVER	0.0006	0.0003	0.0003	0.0003	0.0000
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0022	0.0012	0.0011	0.0011	0.0001
ACETONE	12427.2107	6904.0059	6435.9981	6213.6053	690.4006
CARBON DISULFIDE	43.4124	24.1180	22.4831	21.7062	2.4118
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)	Csed Sediment Conc. Df=0.5, mg/kg
ALUMINUM	0.0001	Below	Below	Below	6879528	2129498.512
ANTIMONY	0.0010	Below	Below	Below	6879528	1.085615479
ARSENIC	0.0000	Below	Below	Below	6879528	134.8844161
BERYLLIUM	0.0000	Below	Below	Below	6879528	0.180129065
CADMIUM	0.0000	Below	Below	Below	6879528	13.40977047
CHROMIUM	0.0000	Below	Below	Below	6879528	815.4589463
COBALT	0.0000	Below	Below	Below	6879528	0.036719347
COPPER	0.0000	Below	Below	Below	6879528	17950.53893
IRON	0.0065	Below	Below	Below	6879528	67119.88037
LEAD	0.0000	Below	Below	Below	6879528	1494.870524
MANGANESE	0.0009	Below	Below	Below	6879528	2548.222477
MERCURY	0.0000	Below	Below	Below	6879528	1.081628508
NICKEL	0.0001	Below	Below	Below	6879528	780.6298011
SELENIUM	0.0049	Below	Below	Below	6879528	0.070597303
SILVER	0.0000	Below	Below	Below	6879528	3.257834804
THALLIUM	0.0012	Below	Below	Below	6879528	3.329210076
VANADIUM	0.0000	Below	Below	Below	6879528	18.29508375
ZINC	0.0000	Below	Below	Below	6879528	7990.501722
ACETONE	222.6855	Exceeds	Below	Below	6879528	1.98253193
CARBON DISULFIDE	0.7779	Exceeds	Exceeds	Below	6879528	0.003151298
PYRENE	0.0000	Below	Below	Below	6879528	2.413519946
4,4'-DDD	0.0000	Below	Below	Below	6879528	0.008891844
4,4'-DDE	0.0000	Below	Below	Below	6879528	0.038107901
4,4'-DDT	0.0000	Below	Below	Below	6879528	0.127026071
AROCLOR-1254	0.0000	Below	Below	Below	6879528	0.035567619
DIELDRIN	0.0000	Below	Below	Below	6879528	0.020326055
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528	0.00279556
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528	0.001194067

Detected Chemicals	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.377	2129498.366
ANTIMONY	1.085301529	1.085274926
ARSENIC	134.884034	134.8840016
BERYLLIUM	0.180123207	0.180122711
CADMIUM	13.4097343	13.40973124
CHROMIUM	815.4586922	815.4586707
COBALT	0.036708728	0.036707828
COPPER	17950.53433	17950.53394
IRON	67119.67818	67119.66105
LEAD	1494.868715	1494.868562
MANGANESE	2548.207639	2548.206382
MERCURY	1.081624242	1.08162388
NICKEL	780.6272229	780.6270044
SELENIUM	0.070420724	0.070405762
SILVER	3.257777315	3.257772444
THALLIUM	3.328598729	3.328546927
VANADIUM	18.29484451	18.29482424
ZINC	7990.496278	7990.495817
ACETONE	1.891814799	1.884127898
CARBON DISULFIDE	0.00299133	0.002977775
PYRENE	2.413503989	2.413502637
4,4'-DDD	0.008891817	0.008891814
4,4'-DDE	0.038107786	0.038107776
4,4'-DDT	0.127025807	0.127025784
AROCLOR-1254	0.035567403	0.035567385
DIELDRIN	0.020325175	0.020325101
ENDOSULFAN SULFATE	0.002795116	0.002795078
ENDRIN ALDEHYDE	0.001194055	0.001194054

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1603553
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1603553
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1603553
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1603553
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1603553
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1603553
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1603553
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1603553
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1603553
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1603553
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1603553
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1603553
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1603553
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1603553
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1603553
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1603553
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1603553
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1603553
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1603553
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1603553
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1603553
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1603553
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1603553
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1603553
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1603553
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1603553
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1603553
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1603553

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	16768850.56	1940.4337
ANTIMONY	1	45	31777.7778	NA	226	14	16768850.56	3189.4485
ARSENIC	1	4617	2837.9310	NA	146	14	16768850.56	284.8354
BERYLLIUM	1	402	7.7114	NA	2011	14	16768850.56	0.7740
CADMIUM	1	4849	321.3333	NA	376	14	16768850.56	32.2513
CHROMIUM	1	41971	3364.7059	NA	4251	14	16768850.56	337.7063
COBALT	1	45	1893.3333	NA	226	14	16768850.56	190.0287
COPPER	1	51038	1154285.7143	NA	176	14	16768850.56	115852.4939
IRON	1	4342	11200000.0000	NA	126	14	16768850.56	1124113.3069
LEAD	1	10811	44444.4444	NA	4501	14	16768850.56	4460.7671
MANGANESE	1	2246	67230.7692	NA	326	14	16768850.56	6747.7681
MERCURY	1	3316	2307.6923	NA	261	14	16768850.56	231.6168
NICKEL	1	3960	60307.6923	NA	326	14	16768850.56	6052.9178
SELENIUM	1	5	1500.0000	NA	26	14	16768850.56	150.5509
SILVER	1	741	3084.3373	NA	42.5	14	16768850.56	309.5665
THALLIUM	1	71	50.7042	NA	356	14	16768850.56	5.0890
VANADIUM	1	1000	109.0000	NA	5001	14	16768850.56	10.9400
ZINC	1	19197	254838.7097	NA	311	14	16768850.56	25577.4629
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	16768850.56	54420.6675
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	16768850.56	169.3832
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	16768850.56	2.1076
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	16768850.56	0.0035
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	16768850.56	0.0151
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	16768850.56	0.0349
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0285
DIELDRIN	1	302.1	1.1579	NA	691.908	14	16768850.56	0.1162
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	16768850.56	0.0588
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0016

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	3189.44847	Leach	2.22	NA	3189.44847	0.0346	226
ARSENIC	284.8353607	Leach	2.22	NA	284.8353607	0.0346	23086
BERYLLIUM	0.77397638	Leach	2.22	NA	0.77397638	0.0346	2011
CADMIUM	32.25134607	Leach	2.22	NA	32.25134607	0.0346	24246
CHROMIUM	337.7063086	Leach	2.22	NA	337.7063086	0.0346	209856
COBALT	190.0286781	Leach	2.22	NA	190.0286781	0.0346	226
COPPER	115852.4939	Leach	2.22	NA	115852.4939	0.0346	255191
IRON	1124113.307	Leach	2.22	NA	1124113.307	0.0346	21711
LEAD	4460.767091	Leach	2.22	NA	4460.767091	0.0346	54056
MANGANESE	6747.768065	Leach	2.22	NA	6747.768065	0.0346	11231
MERCURY	231.6167528	Leach	2.22	NA	231.6167528	0.0346	16581
NICKEL	6052.917807	Leach	2.22	NA	6052.917807	0.0346	19801
SELENIUM	150.5508893	Leach	2.22	NA	150.5508893	0.0346	26
SILVER	309.5664873	Leach	2.22	NA	309.5664873	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	25577.46292	Leach	2.22	NA	25577.46292	0.0346	95986
ACETONE	54420.66745	Leach	2.22	0.0004	54412.01496	0.0346	1.2823
CARBON DISULFIDE	169.3832242	Leach	2.22	0.0004	169.1898378	0.0346	1.1425
PYRENE	2.107556718	Leach	2.22	NA	2.107556718	0.0346	9891.925
4,4'-DDD	0.003534076	Leach	2.22	NA	0.003534076	0.0346	21732.25
4,4'-DDE	0.015146041	Leach	2.22	NA	0.015146041	0.0346	21732.25
4,4'-DDT	0.034948876	Leach	2.22	NA	0.034948876	0.0346	31393.75
AROCLOR-1254	0.028500615	Leach	2.22	NA	0.028500615	0.0346	10779.7
DIELDRIN	0.116214905	Leach	2.22	NA	0.116214905	0.0346	1511.5
ENDOSULFAN SULFATE	0.058813619	Leach	2.22	NA	0.058813619	0.0346	411.4
ENDRIN ALDEHYDE	0.001608285	Leach	2.22	NA	0.001608285	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	5.0619	2.8121	2.6215	2.5309	0.2812
ARSENIC	0.0044	0.0025	0.0023	0.0022	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
CHROMIUM	0.0006	0.0003	0.0003	0.0003	0.0000
COBALT	0.3016	0.1675	0.1562	0.1508	0.0168
COPPER	0.1628	0.0905	0.0843	0.0814	0.0090
IRON	18.5709	10.3172	9.6178	9.2855	1.0317
LEAD	0.0296	0.0164	0.0153	0.0148	0.0016
MANGANESE	0.2155	0.1197	0.1116	0.1077	0.0120
MERCURY	0.0050	0.0028	0.0026	0.0025	0.0003
NICKEL	0.1096	0.0609	0.0568	0.0548	0.0061
SELENIUM	2.0769	1.1538	1.0756	1.0384	0.1154
SILVER	0.0300	0.0166	0.0155	0.0150	0.0017
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0956	0.0531	0.0495	0.0478	0.0053
ACETONE	15222.1964	8456.7758	7883.5090	7611.0982	845.6776
CARBON DISULFIDE	53.1762	29.5423	27.5397	26.5881	2.9542
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0001	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0907	Below	Below	Below	6879528
ARSENIC	0.0001	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0054	Below	Below	Below	6879528
COPPER	0.0029	Below	Below	Below	6879528
IRON	0.3328	Below	Below	Below	6879528
LEAD	0.0005	Below	Below	Below	6879528
MANGANESE	0.0039	Below	Below	Below	6879528
MERCURY	0.0001	Below	Below	Below	6879528
NICKEL	0.0020	Below	Below	Below	6879528
SELENIUM	0.0372	Below	Below	Below	6879528
SILVER	0.0005	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0017	Below	Below	Below	6879528
ACETONE	272.7694	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.9529	Exceeds	Exceeds	Exceeds	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	101.8386656	101.8092147	101.8067192
ARSENIC	932.520663	932.5180213	932.5177975
BERYLLIUM	0.220641629	0.220634454	0.220633846
CADMIUM	110.8931149	110.8928158	110.8927905
CHROMIUM	10050.57046	10050.56733	10050.56706
COBALT	6.067590423	6.06583573	6.065687047
COPPER	4192771.576	4192770.502	4192770.411
IRON	3461025.261	3461014.835	3461013.952
LEAD	34196.2525	34196.21113	34196.20762
MANGANESE	10746.75891	10746.69633	10746.69103
MERCURY	544.6158321	544.613684	544.613502
NICKEL	16996.71951	16996.66337	16996.65862
SELENIUM	0.536792263	0.535449628	0.53533586
SILVER	162.6639478	162.6610774	162.6608342
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	348171.655	348171.4178	348171.3977
ACETONE	2.428420284	2.317300095	2.307884344
CARBON DISULFIDE	0.003860052	0.003664106	0.003647502
PYRENE	2.956341183	2.956321638	2.956319982
4,4'-DDD	0.010891695	0.010891662	0.010891659
4,4'-DDE	0.046678693	0.046678553	0.046678541
4,4'-DDT	0.155595319	0.155594995	0.155594967
AROCLOR-1254	0.04356708	0.043566816	0.043566793
DIELDRIN	0.024897558	0.024896481	0.02489639
ENDOSULFAN SULFATE	0.003424305	0.003423761	0.003423715
ENDRIN ALDEHYDE	0.001462623	0.001462608	0.001462607

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	883423
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	883423
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	883423
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	883423
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	883423
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	883423
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	883423
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	883423
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	883423
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	883423
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	883423
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	883423
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	883423
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	883423
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	883423
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	883423
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	883423
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	883423
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	883423
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	883423
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	883423
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	883423
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	883423
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	883423
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	883423
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	883423
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	883423
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	883423

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	16768850.56	1119.4744
ANTIMONY	1	45	31777.7778	NA	226	14	16768850.56	1840.0556
ARSENIC	1	4617	2837.9310	NA	146	14	16768850.56	164.3271
BERYLLIUM	1	402	7.7114	NA	2011	14	16768850.56	0.4465
CADMIUM	1	4849	321.3333	NA	376	14	16768850.56	18.6064
CHROMIUM	1	41971	3364.7059	NA	4251	14	16768850.56	194.8294
COBALT	1	45	1893.3333	NA	226	14	16768850.56	109.6313
COPPER	1	51038	1154285.7143	NA	176	14	16768850.56	66837.5847
IRON	1	4342	11200000.0000	NA	126	14	16768850.56	648523.0995
LEAD	1	10811	44444.4444	NA	4501	14	16768850.56	2573.5044
MANGANESE	1	2246	67230.7692	NA	326	14	16768850.56	3892.9203
MERCURY	1	3316	2307.6923	NA	261	14	16768850.56	133.6243
NICKEL	1	3960	60307.6923	NA	326	14	16768850.56	3492.0475
SELENIUM	1	5	1500.0000	NA	26	14	16768850.56	86.8558
SILVER	1	741	3084.3373	NA	42.5	14	16768850.56	178.5950
THALLIUM	1	71	50.7042	NA	356	14	16768850.56	2.9360
VANADIUM	1	1000	109.0000	NA	5001	14	16768850.56	6.3115
ZINC	1	19197	254838.7097	NA	311	14	16768850.56	14756.1420
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	16768850.56	31396.3545
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	16768850.56	97.7205
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	16768850.56	1.2159
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	16768850.56	0.0020
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	16768850.56	0.0087
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	16768850.56	0.0202
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0164
DIELDRIN	1	302.1	1.1579	NA	691.908	14	16768850.56	0.0670
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	16768850.56	0.0339
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0009

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	1840.05562	Leach	2.22	NA	1840.05562	0.0346	226
ARSENIC	164.3271277	Leach	2.22	NA	164.3271277	0.0346	23086
BERYLLIUM	0.446522212	Leach	2.22	NA	0.446522212	0.0346	2011
CADMIUM	18.60643655	Leach	2.22	NA	18.60643655	0.0346	24246
CHROMIUM	194.8294186	Leach	2.22	NA	194.8294186	0.0346	209856
COBALT	109.6312859	Leach	2.22	NA	109.6312859	0.0346	226
COPPER	66837.58475	Leach	2.22	NA	66837.58475	0.0346	255191
IRON	648523.0995	Leach	2.22	NA	648523.0995	0.0346	21711
LEAD	2573.504363	Leach	2.22	NA	2573.504363	0.0346	54056
MANGANESE	3892.920254	Leach	2.22	NA	3892.920254	0.0346	11231
MERCURY	133.624265	Leach	2.22	NA	133.624265	0.0346	16581
NICKEL	3492.047459	Leach	2.22	NA	3492.047459	0.0346	19801
SELENIUM	86.85577226	Leach	2.22	NA	86.85577226	0.0346	26
SILVER	178.5950016	Leach	2.22	NA	178.5950016	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	14756.14195	Leach	2.22	NA	14756.14195	0.0346	95986
ACETONE	31396.35455	Leach	2.22	0.0004	31391.36276	0.0346	1.2823
CARBON DISULFIDE	97.72051701	Leach	2.22	0.0004	97.60894862	0.0346	1.1425
PYRENE	1.215890966	Leach	2.22	NA	1.215890966	0.0346	9891.925
4,4'-DDD	0.002038878	Leach	2.22	NA	0.002038878	0.0346	21732.25
4,4'-DDE	0.008738049	Leach	2.22	NA	0.008738049	0.0346	21732.25
4,4'-DDT	0.020162695	Leach	2.22	NA	0.020162695	0.0346	31393.75
AROCLOR-1254	0.016442566	Leach	2.22	NA	0.016442566	0.0346	10779.7
DIELDRIN	0.067046667	Leach	2.22	NA	0.067046667	0.0346	1511.5
ENDOSULFAN SULFATE	0.033930735	Leach	2.22	NA	0.033930735	0.0346	411.4
ENDRIN ALDEHYDE	0.000927851	Leach	2.22	NA	0.000927851	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	2.9203	1.6224	1.5124	1.4601	0.1622
ARSENIC	0.0026	0.0014	0.0013	0.0013	0.0001
BERYLLIUM	0.0001	0.0000	0.0000	0.0000	0.0000
CADMIUM	0.0003	0.0002	0.0001	0.0001	0.0000
CHROMIUM	0.0003	0.0002	0.0002	0.0002	0.0000
COBALT	0.1740	0.0967	0.0901	0.0870	0.0097
COPPER	0.0939	0.0522	0.0487	0.0470	0.0052
IRON	10.7139	5.9522	5.5487	5.3570	0.5952
LEAD	0.0171	0.0095	0.0088	0.0085	0.0009
MANGANESE	0.1243	0.0691	0.0644	0.0622	0.0069
MERCURY	0.0029	0.0016	0.0015	0.0014	0.0002
NICKEL	0.0633	0.0351	0.0328	0.0316	0.0035
SELENIUM	1.1982	0.6657	0.6205	0.5991	0.0666
SILVER	0.0173	0.0096	0.0090	0.0086	0.0010
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0551	0.0306	0.0286	0.0276	0.0031
ACETONE	8781.9848	4878.8805	4548.1516	4390.9924	487.8880
CARBON DISULFIDE	30.6784	17.0436	15.8882	15.3392	1.7044
PYRENE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0523	Below	Below	Below	6879528
ARSENIC	0.0000	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0031	Below	Below	Below	6879528
COPPER	0.0017	Below	Below	Below	6879528
IRON	0.1920	Below	Below	Below	6879528
LEAD	0.0003	Below	Below	Below	6879528
MANGANESE	0.0022	Below	Below	Below	6879528
MERCURY	0.0001	Below	Below	Below	6879528
NICKEL	0.0011	Below	Below	Below	6879528
SELENIUM	0.0215	Below	Below	Below	6879528
SILVER	0.0003	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0010	Below	Below	Below	6879528
ACETONE	157.3660	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.5497	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	58.75273127	58.7357405	58.73430079
ARSENIC	537.989531	537.9880069	537.9878778
BERYLLIUM	0.1272925	0.12728836	0.12728801
CADMIUM	63.97642139	63.97624883	63.97623421
CHROMIUM	5798.371984	5798.370177	5798.370024
COBALT	3.50051238	3.499500063	3.499414285
COPPER	2418892.474	2418891.854	2418891.802
IRON	1996733.617	1996727.603	1996727.093
LEAD	19728.49136	19728.46749	19728.46547
MANGANESE	6200.016809	6199.980706	6199.977647
MERCURY	314.1995965	314.1983572	314.1982522
NICKEL	9805.742135	9805.709748	9805.707004
SELENIUM	0.309686025	0.308911433	0.308845798
SILVER	93.8440342	93.8423782	93.84223788
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	200867.083	200866.9461	200866.9345
ACETONE	1.401003475	1.33689605	1.331463918
CARBON DISULFIDE	0.00222694	0.002113895	0.002104316
PYRENE	1.705571436	1.70556016	1.705559205
4,4'-DDD	0.006283633	0.006283614	0.006283613
4,4'-DDE	0.026929857	0.026929776	0.026929769
4,4'-DDT	0.089766003	0.089765816	0.0897658
AROCLOR-1254	0.025134706	0.025134554	0.025134541
DIELDRIN	0.014363891	0.01436327	0.014363217
ENDOSULFAN SULFATE	0.001975549	0.001975235	0.001975209
ENDRIN ALDEHYDE	0.000843816	0.000843807	0.000843807

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	5936173	3892.8975
ANTIMONY	1	45	31777.7778	NA	226	14	5936173	6398.6706
ARSENIC	1	4617	2837.9310	NA	146	14	5936173	571.4366
BERYLLIUM	1	402	7.7114	NA	2011	14	5936173	1.5528
CADMIUM	1	4849	321.3333	NA	376	14	5936173	64.7026
CHROMIUM	1	41971	3364.7059	NA	4251	14	5936173	677.5063
COBALT	1	45	1893.3333	NA	226	14	5936173	381.2355
COPPER	1	51038	1154285.7143	NA	176	14	5936173	232423.2384
IRON	1	4342	11200000.0000	NA	126	14	5936173	2255195.7789
LEAD	1	10811	44444.4444	NA	4501	14	5936173	8949.1896
MANGANESE	1	2246	67230.7692	NA	326	14	5936173	13537.3703
MERCURY	1	3316	2307.6923	NA	261	14	5936173	464.6695
NICKEL	1	3960	60307.6923	NA	326	14	5936173	12143.3619
SELENIUM	1	5	1500.0000	NA	26	14	5936173	302.0351
SILVER	1	741	3084.3373	NA	42.5	14	5936173	621.0522
THALLIUM	1	71	50.7042	NA	356	14	5936173	10.2096
VANADIUM	1	1000	109.0000	NA	5001	14	5936173	21.9479
ZINC	1	19197	254838.7097	NA	311	14	5936173	51313.4984
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	5936173	109178.7267
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	5936173	339.8166
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	5936173	4.2282
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	5936173	0.0071
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	5936173	0.0304
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	5936173	0.0701
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	5936173	0.0572
DIELDRIN	1	302.1	1.1579	NA	691.908	14	5936173	0.2332
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	5936173	0.1180
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	5936173	0.0032

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	0.79	NA	14500	0.0346	1035566
ANTIMONY	6398.670563	Leach	0.79	NA	6398.670563	0.0346	226
ARSENIC	571.4366152	Leach	0.79	NA	571.4366152	0.0346	23086
BERYLLIUM	1.55275118	Leach	0.79	NA	1.55275118	0.0346	2011
CADMIUM	64.7026408	Leach	0.79	NA	64.7026408	0.0346	24246
CHROMIUM	677.5062949	Leach	0.79	NA	677.5062949	0.0346	209856
COBALT	381.2354769	Leach	0.79	NA	381.2354769	0.0346	226
COPPER	232423.2384	Leach	0.79	NA	232423.2384	0.0346	255191
IRON	2255195.779	Leach	0.79	NA	2255195.779	0.0346	21711
LEAD	8949.189599	Leach	0.79	NA	8949.189599	0.0346	54056
MANGANESE	13537.37027	Leach	0.79	NA	13537.37027	0.0346	11231
MERCURY	464.6694599	Leach	0.79	NA	464.6694599	0.0346	16581
NICKEL	12143.36189	Leach	0.79	NA	12143.36189	0.0346	19801
SELENIUM	302.035149	Leach	0.79	NA	302.035149	0.0346	26
SILVER	621.0521939	Leach	0.79	NA	621.0521939	0.0346	3706
THALLIUM	66.1	GW Sample	0.79	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	0.79	NA	25.8	0.0346	5001
ZINC	51313.49843	Leach	0.79	NA	51313.49843	0.0346	95986
ACETONE	109178.7267	Leach	0.79	0.0012	109129.6836	0.0346	1.2823
CARBON DISULFIDE	339.8165734	Leach	0.79	0.0011	338.7214243	0.0346	1.1425
PYRENE	4.228179654	Leach	0.79	NA	4.228179654	0.0346	9891.925
4,4'-DDD	0.007090063	Leach	0.79	NA	0.007090063	0.0346	21732.25
4,4'-DDE	0.030385983	Leach	0.79	NA	0.030385983	0.0346	21732.25
4,4'-DDT	0.070114425	Leach	0.79	NA	0.070114425	0.0346	31393.75
AROCLOR-1254	0.057177924	Leach	0.79	NA	0.057177924	0.0346	10779.7
DIELDRIN	0.233150308	Leach	0.79	NA	0.233150308	0.0346	1511.5
ENDOSULFAN SULFATE	0.117991866	Leach	0.79	NA	0.117991866	0.0346	411.4
ENDRIN ALDEHYDE	0.003226541	Leach	0.79	NA	0.003226541	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0018	0.0010	0.0009	0.0009	0.0001
ANTIMONY	3.5949	1.9972	1.8618	1.7975	0.1997
ARSENIC	0.0031	0.0017	0.0016	0.0016	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0000	0.0000
CADMIUM	0.0003	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
COBALT	0.2142	0.1190	0.1109	0.1071	0.0119
COPPER	0.1156	0.0642	0.0599	0.0578	0.0064
IRON	13.1890	7.3272	6.8305	6.5945	0.7327
LEAD	0.0210	0.0117	0.0109	0.0105	0.0012
MANGANESE	0.1530	0.0850	0.0793	0.0765	0.0085
MERCURY	0.0036	0.0020	0.0018	0.0018	0.0002
NICKEL	0.0779	0.0433	0.0403	0.0389	0.0043
SELENIUM	1.4750	0.8194	0.7639	0.7375	0.0819
SILVER	0.0213	0.0118	0.0110	0.0106	0.0012
THALLIUM	0.0236	0.0131	0.0122	0.0118	0.0013
VANADIUM	0.0007	0.0004	0.0003	0.0003	0.0000
ZINC	0.0679	0.0377	0.0352	0.0339	0.0038
ACETONE	10810.7230	6005.9572	5598.8262	5405.3615	600.5957
CARBON DISULFIDE	37.7655	20.9808	19.5586	18.8827	2.0981
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0000	Below	Below	Below	2435353
ANTIMONY	0.0644	Below	Below	Below	2435353
ARSENIC	0.0001	Below	Below	Below	2435353
BERYLLIUM	0.0000	Below	Below	Below	2435353
CADMIUM	0.0000	Below	Below	Below	2435353
CHROMIUM	0.0000	Below	Below	Below	2435353
COBALT	0.0038	Below	Below	Below	2435353
COPPER	0.0021	Below	Below	Below	2435353
IRON	0.2363	Below	Below	Below	2435353
LEAD	0.0004	Below	Below	Below	2435353
MANGANESE	0.0027	Below	Below	Below	2435353
MERCURY	0.0001	Below	Below	Below	2435353
NICKEL	0.0014	Below	Below	Below	2435353
SELENIUM	0.0264	Below	Below	Below	2435353
SILVER	0.0004	Below	Below	Below	2435353
THALLIUM	0.0004	Below	Below	Below	2435353
VANADIUM	0.0000	Below	Below	Below	2435353
ZINC	0.0012	Below	Below	Below	2435353
ACETONE	193.7194	Exceeds	Below	Below	2435353
CARBON DISULFIDE	0.6767	Exceeds	Exceeds	Below	2435353
PYRENE	0.0000	Below	Below	Below	2435353
4,4'-DDD	0.0000	Below	Below	Below	2435353
4,4'-DDE	0.0000	Below	Below	Below	2435353
4,4'-DDT	0.0000	Below	Below	Below	2435353
AROCLOR-1254	0.0000	Below	Below	Below	2435353
DIELDRIN	0.0000	Below	Below	Below	2435353
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	2435353
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	2435353

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.316	2129498.269	2129498.265
ANTIMONY	204.2228213	204.2019055	204.2001332
ARSENIC	1870.814971	1870.813095	1870.812936
BERYLLIUM	0.442630247	0.442625151	0.44262472
CADMIUM	222.4728617	222.4726493	222.4726313
CHROMIUM	20163.4423	20163.44008	20163.43989
COBALT	12.16768138	12.16643521	12.16632961
COPPER	8411533.944	8411533.181	8411533.116
IRON	6943477.438	6943470.034	6943469.406
LEAD	68604.39086	68604.36148	68604.35899
MANGANESE	21559.96202	21559.91757	21559.91381
MERCURY	1092.601855	1092.600329	1092.6002
NICKEL	34098.64988	34098.61001	34098.60663
SELENIUM	1.072997339	1.072043807	1.071963009
SILVER	326.3279931	326.3259546	326.3257818
THALLIUM	3.328321483	3.328105066	3.328086728
VANADIUM	18.29473601	18.29465132	18.29464414
ZINC	698501.178	698501.0095	698500.9953
ACETONE	4.54659982	4.467682853	4.460995837
CARBON DISULFIDE	0.007158362	0.007019202	0.00700741
PYRENE	5.9309538	5.930939919	5.930938742
4,4'-DDD	0.02185082	0.021850796	0.021850794
4,4'-DDE	0.09364637	0.093646271	0.093646262
4,4'-DDT	0.312154337	0.312154107	0.312154088
AROCLOR-1254	0.087403492	0.087403304	0.087403288
DIELDRIN	0.049946332	0.049945567	0.049945503
ENDOSULFAN SULFATE	0.006868254	0.006867867	0.006867834
ENDRIN ALDEHYDE	0.00293427	0.002934259	0.002934258

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	36891471	753.7544
ANTIMONY	1	45	31777.7778	NA	226	14	36891471	1238.9296
ARSENIC	1	4617	2837.9310	NA	146	14	36891471	110.6433
BERYLLIUM	1	402	7.7114	NA	2011	14	36891471	0.3006
CADMIUM	1	4849	321.3333	NA	376	14	36891471	12.5279
CHROMIUM	1	41971	3364.7059	NA	4251	14	36891471	131.1808
COBALT	1	45	1893.3333	NA	226	14	36891471	73.8159
COPPER	1	51038	1154285.7143	NA	176	14	36891471	45002.4789
IRON	1	4342	11200000.0000	NA	126	14	36891471	436657.7160
LEAD	1	10811	44444.4444	NA	4501	14	36891471	1732.7687
MANGANESE	1	2246	67230.7692	NA	326	14	36891471	2621.1459
MERCURY	1	3316	2307.6923	NA	261	14	36891471	89.9707
NICKEL	1	3960	60307.6923	NA	326	14	36891471	2351.2339
SELENIUM	1	5	1500.0000	NA	26	14	36891471	58.4809
SILVER	1	741	3084.3373	NA	42.5	14	36891471	120.2500
THALLIUM	1	71	50.7042	NA	356	14	36891471	1.9768
VANADIUM	1	1000	109.0000	NA	5001	14	36891471	4.2496
ZINC	1	19197	254838.7097	NA	311	14	36891471	9935.4722
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	36891471	21139.5099
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	36891471	65.7963
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	36891471	0.8187
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	36891471	0.0014
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	36891471	0.0059
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	36891471	0.0136
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	36891471	0.0111
DIELDRIN	1	302.1	1.1579	NA	691.908	14	36891471	0.0451
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	36891471	0.0228
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	36891471	0.0006

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	4.89	NA	14500	0.0346	1035566
ANTIMONY	1238.929631	Leach	4.89	NA	1238.929631	0.0346	226
ARSENIC	110.6432575	Leach	4.89	NA	110.6432575	0.0346	23086
BERYLLIUM	0.300648303	Leach	4.89	NA	0.300648303	0.0346	2011
CADMIUM	12.5279178	Leach	4.89	NA	12.5279178	0.0346	24246
CHROMIUM	131.1807844	Leach	4.89	NA	131.1807844	0.0346	209856
COBALT	73.81594723	Leach	4.89	NA	73.81594723	0.0346	226
COPPER	45002.47889	Leach	4.89	NA	45002.47889	0.0346	255191
IRON	436657.716	Leach	4.89	NA	436657.716	0.0346	21711
LEAD	1732.768714	Leach	4.89	NA	1732.768714	0.0346	54056
MANGANESE	2621.145905	Leach	4.89	NA	2621.145905	0.0346	11231
MERCURY	89.97068324	Leach	4.89	NA	89.97068324	0.0346	16581
NICKEL	2351.233855	Leach	4.89	NA	2351.233855	0.0346	19801
SELENIUM	58.4809441	Leach	4.89	NA	58.4809441	0.0346	26
SILVER	120.2499734	Leach	4.89	NA	120.2499734	0.0346	3706
THALLIUM	66.1	GW Sample	4.89	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	4.89	NA	25.8	0.0346	5001
ZINC	9935.472224	Leach	4.89	NA	9935.472224	0.0346	95986
ACETONE	21139.50988	Leach	4.89	0.0002	21137.98201	0.0346	1.2823
CARBON DISULFIDE	65.79629591	Leach	4.89	0.0002	65.76213832	0.0346	1.1425
PYRENE	0.818672724	Leach	4.89	NA	0.818672724	0.0346	9891.925
4,4'-DDD	0.001372799	Leach	4.89	NA	0.001372799	0.0346	21732.25
4,4'-DDE	0.005883424	Leach	4.89	NA	0.005883424	0.0346	21732.25
4,4'-DDT	0.013575764	Leach	4.89	NA	0.013575764	0.0346	31393.75
AROCLOR-1254	0.01107096	Leach	4.89	NA	0.01107096	0.0346	10779.7
DIELDRIN	0.045143256	Leach	4.89	NA	0.045143256	0.0346	1511.5
ENDOSULFAN SULFATE	0.022845936	Leach	4.89	NA	0.022845936	0.0346	411.4
ENDRIN ALDEHYDE	0.000624733	Leach	4.89	NA	0.000624733	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0110	0.0061	0.0057	0.0055	0.0006
ANTIMONY	4.3258	2.4032	2.2403	2.1629	0.2403
ARSENIC	0.0038	0.0021	0.0020	0.0019	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0003	0.0002	0.0000
COBALT	0.2577	0.1432	0.1335	0.1289	0.0143
COPPER	0.1392	0.0773	0.0721	0.0696	0.0077
IRON	15.8704	8.8169	8.2192	7.9352	0.8817
LEAD	0.0253	0.0141	0.0131	0.0126	0.0014
MANGANESE	0.1842	0.1023	0.0954	0.0921	0.0102
MERCURY	0.0043	0.0024	0.0022	0.0021	0.0002
NICKEL	0.0937	0.0521	0.0485	0.0468	0.0052
SELENIUM	1.7749	0.9860	0.9192	0.8874	0.0986
SILVER	0.0256	0.0142	0.0133	0.0128	0.0014
THALLIUM	0.1465	0.0814	0.0759	0.0733	0.0081
VANADIUM	0.0041	0.0023	0.0021	0.0020	0.0002
ZINC	0.0817	0.0454	0.0423	0.0408	0.0045
ACETONE	13008.6147	7227.0082	6737.1047	6504.3073	722.7008
CARBON DISULFIDE	45.4434	25.2463	23.5349	22.7217	2.5246
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0002	Below	Below	Below	15134962
ANTIMONY	0.0775	Below	Below	Below	15134962
ARSENIC	0.0001	Below	Below	Below	15134962
BERYLLIUM	0.0000	Below	Below	Below	15134962
CADMIUM	0.0000	Below	Below	Below	15134962
CHROMIUM	0.0000	Below	Below	Below	15134962
COBALT	0.0046	Below	Below	Below	15134962
COPPER	0.0025	Below	Below	Below	15134962
IRON	0.2844	Below	Below	Below	15134962
LEAD	0.0005	Below	Below	Below	15134962
MANGANESE	0.0033	Below	Below	Below	15134962
MERCURY	0.0001	Below	Below	Below	15134962
NICKEL	0.0017	Below	Below	Below	15134962
SELENIUM	0.0318	Below	Below	Below	15134962
SILVER	0.0005	Below	Below	Below	15134962
THALLIUM	0.0026	Below	Below	Below	15134962
VANADIUM	0.0001	Below	Below	Below	15134962
ZINC	0.0015	Below	Below	Below	15134962
ACETONE	233.1038	Exceeds	Below	Below	15134962
CARBON DISULFIDE	0.8143	Exceeds	Exceeds	Below	15134962
PYRENE	0.0000	Below	Below	Below	15134962
4,4'-DDD	0.0000	Below	Below	Below	15134962
4,4'-DDE	0.0000	Below	Below	Below	15134962
4,4'-DDT	0.0000	Below	Below	Below	15134962
AROCLOR-1254	0.0000	Below	Below	Below	15134962
DIELDRIN	0.0000	Below	Below	Below	15134962
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	15134962
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	15134962

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.875	2129498.579	2129498.554
ANTIMONY	39.58974655	39.5645784	39.56244578
ARSENIC	362.2370226	362.234765	362.2345737
BERYLLIUM	0.085714961	0.08570883	0.08570831
CADMIUM	43.07633994	43.07608432	43.07606266
CHROMIUM	3904.110739	3904.108063	3904.107836
COBALT	2.35877371	2.357274182	2.357147119
COPPER	1628667.96	1628667.042	1628666.964
IRON	1344433.579	1344424.67	1344423.915
LEAD	13283.45301	13283.41765	13283.41466
MANGANESE	4174.604953	4174.551474	4174.546943
MERCURY	211.5562874	211.5544517	211.5542962
NICKEL	6602.372607	6602.324633	6602.320568
SELENIUM	0.20992316	0.208775768	0.208678544
SILVER	63.18922802	63.18677502	63.18656716
THALLIUM	3.330860712	3.329515749	3.329401784
VANADIUM	18.29572971	18.29520338	18.29515878
ZINC	135246.2589	135246.0562	135246.039
ACETONE	1.059927823	0.964966512	0.956919982
CARBON DISULFIDE	0.00170576	0.001538308	0.001524119
PYRENE	1.148400454	1.148383751	1.148382336
4,4'-DDD	0.004230874	0.004230846	0.004230843
4,4'-DDE	0.018132315	0.018132195	0.018132185
4,4'-DDT	0.060440774	0.060440497	0.060440474
AROCLOR-1254	0.016923751	0.016923525	0.016923506
DIELDRIN	0.009672495	0.009671575	0.009671497
ENDOSULFAN SULFATE	0.00133073	0.001330265	0.001330225
ENDRIN ALDEHYDE	0.000568166	0.000568153	0.000568152

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	19252474	1394.5271
ANTIMONY	1	45	31777.7778	NA	226	14	19252474	2292.1537
ARSENIC	1	4617	2837.9310	NA	146	14	19252474	204.7020
BERYLLIUM	1	402	7.7114	NA	2011	14	19252474	0.5562
CADMIUM	1	4849	321.3333	NA	376	14	19252474	23.1780
CHROMIUM	1	41971	3364.7059	NA	4251	14	19252474	242.6986
COBALT	1	45	1893.3333	NA	226	14	19252474	136.5675
COPPER	1	51038	1154285.7143	NA	176	14	19252474	83259.4496
IRON	1	4342	11200000.0000	NA	126	14	19252474	807863.9661
LEAD	1	10811	44444.4444	NA	4501	14	19252474	3205.8094
MANGANESE	1	2246	67230.7692	NA	326	14	19252474	4849.4032
MERCURY	1	3316	2307.6923	NA	261	14	19252474	166.4555
NICKEL	1	3960	60307.6923	NA	326	14	19252474	4350.0367
SELENIUM	1	5	1500.0000	NA	26	14	19252474	108.1961
SILVER	1	741	3084.3373	NA	42.5	14	19252474	222.4754
THALLIUM	1	71	50.7042	NA	356	14	19252474	3.6573
VANADIUM	1	1000	109.0000	NA	5001	14	19252474	7.8622
ZINC	1	19197	254838.7097	NA	311	14	19252474	18381.6974
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	19252474	39110.3779
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	19252474	121.7303
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	19252474	1.5146
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	19252474	0.0025
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	19252474	0.0109
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	19252474	0.0251
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	19252474	0.0205
DIELDRIN	1	302.1	1.1579	NA	691.908	14	19252474	0.0835
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	19252474	0.0423
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	19252474	0.0012

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.11	NA	14500	0.0346	1035566
ANTIMONY	2292.153713	Leach	2.11	NA	2292.153713	0.0346	226
ARSENIC	204.701984	Leach	2.11	NA	204.701984	0.0346	23086
BERYLLIUM	0.556231853	Leach	2.11	NA	0.556231853	0.0346	2011
CADMIUM	23.17800188	Leach	2.11	NA	23.17800188	0.0346	24246
CHROMIUM	242.6986285	Leach	2.11	NA	242.6986285	0.0346	209856
COBALT	136.56748	Leach	2.11	NA	136.56748	0.0346	226
COPPER	83259.44957	Leach	2.11	NA	83259.44957	0.0346	255191
IRON	807863.9661	Leach	2.11	NA	807863.9661	0.0346	21711
LEAD	3205.809389	Leach	2.11	NA	3205.809389	0.0346	54056
MANGANESE	4849.403203	Leach	2.11	NA	4849.403203	0.0346	11231
MERCURY	166.4554875	Leach	2.11	NA	166.4554875	0.0346	16581
NICKEL	4350.036741	Leach	2.11	NA	4350.036741	0.0346	19801
SELENIUM	108.1960669	Leach	2.11	NA	108.1960669	0.0346	26
SILVER	222.4754468	Leach	2.11	NA	222.4754468	0.0346	3706
THALLIUM	66.1	GW Sample	2.11	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.11	NA	25.8	0.0346	5001
ZINC	18381.69739	Leach	2.11	NA	18381.69739	0.0346	95986
ACETONE	39110.37791	Leach	2.11	0.0004	39103.817	0.0346	1.2823
CARBON DISULFIDE	121.7302583	Leach	2.11	0.0004	121.5836236	0.0346	1.1425
PYRENE	1.514633016	Leach	2.11	NA	1.514633016	0.0346	9891.925
4,4'-DDD	0.002539827	Leach	2.11	NA	0.002539827	0.0346	21732.25
4,4'-DDE	0.010884971	Leach	2.11	NA	0.010884971	0.0346	21732.25
4,4'-DDT	0.02511663	Leach	2.11	NA	0.02511663	0.0346	31393.75
AROCLOR-1254	0.020482472	Leach	2.11	NA	0.020482472	0.0346	10779.7
DIELDRIN	0.083519903	Leach	2.11	NA	0.083519903	0.0346	1511.5
ENDOSULFAN SULFATE	0.042267451	Leach	2.11	NA	0.042267451	0.0346	411.4
ENDRIN ALDEHYDE	0.001155823	Leach	2.11	NA	0.001155823	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0058	0.0032	0.0030	0.0029	0.0003
ANTIMONY	4.1766	2.3203	2.1630	2.0883	0.2320
ARSENIC	0.0037	0.0020	0.0019	0.0018	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
COBALT	0.2488	0.1382	0.1289	0.1244	0.0138
COPPER	0.1344	0.0746	0.0696	0.0672	0.0075
IRON	15.3230	8.5128	7.9357	7.6615	0.8513
LEAD	0.0244	0.0136	0.0126	0.0122	0.0014
MANGANESE	0.1778	0.0988	0.0921	0.0889	0.0099
MERCURY	0.0041	0.0023	0.0021	0.0021	0.0002
NICKEL	0.0905	0.0503	0.0469	0.0452	0.0050
SELENIUM	1.7137	0.9520	0.8875	0.8568	0.0952
SILVER	0.0247	0.0137	0.0128	0.0124	0.0014
THALLIUM	0.0765	0.0425	0.0396	0.0382	0.0042
VANADIUM	0.0021	0.0012	0.0011	0.0011	0.0001
ZINC	0.0789	0.0438	0.0408	0.0394	0.0044
ACETONE	12559.9735	6977.7630	6504.7554	6279.9867	697.7763
CARBON DISULFIDE	43.8762	24.3756	22.7233	21.9381	2.4376
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	7898451
ANTIMONY	0.0748	Below	Below	Below	7898451
ARSENIC	0.0001	Below	Below	Below	7898451
BERYLLIUM	0.0000	Below	Below	Below	7898451
CADMIUM	0.0000	Below	Below	Below	7898451
CHROMIUM	0.0000	Below	Below	Below	7898451
COBALT	0.0045	Below	Below	Below	7898451
COPPER	0.0024	Below	Below	Below	7898451
IRON	0.2746	Below	Below	Below	7898451
LEAD	0.0004	Below	Below	Below	7898451
MANGANESE	0.0032	Below	Below	Below	7898451
MERCURY	0.0001	Below	Below	Below	7898451
NICKEL	0.0016	Below	Below	Below	7898451
SELENIUM	0.0307	Below	Below	Below	7898451
SILVER	0.0004	Below	Below	Below	7898451
THALLIUM	0.0014	Below	Below	Below	7898451
VANADIUM	0.0000	Below	Below	Below	7898451
ZINC	0.0014	Below	Below	Below	7898451
ACETONE	225.0645	Exceeds	Below	Below	7898451
CARBON DISULFIDE	0.7862	Exceeds	Exceeds	Below	7898451
PYRENE	0.0000	Below	Below	Below	7898451
4,4'-DDD	0.0000	Below	Below	Below	7898451
4,4'-DDE	0.0000	Below	Below	Below	7898451
4,4'-DDT	0.0000	Below	Below	Below	7898451
AROCLOR-1254	0.0000	Below	Below	Below	7898451
DIELDRIN	0.0000	Below	Below	Below	7898451
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	7898451
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	7898451

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.557	2129498.402	2129498.389
ANTIMONY	73.19521655	73.1709164	73.16885733
ARSENIC	670.173147	670.1709673	670.1707826
BERYLLIUM	0.158569738	0.158563818	0.158563317
CADMIUM	79.69537557	79.69512877	79.69510785
CHROMIUM	7223.021475	7223.01889	7223.018671
COBALT	4.361001713	4.3595539	4.35943122
COPPER	3013209.917	3013209.03	3013208.955
IRON	2487329.688	2487321.085	2487320.356
LEAD	24575.7533	24575.71916	24575.71627
MANGANESE	7723.36389	7723.312256	7723.30788
MERCURY	391.3983419	391.3965695	391.3964193
NICKEL	12215.00739	12214.96107	12214.95714
SELENIUM	0.386096832	0.384989012	0.384895141
SILVER	116.9020187	116.8996503	116.8994496
THALLIUM	3.329413805	3.328711912	3.328652437
VANADIUM	18.29516348	18.2948888	18.29486553
ZINC	250219.7921	250219.5964	250219.5798
ACETONE	1.771826117	1.680139833	1.672370811
CARBON DISULFIDE	0.002820868	0.002659191	0.002645491
PYRENE	2.124631708	2.124615581	2.124614214
4,4'-DDD	0.007827518	0.007827491	0.007827488
4,4'-DDE	0.033546504	0.033546388	0.033546379
4,4'-DDT	0.111821413	0.111821146	0.111821123
AROCLOR-1254	0.031310318	0.0313101	0.031310081
DIELDRIN	0.01789333	0.017892441	0.017892366
ENDOSULFAN SULFATE	0.002461068	0.002460619	0.002460581
ENDRIN ALDEHYDE	0.001051143	0.001051131	0.00105113

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	8419796	2917.9019
ANTIMONY	1	45	31777.7778	NA	226	14	8419796	4796.0917
ARSENIC	1	4617	2837.9310	NA	146	14	8419796	428.3175
BERYLLIUM	1	402	7.7114	NA	2011	14	8419796	1.1639
CADMIUM	1	4849	321.3333	NA	376	14	8419796	48.4975
CHROMIUM	1	41971	3364.7059	NA	4251	14	8419796	507.8215
COBALT	1	45	1893.3333	NA	226	14	8419796	285.7532
COPPER	1	51038	1154285.7143	NA	176	14	8419796	174211.6817
IRON	1	4342	11200000.0000	NA	126	14	8419796	1690370.7730
LEAD	1	10811	44444.4444	NA	4501	14	8419796	6707.8205
MANGANESE	1	2246	67230.7692	NA	326	14	8419796	10146.8685
MERCURY	1	3316	2307.6923	NA	261	14	8419796	348.2907
NICKEL	1	3960	60307.6923	NA	326	14	8419796	9101.9965
SELENIUM	1	5	1500.0000	NA	26	14	8419796	226.3889
SILVER	1	741	3084.3373	NA	42.5	14	8419796	465.5066
THALLIUM	1	71	50.7042	NA	356	14	8419796	7.6526
VANADIUM	1	1000	109.0000	NA	5001	14	8419796	16.4509
ZINC	1	19197	254838.7097	NA	311	14	8419796	38461.7774
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	8419796	81834.3713
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	8419796	254.7078
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	8419796	3.1692
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	8419796	0.0053
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	8419796	0.0228
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	8419796	0.0526
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	8419796	0.0429
DIELDRIN	1	302.1	1.1579	NA	691.908	14	8419796	0.1748
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	8419796	0.0884
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	8419796	0.0024

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	0.64	NA	14500	0.0346	1035566
ANTIMONY	4796.091677	Leach	0.64	NA	4796.091677	0.0346	226
ARSENIC	428.3174711	Leach	0.64	NA	428.3174711	0.0346	23086
BERYLLIUM	1.16385692	Leach	0.64	NA	1.16385692	0.0346	2011
CADMIUM	48.49754242	Leach	0.64	NA	48.49754242	0.0346	24246
CHROMIUM	507.8214717	Leach	0.64	NA	507.8214717	0.0346	209856
COBALT	285.7531545	Leach	0.64	NA	285.7531545	0.0346	226
COPPER	174211.6817	Leach	0.64	NA	174211.6817	0.0346	255191
IRON	1690370.773	Leach	0.64	NA	1690370.773	0.0346	21711
LEAD	6707.820528	Leach	0.64	NA	6707.820528	0.0346	54056
MANGANESE	10146.86851	Leach	0.64	NA	10146.86851	0.0346	11231
MERCURY	348.2906812	Leach	0.64	NA	348.2906812	0.0346	16581
NICKEL	9101.99647	Leach	0.64	NA	9101.99647	0.0346	19801
SELENIUM	226.3889428	Leach	0.64	NA	226.3889428	0.0346	26
SILVER	465.5065812	Leach	0.64	NA	465.5065812	0.0346	3706
THALLIUM	66.1	GW Sample	0.64	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	0.64	NA	25.8	0.0346	5001
ZINC	38461.77738	Leach	0.64	NA	38461.77738	0.0346	95986
ACETONE	81834.37127	Leach	0.64	0.0015	81789.15703	0.0346	1.2823
CARBON DISULFIDE	254.7078215	Leach	0.64	0.0014	253.6984953	0.0346	1.1425
PYRENE	3.169211018	Leach	0.64	NA	3.169211018	0.0346	9891.925
4,4'-DDD	0.005314321	Leach	0.64	NA	0.005314321	0.0346	21732.25
4,4'-DDE	0.022775662	Leach	0.64	NA	0.022775662	0.0346	21732.25
4,4'-DDT	0.052553919	Leach	0.64	NA	0.052553919	0.0346	31393.75
AROCLOR-1254	0.042857429	Leach	0.64	NA	0.042857429	0.0346	10779.7
DIELDRIN	0.174756653	Leach	0.64	NA	0.174756653	0.0346	1511.5
ENDOSULFAN SULFATE	0.088440216	Leach	0.64	NA	0.088440216	0.0346	411.4
ENDRIN ALDEHYDE	0.002418438	Leach	0.64	NA	0.002418438	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0025	0.0014	0.0013	0.0013	0.0001
ANTIMONY	3.8219	2.1233	1.9794	1.9110	0.2123
ARSENIC	0.0033	0.0019	0.0017	0.0017	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
COBALT	0.2277	0.1265	0.1179	0.1139	0.0127
COPPER	0.1229	0.0683	0.0637	0.0615	0.0068
IRON	14.0218	7.7899	7.2618	7.0109	0.7790
LEAD	0.0223	0.0124	0.0116	0.0112	0.0012
MANGANESE	0.1627	0.0904	0.0843	0.0814	0.0090
MERCURY	0.0038	0.0021	0.0020	0.0019	0.0002
NICKEL	0.0828	0.0460	0.0429	0.0414	0.0046
SELENIUM	1.5681	0.8712	0.8121	0.7841	0.0871
SILVER	0.0226	0.0126	0.0117	0.0113	0.0013
THALLIUM	0.0334	0.0186	0.0173	0.0167	0.0019
VANADIUM	0.0009	0.0005	0.0005	0.0005	0.0001
ZINC	0.0722	0.0401	0.0374	0.0361	0.0040
ACETONE	11493.3725	6385.2070	5952.3674	5746.6863	638.5207
CARBON DISULFIDE	40.1502	22.3057	20.7936	20.0751	2.2306
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)	Csed Sediment Conc. Df=0.5, mg/kg
ALUMINUM	0.0000	Below	Below	Below	3454275	2129498.361
ANTIMONY	0.0685	Below	Below	Below	3454275	153.0889576
ARSENIC	0.0001	Below	Below	Below	3454275	1402.261375
BERYLLIUM	0.0000	Below	Below	Below	3454275	0.331774894
CADMIUM	0.0000	Below	Below	Below	3454275	166.7535762
CHROMIUM	0.0000	Below	Below	Below	3454275	15113.4094
COBALT	0.0041	Below	Below	Below	3454275	9.121104328
COPPER	0.0022	Below	Below	Below	3454275	6304823.946
IRON	0.2513	Below	Below	Below	3454275	5204454.183
LEAD	0.0004	Below	Below	Below	3454275	51422.10049
MANGANESE	0.0029	Below	Below	Below	3454275	16160.1936
MERCURY	0.0001	Below	Below	Below	3454275	818.9553595
NICKEL	0.0015	Below	Below	Below	3454275	25558.50146
SELENIUM	0.0281	Below	Below	Below	3454275	0.804932629
SILVER	0.0004	Below	Below	Below	3454275	244.5989617
THALLIUM	0.0006	Below	Below	Below	3454275	3.328525212
VANADIUM	0.0000	Below	Below	Below	3454275	18.29481574
ZINC	0.0013	Below	Below	Below	3454275	523558.2007
ACETONE	205.9519	Exceeds	Below	Below	3454275	3.463226717
CARBON DISULFIDE	0.7195	Exceeds	Exceeds	Below	3454275	0.005459897
PYRENE	0.0000	Below	Below	Below	3454275	4.445526699
4,4'-DDD	0.0000	Below	Below	Below	3454275	0.01637819
4,4'-DDE	0.0000	Below	Below	Below	3454275	0.070192241
4,4'-DDT	0.0000	Below	Below	Below	3454275	0.233973892
AROCLOR-1254	0.0000	Below	Below	Below	3454275	0.065512985
DIELDRIN	0.0000	Below	Below	Below	3454275	0.037437565
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	3454275	0.005148338
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	3454275	0.002199375

Detected Chemicals	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.293	2129498.288
ANTIMONY	153.066721	153.0648368
ARSENIC	1402.259381	1402.259212
BERYLLIUM	0.331769477	0.331769018
CADMIUM	166.7533504	166.7533312
CHROMIUM	15113.40704	15113.40684
COBALT	9.119779464	9.119667202
COPPER	6304823.135	6304823.066
IRON	5204446.312	5204445.645
LEAD	51422.06925	51422.06661
MANGANESE	16160.14635	16160.14234
MERCURY	818.9537376	818.9536001
NICKEL	25558.45907	25558.45548
SELENIUM	0.803918886	0.803832986
SILVER	244.5967944	244.5966107
THALLIUM	3.328218249	3.328192239
VANADIUM	18.29469561	18.29468543
ZINC	523558.0216	523558.0064
ACETONE	3.379326491	3.372217219
CARBON DISULFIDE	0.00531195	0.005299414
PYRENE	4.445511942	4.445510691
4,4'-DDD	0.016378165	0.016378163
4,4'-DDE	0.070192135	0.070192126
4,4'-DDT	0.233973648	0.233973627
AROCLOR-1254	0.065512785	0.065512768
DIELDRIN	0.037436751	0.037436682
ENDOSULFAN SULFATE	0.005147927	0.005147892
ENDRIN ALDEHYDE	0.002199363	0.002199363

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	39375095	707.9515
ANTIMONY	1	45	31777.7778	NA	226	14	39375095	1163.6445
ARSENIC	1	4617	2837.9310	NA	146	14	39375095	103.9199
BERYLLIUM	1	402	7.7114	NA	2011	14	39375095	0.2824
CADMIUM	1	4849	321.3333	NA	376	14	39375095	11.7666
CHROMIUM	1	41971	3364.7059	NA	4251	14	39375095	123.2094
COBALT	1	45	1893.3333	NA	226	14	39375095	69.3304
COPPER	1	51038	1154285.7143	NA	176	14	39375095	42267.8455
IRON	1	4342	11200000.0000	NA	126	14	39375095	410123.6492
LEAD	1	10811	44444.4444	NA	4501	14	39375095	1627.4748
MANGANESE	1	2246	67230.7692	NA	326	14	39375095	2461.8686
MERCURY	1	3316	2307.6923	NA	261	14	39375095	84.5035
NICKEL	1	3960	60307.6923	NA	326	14	39375095	2208.3581
SELENIUM	1	5	1500.0000	NA	26	14	39375095	54.9273
SILVER	1	741	3084.3373	NA	42.5	14	39375095	112.9428
THALLIUM	1	71	50.7042	NA	356	14	39375095	1.8567
VANADIUM	1	1000	109.0000	NA	5001	14	39375095	3.9914
ZINC	1	19197	254838.7097	NA	311	14	39375095	9331.7305
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	39375095	19854.9404
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	39375095	61.7981
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	39375095	0.7689
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	39375095	0.0013
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	39375095	0.0055
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	39375095	0.0128
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	39375095	0.0104
DIELDRIN	1	302.1	1.1579	NA	691.908	14	39375095	0.0424
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	39375095	0.0215
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	39375095	0.0006

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	4.97	NA	14500	0.0346	1035566
ANTIMONY	1163.644481	Leach	4.97	NA	1163.644481	0.0346	226
ARSENIC	103.9198779	Leach	4.97	NA	103.9198779	0.0346	23086
BERYLLIUM	0.282379023	Leach	4.97	NA	0.282379023	0.0346	2011
CADMIUM	11.76664279	Leach	4.97	NA	11.76664279	0.0346	24246
CHROMIUM	123.2094156	Leach	4.97	NA	123.2094156	0.0346	209856
COBALT	69.33042642	Leach	4.97	NA	69.33042642	0.0346	226
COPPER	42267.84548	Leach	4.97	NA	42267.84548	0.0346	255191
IRON	410123.6492	Leach	4.97	NA	410123.6492	0.0346	21711
LEAD	1627.474799	Leach	4.97	NA	1627.474799	0.0346	54056
MANGANESE	2461.868609	Leach	4.97	NA	2461.868609	0.0346	11231
MERCURY	84.50349916	Leach	4.97	NA	84.50349916	0.0346	16581
NICKEL	2208.358111	Leach	4.97	NA	2208.358111	0.0346	19801
SELENIUM	54.92727445	Leach	4.97	NA	54.92727445	0.0346	26
SILVER	112.9428294	Leach	4.97	NA	112.9428294	0.0346	3706
THALLIUM	66.1	GW Sample	4.97	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	4.97	NA	25.8	0.0346	5001
ZINC	9331.730498	Leach	4.97	NA	9331.730498	0.0346	95986
ACETONE	19854.94042	Leach	4.97	0.0002	19853.52964	0.0346	1.2823
CARBON DISULFIDE	61.79809952	Leach	4.97	0.0002	61.76655964	0.0346	1.1425
PYRENE	0.768925024	Leach	4.97	NA	0.768925024	0.0346	9891.925
4,4'-DDD	0.001289379	Leach	4.97	NA	0.001289379	0.0346	21732.25
4,4'-DDE	0.005525911	Leach	4.97	NA	0.005525911	0.0346	21732.25
4,4'-DDT	0.012750815	Leach	4.97	NA	0.012750815	0.0346	31393.75
AROCLOR-1254	0.010398219	Leach	4.97	NA	0.010398219	0.0346	10779.7
DIELDRIN	0.042400068	Leach	4.97	NA	0.042400068	0.0346	1511.5
ENDOSULFAN SULFATE	0.021457673	Leach	4.97	NA	0.021457673	0.0346	411.4
ENDRIN ALDEHYDE	0.00058677	Leach	4.97	NA	0.00058677	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0118	0.0066	0.0061	0.0059	0.0007
ANTIMONY	4.3364	2.4091	2.2458	2.1682	0.2409
ARSENIC	0.0038	0.0021	0.0020	0.0019	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0003	0.0002	0.0000
COBALT	0.2584	0.1435	0.1338	0.1292	0.0144
COPPER	0.1395	0.0775	0.0722	0.0697	0.0077
IRON	15.9095	8.8386	8.2395	7.9547	0.8839
LEAD	0.0254	0.0141	0.0131	0.0127	0.0014
MANGANESE	0.1846	0.1026	0.0956	0.0923	0.0103
MERCURY	0.0043	0.0024	0.0022	0.0021	0.0002
NICKEL	0.0939	0.0522	0.0486	0.0470	0.0052
SELENIUM	1.7792	0.9885	0.9215	0.8896	0.0988
SILVER	0.0257	0.0143	0.0133	0.0128	0.0014
THALLIUM	0.1564	0.0869	0.0810	0.0782	0.0087
VANADIUM	0.0043	0.0024	0.0023	0.0022	0.0002
ZINC	0.0819	0.0455	0.0424	0.0409	0.0045
ACETONE	13040.6838	7244.8244	6753.7132	6520.3419	724.4824
CARBON DISULFIDE	45.5554	25.3086	23.5930	22.7777	2.5309
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0002	Below	Below	Below	16153885
ANTIMONY	0.0777	Below	Below	Below	16153885
ARSENIC	0.0001	Below	Below	Below	16153885
BERYLLIUM	0.0000	Below	Below	Below	16153885
CADMIUM	0.0000	Below	Below	Below	16153885
CHROMIUM	0.0000	Below	Below	Below	16153885
COBALT	0.0046	Below	Below	Below	16153885
COPPER	0.0025	Below	Below	Below	16153885
IRON	0.2851	Below	Below	Below	16153885
LEAD	0.0005	Below	Below	Below	16153885
MANGANESE	0.0033	Below	Below	Below	16153885
MERCURY	0.0001	Below	Below	Below	16153885
NICKEL	0.0017	Below	Below	Below	16153885
SELENIUM	0.0319	Below	Below	Below	16153885
SILVER	0.0005	Below	Below	Below	16153885
THALLIUM	0.0028	Below	Below	Below	16153885
VANADIUM	0.0001	Below	Below	Below	16153885
ZINC	0.0015	Below	Below	Below	16153885
ACETONE	233.6785	Exceeds	Below	Below	16153885
CARBON DISULFIDE	0.8163	Exceeds	Exceeds	Below	16153885
PYRENE	0.0000	Below	Below	Below	16153885
4,4'-DDD	0.0000	Below	Below	Below	16153885
4,4'-DDE	0.0000	Below	Below	Below	16153885
4,4'-DDT	0.0000	Below	Below	Below	16153885
AROCLOR-1254	0.0000	Below	Below	Below	16153885
DIELDRIN	0.0000	Below	Below	Below	16153885
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	16153885
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	16153885

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.92	2129498.604	2129498.577
ANTIMONY	37.18760546	37.16237527	37.1602374
ARSENIC	340.225546	340.2232829	340.2230911
BERYLLIUM	0.080507254	0.080501107	0.080500587
CADMIUM	40.4587872	40.45853095	40.45850924
CHROMIUM	3666.872818	3666.870135	3666.869908
COBALT	2.215653137	2.214149911	2.214022536
COPPER	1529699.991	1529699.071	1529698.993
IRON	1262738.614	1262729.683	1262728.926
LEAD	12476.27196	12476.23652	12476.23352
MANGANESE	3920.937332	3920.883721	3920.879178
MERCURY	198.7010592	198.6992189	198.699063
NICKEL	6201.177784	6201.129692	6201.125617
SELENIUM	0.19733015	0.19617993	0.196082466
SILVER	59.34980244	59.34734339	59.34713502
THALLIUM	3.331064441	3.329628932	3.329507294
VANADIUM	18.29580944	18.29524767	18.29520007
ZINC	127027.8752	127027.6719	127027.6547
ACETONE	1.00903115	0.913835738	0.905769371
CARBON DISULFIDE	0.001625942	0.001458077	0.001443853
PYRENE	1.078618802	1.078602058	1.078600639
4,4'-DDD	0.003973783	0.003973755	0.003973753
4,4'-DDE	0.017030499	0.017030379	0.017030369
4,4'-DDT	0.056768053	0.056767775	0.056767751
AROCLOR-1254	0.015895389	0.015895163	0.015895144
DIELDRIN	0.009084865	0.009083942	0.009083864
ENDOSULFAN SULFATE	0.001249932	0.001249466	0.001249427
ENDRIN ALDEHYDE	0.000533643	0.00053363	0.000533629

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	16733345	1587.2311
ANTIMONY	1	45	31777.7778	NA	226	14	16733345	2608.8971
ARSENIC	1	4617	2837.9310	NA	146	14	16733345	232.9889
BERYLLIUM	1	402	7.7114	NA	2011	14	16733345	0.6331
CADMIUM	1	4849	321.3333	NA	376	14	16733345	26.3809
CHROMIUM	1	41971	3364.7059	NA	4251	14	16733345	276.2362
COBALT	1	45	1893.3333	NA	226	14	16733345	155.4392
COPPER	1	51038	1154285.7143	NA	176	14	16733345	94764.7355
IRON	1	4342	11200000.0000	NA	126	14	16733345	919499.4140
LEAD	1	10811	44444.4444	NA	4501	14	16733345	3648.8072
MANGANESE	1	2246	67230.7692	NA	326	14	16733345	5519.5226
MERCURY	1	3316	2307.6923	NA	261	14	16733345	189.4573
NICKEL	1	3960	60307.6923	NA	326	14	16733345	4951.1507
SELENIUM	1	5	1500.0000	NA	26	14	16733345	123.1472
SILVER	1	741	3084.3373	NA	42.5	14	16733345	253.2184
THALLIUM	1	71	50.7042	NA	356	14	16733345	4.1627
VANADIUM	1	1000	109.0000	NA	5001	14	16733345	8.9487
ZINC	1	19197	254838.7097	NA	311	14	16733345	20921.7897
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	16733345	44514.8826
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	16733345	138.5517
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	16733345	1.7239
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	16733345	0.0029
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	16733345	0.0124
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	16733345	0.0286
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	16733345	0.0233
DIELDRIN	1	302.1	1.1579	NA	691.908	14	16733345	0.0951
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	16733345	0.0481
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	16733345	0.0013

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	2608.897147	Leach	2.22	NA	2608.897147	0.0346	226
ARSENIC	232.9889217	Leach	2.22	NA	232.9889217	0.0346	23086
BERYLLIUM	0.633095279	Leach	2.22	NA	0.633095279	0.0346	2011
CADMIUM	26.38087604	Leach	2.22	NA	26.38087604	0.0346	24246
CHROMIUM	276.2361685	Leach	2.22	NA	276.2361685	0.0346	209856
COBALT	155.4391867	Leach	2.22	NA	155.4391867	0.0346	226
COPPER	94764.73552	Leach	2.22	NA	94764.73552	0.0346	255191
IRON	919499.414	Leach	2.22	NA	919499.414	0.0346	21711
LEAD	3648.807198	Leach	2.22	NA	3648.807198	0.0346	54056
MANGANESE	5519.522581	Leach	2.22	NA	5519.522581	0.0346	11231
MERCURY	189.4572968	Leach	2.22	NA	189.4572968	0.0346	16581
NICKEL	4951.150691	Leach	2.22	NA	4951.150691	0.0346	19801
SELENIUM	123.1472429	Leach	2.22	NA	123.1472429	0.0346	26
SILVER	253.2184273	Leach	2.22	NA	253.2184273	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	20921.78966	Leach	2.22	NA	20921.78966	0.0346	95986
ACETONE	44514.88255	Leach	2.22	0.0004	44507.80819	0.0346	1.2823
CARBON DISULFIDE	138.5516695	Leach	2.22	0.0004	138.3935549	0.0346	1.1425
PYRENE	1.723934015	Leach	2.22	NA	1.723934015	0.0346	9891.925
4,4'-DDD	0.002890795	Leach	2.22	NA	0.002890795	0.0346	21732.25
4,4'-DDE	0.012389121	Leach	2.22	NA	0.012389121	0.0346	21732.25
4,4'-DDT	0.028587395	Leach	2.22	NA	0.028587395	0.0346	31393.75
AROCLOR-1254	0.023312862	Leach	2.22	NA	0.023312862	0.0346	10779.7
DIELDRIN	0.09506118	Leach	2.22	NA	0.09506118	0.0346	1511.5
ENDOSULFAN SULFATE	0.048108219	Leach	2.22	NA	0.048108219	0.0346	411.4
ENDRIN ALDEHYDE	0.001315541	Leach	2.22	NA	0.001315541	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	4.1317	2.2954	2.1398	2.0659	0.2295
ARSENIC	0.0036	0.0020	0.0019	0.0018	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
COBALT	0.2462	0.1368	0.1275	0.1231	0.0137
COPPER	0.1329	0.0738	0.0688	0.0665	0.0074
IRON	15.1584	8.4213	7.8505	7.5792	0.8421
LEAD	0.0242	0.0134	0.0125	0.0121	0.0013
MANGANESE	0.1759	0.0977	0.0911	0.0879	0.0098
MERCURY	0.0041	0.0023	0.0021	0.0020	0.0002
NICKEL	0.0895	0.0497	0.0463	0.0447	0.0050
SELENIUM	1.6953	0.9418	0.8780	0.8476	0.0942
SILVER	0.0245	0.0136	0.0127	0.0122	0.0014
THALLIUM	0.0665	0.0369	0.0344	0.0332	0.0037
VANADIUM	0.0018	0.0010	0.0010	0.0009	0.0001
ZINC	0.0780	0.0433	0.0404	0.0390	0.0043
ACETONE	12425.0504	6902.8058	6434.8793	6212.5252	690.2806
CARBON DISULFIDE	43.4048	24.1138	22.4792	21.7024	2.4114
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6864962
ANTIMONY	0.0740	Below	Below	Below	6864962
ARSENIC	0.0001	Below	Below	Below	6864962
BERYLLIUM	0.0000	Below	Below	Below	6864962
CADMIUM	0.0000	Below	Below	Below	6864962
CHROMIUM	0.0000	Below	Below	Below	6864962
COBALT	0.0044	Below	Below	Below	6864962
COPPER	0.0024	Below	Below	Below	6864962
IRON	0.2716	Below	Below	Below	6864962
LEAD	0.0004	Below	Below	Below	6864962
MANGANESE	0.0032	Below	Below	Below	6864962
MERCURY	0.0001	Below	Below	Below	6864962
NICKEL	0.0016	Below	Below	Below	6864962
SELENIUM	0.0304	Below	Below	Below	6864962
SILVER	0.0004	Below	Below	Below	6864962
THALLIUM	0.0012	Below	Below	Below	6864962
VANADIUM	0.0000	Below	Below	Below	6864962
ZINC	0.0014	Below	Below	Below	6864962
ACETONE	222.6468	Exceeds	Below	Below	6864962
CARBON DISULFIDE	0.7778	Exceeds	Exceeds	Below	6864962
PYRENE	0.0000	Below	Below	Below	6864962
4,4'-DDD	0.0000	Below	Below	Below	6864962
4,4'-DDE	0.0000	Below	Below	Below	6864962
4,4'-DDT	0.0000	Below	Below	Below	6864962
AROCLOR-1254	0.0000	Below	Below	Below	6864962
DIELDRIN	0.0000	Below	Below	Below	6864962
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6864962
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6864962

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.511	2129498.377	2129498.365
ANTIMONY	83.30162423	83.27758512	83.27554817
ARSENIC	762.7809282	762.7787719	762.7785892
BERYLLIUM	0.180479864	0.180474008	0.180473511
CADMIUM	90.70807388	90.70782973	90.70780904
CHROMIUM	8221.140677	8221.138121	8221.137904
COBALT	4.963145723	4.961713463	4.961592101
COPPER	3429592.888	3429592.011	3429591.936
IRON	2831040.815	2831032.306	2831031.585
LEAD	27971.76562	27971.73185	27971.72899
MANGANESE	8790.606948	8790.555868	8790.551539
MERCURY	445.4834988	445.4817455	445.4815969
NICKEL	13902.93424	13902.88842	13902.88453
SELENIUM	0.439078771	0.437982852	0.437889989
SILVER	133.0554413	133.0530983	133.0528998
THALLIUM	3.329207163	3.328597111	3.328545418
VANADIUM	18.29508261	18.29484388	18.29482365
ZINC	284796.5857	284796.392	284796.3756
ACETONE	1.985960304	1.895258942	1.887573378
CARBON DISULFIDE	0.003156673	0.002996733	0.002983181
PYRENE	2.41822055	2.418204597	2.418203245
4,4'-DDD	0.008909162	0.008909135	0.008909133
4,4'-DDE	0.038182121	0.038182006	0.038181997
4,4'-DDT	0.127273472	0.127273207	0.127273185
AROCLOR-1254	0.035636891	0.035636675	0.035636657
DIELDRIN	0.020365639	0.020364759	0.020364685
ENDOSULFAN SULFATE	0.002801003	0.002800558	0.002800521
ENDRIN ALDEHYDE	0.001196392	0.00119638	0.001196379

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	16848242	1577.2900
ANTIMONY	1	45	31777.7778	NA	226	14	16848242	2592.5572
ARSENIC	1	4617	2837.9310	NA	146	14	16848242	231.5297
BERYLLIUM	1	402	7.7114	NA	2011	14	16848242	0.6291
CADMIUM	1	4849	321.3333	NA	376	14	16848242	26.2156
CHROMIUM	1	41971	3364.7059	NA	4251	14	16848242	274.5061
COBALT	1	45	1893.3333	NA	226	14	16848242	154.4656
COPPER	1	51038	1154285.7143	NA	176	14	16848242	94171.2088
IRON	1	4342	11200000.0000	NA	126	14	16848242	913740.4414
LEAD	1	10811	44444.4444	NA	4501	14	16848242	3625.9541
MANGANESE	1	2246	67230.7692	NA	326	14	16848242	5484.9529
MERCURY	1	3316	2307.6923	NA	261	14	16848242	188.2707
NICKEL	1	3960	60307.6923	NA	326	14	16848242	4920.1408
SELENIUM	1	5	1500.0000	NA	26	14	16848242	122.3760
SILVER	1	741	3084.3373	NA	42.5	14	16848242	251.6325
THALLIUM	1	71	50.7042	NA	356	14	16848242	4.1367
VANADIUM	1	1000	109.0000	NA	5001	14	16848242	8.8927
ZINC	1	19197	254838.7097	NA	311	14	16848242	20790.7531
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	16848242	44236.0787
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	16848242	137.6839
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	16848242	1.7131
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	16848242	0.0029
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	16848242	0.0123
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	16848242	0.0284
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	16848242	0.0232
DIELDRIN	1	302.1	1.1579	NA	691.908	14	16848242	0.0945
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	16848242	0.0478
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	16848242	0.0013

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	2592.557205	Leach	2.22	NA	2592.557205	0.0346	226
ARSENIC	231.5296747	Leach	2.22	NA	231.5296747	0.0346	23086
BERYLLIUM	0.629130101	Leach	2.22	NA	0.629130101	0.0346	2011
CADMIUM	26.21564838	Leach	2.22	NA	26.21564838	0.0346	24246
CHROMIUM	274.506057	Leach	2.22	NA	274.506057	0.0346	209856
COBALT	154.465646	Leach	2.22	NA	154.465646	0.0346	226
COPPER	94171.20876	Leach	2.22	NA	94171.20876	0.0346	255191
IRON	913740.4414	Leach	2.22	NA	913740.4414	0.0346	21711
LEAD	3625.954133	Leach	2.22	NA	3625.954133	0.0346	54056
MANGANESE	5484.952924	Leach	2.22	NA	5484.952924	0.0346	11231
MERCURY	188.2706953	Leach	2.22	NA	188.2706953	0.0346	16581
NICKEL	4920.140838	Leach	2.22	NA	4920.140838	0.0346	19801
SELENIUM	122.375952	Leach	2.22	NA	122.375952	0.0346	26
SILVER	251.6324796	Leach	2.22	NA	251.6324796	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	20790.75313	Leach	2.22	NA	20790.75313	0.0346	95986
ACETONE	44236.07869	Leach	2.22	0.0004	44229.03914	0.0346	1.2823
CARBON DISULFIDE	137.6838981	Leach	2.22	0.0004	137.5265616	0.0346	1.1425
PYRENE	1.713136739	Leach	2.22	NA	1.713136739	0.0346	9891.925
4,4'-DDD	0.002872689	Leach	2.22	NA	0.002872689	0.0346	21732.25
4,4'-DDE	0.012311526	Leach	2.22	NA	0.012311526	0.0346	21732.25
4,4'-DDT	0.028408348	Leach	2.22	NA	0.028408348	0.0346	31393.75
AROCLOR-1254	0.02316685	Leach	2.22	NA	0.02316685	0.0346	10779.7
DIELDRIN	0.094465796	Leach	2.22	NA	0.094465796	0.0346	1511.5
ENDOSULFAN SULFATE	0.047806909	Leach	2.22	NA	0.047806909	0.0346	411.4
ENDRIN ALDEHYDE	0.001307302	Leach	2.22	NA	0.001307302	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	4.1340	2.2967	2.1410	2.0670	0.2297
ARSENIC	0.0036	0.0020	0.0019	0.0018	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
COBALT	0.2463	0.1368	0.1276	0.1232	0.0137
COPPER	0.1330	0.0739	0.0689	0.0665	0.0074
IRON	15.1669	8.4261	7.8549	7.5835	0.8426
LEAD	0.0242	0.0134	0.0125	0.0121	0.0013
MANGANESE	0.1760	0.0978	0.0911	0.0880	0.0098
MERCURY	0.0041	0.0023	0.0021	0.0020	0.0002
NICKEL	0.0895	0.0497	0.0464	0.0448	0.0050
SELENIUM	1.6962	0.9423	0.8785	0.8481	0.0942
SILVER	0.0245	0.0136	0.0127	0.0122	0.0014
THALLIUM	0.0669	0.0372	0.0347	0.0335	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0781	0.0434	0.0404	0.0390	0.0043
ACETONE	12432.0108	6906.6726	6438.4840	6216.0054	690.6673
CARBON DISULFIDE	43.4292	24.1273	22.4918	21.7146	2.4127
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6912099
ANTIMONY	0.0741	Below	Below	Below	6912099
ARSENIC	0.0001	Below	Below	Below	6912099
BERYLLIUM	0.0000	Below	Below	Below	6912099
CADMIUM	0.0000	Below	Below	Below	6912099
CHROMIUM	0.0000	Below	Below	Below	6912099
COBALT	0.0044	Below	Below	Below	6912099
COPPER	0.0024	Below	Below	Below	6912099
IRON	0.2718	Below	Below	Below	6912099
LEAD	0.0004	Below	Below	Below	6912099
MANGANESE	0.0032	Below	Below	Below	6912099
MERCURY	0.0001	Below	Below	Below	6912099
NICKEL	0.0016	Below	Below	Below	6912099
SELENIUM	0.0304	Below	Below	Below	6912099
SILVER	0.0004	Below	Below	Below	6912099
THALLIUM	0.0012	Below	Below	Below	6912099
VANADIUM	0.0000	Below	Below	Below	6912099
ZINC	0.0014	Below	Below	Below	6912099
ACETONE	222.7715	Exceeds	Below	Below	6912099
CARBON DISULFIDE	0.7782	Exceeds	Exceeds	Below	6912099
PYRENE	0.0000	Below	Below	Below	6912099
4,4'-DDD	0.0000	Below	Below	Below	6912099
4,4'-DDE	0.0000	Below	Below	Below	6912099
4,4'-DDT	0.0000	Below	Below	Below	6912099
AROCLOR-1254	0.0000	Below	Below	Below	6912099
DIELDRIN	0.0000	Below	Below	Below	6912099
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6912099
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6912099

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.513	2129498.378	2129498.367
ANTIMONY	82.78026183	82.75620925	82.75417116
ARSENIC	758.0035417	758.0013843	758.0012014
BERYLLIUM	0.17934958	0.17934372	0.179343223
CADMIUM	90.13995838	90.1397141	90.1396934
CHROMIUM	8169.650392	8169.647834	8169.647617
COBALT	4.932082733	4.93064967	4.93052824
COPPER	3408112.81	3408111.932	3408111.858
IRON	2813309.683	2813301.168	2813300.447
LEAD	27796.57448	27796.54069	27796.53783
MANGANESE	8735.550748	8735.499639	8735.495309
MERCURY	442.693391	442.6916367	442.691488
NICKEL	13815.85863	13815.81278	13815.8089
SELENIUM	0.436345576	0.435249042	0.435156128
SILVER	132.2221297	132.2197854	132.2195867
THALLIUM	3.329216588	3.328602347	3.328550299
VANADIUM	18.2950863	18.29484593	18.29482556
ZINC	283012.8619	283012.6681	283012.6517
ACETONE	1.97491403	1.884161859	1.876471989
CARBON DISULFIDE	0.003139354	0.002979324	0.002965764
PYRENE	2.403075091	2.403059129	2.403057776
4,4'-DDD	0.008853362	0.008853336	0.008853333
4,4'-DDE	0.037942982	0.037942867	0.037942858
4,4'-DDT	0.126476342	0.126476077	0.126476055
AROCLOR-1254	0.035413695	0.035413479	0.03541346
DIELDRIN	0.020238099	0.020237219	0.020237144
ENDOSULFAN SULFATE	0.002783466	0.002783022	0.002782984
ENDRIN ALDEHYDE	0.001188899	0.001188887	0.001188886

Detected Chemicals	Fraction	Surface Water Criteria ug/L	SW Criteria Acute Eco ug/L	SW Criteria Chronic Eco ug/L	SW Criteria Human Health ug/L	Maximum Groundwater Concentration	Units	Location of Maximum
ALUMINUM	M	87	750	87	1300000	14500	UG/L	TP-MW08
ANTIMONY	M	36.6	1500	500	36.6	34	UG/L	TP-MW06
ARSENIC	M	4.9	69	36	4.9	41.2	UG/L	TP-MW02
BERYLLIUM	M	0.53	13	0.53	22.6	NA	UG/L	NA
CADMIUM	M	8.8	40	8.8	27	3.9	UG/L	TP-MW06
CHROMIUM	M	50	1100	50	57	27.4	UG/L	TP-MW08
COBALT	M	23	1500	23	NA	1.15	UG/L	FA-01B
COPPER	M	3.1	4.8	3.1	5200	496	UG/L	TP-MW05
IRON	M	1000	NA	1000	91000	21800	UG/L	TP-MW08
LEAD	M	8.1	210	8.1	950	195	UG/L	TP-MW06
MANGANESE	M	120	2300	120	1120	1600	UG/L	TP-MW08
MERCURY	M	0.94	1.8	0.94	20	0.46	UG/L	TP-MW02
NICKEL	M	8.2	74	8.2	2010	278	UG/L	TP-MW06
SELENIUM	M	71	290	71	650	19.8	UG/L	FA-01
SILVER	M	0.19	1.9	0.19	320	6.2	UG/L	FA-01
THALLIUM	M	9.1	213	21.3	9.1	66.1	UG/L	TP-MW07
VANADIUM	M	20	280	20	650	25.8	UG/L	TP-MW08
ZINC	M	81	90	81	40200	587	UG/L	TP-MW05
ACETONE	OV	1500	28000	1500	120000	NA		NA
CARBON DISULFIDE	OV	0.92	17	0.92	5600	NA		NA
PYRENE	PAH	3	30	3	110	NA		NA
4,4'-DDD	PES/PCB	0.001	0.13	0.001	33	NA		NA
4,4'-DDE	PES/PCB	0.001	0.13	0.001	23	NA		NA
4,4'-DDT	PES/PCB	0.001	0.13	0.001	23	NA		NA
AROCLOR-1254	PES/PCB	0.03	NA	0.03	2.8	NA		NA
DIELDRIN	PES/PCB	0.0019	0.71	0.0019	0.09	NA		NA
ENDOSULFAN SULFATE	PES/PCB	0.034	0.034	0.087	430	NA		NA
ENDRIN ALDEHYDE	PES/PCB	0.0023	0.034	0.0023	16	NA		NA

Detected Chemicals	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)
ALUMINUM	29000	MG/KG	TP-MW01	1500	1282842	1	207113	19333.3333	NA
ANTIMONY	1430	MG/KG	TP-SB24	45	1282842	1	45	31777.7778	NA
ARSENIC	82.3	MG/KG	TP-SB38B	29	1282842	1	4617	2837.9310	NA
BERYLLIUM	3.1	MG/KG	TP-MW01	402	1282842	1	402	7.7114	NA
CADMIUM	24.1	MG/KG	TP-SB37	75	1282842	1	4849	321.3333	NA
CHROMIUM	2860	MG/KG	TP-SB35	850	1282842	1	41971	3364.7059	NA
COBALT	85.2	MG/KG	TP-SB35	45	1282842	1	45	1893.3333	NA
COPPER	40400	MG/KG	TP-SB19	35	1282842	1	51038	1154285.7143	NA
IRON	280000	MG/KG	TP-SB23	25	1282842	1	4342	11200000.0000	NA
LEAD	40000	MG/KG	TP-SB24	900	1282842	1	10811	44444.4444	NA
MANGANESE	4370	MG/KG	TP-SB25	65	1282842	1	2246	67230.7692	NA
MERCURY	120	MG/KG	TP-SB37	52	1282842	1	3316	2307.6923	NA
NICKEL	3920	MG/KG	TP-SB35	65	1282842	1	3960	60307.6923	NA
SELENIUM	7.5	MG/KG	TP-SB35	5	1282842	1	5	1500.0000	NA
SILVER	25.6	MG/KG	TP-SB31	8.3	1282842	1	741	3084.3373	NA
THALLIUM	3.6	MG/KG	TP-MW09	71	1282842	1	71	50.7042	NA
VANADIUM	109	MG/KG	TP-SB23	1000	1282842	1	1000	109.0000	NA
ZINC	15800	MG/KG	TP-SB19	62	1282842	1	19197	254838.7097	NA
ACETONE	14000	UG/KG	TP-SB13	0.02582	1282842	1	0.05646	542215.3369	0.3808
CARBON DISULFIDE	22	UG/KG	TP-MW05	0.013036	1282842	1	0.0285	1687.6342	2.9000
PYRENE	19000	UG/KG	TP-MW02	904.82876	1282842	1	1978.185	20.9984	NA
4,4'-DDD	70	UG/KG	TP-MW01	1987.99	1282842	1	4346.25	0.0352	NA
4,4'-DDE	300	UG/KG	TP-SB17	1987.99	1282842	1	4346.25	0.1509	NA
4,4'-DDT	1000	UG/KG	TP-SB27	2871.8308	1282842	1	6278.55	0.3482	NA
AROCLOR-1254	280	UG/KG	TP-SB115	986.04304	1282842	1	2155.74	0.2840	NA
DIELDRIN	160	UG/KG	TP-SB14	138.1816	1282842	1	302.1	1.1579	NA
ENDOSULFAN SULFATE	22	UG/KG	TP-MW05	37.54368	1282842	1	82.08	0.5860	NA
ENDRIN ALDEHYDE	9.4	UG/KG	TP-SB27	586.62	1282842	1	1282.5	0.0160	NA

Detected Chemicals	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)
ALUMINUM	7501	14	16302507	1625.6509	14500	GW Sample	2.18	NA
ANTIMONY	226	14	16302507	2672.0469	2672.046884	Leach	2.18	NA
ARSENIC	146	14	16302507	238.6285	238.628542	Leach	2.18	NA
BERYLLIUM	2011	14	16302507	0.6484	0.648419685	Leach	2.18	NA
CADMIUM	376	14	16302507	27.0194	27.01943912	Leach	2.18	NA
CHROMIUM	4251	14	16302507	282.9226	282.9226113	Leach	2.18	NA
COBALT	226	14	16302507	159.2017	159.2016745	Leach	2.18	NA
COPPER	176	14	16302507	97058.5661	97058.56615	Leach	2.18	NA
IRON	126	14	16302507	941756.3844	941756.3844	Leach	2.18	NA
LEAD	4501	14	16302507	3737.1285	3737.12851	Leach	2.18	NA
MANGANESE	326	14	16302507	5653.1255	5653.125549	Leach	2.18	NA
MERCURY	261	14	16302507	194.0432	194.0432111	Leach	2.18	NA
NICKEL	326	14	16302507	5070.9959	5070.995916	Leach	2.18	NA
SELENIUM	26	14	16302507	126.1281	126.1280872	Leach	2.18	NA
SILVER	42.5	14	16302507	259.3477	259.3477134	Leach	2.18	NA
THALLIUM	356	14	16302507	4.2635	66.1	GW Sample	2.18	NA
VANADIUM	5001	14	16302507	9.1653	25.8	GW Sample	2.18	NA
ZINC	311	14	16302507	21428.2127	21428.21266	Leach	2.18	NA
ACETONE	1.1291	14	16302507	45592.3889	45592.38887	Leach	2.18	0.0004
CARBON DISULFIDE	1.06518	14	16302507	141.9054	141.905386	Leach	2.18	0.0004
PYRENE	4525.1438	14	16302507	1.7657	1.765662751	Leach	2.18	NA
4,4'-DDD	9940.95	14	16302507	0.0030	0.002960768	Leach	2.18	NA
4,4'-DDE	9940.95	14	16302507	0.0127	0.012689006	Leach	2.18	NA
4,4'-DDT	14360.154	14	16302507	0.0293	0.029279368	Leach	2.18	NA
AROCLOR-1254	4931.2152	14	16302507	0.0239	0.023877162	Leach	2.18	NA
DIELDRIN	691.908	14	16302507	0.0974	0.097362186	Leach	2.18	NA
ENDOSULFAN SULFATE	188.7184	14	16302507	0.0493	0.049272703	Leach	2.18	NA
ENDRIN ALDEHYDE	2934.1	14	16302507	0.0013	0.001347384	Leach	2.18	NA

Detected Chemicals	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L
ALUMINUM	14500	0.0346	1035566	0.0049	0.0027	0.0025
ANTIMONY	2672.046884	0.0346	226	4.1228	2.2904	2.1352
ARSENIC	238.628542	0.0346	23086	0.0036	0.0020	0.0019
BERYLLIUM	0.648419685	0.0346	2011	0.0001	0.0001	0.0001
CADMIUM	27.01943912	0.0346	24246	0.0004	0.0002	0.0002
CHROMIUM	282.9226113	0.0346	209856	0.0005	0.0003	0.0002
COBALT	159.2016745	0.0346	226	0.2456	0.1365	0.1272
COPPER	97058.56615	0.0346	255191	0.1326	0.0737	0.0687
IRON	941756.3844	0.0346	21711	15.1256	8.4031	7.8335
LEAD	3737.12851	0.0346	54056	0.0241	0.0134	0.0125
MANGANESE	5653.125549	0.0346	11231	0.1755	0.0975	0.0909
MERCURY	194.0432111	0.0346	16581	0.0041	0.0023	0.0021
NICKEL	5070.995916	0.0346	19801	0.0893	0.0496	0.0462
SELENIUM	126.1280872	0.0346	26	1.6916	0.9398	0.8761
SILVER	259.3477134	0.0346	3706	0.0244	0.0136	0.0126
THALLIUM	66.1	0.0346	356	0.0647	0.0360	0.0335
VANADIUM	25.8	0.0346	5001	0.0018	0.0010	0.0009
ZINC	21428.21266	0.0346	95986	0.0778	0.0432	0.0403
ACETONE	45585.0003	0.0346	1.2823	12398.1506	6887.8614	6420.9480
CARBON DISULFIDE	141.7402504	0.0346	1.1425	43.3109	24.0616	22.4305
PYRENE	1.765662751	0.0346	9891.925	0.0001	0.0000	0.0000
4,4'-DDD	0.002960768	0.0346	21732.25	0.0000	0.0000	0.0000
4,4'-DDE	0.012689006	0.0346	21732.25	0.0000	0.0000	0.0000
4,4'-DDT	0.029279368	0.0346	31393.75	0.0000	0.0000	0.0000
AROCLOR-1254	0.023877162	0.0346	10779.7	0.0000	0.0000	0.0000
DIELDRIN	0.097362186	0.0346	1511.5	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.049272703	0.0346	411.4	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.001347384	0.0346	6413.5	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)
ALUMINUM	0.0024	0.0003	0.0001	Below	Below
ANTIMONY	2.0614	0.2290	0.0739	Below	Below
ARSENIC	0.0018	0.0002	0.0001	Below	Below
BERYLLIUM	0.0001	0.0000	0.0000	Below	Below
CADMIUM	0.0002	0.0000	0.0000	Below	Below
CHROMIUM	0.0002	0.0000	0.0000	Below	Below
COBALT	0.1228	0.0136	0.0044	Below	Below
COPPER	0.0663	0.0074	0.0024	Below	Below
IRON	7.5628	0.8403	0.2710	Below	Below
LEAD	0.0121	0.0013	0.0004	Below	Below
MANGANESE	0.0878	0.0098	0.0031	Below	Below
MERCURY	0.0020	0.0002	0.0001	Below	Below
NICKEL	0.0447	0.0050	0.0016	Below	Below
SELENIUM	0.8458	0.0940	0.0303	Below	Below
SILVER	0.0122	0.0014	0.0004	Below	Below
THALLIUM	0.0324	0.0036	0.0012	Below	Below
VANADIUM	0.0009	0.0001	0.0000	Below	Below
ZINC	0.0389	0.0043	0.0014	Below	Below
ACETONE	6199.0753	688.7861	222.1648	Exceeds	Below
CARBON DISULFIDE	21.6554	2.4062	0.7761	Exceeds	Exceeds
PYRENE	0.0000	0.0000	0.0000	Below	Below
4,4'-DDD	0.0000	0.0000	0.0000	Below	Below
4,4'-DDE	0.0000	0.0000	0.0000	Below	Below
4,4'-DDT	0.0000	0.0000	0.0000	Below	Below
AROCLOR-1254	0.0000	0.0000	0.0000	Below	Below
DIELDRIN	0.0000	0.0000	0.0000	Below	Below
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	Below	Below
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	Below	Below

Detected Chemicals	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	Below	6688208	2129498.503	2129498.373	2129498.361
ANTIMONY	Below	6688208	85.31655784	85.29257078	85.29053824
ARSENIC	Below	6688208	781.2443167	781.2421651	781.2419827
BERYLLIUM	Below	6688208	0.184848127	0.184842284	0.184841788
CADMIUM	Below	6688208	92.90369637	92.90345275	92.90343211
CHROMIUM	Below	6688208	8420.137591	8420.13504	8420.134824
COBALT	Below	6688208	5.083196313	5.081767154	5.081646054
COPPER	Below	6688208	3512607.948	3512607.073	3512606.999
IRON	Below	6688208	2899567.153	2899558.662	2899557.942
LEAD	Below	6688208	28648.83502	28648.80133	28648.79847
MANGANESE	Below	6688208	9003.385215	9003.334245	9003.329927
MERCURY	Below	6688208	456.2665589	456.2648093	456.2646611
NICKEL	Below	6688208	14239.45941	14239.41369	14239.40981
SELENIUM	Below	6688208	0.449641881	0.448548334	0.448455672
SILVER	Below	6688208	136.2759797	136.2736418	136.2734437
THALLIUM	Below	6688208	3.329171822	3.328577477	3.328527115
VANADIUM	Below	6688208	18.29506878	18.29483619	18.29481648
ZINC	Below	6688208	291690.2264	291690.0332	291690.0168
ACETONE	Below	6688208	2.028644161	1.938139165	1.930470239
CARBON DISULFIDE	Below	6688208	0.003223528	0.003063934	0.003050411
PYRENE	Below	6688208	2.476753913	2.476737994	2.476736645
4,4'-DDD	Below	6688208	0.009124811	0.009124784	0.009124782
4,4'-DDE	Below	6688208	0.039106333	0.039106218	0.039106209
4,4'-DDT	Below	6688208	0.130354178	0.130353914	0.130353892
AROCLOR-1254	Below	6688208	0.036499488	0.036499273	0.036499254
DIELDRIN	Below	6688208	0.020858547	0.02085767	0.020857596
ENDOSULFAN SULFATE	Below	6688208	0.002868776	0.002868333	0.002868295
ENDRIN ALDEHYDE	Below	6688208	0.001225351	0.001225339	0.001225338

Detected Chemicals	Fraction	Surface Water Criteria ug/L	SW Criteria Acute Eco ug/L	SW Criteria Chronic Eco ug/L	SW Criteria Human Health ug/L	Maximum Groundwater Concentration	Units	Location of Maximum
ALUMINUM	M	87	750	87	1300000	14500	UG/L	TP-MW08
ANTIMONY	M	36.6	1500	500	36.6	34	UG/L	TP-MW06
ARSENIC	M	4.9	69	36	4.9	41.2	UG/L	TP-MW02
BERYLLIUM	M	0.53	13	0.53	22.6	NA	UG/L	NA
CADMIUM	M	8.8	40	8.8	27	3.9	UG/L	TP-MW06
CHROMIUM	M	50	1100	50	57	27.4	UG/L	TP-MW08
COBALT	M	23	1500	23	NA	1.15	UG/L	FA-01B
COPPER	M	3.1	4.8	3.1	5200	496	UG/L	TP-MW05
IRON	M	1000	NA	1000	91000	21800	UG/L	TP-MW08
LEAD	M	8.1	210	8.1	950	195	UG/L	TP-MW06
MANGANESE	M	120	2300	120	1120	1600	UG/L	TP-MW08
MERCURY	M	0.94	1.8	0.94	20	0.46	UG/L	TP-MW02
NICKEL	M	8.2	74	8.2	2010	278	UG/L	TP-MW06
SELENIUM	M	71	290	71	650	19.8	UG/L	FA-01
SILVER	M	0.19	1.9	0.19	320	6.2	UG/L	FA-01
THALLIUM	M	9.1	213	21.3	9.1	66.1	UG/L	TP-MW07
VANADIUM	M	20	280	20	650	25.8	UG/L	TP-MW08
ZINC	M	81	90	81	40200	587	UG/L	TP-MW05
ACETONE	OV	1500	28000	1500	120000	NA		NA
CARBON DISULFIDE	OV	0.92	17	0.92	5600	NA		NA
PYRENE	PAH	3	30	3	110	NA		NA
4,4'-DDD	PES/PCB	0.001	0.13	0.001	33	NA		NA
4,4'-DDE	PES/PCB	0.001	0.13	0.001	23	NA		NA
4,4'-DDT	PES/PCB	0.001	0.13	0.001	23	NA		NA
AROCLOR-1254	PES/PCB	0.03	NA	0.03	2.8	NA		NA
DIELDRIN	PES/PCB	0.0019	0.71	0.0019	0.09	NA		NA
ENDOSULFAN SULFATE	PES/PCB	0.034	0.034	0.087	430	NA		NA
ENDRIN ALDEHYDE	PES/PCB	0.0023	0.034	0.0023	16	NA		NA

Detected Chemicals	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)
ALUMINUM	29000	MG/KG	TP-MW01	1500	1282842	1	207113	19333.3333	NA
ANTIMONY	1430	MG/KG	TP-SB24	45	1282842	1	45	31777.7778	NA
ARSENIC	82.3	MG/KG	TP-SB38B	29	1282842	1	4617	2837.9310	NA
BERYLLIUM	3.1	MG/KG	TP-MW01	402	1282842	1	402	7.7114	NA
CADMIUM	24.1	MG/KG	TP-SB37	75	1282842	1	4849	321.3333	NA
CHROMIUM	2860	MG/KG	TP-SB35	850	1282842	1	41971	3364.7059	NA
COBALT	85.2	MG/KG	TP-SB35	45	1282842	1	45	1893.3333	NA
COPPER	40400	MG/KG	TP-SB19	35	1282842	1	51038	1154285.7143	NA
IRON	280000	MG/KG	TP-SB23	25	1282842	1	4342	11200000.0000	NA
LEAD	40000	MG/KG	TP-SB24	900	1282842	1	10811	44444.4444	NA
MANGANESE	4370	MG/KG	TP-SB25	65	1282842	1	2246	67230.7692	NA
MERCURY	120	MG/KG	TP-SB37	52	1282842	1	3316	2307.6923	NA
NICKEL	3920	MG/KG	TP-SB35	65	1282842	1	3960	60307.6923	NA
SELENIUM	7.5	MG/KG	TP-SB35	5	1282842	1	5	1500.0000	NA
SILVER	25.6	MG/KG	TP-SB31	8.3	1282842	1	741	3084.3373	NA
THALLIUM	3.6	MG/KG	TP-MW09	71	1282842	1	71	50.7042	NA
VANADIUM	109	MG/KG	TP-SB23	1000	1282842	1	1000	109.0000	NA
ZINC	15800	MG/KG	TP-SB19	62	1282842	1	19197	254838.7097	NA
ACETONE	14000	UG/KG	TP-SB13	0.02582	1282842	1	0.05646	542215.3369	0.3808
CARBON DISULFIDE	22	UG/KG	TP-MW05	0.013036	1282842	1	0.0285	1687.6342	2.9000
PYRENE	19000	UG/KG	TP-MW02	904.82876	1282842	1	1978.185	20.9984	NA
4,4'-DDD	70	UG/KG	TP-MW01	1987.99	1282842	1	4346.25	0.0352	NA
4,4'-DDE	300	UG/KG	TP-SB17	1987.99	1282842	1	4346.25	0.1509	NA
4,4'-DDT	1000	UG/KG	TP-SB27	2871.8308	1282842	1	6278.55	0.3482	NA
AROCLOR-1254	280	UG/KG	TP-SB115	986.04304	1282842	1	2155.74	0.2840	NA
DIELDRIN	160	UG/KG	TP-SB14	138.1816	1282842	1	302.1	1.1579	NA
ENDOSULFAN SULFATE	22	UG/KG	TP-MW05	37.54368	1282842	1	82.08	0.5860	NA
ENDRIN ALDEHYDE	9.4	UG/KG	TP-SB27	586.62	1282842	1	1282.5	0.0160	NA

Detected Chemicals	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)
ALUMINUM	7501	14	17450505	1527.1536	14500	GW Sample	2.39	NA
ANTIMONY	226	14	17450505	2510.1490	2510.148982	Leach	2.39	NA
ARSENIC	146	14	17450505	224.1702	224.1701653	Leach	2.39	NA
BERYLLIUM	2011	14	17450505	0.6091	0.609132281	Leach	2.39	NA
CADMIUM	376	14	17450505	25.3823	25.38234565	Leach	2.39	NA
CHROMIUM	4251	14	17450505	265.7805	265.7804805	Leach	2.39	NA
COBALT	226	14	17450505	149.5557	149.5557296	Leach	2.39	NA
COPPER	176	14	17450505	91177.8392	91177.83916	Leach	2.39	NA
IRON	126	14	17450505	884695.8651	884695.8651	Leach	2.39	NA
LEAD	4501	14	17450505	3510.6979	3510.697878	Leach	2.39	NA
MANGANESE	326	14	17450505	5310.6057	5310.605674	Leach	2.39	NA
MERCURY	261	14	17450505	182.2862	182.2862359	Leach	2.39	NA
NICKEL	326	14	17450505	4763.7470	4763.746966	Leach	2.39	NA
SELENIUM	26	14	17450505	118.4861	118.4860534	Leach	2.39	NA
SILVER	42.5	14	17450505	243.6340	243.6339732	Leach	2.39	NA
THALLIUM	356	14	17450505	4.0052	66.1	GW Sample	2.39	NA
VANADIUM	5001	14	17450505	8.6100	25.8	GW Sample	2.39	NA
ZINC	311	14	17450505	20129.8886	20129.88864	Leach	2.39	NA
ACETONE	1.1291	14	17450505	42829.9702	42829.97023	Leach	2.39	0.0004
CARBON DISULFIDE	1.06518	14	17450505	133.3074	133.307414	Leach	2.39	0.0004
PYRENE	4525.1438	14	17450505	1.6587	1.658682183	Leach	2.39	NA
4,4'-DDD	9940.95	14	17450505	0.0028	0.002781377	Leach	2.39	NA
4,4'-DDE	9940.95	14	17450505	0.0119	0.011920186	Leach	2.39	NA
4,4'-DDT	14360.154	14	17450505	0.0275	0.027505347	Leach	2.39	NA
AROCLOR-1254	4931.2152	14	17450505	0.0224	0.022430458	Leach	2.39	NA
DIELDRIN	691.908	14	17450505	0.0915	0.091463063	Leach	2.39	NA
ENDOSULFAN SULFATE	188.7184	14	17450505	0.0463	0.046287297	Leach	2.39	NA
ENDRIN ALDEHYDE	2934.1	14	17450505	0.0013	0.001265747	Leach	2.39	NA

Detected Chemicals	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L
ALUMINUM	14500	0.0346	1035566	0.0052	0.0029	0.0027
ANTIMONY	2510.148982	0.0346	226	4.1457	2.3032	2.1470
ARSENIC	224.1701653	0.0346	23086	0.0036	0.0020	0.0019
BERYLLIUM	0.609132281	0.0346	2011	0.0001	0.0001	0.0001
CADMIUM	25.38234565	0.0346	24246	0.0004	0.0002	0.0002
CHROMIUM	265.7804805	0.0346	209856	0.0005	0.0003	0.0002
COBALT	149.5557296	0.0346	226	0.2470	0.1372	0.1279
COPPER	91177.83916	0.0346	255191	0.1334	0.0741	0.0691
IRON	884695.8651	0.0346	21711	15.2097	8.4499	7.8771
LEAD	3510.697878	0.0346	54056	0.0242	0.0135	0.0126
MANGANESE	5310.605674	0.0346	11231	0.1765	0.0981	0.0914
MERCURY	182.2862359	0.0346	16581	0.0041	0.0023	0.0021
NICKEL	4763.746966	0.0346	19801	0.0898	0.0499	0.0465
SELENIUM	118.4860534	0.0346	26	1.7010	0.9450	0.8809
SILVER	243.6339732	0.0346	3706	0.0245	0.0136	0.0127
THALLIUM	66.1	0.0346	356	0.0693	0.0385	0.0359
VANADIUM	25.8	0.0346	5001	0.0019	0.0011	0.0010
ZINC	20129.88864	0.0346	95986	0.0783	0.0435	0.0405
ACETONE	42823.63941	0.0346	1.2823	12467.1141	6926.1745	6456.6639
CARBON DISULFIDE	133.165913	0.0346	1.1425	43.5518	24.1954	22.5553
PYRENE	1.658682183	0.0346	9891.925	0.0001	0.0000	0.0000
4,4'-DDD	0.002781377	0.0346	21732.25	0.0000	0.0000	0.0000
4,4'-DDE	0.011920186	0.0346	21732.25	0.0000	0.0000	0.0000
4,4'-DDT	0.027505347	0.0346	31393.75	0.0000	0.0000	0.0000
AROCLOR-1254	0.022430458	0.0346	10779.7	0.0000	0.0000	0.0000
DIELDRIN	0.091463063	0.0346	1511.5	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.046287297	0.0346	411.4	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.001265747	0.0346	6413.5	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)
ALUMINUM	0.0026	0.0003	0.0001	Below	Below
ANTIMONY	2.0729	0.2303	0.0743	Below	Below
ARSENIC	0.0018	0.0002	0.0001	Below	Below
BERYLLIUM	0.0001	0.0000	0.0000	Below	Below
CADMIUM	0.0002	0.0000	0.0000	Below	Below
CHROMIUM	0.0002	0.0000	0.0000	Below	Below
COBALT	0.1235	0.0137	0.0044	Below	Below
COPPER	0.0667	0.0074	0.0024	Below	Below
IRON	7.6049	0.8450	0.2725	Below	Below
LEAD	0.0121	0.0013	0.0004	Below	Below
MANGANESE	0.0882	0.0098	0.0032	Below	Below
MERCURY	0.0021	0.0002	0.0001	Below	Below
NICKEL	0.0449	0.0050	0.0016	Below	Below
SELENIUM	0.8505	0.0945	0.0305	Below	Below
SILVER	0.0123	0.0014	0.0004	Below	Below
THALLIUM	0.0347	0.0039	0.0012	Below	Below
VANADIUM	0.0010	0.0001	0.0000	Below	Below
ZINC	0.0391	0.0043	0.0014	Below	Below
ACETONE	6233.5571	692.6175	223.4006	Exceeds	Below
CARBON DISULFIDE	21.7759	2.4195	0.7804	Exceeds	Exceeds
PYRENE	0.0000	0.0000	0.0000	Below	Below
4,4'-DDD	0.0000	0.0000	0.0000	Below	Below
4,4'-DDE	0.0000	0.0000	0.0000	Below	Below
4,4'-DDT	0.0000	0.0000	0.0000	Below	Below
AROCLOR-1254	0.0000	0.0000	0.0000	Below	Below
DIELDRIN	0.0000	0.0000	0.0000	Below	Below
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	Below	Below
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	Below	Below

Detected Chemicals	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	Below	7159182	2129498.524	2129498.384	2129498.372
ANTIMONY	Below	7159182	80.15084318	80.12672269	80.12467884
ARSENIC	Below	7159182	733.9094586	733.907295	733.9071117
BERYLLIUM	Below	7159182	0.173649147	0.173643271	0.173642773
CADMIUM	Below	7159182	87.274747	87.27450202	87.27448127
CHROMIUM	Below	7159182	7909.966305	7909.96374	7909.963522
COBALT	Below	7159182	4.775420867	4.773983758	4.773861984
COPPER	Below	7159182	3299781.028	3299780.148	3299780.074
IRON	Below	7159182	2723885.183	2723876.644	2723875.921
LEAD	Below	7159182	26913.02234	26912.98845	26912.98558
MANGANESE	Below	7159182	8457.882472	8457.831219	8457.826876
MERCURY	Below	7159182	428.6218708	428.6201115	428.6199624
NICKEL	Below	7159182	13376.70493	13376.65895	13376.65506
SELENIUM	Below	7159182	0.422561083	0.421461454	0.421368277
SILVER	Below	7159182	128.0194384	128.0170875	128.0168883
THALLIUM	Below	7159182	3.329265991	3.328629793	3.328575885
VANADIUM	Below	7159182	18.29510563	18.29485667	18.29483557
ZINC	Below	7159182	274016.8992	274016.7049	274016.6885
ACETONE	Below	7159182	1.919225033	1.828216611	1.820505027
CARBON DISULFIDE	Below	7159182	0.003052246	0.002891764	0.002878166
PYRENE	Below	7159182	2.326691078	2.32667507	2.326673714
4,4'-DDD	Below	7159182	0.008571947	0.008571921	0.008571918
4,4'-DDE	Below	7159182	0.036736918	0.036736803	0.036736793
4,4'-DDT	Below	7159182	0.122456127	0.122455861	0.122455839
AROCLOR-1254	Below	7159182	0.034288035	0.034287819	0.034287801
DIELDRIN	Below	7159182	0.01959487	0.019593987	0.019593913
ENDOSULFAN SULFATE	Below	7159182	0.002695024	0.002694579	0.002694541
ENDRIN ALDEHYDE	Below	7159182	0.001151109	0.001151097	0.001151096

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	13455332	1935.2094
ANTIMONY	1	45	31777.7778	NA	226	14	13455332	3180.8614
ARSENIC	1	4617	2837.9310	NA	146	14	13455332	284.0685
BERYLLIUM	1	402	7.7114	NA	2011	14	13455332	0.7719
CADMIUM	1	4849	321.3333	NA	376	14	13455332	32.1645
CHROMIUM	1	41971	3364.7059	NA	4251	14	13455332	336.7971
COBALT	1	45	1893.3333	NA	226	14	13455332	189.5171
COPPER	1	51038	1154285.7143	NA	176	14	13455332	115540.5802
IRON	1	4342	11200000.0000	NA	126	14	13455332	1121086.8179
LEAD	1	10811	44444.4444	NA	4501	14	13455332	4448.7572
MANGANESE	1	2246	67230.7692	NA	326	14	13455332	6729.6008
MERCURY	1	3316	2307.6923	NA	261	14	13455332	230.9932
NICKEL	1	3960	60307.6923	NA	326	14	13455332	6036.6213
SELENIUM	1	5	1500.0000	NA	26	14	13455332	150.1456
SILVER	1	741	3084.3373	NA	42.5	14	13455332	308.7330
THALLIUM	1	71	50.7042	NA	356	14	13455332	5.0753
VANADIUM	1	1000	109.0000	NA	5001	14	13455332	10.9106
ZINC	1	19197	254838.7097	NA	311	14	13455332	25508.5998
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	13455332	54274.1488
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	13455332	168.9272
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	13455332	2.1019
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	13455332	0.0035
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	13455332	0.0151
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	13455332	0.0349
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	13455332	0.0284
DIELDRIN	1	302.1	1.1579	NA	691.908	14	13455332	0.1159
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	13455332	0.0587
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	13455332	0.0016

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	1.78	NA	14500	0.0346	1035566
ANTIMONY	3180.861408	Leach	1.78	NA	3180.861408	0.0346	226
ARSENIC	284.0684886	Leach	1.78	NA	284.0684886	0.0346	23086
BERYLLIUM	0.771892576	Leach	1.78	NA	0.771892576	0.0346	2011
CADMIUM	32.16451466	Leach	1.78	NA	32.16451466	0.0346	24246
CHROMIUM	336.7970902	Leach	1.78	NA	336.7970902	0.0346	209856
COBALT	189.5170573	Leach	1.78	NA	189.5170573	0.0346	226
COPPER	115540.5802	Leach	1.78	NA	115540.5802	0.0346	255191
IRON	1121086.818	Leach	1.78	NA	1121086.818	0.0346	21711
LEAD	4448.757214	Leach	1.78	NA	4448.757214	0.0346	54056
MANGANESE	6729.600816	Leach	1.78	NA	6729.600816	0.0346	11231
MERCURY	230.993163	Leach	1.78	NA	230.993163	0.0346	16581
NICKEL	6036.621327	Leach	1.78	NA	6036.621327	0.0346	19801
SELENIUM	150.145556	Leach	1.78	NA	150.145556	0.0346	26
SILVER	308.7330307	Leach	1.78	NA	308.7330307	0.0346	3706
THALLIUM	66.1	GW Sample	1.78	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	1.78	NA	25.8	0.0346	5001
ZINC	25508.59983	Leach	1.78	NA	25508.59983	0.0346	95986
ACETONE	54274.14881	Leach	1.78	0.0005	54263.37587	0.0346	1.2823
CARBON DISULFIDE	168.9271878	Leach	1.78	0.0005	168.686438	0.0346	1.1425
PYRENE	2.10188247	Leach	1.78	NA	2.10188247	0.0346	9891.925
4,4'-DDD	0.003524561	Leach	1.78	NA	0.003524561	0.0346	21732.25
4,4'-DDE	0.015105263	Leach	1.78	NA	0.015105263	0.0346	21732.25
4,4'-DDT	0.034854782	Leach	1.78	NA	0.034854782	0.0346	31393.75
AROCLOR-1254	0.028423881	Leach	1.78	NA	0.028423881	0.0346	10779.7
DIELDRIN	0.115902016	Leach	1.78	NA	0.115902016	0.0346	1511.5
ENDOSULFAN SULFATE	0.058655274	Leach	1.78	NA	0.058655274	0.0346	411.4
ENDRIN ALDEHYDE	0.001603955	Leach	1.78	NA	0.001603955	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L
ALUMINUM	0.0040	0.0022	0.0021	0.0020	0.0002	0.0001
ANTIMONY	4.0507	2.2504	2.0978	2.0254	0.2250	0.0726
ARSENIC	0.0035	0.0020	0.0018	0.0018	0.0002	0.0001
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000	0.0000
COBALT	0.2413	0.1341	0.1250	0.1207	0.0134	0.0043
COPPER	0.1303	0.0724	0.0675	0.0652	0.0072	0.0023
IRON	14.8612	8.2562	7.6965	7.4306	0.8256	0.2663
LEAD	0.0237	0.0132	0.0123	0.0118	0.0013	0.0004
MANGANESE	0.1725	0.0958	0.0893	0.0862	0.0096	0.0031
MERCURY	0.0040	0.0022	0.0021	0.0020	0.0002	0.0001
NICKEL	0.0877	0.0487	0.0454	0.0439	0.0049	0.0016
SELENIUM	1.6620	0.9233	0.8607	0.8310	0.0923	0.0298
SILVER	0.0240	0.0133	0.0124	0.0120	0.0013	0.0004
THALLIUM	0.0534	0.0297	0.0277	0.0267	0.0030	0.0010
VANADIUM	0.0015	0.0008	0.0008	0.0007	0.0001	0.0000
ZINC	0.0765	0.0425	0.0396	0.0382	0.0042	0.0014
ACETONE	12181.4112	6767.4507	6308.6996	6090.7056	676.7451	218.2810
CARBON DISULFIDE	42.5537	23.6410	22.0384	21.2769	2.3641	0.7625
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg
ALUMINUM	Below	Below	Below	5520136	2129498.452	2129498.344
ANTIMONY	Below	Below	Below	5520136	101.5514232	101.5278555
ARSENIC	Below	Below	Below	5520136	930.0088341	930.0067201
BERYLLIUM	Below	Below	Below	5520136	0.220044406	0.220038665
CADMIUM	Below	Below	Below	5520136	110.5944209	110.5941816
CHROMIUM	Below	Below	Below	5520136	10023.50957	10023.50707
COBALT	Below	Below	Below	5520136	6.050476405	6.04907223
COPPER	Below	Below	Below	5520136	4181482.756	4181481.896
IRON	Below	Below	Below	5520136	3451702.4	3451694.057
LEAD	Below	Below	Below	5520136	34104.16641	34104.1333
MANGANESE	Below	Below	Below	5520136	10717.79729	10717.74721
MERCURY	Below	Below	Below	5520136	543.1485916	543.1468726
NICKEL	Below	Below	Below	5520136	16950.93376	16950.88884
SELENIUM	Below	Below	Below	5520136	0.534751711	0.533677281
SILVER	Below	Below	Below	5520136	162.2247293	162.2224323
THALLIUM	Below	Below	Below	5520136	3.328938272	3.328447727
VANADIUM	Below	Below	Below	5520136	18.29497739	18.29478542
ZINC	Below	Below	Below	5520136	347234.1553	347233.9654
ACETONE	Exceeds	Below	Below	5520136	2.372525408	2.283602583
CARBON DISULFIDE	Exceeds	Exceeds	Below	5520136	0.003761809	0.003605005
PYRENE	Below	Below	Below	5520136	2.948373057	2.948357416
4,4'-DDD	Below	Below	Below	5520136	0.010862356	0.01086233
4,4'-DDE	Below	Below	Below	5520136	0.046552956	0.046552844
4,4'-DDT	Below	Below	Below	5520136	0.155176261	0.155176001
AROCLOR-1254	Below	Below	Below	5520136	0.043449665	0.043449454
DIELDRIN	Below	Below	Below	5520136	0.024830048	0.024829186
ENDOSULFAN SULFATE	Below	Below	Below	5520136	0.003414845	0.003414409
ENDRIN ALDEHYDE	Below	Below	Below	5520136	0.001458678	0.001458666

Detected Chemicals	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.335
ANTIMONY	101.5258585
ARSENIC	930.006541
BERYLLIUM	0.220038178
CADMIUM	110.5941613
CHROMIUM	10023.50685
COBALT	6.048953247
COPPER	4181481.823
IRON	3451693.35
LEAD	34104.13049
MANGANESE	10717.74297
MERCURY	543.146727
NICKEL	16950.88503
SELENIUM	0.53358624
SILVER	162.2222376
THALLIUM	3.32840616
VANADIUM	18.29476915
ZINC	347233.9493
ACETONE	2.276067723
CARBON DISULFIDE	0.003591718
PYRENE	2.948356091
4,4'-DDD	0.010862328
4,4'-DDE	0.046552834
4,4'-DDT	0.155175979
AROCLOR-1254	0.043449436
DIELDRIN	0.024829113
ENDOSULFAN SULFATE	0.003414372
ENDRIN ALDEHYDE	0.001458665

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	22390968	1211.3060
ANTIMONY	1	45	31777.7778	NA	226	14	22390968	1990.9972
ARSENIC	1	4617	2837.9310	NA	146	14	22390968	177.8070
BERYLLIUM	1	402	7.7114	NA	2011	14	22390968	0.4832
CADMIUM	1	4849	321.3333	NA	376	14	22390968	20.1327
CHROMIUM	1	41971	3364.7059	NA	4251	14	22390968	210.8115
COBALT	1	45	1893.3333	NA	226	14	22390968	118.6245
COPPER	1	51038	1154285.7143	NA	176	14	22390968	72320.3390
IRON	1	4342	11200000.0000	NA	126	14	22390968	701722.1015
LEAD	1	10811	44444.4444	NA	4501	14	22390968	2784.6115
MANGANESE	1	2246	67230.7692	NA	326	14	22390968	4212.2604
MERCURY	1	3316	2307.6923	NA	261	14	22390968	144.5856
NICKEL	1	3960	60307.6923	NA	326	14	22390968	3778.5036
SELENIUM	1	5	1500.0000	NA	26	14	22390968	93.9806
SILVER	1	741	3084.3373	NA	42.5	14	22390968	193.2453
THALLIUM	1	71	50.7042	NA	356	14	22390968	3.1768
VANADIUM	1	1000	109.0000	NA	5001	14	22390968	6.8293
ZINC	1	19197	254838.7097	NA	311	14	22390968	15966.6031
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	22390968	33971.8291
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	22390968	105.7366
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	22390968	1.3156
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	22390968	0.0022
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	22390968	0.0095
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	22390968	0.0218
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	22390968	0.0178
DIELDRIN	1	302.1	1.1579	NA	691.908	14	22390968	0.0725
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	22390968	0.0367
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	22390968	0.0010

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	3.00	NA	14500	0.0346	1035566
ANTIMONY	1990.997232	Leach	3.00	NA	1990.997232	0.0346	226
ARSENIC	177.8070473	Leach	3.00	NA	177.8070473	0.0346	23086
BERYLLIUM	0.483150878	Leach	3.00	NA	0.483150878	0.0346	2011
CADMIUM	20.13274124	Leach	3.00	NA	20.13274124	0.0346	24246
CHROMIUM	210.8114717	Leach	3.00	NA	210.8114717	0.0346	209856
COBALT	118.6244505	Leach	3.00	NA	118.6244505	0.0346	226
COPPER	72320.33903	Leach	3.00	NA	72320.33903	0.0346	255191
IRON	701722.1015	Leach	3.00	NA	701722.1015	0.0346	21711
LEAD	2784.611514	Leach	3.00	NA	2784.611514	0.0346	54056
MANGANESE	4212.260417	Leach	3.00	NA	4212.260417	0.0346	11231
MERCURY	144.5855978	Leach	3.00	NA	144.5855978	0.0346	16581
NICKEL	3778.503623	Leach	3.00	NA	3778.503623	0.0346	19801
SELENIUM	93.98063859	Leach	3.00	NA	93.98063859	0.0346	26
SILVER	193.2453291	Leach	3.00	NA	193.2453291	0.0346	3706
THALLIUM	66.1	GW Sample	3.00	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	3.00	NA	25.8	0.0346	5001
ZINC	15966.60311	Leach	3.00	NA	15966.60311	0.0346	95986
ACETONE	33971.82908	Leach	3.00	0.0003	33967.83292	0.0346	1.2823
CARBON DISULFIDE	105.7366293	Leach	3.00	0.0003	105.6473022	0.0346	1.1425
PYRENE	1.315631725	Leach	3.00	NA	1.315631725	0.0346	9891.925
4,4'-DDD	0.002206129	Leach	3.00	NA	0.002206129	0.0346	21732.25
4,4'-DDE	0.00945484	Leach	3.00	NA	0.00945484	0.0346	21732.25
4,4'-DDT	0.021816661	Leach	3.00	NA	0.021816661	0.0346	31393.75
AROCLOR-1254	0.017791366	Leach	3.00	NA	0.017791366	0.0346	10779.7
DIELDRIN	0.072546572	Leach	3.00	NA	0.072546572	0.0346	1511.5
ENDOSULFAN SULFATE	0.036714107	Leach	3.00	NA	0.036714107	0.0346	411.4
ENDRIN ALDEHYDE	0.001003964	Leach	3.00	NA	0.001003964	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0067	0.0037	0.0035	0.0034	0.0004
ANTIMONY	4.2192	2.3440	2.1851	2.1096	0.2344
ARSENIC	0.0037	0.0020	0.0019	0.0018	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
COBALT	0.2514	0.1397	0.1302	0.1257	0.0140
COPPER	0.1357	0.0754	0.0703	0.0679	0.0075
IRON	15.4795	8.5997	8.0168	7.7398	0.8600
LEAD	0.0247	0.0137	0.0128	0.0123	0.0014
MANGANESE	0.1796	0.0998	0.0930	0.0898	0.0100
MERCURY	0.0042	0.0023	0.0022	0.0021	0.0002
NICKEL	0.0914	0.0508	0.0473	0.0457	0.0051
SELENIUM	1.7312	0.9618	0.8966	0.8656	0.0962
SILVER	0.0250	0.0139	0.0129	0.0125	0.0014
THALLIUM	0.0889	0.0494	0.0461	0.0445	0.0049
VANADIUM	0.0025	0.0014	0.0013	0.0012	0.0001
ZINC	0.0797	0.0443	0.0413	0.0398	0.0044
ACETONE	12688.2569	7049.0316	6571.1928	6344.1284	704.9032
CARBON DISULFIDE	44.3243	24.6246	22.9554	22.1622	2.4625
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	9186038
ANTIMONY	0.0756	Below	Below	Below	9186038
ARSENIC	0.0001	Below	Below	Below	9186038
BERYLLIUM	0.0000	Below	Below	Below	9186038
CADMIUM	0.0000	Below	Below	Below	9186038
CHROMIUM	0.0000	Below	Below	Below	9186038
COBALT	0.0045	Below	Below	Below	9186038
COPPER	0.0024	Below	Below	Below	9186038
IRON	0.2774	Below	Below	Below	9186038
LEAD	0.0004	Below	Below	Below	9186038
MANGANESE	0.0032	Below	Below	Below	9186038
MERCURY	0.0001	Below	Below	Below	9186038
NICKEL	0.0016	Below	Below	Below	9186038
SELENIUM	0.0310	Below	Below	Below	9186038
SILVER	0.0004	Below	Below	Below	9186038
THALLIUM	0.0016	Below	Below	Below	9186038
VANADIUM	0.0000	Below	Below	Below	9186038
ZINC	0.0014	Below	Below	Below	9186038
ACETONE	227.3633	Exceeds	Below	Below	9186038
CARBON DISULFIDE	0.7943	Exceeds	Exceeds	Below	9186038
PYRENE	0.0000	Below	Below	Below	9186038
4,4'-DDD	0.0000	Below	Below	Below	9186038
4,4'-DDE	0.0000	Below	Below	Below	9186038
4,4'-DDT	0.0000	Below	Below	Below	9186038
AROCLOR-1254	0.0000	Below	Below	Below	9186038
DIELDRIN	0.0000	Below	Below	Below	9186038
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	9186038
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	9186038

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.613	2129498.434	2129498.418
ANTIMONY	63.58614546	63.56159711	63.55951701
ARSENIC	582.1225971	582.1203952	582.1202086
BERYLLIUM	0.13773781	0.13773183	0.137731323
CADMIUM	69.22461242	69.2243631	69.22434197
CHROMIUM	6274.019743	6274.017133	6274.016911
COBALT	3.788489226	3.787026625	3.786902692
COPPER	2617317.162	2617316.266	2617316.19
IRON	2160532.593	2160523.903	2160523.167
LEAD	21346.85883	21346.82434	21346.82142
MANGANESE	6708.639891	6708.587729	6708.583309
MERCURY	339.9747169	339.9729264	339.9727747
NICKEL	10610.14346	10610.09666	10610.0927
SELENIUM	0.335722136	0.334603001	0.334508171
SILVER	101.5435064	101.5411138	101.540911
THALLIUM	3.329671252	3.328854938	3.328785768
VANADIUM	18.29526423	18.29494477	18.2949177
ZINC	217344.5234	217344.3257	217344.309
ACETONE	1.568312614	1.475689877	1.467841504
CARBON DISULFIDE	0.002502525	0.002339196	0.002325357
PYRENE	1.84549038	1.845474088	1.845472708
4,4'-DDD	0.006799102	0.006799074	0.006799072
4,4'-DDE	0.029139006	0.029138889	0.029138879
4,4'-DDT	0.097129751	0.097129481	0.097129458
AROCLOR-1254	0.027196656	0.027196436	0.027196417
DIELDRIN	0.015542683	0.015541785	0.015541709
ENDOSULFAN SULFATE	0.002137862	0.002137408	0.00213737
ENDRIN ALDEHYDE	0.000913042	0.000913029	0.000913028

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	7466554	3228.2225
ANTIMONY	1	45	31777.7778	NA	226	14	7466554	5306.1589
ARSENIC	1	4617	2837.9310	NA	146	14	7466554	473.8693
BERYLLIUM	1	402	7.7114	NA	2011	14	7466554	1.2876
CADMIUM	1	4849	321.3333	NA	376	14	7466554	53.6553
CHROMIUM	1	41971	3364.7059	NA	4251	14	7466554	561.8286
COBALT	1	45	1893.3333	NA	226	14	7466554	316.1432
COPPER	1	51038	1154285.7143	NA	176	14	7466554	192739.1983
IRON	1	4342	11200000.0000	NA	126	14	7466554	1870142.7157
LEAD	1	10811	44444.4444	NA	4501	14	7466554	7421.2013
MANGANESE	1	2246	67230.7692	NA	326	14	7466554	11225.9940
MERCURY	1	3316	2307.6923	NA	261	14	7466554	385.3316
NICKEL	1	3960	60307.6923	NA	326	14	7466554	10069.9992
SELENIUM	1	5	1500.0000	NA	26	14	7466554	250.4655
SILVER	1	741	3084.3373	NA	42.5	14	7466554	515.0135
THALLIUM	1	71	50.7042	NA	356	14	7466554	8.4664
VANADIUM	1	1000	109.0000	NA	5001	14	7466554	18.2005
ZINC	1	19197	254838.7097	NA	311	14	7466554	42552.2104
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	7466554	90537.5056
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	7466554	281.7962
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	7466554	3.5063
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	7466554	0.0059
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	7466554	0.0252
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	7466554	0.0581
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	7466554	0.0474
DIELDRIN	1	302.1	1.1579	NA	691.908	14	7466554	0.1933
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	7466554	0.0978
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	7466554	0.0027

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	1.08	NA	14500	0.0346	1035566
ANTIMONY	5306.158896	Leach	1.08	NA	5306.158896	0.0346	226
ARSENIC	473.8692903	Leach	1.08	NA	473.8692903	0.0346	23086
BERYLLIUM	1.287633799	Leach	1.08	NA	1.287633799	0.0346	2011
CADMIUM	53.65528506	Leach	1.08	NA	53.65528506	0.0346	24246
CHROMIUM	561.828589	Leach	1.08	NA	561.828589	0.0346	209856
COBALT	316.1431734	Leach	1.08	NA	316.1431734	0.0346	226
COPPER	192739.1983	Leach	1.08	NA	192739.1983	0.0346	255191
IRON	1870142.716	Leach	1.08	NA	1870142.716	0.0346	21711
LEAD	7421.201253	Leach	1.08	NA	7421.201253	0.0346	54056
MANGANESE	11225.99405	Leach	1.08	NA	11225.99405	0.0346	11231
MERCURY	385.3316035	Leach	1.08	NA	385.3316035	0.0346	16581
NICKEL	10069.99924	Leach	1.08	NA	10069.99924	0.0346	19801
SELENIUM	250.4655423	Leach	1.08	NA	250.4655423	0.0346	26
SILVER	515.0134845	Leach	1.08	NA	515.0134845	0.0346	3706
THALLIUM	66.1	GW Sample	1.08	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	1.08	NA	25.8	0.0346	5001
ZINC	42552.21041	Leach	1.08	NA	42552.21041	0.0346	95986
ACETONE	90537.5056	Leach	1.08	0.0009	90507.98742	0.0346	1.2823
CARBON DISULFIDE	281.7961507	Leach	1.08	0.0008	281.1367491	0.0346	1.1425
PYRENE	3.506258505	Leach	1.08	NA	3.506258505	0.0346	9891.925
4,4'-DDD	0.005879502	Leach	1.08	NA	0.005879502	0.0346	21732.25
4,4'-DDE	0.025197867	Leach	1.08	NA	0.025197867	0.0346	21732.25
4,4'-DDT	0.058143059	Leach	1.08	NA	0.058143059	0.0346	31393.75
AROCLOR-1254	0.047415342	Leach	1.08	NA	0.047415342	0.0346	10779.7
DIELDRIN	0.193342127	Leach	1.08	NA	0.193342127	0.0346	1511.5
ENDOSULFAN SULFATE	0.097845886	Leach	1.08	NA	0.097845886	0.0346	411.4
ENDRIN ALDEHYDE	0.00267564	Leach	1.08	NA	0.00267564	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0022	0.0012	0.0012	0.0011	0.0001
ANTIMONY	3.7497	2.0831	1.9419	1.8748	0.2083
ARSENIC	0.0033	0.0018	0.0017	0.0016	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
COBALT	0.2234	0.1241	0.1157	0.1117	0.0124
COPPER	0.1206	0.0670	0.0625	0.0603	0.0067
IRON	13.7567	7.6426	7.1245	6.8784	0.7643
LEAD	0.0219	0.0122	0.0114	0.0110	0.0012
MANGANESE	0.1596	0.0887	0.0827	0.0798	0.0089
MERCURY	0.0037	0.0021	0.0019	0.0019	0.0002
NICKEL	0.0812	0.0451	0.0421	0.0406	0.0045
SELENIUM	1.5385	0.8547	0.7968	0.7692	0.0855
SILVER	0.0222	0.0123	0.0115	0.0111	0.0012
THALLIUM	0.0297	0.0165	0.0154	0.0148	0.0016
VANADIUM	0.0008	0.0005	0.0004	0.0004	0.0000
ZINC	0.0708	0.0393	0.0367	0.0354	0.0039
ACETONE	11276.0995	6264.4997	5839.8427	5638.0497	626.4500
CARBON DISULFIDE	39.3912	21.8840	20.4005	19.6956	2.1884
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0000	Below	Below	Below	3063202
ANTIMONY	0.0672	Below	Below	Below	3063202
ARSENIC	0.0001	Below	Below	Below	3063202
BERYLLIUM	0.0000	Below	Below	Below	3063202
CADMIUM	0.0000	Below	Below	Below	3063202
CHROMIUM	0.0000	Below	Below	Below	3063202
COBALT	0.0040	Below	Below	Below	3063202
COPPER	0.0022	Below	Below	Below	3063202
IRON	0.2465	Below	Below	Below	3063202
LEAD	0.0004	Below	Below	Below	3063202
MANGANESE	0.0029	Below	Below	Below	3063202
MERCURY	0.0001	Below	Below	Below	3063202
NICKEL	0.0015	Below	Below	Below	3063202
SELENIUM	0.0276	Below	Below	Below	3063202
SILVER	0.0004	Below	Below	Below	3063202
THALLIUM	0.0005	Below	Below	Below	3063202
VANADIUM	0.0000	Below	Below	Below	3063202
ZINC	0.0013	Below	Below	Below	3063202
ACETONE	202.0586	Exceeds	Below	Below	3063202
CARBON DISULFIDE	0.7059	Exceeds	Exceeds	Below	3063202
PYRENE	0.0000	Below	Below	Below	3063202
4,4'-DDD	0.0000	Below	Below	Below	3063202
4,4'-DDE	0.0000	Below	Below	Below	3063202
4,4'-DDT	0.0000	Below	Below	Below	3063202
AROCLOR-1254	0.0000	Below	Below	Below	3063202
DIELDRIN	0.0000	Below	Below	Below	3063202
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	3063202
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	3063202

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.344	2129498.284	2129498.279
ANTIMONY	169.363793	169.3419768	169.3401282
ARSENIC	1551.392149	1551.390192	1551.390026
BERYLLIUM	0.367057826	0.367052511	0.367052061
CADMIUM	184.4878551	184.4876336	184.4876148
CHROMIUM	16720.72887	16720.72655	16720.72635
COBALT	10.09076585	10.08946603	10.08935589
COPPER	6975345.515	6975344.719	6975344.651
IRON	5757948.78	5757941.057	5757940.403
LEAD	56890.86283	56890.83218	56890.82959
MANGANESE	17878.82653	17878.78018	17878.77625
MERCURY	906.0512947	906.0497035	906.0495686
NICKEL	28276.65143	28276.60984	28276.60632
SELENIUM	0.890251999	0.88925742	0.889173144
SILVER	270.6115967	270.6094704	270.6092903
THALLIUM	3.328447019	3.328174808	3.328151743
VANADIUM	18.29478514	18.29467861	18.29466959
ZINC	579238.878	579238.7023	579238.6874
ACETONE	3.808718819	3.72640466	3.719429783
CARBON DISULFIDE	0.006008107	0.005862956	0.005850657
PYRENE	4.918306963	4.918292485	4.918291258
4,4'-DDD	0.018120013	0.018119989	0.018119987
4,4'-DDE	0.077657198	0.077657094	0.077657085
4,4'-DDT	0.258857087	0.258856847	0.258856826
AROCLOR-1254	0.072480274	0.072480078	0.072480061
DIELDRIN	0.041418843	0.041418045	0.041417977
ENDOSULFAN SULFATE	0.005695751	0.005695348	0.005695314
ENDRIN ALDEHYDE	0.002433276	0.002433265	0.002433264

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	43304161	645.8636
ANTIMONY	1	45	31777.7778	NA	226	14	43304161	1061.5920
ARSENIC	1	4617	2837.9310	NA	146	14	43304161	94.8060
BERYLLIUM	1	402	7.7114	NA	2011	14	43304161	0.2576
CADMIUM	1	4849	321.3333	NA	376	14	43304161	10.7347
CHROMIUM	1	41971	3364.7059	NA	4251	14	43304161	112.4039
COBALT	1	45	1893.3333	NA	226	14	43304161	63.2501
COPPER	1	51038	1154285.7143	NA	176	14	43304161	38560.9224
IRON	1	4342	11200000.0000	NA	126	14	43304161	374155.4851
LEAD	1	10811	44444.4444	NA	4501	14	43304161	1484.7440
MANGANESE	1	2246	67230.7692	NA	326	14	43304161	2245.9608
MERCURY	1	3316	2307.6923	NA	261	14	43304161	77.0925
NICKEL	1	3960	60307.6923	NA	326	14	43304161	2014.6834
SELENIUM	1	5	1500.0000	NA	26	14	43304161	50.1101
SILVER	1	741	3084.3373	NA	42.5	14	43304161	103.0377
THALLIUM	1	71	50.7042	NA	356	14	43304161	1.6939
VANADIUM	1	1000	109.0000	NA	5001	14	43304161	3.6413
ZINC	1	19197	254838.7097	NA	311	14	43304161	8513.3305
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	43304161	18113.6466
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	43304161	56.3784
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	43304161	0.7015
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	43304161	0.0012
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	43304161	0.0050
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	43304161	0.0116
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	43304161	0.0095
DIELDRIN	1	302.1	1.1579	NA	691.908	14	43304161	0.0387
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	43304161	0.0196
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	43304161	0.0005

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	6.02	NA	14500	0.0346	1035566
ANTIMONY	1061.591952	Leach	6.02	NA	1061.591952	0.0346	226
ARSENIC	94.80602348	Leach	6.02	NA	94.80602348	0.0346	23086
BERYLLIUM	0.257614162	Leach	6.02	NA	0.257614162	0.0346	2011
CADMIUM	10.73469904	Leach	6.02	NA	10.73469904	0.0346	24246
CHROMIUM	112.4038537	Leach	6.02	NA	112.4038537	0.0346	209856
COBALT	63.25009392	Leach	6.02	NA	63.25009392	0.0346	226
COPPER	38560.92245	Leach	6.02	NA	38560.92245	0.0346	255191
IRON	374155.4851	Leach	6.02	NA	374155.4851	0.0346	21711
LEAD	1484.743989	Leach	6.02	NA	1484.743989	0.0346	54056
MANGANESE	2245.96081	Leach	6.02	NA	2245.96081	0.0346	11231
MERCURY	77.09247633	Leach	6.02	NA	77.09247633	0.0346	16581
NICKEL	2014.683381	Leach	6.02	NA	2014.683381	0.0346	19801
SELENIUM	50.11010962	Leach	6.02	NA	50.11010962	0.0346	26
SILVER	103.0376551	Leach	6.02	NA	103.0376551	0.0346	3706
THALLIUM	66.1	GW Sample	6.02	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	6.02	NA	25.8	0.0346	5001
ZINC	8513.330451	Leach	6.02	NA	8513.330451	0.0346	95986
ACETONE	18113.64665	Leach	6.02	0.0002	18112.58319	0.0346	1.2823
CARBON DISULFIDE	56.37835796	Leach	6.02	0.0001	56.35458205	0.0346	1.1425
PYRENE	0.7014897	Leach	6.02	NA	0.7014897	0.0346	9891.925
4,4'-DDD	0.0011763	Leach	6.02	NA	0.0011763	0.0346	21732.25
4,4'-DDE	0.005041284	Leach	6.02	NA	0.005041284	0.0346	21732.25
4,4'-DDT	0.011632558	Leach	6.02	NA	0.011632558	0.0346	31393.75
AROCLOR-1254	0.009486287	Leach	6.02	NA	0.009486287	0.0346	10779.7
DIELDRIN	0.038681549	Leach	6.02	NA	0.038681549	0.0346	1511.5
ENDOSULFAN SULFATE	0.019575819	Leach	6.02	NA	0.019575819	0.0346	411.4
ENDRIN ALDEHYDE	0.00053531	Leach	6.02	NA	0.00053531	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0130	0.0072	0.0067	0.0065	0.0007
ANTIMONY	4.3509	2.4172	2.2533	2.1754	0.2417
ARSENIC	0.0038	0.0021	0.0020	0.0019	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0003	0.0002	0.0000
COBALT	0.2592	0.1440	0.1343	0.1296	0.0144
COPPER	0.1400	0.0778	0.0725	0.0700	0.0078
IRON	15.9625	8.8681	8.2669	7.9813	0.8868
LEAD	0.0254	0.0141	0.0132	0.0127	0.0014
MANGANESE	0.1852	0.1029	0.0959	0.0926	0.0103
MERCURY	0.0043	0.0024	0.0022	0.0022	0.0002
NICKEL	0.0942	0.0524	0.0488	0.0471	0.0052
SELENIUM	1.7852	0.9918	0.9245	0.8926	0.0992
SILVER	0.0258	0.0143	0.0133	0.0129	0.0014
THALLIUM	0.1720	0.0955	0.0891	0.0860	0.0096
VANADIUM	0.0048	0.0027	0.0025	0.0024	0.0003
ZINC	0.0822	0.0456	0.0425	0.0411	0.0046
ACETONE	13084.1551	7268.9751	6776.2268	6542.0776	726.8975
CARBON DISULFIDE	45.7073	25.3929	23.6716	22.8537	2.5393
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0002	Below	Below	Below	17765810
ANTIMONY	0.0780	Below	Below	Below	17765810
ARSENIC	0.0001	Below	Below	Below	17765810
BERYLLIUM	0.0000	Below	Below	Below	17765810
CADMIUM	0.0000	Below	Below	Below	17765810
CHROMIUM	0.0000	Below	Below	Below	17765810
COBALT	0.0046	Below	Below	Below	17765810
COPPER	0.0025	Below	Below	Below	17765810
IRON	0.2860	Below	Below	Below	17765810
LEAD	0.0005	Below	Below	Below	17765810
MANGANESE	0.0033	Below	Below	Below	17765810
MERCURY	0.0001	Below	Below	Below	17765810
NICKEL	0.0017	Below	Below	Below	17765810
SELENIUM	0.0320	Below	Below	Below	17765810
SILVER	0.0005	Below	Below	Below	17765810
THALLIUM	0.0031	Below	Below	Below	17765810
VANADIUM	0.0001	Below	Below	Below	17765810
ZINC	0.0015	Below	Below	Below	17765810
ACETONE	234.4574	Exceeds	Below	Below	17765810
CARBON DISULFIDE	0.8190	Exceeds	Exceeds	Below	17765810
PYRENE	0.0000	Below	Below	Below	17765810
4,4'-DDD	0.0000	Below	Below	Below	17765810
4,4'-DDE	0.0000	Below	Below	Below	17765810
4,4'-DDT	0.0000	Below	Below	Below	17765810
AROCLOR-1254	0.0000	Below	Below	Below	17765810
DIELDRIN	0.0000	Below	Below	Below	17765810
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	17765810
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	17765810

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.991	2129498.643	2129498.614
ANTIMONY	33.93139127	33.90607697	33.90393197
ARSENIC	310.3879636	310.385693	310.3855006
BERYLLIUM	0.073447964	0.073441797	0.073441274
CADMIUM	36.91057248	36.91031537	36.91029359
CHROMIUM	3345.28576	3345.283068	3345.28284
COBALT	2.021646529	2.020138292	2.020010492
COPPER	1395544.297	1395543.373	1395543.295
IRON	1151997.282	1151988.32	1151987.561
LEAD	11382.10043	11382.06487	11382.06186
MANGANESE	3577.079049	3577.025259	3577.020702
MERCURY	181.2751981	181.2733518	181.2731953
NICKEL	5657.339503	5657.291251	5657.287162
SELENIUM	0.180259738	0.179105684	0.179007895
SILVER	54.14528213	54.14281488	54.14260582
THALLIUM	3.331386738	3.329807986	3.329674211
VANADIUM	18.29593557	18.29531774	18.29526539
ZINC	115887.473	115887.2691	115887.2518
ACETONE	0.940045887	0.844533141	0.836439884
CARBON DISULFIDE	0.00151783	0.001349406	0.001335134
PYRENE	0.984026521	0.984009721	0.984008298
4,4'-DDD	0.003625285	0.003625257	0.003625254
4,4'-DDE	0.015536936	0.015536815	0.015536805
4,4'-DDT	0.051789507	0.051789228	0.051789205
AROCLOR-1254	0.014501398	0.01450117	0.014501151
DIELDRIN	0.008288304	0.008287378	0.0082873
ENDOSULFAN SULFATE	0.001140408	0.00113994	0.0011399
ENDRIN ALDEHYDE	0.000486844	0.000486831	0.00048683

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	15586630	1693.7740
ANTIMONY	1	45	31777.7778	NA	226	14	15586630	2784.0194
ARSENIC	1	4617	2837.9310	NA	146	14	15586630	248.6283
BERYLLIUM	1	402	7.7114	NA	2011	14	15586630	0.6756
CADMIUM	1	4849	321.3333	NA	376	14	15586630	28.1517
CHROMIUM	1	41971	3364.7059	NA	4251	14	15586630	294.7785
COBALT	1	45	1893.3333	NA	226	14	15586630	165.8730
COPPER	1	51038	1154285.7143	NA	176	14	15586630	101125.8178
IRON	1	4342	11200000.0000	NA	126	14	15586630	981220.8066
LEAD	1	10811	44444.4444	NA	4501	14	15586630	3893.7334
MANGANESE	1	2246	67230.7692	NA	326	14	15586630	5890.0205
MERCURY	1	3316	2307.6923	NA	261	14	15586630	202.1746
NICKEL	1	3960	60307.6923	NA	326	14	15586630	5283.4967
SELENIUM	1	5	1500.0000	NA	26	14	15586630	131.4135
SILVER	1	741	3084.3373	NA	42.5	14	15586630	270.2157
THALLIUM	1	71	50.7042	NA	356	14	15586630	4.4421
VANADIUM	1	1000	109.0000	NA	5001	14	15586630	9.5494
ZINC	1	19197	254838.7097	NA	311	14	15586630	22326.1647
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	15586630	47502.9438
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	15586630	147.8519
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	15586630	1.8397
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	15586630	0.0031
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	15586630	0.0132
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	15586630	0.0305
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	15586630	0.0249
DIELDRIN	1	302.1	1.1579	NA	691.908	14	15586630	0.1014
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	15586630	0.0513
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	15586630	0.0014

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.25	NA	14500	0.0346	1035566
ANTIMONY	2784.019352	Leach	2.25	NA	2784.019352	0.0346	226
ARSENIC	248.6283017	Leach	2.25	NA	248.6283017	0.0346	23086
BERYLLIUM	0.675591796	Leach	2.25	NA	0.675591796	0.0346	2011
CADMIUM	28.15169219	Leach	2.25	NA	28.15169219	0.0346	24246
CHROMIUM	294.7785196	Leach	2.25	NA	294.7785196	0.0346	209856
COBALT	165.8730411	Leach	2.25	NA	165.8730411	0.0346	226
COPPER	101125.8178	Leach	2.25	NA	101125.8178	0.0346	255191
IRON	981220.8066	Leach	2.25	NA	981220.8066	0.0346	21711
LEAD	3893.73336	Leach	2.25	NA	3893.73336	0.0346	54056
MANGANESE	5890.020501	Leach	2.25	NA	5890.020501	0.0346	11231
MERCURY	202.1746167	Leach	2.25	NA	202.1746167	0.0346	16581
NICKEL	5283.496651	Leach	2.25	NA	5283.496651	0.0346	19801
SELENIUM	131.4135009	Leach	2.25	NA	131.4135009	0.0346	26
SILVER	270.2157127	Leach	2.25	NA	270.2157127	0.0346	3706
THALLIUM	66.1	GW Sample	2.25	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.25	NA	25.8	0.0346	5001
ZINC	22326.16467	Leach	2.25	NA	22326.16467	0.0346	95986
ACETONE	47502.94377	Leach	2.25	0.0004	47495.47189	0.0346	1.2823
CARBON DISULFIDE	147.8519494	Leach	2.25	0.0004	147.6849491	0.0346	1.1425
PYRENE	1.839653076	Leach	2.25	NA	1.839653076	0.0346	9891.925
4,4'-DDD	0.003084839	Leach	2.25	NA	0.003084839	0.0346	21732.25
4,4'-DDE	0.013220741	Leach	2.25	NA	0.013220741	0.0346	21732.25
4,4'-DDT	0.030506324	Leach	2.25	NA	0.030506324	0.0346	31393.75
AROCLOR-1254	0.024877738	Leach	2.25	NA	0.024877738	0.0346	10779.7
DIELDRIN	0.101442161	Leach	2.25	NA	0.101442161	0.0346	1511.5
ENDOSULFAN SULFATE	0.051337482	Leach	2.25	NA	0.051337482	0.0346	411.4
ENDRIN ALDEHYDE	0.001403847	Leach	2.25	NA	0.001403847	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0047	0.0026	0.0024	0.0023	0.0003
ANTIMONY	4.1069	2.2816	2.1270	2.0535	0.2282
ARSENIC	0.0036	0.0020	0.0019	0.0018	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
COBALT	0.2447	0.1359	0.1267	0.1223	0.0136
COPPER	0.1321	0.0734	0.0684	0.0661	0.0073
IRON	15.0674	8.3708	7.8034	7.5337	0.8371
LEAD	0.0240	0.0133	0.0124	0.0120	0.0013
MANGANESE	0.1748	0.0971	0.0906	0.0874	0.0097
MERCURY	0.0041	0.0023	0.0021	0.0020	0.0002
NICKEL	0.0890	0.0494	0.0461	0.0445	0.0049
SELENIUM	1.6851	0.9362	0.8727	0.8425	0.0936
SILVER	0.0243	0.0135	0.0126	0.0122	0.0014
THALLIUM	0.0619	0.0344	0.0321	0.0310	0.0034
VANADIUM	0.0017	0.0010	0.0009	0.0009	0.0001
ZINC	0.0775	0.0431	0.0402	0.0388	0.0043
ACETONE	12350.4537	6861.3632	6396.2460	6175.2269	686.1363
CARBON DISULFIDE	43.1442	23.9690	22.3442	21.5721	2.3969
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6394515
ANTIMONY	0.0736	Below	Below	Below	6394515
ARSENIC	0.0001	Below	Below	Below	6394515
BERYLLIUM	0.0000	Below	Below	Below	6394515
CADMIUM	0.0000	Below	Below	Below	6394515
CHROMIUM	0.0000	Below	Below	Below	6394515
COBALT	0.0044	Below	Below	Below	6394515
COPPER	0.0024	Below	Below	Below	6394515
IRON	0.2700	Below	Below	Below	6394515
LEAD	0.0004	Below	Below	Below	6394515
MANGANESE	0.0031	Below	Below	Below	6394515
MERCURY	0.0001	Below	Below	Below	6394515
NICKEL	0.0016	Below	Below	Below	6394515
SELENIUM	0.0302	Below	Below	Below	6394515
SILVER	0.0004	Below	Below	Below	6394515
THALLIUM	0.0011	Below	Below	Below	6394515
VANADIUM	0.0000	Below	Below	Below	6394515
ZINC	0.0014	Below	Below	Below	6394515
ACETONE	221.3101	Exceeds	Below	Below	6394515
CARBON DISULFIDE	0.7731	Exceeds	Exceeds	Below	6394515
PYRENE	0.0000	Below	Below	Below	6394515
4,4'-DDD	0.0000	Below	Below	Below	6394515
4,4'-DDE	0.0000	Below	Below	Below	6394515
4,4'-DDT	0.0000	Below	Below	Below	6394515
AROCLOR-1254	0.0000	Below	Below	Below	6394515
DIELDRIN	0.0000	Below	Below	Below	6394515
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6394515
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6394515

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.49	2129498.365	2129498.355
ANTIMONY	88.88928987	88.86539508	88.86337036
ARSENIC	813.9822386	813.9800952	813.9799136
BERYLLIUM	0.19259361	0.192587789	0.192587296
CADMIUM	96.79681262	96.79656993	96.79654937
CHROMIUM	8772.984275	8772.981734	8772.981519
COBALT	5.296061186	5.294637525	5.294516891
COPPER	3659804.145	3659803.274	3659803.2
IRON	3021073.013	3021064.554	3021063.838
LEAD	29849.36467	29849.3311	29849.32825
MANGANESE	9380.667981	9380.617208	9380.612906
MERCURY	475.3862875	475.3845447	475.384397
NICKEL	14836.16108	14836.11553	14836.11167
SELENIUM	0.468371609	0.467282269	0.467189964
SILVER	141.9864015	141.9840726	141.9838752
THALLIUM	3.3291131	3.328544853	3.328496703
VANADIUM	18.2950458	18.29482343	18.29480458
ZINC	303913.5229	303913.3304	303913.3141
ACETONE	2.104347005	2.014190189	2.006550767
CARBON DISULFIDE	0.003342284	0.003183304	0.003169832
PYRENE	2.580540965	2.580525107	2.580523763
4,4'-DDD	0.009507185	0.009507158	0.009507156
4,4'-DDE	0.040745077	0.040744963	0.040744953
4,4'-DDT	0.135816659	0.135816396	0.135816374
AROCLOR-1254	0.038028981	0.038028767	0.038028749
DIELDRIN	0.021732537	0.021731663	0.021731589
ENDOSULFAN SULFATE	0.002988947	0.002988505	0.002988468
ENDRIN ALDEHYDE	0.001276698	0.001276686	0.001276685

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	16029962	1650.9303
ANTIMONY	1	45	31777.7778	NA	226	14	16029962	2713.5982
ARSENIC	1	4617	2837.9310	NA	146	14	16029962	242.3393
BERYLLIUM	1	402	7.7114	NA	2011	14	16029962	0.6585
CADMIUM	1	4849	321.3333	NA	376	14	16029962	27.4396
CHROMIUM	1	41971	3364.7059	NA	4251	14	16029962	287.3222
COBALT	1	45	1893.3333	NA	226	14	16029962	161.6773
COPPER	1	51038	1154285.7143	NA	176	14	16029962	98567.8612
IRON	1	4342	11200000.0000	NA	126	14	16029962	956401.0293
LEAD	1	10811	44444.4444	NA	4501	14	16029962	3795.2422
MANGANESE	1	2246	67230.7692	NA	326	14	16029962	5741.0337
MERCURY	1	3316	2307.6923	NA	261	14	16029962	197.0607
NICKEL	1	3960	60307.6923	NA	326	14	16029962	5149.8517
SELENIUM	1	5	1500.0000	NA	26	14	16029962	128.0894
SILVER	1	741	3084.3373	NA	42.5	14	16029962	263.3807
THALLIUM	1	71	50.7042	NA	356	14	16029962	4.3298
VANADIUM	1	1000	109.0000	NA	5001	14	16029962	9.3078
ZINC	1	19197	254838.7097	NA	311	14	16029962	21761.4289
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	16029962	46301.3666
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	16029962	144.1121
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	16029962	1.7931
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	16029962	0.0030
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	16029962	0.0129
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	16029962	0.0297
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	16029962	0.0242
DIELDRIN	1	302.1	1.1579	NA	691.908	14	16029962	0.0989
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	16029962	0.0500
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	16029962	0.0014

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.24	NA	14500	0.0346	1035566
ANTIMONY	2713.598158	Leach	2.24	NA	2713.598158	0.0346	226
ARSENIC	242.3393002	Leach	2.24	NA	242.3393002	0.0346	23086
BERYLLIUM	0.658502841	Leach	2.24	NA	0.658502841	0.0346	2011
CADMIUM	27.43960096	Leach	2.24	NA	27.43960096	0.0346	24246
CHROMIUM	287.322158	Leach	2.24	NA	287.322158	0.0346	209856
COBALT	161.6773169	Leach	2.24	NA	161.6773169	0.0346	226
COPPER	98567.86118	Leach	2.24	NA	98567.86118	0.0346	255191
IRON	956401.0293	Leach	2.24	NA	956401.0293	0.0346	21711
LEAD	3795.24218	Leach	2.24	NA	3795.24218	0.0346	54056
MANGANESE	5741.033651	Leach	2.24	NA	5741.033651	0.0346	11231
MERCURY	197.0606516	Leach	2.24	NA	197.0606516	0.0346	16581
NICKEL	5149.851696	Leach	2.24	NA	5149.851696	0.0346	19801
SELENIUM	128.0894236	Leach	2.24	NA	128.0894236	0.0346	26
SILVER	263.3806621	Leach	2.24	NA	263.3806621	0.0346	3706
THALLIUM	66.1	GW Sample	2.24	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.24	NA	25.8	0.0346	5001
ZINC	21761.42895	Leach	2.24	NA	21761.42895	0.0346	95986
ACETONE	46301.36664	Leach	2.24	0.0004	46294.06749	0.0346	1.2823
CARBON DISULFIDE	144.112065	Leach	2.24	0.0004	143.9489257	0.0346	1.1425
PYRENE	1.793119432	Leach	2.24	NA	1.793119432	0.0346	9891.925
4,4'-DDD	0.003006809	Leach	2.24	NA	0.003006809	0.0346	21732.25
4,4'-DDE	0.012886325	Leach	2.24	NA	0.012886325	0.0346	21732.25
4,4'-DDT	0.029734673	Leach	2.24	NA	0.029734673	0.0346	31393.75
AROCLOR-1254	0.024248461	Leach	2.24	NA	0.024248461	0.0346	10779.7
DIELDRIN	0.098876202	Leach	2.24	NA	0.098876202	0.0346	1511.5
ENDOSULFAN SULFATE	0.050038911	Leach	2.24	NA	0.050038911	0.0346	411.4
ENDRIN ALDEHYDE	0.001368337	Leach	2.24	NA	0.001368337	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0048	0.0027	0.0025	0.0024	0.0003
ANTIMONY	4.1169	2.2872	2.1321	2.0584	0.2287
ARSENIC	0.0036	0.0020	0.0019	0.0018	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
COBALT	0.2453	0.1363	0.1270	0.1226	0.0136
COPPER	0.1324	0.0736	0.0686	0.0662	0.0074
IRON	15.1040	8.3911	7.8223	7.5520	0.8391
LEAD	0.0241	0.0134	0.0125	0.0120	0.0013
MANGANESE	0.1753	0.0974	0.0908	0.0876	0.0097
MERCURY	0.0041	0.0023	0.0021	0.0020	0.0002
NICKEL	0.0892	0.0495	0.0462	0.0446	0.0050
SELENIUM	1.6892	0.9384	0.8748	0.8446	0.0938
SILVER	0.0244	0.0135	0.0126	0.0122	0.0014
THALLIUM	0.0637	0.0354	0.0330	0.0318	0.0035
VANADIUM	0.0018	0.0010	0.0009	0.0009	0.0001
ZINC	0.0777	0.0432	0.0403	0.0389	0.0043
ACETONE	12380.4510	6878.0283	6411.7815	6190.2255	687.8028
CARBON DISULFIDE	43.2490	24.0272	22.3985	21.6245	2.4027
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6576395
ANTIMONY	0.0738	Below	Below	Below	6576395
ARSENIC	0.0001	Below	Below	Below	6576395
BERYLLIUM	0.0000	Below	Below	Below	6576395
CADMIUM	0.0000	Below	Below	Below	6576395
CHROMIUM	0.0000	Below	Below	Below	6576395
COBALT	0.0044	Below	Below	Below	6576395
COPPER	0.0024	Below	Below	Below	6576395
IRON	0.2707	Below	Below	Below	6576395
LEAD	0.0004	Below	Below	Below	6576395
MANGANESE	0.0031	Below	Below	Below	6576395
MERCURY	0.0001	Below	Below	Below	6576395
NICKEL	0.0016	Below	Below	Below	6576395
SELENIUM	0.0303	Below	Below	Below	6576395
SILVER	0.0004	Below	Below	Below	6576395
THALLIUM	0.0011	Below	Below	Below	6576395
VANADIUM	0.0000	Below	Below	Below	6576395
ZINC	0.0014	Below	Below	Below	6576395
ACETONE	221.8476	Exceeds	Below	Below	6576395
CARBON DISULFIDE	0.7750	Exceeds	Exceeds	Below	6576395
PYRENE	0.0000	Below	Below	Below	6576395
4,4'-DDD	0.0000	Below	Below	Below	6576395
4,4'-DDE	0.0000	Below	Below	Below	6576395
4,4'-DDT	0.0000	Below	Below	Below	6576395
AROCLOR-1254	0.0000	Below	Below	Below	6576395
DIELDRIN	0.0000	Below	Below	Below	6576395
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6576395
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6576395

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.498	2129498.37	2129498.359
ANTIMONY	86.64234418	86.61839136	86.61636172
ARSENIC	793.3928599	793.3907114	793.3905293
BERYLLIUM	0.187722358	0.187716522	0.187716028
CADMIUM	94.3483724	94.34812913	94.34810851
CHROMIUM	8551.073611	8551.071064	8551.070848
COBALT	5.16218722	5.1607601	5.160639174
COPPER	3567230.211	3567229.337	3567229.263
IRON	2944656.124	2944647.644	2944646.926
LEAD	29094.33325	29094.29961	29094.29675
MANGANESE	9143.389092	9143.338196	9143.333883
MERCURY	463.3615984	463.3598513	463.3597033
NICKEL	14460.88629	14460.84063	14460.83677
SELENIUM	0.456592197	0.455500211	0.455407682
SILVER	138.3950301	138.3926955	138.3924977
THALLIUM	3.329149466	3.328565057	3.328515537
VANADIUM	18.29506003	18.29483133	18.29481195
ZINC	296226.1052	296225.9123	296225.8959
ACETONE	2.056741149	1.966365357	1.95870738
CARBON DISULFIDE	0.003267651	0.003108285	0.003094781
PYRENE	2.515267704	2.515251808	2.515250461
4,4'-DDD	0.009266704	0.009266677	0.009266675
4,4'-DDE	0.039714446	0.039714331	0.039714322
4,4'-DDT	0.132381221	0.132380958	0.132380935
AROCLOR-1254	0.03706706	0.037066845	0.037066826
DIELDRIN	0.021182872	0.021181996	0.021181921
ENDOSULFAN SULFATE	0.00291337	0.002912927	0.00291289
ENDRIN ALDEHYDE	0.001244405	0.001244393	0.001244392

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	18246627	1465.5731
ANTIMONY	1	45	31777.7778	NA	226	14	18246627	2408.9305
ARSENIC	1	4617	2837.9310	NA	146	14	18246627	215.1308
BERYLLIUM	1	402	7.7114	NA	2011	14	18246627	0.5846
CADMIUM	1	4849	321.3333	NA	376	14	18246627	24.3588
CHROMIUM	1	41971	3364.7059	NA	4251	14	18246627	255.0632
COBALT	1	45	1893.3333	NA	226	14	18246627	143.5251
COPPER	1	51038	1154285.7143	NA	176	14	18246627	87501.2110
IRON	1	4342	11200000.0000	NA	126	14	18246627	849021.6517
LEAD	1	10811	44444.4444	NA	4501	14	18246627	3369.1335
MANGANESE	1	2246	67230.7692	NA	326	14	18246627	5096.4624
MERCURY	1	3316	2307.6923	NA	261	14	18246627	174.9358
NICKEL	1	3960	60307.6923	NA	326	14	18246627	4571.6550
SELENIUM	1	5	1500.0000	NA	26	14	18246627	113.7083
SILVER	1	741	3084.3373	NA	42.5	14	18246627	233.8097
THALLIUM	1	71	50.7042	NA	356	14	18246627	3.8437
VANADIUM	1	1000	109.0000	NA	5001	14	18246627	8.2628
ZINC	1	19197	254838.7097	NA	311	14	18246627	19318.1770
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	18246627	41102.9072
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	18246627	127.9320
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	18246627	1.5918
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	18246627	0.0027
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	18246627	0.0114
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	18246627	0.0264
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	18246627	0.0215
DIELDRIN	1	302.1	1.1579	NA	691.908	14	18246627	0.0878
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	18246627	0.0444
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	18246627	0.0012

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.20	NA	14500	0.0346	1035566
ANTIMONY	2408.93048	Leach	2.20	NA	2408.93048	0.0346	226
ARSENIC	215.1307941	Leach	2.20	NA	215.1307941	0.0346	23086
BERYLLIUM	0.584569812	Leach	2.20	NA	0.584569812	0.0346	2011
CADMIUM	24.35883548	Leach	2.20	NA	24.35883548	0.0346	24246
CHROMIUM	255.0632273	Leach	2.20	NA	255.0632273	0.0346	209856
COBALT	143.5250887	Leach	2.20	NA	143.5250887	0.0346	226
COPPER	87501.21105	Leach	2.20	NA	87501.21105	0.0346	255191
IRON	849021.6517	Leach	2.20	NA	849021.6517	0.0346	21711
LEAD	3369.133539	Leach	2.20	NA	3369.133539	0.0346	54056
MANGANESE	5096.462387	Leach	2.20	NA	5096.462387	0.0346	11231
MERCURY	174.9357799	Leach	2.20	NA	174.9357799	0.0346	16581
NICKEL	4571.655048	Leach	2.20	NA	4571.655048	0.0346	19801
SELENIUM	113.7082569	Leach	2.20	NA	113.7082569	0.0346	26
SILVER	233.8097492	Leach	2.20	NA	233.8097492	0.0346	3706
THALLIUM	66.1	GW Sample	2.20	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.20	NA	25.8	0.0346	5001
ZINC	19318.17698	Leach	2.20	NA	19318.17698	0.0346	95986
ACETONE	41102.90723	Leach	2.20	0.0004	41096.29476	0.0346	1.2823
CARBON DISULFIDE	127.9319654	Leach	2.20	0.0004	127.7841753	0.0346	1.1425
PYRENE	1.591797975	Leach	2.20	NA	1.591797975	0.0346	9891.925
4,4'-DDD	0.002669221	Leach	2.20	NA	0.002669221	0.0346	21732.25
4,4'-DDE	0.01143952	Leach	2.20	NA	0.01143952	0.0346	21732.25
4,4'-DDT	0.026396229	Leach	2.20	NA	0.026396229	0.0346	31393.75
AROCLOR-1254	0.021525979	Leach	2.20	NA	0.021525979	0.0346	10779.7
DIELDRIN	0.087774933	Leach	2.20	NA	0.087774933	0.0346	1511.5
ENDOSULFAN SULFATE	0.044420821	Leach	2.20	NA	0.044420821	0.0346	411.4
ENDRIN ALDEHYDE	0.001214708	Leach	2.20	NA	0.001214708	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0055	0.0030	0.0028	0.0027	0.0003
ANTIMONY	4.1600	2.3111	2.1545	2.0800	0.2311
ARSENIC	0.0036	0.0020	0.0019	0.0018	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
COBALT	0.2479	0.1377	0.1284	0.1239	0.0138
COPPER	0.1338	0.0743	0.0693	0.0669	0.0074
IRON	15.2623	8.4791	7.9043	7.6312	0.8479
LEAD	0.0243	0.0135	0.0126	0.0122	0.0014
MANGANESE	0.1771	0.0984	0.0917	0.0886	0.0098
MERCURY	0.0041	0.0023	0.0021	0.0021	0.0002
NICKEL	0.0901	0.0501	0.0467	0.0451	0.0050
SELENIUM	1.7069	0.9483	0.8840	0.8534	0.0948
SILVER	0.0246	0.0137	0.0128	0.0123	0.0014
THALLIUM	0.0725	0.0403	0.0375	0.0362	0.0040
VANADIUM	0.0020	0.0011	0.0010	0.0010	0.0001
ZINC	0.0785	0.0436	0.0407	0.0393	0.0044
ACETONE	12510.2301	6950.1278	6478.9935	6255.1151	695.0128
CARBON DISULFIDE	43.7024	24.2791	22.6333	21.8512	2.4279
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	7485796
ANTIMONY	0.0745	Below	Below	Below	7485796
ARSENIC	0.0001	Below	Below	Below	7485796
BERYLLIUM	0.0000	Below	Below	Below	7485796
CADMIUM	0.0000	Below	Below	Below	7485796
CHROMIUM	0.0000	Below	Below	Below	7485796
COBALT	0.0044	Below	Below	Below	7485796
COPPER	0.0024	Below	Below	Below	7485796
IRON	0.2735	Below	Below	Below	7485796
LEAD	0.0004	Below	Below	Below	7485796
MANGANESE	0.0032	Below	Below	Below	7485796
MERCURY	0.0001	Below	Below	Below	7485796
NICKEL	0.0016	Below	Below	Below	7485796
SELENIUM	0.0306	Below	Below	Below	7485796
SILVER	0.0004	Below	Below	Below	7485796
THALLIUM	0.0013	Below	Below	Below	7485796
VANADIUM	0.0000	Below	Below	Below	7485796
ZINC	0.0014	Below	Below	Below	7485796
ACETONE	224.1732	Exceeds	Below	Below	7485796
CARBON DISULFIDE	0.7831	Exceeds	Exceeds	Below	7485796
PYRENE	0.0000	Below	Below	Below	7485796
4,4'-DDD	0.0000	Below	Below	Below	7485796
4,4'-DDE	0.0000	Below	Below	Below	7485796
4,4'-DDT	0.0000	Below	Below	Below	7485796
AROCLOR-1254	0.0000	Below	Below	Below	7485796
DIELDRIN	0.0000	Below	Below	Below	7485796
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	7485796
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	7485796

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.538	2129498.392	2129498.38
ANTIMONY	76.92124048	76.89703657	76.89498566
ARSENIC	704.3157246	704.3135536	704.3133696
BERYLLIUM	0.166647549	0.166641653	0.166641153
CADMIUM	83.75553015	83.75528432	83.75526349
CHROMIUM	7591.007425	7591.004851	7591.004633
COBALT	4.582999782	4.581557703	4.581435509
COPPER	3166721.724	3166720.841	3166720.767
IRON	2614048.887	2614040.319	2614039.593
LEAD	25827.79295	25827.75895	25827.75607
MANGANESE	8116.834379	8116.782949	8116.778591
MERCURY	411.338423	411.3366576	411.336508
NICKEL	12837.31118	12837.26504	12837.26113
SELENIUM	0.40563018	0.404526747	0.404433248
SILVER	122.8574522	122.8550932	122.8548933
THALLIUM	3.329331296	3.328666074	3.328609706
VANADIUM	18.29513119	18.29487086	18.29484881
ZINC	262967.5423	262967.3473	262967.3308
ACETONE	1.850778487	1.759455323	1.75171707
CARBON DISULFIDE	0.002944735	0.002783698	0.002770052
PYRENE	2.232871855	2.232855792	2.232854431
4,4'-DDD	0.008226297	0.008226271	0.008226268
4,4'-DDE	0.03525556	0.035255445	0.035255435
4,4'-DDT	0.117518268	0.117518002	0.11751798
AROCLOR-1254	0.032905436	0.032905219	0.0329052
DIELDRIN	0.018804819	0.018803934	0.018803859
ENDOSULFAN SULFATE	0.002586395	0.002585948	0.00258591
ENDRIN ALDEHYDE	0.001104694	0.001104681	0.00110468

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	18985515	1412.7030
ANTIMONY	1	45	31777.7778	NA	226	14	18985515	2322.0290
ARSENIC	1	4617	2837.9310	NA	146	14	18985515	207.3700
BERYLLIUM	1	402	7.7114	NA	2011	14	18985515	0.5635
CADMIUM	1	4849	321.3333	NA	376	14	18985515	23.4801
CHROMIUM	1	41971	3364.7059	NA	4251	14	18985515	245.8619
COBALT	1	45	1893.3333	NA	226	14	18985515	138.3475
COPPER	1	51038	1154285.7143	NA	176	14	18985515	84344.6308
IRON	1	4342	11200000.0000	NA	126	14	18985515	818393.4471
LEAD	1	10811	44444.4444	NA	4501	14	18985515	3247.5930
MANGANESE	1	2246	67230.7692	NA	326	14	18985515	4912.6090
MERCURY	1	3316	2307.6923	NA	261	14	18985515	168.6250
NICKEL	1	3960	60307.6923	NA	326	14	18985515	4406.7339
SELENIUM	1	5	1500.0000	NA	26	14	18985515	109.6063
SILVER	1	741	3084.3373	NA	42.5	14	18985515	225.3751
THALLIUM	1	71	50.7042	NA	356	14	18985515	3.7050
VANADIUM	1	1000	109.0000	NA	5001	14	18985515	7.9647
ZINC	1	19197	254838.7097	NA	311	14	18985515	18621.2795
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	18985515	39620.1320
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	18985515	123.3169
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	18985515	1.5344
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	18985515	0.0026
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	18985515	0.0110
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	18985515	0.0254
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	18985515	0.0207
DIELDRIN	1	302.1	1.1579	NA	691.908	14	18985515	0.0846
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	18985515	0.0428
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	18985515	0.0012

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.74	NA	14500	0.0346	1035566
ANTIMONY	2322.029026	Leach	2.74	NA	2322.029026	0.0346	226
ARSENIC	207.3700145	Leach	2.74	NA	207.3700145	0.0346	23086
BERYLLIUM	0.563481629	Leach	2.74	NA	0.563481629	0.0346	2011
CADMIUM	23.48009771	Leach	2.74	NA	23.48009771	0.0346	24246
CHROMIUM	245.8618969	Leach	2.74	NA	245.8618969	0.0346	209856
COBALT	138.3474637	Leach	2.74	NA	138.3474637	0.0346	226
COPPER	84344.63077	Leach	2.74	NA	84344.63077	0.0346	255191
IRON	818393.4471	Leach	2.74	NA	818393.4471	0.0346	21711
LEAD	3247.593044	Leach	2.74	NA	3247.593044	0.0346	54056
MANGANESE	4912.609016	Leach	2.74	NA	4912.609016	0.0346	11231
MERCURY	168.6250234	Leach	2.74	NA	168.6250234	0.0346	16581
NICKEL	4406.733946	Leach	2.74	NA	4406.733946	0.0346	19801
SELENIUM	109.6062652	Leach	2.74	NA	109.6062652	0.0346	26
SILVER	225.3751317	Leach	2.74	NA	225.3751317	0.0346	3706
THALLIUM	66.1	GW Sample	2.74	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.74	NA	25.8	0.0346	5001
ZINC	18621.27947	Leach	2.74	NA	18621.27947	0.0346	95986
ACETONE	39620.13202	Leach	2.74	0.0003	39615.02023	0.0346	1.2823
CARBON DISULFIDE	123.3168577	Leach	2.74	0.0003	123.2025966	0.0346	1.1425
PYRENE	1.534374334	Leach	2.74	NA	1.534374334	0.0346	9891.925
4,4'-DDD	0.00257293	Leach	2.74	NA	0.00257293	0.0346	21732.25
4,4'-DDE	0.011026843	Leach	2.74	NA	0.011026843	0.0346	21732.25
4,4'-DDT	0.025443993	Leach	2.74	NA	0.025443993	0.0346	31393.75
AROCLOR-1254	0.020749435	Leach	2.74	NA	0.020749435	0.0346	10779.7
DIELDRIN	0.084608479	Leach	2.74	NA	0.084608479	0.0346	1511.5
ENDOSULFAN SULFATE	0.042818353	Leach	2.74	NA	0.042818353	0.0346	411.4
ENDRIN ALDEHYDE	0.001170887	Leach	2.74	NA	0.001170887	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0057	0.0032	0.0029	0.0028	0.0003
ANTIMONY	4.1724	2.3180	2.1608	2.0862	0.2318
ARSENIC	0.0036	0.0020	0.0019	0.0018	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
COBALT	0.2486	0.1381	0.1287	0.1243	0.0138
COPPER	0.1342	0.0746	0.0695	0.0671	0.0075
IRON	15.3075	8.5042	7.9277	7.6538	0.8504
LEAD	0.0244	0.0136	0.0126	0.0122	0.0014
MANGANESE	0.1776	0.0987	0.0920	0.0888	0.0099
MERCURY	0.0041	0.0023	0.0021	0.0021	0.0002
NICKEL	0.0904	0.0502	0.0468	0.0452	0.0050
SELENIUM	1.7119	0.9511	0.8866	0.8560	0.0951
SILVER	0.0247	0.0137	0.0128	0.0123	0.0014
THALLIUM	0.0754	0.0419	0.0390	0.0377	0.0042
VANADIUM	0.0021	0.0012	0.0011	0.0010	0.0001
ZINC	0.0788	0.0438	0.0408	0.0394	0.0044
ACETONE	12547.2475	6970.6930	6498.1646	6273.6237	697.0693
CARBON DISULFIDE	43.8317	24.3510	22.7003	21.9159	2.4351
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	7788929
ANTIMONY	0.0748	Below	Below	Below	7788929
ARSENIC	0.0001	Below	Below	Below	7788929
BERYLLIUM	0.0000	Below	Below	Below	7788929
CADMIUM	0.0000	Below	Below	Below	7788929
CHROMIUM	0.0000	Below	Below	Below	7788929
COBALT	0.0045	Below	Below	Below	7788929
COPPER	0.0024	Below	Below	Below	7788929
IRON	0.2743	Below	Below	Below	7788929
LEAD	0.0004	Below	Below	Below	7788929
MANGANESE	0.0032	Below	Below	Below	7788929
MERCURY	0.0001	Below	Below	Below	7788929
NICKEL	0.0016	Below	Below	Below	7788929
SELENIUM	0.0307	Below	Below	Below	7788929
SILVER	0.0004	Below	Below	Below	7788929
THALLIUM	0.0014	Below	Below	Below	7788929
VANADIUM	0.0000	Below	Below	Below	7788929
ZINC	0.0014	Below	Below	Below	7788929
ACETONE	224.8365	Exceeds	Below	Below	7788929
CARBON DISULFIDE	0.7854	Exceeds	Exceeds	Below	7788929
PYRENE	0.0000	Below	Below	Below	7788929
4,4'-DDD	0.0000	Below	Below	Below	7788929
4,4'-DDE	0.0000	Below	Below	Below	7788929
4,4'-DDT	0.0000	Below	Below	Below	7788929
AROCLOR-1254	0.0000	Below	Below	Below	7788929
DIELDRIN	0.0000	Below	Below	Below	7788929
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	7788929
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	7788929

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.552	2129498.399	2129498.387
ANTIMONY	74.14845524	74.12417971	74.12212273
ARSENIC	678.9079341	678.9057566	678.9055721
BERYLLIUM	0.160636306	0.160630392	0.160629891
CADMIUM	80.73409579	80.73384924	80.73382835
CHROMIUM	7317.164306	7317.161725	7317.161506
COBALT	4.417796074	4.416349728	4.416227172
COPPER	3052483.254	3052482.368	3052482.293
IRON	2519748.6	2519740.006	2519739.278
LEAD	24896.06596	24896.03186	24896.02897
MANGANESE	7824.0265	7823.974917	7823.970546
MERCURY	396.4996663	396.4978957	396.4977456
NICKEL	12374.21303	12374.16676	12374.16284
SELENIUM	0.391094101	0.389987403	0.389893628
SILVER	118.4256132	118.4232472	118.4230467
THALLIUM	3.329391906	3.328699746	3.328641096
VANADIUM	18.29515491	18.29488404	18.29486109
ZINC	253481.0832	253480.8877	253480.8711
ACETONE	1.792083257	1.700489871	1.692728721
CARBON DISULFIDE	0.002853217	0.002691704	0.002678018
PYRENE	2.152323075	2.152306964	2.152305599
4,4'-DDD	0.007929539	0.007929512	0.007929509
4,4'-DDE	0.033983737	0.033983621	0.033983611
4,4'-DDT	0.113278855	0.113278588	0.113278565
AROCLOR-1254	0.031718401	0.031718183	0.031718165
DIELDRIN	0.018126518	0.01812563	0.018125555
ENDOSULFAN SULFATE	0.002493131	0.002492682	0.002492644
ENDRIN ALDEHYDE	0.001064843	0.001064831	0.00106483

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	0.01	207113	19333.3333	NA	7501	14	16768850.56	1584.1458
ANTIMONY	0.01	45	31777.7778	NA	226	14	16768850.56	2603.8258
ARSENIC	0.01	4617	2837.9310	NA	146	14	16768850.56	232.5360
BERYLLIUM	0.01	402	7.7114	NA	2011	14	16768850.56	0.6319
CADMIUM	0.01	4849	321.3333	NA	376	14	16768850.56	26.3296
CHROMIUM	0.01	41971	3364.7059	NA	4251	14	16768850.56	275.6992
COBALT	0.01	45	1893.3333	NA	226	14	16768850.56	155.1370
COPPER	0.01	51038	1154285.7143	NA	176	14	16768850.56	94580.5262
IRON	0.01	4342	11200000.0000	NA	126	14	16768850.56	917712.0366
LEAD	0.01	10811	44444.4444	NA	4501	14	16768850.56	3641.7144
MANGANESE	0.01	2246	67230.7692	NA	326	14	16768850.56	5508.7934
MERCURY	0.01	3316	2307.6923	NA	261	14	16768850.56	189.0890
NICKEL	0.01	3960	60307.6923	NA	326	14	16768850.56	4941.5264
SELENIUM	0.01	5	1500.0000	NA	26	14	16768850.56	122.9079
SILVER	0.01	741	3084.3373	NA	42.5	14	16768850.56	252.7262
THALLIUM	0.01	71	50.7042	NA	356	14	16768850.56	4.1546
VANADIUM	0.01	1000	109.0000	NA	5001	14	16768850.56	8.9313
ZINC	0.01	19197	254838.7097	NA	311	14	16768850.56	20881.1206
ACETONE	0.01	0.05646	542215.3369	0.3808	1.1291	14	16768850.56	44428.3519
CARBON DISULFIDE	0.01	0.0285	1687.6342	2.9000	1.06518	14	16768850.56	138.2823
PYRENE	0.01	1978.185	20.9984	NA	4525.1438	14	16768850.56	1.7206
4,4'-DDD	0.01	4346.25	0.0352	NA	9940.95	14	16768850.56	0.0029
4,4'-DDE	0.01	4346.25	0.1509	NA	9940.95	14	16768850.56	0.0124
4,4'-DDT	0.01	6278.55	0.3482	NA	14360.154	14	16768850.56	0.0285
AROCLOR-1254	0.01	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	0.01	302.1	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	0.01	82.08	0.5860	NA	188.7184	14	16768850.56	0.0480
ENDRIN ALDEHYDE	0.01	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0013

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	2603.825818	Leach	2.22	NA	2603.825818	0.0346	226
ARSENIC	232.536024	Leach	2.22	NA	232.536024	0.0346	23086
BERYLLIUM	0.631864631	Leach	2.22	NA	0.631864631	0.0346	2011
CADMIUM	26.32959533	Leach	2.22	NA	26.32959533	0.0346	24246
CHROMIUM	275.6992043	Leach	2.22	NA	275.6992043	0.0346	209856
COBALT	155.1370348	Leach	2.22	NA	155.1370348	0.0346	226
COPPER	94580.52622	Leach	2.22	NA	94580.52622	0.0346	255191
IRON	917712.0366	Leach	2.22	NA	917712.0366	0.0346	21711
LEAD	3641.714431	Leach	2.22	NA	3641.714431	0.0346	54056
MANGANESE	5508.793406	Leach	2.22	NA	5508.793406	0.0346	11231
MERCURY	189.0890185	Leach	2.22	NA	189.0890185	0.0346	16581
NICKEL	4941.526351	Leach	2.22	NA	4941.526351	0.0346	19801
SELENIUM	122.907862	Leach	2.22	NA	122.907862	0.0346	26
SILVER	252.7262063	Leach	2.22	NA	252.7262063	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	20881.12065	Leach	2.22	NA	20881.12065	0.0346	95986
ACETONE	44428.35189	Leach	2.22	0.0000	44428.28124	0.0346	1.2823
CARBON DISULFIDE	138.2823445	Leach	2.22	0.0000	138.2807649	0.0346	1.1425
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	9891.925
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	21732.25
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	21732.25
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	31393.75
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	10779.7
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	1511.5
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	411.4
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	4.1324	2.2958	2.1402	2.0662	0.2296
ARSENIC	0.0036	0.0020	0.0019	0.0018	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
COBALT	0.2462	0.1368	0.1275	0.1231	0.0137
COPPER	0.1329	0.0739	0.0688	0.0665	0.0074
IRON	15.1611	8.4228	7.8518	7.5805	0.8423
LEAD	0.0242	0.0134	0.0125	0.0121	0.0013
MANGANESE	0.1759	0.0977	0.0911	0.0880	0.0098
MERCURY	0.0041	0.0023	0.0021	0.0020	0.0002
NICKEL	0.0895	0.0497	0.0464	0.0448	0.0050
SELENIUM	1.6955	0.9420	0.8781	0.8478	0.0942
SILVER	0.0245	0.0136	0.0127	0.0122	0.0014
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0780	0.0433	0.0404	0.0390	0.0043
ACETONE	12427.2107	6904.0059	6435.9981	6213.6053	690.4006
CARBON DISULFIDE	43.4124	24.1180	22.4831	21.7062	2.4118
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0740	Below	Below	Below	6879528
ARSENIC	0.0001	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0044	Below	Below	Below	6879528
COPPER	0.0024	Below	Below	Below	6879528
IRON	0.2717	Below	Below	Below	6879528
LEAD	0.0004	Below	Below	Below	6879528
MANGANESE	0.0032	Below	Below	Below	6879528
MERCURY	0.0001	Below	Below	Below	6879528
NICKEL	0.0016	Below	Below	Below	6879528
SELENIUM	0.0304	Below	Below	Below	6879528
SILVER	0.0004	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0014	Below	Below	Below	6879528
ACETONE	222.6855	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.7779	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	83.13981214	83.11576885	83.11373155
ARSENIC	761.2981997	761.296043	761.2958603
BERYLLIUM	0.180129065	0.180123207	0.180122711
CADMIUM	90.53175131	90.53150712	90.53148643
CHROMIUM	8205.159949	8205.157392	8205.157176
COBALT	4.953504891	4.952072382	4.951950998
COPPER	3422926.246	3422925.369	3422925.295
IRON	2825537.711	2825529.2	2825528.479
LEAD	27917.39261	27917.35883	27917.35597
MANGANESE	8773.519489	8773.4684	8773.464071
MERCURY	444.61755	444.6157963	444.6156477
NICKEL	13875.90911	13875.86328	13875.8594
SELENIUM	0.438230486	0.437134376	0.437041497
SILVER	132.7968114	132.794468	132.7942695
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	284242.9821	284242.7884	284242.772
ACETONE	1.982811902	1.892094771	1.88440787
CARBON DISULFIDE	0.003154457	0.002994489	0.002980934
PYRENE	2.413519946	2.413503989	2.413502637
4,4'-DDD	0.008891844	0.008891817	0.008891814
4,4'-DDE	0.038107901	0.038107786	0.038107776
4,4'-DDT	0.127026071	0.127025807	0.127025784
AROCLOR-1254	0.035567619	0.035567403	0.035567385
DIELDRIN	0.020326055	0.020325175	0.020325101
ENDOSULFAN SULFATE	0.00279556	0.002795116	0.002795078
ENDRIN ALDEHYDE	0.001194067	0.001194055	0.001194054

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	0.1	207113	19333.3333	NA	7501	14	16768850.56	1584.1458
ANTIMONY	0.1	45	31777.7778	NA	226	14	16768850.56	2603.8258
ARSENIC	0.1	4617	2837.9310	NA	146	14	16768850.56	232.5360
BERYLLIUM	0.1	402	7.7114	NA	2011	14	16768850.56	0.6319
CADMIUM	0.1	4849	321.3333	NA	376	14	16768850.56	26.3296
CHROMIUM	0.1	41971	3364.7059	NA	4251	14	16768850.56	275.6992
COBALT	0.1	45	1893.3333	NA	226	14	16768850.56	155.1370
COPPER	0.1	51038	1154285.7143	NA	176	14	16768850.56	94580.5262
IRON	0.1	4342	11200000.0000	NA	126	14	16768850.56	917712.0366
LEAD	0.1	10811	44444.4444	NA	4501	14	16768850.56	3641.7144
MANGANESE	0.1	2246	67230.7692	NA	326	14	16768850.56	5508.7934
MERCURY	0.1	3316	2307.6923	NA	261	14	16768850.56	189.0890
NICKEL	0.1	3960	60307.6923	NA	326	14	16768850.56	4941.5264
SELENIUM	0.1	5	1500.0000	NA	26	14	16768850.56	122.9079
SILVER	0.1	741	3084.3373	NA	42.5	14	16768850.56	252.7262
THALLIUM	0.1	71	50.7042	NA	356	14	16768850.56	4.1546
VANADIUM	0.1	1000	109.0000	NA	5001	14	16768850.56	8.9313
ZINC	0.1	19197	254838.7097	NA	311	14	16768850.56	20881.1206
ACETONE	0.1	0.05646	542215.3369	0.3808	1.1291	14	16768850.56	44428.3519
CARBON DISULFIDE	0.1	0.0285	1687.6342	2.9000	1.06518	14	16768850.56	138.2823
PYRENE	0.1	1978.185	20.9984	NA	4525.1438	14	16768850.56	1.7206
4,4'-DDD	0.1	4346.25	0.0352	NA	9940.95	14	16768850.56	0.0029
4,4'-DDE	0.1	4346.25	0.1509	NA	9940.95	14	16768850.56	0.0124
4,4'-DDT	0.1	6278.55	0.3482	NA	14360.154	14	16768850.56	0.0285
AROCLOR-1254	0.1	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	0.1	302.1	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	0.1	82.08	0.5860	NA	188.7184	14	16768850.56	0.0480
ENDRIN ALDEHYDE	0.1	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0013

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	2603.825818	Leach	2.22	NA	2603.825818	0.0346	226
ARSENIC	232.536024	Leach	2.22	NA	232.536024	0.0346	23086
BERYLLIUM	0.631864631	Leach	2.22	NA	0.631864631	0.0346	2011
CADMIUM	26.32959533	Leach	2.22	NA	26.32959533	0.0346	24246
CHROMIUM	275.6992043	Leach	2.22	NA	275.6992043	0.0346	209856
COBALT	155.1370348	Leach	2.22	NA	155.1370348	0.0346	226
COPPER	94580.52622	Leach	2.22	NA	94580.52622	0.0346	255191
IRON	917712.0366	Leach	2.22	NA	917712.0366	0.0346	21711
LEAD	3641.714431	Leach	2.22	NA	3641.714431	0.0346	54056
MANGANESE	5508.793406	Leach	2.22	NA	5508.793406	0.0346	11231
MERCURY	189.0890185	Leach	2.22	NA	189.0890185	0.0346	16581
NICKEL	4941.526351	Leach	2.22	NA	4941.526351	0.0346	19801
SELENIUM	122.907862	Leach	2.22	NA	122.907862	0.0346	26
SILVER	252.7262063	Leach	2.22	NA	252.7262063	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	20881.12065	Leach	2.22	NA	20881.12065	0.0346	95986
ACETONE	44428.35189	Leach	2.22	0.0000	44427.64546	0.0346	1.2823
CARBON DISULFIDE	138.2823445	Leach	2.22	0.0000	138.2665486	0.0346	1.1425
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	9891.925
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	21732.25
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	21732.25
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	31393.75
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	10779.7
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	1511.5
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	411.4
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	4.1324	2.2958	2.1402	2.0662	0.2296
ARSENIC	0.0036	0.0020	0.0019	0.0018	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
COBALT	0.2462	0.1368	0.1275	0.1231	0.0137
COPPER	0.1329	0.0739	0.0688	0.0665	0.0074
IRON	15.1611	8.4228	7.8518	7.5805	0.8423
LEAD	0.0242	0.0134	0.0125	0.0121	0.0013
MANGANESE	0.1759	0.0977	0.0911	0.0880	0.0098
MERCURY	0.0041	0.0023	0.0021	0.0020	0.0002
NICKEL	0.0895	0.0497	0.0464	0.0448	0.0050
SELENIUM	1.6955	0.9420	0.8781	0.8478	0.0942
SILVER	0.0245	0.0136	0.0127	0.0122	0.0014
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0780	0.0433	0.0404	0.0390	0.0043
ACETONE	12427.2107	6904.0059	6435.9981	6213.6053	690.4006
CARBON DISULFIDE	43.4124	24.1180	22.4831	21.7062	2.4118
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0740	Below	Below	Below	6879528
ARSENIC	0.0001	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0044	Below	Below	Below	6879528
COPPER	0.0024	Below	Below	Below	6879528
IRON	0.2717	Below	Below	Below	6879528
LEAD	0.0004	Below	Below	Below	6879528
MANGANESE	0.0032	Below	Below	Below	6879528
MERCURY	0.0001	Below	Below	Below	6879528
NICKEL	0.0016	Below	Below	Below	6879528
SELENIUM	0.0304	Below	Below	Below	6879528
SILVER	0.0004	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0014	Below	Below	Below	6879528
ACETONE	222.6855	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.7779	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	83.13981214	83.11576885	83.11373155
ARSENIC	761.2981997	761.296043	761.2958603
BERYLLIUM	0.180129065	0.180123207	0.180122711
CADMIUM	90.53175131	90.53150712	90.53148643
CHROMIUM	8205.159949	8205.157392	8205.157176
COBALT	4.953504891	4.952072382	4.951950998
COPPER	3422926.246	3422925.369	3422925.295
IRON	2825537.711	2825529.2	2825528.479
LEAD	27917.39261	27917.35883	27917.35597
MANGANESE	8773.519489	8773.4684	8773.464071
MERCURY	444.61755	444.6157963	444.6156477
NICKEL	13875.90911	13875.86328	13875.8594
SELENIUM	0.438230486	0.437134376	0.437041497
SILVER	132.7968114	132.794468	132.7942695
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	284242.9821	284242.7884	284242.772
ACETONE	1.982786449	1.892069317	1.884382416
CARBON DISULFIDE	0.003154169	0.002994201	0.002980646
PYRENE	2.413519946	2.413503989	2.413502637
4,4'-DDD	0.008891844	0.008891817	0.008891814
4,4'-DDE	0.038107901	0.038107786	0.038107776
4,4'-DDT	0.127026071	0.127025807	0.127025784
AROCLOR-1254	0.035567619	0.035567403	0.035567385
DIELDRIN	0.020326055	0.020325175	0.020325101
ENDOSULFAN SULFATE	0.00279556	0.002795116	0.002795078
ENDRIN ALDEHYDE	0.001194067	0.001194055	0.001194054

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	10	207113	19333.3333	NA	7501	14	16768850.56	1584.1458
ANTIMONY	10	45	31777.7778	NA	226	14	16768850.56	2603.8258
ARSENIC	10	4617	2837.9310	NA	146	14	16768850.56	232.5360
BERYLLIUM	10	402	7.7114	NA	2011	14	16768850.56	0.6319
CADMIUM	10	4849	321.3333	NA	376	14	16768850.56	26.3296
CHROMIUM	10	41971	3364.7059	NA	4251	14	16768850.56	275.6992
COBALT	10	45	1893.3333	NA	226	14	16768850.56	155.1370
COPPER	10	51038	1154285.7143	NA	176	14	16768850.56	94580.5262
IRON	10	4342	11200000.0000	NA	126	14	16768850.56	917712.0366
LEAD	10	10811	44444.4444	NA	4501	14	16768850.56	3641.7144
MANGANESE	10	2246	67230.7692	NA	326	14	16768850.56	5508.7934
MERCURY	10	3316	2307.6923	NA	261	14	16768850.56	189.0890
NICKEL	10	3960	60307.6923	NA	326	14	16768850.56	4941.5264
SELENIUM	10	5	1500.0000	NA	26	14	16768850.56	122.9079
SILVER	10	741	3084.3373	NA	42.5	14	16768850.56	252.7262
THALLIUM	10	71	50.7042	NA	356	14	16768850.56	4.1546
VANADIUM	10	1000	109.0000	NA	5001	14	16768850.56	8.9313
ZINC	10	19197	254838.7097	NA	311	14	16768850.56	20881.1206
ACETONE	10	0.05646	542215.3369	0.3808	1.1291	14	16768850.56	44428.3519
CARBON DISULFIDE	10	0.0285	1687.6342	2.9000	1.06518	14	16768850.56	138.2823
PYRENE	10	1978.185	20.9984	NA	4525.1438	14	16768850.56	1.7206
4,4'-DDD	10	4346.25	0.0352	NA	9940.95	14	16768850.56	0.0029
4,4'-DDE	10	4346.25	0.1509	NA	9940.95	14	16768850.56	0.0124
4,4'-DDT	10	6278.55	0.3482	NA	14360.154	14	16768850.56	0.0285
AROCLOR-1254	10	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	10	302.1	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	10	82.08	0.5860	NA	188.7184	14	16768850.56	0.0480
ENDRIN ALDEHYDE	10	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0013

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	2603.825818	Leach	2.22	NA	2603.825818	0.0346	226
ARSENIC	232.536024	Leach	2.22	NA	232.536024	0.0346	23086
BERYLLIUM	0.631864631	Leach	2.22	NA	0.631864631	0.0346	2011
CADMIUM	26.32959533	Leach	2.22	NA	26.32959533	0.0346	24246
CHROMIUM	275.6992043	Leach	2.22	NA	275.6992043	0.0346	209856
COBALT	155.1370348	Leach	2.22	NA	155.1370348	0.0346	226
COPPER	94580.52622	Leach	2.22	NA	94580.52622	0.0346	255191
IRON	917712.0366	Leach	2.22	NA	917712.0366	0.0346	21711
LEAD	3641.714431	Leach	2.22	NA	3641.714431	0.0346	54056
MANGANESE	5508.793406	Leach	2.22	NA	5508.793406	0.0346	11231
MERCURY	189.0890185	Leach	2.22	NA	189.0890185	0.0346	16581
NICKEL	4941.526351	Leach	2.22	NA	4941.526351	0.0346	19801
SELENIUM	122.907862	Leach	2.22	NA	122.907862	0.0346	26
SILVER	252.7262063	Leach	2.22	NA	252.7262063	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	20881.12065	Leach	2.22	NA	20881.12065	0.0346	95986
ACETONE	44428.35189	Leach	2.22	0.0042	44357.76455	0.0346	1.2823
CARBON DISULFIDE	138.2823445	Leach	2.22	0.0039	136.7116492	0.0346	1.1425
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	9891.925
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	21732.25
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	21732.25
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	31393.75
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	10779.7
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	1511.5
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	411.4
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	4.1324	2.2958	2.1402	2.0662	0.2296
ARSENIC	0.0036	0.0020	0.0019	0.0018	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
COBALT	0.2462	0.1368	0.1275	0.1231	0.0137
COPPER	0.1329	0.0739	0.0688	0.0665	0.0074
IRON	15.1611	8.4228	7.8518	7.5805	0.8423
LEAD	0.0242	0.0134	0.0125	0.0121	0.0013
MANGANESE	0.1759	0.0977	0.0911	0.0880	0.0098
MERCURY	0.0041	0.0023	0.0021	0.0020	0.0002
NICKEL	0.0895	0.0497	0.0464	0.0448	0.0050
SELENIUM	1.6955	0.9420	0.8781	0.8478	0.0942
SILVER	0.0245	0.0136	0.0127	0.0122	0.0014
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0780	0.0433	0.0404	0.0390	0.0043
ACETONE	12427.2107	6904.0059	6435.9981	6213.6053	690.4006
CARBON DISULFIDE	43.4124	24.1180	22.4831	21.7062	2.4118
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0740	Below	Below	Below	6879528
ARSENIC	0.0001	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0044	Below	Below	Below	6879528
COPPER	0.0024	Below	Below	Below	6879528
IRON	0.2717	Below	Below	Below	6879528
LEAD	0.0004	Below	Below	Below	6879528
MANGANESE	0.0032	Below	Below	Below	6879528
MERCURY	0.0001	Below	Below	Below	6879528
NICKEL	0.0016	Below	Below	Below	6879528
SELENIUM	0.0304	Below	Below	Below	6879528
SILVER	0.0004	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0014	Below	Below	Below	6879528
ACETONE	222.6855	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.7779	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	83.13981214	83.11576885	83.11373155
ARSENIC	761.2981997	761.296043	761.2958603
BERYLLIUM	0.180129065	0.180123207	0.180122711
CADMIUM	90.53175131	90.53150712	90.53148643
CHROMIUM	8205.159949	8205.157392	8205.157176
COBALT	4.953504891	4.952072382	4.951950998
COPPER	3422926.246	3422925.369	3422925.295
IRON	2825537.711	2825529.2	2825528.479
LEAD	27917.39261	27917.35883	27917.35597
MANGANESE	8773.519489	8773.4684	8773.464071
MERCURY	444.61755	444.6157963	444.6156477
NICKEL	13875.90911	13875.86328	13875.8594
SELENIUM	0.438230486	0.437134376	0.437041497
SILVER	132.7968114	132.794468	132.7942695
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	284242.9821	284242.7884	284242.772
ACETONE	1.979988747	1.889271616	1.881584715
CARBON DISULFIDE	0.003122746	0.002962778	0.002949223
PYRENE	2.413519946	2.413503989	2.413502637
4,4'-DDD	0.008891844	0.008891817	0.008891814
4,4'-DDE	0.038107901	0.038107786	0.038107776
4,4'-DDT	0.127026071	0.127025807	0.127025784
AROCLOR-1254	0.035567619	0.035567403	0.035567385
DIELDRIN	0.020326055	0.020325175	0.020325101
ENDOSULFAN SULFATE	0.00279556	0.002795116	0.002795078
ENDRIN ALDEHYDE	0.001194067	0.001194055	0.001194054

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	100	207113	19333.3333	NA	7501	14	16768850.56	1584.1458
ANTIMONY	100	45	31777.7778	NA	226	14	16768850.56	2603.8258
ARSENIC	100	4617	2837.9310	NA	146	14	16768850.56	232.5360
BERYLLIUM	100	402	7.7114	NA	2011	14	16768850.56	0.6319
CADMIUM	100	4849	321.3333	NA	376	14	16768850.56	26.3296
CHROMIUM	100	41971	3364.7059	NA	4251	14	16768850.56	275.6992
COBALT	100	45	1893.3333	NA	226	14	16768850.56	155.1370
COPPER	100	51038	1154285.7143	NA	176	14	16768850.56	94580.5262
IRON	100	4342	11200000.0000	NA	126	14	16768850.56	917712.0366
LEAD	100	10811	44444.4444	NA	4501	14	16768850.56	3641.7144
MANGANESE	100	2246	67230.7692	NA	326	14	16768850.56	5508.7934
MERCURY	100	3316	2307.6923	NA	261	14	16768850.56	189.0890
NICKEL	100	3960	60307.6923	NA	326	14	16768850.56	4941.5264
SELENIUM	100	5	1500.0000	NA	26	14	16768850.56	122.9079
SILVER	100	741	3084.3373	NA	42.5	14	16768850.56	252.7262
THALLIUM	100	71	50.7042	NA	356	14	16768850.56	4.1546
VANADIUM	100	1000	109.0000	NA	5001	14	16768850.56	8.9313
ZINC	100	19197	254838.7097	NA	311	14	16768850.56	20881.1206
ACETONE	100	0.05646	542215.3369	0.3808	1.1291	14	16768850.56	44428.3519
CARBON DISULFIDE	100	0.0285	1687.6342	2.9000	1.06518	14	16768850.56	138.2823
PYRENE	100	1978.185	20.9984	NA	4525.1438	14	16768850.56	1.7206
4,4'-DDD	100	4346.25	0.0352	NA	9940.95	14	16768850.56	0.0029
4,4'-DDE	100	4346.25	0.1509	NA	9940.95	14	16768850.56	0.0124
4,4'-DDT	100	6278.55	0.3482	NA	14360.154	14	16768850.56	0.0285
AROCLOR-1254	100	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	100	302.1	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	100	82.08	0.5860	NA	188.7184	14	16768850.56	0.0480
ENDRIN ALDEHYDE	100	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0013

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	2603.825818	Leach	2.22	NA	2603.825818	0.0346	226
ARSENIC	232.536024	Leach	2.22	NA	232.536024	0.0346	23086
BERYLLIUM	0.631864631	Leach	2.22	NA	0.631864631	0.0346	2011
CADMIUM	26.32959533	Leach	2.22	NA	26.32959533	0.0346	24246
CHROMIUM	275.6992043	Leach	2.22	NA	275.6992043	0.0346	209856
COBALT	155.1370348	Leach	2.22	NA	155.1370348	0.0346	226
COPPER	94580.52622	Leach	2.22	NA	94580.52622	0.0346	255191
IRON	917712.0366	Leach	2.22	NA	917712.0366	0.0346	21711
LEAD	3641.714431	Leach	2.22	NA	3641.714431	0.0346	54056
MANGANESE	5508.793406	Leach	2.22	NA	5508.793406	0.0346	11231
MERCURY	189.0890185	Leach	2.22	NA	189.0890185	0.0346	16581
NICKEL	4941.526351	Leach	2.22	NA	4941.526351	0.0346	19801
SELENIUM	122.907862	Leach	2.22	NA	122.907862	0.0346	26
SILVER	252.7262063	Leach	2.22	NA	252.7262063	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	20881.12065	Leach	2.22	NA	20881.12065	0.0346	95986
ACETONE	44428.35189	Leach	2.22	0.0418	43727.50389	0.0346	1.2823
CARBON DISULFIDE	138.2823445	Leach	2.22	0.0394	123.3543912	0.0346	1.1425
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	9891.925
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	21732.25
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	21732.25
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	31393.75
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	10779.7
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	1511.5
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	411.4
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	4.1324	2.2958	2.1402	2.0662	0.2296
ARSENIC	0.0036	0.0020	0.0019	0.0018	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
COBALT	0.2462	0.1368	0.1275	0.1231	0.0137
COPPER	0.1329	0.0739	0.0688	0.0665	0.0074
IRON	15.1611	8.4228	7.8518	7.5805	0.8423
LEAD	0.0242	0.0134	0.0125	0.0121	0.0013
MANGANESE	0.1759	0.0977	0.0911	0.0880	0.0098
MERCURY	0.0041	0.0023	0.0021	0.0020	0.0002
NICKEL	0.0895	0.0497	0.0464	0.0448	0.0050
SELENIUM	1.6955	0.9420	0.8781	0.8478	0.0942
SILVER	0.0245	0.0136	0.0127	0.0122	0.0014
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0780	0.0433	0.0404	0.0390	0.0043
ACETONE	12427.2107	6904.0059	6435.9981	6213.6053	690.4006
CARBON DISULFIDE	43.4124	24.1180	22.4831	21.7062	2.4118
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0740	Below	Below	Below	6879528
ARSENIC	0.0001	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0044	Below	Below	Below	6879528
COPPER	0.0024	Below	Below	Below	6879528
IRON	0.2717	Below	Below	Below	6879528
LEAD	0.0004	Below	Below	Below	6879528
MANGANESE	0.0032	Below	Below	Below	6879528
MERCURY	0.0001	Below	Below	Below	6879528
NICKEL	0.0016	Below	Below	Below	6879528
SELENIUM	0.0304	Below	Below	Below	6879528
SILVER	0.0004	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0014	Below	Below	Below	6879528
ACETONE	222.6855	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.7779	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	83.13981214	83.11576885	83.11373155
ARSENIC	761.2981997	761.296043	761.2958603
BERYLLIUM	0.180129065	0.180123207	0.180122711
CADMIUM	90.53175131	90.53150712	90.53148643
CHROMIUM	8205.159949	8205.157392	8205.157176
COBALT	4.953504891	4.952072382	4.951950998
COPPER	3422926.246	3422925.369	3422925.295
IRON	2825537.711	2825529.2	2825528.479
LEAD	27917.39261	27917.35883	27917.35597
MANGANESE	8773.519489	8773.4684	8773.464071
MERCURY	444.61755	444.6157963	444.6156477
NICKEL	13875.90911	13875.86328	13875.8594
SELENIUM	0.438230486	0.437134376	0.437041497
SILVER	132.7968114	132.794468	132.7942695
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	284242.9821	284242.7884	284242.772
ACETONE	1.95475609	1.864038958	1.856352057
CARBON DISULFIDE	0.002852808	0.00269284	0.002679285
PYRENE	2.413519946	2.413503989	2.413502637
4,4'-DDD	0.008891844	0.008891817	0.008891814
4,4'-DDE	0.038107901	0.038107786	0.038107776
4,4'-DDT	0.127026071	0.127025807	0.127025784
AROCLOR-1254	0.035567619	0.035567403	0.035567385
DIELDRIN	0.020326055	0.020325175	0.020325101
ENDOSULFAN SULFATE	0.00279556	0.002795116	0.002795078
ENDRIN ALDEHYDE	0.001194067	0.001194055	0.001194054

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	600	207113	19333.3333	NA	7501	14	16768850.56	1584.1458
ANTIMONY	600	45	31777.7778	NA	226	14	16768850.56	2603.8258
ARSENIC	600	4617	2837.9310	NA	146	14	16768850.56	232.5360
BERYLLIUM	600	402	7.7114	NA	2011	14	16768850.56	0.6319
CADMIUM	600	4849	321.3333	NA	376	14	16768850.56	26.3296
CHROMIUM	600	41971	3364.7059	NA	4251	14	16768850.56	275.6992
COBALT	600	45	1893.3333	NA	226	14	16768850.56	155.1370
COPPER	600	51038	1154285.7143	NA	176	14	16768850.56	94580.5262
IRON	600	4342	11200000.0000	NA	126	14	16768850.56	917712.0366
LEAD	600	10811	44444.4444	NA	4501	14	16768850.56	3641.7144
MANGANESE	600	2246	67230.7692	NA	326	14	16768850.56	5508.7934
MERCURY	600	3316	2307.6923	NA	261	14	16768850.56	189.0890
NICKEL	600	3960	60307.6923	NA	326	14	16768850.56	4941.5264
SELENIUM	600	5	1500.0000	NA	26	14	16768850.56	122.9079
SILVER	600	741	3084.3373	NA	42.5	14	16768850.56	252.7262
THALLIUM	600	71	50.7042	NA	356	14	16768850.56	4.1546
VANADIUM	600	1000	109.0000	NA	5001	14	16768850.56	8.9313
ZINC	600	19197	254838.7097	NA	311	14	16768850.56	20881.1206
ACETONE	600	0.05646	542215.3369	0.3808	1.1291	14	16768850.56	44428.3519
CARBON DISULFIDE	600	0.0285	1687.6342	2.9000	1.06518	14	16768850.56	138.2823
PYRENE	600	1978.185	20.9984	NA	4525.1438	14	16768850.56	1.7206
4,4'-DDD	600	4346.25	0.0352	NA	9940.95	14	16768850.56	0.0029
4,4'-DDE	600	4346.25	0.1509	NA	9940.95	14	16768850.56	0.0124
4,4'-DDT	600	6278.55	0.3482	NA	14360.154	14	16768850.56	0.0285
AROCLOR-1254	600	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	600	302.1	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	600	82.08	0.5860	NA	188.7184	14	16768850.56	0.0480
ENDRIN ALDEHYDE	600	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0013

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	2603.825818	Leach	2.22	NA	2603.825818	0.0346	226
ARSENIC	232.536024	Leach	2.22	NA	232.536024	0.0346	23086
BERYLLIUM	0.631864631	Leach	2.22	NA	0.631864631	0.0346	2011
CADMIUM	26.32959533	Leach	2.22	NA	26.32959533	0.0346	24246
CHROMIUM	275.6992043	Leach	2.22	NA	275.6992043	0.0346	209856
COBALT	155.1370348	Leach	2.22	NA	155.1370348	0.0346	226
COPPER	94580.52622	Leach	2.22	NA	94580.52622	0.0346	255191
IRON	917712.0366	Leach	2.22	NA	917712.0366	0.0346	21711
LEAD	3641.714431	Leach	2.22	NA	3641.714431	0.0346	54056
MANGANESE	5508.793406	Leach	2.22	NA	5508.793406	0.0346	11231
MERCURY	189.0890185	Leach	2.22	NA	189.0890185	0.0346	16581
NICKEL	4941.526351	Leach	2.22	NA	4941.526351	0.0346	19801
SELENIUM	122.907862	Leach	2.22	NA	122.907862	0.0346	26
SILVER	252.7262063	Leach	2.22	NA	252.7262063	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	20881.12065	Leach	2.22	NA	20881.12065	0.0346	95986
ACETONE	44428.35189	Leach	2.22	0.2505	40385.65282	0.0346	1.2823
CARBON DISULFIDE	138.2823445	Leach	2.22	0.2364	69.67773346	0.0346	1.1425
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	9891.925
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	21732.25
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	21732.25
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	31393.75
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	10779.7
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	1511.5
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	411.4
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	4.1324	2.2958	2.1402	2.0662	0.2296
ARSENIC	0.0036	0.0020	0.0019	0.0018	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
COBALT	0.2462	0.1368	0.1275	0.1231	0.0137
COPPER	0.1329	0.0739	0.0688	0.0665	0.0074
IRON	15.1611	8.4228	7.8518	7.5805	0.8423
LEAD	0.0242	0.0134	0.0125	0.0121	0.0013
MANGANESE	0.1759	0.0977	0.0911	0.0880	0.0098
MERCURY	0.0041	0.0023	0.0021	0.0020	0.0002
NICKEL	0.0895	0.0497	0.0464	0.0448	0.0050
SELENIUM	1.6955	0.9420	0.8781	0.8478	0.0942
SILVER	0.0245	0.0136	0.0127	0.0122	0.0014
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0780	0.0433	0.0404	0.0390	0.0043
ACETONE	12427.2107	6904.0059	6435.9981	6213.6053	690.4006
CARBON DISULFIDE	43.4124	24.1180	22.4831	21.7062	2.4118
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0740	Below	Below	Below	6879528
ARSENIC	0.0001	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0044	Below	Below	Below	6879528
COPPER	0.0024	Below	Below	Below	6879528
IRON	0.2717	Below	Below	Below	6879528
LEAD	0.0004	Below	Below	Below	6879528
MANGANESE	0.0032	Below	Below	Below	6879528
MERCURY	0.0001	Below	Below	Below	6879528
NICKEL	0.0016	Below	Below	Below	6879528
SELENIUM	0.0304	Below	Below	Below	6879528
SILVER	0.0004	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0014	Below	Below	Below	6879528
ACETONE	222.6855	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.7779	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	83.13981214	83.11576885	83.11373155
ARSENIC	761.2981997	761.296043	761.2958603
BERYLLIUM	0.180129065	0.180123207	0.180122711
CADMIUM	90.53175131	90.53150712	90.53148643
CHROMIUM	8205.159949	8205.157392	8205.157176
COBALT	4.953504891	4.952072382	4.951950998
COPPER	3422926.246	3422925.369	3422925.295
IRON	2825537.711	2825529.2	2825528.479
LEAD	27917.39261	27917.35883	27917.35597
MANGANESE	8773.519489	8773.4684	8773.464071
MERCURY	444.61755	444.6157963	444.6156477
NICKEL	13875.90911	13875.86328	13875.8594
SELENIUM	0.438230486	0.437134376	0.437041497
SILVER	132.7968114	132.794468	132.7942695
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	284242.9821	284242.7884	284242.772
ACETONE	1.820964171	1.730247039	1.722560139
CARBON DISULFIDE	0.001768052	0.001608084	0.001594529
PYRENE	2.413519946	2.413503989	2.413502637
4,4'-DDD	0.008891844	0.008891817	0.008891814
4,4'-DDE	0.038107901	0.038107786	0.038107776
4,4'-DDT	0.127026071	0.127025807	0.127025784
AROCLOR-1254	0.035567619	0.035567403	0.035567385
DIELDRIN	0.020326055	0.020325175	0.020325101
ENDOSULFAN SULFATE	0.00279556	0.002795116	0.002795078
ENDRIN ALDEHYDE	0.001194067	0.001194055	0.001194054

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	1	16768850.56	122.4716
ANTIMONY	1	45	31777.7778	NA	226	1	16768850.56	201.3039
ARSENIC	1	4617	2837.9310	NA	146	1	16768850.56	17.9776
BERYLLIUM	1	402	7.7114	NA	2011	1	16768850.56	0.0488
CADMIUM	1	4849	321.3333	NA	376	1	16768850.56	2.0356
CHROMIUM	1	41971	3364.7059	NA	4251	1	16768850.56	21.3145
COBALT	1	45	1893.3333	NA	226	1	16768850.56	11.9938
COPPER	1	51038	1154285.7143	NA	176	1	16768850.56	7312.0989
IRON	1	4342	11200000.0000	NA	126	1	16768850.56	70949.0785
LEAD	1	10811	44444.4444	NA	4501	1	16768850.56	281.5440
MANGANESE	1	2246	67230.7692	NA	326	1	16768850.56	425.8894
MERCURY	1	3316	2307.6923	NA	261	1	16768850.56	14.6186
NICKEL	1	3960	60307.6923	NA	326	1	16768850.56	382.0335
SELENIUM	1	5	1500.0000	NA	26	1	16768850.56	9.5021
SILVER	1	741	3084.3373	NA	42.5	1	16768850.56	19.5385
THALLIUM	1	71	50.7042	NA	356	1	16768850.56	0.3212
VANADIUM	1	1000	109.0000	NA	5001	1	16768850.56	0.6905
ZINC	1	19197	254838.7097	NA	311	1	16768850.56	1614.3368
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	1	16768850.56	3434.7927
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	1	16768850.56	10.6907
PYRENE	1	1978.185	20.9984	NA	4525.1438	1	16768850.56	0.1330
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	1	16768850.56	0.0002
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	1	16768850.56	0.0010
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	1	16768850.56	0.0022
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	1	16768850.56	0.0018
DIELDRIN	1	302.1	1.1579	NA	691.908	1	16768850.56	0.0073
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	1	16768850.56	0.0037
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	1	16768850.56	0.0001

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	201.3039331	Leach	2.22	NA	201.3039331	0.0346	226
ARSENIC	41.2	GW Sample	2.22	NA	41.2	0.0346	23086
BERYLLIUM	0.048849979	Leach	2.22	NA	0.048849979	0.0346	2011
CADMIUM	3.9	GW Sample	2.22	NA	3.9	0.0346	24246
CHROMIUM	27.4	GW Sample	2.22	NA	27.4	0.0346	209856
COBALT	11.9937728	Leach	2.22	NA	11.9937728	0.0346	226
COPPER	7312.098909	Leach	2.22	NA	7312.098909	0.0346	255191
IRON	70949.07853	Leach	2.22	NA	70949.07853	0.0346	21711
LEAD	281.5439624	Leach	2.22	NA	281.5439624	0.0346	54056
MANGANESE	1600	GW Sample	2.22	NA	1600	0.0346	11231
MERCURY	14.61862882	Leach	2.22	NA	14.61862882	0.0346	16581
NICKEL	382.0334998	Leach	2.22	NA	382.0334998	0.0346	19801
SELENIUM	19.8	GW Sample	2.22	NA	19.8	0.0346	26
SILVER	19.53847257	Leach	2.22	NA	19.53847257	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	1614.336752	Leach	2.22	NA	1614.336752	0.0346	95986
ACETONE	3434.792725	Leach	2.22	0.0004	3434.246618	0.0346	1.2823
CARBON DISULFIDE	10.69072272	Leach	2.22	0.0004	10.67851703	0.0346	1.1425
PYRENE	0.133019693	Leach	2.22	NA	0.133019693	0.0346	9891.925
4,4'-DDD	0.000223055	Leach	2.22	NA	0.000223055	0.0346	21732.25
4,4'-DDE	0.000955951	Leach	2.22	NA	0.000955951	0.0346	21732.25
4,4'-DDT	0.002205819	Leach	2.22	NA	0.002205819	0.0346	31393.75
AROCLOR-1254	0.001798833	Leach	2.22	NA	0.001798833	0.0346	10779.7
DIELDRIN	0.007334973	Leach	2.22	NA	0.007334973	0.0346	1511.5
ENDOSULFAN SULFATE	0.003712057	Leach	2.22	NA	0.003712057	0.0346	411.4
ENDRIN ALDEHYDE	0.000101508	Leach	2.22	NA	0.000101508	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	0.3195	0.1775	0.1655	0.1597	0.0177
ARSENIC	0.0006	0.0004	0.0003	0.0003	0.0000
BERYLLIUM	0.0000	0.0000	0.0000	0.0000	0.0000
CADMIUM	0.0001	0.0000	0.0000	0.0000	0.0000
CHROMIUM	0.0000	0.0000	0.0000	0.0000	0.0000
COBALT	0.0190	0.0106	0.0099	0.0095	0.0011
COPPER	0.0103	0.0057	0.0053	0.0051	0.0006
IRON	1.1721	0.6512	0.6070	0.5861	0.0651
LEAD	0.0019	0.0010	0.0010	0.0009	0.0001
MANGANESE	0.0511	0.0284	0.0265	0.0255	0.0028
MERCURY	0.0003	0.0002	0.0002	0.0002	0.0000
NICKEL	0.0069	0.0038	0.0036	0.0035	0.0004
SELENIUM	0.2731	0.1517	0.1415	0.1366	0.0152
SILVER	0.0019	0.0011	0.0010	0.0009	0.0001
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0060	0.0034	0.0031	0.0030	0.0003
ACETONE	960.7580	533.7544	497.5724	480.3790	53.3754
CARBON DISULFIDE	3.3562	1.8646	1.7382	1.6781	0.1865
PYRENE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Infiltration Rate 1 inch yr

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0057	Below	Below	Below	6879528
ARSENIC	0.0000	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0003	Below	Below	Below	6879528
COPPER	0.0002	Below	Below	Below	6879528
IRON	0.0210	Below	Below	Below	6879528
LEAD	0.0000	Below	Below	Below	6879528
MANGANESE	0.0009	Below	Below	Below	6879528
MERCURY	0.0000	Below	Below	Below	6879528
NICKEL	0.0001	Below	Below	Below	6879528
SELENIUM	0.0049	Below	Below	Below	6879528
SILVER	0.0000	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0001	Below	Below	Below	6879528
ACETONE	17.2160	Below	Below	Below	6879528
CARBON DISULFIDE	0.0601	Exceeds	Below	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	6.427607817	6.425749011	6.425591505
ARSENIC	134.8844161	134.884034	134.8840016
BERYLLIUM	0.013925927	0.013925474	0.013925436
CADMIUM	13.40977047	13.4097343	13.40973124
CHROMIUM	815.4589463	815.4586922	815.4586707
COBALT	0.382959571	0.382848822	0.382839438
COPPER	264629.2664	264629.1986	264629.1929
IRON	218444.6634	218444.0054	218443.9497
LEAD	2158.316772	2158.314161	2158.31394
MANGANESE	2548.222477	2548.207639	2548.206382
MERCURY	34.37375147	34.37361589	34.37360441
NICKEL	1072.758039	1072.754496	1072.754196
SELENIUM	0.070597303	0.070420724	0.070405762
SILVER	10.26663161	10.26645044	10.26643509
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	21975.06065	21975.04567	21975.0444
ACETONE	0.153271187	0.146257771	0.14566349
CARBON DISULFIDE	0.000243629	0.000231262	0.000230214
PYRENE	0.186591228	0.186589995	0.18658989
4,4'-DDD	0.000687436	0.000687434	0.000687434
4,4'-DDE	0.002946153	0.002946145	0.002946144
4,4'-DDT	0.009820491	0.00982047	0.009820469
AROCLOR-1254	0.002749762	0.002749745	0.002749744
DIELDRIN	0.001571424	0.001571356	0.00157135
ENDOSULFAN SULFATE	0.000216127	0.000216093	0.00021609
ENDRIN ALDEHYDE	9.23143E-05	9.23134E-05	9.23133E-05

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	6	16768850.56	712.2695
ANTIMONY	1	45	31777.7778	NA	226	6	16768850.56	1170.7419
ARSENIC	1	4617	2837.9310	NA	146	6	16768850.56	104.5537
BERYLLIUM	1	402	7.7114	NA	2011	6	16768850.56	0.2841
CADMIUM	1	4849	321.3333	NA	376	6	16768850.56	11.8384
CHROMIUM	1	41971	3364.7059	NA	4251	6	16768850.56	123.9609
COBALT	1	45	1893.3333	NA	226	6	16768850.56	69.7533
COPPER	1	51038	1154285.7143	NA	176	6	16768850.56	42525.6490
IRON	1	4342	11200000.0000	NA	126	6	16768850.56	412625.1090
LEAD	1	10811	44444.4444	NA	4501	6	16768850.56	1637.4012
MANGANESE	1	2246	67230.7692	NA	326	6	16768850.56	2476.8842
MERCURY	1	3316	2307.6923	NA	261	6	16768850.56	85.0189
NICKEL	1	3960	60307.6923	NA	326	6	16768850.56	2221.8275
SELENIUM	1	5	1500.0000	NA	26	6	16768850.56	55.2623
SILVER	1	741	3084.3373	NA	42.5	6	16768850.56	113.6317
THALLIUM	1	71	50.7042	NA	356	6	16768850.56	1.8680
VANADIUM	1	1000	109.0000	NA	5001	6	16768850.56	4.0157
ZINC	1	19197	254838.7097	NA	311	6	16768850.56	9388.6474
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	6	16768850.56	19976.0413
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	6	16768850.56	62.1750
PYRENE	1	1978.185	20.9984	NA	4525.1438	6	16768850.56	0.7736
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	6	16768850.56	0.0013
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	6	16768850.56	0.0056
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	6	16768850.56	0.0128
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	6	16768850.56	0.0105
DIELDRIN	1	302.1	1.1579	NA	691.908	6	16768850.56	0.0427
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	6	16768850.56	0.0216
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	6	16768850.56	0.0006

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	1170.741877	Leach	2.22	NA	1170.741877	0.0346	226
ARSENIC	104.5537145	Leach	2.22	NA	104.5537145	0.0346	23086
BERYLLIUM	0.284101332	Leach	2.22	NA	0.284101332	0.0346	2011
CADMIUM	11.83841087	Leach	2.22	NA	11.83841087	0.0346	24246
CHROMIUM	123.9609046	Leach	2.22	NA	123.9609046	0.0346	209856
COBALT	69.75329223	Leach	2.22	NA	69.75329223	0.0346	226
COPPER	42525.64899	Leach	2.22	NA	42525.64899	0.0346	255191
IRON	412625.109	Leach	2.22	NA	412625.109	0.0346	21711
LEAD	1637.401226	Leach	2.22	NA	1637.401226	0.0346	54056
MANGANESE	2476.884239	Leach	2.22	NA	2476.884239	0.0346	11231
MERCURY	85.01890982	Leach	2.22	NA	85.01890982	0.0346	16581
NICKEL	2221.82751	Leach	2.22	NA	2221.82751	0.0346	19801
SELENIUM	55.26229138	Leach	2.22	NA	55.26229138	0.0346	26
SILVER	113.6316995	Leach	2.22	NA	113.6316995	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	9388.647353	Leach	2.22	NA	9388.647353	0.0346	95986
ACETONE	19976.0413	Leach	2.22	0.0004	19972.86525	0.0346	1.2823
CARBON DISULFIDE	62.17502355	Leach	2.22	0.0004	62.10403776	0.0346	1.1425
PYRENE	0.773614915	Leach	2.22	NA	0.773614915	0.0346	9891.925
4,4'-DDD	0.001297243	Leach	2.22	NA	0.001297243	0.0346	21732.25
4,4'-DDE	0.005559615	Leach	2.22	NA	0.005559615	0.0346	21732.25
4,4'-DDT	0.012828586	Leach	2.22	NA	0.012828586	0.0346	31393.75
AROCLOR-1254	0.01046164	Leach	2.22	NA	0.01046164	0.0346	10779.7
DIELDRIN	0.042658678	Leach	2.22	NA	0.042658678	0.0346	1511.5
ENDOSULFAN SULFATE	0.02158855	Leach	2.22	NA	0.02158855	0.0346	411.4
ENDRIN ALDEHYDE	0.000590349	Leach	2.22	NA	0.000590349	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	1.8580	1.0322	0.9623	0.9290	0.1032
ARSENIC	0.0016	0.0009	0.0008	0.0008	0.0001
BERYLLIUM	0.0001	0.0000	0.0000	0.0000	0.0000
CADMIUM	0.0002	0.0001	0.0001	0.0001	0.0000
CHROMIUM	0.0002	0.0001	0.0001	0.0001	0.0000
COBALT	0.1107	0.0615	0.0573	0.0554	0.0062
COPPER	0.0598	0.0332	0.0310	0.0299	0.0033
IRON	6.8168	3.7871	3.5304	3.4084	0.3787
LEAD	0.0109	0.0060	0.0056	0.0054	0.0006
MANGANESE	0.0791	0.0439	0.0410	0.0396	0.0044
MERCURY	0.0018	0.0010	0.0010	0.0009	0.0001
NICKEL	0.0402	0.0224	0.0208	0.0201	0.0022
SELENIUM	0.7624	0.4235	0.3948	0.3812	0.0424
SILVER	0.0110	0.0061	0.0057	0.0055	0.0006
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0351	0.0195	0.0182	0.0175	0.0019
ACETONE	5587.5688	3104.2049	2893.7775	2793.7844	310.4205
CARBON DISULFIDE	19.5192	10.8440	10.1089	9.7596	1.0844
PYRENE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0333	Below	Below	Below	6879528
ARSENIC	0.0000	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0020	Below	Below	Below	6879528
COPPER	0.0011	Below	Below	Below	6879528
IRON	0.1222	Below	Below	Below	6879528
LEAD	0.0002	Below	Below	Below	6879528
MANGANESE	0.0014	Below	Below	Below	6879528
MERCURY	0.0000	Below	Below	Below	6879528
NICKEL	0.0007	Below	Below	Below	6879528
SELENIUM	0.0137	Below	Below	Below	6879528
SILVER	0.0002	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0006	Below	Below	Below	6879528
ACETONE	100.1247	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.3498	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	37.38163245	37.37082202	37.369906
ARSENIC	342.2977362	342.2967665	342.2966844
BERYLLIUM	0.080990302	0.080987668	0.080987445
CADMIUM	40.70522371	40.70511392	40.70510462
CHROMIUM	3689.234622	3689.233472	3689.233375
COBALT	2.227213346	2.226569256	2.226514679
COPPER	1539028.867	1539028.472	1539028.439
IRON	1270428.805	1270424.978	1270424.654
LEAD	12552.3222	12552.30701	12552.30572
MANGANESE	3944.782558	3944.759587	3944.757641
MERCURY	199.9106013	199.9098128	199.909746
NICKEL	6238.938012	6238.917406	6238.91566
SELENIUM	0.197038826	0.196545989	0.196504228
SILVER	59.70859768	59.70754405	59.70745477
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	127802.3899	127802.3028	127802.2954
ACETONE	0.891393401	0.850604826	0.847148613
CARBON DISULFIDE	0.001416898	0.001344973	0.001338878
PYRENE	1.085175841	1.085168666	1.085168058
4,4'-DDD	0.003997984	0.003997972	0.003997971
4,4'-DDE	0.017134217	0.017134165	0.017134161
4,4'-DDT	0.057113936	0.057113817	0.057113807
AROCLOR-1254	0.015992045	0.015991948	0.01599194
DIELDRIN	0.009139077	0.009138681	0.009138648
ENDOSULFAN SULFATE	0.00125695	0.00125675	0.001256733
ENDRIN ALDEHYDE	0.000536881	0.000536875	0.000536875

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	9	16768850.56	1049.0795
ANTIMONY	1	45	31777.7778	NA	226	9	16768850.56	1724.3490
ARSENIC	1	4617	2837.9310	NA	146	9	16768850.56	153.9939
BERYLLIUM	1	402	7.7114	NA	2011	9	16768850.56	0.4184
CADMIUM	1	4849	321.3333	NA	376	9	16768850.56	17.4364
CHROMIUM	1	41971	3364.7059	NA	4251	9	16768850.56	182.5781
COBALT	1	45	1893.3333	NA	226	9	16768850.56	102.7374
COPPER	1	51038	1154285.7143	NA	176	9	16768850.56	62634.6946
IRON	1	4342	11200000.0000	NA	126	9	16768850.56	607742.5810
LEAD	1	10811	44444.4444	NA	4501	9	16768850.56	2411.6769
MANGANESE	1	2246	67230.7692	NA	326	9	16768850.56	3648.1251
MERCURY	1	3316	2307.6923	NA	261	9	16768850.56	125.2217
NICKEL	1	3960	60307.6923	NA	326	9	16768850.56	3272.4601
SELENIUM	1	5	1500.0000	NA	26	9	16768850.56	81.3941
SILVER	1	741	3084.3373	NA	42.5	9	16768850.56	167.3646
THALLIUM	1	71	50.7042	NA	356	9	16768850.56	2.7513
VANADIUM	1	1000	109.0000	NA	5001	9	16768850.56	5.9146
ZINC	1	19197	254838.7097	NA	311	9	16768850.56	13828.2442
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	9	16768850.56	29422.0847
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	9	16768850.56	91.5756
PYRENE	1	1978.185	20.9984	NA	4525.1438	9	16768850.56	1.1394
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	9	16768850.56	0.0019
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	9	16768850.56	0.0082
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	9	16768850.56	0.0189
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	9	16768850.56	0.0154
DIELDRIN	1	302.1	1.1579	NA	691.908	9	16768850.56	0.0628
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	9	16768850.56	0.0318
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	9	16768850.56	0.0009

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	1724.34899	Leach	2.22	NA	1724.34899	0.0346	226
ARSENIC	153.9938867	Leach	2.22	NA	153.9938867	0.0346	23086
BERYLLIUM	0.418443941	Leach	2.22	NA	0.418443941	0.0346	2011
CADMIUM	17.43642405	Leach	2.22	NA	17.43642405	0.0346	24246
CHROMIUM	182.5781283	Leach	2.22	NA	182.5781283	0.0346	209856
COBALT	102.7374363	Leach	2.22	NA	102.7374363	0.0346	226
COPPER	62634.69457	Leach	2.22	NA	62634.69457	0.0346	255191
IRON	607742.581	Leach	2.22	NA	607742.581	0.0346	21711
LEAD	2411.676909	Leach	2.22	NA	2411.676909	0.0346	54056
MANGANESE	3648.125108	Leach	2.22	NA	3648.125108	0.0346	11231
MERCURY	125.2216856	Leach	2.22	NA	125.2216856	0.0346	16581
NICKEL	3272.460051	Leach	2.22	NA	3272.460051	0.0346	19801
SELENIUM	81.39409566	Leach	2.22	NA	81.39409566	0.0346	26
SILVER	167.3645662	Leach	2.22	NA	167.3645662	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	13828.24421	Leach	2.22	NA	13828.24421	0.0346	95986
ACETONE	29422.08467	Leach	2.22	0.0004	29417.40677	0.0346	1.2823
CARBON DISULFIDE	91.57564205	Leach	2.22	0.0004	91.47108931	0.0346	1.1425
PYRENE	1.139433144	Leach	2.22	NA	1.139433144	0.0346	9891.925
4,4'-DDD	0.001910669	Leach	2.22	NA	0.001910669	0.0346	21732.25
4,4'-DDE	0.008188582	Leach	2.22	NA	0.008188582	0.0346	21732.25
4,4'-DDT	0.018894822	Leach	2.22	NA	0.018894822	0.0346	31393.75
AROCLOR-1254	0.015408622	Leach	2.22	NA	0.015408622	0.0346	10779.7
DIELDRIN	0.062830629	Leach	2.22	NA	0.062830629	0.0346	1511.5
ENDOSULFAN SULFATE	0.031797098	Leach	2.22	NA	0.031797098	0.0346	411.4
ENDRIN ALDEHYDE	0.000869506	Leach	2.22	NA	0.000869506	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	2.7367	1.5204	1.4173	1.3683	0.1520
ARSENIC	0.0024	0.0013	0.0012	0.0012	0.0001
BERYLLIUM	0.0001	0.0000	0.0000	0.0000	0.0000
CADMIUM	0.0003	0.0001	0.0001	0.0001	0.0000
CHROMIUM	0.0003	0.0002	0.0002	0.0002	0.0000
COBALT	0.1631	0.0906	0.0844	0.0815	0.0091
COPPER	0.0880	0.0489	0.0456	0.0440	0.0049
IRON	10.0402	5.5779	5.1998	5.0201	0.5578
LEAD	0.0160	0.0089	0.0083	0.0080	0.0009
MANGANESE	0.1165	0.0647	0.0603	0.0583	0.0065
MERCURY	0.0027	0.0015	0.0014	0.0014	0.0002
NICKEL	0.0593	0.0329	0.0307	0.0296	0.0033
SELENIUM	1.1229	0.6238	0.5815	0.5614	0.0624
SILVER	0.0162	0.0090	0.0084	0.0081	0.0009
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0517	0.0287	0.0268	0.0258	0.0029
ACETONE	8229.7549	4572.0860	4262.1541	4114.8774	457.2086
CARBON DISULFIDE	28.7493	15.9718	14.8891	14.3746	1.5972
PYRENE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Infiltration Rate 9 inch yr

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0490	Below	Below	Below	6879528
ARSENIC	0.0000	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0029	Below	Below	Below	6879528
COPPER	0.0016	Below	Below	Below	6879528
IRON	0.1799	Below	Below	Below	6879528
LEAD	0.0003	Below	Below	Below	6879528
MANGANESE	0.0021	Below	Below	Below	6879528
MERCURY	0.0000	Below	Below	Below	6879528
NICKEL	0.0011	Below	Below	Below	6879528
SELENIUM	0.0201	Below	Below	Below	6879528
SILVER	0.0003	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0009	Below	Below	Below	6879528
ACETONE	147.4705	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.5152	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	55.05823395	55.0423116	55.04096243
ARSENIC	504.1595994	504.1581712	504.1580502
BERYLLIUM	0.119288075	0.119284196	0.119283868
CADMIUM	59.95344728	59.95328557	59.95327186
CHROMIUM	5433.757961	5433.756268	5433.756124
COBALT	3.28039268	3.27944402	3.279363635
COPPER	2266787.345	2266786.765	2266786.715
IRON	1871174.74	1871169.103	1871168.626
LEAD	18487.92166	18487.89929	18487.8974
MANGANESE	5810.146501	5810.112668	5810.109801
MERCURY	294.4420544	294.440893	294.4407946
NICKEL	9189.136112	9189.105762	9189.10319
SELENIUM	0.290212306	0.289486422	0.289424914
SILVER	87.94292076	87.94136889	87.94123739
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	188236.1315	188236.0032	188235.9923
ACETONE	1.312905382	1.252829169	1.247738621
CARBON DISULFIDE	0.002086905	0.001980968	0.001971992
PYRENE	1.598321459	1.598310892	1.598309997
4,4'-DDD	0.005888505	0.005888487	0.005888486
4,4'-DDE	0.02523645	0.025236374	0.025236368
4,4'-DDT	0.084121325	0.08412115	0.084121135
AROCLOR-1254	0.023554182	0.023554039	0.023554027
DIELDRIN	0.013460659	0.013460077	0.013460028
ENDOSULFAN SULFATE	0.001851322	0.001851028	0.001851003
ENDRIN ALDEHYDE	0.000790755	0.000790747	0.000790746

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	12	16768850.56	1373.9217
ANTIMONY	1	45	31777.7778	NA	226	12	16768850.56	2258.2851
ARSENIC	1	4617	2837.9310	NA	146	12	16768850.56	201.6773
BERYLLIUM	1	402	7.7114	NA	2011	12	16768850.56	0.5480
CADMIUM	1	4849	321.3333	NA	376	12	16768850.56	22.8355
CHROMIUM	1	41971	3364.7059	NA	4251	12	16768850.56	239.1125
COBALT	1	45	1893.3333	NA	226	12	16768850.56	134.5496
COPPER	1	51038	1154285.7143	NA	176	12	16768850.56	82029.2163
IRON	1	4342	11200000.0000	NA	126	12	16768850.56	795927.0496
LEAD	1	10811	44444.4444	NA	4501	12	16768850.56	3158.4407
MANGANESE	1	2246	67230.7692	NA	326	12	16768850.56	4777.7489
MERCURY	1	3316	2307.6923	NA	261	12	16768850.56	163.9960
NICKEL	1	3960	60307.6923	NA	326	12	16768850.56	4285.7610
SELENIUM	1	5	1500.0000	NA	26	12	16768850.56	106.5974
SILVER	1	741	3084.3373	NA	42.5	12	16768850.56	219.1882
THALLIUM	1	71	50.7042	NA	356	12	16768850.56	3.6033
VANADIUM	1	1000	109.0000	NA	5001	12	16768850.56	7.7461
ZINC	1	19197	254838.7097	NA	311	12	16768850.56	18110.0913
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	12	16768850.56	38532.4869
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	12	16768850.56	119.9316
PYRENE	1	1978.185	20.9984	NA	4525.1438	12	16768850.56	1.4923
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	12	16768850.56	0.0025
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	12	16768850.56	0.0107
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	12	16768850.56	0.0247
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	12	16768850.56	0.0202
DIELDRIN	1	302.1	1.1579	NA	691.908	12	16768850.56	0.0823
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	12	16768850.56	0.0416
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	12	16768850.56	0.0011

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	2258.285081	Leach	2.22	NA	2258.285081	0.0346	226
ARSENIC	201.6773282	Leach	2.22	NA	201.6773282	0.0346	23086
BERYLLIUM	0.548013027	Leach	2.22	NA	0.548013027	0.0346	2011
CADMIUM	22.83552607	Leach	2.22	NA	22.83552607	0.0346	24246
CHROMIUM	239.112538	Leach	2.22	NA	239.112538	0.0346	209856
COBALT	134.5495727	Leach	2.22	NA	134.5495727	0.0346	226
COPPER	82029.21634	Leach	2.22	NA	82029.21634	0.0346	255191
IRON	795927.0496	Leach	2.22	NA	795927.0496	0.0346	21711
LEAD	3158.440673	Leach	2.22	NA	3158.440673	0.0346	54056
MANGANESE	4777.748911	Leach	2.22	NA	4777.748911	0.0346	11231
MERCURY	163.995958	Leach	2.22	NA	163.995958	0.0346	16581
NICKEL	4285.761036	Leach	2.22	NA	4285.761036	0.0346	19801
SELENIUM	106.5973727	Leach	2.22	NA	106.5973727	0.0346	26
SILVER	219.188172	Leach	2.22	NA	219.188172	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	18110.09128	Leach	2.22	NA	18110.09128	0.0346	95986
ACETONE	38532.48691	Leach	2.22	0.0004	38526.36052	0.0346	1.2823
CARBON DISULFIDE	119.9315843	Leach	2.22	0.0004	119.7946573	0.0346	1.1425
PYRENE	1.492252952	Leach	2.22	NA	1.492252952	0.0346	9891.925
4,4'-DDD	0.002502298	Leach	2.22	NA	0.002502298	0.0346	21732.25
4,4'-DDE	0.010724136	Leach	2.22	NA	0.010724136	0.0346	21732.25
4,4'-DDT	0.024745509	Leach	2.22	NA	0.024745509	0.0346	31393.75
AROCLOR-1254	0.020179825	Leach	2.22	NA	0.020179825	0.0346	10779.7
DIELDRIN	0.082285821	Leach	2.22	NA	0.082285821	0.0346	1511.5
ENDOSULFAN SULFATE	0.041642911	Leach	2.22	NA	0.041642911	0.0346	411.4
ENDRIN ALDEHYDE	0.001138744	Leach	2.22	NA	0.001138744	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	3.5840	1.9911	1.8562	1.7920	0.1991
ARSENIC	0.0031	0.0017	0.0016	0.0016	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0000	0.0000
CADMIUM	0.0003	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
COBALT	0.2135	0.1186	0.1106	0.1068	0.0119
COPPER	0.1153	0.0641	0.0597	0.0576	0.0064
IRON	13.1491	7.3051	6.8099	6.5746	0.7305
LEAD	0.0210	0.0116	0.0109	0.0105	0.0012
MANGANESE	0.1526	0.0848	0.0790	0.0763	0.0085
MERCURY	0.0035	0.0020	0.0018	0.0018	0.0002
NICKEL	0.0776	0.0431	0.0402	0.0388	0.0043
SELENIUM	1.4705	0.8170	0.7616	0.7353	0.0817
SILVER	0.0212	0.0118	0.0110	0.0106	0.0012
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0677	0.0376	0.0350	0.0338	0.0038
ACETONE	10778.0575	5987.8097	5581.9089	5389.0288	598.7810
CARBON DISULFIDE	37.6513	20.9174	19.4995	18.8257	2.0917
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0642	Below	Below	Below	6879528
ARSENIC	0.0001	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0038	Below	Below	Below	6879528
COPPER	0.0021	Below	Below	Below	6879528
IRON	0.2356	Below	Below	Below	6879528
LEAD	0.0004	Below	Below	Below	6879528
MANGANESE	0.0027	Below	Below	Below	6879528
MERCURY	0.0001	Below	Below	Below	6879528
NICKEL	0.0014	Below	Below	Below	6879528
SELENIUM	0.0264	Below	Below	Below	6879528
SILVER	0.0004	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0012	Below	Below	Below	6879528
ACETONE	193.1340	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.6747	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	72.10674236	72.08588974	72.08412279
ARSENIC	660.2701129	660.2682424	660.2680839
BERYLLIUM	0.156225035	0.156219955	0.156219524
CADMIUM	78.51773416	78.51752237	78.51750442
CHROMIUM	7116.294099	7116.291881	7116.291693
COBALT	4.296149964	4.294907556	4.294802281
COPPER	2968686.777	2968686.016	2968685.952
IRON	2450574.695	2450567.313	2450566.688
LEAD	24212.61468	24212.58539	24212.58291
MANGANESE	7609.229478	7609.185169	7609.181415
MERCURY	385.6145726	385.6130517	385.6129228
NICKEL	12034.50642	12034.46668	12034.46331
SELENIUM	0.380075104	0.379124453	0.3790439
SILVER	115.1740089	115.1719765	115.1718043
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	246522.5137	246522.3458	246522.3315
ACETONE	1.719440006	1.640761493	1.634094682
CARBON DISULFIDE	0.002733105	0.002594365	0.002582609
PYRENE	2.093233752	2.093219913	2.093218741
4,4'-DDD	0.007711851	0.007711828	0.007711826
4,4'-DDE	0.033050791	0.033050692	0.033050683
4,4'-DDT	0.110169075	0.110168846	0.110168826
AROCLOR-1254	0.030847618	0.03084743	0.030847415
DIELDRIN	0.017628685	0.017627923	0.017627858
ENDOSULFAN SULFATE	0.002424575	0.00242419	0.002424157
ENDRIN ALDEHYDE	0.001035608	0.001035598	0.001035597

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	16	16768850.56	1789.5052
ANTIMONY	1	45	31777.7778	NA	226	16	16768850.56	2941.3707
ARSENIC	1	4617	2837.9310	NA	146	16	16768850.56	262.6806
BERYLLIUM	1	402	7.7114	NA	2011	16	16768850.56	0.7138
CADMIUM	1	4849	321.3333	NA	376	16	16768850.56	29.7428
CHROMIUM	1	41971	3364.7059	NA	4251	16	16768850.56	311.4392
COBALT	1	45	1893.3333	NA	226	16	16768850.56	175.2481
COPPER	1	51038	1154285.7143	NA	176	16	16768850.56	106841.3969
IRON	1	4342	11200000.0000	NA	126	16	16768850.56	1036678.9001
LEAD	1	10811	44444.4444	NA	4501	16	16768850.56	4113.8052
MANGANESE	1	2246	67230.7692	NA	326	16	16768850.56	6222.9214
MERCURY	1	3316	2307.6923	NA	261	16	16768850.56	213.6014
NICKEL	1	3960	60307.6923	NA	326	16	16768850.56	5582.1172
SELENIUM	1	5	1500.0000	NA	26	16	16768850.56	138.8409
SILVER	1	741	3084.3373	NA	42.5	16	16768850.56	285.4882
THALLIUM	1	71	50.7042	NA	356	16	16768850.56	4.6932
VANADIUM	1	1000	109.0000	NA	5001	16	16768850.56	10.0891
ZINC	1	19197	254838.7097	NA	311	16	16768850.56	23588.0280
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	16	16768850.56	50187.7856
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	16	16768850.56	156.2085
PYRENE	1	1978.185	20.9984	NA	4525.1438	16	16768850.56	1.9436
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	16	16768850.56	0.0033
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	16	16768850.56	0.0140
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	16	16768850.56	0.0322
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	16	16768850.56	0.0263
DIELDRIN	1	302.1	1.1579	NA	691.908	16	16768850.56	0.1072
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	16	16768850.56	0.0542
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	16	16768850.56	0.0015

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	2941.370689	Leach	2.22	NA	2941.370689	0.0346	226
ARSENIC	262.680645	Leach	2.22	NA	262.680645	0.0346	23086
BERYLLIUM	0.713775895	Leach	2.22	NA	0.713775895	0.0346	2011
CADMIUM	29.7428113	Leach	2.22	NA	29.7428113	0.0346	24246
CHROMIUM	311.4392494	Leach	2.22	NA	311.4392494	0.0346	209856
COBALT	175.2480998	Leach	2.22	NA	175.2480998	0.0346	226
COPPER	106841.3969	Leach	2.22	NA	106841.3969	0.0346	255191
IRON	1036678.9	Leach	2.22	NA	1036678.9	0.0346	21711
LEAD	4113.805159	Leach	2.22	NA	4113.805159	0.0346	54056
MANGANESE	6222.92142	Leach	2.22	NA	6222.92142	0.0346	11231
MERCURY	213.6014217	Leach	2.22	NA	213.6014217	0.0346	16581
NICKEL	5582.117155	Leach	2.22	NA	5582.117155	0.0346	19801
SELENIUM	138.8409241	Leach	2.22	NA	138.8409241	0.0346	26
SILVER	285.4881653	Leach	2.22	NA	285.4881653	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	23588.02797	Leach	2.22	NA	23588.02797	0.0346	95986
ACETONE	50187.78564	Leach	2.22	0.0004	50179.80614	0.0346	1.2823
CARBON DISULFIDE	156.2084653	Leach	2.22	0.0004	156.0301207	0.0346	1.1425
PYRENE	1.943629318	Leach	2.22	NA	1.943629318	0.0346	9891.925
4,4'-DDD	0.003259193	Leach	2.22	NA	0.003259193	0.0346	21732.25
4,4'-DDE	0.01396797	Leach	2.22	NA	0.01396797	0.0346	21732.25
4,4'-DDT	0.032230526	Leach	2.22	NA	0.032230526	0.0346	31393.75
AROCLOR-1254	0.026283815	Leach	2.22	NA	0.026283815	0.0346	10779.7
DIELDRIN	0.107175619	Leach	2.22	NA	0.107175619	0.0346	1511.5
ENDOSULFAN SULFATE	0.05423905	Leach	2.22	NA	0.05423905	0.0346	411.4
ENDRIN ALDEHYDE	0.001483191	Leach	2.22	NA	0.001483191	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	4.6681	2.5934	2.4176	2.3341	0.2593
ARSENIC	0.0041	0.0023	0.0021	0.0020	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0003	0.0003	0.0000
COBALT	0.2781	0.1545	0.1440	0.1391	0.0155
COPPER	0.1502	0.0834	0.0778	0.0751	0.0083
IRON	17.1265	9.5147	8.8697	8.5632	0.9515
LEAD	0.0273	0.0152	0.0141	0.0136	0.0015
MANGANESE	0.1987	0.1104	0.1029	0.0994	0.0110
MERCURY	0.0046	0.0026	0.0024	0.0023	0.0003
NICKEL	0.1011	0.0562	0.0524	0.0506	0.0056
SELENIUM	1.9153	1.0641	0.9919	0.9577	0.1064
SILVER	0.0276	0.0154	0.0143	0.0138	0.0015
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0881	0.0490	0.0456	0.0441	0.0049
ACETONE	14038.2022	7799.0012	7270.3236	7019.1011	779.9001
CARBON DISULFIDE	49.0401	27.2445	25.3977	24.5201	2.7245
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0836	Below	Below	Below	6879528
ARSENIC	0.0001	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0050	Below	Below	Below	6879528
COPPER	0.0027	Below	Below	Below	6879528
IRON	0.3069	Below	Below	Below	6879528
LEAD	0.0005	Below	Below	Below	6879528
MANGANESE	0.0036	Below	Below	Below	6879528
MERCURY	0.0001	Below	Below	Below	6879528
NICKEL	0.0018	Below	Below	Below	6879528
SELENIUM	0.0343	Below	Below	Below	6879528
SILVER	0.0005	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0016	Below	Below	Below	6879528
ACETONE	251.5532	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.8788	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	93.91757498	93.89041486	93.88811345
ARSENIC	859.988481	859.9860448	859.9858383
BERYLLIUM	0.203479951	0.203473334	0.203472774
CADMIUM	102.2677623	102.2674864	102.267463
CHROMIUM	9268.829276	9268.826388	9268.826143
COBALT	5.595648523	5.594030312	5.593893193
COPPER	3866654.544	3866653.553	3866653.469
IRON	3191824.025	3191814.411	3191813.596
LEAD	31536.4414	31536.40325	31536.40001
MANGANESE	9910.867648	9910.809937	9910.805047
MERCURY	502.2551893	502.2532083	502.2530405
NICKEL	15674.70145	15674.64968	15674.6453
SELENIUM	0.495040143	0.49380194	0.493697021
SILVER	150.0118195	150.0091724	150.0089481
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	321090.5931	321090.3743	321090.3557
ACETONE	2.239535866	2.137058692	2.128375306
CARBON DISULFIDE	0.003559814	0.003379109	0.003363797
PYRENE	2.726394668	2.726376643	2.726375115
4,4'-DDD	0.010044531	0.0100445	0.010044498
4,4'-DDE	0.043047988	0.043047858	0.043047847
4,4'-DDT	0.143492994	0.143492695	0.14349267
AROCLOR-1254	0.040178399	0.040178155	0.040178134
DIELDRIN	0.022961007	0.022960013	0.022959929
ENDOSULFAN SULFATE	0.00315796	0.003157458	0.003157416
ENDRIN ALDEHYDE	0.001348859	0.001348845	0.001348844

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	18	16768850.56	1990.1670
ANTIMONY	1	45	31777.7778	NA	226	18	16768850.56	3271.1941
ARSENIC	1	4617	2837.9310	NA	146	18	16768850.56	292.1357
BERYLLIUM	1	402	7.7114	NA	2011	18	16768850.56	0.7938
CADMIUM	1	4849	321.3333	NA	376	18	16768850.56	33.0779
CHROMIUM	1	41971	3364.7059	NA	4251	18	16768850.56	346.3617
COBALT	1	45	1893.3333	NA	226	18	16768850.56	194.8991
COPPER	1	51038	1154285.7143	NA	176	18	16768850.56	118821.7941
IRON	1	4342	11200000.0000	NA	126	18	16768850.56	1152924.3393
LEAD	1	10811	44444.4444	NA	4501	18	16768850.56	4575.0966
MANGANESE	1	2246	67230.7692	NA	326	18	16768850.56	6920.7134
MERCURY	1	3316	2307.6923	NA	261	18	16768850.56	237.5531
NICKEL	1	3960	60307.6923	NA	326	18	16768850.56	6208.0541
SELENIUM	1	5	1500.0000	NA	26	18	16768850.56	154.4095
SILVER	1	741	3084.3373	NA	42.5	18	16768850.56	317.5007
THALLIUM	1	71	50.7042	NA	356	18	16768850.56	5.2195
VANADIUM	1	1000	109.0000	NA	5001	18	16768850.56	11.2204
ZINC	1	19197	254838.7097	NA	311	18	16768850.56	26233.0135
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	18	16768850.56	55815.4696
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	18	16768850.56	173.7245
PYRENE	1	1978.185	20.9984	NA	4525.1438	18	16768850.56	2.1616
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	18	16768850.56	0.0036
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	18	16768850.56	0.0155
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	18	16768850.56	0.0358
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	18	16768850.56	0.0292
DIELDRIN	1	302.1	1.1579	NA	691.908	18	16768850.56	0.1192
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	18	16768850.56	0.0603
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	18	16768850.56	0.0016

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	3271.194058	Leach	2.22	NA	3271.194058	0.0346	226
ARSENIC	292.1356931	Leach	2.22	NA	292.1356931	0.0346	23086
BERYLLIUM	0.7938134	Leach	2.22	NA	0.7938134	0.0346	2011
CADMIUM	33.07794831	Leach	2.22	NA	33.07794831	0.0346	24246
CHROMIUM	346.3617238	Leach	2.22	NA	346.3617238	0.0346	209856
COBALT	194.8991145	Leach	2.22	NA	194.8991145	0.0346	226
COPPER	118821.7941	Leach	2.22	NA	118821.7941	0.0346	255191
IRON	1152924.339	Leach	2.22	NA	1152924.339	0.0346	21711
LEAD	4575.096584	Leach	2.22	NA	4575.096584	0.0346	54056
MANGANESE	6920.71341	Leach	2.22	NA	6920.71341	0.0346	11231
MERCURY	237.5530919	Leach	2.22	NA	237.5530919	0.0346	16581
NICKEL	6208.054135	Leach	2.22	NA	6208.054135	0.0346	19801
SELENIUM	154.4095097	Leach	2.22	NA	154.4095097	0.0346	26
SILVER	317.5006786	Leach	2.22	NA	317.5006786	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	26233.01348	Leach	2.22	NA	26233.01348	0.0346	95986
ACETONE	55815.46956	Leach	2.22	0.0004	55806.59531	0.0346	1.2823
CARBON DISULFIDE	173.7245174	Leach	2.22	0.0004	173.5261746	0.0346	1.1425
PYRENE	2.161573412	Leach	2.22	NA	2.161573412	0.0346	9891.925
4,4'-DDD	0.003624655	Leach	2.22	NA	0.003624655	0.0346	21732.25
4,4'-DDE	0.015534234	Leach	2.22	NA	0.015534234	0.0346	21732.25
4,4'-DDT	0.035844616	Leach	2.22	NA	0.035844616	0.0346	31393.75
AROCLOR-1254	0.029231086	Leach	2.22	NA	0.029231086	0.0346	10779.7
DIELDRIN	0.119193494	Leach	2.22	NA	0.119193494	0.0346	1511.5
ENDOSULFAN SULFATE	0.060321013	Leach	2.22	NA	0.060321013	0.0346	411.4
ENDRIN ALDEHYDE	0.001649506	Leach	2.22	NA	0.001649506	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	5.1916	2.8842	2.6887	2.5958	0.2884
ARSENIC	0.0045	0.0025	0.0024	0.0023	0.0003
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0005	0.0003	0.0003	0.0002	0.0000
CHROMIUM	0.0006	0.0003	0.0003	0.0003	0.0000
COBALT	0.3093	0.1718	0.1602	0.1547	0.0172
COPPER	0.1670	0.0928	0.0865	0.0835	0.0093
IRON	19.0469	10.5816	9.8643	9.5234	1.0582
LEAD	0.0304	0.0169	0.0157	0.0152	0.0017
MANGANESE	0.2210	0.1228	0.1145	0.1105	0.0123
MERCURY	0.0051	0.0029	0.0027	0.0026	0.0003
NICKEL	0.1125	0.0625	0.0582	0.0562	0.0062
SELENIUM	2.1301	1.1834	1.1032	1.0651	0.1183
SILVER	0.0307	0.0171	0.0159	0.0154	0.0017
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0980	0.0545	0.0508	0.0490	0.0054
ACETONE	15612.3414	8673.5230	8085.5634	7806.1707	867.3523
CARBON DISULFIDE	54.5391	30.2995	28.2456	27.2696	3.0300
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0001	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0930	Below	Below	Below	6879528
ARSENIC	0.0001	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0055	Below	Below	Below	6879528
COPPER	0.0030	Below	Below	Below	6879528
IRON	0.3413	Below	Below	Below	6879528
LEAD	0.0005	Below	Below	Below	6879528
MANGANESE	0.0040	Below	Below	Below	6879528
MERCURY	0.0001	Below	Below	Below	6879528
NICKEL	0.0020	Below	Below	Below	6879528
SELENIUM	0.0382	Below	Below	Below	6879528
SILVER	0.0006	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0018	Below	Below	Below	6879528
ACETONE	279.7605	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.9773	Exceeds	Exceeds	Exceeds	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	104.4487913	104.4185856	104.4160262
ARSENIC	956.4211745	956.4184651	956.4182355
BERYLLIUM	0.226296675	0.226289316	0.226288693
CADMIUM	113.7353063	113.7349995	113.7349735
CHROMIUM	10308.16665	10308.16344	10308.16317
COBALT	6.22310281	6.221303145	6.22115065
COPPER	4300232.343	4300231.24	4300231.147
IRON	3549731.363	3549720.671	3549719.765
LEAD	35072.70271	35072.66027	35072.65668
MANGANESE	11022.19842	11022.13424	11022.1288
MERCURY	558.5743399	558.5721367	558.5719501
NICKEL	17432.34556	17432.28798	17432.2831
SELENIUM	0.550550253	0.549173206	0.549056522
SILVER	166.833026	166.830082	166.8298326
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	357095.2971	357095.0538	357095.0332
ACETONE	2.490660713	2.376692513	2.367035437
CARBON DISULFIDE	0.003958985	0.003758017	0.003740988
PYRENE	3.032112229	3.032092183	3.032090484
4,4'-DDD	0.011170849	0.011170816	0.011170813
4,4'-DDE	0.047875068	0.047874924	0.047874912
4,4'-DDT	0.159583228	0.159582896	0.159582868
AROCLOR-1254	0.044683704	0.044683433	0.04468341
DIELDRIN	0.025535683	0.025534578	0.025534484
ENDOSULFAN SULFATE	0.00351207	0.003511512	0.003511465
ENDRIN ALDEHYDE	0.00150011	0.001500094	0.001500093

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	24	16768850.56	2565.5246
ANTIMONY	1	45	31777.7778	NA	226	24	16768850.56	4216.8968
ARSENIC	1	4617	2837.9310	NA	146	24	16768850.56	376.5922
BERYLLIUM	1	402	7.7114	NA	2011	24	16768850.56	1.0233
CADMIUM	1	4849	321.3333	NA	376	24	16768850.56	42.6408
CHROMIUM	1	41971	3364.7059	NA	4251	24	16768850.56	446.4950
COBALT	1	45	1893.3333	NA	226	24	16768850.56	251.2445
COPPER	1	51038	1154285.7143	NA	176	24	16768850.56	153173.1927
IRON	1	4342	11200000.0000	NA	126	24	16768850.56	1486234.9394
LEAD	1	10811	44444.4444	NA	4501	24	16768850.56	5897.7577
MANGANESE	1	2246	67230.7692	NA	326	24	16768850.56	8921.4927
MERCURY	1	3316	2307.6923	NA	261	24	16768850.56	306.2297
NICKEL	1	3960	60307.6923	NA	326	24	16768850.56	8002.8035
SELENIUM	1	5	1500.0000	NA	26	24	16768850.56	199.0493
SILVER	1	741	3084.3373	NA	42.5	24	16768850.56	409.2902
THALLIUM	1	71	50.7042	NA	356	24	16768850.56	6.7284
VANADIUM	1	1000	109.0000	NA	5001	24	16768850.56	14.4643
ZINC	1	19197	254838.7097	NA	311	24	16768850.56	33816.9816
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	24	16768850.56	71951.7302
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	24	16768850.56	223.9483
PYRENE	1	1978.185	20.9984	NA	4525.1438	24	16768850.56	2.7865
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	24	16768850.56	0.0047
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	24	16768850.56	0.0200
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	24	16768850.56	0.0462
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	24	16768850.56	0.0377
DIELDRIN	1	302.1	1.1579	NA	691.908	24	16768850.56	0.1537
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	24	16768850.56	0.0778
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	24	16768850.56	0.0021

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	4216.896753	Leach	2.22	NA	4216.896753	0.0346	226
ARSENIC	376.592166	Leach	2.22	NA	376.592166	0.0346	23086
BERYLLIUM	1.023304973	Leach	2.22	NA	1.023304973	0.0346	2011
CADMIUM	42.64078814	Leach	2.22	NA	42.64078814	0.0346	24246
CHROMIUM	446.4949503	Leach	2.22	NA	446.4949503	0.0346	209856
COBALT	251.2444779	Leach	2.22	NA	251.2444779	0.0346	226
COPPER	153173.1927	Leach	2.22	NA	153173.1927	0.0346	255191
IRON	1486234.939	Leach	2.22	NA	1486234.939	0.0346	21711
LEAD	5897.757696	Leach	2.22	NA	5897.757696	0.0346	54056
MANGANESE	8921.492699	Leach	2.22	NA	8921.492699	0.0346	11231
MERCURY	306.2297265	Leach	2.22	NA	306.2297265	0.0346	16581
NICKEL	8002.80352	Leach	2.22	NA	8002.80352	0.0346	19801
SELENIUM	199.0493222	Leach	2.22	NA	199.0493222	0.0346	26
SILVER	409.2901726	Leach	2.22	NA	409.2901726	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	33816.98163	Leach	2.22	NA	33816.98163	0.0346	95986
ACETONE	71951.73022	Leach	2.22	0.0004	71940.29042	0.0346	1.2823
CARBON DISULFIDE	223.9483016	Leach	2.22	0.0004	223.6926178	0.0346	1.1425
PYRENE	2.786484611	Leach	2.22	NA	2.786484611	0.0346	9891.925
4,4'-DDD	0.004672543	Leach	2.22	NA	0.004672543	0.0346	21732.25
4,4'-DDE	0.020025183	Leach	2.22	NA	0.020025183	0.0346	21732.25
4,4'-DDT	0.0462073	Leach	2.22	NA	0.0462073	0.0346	31393.75
AROCLOR-1254	0.037681797	Leach	2.22	NA	0.037681797	0.0346	10779.7
DIELDRIN	0.153652351	Leach	2.22	NA	0.153652351	0.0346	1511.5
ENDOSULFAN SULFATE	0.077759827	Leach	2.22	NA	0.077759827	0.0346	411.4
ENDRIN ALDEHYDE	0.002126378	Leach	2.22	NA	0.002126378	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	6.6925	3.7180	3.4660	3.3462	0.3718
ARSENIC	0.0059	0.0033	0.0030	0.0029	0.0003
BERYLLIUM	0.0002	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0006	0.0004	0.0003	0.0003	0.0000
CHROMIUM	0.0008	0.0004	0.0004	0.0004	0.0000
COBALT	0.3987	0.2215	0.2065	0.1994	0.0222
COPPER	0.2153	0.1196	0.1115	0.1076	0.0120
IRON	24.5533	13.6407	12.7161	12.2767	1.3641
LEAD	0.0391	0.0217	0.0203	0.0196	0.0022
MANGANESE	0.2849	0.1583	0.1476	0.1425	0.0158
MERCURY	0.0066	0.0037	0.0034	0.0033	0.0004
NICKEL	0.1450	0.0805	0.0751	0.0725	0.0081
SELENIUM	2.7459	1.5255	1.4221	1.3730	0.1526
SILVER	0.0396	0.0220	0.0205	0.0198	0.0022
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.1264	0.0702	0.0654	0.0632	0.0070
ACETONE	20125.8717	11181.0398	10423.1010	10062.9358	1118.1040
CARBON DISULFIDE	70.3064	39.0591	36.4114	35.1532	3.9059
PYRENE	0.0001	0.0001	0.0001	0.0001	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0001	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.1199	Below	Below	Below	6879528
ARSENIC	0.0001	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0071	Below	Below	Below	6879528
COPPER	0.0039	Below	Below	Below	6879528
IRON	0.4400	Below	Below	Below	6879528
LEAD	0.0007	Below	Below	Below	6879528
MANGANESE	0.0051	Below	Below	Below	6879528
MERCURY	0.0001	Below	Below	Below	6879528
NICKEL	0.0026	Below	Below	Below	6879528
SELENIUM	0.0492	Below	Below	Below	6879528
SILVER	0.0007	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0023	Below	Below	Below	6879528
ACETONE	360.6393	Exceeds	Below	Below	6879528
CARBON DISULFIDE	1.2598	Exceeds	Exceeds	Exceeds	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	134.6449526	134.6060145	134.6027151
ARSENIC	1232.92268	1232.919187	1232.918891
BERYLLIUM	0.291719078	0.291709592	0.291708788
CADMIUM	146.6162005	146.615805	146.6157715
CHROMIUM	13288.25919	13288.25505	13288.25469
COBALT	8.02220277	8.019882821	8.01968624
COPPER	5543430.16	5543428.74	5543428.619
IRON	4575959.235	4575945.451	4575944.283
LEAD	45212.22634	45212.17164	45212.16701
MANGANESE	14208.71764	14208.6349	14208.62789
MERCURY	720.0582657	720.0554256	720.0551849
NICKEL	22472.03928	22471.96506	22471.95877
SELENIUM	0.709714413	0.707939263	0.707788846
SILVER	215.0644789	215.0606838	215.0603623
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	460331.6013	460331.2876	460331.261
ACETONE	3.210711101	3.063794677	3.051345738
CARBON DISULFIDE	0.005103528	0.00484446	0.004822508
PYRENE	3.908696331	3.90867049	3.9086683
4,4'-DDD	0.014400343	0.0144003	0.014400296
4,4'-DDE	0.061715758	0.061715572	0.061715556
4,4'-DDT	0.205718764	0.205718335	0.205718299
AROCLOR-1254	0.05760177	0.057601421	0.057601391
DIELDRIN	0.032918052	0.032916628	0.032916507
ENDOSULFAN SULFATE	0.00452741	0.004526691	0.00452663
ENDRIN ALDEHYDE	0.001933792	0.001933772	0.00193377

Soil Kd for Metals - Geomean

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	12629	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	92.1	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	548	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	513	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	7253	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	8395	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	9680	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	18385	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	10683	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	2047	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	4871	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	2597	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	30.5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	303	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	84.7	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	5111	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	4937	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Soil Kd for Metals - Geomean

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	2296.3022	NA	63146	14	16768850.56	188.1557
ANTIMONY	1	45	15526.6015	NA	461.5	14	16768850.56	1272.2276
ARSENIC	1	4617	150.1825	NA	2741	14	16768850.56	12.3057
BERYLLIUM	1	402	7.7114	NA	2011	14	16768850.56	0.6319
CADMIUM	1	4849	46.9786	NA	2566	14	16768850.56	3.8494
CHROMIUM	1	41971	394.3196	NA	36266	14	16768850.56	32.3100
COBALT	1	45	10.1489	NA	41976	14	16768850.56	0.8316
COPPER	1	51038	4173.5537	NA	48401	14	16768850.56	341.9750
IRON	1	4342	15229.8069	NA	91926	14	16768850.56	1247.9087
LEAD	1	10811	3744.2666	NA	53416	14	16768850.56	306.7999
MANGANESE	1	2246	2134.8315	NA	10236	14	16768850.56	174.9250
MERCURY	1	3316	24.6356	NA	24356	14	16768850.56	2.0186
NICKEL	1	3960	1509.4340	NA	12986	14	16768850.56	123.6809
SELENIUM	1	5	245.9016	NA	153.5	14	16768850.56	20.1488
SILVER	1	741	84.4884	NA	1516	14	16768850.56	6.9229
THALLIUM	1	71	42.5030	NA	424.5	14	16768850.56	3.4826
VANADIUM	1	1000	21.3266	NA	25556	14	16768850.56	1.7475
ZINC	1	19197	3200.3241	NA	24686	14	16768850.56	262.2300
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	16768850.56	44428.3519
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	16768850.56	138.2823
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	16768850.56	1.7206
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	16768850.56	0.0029
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	16768850.56	0.0124
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	16768850.56	0.0285
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	1	302.1	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	16768850.56	0.0480
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0013

Soil Kd for Metals - Geomean

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	1272.227598	Leach	2.22	NA	1272.227598	0.0346	226
ARSENIC	41.2	GW Sample	2.22	NA	41.2	0.0346	23086
BERYLLIUM	0.631864631	Leach	2.22	NA	0.631864631	0.0346	2011
CADMIUM	3.9	GW Sample	2.22	NA	3.9	0.0346	24246
CHROMIUM	32.30998533	Leach	2.22	NA	32.30998533	0.0346	209856
COBALT	1.15	GW Sample	2.22	NA	1.15	0.0346	226
COPPER	496	GW Sample	2.22	NA	496	0.0346	255191
IRON	21800	GW Sample	2.22	NA	21800	0.0346	21711
LEAD	306.7998678	Leach	2.22	NA	306.7998678	0.0346	54056
MANGANESE	1600	GW Sample	2.22	NA	1600	0.0346	11231
MERCURY	2.018605823	Leach	2.22	NA	2.018605823	0.0346	16581
NICKEL	278	GW Sample	2.22	NA	278	0.0346	19801
SELENIUM	20.14882984	Leach	2.22	NA	20.14882984	0.0346	26
SILVER	6.922863076	Leach	2.22	NA	6.922863076	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	587	GW Sample	2.22	NA	587	0.0346	95986
ACETONE	44428.35189	Leach	2.22	0.0004	44421.2881	0.0346	1.2823
CARBON DISULFIDE	138.2823445	Leach	2.22	0.0004	138.1244663	0.0346	1.1425
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	9891.925
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	21732.25
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	21732.25
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	31393.75
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	10779.7
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	1511.5
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	411.4
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	6413.5

Soil Kd for Metals - Geomean

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	2.0191	1.1217	1.0457	1.0096	0.1122
ARSENIC	0.0006	0.0004	0.0003	0.0003	0.0000
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0001	0.0000	0.0000	0.0000	0.0000
CHROMIUM	0.0001	0.0000	0.0000	0.0000	0.0000
COBALT	0.0018	0.0010	0.0009	0.0009	0.0001
COPPER	0.0007	0.0004	0.0004	0.0003	0.0000
IRON	0.3601	0.2001	0.1865	0.1801	0.0200
LEAD	0.0020	0.0011	0.0011	0.0010	0.0001
MANGANESE	0.0511	0.0284	0.0265	0.0255	0.0028
MERCURY	0.0000	0.0000	0.0000	0.0000	0.0000
NICKEL	0.0050	0.0028	0.0026	0.0025	0.0003
SELENIUM	0.2780	0.1544	0.1440	0.1390	0.0154
SILVER	0.0007	0.0004	0.0003	0.0003	0.0000
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0022	0.0012	0.0011	0.0011	0.0001
ACETONE	12427.2107	6904.0059	6435.9981	6213.6053	690.4006
CARBON DISULFIDE	43.4124	24.1180	22.4831	21.7062	2.4118
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0362	Below	Below	Below	6879528
ARSENIC	0.0000	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0000	Below	Below	Below	6879528
COPPER	0.0000	Below	Below	Below	6879528
IRON	0.0065	Below	Below	Below	6879528
LEAD	0.0000	Below	Below	Below	6879528
MANGANESE	0.0009	Below	Below	Below	6879528
MERCURY	0.0000	Below	Below	Below	6879528
NICKEL	0.0001	Below	Below	Below	6879528
SELENIUM	0.0050	Below	Below	Below	6879528
SILVER	0.0000	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0000	Below	Below	Below	6879528
ACETONE	222.6855	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.7779	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Soil Kd for Metals - Geomean

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	40.62205805	40.61031051	40.60931509
ARSENIC	134.8844161	134.884034	134.8840016
BERYLLIUM	0.180129065	0.180123207	0.180122711
CADMIUM	13.40977047	13.4097343	13.40973124
CHROMIUM	961.5863721	961.5860724	961.5860471
COBALT	0.036719347	0.036708728	0.036707828
COPPER	17950.53893	17950.53433	17950.53394
IRON	67119.88037	67119.67818	67119.66105
LEAD	2351.928611	2351.925765	2351.925524
MANGANESE	2548.222477	2548.207639	2548.206382
MERCURY	4.746481749	4.746463028	4.746461441
NICKEL	780.6298011	780.6272229	780.6270044
SELENIUM	0.071841063	0.071661373	0.071646147
SILVER	3.637668431	3.63760424	3.637598801
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	7990.501722	7990.496278	7990.495817
ACETONE	1.98253193	1.891814799	1.884127898
CARBON DISULFIDE	0.003151298	0.00299133	0.002977775
PYRENE	2.413519946	2.413503989	2.413502637
4,4'-DDD	0.008891844	0.008891817	0.008891814
4,4'-DDE	0.038107901	0.038107786	0.038107776
4,4'-DDT	0.127026071	0.127025807	0.127025784
AROCLOR-1254	0.035567619	0.035567403	0.035567385
DIELDRIN	0.020326055	0.020325175	0.020325101
ENDOSULFAN SULFATE	0.00279556	0.002795116	0.002795078
ENDRIN ALDEHYDE	0.001194067	0.001194055	0.001194054

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	903	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	17.2	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	215	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	154	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	196	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	1832	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	767	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	288	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	936	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	1265	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	198	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	109	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	431	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	8.6	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	18.5	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	10.1	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1194	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	765	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	32115.1717	NA	4516	14	16768850.56	2631.4714
ANTIMONY	1	45	83139.5349	NA	87	14	16768850.56	6812.3350
ARSENIC	1	4617	382.7907	NA	1076	14	16768850.56	31.3653
BERYLLIUM	1	402	20.1299	NA	771	14	16768850.56	1.6494
CADMIUM	1	4849	122.9592	NA	981	14	16768850.56	10.0751
CHROMIUM	1	41971	1561.1354	NA	9161	14	16768850.56	127.9172
COBALT	1	45	111.0821	NA	3836	14	16768850.56	9.1019
COPPER	1	51038	140277.7778	NA	1441	14	16768850.56	11494.1612
IRON	1	4342	299145.2991	NA	4681	14	16768850.56	24511.5394
LEAD	1	10811	31620.5534	NA	6326	14	16768850.56	2590.9431
MANGANESE	1	2246	22070.7071	NA	991	14	16768850.56	1808.4423
MERCURY	1	3316	1100.9174	NA	546	14	16768850.56	90.2076
NICKEL	1	3960	9095.1276	NA	2156	14	16768850.56	745.2418
SELENIUM	1	5	872.0930	NA	44	14	16768850.56	71.4581
SILVER	1	741	1383.7838	NA	93.5	14	16768850.56	113.3853
THALLIUM	1	71	356.4356	NA	51.5	14	16768850.56	29.2058
VANADIUM	1	1000	91.2898	NA	5971	14	16768850.56	7.4802
ZINC	1	19197	20653.5948	NA	3826	14	16768850.56	1692.3261
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	16768850.56	44428.3519
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	16768850.56	138.2823
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	16768850.56	1.7206
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	16768850.56	0.0029
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	16768850.56	0.0124
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	16768850.56	0.0285
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	1	302.1	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	16768850.56	0.0480
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0013

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	6812.334989	Leach	2.22	NA	6812.334989	0.0346	226
ARSENIC	41.2	GW Sample	2.22	NA	41.2	0.0346	23086
BERYLLIUM	1.649412867	Leach	2.22	NA	1.649412867	0.0346	2011
CADMIUM	10.07510026	Leach	2.22	NA	10.07510026	0.0346	24246
CHROMIUM	127.9172072	Leach	2.22	NA	127.9172072	0.0346	209856
COBALT	9.101912078	Leach	2.22	NA	9.101912078	0.0346	226
COPPER	11494.16117	Leach	2.22	NA	11494.16117	0.0346	255191
IRON	24511.53944	Leach	2.22	NA	24511.53944	0.0346	21711
LEAD	2590.943073	Leach	2.22	NA	2590.943073	0.0346	54056
MANGANESE	1808.44228	Leach	2.22	NA	1808.44228	0.0346	11231
MERCURY	90.20760517	Leach	2.22	NA	90.20760517	0.0346	16581
NICKEL	745.241793	Leach	2.22	NA	745.241793	0.0346	19801
SELENIUM	71.45805933	Leach	2.22	NA	71.45805933	0.0346	26
SILVER	113.3852709	Leach	2.22	NA	113.3852709	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	1692.326118	Leach	2.22	NA	1692.326118	0.0346	95986
ACETONE	44428.35189	Leach	2.22	0.0004	44421.2881	0.0346	1.2823
CARBON DISULFIDE	138.2823445	Leach	2.22	0.0004	138.1244663	0.0346	1.1425
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	9891.925
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	21732.25
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	21732.25
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	31393.75
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	10779.7
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	1511.5
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	411.4
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	10.8116	6.0065	5.5993	5.4058	0.6006
ARSENIC	0.0006	0.0004	0.0003	0.0003	0.0000
BERYLLIUM	0.0003	0.0002	0.0002	0.0001	0.0000
CADMIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CHROMIUM	0.0002	0.0001	0.0001	0.0001	0.0000
COBALT	0.0144	0.0080	0.0075	0.0072	0.0008
COPPER	0.0162	0.0090	0.0084	0.0081	0.0009
IRON	0.4049	0.2250	0.2097	0.2025	0.0225
LEAD	0.0172	0.0096	0.0089	0.0086	0.0010
MANGANESE	0.0578	0.0321	0.0299	0.0289	0.0032
MERCURY	0.0020	0.0011	0.0010	0.0010	0.0001
NICKEL	0.0135	0.0075	0.0070	0.0067	0.0007
SELENIUM	0.9858	0.5477	0.5105	0.4929	0.0548
SILVER	0.0110	0.0061	0.0057	0.0055	0.0006
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0063	0.0035	0.0033	0.0032	0.0004
ACETONE	12427.2107	6904.0059	6435.9981	6213.6053	690.4006
CARBON DISULFIDE	43.4124	24.1180	22.4831	21.7062	2.4118
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.1937	Below	Below	Below	6879528
ARSENIC	0.0000	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0003	Below	Below	Below	6879528
COPPER	0.0003	Below	Below	Below	6879528
IRON	0.0073	Below	Below	Below	6879528
LEAD	0.0003	Below	Below	Below	6879528
MANGANESE	0.0010	Below	Below	Below	6879528
MERCURY	0.0000	Below	Below	Below	6879528
NICKEL	0.0002	Below	Below	Below	6879528
SELENIUM	0.0177	Below	Below	Below	6879528
SILVER	0.0002	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0001	Below	Below	Below	6879528
ACETONE	222.6855	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.7779	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	217.5169504	217.4540464	217.4487163
ARSENIC	134.8844161	134.884034	134.8840016
BERYLLIUM	0.470207039	0.470191748	0.470190453
CADMIUM	34.64225178	34.64215834	34.64215042
CHROMIUM	3806.979234	3806.978048	3806.977947
COBALT	0.290622842	0.290538797	0.290531675
COPPER	415980.6202	415980.5136	415980.5046
IRON	75468.42177	75468.19444	75468.17518
LEAD	19862.17656	19862.15253	19862.15049
MANGANESE	2880.195792	2880.17902	2880.177599
MERCURY	212.1111248	212.1102881	212.1102173
NICKEL	2092.654506	2092.647594	2092.647009
SELENIUM	0.254785166	0.254147893	0.254093894
SILVER	59.57910998	59.57805863	59.57796955
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	23036.68613	23036.67044	23036.66911
ACETONE	1.98253193	1.891814799	1.884127898
CARBON DISULFIDE	0.003151298	0.00299133	0.002977775
PYRENE	2.413519946	2.413503989	2.413502637
4,4'-DDD	0.008891844	0.008891817	0.008891814
4,4'-DDE	0.038107901	0.038107786	0.038107776
4,4'-DDT	0.127026071	0.127025807	0.127025784
AROCLOR-1254	0.035567619	0.035567403	0.035567385
DIELDRIN	0.020326055	0.020325175	0.020325101
ENDOSULFAN SULFATE	0.00279556	0.002795116	0.002795078
ENDRIN ALDEHYDE	0.001194067	0.001194055	0.001194054

Soil Kd for Metals - Max

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	104413	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	1385	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	2507	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	1111	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	5357	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	275238	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	51485	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	64623	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	478134	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	189011	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	268333	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	64000	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	184884	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	262	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	1370	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	22727	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	50625	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	30952	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	277.7432	NA	522066	14	16768850.56	22.7579
ANTIMONY	1	45	1032.4910	NA	6926	14	16768850.56	84.6008
ARSENIC	1	4617	32.8281	NA	12536	14	16768850.56	2.6899
BERYLLIUM	1	402	2.7903	NA	5556	14	16768850.56	0.2286
CADMIUM	1	4849	4.4988	NA	26786	14	16768850.56	0.3686
CHROMIUM	1	41971	10.3910	NA	1376191	14	16768850.56	0.8514
COBALT	1	45	1.6549	NA	257426	14	16768850.56	0.1356
COPPER	1	51038	625.1644	NA	323116	14	16768850.56	51.2251
IRON	1	4342	585.6099	NA	2390671	14	16768850.56	47.9840
LEAD	1	10811	211.6279	NA	945056	14	16768850.56	17.3405
MANGANESE	1	2246	16.2857	NA	1341666	14	16768850.56	1.3344
MERCURY	1	3316	1.8750	NA	320001	14	16768850.56	0.1536
NICKEL	1	3960	21.2025	NA	924421	14	16768850.56	1.7373
SELENIUM	1	5	28.6260	NA	1311	14	16768850.56	2.3456
SILVER	1	741	18.6861	NA	6851	14	16768850.56	1.5311
THALLIUM	1	71	0.1584	NA	113636	14	16768850.56	0.0130
VANADIUM	1	1000	2.1531	NA	253126	14	16768850.56	0.1764
ZINC	1	19197	510.4678	NA	154761	14	16768850.56	41.8270
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	16768850.56	44428.3519
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	16768850.56	138.2823
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	16768850.56	1.7206
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	16768850.56	0.0029
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	16768850.56	0.0124
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	16768850.56	0.0285
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	1	302.1	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	16768850.56	0.0480
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0013

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	84.60083885	Leach	2.22	NA	84.60083885	0.0346	226
ARSENIC	41.2	GW Sample	2.22	NA	41.2	0.0346	23086
BERYLLIUM	0.228631487	Leach	2.22	NA	0.228631487	0.0346	2011
CADMIUM	3.9	GW Sample	2.22	NA	3.9	0.0346	24246
CHROMIUM	27.4	GW Sample	2.22	NA	27.4	0.0346	209856
COBALT	1.15	GW Sample	2.22	NA	1.15	0.0346	226
COPPER	496	GW Sample	2.22	NA	496	0.0346	255191
IRON	21800	GW Sample	2.22	NA	21800	0.0346	21711
LEAD	195	GW Sample	2.22	NA	195	0.0346	54056
MANGANESE	1600	GW Sample	2.22	NA	1600	0.0346	11231
MERCURY	0.46	GW Sample	2.22	NA	0.46	0.0346	16581
NICKEL	278	GW Sample	2.22	NA	278	0.0346	19801
SELENIUM	19.8	GW Sample	2.22	NA	19.8	0.0346	26
SILVER	6.2	GW Sample	2.22	NA	6.2	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	587	GW Sample	2.22	NA	587	0.0346	95986
ACETONE	44428.35189	Leach	2.22	0.0004	44421.2881	0.0346	1.2823
CARBON DISULFIDE	138.2823445	Leach	2.22	0.0004	138.1244663	0.0346	1.1425
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	9891.925
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	21732.25
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	21732.25
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	31393.75
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	10779.7
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	1511.5
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	411.4
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	0.1343	0.0746	0.0695	0.0671	0.0075
ARSENIC	0.0006	0.0004	0.0003	0.0003	0.0000
BERYLLIUM	0.0000	0.0000	0.0000	0.0000	0.0000
CADMIUM	0.0001	0.0000	0.0000	0.0000	0.0000
CHROMIUM	0.0000	0.0000	0.0000	0.0000	0.0000
COBALT	0.0018	0.0010	0.0009	0.0009	0.0001
COPPER	0.0007	0.0004	0.0004	0.0003	0.0000
IRON	0.3601	0.2001	0.1865	0.1801	0.0200
LEAD	0.0013	0.0007	0.0007	0.0006	0.0001
MANGANESE	0.0511	0.0284	0.0265	0.0255	0.0028
MERCURY	0.0000	0.0000	0.0000	0.0000	0.0000
NICKEL	0.0050	0.0028	0.0026	0.0025	0.0003
SELENIUM	0.2731	0.1517	0.1415	0.1366	0.0152
SILVER	0.0006	0.0003	0.0003	0.0003	0.0000
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0022	0.0012	0.0011	0.0011	0.0001
ACETONE	12427.2107	6904.0059	6435.9981	6213.6053	690.4006
CARBON DISULFIDE	43.4124	24.1180	22.4831	21.7062	2.4118
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0024	Below	Below	Below	6879528
ARSENIC	0.0000	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0000	Below	Below	Below	6879528
COPPER	0.0000	Below	Below	Below	6879528
IRON	0.0065	Below	Below	Below	6879528
LEAD	0.0000	Below	Below	Below	6879528
MANGANESE	0.0009	Below	Below	Below	6879528
MERCURY	0.0000	Below	Below	Below	6879528
NICKEL	0.0001	Below	Below	Below	6879528
SELENIUM	0.0049	Below	Below	Below	6879528
SILVER	0.0000	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0000	Below	Below	Below	6879528
ACETONE	222.6855	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.7779	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Soil Kd for Metals - Max

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	2.701293535	2.700512345	2.700446151
ARSENIC	134.8844161	134.884034	134.8840016
BERYLLIUM	0.065177213	0.065175094	0.065174914
CADMIUM	13.40977047	13.4097343	13.40973124
CHROMIUM	815.4589463	815.4586922	815.4586707
COBALT	0.036719347	0.036708728	0.036707828
COPPER	17950.53893	17950.53433	17950.53394
IRON	67119.88037	67119.67818	67119.66105
LEAD	1494.870524	1494.868715	1494.868562
MANGANESE	2548.222477	2548.207639	2548.206382
MERCURY	1.081628508	1.081624242	1.08162388
NICKEL	780.6298011	780.6272229	780.6270044
SELENIUM	0.070597303	0.070420724	0.070405762
SILVER	3.257834804	3.257777315	3.257772444
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	7990.501722	7990.496278	7990.495817
ACETONE	1.98253193	1.891814799	1.884127898
CARBON DISULFIDE	0.003151298	0.00299133	0.002977775
PYRENE	2.413519946	2.413503989	2.413502637
4,4'-DDD	0.008891844	0.008891817	0.008891814
4,4'-DDE	0.038107901	0.038107786	0.038107776
4,4'-DDT	0.127026071	0.127025807	0.127025784
AROCLOR-1254	0.035567619	0.035567403	0.035567385
DIELDRIN	0.020326055	0.020325175	0.020325101
ENDOSULFAN SULFATE	0.00279556	0.002795116	0.002795078
ENDRIN ALDEHYDE	0.001194067	0.001194055	0.001194054

Soil Kd for Metals - All Maxs

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	104413	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	1385	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	2507	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	1111	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	5357	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	275238	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	51485	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	64623	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	478134	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	189011	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	268333	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	64000	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	184884	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	262	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	1370	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	22727	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	50625	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	30952	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	277.7432	NA	522066	14	16768850.56	22.7579
ANTIMONY	1	45	1032.4910	NA	6926	14	16768850.56	84.6008
ARSENIC	1	4617	32.8281	NA	12536	14	16768850.56	2.6899
BERYLLIUM	1	402	2.7903	NA	5556	14	16768850.56	0.2286
CADMIUM	1	4849	4.4988	NA	26786	14	16768850.56	0.3686
CHROMIUM	1	41971	10.3910	NA	1376191	14	16768850.56	0.8514
COBALT	1	45	1.6549	NA	257426	14	16768850.56	0.1356
COPPER	1	51038	625.1644	NA	323116	14	16768850.56	51.2251
IRON	1	4342	585.6099	NA	2390671	14	16768850.56	47.9840
LEAD	1	10811	211.6279	NA	945056	14	16768850.56	17.3405
MANGANESE	1	2246	16.2857	NA	1341666	14	16768850.56	1.3344
MERCURY	1	3316	1.8750	NA	320001	14	16768850.56	0.1536
NICKEL	1	3960	21.2025	NA	924421	14	16768850.56	1.7373
SELENIUM	1	5	28.6260	NA	1311	14	16768850.56	2.3456
SILVER	1	741	18.6861	NA	6851	14	16768850.56	1.5311
THALLIUM	1	71	0.1584	NA	113636	14	16768850.56	0.0130
VANADIUM	1	1000	2.1531	NA	253126	14	16768850.56	0.1764
ZINC	1	19197	510.4678	NA	154761	14	16768850.56	41.8270
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	16768850.56	44428.3519
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	16768850.56	138.2823
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	16768850.56	1.7206
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	16768850.56	0.0029
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	16768850.56	0.0124
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	16768850.56	0.0285
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	1	302.1	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	16768850.56	0.0480
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0013

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	84.60083885	Leach	2.22	NA	84.60083885	0.0346	226
ARSENIC	41.2	GW Sample	2.22	NA	41.2	0.0346	23086
BERYLLIUM	0.228631487	Leach	2.22	NA	0.228631487	0.0346	2011
CADMIUM	3.9	GW Sample	2.22	NA	3.9	0.0346	24246
CHROMIUM	27.4	GW Sample	2.22	NA	27.4	0.0346	209856
COBALT	1.15	GW Sample	2.22	NA	1.15	0.0346	226
COPPER	496	GW Sample	2.22	NA	496	0.0346	255191
IRON	21800	GW Sample	2.22	NA	21800	0.0346	21711
LEAD	195	GW Sample	2.22	NA	195	0.0346	54056
MANGANESE	1600	GW Sample	2.22	NA	1600	0.0346	11231
MERCURY	0.46	GW Sample	2.22	NA	0.46	0.0346	16581
NICKEL	278	GW Sample	2.22	NA	278	0.0346	19801
SELENIUM	19.8	GW Sample	2.22	NA	19.8	0.0346	26
SILVER	6.2	GW Sample	2.22	NA	6.2	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	587	GW Sample	2.22	NA	587	0.0346	95986
ACETONE	44428.35189	Leach	2.22	0.0004	44421.2881	0.0346	1.2823
CARBON DISULFIDE	138.2823445	Leach	2.22	0.0004	138.1244663	0.0346	1.1425
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	9891.925
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	21732.25
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	21732.25
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	31393.75
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	10779.7
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	1511.5
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	411.4
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	0.1343	0.0746	0.0695	0.0671	0.0075
ARSENIC	0.0006	0.0004	0.0003	0.0003	0.0000
BERYLLIUM	0.0000	0.0000	0.0000	0.0000	0.0000
CADMIUM	0.0001	0.0000	0.0000	0.0000	0.0000
CHROMIUM	0.0000	0.0000	0.0000	0.0000	0.0000
COBALT	0.0018	0.0010	0.0009	0.0009	0.0001
COPPER	0.0007	0.0004	0.0004	0.0003	0.0000
IRON	0.3601	0.2001	0.1865	0.1801	0.0200
LEAD	0.0013	0.0007	0.0007	0.0006	0.0001
MANGANESE	0.0511	0.0284	0.0265	0.0255	0.0028
MERCURY	0.0000	0.0000	0.0000	0.0000	0.0000
NICKEL	0.0050	0.0028	0.0026	0.0025	0.0003
SELENIUM	0.2731	0.1517	0.1415	0.1366	0.0152
SILVER	0.0006	0.0003	0.0003	0.0003	0.0000
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0022	0.0012	0.0011	0.0011	0.0001
ACETONE	12427.2107	6904.0059	6435.9981	6213.6053	690.4006
CARBON DISULFIDE	43.4124	24.1180	22.4831	21.7062	2.4118
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0024	Below	Below	Below	6879528
ARSENIC	0.0000	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0000	Below	Below	Below	6879528
COPPER	0.0000	Below	Below	Below	6879528
IRON	0.0065	Below	Below	Below	6879528
LEAD	0.0000	Below	Below	Below	6879528
MANGANESE	0.0009	Below	Below	Below	6879528
MERCURY	0.0000	Below	Below	Below	6879528
NICKEL	0.0001	Below	Below	Below	6879528
SELENIUM	0.0049	Below	Below	Below	6879528
SILVER	0.0000	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0000	Below	Below	Below	6879528
ACETONE	222.6855	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.7779	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	2.701293535	2.700512345	2.700446151
ARSENIC	134.8844161	134.884034	134.8840016
BERYLLIUM	0.065177213	0.065175094	0.065174914
CADMIUM	13.40977047	13.4097343	13.40973124
CHROMIUM	815.4589463	815.4586922	815.4586707
COBALT	0.036719347	0.036708728	0.036707828
COPPER	17950.53893	17950.53433	17950.53394
IRON	67119.88037	67119.67818	67119.66105
LEAD	1494.870524	1494.868715	1494.868562
MANGANESE	2548.222477	2548.207639	2548.206382
MERCURY	1.081628508	1.081624242	1.08162388
NICKEL	780.6298011	780.6272229	780.6270044
SELENIUM	0.070597303	0.070420724	0.070405762
SILVER	3.257834804	3.257777315	3.257772444
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	7990.501722	7990.496278	7990.495817
ACETONE	1.98253193	1.891814799	1.884127898
CARBON DISULFIDE	0.003151298	0.00299133	0.002977775
PYRENE	2.413519946	2.413503989	2.413502637
4,4'-DDD	0.008891844	0.008891817	0.008891814
4,4'-DDE	0.038107901	0.038107786	0.038107776
4,4'-DDT	0.127026071	0.127025807	0.127025784
AROCLOR-1254	0.035567619	0.035567403	0.035567385
DIELDRIN	0.020326055	0.020325175	0.020325101
ENDOSULFAN SULFATE	0.00279556	0.002795116	0.002795078
ENDRIN ALDEHYDE	0.001194067	0.001194055	0.001194054

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	903	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	17.2	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	154	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	10.1	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	32115.1717	NA	4516	14	16768850.56	2631.4714
ANTIMONY	1	45	83139.5349	NA	87	14	16768850.56	6812.3350
ARSENIC	1	4617	2837.9310	NA	146	14	16768850.56	232.5360
BERYLLIUM	1	402	20.1299	NA	771	14	16768850.56	1.6494
CADMIUM	1	4849	321.3333	NA	376	14	16768850.56	26.3296
CHROMIUM	1	41971	3364.7059	NA	4251	14	16768850.56	275.6992
COBALT	1	45	1893.3333	NA	226	14	16768850.56	155.1370
COPPER	1	51038	1154285.7143	NA	176	14	16768850.56	94580.5262
IRON	1	4342	11200000.0000	NA	126	14	16768850.56	917712.0366
LEAD	1	10811	44444.4444	NA	4501	14	16768850.56	3641.7144
MANGANESE	1	2246	67230.7692	NA	326	14	16768850.56	5508.7934
MERCURY	1	3316	2307.6923	NA	261	14	16768850.56	189.0890
NICKEL	1	3960	60307.6923	NA	326	14	16768850.56	4941.5264
SELENIUM	1	5	1500.0000	NA	26	14	16768850.56	122.9079
SILVER	1	741	3084.3373	NA	42.5	14	16768850.56	252.7262
THALLIUM	1	71	356.4356	NA	51.5	14	16768850.56	29.2058
VANADIUM	1	1000	109.0000	NA	5001	14	16768850.56	8.9313
ZINC	1	19197	254838.7097	NA	311	14	16768850.56	20881.1206
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	16768850.56	44428.3519
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	16768850.56	138.2823
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	16768850.56	1.7206
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	16768850.56	0.0029
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	16768850.56	0.0124
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	16768850.56	0.0285
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	1	302.1	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	16768850.56	0.0480
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0013

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	6812.334989	Leach	2.22	NA	6812.334989	0.0346	226
ARSENIC	232.536024	Leach	2.22	NA	232.536024	0.0346	23086
BERYLLIUM	1.649412867	Leach	2.22	NA	1.649412867	0.0346	2011
CADMIUM	26.32959533	Leach	2.22	NA	26.32959533	0.0346	24246
CHROMIUM	275.6992043	Leach	2.22	NA	275.6992043	0.0346	209856
COBALT	155.1370348	Leach	2.22	NA	155.1370348	0.0346	226
COPPER	94580.52622	Leach	2.22	NA	94580.52622	0.0346	255191
IRON	917712.0366	Leach	2.22	NA	917712.0366	0.0346	21711
LEAD	3641.714431	Leach	2.22	NA	3641.714431	0.0346	54056
MANGANESE	5508.793406	Leach	2.22	NA	5508.793406	0.0346	11231
MERCURY	189.0890185	Leach	2.22	NA	189.0890185	0.0346	16581
NICKEL	4941.526351	Leach	2.22	NA	4941.526351	0.0346	19801
SELENIUM	122.907862	Leach	2.22	NA	122.907862	0.0346	26
SILVER	252.7262063	Leach	2.22	NA	252.7262063	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	20881.12065	Leach	2.22	NA	20881.12065	0.0346	95986
ACETONE	44428.35189	Leach	2.22	0.0004	44421.2881	0.0346	1.2823
CARBON DISULFIDE	138.2823445	Leach	2.22	0.0004	138.1244663	0.0346	1.1425
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	9891.925
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	21732.25
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	21732.25
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	31393.75
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	10779.7
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	1511.5
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	411.4
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	10.8116	6.0065	5.5993	5.4058	0.6006
ARSENIC	0.0036	0.0020	0.0019	0.0018	0.0002
BERYLLIUM	0.0003	0.0002	0.0002	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
COBALT	0.2462	0.1368	0.1275	0.1231	0.0137
COPPER	0.1329	0.0739	0.0688	0.0665	0.0074
IRON	15.1611	8.4228	7.8518	7.5805	0.8423
LEAD	0.0242	0.0134	0.0125	0.0121	0.0013
MANGANESE	0.1759	0.0977	0.0911	0.0880	0.0098
MERCURY	0.0041	0.0023	0.0021	0.0020	0.0002
NICKEL	0.0895	0.0497	0.0464	0.0448	0.0050
SELENIUM	1.6955	0.9420	0.8781	0.8478	0.0942
SILVER	0.0245	0.0136	0.0127	0.0122	0.0014
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0780	0.0433	0.0404	0.0390	0.0043
ACETONE	12427.2107	6904.0059	6435.9981	6213.6053	690.4006
CARBON DISULFIDE	43.4124	24.1180	22.4831	21.7062	2.4118
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.1937	Below	Below	Below	6879528
ARSENIC	0.0001	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0044	Below	Below	Below	6879528
COPPER	0.0024	Below	Below	Below	6879528
IRON	0.2717	Below	Below	Below	6879528
LEAD	0.0004	Below	Below	Below	6879528
MANGANESE	0.0032	Below	Below	Below	6879528
MERCURY	0.0001	Below	Below	Below	6879528
NICKEL	0.0016	Below	Below	Below	6879528
SELENIUM	0.0304	Below	Below	Below	6879528
SILVER	0.0004	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0014	Below	Below	Below	6879528
ACETONE	222.6855	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.7779	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	217.5169504	217.4540464	217.4487163
ARSENIC	761.2981997	761.296043	761.2958603
BERYLLIUM	0.470207039	0.470191748	0.470190453
CADMIUM	90.53175131	90.53150712	90.53148643
CHROMIUM	8205.159949	8205.157392	8205.157176
COBALT	4.953504891	4.952072382	4.951950998
COPPER	3422926.246	3422925.369	3422925.295
IRON	2825537.711	2825529.2	2825528.479
LEAD	27917.39261	27917.35883	27917.35597
MANGANESE	8773.519489	8773.4684	8773.464071
MERCURY	444.61755	444.6157963	444.6156477
NICKEL	13875.90911	13875.86328	13875.8594
SELENIUM	0.438230486	0.437134376	0.437041497
SILVER	132.7968114	132.794468	132.7942695
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	284242.9821	284242.7884	284242.772
ACETONE	1.98253193	1.891814799	1.884127898
CARBON DISULFIDE	0.003151298	0.00299133	0.002977775
PYRENE	2.413519946	2.413503989	2.413502637
4,4'-DDD	0.008891844	0.008891817	0.008891814
4,4'-DDE	0.038107901	0.038107786	0.038107776
4,4'-DDT	0.127026071	0.127025807	0.127025784
AROCLOR-1254	0.035567619	0.035567403	0.035567385
DIELDRIN	0.020326055	0.020325175	0.020325101
ENDOSULFAN SULFATE	0.00279556	0.002795116	0.002795078
ENDRIN ALDEHYDE	0.001194067	0.001194055	0.001194054

Kd Sediment = Kd Soil Baseline

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Kd Sediment = Kd Soil Baseline

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	1500	19333.3333	NA	7501	14	16768850.56	1584.1458
ANTIMONY	1	45	31777.7778	NA	226	14	16768850.56	2603.8258
ARSENIC	1	29	2837.9310	NA	146	14	16768850.56	232.5360
BERYLLIUM	1	402	7.7114	NA	2011	14	16768850.56	0.6319
CADMIUM	1	75	321.3333	NA	376	14	16768850.56	26.3296
CHROMIUM	1	850	3364.7059	NA	4251	14	16768850.56	275.6992
COBALT	1	45	1893.3333	NA	226	14	16768850.56	155.1370
COPPER	1	35	1154285.7143	NA	176	14	16768850.56	94580.5262
IRON	1	25	11200000.0000	NA	126	14	16768850.56	917712.0366
LEAD	1	900	44444.4444	NA	4501	14	16768850.56	3641.7144
MANGANESE	1	65	67230.7692	NA	326	14	16768850.56	5508.7934
MERCURY	1	52	2307.6923	NA	261	14	16768850.56	189.0890
NICKEL	1	65	60307.6923	NA	326	14	16768850.56	4941.5264
SELENIUM	1	5	1500.0000	NA	26	14	16768850.56	122.9079
SILVER	1	8.3	3084.3373	NA	42.5	14	16768850.56	252.7262
THALLIUM	1	71	50.7042	NA	356	14	16768850.56	4.1546
VANADIUM	1	1000	109.0000	NA	5001	14	16768850.56	8.9313
ZINC	1	62	254838.7097	NA	311	14	16768850.56	20881.1206
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	16768850.56	44428.3519
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	16768850.56	138.2823
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	16768850.56	1.7206
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	16768850.56	0.0029
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	16768850.56	0.0124
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	16768850.56	0.0285
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	1	302.1	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	16768850.56	0.0480
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0013

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	7501
ANTIMONY	2603.825818	Leach	2.22	NA	2603.825818	0.0346	226
ARSENIC	232.536024	Leach	2.22	NA	232.536024	0.0346	146
BERYLLIUM	0.631864631	Leach	2.22	NA	0.631864631	0.0346	2011
CADMIUM	26.32959533	Leach	2.22	NA	26.32959533	0.0346	376
CHROMIUM	275.6992043	Leach	2.22	NA	275.6992043	0.0346	4251
COBALT	155.1370348	Leach	2.22	NA	155.1370348	0.0346	226
COPPER	94580.52622	Leach	2.22	NA	94580.52622	0.0346	176
IRON	917712.0366	Leach	2.22	NA	917712.0366	0.0346	126
LEAD	3641.714431	Leach	2.22	NA	3641.714431	0.0346	4501
MANGANESE	5508.793406	Leach	2.22	NA	5508.793406	0.0346	326
MERCURY	189.0890185	Leach	2.22	NA	189.0890185	0.0346	261
NICKEL	4941.526351	Leach	2.22	NA	4941.526351	0.0346	326
SELENIUM	122.907862	Leach	2.22	NA	122.907862	0.0346	26
SILVER	252.7262063	Leach	2.22	NA	252.7262063	0.0346	42.5
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	20881.12065	Leach	2.22	NA	20881.12065	0.0346	311
ACETONE	44428.35189	Leach	2.22	0.0004	44421.2881	0.0346	1.2823
CARBON DISULFIDE	138.2823445	Leach	2.22	0.0004	138.1244663	0.0346	1.1425
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	9891.925
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	21732.25
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	21732.25
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	31393.75
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	10779.7
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	1511.5
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	411.4
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	6413.5

Kd Sediment = Kd Soil Baseline

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.6933	0.3852	0.3591	0.3467	0.0385
ANTIMONY	4.1324	2.2958	2.1402	2.0662	0.2296
ARSENIC	0.5713	0.3174	0.2959	0.2856	0.0317
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0251	0.0140	0.0130	0.0126	0.0014
CHROMIUM	0.0233	0.0129	0.0120	0.0116	0.0013
COBALT	0.2462	0.1368	0.1275	0.1231	0.0137
COPPER	192.7490	107.0828	99.8239	96.3745	10.7083
IRON	2612.3958	1451.3310	1352.9484	1306.1979	145.1331
LEAD	0.2902	0.1612	0.1503	0.1451	0.0161
MANGANESE	6.0610	3.3672	3.1389	3.0305	0.3367
MERCURY	0.2599	0.1444	0.1346	0.1299	0.0144
NICKEL	5.4368	3.0205	2.8157	2.7184	0.3020
SELENIUM	1.6955	0.9420	0.8781	0.8478	0.0942
SILVER	2.1329	1.1849	1.1046	1.0664	0.1185
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	24.0822	13.3790	12.4721	12.0411	1.3379
ACETONE	12427.2107	6904.0059	6435.9981	6213.6053	690.4006
CARBON DISULFIDE	43.4124	24.1180	22.4831	21.7062	2.4118
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Kd Sediment = Kd Soil Baseline

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0124	Below	Below	Below	6879528
ANTIMONY	0.0740	Below	Below	Below	6879528
ARSENIC	0.0102	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0005	Below	Below	Below	6879528
CHROMIUM	0.0004	Below	Below	Below	6879528
COBALT	0.0044	Below	Below	Below	6879528
COPPER	3.4539	Exceeds	Exceeds	Exceeds	6879528
IRON	46.8120	Exceeds	Below	Below	6879528
LEAD	0.0052	Below	Below	Below	6879528
MANGANESE	0.1086	Below	Below	Below	6879528
MERCURY	0.0047	Below	Below	Below	6879528
NICKEL	0.0974	Below	Below	Below	6879528
SELENIUM	0.0304	Below	Below	Below	6879528
SILVER	0.0382	Exceeds	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.4315	Below	Below	Below	6879528
ACETONE	222.6855	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.7779	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Kd Sediment = Kd Soil Baseline

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	15423.02983	15422.89536	15422.88396
ANTIMONY	83.13981214	83.11576885	83.11373155
ARSENIC	4.786605671	4.784463702	4.784282202
BERYLLIUM	0.180129065	0.180123207	0.180122711
CADMIUM	1.400803749	1.400560195	1.400539557
CHROMIUM	166.1771815	166.1746251	166.1744084
COBALT	4.953504891	4.952072382	4.951950998
COPPER	2349.279231	2348.406994	2348.333085
IRON	16287.5308	16279.08669	16278.37118
LEAD	2324.151917	2324.118148	2324.115286
MANGANESE	254.0199035	253.9689669	253.9646508
MERCURY	6.976158688	6.974411631	6.974263595
NICKEL	227.8622475	227.8165561	227.8126844
SELENIUM	0.438230486	0.437134376	0.437041497
SILVER	1.492558512	1.490269662	1.490075717
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	918.4443507	918.2513037	918.2349459
ACETONE	1.98253193	1.891814799	1.884127898
CARBON DISULFIDE	0.003151298	0.00299133	0.002977775
PYRENE	2.413519946	2.413503989	2.413502637
4,4'-DDD	0.008891844	0.008891817	0.008891814
4,4'-DDE	0.038107901	0.038107786	0.038107776
4,4'-DDT	0.127026071	0.127025807	0.127025784
AROCLOR-1254	0.035567619	0.035567403	0.035567385
DIELDRIN	0.020326055	0.020325175	0.020325101
ENDOSULFAN SULFATE	0.00279556	0.002795116	0.002795078
ENDRIN ALDEHYDE	0.001194067	0.001194055	0.001194054

Kd Sediment = Kd Soil Geomean

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	12629	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	92.1	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	548	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	513	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	7253	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	8395	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	9680	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	18385	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	10683	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	2047	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	4871	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	2597	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	30.5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	303	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	84.7	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	5111	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	4937	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Kd Sediment = Kd Soil Geomean

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	12629	2296.3022	NA	63146	14	16768850.56	188.1557
ANTIMONY	1	92.1	15526.6015	NA	461.5	14	16768850.56	1272.2276
ARSENIC	1	548	150.1825	NA	2741	14	16768850.56	12.3057
BERYLLIUM	1	402	7.7114	NA	2011	14	16768850.56	0.6319
CADMIUM	1	513	46.9786	NA	2566	14	16768850.56	3.8494
CHROMIUM	1	7253	394.3196	NA	36266	14	16768850.56	32.3100
COBALT	1	8395	10.1489	NA	41976	14	16768850.56	0.8316
COPPER	1	9680	4173.5537	NA	48401	14	16768850.56	341.9750
IRON	1	18385	15229.8069	NA	91926	14	16768850.56	1247.9087
LEAD	1	10683	3744.2666	NA	53416	14	16768850.56	306.7999
MANGANESE	1	2047	2134.8315	NA	10236	14	16768850.56	174.9250
MERCURY	1	4871	24.6356	NA	24356	14	16768850.56	2.0186
NICKEL	1	2597	1509.4340	NA	12986	14	16768850.56	123.6809
SELENIUM	1	30.5	245.9016	NA	153.5	14	16768850.56	20.1488
SILVER	1	303	84.4884	NA	1516	14	16768850.56	6.9229
THALLIUM	1	84.7	42.5030	NA	424.5	14	16768850.56	3.4826
VANADIUM	1	5111	21.3266	NA	25556	14	16768850.56	1.7475
ZINC	1	4937	3200.3241	NA	24686	14	16768850.56	262.2300
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	16768850.56	44428.3519
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	16768850.56	138.2823
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	16768850.56	1.7206
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	16768850.56	0.0029
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	16768850.56	0.0124
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	16768850.56	0.0285
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	1	302.1	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	16768850.56	0.0480
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0013

Kd Sediment = Kd Soil Geomean

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	63146
ANTIMONY	1272.227598	Leach	2.22	NA	1272.227598	0.0346	461.5
ARSENIC	41.2	GW Sample	2.22	NA	41.2	0.0346	2741
BERYLLIUM	0.631864631	Leach	2.22	NA	0.631864631	0.0346	2011
CADMIUM	3.9	GW Sample	2.22	NA	3.9	0.0346	2566
CHROMIUM	32.30998533	Leach	2.22	NA	32.30998533	0.0346	36266
COBALT	1.15	GW Sample	2.22	NA	1.15	0.0346	41976
COPPER	496	GW Sample	2.22	NA	496	0.0346	48401
IRON	21800	GW Sample	2.22	NA	21800	0.0346	91926
LEAD	306.7998678	Leach	2.22	NA	306.7998678	0.0346	53416
MANGANESE	1600	GW Sample	2.22	NA	1600	0.0346	10236
MERCURY	2.018605823	Leach	2.22	NA	2.018605823	0.0346	24356
NICKEL	278	GW Sample	2.22	NA	278	0.0346	12986
SELENIUM	20.14882984	Leach	2.22	NA	20.14882984	0.0346	153.5
SILVER	6.922863076	Leach	2.22	NA	6.922863076	0.0346	1516
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	424.5
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	25556
ZINC	587	GW Sample	2.22	NA	587	0.0346	24686
ACETONE	44428.35189	Leach	2.22	0.0004	44421.2881	0.0346	1.2823
CARBON DISULFIDE	138.2823445	Leach	2.22	0.0004	138.1244663	0.0346	1.1425
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	9891.925
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	21732.25
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	21732.25
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	31393.75
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	10779.7
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	1511.5
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	411.4
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	6413.5

Kd Sediment = Kd Soil Geomean

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0824	0.0458	0.0427	0.0412	0.0046
ANTIMONY	0.9888	0.5493	0.5121	0.4944	0.0549
ARSENIC	0.0054	0.0030	0.0028	0.0027	0.0003
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0005	0.0003	0.0003	0.0003	0.0000
CHROMIUM	0.0003	0.0002	0.0002	0.0002	0.0000
COBALT	0.0000	0.0000	0.0000	0.0000	0.0000
COPPER	0.0037	0.0020	0.0019	0.0018	0.0002
IRON	0.0851	0.0473	0.0441	0.0425	0.0047
LEAD	0.0021	0.0011	0.0011	0.0010	0.0001
MANGANESE	0.0561	0.0311	0.0290	0.0280	0.0031
MERCURY	0.0000	0.0000	0.0000	0.0000	0.0000
NICKEL	0.0077	0.0043	0.0040	0.0038	0.0004
SELENIUM	0.0471	0.0262	0.0244	0.0235	0.0026
SILVER	0.0016	0.0009	0.0008	0.0008	0.0001
THALLIUM	0.0559	0.0310	0.0289	0.0279	0.0031
VANADIUM	0.0004	0.0002	0.0002	0.0002	0.0000
ZINC	0.0085	0.0047	0.0044	0.0043	0.0005
ACETONE	12427.2107	6904.0059	6435.9981	6213.6053	690.4006
CARBON DISULFIDE	43.4124	24.1180	22.4831	21.7062	2.4118
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Kd Sediment = Kd Soil Geomean

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0015	Below	Below	Below	6879528
ANTIMONY	0.0177	Below	Below	Below	6879528
ARSENIC	0.0001	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0000	Below	Below	Below	6879528
COPPER	0.0001	Below	Below	Below	6879528
IRON	0.0015	Below	Below	Below	6879528
LEAD	0.0000	Below	Below	Below	6879528
MANGANESE	0.0010	Below	Below	Below	6879528
MERCURY	0.0000	Below	Below	Below	6879528
NICKEL	0.0001	Below	Below	Below	6879528
SELENIUM	0.0008	Below	Below	Below	6879528
SILVER	0.0000	Below	Below	Below	6879528
THALLIUM	0.0010	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0002	Below	Below	Below	6879528
ACETONE	222.6855	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.7779	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Kd Sediment = Kd Soil Geomean

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	129849.3844	129849.2499	129849.2385
ANTIMONY	83.11220664	83.10043246	83.09943478
ARSENIC	16.01043038	16.01004839	16.01001602
BERYLLIUM	0.180129065	0.180123207	0.180122711
CADMIUM	1.418759537	1.418723379	1.418720315
CHROMIUM	166.1721037	166.1718041	166.1717787
COBALT	6.845764907	6.845754241	6.845753338
COPPER	3404.554351	3404.54975	3404.549361
IRON	284199.1277	284198.9255	284198.9083
LEAD	2324.082339	2324.079494	2324.079252
MANGANESE	2322.447932	2322.433093	2322.431836
MERCURY	6.972269934	6.972251212	6.972249626
NICKEL	511.9453283	511.94275	511.9425316
SELENIUM	0.436181974	0.435996314	0.435980582
SILVER	1.487552974	1.487488807	1.48748337
THALLIUM	3.971342156	3.970730531	3.970678705
VANADIUM	93.5039602	93.50372092	93.50370065
ZINC	2054.971177	2054.965732	2054.965271
ACETONE	1.98253193	1.891814799	1.884127898
CARBON DISULFIDE	0.003151298	0.00299133	0.002977775
PYRENE	2.413519946	2.413503989	2.413502637
4,4'-DDD	0.008891844	0.008891817	0.008891814
4,4'-DDE	0.038107901	0.038107786	0.038107776
4,4'-DDT	0.127026071	0.127025807	0.127025784
AROCLOR-1254	0.035567619	0.035567403	0.035567385
DIELDRIN	0.020326055	0.020325175	0.020325101
ENDOSULFAN SULFATE	0.00279556	0.002795116	0.002795078
ENDRIN ALDEHYDE	0.001194067	0.001194055	0.001194054

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	903	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	17.2	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	215	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	154	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	196	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	1832	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	767	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	288	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	936	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	1265	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	198	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	109	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	431	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	8.6	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	18.5	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	10.1	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1194	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	765	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	903	32115.1717	NA	4516	14	16768850.56	2631.4714
ANTIMONY	1	17.2	83139.5349	NA	87	14	16768850.56	6812.3350
ARSENIC	1	215	382.7907	NA	1076	14	16768850.56	31.3653
BERYLLIUM	1	154	20.1299	NA	771	14	16768850.56	1.6494
CADMIUM	1	196	122.9592	NA	981	14	16768850.56	10.0751
CHROMIUM	1	1832	1561.1354	NA	9161	14	16768850.56	127.9172
COBALT	1	767	111.0821	NA	3836	14	16768850.56	9.1019
COPPER	1	288	140277.7778	NA	1441	14	16768850.56	11494.1612
IRON	1	936	299145.2991	NA	4681	14	16768850.56	24511.5394
LEAD	1	1265	31620.5534	NA	6326	14	16768850.56	2590.9431
MANGANESE	1	198	22070.7071	NA	991	14	16768850.56	1808.4423
MERCURY	1	109	1100.9174	NA	546	14	16768850.56	90.2076
NICKEL	1	431	9095.1276	NA	2156	14	16768850.56	745.2418
SELENIUM	1	8.6	872.0930	NA	44	14	16768850.56	71.4581
SILVER	1	18.5	1383.7838	NA	93.5	14	16768850.56	113.3853
THALLIUM	1	10.1	356.4356	NA	51.5	14	16768850.56	29.2058
VANADIUM	1	1194	91.2898	NA	5971	14	16768850.56	7.4802
ZINC	1	765	20653.5948	NA	3826	14	16768850.56	1692.3261
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	16768850.56	44428.3519
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	16768850.56	138.2823
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	16768850.56	1.7206
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	16768850.56	0.0029
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	16768850.56	0.0124
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	16768850.56	0.0285
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	1	302.1	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	16768850.56	0.0480
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0013

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	4516
ANTIMONY	6812.334989	Leach	2.22	NA	6812.334989	0.0346	87
ARSENIC	41.2	GW Sample	2.22	NA	41.2	0.0346	1076
BERYLLIUM	1.649412867	Leach	2.22	NA	1.649412867	0.0346	771
CADMIUM	10.07510026	Leach	2.22	NA	10.07510026	0.0346	981
CHROMIUM	127.9172072	Leach	2.22	NA	127.9172072	0.0346	9161
COBALT	9.101912078	Leach	2.22	NA	9.101912078	0.0346	3836
COPPER	11494.16117	Leach	2.22	NA	11494.16117	0.0346	1441
IRON	24511.53944	Leach	2.22	NA	24511.53944	0.0346	4681
LEAD	2590.943073	Leach	2.22	NA	2590.943073	0.0346	6326
MANGANESE	1808.44228	Leach	2.22	NA	1808.44228	0.0346	991
MERCURY	90.20760517	Leach	2.22	NA	90.20760517	0.0346	546
NICKEL	745.241793	Leach	2.22	NA	745.241793	0.0346	2156
SELENIUM	71.45805933	Leach	2.22	NA	71.45805933	0.0346	44
SILVER	113.3852709	Leach	2.22	NA	113.3852709	0.0346	93.5
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	51.5
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5971
ZINC	1692.326118	Leach	2.22	NA	1692.326118	0.0346	3826
ACETONE	44428.35189	Leach	2.22	0.0004	44421.2881	0.0346	1.2823
CARBON DISULFIDE	138.2823445	Leach	2.22	0.0004	138.1244663	0.0346	1.1425
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	9891.925
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	21732.25
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	21732.25
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	31393.75
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	10779.7
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	1511.5
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	411.4
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	6413.5

Kd Sediment = Kd Soil Mins

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	1.1516	0.6398	0.5964	0.5758	0.0640
ANTIMONY	28.0854	15.6030	14.5453	14.0427	1.5603
ARSENIC	0.0137	0.0076	0.0071	0.0069	0.0008
BERYLLIUM	0.0008	0.0004	0.0004	0.0004	0.0000
CADMIUM	0.0037	0.0020	0.0019	0.0018	0.0002
CHROMIUM	0.0050	0.0028	0.0026	0.0025	0.0003
COBALT	0.0009	0.0005	0.0004	0.0004	0.0000
COPPER	2.8610	1.5894	1.4817	1.4305	0.1589
IRON	1.8782	1.0434	0.9727	0.9391	0.1043
LEAD	0.1469	0.0816	0.0761	0.0735	0.0082
MANGANESE	0.6545	0.3636	0.3390	0.3273	0.0364
MERCURY	0.0593	0.0329	0.0307	0.0296	0.0033
NICKEL	0.1240	0.0689	0.0642	0.0620	0.0069
SELENIUM	0.5825	0.3236	0.3017	0.2913	0.0324
SILVER	0.4350	0.2416	0.2253	0.2175	0.0242
THALLIUM	0.4604	0.2558	0.2384	0.2302	0.0256
VANADIUM	0.0015	0.0009	0.0008	0.0008	0.0001
ZINC	0.1587	0.0881	0.0822	0.0793	0.0088
ACETONE	12427.2107	6904.0059	6435.9981	6213.6053	690.4006
CARBON DISULFIDE	43.4124	24.1180	22.4831	21.7062	2.4118
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Kd Sediment = Kd Soil Mins

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0206	Below	Below	Below	6879528
ANTIMONY	0.5033	Below	Below	Below	6879528
ARSENIC	0.0002	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0001	Below	Below	Below	6879528
CHROMIUM	0.0001	Below	Below	Below	6879528
COBALT	0.0000	Below	Below	Below	6879528
COPPER	0.0513	Below	Below	Below	6879528
IRON	0.0337	Below	Below	Below	6879528
LEAD	0.0026	Below	Below	Below	6879528
MANGANESE	0.0117	Below	Below	Below	6879528
MERCURY	0.0011	Below	Below	Below	6879528
NICKEL	0.0022	Below	Below	Below	6879528
SELENIUM	0.0104	Below	Below	Below	6879528
SILVER	0.0078	Exceeds	Below	Below	6879528
THALLIUM	0.0082	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0028	Below	Below	Below	6879528
ACETONE	222.6855	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.7779	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Kd Sediment = Kd Soil Mins

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	9284.784344	9284.649888	9284.638495
ANTIMONY	83.22624362	83.16378634	83.15849403
ARSENIC	6.281986254	6.281604485	6.281572135
BERYLLIUM	0.180150261	0.180134983	0.180133688
CADMIUM	1.400465789	1.400372439	1.400364529
CHROMIUM	166.1740986	166.1729123	166.1728118
COBALT	4.950471639	4.950387242	4.95038009
COPPER	2347.556395	2347.449862	2347.440835
IRON	16269.04297	16268.81567	16268.79641
LEAD	2324.129997	2324.10597	2324.103934
MANGANESE	253.9429974	253.9262413	253.9248214
MERCURY	6.974106856	6.973271725	6.97320096
NICKEL	227.7749866	227.7680778	227.7674924
SELENIUM	0.437221566	0.436573865	0.436518982
SILVER	1.489749469	1.488709082	1.488620925
THALLIUM	0.474748802	0.474147638	0.474096698
VANADIUM	21.84422559	21.84398634	21.84396606
ZINC	918.045302	918.02961	918.0282804
ACETONE	1.98253193	1.891814799	1.884127898
CARBON DISULFIDE	0.003151298	0.00299133	0.002977775
PYRENE	2.413519946	2.413503989	2.413502637
4,4'-DDD	0.008891844	0.008891817	0.008891814
4,4'-DDE	0.038107901	0.038107786	0.038107776
4,4'-DDT	0.127026071	0.127025807	0.127025784
AROCLOR-1254	0.035567619	0.035567403	0.035567385
DIELDRIN	0.020326055	0.020325175	0.020325101
ENDOSULFAN SULFATE	0.00279556	0.002795116	0.002795078
ENDRIN ALDEHYDE	0.001194067	0.001194055	0.001194054

Kd Sediment = Kd Soil Maxs

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	104413	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	1385	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	2507	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	1111	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	5357	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	275238	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	51485	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	64623	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	478134	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	189011	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	268333	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	64000	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	184884	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	262	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	1370	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	22727	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	50625	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	30952	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	104413	277.7432	NA	522066	14	16768850.56	22.7579
ANTIMONY	1	1385	1032.4910	NA	6926	14	16768850.56	84.6008
ARSENIC	1	2507	32.8281	NA	12536	14	16768850.56	2.6899
BERYLLIUM	1	1111	2.7903	NA	5556	14	16768850.56	0.2286
CADMIUM	1	5357	4.4988	NA	26786	14	16768850.56	0.3686
CHROMIUM	1	275238	10.3910	NA	1376191	14	16768850.56	0.8514
COBALT	1	51485	1.6549	NA	257426	14	16768850.56	0.1356
COPPER	1	64623	625.1644	NA	323116	14	16768850.56	51.2251
IRON	1	478134	585.6099	NA	2390671	14	16768850.56	47.9840
LEAD	1	189011	211.6279	NA	945056	14	16768850.56	17.3405
MANGANESE	1	268333	16.2857	NA	1341666	14	16768850.56	1.3344
MERCURY	1	64000	1.8750	NA	320001	14	16768850.56	0.1536
NICKEL	1	184884	21.2025	NA	924421	14	16768850.56	1.7373
SELENIUM	1	262	28.6260	NA	1311	14	16768850.56	2.3456
SILVER	1	1370	18.6861	NA	6851	14	16768850.56	1.5311
THALLIUM	1	22727	0.1584	NA	113636	14	16768850.56	0.0130
VANADIUM	1	50625	2.1531	NA	253126	14	16768850.56	0.1764
ZINC	1	30952	510.4678	NA	154761	14	16768850.56	41.8270
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	16768850.56	44428.3519
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	16768850.56	138.2823
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	16768850.56	1.7206
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	16768850.56	0.0029
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	16768850.56	0.0124
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	16768850.56	0.0285
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	1	302.1	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	16768850.56	0.0480
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0013

Kd Sediment = Kd Soil Maxs

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	522066
ANTIMONY	84.60083885	Leach	2.22	NA	84.60083885	0.0346	6926
ARSENIC	41.2	GW Sample	2.22	NA	41.2	0.0346	12536
BERYLLIUM	0.228631487	Leach	2.22	NA	0.228631487	0.0346	5556
CADMIUM	3.9	GW Sample	2.22	NA	3.9	0.0346	26786
CHROMIUM	27.4	GW Sample	2.22	NA	27.4	0.0346	1376191
COBALT	1.15	GW Sample	2.22	NA	1.15	0.0346	257426
COPPER	496	GW Sample	2.22	NA	496	0.0346	323116
IRON	21800	GW Sample	2.22	NA	21800	0.0346	2390671
LEAD	195	GW Sample	2.22	NA	195	0.0346	945056
MANGANESE	1600	GW Sample	2.22	NA	1600	0.0346	1341666
MERCURY	0.46	GW Sample	2.22	NA	0.46	0.0346	320001
NICKEL	278	GW Sample	2.22	NA	278	0.0346	924421
SELENIUM	19.8	GW Sample	2.22	NA	19.8	0.0346	1311
SILVER	6.2	GW Sample	2.22	NA	6.2	0.0346	6851
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	113636
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	253126
ZINC	587	GW Sample	2.22	NA	587	0.0346	154761
ACETONE	44428.35189	Leach	2.22	0.0004	44421.2881	0.0346	1.2823
CARBON DISULFIDE	138.2823445	Leach	2.22	0.0004	138.1244663	0.0346	1.1425
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	9891.925
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	21732.25
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	21732.25
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	31393.75
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	10779.7
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	1511.5
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	411.4
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	6413.5

Kd Sediment = Kd Soil Maxs

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0100	0.0055	0.0052	0.0050	0.0006
ANTIMONY	0.0044	0.0024	0.0023	0.0022	0.0002
ARSENIC	0.0012	0.0007	0.0006	0.0006	0.0001
BERYLLIUM	0.0000	0.0000	0.0000	0.0000	0.0000
CADMIUM	0.0001	0.0000	0.0000	0.0000	0.0000
CHROMIUM	0.0000	0.0000	0.0000	0.0000	0.0000
COBALT	0.0000	0.0000	0.0000	0.0000	0.0000
COPPER	0.0006	0.0003	0.0003	0.0003	0.0000
IRON	0.0033	0.0018	0.0017	0.0016	0.0002
LEAD	0.0001	0.0000	0.0000	0.0000	0.0000
MANGANESE	0.0004	0.0002	0.0002	0.0002	0.0000
MERCURY	0.0000	0.0000	0.0000	0.0000	0.0000
NICKEL	0.0001	0.0001	0.0001	0.0001	0.0000
SELENIUM	0.0054	0.0030	0.0028	0.0027	0.0003
SILVER	0.0003	0.0002	0.0002	0.0002	0.0000
THALLIUM	0.0002	0.0001	0.0001	0.0001	0.0000
VANADIUM	0.0000	0.0000	0.0000	0.0000	0.0000
ZINC	0.0014	0.0008	0.0007	0.0007	0.0001
ACETONE	12427.2107	6904.0059	6435.9981	6213.6053	690.4006
CARBON DISULFIDE	43.4124	24.1180	22.4831	21.7062	2.4118
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Kd Sediment = Kd Soil Maxs

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0002	Below	Below	Below	6879528
ANTIMONY	0.0001	Below	Below	Below	6879528
ARSENIC	0.0000	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0000	Below	Below	Below	6879528
COPPER	0.0000	Below	Below	Below	6879528
IRON	0.0001	Below	Below	Below	6879528
LEAD	0.0000	Below	Below	Below	6879528
MANGANESE	0.0000	Below	Below	Below	6879528
MERCURY	0.0000	Below	Below	Below	6879528
NICKEL	0.0000	Below	Below	Below	6879528
SELENIUM	0.0001	Below	Below	Below	6879528
SILVER	0.0000	Below	Below	Below	6879528
THALLIUM	0.0000	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0000	Below	Below	Below	6879528
ACETONE	222.6855	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.7779	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Kd Sediment = Kd Soil Maxs

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	1073555.784	1073555.65	1073555.639
ANTIMONY	83.08747997	83.08669542	83.08662895
ARSENIC	73.24172517	73.24134307	73.2413107
BERYLLIUM	0.180120655	0.180118535	0.180118356
CADMIUM	14.81462138	14.81458521	14.81458215
CHROMIUM	5347.624695	5347.624441	5347.62442
COBALT	41.98370127	41.98369061	41.9836897
COPPER	22728.50693	22728.50233	22728.50194
IRON	7391082.76	7391082.558	7391082.541
LEAD	26135.07052	26135.06872	26135.06856
MANGANESE	304436.0188	304436.004	304436.0027
MERCURY	20.87564596	20.8756417	20.87564134
NICKEL	36445.68449	36445.68191	36445.6817
SELENIUM	3.67889288	3.678709378	3.678693829
SILVER	6.023147547	6.023090052	6.02308518
THALLIUM	1065.23653	1065.235917	1065.235865
VANADIUM	926.161902	926.1616627	926.1616425
ZINC	12883.36018	12883.35473	12883.35427
ACETONE	1.98253193	1.891814799	1.884127898
CARBON DISULFIDE	0.003151298	0.00299133	0.002977775
PYRENE	2.413519946	2.413503989	2.413502637
4,4'-DDD	0.008891844	0.008891817	0.008891814
4,4'-DDE	0.038107901	0.038107786	0.038107776
4,4'-DDT	0.127026071	0.127025807	0.127025784
AROCLOR-1254	0.035567619	0.035567403	0.035567385
DIELDRIN	0.020326055	0.020325175	0.020325101
ENDOSULFAN SULFATE	0.00279556	0.002795116	0.002795078
ENDRIN ALDEHYDE	0.001194067	0.001194055	0.001194054

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	40735	19333.3333	NA	7501	14	16768850.56	1584.1458
ANTIMONY	1	17.2	31777.7778	NA	226	14	16768850.56	2603.8258
ARSENIC	1	3680	2837.9310	NA	146	14	16768850.56	232.5360
BERYLLIUM	1	154	7.7114	NA	2011	14	16768850.56	0.6319
CADMIUM	1	3650	321.3333	NA	376	14	16768850.56	26.3296
CHROMIUM	1	12000	3364.7059	NA	4251	14	16768850.56	275.6992
COBALT	1	767	1893.3333	NA	226	14	16768850.56	155.1370
COPPER	1	23920	1154285.7143	NA	176	14	16768850.56	94580.5262
IRON	1	2670	11200000.0000	NA	126	14	16768850.56	917712.0366
LEAD	1	6447	44444.4444	NA	4501	14	16768850.56	3641.7144
MANGANESE	1	789	67230.7692	NA	326	14	16768850.56	5508.7934
MERCURY	1	1952	2307.6923	NA	261	14	16768850.56	189.0890
NICKEL	1	384	60307.6923	NA	326	14	16768850.56	4941.5264
SELENIUM	1	8.6	1500.0000	NA	26	14	16768850.56	122.9079
SILVER	1	320	3084.3373	NA	42.5	14	16768850.56	252.7262
THALLIUM	1	10.1	50.7042	NA	356	14	16768850.56	4.1546
VANADIUM	1	1194	109.0000	NA	5001	14	16768850.56	8.9313
ZINC	1	4259	254838.7097	NA	311	14	16768850.56	20881.1206
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	16768850.56	44428.3519
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	16768850.56	138.2823
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	16768850.56	1.7206
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	16768850.56	0.0029
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	16768850.56	0.0124
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	16768850.56	0.0285
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	1	302.1	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	16768850.56	0.0480
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0013

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	203676
ANTIMONY	2603.825818	Leach	2.22	NA	2603.825818	0.0346	87
ARSENIC	232.536024	Leach	2.22	NA	232.536024	0.0346	18401
BERYLLIUM	0.631864631	Leach	2.22	NA	0.631864631	0.0346	771
CADMIUM	26.32959533	Leach	2.22	NA	26.32959533	0.0346	18251
CHROMIUM	275.6992043	Leach	2.22	NA	275.6992043	0.0346	60001
COBALT	155.1370348	Leach	2.22	NA	155.1370348	0.0346	3836
COPPER	94580.52622	Leach	2.22	NA	94580.52622	0.0346	119601
IRON	917712.0366	Leach	2.22	NA	917712.0366	0.0346	13351
LEAD	3641.714431	Leach	2.22	NA	3641.714431	0.0346	32236
MANGANESE	5508.793406	Leach	2.22	NA	5508.793406	0.0346	3946
MERCURY	189.0890185	Leach	2.22	NA	189.0890185	0.0346	9761
NICKEL	4941.526351	Leach	2.22	NA	4941.526351	0.0346	1921
SELENIUM	122.907862	Leach	2.22	NA	122.907862	0.0346	44
SILVER	252.7262063	Leach	2.22	NA	252.7262063	0.0346	1601
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	51.5
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5971
ZINC	20881.12065	Leach	2.22	NA	20881.12065	0.0346	21296
ACETONE	44428.35189	Leach	2.22	0.0004	44421.2881	0.0346	1.2823
CARBON DISULFIDE	138.2823445	Leach	2.22	0.0004	138.1244663	0.0346	1.1425
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	9891.925
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	21732.25
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	21732.25
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	31393.75
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	10779.7
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	1511.5
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	411.4
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone Cl (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone Cl (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone Cl (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0255	0.0142	0.0132	0.0128	0.0014
ANTIMONY	10.7348	5.9638	5.5595	5.3674	0.5964
ARSENIC	0.0045	0.0025	0.0023	0.0023	0.0003
BERYLLIUM	0.0003	0.0002	0.0002	0.0001	0.0000
CADMIUM	0.0005	0.0003	0.0003	0.0003	0.0000
CHROMIUM	0.0016	0.0009	0.0009	0.0008	0.0001
COBALT	0.0145	0.0081	0.0075	0.0073	0.0008
COPPER	0.2836	0.1576	0.1469	0.1418	0.0158
IRON	24.6545	13.6969	12.7684	12.3272	1.3697
LEAD	0.0405	0.0225	0.0210	0.0203	0.0023
MANGANESE	0.5007	0.2782	0.2593	0.2504	0.0278
MERCURY	0.0069	0.0039	0.0036	0.0035	0.0004
NICKEL	0.9226	0.5126	0.4778	0.4613	0.0513
SELENIUM	1.0019	0.5566	0.5189	0.5010	0.0557
SILVER	0.0566	0.0315	0.0293	0.0283	0.0031
THALLIUM	0.4604	0.2558	0.2384	0.2302	0.0256
VANADIUM	0.0015	0.0009	0.0008	0.0008	0.0001
ZINC	0.3517	0.1954	0.1821	0.1758	0.0195
ACETONE	12427.2107	6904.0059	6435.9981	6213.6053	690.4006
CARBON DISULFIDE	43.4124	24.1180	22.4831	21.7062	2.4118
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0005	Below	Below	Below	6879528
ANTIMONY	0.1924	Below	Below	Below	6879528
ARSENIC	0.0001	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0003	Below	Below	Below	6879528
COPPER	0.0051	Below	Below	Below	6879528
IRON	0.4418	Below	Below	Below	6879528
LEAD	0.0007	Below	Below	Below	6879528
MANGANESE	0.0090	Below	Below	Below	6879528
MERCURY	0.0001	Below	Below	Below	6879528
NICKEL	0.0165	Below	Below	Below	6879528
SELENIUM	0.0180	Below	Below	Below	6879528
SILVER	0.0010	Below	Below	Below	6879528
THALLIUM	0.0082	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0063	Below	Below	Below	6879528
ACETONE	222.6855	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.7779	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	418830.1662	418830.0317	418830.0203
ANTIMONY	31.81091978	31.78704722	31.78502439
ARSENIC	606.7970373	606.7948807	606.794698
BERYLLIUM	0.069012787	0.069006934	0.069006438
CADMIUM	68.14632935	68.14608516	68.14606447
CHROMIUM	2345.955346	2345.952789	2345.952572
COBALT	84.37803882	84.37660032	84.37647843
COPPER	1604225.27	1604224.393	1604224.319
IRON	1737498.32	1737489.809	1737489.088
LEAD	16648.20662	16648.17285	16648.16998
MANGANESE	3082.134602	3082.083521	3082.079193
MERCURY	261.7306511	261.7288975	261.7287489
NICKEL	1345.635771	1345.589963	1345.586081
SELENIUM	0.752021094	0.750907048	0.750812649
SILVER	57.35114443	57.34880189	57.3486034
THALLIUM	0.474748802	0.474147638	0.474096698
VANADIUM	21.84422559	21.84398634	21.84396606
ZINC	63061.79975	63061.60609	63061.58968
ACETONE	1.98253193	1.891814799	1.884127898
CARBON DISULFIDE	0.003151298	0.00299133	0.002977775
PYRENE	2.413519946	2.413503989	2.413502637
4,4'-DDD	0.008891844	0.008891817	0.008891814
4,4'-DDE	0.038107901	0.038107786	0.038107776
4,4'-DDT	0.127026071	0.127025807	0.127025784
AROCLOR-1254	0.035567619	0.035567403	0.035567385
DIELDRIN	0.020326055	0.020325175	0.020325101
ENDOSULFAN SULFATE	0.00279556	0.002795116	0.002795078
ENDRIN ALDEHYDE	0.001194067	0.001194055	0.001194054

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	1081921	19333.3333	NA	7501	14	16768850.56	1584.1458
ANTIMONY	1	1385	31777.7778	NA	226	14	16768850.56	2603.8258
ARSENIC	1	5520	2837.9310	NA	146	14	16768850.56	232.5360
BERYLLIUM	1	1111	7.7114	NA	2011	14	16768850.56	0.6319
CADMIUM	1	6500	321.3333	NA	376	14	16768850.56	26.3296
CHROMIUM	1	148947	3364.7059	NA	4251	14	16768850.56	275.6992
COBALT	1	51485	1893.3333	NA	226	14	16768850.56	155.1370
COPPER	1	126400	1154285.7143	NA	176	14	16768850.56	94580.5262
IRON	1	18182	11200000.0000	NA	126	14	16768850.56	917712.0366
LEAD	1	26944	44444.4444	NA	4501	14	16768850.56	3641.7144
MANGANESE	1	6959	67230.7692	NA	326	14	16768850.56	5508.7934
MERCURY	1	6810	2307.6923	NA	261	14	16768850.56	189.0890
NICKEL	1	9050	60307.6923	NA	326	14	16768850.56	4941.5264
SELENIUM	1	262	1500.0000	NA	26	14	16768850.56	122.9079
SILVER	1	1640	3084.3373	NA	42.5	14	16768850.56	252.7262
THALLIUM	1	22727	50.7042	NA	356	14	16768850.56	4.1546
VANADIUM	1	50625	109.0000	NA	5001	14	16768850.56	8.9313
ZINC	1	91667	254838.7097	NA	311	14	16768850.56	20881.1206
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	16768850.56	44428.3519
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	16768850.56	138.2823
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	16768850.56	1.7206
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	16768850.56	0.0029
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	16768850.56	0.0124
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	16768850.56	0.0285
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	1	302.1	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	16768850.56	0.0480
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0013

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	5409606
ANTIMONY	2603.825818	Leach	2.22	NA	2603.825818	0.0346	6926
ARSENIC	232.536024	Leach	2.22	NA	232.536024	0.0346	27601
BERYLLIUM	0.631864631	Leach	2.22	NA	0.631864631	0.0346	5556
CADMIUM	26.32959533	Leach	2.22	NA	26.32959533	0.0346	32501
CHROMIUM	275.6992043	Leach	2.22	NA	275.6992043	0.0346	744736
COBALT	155.1370348	Leach	2.22	NA	155.1370348	0.0346	257426
COPPER	94580.52622	Leach	2.22	NA	94580.52622	0.0346	632001
IRON	917712.0366	Leach	2.22	NA	917712.0366	0.0346	90911
LEAD	3641.714431	Leach	2.22	NA	3641.714431	0.0346	134721
MANGANESE	5508.793406	Leach	2.22	NA	5508.793406	0.0346	34796
MERCURY	189.0890185	Leach	2.22	NA	189.0890185	0.0346	34051
NICKEL	4941.526351	Leach	2.22	NA	4941.526351	0.0346	45251
SELENIUM	122.907862	Leach	2.22	NA	122.907862	0.0346	1311
SILVER	252.7262063	Leach	2.22	NA	252.7262063	0.0346	8201
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	113636
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	253126
ZINC	20881.12065	Leach	2.22	NA	20881.12065	0.0346	458336
ACETONE	44428.35189	Leach	2.22	0.0004	44421.2881	0.0346	1.2823
CARBON DISULFIDE	138.2823445	Leach	2.22	0.0004	138.1244663	0.0346	1.1425
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	9891.925
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	21732.25
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	21732.25
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	31393.75
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	10779.7
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	1511.5
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	411.4
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0010	0.0005	0.0005	0.0005	0.0001
ANTIMONY	0.1348	0.0749	0.0698	0.0674	0.0075
ARSENIC	0.0030	0.0017	0.0016	0.0015	0.0002
BERYLLIUM	0.0000	0.0000	0.0000	0.0000	0.0000
CADMIUM	0.0003	0.0002	0.0002	0.0001	0.0000
CHROMIUM	0.0001	0.0001	0.0001	0.0001	0.0000
COBALT	0.0002	0.0001	0.0001	0.0001	0.0000
COPPER	0.0537	0.0298	0.0278	0.0268	0.0030
IRON	3.6207	2.0115	1.8751	1.8104	0.2012
LEAD	0.0097	0.0054	0.0050	0.0048	0.0005
MANGANESE	0.0568	0.0315	0.0294	0.0284	0.0032
MERCURY	0.0020	0.0011	0.0010	0.0010	0.0001
NICKEL	0.0392	0.0218	0.0203	0.0196	0.0022
SELENIUM	0.0336	0.0187	0.0174	0.0168	0.0019
SILVER	0.0111	0.0061	0.0057	0.0055	0.0006
THALLIUM	0.0002	0.0001	0.0001	0.0001	0.0000
VANADIUM	0.0000	0.0000	0.0000	0.0000	0.0000
ZINC	0.0163	0.0091	0.0085	0.0082	0.0009
ACETONE	12427.2107	6904.0059	6435.9981	6213.6053	690.4006
CARBON DISULFIDE	43.4124	24.1180	22.4831	21.7062	2.4118
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0000	Below	Below	Below	6879528
ANTIMONY	0.0024	Below	Below	Below	6879528
ARSENIC	0.0001	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0000	Below	Below	Below	6879528
COPPER	0.0010	Below	Below	Below	6879528
IRON	0.0649	Below	Below	Below	6879528
LEAD	0.0002	Below	Below	Below	6879528
MANGANESE	0.0010	Below	Below	Below	6879528
MERCURY	0.0000	Below	Below	Below	6879528
NICKEL	0.0007	Below	Below	Below	6879528
SELENIUM	0.0006	Below	Below	Below	6879528
SILVER	0.0002	Below	Below	Below	6879528
THALLIUM	0.0000	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0003	Below	Below	Below	6879528
ACETONE	222.6855	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.7779	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	11124115.31	11124115.18	11124115.17
ANTIMONY	2557.247995	2557.223848	2557.221802
ARSENIC	910.1931299	910.1909732	910.1907905
BERYLLIUM	0.49779614	0.49779028	0.497789784
CADMIUM	121.3560479	121.3558037	121.3557831
CHROMIUM	29118.51858	29118.51603	29118.51581
COBALT	5663.675585	5663.674146	5663.674025
COPPER	8477168.556	8477167.679	8477167.605
IRON	11831796.78	11831788.27	11831787.55
LEAD	69577.74493	69577.71115	69577.70829
MANGANESE	27183.60658	27183.55549	27183.55116
MERCURY	913.0976264	913.0958727	913.0957241
NICKEL	31711.2254	31711.17957	31711.17569
SELENIUM	22.83660902	22.83546993	22.83537341
SILVER	293.9028762	293.9005324	293.9003338
THALLIUM	1065.23653	1065.235917	1065.235865
VANADIUM	926.161902	926.1616627	926.1616425
ZINC	1357278.213	1357278.02	1357278.003
ACETONE	1.98253193	1.891814799	1.884127898
CARBON DISULFIDE	0.003151298	0.00299133	0.002977775
PYRENE	2.413519946	2.413503989	2.413502637
4,4'-DDD	0.008891844	0.008891817	0.008891814
4,4'-DDE	0.038107901	0.038107786	0.038107776
4,4'-DDT	0.127026071	0.127025807	0.127025784
AROCLOR-1254	0.035567619	0.035567403	0.035567385
DIELDRIN	0.020326055	0.020325175	0.020325101
ENDOSULFAN SULFATE	0.00279556	0.002795116	0.002795078
ENDRIN ALDEHYDE	0.001194067	0.001194055	0.001194054

Retardation of Soil is 1

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Retardation of Soil is 1

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	1	14	16768850.56	1584.1458
ANTIMONY	1	45	31777.7778	NA	1	14	16768850.56	2603.8258
ARSENIC	1	4617	2837.9310	NA	1	14	16768850.56	232.5360
BERYLLIUM	1	402	7.7114	NA	1	14	16768850.56	0.6319
CADMIUM	1	4849	321.3333	NA	1	14	16768850.56	26.3296
CHROMIUM	1	41971	3364.7059	NA	1	14	16768850.56	275.6992
COBALT	1	45	1893.3333	NA	1	14	16768850.56	155.1370
COPPER	1	51038	1154285.7143	NA	1	14	16768850.56	94580.5262
IRON	1	4342	11200000.0000	NA	1	14	16768850.56	917712.0366
LEAD	1	10811	44444.4444	NA	1	14	16768850.56	3641.7144
MANGANESE	1	2246	67230.7692	NA	1	14	16768850.56	5508.7934
MERCURY	1	3316	2307.6923	NA	1	14	16768850.56	189.0890
NICKEL	1	3960	60307.6923	NA	1	14	16768850.56	4941.5264
SELENIUM	1	5	1500.0000	NA	1	14	16768850.56	122.9079
SILVER	1	741	3084.3373	NA	1	14	16768850.56	252.7262
THALLIUM	1	71	50.7042	NA	1	14	16768850.56	4.1546
VANADIUM	1	1000	109.0000	NA	1	14	16768850.56	8.9313
ZINC	1	19197	254838.7097	NA	1	14	16768850.56	20881.1206
ACETONE	1	0.05646	542215.3369	0.3808	1	14	16768850.56	44428.3519
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1	14	16768850.56	138.2823
PYRENE	1	1978.185	20.9984	NA	1	14	16768850.56	1.7206
4,4'-DDD	1	4346.25	0.0352	NA	1	14	16768850.56	0.0029
4,4'-DDE	1	4346.25	0.1509	NA	1	14	16768850.56	0.0124
4,4'-DDT	1	6278.55	0.3482	NA	1	14	16768850.56	0.0285
AROCLOR-1254	1	2155.74	0.2840	NA	1	14	16768850.56	0.0233
DIELDRIN	1	302.1	1.1579	NA	1	14	16768850.56	0.0949
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	1	14	16768850.56	0.0480
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	1	14	16768850.56	0.0013

Retardation of Soil is 1

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	2603.825818	Leach	2.22	NA	2603.825818	0.0346	226
ARSENIC	232.536024	Leach	2.22	NA	232.536024	0.0346	23086
BERYLLIUM	0.631864631	Leach	2.22	NA	0.631864631	0.0346	2011
CADMIUM	26.32959533	Leach	2.22	NA	26.32959533	0.0346	24246
CHROMIUM	275.6992043	Leach	2.22	NA	275.6992043	0.0346	209856
COBALT	155.1370348	Leach	2.22	NA	155.1370348	0.0346	226
COPPER	94580.52622	Leach	2.22	NA	94580.52622	0.0346	255191
IRON	917712.0366	Leach	2.22	NA	917712.0366	0.0346	21711
LEAD	3641.714431	Leach	2.22	NA	3641.714431	0.0346	54056
MANGANESE	5508.793406	Leach	2.22	NA	5508.793406	0.0346	11231
MERCURY	189.0890185	Leach	2.22	NA	189.0890185	0.0346	16581
NICKEL	4941.526351	Leach	2.22	NA	4941.526351	0.0346	19801
SELENIUM	122.907862	Leach	2.22	NA	122.907862	0.0346	26
SILVER	252.7262063	Leach	2.22	NA	252.7262063	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	20881.12065	Leach	2.22	NA	20881.12065	0.0346	95986
ACETONE	44428.35189	Leach	2.22	0.0004	44422.09571	0.0346	1.2823
CARBON DISULFIDE	138.2823445	Leach	2.22	0.0004	138.134122	0.0346	1.1425
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	9891.925
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	21732.25
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	21732.25
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	31393.75
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	10779.7
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	1511.5
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	411.4
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	6413.5

Retardation of Soil is 1

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	4.1324	2.2958	2.1402	2.0662	0.2296
ARSENIC	0.0036	0.0020	0.0019	0.0018	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
COBALT	0.2462	0.1368	0.1275	0.1231	0.0137
COPPER	0.1329	0.0739	0.0688	0.0665	0.0074
IRON	15.1611	8.4228	7.8518	7.5805	0.8423
LEAD	0.0242	0.0134	0.0125	0.0121	0.0013
MANGANESE	0.1759	0.0977	0.0911	0.0880	0.0098
MERCURY	0.0041	0.0023	0.0021	0.0020	0.0002
NICKEL	0.0895	0.0497	0.0464	0.0448	0.0050
SELENIUM	1.6955	0.9420	0.8781	0.8478	0.0942
SILVER	0.0245	0.0136	0.0127	0.0122	0.0014
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0780	0.0433	0.0404	0.0390	0.0043
ACETONE	12427.2107	6904.0059	6435.9981	6213.6053	690.4006
CARBON DISULFIDE	43.4124	24.1180	22.4831	21.7062	2.4118
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Retardation of Soil is 1

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0740	Below	Below	Below	6879528
ARSENIC	0.0001	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0044	Below	Below	Below	6879528
COPPER	0.0024	Below	Below	Below	6879528
IRON	0.2717	Below	Below	Below	6879528
LEAD	0.0004	Below	Below	Below	6879528
MANGANESE	0.0032	Below	Below	Below	6879528
MERCURY	0.0001	Below	Below	Below	6879528
NICKEL	0.0016	Below	Below	Below	6879528
SELENIUM	0.0304	Below	Below	Below	6879528
SILVER	0.0004	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0014	Below	Below	Below	6879528
ACETONE	222.6855	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.7779	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Retardation of Soil is 1

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	83.13981214	83.11576885	83.11373155
ARSENIC	761.2981997	761.296043	761.2958603
BERYLLIUM	0.180129065	0.180123207	0.180122711
CADMIUM	90.53175131	90.53150712	90.53148643
CHROMIUM	8205.159949	8205.157392	8205.157176
COBALT	4.953504891	4.952072382	4.951950998
COPPER	3422926.246	3422925.369	3422925.295
IRON	2825537.711	2825529.2	2825528.479
LEAD	27917.39261	27917.35883	27917.35597
MANGANESE	8773.519489	8773.4684	8773.464071
MERCURY	444.61755	444.6157963	444.6156477
NICKEL	13875.90911	13875.86328	13875.8594
SELENIUM	0.438230486	0.437134376	0.437041497
SILVER	132.7968114	132.794468	132.7942695
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	284242.9821	284242.7884	284242.772
ACETONE	1.982564263	1.891847131	1.88416023
CARBON DISULFIDE	0.003151493	0.002991525	0.00297797
PYRENE	2.413519946	2.413503989	2.413502637
4,4'-DDD	0.008891844	0.008891817	0.008891814
4,4'-DDE	0.038107901	0.038107786	0.038107776
4,4'-DDT	0.127026071	0.127025807	0.127025784
AROCLOR-1254	0.035567619	0.035567403	0.035567385
DIELDRIN	0.020326055	0.020325175	0.020325101
ENDOSULFAN SULFATE	0.00279556	0.002795116	0.002795078
ENDRIN ALDEHYDE	0.001194067	0.001194055	0.001194054

Retardation of Sediment is 1

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Retardation of Sediment is 1

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	16768850.56	1584.1458
ANTIMONY	1	45	31777.7778	NA	226	14	16768850.56	2603.8258
ARSENIC	1	4617	2837.9310	NA	146	14	16768850.56	232.5360
BERYLLIUM	1	402	7.7114	NA	2011	14	16768850.56	0.6319
CADMIUM	1	4849	321.3333	NA	376	14	16768850.56	26.3296
CHROMIUM	1	41971	3364.7059	NA	4251	14	16768850.56	275.6992
COBALT	1	45	1893.3333	NA	226	14	16768850.56	155.1370
COPPER	1	51038	1154285.7143	NA	176	14	16768850.56	94580.5262
IRON	1	4342	11200000.0000	NA	126	14	16768850.56	917712.0366
LEAD	1	10811	44444.4444	NA	4501	14	16768850.56	3641.7144
MANGANESE	1	2246	67230.7692	NA	326	14	16768850.56	5508.7934
MERCURY	1	3316	2307.6923	NA	261	14	16768850.56	189.0890
NICKEL	1	3960	60307.6923	NA	326	14	16768850.56	4941.5264
SELENIUM	1	5	1500.0000	NA	26	14	16768850.56	122.9079
SILVER	1	741	3084.3373	NA	42.5	14	16768850.56	252.7262
THALLIUM	1	71	50.7042	NA	356	14	16768850.56	4.1546
VANADIUM	1	1000	109.0000	NA	5001	14	16768850.56	8.9313
ZINC	1	19197	254838.7097	NA	311	14	16768850.56	20881.1206
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	16768850.56	44428.3519
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	16768850.56	138.2823
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	16768850.56	1.7206
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	16768850.56	0.0029
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	16768850.56	0.0124
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	16768850.56	0.0285
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	1	302.1	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	16768850.56	0.0480
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0013

Retardation of Sediment is 1

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1
ANTIMONY	2603.825818	Leach	2.22	NA	2603.825818	0.0346	1
ARSENIC	232.536024	Leach	2.22	NA	232.536024	0.0346	1
BERYLLIUM	0.631864631	Leach	2.22	NA	0.631864631	0.0346	1
CADMIUM	26.32959533	Leach	2.22	NA	26.32959533	0.0346	1
CHROMIUM	275.6992043	Leach	2.22	NA	275.6992043	0.0346	1
COBALT	155.1370348	Leach	2.22	NA	155.1370348	0.0346	1
COPPER	94580.52622	Leach	2.22	NA	94580.52622	0.0346	1
IRON	917712.0366	Leach	2.22	NA	917712.0366	0.0346	1
LEAD	3641.714431	Leach	2.22	NA	3641.714431	0.0346	1
MANGANESE	5508.793406	Leach	2.22	NA	5508.793406	0.0346	1
MERCURY	189.0890185	Leach	2.22	NA	189.0890185	0.0346	1
NICKEL	4941.526351	Leach	2.22	NA	4941.526351	0.0346	1
SELENIUM	122.907862	Leach	2.22	NA	122.907862	0.0346	1
SILVER	252.7262063	Leach	2.22	NA	252.7262063	0.0346	1
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	1
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	1
ZINC	20881.12065	Leach	2.22	NA	20881.12065	0.0346	1
ACETONE	44428.35189	Leach	2.22	0.0004	44421.2881	0.0346	1
CARBON DISULFIDE	138.2823445	Leach	2.22	0.0004	138.1244663	0.0346	1
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	1
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	1
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	1
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	1
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	1
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	1
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	1
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	1

Retardation of Sediment is 1

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	5200.8114	2889.3396	2693.4775	2600.4057	288.9340
ANTIMONY	933.9315	518.8508	483.6790	466.9658	51.8851
ARSENIC	83.4052	46.3362	43.1952	41.7026	4.6336
BERYLLIUM	0.2266	0.1259	0.1174	0.1133	0.0126
CADMIUM	9.4438	5.2466	4.8909	4.7219	0.5247
CHROMIUM	98.8869	54.9371	51.2131	49.4434	5.4937
COBALT	55.6440	30.9134	28.8178	27.8220	3.0913
COPPER	33923.8259	18846.5700	17569.0012	16961.9130	1884.6570
IRON	329161.8754	182867.7085	170471.4970	164580.9377	18286.7709
LEAD	1306.1979	725.6655	676.4742	653.0990	72.5666
MANGANESE	1975.8755	1097.7086	1023.2973	987.9378	109.7709
MERCURY	67.8218	37.6788	35.1246	33.9109	3.7679
NICKEL	1772.4101	984.6723	917.9234	886.2050	98.4672
SELENIUM	44.0842	24.4912	22.8310	22.0421	2.4491
SILVER	90.6470	50.3594	46.9457	45.3235	5.0359
THALLIUM	23.7085	13.1714	12.2785	11.8543	1.3171
VANADIUM	9.2539	5.1410	4.7925	4.6269	0.5141
ZINC	7489.5703	4160.8724	3878.8157	3744.7852	416.0872
ACETONE	15935.4122	8853.0068	8252.8804	7967.7061	885.3007
CARBON DISULFIDE	49.5986	27.5548	25.6869	24.7993	2.7555
PYRENE	0.6171	0.3429	0.3196	0.3086	0.0343
4,4'-DDD	0.0010	0.0006	0.0005	0.0005	0.0001
4,4'-DDE	0.0044	0.0025	0.0023	0.0022	0.0002
4,4'-DDT	0.0102	0.0057	0.0053	0.0051	0.0006
AROCLOR-1254	0.0083	0.0046	0.0043	0.0042	0.0005
DIELDRIN	0.0340	0.0189	0.0176	0.0170	0.0019
ENDOSULFAN SULFATE	0.0172	0.0096	0.0089	0.0086	0.0010
ENDRIN ALDEHYDE	0.0005	0.0003	0.0002	0.0002	0.0000

Retardation of Sediment is 1

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	93.1943	Exceeds	Exceeds	Exceeds	6879528
ANTIMONY	16.7353	Exceeds	Exceeds	Below	6879528
ARSENIC	1.4946	Exceeds	Below	Below	6879528
BERYLLIUM	0.0041	Below	Below	Below	6879528
CADMIUM	0.1692	Below	Below	Below	6879528
CHROMIUM	1.7720	Below	Below	Below	6879528
COBALT	0.9971	Exceeds	Below	Below	6879528
COPPER	607.8874	Exceeds	Exceeds	Exceeds	6879528
IRON	5898.3138	Exceeds	Exceeds	Exceeds	6879528
LEAD	23.4060	Exceeds	Exceeds	Exceeds	6879528
MANGANESE	35.4061	Exceeds	Below	Below	6879528
MERCURY	1.2153	Exceeds	Exceeds	Exceeds	6879528
NICKEL	31.7602	Exceeds	Exceeds	Exceeds	6879528
SELENIUM	0.7900	Below	Below	Below	6879528
SILVER	1.6243	Exceeds	Exceeds	Exceeds	6879528
THALLIUM	0.4248	Exceeds	Below	Below	6879528
VANADIUM	0.1658	Below	Below	Below	6879528
ZINC	134.2070	Exceeds	Exceeds	Exceeds	6879528
ACETONE	285.5497	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.8888	Exceeds	Exceeds	Below	6879528
PYRENE	0.0111	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0001	Exceeds	Below	Below	6879528
4,4'-DDT	0.0002	Exceeds	Below	Below	6879528
AROCLOR-1254	0.0001	Below	Below	Below	6879528
DIELDRIN	0.0006	Exceeds	Below	Below	6879528
ENDOSULFAN SULFATE	0.0003	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Retardation of Sediment is 1

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2442852.579	2303583.97	2291783.068
ANTIMONY	95.31172725	89.87794391	89.4175132
ARSENIC	873.3172014	823.5288218	819.3100118
BERYLLIUM	0.206619828	0.194840298	0.193842161
CADMIUM	103.8528133	97.93209712	97.43040623
CHROMIUM	9412.537658	8875.922786	8830.452815
COBALT	5.678712701	5.354965609	5.327532954
COPPER	3926605.502	3702747.178	3683778.581
IRON	3241291.903	3056503.751	3040845.758
LEAD	32025.33282	30199.54784	30044.84025
MANGANESE	10064.40569	9490.627403	9442.008396
MERCURY	510.0382263	480.9606165	478.4967301
NICKEL	15917.62243	15010.14846	14933.2538
SELENIUM	0.499886681	0.471387818	0.468972971
SILVER	152.3317332	143.6472024	142.9113201
THALLIUM	3.81752338	3.599883898	3.581442253
VANADIUM	20.98657672	19.79011838	19.68873668
ZINC	326068.6646	307479.2787	305904.1102
ACETONE	2.040153184	1.923826606	1.913969693
CARBON DISULFIDE	0.003202588	0.003019824	0.003004338
PYRENE	2.768626756	2.610785551	2.597410903
4,4'-DDD	0.010200204	0.009618684	0.009569409
4,4'-DDE	0.043715159	0.04122293	0.041011751
4,4'-DDT	0.145717198	0.137409766	0.136705837
AROCLOR-1254	0.040800815	0.038474734	0.038277634
DIELDRIN	0.023314752	0.021985563	0.021872934
ENDOSULFAN SULFATE	0.003205778	0.003023015	0.003007528
ENDRIN ALDEHYDE	0.001369742	0.001291652	0.001285035

Retard. Soil and Sediment is 1

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Retard. Soil and Sediment is 1

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	1	14	16768850.56	1584.1458
ANTIMONY	1	45	31777.7778	NA	1	14	16768850.56	2603.8258
ARSENIC	1	4617	2837.9310	NA	1	14	16768850.56	232.5360
BERYLLIUM	1	402	7.7114	NA	1	14	16768850.56	0.6319
CADMIUM	1	4849	321.3333	NA	1	14	16768850.56	26.3296
CHROMIUM	1	41971	3364.7059	NA	1	14	16768850.56	275.6992
COBALT	1	45	1893.3333	NA	1	14	16768850.56	155.1370
COPPER	1	51038	1154285.7143	NA	1	14	16768850.56	94580.5262
IRON	1	4342	11200000.0000	NA	1	14	16768850.56	917712.0366
LEAD	1	10811	44444.4444	NA	1	14	16768850.56	3641.7144
MANGANESE	1	2246	67230.7692	NA	1	14	16768850.56	5508.7934
MERCURY	1	3316	2307.6923	NA	1	14	16768850.56	189.0890
NICKEL	1	3960	60307.6923	NA	1	14	16768850.56	4941.5264
SELENIUM	1	5	1500.0000	NA	1	14	16768850.56	122.9079
SILVER	1	741	3084.3373	NA	1	14	16768850.56	252.7262
THALLIUM	1	71	50.7042	NA	1	14	16768850.56	4.1546
VANADIUM	1	1000	109.0000	NA	1	14	16768850.56	8.9313
ZINC	1	19197	254838.7097	NA	1	14	16768850.56	20881.1206
ACETONE	1	0.05646	542215.3369	0.3808	1	14	16768850.56	44428.3519
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1	14	16768850.56	138.2823
PYRENE	1	1978.185	20.9984	NA	1	14	16768850.56	1.7206
4,4'-DDD	1	4346.25	0.0352	NA	1	14	16768850.56	0.0029
4,4'-DDE	1	4346.25	0.1509	NA	1	14	16768850.56	0.0124
4,4'-DDT	1	6278.55	0.3482	NA	1	14	16768850.56	0.0285
AROCLOR-1254	1	2155.74	0.2840	NA	1	14	16768850.56	0.0233
DIELDRIN	1	302.1	1.1579	NA	1	14	16768850.56	0.0949
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	1	14	16768850.56	0.0480
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	1	14	16768850.56	0.0013

Retard. Soil and Sediment is 1

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1
ANTIMONY	2603.825818	Leach	2.22	NA	2603.825818	0.0346	1
ARSENIC	232.536024	Leach	2.22	NA	232.536024	0.0346	1
BERYLLIUM	0.631864631	Leach	2.22	NA	0.631864631	0.0346	1
CADMIUM	26.32959533	Leach	2.22	NA	26.32959533	0.0346	1
CHROMIUM	275.6992043	Leach	2.22	NA	275.6992043	0.0346	1
COBALT	155.1370348	Leach	2.22	NA	155.1370348	0.0346	1
COPPER	94580.52622	Leach	2.22	NA	94580.52622	0.0346	1
IRON	917712.0366	Leach	2.22	NA	917712.0366	0.0346	1
LEAD	3641.714431	Leach	2.22	NA	3641.714431	0.0346	1
MANGANESE	5508.793406	Leach	2.22	NA	5508.793406	0.0346	1
MERCURY	189.0890185	Leach	2.22	NA	189.0890185	0.0346	1
NICKEL	4941.526351	Leach	2.22	NA	4941.526351	0.0346	1
SELENIUM	122.907862	Leach	2.22	NA	122.907862	0.0346	1
SILVER	252.7262063	Leach	2.22	NA	252.7262063	0.0346	1
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	1
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	1
ZINC	20881.12065	Leach	2.22	NA	20881.12065	0.0346	1
ACETONE	44428.35189	Leach	2.22	0.0004	44422.09571	0.0346	1
CARBON DISULFIDE	138.2823445	Leach	2.22	0.0004	138.134122	0.0346	1
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	1
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	1
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	1
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	1
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	1
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	1
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	1
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	1

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	5200.8114	2889.3396	2693.4775	2600.4057	288.9340
ANTIMONY	933.9315	518.8508	483.6790	466.9658	51.8851
ARSENIC	83.4052	46.3362	43.1952	41.7026	4.6336
BERYLLIUM	0.2266	0.1259	0.1174	0.1133	0.0126
CADMIUM	9.4438	5.2466	4.8909	4.7219	0.5247
CHROMIUM	98.8869	54.9371	51.2131	49.4434	5.4937
COBALT	55.6440	30.9134	28.8178	27.8220	3.0913
COPPER	33923.8259	18846.5700	17569.0012	16961.9130	1884.6570
IRON	329161.8754	182867.7085	170471.4970	164580.9377	18286.7709
LEAD	1306.1979	725.6655	676.4742	653.0990	72.5666
MANGANESE	1975.8755	1097.7086	1023.2973	987.9378	109.7709
MERCURY	67.8218	37.6788	35.1246	33.9109	3.7679
NICKEL	1772.4101	984.6723	917.9234	886.2050	98.4672
SELENIUM	44.0842	24.4912	22.8310	22.0421	2.4491
SILVER	90.6470	50.3594	46.9457	45.3235	5.0359
THALLIUM	23.7085	13.1714	12.2785	11.8543	1.3171
VANADIUM	9.2539	5.1410	4.7925	4.6269	0.5141
ZINC	7489.5703	4160.8724	3878.8157	3744.7852	416.0872
ACETONE	15935.4122	8853.0068	8252.8804	7967.7061	885.3007
CARBON DISULFIDE	49.5986	27.5548	25.6869	24.7993	2.7555
PYRENE	0.6171	0.3429	0.3196	0.3086	0.0343
4,4'-DDD	0.0010	0.0006	0.0005	0.0005	0.0001
4,4'-DDE	0.0044	0.0025	0.0023	0.0022	0.0002
4,4'-DDT	0.0102	0.0057	0.0053	0.0051	0.0006
AROCLOR-1254	0.0083	0.0046	0.0043	0.0042	0.0005
DIELDRIN	0.0340	0.0189	0.0176	0.0170	0.0019
ENDOSULFAN SULFATE	0.0172	0.0096	0.0089	0.0086	0.0010
ENDRIN ALDEHYDE	0.0005	0.0003	0.0002	0.0002	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	93.1943	Exceeds	Exceeds	Exceeds	6879528
ANTIMONY	16.7353	Exceeds	Exceeds	Below	6879528
ARSENIC	1.4946	Exceeds	Below	Below	6879528
BERYLLIUM	0.0041	Below	Below	Below	6879528
CADMIUM	0.1692	Below	Below	Below	6879528
CHROMIUM	1.7720	Below	Below	Below	6879528
COBALT	0.9971	Exceeds	Below	Below	6879528
COPPER	607.8874	Exceeds	Exceeds	Exceeds	6879528
IRON	5898.3138	Exceeds	Exceeds	Exceeds	6879528
LEAD	23.4060	Exceeds	Exceeds	Exceeds	6879528
MANGANESE	35.4061	Exceeds	Below	Below	6879528
MERCURY	1.2153	Exceeds	Exceeds	Exceeds	6879528
NICKEL	31.7602	Exceeds	Exceeds	Exceeds	6879528
SELENIUM	0.7900	Below	Below	Below	6879528
SILVER	1.6243	Exceeds	Exceeds	Exceeds	6879528
THALLIUM	0.4248	Exceeds	Below	Below	6879528
VANADIUM	0.1658	Below	Below	Below	6879528
ZINC	134.2070	Exceeds	Exceeds	Exceeds	6879528
ACETONE	285.5497	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.8888	Exceeds	Exceeds	Below	6879528
PYRENE	0.0111	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0001	Exceeds	Below	Below	6879528
4,4'-DDT	0.0002	Exceeds	Below	Below	6879528
AROCLOR-1254	0.0001	Below	Below	Below	6879528
DIELDRIN	0.0006	Exceeds	Below	Below	6879528
ENDOSULFAN SULFATE	0.0003	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2442852.579	2303583.97	2291783.068
ANTIMONY	95.31172725	89.87794391	89.4175132
ARSENIC	873.3172014	823.5288218	819.3100118
BERYLLIUM	0.206619828	0.194840298	0.193842161
CADMIUM	103.8528133	97.93209712	97.43040623
CHROMIUM	9412.537658	8875.922786	8830.452815
COBALT	5.678712701	5.354965609	5.327532954
COPPER	3926605.502	3702747.178	3683778.581
IRON	3241291.903	3056503.751	3040845.758
LEAD	32025.33282	30199.54784	30044.84025
MANGANESE	10064.40569	9490.627403	9442.008396
MERCURY	510.0382263	480.9606165	478.4967301
NICKEL	15917.62243	15010.14846	14933.2538
SELENIUM	0.499886681	0.471387818	0.468972971
SILVER	152.3317332	143.6472024	142.9113201
THALLIUM	3.81752338	3.599883898	3.581442253
VANADIUM	20.98657672	19.79011838	19.68873668
ZINC	326068.6646	307479.2787	305904.1102
ACETONE	2.040185517	1.923858939	1.914002026
CARBON DISULFIDE	0.003202783	0.003020019	0.003004533
PYRENE	2.768626756	2.610785551	2.597410903
4,4'-DDD	0.010200204	0.009618684	0.009569409
4,4'-DDE	0.043715159	0.04122293	0.041011751
4,4'-DDT	0.145717198	0.137409766	0.136705837
AROCLOR-1254	0.040800815	0.038474734	0.038277634
DIELDRIN	0.023314752	0.021985563	0.021872934
ENDOSULFAN SULFATE	0.003205778	0.003023015	0.003007528
ENDRIN ALDEHYDE	0.001369742	0.001291652	0.001285035

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	16768850.56	1584.1458
ANTIMONY	1	45	31777.7778	NA	226	14	16768850.56	2603.8258
ARSENIC	1	4617	2837.9310	NA	146	14	16768850.56	232.5360
BERYLLIUM	1	402	7.7114	NA	2011	14	16768850.56	0.6319
CADMIUM	1	4849	321.3333	NA	376	14	16768850.56	26.3296
CHROMIUM	1	41971	3364.7059	NA	4251	14	16768850.56	275.6992
COBALT	1	45	1893.3333	NA	226	14	16768850.56	155.1370
COPPER	1	51038	1154285.7143	NA	176	14	16768850.56	94580.5262
IRON	1	4342	11200000.0000	NA	126	14	16768850.56	917712.0366
LEAD	1	10811	44444.4444	NA	4501	14	16768850.56	3641.7144
MANGANESE	1	2246	67230.7692	NA	326	14	16768850.56	5508.7934
MERCURY	1	3316	2307.6923	NA	261	14	16768850.56	189.0890
NICKEL	1	3960	60307.6923	NA	326	14	16768850.56	4941.5264
SELENIUM	1	5	1500.0000	NA	26	14	16768850.56	122.9079
SILVER	1	741	3084.3373	NA	42.5	14	16768850.56	252.7262
THALLIUM	1	71	50.7042	NA	356	14	16768850.56	4.1546
VANADIUM	1	1000	109.0000	NA	5001	14	16768850.56	8.9313
ZINC	1	19197	254838.7097	NA	311	14	16768850.56	20881.1206
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	16768850.56	44428.3519
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	16768850.56	138.2823
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	16768850.56	1.7206
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	16768850.56	0.0029
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	16768850.56	0.0124
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	16768850.56	0.0285
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	1	302.1	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	16768850.56	0.0480
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0013

Salinty of Groundwater 0.1 ppt

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	2603.825818	Leach	2.22	NA	2603.825818	0.0346	226
ARSENIC	232.536024	Leach	2.22	NA	232.536024	0.0346	23086
BERYLLIUM	0.631864631	Leach	2.22	NA	0.631864631	0.0346	2011
CADMIUM	26.32959533	Leach	2.22	NA	26.32959533	0.0346	24246
CHROMIUM	275.6992043	Leach	2.22	NA	275.6992043	0.0346	209856
COBALT	155.1370348	Leach	2.22	NA	155.1370348	0.0346	226
COPPER	94580.52622	Leach	2.22	NA	94580.52622	0.0346	255191
IRON	917712.0366	Leach	2.22	NA	917712.0366	0.0346	21711
LEAD	3641.714431	Leach	2.22	NA	3641.714431	0.0346	54056
MANGANESE	5508.793406	Leach	2.22	NA	5508.793406	0.0346	11231
MERCURY	189.0890185	Leach	2.22	NA	189.0890185	0.0346	16581
NICKEL	4941.526351	Leach	2.22	NA	4941.526351	0.0346	19801
SELENIUM	122.907862	Leach	2.22	NA	122.907862	0.0346	26
SILVER	252.7262063	Leach	2.22	NA	252.7262063	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	20881.12065	Leach	2.22	NA	20881.12065	0.0346	95986
ACETONE	44428.35189	Leach	2.22	0.0004	44421.2881	0.0346	1.2823
CARBON DISULFIDE	138.2823445	Leach	2.22	0.0004	138.1244663	0.0346	1.1425
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	9891.925
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	21732.25
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	21732.25
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	31393.75
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	10779.7
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	1511.5
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	411.4
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	4.1324	2.2958	2.1402	2.0662	0.2296
ARSENIC	0.0036	0.0020	0.0019	0.0018	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
COBALT	0.2462	0.1368	0.1275	0.1231	0.0137
COPPER	0.1329	0.0739	0.0688	0.0665	0.0074
IRON	15.1611	8.4228	7.8518	7.5805	0.8423
LEAD	0.0242	0.0134	0.0125	0.0121	0.0013
MANGANESE	0.1759	0.0977	0.0911	0.0880	0.0098
MERCURY	0.0041	0.0023	0.0021	0.0020	0.0002
NICKEL	0.0895	0.0497	0.0464	0.0448	0.0050
SELENIUM	1.6955	0.9420	0.8781	0.8478	0.0942
SILVER	0.0245	0.0136	0.0127	0.0122	0.0014
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0780	0.0433	0.0404	0.0390	0.0043
ACETONE	12427.2107	6904.0059	6435.9981	6213.6053	690.4006
CARBON DISULFIDE	43.4124	24.1180	22.4831	21.7062	2.4118
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Salinty of Groundwater 0.1 ppt

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	13221594
ANTIMONY	0.0740	Below	Below	Below	13221594
ARSENIC	0.0001	Below	Below	Below	13221594
BERYLLIUM	0.0000	Below	Below	Below	13221594
CADMIUM	0.0000	Below	Below	Below	13221594
CHROMIUM	0.0000	Below	Below	Below	13221594
COBALT	0.0044	Below	Below	Below	13221594
COPPER	0.0024	Below	Below	Below	13221594
IRON	0.2717	Below	Below	Below	13221594
LEAD	0.0004	Below	Below	Below	13221594
MANGANESE	0.0032	Below	Below	Below	13221594
MERCURY	0.0001	Below	Below	Below	13221594
NICKEL	0.0016	Below	Below	Below	13221594
SELENIUM	0.0304	Below	Below	Below	13221594
SILVER	0.0004	Below	Below	Below	13221594
THALLIUM	0.0012	Below	Below	Below	13221594
VANADIUM	0.0000	Below	Below	Below	13221594
ZINC	0.0014	Below	Below	Below	13221594
ACETONE	222.6855	Exceeds	Below	Below	13221594
CARBON DISULFIDE	0.7779	Exceeds	Exceeds	Below	13221594
PYRENE	0.0000	Below	Below	Below	13221594
4,4'-DDD	0.0000	Below	Below	Below	13221594
4,4'-DDE	0.0000	Below	Below	Below	13221594
4,4'-DDT	0.0000	Below	Below	Below	13221594
AROCLOR-1254	0.0000	Below	Below	Below	13221594
DIELDRIN	0.0000	Below	Below	Below	13221594
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	13221594
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	13221594

Salinty of Groundwater 0.1 ppt

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	1679174.674	1679174.47	1679174.453
ANTIMONY	65.59759964	65.56116307	65.55807562
ARSENIC	600.3103515	600.3070832	600.3068063
BERYLLIUM	0.142046836	0.142037959	0.142037207
CADMIUM	71.38744345	71.38707338	71.38704202
CHROMIUM	6470.02278	6470.018905	6470.018577
COBALT	3.90833251	3.906161604	3.905977653
COPPER	2699083.063	2699081.733	2699081.621
IRON	2228036.489	2228023.59	2228022.497
LEAD	22013.76985	22013.71866	22013.71432
MANGANESE	6918.27097	6918.193547	6918.186987
MERCURY	350.5973521	350.5946945	350.5944693
NICKEL	10941.65203	10941.58258	10941.5767
SELENIUM	0.34735087	0.345689762	0.345549009
SILVER	104.7181644	104.7146131	104.7143122
THALLIUM	2.626183482	2.625257012	2.625178508
VANADIUM	14.42662222	14.42625966	14.42622893
ZINC	224134.5679	224134.2744	224134.2495
ACETONE	1.711662377	1.574184466	1.562535298
CARBON DISULFIDE	0.002746536	0.002504111	0.002483569
PYRENE	1.903160106	1.903135924	1.903133875
4,4'-DDD	0.007011533	0.007011493	0.007011489
4,4'-DDE	0.030049428	0.030049255	0.03004924
4,4'-DDT	0.10016436	0.100163959	0.100163925
AROCLOR-1254	0.028046504	0.028046177	0.028046149
DIELDRIN	0.016029152	0.016027819	0.016027706
ENDOSULFAN SULFATE	0.002205111	0.002204438	0.002204381
ENDRIN ALDEHYDE	0.000941578	0.00094156	0.000941558

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	16768850.56	1584.1458
ANTIMONY	1	45	31777.7778	NA	226	14	16768850.56	2603.8258
ARSENIC	1	4617	2837.9310	NA	146	14	16768850.56	232.5360
BERYLLIUM	1	402	7.7114	NA	2011	14	16768850.56	0.6319
CADMIUM	1	4849	321.3333	NA	376	14	16768850.56	26.3296
CHROMIUM	1	41971	3364.7059	NA	4251	14	16768850.56	275.6992
COBALT	1	45	1893.3333	NA	226	14	16768850.56	155.1370
COPPER	1	51038	1154285.7143	NA	176	14	16768850.56	94580.5262
IRON	1	4342	11200000.0000	NA	126	14	16768850.56	917712.0366
LEAD	1	10811	44444.4444	NA	4501	14	16768850.56	3641.7144
MANGANESE	1	2246	67230.7692	NA	326	14	16768850.56	5508.7934
MERCURY	1	3316	2307.6923	NA	261	14	16768850.56	189.0890
NICKEL	1	3960	60307.6923	NA	326	14	16768850.56	4941.5264
SELENIUM	1	5	1500.0000	NA	26	14	16768850.56	122.9079
SILVER	1	741	3084.3373	NA	42.5	14	16768850.56	252.7262
THALLIUM	1	71	50.7042	NA	356	14	16768850.56	4.1546
VANADIUM	1	1000	109.0000	NA	5001	14	16768850.56	8.9313
ZINC	1	19197	254838.7097	NA	311	14	16768850.56	20881.1206
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	16768850.56	44428.3519
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	16768850.56	138.2823
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	16768850.56	1.7206
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	16768850.56	0.0029
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	16768850.56	0.0124
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	16768850.56	0.0285
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	1	302.1	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	16768850.56	0.0480
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0013

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	2603.825818	Leach	2.22	NA	2603.825818	0.0346	226
ARSENIC	232.536024	Leach	2.22	NA	232.536024	0.0346	23086
BERYLLIUM	0.631864631	Leach	2.22	NA	0.631864631	0.0346	2011
CADMIUM	26.32959533	Leach	2.22	NA	26.32959533	0.0346	24246
CHROMIUM	275.6992043	Leach	2.22	NA	275.6992043	0.0346	209856
COBALT	155.1370348	Leach	2.22	NA	155.1370348	0.0346	226
COPPER	94580.52622	Leach	2.22	NA	94580.52622	0.0346	255191
IRON	917712.0366	Leach	2.22	NA	917712.0366	0.0346	21711
LEAD	3641.714431	Leach	2.22	NA	3641.714431	0.0346	54056
MANGANESE	5508.793406	Leach	2.22	NA	5508.793406	0.0346	11231
MERCURY	189.0890185	Leach	2.22	NA	189.0890185	0.0346	16581
NICKEL	4941.526351	Leach	2.22	NA	4941.526351	0.0346	19801
SELENIUM	122.907862	Leach	2.22	NA	122.907862	0.0346	26
SILVER	252.7262063	Leach	2.22	NA	252.7262063	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	20881.12065	Leach	2.22	NA	20881.12065	0.0346	95986
ACETONE	44428.35189	Leach	2.22	0.0004	44421.2881	0.0346	1.2823
CARBON DISULFIDE	138.2823445	Leach	2.22	0.0004	138.1244663	0.0346	1.1425
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	9891.925
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	21732.25
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	21732.25
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	31393.75
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	10779.7
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	1511.5
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	411.4
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	4.1324	2.2958	2.1402	2.0662	0.2296
ARSENIC	0.0036	0.0020	0.0019	0.0018	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
COBALT	0.2462	0.1368	0.1275	0.1231	0.0137
COPPER	0.1329	0.0739	0.0688	0.0665	0.0074
IRON	15.1611	8.4228	7.8518	7.5805	0.8423
LEAD	0.0242	0.0134	0.0125	0.0121	0.0013
MANGANESE	0.1759	0.0977	0.0911	0.0880	0.0098
MERCURY	0.0041	0.0023	0.0021	0.0020	0.0002
NICKEL	0.0895	0.0497	0.0464	0.0448	0.0050
SELENIUM	1.6955	0.9420	0.8781	0.8478	0.0942
SILVER	0.0245	0.0136	0.0127	0.0122	0.0014
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0780	0.0433	0.0404	0.0390	0.0043
ACETONE	12427.2107	6904.0059	6435.9981	6213.6053	690.4006
CARBON DISULFIDE	43.4124	24.1180	22.4831	21.7062	2.4118
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Salinty of Seawater of 32 ppt

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	5475543
ANTIMONY	0.0740	Below	Below	Below	5475543
ARSENIC	0.0001	Below	Below	Below	5475543
BERYLLIUM	0.0000	Below	Below	Below	5475543
CADMIUM	0.0000	Below	Below	Below	5475543
CHROMIUM	0.0000	Below	Below	Below	5475543
COBALT	0.0044	Below	Below	Below	5475543
COPPER	0.0024	Below	Below	Below	5475543
IRON	0.2717	Below	Below	Below	5475543
LEAD	0.0004	Below	Below	Below	5475543
MANGANESE	0.0032	Below	Below	Below	5475543
MERCURY	0.0001	Below	Below	Below	5475543
NICKEL	0.0016	Below	Below	Below	5475543
SELENIUM	0.0304	Below	Below	Below	5475543
SILVER	0.0004	Below	Below	Below	5475543
THALLIUM	0.0012	Below	Below	Below	5475543
VANADIUM	0.0000	Below	Below	Below	5475543
ZINC	0.0014	Below	Below	Below	5475543
ACETONE	222.6855	Exceeds	Below	Below	5475543
CARBON DISULFIDE	0.7779	Exceeds	Exceeds	Below	5475543
PYRENE	0.0000	Below	Below	Below	5475543
4,4'-DDD	0.0000	Below	Below	Below	5475543
4,4'-DDE	0.0000	Below	Below	Below	5475543
4,4'-DDT	0.0000	Below	Below	Below	5475543
AROCLOR-1254	0.0000	Below	Below	Below	5475543
DIELDRIN	0.0000	Below	Below	Below	5475543
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	5475543
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	5475543

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2263904.664	2263904.55	2263904.54
ANTIMONY	88.37555824	88.35521392	88.35349005
ARSENIC	809.3475263	809.3457015	809.3455469
BERYLLIUM	0.191495298	0.191490342	0.191489922
CADMIUM	96.24566769	96.24546107	96.24544356
CHROMIUM	8723.038619	8723.036455	8723.036272
COBALT	5.265452841	5.264240718	5.264138008
COPPER	3638968.5	3638967.758	3638967.695
IRON	3003871.242	3003864.04	3003863.43
LEAD	29679.42062	29679.39205	29679.38962
MANGANESE	9327.247258	9327.204029	9327.200366
MERCURY	472.67934	472.6778562	472.6777304
NICKEL	14751.68376	14751.64498	14751.6417
SELENIUM	0.46535492	0.464427443	0.464348853
SILVER	141.1773202	141.1753374	141.1751694
THALLIUM	3.539039295	3.538522001	3.538478169
VANADIUM	19.44968625	19.44948382	19.44946666
ZINC	302183.273	302183.1092	302183.0953
ACETONE	2.06337716	1.98661651	1.98011221
CARBON DISULFIDE	0.003272106	0.003136748	0.003125279
PYRENE	2.565844776	2.565831275	2.565830131
4,4'-DDD	0.009453051	0.009453029	0.009453027
4,4'-DDE	0.040513077	0.04051298	0.040512972
4,4'-DDT	0.135043367	0.135043143	0.135043124
AROCLOR-1254	0.037812412	0.03781223	0.037812214
DIELDRIN	0.021608532	0.021607788	0.021607725
ENDOSULFAN SULFATE	0.002971789	0.002971413	0.002971381
ENDRIN ALDEHYDE	0.001269426	0.001269416	0.001269415

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	16768850.56	1584.1458
ANTIMONY	1	45	31777.7778	NA	226	14	16768850.56	2603.8258
ARSENIC	1	4617	2837.9310	NA	146	14	16768850.56	232.5360
BERYLLIUM	1	402	7.7114	NA	2011	14	16768850.56	0.6319
CADMIUM	1	4849	321.3333	NA	376	14	16768850.56	26.3296
CHROMIUM	1	41971	3364.7059	NA	4251	14	16768850.56	275.6992
COBALT	1	45	1893.3333	NA	226	14	16768850.56	155.1370
COPPER	1	51038	1154285.7143	NA	176	14	16768850.56	94580.5262
IRON	1	4342	11200000.0000	NA	126	14	16768850.56	917712.0366
LEAD	1	10811	44444.4444	NA	4501	14	16768850.56	3641.7144
MANGANESE	1	2246	67230.7692	NA	326	14	16768850.56	5508.7934
MERCURY	1	3316	2307.6923	NA	261	14	16768850.56	189.0890
NICKEL	1	3960	60307.6923	NA	326	14	16768850.56	4941.5264
SELENIUM	1	5	1500.0000	NA	26	14	16768850.56	122.9079
SILVER	1	741	3084.3373	NA	42.5	14	16768850.56	252.7262
THALLIUM	1	71	50.7042	NA	356	14	16768850.56	4.1546
VANADIUM	1	1000	109.0000	NA	5001	14	16768850.56	8.9313
ZINC	1	19197	254838.7097	NA	311	14	16768850.56	20881.1206
ACETONE	1	0.0180271	542215.3369	0.3808	1.1291	14	16768850.56	44428.3519
CARBON DISULFIDE	1	0.0091	1687.6342	2.9000	1.06518	14	16768850.56	138.2823
PYRENE	1	631.631	20.9984	NA	4525.1438	14	16768850.56	1.7206
4,4'-DDD	1	1387.75	0.0352	NA	9940.95	14	16768850.56	0.0029
4,4'-DDE	1	1387.75	0.1509	NA	9940.95	14	16768850.56	0.0124
4,4'-DDT	1	2004.73	0.3482	NA	14360.154	14	16768850.56	0.0285
AROCLOR-1254	1	688.324	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	1	96.46	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	1	26.208	0.5860	NA	188.7184	14	16768850.56	0.0480
ENDRIN ALDEHYDE	1	409.5	0.0160	NA	2934.1	14	16768850.56	0.0013

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	2603.825818	Leach	2.22	NA	2603.825818	0.0346	226
ARSENIC	232.536024	Leach	2.22	NA	232.536024	0.0346	23086
BERYLLIUM	0.631864631	Leach	2.22	NA	0.631864631	0.0346	2011
CADMIUM	26.32959533	Leach	2.22	NA	26.32959533	0.0346	24246
CHROMIUM	275.6992043	Leach	2.22	NA	275.6992043	0.0346	209856
COBALT	155.1370348	Leach	2.22	NA	155.1370348	0.0346	226
COPPER	94580.52622	Leach	2.22	NA	94580.52622	0.0346	255191
IRON	917712.0366	Leach	2.22	NA	917712.0366	0.0346	21711
LEAD	3641.714431	Leach	2.22	NA	3641.714431	0.0346	54056
MANGANESE	5508.793406	Leach	2.22	NA	5508.793406	0.0346	11231
MERCURY	189.0890185	Leach	2.22	NA	189.0890185	0.0346	16581
NICKEL	4941.526351	Leach	2.22	NA	4941.526351	0.0346	19801
SELENIUM	122.907862	Leach	2.22	NA	122.907862	0.0346	26
SILVER	252.7262063	Leach	2.22	NA	252.7262063	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	20881.12065	Leach	2.22	NA	20881.12065	0.0346	95986
ACETONE	44428.35189	Leach	2.22	0.0004	44421.2881	0.0346	1.0901355
CARBON DISULFIDE	138.2823445	Leach	2.22	0.0004	138.1244663	0.0346	1.0455
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	3159.155
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	6939.75
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	6939.75
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	10024.65
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	3442.62
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	483.3
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	132.04
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	2048.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	4.1324	2.2958	2.1402	2.0662	0.2296
ARSENIC	0.0036	0.0020	0.0019	0.0018	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
COBALT	0.2462	0.1368	0.1275	0.1231	0.0137
COPPER	0.1329	0.0739	0.0688	0.0665	0.0074
IRON	15.1611	8.4228	7.8518	7.5805	0.8423
LEAD	0.0242	0.0134	0.0125	0.0121	0.0013
MANGANESE	0.1759	0.0977	0.0911	0.0880	0.0098
MERCURY	0.0041	0.0023	0.0021	0.0020	0.0002
NICKEL	0.0895	0.0497	0.0464	0.0448	0.0050
SELENIUM	1.6955	0.9420	0.8781	0.8478	0.0942
SILVER	0.0245	0.0136	0.0127	0.0122	0.0014
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0780	0.0433	0.0404	0.0390	0.0043
ACETONE	14617.8271	8121.0151	7570.5088	7308.9135	812.1015
CARBON DISULFIDE	47.4401	26.3556	24.5690	23.7201	2.6356
PYRENE	0.0002	0.0001	0.0001	0.0001	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0001	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0001	0.0001	0.0001	0.0001	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0740	Below	Below	Below	6879528
ARSENIC	0.0001	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0044	Below	Below	Below	6879528
COPPER	0.0024	Below	Below	Below	6879528
IRON	0.2717	Below	Below	Below	6879528
LEAD	0.0004	Below	Below	Below	6879528
MANGANESE	0.0032	Below	Below	Below	6879528
MERCURY	0.0001	Below	Below	Below	6879528
NICKEL	0.0016	Below	Below	Below	6879528
SELENIUM	0.0304	Below	Below	Below	6879528
SILVER	0.0004	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0014	Below	Below	Below	6879528
ACETONE	261.9396	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.8501	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	83.13981214	83.11576885	83.11373155
ARSENIC	761.2981997	761.296043	761.2958603
BERYLLIUM	0.180129065	0.180123207	0.180122711
CADMIUM	90.53175131	90.53150712	90.53148643
CHROMIUM	8205.159949	8205.157392	8205.157176
COBALT	4.953504891	4.952072382	4.951950998
COPPER	3422926.246	3422925.369	3422925.295
IRON	2825537.711	2825529.2	2825528.479
LEAD	27917.39261	27917.35883	27917.35597
MANGANESE	8773.519489	8773.4684	8773.464071
MERCURY	444.61755	444.6157963	444.6156477
NICKEL	13875.90911	13875.86328	13875.8594
SELENIUM	0.438230486	0.437134376	0.437041497
SILVER	132.7968114	132.794468	132.7942695
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	284242.9821	284242.7884	284242.772
ACETONE	0.644490284	0.610419395	0.607532404
CARBON DISULFIDE	0.001016866	0.00096105	0.00095632
PYRENE	0.770657116	0.770641162	0.770639811
4,4'-DDD	0.002839191	0.002839164	0.002839162
4,4'-DDE	0.012167961	0.012167847	0.012167837
4,4'-DDT	0.040559607	0.040559342	0.04055932
AROCLOR-1254	0.011357009	0.011356793	0.011356775
DIELDRIN	0.006491418	0.00649054	0.006490465
ENDOSULFAN SULFATE	0.000893293	0.000892851	0.000892813
ENDRIN ALDEHYDE	0.000381282	0.00038127	0.000381269

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	16768850.56	1584.1458
ANTIMONY	1	45	31777.7778	NA	226	14	16768850.56	2603.8258
ARSENIC	1	4617	2837.9310	NA	146	14	16768850.56	232.5360
BERYLLIUM	1	402	7.7114	NA	2011	14	16768850.56	0.6319
CADMIUM	1	4849	321.3333	NA	376	14	16768850.56	26.3296
CHROMIUM	1	41971	3364.7059	NA	4251	14	16768850.56	275.6992
COBALT	1	45	1893.3333	NA	226	14	16768850.56	155.1370
COPPER	1	51038	1154285.7143	NA	176	14	16768850.56	94580.5262
IRON	1	4342	11200000.0000	NA	126	14	16768850.56	917712.0366
LEAD	1	10811	44444.4444	NA	4501	14	16768850.56	3641.7144
MANGANESE	1	2246	67230.7692	NA	326	14	16768850.56	5508.7934
MERCURY	1	3316	2307.6923	NA	261	14	16768850.56	189.0890
NICKEL	1	3960	60307.6923	NA	326	14	16768850.56	4941.5264
SELENIUM	1	5	1500.0000	NA	26	14	16768850.56	122.9079
SILVER	1	741	3084.3373	NA	42.5	14	16768850.56	252.7262
THALLIUM	1	71	50.7042	NA	356	14	16768850.56	4.1546
VANADIUM	1	1000	109.0000	NA	5001	14	16768850.56	8.9313
ZINC	1	19197	254838.7097	NA	311	14	16768850.56	20881.1206
ACETONE	1	0.21791	542215.3369	0.3808	1.1291	14	16768850.56	44428.3519
CARBON DISULFIDE	1	0.11	1687.6342	2.9000	1.06518	14	16768850.56	138.2823
PYRENE	1	7635.1	20.9984	NA	4525.1438	14	16768850.56	1.7206
4,4'-DDD	1	16775	0.0352	NA	9940.95	14	16768850.56	0.0029
4,4'-DDE	1	16775	0.1509	NA	9940.95	14	16768850.56	0.0124
4,4'-DDT	1	24233	0.3482	NA	14360.154	14	16768850.56	0.0285
AROCLOR-1254	1	8320.4	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	1	1166	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	1	316.8	0.5860	NA	188.7184	14	16768850.56	0.0480
ENDRIN ALDEHYDE	1	4950	0.0160	NA	2934.1	14	16768850.56	0.0013

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	2603.825818	Leach	2.22	NA	2603.825818	0.0346	226
ARSENIC	232.536024	Leach	2.22	NA	232.536024	0.0346	23086
BERYLLIUM	0.631864631	Leach	2.22	NA	0.631864631	0.0346	2011
CADMIUM	26.32959533	Leach	2.22	NA	26.32959533	0.0346	24246
CHROMIUM	275.6992043	Leach	2.22	NA	275.6992043	0.0346	209856
COBALT	155.1370348	Leach	2.22	NA	155.1370348	0.0346	226
COPPER	94580.52622	Leach	2.22	NA	94580.52622	0.0346	255191
IRON	917712.0366	Leach	2.22	NA	917712.0366	0.0346	21711
LEAD	3641.714431	Leach	2.22	NA	3641.714431	0.0346	54056
MANGANESE	5508.793406	Leach	2.22	NA	5508.793406	0.0346	11231
MERCURY	189.0890185	Leach	2.22	NA	189.0890185	0.0346	16581
NICKEL	4941.526351	Leach	2.22	NA	4941.526351	0.0346	19801
SELENIUM	122.907862	Leach	2.22	NA	122.907862	0.0346	26
SILVER	252.7262063	Leach	2.22	NA	252.7262063	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	20881.12065	Leach	2.22	NA	20881.12065	0.0346	95986
ACETONE	44428.35189	Leach	2.22	0.0004	44421.2881	0.0346	2.08955
CARBON DISULFIDE	138.2823445	Leach	2.22	0.0004	138.1244663	0.0346	1.55
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	38176.5
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	83876
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	83876
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	121166
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	41603
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	5831
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	1585
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	24751

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	4.1324	2.2958	2.1402	2.0662	0.2296
ARSENIC	0.0036	0.0020	0.0019	0.0018	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
COBALT	0.2462	0.1368	0.1275	0.1231	0.0137
COPPER	0.1329	0.0739	0.0688	0.0665	0.0074
IRON	15.1611	8.4228	7.8518	7.5805	0.8423
LEAD	0.0242	0.0134	0.0125	0.0121	0.0013
MANGANESE	0.1759	0.0977	0.0911	0.0880	0.0098
MERCURY	0.0041	0.0023	0.0021	0.0020	0.0002
NICKEL	0.0895	0.0497	0.0464	0.0448	0.0050
SELENIUM	1.6955	0.9420	0.8781	0.8478	0.0942
SILVER	0.0245	0.0136	0.0127	0.0122	0.0014
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0780	0.0433	0.0404	0.0390	0.0043
ACETONE	7626.2412	4236.8007	3949.5970	3813.1206	423.6801
CARBON DISULFIDE	31.9991	17.7773	16.5722	15.9996	1.7777
PYRENE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0740	Below	Below	Below	6879528
ARSENIC	0.0001	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0044	Below	Below	Below	6879528
COPPER	0.0024	Below	Below	Below	6879528
IRON	0.2717	Below	Below	Below	6879528
LEAD	0.0004	Below	Below	Below	6879528
MANGANESE	0.0032	Below	Below	Below	6879528
MERCURY	0.0001	Below	Below	Below	6879528
NICKEL	0.0016	Below	Below	Below	6879528
SELENIUM	0.0304	Below	Below	Below	6879528
SILVER	0.0004	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0014	Below	Below	Below	6879528
ACETONE	136.6561	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.5734	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	83.13981214	83.11576885	83.11373155
ARSENIC	761.2981997	761.296043	761.2958603
BERYLLIUM	0.180129065	0.180123207	0.180122711
CADMIUM	90.53175131	90.53150712	90.53148643
CHROMIUM	8205.159949	8205.157392	8205.157176
COBALT	4.953504891	4.952072382	4.951950998
COPPER	3422926.246	3422925.369	3422925.295
IRON	2825537.711	2825529.2	2825528.479
LEAD	27917.39261	27917.35883	27917.35597
MANGANESE	8773.519489	8773.4684	8773.464071
MERCURY	444.61755	444.6157963	444.6156477
NICKEL	13875.90911	13875.86328	13875.8594
SELENIUM	0.438230486	0.437134376	0.437041497
SILVER	132.7968114	132.794468	132.7942695
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	284242.9821	284242.7884	284242.772
ACETONE	7.347331275	7.132467862	7.114261447
CARBON DISULFIDE	0.01179768	0.011342582	0.011304019
PYRENE	9.315237477	9.315221519	9.315220167
4,4'-DDD	0.034319224	0.034319197	0.034319195
4,4'-DDE	0.147082388	0.147082273	0.147082264
4,4'-DDT	0.490274362	0.490274098	0.490274075
AROCLOR-1254	0.13727714	0.137276924	0.137276906
DIELDRIN	0.078445782	0.078444902	0.078444828
ENDOSULFAN SULFATE	0.010787024	0.010786579	0.010786541
ENDRIN ALDEHYDE	0.004608601	0.004608589	0.004608588

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	16768850.56	1584.1458
ANTIMONY	1	45	31777.7778	NA	226	14	16768850.56	2603.8258
ARSENIC	1	4617	2837.9310	NA	146	14	16768850.56	232.5360
BERYLLIUM	1	402	7.7114	NA	2011	14	16768850.56	0.6319
CADMIUM	1	4849	321.3333	NA	376	14	16768850.56	26.3296
CHROMIUM	1	41971	3364.7059	NA	4251	14	16768850.56	275.6992
COBALT	1	45	1893.3333	NA	226	14	16768850.56	155.1370
COPPER	1	51038	1154285.7143	NA	176	14	16768850.56	94580.5262
IRON	1	4342	11200000.0000	NA	126	14	16768850.56	917712.0366
LEAD	1	10811	44444.4444	NA	4501	14	16768850.56	3641.7144
MANGANESE	1	2246	67230.7692	NA	326	14	16768850.56	5508.7934
MERCURY	1	3316	2307.6923	NA	261	14	16768850.56	189.0890
NICKEL	1	3960	60307.6923	NA	326	14	16768850.56	4941.5264
SELENIUM	1	5	1500.0000	NA	26	14	16768850.56	122.9079
SILVER	1	741	3084.3373	NA	42.5	14	16768850.56	252.7262
THALLIUM	1	71	50.7042	NA	356	14	16768850.56	4.1546
VANADIUM	1	1000	109.0000	NA	5001	14	16768850.56	8.9313
ZINC	1	19197	254838.7097	NA	311	14	16768850.56	20881.1206
ACETONE	1	0.0689388	542215.3369	0.3808	1.1291	14	16768850.56	44428.3519
CARBON DISULFIDE	1	0.0348	1687.6342	2.9000	1.06518	14	16768850.56	138.2823
PYRENE	1	2415.468	20.9984	NA	4525.1438	14	16768850.56	1.7206
4,4'-DDD	1	5307	0.0352	NA	9940.95	14	16768850.56	0.0029
4,4'-DDE	1	5307	0.1509	NA	9940.95	14	16768850.56	0.0124
4,4'-DDT	1	7666.44	0.3482	NA	14360.154	14	16768850.56	0.0285
AROCLOR-1254	1	2632.272	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	1	368.88	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	1	100.224	0.5860	NA	188.7184	14	16768850.56	0.0480
ENDRIN ALDEHYDE	1	1566	0.0160	NA	2934.1	14	16768850.56	0.0013

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	2603.825818	Leach	2.22	NA	2603.825818	0.0346	226
ARSENIC	232.536024	Leach	2.22	NA	232.536024	0.0346	23086
BERYLLIUM	0.631864631	Leach	2.22	NA	0.631864631	0.0346	2011
CADMIUM	26.32959533	Leach	2.22	NA	26.32959533	0.0346	24246
CHROMIUM	275.6992043	Leach	2.22	NA	275.6992043	0.0346	209856
COBALT	155.1370348	Leach	2.22	NA	155.1370348	0.0346	226
COPPER	94580.52622	Leach	2.22	NA	94580.52622	0.0346	255191
IRON	917712.0366	Leach	2.22	NA	917712.0366	0.0346	21711
LEAD	3641.714431	Leach	2.22	NA	3641.714431	0.0346	54056
MANGANESE	5508.793406	Leach	2.22	NA	5508.793406	0.0346	11231
MERCURY	189.0890185	Leach	2.22	NA	189.0890185	0.0346	16581
NICKEL	4941.526351	Leach	2.22	NA	4941.526351	0.0346	19801
SELENIUM	122.907862	Leach	2.22	NA	122.907862	0.0346	26
SILVER	252.7262063	Leach	2.22	NA	252.7262063	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	20881.12065	Leach	2.22	NA	20881.12065	0.0346	95986
ACETONE	44428.35189	Leach	2.22	0.0004	44421.2881	0.0346	1.344694
CARBON DISULFIDE	138.2823445	Leach	2.22	0.0004	138.1244663	0.0346	1.174
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	12078.34
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	26536
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	26536
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	38333.2
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	13162.36
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	1845.4
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	502.12
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	7831

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	4.1324	2.2958	2.1402	2.0662	0.2296
ARSENIC	0.0036	0.0020	0.0019	0.0018	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
COBALT	0.2462	0.1368	0.1275	0.1231	0.0137
COPPER	0.1329	0.0739	0.0688	0.0665	0.0074
IRON	15.1611	8.4228	7.8518	7.5805	0.8423
LEAD	0.0242	0.0134	0.0125	0.0121	0.0013
MANGANESE	0.1759	0.0977	0.0911	0.0880	0.0098
MERCURY	0.0041	0.0023	0.0021	0.0020	0.0002
NICKEL	0.0895	0.0497	0.0464	0.0448	0.0050
SELENIUM	1.6955	0.9420	0.8781	0.8478	0.0942
SILVER	0.0245	0.0136	0.0127	0.0122	0.0014
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0780	0.0433	0.0404	0.0390	0.0043
ACETONE	11850.5863	6583.6590	6137.3668	5925.2931	658.3659
CARBON DISULFIDE	42.2476	23.4709	21.8798	21.1238	2.3471
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0740	Below	Below	Below	6879528
ARSENIC	0.0001	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0044	Below	Below	Below	6879528
COPPER	0.0024	Below	Below	Below	6879528
IRON	0.2717	Below	Below	Below	6879528
LEAD	0.0004	Below	Below	Below	6879528
MANGANESE	0.0032	Below	Below	Below	6879528
MERCURY	0.0001	Below	Below	Below	6879528
NICKEL	0.0016	Below	Below	Below	6879528
SELENIUM	0.0304	Below	Below	Below	6879528
SILVER	0.0004	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0014	Below	Below	Below	6879528
ACETONE	212.3529	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.7570	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	83.13981214	83.11576885	83.11373155
ARSENIC	761.2981997	761.296043	761.2958603
BERYLLIUM	0.180129065	0.180123207	0.180122711
CADMIUM	90.53175131	90.53150712	90.53148643
CHROMIUM	8205.159949	8205.157392	8205.157176
COBALT	4.953504891	4.952072382	4.951950998
COPPER	3422926.246	3422925.369	3422925.295
IRON	2825537.711	2825529.2	2825528.479
LEAD	27917.39261	27917.35883	27917.35597
MANGANESE	8773.519489	8773.4684	8773.464071
MERCURY	444.61755	444.6157963	444.6156477
NICKEL	13875.90911	13875.86328	13875.8594
SELENIUM	0.438230486	0.437134376	0.437041497
SILVER	132.7968114	132.794468	132.7942695
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	284242.9821	284242.7884	284242.772
ACETONE	2.409147358	2.303519535	2.294569179
CARBON DISULFIDE	0.003836109	0.00364602	0.003629913
PYRENE	2.947026946	2.947010989	2.947009637
4,4'-DDD	0.010857396	0.010857369	0.010857367
4,4'-DDE	0.046531696	0.046531581	0.046531571
4,4'-DDT	0.155105387	0.155105123	0.1551051
AROCLOR-1254	0.043429827	0.043429611	0.043429593
DIELDRIN	0.024818746	0.024817866	0.024817792
ENDOSULFAN SULFATE	0.003413305	0.003412861	0.003412823
ENDRIN ALDEHYDE	0.001458012	0.001458	0.001457999

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.0075278	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.0038	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	263.758	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	579.5	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	579.5	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	837.14	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	287.432	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	40.28	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	10.944	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	171	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	16768850.56	1584.1458
ANTIMONY	1	45	31777.7778	NA	226	14	16768850.56	2603.8258
ARSENIC	1	4617	2837.9310	NA	146	14	16768850.56	232.5360
BERYLLIUM	1	402	7.7114	NA	2011	14	16768850.56	0.6319
CADMIUM	1	4849	321.3333	NA	376	14	16768850.56	26.3296
CHROMIUM	1	41971	3364.7059	NA	4251	14	16768850.56	275.6992
COBALT	1	45	1893.3333	NA	226	14	16768850.56	155.1370
COPPER	1	51038	1154285.7143	NA	176	14	16768850.56	94580.5262
IRON	1	4342	11200000.0000	NA	126	14	16768850.56	917712.0366
LEAD	1	10811	44444.4444	NA	4501	14	16768850.56	3641.7144
MANGANESE	1	2246	67230.7692	NA	326	14	16768850.56	5508.7934
MERCURY	1	3316	2307.6923	NA	261	14	16768850.56	189.0890
NICKEL	1	3960	60307.6923	NA	326	14	16768850.56	4941.5264
SELENIUM	1	5	1500.0000	NA	26	14	16768850.56	122.9079
SILVER	1	741	3084.3373	NA	42.5	14	16768850.56	252.7262
THALLIUM	1	71	50.7042	NA	356	14	16768850.56	4.1546
VANADIUM	1	1000	109.0000	NA	5001	14	16768850.56	8.9313
ZINC	1	19197	254838.7097	NA	311	14	16768850.56	20881.1206
ACETONE	1	0.05646	1859773.1077	0.3808	1.037639	14	16768850.56	152387.1577
CARBON DISULFIDE	1	0.0285	5789.4737	2.9000	1.019	14	16768850.56	474.3812
PYRENE	1	1978.185	72.0357	NA	1319.79	14	16768850.56	5.9025
4,4'-DDD	1	4346.25	0.1208	NA	2898.5	14	16768850.56	0.0099
4,4'-DDE	1	4346.25	0.5177	NA	2898.5	14	16768850.56	0.0424
4,4'-DDT	1	6278.55	1.1945	NA	4186.7	14	16768850.56	0.0979
AROCLOR-1254	1	2155.74	0.9741	NA	1438.16	14	16768850.56	0.0798
DIELDRIN	1	302.1	3.9722	NA	202.4	14	16768850.56	0.3255
ENDOSULFAN SULFATE	1	82.08	2.0102	NA	55.72	14	16768850.56	0.1647
ENDRIN ALDEHYDE	1	1282.5	0.0550	NA	856	14	16768850.56	0.0045

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	2603.825818	Leach	2.22	NA	2603.825818	0.0346	226
ARSENIC	232.536024	Leach	2.22	NA	232.536024	0.0346	23086
BERYLLIUM	0.631864631	Leach	2.22	NA	0.631864631	0.0346	2011
CADMIUM	26.32959533	Leach	2.22	NA	26.32959533	0.0346	24246
CHROMIUM	275.6992043	Leach	2.22	NA	275.6992043	0.0346	209856
COBALT	155.1370348	Leach	2.22	NA	155.1370348	0.0346	226
COPPER	94580.52622	Leach	2.22	NA	94580.52622	0.0346	255191
IRON	917712.0366	Leach	2.22	NA	917712.0366	0.0346	21711
LEAD	3641.714431	Leach	2.22	NA	3641.714431	0.0346	54056
MANGANESE	5508.793406	Leach	2.22	NA	5508.793406	0.0346	11231
MERCURY	189.0890185	Leach	2.22	NA	189.0890185	0.0346	16581
NICKEL	4941.526351	Leach	2.22	NA	4941.526351	0.0346	19801
SELENIUM	122.907862	Leach	2.22	NA	122.907862	0.0346	26
SILVER	252.7262063	Leach	2.22	NA	252.7262063	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	20881.12065	Leach	2.22	NA	20881.12065	0.0346	95986
ACETONE	152387.1577	Leach	2.22	0.0004	152364.8917	0.0346	1.2823
CARBON DISULFIDE	474.3812219	Leach	2.22	0.0004	473.8630846	0.0346	1.1425
PYRENE	5.90250502	Leach	2.22	NA	5.90250502	0.0346	9891.925
4,4'-DDD	0.009897671	Leach	2.22	NA	0.009897671	0.0346	21732.25
4,4'-DDE	0.042418589	Leach	2.22	NA	0.042418589	0.0346	21732.25
4,4'-DDT	0.097879178	Leach	2.22	NA	0.097879178	0.0346	31393.75
AROCLOR-1254	0.079819926	Leach	2.22	NA	0.079819926	0.0346	10779.7
DIELDRIN	0.325475967	Leach	2.22	NA	0.325475967	0.0346	1511.5
ENDOSULFAN SULFATE	0.164715702	Leach	2.22	NA	0.164715702	0.0346	411.4
ENDRIN ALDEHYDE	0.004504226	Leach	2.22	NA	0.004504226	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	4.1324	2.2958	2.1402	2.0662	0.2296
ARSENIC	0.0036	0.0020	0.0019	0.0018	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
COBALT	0.2462	0.1368	0.1275	0.1231	0.0137
COPPER	0.1329	0.0739	0.0688	0.0665	0.0074
IRON	15.1611	8.4228	7.8518	7.5805	0.8423
LEAD	0.0242	0.0134	0.0125	0.0121	0.0013
MANGANESE	0.1759	0.0977	0.0911	0.0880	0.0098
MERCURY	0.0041	0.0023	0.0021	0.0020	0.0002
NICKEL	0.0895	0.0497	0.0464	0.0448	0.0050
SELENIUM	1.6955	0.9420	0.8781	0.8478	0.0942
SILVER	0.0245	0.0136	0.0127	0.0122	0.0014
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0780	0.0433	0.0404	0.0390	0.0043
ACETONE	42624.7482	23680.4157	22075.1708	21312.3741	2368.0416
CARBON DISULFIDE	148.9273	82.7374	77.1288	74.4637	8.2737
PYRENE	0.0002	0.0001	0.0001	0.0001	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0001	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0001	0.0001	0.0001	0.0001	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0740	Below	Below	Below	6879528
ARSENIC	0.0001	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0044	Below	Below	Below	6879528
COPPER	0.0024	Below	Below	Below	6879528
IRON	0.2717	Below	Below	Below	6879528
LEAD	0.0004	Below	Below	Below	6879528
MANGANESE	0.0032	Below	Below	Below	6879528
MERCURY	0.0001	Below	Below	Below	6879528
NICKEL	0.0016	Below	Below	Below	6879528
SELENIUM	0.0304	Below	Below	Below	6879528
SILVER	0.0004	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0014	Below	Below	Below	6879528
ACETONE	763.8009	Exceeds	Exceeds	Below	6879528
CARBON DISULFIDE	2.6687	Exceeds	Exceeds	Exceeds	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	83.13981214	83.11576885	83.11373155
ARSENIC	761.2981997	761.296043	761.2958603
BERYLLIUM	0.180129065	0.180123207	0.180122711
CADMIUM	90.53175131	90.53150712	90.53148643
CHROMIUM	8205.159949	8205.157392	8205.157176
COBALT	4.953504891	4.952072382	4.951950998
COPPER	3422926.246	3422925.369	3422925.295
IRON	2825537.711	2825529.2	2825528.479
LEAD	27917.39261	27917.35883	27917.35597
MANGANESE	8773.519489	8773.4684	8773.464071
MERCURY	444.61755	444.6157963	444.6156477
NICKEL	13875.90911	13875.86328	13875.8594
SELENIUM	0.438230486	0.437134376	0.437041497
SILVER	132.7968114	132.794468	132.7942695
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	284242.9821	284242.7884	284242.772
ACETONE	6.800069857	6.488914362	6.462548654
CARBON DISULFIDE	0.010811085	0.01026231	0.01021581
PYRENE	8.279643688	8.279588949	8.279584311
4,4'-DDD	0.030503703	0.030503611	0.030503604
4,4'-DDE	0.130730157	0.130729763	0.13072973
4,4'-DDT	0.435766281	0.435765373	0.435765296
AROCLOR-1254	0.122015652	0.122014912	0.122014849
DIELDRIN	0.069729066	0.069726049	0.069725793
ENDOSULFAN SULFATE	0.009590242	0.009588718	0.009588589
ENDRIN ALDEHYDE	0.004096278	0.004096236	0.004096233

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.31696	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.16	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	11105.6	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	24400	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	24400	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	35248	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	12102.4	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	1696	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	460.8	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	7200	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	16768850.56	1584.1458
ANTIMONY	1	45	31777.7778	NA	226	14	16768850.56	2603.8258
ARSENIC	1	4617	2837.9310	NA	146	14	16768850.56	232.5360
BERYLLIUM	1	402	7.7114	NA	2011	14	16768850.56	0.6319
CADMIUM	1	4849	321.3333	NA	376	14	16768850.56	26.3296
CHROMIUM	1	41971	3364.7059	NA	4251	14	16768850.56	275.6992
COBALT	1	45	1893.3333	NA	226	14	16768850.56	155.1370
COPPER	1	51038	1154285.7143	NA	176	14	16768850.56	94580.5262
IRON	1	4342	11200000.0000	NA	126	14	16768850.56	917712.0366
LEAD	1	10811	44444.4444	NA	4501	14	16768850.56	3641.7144
MANGANESE	1	2246	67230.7692	NA	326	14	16768850.56	5508.7934
MERCURY	1	3316	2307.6923	NA	261	14	16768850.56	189.0890
NICKEL	1	3960	60307.6923	NA	326	14	16768850.56	4941.5264
SELENIUM	1	5	1500.0000	NA	26	14	16768850.56	122.9079
SILVER	1	741	3084.3373	NA	42.5	14	16768850.56	252.7262
THALLIUM	1	71	50.7042	NA	356	14	16768850.56	4.1546
VANADIUM	1	1000	109.0000	NA	5001	14	16768850.56	8.9313
ZINC	1	19197	254838.7097	NA	311	14	16768850.56	20881.1206
ACETONE	1	0.05646	44169.6113	0.3808	2.5848	14	16768850.56	3619.1950
CARBON DISULFIDE	1	0.0285	137.5000	2.9000	1.8	14	16768850.56	11.2666
PYRENE	1	1978.185	1.7108	NA	55529	14	16768850.56	0.1402
4,4'-DDD	1	4346.25	0.0029	NA	122001	14	16768850.56	0.0002
4,4'-DDE	1	4346.25	0.0123	NA	122001	14	16768850.56	0.0010
4,4'-DDT	1	6278.55	0.0284	NA	176241	14	16768850.56	0.0023
AROCLOR-1254	1	2155.74	0.0231	NA	60513	14	16768850.56	0.0019
DIELDRIN	1	302.1	0.0943	NA	8481	14	16768850.56	0.0077
ENDOSULFAN SULFATE	1	82.08	0.0477	NA	2305	14	16768850.56	0.0039
ENDRIN ALDEHYDE	1	1282.5	0.0013	NA	36001	14	16768850.56	0.0001

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	2603.825818	Leach	2.22	NA	2603.825818	0.0346	226
ARSENIC	232.536024	Leach	2.22	NA	232.536024	0.0346	23086
BERYLLIUM	0.631864631	Leach	2.22	NA	0.631864631	0.0346	2011
CADMIUM	26.32959533	Leach	2.22	NA	26.32959533	0.0346	24246
CHROMIUM	275.6992043	Leach	2.22	NA	275.6992043	0.0346	209856
COBALT	155.1370348	Leach	2.22	NA	155.1370348	0.0346	226
COPPER	94580.52622	Leach	2.22	NA	94580.52622	0.0346	255191
IRON	917712.0366	Leach	2.22	NA	917712.0366	0.0346	21711
LEAD	3641.714431	Leach	2.22	NA	3641.714431	0.0346	54056
MANGANESE	5508.793406	Leach	2.22	NA	5508.793406	0.0346	11231
MERCURY	189.0890185	Leach	2.22	NA	189.0890185	0.0346	16581
NICKEL	4941.526351	Leach	2.22	NA	4941.526351	0.0346	19801
SELENIUM	122.907862	Leach	2.22	NA	122.907862	0.0346	26
SILVER	252.7262063	Leach	2.22	NA	252.7262063	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	20881.12065	Leach	2.22	NA	20881.12065	0.0346	95986
ACETONE	3619.194995	Leach	2.22	0.0010	3617.877833	0.0346	1.2823
CARBON DISULFIDE	11.26655402	Leach	2.22	0.0007	11.24482576	0.0346	1.1425
PYRENE	0.140184494	Leach	2.22	NA	0.140184494	0.0346	9891.925
4,4'-DDD	0.00023507	Leach	2.22	NA	0.00023507	0.0346	21732.25
4,4'-DDE	0.001007441	Leach	2.22	NA	0.001007441	0.0346	21732.25
4,4'-DDT	0.00232463	Leach	2.22	NA	0.00232463	0.0346	31393.75
AROCLOR-1254	0.001895723	Leach	2.22	NA	0.001895723	0.0346	10779.7
DIELDRIN	0.007730054	Leach	2.22	NA	0.007730054	0.0346	1511.5
ENDOSULFAN SULFATE	0.003911998	Leach	2.22	NA	0.003911998	0.0346	411.4
ENDRIN ALDEHYDE	0.000106975	Leach	2.22	NA	0.000106975	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	4.1324	2.2958	2.1402	2.0662	0.2296
ARSENIC	0.0036	0.0020	0.0019	0.0018	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
COBALT	0.2462	0.1368	0.1275	0.1231	0.0137
COPPER	0.1329	0.0739	0.0688	0.0665	0.0074
IRON	15.1611	8.4228	7.8518	7.5805	0.8423
LEAD	0.0242	0.0134	0.0125	0.0121	0.0013
MANGANESE	0.1759	0.0977	0.0911	0.0880	0.0098
MERCURY	0.0041	0.0023	0.0021	0.0020	0.0002
NICKEL	0.0895	0.0497	0.0464	0.0448	0.0050
SELENIUM	1.6955	0.9420	0.8781	0.8478	0.0942
SILVER	0.0245	0.0136	0.0127	0.0122	0.0014
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0780	0.0433	0.0404	0.0390	0.0043
ACETONE	1012.3378	562.4099	524.2853	506.1689	56.2410
CARBON DISULFIDE	3.5370	1.9650	1.8318	1.7685	0.1965
PYRENE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0740	Below	Below	Below	6879528
ARSENIC	0.0001	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0044	Below	Below	Below	6879528
COPPER	0.0024	Below	Below	Below	6879528
IRON	0.2717	Below	Below	Below	6879528
LEAD	0.0004	Below	Below	Below	6879528
MANGANESE	0.0032	Below	Below	Below	6879528
MERCURY	0.0001	Below	Below	Below	6879528
NICKEL	0.0016	Below	Below	Below	6879528
SELENIUM	0.0304	Below	Below	Below	6879528
SILVER	0.0004	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0014	Below	Below	Below	6879528
ACETONE	18.1403	Below	Below	Below	6879528
CARBON DISULFIDE	0.0634	Exceeds	Below	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	83.13981214	83.11576885	83.11373155
ARSENIC	761.2981997	761.296043	761.2958603
BERYLLIUM	0.180129065	0.180123207	0.180122711
CADMIUM	90.53175131	90.53150712	90.53148643
CHROMIUM	8205.159949	8205.157392	8205.157176
COBALT	4.953504891	4.952072382	4.951950998
COPPER	3422926.246	3422925.369	3422925.295
IRON	2825537.711	2825529.2	2825528.479
LEAD	27917.39261	27917.35883	27917.35597
MANGANESE	8773.519489	8773.4684	8773.464071
MERCURY	444.61755	444.6157963	444.6156477
NICKEL	13875.90911	13875.86328	13875.8594
SELENIUM	0.438230486	0.437134376	0.437041497
SILVER	132.7968114	132.794468	132.7942695
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	284242.9821	284242.7884	284242.772
ACETONE	0.161470098	0.154080155	0.153453969
CARBON DISULFIDE	0.000256573	0.000243539	0.000242435
PYRENE	0.196641538	0.196640238	0.196640127
4,4'-DDD	0.000724463	0.000724461	0.000724461
4,4'-DDE	0.003104841	0.003104832	0.003104831
4,4'-DDT	0.010349449	0.010349428	0.010349426
AROCLOR-1254	0.002897872	0.002897854	0.002897853
DIELDRIN	0.001656065	0.001655994	0.001655988
ENDOSULFAN SULFATE	0.000227768	0.000227732	0.000227729
ENDRIN ALDEHYDE	9.72866E-05	9.72856E-05	9.72855E-05

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.0497231	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.0251	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	1742.191	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	3827.75	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	3827.75	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	5529.53	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	1898.564	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	266.06	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	72.288	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	1129.5	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	16768850.56	1584.1458
ANTIMONY	1	45	31777.7778	NA	226	14	16768850.56	2603.8258
ARSENIC	1	4617	2837.9310	NA	146	14	16768850.56	232.5360
BERYLLIUM	1	402	7.7114	NA	2011	14	16768850.56	0.6319
CADMIUM	1	4849	321.3333	NA	376	14	16768850.56	26.3296
CHROMIUM	1	41971	3364.7059	NA	4251	14	16768850.56	275.6992
COBALT	1	45	1893.3333	NA	226	14	16768850.56	155.1370
COPPER	1	51038	1154285.7143	NA	176	14	16768850.56	94580.5262
IRON	1	4342	11200000.0000	NA	126	14	16768850.56	917712.0366
LEAD	1	10811	44444.4444	NA	4501	14	16768850.56	3641.7144
MANGANESE	1	2246	67230.7692	NA	326	14	16768850.56	5508.7934
MERCURY	1	3316	2307.6923	NA	261	14	16768850.56	189.0890
NICKEL	1	3960	60307.6923	NA	326	14	16768850.56	4941.5264
SELENIUM	1	5	1500.0000	NA	26	14	16768850.56	122.9079
SILVER	1	741	3084.3373	NA	42.5	14	16768850.56	252.7262
THALLIUM	1	71	50.7042	NA	356	14	16768850.56	4.1546
VANADIUM	1	1000	109.0000	NA	5001	14	16768850.56	8.9313
ZINC	1	19197	254838.7097	NA	311	14	16768850.56	20881.1206
ACETONE	1	0.05646	281559.2753	0.3808	1.2486155	14	16768850.56	23070.5657
CARBON DISULFIDE	1	0.0285	876.4940	2.9000	1.1255	14	16768850.56	71.8187
PYRENE	1	1978.185	10.9058	NA	8711.955	14	16768850.56	0.8936
4,4'-DDD	1	4346.25	0.0183	NA	19139.75	14	16768850.56	0.0015
4,4'-DDE	1	4346.25	0.0784	NA	19139.75	14	16768850.56	0.0064
4,4'-DDT	1	6278.55	0.1808	NA	27648.65	14	16768850.56	0.0148
AROCLOR-1254	1	2155.74	0.1475	NA	9493.82	14	16768850.56	0.0121
DIELDRIN	1	302.1	0.6014	NA	1331.3	14	16768850.56	0.0493
ENDOSULFAN SULFATE	1	82.08	0.3043	NA	362.44	14	16768850.56	0.0249
ENDRIN ALDEHYDE	1	1282.5	0.0083	NA	5648.5	14	16768850.56	0.0007

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	2603.825818	Leach	2.22	NA	2603.825818	0.0346	226
ARSENIC	232.536024	Leach	2.22	NA	232.536024	0.0346	23086
BERYLLIUM	0.631864631	Leach	2.22	NA	0.631864631	0.0346	2011
CADMIUM	26.32959533	Leach	2.22	NA	26.32959533	0.0346	24246
CHROMIUM	275.6992043	Leach	2.22	NA	275.6992043	0.0346	209856
COBALT	155.1370348	Leach	2.22	NA	155.1370348	0.0346	226
COPPER	94580.52622	Leach	2.22	NA	94580.52622	0.0346	255191
IRON	917712.0366	Leach	2.22	NA	917712.0366	0.0346	21711
LEAD	3641.714431	Leach	2.22	NA	3641.714431	0.0346	54056
MANGANESE	5508.793406	Leach	2.22	NA	5508.793406	0.0346	11231
MERCURY	189.0890185	Leach	2.22	NA	189.0890185	0.0346	16581
NICKEL	4941.526351	Leach	2.22	NA	4941.526351	0.0346	19801
SELENIUM	122.907862	Leach	2.22	NA	122.907862	0.0346	26
SILVER	252.7262063	Leach	2.22	NA	252.7262063	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	20881.12065	Leach	2.22	NA	20881.12065	0.0346	95986
ACETONE	23070.56571	Leach	2.22	0.0005	23066.50942	0.0346	1.2823
CARBON DISULFIDE	71.81867105	Leach	2.22	0.0004	71.73203448	0.0346	1.1425
PYRENE	0.893606338	Leach	2.22	NA	0.893606338	0.0346	9891.925
4,4'-DDD	0.001498452	Leach	2.22	NA	0.001498452	0.0346	21732.25
4,4'-DDE	0.006421938	Leach	2.22	NA	0.006421938	0.0346	21732.25
4,4'-DDT	0.014818362	Leach	2.22	NA	0.014818362	0.0346	31393.75
AROCLOR-1254	0.012084292	Leach	2.22	NA	0.012084292	0.0346	10779.7
DIELDRIN	0.049275246	Leach	2.22	NA	0.049275246	0.0346	1511.5
ENDOSULFAN SULFATE	0.024937039	Leach	2.22	NA	0.024937039	0.0346	411.4
ENDRIN ALDEHYDE	0.000681915	Leach	2.22	NA	0.000681915	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	4.1324	2.2958	2.1402	2.0662	0.2296
ARSENIC	0.0036	0.0020	0.0019	0.0018	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
COBALT	0.2462	0.1368	0.1275	0.1231	0.0137
COPPER	0.1329	0.0739	0.0688	0.0665	0.0074
IRON	15.1611	8.4228	7.8518	7.5805	0.8423
LEAD	0.0242	0.0134	0.0125	0.0121	0.0013
MANGANESE	0.1759	0.0977	0.0911	0.0880	0.0098
MERCURY	0.0041	0.0023	0.0021	0.0020	0.0002
NICKEL	0.0895	0.0497	0.0464	0.0448	0.0050
SELENIUM	1.6955	0.9420	0.8781	0.8478	0.0942
SILVER	0.0245	0.0136	0.0127	0.0122	0.0014
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0780	0.0433	0.0404	0.0390	0.0043
ACETONE	6453.1491	3585.0829	3342.0577	3226.5746	358.5083
CARBON DISULFIDE	22.5468	12.5260	11.6769	11.2734	1.2526
PYRENE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Soil Foc Shoreline Geomeans

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0740	Below	Below	Below	6879528
ARSENIC	0.0001	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0044	Below	Below	Below	6879528
COPPER	0.0024	Below	Below	Below	6879528
IRON	0.2717	Below	Below	Below	6879528
LEAD	0.0004	Below	Below	Below	6879528
MANGANESE	0.0032	Below	Below	Below	6879528
MERCURY	0.0001	Below	Below	Below	6879528
NICKEL	0.0016	Below	Below	Below	6879528
SELENIUM	0.0304	Below	Below	Below	6879528
SILVER	0.0004	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0014	Below	Below	Below	6879528
ACETONE	115.6352	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.4040	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	83.13981214	83.11576885	83.11373155
ARSENIC	761.2981997	761.296043	761.2958603
BERYLLIUM	0.180129065	0.180123207	0.180122711
CADMIUM	90.53175131	90.53150712	90.53148643
CHROMIUM	8205.159949	8205.157392	8205.157176
COBALT	4.953504891	4.952072382	4.951950998
COPPER	3422926.246	3422925.369	3422925.295
IRON	2825537.711	2825529.2	2825528.479
LEAD	27917.39261	27917.35883	27917.35597
MANGANESE	8773.519489	8773.4684	8773.464071
MERCURY	444.61755	444.6157963	444.6156477
NICKEL	13875.90911	13875.86328	13875.8594
SELENIUM	0.438230486	0.437134376	0.437041497
SILVER	132.7968114	132.794468	132.7942695
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	284242.9821	284242.7884	284242.772
ACETONE	1.02946521	0.982358004	0.978366383
CARBON DISULFIDE	0.001636572	0.001553491	0.001546451
PYRENE	1.253491873	1.253483586	1.253482884
4,4'-DDD	0.004618091	0.004618077	0.004618075
4,4'-DDE	0.019791817	0.019791757	0.019791752
4,4'-DDT	0.065972584	0.065972447	0.065972435
AROCLOR-1254	0.018472489	0.018472377	0.018472368
DIELDRIN	0.010556592	0.010556135	0.010556096
ENDOSULFAN SULFATE	0.001451909	0.001451678	0.001451659
ENDRIN ALDEHYDE	0.000620154	0.000620147	0.000620147

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	4.2	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	16768850.56	1584.1458
ANTIMONY	1	45	31777.7778	NA	226	14	16768850.56	2603.8258
ARSENIC	1	4617	2837.9310	NA	146	14	16768850.56	232.5360
BERYLLIUM	1	402	7.7114	NA	2011	14	16768850.56	0.6319
CADMIUM	1	4849	321.3333	NA	376	14	16768850.56	26.3296
CHROMIUM	1	41971	3364.7059	NA	4251	14	16768850.56	275.6992
COBALT	1	45	1893.3333	NA	226	14	16768850.56	155.1370
COPPER	1	51038	1154285.7143	NA	176	14	16768850.56	94580.5262
IRON	1	4342	11200000.0000	NA	126	14	16768850.56	917712.0366
LEAD	1	10811	44444.4444	NA	4501	14	16768850.56	3641.7144
MANGANESE	1	2246	67230.7692	NA	326	14	16768850.56	5508.7934
MERCURY	1	3316	2307.6923	NA	261	14	16768850.56	189.0890
NICKEL	1	3960	60307.6923	NA	326	14	16768850.56	4941.5264
SELENIUM	1	5	1500.0000	NA	26	14	16768850.56	122.9079
SILVER	1	741	3084.3373	NA	42.5	14	16768850.56	252.7262
THALLIUM	1	71	50.7042	NA	356	14	16768850.56	4.1546
VANADIUM	1	1000	109.0000	NA	5001	14	16768850.56	8.9313
ZINC	1	19197	254838.7097	NA	311	14	16768850.56	20881.1206
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	16768850.56	44428.3519
CARBON DISULFIDE	1	0.0285	322.1847	2.9000	1.06518	14	16768850.56	26.3994
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	16768850.56	1.7206
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	16768850.56	0.0029
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	16768850.56	0.0124
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	16768850.56	0.0285
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	1	302.1	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	16768850.56	0.0480
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0013

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	2603.825818	Leach	2.22	NA	2603.825818	0.0346	226
ARSENIC	232.536024	Leach	2.22	NA	232.536024	0.0346	23086
BERYLLIUM	0.631864631	Leach	2.22	NA	0.631864631	0.0346	2011
CADMIUM	26.32959533	Leach	2.22	NA	26.32959533	0.0346	24246
CHROMIUM	275.6992043	Leach	2.22	NA	275.6992043	0.0346	209856
COBALT	155.1370348	Leach	2.22	NA	155.1370348	0.0346	226
COPPER	94580.52622	Leach	2.22	NA	94580.52622	0.0346	255191
IRON	917712.0366	Leach	2.22	NA	917712.0366	0.0346	21711
LEAD	3641.714431	Leach	2.22	NA	3641.714431	0.0346	54056
MANGANESE	5508.793406	Leach	2.22	NA	5508.793406	0.0346	11231
MERCURY	189.0890185	Leach	2.22	NA	189.0890185	0.0346	16581
NICKEL	4941.526351	Leach	2.22	NA	4941.526351	0.0346	19801
SELENIUM	122.907862	Leach	2.22	NA	122.907862	0.0346	26
SILVER	252.7262063	Leach	2.22	NA	252.7262063	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	20881.12065	Leach	2.22	NA	20881.12065	0.0346	95986
ACETONE	44428.35189	Leach	2.22	0.0004	44421.2881	0.0346	1.2823
CARBON DISULFIDE	26.39935668	Leach	2.22	0.0004	26.3692163	0.0346	1.1425
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	9891.925
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	21732.25
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	21732.25
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	31393.75
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	10779.7
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	1511.5
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	411.4
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	4.1324	2.2958	2.1402	2.0662	0.2296
ARSENIC	0.0036	0.0020	0.0019	0.0018	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
COBALT	0.2462	0.1368	0.1275	0.1231	0.0137
COPPER	0.1329	0.0739	0.0688	0.0665	0.0074
IRON	15.1611	8.4228	7.8518	7.5805	0.8423
LEAD	0.0242	0.0134	0.0125	0.0121	0.0013
MANGANESE	0.1759	0.0977	0.0911	0.0880	0.0098
MERCURY	0.0041	0.0023	0.0021	0.0020	0.0002
NICKEL	0.0895	0.0497	0.0464	0.0448	0.0050
SELENIUM	1.6955	0.9420	0.8781	0.8478	0.0942
SILVER	0.0245	0.0136	0.0127	0.0122	0.0014
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0780	0.0433	0.0404	0.0390	0.0043
ACETONE	12427.2107	6904.0059	6435.9981	6213.6053	690.4006
CARBON DISULFIDE	8.2878	4.6043	4.2922	4.1439	0.4604
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0740	Below	Below	Below	6879528
ARSENIC	0.0001	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0044	Below	Below	Below	6879528
COPPER	0.0024	Below	Below	Below	6879528
IRON	0.2717	Below	Below	Below	6879528
LEAD	0.0004	Below	Below	Below	6879528
MANGANESE	0.0032	Below	Below	Below	6879528
MERCURY	0.0001	Below	Below	Below	6879528
NICKEL	0.0016	Below	Below	Below	6879528
SELENIUM	0.0304	Below	Below	Below	6879528
SILVER	0.0004	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0014	Below	Below	Below	6879528
ACETONE	222.6855	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.1485	Exceeds	Below	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	83.13981214	83.11576885	83.11373155
ARSENIC	761.2981997	761.296043	761.2958603
BERYLLIUM	0.180129065	0.180123207	0.180122711
CADMIUM	90.53175131	90.53150712	90.53148643
CHROMIUM	8205.159949	8205.157392	8205.157176
COBALT	4.953504891	4.952072382	4.951950998
COPPER	3422926.246	3422925.369	3422925.295
IRON	2825537.711	2825529.2	2825528.479
LEAD	27917.39261	27917.35883	27917.35597
MANGANESE	8773.519489	8773.4684	8773.464071
MERCURY	444.61755	444.6157963	444.6156477
NICKEL	13875.90911	13875.86328	13875.8594
SELENIUM	0.438230486	0.437134376	0.437041497
SILVER	132.7968114	132.794468	132.7942695
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	284242.9821	284242.7884	284242.772
ACETONE	1.98253193	1.891814799	1.884127898
CARBON DISULFIDE	0.000601611	0.000571072	0.000568484
PYRENE	2.413519946	2.413503989	2.413502637
4,4'-DDD	0.008891844	0.008891817	0.008891814
4,4'-DDE	0.038107901	0.038107786	0.038107776
4,4'-DDT	0.127026071	0.127025807	0.127025784
AROCLOR-1254	0.035567619	0.035567403	0.035567385
DIELDRIN	0.020326055	0.020325175	0.020325101
ENDOSULFAN SULFATE	0.00279556	0.002795116	0.002795078
ENDRIN ALDEHYDE	0.001194067	0.001194055	0.001194054

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	2	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	16768850.56	1584.1458
ANTIMONY	1	45	31777.7778	NA	226	14	16768850.56	2603.8258
ARSENIC	1	4617	2837.9310	NA	146	14	16768850.56	232.5360
BERYLLIUM	1	402	7.7114	NA	2011	14	16768850.56	0.6319
CADMIUM	1	4849	321.3333	NA	376	14	16768850.56	26.3296
CHROMIUM	1	41971	3364.7059	NA	4251	14	16768850.56	275.6992
COBALT	1	45	1893.3333	NA	226	14	16768850.56	155.1370
COPPER	1	51038	1154285.7143	NA	176	14	16768850.56	94580.5262
IRON	1	4342	11200000.0000	NA	126	14	16768850.56	917712.0366
LEAD	1	10811	44444.4444	NA	4501	14	16768850.56	3641.7144
MANGANESE	1	2246	67230.7692	NA	326	14	16768850.56	5508.7934
MERCURY	1	3316	2307.6923	NA	261	14	16768850.56	189.0890
NICKEL	1	3960	60307.6923	NA	326	14	16768850.56	4941.5264
SELENIUM	1	5	1500.0000	NA	26	14	16768850.56	122.9079
SILVER	1	741	3084.3373	NA	42.5	14	16768850.56	252.7262
THALLIUM	1	71	50.7042	NA	356	14	16768850.56	4.1546
VANADIUM	1	1000	109.0000	NA	5001	14	16768850.56	8.9313
ZINC	1	19197	254838.7097	NA	311	14	16768850.56	20881.1206
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	16768850.56	44428.3519
CARBON DISULFIDE	1	0.0285	153.4213	2.9000	1.06518	14	16768850.56	12.5711
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	16768850.56	1.7206
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	16768850.56	0.0029
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	16768850.56	0.0124
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	16768850.56	0.0285
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	1	302.1	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	16768850.56	0.0480
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0013

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	2603.825818	Leach	2.22	NA	2603.825818	0.0346	226
ARSENIC	232.536024	Leach	2.22	NA	232.536024	0.0346	23086
BERYLLIUM	0.631864631	Leach	2.22	NA	0.631864631	0.0346	2011
CADMIUM	26.32959533	Leach	2.22	NA	26.32959533	0.0346	24246
CHROMIUM	275.6992043	Leach	2.22	NA	275.6992043	0.0346	209856
COBALT	155.1370348	Leach	2.22	NA	155.1370348	0.0346	226
COPPER	94580.52622	Leach	2.22	NA	94580.52622	0.0346	255191
IRON	917712.0366	Leach	2.22	NA	917712.0366	0.0346	21711
LEAD	3641.714431	Leach	2.22	NA	3641.714431	0.0346	54056
MANGANESE	5508.793406	Leach	2.22	NA	5508.793406	0.0346	11231
MERCURY	189.0890185	Leach	2.22	NA	189.0890185	0.0346	16581
NICKEL	4941.526351	Leach	2.22	NA	4941.526351	0.0346	19801
SELENIUM	122.907862	Leach	2.22	NA	122.907862	0.0346	26
SILVER	252.7262063	Leach	2.22	NA	252.7262063	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	20881.12065	Leach	2.22	NA	20881.12065	0.0346	95986
ACETONE	44428.35189	Leach	2.22	0.0004	44421.2881	0.0346	1.2823
CARBON DISULFIDE	12.57112223	Leach	2.22	0.0004	12.55676967	0.0346	1.1425
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	9891.925
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	21732.25
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	21732.25
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	31393.75
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	10779.7
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	1511.5
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	411.4
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	4.1324	2.2958	2.1402	2.0662	0.2296
ARSENIC	0.0036	0.0020	0.0019	0.0018	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
COBALT	0.2462	0.1368	0.1275	0.1231	0.0137
COPPER	0.1329	0.0739	0.0688	0.0665	0.0074
IRON	15.1611	8.4228	7.8518	7.5805	0.8423
LEAD	0.0242	0.0134	0.0125	0.0121	0.0013
MANGANESE	0.1759	0.0977	0.0911	0.0880	0.0098
MERCURY	0.0041	0.0023	0.0021	0.0020	0.0002
NICKEL	0.0895	0.0497	0.0464	0.0448	0.0050
SELENIUM	1.6955	0.9420	0.8781	0.8478	0.0942
SILVER	0.0245	0.0136	0.0127	0.0122	0.0014
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0780	0.0433	0.0404	0.0390	0.0043
ACETONE	12427.2107	6904.0059	6435.9981	6213.6053	690.4006
CARBON DISULFIDE	3.9466	2.1925	2.0439	1.9733	0.2193
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Carbon Disulfide Shoreline Min

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0740	Below	Below	Below	6879528
ARSENIC	0.0001	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0044	Below	Below	Below	6879528
COPPER	0.0024	Below	Below	Below	6879528
IRON	0.2717	Below	Below	Below	6879528
LEAD	0.0004	Below	Below	Below	6879528
MANGANESE	0.0032	Below	Below	Below	6879528
MERCURY	0.0001	Below	Below	Below	6879528
NICKEL	0.0016	Below	Below	Below	6879528
SELENIUM	0.0304	Below	Below	Below	6879528
SILVER	0.0004	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0014	Below	Below	Below	6879528
ACETONE	222.6855	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.0707	Exceeds	Below	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	83.13981214	83.11576885	83.11373155
ARSENIC	761.2981997	761.296043	761.2958603
BERYLLIUM	0.180129065	0.180123207	0.180122711
CADMIUM	90.53175131	90.53150712	90.53148643
CHROMIUM	8205.159949	8205.157392	8205.157176
COBALT	4.953504891	4.952072382	4.951950998
COPPER	3422926.246	3422925.369	3422925.295
IRON	2825537.711	2825529.2	2825528.479
LEAD	27917.39261	27917.35883	27917.35597
MANGANESE	8773.519489	8773.4684	8773.464071
MERCURY	444.61755	444.6157963	444.6156477
NICKEL	13875.90911	13875.86328	13875.8594
SELENIUM	0.438230486	0.437134376	0.437041497
SILVER	132.7968114	132.794468	132.7942695
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	284242.9821	284242.7884	284242.772
ACETONE	1.98253193	1.891814799	1.884127898
CARBON DISULFIDE	0.000286482	0.000271939	0.000270707
PYRENE	2.413519946	2.413503989	2.413502637
4,4'-DDD	0.008891844	0.008891817	0.008891814
4,4'-DDE	0.038107901	0.038107786	0.038107776
4,4'-DDT	0.127026071	0.127025807	0.127025784
AROCLOR-1254	0.035567619	0.035567403	0.035567385
DIELDRIN	0.020326055	0.020325175	0.020325101
ENDOSULFAN SULFATE	0.00279556	0.002795116	0.002795078
ENDRIN ALDEHYDE	0.001194067	0.001194055	0.001194054

Carbon Disulfide Shoreline Max

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	16768850.56	1584.1458
ANTIMONY	1	45	31777.7778	NA	226	14	16768850.56	2603.8258
ARSENIC	1	4617	2837.9310	NA	146	14	16768850.56	232.5360
BERYLLIUM	1	402	7.7114	NA	2011	14	16768850.56	0.6319
CADMIUM	1	4849	321.3333	NA	376	14	16768850.56	26.3296
CHROMIUM	1	41971	3364.7059	NA	4251	14	16768850.56	275.6992
COBALT	1	45	1893.3333	NA	226	14	16768850.56	155.1370
COPPER	1	51038	1154285.7143	NA	176	14	16768850.56	94580.5262
IRON	1	4342	11200000.0000	NA	126	14	16768850.56	917712.0366
LEAD	1	10811	44444.4444	NA	4501	14	16768850.56	3641.7144
MANGANESE	1	2246	67230.7692	NA	326	14	16768850.56	5508.7934
MERCURY	1	3316	2307.6923	NA	261	14	16768850.56	189.0890
NICKEL	1	3960	60307.6923	NA	326	14	16768850.56	4941.5264
SELENIUM	1	5	1500.0000	NA	26	14	16768850.56	122.9079
SILVER	1	741	3084.3373	NA	42.5	14	16768850.56	252.7262
THALLIUM	1	71	50.7042	NA	356	14	16768850.56	4.1546
VANADIUM	1	1000	109.0000	NA	5001	14	16768850.56	8.9313
ZINC	1	19197	254838.7097	NA	311	14	16768850.56	20881.1206
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	16768850.56	44428.3519
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	16768850.56	138.2823
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	16768850.56	1.7206
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	16768850.56	0.0029
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	16768850.56	0.0124
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	16768850.56	0.0285
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	1	302.1	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	16768850.56	0.0480
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0013

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	2603.825818	Leach	2.22	NA	2603.825818	0.0346	226
ARSENIC	232.536024	Leach	2.22	NA	232.536024	0.0346	23086
BERYLLIUM	0.631864631	Leach	2.22	NA	0.631864631	0.0346	2011
CADMIUM	26.32959533	Leach	2.22	NA	26.32959533	0.0346	24246
CHROMIUM	275.6992043	Leach	2.22	NA	275.6992043	0.0346	209856
COBALT	155.1370348	Leach	2.22	NA	155.1370348	0.0346	226
COPPER	94580.52622	Leach	2.22	NA	94580.52622	0.0346	255191
IRON	917712.0366	Leach	2.22	NA	917712.0366	0.0346	21711
LEAD	3641.714431	Leach	2.22	NA	3641.714431	0.0346	54056
MANGANESE	5508.793406	Leach	2.22	NA	5508.793406	0.0346	11231
MERCURY	189.0890185	Leach	2.22	NA	189.0890185	0.0346	16581
NICKEL	4941.526351	Leach	2.22	NA	4941.526351	0.0346	19801
SELENIUM	122.907862	Leach	2.22	NA	122.907862	0.0346	26
SILVER	252.7262063	Leach	2.22	NA	252.7262063	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	20881.12065	Leach	2.22	NA	20881.12065	0.0346	95986
ACETONE	44428.35189	Leach	2.22	0.0004	44421.2881	0.0346	1.2823
CARBON DISULFIDE	138.2823445	Leach	2.22	0.0004	138.1244663	0.0346	1.1425
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	9891.925
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	21732.25
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	21732.25
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	31393.75
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	10779.7
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	1511.5
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	411.4
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	4.1324	2.2958	2.1402	2.0662	0.2296
ARSENIC	0.0036	0.0020	0.0019	0.0018	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
COBALT	0.2462	0.1368	0.1275	0.1231	0.0137
COPPER	0.1329	0.0739	0.0688	0.0665	0.0074
IRON	15.1611	8.4228	7.8518	7.5805	0.8423
LEAD	0.0242	0.0134	0.0125	0.0121	0.0013
MANGANESE	0.1759	0.0977	0.0911	0.0880	0.0098
MERCURY	0.0041	0.0023	0.0021	0.0020	0.0002
NICKEL	0.0895	0.0497	0.0464	0.0448	0.0050
SELENIUM	1.6955	0.9420	0.8781	0.8478	0.0942
SILVER	0.0245	0.0136	0.0127	0.0122	0.0014
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0780	0.0433	0.0404	0.0390	0.0043
ACETONE	12427.2107	6904.0059	6435.9981	6213.6053	690.4006
CARBON DISULFIDE	43.4124	24.1180	22.4831	21.7062	2.4118
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Carbon Disulfide Shoreline Max

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0740	Below	Below	Below	6879528
ARSENIC	0.0001	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0044	Below	Below	Below	6879528
COPPER	0.0024	Below	Below	Below	6879528
IRON	0.2717	Below	Below	Below	6879528
LEAD	0.0004	Below	Below	Below	6879528
MANGANESE	0.0032	Below	Below	Below	6879528
MERCURY	0.0001	Below	Below	Below	6879528
NICKEL	0.0016	Below	Below	Below	6879528
SELENIUM	0.0304	Below	Below	Below	6879528
SILVER	0.0004	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0014	Below	Below	Below	6879528
ACETONE	222.6855	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.7779	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Carbon Disulfide Shoreline Max

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	83.13981214	83.11576885	83.11373155
ARSENIC	761.2981997	761.296043	761.2958603
BERYLLIUM	0.180129065	0.180123207	0.180122711
CADMIUM	90.53175131	90.53150712	90.53148643
CHROMIUM	8205.159949	8205.157392	8205.157176
COBALT	4.953504891	4.952072382	4.951950998
COPPER	3422926.246	3422925.369	3422925.295
IRON	2825537.711	2825529.2	2825528.479
LEAD	27917.39261	27917.35883	27917.35597
MANGANESE	8773.519489	8773.4684	8773.464071
MERCURY	444.61755	444.6157963	444.6156477
NICKEL	13875.90911	13875.86328	13875.8594
SELENIUM	0.438230486	0.437134376	0.437041497
SILVER	132.7968114	132.794468	132.7942695
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	284242.9821	284242.7884	284242.772
ACETONE	1.98253193	1.891814799	1.884127898
CARBON DISULFIDE	0.003151298	0.00299133	0.002977775
PYRENE	2.413519946	2.413503989	2.413502637
4,4'-DDD	0.008891844	0.008891817	0.008891814
4,4'-DDE	0.038107901	0.038107786	0.038107776
4,4'-DDT	0.127026071	0.127025807	0.127025784
AROCLOR-1254	0.035567619	0.035567403	0.035567385
DIELDRIN	0.020326055	0.020325175	0.020325101
ENDOSULFAN SULFATE	0.00279556	0.002795116	0.002795078
ENDRIN ALDEHYDE	0.001194067	0.001194055	0.001194054

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	262	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	16768850.56	1584.1458
ANTIMONY	1	45	31777.7778	NA	226	14	16768850.56	2603.8258
ARSENIC	1	4617	2837.9310	NA	146	14	16768850.56	232.5360
BERYLLIUM	1	402	7.7114	NA	2011	14	16768850.56	0.6319
CADMIUM	1	4849	321.3333	NA	376	14	16768850.56	26.3296
CHROMIUM	1	41971	3364.7059	NA	4251	14	16768850.56	275.6992
COBALT	1	45	1893.3333	NA	226	14	16768850.56	155.1370
COPPER	1	51038	1154285.7143	NA	176	14	16768850.56	94580.5262
IRON	1	4342	11200000.0000	NA	126	14	16768850.56	917712.0366
LEAD	1	10811	44444.4444	NA	4501	14	16768850.56	3641.7144
MANGANESE	1	2246	67230.7692	NA	326	14	16768850.56	5508.7934
MERCURY	1	3316	2307.6923	NA	261	14	16768850.56	189.0890
NICKEL	1	3960	60307.6923	NA	326	14	16768850.56	4941.5264
SELENIUM	1	5	1500.0000	NA	26	14	16768850.56	122.9079
SILVER	1	741	3084.3373	NA	42.5	14	16768850.56	252.7262
THALLIUM	1	71	50.7042	NA	356	14	16768850.56	4.1546
VANADIUM	1	1000	109.0000	NA	5001	14	16768850.56	8.9313
ZINC	1	19197	254838.7097	NA	311	14	16768850.56	20881.1206
ACETONE	1	0.05646	10147.1727	0.3808	1.1291	14	16768850.56	831.4449
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	16768850.56	138.2823
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	16768850.56	1.7206
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	16768850.56	0.0029
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	16768850.56	0.0124
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	16768850.56	0.0285
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	1	302.1	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	16768850.56	0.0480
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0013

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	2603.825818	Leach	2.22	NA	2603.825818	0.0346	226
ARSENIC	232.536024	Leach	2.22	NA	232.536024	0.0346	23086
BERYLLIUM	0.631864631	Leach	2.22	NA	0.631864631	0.0346	2011
CADMIUM	26.32959533	Leach	2.22	NA	26.32959533	0.0346	24246
CHROMIUM	275.6992043	Leach	2.22	NA	275.6992043	0.0346	209856
COBALT	155.1370348	Leach	2.22	NA	155.1370348	0.0346	226
COPPER	94580.52622	Leach	2.22	NA	94580.52622	0.0346	255191
IRON	917712.0366	Leach	2.22	NA	917712.0366	0.0346	21711
LEAD	3641.714431	Leach	2.22	NA	3641.714431	0.0346	54056
MANGANESE	5508.793406	Leach	2.22	NA	5508.793406	0.0346	11231
MERCURY	189.0890185	Leach	2.22	NA	189.0890185	0.0346	16581
NICKEL	4941.526351	Leach	2.22	NA	4941.526351	0.0346	19801
SELENIUM	122.907862	Leach	2.22	NA	122.907862	0.0346	26
SILVER	252.7262063	Leach	2.22	NA	252.7262063	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	20881.12065	Leach	2.22	NA	20881.12065	0.0346	95986
ACETONE	831.444871	Leach	2.22	0.0004	831.3126773	0.0346	1.2823
CARBON DISULFIDE	138.2823445	Leach	2.22	0.0004	138.1244663	0.0346	1.1425
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	9891.925
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	21732.25
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	21732.25
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	31393.75
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	10779.7
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	1511.5
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	411.4
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	4.1324	2.2958	2.1402	2.0662	0.2296
ARSENIC	0.0036	0.0020	0.0019	0.0018	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
COBALT	0.2462	0.1368	0.1275	0.1231	0.0137
COPPER	0.1329	0.0739	0.0688	0.0665	0.0074
IRON	15.1611	8.4228	7.8518	7.5805	0.8423
LEAD	0.0242	0.0134	0.0125	0.0121	0.0013
MANGANESE	0.1759	0.0977	0.0911	0.0880	0.0098
MERCURY	0.0041	0.0023	0.0021	0.0020	0.0002
NICKEL	0.0895	0.0497	0.0464	0.0448	0.0050
SELENIUM	1.6955	0.9420	0.8781	0.8478	0.0942
SILVER	0.0245	0.0136	0.0127	0.0122	0.0014
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0780	0.0433	0.0404	0.0390	0.0043
ACETONE	232.5664	129.2035	120.4451	116.2832	12.9204
CARBON DISULFIDE	43.4124	24.1180	22.4831	21.7062	2.4118
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0740	Below	Below	Below	6879528
ARSENIC	0.0001	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0044	Below	Below	Below	6879528
COPPER	0.0024	Below	Below	Below	6879528
IRON	0.2717	Below	Below	Below	6879528
LEAD	0.0004	Below	Below	Below	6879528
MANGANESE	0.0032	Below	Below	Below	6879528
MERCURY	0.0001	Below	Below	Below	6879528
NICKEL	0.0016	Below	Below	Below	6879528
SELENIUM	0.0304	Below	Below	Below	6879528
SILVER	0.0004	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0014	Below	Below	Below	6879528
ACETONE	4.1674	Below	Below	Below	6879528
CARBON DISULFIDE	0.7779	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	83.13981214	83.11576885	83.11373155
ARSENIC	761.2981997	761.296043	761.2958603
BERYLLIUM	0.180129065	0.180123207	0.180122711
CADMIUM	90.53175131	90.53150712	90.53148643
CHROMIUM	8205.159949	8205.157392	8205.157176
COBALT	4.953504891	4.952072382	4.951950998
COPPER	3422926.246	3422925.369	3422925.295
IRON	2825537.711	2825529.2	2825528.479
LEAD	27917.39261	27917.35883	27917.35597
MANGANESE	8773.519489	8773.4684	8773.464071
MERCURY	444.61755	444.6157963	444.6156477
NICKEL	13875.90911	13875.86328	13875.8594
SELENIUM	0.438230486	0.437134376	0.437041497
SILVER	132.7968114	132.794468	132.7942695
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	284242.9821	284242.7884	284242.772
ACETONE	0.037101669	0.035403963	0.035260108
CARBON DISULFIDE	0.003151298	0.00299133	0.002977775
PYRENE	2.413519946	2.413503989	2.413502637
4,4'-DDD	0.008891844	0.008891817	0.008891814
4,4'-DDE	0.038107901	0.038107786	0.038107776
4,4'-DDT	0.127026071	0.127025807	0.127025784
AROCLOR-1254	0.035567619	0.035567403	0.035567385
DIELDRIN	0.020326055	0.020325175	0.020325101
ENDOSULFAN SULFATE	0.00279556	0.002795116	0.002795078
ENDRIN ALDEHYDE	0.001194067	0.001194055	0.001194054

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	80	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	16768850.56	1584.1458
ANTIMONY	1	45	31777.7778	NA	226	14	16768850.56	2603.8258
ARSENIC	1	4617	2837.9310	NA	146	14	16768850.56	232.5360
BERYLLIUM	1	402	7.7114	NA	2011	14	16768850.56	0.6319
CADMIUM	1	4849	321.3333	NA	376	14	16768850.56	26.3296
CHROMIUM	1	41971	3364.7059	NA	4251	14	16768850.56	275.6992
COBALT	1	45	1893.3333	NA	226	14	16768850.56	155.1370
COPPER	1	51038	1154285.7143	NA	176	14	16768850.56	94580.5262
IRON	1	4342	11200000.0000	NA	126	14	16768850.56	917712.0366
LEAD	1	10811	44444.4444	NA	4501	14	16768850.56	3641.7144
MANGANESE	1	2246	67230.7692	NA	326	14	16768850.56	5508.7934
MERCURY	1	3316	2307.6923	NA	261	14	16768850.56	189.0890
NICKEL	1	3960	60307.6923	NA	326	14	16768850.56	4941.5264
SELENIUM	1	5	1500.0000	NA	26	14	16768850.56	122.9079
SILVER	1	741	3084.3373	NA	42.5	14	16768850.56	252.7262
THALLIUM	1	71	50.7042	NA	356	14	16768850.56	4.1546
VANADIUM	1	1000	109.0000	NA	5001	14	16768850.56	8.9313
ZINC	1	19197	254838.7097	NA	311	14	16768850.56	20881.1206
ACETONE	1	0.05646	3098.3734	0.3808	1.1291	14	16768850.56	253.8763
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	16768850.56	138.2823
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	16768850.56	1.7206
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	16768850.56	0.0029
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	16768850.56	0.0124
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	16768850.56	0.0285
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	1	302.1	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	16768850.56	0.0480
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0013

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	2603.825818	Leach	2.22	NA	2603.825818	0.0346	226
ARSENIC	232.536024	Leach	2.22	NA	232.536024	0.0346	23086
BERYLLIUM	0.631864631	Leach	2.22	NA	0.631864631	0.0346	2011
CADMIUM	26.32959533	Leach	2.22	NA	26.32959533	0.0346	24246
CHROMIUM	275.6992043	Leach	2.22	NA	275.6992043	0.0346	209856
COBALT	155.1370348	Leach	2.22	NA	155.1370348	0.0346	226
COPPER	94580.52622	Leach	2.22	NA	94580.52622	0.0346	255191
IRON	917712.0366	Leach	2.22	NA	917712.0366	0.0346	21711
LEAD	3641.714431	Leach	2.22	NA	3641.714431	0.0346	54056
MANGANESE	5508.793406	Leach	2.22	NA	5508.793406	0.0346	11231
MERCURY	189.0890185	Leach	2.22	NA	189.0890185	0.0346	16581
NICKEL	4941.526351	Leach	2.22	NA	4941.526351	0.0346	19801
SELENIUM	122.907862	Leach	2.22	NA	122.907862	0.0346	26
SILVER	252.7262063	Leach	2.22	NA	252.7262063	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	20881.12065	Leach	2.22	NA	20881.12065	0.0346	95986
ACETONE	253.8762965	Leach	2.22	0.0004	253.835932	0.0346	1.2823
CARBON DISULFIDE	138.2823445	Leach	2.22	0.0004	138.1244663	0.0346	1.1425
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	9891.925
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	21732.25
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	21732.25
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	31393.75
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	10779.7
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	1511.5
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	411.4
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	4.1324	2.2958	2.1402	2.0662	0.2296
ARSENIC	0.0036	0.0020	0.0019	0.0018	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
COBALT	0.2462	0.1368	0.1275	0.1231	0.0137
COPPER	0.1329	0.0739	0.0688	0.0665	0.0074
IRON	15.1611	8.4228	7.8518	7.5805	0.8423
LEAD	0.0242	0.0134	0.0125	0.0121	0.0013
MANGANESE	0.1759	0.0977	0.0911	0.0880	0.0098
MERCURY	0.0041	0.0023	0.0021	0.0020	0.0002
NICKEL	0.0895	0.0497	0.0464	0.0448	0.0050
SELENIUM	1.6955	0.9420	0.8781	0.8478	0.0942
SILVER	0.0245	0.0136	0.0127	0.0122	0.0014
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0780	0.0433	0.0404	0.0390	0.0043
ACETONE	71.0126	39.4515	36.7771	35.5063	3.9451
CARBON DISULFIDE	43.4124	24.1180	22.4831	21.7062	2.4118
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0740	Below	Below	Below	6879528
ARSENIC	0.0001	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0044	Below	Below	Below	6879528
COPPER	0.0024	Below	Below	Below	6879528
IRON	0.2717	Below	Below	Below	6879528
LEAD	0.0004	Below	Below	Below	6879528
MANGANESE	0.0032	Below	Below	Below	6879528
MERCURY	0.0001	Below	Below	Below	6879528
NICKEL	0.0016	Below	Below	Below	6879528
SELENIUM	0.0304	Below	Below	Below	6879528
SILVER	0.0004	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0014	Below	Below	Below	6879528
ACETONE	1.2725	Below	Below	Below	6879528
CARBON DISULFIDE	0.7779	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	83.13981214	83.11576885	83.11373155
ARSENIC	761.2981997	761.296043	761.2958603
BERYLLIUM	0.180129065	0.180123207	0.180122711
CADMIUM	90.53175131	90.53150712	90.53148643
CHROMIUM	8205.159949	8205.157392	8205.157176
COBALT	4.953504891	4.952072382	4.951950998
COPPER	3422926.246	3422925.369	3422925.295
IRON	2825537.711	2825529.2	2825528.479
LEAD	27917.39261	27917.35883	27917.35597
MANGANESE	8773.519489	8773.4684	8773.464071
MERCURY	444.61755	444.6157963	444.6156477
NICKEL	13875.90911	13875.86328	13875.8594
SELENIUM	0.438230486	0.437134376	0.437041497
SILVER	132.7968114	132.794468	132.7942695
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	284242.9821	284242.7884	284242.772
ACETONE	0.011328754	0.01081037	0.010766445
CARBON DISULFIDE	0.003151298	0.00299133	0.002977775
PYRENE	2.413519946	2.413503989	2.413502637
4,4'-DDD	0.008891844	0.008891817	0.008891814
4,4'-DDE	0.038107901	0.038107786	0.038107776
4,4'-DDT	0.127026071	0.127025807	0.127025784
AROCLOR-1254	0.035567619	0.035567403	0.035567385
DIELDRIN	0.020326055	0.020325175	0.020325101
ENDOSULFAN SULFATE	0.00279556	0.002795116	0.002795078
ENDRIN ALDEHYDE	0.001194067	0.001194055	0.001194054

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	NA	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	NA		NA	6400	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	NA		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	NA		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	NA		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	NA		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	NA		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	NA		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	NA		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	NA		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	NA		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	19333.3333	NA	7501	14	16768850.56	1584.1458
ANTIMONY	1	45	31777.7778	NA	226	14	16768850.56	2603.8258
ARSENIC	1	4617	2837.9310	NA	146	14	16768850.56	232.5360
BERYLLIUM	1	402	7.7114	NA	2011	14	16768850.56	0.6319
CADMIUM	1	4849	321.3333	NA	376	14	16768850.56	26.3296
CHROMIUM	1	41971	3364.7059	NA	4251	14	16768850.56	275.6992
COBALT	1	45	1893.3333	NA	226	14	16768850.56	155.1370
COPPER	1	51038	1154285.7143	NA	176	14	16768850.56	94580.5262
IRON	1	4342	11200000.0000	NA	126	14	16768850.56	917712.0366
LEAD	1	10811	44444.4444	NA	4501	14	16768850.56	3641.7144
MANGANESE	1	2246	67230.7692	NA	326	14	16768850.56	5508.7934
MERCURY	1	3316	2307.6923	NA	261	14	16768850.56	189.0890
NICKEL	1	3960	60307.6923	NA	326	14	16768850.56	4941.5264
SELENIUM	1	5	1500.0000	NA	26	14	16768850.56	122.9079
SILVER	1	741	3084.3373	NA	42.5	14	16768850.56	252.7262
THALLIUM	1	71	50.7042	NA	356	14	16768850.56	4.1546
VANADIUM	1	1000	109.0000	NA	5001	14	16768850.56	8.9313
ZINC	1	19197	254838.7097	NA	311	14	16768850.56	20881.1206
ACETONE	1	0.05646	247869.8683	0.3808	1.1291	14	16768850.56	20310.1037
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	16768850.56	138.2823
PYRENE	1	1978.185	20.9984	NA	4525.1438	14	16768850.56	1.7206
4,4'-DDD	1	4346.25	0.0352	NA	9940.95	14	16768850.56	0.0029
4,4'-DDE	1	4346.25	0.1509	NA	9940.95	14	16768850.56	0.0124
4,4'-DDT	1	6278.55	0.3482	NA	14360.154	14	16768850.56	0.0285
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	1	302.1	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	1	82.08	0.5860	NA	188.7184	14	16768850.56	0.0480
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0013

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	2603.825818	Leach	2.22	NA	2603.825818	0.0346	226
ARSENIC	232.536024	Leach	2.22	NA	232.536024	0.0346	23086
BERYLLIUM	0.631864631	Leach	2.22	NA	0.631864631	0.0346	2011
CADMIUM	26.32959533	Leach	2.22	NA	26.32959533	0.0346	24246
CHROMIUM	275.6992043	Leach	2.22	NA	275.6992043	0.0346	209856
COBALT	155.1370348	Leach	2.22	NA	155.1370348	0.0346	226
COPPER	94580.52622	Leach	2.22	NA	94580.52622	0.0346	255191
IRON	917712.0366	Leach	2.22	NA	917712.0366	0.0346	21711
LEAD	3641.714431	Leach	2.22	NA	3641.714431	0.0346	54056
MANGANESE	5508.793406	Leach	2.22	NA	5508.793406	0.0346	11231
MERCURY	189.0890185	Leach	2.22	NA	189.0890185	0.0346	16581
NICKEL	4941.526351	Leach	2.22	NA	4941.526351	0.0346	19801
SELENIUM	122.907862	Leach	2.22	NA	122.907862	0.0346	26
SILVER	252.7262063	Leach	2.22	NA	252.7262063	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	20881.12065	Leach	2.22	NA	20881.12065	0.0346	95986
ACETONE	20310.10372	Leach	2.22	0.0004	20306.87456	0.0346	1.2823
CARBON DISULFIDE	138.2823445	Leach	2.22	0.0004	138.1244663	0.0346	1.1425
PYRENE	1.72058293	Leach	2.22	NA	1.72058293	0.0346	9891.925
4,4'-DDD	0.002885176	Leach	2.22	NA	0.002885176	0.0346	21732.25
4,4'-DDE	0.012365038	Leach	2.22	NA	0.012365038	0.0346	21732.25
4,4'-DDT	0.028531825	Leach	2.22	NA	0.028531825	0.0346	31393.75
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	10779.7
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	1511.5
ENDOSULFAN SULFATE	0.048014703	Leach	2.22	NA	0.048014703	0.0346	411.4
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	4.1324	2.2958	2.1402	2.0662	0.2296
ARSENIC	0.0036	0.0020	0.0019	0.0018	0.0002
BERYLLIUM	0.0001	0.0001	0.0001	0.0001	0.0000
CADMIUM	0.0004	0.0002	0.0002	0.0002	0.0000
CHROMIUM	0.0005	0.0003	0.0002	0.0002	0.0000
COBALT	0.2462	0.1368	0.1275	0.1231	0.0137
COPPER	0.1329	0.0739	0.0688	0.0665	0.0074
IRON	15.1611	8.4228	7.8518	7.5805	0.8423
LEAD	0.0242	0.0134	0.0125	0.0121	0.0013
MANGANESE	0.1759	0.0977	0.0911	0.0880	0.0098
MERCURY	0.0041	0.0023	0.0021	0.0020	0.0002
NICKEL	0.0895	0.0497	0.0464	0.0448	0.0050
SELENIUM	1.6955	0.9420	0.8781	0.8478	0.0942
SILVER	0.0245	0.0136	0.0127	0.0122	0.0014
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0780	0.0433	0.0404	0.0390	0.0043
ACETONE	5681.0106	3156.1170	2942.1706	2840.5053	315.6117
CARBON DISULFIDE	43.4124	24.1180	22.4831	21.7062	2.4118
PYRENE	0.0001	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0740	Below	Below	Below	6879528
ARSENIC	0.0001	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0044	Below	Below	Below	6879528
COPPER	0.0024	Below	Below	Below	6879528
IRON	0.2717	Below	Below	Below	6879528
LEAD	0.0004	Below	Below	Below	6879528
MANGANESE	0.0032	Below	Below	Below	6879528
MERCURY	0.0001	Below	Below	Below	6879528
NICKEL	0.0016	Below	Below	Below	6879528
SELENIUM	0.0304	Below	Below	Below	6879528
SILVER	0.0004	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0014	Below	Below	Below	6879528
ACETONE	101.7991	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.7779	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	83.13981214	83.11576885	83.11373155
ARSENIC	761.2981997	761.296043	761.2958603
BERYLLIUM	0.180129065	0.180123207	0.180122711
CADMIUM	90.53175131	90.53150712	90.53148643
CHROMIUM	8205.159949	8205.157392	8205.157176
COBALT	4.953504891	4.952072382	4.951950998
COPPER	3422926.246	3422925.369	3422925.295
IRON	2825537.711	2825529.2	2825528.479
LEAD	27917.39261	27917.35883	27917.35597
MANGANESE	8773.519489	8773.4684	8773.464071
MERCURY	444.61755	444.6157963	444.6156477
NICKEL	13875.90911	13875.86328	13875.8594
SELENIUM	0.438230486	0.437134376	0.437041497
SILVER	132.7968114	132.794468	132.7942695
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	284242.9821	284242.7884	284242.772
ACETONE	0.906300311	0.864829622	0.86131561
CARBON DISULFIDE	0.003151298	0.00299133	0.002977775
PYRENE	2.413519946	2.413503989	2.413502637
4,4'-DDD	0.008891844	0.008891817	0.008891814
4,4'-DDE	0.038107901	0.038107786	0.038107776
4,4'-DDT	0.127026071	0.127025807	0.127025784
AROCLOR-1254	0.035567619	0.035567403	0.035567385
DIELDRIN	0.020326055	0.020325175	0.020325101
ENDOSULFAN SULFATE	0.00279556	0.002795116	0.002795078
ENDRIN ALDEHYDE	0.001194067	0.001194055	0.001194054

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	*5*	UG/L	TP-MW08	12781	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	*0.65*	UG/L	TP-MW06	2	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	6.8	UG/L	TP-MW02	20.6	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	*5*	UG/L	NA	0.59	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	0.56	UG/L	TP-MW06	1.8	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	3.9	UG/L	TP-MW08	75.7	MG/KG	TP-SB35	850	1282842
COBALT	M	23	*5*	UG/L	FA-01B	10.4	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	50.5	UG/L	TP-MW05	1030	MG/KG	TP-SB19	35	1282842
IRON	M	1000	2426	UG/L	TP-MW08	43500	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	10.5	UG/L	TP-MW06	2140	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	850	UG/L	TP-MW08	386	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.069	UG/L	TP-MW02	2.1	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	50	UG/L	TP-MW06	51.6	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	8	UG/L	FA-01	0.67	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	*0.285*	UG/L	FA-01	0.53	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	7.3	UG/L	TP-MW07	0.48	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	*0.18*	UG/L	TP-MW08	50.2	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	141	UG/L	TP-MW05	472	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	*0.5*		NA	*5.5*	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	*0.5*		NA	*5.5*	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	0.14		NA	1106	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	*0.5*		NA	8.7	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	*0.5*		NA	42.5	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	*0.5*		NA	85	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	*0.5*		NA	*7.5*	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	*0.5*		NA	*0.65*	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	*0.5*		NA	5.5	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	*0.5*		NA	*0.725*	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	8520.6667	NA	7501	14	16768850.56	698.1713
ANTIMONY	1	45	44.4444	NA	226	14	16768850.56	3.6417
ARSENIC	1	4617	710.3448	NA	146	14	16768850.56	58.2046
BERYLLIUM	1	402	1.4677	NA	2011	14	16768850.56	0.1203
CADMIUM	1	4849	24.0000	NA	376	14	16768850.56	1.9665
CHROMIUM	1	41971	89.0588	NA	4251	14	16768850.56	7.2974
COBALT	1	45	231.1111	NA	226	14	16768850.56	18.9369
COPPER	1	51038	29428.5714	NA	176	14	16768850.56	2411.3352
IRON	1	4342	1740000.0000	NA	126	14	16768850.56	142573.1200
LEAD	1	10811	2377.7778	NA	4501	14	16768850.56	194.8317
MANGANESE	1	2246	5938.4615	NA	326	14	16768850.56	486.5891
MERCURY	1	3316	40.3846	NA	261	14	16768850.56	3.3091
NICKEL	1	3960	793.8462	NA	326	14	16768850.56	65.0466
SELENIUM	1	5	134.0000	NA	26	14	16768850.56	10.9798
SILVER	1	741	63.8554	NA	42.5	14	16768850.56	5.2322
THALLIUM	1	71	6.7606	NA	356	14	16768850.56	0.5540
VANADIUM	1	1000	50.2000	NA	5001	14	16768850.56	4.1133
ZINC	1	19197	7612.9032	NA	311	14	16768850.56	623.7904
ACETONE	1	0.05646	213.0132	0.3808	1.1291	14	16768850.56	17.4540
CARBON DISULFIDE	1	0.0285	421.9086	2.9000	1.06518	14	16768850.56	34.5706
PYRENE	1	1978.185	1.2223	NA	4525.1438	14	16768850.56	0.1002
4,4'-DDD	1	4346.25	0.0044	NA	9940.95	14	16768850.56	0.0004
4,4'-DDE	1	4346.25	0.0214	NA	9940.95	14	16768850.56	0.0018
4,4'-DDT	1	6278.55	0.0296	NA	14360.154	14	16768850.56	0.0024
AROCLOR-1254	1	2155.74	0.0076	NA	4931.2152	14	16768850.56	0.0006
DIELDRIN	1	302.1	0.0047	NA	691.908	14	16768850.56	0.0004
ENDOSULFAN SULFATE	1	82.08	0.1465	NA	188.7184	14	16768850.56	0.0120
ENDRIN ALDEHYDE	1	1282.5	0.0012	NA	2934.1	14	16768850.56	0.0001

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	698.1712821	Leach	2.22	NA	698.1712821	0.0346	1035566
ANTIMONY	3.641714431	Leach	2.22	NA	3.641714431	0.0346	226
ARSENIC	58.20464271	Leach	2.22	NA	58.20464271	0.0346	23086
BERYLLIUM	5	GW Sample	2.22	NA	5	0.0346	2011
CADMIUM	1.966525793	Leach	2.22	NA	1.966525793	0.0346	24246
CHROMIUM	7.297353064	Leach	2.22	NA	7.297353064	0.0346	209856
COBALT	18.93691504	Leach	2.22	NA	18.93691504	0.0346	226
COPPER	2411.335198	Leach	2.22	NA	2411.335198	0.0346	255191
IRON	142573.12	Leach	2.22	NA	142573.12	0.0346	21711
LEAD	194.831722	Leach	2.22	NA	194.831722	0.0346	54056
MANGANESE	850	GW Sample	2.22	NA	850	0.0346	11231
MERCURY	3.309057824	Leach	2.22	NA	3.309057824	0.0346	16581
NICKEL	65.04662237	Leach	2.22	NA	65.04662237	0.0346	19801
SELENIUM	10.97976901	Leach	2.22	NA	10.97976901	0.0346	26
SILVER	5.232222239	Leach	2.22	NA	5.232222239	0.0346	3706
THALLIUM	7.3	GW Sample	2.22	NA	7.3	0.0346	356
VANADIUM	4.11331645	Leach	2.22	NA	4.11331645	0.0346	5001
ZINC	623.7904396	Leach	2.22	NA	623.7904396	0.0346	95986
ACETONE	17.45399538	Leach	2.22	0.0004	17.45122033	0.0346	1.2823
CARBON DISULFIDE	34.57058613	Leach	2.22	0.0004	34.53111658	0.0346	1.1425
PYRENE	0.14	GW Sample	2.22	NA	0.14	0.0346	9891.925
4,4'-DDD	0.5	GW Sample	2.22	NA	0.5	0.0346	21732.25
4,4'-DDE	0.5	GW Sample	2.22	NA	0.5	0.0346	21732.25
4,4'-DDT	0.5	GW Sample	2.22	NA	0.5	0.0346	31393.75
AROCLOR-1254	0.5	GW Sample	2.22	NA	0.5	0.0346	10779.7
DIELDRIN	0.5	GW Sample	2.22	NA	0.5	0.0346	1511.5
ENDOSULFAN SULFATE	0.5	GW Sample	2.22	NA	0.5	0.0346	411.4
ENDRIN ALDEHYDE	0.5	GW Sample	2.22	NA	0.5	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0002	0.0001	0.0001	0.0001	0.0000
ANTIMONY	0.0058	0.0032	0.0030	0.0029	0.0003
ARSENIC	0.0009	0.0005	0.0005	0.0005	0.0001
BERYLLIUM	0.0009	0.0005	0.0005	0.0004	0.0000
CADMIUM	0.0000	0.0000	0.0000	0.0000	0.0000
CHROMIUM	0.0000	0.0000	0.0000	0.0000	0.0000
COBALT	0.0301	0.0167	0.0156	0.0150	0.0017
COPPER	0.0034	0.0019	0.0018	0.0017	0.0002
IRON	2.3554	1.3085	1.2198	1.1777	0.1309
LEAD	0.0013	0.0007	0.0007	0.0006	0.0001
MANGANESE	0.0271	0.0151	0.0141	0.0136	0.0015
MERCURY	0.0001	0.0000	0.0000	0.0000	0.0000
NICKEL	0.0012	0.0007	0.0006	0.0006	0.0001
SELENIUM	0.1515	0.0841	0.0784	0.0757	0.0084
SILVER	0.0005	0.0003	0.0003	0.0003	0.0000
THALLIUM	0.0074	0.0041	0.0038	0.0037	0.0004
VANADIUM	0.0003	0.0002	0.0002	0.0001	0.0000
ZINC	0.0023	0.0013	0.0012	0.0012	0.0001
ACETONE	4.8821	2.7123	2.5284	2.4411	0.2712
CARBON DISULFIDE	10.8531	6.0295	5.6208	5.4265	0.6029
PYRENE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0001	0.0001	0.0001	0.0001	0.0000
ENDOSULFAN SULFATE	0.0004	0.0002	0.0002	0.0002	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0000	Below	Below	Below	6879528
ANTIMONY	0.0001	Below	Below	Below	6879528
ARSENIC	0.0000	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0005	Below	Below	Below	6879528
COPPER	0.0001	Below	Below	Below	6879528
IRON	0.0422	Below	Below	Below	6879528
LEAD	0.0000	Below	Below	Below	6879528
MANGANESE	0.0005	Below	Below	Below	6879528
MERCURY	0.0000	Below	Below	Below	6879528
NICKEL	0.0000	Below	Below	Below	6879528
SELENIUM	0.0027	Below	Below	Below	6879528
SILVER	0.0000	Below	Below	Below	6879528
THALLIUM	0.0001	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0000	Below	Below	Below	6879528
ACETONE	0.0875	Below	Below	Below	6879528
CARBON DISULFIDE	0.1945	Exceeds	Below	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	102534.8073	102534.8008	102534.8003
ANTIMONY	0.116279458	0.116245831	0.116242981
ARSENIC	190.555807	190.5552671	190.5552214
BERYLLIUM	1.425377018	1.425330666	1.425326739
CADMIUM	6.761707567	6.761689329	6.761687783
CHROMIUM	217.1785343	217.1784666	217.1784609
COBALT	0.604653179	0.604478319	0.604463502
COPPER	87267.6741	87267.65173	87267.64984
IRON	438967.4658	438966.1436	438966.0315
LEAD	1493.580505	1493.578698	1493.578544
MANGANESE	1353.743191	1353.735308	1353.73464
MERCURY	7.780807124	7.780776435	7.780773835
NICKEL	182.652273	182.6516697	182.6516186
SELENIUM	0.03914859	0.039050671	0.039042374
SILVER	2.749308986	2.749260471	2.74925636
THALLIUM	0.36767373	0.367606214	0.367600493
VANADIUM	2.916801122	2.916762979	2.916759747
ZINC	8491.309339	8491.303554	8491.303063
ACETONE	0.000778852	0.000743213	0.000740193
CARBON DISULFIDE	0.000787825	0.000747832	0.000744444
PYRENE	0.196382741	0.196381443	0.196381333
4,4'-DDD	1.540953616	1.540948978	1.540948585
4,4'-DDE	1.540953616	1.540948978	1.540948585
4,4'-DDT	2.226041798	2.22603716	2.226036767
AROCLOR-1254	0.764318251	0.764313614	0.764313222
DIELDRIN	0.107118609	0.107113975	0.107113582
ENDOSULFAN SULFATE	0.0291115	0.029106874	0.029106482
ENDRIN ALDEHYDE	0.454714978	0.454710341	0.454709948

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	*5*	UG/L	TP-MW08	12781	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	*0.65*	UG/L	TP-MW06	2	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	6.8	UG/L	TP-MW02	20.6	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	*5*	UG/L	NA	0.59	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	0.56	UG/L	TP-MW06	1.8	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	3.9	UG/L	TP-MW08	75.7	MG/KG	TP-SB35	850	1282842
COBALT	M	23	*5*	UG/L	FA-01B	10.4	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	50.5	UG/L	TP-MW05	1030	MG/KG	TP-SB19	35	1282842
IRON	M	1000	2426	UG/L	TP-MW08	43500	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	10.5	UG/L	TP-MW06	2140	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	850	UG/L	TP-MW08	386	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.069	UG/L	TP-MW02	2.1	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	50	UG/L	TP-MW06	51.6	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	8	UG/L	FA-01	0.67	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	*0.285*	UG/L	FA-01	0.53	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	7.3	UG/L	TP-MW07	0.48	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	*0.18*	UG/L	TP-MW08	50.2	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	141	UG/L	TP-MW05	472	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	*0.5*		NA	*5.5*	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	*0.5*		NA	*5.5*	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	0.14		NA	1106	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	*0.5*		NA	8.7	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	*0.5*		NA	42.5	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	*0.5*		NA	85	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	*0.5*		NA	*7.5*	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	*0.5*		NA	*0.65*	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	*0.5*		NA	5.5	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	*0.5*		NA	*0.725*	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	8520.6667	NA	7501	14	16768850.56	698.1713
ANTIMONY	1	45	44.4444	NA	226	14	16768850.56	3.6417
ARSENIC	1	4617	710.3448	NA	146	14	16768850.56	58.2046
BERYLLIUM	1	402	1.4677	NA	2011	14	16768850.56	0.1203
CADMIUM	1	4849	24.0000	NA	376	14	16768850.56	1.9665
CHROMIUM	1	41971	89.0588	NA	4251	14	16768850.56	7.2974
COBALT	1	45	231.1111	NA	226	14	16768850.56	18.9369
COPPER	1	51038	29428.5714	NA	176	14	16768850.56	2411.3352
IRON	1	4342	1740000.0000	NA	126	14	16768850.56	142573.1200
LEAD	1	10811	2377.7778	NA	4501	14	16768850.56	194.8317
MANGANESE	1	2246	5938.4615	NA	326	14	16768850.56	486.5891
MERCURY	1	3316	40.3846	NA	261	14	16768850.56	3.3091
NICKEL	1	3960	793.8462	NA	326	14	16768850.56	65.0466
SELENIUM	1	5	134.0000	NA	26	14	16768850.56	10.9798
SILVER	1	741	63.8554	NA	42.5	14	16768850.56	5.2322
THALLIUM	1	71	6.7606	NA	356	14	16768850.56	0.5540
VANADIUM	1	1000	50.2000	NA	5001	14	16768850.56	4.1133
ZINC	1	19197	7612.9032	NA	311	14	16768850.56	623.7904
ACETONE	1	0.05646	213.0132	0.3808	1.1291	14	16768850.56	17.4540
CARBON DISULFIDE	1	0.0285	421.9086	2.9000	1.06518	14	16768850.56	34.5706
PYRENE	1	1978.185	1.2223	NA	4525.1438	14	16768850.56	0.1002
4,4'-DDD	1	4346.25	0.0044	NA	9940.95	14	16768850.56	0.0004
4,4'-DDE	1	4346.25	0.0214	NA	9940.95	14	16768850.56	0.0018
4,4'-DDT	1	6278.55	0.0296	NA	14360.154	14	16768850.56	0.0024
AROCLOR-1254	1	2155.74	0.0076	NA	4931.2152	14	16768850.56	0.0006
DIELDRIN	1	302.1	0.0047	NA	691.908	14	16768850.56	0.0004
ENDOSULFAN SULFATE	1	82.08	0.1465	NA	188.7184	14	16768850.56	0.0120
ENDRIN ALDEHYDE	1	1282.5	0.0012	NA	2934.1	14	16768850.56	0.0001

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	5	GW Sample	2.22	NA	5	0.0346	1035566
ANTIMONY	0.65	GW Sample	2.22	NA	0.65	0.0346	226
ARSENIC	6.8	GW Sample	2.22	NA	6.8	0.0346	23086
BERYLLIUM	5	GW Sample	2.22	NA	5	0.0346	2011
CADMIUM	0.56	GW Sample	2.22	NA	0.56	0.0346	24246
CHROMIUM	3.9	GW Sample	2.22	NA	3.9	0.0346	209856
COBALT	5	GW Sample	2.22	NA	5	0.0346	226
COPPER	50.5	GW Sample	2.22	NA	50.5	0.0346	255191
IRON	2426	GW Sample	2.22	NA	2426	0.0346	21711
LEAD	10.5	GW Sample	2.22	NA	10.5	0.0346	54056
MANGANESE	850	GW Sample	2.22	NA	850	0.0346	11231
MERCURY	0.069	GW Sample	2.22	NA	0.069	0.0346	16581
NICKEL	50	GW Sample	2.22	NA	50	0.0346	19801
SELENIUM	8	GW Sample	2.22	NA	8	0.0346	26
SILVER	0.285	GW Sample	2.22	NA	0.285	0.0346	3706
THALLIUM	7.3	GW Sample	2.22	NA	7.3	0.0346	356
VANADIUM	0.18	GW Sample	2.22	NA	0.18	0.0346	5001
ZINC	141	GW Sample	2.22	NA	141	0.0346	95986
ACETONE	0.5	GW Sample	2.22	0.0004	0.499920504	0.0346	1.2823
CARBON DISULFIDE	0.5	GW Sample	2.22	0.0004	0.499429145	0.0346	1.1425
PYRENE	0.14	GW Sample	2.22	NA	0.14	0.0346	9891.925
4,4'-DDD	0.5	GW Sample	2.22	NA	0.5	0.0346	21732.25
4,4'-DDE	0.5	GW Sample	2.22	NA	0.5	0.0346	21732.25
4,4'-DDT	0.5	GW Sample	2.22	NA	0.5	0.0346	31393.75
AROCLOR-1254	0.5	GW Sample	2.22	NA	0.5	0.0346	10779.7
DIELDRIN	0.5	GW Sample	2.22	NA	0.5	0.0346	1511.5
ENDOSULFAN SULFATE	0.5	GW Sample	2.22	NA	0.5	0.0346	411.4
ENDRIN ALDEHYDE	0.5	GW Sample	2.22	NA	0.5	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0000	0.0000	0.0000	0.0000	0.0000
ANTIMONY	0.0010	0.0006	0.0005	0.0005	0.0001
ARSENIC	0.0001	0.0001	0.0001	0.0001	0.0000
BERYLLIUM	0.0009	0.0005	0.0005	0.0004	0.0000
CADMIUM	0.0000	0.0000	0.0000	0.0000	0.0000
CHROMIUM	0.0000	0.0000	0.0000	0.0000	0.0000
COBALT	0.0079	0.0044	0.0041	0.0040	0.0004
COPPER	0.0001	0.0000	0.0000	0.0000	0.0000
IRON	0.0401	0.0223	0.0208	0.0200	0.0022
LEAD	0.0001	0.0000	0.0000	0.0000	0.0000
MANGANESE	0.0271	0.0151	0.0141	0.0136	0.0015
MERCURY	0.0000	0.0000	0.0000	0.0000	0.0000
NICKEL	0.0009	0.0005	0.0005	0.0005	0.0001
SELENIUM	0.1104	0.0613	0.0572	0.0552	0.0061
SILVER	0.0000	0.0000	0.0000	0.0000	0.0000
THALLIUM	0.0074	0.0041	0.0038	0.0037	0.0004
VANADIUM	0.0000	0.0000	0.0000	0.0000	0.0000
ZINC	0.0005	0.0003	0.0003	0.0003	0.0000
ACETONE	0.1399	0.0777	0.0724	0.0699	0.0078
CARBON DISULFIDE	0.1570	0.0872	0.0813	0.0785	0.0087
PYRENE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0001	0.0001	0.0001	0.0001	0.0000
ENDOSULFAN SULFATE	0.0004	0.0002	0.0002	0.0002	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0000	Below	Below	Below	6879528
ANTIMONY	0.0000	Below	Below	Below	6879528
ARSENIC	0.0000	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0001	Below	Below	Below	6879528
COPPER	0.0000	Below	Below	Below	6879528
IRON	0.0007	Below	Below	Below	6879528
LEAD	0.0000	Below	Below	Below	6879528
MANGANESE	0.0005	Below	Below	Below	6879528
MERCURY	0.0000	Below	Below	Below	6879528
NICKEL	0.0000	Below	Below	Below	6879528
SELENIUM	0.0020	Below	Below	Below	6879528
SILVER	0.0000	Below	Below	Below	6879528
THALLIUM	0.0001	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0000	Below	Below	Below	6879528
ACETONE	0.0025	Below	Below	Below	6879528
CARBON DISULFIDE	0.0028	Below	Below	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	734.3098316	734.3097852	734.3097813
ANTIMONY	0.020754414	0.020748412	0.020747903
ARSENIC	22.26247644	22.26241338	22.26240803
BERYLLIUM	1.425377018	1.425330666	1.425326739
CADMIUM	1.925505504	1.92550031	1.92549987
CHROMIUM	116.0689741	116.0689379	116.0689349
COBALT	0.159649335	0.159603166	0.159599254
COPPER	1827.625436	1827.624967	1827.624928
IRON	7469.395861	7469.373361	7469.371455
LEAD	80.49302821	80.49293082	80.49292257
MANGANESE	1353.743191	1353.735308	1353.73464
MERCURY	0.162244276	0.162243636	0.162243582
NICKEL	140.4010434	140.4005797	140.4005404
SELENIUM	0.028524163	0.028452818	0.028446772
SILVER	0.14975531	0.149752667	0.149752443
THALLIUM	0.36767373	0.367606214	0.367600493
VANADIUM	0.127640119	0.12763845	0.127638309
ZINC	1919.353906	1919.352598	1919.352488
ACETONE	2.23116E-05	2.12906E-05	2.12041E-05
CARBON DISULFIDE	1.13944E-05	1.0816E-05	1.0767E-05
PYRENE	0.196382741	0.196381443	0.196381333
4,4'-DDD	1.540953616	1.540948978	1.540948585
4,4'-DDE	1.540953616	1.540948978	1.540948585
4,4'-DDT	2.226041798	2.22603716	2.226036767
AROCLOR-1254	0.764318251	0.764313614	0.764313222
DIELDRIN	0.107118609	0.107113975	0.107113582
ENDOSULFAN SULFATE	0.0291115	0.029106874	0.029106482
ENDRIN ALDEHYDE	0.454714978	0.454710341	0.454709948

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	*14500*	UG/L	TP-MW08	12781	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	*34*	UG/L	TP-MW06	2	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	6.8	UG/L	TP-MW02	20.6	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	*NA*	UG/L	NA	0.59	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	0.56	UG/L	TP-MW06	1.8	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	3.9	UG/L	TP-MW08	75.7	MG/KG	TP-SB35	850	1282842
COBALT	M	23	*1.15*	UG/L	FA-01B	10.4	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	50.5	UG/L	TP-MW05	1030	MG/KG	TP-SB19	35	1282842
IRON	M	1000	2426	UG/L	TP-MW08	43500	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	10.5	UG/L	TP-MW06	2140	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	850	UG/L	TP-MW08	386	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.069	UG/L	TP-MW02	2.1	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	50	UG/L	TP-MW06	51.6	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	8	UG/L	FA-01	0.67	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	*6.2*	UG/L	FA-01	0.53	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	7.3	UG/L	TP-MW07	0.48	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	*25.8*	UG/L	TP-MW08	50.2	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	141	UG/L	TP-MW05	472	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	*NA*		NA	*14000*	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	*NA*		NA	*22*	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	0.14		NA	1106	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	*NA*		NA	8.7	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	*NA*		NA	42.5	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	*NA*		NA	85	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	*NA*		NA	*280*	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	*NA*		NA	*160*	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	*NA*		NA	5.5	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	*NA*		NA	*9.4*	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	8520.6667	NA	7501	14	16768850.56	698.1713
ANTIMONY	1	45	44.4444	NA	226	14	16768850.56	3.6417
ARSENIC	1	4617	710.3448	NA	146	14	16768850.56	58.2046
BERYLLIUM	1	402	1.4677	NA	2011	14	16768850.56	0.1203
CADMIUM	1	4849	24.0000	NA	376	14	16768850.56	1.9665
CHROMIUM	1	41971	89.0588	NA	4251	14	16768850.56	7.2974
COBALT	1	45	231.1111	NA	226	14	16768850.56	18.9369
COPPER	1	51038	29428.5714	NA	176	14	16768850.56	2411.3352
IRON	1	4342	1740000.0000	NA	126	14	16768850.56	142573.1200
LEAD	1	10811	2377.7778	NA	4501	14	16768850.56	194.8317
MANGANESE	1	2246	5938.4615	NA	326	14	16768850.56	486.5891
MERCURY	1	3316	40.3846	NA	261	14	16768850.56	3.3091
NICKEL	1	3960	793.8462	NA	326	14	16768850.56	65.0466
SELENIUM	1	5	134.0000	NA	26	14	16768850.56	10.9798
SILVER	1	741	63.8554	NA	42.5	14	16768850.56	5.2322
THALLIUM	1	71	6.7606	NA	356	14	16768850.56	0.5540
VANADIUM	1	1000	50.2000	NA	5001	14	16768850.56	4.1133
ZINC	1	19197	7612.9032	NA	311	14	16768850.56	623.7904
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	16768850.56	44428.3519
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	16768850.56	138.2823
PYRENE	1	1978.185	1.2223	NA	4525.1438	14	16768850.56	0.1002
4,4'-DDD	1	4346.25	0.0044	NA	9940.95	14	16768850.56	0.0004
4,4'-DDE	1	4346.25	0.0214	NA	9940.95	14	16768850.56	0.0018
4,4'-DDT	1	6278.55	0.0296	NA	14360.154	14	16768850.56	0.0024
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	1	302.1	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	1	82.08	0.1465	NA	188.7184	14	16768850.56	0.0120
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0013

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	34	GW Sample	2.22	NA	34	0.0346	226
ARSENIC	58.20464271	Leach	2.22	NA	58.20464271	0.0346	23086
BERYLLIUM	0.120258107	Leach	2.22	NA	0.120258107	0.0346	2011
CADMIUM	1.966525793	Leach	2.22	NA	1.966525793	0.0346	24246
CHROMIUM	7.297353064	Leach	2.22	NA	7.297353064	0.0346	209856
COBALT	18.93691504	Leach	2.22	NA	18.93691504	0.0346	226
COPPER	2411.335198	Leach	2.22	NA	2411.335198	0.0346	255191
IRON	142573.12	Leach	2.22	NA	142573.12	0.0346	21711
LEAD	194.831722	Leach	2.22	NA	194.831722	0.0346	54056
MANGANESE	850	GW Sample	2.22	NA	850	0.0346	11231
MERCURY	3.309057824	Leach	2.22	NA	3.309057824	0.0346	16581
NICKEL	65.04662237	Leach	2.22	NA	65.04662237	0.0346	19801
SELENIUM	10.97976901	Leach	2.22	NA	10.97976901	0.0346	26
SILVER	6.2	GW Sample	2.22	NA	6.2	0.0346	3706
THALLIUM	7.3	GW Sample	2.22	NA	7.3	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	623.7904396	Leach	2.22	NA	623.7904396	0.0346	95986
ACETONE	44428.35189	Leach	2.22	0.0004	44421.2881	0.0346	1.2823
CARBON DISULFIDE	138.2823445	Leach	2.22	0.0004	138.1244663	0.0346	1.1425
PYRENE	0.14	GW Sample	2.22	NA	0.14	0.0346	9891.925
4,4'-DDD	0.000358586	Leach	2.22	NA	0.000358586	0.0346	21732.25
4,4'-DDE	0.001751714	Leach	2.22	NA	0.001751714	0.0346	21732.25
4,4'-DDT	0.002425205	Leach	2.22	NA	0.002425205	0.0346	31393.75
AROCLOR-1254	0.023267545	Leach	2.22	NA	0.023267545	0.0346	10779.7
DIELDRIN	0.094876394	Leach	2.22	NA	0.094876394	0.0346	1511.5
ENDOSULFAN SULFATE	0.012003676	Leach	2.22	NA	0.012003676	0.0346	411.4
ENDRIN ALDEHYDE	0.001312984	Leach	2.22	NA	0.001312984	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	0.0540	0.0300	0.0279	0.0270	0.0030
ARSENIC	0.0009	0.0005	0.0005	0.0005	0.0001
BERYLLIUM	0.0000	0.0000	0.0000	0.0000	0.0000
CADMIUM	0.0000	0.0000	0.0000	0.0000	0.0000
CHROMIUM	0.0000	0.0000	0.0000	0.0000	0.0000
COBALT	0.0301	0.0167	0.0156	0.0150	0.0017
COPPER	0.0034	0.0019	0.0018	0.0017	0.0002
IRON	2.3554	1.3085	1.2198	1.1777	0.1309
LEAD	0.0013	0.0007	0.0007	0.0006	0.0001
MANGANESE	0.0271	0.0151	0.0141	0.0136	0.0015
MERCURY	0.0001	0.0000	0.0000	0.0000	0.0000
NICKEL	0.0012	0.0007	0.0006	0.0006	0.0001
SELENIUM	0.1515	0.0841	0.0784	0.0757	0.0084
SILVER	0.0006	0.0003	0.0003	0.0003	0.0000
THALLIUM	0.0074	0.0041	0.0038	0.0037	0.0004
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0023	0.0013	0.0012	0.0012	0.0001
ACETONE	12427.2107	6904.0059	6435.9981	6213.6053	690.4006
CARBON DISULFIDE	43.4124	24.1180	22.4831	21.7062	2.4118
PYRENE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0010	Below	Below	Below	6879528
ARSENIC	0.0000	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0005	Below	Below	Below	6879528
COPPER	0.0001	Below	Below	Below	6879528
IRON	0.0422	Below	Below	Below	6879528
LEAD	0.0000	Below	Below	Below	6879528
MANGANESE	0.0005	Below	Below	Below	6879528
MERCURY	0.0000	Below	Below	Below	6879528
NICKEL	0.0000	Below	Below	Below	6879528
SELENIUM	0.0027	Below	Below	Below	6879528
SILVER	0.0000	Below	Below	Below	6879528
THALLIUM	0.0001	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0000	Below	Below	Below	6879528
ACETONE	222.6855	Exceeds	Below	Below	6879528
CARBON DISULFIDE	0.7779	Exceeds	Exceeds	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	1.085615479	1.085301529	1.085274926
ARSENIC	190.555807	190.5552671	190.5552214
BERYLLIUM	0.034282628	0.034281514	0.034281419
CADMIUM	6.761707567	6.761689329	6.761687783
CHROMIUM	217.1785343	217.1784666	217.1784609
COBALT	0.604653179	0.604478319	0.604463502
COPPER	87267.6741	87267.65173	87267.64984
IRON	438967.4658	438966.1436	438966.0315
LEAD	1493.580505	1493.578698	1493.578544
MANGANESE	1353.743191	1353.735308	1353.73464
MERCURY	7.780807124	7.780776435	7.780773835
NICKEL	182.652273	182.6516697	182.6516186
SELENIUM	0.03914859	0.039050671	0.039042374
SILVER	3.257834804	3.257777315	3.257772444
THALLIUM	0.36767373	0.367606214	0.367600493
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	8491.309339	8491.303554	8491.303063
ACETONE	1.98253193	1.891814799	1.884127898
CARBON DISULFIDE	0.003151298	0.00299133	0.002977775
PYRENE	0.196382741	0.196381443	0.196381333
4,4'-DDD	0.001105129	0.001105126	0.001105126
4,4'-DDE	0.005398619	0.005398603	0.005398602
4,4'-DDT	0.010797216	0.010797194	0.010797192
AROCLOR-1254	0.035567619	0.035567403	0.035567385
DIELDRIN	0.020326055	0.020325175	0.020325101
ENDOSULFAN SULFATE	0.00069889	0.000698779	0.00069877
ENDRIN ALDEHYDE	0.001194067	0.001194055	0.001194054

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	*14500*	UG/L	TP-MW08	12781	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	*34*	UG/L	TP-MW06	2	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	6.8	UG/L	TP-MW02	20.6	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	*NA*	UG/L	NA	0.59	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	0.56	UG/L	TP-MW06	1.8	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	3.9	UG/L	TP-MW08	75.7	MG/KG	TP-SB35	850	1282842
COBALT	M	23	*1.15*	UG/L	FA-01B	10.4	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	50.5	UG/L	TP-MW05	1030	MG/KG	TP-SB19	35	1282842
IRON	M	1000	2426	UG/L	TP-MW08	43500	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	10.5	UG/L	TP-MW06	2140	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	850	UG/L	TP-MW08	386	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.069	UG/L	TP-MW02	2.1	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	50	UG/L	TP-MW06	51.6	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	8	UG/L	FA-01	0.67	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	*6.2*	UG/L	FA-01	0.53	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	7.3	UG/L	TP-MW07	0.48	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	*25.8*	UG/L	TP-MW08	50.2	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	141	UG/L	TP-MW05	472	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	*NA*		NA	*14000*	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	*NA*		NA	*22*	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	0.14		NA	1106	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	*NA*		NA	8.7	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	*NA*		NA	42.5	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	*NA*		NA	85	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	*NA*		NA	*280*	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	*NA*		NA	*160*	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	*NA*		NA	5.5	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	*NA*		NA	*9.4*	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	1	207113	8520.6667	NA	7501	14	16768850.56	698.1713
ANTIMONY	1	45	44.4444	NA	226	14	16768850.56	3.6417
ARSENIC	1	4617	710.3448	NA	146	14	16768850.56	58.2046
BERYLLIUM	1	402	1.4677	NA	2011	14	16768850.56	0.1203
CADMIUM	1	4849	24.0000	NA	376	14	16768850.56	1.9665
CHROMIUM	1	41971	89.0588	NA	4251	14	16768850.56	7.2974
COBALT	1	45	231.1111	NA	226	14	16768850.56	18.9369
COPPER	1	51038	29428.5714	NA	176	14	16768850.56	2411.3352
IRON	1	4342	1740000.0000	NA	126	14	16768850.56	142573.1200
LEAD	1	10811	2377.7778	NA	4501	14	16768850.56	194.8317
MANGANESE	1	2246	5938.4615	NA	326	14	16768850.56	486.5891
MERCURY	1	3316	40.3846	NA	261	14	16768850.56	3.3091
NICKEL	1	3960	793.8462	NA	326	14	16768850.56	65.0466
SELENIUM	1	5	134.0000	NA	26	14	16768850.56	10.9798
SILVER	1	741	63.8554	NA	42.5	14	16768850.56	5.2322
THALLIUM	1	71	6.7606	NA	356	14	16768850.56	0.5540
VANADIUM	1	1000	50.2000	NA	5001	14	16768850.56	4.1133
ZINC	1	19197	7612.9032	NA	311	14	16768850.56	623.7904
ACETONE	1	0.05646	542215.3369	0.3808	1.1291	14	16768850.56	44428.3519
CARBON DISULFIDE	1	0.0285	1687.6342	2.9000	1.06518	14	16768850.56	138.2823
PYRENE	1	1978.185	1.2223	NA	4525.1438	14	16768850.56	0.1002
4,4'-DDD	1	4346.25	0.0044	NA	9940.95	14	16768850.56	0.0004
4,4'-DDE	1	4346.25	0.0214	NA	9940.95	14	16768850.56	0.0018
4,4'-DDT	1	6278.55	0.0296	NA	14360.154	14	16768850.56	0.0024
AROCLOR-1254	1	2155.74	0.2840	NA	4931.2152	14	16768850.56	0.0233
DIELDRIN	1	302.1	1.1579	NA	691.908	14	16768850.56	0.0949
ENDOSULFAN SULFATE	1	82.08	0.1465	NA	188.7184	14	16768850.56	0.0120
ENDRIN ALDEHYDE	1	1282.5	0.0160	NA	2934.1	14	16768850.56	0.0013

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	34	GW Sample	2.22	NA	34	0.0346	226
ARSENIC	6.8	GW Sample	2.22	NA	6.8	0.0346	23086
BERYLLIUM	0	Leach	2.22	NA	0	0.0346	2011
CADMIUM	0.56	GW Sample	2.22	NA	0.56	0.0346	24246
CHROMIUM	3.9	GW Sample	2.22	NA	3.9	0.0346	209856
COBALT	1.15	GW Sample	2.22	NA	1.15	0.0346	226
COPPER	50.5	GW Sample	2.22	NA	50.5	0.0346	255191
IRON	2426	GW Sample	2.22	NA	2426	0.0346	21711
LEAD	10.5	GW Sample	2.22	NA	10.5	0.0346	54056
MANGANESE	850	GW Sample	2.22	NA	850	0.0346	11231
MERCURY	0.069	GW Sample	2.22	NA	0.069	0.0346	16581
NICKEL	50	GW Sample	2.22	NA	50	0.0346	19801
SELENIUM	8	GW Sample	2.22	NA	8	0.0346	26
SILVER	6.2	GW Sample	2.22	NA	6.2	0.0346	3706
THALLIUM	7.3	GW Sample	2.22	NA	7.3	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	141	GW Sample	2.22	NA	141	0.0346	95986
ACETONE	0	Leach	2.22	0.0004	0	0.0346	1.2823
CARBON DISULFIDE	0	Leach	2.22	0.0004	0	0.0346	1.1425
PYRENE	0.14	GW Sample	2.22	NA	0.14	0.0346	9891.925
4,4'-DDD	0	Leach	2.22	NA	0	0.0346	21732.25
4,4'-DDE	0	Leach	2.22	NA	0	0.0346	21732.25
4,4'-DDT	0	Leach	2.22	NA	0	0.0346	31393.75
AROCLOR-1254	0	Leach	2.22	NA	0	0.0346	10779.7
DIELDRIN	0	Leach	2.22	NA	0	0.0346	1511.5
ENDOSULFAN SULFATE	0	Leach	2.22	NA	0	0.0346	411.4
ENDRIN ALDEHYDE	0	Leach	2.22	NA	0	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	0.0540	0.0300	0.0279	0.0270	0.0030
ARSENIC	0.0001	0.0001	0.0001	0.0001	0.0000
BERYLLIUM	0.0000	0.0000	0.0000	0.0000	0.0000
CADMIUM	0.0000	0.0000	0.0000	0.0000	0.0000
CHROMIUM	0.0000	0.0000	0.0000	0.0000	0.0000
COBALT	0.0018	0.0010	0.0009	0.0009	0.0001
COPPER	0.0001	0.0000	0.0000	0.0000	0.0000
IRON	0.0401	0.0223	0.0208	0.0200	0.0022
LEAD	0.0001	0.0000	0.0000	0.0000	0.0000
MANGANESE	0.0271	0.0151	0.0141	0.0136	0.0015
MERCURY	0.0000	0.0000	0.0000	0.0000	0.0000
NICKEL	0.0009	0.0005	0.0005	0.0005	0.0001
SELENIUM	0.1104	0.0613	0.0572	0.0552	0.0061
SILVER	0.0006	0.0003	0.0003	0.0003	0.0000
THALLIUM	0.0074	0.0041	0.0038	0.0037	0.0004
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0005	0.0003	0.0003	0.0003	0.0000
ACETONE	0.0000	0.0000	0.0000	0.0000	0.0000
CARBON DISULFIDE	0.0000	0.0000	0.0000	0.0000	0.0000
PYRENE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0000	0.0000	0.0000	0.0000	0.0000
ENDOSULFAN SULFATE	0.0000	0.0000	0.0000	0.0000	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0010	Below	Below	Below	6879528
ARSENIC	0.0000	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0000	Below	Below	Below	6879528
COPPER	0.0000	Below	Below	Below	6879528
IRON	0.0007	Below	Below	Below	6879528
LEAD	0.0000	Below	Below	Below	6879528
MANGANESE	0.0005	Below	Below	Below	6879528
MERCURY	0.0000	Below	Below	Below	6879528
NICKEL	0.0000	Below	Below	Below	6879528
SELENIUM	0.0020	Below	Below	Below	6879528
SILVER	0.0000	Below	Below	Below	6879528
THALLIUM	0.0001	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0000	Below	Below	Below	6879528
ACETONE	0.0000	Below	Below	Below	6879528
CARBON DISULFIDE	0.0000	Below	Below	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	1.085615479	1.085301529	1.085274926
ARSENIC	22.26247644	22.26241338	22.26240803
BERYLLIUM	0	0	0
CADMIUM	1.925505504	1.92550031	1.92549987
CHROMIUM	116.0689741	116.0689379	116.0689349
COBALT	0.036719347	0.036708728	0.036707828
COPPER	1827.625436	1827.624967	1827.624928
IRON	7469.395861	7469.373361	7469.371455
LEAD	80.49302821	80.49293082	80.49292257
MANGANESE	1353.743191	1353.735308	1353.73464
MERCURY	0.162244276	0.162243636	0.162243582
NICKEL	140.4010434	140.4005797	140.4005404
SELENIUM	0.028524163	0.028452818	0.028446772
SILVER	3.257834804	3.257777315	3.257772444
THALLIUM	0.36767373	0.367606214	0.367600493
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	1919.353906	1919.352598	1919.352488
ACETONE	0	0	0
CARBON DISULFIDE	0	0	0
PYRENE	0.196382741	0.196381443	0.196381333
4,4'-DDD	0	0	0
4,4'-DDE	0	0	0
4,4'-DDT	0	0	0
AROCLOR-1254	0	0	0
DIELDRIN	0	0	0
ENDOSULFAN SULFATE	0	0	0
ENDRIN ALDEHYDE	0	0	0

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	*5*	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	*0.5*		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	*0.5*		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	*0.5*		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	*0.5*		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	*0.5*		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	*0.5*		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	*0.5*		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	*0.5*		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	*0.5*		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	*0.5*		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	100	207113	19333.3333	NA	7501	2	16768850.56	243.4014
ANTIMONY	100	45	31777.7778	NA	226	2	16768850.56	400.0735
ARSENIC	100	4617	2837.9310	NA	146	2	16768850.56	35.7288
BERYLLIUM	100	402	7.7114	NA	2011	2	16768850.56	0.0971
CADMIUM	100	4849	321.3333	NA	376	2	16768850.56	4.0455
CHROMIUM	100	41971	3364.7059	NA	4251	2	16768850.56	42.3607
COBALT	100	45	1893.3333	NA	226	2	16768850.56	23.8365
COPPER	100	51038	1154285.7143	NA	176	2	16768850.56	14532.1405
IRON	100	4342	11200000.0000	NA	126	2	16768850.56	141004.9276
LEAD	100	10811	44444.4444	NA	4501	2	16768850.56	559.5434
MANGANESE	100	2246	67230.7692	NA	326	2	16768850.56	846.4169
MERCURY	100	3316	2307.6923	NA	261	2	16768850.56	29.0532
NICKEL	100	3960	60307.6923	NA	326	2	16768850.56	759.2573
SELENIUM	100	5	1500.0000	NA	26	2	16768850.56	18.8846
SILVER	100	741	3084.3373	NA	42.5	2	16768850.56	38.8310
THALLIUM	100	71	50.7042	NA	356	2	16768850.56	0.6384
VANADIUM	100	1000	109.0000	NA	5001	2	16768850.56	1.3723
ZINC	100	19197	254838.7097	NA	311	2	16768850.56	3208.3494
ACETONE	100	0.05646	542215.3369	0.3808	1.1291	2	16768850.56	6826.3424
CARBON DISULFIDE	100	0.0285	1687.6342	2.9000	1.06518	2	16768850.56	21.2469
PYRENE	100	1978.185	20.9984	NA	4525.1438	2	16768850.56	0.2644
4,4'-DDD	100	4346.25	0.0352	NA	9940.95	2	16768850.56	0.0004
4,4'-DDE	100	4346.25	0.1509	NA	9940.95	2	16768850.56	0.0019
4,4'-DDT	100	6278.55	0.3482	NA	14360.154	2	16768850.56	0.0044
AROCLOR-1254	100	2155.74	0.2840	NA	4931.2152	2	16768850.56	0.0036
DIELDRIN	100	302.1	1.1579	NA	691.908	2	16768850.56	0.0146
ENDOSULFAN SULFATE	100	82.08	0.5860	NA	188.7184	2	16768850.56	0.0074
ENDRIN ALDEHYDE	100	1282.5	0.0160	NA	2934.1	2	16768850.56	0.0002

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	400.0735049	Leach	2.22	NA	400.0735049	0.0346	226
ARSENIC	41.2	GW Sample	2.22	NA	41.2	0.0346	23086
BERYLLIUM	5	GW Sample	2.22	NA	5	0.0346	2011
CADMIUM	4.045498519	Leach	2.22	NA	4.045498519	0.0346	24246
CHROMIUM	42.36072405	Leach	2.22	NA	42.36072405	0.0346	209856
COBALT	23.83654729	Leach	2.22	NA	23.83654729	0.0346	226
COPPER	14532.1405	Leach	2.22	NA	14532.1405	0.0346	255191
IRON	141004.9276	Leach	2.22	NA	141004.9276	0.0346	21711
LEAD	559.5433636	Leach	2.22	NA	559.5433636	0.0346	54056
MANGANESE	1600	GW Sample	2.22	NA	1600	0.0346	11231
MERCURY	29.05321311	Leach	2.22	NA	29.05321311	0.0346	16581
NICKEL	759.2573026	Leach	2.22	NA	759.2573026	0.0346	19801
SELENIUM	19.8	GW Sample	2.22	NA	19.8	0.0346	26
SILVER	38.83096113	Leach	2.22	NA	38.83096113	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	3208.349448	Leach	2.22	NA	3208.349448	0.0346	95986
ACETONE	6826.342352	Leach	2.22	0.0418	6718.610101	0.0346	1.2823
CARBON DISULFIDE	21.24685218	Leach	2.22	0.0394	18.95222173	0.0346	1.1425
PYRENE	0.5	GW Sample	2.22	NA	0.5	0.0346	9891.925
4,4'-DDD	0.5	GW Sample	2.22	NA	0.5	0.0346	21732.25
4,4'-DDE	0.5	GW Sample	2.22	NA	0.5	0.0346	21732.25
4,4'-DDT	0.5	GW Sample	2.22	NA	0.5	0.0346	31393.75
AROCLOR-1254	0.5	GW Sample	2.22	NA	0.5	0.0346	10779.7
DIELDRIN	0.5	GW Sample	2.22	NA	0.5	0.0346	1511.5
ENDOSULFAN SULFATE	0.5	GW Sample	2.22	NA	0.5	0.0346	411.4
ENDRIN ALDEHYDE	0.5	GW Sample	2.22	NA	0.5	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	0.6349	0.3527	0.3288	0.3175	0.0353
ARSENIC	0.0006	0.0004	0.0003	0.0003	0.0000
BERYLLIUM	0.0009	0.0005	0.0005	0.0004	0.0000
CADMIUM	0.0001	0.0000	0.0000	0.0000	0.0000
CHROMIUM	0.0001	0.0000	0.0000	0.0000	0.0000
COBALT	0.0378	0.0210	0.0196	0.0189	0.0021
COPPER	0.0204	0.0113	0.0106	0.0102	0.0011
IRON	2.3295	1.2942	1.2064	1.1647	0.1294
LEAD	0.0037	0.0021	0.0019	0.0019	0.0002
MANGANESE	0.0511	0.0284	0.0265	0.0255	0.0028
MERCURY	0.0006	0.0003	0.0003	0.0003	0.0000
NICKEL	0.0138	0.0076	0.0071	0.0069	0.0008
SELENIUM	0.2731	0.1517	0.1415	0.1366	0.0152
SILVER	0.0038	0.0021	0.0019	0.0019	0.0002
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0120	0.0067	0.0062	0.0060	0.0007
ACETONE	1909.4202	1060.7890	988.8804	954.7101	106.0789
CARBON DISULFIDE	6.6702	3.7057	3.4545	3.3351	0.3706
PYRENE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0001	0.0001	0.0001	0.0001	0.0000
ENDOSULFAN SULFATE	0.0004	0.0002	0.0002	0.0002	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0114	Below	Below	Below	6879528
ARSENIC	0.0000	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0007	Below	Below	Below	6879528
COPPER	0.0004	Below	Below	Below	6879528
IRON	0.0417	Below	Below	Below	6879528
LEAD	0.0001	Below	Below	Below	6879528
MANGANESE	0.0009	Below	Below	Below	6879528
MERCURY	0.0000	Below	Below	Below	6879528
NICKEL	0.0002	Below	Below	Below	6879528
SELENIUM	0.0049	Below	Below	Below	6879528
SILVER	0.0001	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0002	Below	Below	Below	6879528
ACETONE	34.2153	Below	Below	Below	6879528
CARBON DISULFIDE	0.1195	Exceeds	Below	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	12.77429382	12.7705996	12.77028658
ARSENIC	134.8844161	134.884034	134.8840016
BERYLLIUM	1.425377018	1.425330666	1.425326739
CADMIUM	13.91005297	13.91001545	13.91001227
CHROMIUM	1260.709175	1260.708782	1260.708749
COBALT	0.761097785	0.760877683	0.760859032
COPPER	525926.923	525926.7882	525926.7768
IRON	434139.1685	434137.8607	434137.7499
LEAD	4289.460928	4289.455739	4289.455299
MANGANESE	2548.222477	2548.207639	2548.206382
MERCURY	68.31474684	68.31447739	68.31445456
NICKEL	2132.010349	2132.003308	2132.002711
SELENIUM	0.070597303	0.070420724	0.070405762
SILVER	20.40400914	20.40364908	20.40361857
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	43673.46131	43673.43155	43673.42903
ACETONE	0.300343095	0.286404558	0.285223479
CARBON DISULFIDE	0.00043831	0.000413731	0.000411648
PYRENE	0.701366933	0.701362296	0.701361903
4,4'-DDD	1.540953616	1.540948978	1.540948585
4,4'-DDE	1.540953616	1.540948978	1.540948585
4,4'-DDT	2.226041798	2.22603716	2.226036767
AROCLOR-1254	0.764318251	0.764313614	0.764313222
DIELDRIN	0.107118609	0.107113975	0.107113582
ENDOSULFAN SULFATE	0.0291115	0.029106874	0.029106482
ENDRIN ALDEHYDE	0.454714978	0.454710341	0.454709948

Detected Chemicals	Fraction	Surface Water Criteria ug/L	Maximum Groundwater Concentration	Units	Location of Maximum	Maximum Soil Concentration	Units	Location of Maximum	Kd (soil) L/kg	Source Area ft^2
ALUMINUM	M	87	14500	UG/L	TP-MW08	29000	MG/KG	TP-MW01	1500	1282842
ANTIMONY	M	36.6	34	UG/L	TP-MW06	1430	MG/KG	TP-SB24	45	1282842
ARSENIC	M	4.9	41.2	UG/L	TP-MW02	82.3	MG/KG	TP-SB38B	29	1282842
BERYLLIUM	M	0.53	*5*	UG/L	NA	3.1	MG/KG	TP-MW01	402	1282842
CADMIUM	M	8.8	3.9	UG/L	TP-MW06	24.1	MG/KG	TP-SB37	75	1282842
CHROMIUM	M	50	27.4	UG/L	TP-MW08	2860	MG/KG	TP-SB35	850	1282842
COBALT	M	23	1.15	UG/L	FA-01B	85.2	MG/KG	TP-SB35	45	1282842
COPPER	M	3.1	496	UG/L	TP-MW05	40400	MG/KG	TP-SB19	35	1282842
IRON	M	1000	21800	UG/L	TP-MW08	280000	MG/KG	TP-SB23	25	1282842
LEAD	M	8.1	195	UG/L	TP-MW06	40000	MG/KG	TP-SB24	900	1282842
MANGANESE	M	120	1600	UG/L	TP-MW08	4370	MG/KG	TP-SB25	65	1282842
MERCURY	M	0.94	0.46	UG/L	TP-MW02	120	MG/KG	TP-SB37	52	1282842
NICKEL	M	8.2	278	UG/L	TP-MW06	3920	MG/KG	TP-SB35	65	1282842
SELENIUM	M	71	19.8	UG/L	FA-01	7.5	MG/KG	TP-SB35	5	1282842
SILVER	M	0.19	6.2	UG/L	FA-01	25.6	MG/KG	TP-SB31	8.3	1282842
THALLIUM	M	9.1	66.1	UG/L	TP-MW07	3.6	MG/KG	TP-MW09	71	1282842
VANADIUM	M	20	25.8	UG/L	TP-MW08	109	MG/KG	TP-SB23	1000	1282842
ZINC	M	81	587	UG/L	TP-MW05	15800	MG/KG	TP-SB19	62	1282842
ACETONE	OV	1500	*0.5*		NA	14000	UG/KG	TP-SB13	0.02582	1282842
CARBON DISULFIDE	OV	0.92	*0.5*		NA	22	UG/KG	TP-MW05	0.013036	1282842
PYRENE	PAH	3	*0.5*		NA	19000	UG/KG	TP-MW02	904.82876	1282842
4,4'-DDD	PES/PCB	0.001	*0.5*		NA	70	UG/KG	TP-MW01	1987.99	1282842
4,4'-DDE	PES/PCB	0.001	*0.5*		NA	300	UG/KG	TP-SB17	1987.99	1282842
4,4'-DDT	PES/PCB	0.001	*0.5*		NA	1000	UG/KG	TP-SB27	2871.8308	1282842
AROCLOR-1254	PES/PCB	0.03	*0.5*		NA	280	UG/KG	TP-SB115	986.04304	1282842
DIELDRIN	PES/PCB	0.0019	*0.5*		NA	160	UG/KG	TP-SB14	138.1816	1282842
ENDOSULFAN SULFATE	PES/PCB	0.034	*0.5*		NA	22	UG/KG	TP-MW05	37.54368	1282842
ENDRIN ALDEHYDE	PES/PCB	0.0023	*0.5*		NA	9.4	UG/KG	TP-SB27	586.62	1282842

Detected Chemicals	Travel Distance to Shoreline ft	Kd (sed) L/kg	C(leachate) ug/L (8)	Half-Life (years)	Retardation Factor (soil)	Infiltration Rate (inches/year)	Net Groundwater Flow Rate Qgw	Cgw(source) ug/L
ALUMINUM	100	207113	19333.3333	NA	7501	2	16768850.56	243.4014
ANTIMONY	100	45	31777.7778	NA	226	2	16768850.56	400.0735
ARSENIC	100	4617	2837.9310	NA	146	2	16768850.56	35.7288
BERYLLIUM	100	402	7.7114	NA	2011	2	16768850.56	0.0971
CADMIUM	100	4849	321.3333	NA	376	2	16768850.56	4.0455
CHROMIUM	100	41971	3364.7059	NA	4251	2	16768850.56	42.3607
COBALT	100	45	1893.3333	NA	226	2	16768850.56	23.8365
COPPER	100	51038	1154285.7143	NA	176	2	16768850.56	14532.1405
IRON	100	4342	11200000.0000	NA	126	2	16768850.56	141004.9276
LEAD	100	10811	44444.4444	NA	4501	2	16768850.56	559.5434
MANGANESE	100	2246	67230.7692	NA	326	2	16768850.56	846.4169
MERCURY	100	3316	2307.6923	NA	261	2	16768850.56	29.0532
NICKEL	100	3960	60307.6923	NA	326	2	16768850.56	759.2573
SELENIUM	100	5	1500.0000	NA	26	2	16768850.56	18.8846
SILVER	100	741	3084.3373	NA	42.5	2	16768850.56	38.8310
THALLIUM	100	71	50.7042	NA	356	2	16768850.56	0.6384
VANADIUM	100	1000	109.0000	NA	5001	2	16768850.56	1.3723
ZINC	100	19197	254838.7097	NA	311	2	16768850.56	3208.3494
ACETONE	100	0.05646	542215.3369	0.3808	1.1291	2	16768850.56	6826.3424
CARBON DISULFIDE	100	0.0285	1687.6342	2.9000	1.06518	2	16768850.56	21.2469
PYRENE	100	1978.185	20.9984	NA	4525.1438	2	16768850.56	0.2644
4,4'-DDD	100	4346.25	0.0352	NA	9940.95	2	16768850.56	0.0004
4,4'-DDE	100	4346.25	0.1509	NA	9940.95	2	16768850.56	0.0019
4,4'-DDT	100	6278.55	0.3482	NA	14360.154	2	16768850.56	0.0044
AROCLOR-1254	100	2155.74	0.2840	NA	4931.2152	2	16768850.56	0.0036
DIELDRIN	100	302.1	1.1579	NA	691.908	2	16768850.56	0.0146
ENDOSULFAN SULFATE	100	82.08	0.5860	NA	188.7184	2	16768850.56	0.0074
ENDRIN ALDEHYDE	100	1282.5	0.0160	NA	2934.1	2	16768850.56	0.0002

Detected Chemicals	Larger Concentration of Measured GW Max or Cgw(source)	Source Type	Darcy Law Groundwater Velocity (ft/day)	Travel Time to Shoreline (years)	Groundwater Conc. at shoreline ug/L	Df (A_{near} = 1/4 Channel Sect.)	Retardation Factor (sediment)
ALUMINUM	14500	GW Sample	2.22	NA	14500	0.0346	1035566
ANTIMONY	34	GW Sample	2.22	NA	34	0.0346	226
ARSENIC	41.2	GW Sample	2.22	NA	41.2	0.0346	23086
BERYLLIUM	5	GW Sample	2.22	NA	5	0.0346	2011
CADMIUM	3.9	GW Sample	2.22	NA	3.9	0.0346	24246
CHROMIUM	27.4	GW Sample	2.22	NA	27.4	0.0346	209856
COBALT	1.15	GW Sample	2.22	NA	1.15	0.0346	226
COPPER	496	GW Sample	2.22	NA	496	0.0346	255191
IRON	21800	GW Sample	2.22	NA	21800	0.0346	21711
LEAD	195	GW Sample	2.22	NA	195	0.0346	54056
MANGANESE	1600	GW Sample	2.22	NA	1600	0.0346	11231
MERCURY	0.46	GW Sample	2.22	NA	0.46	0.0346	16581
NICKEL	278	GW Sample	2.22	NA	278	0.0346	19801
SELENIUM	19.8	GW Sample	2.22	NA	19.8	0.0346	26
SILVER	6.2	GW Sample	2.22	NA	6.2	0.0346	3706
THALLIUM	66.1	GW Sample	2.22	NA	66.1	0.0346	356
VANADIUM	25.8	GW Sample	2.22	NA	25.8	0.0346	5001
ZINC	587	GW Sample	2.22	NA	587	0.0346	95986
ACETONE	0.5	GW Sample	2.22	0.0418	0.492109079	0.0346	1.2823
CARBON DISULFIDE	0.5	GW Sample	2.22	0.0394	0.446000696	0.0346	1.1425
PYRENE	0.5	GW Sample	2.22	NA	0.5	0.0346	9891.925
4,4'-DDD	0.5	GW Sample	2.22	NA	0.5	0.0346	21732.25
4,4'-DDE	0.5	GW Sample	2.22	NA	0.5	0.0346	21732.25
4,4'-DDT	0.5	GW Sample	2.22	NA	0.5	0.0346	31393.75
AROCLOR-1254	0.5	GW Sample	2.22	NA	0.5	0.0346	10779.7
DIELDRIN	0.5	GW Sample	2.22	NA	0.5	0.0346	1511.5
ENDOSULFAN SULFATE	0.5	GW Sample	2.22	NA	0.5	0.0346	411.4
ENDRIN ALDEHYDE	0.5	GW Sample	2.22	NA	0.5	0.0346	6413.5

Detected Chemicals	Steady State Conc. In Intertidal Zone CI (Df=0.5), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.1), ug/L	Steady State Conc. In Intertidal Zone CI (Df=0.0346), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.5), ug/L	Steady State Conc. In Near Shore Cnear (Df=0.1), ug/L
ALUMINUM	0.0050	0.0028	0.0026	0.0025	0.0003
ANTIMONY	0.0540	0.0300	0.0279	0.0270	0.0030
ARSENIC	0.0006	0.0004	0.0003	0.0003	0.0000
BERYLLIUM	0.0009	0.0005	0.0005	0.0004	0.0000
CADMIUM	0.0001	0.0000	0.0000	0.0000	0.0000
CHROMIUM	0.0000	0.0000	0.0000	0.0000	0.0000
COBALT	0.0018	0.0010	0.0009	0.0009	0.0001
COPPER	0.0007	0.0004	0.0004	0.0003	0.0000
IRON	0.3601	0.2001	0.1865	0.1801	0.0200
LEAD	0.0013	0.0007	0.0007	0.0006	0.0001
MANGANESE	0.0511	0.0284	0.0265	0.0255	0.0028
MERCURY	0.0000	0.0000	0.0000	0.0000	0.0000
NICKEL	0.0050	0.0028	0.0026	0.0025	0.0003
SELENIUM	0.2731	0.1517	0.1415	0.1366	0.0152
SILVER	0.0006	0.0003	0.0003	0.0003	0.0000
THALLIUM	0.0666	0.0370	0.0345	0.0333	0.0037
VANADIUM	0.0019	0.0010	0.0010	0.0009	0.0001
ZINC	0.0022	0.0012	0.0011	0.0011	0.0001
ACETONE	0.1399	0.0777	0.0724	0.0699	0.0078
CARBON DISULFIDE	0.1570	0.0872	0.0813	0.0785	0.0087
PYRENE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDD	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDE	0.0000	0.0000	0.0000	0.0000	0.0000
4,4'-DDT	0.0000	0.0000	0.0000	0.0000	0.0000
AROCLOR-1254	0.0000	0.0000	0.0000	0.0000	0.0000
DIELDRIN	0.0001	0.0001	0.0001	0.0001	0.0000
ENDOSULFAN SULFATE	0.0004	0.0002	0.0002	0.0002	0.0000
ENDRIN ALDEHYDE	0.0000	0.0000	0.0000	0.0000	0.0000

Detected Chemicals	Steady State Conc. In Near Shore Cnear (Df=0.0346), ug/L	Near Shore Conc. > Surface Water Criteria (Df=0.5)	Near Shore Conc. > Surface Water Criteria (Df=0.1)	Near Shore Conc. > Surface Water Criteria (Df=0.0346)	Seawater Flowrate into Sediment Layer Qsw (ft3/year)
ALUMINUM	0.0001	Below	Below	Below	6879528
ANTIMONY	0.0010	Below	Below	Below	6879528
ARSENIC	0.0000	Below	Below	Below	6879528
BERYLLIUM	0.0000	Below	Below	Below	6879528
CADMIUM	0.0000	Below	Below	Below	6879528
CHROMIUM	0.0000	Below	Below	Below	6879528
COBALT	0.0000	Below	Below	Below	6879528
COPPER	0.0000	Below	Below	Below	6879528
IRON	0.0065	Below	Below	Below	6879528
LEAD	0.0000	Below	Below	Below	6879528
MANGANESE	0.0009	Below	Below	Below	6879528
MERCURY	0.0000	Below	Below	Below	6879528
NICKEL	0.0001	Below	Below	Below	6879528
SELENIUM	0.0049	Below	Below	Below	6879528
SILVER	0.0000	Below	Below	Below	6879528
THALLIUM	0.0012	Below	Below	Below	6879528
VANADIUM	0.0000	Below	Below	Below	6879528
ZINC	0.0000	Below	Below	Below	6879528
ACETONE	0.0025	Below	Below	Below	6879528
CARBON DISULFIDE	0.0028	Below	Below	Below	6879528
PYRENE	0.0000	Below	Below	Below	6879528
4,4'-DDD	0.0000	Below	Below	Below	6879528
4,4'-DDE	0.0000	Below	Below	Below	6879528
4,4'-DDT	0.0000	Below	Below	Below	6879528
AROCLOR-1254	0.0000	Below	Below	Below	6879528
DIELDRIN	0.0000	Below	Below	Below	6879528
ENDOSULFAN SULFATE	0.0000	Below	Below	Below	6879528
ENDRIN ALDEHYDE	0.0000	Below	Below	Below	6879528

Detected Chemicals	Csed Sediment Conc. Df=0.5, mg/kg	Csed Sediment Conc. Df=0.1, mg/kg	Csed Sediment Conc. Df=0.0346, mg/kg
ALUMINUM	2129498.512	2129498.377	2129498.366
ANTIMONY	1.085615479	1.085301529	1.085274926
ARSENIC	134.8844161	134.884034	134.8840016
BERYLLIUM	1.425377018	1.425330666	1.425326739
CADMIUM	13.40977047	13.4097343	13.40973124
CHROMIUM	815.4589463	815.4586922	815.4586707
COBALT	0.036719347	0.036708728	0.036707828
COPPER	17950.53893	17950.53433	17950.53394
IRON	67119.88037	67119.67818	67119.66105
LEAD	1494.870524	1494.868715	1494.868562
MANGANESE	2548.222477	2548.207639	2548.206382
MERCURY	1.081628508	1.081624242	1.08162388
NICKEL	780.6298011	780.6272229	780.6270044
SELENIUM	0.070597303	0.070420724	0.070405762
SILVER	3.257834804	3.257777315	3.257772444
THALLIUM	3.329210076	3.328598729	3.328546927
VANADIUM	18.29508375	18.29484451	18.29482424
ZINC	7990.501722	7990.496278	7990.495817
ACETONE	2.19988E-05	2.09779E-05	2.08914E-05
CARBON DISULFIDE	1.03147E-05	9.73628E-06	9.68727E-06
PYRENE	0.701366933	0.701362296	0.701361903
4,4'-DDD	1.540953616	1.540948978	1.540948585
4,4'-DDE	1.540953616	1.540948978	1.540948585
4,4'-DDT	2.226041798	2.22603716	2.226036767
AROCLOR-1254	0.764318251	0.764313614	0.764313222
DIELDRIN	0.107118609	0.107113975	0.107113582
ENDOSULFAN SULFATE	0.0291115	0.029106874	0.029106482
ENDRIN ALDEHYDE	0.454714978	0.454710341	0.454709948

APPENDIX D

SUPPORTING INFORMATION FOR HEALTH RISK ASSESSMENT

APPENDIX D

SUPPORTING INFORMATION FOR HEALTH RISK ASSESSMENT

D.1 RAGS Part D Tables
D.2 Exposure Assessment and Example Calculations
D.2.1 Chemical Intake Estimation
D.2.2 ProUCL Printouts
D.2.3 Example Calculations – Risk Estimation and Calculated Parameters
D.3 Technical Memorandum: Recommended Human Health Risk Assessment Protocol, Site 32 – Topeka Pier, Portsmouth Naval Shipyard
D.4 Data Quality Worksheets and Detection Limit Evaluation Tables
D.5 Calculated Screening Level Methodology
D.5.1 Risk-Based Screening Level Development Updates For Surface Water and Sediment at Portsmouth Naval Shipyard
D.5.2 Final Technical Memorandum: Development of Facility-Specific Human Health Risk Screening Levels for Intertidal Surface Water and Sediment
D.5.3 Risk-Based Screening Level Development for the Construction Worker Exposed to Groundwater at Portsmouth Naval Shipyard
D.5.4 Lead Screening Level Development Updates for Surface Water and Groundwater at Portsmouth Naval Shipyard
D.5.5 Technical Memorandum: Derivation of Lead Screening Levels for Recreational Users Exposed to Intertidal Surface Water and Construction Workers Exposed to Shallow Groundwater at Portsmouth Naval Shipyard, Kittery, Maine
D.5.6 Calculated Screening Level Tables
D.5.7 Example Screening Level Calculations
D.6 Lead Modeling Results
D.7 Additional Risk Estimates
D.7.1 Additional Receptors Exposed to Subsurface Soil
D.7.2 Recreational Exposure to Surface Water
D.7.3 Cumulative Human Health Risks
D.8 Subsurface Soil Analytical Results and Summary Statistics for Samples Greater Than 10 Feet Below Ground Surface

APPENDIX D.1

RAGS-PART D TABLES

RAGS Part D Table 1

Selection Of Exposure Pathways

TABLE 1
SELECTION OF EXPOSURE PATHWAYS
OU7, PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Surface Soil	Surface Soil	OU7	Construction Workers	Adult	Ingestion Dermal	Quant Quant	Construction workers may have contact with surface soil during excavation activities.
		Air	OU7	Construction Workers	Adult	Inhalation	Quant	Construction workers may inhale air/dust particulates and vapors from surface soil during excavation activities.
	Subsurface Soil	Subsurface Soil	OU7	Construction Workers	Adult	Ingestion Dermal	Quant Quant	Construction workers may have contact with subsurface soil during excavation activities.
		Air	OU7	Construction Workers	Adult	Inhalation	Quant	Construction workers may inhale air/dust particulates and vapors from subsurface soil during excavation activities.
	Groundwater	Groundwater	OU7	Construction Workers	Adult	Ingestion Dermal	None Quant	Construction workers are not expected to ingest groundwater. Construction workers may have dermal contact with groundwater during excavation activities.
	Surface Water	Surface Water	OU7	Recreational Users	Adolescent	Ingestion Dermal	Quant Quant	Recreational users may have contact with surface water in the intertidal area of the site.
					Adult	Ingestion Dermal	Quant Quant	Recreational users may have contact with surface water in the intertidal area of the site.
	Sediment	Sediment	OU7	Recreational Users	Adolescent	Ingestion Dermal	Quant Quant	Recreational users may have contact with sediment in the intertidal area of the site.
					Adult	Ingestion Dermal	Quant Quant	Recreational users may have contact with sediment in the intertidal area of the site.
Future	Surface Soil	Surface Soil	OU7	Occupational Workers	Adult	Ingestion Dermal	Quant Quant	Occupational workers may have contact with surface soil while working at the site.
				Residents	Child	Ingestion Dermal	Quant	Although a future residential scenario is considered unlikely at the site this scenario is included to aid in future risk management decisions.
					Adult	Ingestion Dermal	Quant	Although a future residential scenario is considered unlikely at the site this scenario is included to aid in future risk management decisions.
				Recreationl Users	Adolescent	Ingestion Dermal	Quant Quant	Recreational users may contact surface soil while at the site.
					Adult	Ingestion Dermal	Quant Quant	Recreational users may contact surface soil while at the site.
		Air	OU7	Occupational Workers	Adult	Ingestion Dermal	Quant Quant	Occupational workers may inhale air/dust particulates and vapors while working at the site. surface soil while working at the site.
				Residents	Child	Ingestion Dermal	Quant	Although a future residential scenario is considered unlikely at the site this scenario is included to aid in future risk management decisions.
					Adult	Ingestion Dermal	Quant	Although a future residential scenario is considered unlikely at the site this scenario is included to aid in future risk management decisions.
				Recreational Users	Adolescent	Inhalation	Quant	Recreational users may inhale air/dust particulates and vapors while at the site.
					Adult	Inhalation	Quant	Recreational users may inhale air/dust particulates and vapors while at the site.

Notes:
Quant - Quantitative.

RAGS Part D Table 2

Occurrence, Distribution And Selection Of Chemicals Of Potential Concern

LIST OF TABLES
RAGS PART D TABLE 2
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

Table No.

2.1 Residential Direct Contact With Entire Site Surface Soil
2.2 Residential Direct Contact Former Location of Building 237 Surface Soil
2.3 Residential Direct Contact With Entire Site Subsurface Soil
2.4 Residential Direct Contact Former Location of Building 237 Subsurface Soil
2.5 Construction Worker Direct Contact With Groundwater
2.6 Recreational User Direct Contact With Sediment

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - ENTIRE SITE SURFACE SOIL - RESIDENTIAL - DIRECT CONTACT
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

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

CAS Number	Chemical	Minimum Detected Concentration [1]	Maximum Detected Concentration [1]	Location of Maximum Concentration	Detection Frequency[2]	Range of Detection Limits[3]	Concentration Used for Screening[4]	U.S. EPA Residential RSL [5]		U.S. EPA SSL [6] Soil-to-Air		Site Background Exceedance[7]	COPC	Rationale for Selection or Deletion[8]
Volatile Organic Compounds (ug/kg)														
76131	1,1,2-TRICHLOROTRIFLUOROETHANE	3 J	3 J	TP-MW07	1/14	10-12	3	4300000	n	910000	sat	N/A	No	BSL
78933	2-BUTANONE	2 J	4 J	TP-SB09	5/15	11-18	4	2800000	n	28400000	sat	N/A	No	BSL
67663	CHLOROFORM	2 J	2 J	TP-SB12	1/15	6-12	2	290	c	2540000	sat	N/A	No	BSL
75092	METHYLENE CHLORIDE	4 J	4 J	BGS-05	1/15	11-39	4	11000	c	3320000	sat	N/A	No	BSL
108883	TOLUENE	1 J	2 J	TP-SB09, TP-MW02	3/14	6-12	2	500000	n	818000	sat	N/A	No	BSL
1330207	TOTAL XYLENES	2 J	7 J	TP-SB09	3/14	6-12	7	63000	n[9]	258000	sat[9]	N/A	No	BSL
79016	TRICHLOROETHENE	2 J	2 J	TP-SB15	1/15	6-12	2	2500	n	690000	sat	N/A	No	BSL
Semivolatile Organic Compounds (ug/kg)														
95501	1,2-DICHLOROBENZENE	1700 J	1700 J	TP-MW06	1/42	40-6900	1700	190000	n	376000	sat	N/A	No	BSL
91576	2-METHYLNAPHTHALENE	5.1	720 J	TP-SB27	15/51	3.7-6900	720	31000	n	N/A		N/A	No	BSL
123422	4-HYDROXY-4-METHYL-2-PENTANONE	26000 J	26000 J	BGS-05	1/1	--	26000	N/A		N/A		N/A	No	NTX
106445	4-METHYLPHENOL	19 J	19 J	TP-SB15	1/51	61-6900	19	31000	n	N/A		N/A	No	BSL
83329	ACENAPHTHENE	8.6	1400	TP-SB31	7/51	3.5-6900	1400	340000	n	N/A		N/A	No	BSL
208968	ACENAPHTHYLENE	3.9	89	TP-SB120	8/51	3.6-6900	89	340000	n[10]	N/A		N/A	No	BSL
120127	ANTHRACENE	3.7	2200	TP-SB31	19/51	3.6-6900	2200	1700000	n	N/A		N/A	No	BSL
--	**BAP EQUIVALENT[20]**	4.7	6300	TP-SB120	38/51	69-7600	6300	**15**	c	N/A		Yes	Yes	ASL
56553	**BENZO(A)ANTHRACENE**	5.7	4500	TP-SB31	34/51	3.8-6600	4500	**150**	c	N/A		Yes	Yes	ASL
50328	**BENZO(A)PYRENE**	6	4000	TP-SB120	35/51	3.8-6600	4000	**15**	c	N/A		Yes	Yes	ASL
205992	**BENZO(B)FLUORANTHENE**	4.7	6100 J	TP-SB120	34/51	39-6600	6100	**150**	c	N/A		Yes	Yes	ASL
191242	BENZO(G,H,I)PERYLENE	11	2800	TP-SB120	30/51	3.7-6600	2800	170000	n[11]	N/A		N/A	No	BSL
207089	**BENZO(K)FLUORANTHENE**	4.3	3000	TP-SB31	33/51	68-6600	3000	**1500**	c	N/A		Yes	Yes	ASL
117817	BIS(2-ETHYLHEXYL)PHTHALATE	93 J	430	TP-MW01	9/51	73-6900	430	35000	c	N/A		N/A	No	BSL
85687	BUTYL BENZYL PHTHALATE	23 J	76 J	TP-SB11	4/51	71-6900	76	260000	c	N/A		N/A	No	BSL
86748	CARBAZOLE	19 J	740	TP-SB31	11/50	63-6900	740	N/A		N/A		N/A	No	NTX
218019	CHRYSENE	4.4	4900	TP-SB31	37/51	57-6600	4900	15000	c	3760000000	c	N/A	No	BSL
84742	DI-N-BUTYL PHTHALATE	18 J	51 J	TP-SB17	5/51	220-6900	51	610000	n	N/A		N/A	No	BSL
117840	DI-N-OCTYL PHTHALATE	210 J	210 J	TP-SB24	1/51	53-6900	210	N/A		N/A		N/A	No	NTX
53703	**DIBENZO(A,H)ANTHRACENE**	3.6	1000 J	TP-SB120	15/51	3.6-6900	1000	**15**	c	N/A		Yes	Yes	ASL
132649	DIBENZOFURAN	29 J	640 J	TP-SB31	6/51	36-6900	640	7800	n[12]	N/A		N/A	No	BSL
206440	FLUORANTHENE	34 J	7600	TP-SB31	35/51	8.1-6600	7600	230000	n	N/A		N/A	No	BSL
86737	FLUORENE	4.4	1200	TP-SB31	11/51	3.5-6900	1200	230000	n	N/A		N/A	No	BSL
193395	**INDENO(1,2,3-CD)PYRENE**	11	2500	TP-SB120	29/51	3.6-6900	2500	**150**	c	N/A		Yes	Yes	ASL
91203	NAPHTHALENE	10	490 J	TP-SB31	12/51	3.5-6900	490	3600	c	425000000	n	N/A	No	BSL
85018	PHENANTHRENE	4.8	9500	TP-SB31	35/51	51-6600	9500	170000	n[11]	N/A		N/A	No	BSL
129000	PYRENE	30	9600	TP-SB31	33/51	7.4-6600	9600	170000	n	N/A		N/A	No	BSL

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - ENTIRE SITE SURFACE SOIL - RESIDENTIAL - DIRECT CONTACT
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

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

CAS Number	Chemical	Minimum Detected Concentration [1]	Maximum Detected Concentration [1]	Location of Maximum Concentration	Detection Frequency[2]	Range of Detection Limits[3]	Concentration Used for Screening[4]	U.S. EPA Residential RSL [5]		U.S. EPA SSL [6] Soil-to-Air		Site Background Exceedance[7]	COPC	Rationale for Selection or Deletion[8]
Pesticides/PCBs (ug/kg)														
72548	4,4'-DDD	2 J	70 J	TP-MW01	9/41	1.3-18	70	2000	c	N/A		N/A	No	BSL
72559	4,4'-DDE	1.7 J	300	TP-SB17	18/41	1.3-18	300	1400	c	N/A		N/A	No	BSL
50293	4,4'-DDT	2.2 J	670	TP-SB17	26/41	1.2-18	670	1700	c	34100000	c	N/A	No	BSL
12672296	**AROCLOR-1248**	1500	1500	TP-SB120	1/60	4.8-300	1500	**220**	c	N/A		Yes	No	ASL
11097691	AROCLOR-1254	280 J	280 J	TP-SB115	1/60	15-370	280	**110**	n[13]	N/A		Yes	No	FREQ
11096825	AROCLOR-1260	21	210 J	TP-MW04	8/60	7.9-370	210	220	c	N/A		N/A	No	BSL
959988	ENDOSULFAN I	2.7 J	2.7 J	TP-SB40	1/42	1.3-15	2.7	37000	n[14]	N/A		N/A	No	BSL
1031078	ENDOSULFAN SULFATE	6.5 J	12	TP-SB10	3/41	1.5-30	12	37000	n[14]	N/A		N/A	No	BSL
7421934	ENDRIN ALDEHYDE	4 J	9.4	TP-SB27	2/40	1.4-30	9.4	1800	n[15]	N/A		N/A	No	BSL
Dioxins/Furans (ng/kg)														
3268879	1,2,3,4,6,7,8,9-OCDD[21]	88.1 J	905 J	TP-SB31	11/12	6.8-6.8	905	15000	c	N/A		N/A	No	BSL
39001020	1,2,3,4,6,7,8,9-OCDF[21]	2.7 J	62.8	TP-SB26A	7/12	0.6-6.4	62.8	15000	c	N/A		N/A	No	BSL
35822469	1,2,3,4,6,7,8-HPCDD[21]	5.1 J	38.3	TP-SB31	10/12	0.4-2.5	38.3	450	c	N/A		N/A	No	BSL
67562394	1,2,3,4,6,7,8-HPCDF[21]	3.1 J	85.2	TP-SB31	10/12	0.4-0.85	85.2	450	c	N/A		N/A	No	BSL
55673897	1,2,3,4,7,8,9-HPCDF[21]	7.6	7.6	TP-SB27	1/12	0.3-4.1	7.6	450	c	N/A		N/A	No	BSL
39227286	1,2,3,4,7,8-HXCDD[21]	0.81 J	0.81 J	TP-SB27	1/12	0.2-3.4	0.81	45	c	N/A		N/A	No	BSL
70648269	1,2,3,4,7,8-HXCDF[21]	1 J	41.5	TP-SB27	6/12	0.1-7.3	41.5	45	c	N/A		N/A	No	BSL
57653857	1,2,3,6,7,8-HXCDD[21]	1.9 J	3.2 J	TP-SB31	5/12	0.2-3.1	3.2	45	c	N/A		N/A	No	BSL
57117449	1,2,3,6,7,8-HXCDF[21]	0.57 J	16.5	TP-SB27	7/12	0.1-2.2	16.5	45	c	N/A		N/A	No	BSL
19408743	1,2,3,7,8,9-HXCDD[21]	1.5 J	3.5 J	TP-SB36, TP-SB34	4/12	0.2-3.3	3.5	45	c	2540000	c	N/A	No	BSL
72918219	1,2,3,7,8,9-HXCDF[21]	10.2	10.2	TP-SB27	1/12	0.2-1.9	10.2	45	c	N/A		N/A	No	BSL
40321764	1,2,3,7,8-PECDD[21]	1 J	1 J	TP-SB27	1/12	0.2-1.4	1	4.5	c	N/A		N/A	No	BSL
57117416	1,2,3,7,8-PECDF[21]	0.67 J	41.5	TP-SB27	3/12	0.07-3.9	41.5	150	c	N/A		N/A	No	BSL
60851345	2,3,4,6,7,8-HXCDF[21]	0.8 J	19.9	TP-SB27	9/12	0.1-1.4	19.9	45	c	N/A		N/A	No	BSL
57117314	2,3,4,7,8-PECDF[21]	1.1 J	25.4	TP-SB27	4/12	0.1-5.3	25.4	**15**	c	N/A		N/A	No	BKG[19]
1746016	2,3,7,8-TCDD	0.38 J	0.38 J	TP-SB27	1/12	0.2-1.5	0.38	4.5	c	100000	c	N/A	No	BSL
51207319	2,3,7,8-TCDF[21]	23.2	23.2	TP-SB27	1/12	0.1-2.3	23.2	45	c	N/A		N/A	No	BSL
--	2,3,7,8-TCDD TEQ[22]	0.5	22	TP-SB27	11/12	0.2-0.2	22	**4.5**	c	N/A		No	No	BKG

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - ENTIRE SITE SURFACE SOIL - RESIDENTIAL - DIRECT CONTACT
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

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

CAS Number	Chemical	Minimum Detected Concentration [1]	Maximum Detected Concentration [1]	Location of Maximum Concentration	Detection Frequency[2]	Range of Detection Limits[3]	Concentration Used for Screening[4]	U.S. EPA Residential RSL [5]		U.S. EPA SSL [6] Soil-to-Air		Site Background Exceedance[7]	COPC	Rationale for Selection or Deletion[8]
Inorganics (mg/kg)														
7429905	ALUMINUM	5520	21100	TP-SB17	51/51	--	21100	**7700**	n	709000	n	No	No	BKG
7440360	ANTIMONY	0.32 J	12.4 J	TP-SB32	13/35	0.086-5.8	12.4	**3.1**	n	N/A		No	No	BKG
7440382	ARSENIC	6.2	82.3 J	TP-SB42	55/56	2.4-2.4	82.3	**0.39**	c	769	c	No	No	BKG
7440393	**BARIUM**	25.2	2530	TP-SB27	51/51	--	2530	**1500**	n	70900	n	Yes	Yes	ASL
7440417	BERYLLIUM	0.12 J	1.2	TP-SB120	49/51	0.24-0.5	1.2	16	n	1380	c	N/A	No	BSL
7440439	CADMIUM	0.14 J	8.7 J	TP-SB42	30/51	0.3-0.75	8.7	**7**	n	1840	c	No	No	BKG
7440702	CALCIUM	784	15800	TP-SB25	51/51	--	15800	N/A		N/A		N/A	No	NUT
7440473	CHROMIUM	18.8 J	280	TP-SB23	51/51	--	280	12000	n[16]	N/A		No	No	BSL
7440484	COBALT	3.9 J	20.9	TP-MW02	51/51	--	20.9	**2.3**	n	1180	c	No	No	BKG
7440508	**COPPER**	13.2	5620	TP-SB32	51/51	--	5620	**310**	n	N/A		Yes	Yes	ASL
7439896	**IRON**	12600	196000	TP-SB27	51/51	--	196000	**5500**	n	N/A		Yes	Yes	ASL
7439921	**LEAD**	6.1 J	13200 J	TP-SB27	50/51	21.2-21.2	13200	**400**		N/A		Yes	Yes	ASL
7439954	MAGNESIUM	2800 J	13900	TP-SB25	51/51	--	13900	N/A		N/A		N/A	No	NUT
7439965	MANGANESE	101	648	TP-SB19	51/51	--	648	**180**	n	7090	n	No	No	BKG
7439976	**MERCURY**	0.01 J	16.3 J	TP-SB09	44/51	0.01-0.13	16.3	**2.3**	n[17]	42500	n	Yes	Yes	ASL
7440020	NICKEL	13.2	133	TP-SB19	51/51	--	133	150	n	N/A		N/A	No	BSL
7440097	POTASSIUM	828 J	5820 J	TP-SB25	51/51	--	5820	N/A		N/A		N/A	No	NUT
7782492	SELENIUM	0.21 J	3.7	TP-SB38B	13/51	0.18-3.9	3.7	39	n	N/A		N/A	No	BSL
7440224	SILVER	0.22 J	4.4 J	TP-SB19	10/50	0.05-1.3	4.4	39	n	N/A		N/A	No	BSL
7440235	SODIUM	128 J	1410 J	TP-SB40	47/51	95.4-110	1410	N/A		N/A		N/A	No	NUT
7440280	**THALLIUM**	0.24 J	1.1	TP-MW09, TP-SB24, TP-MW08, TP-SB31	8/51	0.22-1.8	1.1	**0.078**	n	N/A		N/A	No	ASL
7440622	VANADIUM	18.2	109 J	TP-SB23	51/51	--	109	**39**	n[18]	N/A		No	No	BKG
7440666	ZINC	30.6	1630	TP-SB32	51/51	--	1630	2300	n	N/A		N/A	No	BSL

Shaded chemicals were selected as COPCs.
Shading of the screening criteria indicates that the corresponding maximum detected concentration exceeded the screening criteria.

Definitions:
c = Carcinogen
COPC = Chemical Of Potential Concern
J = Estimated value
n = Noncarcinogen
N/A = Not Applicable/Not Available
ND = Not Detected.
RSL = Regional Screening Level
sat = soil saturation limit
SSL = Soil Screening Level

Notes:
1- Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
2 - Sample and duplicate are counted as one sample when determining frequency of detection.
3 - Values presented are sample-specific quantitation limits.
4 - The maximum detected concentration is used for screening purposes.
5 - U.S. EPA RSL - June, 2011. (Screening levels for noncarcinogenic compounds are divided by 10 to correspond to a HI of 0.1).
6 - U.S. EPA SSL. http://rais.ornl.gov/epa/ssl1.shtml. (Accessed June 2011).
7- Background data set comparisons were only performed for chemicals with maximum concentrations greater than screening criteria. Appendix B.2 provides the methodology used for comparison of the facility background data set to the site data set.
8 - Rationale Codes

Selection Reason: Above Screening Levels (ASL)
Deletion Reason: Essential Nutrient (NUT)
Below Screening Level (BSL)
No Toxicity Information (NTX)
Detection frequency less than 5% (FREQ)

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - ENTIRE SITE SURFACE SOIL - RESIDENTIAL - DIRECT CONTACT
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

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

CAS Number	Chemical	Minimum Detected Concentration [1]	Maximum Detected Concentration [1]	Location of Maximum Concentration	Detection Frequency[2]	Range of Detection Limits[3]	Concentration Used for Screening[4]	U.S. EPA Residential RSL [5]	U.S. EPA SSL [6] Soil-to-Air	Site Background Exceedance[7]	COPC	Rationale for Selection or Deletion[8]

9 - Value is for xylenes, mixture. Below Site Background (BKG)
10 - Value is for acenaphthene.
11 - Value is for pyrene.
12 - The screening level for dibenzofuran was calculated using a reference dose (RfD) of 1E-03, provided by USEPA Region I.
13 - One tenth of the non-carcinogenic value is less than the carcinogenic value. Therefore, the non-carcinogenic value is presented.
14 - Value is for endosulfan.
15 - Value is for endrin.
16 - Value is for trivalent chromium.
17 - Value is for mercuric chloride (and other mercury salts).
18 - Value for vanadium and compounds was used because vanadium is mostly combined with other metals rather than found in the elemental form. ATSDR, 2009. Toxicological Profile for Vanadium. (Draft for Public Comment) Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.
19 - Although no background comparison was conducted for 2,3,7,8-PECDF, this chemical is not retained as a COPC because 2,3,7,8-PECDF is evaluated as part of the 2,3,7,8-TCDD toxic equivalency (TEQ), which is below site background.
20 - See Appendix D.2 for methodology used in calculating BAP Equivalent results.
21 - The screening level was calculated based on 2005 World Health Organization (WHO) toxicity equivalence factors (TEFs).
22 - 2,3,7,8-TCDD TEQ was calculated using 2005 World Health Organization (WHO) toxicity equivalence factors (TEFs); see Appendix D.2.

Associated Samples:

BGS-05	TPSS1020001	TPSS1180001	TPSS280001
TP-SS01-0001-98	TPSS1030001	TPSS1190001	TPSS290001
TP-SS02-0001-98	TPSS1040001	TPSS1200001	TPSS300001
TP-SS03-0001-98	TPSS1050001	TPSS1200001-D	TPSS310001
TP-SS04-0001-98	TPSS1060001	TPSS1210001	TPSS320001
TP-SS05-0001-98	TPSS1070001	TPSS1220001	TPSS33B0001
TP-SS06-0001-98	TPSS1080001	TPSS1230001	TPSS340001
TP-SS07-0001-98	TPSS1090001	TPSS180001	TPSS350001
TP-SS08-0001-98	TPSS1100001	TPSS190001	TPSS360001
TP-SS09-0001-98	TPSS1110001	TPSS200001	TPSS360001-D
TP-SS09-0001-98-D	TPSS1120001	TPSS210001	TPSS370001
TP-SS10-0001-98	TPSS1130001	TPSS220001	TPSS38B0001
TP-SS11-0001-98	TPSS1140001	TPSS230001	TPSS390001
TP-SS11-0001-98-D	TPSS1150001	TPSS240001	TPSS400001
TP-SS12-0001-98	TPSS1160001	TPSS250001	TPSS410001
TP-SS15-0001-98	TPSS1160001-D	TPSS26A0001	TPSS420001
TP-SS17-0001-98	TPSS1170001	TPSS26B0001	TPSS420001-D
TPSS1010001	TPSS1170001-D	TPSS270001	TPSS430001

TABLE 2.2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN: FORMER LOCATION OF BUILDING 237 - RESIDENTIAL - DIRECT CONTACT
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Soil Area With No Debris
Exposure Medium: Surface Soil Former Location of Buidling 237

CAS Number	Chemical	Minimum Detected Concentration [1]	Maximum Detected Concentration [1]	Location of Maximum Concentration	Detection Frequency[2]	Range of Detection Limits[3]	Concentration Used for Screening[4]	U.S. EPA Residential RSL [5]	U.S. EPA SSL [6] Soil-to-Air	Site Background Exceedance[7]	COPC	Rationale for Selection or Deletion[8]
Semivolatiles (ug/kg)												
91576	2-METHYLNAPHTHALENE	5.1	66	TP-SB119	4/7	3.7-52	66	31000 n	N/A	N/A	No	BSL
208968	ACENAPHTHYLENE	5	13	TP-SB116	3/7	3.6-46	13	340000 n[9]	N/A	N/A	No	BSL
120127	ANTHRACENE	3.7	10	TP-SB116, TP-SB119	3/7	3.6-55	10	1700000 n	N/A	N/A	No	BSL
--	BENZO(A)PYRENE EQUIVALENT[10]	4.7	78	TP-SB116	6/7	64-64	78	**15 c**	N/A	No	No	BKG
56553	BENZO(A)ANTHRACENE	5.7	53	TP-SB116	5/7	3.8-63	53	150 c	N/A	N/A	No	BSL
50328	BENZO(A)PYRENE	6	48	TP-SB116	5/7	3.8-64	48	**15 c**	N/A	No	No	BKG
205992	BENZO(B)FLUORANTHENE	4.7	97	TP-SB116	6/7	46-46	97	150 c	N/A	N/A	No	BSL
191242	BENZO(G,H,I)PERYLENE	11	31	TP-SB116	4/7	3.7-84	31	170000 n[11]	N/A	N/A	No	BSL
207089	BENZO(K)FLUORANTHENE	4.3	67	TP-SB116	6/7	81-81	67	1500 c	N/A	N/A	No	BSL
117817	BIS(2-ETHYLHEXYL)PHTHALATE	190 J	190 J	TP-SB115	1/7	100-380	190	35000 c	N/A	N/A	No	BSL
218019	CHRYSENE	4.4	73	TP-SB119	6/7	68-68	73	15000 c	376000000 c	N/A	No	BSL
53703	DIBENZO(A,H)ANTHRACENE	3.6	13	TP-SB116	3/7	3.6-81	13	15 c	N/A	N/A	No	BSL
206440	FLUORANTHENE	34	88 J	TP-SB43	4/7	8.1-17	88	230000 n	N/A	N/A	No	BSL
86737	FLUORENE	4.4	7.2	TP-SB119	2/7	3.5-63	7.2	230000 n	N/A	N/A	No	BSL
193395	INDENO(1,2,3-CD)PYRENE	11	27	TP-SB116	3/7	3.6-75	27	150 c	N/A	N/A	No	BSL
91203	NAPHTHALENE	13	53	TP-SB119	2/7	3.5-42	53	3600 c	425000000 n	N/A	No	BSL
85018	PHENANTHRENE	4.8	65	TP-SB119	6/7	61-61	65	170000 n[11]	N/A	N/A	No	BSL
129000	PYRENE	30	57	TP-SB116	3/7	7.4-98	57	170000 n	N/A	N/A	No	BSL
Pesticides/PCBs (ug/kg)												
72559	4,4'-DDE	18 J	18 J	TP-SB43	1/1	--	18	1400 c	N/A	N/A	No	BSL
50293	4,4'-DDT	14	14 J	TP-SB43	1/1	--	14	1700 c	34100000 c	N/A	No	BSL
11097691	**AROCLOR-1254**	280	280 J	TP-SB115	1/7	18-37	280	**110 n[12]**	N/A	Yes	Yes	ASL
Dioxins/Furans (ng/kg)												
3268879	1,2,3,4,6,7,8,9-OCDD	654	654	TP-SB43	1/1	--	654	15000 c	N/A	N/A	No	BSL
35822469	1,2,3,4,6,7,8-HPCDD	5.1	5.1 J	TP-SB43	1/1	--	5.1	450 c	N/A	N/A	No	BSL
67562394	1,2,3,4,6,7,8-HPCDF	3.1	3.1 J	TP-SB43	1/1	--	3.1	450 c	N/A	N/A	No	BSL
70648269	1,2,3,4,7,8-HXCDF	1	1 J	TP-SB43	1/1	--	1	45 c	N/A	N/A	No	BSL
57117449	1,2,3,6,7,8-HXCDF	0.57	0.57 J	TP-SB43	1/1	--	0.57	45 c	N/A	N/A	No	BSL
60851345	2,3,4,6,7,8-HXCDF	0.8	0.8 J	TP-SB43	1/1	--	0.8	45 c	N/A	N/A	No	BSL
--	2,3,7,8-TCDD TEQ[13]	1.15	1.15	TP-SB43	1/1	--	1.15	4.5 c	100000 c	N/A	No	BSL

TABLE 2.2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN: FORMER LOCATION OF BUILDING 237 - RESIDENTIAL - DIRECT CONTACT
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Soil Area With No Debris
Exposure Medium: Surface Soil Former Location of Buidling 237

CAS Number	Chemical	Minimum Detected Concentration (1)	Maximum Detected Concentration (1)	Location of Maximum Concentration	Detection Frequency(2)	Range of Detection Limits(3)	Concentration Used for Screening(4)	U.S. EPA Residential RSL (5)	U.S. EPA SSL (6) Soil-to-Air		Site Background Exceedance(7)	COPC	Rationale for Selection or Deletion(8)
Inorganics (mg/kg)													
7429905	ALUMINUM	9330	19900	TP-SB43	7/7	--	19900	**7700 n**	709000	n	No	No	BKG
7440382	ARSENIC	9.8	25.5	TP-SB119	7/7	--	25.5	**0.39 c**	769	c	No	No	BKG
7440393	BARIUM	33.5	87.1	TP-SB116	7/7	--	87.1	1500 n	70900	n	N/A	No	BSL
7440417	BERYLLIUM	0.47	0.79	TP-SB115	7/7	--	0.79	16 n	1380	c	N/A	No	BSL
7440439	CADMIUM	0.14	0.63 J	TP-SB116	7/7	--	0.63	7 n	1840	c	N/A	No	BSL
7440702	CALCIUM	1060	5260	TP-SB115	7/7	--	5260	N/A	N/A		N/A	No	NUT
7440473	CHROMIUM	27.3	65.5	TP-SB43	7/7	--	65.5	12000 n(14)	N/A		N/A	No	BSL
7440484	COBALT	6.7	10.5	TP-SB121	7/7	--	10.5	**2.3 n**	1180	c	No	No	BKG
7440508	COPPER	16	148 J	TP-SB116	7/7	--	148	310 n	N/A		N/A	No	BSL
7439896	IRON	17100	30100	TP-SB121	7/7	--	30100	**5500 n**	N/A		No	No	BKG
7439921	LEAD	11.5	142 J	TP-SB116	7/7	--	142	400	N/A		N/A	No	BSL
7439954	MAGNESIUM	4820	8760	TP-SB116	7/7	--	8760	N/A	N/A		N/A	No	NUT
7439965	MANGANESE	227	430	TP-SB116	7/7	--	430	**180 n**	7090	n	No	No	BKG
7439976	MERCURY	0.025	0.66 J	TP-SB116	7/7	--	0.66	2.3 n(15)	42500	n	N/A	No	BSL
7440020	NICKEL	22.4	42.2	TP-SB43	7/7	--	42.2	150 n	13800	c	N/A	No	BSL
7440097	POTASSIUM	1260	3740	TP-SB116	7/7	--	3740	N/A	N/A		N/A	No	NUT
7782492	SELENIUM	0.86	0.86	TP-SB43	1/7	0.37-0.57	0.86	39 n	N/A		N/A	No	BSL
7440235	SODIUM	167	574	TP-SB119	7/7	--	574	N/A	N/A		N/A	No	NUT
7440622	VANADIUM	21.1	43	TP-SB116	7/7	--	43	**39 n(16)**	N/A		No	No	BKG
7440666	ZINC	37.5	152 J	TP-SB116	7/7	--	152	2300 n	N/A		N/A	No	BSL

Shaded chemicals were selected as COPCs.
Shading of the screening criteria indicates that the corresponding maximum detected concentration exceeded the screening criteria.

Definitions:
c = Carcinogen
COPC = Chemical Of Potential Concern
J = Estimated value
n = Noncarcinogen
N/A = Not Applicable/Not Available
ND = Not Detected.
RSL = Regional Screening Level
sat = Soil saturation limit
SSL = Soil Screening Level

Notes:
1 Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
2 Sample and duplicate are counted as one sample when determining frequency of detection.
3 Values presented are sample specific quantitation limits.
4 The maximum detected concentration is used for screening purposes.
5 U.S. EPA RSL June, 2011. (Screening levels for noncarcinogenic compounds are divided by 10 to correspond to a HI of 0.1).
6 U.S. EPA SSL. http://rais.ornl.gov/epa/ssl1.shtml. (Accessed June 2011). (Screening levels for noncarcinogenic compounds are divided by 10 to correspond to a HI of 0.1).
7 Background data set comparisons were only performed for chemicals with maximum concentrations greater than screening criteria. Appendix B.2 provides the methodology used for comparison of the facility background data set to the site data set.
8 Rationale Codes

Selection Reason:	Above Screening Level (ASL)
Deletion Reason:	Essential Nutrient (NUT)
	Below Screening Level (BSL)
	Below Site Background (BKG)

9 Value is for acenaphthene.
10 See Appendix D.2 for methodology used in calculating BAP Equivalent results.
11 Value is for pyrene.

TABLE 2.2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN: FORMER LOCATION OF BUILDING 237 - RESIDENTIAL - DIRECT CONTACT
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Soil Area With No Debris
Exposure Medium: Surface Soil Former Location of Buidling 237

CAS Number	Chemical	Minimum Detected Concentration (1)	Maximum Detected Concentration (1)	Location of Maximum Concentration	Detection Frequency(2)	Range of Detection Limits(3)	Concentration Used for Screening(4)	U.S. EPA Residential RSL (5)	U.S. EPA SSL (6) Soil-to-Air	Site Background Exceedance(7)	COPC	Rationale for Selection or Deletion(8)

12 One tenth of the noncarcinogenic value is less than the carcinogenic value. Therefore, the noncarcinogenic value is presented.
13 2,3,7,8-TCDD TEQ was calculated using 2005 World Health Organization (WHO) toxicity equivalence factors (TEFs); see Appendix D.2.
14 Value is for trivalent chromium.
15 Value is for mercuric chloride (and other mercury salts).
16 Value for vanadium and compounds was used because vanadium is mostly combined with other metals rather than found in the elemental form. ATSDR, 2009. Toxicological Profile for Vanadium. (Draft for Public Comment) Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Associated Samples:
TPSS1150001
TPSS1160001
TPSS1160001D
TPSS1170001
TPSS1170001D
TPSS1180001
TPSS1190001
TPSS1210001
TPSS430001

TABLE 2.3
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - ENTIRE SITE SUBSURFACE SOIL - RESIDENTIAL - DIRECT CONTACT
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

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

CAS Number	Chemical	Minimum Detected Concentration [1]	Maximum Detected Concentration [1]	Location of Maximum Concentration	Detection Frequency[2]	Range of Detection Limits[3]	Concentration Used for Screening[4]	U.S. EPA Residential RSL [5]		U.S. EPA SSL [6] Soil-to-Air		Site Background Exceedance [7]	COPC	Rationale for Selection or Deletion[8]
Volatile Organics (ug/kg)														
76131	1,1,2-TRICHLOROTRIFLUOROETHANE	11 J	46 J	TP-MW05	3/31	10-58	46	4300000	n	910000	sat	N/A	No	BSL
78933	2-BUTANONE	1 J	38 J	TP-SB09	8/31	10-58	38	2800000	n	28400000	sat	N/A	No	BSL
67641	ACETONE	80	14000 J	TP-SB13	13/31	11-3400	14000	6100000	n	N/A		N/A	No	BSL
71432	BENZENE	2 J	2 J	TP-MW05	1/31	10-58	2	1100	c	1800000	sat	N/A	No	BSL
75150	CARBON DISULFIDE	1 J	22	TP-MW05	9/31	11-58	22	82000	n	740000	sat	N/A	No	BSL
67663	CHLOROFORM	8 J	8 J	TP-SB14	1/31	10-58	8	290	c	2540000	sat	N/A	No	BSL
100414	ETHYLBENZENE	18	18	TP-MW05	1/29	11-58	18	5400	c	480000	sat	N/A	No	BSL
75092	METHYLENE CHLORIDE	52	64	TP-SB17	3/31	12-70	64	11000	c	3320000	sat	N/A	No	BSL
127184	TETRACHLOROETHENE	1 J	9 J	TP-SB09	3/29	11-58	9	550	c	170000	sat	N/A	No	BSL
108883	TOLUENE	3 J	3 J	TP-MW05	1/29	11-58	3	500000	n	818000	sat	N/A	No	BSL
1330207	TOTAL XYLENES	1 J	16	TP-MW05/TP-SB11/TP-SB08	5/29	11-58	16	63000	n [9]	258000	sat[9]	N/A	No	BSL
79016	TRICHLOROETHENE	2 J	2 J	TP-SB11	3/31	11-58	2	2800	c	692000	sat	N/A	No	BSL
Semivolatile Organics (ug/kg)														
120821	1,2,4-TRICHLOROBENZENE	51 J	51 J	TP-MW06	1/72	38-1900	51	6200	n	400000	sat	N/A	No	BSL
95501	1,2-DICHLOROBENZENE	720 J	730	TP-MW06	2/72	40-530	730	190000	n	376000	sat	N/A	No	BSL
541731	1,3-DICHLOROBENZENE	110 J	130 J	TP-MW06	2/72	39-530	130	N/A		N/A		N/A	No	NTX
106467	1,4-DICHLOROBENZENE	96 J	120 J	TP-SB14	3/72	37-460	120	2400	c	1.13E+11	n	N/A	No	BSL
105679	2,4-DIMETHYLPHENOL	240 J	240 J	TP-SB14	1/74	130-1900	240	120000	n	N/A		N/A	No	BSL
91576	2-METHYLNAPHTHALENE	14	1200	TP-SB39	23/74	4-1900	1200	31000	n	N/A		N/A	No	BSL
83329	ACENAPHTHENE	23 J	1400	TP-SB39	17/74	4-1900	1400	340000	n	N/A		N/A	No	BSL
208968	ACENAPHTHYLENE	22 J	2700	TP-SB14	7/74	4-1900	2700	340000	n[10]	N/A		N/A	No	BSL
120127	ANTHRACENE	28 J	3500	TP-SB39	31/74	4-1900	3500	1700000	n	N/A		N/A	No	BSL
--	**BAP EQUIVALENT[18]**	5	5800	TP-SB39	61/74	71-460	5800	**15**	c	N/A		N/A	Yes	ASL
56553	**BENZO(A)ANTHRACENE**	5.8	5100	TP-SB39	57/74	53-400	5100	**150**	c	N/A		Yes	Yes	ASL
50328	**BENZO(A)PYRENE**	6	4100	TP-SB39	57/74	4-400	4100	**15**	c	N/A		Yes	Yes	ASL
205992	**BENZO(B)FLUORANTHENE**	8.5	3200	TP-SB39	56/74	40-400	3200	**150**	c	N/A		Yes	Yes	ASL
191242	BENZO(G,H,I)PERYLENE	5.2	1900	TP-MW05/TP-SB39	45/74	4-1900	1900	170000	n[11]	N/A		N/A	No	BSL
207089	BENZO(K)FLUORANTHENE	5	3600	TP-SB39	45/74	4-530	3600	**1500**	c	N/A		No	No	BKG
117817	BIS(2-ETHYLHEXYL)PHTHALATE	120 J	7600	TP-SB20	13/74	65-1900	7600	35000	c	N/A		N/A	No	BSL
85687	BUTYL BENZYL PHTHALATE	20 J	20 J	TP-SB11	1/74	72-1900	20	260000	c	N/A		N/A	No	BSL
86748	CARBAZOLE	32 J	1300	TP-SB39	15/74	64-1900	1300	N/A		N/A		N/A	No	NTX
218019	CHRYSENE	14	4300	TP-SB39	59/74	58-400	4300	15000	c	3760000000	c	N/A	No	BSL
84742	DI-N-BUTYL PHTHALATE	20 J	38 J	TP-MW06	9/74	220-1900	38	610000	n	N/A		N/A	No	BSL
117840	DI-N-OCTYL PHTHALATE	69 J	340 J	TP-SB23	6/74	55-1900	340	N/A		N/A		N/A	No	NTX
53703	**DIBENZO(A,H)ANTHRACENE**	21 J	750	TP-MW05	26/74	4-1900	750	**15**	c	N/A		Yes	Yes	ASL
132649	DIBENZOFURAN	19 J	2000	TP-SB39	16/74	36-1900	2000	7800	n	N/A		N/A	No	BSL
84662	DIETHYL PHTHALATE	240 J	240 J	TP-SB20	1/74	44-1900	240	4900000	n	N/A		N/A	No	BSL
206440	FLUORANTHENE	36 J	12000	TP-SB39	61/74	12-400	12000	230000	n	N/A		N/A	No	BSL
86737	FLUORENE	22 J	2500	TP-SB39	19/74	4-1900	2500	230000	n	N/A		N/A	No	BSL
193395	**INDENO(1,2,3-CD)PYRENE**	4.9	2100	TP-SB39	54/74	4-400	2100	**150**	c	N/A		Yes	Yes	ASL
91203	NAPHTHALENE	5	2300	TP-SB39	22/74	4-1900	2300	3600	c	425000000	n	N/A	No	BSL
85018	PHENANTHRENE	10	12000	TP-SB39	57/74	51-400	12000	170000	n[11]	N/A		N/A	No	BSL
108952	PHENOL	200 J	200 J	TP-SB14	1/74	75-1900	200	1800000	n	N/A		N/A	No	BSL
129000	PYRENE	19 J	8200	TP-SB39	54/74	9-430	8200	170000	n	N/A		N/A	No	BSL

TABLE 2.3
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - ENTIRE SITE SUBSURFACE SOIL - RESIDENTIAL - DIRECT CONTACT
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

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

CAS Number	Chemical	Minimum Detected Concentration [1]	Maximum Detected Concentration [1]	Location of Maximum Concentration	Detection Frequency[2]	Range of Detection Limits[3]	Concentration Used for Screening[4]	U.S. EPA Residential RSL [5]		U.S. EPA SSL [6] Soil-to-Air		Site Background Exceedance [7]	COPC	Rationale for Selection or Deletion[8]
Pesticides/PCBs (ug/kg)														
72548	4,4'-DDD	5.2	5.5	TP-SB41	2/67	1.4-150	5.5	2000	c	N/A		N/A	No	BSL
72559	4,4'-DDE	2.5 J	20 J	TP-SB18	17/68	1.4-150	20	1400	c	N/A		N/A	No	BSL
50293	4,4'-DDT	2 J	1000 J	TP-SB27	20/67	1.2-140	1000	1700	c	34100000	c	N/A	No	BSL
309002	ALDRIN	2 J	2 J	TP-MW05	1/67	1.2-140	2	29	c	675000	c	N/A	No	BSL
319846	ALPHA-BHC	2.8 J	2.8 J	TP-SB38B	1/68	1.5-170	2.8	77	c	1840000	c	N/A	No	BSL
5103719	ALPHA-CHLORDANE	21	21	TP-SB14	1/68	1.5-170	21	1600	c[12]	33100000	c[12]	N/A	No	BSL
12672296	**AROCLOR-1248**	41000 J	41000 J	TP-SB108	1/88	4.9-680	41000	**220**	c	N/A		Yes	Yes	HOT
11097691	AROCLOR-1254	160	200	TP-SB114	2/88	15-680	200	**110**	n	N/A		N/A	No	FREQ
11096825	**AROCLOR-1260**	17 J	42000	TP-SB14	16/88	8-74	42000	**220**	c	N/A		Yes	Yes	ASL
60571	DIELDRIN	32 J	160	TP-SB14	2/68	1.3-150	160	**30**	c	719000	c	Yes	No	FREQ
1031078	ENDOSULFAN SULFATE	5.4	22 J	TP-MW05	4/67	1.5-170	22	37000	n[13]	N/A		N/A	No	BSL
7421934	ENDRIN ALDEHYDE	3.2 J	8.8 J	TP-SB36	3/68	1.5-170	8.8	1800	n[14]	N/A		N/A	No	BSL
Dioxins/Furans (ng/kg)														
3268879	1,2,3,4,6,7,8,9-OCDD	29.8 J	1420	TP-SB27	14/14	--	1420	15000	c	N/A		N/A	No	BSL
39001020	1,2,3,4,6,7,8,9-OCDF	9 J	562 J	TP-SB27	6/14	3-15	562	15000	c	N/A		N/A	No	BSL
35822469	1,2,3,4,6,7,8-HPCDD	3.1 J	76.3	TP-SB34	13/14	2	76.3	450	c	N/A		N/A	No	BSL
67562394	**1,2,3,4,6,7,8-HPCDF**	3 J	538	TP-SB27	14/14	--	538	**450**	c	N/A		N/A	Yes	ASL
55673897	1,2,3,4,7,8,9-HPCDF	7.8	267	TP-SB27	2/14	0.9-4	267	450	c	N/A		N/A	No	BSL
39227286	1,2,3,4,7,8-HXCDD	5.2 J	5.2 J	TP-SB34	1/14	0.3-3	5.2	45	c	N/A		N/A	No	BSL
70648269	**1,2,3,4,7,8-HXCDF**	0.84 J	1690	TP-SB27	10/14	0.7-14	1690	**45**	c	N/A		N/A	Yes	ASL
57653857	1,2,3,6,7,8-HXCDD	1.6 J	16.5	TP-SB34	4/14	0.2-3	16.5	45	c	N/A		N/A	No	BSL
57117449	**1,2,3,6,7,8-HXCDF**	1.7 J	533	TP-SB27	10/14	0.5-2	533	**45**	c	N/A		N/A	Yes	ASL
19408743	1,2,3,7,8,9-HXCDD	2.8 J	17.3	TP-SB34	3/14	0.2-3	17.3	45	c	2540000	c	N/A	No	BSL
72918219	**1,2,3,7,8,9-HXCDF**	1.1 J	521 J	TP-SB27	4/14	0.5-2	521	**45**	c	N/A		N/A	Yes	ASL
40321764	**1,2,3,7,8-PECDD**	2.1 J	10.1	TP-SB34	2/14	0.1-2	10.1	**4.5**	c	N/A		N/A	Yes	ASL
57117416	**1,2,3,7,8-PECDF**	0.93 J	5050	TP-SB27	9/14	0.2-12	5050	**150**	c	N/A		N/A	Yes	ASL
60851345	**2,3,4,6,7,8-HXCDF**	2.3 J	549	TP-SB27	11/14	0.5-2	549	**45**	c	N/A		N/A	Yes	ASL
57117314	**2,3,4,7,8-PECDF**	1.6 J	2240	TP-SB27	8/14	0.3-10	2240	**15**	c	N/A		N/A	Yes	ASL
1746016	2,3,7,8-TCDD	1 J	1 J	TP-SB34	1/14	0.2-0.9	1	4.5	c	100000	c	N/A	No	BSL
51207319	**2,3,7,8-TCDF**	0.6 J	5210	TP-SB27	9/14	0.4-12	5210	**45**	c	N/A		N/A	Yes	ASL
--	**2,3,7,8-TCDD TEQ[19]**	0.9	1700	TP-SB27	14/14	--	1700	**4.5**	c	100000	c	N/A	Yes	ASL

TABLE 2.3
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - ENTIRE SITE SUBSURFACE SOIL - RESIDENTIAL - DIRECT CONTACT
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

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

CAS Number	Chemical	Minimum Detected Concentration [1]	Maximum Detected Concentration [1]	Location of Maximum Concentration	Detection Frequency[2]	Range of Detection Limits[3]	Concentration Used for Screening[4]	U.S. EPA Residential RSL [5]		U.S. EPA SSL [6] Soil-to-Air		Site Background Exceedance [7]	COPC	Rationale for Selection or Deletion[8]
Inorganics (mg/kg)														
7429905	ALUMINUM	2360	29000	TP-MW01	78/78	--	29000	**7700**	n	709000	n	No	No	BKG
7440360	**ANTIMONY**	0.26 J	1430 J	TP-SB24	27/60	0.093-3.2	1430	**3.1**	n	N/A		Yes	Yes	ASL
7440382	ARSENIC	4.4 J	65.7	TP-SB34	88/88	3.9	65.7	**0.39**	c	769	c	No	No	BKG
7440393	**BARIUM**	8.8	1580 J	TP-SB37	78/78	--	1580	**1500**	n	70900	n	Yes	Yes	ASL
7440417	BERYLLIUM	0.21	3.1	TP-MW01	53/78	0.08-0.54	3.1	16	n	1380	c	N/A	No	BSL
7440439	**CADMIUM**	0.32 J	24.1	TP-SB37	52/78	0.26-3.4	24.1	**7**	n	1840	c	Yes	Yes	ASL
7440702	CALCIUM	914	43600	TP-SB25	78/78	--	43600	N/A		N/A		N/A	No	NUT
7440473	CHROMIUM	14.6	2860	TP-SB35	78/78	--	2860	12000	n[15]	N/A		No	No	BSL
7440484	**COBALT**	4.1	85.2	TP-SB35	78/78	--	85.2	**2.3**	n	1180	c	Yes	Yes	ASL
7440508	**COPPER**	17.3	40400	TP-SB19	78/78	--	40400	**310**	n	N/A		Yes	Yes	ASL
7439896	**IRON**	9280	280000	TP-SB23	78/78	--	280000	**5500**	n	N/A		Yes	Yes	ASL
7439921	**LEAD**	18.2 J	40000 J	TP-SB24	75/78	4.3-23.4	40000	**400**		N/A		Yes	Yes	ASL
7439954	MAGNESIUM	1150	13300	TP-SB13	78/78	--	13300	N/A		N/A		N/A	No	NUT
7439965	**MANGANESE**	114	4370	TP-SB25	78/78	--	4370	**180**	n	7090	n	Yes	Yes	ASL
7439976	**MERCURY**	0.03	120 J	TP-SB37	73/78	0.01-0.08	120	**2.3**	n[16]	42500	n	Yes	Yes	ASL
7440020	**NICKEL**	17 J	3920	TP-SB35	77/78	29.1	3920	**150**	n	N/A		Yes	Yes	ASL
7440097	POTASSIUM	460	6330	TP-MW01	71/78	442-2260	6330	N/A		N/A		N/A	No	NUT
7782492	SELENIUM	0.45 J	7.5 J	TP-SB35	31/78	0.14-24.5	7.5	39	n	N/A		N/A	No	BSL
7440224	SILVER	0.16 J	25.6 J	TP-SB31	29/78	0.05-13	25.6	39	n	N/A		N/A	No	BSL
7440235	SODIUM	127 J	3490	TP-SB09	73/78	126-305	3490	N/A		N/A		N/A	No	BSL
7440280	**THALLIUM**	0.66 J	3.6	TP-MW09	10/78	0.23-5.6	3.6	**0.078**	n	N/A		N/A	Yes	ASL
7440622	VANADIUM	8.9 J	98.1 J	TP-SB23	78/78	--	98.1	**39**	n[17]	N/A		No	No	BKG
7440666	**ZINC**	30.8 J	15800 J	TP-SB19	78/78	--	15800	**2300**	n	N/A		Yes	Yes	ASL

Shaded chemicals were selected as COPCs.
Shading of the screening criteria indicates that the corresponding maximum detected concentration exceeded the screening criteria.

Notes:
1- Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
2 - Sample and duplicate are counted as one sample when determining frequency of detection.
3 - Values presented are sample-specific quantitation limits.
4 - The maximum detected concentration is used for screening purposes.
5 - U.S. EPA RSL - June, 2011. (Screening levels for noncarcinogenic compounds are divided by 10 to correspond to a HI of 0.1).
6 - U.S. EPA SSL. http://rais.ornl.gov/epa/ssl1.shtml. (Accessed June 2011). (Screening levels for noncarcinogenic compounds are divided by 10 to correspond to a HI of 0.1).
7- Background data set comparisons were only performed for chemicals with maximum concentrations greater than screening criteria. Appendix B.2 provides the methodology used for comparison of the facility background data set to the site data set.

Definitions:
C = Carcinogen
COPC = Chemical Of Potential Concern
J = Estimated value
N = Noncarcinogen
NA = Not Applicable/Not Available
RSL = Risk Screening Level
sat = Soil saturation limit
SSL = Soil Screening Level
U.S. EPA = United States Environmental Protection Agency

TABLE 2.3
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - ENTIRE SITE SUBSURFACE SOIL - RESIDENTIAL - DIRECT CONTACT
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

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

CAS Number	Chemical	Minimum Detected Concentration (1)	Maximum Detected Concentration (1)	Location of Maximum Concentration	Detection Frequency(2)	Range of Detection Limits(3)	Concentration Used for Screening(4)	U.S. EPA Residential RSL (5)	U.S. EPA SSL (6) Soil-to-Air	Site Background Exceedance (7)	COPC	Rationale for Selection or Deletion(8)

8 - Rationale Codes

Selection Reason:	Above Screening Levels (ASL)	Hot spot (HOT)
Deletion Reason:	Below Site Background (BKG)	Essential Nutrient (NUT)
	Below Screening Level (BSL)	No Toxicity Information (NTX)
	Detection frequency less than 5% (FREQ)	

9 - Value is for xylenes, mixture.
10 - Value is for acenaphthene.
11 - Value is for pyrene.
12 - Chlordane screening value used as a surrogate.
13 - Endosulfan screening value used as a surrogate.
14 - Endrin screening value used as a surrogate.
15 - Value is for trivalent chromium.
16 - Value is for mercuric chloride (and other mercury salts).
17 - Value for vanadium and compounds was used because vanadium is mostly combined with other metals rather than found in the elemental form.
ATSDR, 2009. Toxicological Profile for Vanadium. (Draft for Public Comment) Atlanta, GA: U.S. Department of Health and Human Services, Public Health
18 - See Appendix D.2 for methodology used in calculating BAP Equivalent results.
19 - 2,3,7,8-TCDD TEQ was calculated using 2005 World Health Organization (WHO) toxicity equivalence factors (TEFs); Appendix D.2.

Associated Samples:

TP-SB01-0305-98	TPSB1010205	TPSB1180205-D	TP-SB13-0709-98	TPSB26B0508
TP-SB01-0810-98	TPSB1010508	TPSB180205	TP-SB14-0305-98	TPSB270205
TP-SB02-0305-98	TPSB1020205	TPSB180508	TP-SB14-0709-98	TPSB270508
TP-SB03-0305-98	TPSB1020205-D	TPSB190205	TP-SB15-0305-98	TPSB270508-D
TP-SB03-0507-98	TPSB1020508	TPSB190205-D	TP-SB15-0709-98	TPSB280205
TP-SB04-0305-98	TPSB1030205	TPSB190508	TP-SB16-0305-98	TPSB38A0305
TP-SB04-0709-98	TPSB1030508	TPSB200205	TP-SB17-0305-98	TPSB38A0709
TP-SB05-0305-98	TPSB1030508-D	TPSB200205-D	TP-SB17-0709-98	TPSB38B0205
TP-SB05-0305-98-D	TPSB1040205	TPSB200506	TPSB1110205	TPSB390205
TP-SB05-0507-98	TPSB1040508	TPSB20B0203	TPSB1110508	TPSB400205
TP-SB05-0810-98	TPSB1050205	TPSB20B0508	TPSB1120205	TPSB400508
TP-SB06-0305-98	TPSB1050508	TPSB210205	TPSB1120508	TPSB410205
TP-SB06-0507-98	TPSB1060205	TPSB210508	TPSB1130205	TPSB410508
TP-SB07-0305-98	TPSB1060508	TPSB220205	TPSB1130508	TP-SB11-0305-98
TP-SB07-0709-98	TPSB1070205	TPSB220508	TPSB1140205	TPSB1100508
TP-SB08-0305-98	TPSB1070508	TPSB230205	TPSB1140508	TPSB250205
TP-SB08-0507-98	TPSB1080205	TPSB230508	TPSB1170205	
TP-SB09-0305-98	TPSB1080508	TPSB240205	TPSB1170205-D	
TP-SB09-0507-98	TPSB1090205	TPSB240508	TPSB250508	
TP-SB09-0810-98	TPSB1090508	TP-SB11-0709-98	TPSB250508-D	
TP-SB10-0305-98	TPSB1100205	TP-SB12-0507-98	TPSB26A0203	
TP-SB10-0709-98	TPSB1180205	TP-SB13-0305-98	TPSB26B0205	

TABLE 2.4
OCCURENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN FORMER LOCATION OF BUILDING 237 SUBSURFACE SOIL RESIDENTIAL DIRECT CONTACT
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Soil Area With No Debris
Exposure Medium: Subsurface Soil Former Location of Building 237

CAS Number	Chemical	Minimum Detected Concentration [1]	Maximum Detected Concentration [1]	Location of Maximum Concentration	Detection Frequency[2]	Range of Detection Limits[3]	Concentration Used for Screening[4]	U.S. EPA Residential RSL [5]		U.S. EPA SSL [6] Soil-to-Air		Site Background Exceedance [7]	COPC	Rationale for Selection or Deletion[8]
Volatile Organics (ug/kg)														
75092	METHYLENE CHLORIDE	54	54	TP-SB16-1719-98	1/1	--	54	11000	c	3320000	sat	N/A	No	BSL
Semivolatile Organics (ug/kg)														
91576	2-METHYLNAPHTHALENE	14	15	TPSB1170205-D	1/4	3.8-400	15	31000	n	N/A		N/A	No	BSL
N/A	**BAP EQUIVALENT[9]**	5.269	251.1	TP-SB16-0305-98	3/4	462.2-462.2	251.1	**15**	**c**	N/A		Yes	Yes	ASL
56553	**BENZO(A)ANTHRACENE**	5.8 J	180 J	TP-SB16-0305-98	3/4	400-400	180	**150**	**c**	N/A		Yes	Yes	ASL
50328	**BENZO(A)PYRENE**	6 J	170 J	TP-SB16-0305-98	3/4	3.6-400	170	**15**	**c**	N/A		Yes	Yes	ASL
205992	**BENZO(B)FLUORANTHENE**	8.5 J	230 J	TP-SB16-0305-98	3/4	400-400	230	**150**	**c**	N/A		Yes	Yes	ASL
191242	BENZO(G,H,I)PERYLENE	5.2 J	140 J	TP-SB16-0305-98	2/4	3.6-400	140	170000	n[10]	N/A		N/A	No	BSL
207089	BENZO(K)FLUORANTHENE	5 J	150 J	TP-SB16-0305-98	3/4	3.6-400	150	1500	c	N/A		N/A	No	BSL
218019	CHRYSENE	14 J	200 J	TP-SB16-0305-98	3/4	400-400	200	15000	c	3760000000	c	N/A	No	BSL
193395	INDENO(1,2,3-CD)PYRENE	4.9 J	110 J	TP-SB16-0305-98	2/4	3.6-400	110	150	c	N/A		N/A	No	BSL
91203	NAPHTHALENE	5	5.5	TPSB1170205	1/4	3.8-400	5.5	3600	c	425000	n	N/A	No	BSL
85018	PHENANTHRENE	10 J	150 J	TP-SB16-0305-98	3/4	400-400	150	170000	n[10]	N/A		N/A	No	BSL
Inorganics (mg/kg)														
7429905	ALUMINUM	3700	16200	TPSB1180205	3/3	--	16200	**7700**	**n**	709000	n	No	No	BKG
7440382	ARSENIC	9.3 J	19.6	TPSB1180205	3/3	--	19.6	**0.39**	**c**	769	c	No	No	BKG
7440393	BARIUM	19.1	85.8	TPSB1180205	3/3	--	85.8	1500	n	70900	n	N/A	No	BSL
7440417	BERYLLIUM	0.63	0.95	TPSB1180205	2/3	0.1-0.1	0.95	16	n	1380	c	N/A	No	BSL
7440439	CADMIUM	0.32 J	0.51	TPSB1170205-D	2/3	0.21-0.21	0.51	7	n	1840	c	N/A	No	BSL
7440702	CALCIUM	789	1880	TPSB1180205	3/3	--	1880	N/A		N/A		N/A	No	NUT
7440473	CHROMIUM	16.4	47.2 J	TPSB1180205	3/3	--	47.2	12000	c[11]	276	c[14]	N/A	No	BSL
7440484	COBALT	2.8	9.5	TPSB1170205-D	3/3	--	9.5	**2.3**	**n**	1180	c	No	No	BKG
7440508	COPPER	6.4 J	63.4 J	TPSB1180205	3/3	--	63.4	310	n	N/A		N/A	No	BSL
7439896	IRON	8350	23100	TPSB1180205	3/3	--	23100	**5500**	**n**	N/A		No	No	BKG
7439921	LEAD	180 J	188 J	TPSB1170205-D	2/3	6.6-6.6	188	400		N/A		N/A	No	BSL
7439954	MAGNESIUM	2620	7240	TPSB1170205-D	3/3	--	7240	N/A		N/A		N/A	No	NUT
7439965	**MANGANESE**	59.4	405	TPSB1170205	3/3	--	405	**180**	**n**	7090	n	Yes	Yes	ASL
7439976	MERCURY	0.21 J	0.65 J	TPSB1180205	2/3	0.02-0.02	0.65	2.3	n[12]	N/A		N/A	No	BSL
7440020	NICKEL	13.6	34.2	TPSB1170205-D	3/3	--	34.2	150	n	N/A		N/A	No	BSL
7440097	POTASSIUM	1120	1970	TPSB1170205-D	3/3	--	1970	N/A		N/A		N/A	No	NUT
7440235	SODIUM	218	1980	TP-SB16-1719-98	3/3	--	1980	N/A		N/A		N/A	No	NUT
7440622	VANADIUM	10.4 J	35.2	TPSB1180205	3/3	--	35.2	39	n[13]	N/A		N/A	No	BSL
7440666	ZINC	15 J	101 J	TPSB1170205-D	3/3	--	101	2300	n	N/A		N/A	No	BSL

Shaded chemicals were selected as COPCs.
Shading of the screening criteria indicates that the corresponding maximum detected concentration exceeded the screening criteria.

Notes:
1- Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
2 - Sample and duplicate are counted as one sample when determining frequency of detection.
3 - Values presented are sample-specific quantitation limits.
4 - The maximum detected concentration is used for screening purposes.
5 - U.S. EPA RSL - June, 2011. (Screening levels for noncarcinogenic compounds are divided by 10 to correspond to a HI of 0.1).
6 - U.S. EPA SSL. http://rais.ornl.gov/epa/ssl1.shtml. (Accessed June 2011). (Screening levels for noncarcinogenic compounds are divided by 10 to correspond to a HI of 0.1).
7- Background data set comparisons were only performed for chemicals with maximum concentrations greater than screening criteria. Appendix B.2 provides the methodology used for comparison of the facility background data set to the site data set.

Definitions:
C = Carcinogen
COPC = Chemical Of Potential Concern
J = Estimated value
N = Noncarcinogen
NA = Not Applicable/Not Available
RSL = Risk Screening Level
sat = Soil saturation limit
SSL = Soil Screening Level
U.S. EPA = United States Environmental Protection Agency

TABLE 2.4
OCCURENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN FORMER LOCATION OF BUILDING 237 SUBSURFACE SOIL RESIDENTIAL DIRECT CONTACT
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Soil Area With No Debris
Exposure Medium: Subsurface Soil Former Location of Building 237

CAS Number	Chemical	Minimum Detected Concentration (1)	Maximum Detected Concentration (1)	Location of Maximum Concentration	Detection Frequency(2)	Range of Detection Limits(3)	Concentration Used for Screening(4)	U.S. EPA Residential RSL (5)	U.S. EPA SSL (6) Soil-to-Air	Site Background Exceedance (7)	COPC	Rationale for Selection or Deletion(8)

8 - Rationale Codes
Selection Reason: Above Screening Levels (ASL)
Deletion Reason: Below Site Background (BKG) Essential Nutrient (NUT)
Below Screening Level (BSL)
9 - See Appendix D.2 for methodology used in calculating BAP Equivalent results.
10 - Value is for pyrene.
11 - Value is for trivalent chromium.
12 - Value is for mercuric chloride (and other mercury salts).
13 - Value is for vanadium and compounds was used because vanadium is mostly combined with other metals rather than found in the elemental form. ATSDR, 2009. Toxicological Profile for Vanadium. (Draft for Public Comment) Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.
14 - Value is for total chromium.

Associated Samples:
TP-SB16-0305-98
TP-SB16-1719-98
TPSB1170205
TPSB1170205-D
TPSB1180205
TPSB1180205-D

TABLE 2.5
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUNDWATER - CONSTRUCTION WORKER - DIRECT CONTACT
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

CAS Number	Chemical	Minimum Detected Concentration [1]	Maximum Detected Concentration [1]	Location of Maximum Concentration	Detection Frequency[2]	Range of Detection Limits[3]	Concentration Used for Screening[4]	PNS HHSL for Groundwater [5]	Site Background Exccedance [6]	COPC	Rationale for Selection or Deletion[7]
Semivolatile Organics (ug/L)											
91-57-6	2-METHYLNAPHTHALENE	0.2 J	0.2 J	TP-MW09	1/28	0.07-12	0.2	720 n	N/A	No	BSL
83-32-9	ACENAPHTHENE	0.4	0.4	TP-MW09	1/28	0.07-12	0.4	10000 n	N/A	No	BSL
208-96-8	ACENAPHTHYLENE	0.1 J	0.1 J	TP-MW09	1/28	0.05-12	0.1	10000 n	N/A	No	BSL
120-12-7	ANTHRACENE	0.021 J	0.6	TP-MW09	3/28	0.07-12	0.6	28000 n	N/A	No	BSL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	1 J	1 J	TP-MW05	1/17	8-11	1	320 n	N/A	No	BSL
84-74-2	DI-N-BUTYL PHTHALATE	0.8 J	0.8 J	TP-MW05	1/16	2-11	0.8	31000 n	N/A	No	BSL
206-44-0	FLUORANTHENE	0.16	0.9	TP-MW09	3/28	0.1-12	0.9	200 n	N/A	No	BSL
86-73-7	FLUORENE	0.9	0.9	TP-MW09	1/28	0.06-12	0.9	5200 n	N/A	No	BSL
91-20-3	NAPHTHALENE	0.021 J	0.3	TP-MW09	3/28	0.05-12	0.3	730 n	N/A	No	BSL
85-01-8	PHENANTHRENE	0.2 J	2	TP-MW09	2/28	0.07-12	2	270 n	N/A	No	BSL
129-00-0	PYRENE	0.1 J	0.4	TP-MW09	4/28	0.08-12	0.4	1700 n	N/A	No	BSL
Inorganics (ug/L)											
7429-90-5	ALUMINUM	2770	14500	TP-MW08	2/41	10-3610	14500	2580000 n	N/A	No	BSL
7440-36-0	ANTIMONY	34	34	TP-MW06	1/41	1.3-39.6	34	155 n	N/A	No	BSL
7440-38-2	ARSENIC	2.6 J	41.2 J	TP-MW02	7/41	1.8-37	41.2	774 n	N/A	No	BSL
7440-39-3	BARIUM	7.2 J	556	TP-MW08	36/41	8.9-37.8	556	36100 n	N/A	No	BSL
7440-43-9	CADMIUM	0.18 J	3.9 J	TP-MW06	6/41	0.14-2.3	3.9	64.5 n	N/A	No	BSL
7440-70-2	CALCIUM	71500	1080000	FA-01DB	41/41	--	1080000	N/A	N/A	No	NUT
7440-47-3	CHROMIUM	1.2 J	27.4	TP-MW08	4/41	0.68-23.8	27.4	25800 n	N/A	No	BSL
7440-50-8	COPPER	7.3 J	496	TP-MW05	10/41	2.2-238	496	103000 n	N/A	No	BSL
7439-89-6	IRON	229	21800	TP-MW08	19/41	6.1-2360	21800	1810000 n	N/A	No	BSL
7439-92-1	LEAD	1.7 J	195 J	TP-MW06	6/41	0.91-26.2	195	1340 [8]	N/A	No	BSL
7439-95-4	MAGNESIUM	32200	1240000	FA-01	41/41	--	1240000	N/A	N/A	No	NUT
7439-96-5	MANGANESE	3 J	2820	FA-01DB	29/41	0.7-25.8	2820	**2480** n	No	No	BKG[9]
7439-97-6	MERCURY	0.01 J	0.46 J	TP-MW02	9/41	0.01-0.13	0.46	54.2 n	N/A	No	BSL
7440-02-0	NICKEL	1.1 J	278	TP-MW06	25/41	1.5-66.4	278	10300 n	N/A	No	BSL
7440-09-7	POTASSIUM	14300	448000	TP-MW07	41/41	--	448000	N/A	N/A	No	NUT
7782-49-2	SELENIUM	7.3 J	19.8 J	FA-01	5/38	1.9-63.8	19.8	12900 n	N/A	No	BSL
7440-21-3	SILICON	732 J	20600	TP-MW08	10/11	755-755	20600	N/A	N/A	No	NTX
7440-22-4	SILVER	1.4 J	6.2 J	FA-01	2/41	0.57-10.7	6.2	860 n	N/A	No	BSL
7440-23-5	SODIUM	433000	10400000	FA-01	41/41	--	10400000	N/A	N/A	No	NUT
7440-28-0	**THALLIUM**	4.8 J	66.1 J	TP-MW07	8/41	0.11-64.4	66.1	**26** n	N/A	Yes	ASL
7440-62-2	VANADIUM	0.68 J	25.8	TP-MW08	2/41	0.36-22.6	25.8	12900 n	N/A	No	BSL
7440-66-6	ZINC	5	587	TP-MW05	24/41	2.1-171	587	1290000 n	N/A	No	BSL

TABLE 2.5
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUNDWATER - CONSTRUCTION WORKER - DIRECT CONTACT
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

CAS Number	Chemical	Minimum Detected Concentration (1)	Maximum Detected Concentration (1)	Location of Maximum Concentration	Detection Frequency(2)	Range of Detection Limits(3)	Concentration Used for Screening(4)	PNS HHSL for Groundwater (5)	Site Background Exccedance (6)	COPC	Rationale for Selection or Deletion(7)
Filtered Inorganics (ug/L)											
7440-38-2	ARSENIC	7.2	7.2	TP-MW09	1/25	1.8-37	7.2	774 n	N/A	No	BSL
7440-39-3	BARIUM	8.7 J	570	TP-MW08	23/25	9.2-61.4	570	36100 n	N/A	No	BSL
7440-43-9	CADMIUM	0.14 J	3.6 J	TP-MW06	8/25	0.14-2.3	3.6	64.5 n	N/A	No	BSL
7440-70-2	CALCIUM	69500	360000	TP-MW04	25/25	--	360000	N/A	N/A	No	NUT
7440-48-4	COBALT	1.4 J	1.7 J	FA-01	3/25	0.8-7.1	1.7	1940 n	N/A	No	BSL
7440-50-8	COPPER	45.4	65.2	TP-MW05	2/25	2.2-65.6	65.2	103000 n	N/A	No	BSL
7439-89-6	IRON	121 J	6720	TP-MW06	10/25	6.1-79.1	6720	1810000 n	N/A	No	BSL
7439-92-1	LEAD	3.4 J	6.2 J	TP-MW06	2/25	0.91-26.2	6.2	1340 (8)	N/A	No	BSL
7439-95-4	MAGNESIUM	33700	1070000	TP-MW04	25/25	--	1070000	N/A	N/A	No	NUT
7439-96-5	MANGANESE	16.6 J	1380	TP-MW08	16/25	0.75-23.4	1380	2480 n	N/A	No	BSL
7439-97-6	MERCURY	0.01 J	0.28	TP-MW06	3/25	0.03-0.16	0.28	54.2 n	N/A	No	BSL
7440-02-0	NICKEL	2.5 J	270	TP-MW06	20/25	1.5-28.6	270	10300 n	N/A	No	BSL
7440-09-7	POTASSIUM	14800	401000	TP-MW05	25/25	--	401000	N/A	N/A	No	NUT
7782-49-2	SELENIUM	2.2 J	24.8	TP-MW08	11/25	2.1-63.8	24.8	12900 n	N/A	No	BSL
7440-21-3	SILICON	689 J	5180	FA-01B	11/11	--	5180	N/A	N/A	No	NTX
7440-23-5	SODIUM	446000	9210000	TP-MW04	25/25	--	9210000	N/A	N/A	No	NUT
7440-28-0	THALLIUM	4.7 J	4.7 J	TP-MW07	1/25	0.1-64.4	4.7	26 n	N/A	No	BSL
7440-66-6	ZINC	5.3	572	TP-MW05	19/25	4.1-20.6	572	1290000 n	N/A	No	BSL

Shaded chemicals were selected as COPCs.
Shading of the maximum detected concentration indicates that it exceeded the screening criteria.

Notes:
1 - Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
2 - Sample and duplicate are counted as one sample when determining frequency of detection.
3 - Values presented are sample-specific quantitation limits.
4 - The maximum detected concentration is used for screening purposes.
5 - Aqueous risk-based screening levels calculated for construction workers (see text). (RBCs for noncarcinogenic compounds are divided by 10 to correspond to a HI of 0.1).
6- Background data set comparisons were only performed for chemicals with maximum concentrations greater than screening criteria. Appendix B.2 provides the methodology used for comparison of the facility background data set to the site data set.
7 - Rationale Codes

Selection Reason:	Above Screening Levels (ASL)	Definitions:
Deletion Reason:	Essential Nutrient (NUT)	c = Carcinogen
	Below Screening Level (BSL)	COPC = Chemical Of Potential Concern
	No Toxicity Information (NTX)	J = Estimated value
	Detection frequency less than 5% (FREQ)	n = Noncarcinogen
	Below Site Background (BKG)	N/A = Not Applicable/Not Available

8 - Screening level for lead was derived from an adaptation of the USEPA's Adult Lead Model as described in Appendices D.5.4 and D.5.5.

TABLE 2.5
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUNDWATER - CONSTRUCTION WORKER - DIRECT CONTACT
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

CAS Number	Chemical	Minimum Detected Concentration (1)	Maximum Detected Concentration (1)	Location of Maximum Concentration	Detection Frequency(2)	Range of Detection Limits(3)	Concentration Used for Screening(4)	PNS HHSL for Groundwater (5)	Site Background Exccedance (6)	COPC	Rationale for Selection or Deletion(7)

9 - See background data comparasion for more information.

Associated Samples:

FA-01-GW-07	FA-01DB-GW-08	TPGWFA010503-F	TPGWMW040503-F	TPGWMW071208
FA-01-GW-07-D	FA-01DB-GW-09	TPGWFA011208	TPGWMW040503-F-D	TPGWMW071208-D
FA-01-GW-07-F	FA-01DB-GW-10	TPGWFA01B0503	TPGWMW041208	TPGWMW080503
FA-01-GW-07-F-D	FA-01DB-GW-10-D	TPGWFA01B0503-F	TPGWMW050503	TPGWMW080503-F
FA-01-GW-08	TP-MW-02-11	TPGWFA01B1208	TPGWMW050503-F	TPGWMW081208
FA-01-GW-09	TP-MW-03-11	TPGWMW020503	TPGWMW051208	TPGWMW090503
FA-01-GW-10	TP-MW-04-11	TPGWMW020503-F	TPGWMW060503	TPGWMW090503-F
FA-01B-GW-07	TP-MW-04-11-D	TPGWMW021208	TPGWMW060503-F	TPGWMW091208
FA-01B-GW-08	TP-MW-05-11	TPGWMW030503	TPGWMW061208	TPGWMW091208-D
FA-01B-GW-08-D	TP-MW-05-11-F	TPGWMW030503-F	TPGWMW070503	TPGWMW100503
FA-01B-GW-09	TP-MW-06-11	TPGWMW031208	TPGWMW070503-D	TPGWMW100503-F
FA-01B-GW-10	TP-MW-07-11	TPGWMW040503	TPGWMW070503-F	TPGWMW1012008
FA-01DB-GW-07	TPGWFA010503	TPGWMW040503-D	TPGWMW070503-F-D	TPGWMW121208

TABLE 2.6
OCCURENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SEDIMENT - RECREATIONAL USER - DIRECT CONTACT
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

CAS Number	Chemical	Minimum Detected Concentration [1]	Maximum Detected Concentration [1]	Location of Maximum Concentration	Detection Frequency[2]	Range of Detection Limits[3]	Concentration Used for Screening[4]	PNS HHSL [5]		COPC Flag	Rationale for Selection or Deletion[6]
Semivolatile Organics (ug/kg)											
92-52-4	1,1-BIPHENYL	0.9	51.5 J	MS-4 LOC.1	47/58	1.1-13.2	52	410000	c	No	BSL
90-12-0	1-METHYLNAPHTHALENE	1.4 J	110 J	MS-4 LOC.1	52/58	3-31.1	110	110000	c	No	BSL
832-69-9	1-METHYLPHENANTHRENE	4.8	525 J	MS-4 LOC.1	58/58	--	530	910000	n	No	BSL
2245-38-7	2,3,5-TRIMETHYLNAPHTHALENE	0.9	95 J	MS-4 LOC.1	58/58	--	95	910000	n	No	BSL
581-42-0	2,6-DIMETHYLNAPHTHALENE	1.5	127 J	MS-4 LOC.1	58/58	--	130	910000	n	No	BSL
91-57-6	2-METHYLNAPHTHALENE	2.6 J	199	MS-4 LOC.1	57/63	4.45-54.4	200	180000	n	No	BSL
83-32-9	ACENAPHTHENE	1.4 J	460	MS-4 LOC.1	63/63	--	460	2700000	n	No	BSL
208-96-8	ACENAPHTHYLENE	7.7	557 J	MS-4 LOC.1	63/63	--	560	2700000	n	No	BSL
120-12-7	ANTHRACENE	22.2	5921 J	MS-4 LOC.1	63/63	--	5900	14000000	n	No	BSL
--	**BAP EQUIVALENT[15]**	66	8200	MS-4 LOC.1	63/63	--	8200	**162**	c	Yes	ASL
56-55-3	**BENZO(A)ANTHRACENE**	31.2	4812 J	MS-4 LOC.1	63/63	--	4800	**1600**	c	Yes	ASL
50-32-8	**BENZO(A)PYRENE**	32.9 J	6008 J	MS-4 LOC.1	63/63	--	6000	**162**	c	Yes	ASL
205-99-2	BENZO(B)FLUORANTHENE	49.1 J	5491 J	MS-4 LOC.1	63/63	--	5500	16000	c	No	BSL
192-97-2	BENZO(E)PYRENE	25.7	2587 J	MS-4 LOC.1	58/58	--	2600	910000	n	No	BSL
191-24-2	BENZO(G,H,I)PERYLENE	28	2612 J	MS-4 LOC.1	63/63	--	2600	1400000	n	No	BSL
207-08-9	BENZO(K)FLUORANTHENE	3.7 J	1851 J	MS-4 LOC.1	47/47	--	1900	16000	c	No	BSL
218-01-9	CHRYSENE	31	3920 J	MS-4 LOC.1	63/63	--	3900	160000	c	No	BSL
53-70-3	**DIBENZO(A,H)ANTHRACENE**	4.7 J	812 J	MS-4 LOC.1	63/63	--	810	**162**	c	Yes	ASL
132-65-0	DIBENZOTHIOPHENE	1.4	345 J	MS-4 LOC.1	42/42	--	340	N/A		No	NTX
206-44-0	FLUORANTHENE	65.9	16098 J	MS-4 LOC.1	63/63	--	16000	11000000	n	No	BSL
86-73-7	FLUORENE	3.4 J	1221 J	MS-4 LOC.1	63/63	--	1200	1800000	n	No	BSL
193-39-5	**INDENO(1,2,3-CD)PYRENE**	5.4 J	3509 J	MS-4 LOC.1	63/63	--	3500	**1600**	c	Yes	ASL
91-20-3	NAPHTHALENE	3.3	269	MS-4 LOC.1	57/63	5.92-68.3	270	910000	n	No	BSL
198-55-0	PERYLENE	7.6	670 J	MS-4 LOC.1	58/58	--	670	5600000	n	No	BSL
85-01-8	PHENANTHRENE	24.6	8961 J	MS-4 LOC.1	63/63	--	9000	8400000	n[7]	No	BSL
129-00-0	PYRENE	56.5	12102 J	MS-4 LOC.1	63/63	--	12000	8400000	n	No	BSL

TABLE 2.6
OCCURENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SEDIMENT - RECREATIONAL USER - DIRECT CONTACT
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

CAS Number	Chemical	Minimum Detected Concentration [1]	Maximum Detected Concentration [1]	Location of Maximum Concentration	Detection Frequency[2]	Range of Detection Limits[3]	Concentration Used for Screening[4]	PNS HHSL [5]		COPC Flag	Rationale for Selection or Deletion[6]
Pesticides/PCBs (ug/kg)											
634-66-2	1,2,3,4-TETRACHLOROBENZENE	0.02 J	4.02 J	MS-4 LOC.1	33/42	0.12-0.49	4.0	17000	n[16]	No	BSL
95-94-3	1,2,4,5-TETRACHLOROBENZENE	0.16 J	5.51 J	MS-4 LOC.1	30/42	0.22-3	5.5	17000	n	No	BSL
53-19-0	2,4'-DDD	0.73	27	MS-4 LOC.1	42/42	--	27	37000	c	No	BSL
3424-82-6	2,4'-DDE	0.1	36.81	MS-3 LOC.2	38/58	0.076-0.8	37	26000	c	No	BSL
789-02-6	2,4'-DDT	0.04 J	34	MS-4 LOC.3	52/58	0.033-1	34	26000	c	No	BSL
72-54-8	4,4'-DDD	0.73	1060	1018	58/58	--	1100	37000	c	No	BSL
72-55-9	4,4'-DDE	0.51	138	MS-4 LOC.3	58/58	--	140	26000	c	No	BSL
50-29-3	4,4'-DDT	0.38	174	MS-4 LOC.3	53/58	0.6-4.1	170	26000	c	No	BSL
309-00-2	ALDRIN	0.01 J	24.26	MS-3 LOC.1	20/57	0.022-0.7	24	190	c	No	BSL
319-84-6	ALPHA-BHC	0.01 J	0.58	MS-3 LOC.2	34/42	0.033-0.1	0.58	1100	c	No	BSL
5103-71-9	ALPHA-CHLORDANE	0.1 J	8.89	MS-3 LOC.2	48/58	0.15-0.8	8.9	20000	c[8]	No	BSL
319-85-7	BETA-BHC	0.028 J	3.1	MS-3 LOC.1, MS-4-LOC.2	27/42	0.04-0.33	3.1	4000	c	No	BSL
2921-88-2	CHLORPYRIFOS	0.006 J	1.06	MS-3 LOC.1	19/42	0.065-3.2	1.1	170000	n	No	BSL
5103-73-1	CIS-NONACHLOR	0.11 J	2.2	MS-3 LOC.1	41/42	0.046-0.046	2.2	N/A		No	NTX
319-86-8	DELTA-BHC	0.004 J	0.44	MS-3 LOC.1	32/42	0.037-0.1	0.44	32000	n[9]	No	BSL
60-57-1	DIELDRIN	0.03 J	33.29	MS-3 LOC.2	32/42	0.041-0.11	33	210	c	No	BSL
33213-65-9	ENDOSULFAN II	0.08 J	2.21	MS-4 LOC.1	36/42	0.12-0.24	2.2	340000	n	No	BSL
72-20-8	ENDRIN	0.041 J	0.45	MS-3 LOC.2	8/42	0.055-0.24	0.45	17000	n	No	BSL
58-89-9	GAMMA-BHC (LINDANE)	0.02 J	0.6 J	1018	25/58	0.14-1.1	0.6	6500	c	No	BSL
5103-74-2	GAMMA-CHLORDANE	0.02 J	0.69	MS-3 LOC.1	34/42	0.03-0.11	0.69	20000	c[8]	No	BSL
76-44-8	HEPTACHLOR	0.02 J	28.79	MS-3 LOC.2	48/58	0.14-0.5	29	740	c	No	BSL
1024-57-3	HEPTACHLOR EPOXIDE	0.03 J	0.4 J	1018	12/58	0.024-0.5	0.4	360	c	No	BSL
118-74-1	HEXACHLOROBENZENE	0.03 J	8.5	MS-3 LOC.1	39/58	0.041-0.6	8.5	2100	c	No	BSL
2385-85-5	MIREX	0.03 J	8	1017	34/58	0.024-0.6	8.0	1800	c	No	BSL
26880-48-8	OXYCHLORDANE	0.02 J	1.84 J	MS-4 LOC.1	28/42	0.013-0.08	1.8	N/A		No	NTX
1825-21-4	PENTACHLOROANISOLE	0.03 J	0.33	MS-4 LOC.3	31/42	0.04-0.2	0.33	N/A		No	NTX
608-93-5	PENTACHLOROBENZENE	0.04 J	1.09	MS-3 LOC.1	30/42	0.087-0.84	1.1	45000	n	No	BSL
--	**TEQ PCB[10]**	0.000072	7.0	MS-3 LOC.2	56/58	0.000072-0.000084	7.0	**0.068**	c[11]	Yes	ASL
--	**TOTAL PCB CONGENERS[12]**	32	2700	MS-3 LOC.2	58/58	--	2700	**1200**	c[13]	Yes	ASL
39765-80-5	TRANS-NONACHLOR	0.02 J	2.9	1018	54/58	0.15-0.8	2.9	N/A		No	NTX

TABLE 2.6
OCCURENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SEDIMENT - RECREATIONAL USER - DIRECT CONTACT
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

CAS Number	Chemical	Minimum Detected Concentration (1)	Maximum Detected Concentration (1)	Location of Maximum Concentration	Detection Frequency(2)	Range of Detection Limits(3)	Concentration Used for Screening(4)	PNS HHSL (5)		COPC Flag	Rationale for Selection or Deletion(6)
Inorganics (mg/kg)											
7429-90-5	ALUMINUM	7870 J	42364.3	1018	18/18	--	42400	200000	n	No	BSL
7440-38-2	**ARSENIC**	7.5 J	36.2 J	MS-4 LOC.1	18/18	--	36.2	**5.9**	c	Yes	ASL
7440-43-9	CADMIUM	0.27 J	1.2 J	MS-4 LOC.1	17/17	--	1.2	78	n	No	BSL
7440-47-3	**CHROMIUM**	58.1 J	208.8	1016	18/18	--	209	**60**	c	Yes	ASL
7440-50-8	COPPER	9.1 J	6490 J	MS-4 LOC.1	104/104	--	6490	8000	n	No	BSL
7439-89-6	**IRON**	23911.4	141000 J	MS-4 LOC.1	18/18	--	141000	**140000**	n	Yes	ASL
7439-92-1	**LEAD**	49 J	575 J	MS-4 LOC.1	17/17	--	575	**400**	(14)	Yes	ASL
7439-96-5	**MANGANESE**	185 J	684.4 J	1020	18/18	--	684	**610**	n	Yes	ASL
7439-97-6	MERCURY	0.46 J	2.975	1016	12/16	0.302-0.58	3.0	13	n	No	BSL
7440-02-0	NICKEL	12.9 J	500 J	MS-4 LOC.1	75/84	38.3-89	500	510	n	No	BSL
7440-22-4	SILVER	0.14 J	2.12	1016	14/18	0.39-0.85	2.1	130	n	No	BSL
7440-66-6	ZINC	469.4	1540 J	MS-4 LOC.1	6/17	266-558	1540	60000	n	No	BSL

Shading indicates that the maximum detected concentration exceeded the screening criteria; therefore, the chemcial was retained as a COPC.

Notes:
1- Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
2 - Sample and duplicate are counted as one sample when determining frequency of detection.
3 - Values presented are sample-specific quantitation limits.
4 - The maximum detected concentration is used for screening purposes.
5 - Calculated site-specific human health screening levels for PNS. Note that screening levels for ingestion only were used for PAHs, PCBs, dioxins, and DDT and degredation by-products. See text for explanation. (Screening levels for noncarcinogenic compounds are divided by 10 to correspond to a HI of 0.1).
6 - Rationale Codes

Selection Reason:	Above Screening Levels (ASL)
Deletion Reason:	Essential Nutrient (NUT)
	Below Screening Level (BSL)
	No Toxicity Information (NTX)
	Detection frequency less than 5% (FREQ)

7 - Toxicity criteria for pyrene were used as surrogate values in calculating screening levels for phenanthrene.
8 - Toxicity criteria for chlordane were used as surrogate values in calculating screening levels for alpha-chlordane and gamma-chlordane.
9 - The non-cancer screening level for gamma-BHC was used as a surrogate for delta-BHC.
10 - See Appendix D.2 for example calculation and methodology used for calculating TEQ PCB.
11 - Value is for TCDD.
12 - See Appendix D.2 for example calculation and methodology used for calculating Total PCB Congeners.
13 - Value is based on PCB-high risk (CAS # 1336-36-3) toxicitiy information.

Definitions:
c = Carcinogen
COPC = Chemical Of Potential Concern
J = Estimated value
n = Noncarcinogen
N/A = Not Applicable/Not Available
PNS = Portsmouth Naval Shipyard
HHSL = Human Health Screening Level

TABLE 2.6
OCCURENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SEDIMENT - RECREATIONAL USER - DIRECT CONTACT
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

CAS Number	Chemical	Minimum Detected Concentration (1)	Maximum Detected Concentration (1)	Location of Maximum Concentration	Detection Frequency(2)	Range of Detection Limits(3)	Concentration Used for Screening(4)	PNS HHSL (5)	COPC Flag	Rationale for Selection or Deletion(6)

14 - Value is EPA's OSWER soil screening level for residential land use.
15 - See Appendix D.2 for methodology used in calculating BAP Equivalent results.
16 - The screening level for 1,2,4,5-tetrachlorobenzene was used as a surrogate for 1,2,3,4-tetrachlorobenzene.

Associated Samples:

BC-1016-SD-0497	OU4-SD-M03-201B	OU4-SD-M04-300B	TPSD1010004	TPSD140612	TPSD280006
BC-1016-SD-0897	OU4-SD-M03-202A	OU4-SD-M04-301A	TPSD1020004	TPSD150006	TPSD280612
BC-1016-SD-1197	OU4-SD-M03-203A	OU4-SD-M04-301B	TPSD1030004	TPSD150006-D	TPSD290006
BC-1016-SD-1197-D	OU4-SD-M03-299A	OU4-SD-M04-302A	TPSD1040004	TPSD150612	TPSD290612
BC-1016-SD-1296	OU4-SD-M03-300A	OU4-SD-M04-303A	TPSD1050004	TPSD160006	TPSD300006
BC-1017-SD-0497	OU4-SD-M03-300B	OU4-SD-M04-399A	TPSD1060004	TPSD160612	TPSD300612
BC-1017-SD-0897	OU4-SD-M03-301A	OU4-SD-M04-401B	TPSD1070004	TPSD170006	TPSD330006
BC-1017-SD-1197	OU4-SD-M03-301B	OU4-SD-M04-501B	TPSD1080004	TPSD170612	TPSD330612
BC-1017-SD-1296	OU4-SD-M03-302A	OU4-SD-M04-601B	TPSD1090004	TPSD180006	TPSD340006
BC-1018-SD-0497	OU4-SD-M03-303A	TPSD010006	TPSD1100004	TPSD180612	TPSD340612
BC-1018-SD-0897	OU4-SD-M03-399A	TPSD010612	TPSD1110004	TPSD190006	TPSD350006
BC-1018-SD-1197	OU4-SD-M04-100A	TPSD010612-D	TPSD1120004	TPSD190612	TPSD350612
BC-1018-SD-1296	OU4-SD-M04-100B	TPSD020006	TPSD1130004	TPSD190612-D	TPSD350612-D
BC-1018-SD-1296-D	OU4-SD-M04-101A	TPSD030006	TPSD1140004	TPSD200006	TPSD360006
BC-1020-SD-0497	OU4-SD-M04-101A-D	TPSD030006-D	TPSD1150004	TPSD200612	TPSD370006
BC-1020-SD-0897	OU4-SD-M04-101B	TPSD030612	TPSD1160004	TPSD210006	TPSD370612
BC-1020-SD-0897-D	OU4-SD-M04-101B-D	TPSD040006	TPSD1160004-D	TPSD210612	TPSD380006
BC-1020-SD-1197	OU4-SD-M04-102A	TPSD040612	TPSD1170004	TPSD220006	TPSD380612
BC-1020-SD-1296	OU4-SD-M04-102A-D	TPSD050006	TPSD1180004	TPSD220612	
OU4-SD-M03-100A	OU4-SD-M04-103A	TPSD050612	TPSD1190004	TPSD230006	
OU4-SD-M03-100B	OU4-SD-M04-103A-D	TPSD060006	TPSD1190004-D	TPSD230612	
OU4-SD-M03-101A	OU4-SD-M04-199A	TPSD060006-D	TPSD1200004	TPSD240006	
OU4-SD-M03-101B	OU4-SD-M04-200A	TPSD060612	TPSD120006	TPSD240612	
OU4-SD-M03-102A	OU4-SD-M04-200B	TPSD070006	TPSD120612	TPSD250006	
OU4-SD-M03-103A	OU4-SD-M04-201A	TPSD070612	TPSD120612-D	TPSD250612	
OU4-SD-M03-199A	OU4-SD-M04-201B	TPSD090006	TPSD120612-RE	TPSD250612-D	
OU4-SD-M03-199A-D	OU4-SD-M04-202A	TPSD090612	TPSD120612-RE-D	TPSD260006	
OU4-SD-M03-200A	OU4-SD-M04-203A	TPSD090612-D	TPSD130006	TPSD260612	
OU4-SD-M03-200B	OU4-SD-M04-299A	TPSD100006	TPSD130612	TPSD270006	
OU4-SD-M03-201A	OU4-SD-M04-300A	TPSD100612	TPSD140006	TPSD270612	

RAGS Part D Table 3

Medium-Specific Exposure Point Concentration Summary

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MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

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3.3.RME	Surface Soil - Former Location of Buidling 237
3.4.RME	Subsurface Soil - Former Location of Buidling 237
3.5.RME	Sediment
3.6.RME	Groundwater

TABLE 3.1.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale[1]
OU7	BAP Equivalent	mg/kg	0.72	1.8 (L)	6.3	1.8	mg/kg	97.5% KM (Chebyshev) UCL	ProUCL
	Aroclor-1248	mg/kg	--	--	1.5	1.5	mg/kg	Maximum Concentration	(3)
	Barium	mg/kg	120	335(NP)	2530	335	mg/kg	95% Chebyshev (Mean, Sd) UCL	ProUCL
	Chromium	mg/kg	52.8	62.2(L)	280	62.2	mg/kg	95% Modified-t UCL	ProUCL
	Copper	mg/kg	402	1030(NP)	5620	1030	mg/kg	95% Chebyshev (Mean, Sd) UCL	ProUCL
	Iron	mg/kg	27500	34200 (NP)	196000	34200	mg/kg	95% Modified-t UCL	ProUCL
	Lead	mg/kg	510	2140 (L)	13200	510	mg/kg	Mean Concentration	(2)
	Mercury	mg/kg	0.72	2.1 (L)	16.3	2.1	mg/kg	97.5% KM (Chebyshev) UCL	ProUCL
	Thallium	mg/kg	0.49	0.48 (G)	1.1	0.48	mg/kg	95% KM (t) UCL	ProUCL

For non-detects, the sample quantitation limit was used as an input to ProUCL; for duplicate sample results, the average value was used in the calculation.

G = Gamma
L = Lognormal
NP = Non-parametric

1. Exposure point concentration is the value recommended by USEPA's ProUCL. The maximum detected concentration is used if the recommended UCL is greater than the maximum or if the dataset contains less than 10 samples.
2. As per USEPA guidance for lead, the mean concentration is used as the exposure point concentration for lead.
3. Hotspot maximum concentration.

Exposure point concentrations for the RME scenarios are also the exposure point concentrations for the CTE scenarios.

TABLE 3.2.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale[1]
OU7	BAP Equivalent	mg/kg	0.64	1.1 (NP)	5.8	1.1	mg/kg	95% KM (Chebyshev) UCL	ProUCL
	Aroclor-1248	mg/kg	--	--	41.0	41	mg/kg	Maximum Concentration	(3)
	Aroclor-1260	mg/kg	0.95	4.6 (NP)	42	4.6	mg/kg	97.5% KM (Chebyshev) UCL	ProUCL
	2,3,7,8-TCDD TEQ	mg/kg	0.00013	0.0013 (NP)	0.0017	0.0013	mg/kg	99% Chebyshev (Mean, Sd) UCL	ProUCL
	Antimony	mg/kg	31.2	182 (L)	1430	182	mg/kg	97.5% KM (Chebyshev) UCL	ProUCL
	Barium	mg/kg	152	280(NP)	1580	280	mg/kg	95% Chebyshev (Mean, Sd) UC	ProUCL
	Cadmium	mg/kg	2.8	5.1 (NP)	24.1	5.1	mg/kg	95% KM (Chebyshev) UCL	ProUCL
	Chromium	mg/kg	121	290(NP)	2860	290	mg/kg	95% Chebyshev (Mean, Sd) UCL	ProUCL
	Cobalt	mg/kg	14.5	15.9(L)	85.2	15.9	mg/kg	95% H-UCL	ProUCL
	Copper	mg/kg	3000	6020(NP)	40400	6020	mg/kg	95% Chebyshev (Mean, Sd) UCL	ProUCL
	Iron	mg/kg	64700	97100(NP)	280000	97100	mg/kg	95% Chebyshev (Mean, Sd) UCL	ProUCL
	Lead	mg/kg	1600	5630 (L)	40000	1600	mg/kg	Mean Concentration	(2)
	Manganese	mg/kg	662	969 (NP)	4370	969	mg/kg	95% Chebyshev (Mean, Sd) UCL	ProUCL
	Mercury	mg/kg	2.6	9.4 (L)	120	9.4	mg/kg	95% KM (Chebyshev) UCL	ProUCL
	Nickel	mg/kg	229	484 (NP)	3920	484	mg/kg	95% KM (Chebyshev) UCL	ProUCL
	Thallium	mg/kg	0.85	0.89 (G)	3.6	0.89	mg/kg	95% KM (t) UCL	ProUCL
	Zinc	mg/kg	1510	2600(L)	15800	2600	mg/kg	95% H-UCL	ProUCL

For non-detects, the sample quantitation limit was used as an input to ProUCL; for duplicate sample results, the average value was used in the calculation.

G = Gamma
L = Lognormal
NP = Non-parametric

1. The maximum concentration was used as the EPC because the dataset contained less than 10 samples for each of the COPCs.
2. As per USEPA guidance for lead, the mean concentration is used as the exposure point concentration for lead.
3. Hotspot maximum concentration.

Exposure point concentrations for the RME scenarios are also the exposure point concentrations for the CTE scenarios.

TABLE 3.3.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Surface Soil - Former Location of Building 237
Exposure Medium: Surface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale[1]
OU7	Aroclor-1254	mg/kg	--	--	0.28	0.28	mg/kg	Maximum Concentration	< 10 Samples

For non-detects, the sample quantitation limit was used as an input to ProUCL; for duplicate sample results, the average value was used in the calculation.

1. The maximum concentration was used as the EPC because the dataset contained less than 10 samples for each of the COPCs.

Exposure point concentrations for the RME scenarios are also the exposure point concentrations for the CTE scenarios.

TABLE 3.4.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Subsurface Soil - Former Location of Building 237
Exposure Medium: Subsurface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale[1]
OU7	BAP Equivalent	mg/kg	--	--	0.25	0.25	mg/kg	Maximum Concentration	< 10 Samples
	Manganese	mg/kg	--	--	405	405	mg/kg	Maximum Concentration	< 10 Samples

For non-detects, the sample quantitation limit was used as an input to ProUCL; for duplicate sample results, the average value was used in the calculation.

1. The maximum concentration was used as the EPC because the dataset contained less than 10 samples for each of the COPCs.

Exposure point concentrations for the RME scenarios are also the exposure point concentrations for the CTE scenarios.

TABLE 3.5.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale[1]
OU7	BAP Equivalent	mg/kg	0.99	1.2(G)	8.2	1.2	mg/kg	95% Approximate Gamma UCL	ProUCL
	TEQ PCB	mg/kg	0.00028	0.0016(NP)	0.007	0.0016	mg/kg	99% KM (Chebyshev) UCL	ProUCL
	Total PCB Congeners	mg/kg	0.34	0.42(G)	2.7	0.42	mg/kg	95% Approximate Gamma UCL	ProUCL
	Arsenic	mg/kg	12.7	14.5(G)	36.2	14.5	mg/kg	95% Approximate Gamma UCL	ProUCL
	Chromium	mg/kg	132	150(N)	208.8	150	mg/kg	95% Student's-t UCL	ProUCL
	Iron	mg/kg	36733	45900(NP)	141000	45900	mg/kg	95% Modified-t UCL	ProUCL
	Lead	mg/kg	187	248(NP)	575	187	mg/kg	Mean Concentration	(2)
	Manganese	mg/kg	425	468(N)	684.4	468	mg/kg	95% Student's-t UCL	ProUCL

For non-detects, the sample quantitation limit was used as an input to ProUCL; for duplicate sample results, the average value was used in the calculation.

G = Gamma
N = Normal
NP = Non-parametric

1. The maximum concentration was used as the EPC because the dataset contained less than 10 samples for each of the COPCs.
2. As per USEPA guidance for lead, the mean concentration is used as the exposure point concentration for lead.

Exposure point concentrations for the RME scenarios are also the exposure point concentrations for the CTE scenarios.

TABLE 3.6.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
OU7	Thallium	ug/L	8.8	9.0 (G)	66.1 J	66.1	mg/kg	Maximum Detected Concentration	(1)

For non-detects, the sample quantitation limit was used as an input to ProUCL; for duplicate sample results, the average value was used in the calculation.

G = Gamma
J = Estimated

1 - The maximum detected concentration is used as the exposure point concentration for groundwater.

Exposure point concentrations for the RME scenarios are also the exposure point concentrations for the CTE scenarios.

RAGS Part D Table 4

Values Used For Daily Intake Calculations

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4.2.RME Construction Workers Exposed to Surface/Subsurface Soil - Soils to Air
4.3.RME Construction Workers Exposed to Groundwater
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4.5.RME Occupational Workers Exposed to Surface/Subsurface Soil - Soils to Air
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Central Tendency Exposures

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4.5.CTE Occupational Workers Exposed to Surface/Subsurface Soil - Soils to Air
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4.12.CTE Adult Residents Exposed to Surface/Subsurface Soil
4.13.CTE Adult Residents Exposed to Surface/Subsurface Soil - Soils to Air
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4.15.CTE Child Residents Exposed to Surface/Subsurface Soil - Soils to Air

TABLE 4.1.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - CONSTRUCTION WORKERS - SOILS

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Construction Workers	Adult	OU7	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002a	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	330	mg/day	USEPA, 2002b	
				CF3	Conversion Factor 3	0.000001	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	Assumed	BW x AT
				EF	Exposure Frequency	150	days/year	(1)	
				ED	Exposure Duration	1	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	
Dermal	Construction Workers	Adult	OU7	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002a	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				SA	Skin Surface Available for Contact	3300	cm2	USEPA, 2004	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.3	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	150	days/year	(1)	
				ED	Exposure Duration	1	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	

Notes:

1 - Professional judgement.

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.

USEPA, 1991: Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual: Standard default Exposure Factors, OSWER Directive 9285.6-03, March, 1991.

USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.

USEPA, 2002a:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2002b: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 2.77E-08 Cancer Dermal Intake = 8.30E-08

Noncancer Ingestion Intake = 1.94E-06 Noncancer Dermal Intake = 5.81E-06

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.1.CTE

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURES - CONSTRUCTION WORKERS - SOILS

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Construction Workers	Adult	OU7	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002a	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	330	mg/day	USEPA, 2002b	
				CF3	Conversion Factor 3	0.000001	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	Assumed	BW x AT
				EF	Exposure Frequency	150	days/year	(1)	
				ED	Exposure Duration	1	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	
Dermal	Construction Workers	Adult	OU7	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				SA	Skin Surface Available for Contact	3300	cm2	USEPA, 2004	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.1	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	150	days/year	(1)	
				ED	Exposure Duration	1	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	

Notes:

1 - Professional judgment.

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.

USEPA, 1991: Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual: Standard default Exposure Factors, OSWER Directive 9285.6-03, March, 1991.

USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.

USEPAa, 2002a: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPAb, 2002b: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 2.77E-08 Cancer Dermal Intake = 2.77E-08

Noncancer Ingestion Intake = 1.94E-06 Noncancer Dermal Intake = 1.94E-06

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.2.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - CONSTRUCTION WORKERS - SOILS TO AIR

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Surface/Subsurface Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Construction Workers	Adult	OU7	CA	Chemical concentration in air	Calculated	mg/m3	USEPA, 2002a	Exposure Concentration (mg/m^3) =
				CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002b	
				ET	Exposure Time	8	hours/day	(1)	CA x ET x EF x ED
				CF	Conversion Factor	24	hours/day	--	AT x CF
				EF	Exposure Frequency	150	days/year	(1)	
				ED	Exposure Duration	1	years	(1)	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	CA = (1/PEF + 1/VF) x Cs
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	
				PEF	Particulate Emission Factor	1.43E+06	m3/kg	USEPA, 2002a	
				VF	Volatilization Factor	Chemical-specific	m3/kg	USEPA, 2002a	

Notes:

1 - Professional judgement.

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1991: Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual: Standard default Exposure Factors, OSWER Directive 9285.6-03, March, 1991.

USEPA, 2002a: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2002b:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

Unit Intake Calculations

Inhalation Intake = (ET x EF x ED)/(AT x CF)

Cancer Inhalation Intake = 1.96E-03 Noncancer Inhalation Intake = 1.37E-01

Cancer risk from ingestion = Air concentration x Cancer Inhalation Intake x Inhalation Cancer Slope Factor

Hazard Index from ingestion = Air concentration x Noncancer Inhalation Intake / Inhalation Reference Dose

TABLE 4.2.CTE

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURES - CONSTRUCTION WORKERS - SOILS TO AIR

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Surface/Subsurface Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Construction Workers	Adult	OU7	CA	Chemical concentration in air	Calculated	mg/m3	USEPA, 2002a	Exposure Concentration (mg/m^3) =
				CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002b	
				ET	Exposure Time	8	hours/day	(1)	CA x ET x EF x ED
				CF	Conversion Factor	24	hours/day	--	AT x CF
				EF	Exposure Frequency	150	days/year	(1)	
				ED	Exposure Duration	1	years	(1)	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	CA = (1/PEF + 1/VF) x Cs
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	
				PEF	Particulate Emission Factor	1.43E+06	m3/kg	USEPA, 2002a	
				VF	Volatilization Factor	Chemical-specific	m3/kg	USEPA, 2002a	

Notes:

1 - Professional judgement.

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1991: Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual: Standard default Exposure Factors, OSWER Directive 9285.6-03, March, 1991.

USEPA, 2002a: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2002b:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

Unit Intake Calculations

Inhalation Intake = (ET x EF x ED)/(AT x CF)

Cancer Inhalation Intake = 1.96E-03 Noncancer Inhalation Intake = 1.37E-01

Cancer risk from ingestion = Air concentration x Cancer Inhalation Intake x Inhalation Cancer Slope Factor

Hazard Index from ingestion = Air concentration x Noncancer Inhalation Intake / Inhalation Reference Dose

TABLE 4.3 RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - CONSTRUCTION WORKERS - GROUNDWATER

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Construction Workers	Adult	OU7	Daevent	Dermally Absorbed Dose per Event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) =
				Cw	Chemical Concentration in Groundwater	Average	ug/L	(1)	
				FA	Fraction Absorbed	Chemical Specific	unitless	USEPA, 2004	DAevent x EV x EF x ED x SA
				CF	Conversion factor	0.001	L/cm^3	- -	BW x AT
				Kp	Permeability coefficient	Chemical Specific	cm/hr	USEPA, 2004	
				τ	Lag time	Chemical Specific	hr/event	USEPA, 2004	For inorganics
				t*	Time it takes to reach steady state	Chemical Specific	hr/event	USEPA, 2004	DAevent = Kp x CW x CF x tevent
				tevent	Duration of event	4	hr/event	(1)	
				B	Bunge model constant	Chemical Specific	unitless	USEPA, 2004	For organics if tevent <= t*
				SA	Skin Surface Available for Contact	3300	cm2	USEPA, 2004	DAevent= 2 x FA x Kp x Cw x CF x sqrt[(6 x τ x tevent)/pi]
				EV	Event Frequency	1	events/day	(1)	
				EF	Exposure Frequency	30	days/year	(1)	For organics if tevent > t*
				ED	Exposure Duration	1	years	(1)	DAevent =FA x Kp x Cw x CF x [tevent/(1+B) +
				BW	Body Weight	70	kg	USEPA, 1989	2 x τ +(1 + 3B + $3B^2$)/(1+B^2)
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	

Notes

1 - Professional judgment.

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 2002:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Ingestion Intake = (IR-GW x EF x ED) / (BW x AT)

Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Cancer Ingestion Intake =	1.6774E-07	Noncancer Ingestion Intake =	1.17E-05
Cancer Dermal Intake =	5.54E-02	Noncancer Dermal Intake =	3.87E+00

Cancer risk from dermal contact = Groundwater concentration x Cancer Dermal Intake x DAevent x Dermal Cancer Slope Factor

Hazard Index from dermal contact = Groundwater concentration x Noncancer Dermal Intake x DAevent / Dermal Reference Dose

TABLE 4.3 CTE

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURES - CONSTRUCTION WORKERS - GROUNDWATER

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Construction Workers	Adult	OU7	Daevent	Dermally Absorbed Dose per Event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) =
				Cw	Chemical Concentration in Groundwater	Average	ug/L	(1)	
				FA	Fraction Absorbed	Chemical Specific	unitless	USEPA, 2004	DAevent x EV x EF x ED x SA
				CF	Conversion factor	0.001	L/cm^3	- -	BW x AT
				Kp	Permeability coefficient	Chemical Specific	cm/hr	USEPA, 2004	
				τ	Lag time	Chemical Specific	hr/event	USEPA, 2004	For inorganics
				t*	Time it takes to reach steady state	Chemical Specific	hr/event	USEPA, 2004	DAevent = Kp x CW x CF x tevent
				tevent	Duration of event	2	hr/event	(1)	
				B	Bunge model constant	Chemical Specific	unitless	USEPA, 2004	For organics if tevent <= t*
				SA	Skin Surface Available for Contact	3300	cm2	USEPA, 2004	DAevent= 2 x FA x Kp x Cw x CF x sqrt[(6 x τ x tevent)/pi]
				EV	Event Frequency	1	events/day	(1)	
				EF	Exposure Frequency	15	days/year	(1)	DAevent =FA x Kp x Cw x CF x [tevent/(1+B) +
				ED	Exposure Duration	1	years	(1)	2 x τ +(1 + 3B + $3B^2$)/(1+B^2)
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	

Notes

1 - Professional judgment. For some factors, CTE is assumed to be 50 percent of RME.

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Cancer Dermal Intake = 2.77E-02 Noncancer Dermal Intake = 1.94E+00

Cancer risk from dermal contact = Groundwater concentration x Cancer Dermal Intake x DAevent x Dermal Cancer Slope Factor

Hazard Index from dermal contact = Groundwater concentration x Noncancer Dermal Intake x DAevent / Dermal Reference Dose

TABLE 4.4.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - OCCUPATIONAL WORKERS - SOIL

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

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

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Occupational Worker	Adult	OU7	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002a	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	100	mg/day	USEPA, 2002b	
				CF3	Conversion Factor 3	0.000001	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	--	Assumed	BW x AT
				EF	Exposure Frequency	250	days/year	USEPA, 1997	
				ED	Exposure Duration	25	years	USEPA, 1997	
				BW	Body Weight	70	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	9125	days	USEPA, 1989	
Dermal	Occupational Worker	Adult	OU7	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002a	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				SA	Skin Surface Available for Contact	3300	cm2	USEPA, 2004	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	250	days/year	USEPA, 1997	
				ED	Exposure Duration	25	years	USEPA, 1997	
				BW	Body Weight	70	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	9125	days	USEPA, 1989	

Notes:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1994. USEPA Region I Risk Updates, August 1994.

USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.

USEPAa, 2002a: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPAb, 2002b: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 3.49E-07 Cancer Dermal Intake = 2.31E-06

Noncancer Ingestion Intake = 9.78E-07 Noncancer Dermal Intake = 6.46E-06

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.4.CTE

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURES - OCCUPATIONAL WORKERS - SOIL

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

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

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Occupational Worker	Adult	OU7	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002a	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	50	mg/day	USEPA, 2002b	
				CF3	Conversion Factor 3	0.000001	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	Assumed	BW x AT
				EF	Exposure Frequency	219	days/year	USEPA, 1997	
				ED	Exposure Duration	9	years	USEPA, 1997	
				BW	Body Weight	70	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3285	days	USEPA, 1989	
Dermal	Occupational Worker	Adult	OU7	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002a	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				SA	Skin Surface Available for Contact	3300	cm2	USEPA, 2004	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.02	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	219	days/year	USEPA, 1997	
				ED	Exposure Duration	9	years	USEPA, 1997	
				BW	Body Weight	70	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3285	days	USEPA, 1989	

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

USEPA, 1994. USEPA Region I Risk Updates, August 1994.

USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.

USEPAa, 2002a: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPAb, 2002b: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 5.51E-08 Cancer Dermal Intake = 7.27E-08

Noncancer Ingestion Intake = 4.29E-07 Noncancer Dermal Intake = 5.66E-07

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.5.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - OCCUPATIONAL WORKERS - SOILS TO AIR

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Occupational Worker	Adult	OU7	CA	Chemical concentration in air	Calculated	mg/m3	USEPA, 2002a	Exposure Concentration (mg/m^3) =
				CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002b	
				ET	Exposure Time	8	hours/day	USEPA, 1991	CA x ET x EF x ED
				CF	Conversion Factor	24	hours/day	--	AT x CF
				EF	Exposure Frequency	250	days/year	USEPA, 1997	
				ED	Exposure Duration	25	years	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	CA = (1/PEF + 1/VF) x Cs
				AT-N	Averaging Time (Non-Cancer)	9125	days	USEPA, 1989	
				PEF	Particulate Emission Factor	9.37E+09	m3/kg	USEPA, 2002a	
				VF	Volatilization Factor	Chemical-specific	m3/kg	USEPA, 2002a	

Notes:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1991: Human Health Evaluation Manual, Supplemental guidance: Standard Default Exposure Factors, March 1991.

USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.

USEPA, 2002a: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2002b:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

Unit Intake Calculations

Inhalation Intake = (ET x EF x ED)/(AT x CF)

Cancer Inhalation Intake = 8.15E-02 Noncancer Inhalation Intake = 2.28E-01

Cancer risk from ingestion = Air concentration x Cancer Inhalation Intake x Inhalation Cancer Slope Factor

Hazard Index from ingestion = Air concentration x Noncancer Inhalation Intake / Inhalation Reference Dose

TABLE 4.5.CTE

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURES - OCCUPATIONAL WORKERS - SOILS TO AIR

PORSTMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Occupational Worker	Adult	OU7	CA	Chemical concentration in air	Calculated	mg/m3	USEPA, 2002a	Exposure Concentration (mg/m^3) =
				CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002b	
				ET	Exposure Time	8	hours/day	USEPA, 1991	CA x ET x EF x ED
				CF	Conversion Factor	24	hours/day	--	AT x CF
				EF	Exposure Frequency	219	days/year	USEPA, 1997	
				ED	Exposure Duration	9	years	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	CA = (1/PEF + 1/VF) x Cs
				AT-N	Averaging Time (Non-Cancer)	3285	days	USEPA, 1989	
				PEF	Particulate Emission Factor	9.37E+09	m3/kg	USEPA, 2002a	
				VF	Volatilization Factor	Chemical-specific	m3/kg	USEPA, 2002a	

Notes:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1991: Human Health Evaluation Manual, Supplemental guidance: Standard Default Exposure Factors, March 1991.

USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.

USEPA, 2002a: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2002b: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

Unit Intake Calculations

Inhalation Intake = (ET x EF x ED)/(AT x CF)

Cancer Inhalation Intake = 2.57E-02 Noncancer Inhalation Intake = 2.00E-01

Cancer risk from ingestion = Air concentration x Cancer Inhalation Intake x Inhalation Cancer Slope Factor

Hazard Index from ingestion = Air concentration x Noncancer Inhalation Intake / Inhalation Reference Dose

TABLE 4.6.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - ADULT RECREATIONAL USERS - SOILS

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Recreational User	Adult	OU7	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	100	mg/day	(1)	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	(2)	BW x AT
				EF	Exposure Frequency	90	days/year	(3)	
				ED	Exposure Duration (Age 16 - 30)	14	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	5,110	days	USEPA, 1989	
Dermal	Recreational User	Adult	OU7	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	5,700	cm2	USEPA, 2004	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.07	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	90	days/year	(3)	
				ED	Exposure Duration (Age 16 - 30)	14	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	5,110	days	USEPA, 1989	

Notes:

1 - Same as adult resident exposures.

2 - Professional Judgement.

3 - Professional judgement, 2 days per week during warm weather months (26 weeks).

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.

USEPA, 2002:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake (Age 16 - 30) = 7.05E-08 Cancer Dermal Intake (Age 6 - 30) = 2.81E-07

Mutagenic Chemicals

Cancer Ingestion Intake Age (16 - 30) = 7.05E-08 Cancer Dermal Intake (Age 16 - 30) = 2.81E-07

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 3.52E-07 Noncancer Dermal Intake = 1.41E-06

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.6.CTE

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURES - ADULT RECREATIONAL USERS - SOILS

PORSTMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Recreational User	Adult	OU7	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	50	mg/day	(1)	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	(2)	BW x AT
				EF	Exposure Frequency	90	days/year	(3)	
				ED	Exposure Duration	7	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,555	days	USEPA, 1989	
Dermal	Recreational User	Adult	OU7	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	5,700	cm2	USEPA, 2004	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.01	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	90	days/year	(3)	
				ED	Exposure Duration	7	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,555	days	USEPA, 1989	

Notes:

1 - Same as adult resident exposures.

2 - Professional Judgement.

3 - Professional judgement, 2 days per week during warm weather months (26 weeks).

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.

USEPA, 2002:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 1.76E-08 Cancer Dermal Intake = 2.01E-08

Noncancer Ingestion Intake = 1.76E-07 Noncancer Dermal Intake = 2.01E-07

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.7.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - ADULT RECREATIONAL USERS - SOILS TO AIR

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Surface/Subsurface Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Recreational User	Adult	OU7	CA	Chemical concentration in air	Calculated	mg/m3	USEPA, 2002a	Exposure Concentration (mg/m^3) =
				CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002b	
				ET	Exposure Time	2	hours/day	(1)	CA x ET x EF x ED
				CF	Conversion Factor	24	hours/day	--	AT x CF
				EF	Exposure Frequency	90	days/year	(2)	
				ED	Exposure Duration (Age 16 - 30)	14	years	(3)	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	CA = (1/PEF + 1/VF) x Cs
				AT-N	Averaging Time (Non-Cancer)	5110	days	USEPA, 1989	
				PEF	Particulate Emission Factor	9.37E+09	m3/kg	USEPA, 2002a	
				VF	Volatilization Factor	Chemical-specific	m3/kg	USEPA, 2002a	

Notes:

1 - Professional judgment.

2 - Professional judgment, 2 days a week in warm weather months (26 weeks)

3 - Same as adult resident exposures.

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 2002b: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2002b:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

Unit Intake Calculations

Inhalation Intake = (ET x EF x ED)/(AT x CF)

Cancer Inhalation Intake = 4.11E-03 Noncancer Inhalation Intake = 2.05E-02

Cancer risk from ingestion = Air concentration x Cancer Inhalation Intake x Inhalation Cancer Slope Factor

Hazard Index from ingestion = Air concentration x Noncancer Inhalation Intake / Inhalation Reference Dose

TABLE 4.7.CTE

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURES - ADULT RECREATIONAL USERS - SOILS TO AIR

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Surface/Subsurface Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Recreational User	Adult	OU7	CA	Chemical concentration in air	Calculated	mg/m3	USEPA, 2002a	Exposure Concentration (mg/m^3) =
				CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002b	
				ET	Exposure Time	2	hours/day	(1)	CA x ET x EF x ED
				CF	Conversion Factor	24	hours/day	--	AT x CF
				EF	Exposure Frequency	90	days/year	(2)	
				ED	Exposure Duration	7	years	(3)	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	CA = (1/PEF + 1/VF) x Cs
				AT-N	Averaging Time (Non-Cancer)	2555	days	USEPA, 1989	
				PEF	Particulate Emission Factor	9.37E+09	m3/kg	USEPA, 2002a	
				VF	Volatilization Factor	Chemical-specific	m3/kg	USEPA, 2002a	

Notes:

1 - Professional judgment.

2 - Professional judgment, 2 days a week in warm weather months (26 weeks)

3 - Same as adult resident exposures.

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 2002a: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2002b:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

Unit Intake Calculations

Inhalation Intake = (ET x EF x ED)/(AT x CF)

Cancer Inhalation Intake = 2.05E-03 Noncancer Inhalation Intake = 2.05E-02

Cancer risk from ingestion = Air concentration x Cancer Inhalation Intake x Inhalation Cancer Slope Factor

Hazard Index from ingestion = Air concentration x Noncancer Inhalation Intake / Inhalation Reference Dose

TABLE 4.8.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - ADULT RECREATIONAL USERS - SEDIMENT

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Recreational User	Adult	OU7	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	100	mg/day	(1)	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	CSx IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	(2)	BW x AT
				EF	Exposure Frequency	7	days/year	(2)	
				ED	Exposure Duration (Age 16 - 30)	14	years	(1) USEPA, 1989, 2005	
				BW	Body Weight	70	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	5,110	days	USEPA, 1989	
Dermal	Recreational User	Adult	OU7	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	5,700	cm2	USEPA, 2004	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.07	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	7	days/year	(2)	
				ED	Exposure Duration (Age 16 - 30)	14	years	(1) USEPA, 1989, 2005	
				BW	Body Weight	70	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	5,110	days	USEPA, 1989	

Notes:

1 - Same as adult resident exposures.

2 - Professional judgement.

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake (Age 6 - 30) = 5.48E-09 Cancer Dermal Intake (Age 6 - 30) = 2.19E-08

Mutagenic Chemicals

Cancer Ingestion Intake Age (16 - 30) = 5.48E-09 Cancer Dermal Intake Age 16 - 30) = 2.19E-08

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 2.74E-08 Noncancer Dermal Intake = 1.09E-07

Cancer risk from ingestion = Sediment concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Sediment concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Sediment concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Sediment concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.8.CTE

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURES - ADULT RECREATIONAL USERS - SEDIMENT

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Recreational User	Adult	OU7	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	50	mg/day	(1)	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	(2)	BW x AT
				EF	Exposure Frequency	4	days/year	(2)	
				ED	Exposure Duration	7	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,555	days	USEPA, 1989	
Dermal	Recreational User	Adult	OU7	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	5,700	cm2	USEPA, 2002	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.01	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	4	days/year	(2)	
				ED	Exposure Duration	7	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,555	days	USEPA, 1989	

Notes:

1 - Same as adult resident exposures to soil in the work plan.

2 - Professional judgement.

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 7.83E-10 Cancer Dermal Intake = 8.92E-10

Noncancer Ingestion Intake = 7.83E-09 Noncancer Dermal Intake = 8.92E-09

Cancer risk from ingestion = Sediment concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Sediment concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Sediment concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Sediment concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.9.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE - ADOLESCENT RECREATIONAL USERS - SOILS
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Recreational User	Adolescent	OU7	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	100	mg/day	(1)	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	(2)	BW x AT
				EF	Exposure Frequency	90	days/year	(3)	
				ED	Exposure Duration (Age 6 - 16)	10	years	(4), USEPA, 1989, 2005	
				BW	Body Weight	45	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,650	days	USEPA, 1989	
Dermal	Recreational User	Adolescent	OU7	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	4,050	cm2	(2)(5), USEPA, 2004	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm2/event	(2), USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	90	days/year	USEPA, 1994	
				ED	Exposure Duration (Age 6 - 16)	10	years	(4), USEPA, 1989, 2005	
				BW	Body Weight	45	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,650	days	USEPA, 1989	

Notes:
1 - Same as adult resident exposures.
2 - Professional judgement.
3 - Professional judgment, 2 days a week in warm weather months (26 weeks)
4 - For chemicals that act via the mutagenic mode of action the intake will be multiplied by the appropriate age-dependent adjustment factor in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).
5 - Assumes hands, forearms, lower legs, and feet are exposed.

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.
USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.
USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.
USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake (Age 6 - 16) = 7.83E-08 Cancer Dermal Intake (Age 6 - 16) = 6.34E-07

Mutagenic Chemicals

Cancer Ingestion Intake (Age 6 - 16) = 7.83E-08 Cancer Dermal Intake (Age 6 - 16) = 6.34E-07

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 5.48E-07 Noncancer Dermal Intake = 4.44E-06

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor
Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor
Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose
Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.9.CTE

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURES - ADOLESCENT RECREATIONAL USERS - SOILS

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Recreational User	Adolescent	OU7	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	50	mg/day	(1)	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	(2)	BW x AT
				EF	Exposure Frequency	90	days/year	(3)	
				ED	Exposure Duration	5	years	1/2 RME	
				BW	Body Weight	45	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	1,825	days	USEPA, 1989	
Dermal	Recreational User	Adolescent	OU7	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	4,050	cm2	(1), USEPA, 2004	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.04	mg/cm2/event	(1), USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	90	days/year	(3)	
				ED	Exposure Duration	5	years	1/2 RME	
				BW	Body Weight	45	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	1,825	days	USEPA, 1989	

Notes:

1 - Same as adult resident exposures.

2 - Professional judgement.

3 - Professional judgment, 2 days a week in warm weather months (26 weeks)

4 - Assumes hands, forearms, lower legs, and feet are exposed.

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 1.96E-08 Cancer Dermal Intake = 6.34E-08

Noncancer Ingestion Intake = 2.74E-07 Noncancer Dermal Intake = 8.88E-07

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.10.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - ADOLESCENT RECREATIONAL USERS - SOILS TO AIR

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Surface/Subsurface Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Recreational User	Adolescent	OU7	CA	Chemical concentration in air	Calculated	mg/m3	USEPA, 2002a	Exposure Concentration (mg/m^3) =
				CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002b	
				ET	Exposure Time	2	hours/day	(1)	CA x ET x EF x ED
				CF	Conversion Factor	24	hours/day	--	AT x CF
				EF	Exposure Frequency	90	days/year	(2)	
				ED	Exposure Duration	10	years	(3)	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	CA = (1/PEF + 1/VF) x Cs
				AT-N	Averaging Time (Non-Cancer)	3650	days	USEPA, 1989	
				PEF	Particulate Emission Factor	9.37E+09	m3/kg	USEPA, 2002a	
				VF	Volatilization Factor	Chemical-specific	m3/kg	USEPA, 2002a	

Notes:

1 - Professional judgment.

2 - Professional judgment, 2 days a week in warm weather months (26 weeks)

3 - For chemicals that act via the mutagenic mode of action the intake will be multiplied by the appropriate age-dependent adjustment factor in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 2002a: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2002b:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

Unit Intake Calculations

Inhalation Intake = (ET x EF x ED)/(AT x CF)

Cancer Inhalation Intake = 2.94E-03 Noncancer Inhalation Intake = 2.05E-02

Cancer risk from ingestion = Air concentration x Cancer Inhalation Intake x Inhalation Cancer Slope Factor

Hazard Index from ingestion = Air concentration x Noncancer Inhalation Intake / Inhalation Reference Dose

TABLE 4.10.CTE

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURES - ADOLESCENT RECREATIONAL USERS - SOILS TO AIR

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Surface/Subsurface Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Recreational User	Adolescent	OU7	CA	Chemical concentration in air	Calculated	mg/m3	USEPA, 2002a	Exposure Concentration (mg/m^3) =
				CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002b	
				ET	Exposure Time	2	hours/day	(1)	CA x ET x EF x ED
				CF	Conversion Factor	24	hours/day	--	AT x CF
				EF	Exposure Frequency	90	days/year	(2)	
				ED	Exposure Duration	5	years	1/2 RME	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	CA = (1/PEF + 1/VF) x Cs
				AT-N	Averaging Time (Non-Cancer)	1825	days	USEPA, 1989	
				PEF	Particulate Emission Factor	9.37E+09	m3/kg	USEPA, 2002a	
				VF	Volatilization Factor	Chemical-specific	m3/kg	USEPA, 2002a	

Notes:

1 - Professional judgment.

2 - Professional judgment, 2 days a week in warm weather months (26 weeks)

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 2002a: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2002b:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

Unit Intake Calculations

Inhalation Intake = (ET x EF x ED)/(AT x CF)

Cancer Inhalation Intake = 1.47E-03 Noncancer Inhalation Intake = 2.05E-02

Cancer risk from ingestion = Air concentration x Cancer Inhalation Intake x Inhalation Cancer Slope Factor

Hazard Index from ingestion = Air concentration x Noncancer Inhalation Intake / Inhalation Reference Dose

TABLE 4.11.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - ADOLESCENT RECREATIONAL USERS - SEDIMENT

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Recreational User	Adolescent	OU7	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	100	mg/day	(1)	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	CSx IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	(2)	BW x AT
				EF	Exposure Frequency	7	days/year	(2)	
				ED	Exposure Duration (Age 6 - 16)	10	years	(3), USEPA, 1989, 2005	
				BW	Body Weight	45	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,650	days	USEPA, 1989	
Dermal	Recreational User	Adolescent	OU7	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	4,050	cm2	(4)	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	7	days/year	(2)	
				ED	Exposure Duration (Age 6 - 16)	10	years	(3), USEPA, 1989, 2005	
				BW	Body Weight	45	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,650	days	USEPA, 1989	

Notes:

1 - Same as adult recreational user.

2 - Professional judgement.

3 - For chemicals that act via the mutagenic mode of action the intake will be multiplied by the appropriate age-dependent adjustment factor in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

4 - Assumes hands, forearms, lower legs, and feet are exposed.

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake (Age 6 - 16) = 6.09E-09 Cancer Dermal Intake (Age 6 - 16) = 4.93E-08

Mutagenic Chemicals

Cancer Ingestion Intake (Age 6 - 16) = 6.09E-09 Cancer Dermal Intake (Age 6 - 16) = 4.93E-08

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 4.26E-08 Noncancer Dermal Intake = 3.45E-07

Cancer risk from ingestion = Sediment concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Sediment concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Sediment concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Sediment concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.11.CTE

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURES - ADOLESCENT RECREATIONAL USERS - SEDIMENT

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Recreational User	Adolescent	OU7	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	50	mg/day	(1)	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	(2)	BW x AT
				EF	Exposure Frequency	4	days/year	(1)	
				ED	Exposure Duration	5	years	1/2 RME	
				BW	Body Weight	45	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	1,825	days	USEPA, 1989	
Dermal	Recreational User	Adolescent	OU7	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	4,050	cm2	(3)	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.04	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	4	days/year	(1)	
				ED	Exposure Duration	5	years	1/2 RME	
				BW	Body Weight	45	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	1,825	days	USEPA, 1989	

Notes:

1 - Same as adult recreational user.

2 - Professional judgement.

3 - Assumes hands, forearms, lower legs, and feet are exposed.

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 8.70E-10 Cancer Dermal Intake = 2.82E-09

Noncancer Ingestion Intake = 1.22E-08 Noncancer Dermal Intake = 3.95E-08

Cancer risk from ingestion = Sediment concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Sediment concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Sediment concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Sediment concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.12.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - ADULT RESIDENTS - SOILS

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

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

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Residents	Adult	OU7	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002a	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	100	mg/day	USEPA, 2002b	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	Assumed	BW x AT
				EF	Exposure Frequency	350	days/year	USEPA, 2002b	
				ED1	Exposure Duration (Age 6 - 16)	10	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 16 - 30)	14	years	(1), USEPA, 1989, 2005	
				BW	Body Weight	70	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1989	
Dermal	Residents	Adult	OU7	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	5,700	cm2	USEPA, 2004	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.07	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	350	days/year	USEPA, 2002b	
				ED1	Exposure Duration (Age 6 - 16)	10	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 16 - 30)	14	years	(1), USEPA, 1989, 2005	
				BW	Body Weight	70	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1989	

Notes:

1 - Adults were evaluated as one age group (7 - 30 years) for non-mutagenic chemicals. For chemicals that act via the mutagenic mode of action, residential adults were evaluated as two age groups, 7 - 16 years and 16 - 30 years in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.

USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.

USEPA, 2002a:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2002b: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake (Age 6 - 30) = 4.70E-07 Cancer Dermal Intake (Age 6 - 30) = 1.87E-06

Mutagenic Chemicals

Cancer Ingestion Intake (Age 6 - 16) = 1.96E-07 Cancer Dermal Intake (Age 6 - 16) = 7.81E-07

Cancer Ingestion Intake (Age 16 - 30) = 2.74E-07 Cancer Dermal Intake (Age 16 - 30) = 1.09E-06

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 1.37E-06 Noncancer Dermal Intake = 5.47E-06

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.12.CTE

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURES - ADULT RESIDENTS - SOILS

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

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

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Residents	Adult	OU7	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002b	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	50	mg/day	USEPA, 2002b	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	Assumed	BW x AT
				EF	Exposure Frequency	234	days/year	USEPA, 2002b	
				ED	Exposure Duration	7	years	USEPA, 2002b	
				BW	Body Weight	70	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,555	days	USEPA, 1989	
Dermal	Residents	Adult	OU7	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002a	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	5,700	cm2	USEPA, 2004	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.01	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	234	days/year	USEPA, 2002b	
				ED	Exposure Duration	7	years	USEPA, 2002b	
				BW	Body Weight	70	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,555	days	USEPA, 1989	

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.

USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.

USEPA, 2002a:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2002b: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 4.58E-08 Cancer Dermal Intake = 5.22E-08

Noncancer Ingestion Intake = 4.58E-07 Noncancer Dermal Intake = 5.22E-07

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.13.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - ADULT RESIDENTS - SOILS TO AIR

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Residents	Adult	OU7	CA	Chemical concentration in air	Calculated	mg/m3	USEPA, 2002a	Exposure Concentration (mg/m^3) =
				CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002b	
				ET	Exposure Time	24	hours/day	USEPA, 2002a	CA x ET x EF x ED
				CF	Conversion Factor	24	hours/day	--	AT x CF
				EF	Exposure Frequency	350	days/year	USEPA, 2002a	
				ED1	Exposure Duration (Age 6 - 16)	10	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 16 - 30)	14	years	(1), USEPA, 1989, 2005	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	CA = (1/PEF + 1/VF) x Cs
				AT-N	Averaging Time (Non-Cancer)	3650	days	USEPA, 1989	
				PEF	Particulate Emission Factor	9.37E+09	m3/kg	USEPA, 2002a	
				VF	Volatilization Factor	Chemical-specific	m3/kg	USEPA, 2002a	

Notes:

1 - Adults were evaluated as one age group (7 - 30 years) for non-mutagenic chemicals. For chemicals that act via the mutagenic mode of action, residential adults were evaluated as two age groups, 7 - 16 years and 16 - 30 years in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 2002a: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2002b:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

Unit Intake Calculations

Inhalation Intake = (ET x EF x ED)/(AT x CF)

Cancer Inhalation Intake = 1.37E-01 Noncancer Inhalation Intake = 9.59E-01

Cancer risk from ingestion = Air concentration x Cancer Inhalation Intake x Inhalation Cancer Slope Factor

Hazard Index from ingestion = Air concentration x Noncancer Inhalation Intake / Inhalation Reference Dose

TABLE 4.13.CTE

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURES - ADULT RESIDENTS - SOILS TO AIR

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Residents	Adult	OU7	CA	Chemical concentration in air	Calculated	mg/m3	USEPA, 2002a	Exposure Concentration (mg/m^3) =
				CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002b	
				ET	Exposure Time	24	hours/day	USEPA, 2002a	CA x ET x EF x ED
				CF	Conversion Factor	24	hours/day	--	AT x CF
				EF	Exposure Frequency	234	days/year	USEPA, 2002a	
				ED	Exposure Duration	7	years	USEPA, 2002a	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	CA = (1/PEF + 1/VF) x Cs
				AT-N	Averaging Time (Non-Cancer)	2555	days	USEPA, 1989	
				PEF	Particulate Emission Factor	9.37E+09	m3/kg	USEPA, 2002a	
				VF	Volatilization Factor	Chemical-specific	m3/kg	USEPA, 2002a	

Notes:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 2002a: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2002b:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

Unit Intake Calculations

Inhalation Intake = (ET x EF x ED)/(AT x CF)

Cancer Inhalation Intake = 6.41E-02 Noncancer Inhalation Intake = 6.41E-01

Cancer risk from ingestion = Air concentration x Cancer Inhalation Intake x Inhalation Cancer Slope Factor

Hazard Index from ingestion = Air concentration x Noncancer Inhalation Intake / Inhalation Reference Dose

TABLE 4.14.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE - CHILD RESIDENTS - SOILS
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

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

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Residents	Child	OU7	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002a	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	200	mg/day	USEPA, 2002b	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	Assumed	BW x AT
				EF	Exposure Frequency	350	days/year	USEPA, 2002b	
				ED1	Exposure Duration (Age 0 - 2)	2	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 2 - 6)	4	years	(1), USEPA, 1989, 2005	
				BW	Body Weight	15	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1989	
Dermal	Residents	Child	OU7	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002a	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	1E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	2,800	cm2	USEPA, 2004	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	350	days/year	USEPA, 2002b	
				ED1	Exposure Duration (Age 0 - 2)	2	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 2 - 6)	4	years	(1), USEPA, 1989, 2005	
				BW	Body Weight	15	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1989	

Notes:

1 - Children were evaluated as one age group (0 - 6 years) for non-mutagenic chemicals. For chemicals that act via the mutagenic mode of action, recreational children were evaluated as two age groups, 0 - 2 years and 2 - 6 years in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.

USEPA, 2002a:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2002b: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake (Age 0 - 6) = 1.10E-06 Cancer Dermal Intake (Age 0 - 6) = 3.07E-06

Mutagenic Chemicals

Cancer Ingestion Intake (Age 0 - 2) = 3.65E-07 Cancer Dermal Intake (Age 0 - 2) = 1.02E-06

Cancer Ingestion Intake (Age 2 - 6) = 7.31E-07 Cancer Dermal Intake (Age 2 - 6) = 2.05E-06

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 1.28E-05 Noncancer Dermal Intake = 3.58E-05

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.14.CTE

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURES - CHILD RESIDENTS - SOILS

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

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

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Residents	Child	OU7	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002a	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	100	mg/day	USEPA, 2002b	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	Assumed	BW x AT
				EF	Exposure Frequency	234	days/year	USEPA, 2002b	
				ED	Exposure Duration	2	years	USEPA, 2002b	
				BW	Body Weight	15	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	730	days	USEPA, 1989	
Dermal	Residents	Child	OU7	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 1994	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	1E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	2,800	cm2	USEPA, 2004	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.04	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	234	days/year	USEPA, 2002b	
				ED	Exposure Duration	2	years	USEPA, 2002b	
				BW	Body Weight	15	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	730	days	USEPA, 1989	

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.

USEPA, 2002a:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2002b: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 1.22E-07 Cancer Dermal Intake = 1.37E-07

Noncancer Ingestion Intake = 4.27E-06 Noncancer Dermal Intake = 4.79E-06

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.15.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - CHILD RESIDENTS - SOILS TO AIR

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Residents	Child	OU7	CA	Chemical concentration in air	Calculated	mg/m3	USEPA, 2002a	Exposure Concentration (mg/m^3) =
				CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002b	
				ET	Exposure Time	24	hours/day	USEPA, 2002a	CA x ET x EF x ED
				CF	Conversion Factor	24	hours/day	--	AT x CF
				EF	Exposure Frequency	350	days/year	USEPA, 2002a	
				ED1	Exposure Duration (Age 0 - 2)	2	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 2 - 6)	4	years	(1), USEPA, 1989, 2005	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	CA = (1/PEF + 1/VF) x Cs
				AT-N	Averaging Time (Non-Cancer)	2190	days	USEPA, 1989	
				PEF	Particulate Emission Factor	9.37E+09	m3/kg	USEPA, 2002a	
				VF	Volatilization Factor	Chemical-specific	m3/kg	USEPA, 2002a	

Notes:

1 - Children were evaluated as one age group (0 - 6 years) for non-mutagenic chemicals. For chemicals that act via the mutagenic mode of action, recreational children were evaluated as two age groups, 0 - 2 years and 2 - 6 years in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 2002a: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2002b:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

Unit Intake Calculations

Inhalation Intake = (ET x EF x ED)/(AT x CF)

Cancer Inhalation Intake = 8.22E-02 Noncancer Inhalation Intake = 9.59E-01

Cancer risk from ingestion = Air concentration x Cancer Inhalation Intake x Inhalation Cancer Slope Factor

Hazard Index from ingestion = Air concentration x Noncancer Inhalation Intake / Inhalation Reference Dose

TABLE 4.15.CTE

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURES - CHILD RESIDENTS - SOILS TO AIR

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Residents	Child	OU7	CA	Chemical concentration in air	Calculated	mg/m3	USEPA, 2002a	Exposure Concentration (mg/m^3) =
				CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002b	
				ET	Exposure Time	24	hours/day	USEPA, 2002a	CA x ET x EF x ED
				CF	Conversion Factor	24	hours/day	--	AT x CF
				EF	Exposure Frequency	234	days/year	USEPA, 2002a	
				ED	Exposure Duration	2	years	USEPA, 2002a	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	CA = (1/PEF + 1/VF) x Cs
				AT-N	Averaging Time (Non-Cancer)	730	days	USEPA, 1989	
				PEF	Particulate Emission Factor	9.37E+09	m3/kg	USEPA, 2002a	
				VF	Volatilization Factor	Chemical-specific	m3/kg	USEPA, 2002a	

Notes:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1994. USEPA Region I Risk Updates, August 1994.

USEPA, 2002a: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2002b:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

Unit Intake Calculations

Inhalation Intake = (ET x EF x ED)/(AT x CF)

Cancer Inhalation Intake = 1.83E-02 Noncancer Inhalation Intake = 6.41E-01

Cancer risk from ingestion = Air concentration x Cancer Inhalation Intake x Inhalation Cancer Slope Factor

Hazard Index from ingestion = Air concentration x Noncancer Inhalation Intake / Inhalation Reference Dose

RAGS Part D Table 5

Non-Cancer Toxicity Data

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NON-CANCER TOXICITY DATA

Table No.

5-1 Non-Cancer Toxicity Data - Oral/Dermal
5-2 Non-Cancer Toxicity Data - Inhalation

TABLE 5.1
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
OPERABLE UNIT 7 REMEDIAL INVESTIGATION
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal[1]	Absorbed RfD for Dermal[2]		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Semivolatile Organic Compounds										
BAP Equivalent	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs										
Aroclor-1254	Chronic	5.0E-02	mg/kg/day	1	5.0E-02	mg/kg/day	Immune	300/1	IRIS	6/10/2011
Aroclor-1260[3]	Chronic	5.0E-02	mg/kg/day	1	5.0E-02	mg/kg/day	NA	300/1	IRIS	6/10/2011
TEQ PCB[4]	Chronic	1.0E-09	mg/kg/day	1	1.0E-09	mg/kg/day	Developmental	90	ASTDR	12/1995
Total PCB Congeners[5]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dioxins/Furans										
2,3,7,8-TCDD TEQ	Chronic	1.0E-09	mg/kg/day	1	1.0E-09	mg/kg/day	Developmental	90	ASTDR	12/1995
Inorganics										
Antimony	Chronic	4.0E-04	mg/kg/day	0.15	6.0E-05	mg/kg/day	Blood	1000/1	IRIS	6/10/2011
Arsenic	Chronic	3.0E-04	mg/kg/day	1	3.0E-04	mg/kg/day	Skin, CVS	3/1	IRIS	6/10/2011
Barium	Chronic	2.0E-01	mg/kg/day	0.07	1.4E-02	mg/kg/day	Kidney	300/1	IRIS	6/10/2011
Cadmium[6]	Chronic	1.0E-03	mg/kg/day	0.025	2.5E-05	mg/kg/day	NA	10/1	IRIS	6/10/2011
Chromium[7]	Chronic	1.5E+00	mg/kg/day	0.013	2.0E-02	mg/kg/day	NOAEL	100/10	IRIS	6/10/2011
Cobalt	Chronic	3.0E-04	mg/kg/day	1	3.0E-04	mg/kg/day	Blood	3000/1	PPRV	8/25/2008
Copper	Chronic	4.0E-02	mg/kg/day	1	4.0E-02	mg/kg/day	GS	NA	HEAST	7/1997
Iron	Chronic	7.0E-01	mg/kg/day	1	7.0E-01	mg/kg/day	GS	1.5	PPRTV	9/11/2006
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese (soil)[8]	Chronic	1.4E-01	mg/kg/day	0.04	5.6E-03	mg/kg/day	CNS	1/1	IRIS	6/10/2011
Mercury[9]	Chronic	3.0E-04	mg/kg/day	0.07	2.1E-05	mg/kg/day	Autoimmune	1000/1	IRIS	6/10/2011
Nickel	Chronic	2.0E-02	mg/kg/day	0.04	8.0E-04	mg/kg/day	Body Weight	300/1	IRIS	6/10/2011
Thallium	Chronic	1.0E-05	mg/kg/day	1	1.0E-05	mg/kg/day	Skin	3000/1	PPRTV	10/8/2010
Zinc	Chronic	3.0E-01	mg/kg/day	1	3.0E-01	mg/kg/day	Blood	3/1	IRIS	6/10/2011

Notes:
1 - U.S. EPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.
2 - Adjusted dermal RfD = Oral RfD x Oral Absorption Efficiency for Dermal.
3 - Values are for Aroclor-1254.
4 - Criteria for 2,3,7,8-TCDD were used for this parameter.
5 - Criteria for PCBs (high risk) were used for this parameter.
6 - Values are for cadmium - diet.
7 - Values are for trivalent chromium.
8 - Adjusted IRIS value in accordance with USEPA Region I Risk Update Number 4, November 1996.
9 - Values are for mercuric chloride (and other mercury salts).

Definitions:
CNS = Central Nervous System
CVS = Cardiovascular system
GS = Gastrointestinal
HEAST = Health Effects Assessment Summary Tables
IRIS = Integrated Risk Information System
NA = Not Available.
NOAEL = No observed adverse effect level
PPRTV = Provisional Peer Reviewed Toxicity Values

TABLE 5.2
NON-CANCER TOXICITY DATA -- INHALATION
OPERABLE UNIT 7 REMEDIAL INVESTIGATION
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Chemical of Potential Concern	Chronic/ Subchronic	Inhalation RfC		Extrapolated RfD[1]		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
		Value	Units	Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Semivolatile Organic Compounds									
BAP Equivalent	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs									
Aroclor-1254	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA	NA	NA	NA
TEQ PCB[2]	Chronic	4.00E-08	mg/m^3	1.1E-08	(mg/kg/day)	Liver, Respiratory, Developmental	NA	Cal EPA	12/2000
Total PCB Congeners[3]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dioxins/Furans									
2,3,7,8-TCDD TEQ	Chronic	4.00E-08	mg/m^3	1.1E-08	(mg/kg/day)	Liver, Respiratory, Developmental	NA	Cal EPA	12/2000
Inorganics									
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	Chronic	1.50E-05	mg/m^3	4.3E-06	(mg/kg/day)	NA	NA	Cal EPA	9/2009
Barium	Chronic	5.0E-04	mg/m^3	1.4E-04	(mg/kg/day)	Fetotoxicity	1000/1	HEAST	9/1997
Cadmium	Chronic	2.0E-05	mg/m^3	5.7E-06	(mg/kg/day)	NA	NA	Cal EPA	12/2000
Chromium[4]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	Chronic	6.0E-06	mg/m^3	1.7E-06	(mg/kg/day)	Lungs	NA	PPRTV	8/25/2008
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	Chronic	5.0E-05	mg/m^3	1.4E-05	(mg/kg/day)	CNS	1000/1	IRIS	6/10/2011
Mercury	NA	3.0E-05	NA	NA	NA	CNS	NA	Cal EPA	12/2008
Nickel	Chronic	9.00E-05	mg/m^3	2.6E-05	(mg/kg/day)	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	Respiratory	30/1	ATSDR	9/2005
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 - Extrapolated RfD = RfC *$20m^3$/day / 70 kg
2 - Criteria for 2,3,7,8-TCDD were used for this parameter.
3 - Criteria for PCBs (high risk) were used for this parameter.
4 - Total and trivalent chromium are considered.

Definitions:
CNS = Central Nervous System
HEAST= Health Effects Assessment Summary Tables
IRIS = Integrated Risk Information System
NA = Not Applicable
PPRTV = Provisional Peer Reviewed Toxicity Values

RAGS Part D Table 6

Cancer Toxicity Data

LIST OF TABLES
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CANCER TOXICITY DATA

Table No.

6-1	Cancer Toxicity Data - Oral/Dermal
6-2	Cancer Toxicity Data - Inhalation

TABLE 6.1
CANCER TOXICITY DATA -- ORAL/DERMAL
OPERABLE UNIT 7 REMEDIAL INVESTIGATION
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal[1]	Absorbed Cancer Slope Factor for Dermal[2]		Weight of Evidence/ Cancer Guideline Description	Oral CSF	
	Value	Units		Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
Semivolatile Organic Compounds								
BAP Equivalent[3]	7.3E+00	$(mg/kg/day)^{-1}$	1	7.3E+00	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	IRIS	6/10/2011
PCBs								
Aroclor-1254	2.0E+00	$(mg/kg/day)^{-1}$	1	2.0E+00	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	USEPA(1)	9/1996
Aroclor-1260	2.0E+00	$(mg/kg/day)^{-1}$	1	2.0E+00	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	USEPA(1)	9/1996
TEQ PCB[4]	1.3E+05	$(mg/kg/day)^{-1}$	1	1.3E+05	$(mg/kg/day)^{-1}$	NA	CAL EPA	9/2009
Total PCB Congeners[5]	2.0E+00	$(mg/kg/day)^{-1}$	1	2.0E+00	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	IRIS	6/10/2011
Dioxins/Furans								
2,3,7,8-TCDD TEQ	1.3E+05	$(mg/kg/day)^{-1}$	1	1.3E+05	$(mg/kg/day)^{-1}$	NA	CAL EPA	9/2009
Inorganics								
Antimony	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	1.5E+00	$(mg/kg/day)^{-1}$	1	1.5E+00	$(mg/kg/day)^{-1}$	A (Human Carcinogen)	IRIS	6/10/2011
Barium	NA	NA	NA	NA	NA	D (Not classifiable as to human carcinogenicity)	IRIS	6/10/2011
Cadmium	NA	NA	NA	NA	NA	B1 / Probable human carcinogen	IRIS	6/10/2011
Chromium	NA	NA	NA	NA	NA	D / Not classifiable as to human carcinogenicity	IRIS	6/10/2011
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	D / Not classifiable as to human carcinogenicity	IRIS	6/10/2011
Iron	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	B2 / Probable human carcinogen	IRIS	6/10/2011
Manganese	NA	NA	NA	NA	NA	D / Not classifiable as to human carcinogenicity	IRIS	6/10/2011
Mercury	NA	NA	NA	NA	NA	C/ Possible Human Carcinogen	IRIS	6/10/2011
Nickel	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	D / Not classifiable as to human carcinogenicity	IRIS	6/10/2011
Zinc	NA	NA	NA	NA	NA	D / Not classifiable as to human carcinogenicity	IRIS	6/10/2011

Notes:
1 - USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.
2 - Adjusted cancer slope factor for dermal = Oral cancer slope factor / Oral Absorption Efficiency for Dermal.
3 - The carcinogenic PAHs are considered to act via the mutagenic mode of action. These chemicals are evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).
4 - Criteria for 2,3,7,8-TCDD were used for this parameter.
5 - Criteria for PCBs (high risk) were used for this parameter.

Definitions:
HEAST = Health Effects Assessment Summary Tables
IRIS = Integrated Risk Information System.
NA = Not Available.

USEPA(1) = USEPA, PCBs: Cancer Dose-Response Assessment and Applications to Environmental Mixtures, September 1996, EPA/600/P-96/001F.

TABLE 6.2
CANCER TOXICITY DATA -- INHALATION
OPERABLE UNIT 7 REMEDIAL INVESTIGATION
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Chemical of Potential Concern	Unit Risk		Inhalation Cancer Slope Factor[1]		Weight of Evidence/ Cancer Guideline Description	Unit Risk : Inhalation CSF	
	Value	Units	Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
Semivolatile Organic Compounds							
BAP Equivalent[2]	1.1E-03	$(ug/m^3)^{-1}$	3.9E+00	$(mg/kg/day)^{-1}$	NA	IRIS	6/10/2011
PCBs							
Aroclor-1254	5.7E-04	$(ug/m^3)^{-1}$	2.0E+00	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	USEPA(1)	9/1996
Aroclor-1260	5.7E-04	$(ug/m^3)^{-1}$	2.0E+00	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	USEPA(1)	9/1996
TEQ PCB[3]	3.8E+01	$(ug/m^3)^{-1}$	1.3E+05	$(mg/kg/day)^{-1}$	NA	CAL EPA	9/2009
Total PCB Congeners[4]	5.7E-04	$(ug/m^3)^{-1}$	2.0E+00	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	IRIS	9/09/2009
Dioxins/Furans							
2,3,7,8-TCDD TEQ	3.8E+01	$(ug/m^3)^{-1}$	1.3E+05	$(mg/kg/day)^{-1}$	NA	CAL EPA	9/2009
Inorganics							
Antimony	NA	NA	NA	NA	NA	NA	NA
Arsenic	4.3E-03	$(ug/m^3)^{-1}$	1.5E+01	$(mg/kg/day)^{-1}$	A / Known human carcinogen	IRIS	6/10/2011
Barium	NA	NA	NA	NA	D / Not classifiable as to human carcinogenicity	IRIS	6/10/2011
Cadmium[5]	1.8E-03	$(ug/m^3)^{-1}$	6.3E+00	$(mg/kg/day)^{-1}$	B1 / Probable human carcinogen	IRIS	6/10/2011
Chromium[6]	NA	NA	NA	NA	D / Not classifiable as to human carcinogenicity	IRIS	6/10/2011
Cobalt	9.0E-03	$(ug/m^3)^{-1}$	3.2E+01	$(mg/kg/day)^{-1}$	NA	PPRTV	8/25/2008
Copper	NA	NA	NA	NA	D / Not classifiable as to human carcinogenicity	IRIS	6/10/2011
Iron	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	B2 / Probable human carcinogen	IRIS	6/10/2011
Manganese	NA	NA	NA	NA	D / Not classifiable as to human carcinogenicity	IRIS	6/10/2011
Mercury	NA	NA	NA	NA	C/ Possible Human Carcinogen	IRIS	6/10/2011
Nickel	2.6E-04	$(ug/m^3)^{-1}$	9.1E-01	$(mg/kg/day)^{-1}$	NA	NA	NA
Thallium	NA	NA	NA	NA	D / Not classifiable as to human carcinogenicity	IRIS	6/10/2011
Zinc	NA	NA	NA	NA	D / Not classifiable as to human carcinogenicity	IRIS	6/10/2011

1 - Inhalation CSF = Unit Risk * 70 kg / $20m^3$/day.

2 - The carcinogenic PAHs are considered to act via the mutagenic mode of action. These chemicals are evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

3 - Criteria for 2,3,7,8-TCDD were used for this parameter.

4 - Criteria for PCB hexachlorobiphenyl (2,3,3',4,4',5') were used for this parameter.

5 - Values are for cadmium - diet.

6 - Values are for total chromium.

IRIS = Integrated Risk Information System.

NA = Not Available.

USEPA(1) = USEPA, PCBs: Cancer Dose-Response Assessment and Applications to Environmental Mixtures, September 1996, EPA/600/P-96/001F.

RAGS Part D Table 7

Calculation Of Cancer Risks and Non-Cancer Hazards

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CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

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7.1A.RME	Construction Workers - Entire Site Surface/Subsurface Soil
7.1B.RME	Construction Workers - Former Location of Buidling 237 Subsurface Soil
7.2.RME	Occupational Workers - Entire Site Surface Soil
7.3.RME	Adult Recreational Users - Entire Site Surface Soil & Sediment
7.4.RME	Adolescent Recreational Users - Entire Site Surface Soil & Sediment
7.5.RME	Adult Residents - Entire Site Surface Soil
7.6.RME	Child Residents - Entire Site Surface Soil
	CENTRAL TENDENCY EXPOSURES
7.1A.CTE	Construction Workers - Entire Site Surface/Subsurface Soil
7.1B.CTE	Construction Workers - Former Location of Building 237 Subsurface Soil
7.2.CTE	Occupational Workers - Entire Site Surface Soil
7.3.CTE	Adult Recreational Users - Entire Site Surface Soil & Sediment
7.4.CTE	Adolescent Recreational Users - Entire Site Surface Soil & Sediment
7.5.CTE	Adult Residents - Entire Site Surface Soil
7.6.CTE	Child Residents - Entire Site Surface Soil

TABLE 7.1A.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.80	mg/kg	5.0E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	3.6E-07	3.5E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	4.2E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	8.3E-08	2.9E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	9.3E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	6.5E-04	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.003
				Chromium	62.2	mg/kg	1.7E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.2E-04	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.00008
				Copper	1,030	mg/kg	2.9E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.0E-03	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.05
				Iron	34,200	mg/kg	9.5E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	6.6E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.09
				Lead	510	mg/kg	1.4E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	9.9E-04	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	5.8E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.1E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.01
				Thallium	0.480	mg/kg	1.3E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	9.3E-07	(mg/kg/day)	1.0E-05	(mg/kg/day)	0.09
			Exp. Route Total								4.5E-07					0.3
			Dermal	Benzo(a)pyrene Equivalents	1.80	mg/kg	1.9E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.4E-07	1.4E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	1.7E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	3.5E-08	1.2E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	--
				Chromium	62.2	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.0E-02	(mg/kg/day)	--
				Copper	1,030	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Iron	34,200	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	510	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	--
				Thallium	0.480	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.0E-05	(mg/kg/day)	--
			Exp. Route Total								1.8E-07					--
		Exposure Point Total									6.2E-07					0.3
	Exposure Medium Total										6.2E-07					0.3
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.3E-6	mg/m^3	2.5E-09	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	2.7E-09	1.7E-07	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1248	1.0E-6	mg/m^3	2.1E-09	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	1.2E-09	1.4E-07	(mg/m^3)	NA	(mg/m^3)	--
				Barium	2.3E-4	mg/m^3	4.6E-07	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	3.2E-05	(mg/m^3)	5.0E-04	(mg/m^3)	0.06
				Chromium	4.3E-5	mg/m^3	8.5E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	6.0E-06	(mg/m^3)	NA	(mg/m^3)	--
				Copper	7.2E-4	mg/m^3	1.4E-06	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	9.9E-05	(mg/m^3)	NA	(mg/m^3)	--
				Iron	0.024	mg/m^3	4.7E-05	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	3.3E-03	(mg/m^3)	NA	(mg/m^3)	--
				Lead	3.6E-4	mg/m^3	7.0E-07	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	4.9E-05	(mg/m^3)	NA	(mg/m^3)	--
				Mercury	1.5E-6	mg/m^3	2.9E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.0E-07	(mg/m^3)	3.0E-05	(mg/m^3)	0.007
				Thallium	3.4E-7	mg/m^3	6.6E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	4.6E-08	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								3.9E-09					0.07
		Exposure Point Total									3.9E-09					0.07
	Exposure Medium Total										3.9E-09					0.07
Medium Total											6.3E-07					0.3
Subsurface Soil	Subsurface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.10	mg/kg	3.0E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	2.2E-07	2.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	41.0	mg/kg	1.1E-06	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.3E-06	7.9E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1260	4.60	mg/kg	1.3E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.5E-07	8.9E-06	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.4
				2,3,7,8-TCDD Equivalents	0.001	mg/kg	3.6E-11	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	4.7E-06	2.5E-09	(mg/kg/day)	1.0E-09	(mg/kg/day)	2.5
				Antimony	182	mg/kg	5.0E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.5E-04	(mg/kg/day)	4.0E-04	(mg/kg/day)	0.9
				Barium	280	mg/kg	7.7E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	5.4E-04	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.003
				Cadmium	5.10	mg/kg	1.4E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	9.9E-06	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.010
				Chromium	290	mg/kg	8.0E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	5.6E-04	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.0004
				Cobalt	15.9	mg/kg	4.4E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.1E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.1
				Copper	6,020	mg/kg	1.7E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.2E-02	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.3
				Iron	97,100	mg/kg	2.7E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.9E-01	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.3
				Lead	1,600	mg/kg	4.4E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.1E-03	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	969	mg/kg	2.7E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.9E-03	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.01
				Mercury	9.40	mg/kg	2.6E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.8E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.06
				Nickel	484	mg/kg	1.3E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	9.4E-04	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.05
				Thallium	0.890	mg/kg	2.5E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.7E-06	(mg/kg/day)	1.0E-05	(mg/kg/day)	0.2
				Zinc	2,600	mg/kg	7.2E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	5.0E-03	(mg/kg/day)	3.0E-01	(mg/kg/day)	0.02
			Exp. Route Total								7.4E-06					4.8

TABLE 7.1A.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Subsurface Soil	Subsurface Soil	OU7	Dermal	Benzo(a)pyrene Equivalents	1.10	mg/kg	1.2E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	8.7E-08	8.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	41.0	mg/kg	4.8E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	9.5E-07	3.3E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1260	4.60	mg/kg	5.3E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.1E-07	3.7E-06	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.2
				2,3,7,8-TCDD Equivalents	0.001	mg/kg	3.2E-12	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	4.2E-07	2.3E-10	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.2
				Antimony	182	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	6.0E-05	(mg/kg/day)	--
				Barium	280	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	--
				Cadmium	5.10	mg/kg	4.2E-10	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.0E-08	(mg/kg/day)	2.5E-05	(mg/kg/day)	0.001
				Chromium	290	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.0E-02	(mg/kg/day)	--
				Cobalt	15.9	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	--
				Copper	6,020	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Iron	97,100	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	1,600	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	969	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
				Mercury	9.40	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	--
				Nickel	484	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	8.0E-04	(mg/kg/day)	--
				Thallium	0.890	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.0E-05	(mg/kg/day)	--
				Zinc	2,600	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	3.0E-01	(mg/kg/day)	--
			Exp. Route Total								1.6E-06					0.4
		Exposure Point Total									9.0E-06					5.2
	Exposure Medium Total										9.0E-06					5.2
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	7.7E-7	mg/m^3	1.5E-09	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	1.7E-09	1.1E-07	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1248	2.9E-5	mg/m^3	5.6E-08	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	3.2E-08	3.9E-06	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1260	3.2E-6	mg/m^3	6.3E-09	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	3.6E-09	4.4E-07	(mg/m^3)	NA	(mg/m^3)	--
				2,3,7,8-TCDD Equivalents	9.1E-10	mg/m^3	1.8E-12	(mg/m^3)	3.8E+01	$(ug/m^3)^{-1}$	6.8E-08	1.2E-10	(mg/m^3)	4.0E-08	(mg/m^3)	0.003
				Antimony	1.3E-4	mg/m^3	2.5E-07	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.7E-05	(mg/m^3)		(mg/m^3)	--
				Barium	2.0E-4	mg/m^3	3.8E-07	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.7E-05	(mg/m^3)	5.0E-04	(mg/m^3)	0.05
				Cadmium	3.6E-6	mg/m^3	7.0E-09	(mg/m^3)	1.8E-03	$(ug/m^3)^{-1}$	1.3E-08	4.9E-07	(mg/m^3)	2.0E-05	(mg/m^3)	0.02
				Chromium	2.0E-4	mg/m^3	4.0E-07	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.8E-05	(mg/m^3)	NA	(mg/m^3)	--
				Cobalt	1.1E-5	mg/m^3	2.2E-08	(mg/m^3)	9.0E-03	$(ug/m^3)^{-1}$	2.0E-07	1.5E-06	(mg/m^3)	6.0E-06	(mg/m^3)	0.3
				Copper	0.004	mg/m^3	8.2E-06	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	5.8E-04	(mg/m^3)	NA	(mg/m^3)	--
				Iron	0.068	mg/m^3	1.3E-04	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	9.3E-03	(mg/m^3)	NA	(mg/m^3)	--
				Lead	0.001	mg/m^3	2.2E-06	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.5E-04	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	6.8E-4	mg/m^3	1.3E-06	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	9.3E-05	(mg/m^3)	5.0E-05	(mg/m^3)	1.9
				Mercury	6.6E-6	mg/m^3	1.3E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	9.0E-07	(mg/m^3)	3.0E-05	(mg/m^3)	0.03
				Nickel	3.4E-4	mg/m^3	6.6E-07	(mg/m^3)	2.6E-04	$(ug/m^3)^{-1}$	1.7E-07	4.6E-05	(mg/m^3)	9.0E-05	(mg/m^3)	0.5
				Thallium	6.2E-7	mg/m^3	1.2E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	8.5E-08	(mg/m^3)	NA	(mg/m^3)	--
				Zinc	0.002	mg/m^3	3.6E-06	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.5E-04	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								4.9E-07					2.7
		Exposure Point Total									4.9E-07					2.7
	Exposure Medium Total										4.9E-07					2.7
Medium Total											9.5E-06					8.0
Groundwater	Groundwater	OU7	Dermal	Thallium	66.10	mg/kg	1.5E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.0E-06	(mg/kg/day)	1.0E-05	(mg/kg/day)	0.1
			Exp. Route Total								- -					0.1
		Exposure Point Total									- -					0.1
	Exposure Medium Total										- -					0.1
Medium Total											- -					0.1
										Total of Receptor Risks Across All Media	1.0E-05			Total of Receptor Hazards Across All Media		8.4

TABLE 7.1.B.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Aroclor-1254	0.280	mg/kg	7.7E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.5E-08	5.4E-07	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.03
			Exp. Route Total								1.5E-08					0.03
			Dermal	Aroclor-1254	0.280	mg/kg	3.3E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	6.5E-09	2.3E-07	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.01
			Exp. Route Total								6.5E-09					0.01
		Exposure Point Total									2.2E-08					0.04
	Exposure Medium Total										2.2E-08					0.04
	Air	OU7	Inhalation	Aroclor-1254	2.0E-7	mg/m^3	3.8E-10	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	2.2E-10	2.7E-08	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								2.2E-10					--
		Exposure Point Total									2.2E-10					--
	Exposure Medium Total										2.2E-10					--
Medium Total											2.2E-08					0.04
Subsurface Soil	Subsurface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	0.250	mg/kg	6.9E-09	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	5.1E-08	4.8E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	405	mg/kg	1.1E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	7.8E-04	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.006
			Exp. Route Total								5.1E-08					0.006
			Dermal	Benzo(a)pyrene Equivalents	0.250	mg/kg	2.7E-09	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	2.0E-08	1.9E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	405	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
			Exp. Route Total								2.0E-08					--
		Exposure Point Total									7.0E-08					0.006
	Exposure Medium Total										7.0E-08					0.006
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.7E-7	mg/m^3	3.4E-10	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	3.8E-10	2.4E-08	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	2.8E-4	mg/m^3	5.5E-07	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	3.9E-05	(mg/m^3)	5.0E-05	(mg/m^3)	0.8
			Exp. Route Total								3.8E-10					0.8
		Exposure Point Total									3.8E-10					0.8
	Exposure Medium Total										3.8E-10					0.8
Medium Total											7.1E-08					0.8
Total of Receptor Risks Across All Media											9.3E-08	Total of Receptor Hazards Across All Media				0.8

TABLE 7.2.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Occupational Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.80	mg/kg	6.3E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	4.6E-06	1.8E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	5.2E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.0E-06	1.5E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	1.2E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.3E-04	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.002
				Copper	1,030	mg/kg	3.6E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.0E-03	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.03
				Iron	34,200	mg/kg	1.2E-02	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.3E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.05
				Lead	510	mg/kg	1.8E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	5.0E-04	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	7.3E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.1E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.007
				Thallium	0.480	mg/kg	1.7E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.7E-07	(mg/kg/day)	1.0E-05	(mg/kg/day)	0.05
			Exp. Route Total								5.6E-06					0.1
			Dermal	Benzo(a)pyrene Equivalents	1.80	mg/kg	5.4E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	3.9E-06	1.5E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	4.8E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	9.7E-07	1.4E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	--
				Copper	1,030	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Iron	34,200	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	510	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	--
				Thallium	0.480	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.0E-05	(mg/kg/day)	--
			Exp. Route Total								4.9E-06					--
		Exposure Point Total									1.1E-05					0.1
	Exposure Medium Total										1.1E-05					0.1
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.6E-10	mg/m^3	1.3E-11	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	1.5E-11	3.7E-11	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1248	1.4E-10	mg/m^3	1.1E-11	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	6.3E-12	3.1E-11	(mg/m^3)	NA	(mg/m^3)	--
				Barium	3.0E-8	mg/m^3	2.5E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	7.0E-09	(mg/m^3)	5.0E-04	(mg/m^3)	0.00001
				Copper	9.4E-8	mg/m^3	7.6E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.1E-08	(mg/m^3)	NA	(mg/m^3)	--
				Iron	3.1E-6	mg/m^3	2.5E-07	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	7.1E-07	(mg/m^3)	NA	(mg/m^3)	--
				Lead	4.6E-8	mg/m^3	3.8E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.1E-08	(mg/m^3)	NA	(mg/m^3)	--
				Mercury	1.9E-10	mg/m^3	1.6E-11	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	4.4E-11	(mg/m^3)	3.0E-05	(mg/m^3)	0.0000015
				Thallium	4.4E-11	mg/m^3	3.6E-12	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.0E-11	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								2.1E-11					0.00002
		Exposure Point Total									2.1E-11					0.00002
	Exposure Medium Total										2.1E-11					0.00002
Medium Total											1.1E-05					0.1

TABLE 7.3.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.80	mg/kg	1.3E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	9.3E-07	6.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	1.1E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.1E-07	5.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	2.4E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.2E-04	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.0006
				Copper	1,030	mg/kg	7.3E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.6E-04	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.009
				Iron	34,200	mg/kg	2.4E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.2E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.02
				Lead	510	mg/kg	3.6E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.8E-04	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	1.5E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	7.4E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.002
				Thallium	0.480	mg/kg	3.4E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.7E-07	(mg/kg/day)	1.0E-05	(mg/kg/day)	0.02
			Exp. Route Total								1.1E-06					0.05
			Dermal	Benzo(a)pyrene Equivalents	1.80	mg/kg	6.6E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	4.8E-07	3.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	5.9E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.2E-07	3.0E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	--
				Copper	1,030	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Iron	34,200	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	510	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	--
				Thallium	0.480	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.0E-05	(mg/kg/day)	--
			Exp. Route Total								6.0E-07					--
		Exposure Point Total									1.7E-06					0.05
	Exposure Medium Total										1.7E-06					0.05
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.9E-10	mg/m^3	7.9E-13	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	8.7E-13	3.9E-12	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1248	1.6E-10	mg/m^3	6.6E-13	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	3.7E-13	3.3E-12	(mg/m^3)	NA	(mg/m^3)	--
				Barium	3.6E-8	mg/m^3	1.5E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	7.3E-10	(mg/m^3)	5.0E-04	(mg/m^3)	0.000001
				Copper	1.1E-7	mg/m^3	4.5E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.3E-09	(mg/m^3)	NA	(mg/m^3)	--
				Iron	3.6E-6	mg/m^3	1.5E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	7.5E-08	(mg/m^3)	NA	(mg/m^3)	--
				Lead	5.4E-8	mg/m^3	2.2E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.1E-09	(mg/m^3)	NA	(mg/m^3)	--
				Mercury	2.2E-10	mg/m^3	9.2E-13	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	4.6E-12	(mg/m^3)	3.0E-05	(mg/m^3)	0.0000002
				Thallium	5.1E-11	mg/m^3	2.1E-13	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.1E-12	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								1.2E-12					0.000002
		Exposure Point Total									1.2E-12					0.000002
	Exposure Medium Total										1.2E-12					0.000002
Medium Total											1.7E-06					0.05
Sediment	Sediment	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.20	mg/kg	6.6E-09	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	4.8E-08	3.3E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				TEQ PCB	0.002	mg/kg	8.8E-12	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	1.1E-06	4.4E-11	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.04
				Total PCB Congeners	0.420	mg/kg	2.3E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	4.6E-09	1.2E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	14.5	mg/kg	7.9E-08	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	1.2E-07	4.0E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.001
				Chromium	150	mg/kg	8.2E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.1E-06	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.000003
				Iron	45,900	mg/kg	2.5E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.3E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.002
				Lead	187	mg/kg	1.0E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	5.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	468	mg/kg	2.6E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.3E-05	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.00009
			Exp. Route Total								1.3E-06					0.05
			Dermal	Benzo(a)pyrene Equivalents	1.20	mg/kg	3.4E-09	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	2.5E-08	1.7E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				TEQ PCB	0.002	mg/kg	1.0E-12	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	1.4E-07	5.2E-12	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.005
				Total PCB Congeners	0.420	mg/kg	1.3E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.6E-09	6.4E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	14.5	mg/kg	9.5E-09	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	1.4E-08	4.8E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0002
				Chromium	150	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.0E-02	(mg/kg/day)	--
				Iron	45,900	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	187	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	468	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
			Exp. Route Total								1.8E-07					0.005
		Exposure Point Total									1.5E-06					0.05
	Exposure Medium Total										1.5E-06					0.05
Medium Total											1.5E-06					0.05

TABLE 7.4.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Recreational User
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.80	mg/kg	4.2E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	3.1E-06	9.9E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	1.2E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.3E-07	8.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	2.6E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.8E-04	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.0009
				Copper	1,030	mg/kg	8.1E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	5.6E-04	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.01
				Iron	34,200	mg/kg	2.7E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.9E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.03
				Lead	510	mg/kg	4.0E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.8E-04	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	1.6E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.2E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.004
				Thallium	0.480	mg/kg	3.8E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.6E-07	(mg/kg/day)	1.0E-05	(mg/kg/day)	0.03
			Exp. Route Total								3.3E-06					0.07
			Dermal	Benzo(a)pyrene Equivalents	1.80	mg/kg	4.5E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	3.2E-06	1.0E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	1.3E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.7E-07	9.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	--
				Copper	1,030	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Iron	34,200	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	510	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	--
				Thallium	0.480	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.0E-05	(mg/kg/day)	--
			Exp. Route Total								3.5E-06					--
		Exposure Point Total									6.8E-06					0.07
	Exposure Medium Total										6.8E-06					0.07
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.9E-10	mg/m^3	1.7E-12	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	1.9E-12	3.9E-12	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1248	1.6E-10	mg/m^3	4.7E-13	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	2.7E-13	3.3E-12	(mg/m^3)	NA	(mg/m^3)	--
				Barium	3.6E-8	mg/m^3	1.0E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	7.3E-10	(mg/m^3)	5.0E-04	(mg/m^3)	0.000001
				Copper	1.1E-7	mg/m^3	3.2E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.3E-09	(mg/m^3)	NA	(mg/m^3)	--
				Iron	3.6E-6	mg/m^3	1.1E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	7.5E-08	(mg/m^3)	NA	(mg/m^3)	--
				Lead	5.4E-8	mg/m^3	1.6E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.1E-09	(mg/m^3)	NA	(mg/m^3)	--
				Mercury	2.2E-10	mg/m^3	6.6E-13	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	4.6E-12	(mg/m^3)	3.0E-05	(mg/m^3)	0.0000002
				Thallium	5.1E-11	mg/m^3	1.5E-13	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.1E-12	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								2.1E-12					0.000002
		Exposure Point Total									2.1E-12					0.000002
	Exposure Medium Total										2.1E-12					0.000002
Medium Total											6.8E-06					0.07
Sediment	Sediment	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.20	mg/kg	2.2E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.6E-07	5.1E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				TEQ PCB	0.002	mg/kg	9.7E-12	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	1.3E-06	6.8E-11	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.07
				Total PCB Congeners	0.420	mg/kg	2.6E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	5.1E-09	1.8E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	14.5	mg/kg	8.8E-08	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	1.3E-07	6.2E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.002
				Chromium	150	mg/kg	9.1E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	6.4E-06	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.000004
				Iron	45,900	mg/kg	2.8E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.0E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.003
				Lead	187	mg/kg	1.1E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	8.0E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	468	mg/kg	2.8E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.0E-05	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.0001
			Exp. Route Total								1.6E-06					0.07
			Dermal	Benzo(a)pyrene Equivalents	1.20	mg/kg	2.3E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.7E-07	5.4E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				TEQ PCB	0.002	mg/kg	2.4E-12	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	3.1E-07	1.7E-11	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.02
				Total PCB Congeners	0.420	mg/kg	2.9E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	5.8E-09	2.0E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	14.5	mg/kg	2.1E-08	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	3.2E-08	1.5E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0005
				Chromium	150	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.0E-02	(mg/kg/day)	--
				Iron	45,900	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	187	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	468	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
			Exp. Route Total								5.1E-07					0.02
		Exposure Point Total									2.1E-06					0.09
	Exposure Medium Total										2.1E-06					0.09
Medium Total											2.1E-06					0.09

TABLE 7.4.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Recreational User
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Total of Receptor Risks Across All Media											8.9E-06	Total of Receptor Hazards Across All Media				0.2

TABLE 7.5.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.80	mg/kg	1.5E-06	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.1E-05	2.5E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	7.0E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.4E-06	2.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	1.6E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.6E-04	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.002
				Copper	1,030	mg/kg	4.8E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.4E-03	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.04
				Iron	34,200	mg/kg	1.6E-02	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.7E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.07
				Lead	510	mg/kg	2.4E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	7.0E-04	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	9.9E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.9E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.010
				Thallium	0.480	mg/kg	2.3E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	6.6E-07	(mg/kg/day)	1.0E-05	(mg/kg/day)	0.07
			Exp. Route Total								1.3E-05					0.2
			Dermal	Benzo(a)pyrene Equivalents	1.80	mg/kg	8.0E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	5.9E-06	1.3E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	3.9E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	7.9E-07	1.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	--
				Copper	1,030	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Iron	34,200	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	510	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	--
				Thallium	0.480	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.0E-05	(mg/kg/day)	--
			Exp. Route Total								6.7E-06					--
		Exposure Point Total									1.9E-05					0.2
	Exposure Medium Total										1.9E-05					0.2
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.9E-10	mg/m^3	1.2E-10	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	1.3E-10	1.8E-10	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1248	1.6E-10	mg/m^3	5.3E-11	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	3.0E-11	1.5E-10	(mg/m^3)	NA	(mg/m^3)	--
				Barium	3.6E-8	mg/m^3	1.2E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	3.4E-08	(mg/m^3)	5.0E-04	(mg/m^3)	0.00007
				Copper	1.1E-7	mg/m^3	3.6E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.1E-07	(mg/m^3)	NA	(mg/m^3)	--
				Iron	3.6E-6	mg/m^3	1.2E-06	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	3.5E-06	(mg/m^3)	NA	(mg/m^3)	--
				Lead	5.4E-8	mg/m^3	1.8E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	5.2E-08	(mg/m^3)	NA	(mg/m^3)	--
				Mercury	2.2E-10	mg/m^3	7.4E-11	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.1E-10	(mg/m^3)	3.0E-05	(mg/m^3)	0.0000072
				Thallium	5.1E-11	mg/m^3	1.7E-11	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	4.9E-11	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								1.6E-10					0.00008
		Exposure Point Total									1.6E-10					0.00008
	Exposure Medium Total										1.6E-10					0.00008
Medium Total											1.9E-05					0.2

TABLE 7.6.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Residents
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.80	mg/kg	1.1E-05	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	7.7E-05	2.3E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	1.6E-06	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	3.3E-06	1.9E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	3.7E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.3E-03	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.02
				Copper	1,030	mg/kg	1.1E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.3E-02	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.3
				Iron	34,200	mg/kg	3.7E-02	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.4E-01	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.6
				Lead	510	mg/kg	5.6E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	6.5E-03	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	2.3E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.7E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.09
				Thallium	0.480	mg/kg	5.3E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	6.1E-06	(mg/kg/day)	1.0E-05	(mg/kg/day)	0.6
			Exp. Route Total								8.0E-05					1.7
			Dermal	Benzo(a)pyrene Equivalents	1.80	mg/kg	3.8E-06	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	2.8E-05	8.4E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	6.4E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.3E-06	7.5E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	--
				Copper	1,030	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Iron	34,200	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	510	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	--
				Thallium	0.480	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.0E-05	(mg/kg/day)	--
			Exp. Route Total								2.9E-05					--
		Exposure Point Total									1.1E-04					1.7
	Exposure Medium Total										1.1E-04					1.7
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.9E-10	mg/m^3	8.4E-11	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	9.3E-11	1.8E-10	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1248	1.6E-10	mg/m^3	1.3E-11	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	7.5E-12	1.5E-10	(mg/m^3)	NA	(mg/m^3)	--
				Barium	3.6E-8	mg/m^3	2.9E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	3.4E-08	(mg/m^3)	5.0E-04	(mg/m^3)	0.00007
				Copper	1.1E-7	mg/m^3	9.0E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.1E-07	(mg/m^3)	NA	(mg/m^3)	--
				Iron	3.6E-6	mg/m^3	3.0E-07	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	3.5E-06	(mg/m^3)	NA	(mg/m^3)	--
				Lead	5.4E-8	mg/m^3	4.5E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	5.2E-08	(mg/m^3)	NA	(mg/m^3)	--
				Mercury	2.2E-10	mg/m^3	1.8E-11	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.1E-10	(mg/m^3)	3.0E-05	(mg/m^3)	0.0000072
				Thallium	5.1E-11	mg/m^3	4.2E-12	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	4.9E-11	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								1.0E-10					0.00008
		Exposure Point Total									1.0E-10					0.00008
	Exposure Medium Total										1.0E-10					0.00008
Medium Total											1.1E-04					1.7

RAGS Part D Table 9

Summary Of Receptor Risks And Hazards For COPCs

LIST OF TABLES
RAGS PART D TABLE 9
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

Table No.	
	REASONABLE MAXIMUM EXPOSURES
9.1A.RME	Construction Workers - Entire Site Surface/Subsurface Soil
9.1B.RME	Construction Workers - Former Location of Building 237 Subsurface Soil
9.2.RME	Occupational Workers - Entire Site Surface Soil
9.3.RME	Adult Recreational Users - Entire Site Surface Soil & Sediment
9.4.RME	Adolescent Recreational Users - Entire Site Surface Soil & Sediment
9.5.RME	Lifetime Recreational Users - Entire Site Surface Soil & Sediment
9.6.RME	Adult Residents - Entire Site Surface Soil
9.7.RME	Child Residents - Entire Site Surface Soil
9.8.RME	Lifetime Residents - Entire Site Surface Soil
	CENTRAL TENDENCY EXPOSURES
9.1A.CTE	Construction Workers - Entire Site Surface/Subsurface Soil
9.1B.CTE	Construction Workers - Former Location of Building 237 Subsurface Soil
9.2.CTE	Occupational Workers - Entire Site Surface Soil
9.3.CTE	Adult Recreational Users - Entire Site Surface Soil & Sediment
9.4.CTE	Adolescent Recreational Users - Entire Site Surface Soil & Sediment
9.5.CTE	Lifetime Recreational Users - Entire Site Surface Soil & Sediment
9.6.CTE	Adult Residents - Entire Site Surface Soil
9.7.CTE	Child Residents - Entire Site Surface Soil
9.8.CTE	Lifetime Residents - Entire Site Surface Soil

TABLE 9.1A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	4E-07	--	1E-07	--	5E-07	NA	--	--	--	--
			Aroclor-1248	8E-08	--	3E-08	--	1E-07	NA	--	--	--	--
			Barium	- -	--	- -	--	- -	Kidney	0.003	--	--	0.003
			Chromium	- -	--	- -	--	- -	None Reported	0.00008	--	--	0.00008
			Copper	- -	--	- -	--	- -	GS	0.05	--	--	0.05
			Iron	- -	--	- -	--	- -	GS	0.09	--	--	0.09
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Mercury	- -	--	- -	--	- -	Autoimmune	0.01	--	--	0.01
			Thallium	- -	--	- -	--	- -	NA	0.09	--	--	0.09
			Chemical Total	4E-07	--	2E-07	--	6E-07		0.3	--	--	0.3
		Exposure Point Total						6E-07					0.3
	Exposure Medium Total							6E-07					0.3
	Air	OU7	Benzo(a)pyrene Equivalents	--	3E-09	--	--	3E-09	NA	--	--	--	--
			Aroclor-1248	--	1E-09	--	--	1E-09	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.06	--	0.06
			Chromium	--	- -	--	--	- -	Respiratory	--	--	--	--
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.007	--	0.007
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	4E-09	--	--	4E-09		- -	0.07	- -	0.07
		Exposure Point Total						4E-09					0.07
	Exposure Medium Total							4E-09					0.07
Medium Total								6E-07					0.3
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	2E-07	--	9E-08	--	3E-07	NA	--	--	--	--
			Aroclor-1248	2E-06	--	1E-06	--	3E-06	NA	--	--	--	--
			Aroclor-1260	3E-07	--	1E-07	--	4E-07	NA	0.4	--	0.2	0.6
			2,3,7,8-TCDD Equivalents	5E-06	--	4E-07	--	5E-06	Developmental	3	--	0.2	3
			Antimony	- -	--	- -	--	- -	Blood	0.9	--	--	0.9
			Barium	- -	--	- -	--	- -	Kidney	0.003	--	--	0.003
			Cadmium	- -	--	- -	--	- -	NA	0.010	--	0.001	0.01
			Chromium	- -	--	- -	--	- -	None Reported	0.0004	--	--	0.0004
			Cobalt	- -	--	- -	--	- -	Thyroid	0.1	--	--	0.1
			Copper	- -	--	- -	--	- -	GS	0.3	--	--	0.3
			Iron	- -	--	- -	--	- -	GS	0.3	--	--	0.3
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.01	--	--	0.01
			Mercury	- -	--	- -	--	- -	Autoimmune	0.06	--	--	0.06
			Nickel	- -	--	- -	--	- -	Body Weight	0.05	--	--	0.05
			Thallium	- -	--	- -	--	- -	NA	0.2	--	--	0.2
			Zinc	- -	--	- -	--	- -	Blood	0.02	--	--	0.02
			Chemical Total	7E-06	--	2E-06	--	9E-06		5	--	0.4	5
		Exposure Point Total						9E-06					5
	Exposure Medium Total							9E-06					5

TABLE 9.1A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Air	OU7	Benzo(a)pyrene Equivalents	--	2E-09	--	--	2E-09	NA	--	--	--	--
			Aroclor-1248	--	3E-08	--	--	3E-08	NA	--	--	--	--
			Aroclor-1260	--	4E-09	--	--	4E-09	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	7E-08	--	--	7E-08	NA	--	0.003	--	0.003
			Antimony	--	- -	--	--	- -	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.05	--	0.05
			Cadmium	--	1E-08	--	--	1E-08	NA	--	0.02	--	0.02
			Chromium	--	- -	--	--	- -	Respiratory	--	--	--	--
			Cobalt	--	2E-07	--	--	2E-07	Respiratory	--	0.3	--	0.3
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Manganese	--	- -	--	--	- -	CNS	--	2	--	2
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.03	--	0.03
			Nickel	--	2E-07	--	--	2E-07	Respiratory	--	0.5	--	0.5
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Zinc	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	5E-07	--	--	5E-07		- -	3	- -	3
		Exposure Point Total						5E-07					3
	Exposure Medium Total							5E-07					3
Medium Total								9E-06					8
Groundwater	Groundwater	OU7	Thallium	- -	--	- -	--	- -	NA	--	--	0.1	0.1
			Chemical Total	- -	--	- -	--	- -		--	--	0.1	0.1
		Exposure Point Total						- -					0.1
	Exposure Medium Total							- -					0.1
Medium Total								- -					0.1
Receptor Total							Receptor Risk Total	1E-05				Receptor HI Total	8

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.07
Total Blood HI	0.9
Total Body Weight HI	0.05
Total CNS HI	2
Total Developmental HI	3
Total Fetotoxicity HI	0.1
Total GS HI	0.7
Total Kidney HI	0.04
Total Respiratory HI	0.8
Total None Reported HI	0.0005
Total Thyroid HI	0.1
Total NA HI	1

TABLE 9.1.B.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Aroclor-1254	2E-08	--	7E-09	--	2E-08	Immune	0.03	--	0.01	0.04
			Chemical Total	2E-08	--	7E-09	--	2E-08		0.03	--	0.01	0.04
		Exposure Point Total						2E-08					0.04
	Exposure Medium Total							2E-08					0.04
	Air	OU7	Aroclor-1254	--	2E-10	--	--	2E-10	NA	--	--	--	--
			Chemical Total	--	2E-10	--	--	2E-10		- -	--	- -	--
		Exposure Point Total						2E-10					--
	Exposure Medium Total							2E-10					--
Medium Total								2E-08					0.04
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	5E-08	--	2E-08	--	7E-08	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.006	--	--	0.006
			Chemical Total	5E-08	--	2E-08	--	7E-08		0.006	--	--	0.006
		Exposure Point Total						7E-08					0.006
	Exposure Medium Total							7E-08					0.006
	Air	OU7	Benzo(a)pyrene Equivalents	--	4E-10	--	--	4E-10	NA	--	--	--	--
			Manganese	--	- -	--	--	- -	CNS	--	0.8	--	0.8
			Chemical Total	--	4E-10	--	--	4E-10		- -	0.8	- -	0.8
		Exposure Point Total						4E-10					0.8
	Exposure Medium Total							4E-10					0.8
Medium Total								7E-08					0.8
	Exposure Medium Total							4E-10					0.8
Medium Total								7E-08					0.8
Receptor Total							Receptor Risk Total	9E-08				Receptor HI Total	0.8

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total CNS HI	0.8
Total Immune HI	0.04

TABLE 9.2.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Occupational Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	5E-06	--	4E-06	--	9E-06	NA	--	--	--	--
			Aroclor-1248	1E-06	--	1E-06	--	2E-06	NA	--	--	--	--
			Barium	- -	--	- -	--	- -	Kidney	0.002	--	--	0.002
			Copper	- -	--	- -	--	- -	GS	0.03	--	--	0.03
			Iron	- -	--	- -	--	- -	GS	0.05	--	--	0.05
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Mercury	- -	--	- -	--	- -	Autoimmune	0.007	--	--	0.007
			Thallium	- -	--	- -	--	- -	NA	0.05	--	--	0.05
			Chemical Total	6E-06	--	5E-06	--	1E-05		0.1	--	--	0.1
		Exposure Point Total						1E-05					0.1
	Exposure Medium Total							1E-05					0.1
	Air	OU7	Benzo(a)pyrene Equivalents	--	1E-11	--	--	1E-11	NA	--	--	--	--
			Aroclor-1248	--	6E-12	--	--	6E-12	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.00001	--	0.00001
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.0000015	--	0.0000015
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	2E-11	--	--	2E-11		- -	0.00002	- -	0.00002
		Exposure Point Total						2E-11					0.00002
	Exposure Medium Total							2E-11					0.00002
Medium Total								1E-05					0.1

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.007
Total CNS HI	0.0000015
Total Fetotoxicity HI	0.00001
Total GS HI	0.07
Total Kidney HI	0.002
Total NA HI	0.05

TABLE 9.3.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	9E-07	--	5E-07	--	1E-06	NA	--	--	--	--
			Aroclor-1248	2E-07	--	1E-07	--	3E-07	NA	--	--	--	--
			Barium	- -	--	- -	--	- -	Kidney	0.0006	--	--	0.0006
			Copper	- -	--	- -	--	- -	GS	0.009	--	--	0.009
			Iron	- -	--	- -	--	- -	GS	0.02	--	--	0.02
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Mercury	- -	--	- -	--	- -	Autoimmune	0.002	--	--	0.002
			Thallium	- -	--	- -	--	- -	NA	0.02	--	--	0.02
			Chemical Total	1E-06	--	6E-07	--	2E-06		0.05	--	--	0.05
		Exposure Point Total						2E-06					0.05
	Exposure Medium Total							2E-06					0.05
	Air	OU7	Benzo(a)pyrene Equivalents	--	9E-13	--	--	9E-13	NA	--	--	--	--
			Aroclor-1248	--	4E-13	--	--	4E-13	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.000001	--	0.000001
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.0000002	--	0.0000002
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	1E-12	--	--	1E-12		- -	0.000002	- -	0.000002
		Exposure Point Total						1E-12					0.000002
	Exposure Medium Total							1E-12					0.000002
Medium Total								2E-06					0.05
Sediment	Sediment	OU7	Benzo(a)pyrene Equivalents	5E-08	--	2E-08	--	7E-08	NA	--	--	--	--
			TEQ PCB	1E-06	--	1E-07	--	1E-06	Developmental	0.04	--	0.005	0.05
			Total PCB Congeners	5E-09	--	3E-09	--	7E-09	NA	--	--	--	--
			Arsenic	1E-07	--	1E-08	--	1E-07	Skin, CVS	0.001	--	0.0002	0.001
			Chromium	- -	--	- -	--	- -	NA	0.000003	--	--	0.000003
			Iron	- -	--	- -	--	- -	GS	0.002	--	--	0.002
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.00009	--	--	0.00009
			Chemical Total	1E-06	--	2E-07	--	1E-06		0.05	--	0.005	0.05
		Exposure Point Total						1E-06					0.05
	Exposure Medium Total							1E-06					0.05
Medium Total								1E-06					0.05

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.002
Total CNS HI	0.00009
Total CVS HI	0.001
Total Fetotoxicity HI	0.000001
Total GS HI	0.03
Total Kidney HI	0.0006
Total Skin HI	0.001
Total NA HI	0.02

TABLE 9.4.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Recreational User
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	3E-06	--	3E-06	--	6E-06	NA	--	--	--	--
			Aroclor-1248	2E-07	--	3E-07	--	5E-07	NA	--	--	--	--
			Barium	- -	--	- -	--	- -	Kidney	0.0009	--	--	0.0009
			Copper	- -	--	- -	--	- -	GS	0.01	--	--	0.01
			Iron	- -	--	- -	--	- -	GS	0.03	--	--	0.03
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Mercury	- -	--	- -	--	- -	Autoimmune	0.004	--	--	0.004
			Thallium	- -	--	- -	--	- -	NA	0.03	--	--	0.03
			Chemical Total	3E-06	--	4E-06	--	7E-06		0.07	--	--	0.07
		Exposure Point Total						7E-06					0.07
	Exposure Medium Total							7E-06					0.07
	Air	OU7	Benzo(a)pyrene Equivalents	--	2E-12	--	--	2E-12	NA	--	--	--	--
			Aroclor-1248	--	3E-13	--	--	3E-13	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.000001	--	0.000001
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.0000002	--	0.0000002
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	2E-12	--	--	2E-12		- -	0.000002	- -	0.000002
		Exposure Point Total						2E-12					0.000002
	Exposure Medium Total							2E-12					0.000002
Medium Total								7E-06					0.07
Sediment	Sediment	OU7	Benzo(a)pyrene Equivalents	2E-07	--	2E-07	--	3E-07	NA	--	--	--	--
			TEQ PCB	1E-06	--	3E-07	--	2E-06	Developmental	0.07	--	0.02	0.08
			Total PCB Congeners	5E-09	--	6E-09	--	1E-08	NA	--	--	--	--
			Arsenic	1E-07	--	3E-08	--	2E-07	Skin, CVS	0.002	--	0.0005	0.003
			Chromium	- -	--	- -	--	- -	NA	0.000004	--	--	0.000004
			Iron	- -	--	- -	--	- -	GS	0.003	--	--	0.003
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.0001	--	--	0.0001
			Chemical Total	2E-06	--	5E-07	--	2E-06		0.07	--	0.02	0.09
		Exposure Point Total						2E-06					0.09
	Exposure Medium Total							2E-06					0.09
Medium Total								2E-06					0.09

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.004
Total CNS HI	0.0001
Total CVS HI	0.003
Total Fetotoxicity HI	0.000001
Total GS HI	0.04
Total Kidney HI	0.0009
Total Skin HI	0.003
Total NA HI	0.03

TABLE 9.4.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Recreational User
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total

TABLE 9.5.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Recreational User
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	4E-06	--	4E-06	--	8E-06
			Aroclor-1248	4E-07	--	4E-07	--	8E-07
			Barium	- -	--	- -	--	- -
			Copper	- -	--	- -	--	- -
			Iron	- -	--	- -	--	- -
			Lead	- -	--	- -	--	- -
			Mercury	- -	--	- -	--	- -
			Thallium	- -	--	- -	--	- -
			Chemical Total	4E-06	--	4E-06	--	9E-06
		Exposure Point Total						9E-06
	Exposure Medium Total							9E-06
	Air	OU7	Benzo(a)pyrene Equivalents	--	3E-12	--	--	3E-12
			Aroclor-1248	--	6E-13	--	--	6E-13
			Barium	--	- -	--	--	- -
			Copper	--	- -	--	--	- -
			Iron	--	- -	--	--	- -
			Lead	--	- -	--	--	- -
			Mercury	--	- -	--	--	- -
			Thallium	--	- -	--	--	- -
			Chemical Total	--	3E-12	--	--	3E-12
		Exposure Point Total						3E-12
	Exposure Medium Total							3E-12
Medium Total								9E-06

TABLE 9.5.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Recreational User
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Sediment	Sediment	OU7	Benzo(a)pyrene Equivalents	2E-07	--	2E-07	--	4E-07
			TEQ PCB	2E-06	--	4E-07	--	3E-06
			Total PCB Congeners	1E-08	--	8E-09	--	2E-08
			Arsenic	3E-07	--	5E-08	--	3E-07
			Chromium	- -	--	- -	--	- -
			Iron	- -	--	- -	--	- -
			Lead	- -	--	- -	--	- -
			Manganese	- -	--	- -	--	- -
			Chemical Total	3E-06	--	7E-07	--	4E-06
		Exposure Point Total						4E-06
	Exposure Medium Total							4E-06
Medium Total								4E-06

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 9.6.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	1E-05	--	6E-06	--	2E-05	NA	--	--	--	--
			Aroclor-1248	1E-06	--	8E-07	--	2E-06	NA	--	--	--	--
			Barium	- -	--	- -	--	- -	Kidney	0.002	--	--	0.002
			Copper	- -	--	- -	--	- -	GS	0.04	--	--	0.04
			Iron	- -	--	- -	--	- -	GS	0.07	--	--	0.07
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Mercury	- -	--	- -	--	- -	Autoimmune	0.010	--	--	0.010
			Thallium	- -	--	- -	--	- -	NA	0.07	--	--	0.07
			Chemical Total	1E-05	--	7E-06	--	2E-05		0.2	--	--	0.2
		Exposure Point Total						2E-05					0.2
	Exposure Medium Total							2E-05					0.2
	Air	OU7	Benzo(a)pyrene Equivalents	--	1E-10	--	--	1E-10	NA	--	--	--	--
			Aroclor-1248	--	3E-11	--	--	3E-11	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.00007	--	0.00007
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.0000072	--	0.0000072
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	2E-10	--	--	2E-10		- -	0.00008	- -	0.00008
		Exposure Point Total						2E-10					0.00008
	Exposure Medium Total							2E-10					0.00008
Medium Total								2E-05					0.2

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.01
Total CNS HI	0.000007
Total Fetotoxicity HI	0.00007
Total GS HI	0.1
Total Kidney HI	0.002
Total NA HI	0.07

TABLE 9.7.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Residents
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	8E-05	--	3E-05	--	1E-04	NA	--	--	--	--
			Aroclor-1248	3E-06	--	1E-06	--	5E-06	NA	--	--	--	--
			Barium	- -	--	- -	--	- -	Kidney	0.02	--	--	0.02
			Copper	- -	--	- -	--	- -	GS	0.3	--	--	0.3
			Iron	- -	--	- -	--	- -	GS	0.6	--	--	0.6
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Mercury	- -	--	- -	--	- -	Autoimmune	0.09	--	--	0.09
			Thallium	- -	--	- -	--	- -	NA	0.6	--	--	0.6
			Chemical Total	8E-05	--	3E-05	--	1E-04		2	--	--	2
		Exposure Point Total						1E-04					2
	Exposure Medium Total							1E-04					2
	Air	OU7	Benzo(a)pyrene Equivalents	--	9E-11	--	--	9E-11	NA	--	--	--	--
			Aroclor-1248	--	7E-12	--	--	7E-12	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.00007	--	0.00007
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.0000072	--	0.0000072
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	1E-10	--	--	1E-10		- -	0.00008	- -	0.00008
		Exposure Point Total						1E-10					0.00008
	Exposure Medium Total							1E-10					0.00008
Medium Total								1E-04					2

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.09
Total CNS HI	0.000007
Total Fetotoxicity HI	0.00007
Total GS HI	1
Total Kidney HI	0.02
Total NA HI	0.6

TABLE 9.8.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Residents
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	9E-05	--	3E-05	--	1E-04
			Aroclor-1248	5E-06	--	2E-06	--	7E-06
			Barium	- -	--	- -	--	- -
			Copper	- -	--	- -	--	- -
			Iron	- -	--	- -	--	- -
			Lead	- -	--	- -	--	- -
			Mercury	- -	--	- -	--	- -
			Thallium	- -	--	- -	--	- -
			Chemical Total	9E-05	--	4E-05	--	1E-04
		Exposure Point Total						1E-04
	Exposure Medium Total							1E-04
	Air	OU7	Benzo(a)pyrene Equivalents	--	2E-10	--	--	2E-10
			Aroclor-1248	--	4E-11	--	--	4E-11
			Barium	--	- -	--	--	- -
			Copper	--	- -	--	--	- -
			Iron	--	- -	--	--	- -
			Lead	--	- -	--	--	- -
			Mercury	--	- -	--	--	- -
			Thallium	--	- -	--	--	- -
			Chemical Total	--	3E-10	--	--	3E-10
		Exposure Point Total						3E-10
	Exposure Medium Total							3E-10
Medium Total								1E-04

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 9.1A.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	4E-07	--	5E-08	--	4E-07	NA	--	--	--	--
			Aroclor-1248	8E-08	--	1E-08	--	9E-08	NA	--	--	--	--
			Barium	- -	--	- -	--	- -	Kidney	0.003	--	--	0.003
			Chromium	- -	--	- -	--	- -	None Reported	0.00008	--	--	0.00008
			Copper	- -	--	- -	--	- -	GS	0.05	--	--	0.05
			Iron	- -	--	- -	--	- -	GS	0.09	--	--	0.09
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Mercury	- -	--	- -	--	- -	Autoimmune	0.01	--	--	0.01
			Thallium	- -	--	- -	--	- -	NA	0.09	--	--	0.09
			Chemical Total	4E-07	--	6E-08	--	5E-07		0.3	--	--	0.3
		Exposure Point Total						5E-07					0.3
	Exposure Medium Total							5E-07					0.3
	Air	OU7	Benzo(a)pyrene Equivalents	--	3E-09	--	--	3E-09	NA	--	--	--	--
			Aroclor-1248	--	1E-09	--	--	1E-09	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.06	--	0.06
			Chromium	--	- -	--	--	- -	Respiratory	--	--	--	--
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.007	--	0.007
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	4E-09	--	--	4E-09		- -	0.07	- -	0.07
		Exposure Point Total						4E-09					0.07
	Exposure Medium Total							4E-09					0.07
Medium Total								5E-07					0.3
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	2E-07	--	3E-08	--	3E-07	NA	--	--	--	--
			Aroclor-1248	2E-06	--	3E-07	--	3E-06	NA	--	--	--	--
			Aroclor-1260	3E-07	--	4E-08	--	3E-07	NA	0.4	--	0.06	0.5
			2,3,7,8-TCDD Equivalents	5E-06	--	1E-07	--	5E-06	Developmental	3	--	0.08	3
			Antimony	- -	--	- -	--	- -	Blood	0.9	--	--	0.9
			Barium	- -	--	- -	--	- -	Kidney	0.003	--	--	0.003
			Cadmium	- -	--	- -	--	- -	NA	0.010	--	0.0004	0.01
			Chromium	- -	--	- -	--	- -	None Reported	0.0004	--	--	0.0004
			Cobalt	- -	--	- -	--	- -	Thyroid	0.1	--	--	0.1
			Copper	- -	--	- -	--	- -	GS	0.3	--	--	0.3
			Iron	- -	--	- -	--	- -	GS	0.3	--	--	0.3
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.01	--	--	0.01
			Mercury	- -	--	- -	--	- -	Autoimmune	0.06	--	--	0.06
			Nickel	- -	--	- -	--	- -	Body Weight	0.05	--	--	0.05
			Thallium	- -	--	- -	--	- -	NA	0.2	--	--	0.2
			Zinc	- -	--	- -	--	- -	Blood	0.02	--	--	0.02
			Chemical Total	7E-06	--	5E-07	--	8E-06		5	--	0.1	5
		Exposure Point Total						8E-06					5
	Exposure Medium Total							8E-06					5

TABLE 9.1A.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Air	OU7	Benzo(a)pyrene Equivalents	--	2E-09	--	--	2E-09	NA	--	--	--	--
			Aroclor-1248	--	3E-08	--	--	3E-08	NA	--	--	--	--
			Aroclor-1260	--	4E-09	--	--	4E-09	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	7E-08	--	--	7E-08	NA	--	0.003	--	0.003
			Antimony	--	- -	--	--	- -	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.05	--	0.05
			Cadmium	--	1E-08	--	--	1E-08	NA	--	0.02	--	0.02
			Chromium	--	- -	--	--	- -	Respiratory	--	--	--	--
			Cobalt	--	2E-07	--	--	2E-07	Respiratory	--	0.3	--	0.3
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Manganese	--	- -	--	--	- -	CNS	--	2	--	2
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.03	--	0.03
			Nickel	--	2E-07	--	--	2E-07	Respiratory	--	0.5	--	0.5
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Zinc	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	5E-07	--	--	5E-07		- -	3	- -	3
		Exposure Point Total						5E-07					3
	Exposure Medium Total							5E-07					3
Medium Total								8E-06					8
Groundwater	Groundwater	OU7	Thallium	- -	--	- -	--	- -	NA	--	--	0.03	0.03
			Chemical Total	- -	--	- -	--	- -		--	--	0.03	0.03
		Exposure Point Total						- -					0.03
	Exposure Medium Total							- -					0.03
Medium Total								- -					0.03
Receptor Total							Receptor Risk Total	9E-06				Receptor HI Total	8

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.07
Total Blood HI	0.9
Total Body Weight HI	0.05
Total CNS HI	2
Total Developmental HI	3
Total Fetotoxicity HI	0.1
Total GS HI	0.7
Total Kidney HI	0.04
Total Respiratory HI	0.8
Total None Reported HI	0.0005
Total Thyroid HI	0.1
Total NA HI	0.8

TABLE 9.1.B.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Aroclor-1254	2E-08	--	2E-09	--	2E-08	Immune	0.03	--	0.004	0.03
			Chemical Total	2E-08	--	2E-09	--	2E-08		0.03	--	0.004	0.03
		Exposure Point Total						2E-08					0.03
	Exposure Medium Total							2E-08					0.03
	Air	OU7	Aroclor-1254	--	2E-10	--	--	2E-10	NA	--	--	--	--
			Chemical Total	--	2E-10	--	--	2E-10		- -	--	- -	--
		Exposure Point Total						2E-10					--
	Exposure Medium Total							2E-10					--
Medium Total								2E-08					0.03
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	5E-08	--	7E-09	--	6E-08	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.006	--	--	0.006
			Chemical Total	5E-08	--	7E-09	--	6E-08		0.006	--	--	0.006
		Exposure Point Total						6E-08					0.006
	Exposure Medium Total							6E-08					0.006
	Air	OU7	Benzo(a)pyrene Equivalents	--	4E-10	--	--	4E-10	NA	--	--	--	--
			Manganese	--	- -	--	--	- -	CNS	--	0.8	--	0.8
			Chemical Total	--	4E-10	--	--	4E-10		- -	0.8	- -	0.8
		Exposure Point Total						4E-10					0.8
	Exposure Medium Total							4E-10					0.8
Medium Total								6E-08					0.8
	Exposure Medium Total							4E-10					0.8
Medium Total								6E-08					0.8
Receptor Total							Receptor Risk Total	8E-08				Receptor HI Total	0.8

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total CNS HI	0.8
Total Immune HI	0.03

TABLE 9.2.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Occupational Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	7E-07	--	1E-07	--	8E-07	NA	--	--	--	--
			Aroclor-1248	2E-07	--	3E-08	--	2E-07	NA	--	--	--	--
			Barium	- -	--	- -	--	- -	Kidney	0.0007	--	--	0.0007
			Copper	- -	--	- -	--	- -	GS	0.01	--	--	0.01
			Iron	- -	--	- -	--	- -	GS	0.02	--	--	0.02
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Mercury	- -	--	- -	--	- -	Autoimmune	0.003	--	--	0.003
			Thallium	- -	--	- -	--	- -	NA	0.02	--	--	0.02
			Chemical Total	9E-07	--	2E-07	--	1E-06		0.06	--	--	0.06
		Exposure Point Total						1E-06					0.06
	Exposure Medium Total							1E-06					0.06
	Air	OU7	Benzo(a)pyrene Equivalents	--	5E-12	--	--	5E-12	NA	--	--	--	--
			Aroclor-1248	--	2E-12	--	--	2E-12	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.00001	--	0.00001
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.0000013	--	0.0000013
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	7E-12	--	--	7E-12		- -	0.00001	- -	0.00001
		Exposure Point Total						7E-12					0.00001
	Exposure Medium Total							7E-12					0.00001
Medium Total								1E-06					0.06

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.003
Total CNS HI	0.0000013
Total Fetotoxicity HI	0.00001
Total GS HI	0.03
Total Kidney HI	0.0007
Total NA HI	0.02

TABLE 9.3.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	2E-07	--	3E-08	--	3E-07	NA	--	--	--	--
			Aroclor-1248	5E-08	--	8E-09	--	6E-08	NA	--	--	--	--
			Barium	- -	--	- -	--	- -	Kidney	0.0003	--	--	0.0003
			Copper	- -	--	- -	--	- -	GS	0.005	--	--	0.005
			Iron	- -	--	- -	--	- -	GS	0.009	--	--	0.009
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Mercury	- -	--	- -	--	- -	Autoimmune	0.001	--	--	0.001
			Thallium	- -	--	- -	--	- -	NA	0.008	--	--	0.008
			Chemical Total	2E-07	--	2E-08	--	3E-07		0.02	--	--	0.02
		Exposure Point Total						2E-07					0.02
	Exposure Medium Total							2E-07					0.02
	Air	OU7	Benzo(a)pyrene Equivalents	--	4E-13	--	--	4E-13	NA	--	--	--	--
			Aroclor-1248	--	2E-13	--	--	2E-13	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.000001	--	0.000001
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.0000002	--	0.0000002
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	4E-13	--	--	6E-13		- -	0.000002	- -	--
		Exposure Point Total						6E-13					--
	Exposure Medium Total							6E-13					--
Medium Total								2E-07					0.02
Sediment	Sediment	OU7	Benzo(a)pyrene Equivalents	7E-09	--	1E-09	--	8E-09	NA	--	--	--	--
			TEQ PCB	2E-07	--	6E-09	--	2E-07	NA	0.01	--	0.0004	0.01
			Total PCB Congeners	7E-10	--	1E-10	--	8E-10	NA	--	--	--	--
			Arsenic	2E-08	--	6E-10	--	2E-08	Skin, CVS	0.0004	--	0.00001	0.0004
			Chromium	- -	--	- -	--	- -	NA	0.0000008	--	--	0.0000008
			Iron	- -	--	- -	--	- -	GS	0.0005	--	--	0.0005
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.00003	--	--	0.00003
			Chemical Total	2E-07	--	7E-09	--	2E-07		0.01	--	0.0004	0.01
		Exposure Point Total						2E-07					0.01
	Exposure Medium Total							2E-07					0.01
Medium Total								2E-07					0.01

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.0007
Total CNS HI	0.00003
Total CVS HI	0.0004
Total Fetotoxicity HI	0.0000008
Total GS HI	0.009
Total Kidney HI	0.0002
Total Skin HI	0.0004
Total NA HI	0.02

TABLE 9.4.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Recreational User
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	8E-07	--	3E-07	--	1E-06	NA	--	--	--	--
			Aroclor-1248	6E-08	--	3E-08	--	9E-08	NA	--	--	--	--
			Barium	- -	--	- -	--	- -	Kidney	0.0005	--	--	0.0005
			Copper	- -	--	- -	--	- -	GS	0.007	--	--	0.007
			Iron	- -	--	- -	--	- -	GS	0.01	--	--	0.01
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Mercury	- -	--	- -	--	- -	Autoimmune	0.002	--	--	0.002
			Thallium	- -	--	- -	--	- -	NA	0.01	--	--	0.01
			Chemical Total	8E-07	--	4E-07	--	1E-06		0.04	--	--	0.04
		Exposure Point Total						1E-06					0.04
	Exposure Medium Total							1E-06					0.04
	Air	OU7	Benzo(a)pyrene Equivalents	--	9E-13	--	--	9E-13	NA	--	--	--	--
			Aroclor-1248	--	1E-13	--	--	1E-13	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.000001	--	0.000001
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.0000002	--	0.0000002
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	1E-12	--	--	1E-12		- -	0.000002	- -	0.000002
		Exposure Point Total						1E-12					0.000002
	Exposure Medium Total							1E-12					0.000002
Medium Total								1E-06					0.04
Sediment	Sediment	OU7	Benzo(a)pyrene Equivalents	2E-08	--	1E-08	--	3E-08	NA	--	--	--	--
			TEQ PCB	2E-07	--	2E-08	--	2E-07	Developmental	0.02	--	0.002	0.02
			Total PCB Congeners	7E-10	--	3E-10	--	1E-09	NA	--	--	--	--
			Arsenic	2E-08	--	2E-09	--	2E-08	Skin, CVS	0.0006	--	0.00006	0.0006
			Chromium	- -	--	- -	--	- -	NA	0.000001	--	--	0.000001
			Iron	- -	--	- -	--	- -	GS	0.0008	--	--	0.0008
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.00004	--	--	0.00004
			Chemical Total	2E-07	--	3E-08	--	3E-07		0.02	--	0.002	0.02
		Exposure Point Total						3E-07					0.02
	Exposure Medium Total							3E-07					0.02
Medium Total								3E-07					0.02

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.002
Total CNS HI	0.00004
Total CVS HI	0.0006
Total Fetotoxicity HI	0.000001
Total GS HI	0.02
Total Kidney HI	0.0005
Total Skin HI	0.0006
Total NA HI	0.01

TABLE 9.5.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Recreational User
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	1E-06	--	4E-07	--	1E-06
			Aroclor-1248	1E-07	--	4E-08	--	1E-07
			Barium	- -	--	- -	--	- -
			Copper	- -	--	- -	--	- -
			Iron	- -	--	- -	--	- -
			Lead	- -	--	- -	--	- -
			Mercury	- -	--	- -	--	- -
			Thallium	- -	--	- -	--	- -
			Chemical Total	1E-06	--	4E-07	--	2E-06
		Exposure Point Total						2E-06
	Exposure Medium Total							2E-06
	Air	OU7	Benzo(a)pyrene Equivalents	--	1E-12	--	--	1E-12
			Aroclor-1248	--	3E-13	--	--	3E-13
			Barium	--	- -	--	--	- -
			Copper	--	- -	--	--	- -
			Iron	--	- -	--	--	- -
			Lead	--	- -	--	--	- -
			Mercury	--	- -	--	--	- -
			Thallium	--	- -	--	--	- -
			Chemical Total	--	2E-12	--	--	2E-12
		Exposure Point Total						2E-12
	Exposure Medium Total							2E-12
Medium Total								2E-06

TABLE 9.5.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Recreational User
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Sediment	Sediment	OU7	Benzo(a)pyrene Equivalents	3E-08	--	1E-08	--	4E-08
			TEQ PCB	3E-07	--	2E-08	--	4E-07
			Total PCB Congeners	1E-09	--	4E-10	--	2E-09
			Arsenic	4E-08	--	2E-09	--	4E-08
			Chromium	- -	--	- -	--	- -
			Iron	- -	--	- -	--	- -
			Lead	- -	--	- -	--	- -
			Manganese	- -	--	- -	--	- -
			Chemical Total	4E-07	--	4E-08	--	4E-07
		Exposure Point Total						4E-07
	Exposure Medium Total							4E-07
Medium Total								4E-07

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 9.6.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	9E-07	--	1E-07	--	1E-06	NA	--	--	--	--
			Aroclor-1248	1E-07	--	2E-08	--	2E-07	NA	--	--	--	--
			Barium	- -	--	- -	--	- -	Kidney	0.0008	--	--	0.0008
			Copper	- -	--	- -	--	- -	GS	0.01	--	--	0.01
			Iron	- -	--	- -	--	- -	GS	0.02	--	--	0.02
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Mercury	- -	--	- -	--	- -	Autoimmune	0.003	--	--	0.003
			Thallium	- -	--	- -	--	- -	NA	0.02	--	--	0.02
			Chemical Total	1E-06	--	2E-07	--	1E-06		0.06	--	--	0.06
		Exposure Point Total						1E-06					0.06
	Exposure Medium Total							1E-06					0.06
	Air	OU7	Benzo(a)pyrene Equivalents	--	2E-11	--	--	2E-11	NA	--	--	--	--
			Aroclor-1248	--	6E-12	--	--	6E-12	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.00005	--	0.00005
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.0000048	--	0.0000048
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	3E-11	--	--	3E-11		- -	0.00005	- -	0.00005
		Exposure Point Total						3E-11					0.00005
	Exposure Medium Total							3E-11					0.00005
Medium Total								1E-06					0.06

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.003
Total CNS HI	0.000005
Total Fetotoxicity HI	0.00005
Total GS HI	0.03
Total Kidney HI	0.0008
Total NA HI	0.02

TABLE 9.7.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Residents
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	1E-05	--	2E-06	--	1E-05	NA	--	--	--	--
			Aroclor-1248	4E-07	--	6E-08	--	4E-07	NA	--	--	--	--
			Barium	- -	--	- -	--	- -	Kidney	0.007	--	--	0.007
			Copper	- -	--	- -	--	- -	GS	0.1	--	--	0.1
			Iron	- -	--	- -	--	- -	GS	0.2	--	--	0.2
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Mercury	- -	--	- -	--	- -	Autoimmune	0.03	--	--	0.03
			Thallium	- -	--	- -	--	- -	NA	0.2	--	--	0.2
			Chemical Total	1E-05	--	2E-06	--	1E-05		0.6	--	--	0.6
		Exposure Point Total						1E-05					0.6
	Exposure Medium Total							1E-05					0.6
	Air	OU7	Benzo(a)pyrene Equivalents	--	3E-11	--	--	3E-11	NA	--	--	--	--
			Aroclor-1248	--	2E-12	--	--	2E-12	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.00005	--	0.00005
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.0000048	--	0.0000048
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	3E-11	--	--	3E-11		- -	0.00005	- -	0.00005
		Exposure Point Total						3E-11					0.00005
	Exposure Medium Total							3E-11					0.00005
Medium Total								1E-05					0.6

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.03
Total CNS HI	0.000005
Total Fetotoxicity HI	0.00005
Total GS HI	0.3
Total Kidney HI	0.007
Total NA HI	0.2

TABLE 9.8.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Residents
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	1E-05	--	2E-06	--	1E-05
			Aroclor-1248	5E-07	--	8E-08	--	6E-07
			Barium	- -	--	- -	--	- -
			Copper	- -	--	- -	--	- -
			Iron	- -	--	- -	--	- -
			Lead	- -	--	- -	--	- -
			Mercury	- -	--	- -	--	- -
			Thallium	- -	--	- -	--	- -
			Chemical Total	1E-05	--	2E-06	--	1E-05
		Exposure Point Total						1E-05
	Exposure Medium Total							1E-05
	Air	OU7	Benzo(a)pyrene Equivalents	--	5E-11	--	--	5E-11
			Aroclor-1248	--	8E-12	--	--	8E-12
			Barium	--	- -	--	--	- -
			Copper	--	- -	--	--	- -
			Iron	--	- -	--	--	- -
			Lead	--	- -	--	--	- -
			Mercury	--	- -	--	--	- -
			Thallium	--	- -	--	--	- -
			Chemical Total	--	5E-11	--	--	5E-11
		Exposure Point Total						5E-11
	Exposure Medium Total							5E-11
Medium Total								1E-05

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

LIST OF TABLES
RAGS PART D TABLE 10
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

Table No.	
	REASONABLE MAXIMUM EXPOSURES
10.1A.RME	Construction Workers - Entire Site Surface/Subsurface Soil
	CENTRAL TENDENCY EXPOSURES
10.1A.CTE	Construction Workers - Entire Site Surface/Subsurface Soil

TABLE 10.1A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	OU7	2,3,7,8-TCDD Equivalents	5E-06	--	4E-07	--	5E-06	Developmental	3	--	0.2	3
			Chemical Total	7E-06	--	2E-06	--	9E-06		5	--	0.4	5
		Exposure Point Total						9E-06					5
	Exposure Medium Total							9E-06					5
Subsurface Soil	Air	OU7	Manganese	--	- -	--	--	- -	CNS	--	2	--	2
			Chemical Total	--	5E-07	--	--	5E-07		- -	3	- -	3
		Exposure Point Total						5E-07					3
	Exposure Medium Total							5E-07					3
Medium Total								9E-06					8

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.07
Total Blood HI	0.9
Total Body Weight HI	0.05
Total CNS HI	2
Total Developmental HI	3
Total Fetotoxicity HI	0.1
Total GS HI	0.7
Total Kidney HI	0.04
Total Respiratory HI	0.8
Total None Reported HI	0.0005
Total Thyroid HI	0.1
Total NA HI	1.0

TABLE 10.1A.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Current
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	OU7	2,3,7,8-TCDD Equivalents	5E-06	--	1E-07	--	5E-06	Developmental	3	--	0.08	3
			Chemical Total	7E-06	--	5E-07	--	8E-06		5	--	0.14	5
		Exposure Point Total						8E-06					5
	Exposure Medium Total							8E-06					5
Subsurface Soil	Air	OU7	Manganese	--	- -	--	--	- -	CNS	--	2	--	2
			Chemical Total	--	5E-07	--	--	5E-07		- -	3	- -	3
		Exposure Point Total						5E-07					3
	Exposure Medium Total							5E-07					3
Medium Total								8E-06					8
Receptor Total							Receptor Risk Total	9E-06				Receptor HI Total	8

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.07
Total Blood HI	0.9
Total Body Weight HI	0.05
Total CNS HI	2
Total Developmental HI	3
Total Fetotoxicity HI	0.1
Total GS HI	0.7
Total Kidney HI	0.04
Total Respiratory HI	0.8
Total None Reported HI	0.0005
Total Thyroid HI	0.1
Total NA HI	0.8

APPENDIX D.2

EXPOSURE ASSESSMENT AND EXAMPLE CALCULATIONS

Appendix D.2.1

Chemical Intake Estimation

D.2.1 CHEMICAL INTAKE ESTIMATION

The methodologies and techniques used to estimate exposure intakes are presented in this Appendix. Intakes for the identified potential receptor groups were calculated using current USEPA risk assessment guidance (e.g., USEPA, 1991, 1997, and 2004) and presented in the risk assessment spreadsheets. All quantitative risk assessment results are presented in RAGS Part D format tables (Appendix D.1).

Non-carcinogenic intakes are estimated using the concept of an average annual exposure. Carcinogenic intakes are calculated as an incremental lifetime exposure, which assumes a life expectancy of 70 years. Equations used to calculate estimated intakes are provided below. Assumptions regarding exposure for all receptors and exposure pathways are presented in the RAGS Part D Table 4s which are provided in Appendix D.1.

Several general parameters (exposure duration, exposure frequency, body weight, and averaging time) are consistent for each potential receptor across all applicable exposure routes. Exposure frequencies of 150 days/year for the construction worker, 250 days/year for the occupational worker, 350 days/year for the future resident (adult and child) (for soil), and 90 days/year for the adult and child recreational user are used for the RME scenario. These exposure frequencies are in accordance with current USEPA guidance (USEPA, December 2002a). Exposure durations are set at 1 year for the construction worker, 25 years for the occupational worker, 30 years (24 for the adult, 6 for the child) for the future resident, and 24 years (14 for the adult, 10 for the adolescent) for the recreational user. These exposure durations are based on USEPA (December 1989) guidance. Adults are assumed to weigh 70 kg, whereas the weights of the adolescent and child are assumed to be 45 kg and 15 kg, respectively (USEPA, August 1997). For all receptors, averaging time for non-carcinogenic effects is the associated exposure duration multiplied by 365 days/year. Averaging time for carcinogenic effects for all receptors is the estimated lifetime of a receptor, assumed to be 70 years, multiplied by 365 days/year.

D.2.1.1 <u>Incidental Ingestion of Soil</u>

Direct physical contact with surface and/or subsurface soil at OU7 may result in the incidental ingestion of chemicals. Chemical intake for the incidental ingestion of soil is estimated in the following manner (USEPA, December 1989):

$$\text{Intake} = \frac{(C_{soil})(IR_s)(FI)(EF)(ED)(CF)}{(BW)(AT)}$$

where:

Intake	=	intake of chemical from soil (mg/kg/day)
C_{soil}	=	concentration of chemical in soil (mg/kg)
IR	=	ingestion rate (mg/day)
FI	=	fraction ingested from contaminated source (dimensionless)
EF	=	exposure frequency (days/yr)
ED	=	exposure duration (yr)
CF	=	conversion factor (1 x 10-6 kg/mg)
BW	=	body weight (kg)
AT	=	averaging time (days);
		for non-carcinogens, AT = ED x 365 days/yr;
		for carcinogens, AT = 70 yr x 365 days/yr

The majority of the exposure assumptions that will be used to estimate chemical intakes from incidental ingestion of soil are based on default assumptions described in the standard USEPA guidance and are provided in the RAGS Part D Table 4s (Appendix D.1).

There are no USEPA default recommendations for the exposure frequency for the construction worker or recreational user potentially exposed to soil. Consequently, the aforementioned exposure frequencies for the construction worker and recreational users (150 days per year and 90 days per year, respectively) were derived based on professional judgment. The exposure assumption for recreational users assumes that a recreational user visits the site 1 day per week each year.

The incidental ingestion of a small amount of soil is assumed to occur when a receptor comes into direct contact with a contaminated medium. Exposure to surface and subsurface soil (2 to 10 feet bgs) is evaluated for construction workers. All other potential receptors are assumed to be exposed to surface soil (collected from depths of 0 to 1 feet bgs) only. For informational purposes, an evaluation of residents, recreational users, and occupational workers for exposure to subsurface soil (2 to 10 feet bgs) in addition to the other media is included in Appendix D.7.

For the RME scenario, the soil ingestion rate is set at 330 mg/day for the construction workers, 200 mg/day for the future child resident, and 100 mg/day for the other potential receptors (the occupational worker and adult recreational user) (USEPA, December 2002a). A value of 1.0 is assumed for the fraction of soil available from the contaminated source and ingested by all potential receptors except for recreational users. A value of 0.5 is used for the FI for recreational

users because these receptors are assumed to be exposed to soil over shorter periods of time (i.e., they spend less time at the site) than other receptors.

A summary of the receptor-specific input values that will be used to estimate chemical intakes from incidental ingestion of soil are presented in the RAGS Part D Table 4s (Appendix D.1) for RME and CTE exposure scenarios, respectively.

D.2.1.2 Dermal Contact with Soil

During direct contact, potential receptors maybe dermally exposed to contaminated soil or sediment. Direct physical contact with soil may result in the dermal absorption of chemicals. Construction workers are evaluated for exposure to surface and subsurface soil to an estimated depth of 10 feet bgs, whereas all other potential receptors (occupational worker, recreational users [adult and adolescent], and hypothetical future residents) are assumed to be exposed to surface soil (collected from depths of 0 to 1 foot bgs) only. In addition, an evaluation of exposure of residents, recreational users, and occupational workers to surface (0-1 foot bgs) and subsurface soil (2-10 feet bgs) is included in Appendix D.7 for informational purposes only. Exposure associated with dermal contact with soil is estimated in the following manner (USEPA, December 1989):

$$\text{Intake} = \frac{(C_{soil})(CF)(SA)(AF)(ABS)(EF)(ED)}{(BW)(AT)}$$

where:

Intake	=	amount of chemical absorbed during contact with soil (mg/kg/day)
C_{soil}	=	concentration of chemical in soil (mg/kg)
SA	=	skin surface area available for contact (cm^2)
AF	=	skin adherence factor (mg/cm^2/event)
ABS	=	absorption factor (dimensionless)
CF	=	conversion factor (1×10^{-6} kg/mg)
EF	=	exposure frequency (days/yr)
ED	=	exposure duration (yr)
BW	=	body weight (kg)
AT	=	averaging time (days); for non-carcinogens, AT = ED x 365 days/yr; for carcinogens, AT = 70 yr x 365 days/yr

As suggested in the USEPA's Dermal Risk Assessment Guidance (USEPA, July 2004), the exposed skin surface areas for the RME and CTE are 5,700 cm^2/day for the adult resident, occupational worker, and construction worker and 2,800 cm^2/day for the future child resident. Soils to skin adherence factors (for the RME and CTE) were also published in the 2004 Dermal Guidance. Skin surface areas and soil adherence factors used to evaluate exposures to soil or sediment are presented in Appendix D.1. The following dermal absorption factors (DABS; USEPA, July 2004) were used to estimate dermal risks from exposure to soil or sediment.

Because of the limited guidance available to estimate exposure to soil via dermal contact, the USEPA recommends performing a quantitative evaluation of risks for select chemicals. USEPA (July 2004) suggests dermal absorption factors for arsenic, cadmium, chlordane, 2,4-dichlorophenoxyacetic acid, DDT, 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD), Lindane, PAHs [benzo(a)pyrene], PCBs (Aroclor 1254 and Aroclor 1242), and pentachlorophenol. The dermal route of exposure is evaluated quantitatively for these chemicals only. For chemicals lacking an ABS value in RAGS Part E, zero was used for the ABS value. Generic defaults only are suggested for semivolatile organic compounds and inorganics (0.1 and 0.01, respectively). Gastrointestinal (GI) absorption factors presented in the most recent USEPA dermal guidance (USEPA, July 2004) are used to calculate dermal cancer slope factors (CSFs) and dermal reference doses (RfDs).

Dermal Absorption Factors from Soil

Compound	Dermal Absorption Factor	Reference
Arsenic	0.03	Wester, et al. (1993a)
Cadmium	0.1	Wester, et al. (1992a) USEPA (1992a)
Chlordane	0.04	Wester, et al. (1992b)
Dioxins TCDD < 10% organic soil TCDD > 10% organic soil	 0.03 0.001	USEPA (1992a)
PAHs Benzo(a)pyrene	0.13	Wester, et al. (1990)
PCBs Aroclor 1254	0.14	Wester, et al. (1993b)
Remaining chemicals	0	Remaining chemicals were not evaluated because RAGS Part E does not provide ABS values for these (USEPA, July 2004)

Source: Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final, July 2004.

The dermal absorption factor of 0.13 for benzo(a)pyrene was used for all PAHs following USEPA guidance (USEPA, July 2004). The TCDD DABS of 0.03 was used for 2,3,7,8-TCDD TEQ and TEQ PCB. The PCB DABS of 0.14 was used for Total PCB Congeners.

For chemicals other than those listed above, 0 was used as the DABS value. Dermal exposures to volatile chemicals in soil are not evaluated as no USEPA approved dermal absorption values have been published.

D.2.1.3 Dermal Contact with Groundwater

As discussed in Section 6.3.1.1, construction workers are the only receptors likely to be exposed to groundwater by dermal contact.

Short-term dermal exposure is assumed to occur for the construction worker during excavation activities.

The following equation was used to assess exposures from dermal contact with groundwater (USEPA, 2004b):

$$DAD = \frac{(DA_{event})(EV)(ED)(EF)(SA)}{(BW)(AT)}$$

where:

DAD	=	dermally-absorbed chemical dose from water (mg/kg/day)
DA_{event}	=	dermally-absorbed dose per event (mg/cm^2-event)
EV	=	event frequency (events/day)
ED	=	exposure duration (yr)
EF	=	exposure frequency (days/yr)
SA	=	skin surface area available for contact (cm^2)
BW	=	body weight (kg)
AT	=	averaging time (days)

for non-carcinogens, AT = ED×365 days per year

for carcinogens, AT = 70 years×365 days per year

For construction workers, the exposed surface area of the body available for contact is based on assumed activities and is similar to the assumptions outlined for dermal contact with soil. USEPA has not established default exposure frequency assumptions for a construction worker exposed to groundwater. Consequently, it was assumed that the construction worker would be exposed to groundwater for 4 hours per day for 30 days per year for the RME scenario and 2 hours per day for 15 days under the CTE scenario. A shorter exposure frequency is recommended for a construction worker exposed to groundwater than that recommended for exposure to soil

because it is unlikely that a construction worker would have direct contact with groundwater on a daily basis during a construction project.

The absorbed dose per event (DA_{event}) was estimated using a non-steady-state approach for organic compounds and a traditional steady-state approach for inorganics. For organics, the following equations apply:

$$\text{If } t_{event} < t^*, \text{ then: } DA_{event} = (2)(K_p)(FA)(C_w)(CF)\left(\sqrt{\frac{6\,\tau\, t_{event}}{\pi}}\right)$$

$$\text{If } t_{event} > t^*, \text{ then: } DA_{event} = (K_p)(FA)(C_w)(CF)\left(\frac{t_{event}}{1+B} + 2\,\tau\left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right)$$

where:

t_{event}	=	event duration (hour/event)
t^*	=	time to reach steady-state conditions (hour)
K_p	=	permeability coefficient of water through skin (cm/hour)
FA	=	chemical-specific fraction absorbed (dimensionless)
C_w	=	chemical concentration in water (mg/L)
τ	=	lag time (hour)
π	=	pi (dimensionless; equal to 3.1416)
CF	=	conversion factor (0.001 L/cm^3)
B	=	dimensionless ratio of the permeability of the stratum corneum relative to permeability across the viable epidermis

However, no organics were selected as COPCs in groundwater.

The following steady-state equation was used to estimate DA_{event} for inorganics:

$$DA_{event} = (K_p)(C_w)(t_{event})$$

The dermal permeability (K_p) values recommended in the USEPA dermal guidance (2004b) were used to calculate DA_{event} values for inorganic COPCs.

D.2.1.4 <u>Ingestion of Surface Water</u>

Surface water was evaluated in the Uncertainty Analysis (Section 6.6) section of the HHRA, and corresponding tables are provided in Appendix D.7. Ingestion of surface water is expected to be limited to exposure experienced by receptors engaged in recreational activities (i.e., the adult and adolescent recreational users) in the intertidal area.

Chronic Daily Intakes (CDI) associated with ingestion of surface water will be evaluated using the following equations (USEPA, December 1989):

$$\text{Intake} = \frac{(C)(CF)(CR)(ET)(EF)(ED)}{(BW)(AT)}$$

where:

Intake	=	intake of chemical from surface water (mg/kg/day)
C	=	concentration of chemical in surface water (µg/L)
CF	=	conversion factor (0.001 mg/µg)
CR	=	contact rate for surface water (L/hr)
EF	=	exposure frequency (days/yr)
ET	=	exposure time (hrs/day)
ED	=	exposure duration (yr)
BW	=	body weight (kg)
AT	=	averaging time (days);
		for non-carcinogens, AT = ED x 365 days/yr;
		for carcinogens, AT = 70 yrs x 365 days/yr

The majority of the exposure assumptions that will be used to estimate chemical intakes from ingestion of surface water are based on default assumptions described in the standard USEPA guidance and are included in Appendix D.1.

It is assumed that receptors would recreate (i.e., walk) in the intertidal area of OU7 7 days per year and 4 days per year under the RME and CTE case scenarios, respectively. This exposure frequency is appropriate for the rocky characteristics of the shoreline and climate at the site. The exposure time selected for each day the receptor recreated at the site was 1 hour per day for the RME and 0.5 hours/day for the CTE. As indicated in the Tables 4s (Appendix D.7), the surface water ingestion rate assumed while swimming is 0.05 L/hr.

D.2.1.5 Dermal Contact with Surface Water

Surface water was evaluated in the Uncertainty Analysis (Section 6.6) section of the HHRA, and corresponding tables are provided in Appendix D.7. Direct contact with surface water is expected to be limited to exposure experienced by receptors (i.e., the adult and adolescent recreational users) engaged in recreational activities in the intertidal area.

The following equation is used to assess exposures resulting from dermal contact with groundwater or surface waters (USEPA, July 2004):

$$DAD = \frac{DAevent \times EV \times EF \times ED \times SA}{BW \times AT}$$

where:

DAD	=	dermally absorbed dose of chemical from water (mg/kg/day)
DA_{event}	=	dermally absorbed dose per event (mg/cm^2 event)
EV	=	event frequency (events/day)
ED	=	exposure duration (yr)
EF	=	exposure frequency (days/yr)
SA	=	skin surface area available for contact (cm^2)
BW	=	body weight (kg)
AT	=	averaging time (days);
		for non-carcinogens, AT = ED x 365 days/yr;
		for carcinogens, AT = 70 yrs x 365 days/yr

The majority of the exposure assumptions that will be used to estimate chemical intakes from dermal contact with groundwater or surface water are based on default assumptions described in the standard USEPA guidance and are provided in Appendix D.1. The following paragraphs detail the non-default receptor-specific exposure assumptions (for dermal contact with surface water) used in the HHRA.

Exposed surface areas of the body available for dermal contact are determined on a receptor-specific basis since they correspond with assumed human activities and clothing worn during exposure events. As discussed in Section 6.2.2 (COPC selection), surface water at OU7 consists of near-shore water, seep water, and combined near-shore and seep water. However, no COPCs were selected for near-shore or combined near-shore/seep water. Only one COPC (chromium) was selected in seep water. Because the seeps are very shallow, dermal contact was considered to be limited to the lower legs and feet of recreational receptors. Current guidance (USEPA, July 2004) was used to develop the following assumption concerning the available skin surface areas for adult and adolescent recreational users:

- For adolescent recreational users, SA = 2,600 cm^2
- For adult recreational users, SA = 3,600 cm^2

The remaining exposure assumptions (EV, ED, EF, BW, and AT) are the same as for ingestion of surface water.

The absorbed dose per event (DA_{event}) is estimated using a non-steady-state approach for organic compounds and a traditional steady-state approach for inorganics. For organics, the following equations apply:

$$\text{If } t_{event} < t^*, \text{ then}: DA_{event} = 2(FA)(K_p)(C_{sw})(CF)\left[\frac{\sqrt{6\,\tau\, t_{event}}}{\pi}\right]$$

$$\text{If } t_{event} < t^*, \text{ then}: DA_{event} = (FA)(K_p)(C_{sw})(CF)\left[\frac{t_{event}}{1+B} + 2\tau\left[\frac{1+3B+3B^2}{(1+B)^2}\right]\right]$$

where:

DA_{event}	=	absorbed dose per event (mg/cm^2-event)
FA	=	fraction absorbed (dimensionless) – chemical specific
t_{event}	=	duration of event (hr/event)
t*	=	time it takes to reach steady-state conditions (hr)
Kp	=	permeability coefficient from water through skin (cm/hr)
C_{sw}	=	concentration of chemical in surface water (µg/L)
τ	=	lag time (hr)
*	=	constant (dimensionless; equal to 3.14159)
CF	=	conversion factor (1 x 10^{-6} L-mg/cm^3-µg)
B	=	partitioning constant derived by Bunge Model (dimensionless)

Values for the chemical-specific parameters (t*, K_p, FA, τ, and B) are obtained from the current dermal guidance (USEPA, July 2004, Exhibit B-3). If published values are not available for a particular compound, they were calculated using equations provided in the USEPA dermal guidance.

The following steady-state equation is used to estimate DA_{event} for inorganics:

$$DA_{event} = (K_p)(C_{sw})(t_{event})$$

The dermal permeability (K_p) values recommended in the USEPA dermal guidance (USEPA, 2004) will be used to calculate DA_{event} for inorganic COPCs.

The receptor-specific input values that will be used to estimate chemical intakes from dermal contact with surface water are presented in Tables 4.16 and 4.17 in Appendix D.7.2 for RME and CTE exposure scenarios.

D.2.1.6 Incidental Ingestion of Sediment

Direct physical contact with sediment may result in the incidental ingestion of chemicals while receptors (i.e., recreational users) are involved in recreational activities (e.g., walking) in the intertidal area of OU7. Chemical intake for incidental ingestion of sediment is estimated in the following manner (USEPA, December 1989):

$$\text{Intake} = \frac{(C_{sd})(IR)(FI)(EF)(ED)(CF)}{(BW)(AT)}$$

where:

Intake	=	intake of chemical from sediment (mg/kg/day)
C_{sd}	=	concentration of chemical in sediment (mg/kg)
IR	=	ingestion rate (mg/day)
FI	=	fraction ingested from contaminated source (dimensionless)
EF	=	exposure frequency (days/yr)
ED	=	exposure duration (yr)
CF	=	conversion factor (1×10^{-6} kg/mg)
BW	=	body weight (kg)
AT	=	averaging time (days);
		for non-carcinogens, AT = ED x 365 days/yr;
		for carcinogens, AT = 70 yr x 365 days/yr

The majority of the exposure assumptions that will be used to estimate chemical intakes from incidental ingestion of sediment are based on default assumptions described in the standard USEPA guidance and are summarized in Appendix D.1. The following paragraph details the non-default receptor and pathway-specific exposure assumptions (for incidental ingestion of sediment) that will be used in the HHRA.

There are no USEPA default exposure assumptions for exposure to sediment while recreating. Conservatively, the soil ingestion rates presented in Appendix D.1 are also used as sediment ingestion rates. Because most of the sediments are routinely covered by surface water, the fraction ingested (FI) from the contaminated source is set at 0.5 (or 50%) for all exposed receptor groups. The FI of 0.5 is based on the assumption that sediment exposure at OU7 is anticipated to be less intense and to occur over shorter periods of time than is typically assumed for soils. It is assumed that receptors would recreate (walk) in the intertidal area 7 days per year and 4 days per year under the RME and CTE case scenario, respectively; these exposure frequencies are the same as for surface water.

The receptor and pathway-specific input values that will be used to estimate chemical intakes from incidental ingestion of sediment are presented in Tables 4.8 and 4.11 of Appendix D.1 for adult and adolescent recreational users, respectively.

D.2.1.7 Dermal Contact with Sediment

Direct physical contact with sediment may result in the dermal absorption of chemicals while receptors (i.e., recreational users) are involved in recreational activities (walking) in the intertidal area. Exposure associated with dermal contact with sediment is estimated in the following manner (USEPA, December 1989):

$$\text{Intake} = \frac{(C_{sd})(SA)(AF)(ABS)(CF)(EF)ED}{(BW)(AT)}$$

where:

Intake	=	amount of chemical absorbed during contact with sediment (mg/kg/day)
C_{sd}	=	concentration of chemical in sediment (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 (1×10^{-6} kg/mg)
EF	=	exposure frequency (days/yr)
ED	=	exposure duration (yr)
BW	=	body weight (kg)
AT	=	averaging time (days); for non-carcinogens, AT = ED x 365 days/yr; for carcinogens, AT = 70 yr x 365 days/yr

A summary of the receptor-specific input values that will be used to estimate chemical intakes from dermal contact with sediment are presented in Appendix D.1 for RME and CTE exposure scenarios. The skin surface areas are those previously specified for receptor exposure to soils. The same exposure duration and fraction ingestion assumptions recommended for the evaluation of the incidental ingestion of sediments exposure pathway are used to estimate chemical intakes for dermal contact with sediment. However, the exposure frequency assumed for sediment is 7 days and 4 days for the RME and CTE, respectively. The adherence factors presented are selected from those listed in Exhibits 3.3 and 3.5 of RAGS Part E. To the extent possible, chemical specific dermal absorption factors provided in RAGS E were used to evaluate the COPCs for sediments.

D.2.1.8 Inhalation of Particulates

As mentioned previously, a qualitative evaluation of exposure to fugitive dust/volatile emissions from soil (i.e., comparison of maximum site soil concentrations to USEPA generic SSLs for chemical transfers from soil to air) was used to identify whether a quantitative analysis of the inhalation exposure pathway is warranted. As discussed in Section 5.2, the maximum chemical concentrations reported for a few chemicals detected in soil exceeded the SSLs, therefore quantitative risk from inhalation of air and fugitive dust was evaluated for soil. Ambient air concentrations resulting from the volatilization of COPCs from groundwater were not calculated in this risk assessment because no volatile chemicals were identified as COPCs in groundwater.

The amount of a chemical a receptor takes in as a result of respiration is determined using the concentration of the contaminant in air. Intakes of both particulates and vapors/gases are calculated using the same equation, presented in Appendix D.1 (USEPA, January 2009). All exposure factors for the identified receptor groups are outlined in the RAGS Part D Table 4s in Appendix D.1 (Table 4s for surface water are in Appendix D.7). The estimated concentrations of chemicals in air resulting from emissions from soil were developed following procedures presented in USEPA Soil Screening Guidance (USEPA, December 2002a). The chemical concentration in air is estimated using the equations presented in Appendix D.1. Intakes of both particulates and vapors/gases are calculated using the same equation, as follows (USEPA, January 2009):

$$EC = \frac{(C_{air})(ET)(EF)(ED)}{(AT)}$$

where:

EC	=	exposure concentration (mg/m^3)
C_{air}	=	concentration of chemical in air (mg/m^3)
ET	=	exposure time (hours/day)
EF	=	exposure frequency (days/yr)
ED	=	exposure duration (yr)
AT	=	averaging time (hours);
	=	for non-carcinogens, AT = ED x 365 days/yr x 24 hours/day;
	=	for carcinogens, AT = 70 yr x 365 days/yr x 24 hours/day

The exposure assumptions that were used to estimate chemical intakes from inhalation of fugitive dusts/volatile emissions from surface and subsurface soils are based on default assumptions described in the standard USEPA guidance and are summarized in Appendix D.1. The same exposure frequencies and durations used to estimate incidental ingestion of soil intakes are used to estimate exposure via inhalation of fugitive dust/volatile emissions for surface and subsurface soils.

The concentrations of chemicals in air resulting from emissions from soil are developed following procedures presented in USEPA Soil Screening Guidance (USEPA, December 2002a). The chemical concentration in air is calculated from:

$$C_{air} = C_{soil} \times [1/PEF + 1/VF]$$

where:

C_{air}	=	chemical concentration in air, mg/m^3
C_s	=	chemical concentration in soil, mg/kg
PEF	=	Particulate emission factor, m^3/kg
VF	=	volatilization factor, m^3/kg

The particulate emissions factor, PEF, relates the concentration of the chemical in soil with the concentration of dust particles in air. A PEF value of 9.37E09 m^3/kg was obtained from USEPA's Soil Screening Internet site located at http://rais.ornl.gov/epa/ssl1.shtml. This is the default value for Portland, Maine which is the closest city to PNS listed on the Internet site. Because air emissions resulting from fugitive dust emissions settings will be different than dust emissions generated during construction activities, a separate PEF was used for construction activities. The PEF for construction workers (1.43E06 m^3/kg) was calculated using the equations presented in the supplemental SSL guidance document (USEPA, December 2002). Sample calculations for the PEFs are presented in Appendix D.2.3.

Ambient air concentrations resulting from the volatilization of COPCs from soil are chemical dependent and were calculated using the following equation from USEPA's Soil Screening Guidance:

$$VF = \frac{Q/C \times (3.14 \times D_a \times T)^{0.5} \times 10^{-4} \ (m^2 / cm^2)}{(2 \times \rho_b \times D_a)}$$

and

$$D_a = \frac{[(\theta_a^{10/3} \times D_i \times H' + \theta_w^{10/3} \times D_w)/n^2]}{\rho_b \times K_d + \theta_w + \theta_a \times H'}$$

where:

VF	=	volatilization factor (m^3-air/kg-soil)
Q/C	=	inverse of the mean concentration at the center of source (gm/m^2-sec per kg/m^3)
D_a	=	apparent diffusivity, chemical specific, (cm^2/sec)
T	=	exposure interval, exposure specific, (sec)
ρ_b	=	dry bulk soil particle density (g/cm^3)
θ_a	=	air-filled soil porosity (L_{air}/L_{soil})
D_i	=	diffusivity in air, chemical specific, (cm^2/sec)
n	=	total soil porosity (L_{pore}/L_{soil})
θ_w	=	water-filled soil porosity (L_{air}/L_{soil})
D_w	=	diffusivity in water, chemical specific, (cm^2/sec)
K_d	=	soil-water partition coefficient, chemical specific
H'	=	dimensionless Henry's law constant, chemical specific

Chemical properties were obtained from the Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites (USEPA, December 2002a).

D.2.1.9 Exposure Assessment and Risk Characterization of Lead

The equations and methodology presented in the previous section cannot be used to evaluate exposure to lead because of the absence of published dose-response parameters. In addition to the quantitative risk evaluation described in the preceding paragraphs, lead is evaluated using the IEUBK Version 1.1 Build 9 (USEPA, February 1994, May 2002, May 2009, and June 2009a) and the Adult Lead Model presented in the USEPA document entitled: "Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soils (USEPA, December 1996, January 2003)". The most

current guidance for ALM input parameters (USEPA, June 2009b) was also used to evaluate adult lead exposures.

Lead was selected as a COPC in surface soil, subsurface soil, and sediment at OU7. The methodology presented in the previous section cannot be used to evaluate exposure to lead because of the absence of published dose-response parameters for this chemical. Exposure to lead is typically addressed using the USEPA IEUBK Model for lead (USEPA, February 1994, May 2002, May 2009, and June 2009a) for exposure to small children and the Technical Review Workgroup (TRW) ALM (USEPA, December 1996, January 2003). These models may be used to evaluate exposure to soil and are designed to estimate blood lead levels based on either default or site-specific input values. Additional guidance for the ALM was provided by the USEPA (USEPA, June 2009b). This guidance presented updated values for the default baseline blood lead concentration and the geometric standard deviation parameters used in the model. Both the USEPA and TRW guidance explicitly state that the average lead concentration is to be used as the exposure point concentration to be used in the model.

Studies indicate that infants and young children are extremely susceptible to adverse effects from exposure to lead. Considerable behavioral and developmental impairments have been noted in small children with elevated blood lead levels. The threshold for toxic effects from this chemical is believed to be in the range of 10 µg/dL to 15 µg/dL. Blood lead levels greater than 10 µg/dL are considered to be a “concern.”

The aforementioned lead models are used to address exposure to lead at for surface soil, subsurface soil, and sediment at OU7 because the maximum detected site concentrations exceeded the associated screening levels. Results for the lead evaluations are discussed in the Risk Characterization, Section 6.5.

D.2.1.10 Assessing Cancer Risks from Early Life Exposures

USEPA’s Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, March 2005b) recommends making adjustments to the toxicity of carcinogenic chemicals which act via the mutagenic mode of action when evaluating early life exposures. The guidance recommends using age dependent adjustment factors (ADAFs) combined with age specific exposure estimates when assessing cancer risks. In the absence of chemical specific data the supplement guidance recommends the following default adjustments which reflect that cancer risks are generally higher from early-life exposures than from similar exposures later in life:

- For exposures before 2 years of age (i.e., spanning a 2-year interval from the first day of birth up until a child's second birthday), a 10-fold adjustment.

- For exposures between 2 and < 16 years of age (i.e., spanning a 14-year time interval from a child's second birthday up until their sixteenth birthday), a 3-fold adjustment.

- For exposures after turning 16 years of age, no adjustment.

The adjustments were applied using the same method used by USEPA in the development of the RSLs. Children were evaluated as two age groups, ages 0 to 2 years and ages 2 to 6 years; and adults were evaluated as two age groups, ages 6 to 17, and ages greater than 16 years old. Using this approach the intakes for recreational users and hypothetical residents were calculated as follows:

$$\text{Intake}_{\text{Child}} = \text{Intake}_{(\text{ages } 0 - 2 \text{ years})} \times 10 + \text{Intake}_{(\text{ages } 2 - 6 \text{ years})} \times 3$$

$$\text{Intake}_{\text{Adult}} = \text{Intake}_{(\text{ages } 6 - 16 \text{ years})} \times 3 + \text{Intake}_{(\text{ages} > 16 \text{ years})}$$

The above approach was used only for those chemicals which are identified as mutagenic in the USEPA RSL table (e.g., carcinogenic PAHs). Sample calculations demonstrating this approach are included in Appendix D.2.3.

Appendix D.2.2

ProUCL Printouts

Evaluation of 95-Percent Upper Confidence Limits Calculated by ProUCL

During a conference call on April 8, 2011, between the Navy and the Maine Department of Environmental Protection (MEDEP), concern was raised by MEDEP that the version of USEPA's ProUCL used to calculate the 95-percent Upper Confidence Limits (UCLs) for the risk assessment in the draft Operable Unit (OU) 7 Remedial Investigation (RI) Report may not have correctly calculated the 95-percent UCLs. As discussed below the version of ProUCL used in the OU7 RI Report may contain bugs and may have incorrectly calculated the 95-percent UCLs. This evaluation compares the 95-percent UCLs calculated in the OU7 draft RI Report with the 95-percent UCLs calculated with the latest version of ProUCL in which the bugs have been corrected.

When work on the OU7 risk assessment for the draft RI Report was conducted the most current version of ProUCL was 4.00.04. After the draft RI Report was submitted, the EPA issued two updated versions of ProUCL, 4.00.05 and 4.1.00. The latest version of ProUCL is 4.1.00 and the accompanying Technical Guide states, "It should be noted that all known software bugs found by the various users and developers of ProUCL 4.00.05 (and earlier versions) and most of the suggestions made by the users have been addressed in ProUCL 4.1.00." To verify that the software bugs in the previous versions of ProUCL do not impact the risk calculations presented in the OU7 draft RI Report, the 95-percent UCLs were recalculated using version 4.1.00. In the risk assessment presented in the draft OU7 RI report, 95-percent UCLs were used to represent the exposure point concentration for receptors exposed to entire site surface soil, entire site subsurface soil, sediment, chemicals eliminated due to background in surface soil, and chemicals eliminated due to background in subsurface soil at OU7. The recalculated 95-percent UCLs using version 4.1.00 will replace the 95-percent UCLs used in the draft OU7 RI Report.

To calculate a representative 95-percent UCL, ProUCL 4.1.00 utilizes various computation methods for data sets with and without non-detected concentrations. Table 1 presents the 95-percent UCLs, data distribution, and UCL computation method by versions 4.00.04 and 4.1.00 by media (entire site surface soil, entire site subsurface soil, sediment, and chemicals eliminated due to background in surface soil and subsurface soil). Changes to the 95-percent UCL, data distribution, and UCL computation method recommended by version 4.1.00 are presented in red text. The 95-percent UCLs and UCL computation method for copper in entire site surface soil and entire site subsurface soil and antimony in entire site surface soil chemicals eliminated due to background are the only changes between the UCLs calculated by versions 4.00.04 and 4.1.00. The 95-percent UCL for copper in entire site surface soil decreased from 1302 mg/kg to 1030 mg/kg and the UCL computation method changed from the 97.5-percent Chebyshev (Mean, Sd) UCL to the 95-percent Chebyshev (Mean, Sd) UCL. The 95-percent UCL for copper in entire site subsurface soil decreased from 9900 mg/kg to 6020 mg/kg and the UCL computation method changed from the 99-percent Chebyshev (Mean, Sd) UCL to the 95-percent Chebyshev (Mean, Sd) UCL.

The 95-percent UCL for antimony in entire site surface soil chemicals eliminated due to background concentrations changed from 2.1 mg/kg to 2.0 mg/kg and the UCL computation method did not change, both versions recommended 95-percent KM (BCA) UCL. The UCLs calculated by ProUCL, version 4.1.00, will be incorporated in the risk assessment presented in the OU7 RI Report.

TABLE 1
COMPARISON OF 95-PERCENT UPPER CONFIDENCE LIMITS
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

		ProUCL version 4.00.04			ProUCL version 4.1.00		
Exposure Media	**Chemical**	**95-Percent UCL(1)**	**Data Distribution**	**UCL Computation Method**	**95-Percent UCL(1)**	**Data Distribution**	**UCL Computation Method**
Entire Site Surface Soil	BAP Equivalent	1.8	Lognormal	97.5% KM (Chebyshev) UCL	1.8	Lognormal	97.5% KM (Chebyshev) UCL
	Barium	335	Nonparametric	95% Chebyshev (Mean, Sd) UCL	335	Nonparametric	95% Chebyshev (Mean, Sd) UCL
	Chromium	62.2	Lognormal	95% Modified-t UCL	62.2	Lognormal	95% Modified-t UCL
	Copper	1302	Nonparametric	97.5% Chebyshev (Mean, Sd) UCL	**1030**	Nonparametric	**95% Chebyshev (Mean, Sd) UCL**
	Iron	34200	Nonparametric	95% Modified-t UCL	34200	Nonparametric	95% Modified-t UCL
	Lead	2140	Lognormal	97.5% KM (Chebyshev) UCL	2140	Lognormal	97.5% KM (Chebyshev) UCL
	Mercury	2.1	Lognormal	97.5% KM (Chebyshev) UCL	2.1	Lognormal	97.5% KM (Chebyshev) UCL
	Thallium	0.48	Gamma	95% KM (t) UCL	0.48	Gamma	95% KM (t) UCL
Entire Site Subsurface Soil	BAP Equivalent	1.1	Nonparametric	95% KM (Chebyshev) UCL	1.1	Nonparametric	95% KM (Chebyshev) UCL
	Aroclor-1260	4.6	Nonparametric	97.5% KM (Chebyshev) UCL	4.6	Nonparametric	97.5% KM (Chebyshev) UCL
	2,3,7,8-TCDD TEQ	0.0013	Nonparametric	99% Chebyshev (Mean, Sd) UCL	0.0013	Nonparametric	99% Chebyshev (Mean, Sd) UCL
	Antimony	182	Lognormal	97.5% KM (Chebyshev) UCL	182	Lognormal	97.5% KM (Chebyshev) UCL
	Barium	280	Nonparametric	95% Chebyshev (Mean, Sd) UCL	280	Nonparametric	95% Chebyshev (Mean, Sd) UCL
	Cadmium	5.1	Nonparametric	95% KM (Chebyshev) UCL	5.1	Nonparametric	95% KM (Chebyshev) UCL
	Chromium	290	Nonparametric	95% Chebyshev (Mean, Sd) UCL	290	Nonparametric	95% Chebyshev (Mean, Sd) UCL
	Cobalt	15.9	Lognormal	95% H-UCL	15.9	Lognormal	95% H-UCL
	Copper	9900	Nonparametric	99% Chebyshev (Mean, Sd) UCL	**6020**	Nonparametric	**95% Chebyshev (Mean, Sd) UCL**
	Iron	97100	Nonparametric	95% Chebyshev (Mean, Sd) UCL	97100	Nonparametric	95% Chebyshev (Mean, Sd) UCL
	Lead	5630	Lognormal	97.5% KM (Chebyshev) UCL	5630	Lognormal	97.5% KM (Chebyshev) UCL
	Manganese	969	Nonparametric	95% Chebyshev (Mean, Sd) UCL	969	Nonparametric	95% Chebyshev (Mean, Sd) UCL
	Mercury	9.4	Lognormal	95% KM (Chebyshev) UCL	9.4	Lognormal	95% KM (Chebyshev) UCL
	Nickel	484	Nonparametric	95% KM (Chebyshev) UCL	484	Nonparametric	95% KM (Chebyshev) UCL
	Thallium	0.89	Gamma	95% KM (t) UCL	0.89	Gamma	95% KM (t) UCL
	Zinc	2600	Lognormal	95% H-UCL	2600	Lognormal	95% H-UCL
Sediment	BAP Equivalent	1.2	Gamma	95% Approximate Gamma UCL	1.2	Gamma	95% Approximate Gamma
	TEQ PCB	0.0016	Nonparametric	99% KM (Chebyshev) UCL	0.0016	Nonparametric	99% KM (Chebyshev) UCL
	Total PCB Congeners	0.42	Gamma	95% Approximate Gamma UCL	0.42	Gamma	95% Approximate Gamma
	Arsenic	14.5	Gamma	95% Approximate Gamma UCL	14.5	Gamma	95% Approximate Gamma
	Chromium	150	Normal	95% Student's t UCL	150	Normal	95% Student's t UCL
	Iron	45900	Nonparametric	95% Modified-t UCL	45900	Nonparametric	95% Modified-t UCL
	Lead	248	Gamma	95% Approximate Gamma UCL	248	Gamma	95% Approximate Gamma
	Manganese	468	Normal	95% Student's t UCL	468	Normal	95% Student's t UCL
Entire Site Surface Soil Chemicals Eliminated due to Background	2,3,7,8-TCDD TEQ	12	Gamma	95% KM (Chebyshev) UCL	12	Gamma	95% KM (Chebyshev) UCL
	Aluminum	12800	Gamma	95% Approximate Gamma UCL	12800	Gamma	95% Approximate Gamma UCL
	Antimony	2.1	Lognormal	95% KM (BCA) UCL	**2.0**	Lognormal	95% KM (BCA) UCL
	Arsenic	20.6	Nonparametric	95% KM (Chebyshev) UCL	20.6	Nonparametric	95% KM (Chebyshev) UCL
	Cadmium	1.8	Lognormal	95% KM (Chebyshev) UCL	1.8	Lognormal	95% KM (Chebyshev) UCL
	Cobalt	10.4	Normal	95% Student's t UCL	10.4	Normal	95% Student's t UCL
	Manganese	386	Normal	95% Student's t UCL	386	Normal	95% Student's t UCL
	Vanadium	43.7	Lognormal	95% Modified-t UCL	43.7	Lognormal	95% Modified-t UCL
Entire Site Subsurface Soil Chemicals Eliminated due to Background	Aluminum	11600	Normal	95% Student's t UCL	11600	Normal	95% Student's t UCL
	Arsenic	18	Gamma	95% Approximate Gamma UCL	18	Gamma	95% Approximate Gamma UCL
	Vanadium	34.8	Gamma	95% Approximate Gamma UCL	34.8	Gamma	95% Approximate Gamma UCL

Sd = Standard deviation
UCL = Upper Confidence Limit

(1) units are mg/kg.
ProUCL version 4.00.04 was used to calculate the exposure point concentrations for the Operable Unit 7 risk assessment.
Values in red text indicate a change from version 4.00.04 and 4.1.00.

	General UCL Statistics for Data Sets with Non-Detects
User Selected Options	
From File	Converted_Data_2.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

LEAD

General Statistics			
Number of Valid Data	51	Number of Detected Data	50
Number of Distinct Detected Data	49	Number of Non-Detect Data	1
Number of Missing Values	14	Percent Non-Detects	1.96%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	6.1	Minimum Detected	1.808
Maximum Detected	13200	Maximum Detected	9.488
Mean of Detected	520.4	Mean of Detected	4.718
SD of Detected	1881	SD of Detected	1.569
Minimum Non-Detect	21.2	Minimum Non-Detect	3.054
Maximum Non-Detect	21.2	Maximum Non-Detect	3.054

UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.271	Shapiro Wilk Test Statistic	0.973
5% Shapiro Wilk Critical Value	0.947	5% Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	510.4	Mean	4.672
SD	1864	SD	1.588
95% DL/2 (t) UCL	947.8	95% H-Stat (DL/2) UCL	739.1
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	195.1	Mean in Log Scale	4.676
SD	2104	SD in Log Scale	1.583
95% MLE (t) UCL	688.8	Mean in Original Scale	510.5
95% MLE (Tiku) UCL	674	SD in Original Scale	1864
		95% t UCL	947.8
		95% Percentile Bootstrap UCL	992.8
		95% BCA Bootstrap UCL	1439
		95% H UCL	732.7
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.412	**Data appear Lognormal at 5% Significance Level**	
Theta Star	1263		

nu star	41.22		
A-D Test Statistic	3.568	**Nonparametric Statistics**	
5% A-D Critical Value	0.832	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.832	Mean	510.5
5% K-S Critical Value	0.134	SD	1845
Data not Gamma Distributed at 5% Significance Level		SE of Mean	261
		95% KM (t) UCL	947.9
Assuming Gamma Distribution		95% KM (z) UCL	939.8
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	947.8
Minimum	0.000001	95% KM (bootstrap t) UCL	2381
Maximum	13200	95% KM (BCA) UCL	1042
Mean	510.2	95% KM (Percentile Bootstrap) UCL	1015
Median	98.1	95% KM (Chebyshev) UCL	1648
SD	1864	97.5% KM (Chebyshev) UCL	2140
k star	0.349	99% KM (Chebyshev) UCL	3107
Theta star	1463		
Nu star	35.57	**Potential UCLs to Use**	
AppChi2	22.92	97.5% KM (Chebyshev) UCL	2140
95% Gamma Approximate UCL	791.7		
95% Adjusted Gamma UCL	802.1		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

MERCURY

General Statistics

Number of Valid Data	51	Number of Detected Data	44
Number of Distinct Detected Data	40	Number of Non-Detect Data	7
Number of Missing Values	14	Percent Non-Detects	13.73%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.01	Minimum Detected	-4.605
Maximum Detected	8.385	Maximum Detected	2.126
Mean of Detected	0.835	Mean of Detected	-1.356
SD of Detected	1.648	SD of Detected	1.57
Minimum Non-Detect	0.01	Minimum Non-Detect	-4.605
Maximum Non-Detect	0.12	Maximum Non-Detect	-2.12
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	21
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	30
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	41.18%

UCL Statistics

Normal Distribution Test with Detected Values Only	**Lognormal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic	0.52	Shapiro Wilk Test Statistic	0.983
5% Shapiro Wilk Critical Value	0.944	5% Shapiro Wilk Critical Value	0.944
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.723	Mean	-1.776
SD	1.555	SD	1.835
95% DL/2 (t) UCL	1.088	95% H-Stat (DL/2) UCL	2.154
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.0253	Mean in Log Scale	-1.792
SD	2.178	SD in Log Scale	1.846
95% MLE (t) UCL	0.536	Mean in Original Scale	0.722
95% MLE (Tiku) UCL	0.607	SD in Original Scale	1.555
		95% t UCL	1.087
		95% Percentile Bootstrap UCL	1.108
		95% BCA Bootstrap UCL	1.225
		95% H UCL	2.185
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.513	**Data appear Lognormal at 5% Significance Level**	
Theta Star	1.626		
nu star	45.19		
A-D Test Statistic	1.481	**Nonparametric Statistics**	
5% A-D Critical Value	0.81	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.81	Mean	0.723
5% K-S Critical Value	0.141	SD	1.54
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.218
		95% KM (t) UCL	1.088
Assuming Gamma Distribution		95% KM (z) UCL	1.082
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.087
Minimum	0.000001	95% KM (bootstrap t) UCL	1.434
Maximum	8.385	95% KM (BCA) UCL	1.111
Mean	0.72	95% KM (Percentile Bootstrap) UCL	1.087
Median	0.21	95% KM (Chebyshev) UCL	1.673
SD	1.556	97.5% KM (Chebyshev) UCL	2.085
k star	0.256	99% KM (Chebyshev) UCL	2.893
Theta star	2.815		
Nu star	26.11	**Potential UCLs to Use**	
AppChi2	15.46	97.5% KM (Chebyshev) UCL	2.085
95% Gamma Approximate UCL	1.216		
95% Adjusted Gamma UCL	1.236		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

For additional insight, the user may want to consult a statistician.

THALLIUM

General Statistics			
Number of Valid Data	51	Number of Detected Data	8
Number of Distinct Detected Data	5	Number of Non-Detect Data	43
Number of Missing Values	14	Percent Non-Detects	84.31%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.24	Minimum Detected	-1.427
Maximum Detected	1.1	Maximum Detected	0.0953
Mean of Detected	0.833	Mean of Detected	-0.287
SD of Detected	0.333	SD of Detected	0.543
Minimum Non-Detect	0.22	Minimum Non-Detect	-1.514
Maximum Non-Detect	1.8	Maximum Non-Detect	0.588
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	51
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

Warning: There are only 8 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.811	Shapiro Wilk Test Statistic	0.769
5% Shapiro Wilk Critical Value	0.818	5% Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.489	Mean	-0.894
SD	0.277	SD	0.641
95% DL/2 (t) UCL	0.554	95% H-Stat (DL/2) UCL	0.601
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-1.358
		SD in Log Scale	0.584
		Mean in Original Scale	0.317
		SD in Original Scale	0.266
		95% t UCL	0.38
		95% Percentile Bootstrap UCL	0.383
		95% BCA Bootstrap UCL	0.394
		95% H-UCL	0.358

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	3.19	**Data Follow Appr. Gamma Distribution at 5% Significance Level**	
Theta Star	0.261		
nu star	51.04		
A-D Test Statistic	0.803	**Nonparametric Statistics**	
5% A-D Critical Value	0.719	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.719	Mean	0.387
5% K-S Critical Value	0.295	SD	0.282
Data follow Appr. Gamma Distribution at 5% Significance Level		SE of Mean	0.0532
		95% KM (t) UCL	0.476
Assuming Gamma Distribution		95% KM (z) UCL	0.474
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.561
Minimum	0.000001	95% KM (bootstrap t) UCL	0.471
Maximum	1.1	95% KM (BCA) UCL	0.91
Mean	0.17	95% KM (Percentile Bootstrap) UCL	0.699
Median	0.000001	95% KM (Chebyshev) UCL	0.619
SD	0.336	97.5% KM (Chebyshev) UCL	0.719
k star	0.106	99% KM (Chebyshev) UCL	0.916
Theta star	1.598		
Nu star	10.83	**Potential UCLs to Use**	
AppChi2	4.464	95% KM (t) UCL	0.476
95% Gamma Approximate UCL	0.411		
95% Adjusted Gamma UCL	0.423		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

For additional insight, the user may want to consult a statistician.

	General UCL Statistics for Data Sets with Non-Detects
User Selected Options	
From File	Converted_Data.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

BAP EQUIVALENT-HALFND

General Statistics

Number of Valid Data	51	Number of Detected Data	38
Number of Distinct Detected Data	38	Number of Non-Detect Data	13
Number of Missing Values	14	Percent Non-Detects	25.49%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	4.716	Minimum Detected	1.551
Maximum Detected	5687	Maximum Detected	8.646
Mean of Detected	870.7	Mean of Detected	5.751
SD of Detected	1414	SD of Detected	1.566
Minimum Non-Detect	53	Minimum Non-Detect	3.97
Maximum Non-Detect	6600	Maximum Non-Detect	8.795
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	51
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.599	Shapiro Wilk Test Statistic	0.95
5% Shapiro Wilk Critical Value	0.938	5% Shapiro Wilk Critical Value	0.938
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	724.5	Mean	5.315
SD	1319	SD	1.673
95% DL/2 (t) UCL	1034	95% H-Stat (DL/2) UCL	1715
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	5.15
		SD in Log Scale	1.735
		Mean in Original Scale	658.8
		SD in Original Scale	1270
		95% t UCL	956.9
		95% Percentile Bootstrap UCL	971.8
		95% BCA Bootstrap UCL	1061
		95% H-UCL	1696

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.576	Data appear Lognormal at 5% Significance Level	
Theta Star	1512		
nu star	43.75		
A-D Test Statistic	1.544	Nonparametric Statistics	
5% A-D Critical Value	0.802	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.802	Mean	668.5
5% K-S Critical Value	0.15	SD	1269
Data not Gamma Distributed at 5% Significance Level		SE of Mean	181.8
		95% KM (t) UCL	973.3
Assuming Gamma Distribution		95% KM (z) UCL	967.6
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	972.4
Minimum	0.000001	95% KM (bootstrap t) UCL	1148
Maximum	5687	95% KM (BCA) UCL	1005
Mean	653.8	95% KM (Percentile Bootstrap) UCL	996.7
Median	210.8	95% KM (Chebyshev) UCL	1461
SD	1273	97.5% KM (Chebyshev) UCL	1804
k star	0.149	99% KM (Chebyshev) UCL	2478
Theta star	4380		
Nu star	15.22	Potential UCLs to Use	
AppChi2	7.418	97.5% KM (Chebyshev) UCL	1804
95% Gamma Approximate UCL	1342		
95% Adjusted Gamma UCL	1371		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

For additional insight, the user may want to consult a statistician.

	General UCL Statistics for Full Data Sets
User Selected Options	
From File	Converted_Data_2.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

BARIUM

General Statistics			
Number of Valid Observations	51	Number of Distinct Observations	51
Number of Missing Values	14		

Raw Statistics		**Log-transformed Statistics**	
Minimum	25.2	Minimum of Log Data	3.227
Maximum	2530	Maximum of Log Data	7.836
Mean	120.4	Mean of log Data	4.173
Median	56.1	SD of log Data	0.733
SD	351.3		
Std. Error of Mean	49.19		
Coefficient of Variation	2.918		
Skewness	6.743		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.443	Lilliefors Test Statistic	0.173
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	202.8	95% H-UCL	105.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	126
95% Adjusted-CLT UCL (Chen-1995)	250.9	97.5% Chebyshev (MVUE) UCL	144
95% Modified-t UCL (Johnson-1978)	210.6	99% Chebyshev (MVUE) UCL	179.4
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.899	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	133.9		
MLE of Mean	120.4		
MLE of Standard Deviation	126.9		
nu star	91.73		
Approximate Chi Square Value (.05)	70.64	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0453	95% CLT UCL	201.3
Adjusted Chi Square Value	70.1	95% Jackknife UCL	202.8
		95% Standard Bootstrap UCL	198.5
Anderson-Darling Test Statistic	8.135	95% Bootstrap-t UCL	960.2
Anderson-Darling 5% Critical Value	0.783	95% Hall's Bootstrap UCL	597.8
Kolmogorov-Smirnov Test Statistic	0.331	95% Percentile Bootstrap UCL	211.8

Kolmogorov-Smirnov 5% Critical Value	0.128	95% BCA Bootstrap UCL	282.1
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	334.8
		97.5% Chebyshev(Mean, Sd) UCL	427.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	609.9
95% Approximate Gamma UCL	156.3		
95% Adjusted Gamma UCL	157.5		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	334.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

CHROMIUM

General Statistics

Number of Valid Observations	51	Number of Distinct Observations	49
Number of Missing Values	14		

Raw Statistics		**Log-transformed Statistics**	
Minimum	18.8	Minimum of Log Data	2.934
Maximum	280	Maximum of Log Data	5.635
Mean	52.76	Mean of log Data	3.836
Median	45.8	SD of log Data	0.469
SD	37.66		
Std. Error of Mean	5.273		
Coefficient of Variation	0.714		
Skewness	4.602		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.217	Lilliefors Test Statistic	0.0826
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	61.59	95% H-UCL	58.49
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	67
95% Adjusted-CLT UCL (Chen-1995)	65.06	97.5% Chebyshev (MVUE) UCL	73.68
95% Modified-t UCL (Johnson-1978)	62.16	99% Chebyshev (MVUE) UCL	86.78
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.782	**Data appear Lognormal at 5% Significance Level**	
Theta Star	13.95		
MLE of Mean	52.76		
MLE of Standard Deviation	27.13		
nu star	385.8		
Approximate Chi Square Value (.05)	341.3	**Nonparametric Statistics**	

Adjusted Level of Significance	0.0453	95% CLT UCL	61.43
Adjusted Chi Square Value	340	95% Jackknife UCL	61.59
		95% Standard Bootstrap UCL	61.56
Anderson-Darling Test Statistic	1.163	95% Bootstrap-t UCL	68.81
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	100.1
Kolmogorov-Smirnov Test Statistic	0.125	95% Percentile Bootstrap UCL	62.23
Kolmogorov-Smirnov 5% Critical Value	0.125	95% BCA Bootstrap UCL	66.29
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	75.74
		97.5% Chebyshev(Mean, Sd) UCL	85.69
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	105.2
95% Approximate Gamma UCL	59.64		
95% Adjusted Gamma UCL	59.85		
Potential UCL to Use		Use 95% Student's-t UCL	61.59
		or 95% Modified-t UCL	62.16
		or 95% H-UCL	58.49

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.

H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.

It is therefore recommended to avoid the use of H-statistic based 95% UCLs.

Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

COPPER

General Statistics

Number of Valid Observations	51	Number of Distinct Observations	50
Number of Missing Values	14		

Raw Statistics		**Log-transformed Statistics**	
Minimum	13.2	Minimum of Log Data	2.58
Maximum	5620	Maximum of Log Data	8.634
Mean	401.5	Mean of log Data	4.567
Median	68.2	SD of log Data	1.432
SD	1030		
Std. Error of Mean	144.3		
Coefficient of Variation	2.566		
Skewness	3.825		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.407	Lilliefors Test Statistic	0.156
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	643.2	95% H-UCL	472.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	553.5
95% Adjusted-CLT UCL (Chen-1995)	721.3	97.5% Chebyshev (MVUE) UCL	681.3
95% Modified-t UCL (Johnson-1978)	656.1	99% Chebyshev (MVUE) UCL	932.3
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.438	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	916		
MLE of Mean	401.5		
MLE of Standard Deviation	606.4		
nu star	44.7		
Approximate Chi Square Value (.05)	30.37	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0453	95% CLT UCL	638.7
Adjusted Chi Square Value	30.02	95% Jackknife UCL	643.2
		95% Standard Bootstrap UCL	636.7
Anderson-Darling Test Statistic	5.868	95% Bootstrap-t UCL	867.4
Anderson-Darling 5% Critical Value	0.826	95% Hall's Bootstrap UCL	804.7
Kolmogorov-Smirnov Test Statistic	0.294	95% Percentile Bootstrap UCL	655.3
Kolmogorov-Smirnov 5% Critical Value	0.132	95% BCA Bootstrap UCL	766.8
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1030
		97.5% Chebyshev(Mean, Sd) UCL	1302
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1837
95% Approximate Gamma UCL	591		
95% Adjusted Gamma UCL	597.8		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1030

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

IRON

General Statistics			
Number of Valid Observations	51	Number of Distinct Observations	43
Number of Missing Values	14		

Raw Statistics		Log-transformed Statistics	
Minimum	12600	Minimum of Log Data	9.441
Maximum	196000	Maximum of Log Data	12.19
Mean	27547	Mean of log Data	10.08
Median	22800	SD of log Data	0.426
SD	26133		
Std. Error of Mean	3659		
Coefficient of Variation	0.949		
Skewness	5.74		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.363	Lilliefors Test Statistic	0.213
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	33680	95% H-UCL	29197
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	33135
95% Adjusted-CLT UCL (Chen-1995)	36709	97.5% Chebyshev (MVUE) UCL	36184
95% Modified-t UCL (Johnson-1978)	34170	99% Chebyshev (MVUE) UCL	42171
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.446	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	7994		
MLE of Mean	27547		
MLE of Standard Deviation	14840		
nu star	351.5		
Approximate Chi Square Value (.05)	309	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0453	95% CLT UCL	33566
Adjusted Chi Square Value	307.9	95% Jackknife UCL	33680
		95% Standard Bootstrap UCL	33574
Anderson-Darling Test Statistic	5.778	95% Bootstrap-t UCL	48806
Anderson-Darling 5% Critical Value	0.755	95% Hall's Bootstrap UCL	57261
Kolmogorov-Smirnov Test Statistic	0.276	95% Percentile Bootstrap UCL	34509
Kolmogorov-Smirnov 5% Critical Value	0.125	95% BCA Bootstrap UCL	37374
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	43498
		97.5% Chebyshev(Mean, Sd) UCL	50400
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	63957
95% Approximate Gamma UCL	31331		
95% Adjusted Gamma UCL	31448		
Potential UCL to Use		Use 95% Student's-t UCL	33680
		or 95% Modified-t UCL	34170

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

	General UCL Statistics for Data Sets with Non-Detects
User Selected Options	
From File	COPCs.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

BAP EQUIVALENT-HALFND

General Statistics

Number of Valid Data	74	Number of Detected Data	61
Number of Distinct Detected Data	61	Number of Non-Detect Data	13
Number of Missing Values	42	Percent Non-Detects	17.57%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	7.728	Minimum Detected	2.045
Maximum Detected	5809	Maximum Detected	8.667
Mean of Detected	762.7	Mean of Detected	6.033
SD of Detected	998.2	SD of Detected	1.184
Minimum Non-Detect	55	Minimum Non-Detect	4.007
Maximum Non-Detect	400	Maximum Non-Detect	5.991
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	44
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	30
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	59.46%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.261	Lilliefors Test Statistic	0.124
5% Lilliefors Critical Value	0.113	5% Lilliefors Critical Value	0.113
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	641.2	Mean	5.666
SD	943.3	SD	1.377
95% DL/2 (t) UCL	823.9	95% H-Stat (DL/2) UCL	1144
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	5.679
		SD in Log Scale	1.339
		Mean in Original Scale	639.8
		SD in Original Scale	943.9
		95% t UCL	822.6
		95% Percentile Bootstrap UCL	827
		95% BCA Bootstrap UCL	863.1
		95% H-UCL	1080

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.924	Data do not follow a Discernable Distribution (0.05)	
Theta Star	825.1		
nu star	112.8		
A-D Test Statistic	1.469	Nonparametric Statistics	
5% A-D Critical Value	0.781	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.781	Mean	637.5
5% K-S Critical Value	0.117	SD	939.5
Data not Gamma Distributed at 5% Significance Level		SE of Mean	110.2
		95% KM (t) UCL	821.1
Assuming Gamma Distribution		95% KM (z) UCL	818.8
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	820.8
Minimum	0.000001	95% KM (bootstrap t) UCL	892.9
Maximum	5809	95% KM (BCA) UCL	832.9
Mean	628.7	95% KM (Percentile Bootstrap) UCL	836.8
Median	308.9	95% KM (Chebyshev) UCL	1118
SD	951	97.5% KM (Chebyshev) UCL	1326
k star	0.192	99% KM (Chebyshev) UCL	1734
Theta star	3282		
Nu star	28.35	Potential UCLs to Use	
AppChi2	17.2	95% KM (Chebyshev) UCL	1118
95% Gamma Approximate UCL	1036		
95% Adjusted Gamma UCL	1047		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

For additional insight, the user may want to consult a statistician.

AROCLOR-1260

General Statistics			
Number of Valid Data	88	Number of Detected Data	16
Number of Distinct Detected Data	16	Number of Non-Detect Data	72
Number of Missing Values	28	Percent Non-Detects	81.82%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	17	Minimum Detected	2.833
Maximum Detected	42000	Maximum Detected	10.65
Mean of Detected	5185	Mean of Detected	5.377
SD of Detected	11820	SD of Detected	2.609
Minimum Non-Detect	8	Minimum Non-Detect	2.079
Maximum Non-Detect	74	Maximum Non-Detect	4.304
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	78
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	10
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	88.64%

UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.513	Shapiro Wilk Test Statistic	0.829
5% Shapiro Wilk Critical Value	0.887	5% Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	952.6	Mean	2.807
SD	5302	SD	1.768
95% DL/2 (t) UCL	1892	95% H-Stat (DL/2) UCL	142
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-2.245
		SD in Log Scale	4.505
		Mean in Original Scale	942.9
		SD in Original Scale	5304
		95% t UCL	1883
		95% Percentile Bootstrap UCL	1912
		95% BCA Bootstrap UCL	2522
		95% H-UCL	72645
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.226	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	22921		
nu star	7.238		
A-D Test Statistic	2.15	**Nonparametric Statistics**	
5% A-D Critical Value	0.867	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.867	Mean	956.8
5% K-S Critical Value	0.236	SD	5271
Data not Gamma Distributed at 5% Significance Level		SE of Mean	580.4
		95% KM (t) UCL	1922
Assuming Gamma Distribution		95% KM (z) UCL	1911
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1894
Minimum	0.000001	95% KM (bootstrap t) UCL	2822
Maximum	42000	95% KM (BCA) UCL	2140
Mean	942.6	95% KM (Percentile Bootstrap) UCL	1935
Median	0.000001	95% KM (Chebyshev) UCL	3487
SD	5304	97.5% KM (Chebyshev) UCL	4581
k star	0.0567	99% KM (Chebyshev) UCL	6731
Theta star	16621		
Nu star	9.982	**Potential UCLs to Use**	
AppChi2	3.93	97.5% KM (Chebyshev) UCL	4581
95% Gamma Approximate UCL	2394		
95% Adjusted Gamma UCL	2433		
Note: DL/2 is not a recommended method.			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

ANTIMONY

General Statistics

Number of Valid Data	60	Number of Detected Data	27
Number of Distinct Detected Data	26	Number of Non-Detect Data	33
Number of Missing Values	56	Percent Non-Detects	55.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.26	Minimum Detected	-1.347
Maximum Detected	1430	Maximum Detected	7.265
Mean of Detected	68.75	Mean of Detected	1.441
SD of Detected	274.5	SD of Detected	2.051
Minimum Non-Detect	0.11	Minimum Non-Detect	-2.207
Maximum Non-Detect	3.2	Maximum Non-Detect	1.163
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	47
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	13
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	78.33%

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.265	Shapiro Wilk Test Statistic	0.923
5% Shapiro Wilk Critical Value	0.923	5% Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	31.16	Mean	-0.0149
SD	185.4	SD	2
95% DL/2 (t) UCL	71.16	95% H-Stat (DL/2) UCL	20.02
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-1.165
		SD in Log Scale	2.793
		Mean in Original Scale	30.96
		SD in Original Scale	185.4
		95% t UCL	70.97
		95% Percentile Bootstrap UCL	77.23
		95% BCA Bootstrap UCL	127.6
		95% H-UCL	109.6
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.25	**Data appear Lognormal at 5% Significance Level**	
Theta Star	274.5		

nu star	13.53		
A-D Test Statistic	3.546	**Nonparametric Statistics**	
5% A-D Critical Value	0.873	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.873	Mean	31.11
5% K-S Critical Value	0.184	SD	183.8
Data not Gamma Distributed at 5% Significance Level		SE of Mean	24.19
		95% KM (t) UCL	71.53
Assuming Gamma Distribution		95% KM (z) UCL	70.89
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	71.07
Minimum	0.000001	95% KM (bootstrap t) UCL	399.5
Maximum	1430	95% KM (BCA) UCL	79.23
Mean	30.94	95% KM (Percentile Bootstrap) UCL	77.79
Median	0.000001	95% KM (Chebyshev) UCL	136.5
SD	185.4	97.5% KM (Chebyshev) UCL	182.2
k star	0.0874	99% KM (Chebyshev) UCL	271.8
Theta star	353.9		
Nu star	10.49	**Potential UCLs to Use**	
AppChi2	4.25	97.5% KM (Chebyshev) UCL	182.2
95% Gamma Approximate UCL	76.36		
95% Adjusted Gamma UCL	78.15		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

For additional insight, the user may want to consult a statistician.

CADMIUM

General Statistics

Number of Valid Data	78	Number of Detected Data	52
Number of Distinct Detected Data	44	Number of Non-Detect Data	26
Number of Missing Values	38	Percent Non-Detects	33.33%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.32	Minimum Detected	-1.139
Maximum Detected	24.1	Maximum Detected	3.182
Mean of Detected	4.039	Mean of Detected	0.662
SD of Detected	5.343	SD of Detected	1.218
Minimum Non-Detect	0.26	Minimum Non-Detect	-1.347
Maximum Non-Detect	3.4	Maximum Non-Detect	1.224
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	59
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	19
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	75.64%

UCL Statistics

Normal Distribution Test with Detected Values Only	**Lognormal Distribution Test with Detected Values Only**

Lilliefors Test Statistic	0.243	Lilliefors Test Statistic	0.149
5% Lilliefors Critical Value	0.123	5% Lilliefors Critical Value	0.123
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	2.827	Mean	0.0483
SD	4.684	SD	1.374
95% DL/2 (t) UCL	3.71	95% H-Stat (DL/2) UCL	4.094
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-0.0854
		SD in Log Scale	1.489
		Mean in Original Scale	2.772
		SD in Original Scale	4.708
		95% t UCL	3.66
		95% Percentile Bootstrap UCL	3.67
		95% BCA Bootstrap UCL	3.87
		95% H-UCL	4.476
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.774	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	5.22		
nu star	80.46		
A-D Test Statistic	2.006	**Nonparametric Statistics**	
5% A-D Critical Value	0.79	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.79	Mean	2.829
5% K-S Critical Value	0.128	SD	4.649
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.532
		95% KM (t) UCL	3.714
Assuming Gamma Distribution		95% KM (z) UCL	3.704
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	3.709
Minimum	0.000001	95% KM (bootstrap t) UCL	3.985
Maximum	24.1	95% KM (BCA) UCL	3.71
Mean	2.692	95% KM (Percentile Bootstrap) UCL	3.775
Median	0.695	95% KM (Chebyshev) UCL	5.147
SD	4.752	97.5% KM (Chebyshev) UCL	6.15
k star	0.152	99% KM (Chebyshev) UCL	8.12
Theta star	17.71		
Nu star	23.72	**Potential UCLs to Use**	
AppChi2	13.63	95% KM (Chebyshev) UCL	5.147
95% Gamma Approximate UCL	4.684		
95% Adjusted Gamma UCL	4.734		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

For additional insight, the user may want to consult a statistician.

LEAD

General Statistics			
Number of Valid Data	78	Number of Detected Data	75
Number of Distinct Detected Data	75	Number of Non-Detect Data	3
Number of Missing Values	38	Percent Non-Detects	3.85%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	18.2	Minimum Detected	2.901
Maximum Detected	40000	Maximum Detected	10.6
Mean of Detected	1660	Mean of Detected	5.733
SD of Detected	5804	SD of Detected	1.572
Minimum Non-Detect	4.3	Minimum Non-Detect	1.459
Maximum Non-Detect	23.4	Maximum Non-Detect	3.153
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	5
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	73
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	6.41%

UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.391	Lilliefors Test Statistic	0.0871
5% Lilliefors Critical Value	0.102	5% Lilliefors Critical Value	0.102
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1596	Mean	5.581
SD	5698	SD	1.726
95% DL/2 (t) UCL	2670	95% H-Stat (DL/2) UCL	2159
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	1324	Mean in Log Scale	5.591
SD	5891	SD in Log Scale	1.699
95% MLE (t) UCL	2434	Mean in Original Scale	1596
95% MLE (Tiku) UCL	2325	SD in Original Scale	5698
		95% t UCL	2670
		95% Percentile Bootstrap UCL	2783
		95% BCA Bootstrap UCL	3291
		95% H UCL	2050
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.386	**Data appear Lognormal at 5% Significance Level**	
Theta Star	4303		
nu star	57.86		
A-D Test Statistic	6.854	**Nonparametric Statistics**	

5% A-D Critical Value	0.843	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.843	Mean	1597
5% K-S Critical Value	0.111	SD	5662
Data not Gamma Distributed at 5% Significance Level		SE of Mean	645.4
		95% KM (t) UCL	2671
Assuming Gamma Distribution		95% KM (z) UCL	2658
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	2671
Minimum	0.000001	95% KM (bootstrap t) UCL	5589
Maximum	40000	95% KM (BCA) UCL	2903
Mean	1596	95% KM (Percentile Bootstrap) UCL	2752
Median	239	95% KM (Chebyshev) UCL	4410
SD	5699	97.5% KM (Chebyshev) UCL	5627
k star	0.287	99% KM (Chebyshev) UCL	8018
Theta star	5559		
Nu star	44.78	**Potential UCLs to Use**	
AppChi2	30.43	97.5% KM (Chebyshev) UCL	5627
95% Gamma Approximate UCL	2348		
95% Adjusted Gamma UCL	2366		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

MERCURY

General Statistics

Number of Valid Data	78	Number of Detected Data	73
Number of Distinct Detected Data	51	Number of Non-Detect Data	5
Number of Missing Values	38	Percent Non-Detects	6.41%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.03	Minimum Detected	-3.507
Maximum Detected	120	Maximum Detected	4.787
Mean of Detected	2.746	Mean of Detected	-0.849
SD of Detected	14.26	SD of Detected	1.388
Minimum Non-Detect	0.01	Minimum Non-Detect	-4.605
Maximum Non-Detect	0.08	Maximum Non-Detect	-2.526
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	9
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	69
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	11.54%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.436	Lilliefors Test Statistic	0.099
5% Lilliefors Critical Value	0.104	5% Lilliefors Critical Value	0.104
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	2.571	Mean	-1.069
SD	13.81	SD	1.602
95% DL/2 (t) UCL	5.173	95% H-Stat (DL/2) UCL	2.115
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	1.27	Mean in Log Scale	-1.044
SD	14.71	SD in Log Scale	1.538
95% MLE (t) UCL	4.043	Mean in Original Scale	2.571
95% MLE (Tiku) UCL	3.834	SD in Original Scale	13.81
		95% t UCL	5.174
		95% Percentile Bootstrap UCL	5.59
		95% BCA Bootstrap UCL	7.618
		95% H UCL	1.895
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.354	**Data appear Lognormal at 5% Significance Level**	
Theta Star	7.749		
nu star	51.73		
A-D Test Statistic	10.59	**Nonparametric Statistics**	
5% A-D Critical Value	0.851	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.851	Mean	2.572
5% K-S Critical Value	0.113	SD	13.72
Data not Gamma Distributed at 5% Significance Level		SE of Mean	1.564
		95% KM (t) UCL	5.175
Assuming Gamma Distribution		95% KM (z) UCL	5.144
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	5.172
Minimum	0.000001	95% KM (bootstrap t) UCL	22.95
Maximum	120	95% KM (BCA) UCL	5.583
Mean	2.57	95% KM (Percentile Bootstrap) UCL	5.579
Median	0.305	95% KM (Chebyshev) UCL	9.389
SD	13.81	97.5% KM (Chebyshev) UCL	12.34
k star	0.266	99% KM (Chebyshev) UCL	18.13
Theta star	9.663		
Nu star	41.49	**Potential UCLs to Use**	
AppChi2	27.72	95% KM (Chebyshev) UCL	9.389
95% Gamma Approximate UCL	3.845		
95% Adjusted Gamma UCL	3.875		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

For additional insight, the user may want to consult a statistician.

NICKEL

General Statistics			
Number of Valid Data	78	Number of Detected Data	77
Number of Distinct Detected Data	75	Number of Non-Detect Data	1
Number of Missing Values	38	Percent Non-Detects	1.28%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	17	Minimum Detected	2.833
Maximum Detected	3920	Maximum Detected	8.274
Mean of Detected	231.5	Mean of Detected	4.526
SD of Detected	520.7	SD of Detected	1.167
Minimum Non-Detect	29.1	Minimum Non-Detect	3.371
Maximum Non-Detect	29.1	Maximum Non-Detect	3.371

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.34	Lilliefors Test Statistic	0.183
5% Lilliefors Critical Value	0.101	5% Lilliefors Critical Value	0.101
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	228.7	Mean	4.503
SD	517.9	SD	1.178
95% DL/2 (t) UCL	326.3	95% H-Stat (DL/2) UCL	251
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	205.6	Mean in Log Scale	4.498
SD	536.4	SD in Log Scale	1.186
95% MLE (t) UCL	306.7	Mean in Original Scale	228.7
95% MLE (Tiku) UCL	297.4	SD in Original Scale	517.9
		95% t UCL	326.3
		95% Percentile Bootstrap UCL	332.8
		95% BCA Bootstrap UCL	377
		95% H UCL	252.9
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.646	Data do not follow a Discernable Distribution (0.05)	
Theta Star	358.4		
nu star	99.48		
A-D Test Statistic	6.519	Nonparametric Statistics	
5% A-D Critical Value	0.802	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.802	Mean	228.8
5% K-S Critical Value	0.106	SD	514.5
Data not Gamma Distributed at 5% Significance Level		SE of Mean	58.64
		95% KM (t) UCL	326.4
Assuming Gamma Distribution		95% KM (z) UCL	325.2

Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	326.4
Minimum	0.000001	95% KM (bootstrap t) UCL	420.1
Maximum	3920	95% KM (BCA) UCL	335.8
Mean	228.5	95% KM (Percentile Bootstrap) UCL	333.5
Median	68.55	95% KM (Chebyshev) UCL	484.4
SD	517.9	97.5% KM (Chebyshev) UCL	595
k star	0.536	99% KM (Chebyshev) UCL	812.2
Theta star	426		
Nu star	83.68	**Potential UCLs to Use**	
AppChi2	63.6	95% KM (Chebyshev) UCL	484.4
95% Gamma Approximate UCL	300.7		
95% Adjusted Gamma UCL	302.3		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

For additional insight, the user may want to consult a statistician.

THALLIUM

General Statistics

Number of Valid Data	78	Number of Detected Data	10
Number of Distinct Detected Data	9	Number of Non-Detect Data	68
Number of Missing Values	38	Percent Non-Detects	87.18%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.66	Minimum Detected	-0.416
Maximum Detected	3.6	Maximum Detected	1.281
Mean of Detected	1.472	Mean of Detected	0.227
SD of Detected	0.975	SD of Detected	0.566
Minimum Non-Detect	0.28	Minimum Non-Detect	-1.273
Maximum Non-Detect	5.6	Maximum Non-Detect	1.723

Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect	78
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.788	Shapiro Wilk Test Statistic	0.908
5% Shapiro Wilk Critical Value	0.842	5% Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.849	Mean	-0.428
SD	0.704	SD	0.711
95% DL/2 (t) UCL	0.982	95% H-Stat (DL/2) UCL	0.986

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-1.19
		SD in Log Scale	0.665
		Mean in Original Scale	0.417
		SD in Original Scale	0.533
		95% t UCL	0.518
		95% Percentile Bootstrap UCL	0.526
		95% BCA Bootstrap UCL	0.549
		95% H-UCL	0.44
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	2.376	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	0.619		
nu star	47.52		
A-D Test Statistic	0.591	**Nonparametric Statistics**	
5% A-D Critical Value	0.731	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.731	Mean	0.794
5% K-S Critical Value	0.268	SD	0.45
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0577
		95% KM (t) UCL	0.89
Assuming Gamma Distribution		95% KM (z) UCL	0.889
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.886
Minimum	0.000001	95% KM (bootstrap t) UCL	0.965
Maximum	3.6	95% KM (BCA) UCL	1.088
Mean	0.189	95% KM (Percentile Bootstrap) UCL	1.052
Median	0.000001	95% KM (Chebyshev) UCL	1.046
SD	0.597	97.5% KM (Chebyshev) UCL	1.155
k star	0.086	99% KM (Chebyshev) UCL	1.369
Theta star	2.194		
Nu star	13.42	**Potential UCLs to Use**	
AppChi2	6.174	95% KM (t) UCL	0.89
95% Gamma Approximate UCL	0.41		
95% Adjusted Gamma UCL	0.416		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

For additional insight, the user may want to consult a statistician.

	General UCL Statistics for Full Data Sets
User Selected Options	
From File	COPCs.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

BARIUM

General Statistics			
Number of Valid Observations	78	Number of Distinct Observations	74
Number of Missing Values	38		

Raw Statistics		**Log-transformed Statistics**	
Minimum	8.8	Minimum of Log Data	2.175
Maximum	1580	Maximum of Log Data	7.365
Mean	151.9	Mean of log Data	4.436
Median	79.3	SD of log Data	0.947
SD	259.1		
Std. Error of Mean	29.34		
Coefficient of Variation	1.705		
Skewness	3.927		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.355	Lilliefors Test Statistic	0.174
Lilliefors Critical Value	0.1	Lilliefors Critical Value	0.1
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	200.8	95% H-UCL	167.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	203.1
95% Adjusted-CLT UCL (Chen-1995)	214.1	97.5% Chebyshev (MVUE) UCL	234.2
95% Modified-t UCL (Johnson-1978)	202.9	99% Chebyshev (MVUE) UCL	295.4
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.955	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	159.1		
MLE of Mean	151.9		
MLE of Standard Deviation	155.5		
nu star	149		
Approximate Chi Square Value (.05)	121.8	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0469	95% CLT UCL	200.2
Adjusted Chi Square Value	121.3	95% Jackknife UCL	200.8
		95% Standard Bootstrap UCL	200.7
Anderson-Darling Test Statistic	6.089	95% Bootstrap-t UCL	226.1
Anderson-Darling 5% Critical Value	0.782	95% Hall's Bootstrap UCL	229.5
Kolmogorov-Smirnov Test Statistic	0.268	95% Percentile Bootstrap UCL	201.4

Kolmogorov-Smirnov 5% Critical Value	0.104	95% BCA Bootstrap UCL	221.6
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	279.8
		97.5% Chebyshev(Mean, Sd) UCL	335.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	443.8
95% Approximate Gamma UCL	185.9		
95% Adjusted Gamma UCL	186.6		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	279.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

CHROMIUM

General Statistics

Number of Valid Observations	78	Number of Distinct Observations	76
Number of Missing Values	38		

Raw Statistics		**Log-transformed Statistics**	
Minimum	14.6	Minimum of Log Data	2.681
Maximum	2860	Maximum of Log Data	7.959
Mean	120.7	Mean of log Data	4.076
Median	54.15	SD of log Data	0.889
SD	343.3		
Std. Error of Mean	38.87		
Coefficient of Variation	2.845		
Skewness	7.108		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.39	Lilliefors Test Statistic	0.148
Lilliefors Critical Value	0.1	Lilliefors Critical Value	0.1
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	185.4	95% H-UCL	108.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	131
95% Adjusted-CLT UCL (Chen-1995)	218	97.5% Chebyshev (MVUE) UCL	150.1
95% Modified-t UCL (Johnson-1978)	190.6	99% Chebyshev (MVUE) UCL	187.6
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.802	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	150.5		
MLE of Mean	120.7		
MLE of Standard Deviation	134.8		
nu star	125.1		
Approximate Chi Square Value (.05)	100.2	**Nonparametric Statistics**	

Adjusted Level of Significance	0.0469	95% CLT UCL	184.6
Adjusted Chi Square Value	99.82	95% Jackknife UCL	185.4
		95% Standard Bootstrap UCL	185.2
Anderson-Darling Test Statistic	8.605	95% Bootstrap-t UCL	394.4
Anderson-Darling 5% Critical Value	0.79	95% Hall's Bootstrap UCL	422.8
Kolmogorov-Smirnov Test Statistic	0.266	95% Percentile Bootstrap UCL	188.7
Kolmogorov-Smirnov 5% Critical Value	0.105	95% BCA Bootstrap UCL	242
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	290.1
		97.5% Chebyshev(Mean, Sd) UCL	363.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	507.4
95% Approximate Gamma UCL	150.5		
95% Adjusted Gamma UCL	151.2		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	290.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

COBALT

General Statistics

Number of Valid Observations	78	Number of Distinct Observations	64
Number of Missing Values	38		

Raw Statistics		**Log-transformed Statistics**	
Minimum	4.1	Minimum of Log Data	1.411
Maximum	85.2	Maximum of Log Data	4.445
Mean	14.52	Mean of log Data	2.517
Median	11.68	SD of log Data	0.527
SD	10.85		
Std. Error of Mean	1.229		
Coefficient of Variation	0.747		
Skewness	4.097		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.202	Lilliefors Test Statistic	0.0702
Lilliefors Critical Value	0.1	Lilliefors Critical Value	0.1
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	16.56	95% H-UCL	15.93
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	18.12
95% Adjusted-CLT UCL (Chen-1995)	17.15	97.5% Chebyshev (MVUE) UCL	19.81
95% Modified-t UCL (Johnson-1978)	16.66	99% Chebyshev (MVUE) UCL	23.13
Gamma Distribution Test		**Data Distribution**	

k star (bias corrected)	3.196	**Data appear Lognormal at 5% Significance Level**	
Theta Star	4.542		
MLE of Mean	14.52		
MLE of Standard Deviation	8.12		
nu star	498.7		
Approximate Chi Square Value (.05)	447.9	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0469	95% CLT UCL	16.54
Adjusted Chi Square Value	447	95% Jackknife UCL	16.56
		95% Standard Bootstrap UCL	16.52
Anderson-Darling Test Statistic	1.535	95% Bootstrap-t UCL	17.83
Anderson-Darling 5% Critical Value	0.758	95% Hall's Bootstrap UCL	25.01
Kolmogorov-Smirnov Test Statistic	0.115	95% Percentile Bootstrap UCL	16.76
Kolmogorov-Smirnov 5% Critical Value	0.102	95% BCA Bootstrap UCL	17.43
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	19.87
		97.5% Chebyshev(Mean, Sd) UCL	22.19
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	26.74
95% Approximate Gamma UCL	16.16		
95% Adjusted Gamma UCL	16.2		
Potential UCL to Use		Use 95% H-UCL	15.93

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.

H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.

It is therefore recommended to avoid the use of H-statistic based 95% UCLs.

Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

COPPER

General Statistics

Number of Valid Observations	78	Number of Distinct Observations	75
Number of Missing Values	38		

Raw Statistics		**Log-transformed Statistics**	
Minimum	17.3	Minimum of Log Data	2.851
Maximum	32400	Maximum of Log Data	10.39
Mean	2999	Mean of log Data	6.132
Median	292	SD of log Data	2.103
SD	6121		
Std. Error of Mean	693		
Coefficient of Variation	2.041		
Skewness	3.053		

Relevant UCL Statistics

Normal Distribution Test	**Lognormal Distribution Test**

Lilliefors Test Statistic	0.313	Lilliefors Test Statistic	0.128
Lilliefors Critical Value	0.1	Lilliefors Critical Value	0.1
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	4153	95% H-UCL	9867
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10148
95% Adjusted-CLT UCL (Chen-1995)	4395	97.5% Chebyshev (MVUE) UCL	12870
95% Modified-t UCL (Johnson-1978)	4193	99% Chebyshev (MVUE) UCL	18217
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.352	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	8513		
MLE of Mean	2999		
MLE of Standard Deviation	5053		
nu star	54.96		
Approximate Chi Square Value (.05)	38.92	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0469	95% CLT UCL	4139
Adjusted Chi Square Value	38.67	95% Jackknife UCL	4153
		95% Standard Bootstrap UCL	4106
Anderson-Darling Test Statistic	3.399	95% Bootstrap-t UCL	4661
Anderson-Darling 5% Critical Value	0.852	95% Hall's Bootstrap UCL	4401
Kolmogorov-Smirnov Test Statistic	0.191	95% Percentile Bootstrap UCL	4192
Kolmogorov-Smirnov 5% Critical Value	0.109	95% BCA Bootstrap UCL	4418
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	6020
		97.5% Chebyshev(Mean, Sd) UCL	7327
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	9895
95% Approximate Gamma UCL	4235		
95% Adjusted Gamma UCL	4262		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	6020

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

IRON

General Statistics			
Number of Valid Observations	78	Number of Distinct Observations	77
Number of Missing Values	38		
Raw Statistics		**Log-transformed Statistics**	
Minimum	9280	Minimum of Log Data	9.136
Maximum	280000	Maximum of Log Data	12.54
Mean	64723	Mean of log Data	10.67
Median	30850	SD of log Data	0.871
SD	65602		

Std. Error of Mean	7428		
Coefficient of Variation	1.014		
Skewness	1.591		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.261	Lilliefors Test Statistic	0.168
Lilliefors Critical Value	0.1	Lilliefors Critical Value	0.1
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	77090	95% H-UCL	77508
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	93037
95% Adjusted-CLT UCL (Chen-1995)	78370	97.5% Chebyshev (MVUE) UCL	106359
95% Modified-t UCL (Johnson-1978)	77313	99% Chebyshev (MVUE) UCL	132526
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.314	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	49238		
MLE of Mean	64723		
MLE of Standard Deviation	56452		
nu star	205.1		
Approximate Chi Square Value (.05)	172.9	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0469	95% CLT UCL	76941
Adjusted Chi Square Value	172.4	95% Jackknife UCL	77090
		95% Standard Bootstrap UCL	76714
Anderson-Darling Test Statistic	4.604	95% Bootstrap-t UCL	78632
Anderson-Darling 5% Critical Value	0.773	95% Hall's Bootstrap UCL	78375
Kolmogorov-Smirnov Test Statistic	0.21	95% Percentile Bootstrap UCL	77424
Kolmogorov-Smirnov 5% Critical Value	0.103	95% BCA Bootstrap UCL	78262
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	97101
		97.5% Chebyshev(Mean, Sd) UCL	111111
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	138630
95% Approximate Gamma UCL	76751		
95% Adjusted Gamma UCL	76996		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	97101

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

ZINC

General Statistics

Number of Valid Observations	78	Number of Distinct Observations	78
Number of Missing Values	38		

Raw Statistics		Log-transformed Statistics	
Minimum	30.8	Minimum of Log Data	3.428
Maximum	12440	Maximum of Log Data	9.429
Mean	1505	Mean of log Data	6.268
Median	517.5	SD of log Data	1.493
SD	2499		
Std. Error of Mean	282.9		
Coefficient of Variation	1.661		
Skewness	2.883		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.278	Lilliefors Test Statistic	0.0862
Lilliefors Critical Value	0.1	Lilliefors Critical Value	0.1
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	1976	95% H-UCL	2590
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3133
95% Adjusted-CLT UCL (Chen-1995)	2069	97.5% Chebyshev (MVUE) UCL	3813
95% Modified-t UCL (Johnson-1978)	1991	99% Chebyshev (MVUE) UCL	5149
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.577	**Data appear Lognormal at 5% Significance Level**	
Theta Star	2609		
MLE of Mean	1505		
MLE of Standard Deviation	1981		
nu star	89.96		
Approximate Chi Square Value (.05)	69.09	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0469	95% CLT UCL	1970
Adjusted Chi Square Value	68.75	95% Jackknife UCL	1976
		95% Standard Bootstrap UCL	1967
Anderson-Darling Test Statistic	2.221	95% Bootstrap-t UCL	2157
Anderson-Darling 5% Critical Value	0.809	95% Hall's Bootstrap UCL	2082
Kolmogorov-Smirnov Test Statistic	0.125	95% Percentile Bootstrap UCL	1991
Kolmogorov-Smirnov 5% Critical Value	0.106	95% BCA Bootstrap UCL	2090
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2738
		97.5% Chebyshev(Mean, Sd) UCL	3271
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4319
95% Approximate Gamma UCL	1959		
95% Adjusted Gamma UCL	1969		
Potential UCL to Use		Use 95% H-UCL	2590

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.

H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.

It is therefore recommended to avoid the use of H-statistic based 95% UCLs.

Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

TEQ WHO-2005 - HALFND

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	14
Number of Missing Values	98		

Raw Statistics		Log-transformed Statistics	
Minimum	0.876	Minimum of Log Data	-0.132
Maximum	1684	Maximum of Log Data	7.429
Mean	125.9	Mean of log Data	1.752
Median	3.392	SD of log Data	1.854
SD	448.6		
Std. Error of Mean	119.9		
Coefficient of Variation	3.564		
Skewness	3.739		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.308	Shapiro Wilk Test Statistic	0.714
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	338.2	95% H-UCL	305.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	85.43
95% Adjusted-CLT UCL (Chen-1995)	451.1	97.5% Chebyshev (MVUE) UCL	111.7
95% Modified-t UCL (Johnson-1978)	358.1	99% Chebyshev (MVUE) UCL	163.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.231	Data do not follow a Discernable Distribution (0.05)	
Theta Star	545.6		
MLE of Mean	125.9		
MLE of Standard Deviation	262.1		
nu star	6.459		
Approximate Chi Square Value (.05)	1.879	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0312	95% CLT UCL	323.1
Adjusted Chi Square Value	1.57	95% Jackknife UCL	338.2
		95% Standard Bootstrap UCL	318.1
Anderson-Darling Test Statistic	3.401	95% Bootstrap-t UCL	27859
Anderson-Darling 5% Critical Value	0.86	95% Hall's Bootstrap UCL	10002
Kolmogorov-Smirnov Test Statistic	0.452	95% Percentile Bootstrap UCL	364.3
Kolmogorov-Smirnov 5% Critical Value	0.251	95% BCA Bootstrap UCL	488.5
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	648.4
		97.5% Chebyshev(Mean, Sd) UCL	874.5

Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1319
95% Approximate Gamma UCL	432.7		
95% Adjusted Gamma UCL	517.8		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	1319

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

	General UCL Statistics for Full Data Sets
User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Manganese

General Statistics			
Number of Valid Observations	78	Number of Distinct Observations	77
Number of Missing Values	38		

Raw Statistics		**Log-transformed Statistics**	
Minimum	114	Minimum of Log Data	4.736
Maximum	4370	Maximum of Log Data	8.383
Mean	661.7	Mean of log Data	6.221
Median	466.5	SD of log Data	0.708
SD	622.8		
Std. Error of Mean	70.52		
Coefficient of Variation	0.941		
Skewness	3.349		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.256	Lilliefors Test Statistic	0.113
Lilliefors Critical Value	0.1	Lilliefors Critical Value	0.1
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	779.1	95% H-UCL	758.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	891.5
95% Adjusted-CLT UCL (Chen-1995)	806.3	97.5% Chebyshev (MVUE) UCL	998.8
95% Modified-t UCL (Johnson-1978)	783.6	99% Chebyshev (MVUE) UCL	1210
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.906	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	347.2		
MLE of Mean	661.7		
MLE of Standard Deviation	479.3		
nu star	297.3		
Approximate Chi Square Value (.05)	258.4	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0469	95% CLT UCL	777.7
Adjusted Chi Square Value	257.7	95% Jackknife UCL	779.1
		95% Standard Bootstrap UCL	777.1
Anderson-Darling Test Statistic	1.864	95% Bootstrap-t UCL	829.3
Anderson-Darling 5% Critical Value	0.764	95% Hall's Bootstrap UCL	839.5
Kolmogorov-Smirnov Test Statistic	0.169	95% Percentile Bootstrap UCL	777.6

Kolmogorov-Smirnov 5% Critical Value	0.102	95% BCA Bootstrap UCL	812.1
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	969.1
		97.5% Chebyshev(Mean, Sd) UCL	1102
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1363
95% Approximate Gamma UCL	761.5		
95% Adjusted Gamma UCL	763.5		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	969.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

	General UCL Statistics for Full Data Sets
User Selected Options	
From File	Converted_Data.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

BAP EQUIVALENT-HALFND

General Statistics			
Number of Valid Observations	63	Number of Distinct Observations	63
Number of Missing Values	31		

Raw Statistics		Log-transformed Statistics	
Minimum	65.94	Minimum of Log Data	4.189
Maximum	6152	Maximum of Log Data	8.725
Mean	988.2	Mean of log Data	6.528
Median	728.2	SD of log Data	0.904
SD	986.8		
Std. Error of Mean	124.3		
Coefficient of Variation	0.999		
Skewness	3.038		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.206	Lilliefors Test Statistic	0.084
Lilliefors Critical Value	0.112	Lilliefors Critical Value	0.112
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	1196	95% H-UCL	1321
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1604
95% Adjusted-CLT UCL (Chen-1995)	1244	97.5% Chebyshev (MVUE) UCL	1856
95% Modified-t UCL (Johnson-1978)	1204	99% Chebyshev (MVUE) UCL	2353
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.441	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	685.7		
MLE of Mean	988.2		
MLE of Standard Deviation	823.2		
nu star	181.6		
Approximate Chi Square Value (.05)	151.4	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0462	95% CLT UCL	1193
Adjusted Chi Square Value	150.8	95% Jackknife UCL	1196
		95% Standard Bootstrap UCL	1190
Anderson-Darling Test Statistic	0.708	95% Bootstrap-t UCL	1278
Anderson-Darling 5% Critical Value	0.769	95% Hall's Bootstrap UCL	1328
Kolmogorov-Smirnov Test Statistic	0.102	95% Percentile Bootstrap UCL	1214

Kolmogorov-Smirnov 5% Critical Value	0.114	95% BCA Bootstrap UCL	1251
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1530
		97.5% Chebyshev(Mean, Sd) UCL	1765
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2225
95% Approximate Gamma UCL	1185		
95% Adjusted Gamma UCL	1190		
Potential UCL to Use		Use 95% Approximate Gamma UCL	1185

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

	General UCL Statistics for Data Sets with Non-Detects
User Selected Options	
From File	Converted_Data.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

TEQ PCB-HH-HALFND

General Statistics			
Number of Valid Data	58	Number of Detected Data	56
Number of Distinct Detected Data	47	Number of Non-Detect Data	2
		Percent Non-Detects	3.45%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.000072	Minimum Detected	-9.539
Maximum Detected	7	Maximum Detected	1.946
Mean of Detected	0.287	Mean of Detected	-4.311
SD of Detected	0.999	SD of Detected	3.092
Minimum Non-Detect	0.000071	Minimum Non-Detect	-9.553
Maximum Non-Detect	0.000084	Maximum Non-Detect	-9.385
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	3
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	55
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	5.17%

UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.387	Lilliefors Test Statistic	0.131
5% Lilliefors Critical Value	0.118	5% Lilliefors Critical Value	0.118
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.277	Mean	-4.513
SD	0.983	SD	3.223
95% DL/2 (t) UCL	0.493	95% H-Stat (DL/2) UCL	24.04
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.24	Mean in Log Scale	-4.564
SD	1.006	SD in Log Scale	3.324
95% MLE (t) UCL	0.46	Mean in Original Scale	0.277
95% MLE (Tiku) UCL	0.438	SD in Original Scale	0.983
		95% t UCL	0.493
		95% Percentile Bootstrap UCL	0.508
		95% BCA Bootstrap UCL	0.646
		95% H UCL	36.92

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.234	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	1.227		
nu star	26.18		
A-D Test Statistic	1.883	**Nonparametric Statistics**	
5% A-D Critical Value	0.893	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.893	Mean	0.277
5% K-S Critical Value	0.131	SD	0.974
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.129
		95% KM (t) UCL	0.493
Assuming Gamma Distribution		95% KM (z) UCL	0.489
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.493
Minimum	0.000001	95% KM (bootstrap t) UCL	1.088
Maximum	7	95% KM (BCA) UCL	0.516
Mean	0.277	95% KM (Percentile Bootstrap) UCL	0.502
Median	0.019	95% KM (Chebyshev) UCL	0.839
SD	0.983	97.5% KM (Chebyshev) UCL	1.083
k star	0.217	99% KM (Chebyshev) UCL	1.561
Theta star	1.276		
Nu star	25.16	**Potential UCLs to Use**	
AppChi2	14.74	99% KM (Chebyshev) UCL	1.561
95% Gamma Approximate UCL	0.473		
95% Adjusted Gamma UCL	0.479		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

For additional insight, the user may want to consult a statistician.

	General UCL Statistics for Full Data Sets
User Selected Options	
From File	Converted_Data_2.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

TOTAL PCB CONGENERS-HH-HALFND

General Statistics			
Number of Valid Observations	58	Number of Distinct Observations	58
Raw Statistics		**Log-transformed Statistics**	
Minimum	31.67	Minimum of Log Data	3.455
Maximum	2708	Maximum of Log Data	7.904
Mean	342.2	Mean of log Data	5.391
Median	235	SD of log Data	0.962
SD	398		
Std. Error of Mean	52.26		
Coefficient of Variation	1.163		
Skewness	3.933		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.218	Lilliefors Test Statistic	0.0721
Lilliefors Critical Value	0.116	Lilliefors Critical Value	0.116
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	429.6	95% H-UCL	466.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	566.5
95% Adjusted-CLT UCL (Chen-1995)	457	97.5% Chebyshev (MVUE) UCL	662.5
95% Modified-t UCL (Johnson-1978)	434.1	99% Chebyshev (MVUE) UCL	851.1
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.213	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	282.2		
MLE of Mean	342.2		
MLE of Standard Deviation	310.7		
nu star	140.7		
Approximate Chi Square Value (.05)	114.3	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0459	95% CLT UCL	428.1
Adjusted Chi Square Value	113.6	95% Jackknife UCL	429.6
		95% Standard Bootstrap UCL	427.4
Anderson-Darling Test Statistic	0.577	95% Bootstrap-t UCL	480.7
Anderson-Darling 5% Critical Value	0.774	95% Hall's Bootstrap UCL	829.3
Kolmogorov-Smirnov Test Statistic	0.117	95% Percentile Bootstrap UCL	434.8
Kolmogorov-Smirnov 5% Critical Value	0.12	95% BCA Bootstrap UCL	459.4

Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	570
		97.5% Chebyshev(Mean, Sd) UCL	668.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	862.1
95% Approximate Gamma UCL	421.3		
95% Adjusted Gamma UCL	423.5		
Potential UCL to Use		Use 95% Approximate Gamma UCL	421.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

ARSENIC

General Statistics

Number of Valid Observations	18	Number of Distinct Observations	17
Number of Missing Values	26		

Raw Statistics		**Log-transformed Statistics**	
Minimum	7.5	Minimum of Log Data	2.015
Maximum	30	Maximum of Log Data	3.401
Mean	12.68	Mean of log Data	2.492
Median	11.3	SD of log Data	0.296
SD	4.885		
Std. Error of Mean	1.151		
Coefficient of Variation	0.385		
Skewness	2.886		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.677	Shapiro Wilk Test Statistic	0.853
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	14.68	95% H-UCL	14.41
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	16.46
95% Adjusted-CLT UCL (Chen-1995)	15.41	97.5% Chebyshev (MVUE) UCL	18.14
95% Modified-t UCL (Johnson-1978)	14.81	99% Chebyshev (MVUE) UCL	21.43
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	8.779	**Data Follow Appr. Gamma Distribution at 5% Significance Level**	
Theta Star	1.444		
MLE of Mean	12.68		
MLE of Standard Deviation	4.28		
nu star	316		
Approximate Chi Square Value (.05)	275.9	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0357	95% CLT UCL	14.57

Adjusted Chi Square Value	272.3	95% Jackknife UCL	14.68
		95% Standard Bootstrap UCL	14.53
Anderson-Darling Test Statistic	1.227	95% Bootstrap-t UCL	16.99
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	23.54
Kolmogorov-Smirnov Test Statistic	0.198	95% Percentile Bootstrap UCL	14.73
Kolmogorov-Smirnov 5% Critical Value	0.203	95% BCA Bootstrap UCL	15.65
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	17.7
		97.5% Chebyshev(Mean, Sd) UCL	19.87
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	24.14
95% Approximate Gamma UCL	14.53		
95% Adjusted Gamma UCL	14.72		
Potential UCL to Use		Use 95% Approximate Gamma UCL	14.53

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

CHROMIUM

General Statistics

Number of Valid Observations	18	Number of Distinct Observations	15
Number of Missing Values	26		

Raw Statistics		**Log-transformed Statistics**	
Minimum	58.1	Minimum of Log Data	4.062
Maximum	208.8	Maximum of Log Data	5.341
Mean	132.4	Mean of log Data	4.832
Median	135.5	SD of log Data	0.353
SD	41.74		
Std. Error of Mean	9.838		
Coefficient of Variation	0.315		
Skewness	-0.0545		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.972	Shapiro Wilk Test Statistic	0.935
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	149.5	95% H-UCL	156.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	182
95% Adjusted-CLT UCL (Chen-1995)	148.4	97.5% Chebyshev (MVUE) UCL	203.2
95% Modified-t UCL (Johnson-1978)	149.5	99% Chebyshev (MVUE) UCL	244.9
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	7.907	**Data appear Normal at 5% Significance Level**	

Theta Star	16.74		
MLE of Mean	132.4		
MLE of Standard Deviation	47.08		
nu star	284.7		
Approximate Chi Square Value (.05)	246.6	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0357	95% CLT UCL	148.6
Adjusted Chi Square Value	243.2	95% Jackknife UCL	149.5
		95% Standard Bootstrap UCL	148
Anderson-Darling Test Statistic	0.391	95% Bootstrap-t UCL	149.4
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	148.2
Kolmogorov-Smirnov Test Statistic	0.169	95% Percentile Bootstrap UCL	149
Kolmogorov-Smirnov 5% Critical Value	0.204	95% BCA Bootstrap UCL	148
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	175.3
		97.5% Chebyshev(Mean, Sd) UCL	193.8
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	230.3
95% Approximate Gamma UCL	152.8		
95% Adjusted Gamma UCL	155		
Potential UCL to Use		Use 95% Student's-t UCL	149.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Note: For highly negative-skewed data, confidence limits
(e.g., Chen, Johnson, Lognormal, and Gamma) may not be
reliable. Chen's and Johnson's methods provide
adjustments for positvely skewed data sets.

IRON

General Statistics

Number of Valid Observations	18	Number of Distinct Observations	18
Number of Missing Values	26		

Raw Statistics		**Log-transformed Statistics**	
Minimum	23911	Minimum of Log Data	10.08
Maximum	114000	Maximum of Log Data	11.64
Mean	36733	Mean of log Data	10.43
Median	31584	SD of log Data	0.362
SD	20686		
Std. Error of Mean	4876		
Coefficient of Variation	0.563		
Skewness	3.461		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.522	Shapiro Wilk Test Statistic	0.71

Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	45214	95% H-UCL	42671
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	49604
95% Adjusted-CLT UCL (Chen-1995)	49002	97.5% Chebyshev (MVUE) UCL	55497
95% Modified-t UCL (Johnson-1978)	45877	99% Chebyshev (MVUE) UCL	67073
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	5.244	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	7004		
MLE of Mean	36733		
MLE of Standard Deviation	16040		
nu star	188.8		
Approximate Chi Square Value (.05)	158	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0357	95% CLT UCL	44752
Adjusted Chi Square Value	155.3	95% Jackknife UCL	45214
		95% Standard Bootstrap UCL	44446
Anderson-Darling Test Statistic	2.301	95% Bootstrap-t UCL	70929
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	84063
Kolmogorov-Smirnov Test Statistic	0.326	95% Percentile Bootstrap UCL	45518
Kolmogorov-Smirnov 5% Critical Value	0.204	95% BCA Bootstrap UCL	51316
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	57985
		97.5% Chebyshev(Mean, Sd) UCL	67182
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	85246
95% Approximate Gamma UCL	43889		
95% Adjusted Gamma UCL	44653		
Potential UCL to Use		Use 95% Student's-t UCL	45214
		or 95% Modified-t UCL	45877

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

LEAD

General Statistics			
Number of Valid Observations	17	Number of Distinct Observations	17
Number of Missing Values	27		
Raw Statistics		**Log-transformed Statistics**	
Minimum	49	Minimum of Log Data	3.892
Maximum	548	Maximum of Log Data	6.306
Mean	186.5	Mean of log Data	5.035
Median	137.7	SD of log Data	0.638
SD	128.1		

Std. Error of Mean	31.06		
Coefficient of Variation	0.687		
Skewness	1.616		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.845	Shapiro Wilk Test Statistic	0.983
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	240.7	95% H-UCL	266.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	317.2
95% Adjusted-CLT UCL (Chen-1995)	250.6	97.5% Chebyshev (MVUE) UCL	374.2
95% Modified-t UCL (Johnson-1978)	242.8	99% Chebyshev (MVUE) UCL	486
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.289	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	81.47		
MLE of Mean	186.5		
MLE of Standard Deviation	123.3		
nu star	77.84		
Approximate Chi Square Value (.05)	58.52	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0346	95% CLT UCL	237.6
Adjusted Chi Square Value	56.76	95% Jackknife UCL	240.7
		95% Standard Bootstrap UCL	236.6
Anderson-Darling Test Statistic	0.303	95% Bootstrap-t UCL	271.5
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	275.3
Kolmogorov-Smirnov Test Statistic	0.136	95% Percentile Bootstrap UCL	239.5
Kolmogorov-Smirnov 5% Critical Value	0.211	95% BCA Bootstrap UCL	253.8
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	321.9
		97.5% Chebyshev(Mean, Sd) UCL	380.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	495.6
95% Approximate Gamma UCL	248.1		
95% Adjusted Gamma UCL	255.8		
Potential UCL to Use		Use 95% Approximate Gamma UCL	248.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

MANGANESE

General Statistics			
Number of Valid Observations	18	Number of Distinct Observations	18
Number of Missing Values	26		

Raw Statistics		Log-transformed Statistics	
Minimum	185	Minimum of Log Data	5.22
Maximum	684.4	Maximum of Log Data	6.529
Mean	425	Mean of log Data	6.021
Median	398.5	SD of log Data	0.269
SD	105.3		
Std. Error of Mean	24.82		
Coefficient of Variation	0.248		
Skewness	0.385		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.919	Shapiro Wilk Test Statistic	0.87
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	468.2	95% H-UCL	481.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	545
95% Adjusted-CLT UCL (Chen-1995)	468.3	97.5% Chebyshev (MVUE) UCL	596.5
95% Modified-t UCL (Johnson-1978)	468.6	99% Chebyshev (MVUE) UCL	697.5
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	13.38	**Data appear Normal at 5% Significance Level**	
Theta Star	31.76		
MLE of Mean	425		
MLE of Standard Deviation	116.2		
nu star	481.8		
Approximate Chi Square Value (.05)	431.9	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0357	95% CLT UCL	465.9
Adjusted Chi Square Value	427.4	95% Jackknife UCL	468.2
		95% Standard Bootstrap UCL	465.5
Anderson-Darling Test Statistic	0.752	95% Bootstrap-t UCL	470.7
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	482.8
Kolmogorov-Smirnov Test Statistic	0.224	95% Percentile Bootstrap UCL	463.8
Kolmogorov-Smirnov 5% Critical Value	0.203	95% BCA Bootstrap UCL	468.8
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	533.2
		97.5% Chebyshev(Mean, Sd) UCL	580.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	672
95% Approximate Gamma UCL	474.1		
95% Adjusted Gamma UCL	479.2		
Potential UCL to Use		Use 95% Student's-t UCL	468.2

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

	General UCL Statistics for Data Sets with Non-Detects
User Selected Options	
From File	Converted_Data_2.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

TEQ WHO-2005 - HALFND

General Statistics

Number of Valid Data	12	Number of Detected Data	11
Number of Distinct Detected Data	11	Number of Non-Detect Data	1
Number of Missing Values	53	Percent Non-Detects	8.33%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.469	Minimum Detected	-0.758
Maximum Detected	22.2	Maximum Detected	3.1
Mean of Detected	4.578	Mean of Detected	0.995
SD of Detected	6.137	SD of Detected	1.027
Minimum Non-Detect	0.2	Minimum Non-Detect	-1.609
Maximum Non-Detect	0.2	Maximum Non-Detect	-1.609

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.618	Shapiro Wilk Test Statistic	0.971
5% Shapiro Wilk Critical Value	0.85	5% Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	4.205	Mean	0.72
SD	5.992	SD	1.366
95% DL/2 (t) UCL	7.312	95% H-Stat (DL/2) UCL	23.16
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	3.902	Mean in Log Scale	0.787
SD	6.099	SD in Log Scale	1.216
95% MLE (t) UCL	7.064	Mean in Original Scale	4.215
95% MLE (Tiku) UCL	6.874	SD in Original Scale	5.985
		95% t UCL	7.318
		95% Percentile Bootstrap UCL	7.267
		95% BCA Bootstrap UCL	8.889
		95% H UCL	15.54
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.85	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	5.384		

nu star	18.71		
A-D Test Statistic	0.543	**Nonparametric Statistics**	
5% A-D Critical Value	0.75	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.75	Mean	4.236
5% K-S Critical Value	0.262	SD	5.716
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	1.731
		95% KM (t) UCL	7.344
Assuming Gamma Distribution		95% KM (z) UCL	7.083
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	7.296
Minimum	0.000001	95% KM (bootstrap t) UCL	12.42
Maximum	22.2	95% KM (BCA) UCL	7.603
Mean	4.197	95% KM (Percentile Bootstrap) UCL	7.377
Median	2.075	95% KM (Chebyshev) UCL	11.78
SD	5.999	97.5% KM (Chebyshev) UCL	15.04
k star	0.351	99% KM (Chebyshev) UCL	21.46
Theta star	11.95		
Nu star	8.427	**Potential UCLs to Use**	
AppChi2	2.985	95% KM (Chebyshev) UCL	11.78
95% Gamma Approximate UCL	11.85		
95% Adjusted Gamma UCL	14.08		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

For additional insight, the user may want to consult a statistician.

ANTIMONY

General Statistics

Number of Valid Data	35	Number of Detected Data	13
Number of Distinct Detected Data	13	Number of Non-Detect Data	22
Number of Missing Values	26	Percent Non-Detects	62.86%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.32	Minimum Detected	-1.139
Maximum Detected	12.4	Maximum Detected	2.518
Mean of Detected	2.245	Mean of Detected	0.173
SD of Detected	3.344	SD of Detected	1.06
Minimum Non-Detect	0.086	Minimum Non-Detect	-2.453
Maximum Non-Detect	5.8	Maximum Non-Detect	1.758
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	34
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	1
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	97.14%

UCL Statistics

Normal Distribution Test with Detected Values Only	**Lognormal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic	0.601	Shapiro Wilk Test Statistic	0.889
5% Shapiro Wilk Critical Value	0.866	5% Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.028	Mean	-1.138
SD	2.252	SD	1.476
95% DL/2 (t) UCL	1.672	95% H-Stat (DL/2) UCL	2.086
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-1.455
		SD in Log Scale	1.461
		Mean in Original Scale	0.896
		SD in Original Scale	2.248
		95% t UCL	1.539
		95% Percentile Bootstrap UCL	1.579
		95% BCA Bootstrap UCL	1.963
		95% H-UCL	1.466
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.757	**Data appear Lognormal at 5% Significance Level**	
Theta Star	2.965		
nu star	19.69		
A-D Test Statistic	1.139	**Nonparametric Statistics**	
5% A-D Critical Value	0.762	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.762	Mean	1.058
5% K-S Critical Value	0.244	SD	2.168
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.383
		95% KM (t) UCL	1.705
Assuming Gamma Distribution		95% KM (z) UCL	1.688
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.645
Minimum	0.000001	95% KM (bootstrap t) UCL	2.948
Maximum	12.4	95% KM (BCA) UCL	2.002
Mean	0.834	95% KM (Percentile Bootstrap) UCL	1.799
Median	0.000001	95% KM (Chebyshev) UCL	2.727
SD	2.271	97.5% KM (Chebyshev) UCL	3.448
k star	0.107	99% KM (Chebyshev) UCL	4.867
Theta star	7.761		
Nu star	7.519	**Potential UCLs to Use**	
AppChi2	2.46	95% KM (BCA) UCL	2.002
95% Gamma Approximate UCL	2.548		
95% Adjusted Gamma UCL	2.697		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

For additional insight, the user may want to consult a statistician.

ARSENIC

General Statistics			
Number of Valid Data	56	Number of Detected Data	55
Number of Distinct Detected Data	46	Number of Non-Detect Data	1
Number of Missing Values	9	Percent Non-Detects	1.79%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	6.2	Minimum Detected	1.825
Maximum Detected	82.3	Maximum Detected	4.41
Mean of Detected	14.45	Mean of Detected	2.549
SD of Detected	10.8	SD of Detected	0.429
Minimum Non-Detect	2.4	Minimum Non-Detect	0.875
Maximum Non-Detect	2.4	Maximum Non-Detect	0.875

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.301	Lilliefors Test Statistic	0.164
5% Lilliefors Critical Value	0.119	5% Lilliefors Critical Value	0.119
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	14.21	Mean	2.507
SD	10.85	SD	0.53
95% DL/2 (t) UCL	16.64	95% H-Stat (DL/2) UCL	16.17
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	14.13	Mean in Log Scale	2.53
SD	10.88	SD in Log Scale	0.448
95% MLE (t) UCL	16.57	Mean in Original Scale	14.27
95% MLE (Tiku) UCL	16.45	SD in Original Scale	10.79
		95% t UCL	16.68
		95% Percentile Bootstrap UCL	16.91
		95% BCA Bootstrap UCL	18.26
		95% H UCL	15.53
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	4.055	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.563		
nu star	446.1		
A-D Test Statistic	3.423	Nonparametric Statistics	
5% A-D Critical Value	0.754	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.754	Mean	14.3
5% K-S Critical Value	0.12	SD	10.66

Data not Gamma Distributed at 5% Significance Level		SE of Mean	1.438
		95% KM (t) UCL	16.71
Assuming Gamma Distribution		95% KM (z) UCL	16.67
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	16.7
Minimum	0.000001	95% KM (bootstrap t) UCL	19.47
Maximum	82.3	95% KM (BCA) UCL	17.25
Mean	14.19	95% KM (Percentile Bootstrap) UCL	16.91
Median	12.5	95% KM (Chebyshev) UCL	20.57
SD	10.88	97.5% KM (Chebyshev) UCL	23.28
k star	1.344	99% KM (Chebyshev) UCL	28.61
Theta star	10.56		
Nu star	150.5	**Potential UCLs to Use**	
AppChi2	123.1	95% KM (Chebyshev) UCL	20.57
95% Gamma Approximate UCL	17.34		
95% Adjusted Gamma UCL	17.43		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

CADMIUM

General Statistics

Number of Valid Data	51	Number of Detected Data	30
Number of Distinct Detected Data	28	Number of Non-Detect Data	21
Number of Missing Values	14	Percent Non-Detects	41.18%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.14	Minimum Detected	-1.966
Maximum Detected	8.6	Maximum Detected	2.152
Mean of Detected	1.325	Mean of Detected	-0.278
SD of Detected	1.758	SD of Detected	1.028
Minimum Non-Detect	0.3	Minimum Non-Detect	-1.204
Maximum Non-Detect	0.68	Maximum Non-Detect	-0.386

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	38
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	13
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	74.51%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.643	Shapiro Wilk Test Statistic	0.955
5% Shapiro Wilk Critical Value	0.927	5% Shapiro Wilk Critical Value	0.927
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	

Mean	0.873	Mean	-0.79
SD	1.446	SD	1.016
95% DL/2 (t) UCL	1.213	95% H-Stat (DL/2) UCL	1.061
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-0.834
		SD in Log Scale	1.054
		Mean in Original Scale	0.865
		SD in Original Scale	1.45
		95% t UCL	1.206
		95% Percentile Bootstrap UCL	1.216
		95% BCA Bootstrap UCL	1.381
		95% H-UCL	1.076
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.948	**Data appear Lognormal at 5% Significance Level**	
Theta Star	1.398		
nu star	56.88		
A-D Test Statistic	1.279	**Nonparametric Statistics**	
5% A-D Critical Value	0.775	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.775	Mean	0.874
5% K-S Critical Value	0.165	SD	1.433
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.205
		95% KM (t) UCL	1.217
Assuming Gamma Distribution		95% KM (z) UCL	1.211
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.215
Minimum	0.000001	95% KM (bootstrap t) UCL	1.492
Maximum	8.6	95% KM (BCA) UCL	1.246
Mean	0.797	95% KM (Percentile Bootstrap) UCL	1.227
Median	0.38	95% KM (Chebyshev) UCL	1.766
SD	1.488	97.5% KM (Chebyshev) UCL	2.151
k star	0.158	99% KM (Chebyshev) UCL	2.909
Theta star	5.039		
Nu star	16.14	**Potential UCLs to Use**	
AppChi2	8.06	95% KM (Chebyshev) UCL	1.766
95% Gamma Approximate UCL	1.596		
95% Adjusted Gamma UCL	1.63		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

For additional insight, the user may want to consult a statistician.

	General UCL Statistics for Full Data Sets
User Selected Options	
From File	Converted_Data_2.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ALUMINUM

General Statistics			
Number of Valid Observations	51	Number of Distinct Observations	44
Number of Missing Values	14		

Raw Statistics		Log-transformed Statistics	
Minimum	5520	Minimum of Log Data	8.616
Maximum	21100	Maximum of Log Data	9.957
Mean	11862	Mean of log Data	9.332
Median	11200	SD of log Data	0.319
SD	3789		
Std. Error of Mean	530.6		
Coefficient of Variation	0.319		
Skewness	0.613		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.131	Lilliefors Test Statistic	0.0707
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	12751	95% H-UCL	12843
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14230
95% Adjusted-CLT UCL (Chen-1995)	12783	97.5% Chebyshev (MVUE) UCL	15252
95% Modified-t UCL (Johnson-1978)	12759	99% Chebyshev (MVUE) UCL	17260
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	9.667	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	1227		
MLE of Mean	11862		
MLE of Standard Deviation	3815		
nu star	986.1		
Approximate Chi Square Value (.05)	914.2	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0453	95% CLT UCL	12735
Adjusted Chi Square Value	912.2	95% Jackknife UCL	12751
		95% Standard Bootstrap UCL	12729
Anderson-Darling Test Statistic	0.321	95% Bootstrap-t UCL	12826
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	12827
Kolmogorov-Smirnov Test Statistic	0.0896	95% Percentile Bootstrap UCL	12720

Kolmogorov-Smirnov 5% Critical Value	0.124	95% BCA Bootstrap UCL	12802
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14175
		97.5% Chebyshev(Mean, Sd) UCL	15176
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17142
95% Approximate Gamma UCL	12795		
95% Adjusted Gamma UCL	12823		
Potential UCL to Use		Use 95% Approximate Gamma UCL	12795

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

COBALT

General Statistics

Number of Valid Observations	51	Number of Distinct Observations	41
Number of Missing Values	14		

Raw Statistics		**Log-transformed Statistics**	
Minimum	3.9	Minimum of Log Data	1.361
Maximum	20.9	Maximum of Log Data	3.04
Mean	9.71	Mean of log Data	2.231
Median	9.5	SD of log Data	0.295
SD	2.907		
Std. Error of Mean	0.407		
Coefficient of Variation	0.299		
Skewness	1.129		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.0901	Lilliefors Test Statistic	0.0923
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	10.39	95% H-UCL	10.44
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.49
95% Adjusted-CLT UCL (Chen-1995)	10.45	97.5% Chebyshev (MVUE) UCL	12.26
95% Modified-t UCL (Johnson-1978)	10.4	99% Chebyshev (MVUE) UCL	13.78
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	11.34	**Data appear Normal at 5% Significance Level**	
Theta Star	0.856		
MLE of Mean	9.71		
MLE of Standard Deviation	2.883		
nu star	1157		
Approximate Chi Square Value (.05)	1079	**Nonparametric Statistics**	

Adjusted Level of Significance	0.0453	95% CLT UCL	10.38
Adjusted Chi Square Value	1077	95% Jackknife UCL	10.39
		95% Standard Bootstrap UCL	10.36
Anderson-Darling Test Statistic	0.364	95% Bootstrap-t UCL	10.48
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	10.55
Kolmogorov-Smirnov Test Statistic	0.0781	95% Percentile Bootstrap UCL	10.38
Kolmogorov-Smirnov 5% Critical Value	0.124	95% BCA Bootstrap UCL	10.45
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.48
		97.5% Chebyshev(Mean, Sd) UCL	12.25
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13.76
95% Approximate Gamma UCL	10.41		
95% Adjusted Gamma UCL	10.43		
Potential UCL to Use		Use 95% Student's-t UCL	10.39

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

MANGANESE

General Statistics

Number of Valid Observations	51	Number of Distinct Observations	51
Number of Missing Values	14		

Raw Statistics		**Log-transformed Statistics**	
Minimum	101	Minimum of Log Data	4.615
Maximum	648	Maximum of Log Data	6.474
Mean	359.1	Mean of log Data	5.829
Median	353	SD of log Data	0.349
SD	113.7		
Std. Error of Mean	15.92		
Coefficient of Variation	0.317		
Skewness	0.404		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.0783	Lilliefors Test Statistic	0.0872
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	385.7	95% H-UCL	394
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	439.8
95% Adjusted-CLT UCL (Chen-1995)	386.2	97.5% Chebyshev (MVUE) UCL	473.9
95% Modified-t UCL (Johnson-1978)	385.9	99% Chebyshev (MVUE) UCL	540.8
Gamma Distribution Test		**Data Distribution**	

k star (bias corrected)	8.836	**Data appear Normal at 5% Significance Level**	
Theta Star	40.64		
MLE of Mean	359.1		
MLE of Standard Deviation	120.8		
nu star	901.2		
Approximate Chi Square Value (.05)	832.6	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0453	95% CLT UCL	385.2
Adjusted Chi Square Value	830.7	95% Jackknife UCL	385.7
		95% Standard Bootstrap UCL	384.9
Anderson-Darling Test Statistic	0.336	95% Bootstrap-t UCL	387.4
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	386.5
Kolmogorov-Smirnov Test Statistic	0.0699	95% Percentile Bootstrap UCL	385.1
Kolmogorov-Smirnov 5% Critical Value	0.124	95% BCA Bootstrap UCL	384.6
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	428.4
		97.5% Chebyshev(Mean, Sd) UCL	458.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	517.5
95% Approximate Gamma UCL	388.7		
95% Adjusted Gamma UCL	389.6		
Potential UCL to Use		Use 95% Student's-t UCL	385.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

VANADIUM

General Statistics

Number of Valid Observations	51	Number of Distinct Observations	51
Number of Missing Values	14		

Raw Statistics		**Log-transformed Statistics**	
Minimum	18.2	Minimum of Log Data	2.901
Maximum	109	Maximum of Log Data	4.691
Mean	39.5	Mean of log Data	3.604
Median	35.1	SD of log Data	0.365
SD	17.45		
Std. Error of Mean	2.443		
Coefficient of Variation	0.442		
Skewness	2.254		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.19	Lilliefors Test Statistic	0.108
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	

95% Student's-t UCL	43.6	95% H-UCL	43.05
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	48.22
95% Adjusted-CLT UCL (Chen-1995)	44.35	97.5% Chebyshev (MVUE) UCL	52.11
95% Modified-t UCL (Johnson-1978)	43.73	99% Chebyshev (MVUE) UCL	59.75
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	6.691	**Data appear Lognormal at 5% Significance Level**	
Theta Star	5.904		
MLE of Mean	39.5		
MLE of Standard Deviation	15.27		
nu star	682.5		
Approximate Chi Square Value (.05)	622.9	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0453	95% CLT UCL	43.52
Adjusted Chi Square Value	621.2	95% Jackknife UCL	43.6
		95% Standard Bootstrap UCL	43.45
Anderson-Darling Test Statistic	1.245	95% Bootstrap-t UCL	44.89
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	45.73
Kolmogorov-Smirnov Test Statistic	0.131	95% Percentile Bootstrap UCL	43.57
Kolmogorov-Smirnov 5% Critical Value	0.124	95% BCA Bootstrap UCL	44.79
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	50.15
		97.5% Chebyshev(Mean, Sd) UCL	54.76
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	63.81
95% Approximate Gamma UCL	43.28		
95% Adjusted Gamma UCL	43.4		
Potential UCL to Use		Use 95% Student's-t UCL	43.6
		or 95% Modified-t UCL	43.73
		or 95% H-UCL	43.05

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.

H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.

It is therefore recommended to avoid the use of H-statistic based 95% UCLs.

Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

	General UCL Statistics for Full Data Sets
User Selected Options	
From File	COPCs.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ALUMINUM

General Statistics			
Number of Valid Observations	78	Number of Distinct Observations	69
Number of Missing Values	38		

Raw Statistics		Log-transformed Statistics	
Minimum	2360	Minimum of Log Data	7.766
Maximum	29000	Maximum of Log Data	10.28
Mean	10632	Mean of log Data	9.146
Median	10400	SD of log Data	0.52
SD	5313		
Std. Error of Mean	601.6		
Coefficient of Variation	0.5		
Skewness	1.012		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.0835	Lilliefors Test Statistic	0.103
Lilliefors Critical Value	0.1	Lilliefors Critical Value	0.1
Data appear Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	11634	95% H-UCL	11990
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13619
95% Adjusted-CLT UCL (Chen-1995)	11695	97.5% Chebyshev (MVUE) UCL	14877
95% Modified-t UCL (Johnson-1978)	11645	99% Chebyshev (MVUE) UCL	17348
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.987	**Data appear Normal at 5% Significance Level**	
Theta Star	2666		
MLE of Mean	10632		
MLE of Standard Deviation	5324		
nu star	622		
Approximate Chi Square Value (.05)	565.2	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0469	95% CLT UCL	11622
Adjusted Chi Square Value	564.2	95% Jackknife UCL	11634
		95% Standard Bootstrap UCL	11627
Anderson-Darling Test Statistic	0.402	95% Bootstrap-t UCL	11735
Anderson-Darling 5% Critical Value	0.756	95% Hall's Bootstrap UCL	11735
Kolmogorov-Smirnov Test Statistic	0.0709	95% Percentile Bootstrap UCL	11629

Kolmogorov-Smirnov 5% Critical Value	0.102	95% BCA Bootstrap UCL	11678
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13254
		97.5% Chebyshev(Mean, Sd) UCL	14389
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16618
95% Approximate Gamma UCL	11701		
95% Adjusted Gamma UCL	11722		
Potential UCL to Use		Use 95% Student's-t UCL	11634

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

ARSENIC

General Statistics

Number of Valid Observations	88	Number of Distinct Observations	79
Number of Missing Values	28		

Raw Statistics		**Log-transformed Statistics**	
Minimum	3.175	Minimum of Log Data	1.155
Maximum	65.7	Maximum of Log Data	4.185
Mean	16.5	Mean of log Data	2.681
Median	14.55	SD of log Data	0.498
SD	9.027		
Std. Error of Mean	0.962		
Coefficient of Variation	0.547		
Skewness	2.331		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.155	Lilliefors Test Statistic	0.0677
Lilliefors Critical Value	0.0944	Lilliefors Critical Value	0.0944
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	18.1	95% H-UCL	18.24
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	20.53
95% Adjusted-CLT UCL (Chen-1995)	18.34	97.5% Chebyshev (MVUE) UCL	22.27
95% Modified-t UCL (Johnson-1978)	18.14	99% Chebyshev (MVUE) UCL	25.69
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	4.115	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	4.01		
MLE of Mean	16.5		
MLE of Standard Deviation	8.134		
nu star	724.3		
Approximate Chi Square Value (.05)	662.9	**Nonparametric Statistics**	

Adjusted Level of Significance	0.0473	95% CLT UCL	18.08
Adjusted Chi Square Value	661.9	95% Jackknife UCL	18.1
		95% Standard Bootstrap UCL	18.09
Anderson-Darling Test Statistic	0.742	95% Bootstrap-t UCL	18.39
Anderson-Darling 5% Critical Value	0.755	95% Hall's Bootstrap UCL	18.59
Kolmogorov-Smirnov Test Statistic	0.087	95% Percentile Bootstrap UCL	18.18
Kolmogorov-Smirnov 5% Critical Value	0.0956	95% BCA Bootstrap UCL	18.32
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	20.7
		97.5% Chebyshev(Mean, Sd) UCL	22.51
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	26.08
95% Approximate Gamma UCL	18.03		
95% Adjusted Gamma UCL	18.06		
Potential UCL to Use		Use 95% Approximate Gamma UCL	18.03

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

VANADIUM

General Statistics

Number of Valid Observations	78	Number of Distinct Observations	73
Number of Missing Values	38		

Raw Statistics		**Log-transformed Statistics**	
Minimum	8.9	Minimum of Log Data	2.186
Maximum	98.1	Maximum of Log Data	4.586
Mean	32.07	Mean of log Data	3.376
Median	28.8	SD of log Data	0.429
SD	14.81		
Std. Error of Mean	1.677		
Coefficient of Variation	0.462		
Skewness	1.836		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.135	Lilliefors Test Statistic	0.0654
Lilliefors Critical Value	0.1	Lilliefors Critical Value	0.1
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	34.86	95% H-UCL	35.06
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	39.1
95% Adjusted-CLT UCL (Chen-1995)	35.2	97.5% Chebyshev (MVUE) UCL	42.15
95% Modified-t UCL (Johnson-1978)	34.92	99% Chebyshev (MVUE) UCL	48.15
Gamma Distribution Test		**Data Distribution**	

k star (bias corrected)	5.422	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	5.915		
MLE of Mean	32.07		
MLE of Standard Deviation	13.77		
nu star	845.8		
Approximate Chi Square Value (.05)	779.3	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0469	95% CLT UCL	34.83
Adjusted Chi Square Value	778.1	95% Jackknife UCL	34.86
		95% Standard Bootstrap UCL	34.84
Anderson-Darling Test Statistic	0.461	95% Bootstrap-t UCL	35.4
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	35.56
Kolmogorov-Smirnov Test Statistic	0.08	95% Percentile Bootstrap UCL	34.94
Kolmogorov-Smirnov 5% Critical Value	0.101	95% BCA Bootstrap UCL	35.22
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	39.38
		97.5% Chebyshev(Mean, Sd) UCL	42.54
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	48.75
95% Approximate Gamma UCL	34.81		
95% Adjusted Gamma UCL	34.86		
Potential UCL to Use		Use 95% Approximate Gamma UCL	34.81

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Appendix D.2.3

Example Calculations – Risk Estimation and Calculated Parameters

CALCULATION WORKSHEET

CLIENT: PORTSMOUTH NAVAL SHIPYARD		**JOB NUMBER:** 00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SOIL CONSTRUCTION WORKERS		
BASED ON: USEPA, DECEMBER 1989		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 11/06/09

PURPOSE: To estimate intake, carcinogenic and non-carcinogenic risks from incidental ingestion of subsurface soil at OU7.

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 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:

ILCR (Carcinogens) = Intake (mg/kg/day) x CSFo (mg/kg/day)-1
HQ (Noncarcinogens) = Intake (mg/kg/day) / RFDo (mg/kg/day)

ASSUMPTIONS:

Cs	=	0.0013	mg/kg	Chemical: 2,3,7,8-TCDD TEQ
IR	=	330	mg/day	
EF	=	150	days/year	
ED	=	1	years	
FI	=	1		
CF	=	1.0E-06	kg/mg	
BW	=	70	kg	
ATc	=	25550	days	
ATnc	=	365	days	
CSFo	=	1.3E+05	$(mg/kg/day)^{-1}$	
RfDo	=	1.0E-09	(mg/kg/day)	

CLIENT: PORTSMOUTH NAVAL SHIPYARD		JOB NUMBER: 00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SOIL CONSTRUCTION WORKERS		
BASED ON: USEPA, DECEMBER 1989		
BY: L. CIOFANI	CHECKED BY:	DATE: 11/06/09

EXAMPLE CARCINOGENIC CALCULATION

$$IEXc = \frac{0.0013 \text{ mg/kg} \times 330 \text{ mg/day} \times 150 \text{ days/year} \times 1 \text{ years} \times 1 \times 1.0E\text{-}06 \text{ kg/mg}}{70 \text{ kg} \times 25550 \text{ days}}$$

IEXc = 3.60E-11 mg/kg/day

ILCR = 3.60E-11 mg/kg/day x 1.30E+05 (mg/kg/day)-1 = Incremental Lifetime Cancer Risk

ILCR = 4.7E-06

EXAMPLE NON-CARCINOGENIC CALCULATION

$$IEXnc = \frac{0.0013 \text{ mg/kg} \times 330 \text{ mg/day} \times 150 \text{ days/year} \times 1 \text{ years} \times 1 \times 1.0E\text{-}06 \text{ kg/mg}}{70 \text{ kg} \times 365 \text{ days}}$$

IEXnc = 2.52E-09 mg/kg/day

HQ = 2.52E-09 mg/kg/day / 1.00E-09 (mg/kg/day) = Hazard Quotient

HQ = 2.5E+00

CALCULATION WORKSHEET

CLIENT: PORTSMOUTH NAVAL SHIPYARD		**JOB NUMBER:** 00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SOIL CONSTRUCTION WORKERS		
BASED ON: USEPA, JULY 2004		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 11/06/09

PURPOSE: To estimate intake, carcinogenic and non-carcinogenic risks from dermal contact with subsurface soil at OU7.

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:

ILCR (Carcinogens) = Intake (mg/kg/day) x CSFd (mg/kg/day)-1
HQ (Noncarcinogens) = Intake (mg/kg/day) / RFDd (mg/kg/day)

ASSUMPTIONS:

Cs	=	0.0013	mg/kg	Chemical: 2,3,7,8-TCDD TEQ
CF	=	1.0E-06	kg/mg	
SA	=	3300	cm^2/day	
AF	=	0.3	mg/cm^2	
ABS	=	0.03		
EF	=	150	days/year	
ED	=	1	years	
BW	=	70	kg	
ATc	=	25550	days	
ATnc	=	365	days	
CSFd	=	1.3E+05	$(mg/kg/day)^{-1}$	
RfDd	=	1.0E-09	(mg/kg/day)	

CALCULATION WORKSHEET

CLIENT: PORTSMOUTH NAVAL SHIPYARD		**JOB NUMBER:** 00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SOIL CONSTRUCTION WORKERS		
BASED ON: USEPA, JULY 2004		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 11/06/09

EXAMPLE CARCINOGENIC CALCULATION

$$DEXc = \frac{0.0013 \text{ mg/kg} \times 1.0E\text{-}06 \text{ kg/mg} \times 3300 \text{ cm2/day} \times 0.3 \text{ mg/cm2} \times 0.03 \times 150 \text{ days/year} \times 1 \text{ years}}{70 \text{ kg} \times 25550 \text{ days}}$$

DEXc = 3.24E-12 mg/kg/day ✓

ILCR = 3.24E-12 mg/kg/day x 1.30E+05 (mg/kg/day)-1 = Incremental Lifetime Cancer Risk

ILCR = 4.2E-07 ✓

EXAMPLE NONCARCINOGENIC CALCULATION

$$DEXnc = \frac{0.0013 \text{ mg/kg} \times 1.0E\text{-}06 \text{ kg/mg} \times 3300 \text{ cm2/day} \times 0.3 \text{ mg/cm2} \times 0.03 \times 150 \text{ days/year} \times 1 \text{ years}}{70 \text{ kg} \times 365 \text{ days}}$$

DEXnc = 2.27E-10 mg/kg/day ✓

HQ = 2.27E-10 mg/kg/day / 1.00E-09 (mg/kg/day) = Hazard Quotient

HQ = 2.3E-01 ✓

CALCULATION WORKSHEET

CLIENT: PORTSMOUTH NAVAL SHIPYARD		**JOB NUMBER:** 00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM INHALATION OF FUGATIVE DUST EMISSIONS CONSTRUCTION WORKERS		
BASED ON: USEPA, JANUARY 2009		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 11/06/09

PURPOSE: To estimate intake, carcinogenic and non-carcinogenic risks from inhalation of surface soil at OU7.

EQUATION:

$$EC = \frac{Ca \times ET \times EF \times ED}{AT \times 24 \text{ hours/day}}$$

Where:

EC	=	exposure concentration (mg/m3)
Ca	=	exposure point concentration in air (mg/m3)
	=	Cs x 1/PEF
Cs	=	exposure point concentration in soil (mg/kg)
PEF	=	particulate emission factor (m3/kg)
ET	=	exposure time (hrs/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
BW	=	body weight (kg)
AT	=	averaging time (days)
IURi	=	inhalation unit risk ($(ug/m3)^{-1}$)
RfCi	=	inhalation reference concentration (mg/m3)

RISKS:

ILCR (Carcinogens) = Exposure Concentration (mg/m3) x IURi (ug/m3)-1 x 1000 ug/mg
HQ (Noncarcinogens) = Exposure Concentration (mg/m3) / RFCi (mg/m3)

ASSUMPTIONS:

Cs	=	0.0013	mg/kg	Chemical: 2,3,7,8-TCDD TEQ
PEF	=	1.43E+06	m3/kg	
Ca	=	9.09E-10	mg/m3	
ET	=	8	hours	
EF	=	150	days/year	
ED	=	1	years	
ATc	=	25550	days	
ATnc	=	365	days	
IURi	=	3.8E+01	$(ug/m3)^{-1}$	
RfCi	=	4.0E-08	(mg/m3)	

CLIENT: PORTSMOUTH NAVAL SHIPYARD		JOB NUMBER: 00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM INHALATION OF FUGATIVE DUST EMISSIONS CONSTRUCTION WORKERS		
BASED ON: USEPA, JANUARY 2009		
BY: L. CIOFANI	CHECKED BY:	DATE: 11/06/09

EXAMPLE CARCINOGENIC CALCULATION

$$IEXc = \frac{9.09E\text{-}10 \text{ mg/m3} \times 8 \text{ hours} \times 150 \text{ days/year} \times 1 \text{ years}}{25550 \text{ days} \times 24 \text{ hours/day}}$$

IEXc = 1.78E-12 mg/m3 ✓

ILCR = 1.78E-12 mg/m3 x 3.80E+01 (ug/m3)-1 x 1000 ug/mg = Incremental Lifetime Cancer Risk

ILCR = 6.8E-08 ✓

EXAMPLE NON-CARCINOGENIC CALCULATION

$$IEXnc = \frac{9.09E\text{-}10 \text{ mg/m3} \times 8 \text{ hours} \times 150 \text{ days/year} \times 1 \text{ years}}{365 \text{ days} \times 24 \text{ hours/day}}$$

IEXnc = 1.25E-10 mg/m3 ✓

HQ = 1.25E-10 mg/m3 / 4.00E-08 (mg/m3) = Hazard Quotient

HQ **3.1E-03** ✓

CLIENT:	JOB NUMBER:
PORTSMOUTH NAVAL SHIPYARD	00383

SUBJECT:
CALCULATION OF PARTICUALATE EMISSION FACTOR FOR CONSTRUCTION WORKERS

BASED ON:
Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites (USEPA, March 2001)

BY:	CHECKED BY:	DATE:
L. CIOFANI		11/13/09

Equation 5-5
Derivation of the Particulate Emission Factor
Construction Scenario - Construction Worker

$$PEF_{sc} = Q/C_{sr} \times \frac{1}{F_D} \times \left[\frac{T \times A_R}{556 \times \left(\frac{W}{3}\right)^{0.4} \times \frac{(365d/yr - p)}{365d/yr} \times VKT} \right]$$

Parameter/Definition (units)	Default
PEF_{sc}/subchronic road particulate emission factor (m^3/kg)	site-specific
Q/C_{sr}/ inverse of 1-h average air concentration along a straight road segment bisecting a 0.5-acre square site (g/m^2-s per kg/m^3)	23.02
F_D/dispersion correction factor (unitless)	0.185 (Appendix E)
T/total time over which construction occurs (s)	site-specific
A_R/surface area of contaminated road segment (m^2) L_R/length of road segment (ft) W_R/width of road segment (ft)	274.213 ($A_R = L_R \times W_R \times 0.092903 m^2/ft^2$)
W/mean vehicle weight (tons)	site-specific
p/number of days with at least 0.01 inches of precipitation (days/year) (see Figure 5-2)	site-specific
• VKT/sum of fleet vehicle kilometers traveled during the exposure duration (km)	site-specific

Calculation of PEF for Construction Workers

Q/C	23.02	(g/m2-s per kg/m3)	
Fd	0.185	dispersion correction factor (unitless)	
T	7.20E+06	sec	3600 sec/hr x 8hr/day x 250 days/yr
Area (A)	274.213	m^2	
W	8	tons	
p	140	day/year	
VKT	337.5	km	30 vehicles x 0.045 km/day x 250 days

PEF = 1.43E+06 m^3/kg

CLIENT: PORTSMOUTH NAVAL SHIPYARD		JOB NUMBER: 00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SOIL FOR MUTAGENIC CHEMICALS - HYPOTHETICAL CHILD RESIDENTS EXPOSED TO SURFACE SOIL		
BASED ON: U.S. EPA, DECEMBER 1989		
BY: L. CIOFANI	CHECKED BY:	DATE: 08/14/09

PURPOSE: To estimate intake and cancer risks for mutagenic chemicals from incidental ingestion of surface soil at OU7.

EQUATION:

$$IEX = \frac{CS \times IR \times EF \times ED \times FI \times CF}{BW \times AT} \times ADAF$$

Where:

IEX	=	estimated exposure intake (mg/kg/day)
Cs	=	exposure point concentration in soil (mg/kg)
IR	=	incidental 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)
ADAF	=	age-dependent adjustment factor
CSFo	=	oral carcinogenic slope factor ($(mg/kg/day)^{-1}$)

RISKS:

ILCR (Carcinogens) = Intake (mg/kg/day) x CSFo (mg/kg/day)-1

ASSUMPTIONS:

Cs	=	1.8	mg/kg	Chemical: Benzo(a)pyrene Equivalents
IR	=	200	mg/day	
EF	=	350	days/year	
ED_1	=	2	years	
ED_2	=	4	years	
FI	=	1		
CF	=	1.0E-06	kg/mg	
BW	=	15	kg	
AT	=	25550	days	
CSFo	=	7.3E+00	$(mg/kg/day)^{-1}$	
$ADAF_1$	=	10		
$ADAF_2$	=	3		

CLIENT: PORTSMOUTH NAVAL SHIPYARD		JOB NUMBER: 00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SOIL FOR MUTAGENIC CHEMICALS - HYPOTHETICAL CHILD RESIDENTS EXPOSED TO SURFACE SOIL		
BASED ON: U.S. EPA, DECEMBER 1989		
BY: L. CIOFANI	CHECKED BY:	DATE: 08/14/09

EXAMPLE CARCINOGENIC CALCULATION

$$IEX_1 = \frac{1.8 \text{ mg/kg} \times 200 \text{ mg/day} \times 350 \text{ days/year} \times 2 \text{ years} \times 1 \times 1.0\text{E-06 kg/mg}}{15 \text{ kg} \times 25550 \text{ days}} \times 10$$

IEX_1 = 6.58E-06 mg/kg/day

$$IEX_2 = \frac{1.8 \text{ mg/kg} \times 200 \text{ mg/day} \times 350 \text{ days/year} \times 4 \text{ years} \times 1 \times 1.0\text{E-06 kg/mg}}{15 \text{ kg} \times 25550 \text{ days}} \times 3$$

IEX_2 = 3.95E-06 mg/kg/day

ILCR = (6.58E-06 mg/kg/day + 3.95E-06 mg/kg/day) x 7.30E+00 (mg/kg/day)-1

ILCR = 7.7E-05

CALCULATION WORKSHEET

CLIENT: PORTSMOUTH NAVAL SHIPYARD		**JOB NUMBER:** 00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM INHALATION OF FUGATIVE DUST EMISSIONS FOR MUTAGENIC CHEMICALS - HYPOTHETICAL CHILD RESIDENTS		
BASED ON: USEPA, DECEMBER 1989, MARCH 2005, January 2009		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 11/09/2009

PURPOSE: To estimate intake, carcinogenic risks for mutagenic chemicals from inhalation of surface soil at OU7.

EQUATION:

$$EC = \frac{Ca \times ET \times EF \times ED}{AT} \times ADAF$$

Where:

EC	=	estimated exposure concentration (mg/m3)
Ca	=	exposure point concentration in air (mg/m3)
	=	Cs x 1/PEF
Cs	=	exposure point concentration in soil (mg/kg)
PEF	=	particulate emission factor (m3/kg)
ET	=	exposure time (hrs/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
AT	=	averaging time (hours)
ADAF	=	age-dependent adjustment factor
IURi	=	inhalation unit risk($(ug/mg)^{-1}$)

RISKS:

ILCR = Exposure concentration (mg/m3) x IURi (ug/m3)-1 x 1000 ug/mg

ASSUMPTIONS:

Cs	=	1.8	mg/kg	Chemical: BAP Equivalent
PEF	=	9.37E+09	m3/kg	
Ca	=	1.92E-10	mg/m3	
ET	=	24	hr/day	
EF	=	350	days/year	
ED_1	=	2	years	
ED_2	=	4	years	
ATc	=	613200	days	
IURi	=	1.1E-03	$(ug/m3)^{-1}$	
$ADAF_1$	=	10		
$ADAF_2$	=	3		

CLIENT: PORTSMOUTH NAVAL SHIPYARD		JOB NUMBER: 00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM INHALATION OF FUGATIVE DUST EMISSIONS FOR MUTAGENIC CHEMICALS - HYPOTHETICAL CHILD RESIDENTS		
BASED ON: USEPA, DECEMBER 1989, MARCH 2005		
BY: L. CIOFANI	CHECKED BY:	DATE: 11/09/2009

EXAMPLE CARCINOGENIC CALCULATION

$$EC = \frac{1.92E\text{-}10 \text{ mg/m3} \times 24 \text{ hr/day} \times 350 \text{ days/year} \times 2 \text{ years}}{613200 \text{ days}} \times 10$$

EC = 5.26E-11 mg/m3 ✓

$$EC = \frac{1.92E\text{-}10 \text{ mg/m3} \times 24 \text{ hr/day} \times 350 \text{ days/year} \times 4 \text{ years}}{613200 \text{ days}} \times 3$$

EC = 3.16E-11 mg/m3 ✓

ILCR = (5.26E-11 mg/m3 + 3.16E-11 mg/m3) x 1.10E-03 (ug/m3)-1 x 1000 ug/mg

ILCR = 9.3E-11 ✓

CALCULATION WORKSHEET

CLIENT: PORTSMOUTH NAVAL SHIPYARD		**JOB NUMBER:** 00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SOIL FOR MUTAGENIC CHEMICALS HYPOTHETICAL ADULT RESIDENTS EXPOSED TO SURFACE SOIL		
BASED ON: U.S. EPA, JULY 2004 → March 2005		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 11/06/09

PURPOSE: To estimate intake and cancer risks for mutagenic chemicals from dermal contact with surface soil at OU7.

EQUATION:

$$DEX = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT} \times ADAF$$

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)
ADAF	=	age-dependent adjustment factor
CSFd	=	dermal carcinogenic slope factor ($(mg/kg/day)^{-1}$)

RISKS:

ILCR (Carcinogens) = Intake (mg/kg/day) x CSFd (mg/kg/day)-1

ASSUMPTIONS:

Cs	=	1.8	mg/kg	Chemical: Benzo(a)pyrene Equivalents
CF	=	1.0E-06	kg/mg	
SA	=	5700	cm^2/day	
AF	=	0.07	mg/cm^2	
ABS	=	0.13		
EF	=	350	days/year	
ED_1	=	10	years	
ED_2	=	14	years	
BW	=	70	kg	
AT	=	25550	days	
CSFd	=	7.3E+00	$(mg/kg/day)^{-1}$	
$ADAF_1$	=	3		
$ADAF_2$	=	1		

CLIENT: PORTSMOUTH NAVAL SHIPYARD		JOB NUMBER: 00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SOIL FOR MUTAGENIC CHEMICALS HYPOTHETICAL ADULT RESIDENTS EXPOSED TO SURFACE SOIL		
BASED ON: U.S. EPA, JULY 2004		
BY: L. CIOFANI	CHECKED BY:	DATE: 11/06/09

EXAMPLE CARCINOGENIC CALCULATION

$$DEXc = \frac{1.8 \text{ mg/kg} \times 1.0E\text{-}06 \text{ kg/mg} \times 5700 \text{ cm2/day} \times 0.07 \text{ mg/cm2} \times 0.13 \times 350 \text{ days/year} \times 10 \text{ years}}{70 \text{ kg} \times 25550 \text{ days}} \times 3$$

DEXc = 5.48E-07 mg/kg/day ✓

$$DEXc = \frac{1.8 \text{ mg/kg} \times 1.0E\text{-}06 \text{ kg/mg} \times 5700 \text{ cm2/day} \times 0.07 \text{ mg/cm2} \times 0.13 \times 350 \text{ days/year} \times 14 \text{ years}}{70 \text{ kg} \times 25550 \text{ days}} \times 1$$

DEXc = 2.56E-07 mg/kg/day ✓

ILCR = (5.48E-07 mg/kg/day + 2.56E-07 mg/kg/day) x 7.30E+00 (mg/kg/day)-1

ILCR = 5.9E-06 ✓

CLIENT: PORTSMOUTH NAVAL SHIPYARD		JOB NUMBER: 00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM INHALATION OF FUGATIVE DUST EMISSIONS FOR MUTAGENIC CHEMICALS - HYPOTHETICAL ADULT RESIDENTS		
BASED ON: USEPA, DECEMBER 1989, MARCH 2005, January 2009		
BY: L. CIOFANI	CHECKED BY:	DATE: 11/09/2009

PURPOSE: To estimate intake, carcinogenic risks for mutagenic chemicals from inhalation of surface soil at OU7.

EQUATION:

$$EC = \frac{Ca \times ET \times EF \times ED}{AT} \times ADAF$$

Where:

EC	=	estimated exposure intake (mg/kg/day)
Ca	=	exposure point concentration in air (mg/m3)
	=	Cs x 1/PEF
Cs	=	exposure point concentration in soil (mg/kg)
PEF	=	particulate emission factor (m3/kg)
IR	=	inhlation rate (m3/hr)
ET	=	exposure time (hrs/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
BW	=	body weight (kg)
AT	=	averaging time (hours)
ADAF	=	age-dependent adjustment factor
IURi	=	inhalation unit risk($(ug/mg)^{-1}$)

RISKS:

ILCR = Exposure concentration (mg/m3) x IURi (ug/m3)-1 x 1000 ug/mg

ASSUMPTIONS:

Cs	=	1.8	mg/kg	Chemical: BAP Equivalent
PEF	=	9.37E+09	m3/kg	
Ca	=	1.92E-10	mg/m3	
ET	=	24	hr/day	
EF	=	350	days/year	
ED_1	=	10	years	
ED_2	=	14	years	
ATc	=	613200	hours	
IURi	=	1.1E-03	$(ug/m3)^{-1}$	
$ADAF_1$	=	3		
$ADAF_2$	=	1		

CLIENT: PORTSMOUTH NAVAL SHIPYARD		JOB NUMBER: 00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM INHALATION OF FUGATIVE DUST EMISSIONS FOR MUTAGENIC CHEMICALS - HYPOTHETICAL ADULT RESIDENTS		
BASED ON: USEPA, DECEMBER 1989, MARCH 2005		
BY: L. CIOFANI	CHECKED BY:	DATE: 11/09/2009

EXAMPLE CARCINOGENIC CALCULATION

$$EC = \frac{1.92E\text{-}10 \text{ mg/m3} \times 24 \text{ hr/day} \times 350 \text{ days/year} \times 10 \text{ years}}{613200 \text{ hours}} \times 3$$

EC = 7.89E-11 mg/m3 ✓

$$EC = \frac{1.92E\text{-}10 \text{ mg/m3} \times 24 \text{ hr/day} \times 350 \text{ days/year} \times 14 \text{ years}}{613200 \text{ hours}} \times 1$$

EC = 3.68E-11 mg/m3 ✓

ILCR = (7.89E-11 mg/m3 + 3.68E-11 mg/m3) x 1.10E-03 (ug/m3)-1 x 1000 ug/mg

ILCR = 1.3E-10 ✓

CALCULATION WORKSHEET

CLIENT: PORTSMOUTH NAVAL SHIPYARD		**JOB NUMBER:** 00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SURFACE WATER ADULT RECREATIONAL USERS		
BASED ON: USEPA, DECEMBER 1989		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 11/06/09

PURPOSE: To estimate intake, carcinogenic and non-carcinogenic risks from incidental ingestion of surface water.

EQUATION:

$$IEX = \frac{Csw \times CF \times CRsw \times ET \times EF \times ED}{BW \times AT}$$

Where:

IEX	=	estimated exposure intake (mg/kg/day)
Csw	=	exposure point concentration in surface water (ug/L)
CF	=	conversion factor (1.0E-3 mg/ug)
CRsw	=	contact rate (L/hour)
ET	=	exposure time (hours/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
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:

ILCR (Carcinogens) = Intake (mg/kg/day) x CSFo (mg/kg/day)-1
HQ (Noncarcinogens) = Intake (mg/kg/day) / RFDo (mg/kg/day)

ASSUMPTIONS:

Csw	=	24.5	ug/L	Chemical: Chromium
CRsw	=	0.05	L/hr	
CF	=	1.0E-03	mg/ug	
ET	=	1	hours/day	
EF	=	7	days/year	
ED	=	24	years	
BW	=	70	kg	
ATc	=	25550	days	
ATnc	=	8760	days	
CSFo	=	NA	$(mg/kg/day)^{-1}$	
RfDo	=	1.5E+00	(mg/kg/day)	

CLIENT: PORTSMOUTH NAVAL SHIPYARD		JOB NUMBER: 00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SURFACE WATER ADULT RECREATIONAL USERS		
BASED ON: USEPA, DECEMBER 1989		
BY: L. CIOFANI	CHECKED BY:	DATE: 11/06/09

EXAMPLE CARCINOGENIC CALCULATION

$$IEXc = \frac{24.5\ ug/L \times 1.0E\text{-}03\ mg/ug \times 0.05\ L/hr \times 1\ hours/day \times 7\ days/year \times 24\ years}{70\ kg \times 25550\ days}$$

IEXc = 1.15E-07 mg/kg/day ✓

ILCR = 1.15E-07 mg/kg/day x NA (mg/kg/day)-1 = Incremental Lifetime Cancer Risk

ILCR = NA

EXAMPLE NONCARCINOGENIC CALCULATION

$$IEXnc = \frac{24.5\ ug/L \times 1.0E\text{-}03\ mg/ug \times 0.05\ L/hr \times 1\ hours/day \times 7\ days/year \times 24\ years}{70\ kg \times 8760\ days}$$

IEXnc = 3.36E-07 mg/kg/day ✓

$$HQ = \frac{3.36E\text{-}07\ mg/kg/day}{1.50E+00\ (mg/kg/day)} = \text{Hazard Quotient}$$

HQ = 2.2E-07 ✓

CALCULATION WORKSHEET

CLIENT: PORTSMOUTH NAVAL SHIPYARD		**JOB NUMBER:** 00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SURFACE WATER ADULT RECREATIONAL USERS		
BASED ON: USEPA, DECEMBER 1989, JULY 2004		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 11/06/09

PURPOSE: To estimate intake, carcinogenic and non-carcinogenic risks from dermal contact with surface water.

EQUATION:

$$DAD = \frac{DAevent \times EV \times ED \times EF \times A}{BW \times AT}$$

Where:

DAD	=	dermally absorbed dose (mg/kg/day)
DAevent	=	absorbed dose per event (mg/cm^2/event)
EV	=	event frequency (events/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
A	=	skin surface available for contact (cm^2)
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:

ILCR (Carcinogens) = DAD (mg/kg/day) x CSFd (mg/kg/day)-1
HQ (Noncarcinogens) = DAD (mg/kg/day) / RFDd (mg/kg/day)

EQUATIONS for DAevent:

For Inorganics:

DAevent = Kp x Cw x CF x tevent

For Organics:

$$\text{If } tevent \le t^*, \text{ then: } DAevent = 2 \times FA \times Kp \times Cw \times CF \times \sqrt{\frac{6 \times tau \times tevent}{\pi}}$$

$$\text{If } tevent > t^*, \text{ then: } DAevent = FA \times Kp \times Cw \times CF \times \left[\frac{tevent}{1+B} + 2 \times tau \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right]$$

CLIENT: PORTSMOUTH NAVAL SHIPYARD		JOB NUMBER: 00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SURFACE WATER ADULT RECREATIONAL USERS		
BASED ON: USEPA, DECEMBER 1989, JULY 2004		
BY: L. CIOFANI	CHECKED BY:	DATE: 11/06/09

Where:

Kp	=	permeability coefficient from water (cm/hr)
Csw	=	concentration of chemical in surface water (mg/L)
tevent	=	duration of event (hr/event)
CF	=	conversion factor (0.001 L/cm^3)
t*	=	time it takes to reach steady-state (hr/event)
τ	=	lag time (hr/event)
B	=	Bunge Model Constant (dimensionless)

EXAMPLE CALCULATION OF DAevent

ASSUMPTIONS:

Csw	=	24.5	ug/L	Chemical: Chromium
Kp	=	2.00E-03	cm/hr	
tevent	=	1	hr/event	
CF	=	0.001	L/cm^3	

DAevent = 0.002 cm/hr x 24.5 ug/L x 0.001 L/cm3 x 1 hr/event x 0.001 mg/ug

DAevent = 4.90E-08 mg/cm^2/event ✓

RISK CALCULATIONS

ASSUMPTIONS:

A	=	3600	cm^2/day
EV	=	1	event/day
ED	=	24	years
EF	=	7	days/year
BW	=	70	kg
ATc	=	25550	days
ATnc	=	8760	days
CSFd	=	NA	$(mg/kg/day)^{-1}$
RfDd	=	2.0E-02	(mg/kg/day)

CLIENT: PORTSMOUTH NAVAL SHIPYARD		JOB NUMBER: 00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SURFACE WATER ADULT RECREATIONAL USERS		
BASED ON: USEPA, DECEMBER 1989, JULY 2004		
BY: L. CIOFANI	CHECKED BY:	DATE: 11/06/09

EXAMPLE CARCINOGENIC CALCULATION

$$DADc = \frac{4.90E\text{-}08 \text{ mg/cm2/event} \times 1 \text{ event/day} \times 24 \text{ years} \times 7 \text{ days/year} \times 3600 \text{ cm2/day}}{70 \text{ kg} \times 25550 \text{ days}}$$

DADc = 1.66E-08 mg/kg/day

DADc = 1.66E-08 mg/kg/day x NA (mg/kg/day)-1 = Incremental Lifetime Cancer Risk

ILCR = NA

EXAMPLE NON-CARCINOGENIC CALCULATION

$$DADnc = \frac{4.90E\text{-}08 \text{ mg/cm2/event} \times 1 \text{ event/day} \times 24 \text{ years} \times 7 \text{ days/year} \times 3600 \text{ cm2/day}}{70 \text{ kg} \times 8760 \text{ days}}$$

DADnc = 4.83E-08 mg/kg/day ✓

HQ = 4.83E-08 mg/kg/day / 2.00E-02 (mg/kg/day) = Hazard Quotient

HQ = 2.4E-06 ✓

CALCULATION WORKSHEET

CLIENT: PORTSMOUTH NAVAL SHIPYARD		**JOB NUMBER:** 00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SEDIMENT ADULT RECREATIONAL USER		
BASED ON: USEPA, DECEMBER 1989		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 11/06/09

PURPOSE: To estimate intake, carcinogenic and non-carcinogenic risks from incidental ingestion of sediment.

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 sediment (mg/kg)
IR	=	incidental 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:

ILCR (Carcinogens) = Intake (mg/kg/day) x CSFo (mg/kg/day)-1
HQ (Noncarcinogens) = Intake (mg/kg/day) / RFDo (mg/kg/day)

ASSUMPTIONS:

Cs	=	14.5	mg/kg	Chemical: Arsenic
IR	=	100	mg/day	
EF	=	7	days/year	
ED	=	24	years	
FI	=	0.5		
CF	=	1.0E-06	kg/mg	
BW	=	70	kg	
ATc	=	25550	days	
ATnc	=	8760	days	
CSFo	=	1.5E+00	$(mg/kg/day)^{-1}$	
RfDo	=	3.0E-04	(mg/kg/day)	

CLIENT: PORTSMOUTH NAVAL SHIPYARD		JOB NUMBER: 00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SEDIMENT ADULT RECREATIONAL USER		
BASED ON: USEPA, DECEMBER 1989		
BY: L. CIOFANI	CHECKED BY:	DATE: 11/06/09

EXAMPLE CARCINOGENIC CALCULATION

$$IEXc = \frac{14.5 \text{ mg/kg} \times 100 \text{ mg/day} \times 7 \text{ days/year} \times 24 \text{ years} \times 1.0\text{E-06 kg/mg} \times 0.5}{70 \text{ kg} \times 25550 \text{ days}}$$

IEXc = 6.81E-08 mg/kg/day

ILCR = 6.81E-08 mg/kg/day x 1.50E+00 (mg/kg/day)-1 = Incremental Lifetime Cancer Risk

ILCR = 1.0E-07 ✓

EXAMPLE NONCARCINOGENIC CALCULATION

$$IEXnc = \frac{14.5 \text{ mg/kg} \times 100 \text{ mg/day} \times 7 \text{ days/year} \times 24 \text{ years} \times 1.0\text{E-06 kg/mg} \times 0.5}{70 \text{ kg} \times 8760 \text{ days}}$$

IEXnc = 1.99E-07 mg/kg/day

HQ = 1.99E-07 mg/kg/day / 3.00E-04 (mg/kg/day) = Hazard Quotient

HQ = 6.6E-04 ✓

CLIENT: PORTSMOUTH NAVAL SHIPYARD		JOB NUMBER: 00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SEDIMENT ADULT RECREATIONAL USER		
BASED ON: USEPA, JULY 2004		
BY: L. CIOFANI	CHECKED BY:	DATE: 11/06/09

PURPOSE: To estimate intake, carcinogenic and non-carcinogenic risks from dermal contact with sediment.

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 sediment (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:

ILCR (Carcinogens) = Intake (mg/kg/day) x CSFd (mg/kg/day)-1
HQ (Noncarcinogens) = Intake (mg/kg/day) / RFDd (mg/kg/day)

ASSUMPTIONS:

Cs	=	14.5	mg/kg	Chemical: Arsenic
CF	=	1.0E-06	kg/mg	
SA	=	5700	cm^2/day	
AF	=	0.07	mg/cm^2	
ABS	=	0.03		
EF	=	7	days/year	
ED	=	24	years	
BW	=	70	kg	
ATc	=	25550	days	
ATnc	=	8760	days	
CSFd	=	1.5E+00	$(mg/kg/day)^{-1}$	
RfDd	=	3.0E-04	(mg/kg/day)	

CLIENT: PORTSMOUTH NAVAL SHIPYARD		JOB NUMBER: 00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SEDIMENT ADULT RECREATIONAL USER		
BASED ON: USEPA, JULY 2004		
BY: L. CIOFANI	CHECKED BY:	DATE: 11/06/09

EXAMPLE CARCINOGENIC CALCULATION

$$DEXc = \frac{14.5 \text{ mg/kg} \times 1.0E\text{-}06 \text{ kg/mg} \times 5700 \text{ cm2/day} \times 0.07 \text{ mg/cm2} \times 0.03 \times 7 \text{ days/year} \times 24 \text{ years}}{70 \text{ kg} \times 25550 \text{ days}}$$

DEXc = 1.63E-08 mg/kg/day ✓

ILCR = 1.63E-08 mg/kg/day x 1.50E+00 (mg/kg/day)-1 = Incremental Lifetime Cancer Risk

ILCR = 2.4E-08 ✓

EXAMPLE NONCARCINOGENIC CALCULATION

$$DEXnc = \frac{14.5 \text{ mg/kg} \times 1.0E\text{-}06 \text{ kg/mg} \times 5700 \text{ cm2/day} \times 0.07 \text{ mg/cm2} \times 0.03 \times 7 \text{ days/year} \times 24 \text{ years}}{70 \text{ kg} \times 8760 \text{ days}}$$

DEXnc = 4.76E-08 mg/kg/day ✓

HQ = 4.76E-08 mg/kg/day / 3.00E-04 (mg/kg/day) = Hazard Quotient

HQ = 1.6E-04 ✓

CLIENT: PORTSMOUTH NAVAL SHIPYARD		JOB NUMBER: 00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SEDIMENT FOR MUTAGENIC CHEMICALS - ADULT RECREATIONAL USERS		
BASED ON: USEPA, DECEMBER 1989, MARCH 2005		
BY: L. CIOFANI	CHECKED BY:	DATE: 11/06/09

PURPOSE: To estimate intake, carcinogenic risks for mutagenic chemicals from incidental ingestion of sediment.

EQUATION:

$$IEX = \frac{CS \times IR \times EF \times ED \times FI \times CF}{BW \times AT} \times ADAF$$

Where:

IEX	=	estimated exposure intake (mg/kg/day)
Cs	=	exposure point concentration in sediment (mg/kg)
IR	=	incidental 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)
ADAF	=	age-dependent adjustment factor
CSFo	=	oral carcinogenic slope factor ($(mg/kg/day)^{-1}$)

RISKS:

ILCR (Carcinogens) = Intake (mg/kg/day) x CSFo (mg/kg/day)-1

ASSUMPTIONS:

Cs	=	1.2	mg/kg	Chemical: Benzo(a)pyrene Equivalents
IR	=	100	mg/day	
EF	=	7	days/year	
ED_1	=	10	years	
ED_2	=	14	years	
FI	=	0.5		
CF	=	1.0E-06	kg/mg	
BW	=	70	kg	
ATc	=	25550	days	
CSFo	=	7.3E+00	$(mg/kg/day)^{-1}$	
$ADAF_1$	=	3		
$ADAF_2$	=	1		

CLIENT: PORTSMOUTH NAVAL SHIPYARD		JOB NUMBER: 00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SEDIMENT FOR MUTAGENIC CHEMICALS - ADULT RECREATIONAL USERS		
BASED ON: USEPA, DECEMBER 1989, MARCH 2005		
BY: L. CIOFANI	CHECKED BY:	DATE: 11/06/09

EXAMPLE CARCINOGENIC CALCULATION

$$IEXc = \frac{1.2\ mg/kg \times 100\ mg/day \times 7\ days/year \times 10\ years \times 1.0E\text{-}06\ kg/mg \times 0.5}{70\ kg \times 25550\ days} \times 3$$

IEXc = 7.05E-09 mg/kg/day ✓

$$IEXc = \frac{1.2\ mg/kg \times 100\ mg/day \times 7\ days/year \times 14\ years \times 1.0E\text{-}06\ kg/mg \times 0.5}{70\ kg \times 25550\ days} \times 1$$

IEXc = 3.29E-09 mg/kg/day ✓

ILCR = (7.05E-09 mg/kg/day + 3.29E-09 mg/kg/day) x 7.30E+00 (mg/kg/day)-1

ILCR = 7.5E-08 ✓

CLIENT: PORTSMOUTH NAVAL SHIPYARD		JOB NUMBER: 00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SEDIMENT FOR MUTAGENIC CHEMICALS - ADULT RECREATIONAL USERS		
BASED ON: USEPA, JULY 2004, MARCH 2005		
BY: L. CIOFANI	CHECKED BY:	DATE: 11/06/09

PURPOSE: To estimate intake, carcinogenic risks for mutagenic chemicals from dermal contact with sediment.

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 sediment (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)
ADAF	=	age-dependent adjustment factor
CSFd	=	dermal carcinogenic slope factor ($(mg/kg/day)^{-1}$)

RISKS:

ILCR (Carcinogens) = Intake (mg/kg/day) x CSFd (mg/kg/day)-1
HQ (Noncarcinogens) = Intake (mg/kg/day) / RFDd (mg/kg/day)

ASSUMPTIONS:

Cs	=	1.2	mg/kg	Chemical: Benzo(a)pyrene Equivalents
CF	=	1.0E-06	kg/mg	
SA	=	5700	cm^2/day	
AF	=	0.07	mg/cm^2	
ABS	=	0.13		
EF	=	7	days/year	
ED_1	=	10	years	
ED_2	=	14	years	
BW	=	70	kg	
ATc	=	25550	days	
CSFd	=	7.3E+00	$(mg/kg/day)^{-1}$	
$ADAF_1$	=	3		
$ADAF_2$	=	1		

CLIENT: PORTSMOUTH NAVAL SHIPYARD		JOB NUMBER: 00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SEDIMENT FOR MUTAGENIC CHEMICALS - ADULT RECREATIONAL USERS		
BASED ON: USEPA, JULY 2004, MARCH 2005		
BY: L. CIOFANI	CHECKED BY:	DATE: 11/06/09

EXAMPLE CARCINOGENIC CALCULATION

$$DEXc = \frac{1.2\ mg/kg \times 1.0E\text{-}06\ kg/mg \times 5700\ cm2/day \times 0.07\ mg/cm2 \times 0.13 \times 7\ days/year \times 10\ years}{70\ kg \times 25550\ days} \times 3$$

DEXc = 7.31E-09 mg/kg/day ✓

$$DEXc = \frac{1.2\ mg/kg \times 1.0E\text{-}06\ kg/mg \times 5700\ cm2/day \times 0.07\ mg/cm2 \times 0.13 \times 7\ days/year \times 10\ years}{70\ kg \times 25550\ days} \times 1$$

DEXc = 3.41E-09 mg/kg/day ✓

ILCR = (7.31E-09 mg/kg/day + 3.41E-09 mg/kg/day) x 7.30E+00 (mg/kg/day)-1

ILCR = 7.8E-08 ✓

CALCULATION WORKSHEET

CLIENT: PORTSMOUTH NAVAL SHIPYARD		**JOB NUMBER:** 00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SEDIMENT FOR MUTAGENIC CHEMICALS - ADOLESCENT RECREATIONAL USERS		
BASED ON: USEPA, DECEMBER 1989, MARCH 2005		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 11/06/09

PURPOSE: To estimate intake, carcinogenic risks for mutagenic chemicals from incidental ingestion of sediment.

EQUATION:

$$IEX = \frac{CS \times IR \times EF \times ED \times FI \times CF}{BW \times AT} \times ADAF$$

Where:

IEX	=	estimated exposure intake (mg/kg/day)
Cs	=	exposure point concentration in sediment (mg/kg)
IR	=	incidental 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)
ADAF	=	age-dependent adjustment factor
CSFo	=	oral carcinogenic slope factor ($(mg/kg/day)^{-1}$)

RISKS:

ILCR (Carcinogens) = Intake (mg/kg/day) x CSFo (mg/kg/day)-1

ASSUMPTIONS:

Cs	=	1.2	mg/kg	Chemical: BAP Equivalent
IR	=	100	mg/day	
EF	=	7	days/year	
ED	=	10	years	
FI	=	0.5		
CF	=	1.0E-06	kg/mg	
BW	=	45	kg	
ATc	=	25550	days	
CSFo	=	7.3E+00	$(mg/kg/day)^{-1}$	
ADAF	=	3		

CLIENT: PORTSMOUTH NAVAL SHIPYARD		**JOB NUMBER:** 00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SEDIMENT FOR MUTAGENIC CHEMICALS - ADOLESCENT RECREATIONAL USERS		
BASED ON: USEPA, DECEMBER 1989, MARCH 2005		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 11/06/09

EXAMPLE CARCINOGENIC CALCULATION

$$IEXc = \frac{1.2 \text{ mg/kg} \times 100 \text{ mg/day} \times 7 \text{ days/year} \times 10 \text{ years} \times 1.0\text{E-06 kg/mg} \times 0.5}{45 \text{ kg} \times 25550 \text{ days}} \times 3$$

IEXc = 1.10E-08 mg/kg/day

ILCR = (1.10E-08 mg/kg/day) x 7.30E+00 (mg/kg/day)-1

ILCR = 8.0E-08

CLIENT:		JOB NUMBER:
PORTSMOUTH NAVAL SHIPYARD		00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SEDIMENT FOR MUTAGENIC CHEMICALS - ADOLESCENT RECREATIONAL USERS		
BASED ON: USEPA, JULY 2004, MARCH 2005		
BY: L. CIOFANI	CHECKED BY:	DATE: 11/06/09

PURPOSE: To estimate intake, carcinogenic risks for mutagenic chemicals from dermal contact with sediment.

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 sediment (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)
ADAF	=	age-dependent adjustment factor
CSFd	=	dermal carcinogenic slope factor ((mg/kg/day)$^{-1}$)

RISKS:

ILCR (Carcinogens) = Intake (mg/kg/day) x CSFd (mg/kg/day)-1
HQ (Noncarcinogens) = Intake (mg/kg/day) / RFDd (mg/kg/day)

ASSUMPTIONS:

Cs	=	1.2	mg/kg	Chemical: Benzo(a)pyrene Equivalents
CF	=	1.0E-06	kg/mg	
SA	=	4050	cm^2/day	
AF	=	0.2	mg/cm^2	
ABS	=	0.13		
EF	=	7	days/year	
ED	=	10	years	
BW	=	45	kg	
ATc	=	25550	days	
CSFd	=	7.3E+00	(mg/kg/day)$^{-1}$	
ADAF	=	3		

CLIENT: PORTSMOUTH NAVAL SHIPYARD		JOB NUMBER: 00383
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SEDIMENT FOR MUTAGENIC CHEMICALS - ADOLESCENT RECREATIONAL USERS		
BASED ON: USEPA, JULY 2004, MARCH 2005		
BY: L. CIOFANI	CHECKED BY:	DATE: 11/06/09

EXAMPLE CARCINOGENIC CALCULATION

$$DEXc = \frac{1.2 \text{ mg/kg} \times 1.0E\text{-}06 \text{ kg/mg} \times 4050 \text{ cm2/day} \times 0.2 \text{ mg/cm2} \times 0.13 \times 7 \text{ days/year} \times 10 \text{ years}}{45 \text{ kg} \times 25550 \text{ days}} \times 3$$

DEXc = 2.31E-08 mg/kg/day ✓

ILCR = (2.31E-08 mg/kg/day) x 7.30E+00 (mg/kg/day)-1

ILCR = 1.7E-07 ✓

Example Calculation - BAP Equivalent
Units = ug/kg
Sample = BC-1016-SD-0497

Sample Results	
Chemical	**Concentration (with qualifier)**
BENZO(A)ANTHRACENE	570
BENZO(A)PYRENE	426
BENZO(B)FLUORANTHENE	847
BENZO(K)FLUORANTHENE	NA
CHRYSENE	380
DIBENZO(A,H)ANTHRACENE	82.7
INDENO(1,2,3-CD)PYRENE	2364

Assumptions:
- Positive results accepted
- Non-detected results are assumed to be 1/2 quantitation limit
- Rejected results (R) are not used
- If all individual cPAHs are non-detected, BAP Equivalent = the quantitation limit for benzo(a)pyrene

Benzo(a)pyrene Equivalents = Σ(Sample Result$_{\text{chemical 1}}$ x TEF$_{\text{chemical 1}}$ + Sample Result$_{\text{chemical 2}}$ x TEF$_{\text{chemical 2}}$...)

Used in Calculation:

Carcinogenic PAH	TEF	Concentration
BENZO(A)ANTHRACENE	0.1	570
BENZO(A)PYRENE	1	426
BENZO(B)FLUORANTHENE	0.1	847
BENZO(K)FLUORANTHENE	0.01	NA
CHRYSENE	0.001	380
DIBENZO(A,H)ANTHRACENE	1	82.7
INDENO(1,2,3-CD)PYRENE	0.1	2364

TEF = Toxicity Equivalence Factor
TEF Source = USEPA, July 1993.

= 0.01 x 570 + 1 x 426 + 0.1 x 847 + 0.01 x NA + 0.001 x 380 + 1 x 82.7 + 0.1 x 2364

= 890 ug/kg ✓

Example Calculation - 2,3,7,8-TCDD TEQ
Units = ng/kg
Sample = TPBGS010001

Sample Results		
Chemical	Concentration (with qualifier)	
1,2,3,4,6,7,8,9-OCDD	26.5	
1,2,3,4,6,7,8,9-OCDF	2.4	U
1,2,3,4,6,7,8-HPCDD	4.6	J
1,2,3,4,6,7,8-HPCDF	2.6	J
1,2,3,4,7,8,9-HPCDF	0.8	U
1,2,3,4,7,8-HXCDD	0.7	U
1,2,3,4,7,8-HXCDF	0.93	J
1,2,3,6,7,8-HXCDD	0.7	U
1,2,3,6,7,8-HXCDF	0.48	J
1,2,3,7,8,9-HXCDD	0.7	U
1,2,3,7,8,9-HXCDF	0.75	J
1,2,3,7,8-PECDD	0.7	U
1,2,3,7,8-PECDF	0.4	U
2,3,4,6,7,8-HXCDF	0.63	J
2,3,4,7,8-PECDF	0.5	U
2,3,7,8-TCDD	0.5	U
2,3,7,8-TCDF	0.54	J

Used in Calculation:

Dioxins/Furans	TEF	Concentration
1,2,3,4,6,7,8,9-OCDD	0.0003	26.5
1,2,3,4,6,7,8,9-OCDF	0.0003	1.2
1,2,3,4,6,7,8-HPCDD	0.01	4.6
1,2,3,4,6,7,8-HPCDF	0.01	2.6
1,2,3,4,7,8,9-HPCDF	0.01	0.4
1,2,3,4,7,8-HXCDD	0.1	0.35
1,2,3,4,7,8-HXCDF	0.1	0.93
1,2,3,6,7,8-HXCDD	0.1	0.35
1,2,3,6,7,8-HXCDF	0.1	0.48
1,2,3,7,8,9-HXCDD	0.1	0.35
1,2,3,7,8,9-HXCDF	0.1	0.75
1,2,3,7,8-PECDD	1	0.35
1,2,3,7,8-PECDF	0.03	0.2
2,3,4,6,7,8-HXCDF	0.1	0.63
2,3,4,7,8-PECDF	0.3	0.25
2,3,7,8-TCDD	1	0.25
2,3,7,8-TCDF	0.1	0.54

TEF = Toxicity Equivalence Factor
TEF Source = WHO, 2006.

Assumptions:
- Positive results accepted
- Non-detected results are assumed to be 1/2 quantitation limit
- Rejected results (R) are not used
- If all individual dioxins/furans are non-detected, TCDD TEQ = the quantitation limit for 2,3,7,8-TCDD

$$\text{2,3,7,8-TCDD TEQ} = \Sigma(\text{Sample Result}_{\text{chemical 1}} \times \text{TEF}_{\text{chemical 1}} + \text{Sample Result}_{\text{chemical 2}} \times \text{TEF}_{\text{chemical 2}} \cdots)$$

$$= 26.5 \times 0.0003 + 1.2 \times 0.0003 \ldots$$

$$= 1.20 \text{ ng/kg}$$

Example Calculation - TEQ PCB
Units = ug/kg
Sample = BC-1016-SD-0497

Sample Results		
Chemical	Concentration (with qualifier)	
PCB-101	7.1	
PCB-105	0.60	U
PCB-118	2.6	
PCB-128	3.8	
PCB-138	18	
PCB-153	16	
PCB-170	6	
PCB-18	0.70	U
PCB-180	19	
PCB-185	14	
PCB-195	3.9	
PCB-201	3.3	
PCB-206	24	
PCB-28	2.9	U
PCB-29	0.70	U
PCB-44	0.90	
PCB-50	4.7	
PCB-52	10	
PCB-66	5.8	
PCB-8	0.30	U
PCB-87	5.4	

Used in Calculation:

Chemical	Concentration
PCB-101	7.1
PCB-105	0.3
PCB-118	2.6
PCB-128	3.8
PCB-138	18
PCB-153	16
PCB-170	6
PCB-18	0.35
PCB-180	19
PCB-185	14
PCB-195	3.9
PCB-201	3.3
PCB-206	24
PCB-28	1.45
PCB-29	0.35
PCB-44	0.9
PCB-50	4.7
PCB-52	10
PCB-66	5.8
PCB-8	0.15
PCB-87	5.4

Assumptions:
- Positive results accepted
- Non-detected results are assumed to be 1/2 quantitation limit
- Rejected results (R) are not used

Total PCB Congeners = Σ(Sample Result$_{\text{chemical 1}}$ + Sample Result$_{\text{chemical 2}}$...) x 2

= (7.1 + 0.3...) x 2

= 294.2 ng/kg

Example Calculation - TEQ PCB
Units = ug/kg
Sample = BC-1016-SD-0497

Sample Results		
Chemical	Concentration (with qualifier)	
PCB-101	7.1	
PCB-105	0.60	U
PCB-118	2.6	
PCB-128	3.8	
PCB-138	18	
PCB-153	16	
PCB-170	6	
PCB-18	0.70	U
PCB-180	19	
PCB-185	14	
PCB-195	3.9	
PCB-201	3.3	
PCB-206	24	
PCB-28	2.9	U
PCB-29	0.70	U
PCB-44	0.90	
PCB-50	4.7	
PCB-52	10	
PCB-66	5.8	
PCB-8	0.30	U
PCB-87	5.4	

Used in Calculation:

PCBs with TEFs	TEF	Concentration
PCB-105	0.00003	0.3
PCB-118	0.00003	2.6

TEF = Toxicity Equivalence Factor
TEF Source = WHO 2005 TEFs (WHO, July 2006).

Assumptions:
- Positive results accepted
- Non-detected results are assumed to be 1/2 quantitation limit
- Rejected results (R) are not used

$$\text{TEQ PCB} = \Sigma(\text{Sample Result}_{\text{chemical 1}} \times \text{TEF}_{\text{chemical 1}} + \text{Sample Result}_{\text{chemical 2}} \times \text{TEF}_{\text{chemical 2}})$$

$$= 0.3 \times 0.00003 + 2.6 \times 0.00003)$$

$$= 0.000087 \text{ ng/kg}$$

APPENDIX D.3

TECHNICAL MEMORANDUM: RECOMMENDED HUMAN HEALTH RISK ASSESSMENT PROTOCOL, SITE 32 – TOPEKA PIER, PORTSMOUTH NAVAL SHIPYARD

(Provided in Appendix C of Site 32 RI QAPP for Portsmouth Naval Shipyard, Kittery, Maine, November 2008)

TECHNICAL MEMORANDUM

SUBJECT:	Recommended Human Health Risk Assessment Protocol Site 32 – Topeka Pier Portsmouth Naval Shipyard, Kittery, Maine
DATE:	March 2002

1.0 INTRODUCTION

This technical memorandum recommends a risk assessment protocol for the following components of a baseline risk assessment:

- The selection of chemicals of potential concern (COPCs).
- The calculation of the exposure point concentration.
- The calculation of the chemical intakes (i.e., exposure assumptions are suggested).
- Toxicity assessment.

Current guidance and reports published by the U.S. Environmental Protection Agency (USEPA) and the state of Maine were considered in the preparation of this document. Information provided in USEPA Region I risk updates will also be considered when evaluating human health risks for the site.

The risk assessment will be structured and reported according to the guidelines of the Risk Assessment for Superfund (RAGS), Human Health Evaluation Manual, Part D: Standardized Planning, Reporting, and Review of Superfund Risk Assessments (RAGS Part D).

A data evaluation/usability section will precede the actual baseline risk assessment. The evaluation will address such issues as the adequacy of detection limits achieved in the environmental investigations. As noted in the recently published USEPA RAGS Part D, “data quality is an important component of the risk assessment and the data quality should be documented.” The Navy will evaluate and document data quality as follows:

- The results of data validation conducted for the datasets used in the baseline risk assessment will be summarized and presented in the data evaluation.

- The Data Usability Worksheet suggested in RAGS Part D will be completed.

- The data evaluation narrative will discuss any data quality issues identified during the completion of the Data Usability Worksheet.

2.0 SELECTION OF CHEMICALS OF POTENTIAL CONCERN

General selection criteria for inorganic and organic COPCs are provided in the following paragraphs. The list of COPCs will be determined from validated data collected as part of the following investigations:

- RCRA Facilities Investigation (RFI) Data Gap investigation and 1996/1997 groundwater monitoring included the FA monitoring well cluster.

- 1996/1997 seep and sediment monitoring included locations in the intertidal area offshore of Site 32.

- Site 32 Site Screening Investigation (SSI) (1998) included soil and groundwater sampling at Site 32.

- Interim offshore monitoring (Rounds 1 through 4, 1999 to 2001) included two monitoring stations (intertidal and subtidal) offshore of Site 32.

- Data will be obtained for the RI for Site 32, as proposed in this work plan.

Note that the databases derived from these investigations will be re-evaluated and modified, if necessary, to account for any interim actions that may have occurred in onshore or offshore media at the site.

Toxicity Screen.

The selection of COPCs is a qualitative screening process used to limit the number of chemicals and exposure routes quantitatively evaluated in the baseline human health risk assessment to those site-related constituents that dominate overall potential risks. Screening by risk-based concentrations and PNS background levels are used to focus the risk assessment on meaningful chemicals and exposure routes.

In general, a chemical is selected as a COPC and retained for further quantitative risk evaluation if the maximum detection in a sampled medium exceeds the lowest risk-based concentration and the chemical is determined to be present at concentrations exceeding background. Chemicals eliminated from further

evaluation are assumed to present minimal risks to potential human receptors. Medium-specific tables summarizing the selection of COPCs will be included in the risk assessment.

Several screening criteria will be used to identify COPCs for Site 32: screening levels based on risk-based concentrations developed by USEPA Region 9 (referred to as Preliminary Remediation Goals [PRGs]) (USEPA, November 2000) will be used for soil and fresh groundwater; screening levels for brackish/saline groundwater and intertidal surface water (i.e., seeps) and sediment will be calculated using the methodology employed by USEPA Region 9 in the development of the PRGs. The Region 9 PRG concentrations are based on exposure pathways for which generally accepted methods, models, and assumptions have been developed (i.e., ingestion, dermal contact, and inhalation) for specific land-use conditions and do not consider impact to groundwater or ecological receptors. The risk-based screening concentrations will correspond to a systemic hazard quotient (HQ) of 0.1 for noncarcinogens or an incremetal lifetime cancer risk of 1 $x10^{-6}$ for carcinogens. Note that the USEPA Region 9 PRGs for noncarcinogens are based on an HQ of 1.0, whereas the screening concentrations will be based on an HQ of 0.1. The screening concentrations are based on an HQ of 0.1 to account for the potential cumulative effects of several chemicals affecting the same target organ or producing the same adverse noncarcinogenic effect.

The COPC screening levels used for each medium in the risk assessment are as follows:

Screening Levels for Soil

Screening levels based on the following criteria will be used to select COPCs for surface and subsurface soil:

- USEPA Region 9 PRGs for Residential Soil (USEPA, November 2000).
- USEPA Generic SSLs (SSL_{air}) for Transfers from Soil to Air (USEPA, May 1996).

Maximum chemical concentrations in soils will also be compared to federal soil screening levels for migration from soil to air (SSL_{air}); chemicals detected at a maximum concentration exceeding the SSL_{air} will be selected as COPCs. For potentially significant site-related chemicals lacking published SSLs, SSLs will be calculated using the methodology presented in the Soil Screening Guidance: Technical Background Document (USEPA/540/R-95/12B). The feasibility of calculating SSLs may be limited for some compounds because of the lack of toxicity criteria (i.e., cancer slope factors, reference doses) and/or fate-and-transport parameters (e.g., distribution coefficients). Those chemicals lacking published or calculated SSLs will be addressed in the uncertainty section of the baseline risk assessment.

Screening Levels for Fresh Groundwater

Any groundwater at the site that is determined to freshwater will be screened assuming potential residential use of groundwater and the screening levels will be based on USEPA Region 9 PRGs for tap water (USEPA, Region 9, November 2000).

Screening Levels for Brackish/Saline Groundwater

Any groundwater at the site that is determined to brackish or saline will be screened assuming industrial use of groundwater. This scenario will assume that future construction workers are exposed to shallow groundwater by dermal contact during excavation. Because screening levels for this exposure scenario are not available, they will be calculated based on USEPA dermal guidance (USEPA, September 2001) and USEPA Region 9 PRG methodology. Conservative exposure assumptions (e.g., exposure time, frequency, duration, and exposed skin surface area) will be employed when calculating the construction worker screening levels. A detailed description of the screening level development and all screening level calculations will be provided in an appendix to the risk assessment.

Screening Levels for Recreational Exposure to Intertidal Surface Water and Sediment

This scenario is evaluated to account for the possibility that adult and child recreational users could be exposed to surface water (i.e., seep water) and sediment in the intertidal areas adjacent to the site. These receptors could be exposed by incidental ingestion or dermal contact. However, screening levels are not available for the recreational scenario and, therefore, will be calculated based on USEPA risk assessment guidance (USEPA, December 1989, USEPA, September 2001, and USEPA Region 9 PRG methodology). Conservative exposure assumptions (e.g., exposure time, frequency, duration, ingestion rates, and exposed skin surface area) will be employed when calculating the recreational screening levels. A detailed description of the screening level development and all screening level calculations will be provided in an appendix to the risk assessment.

Frequency of Detection Screen and Dataset Definition. A chemical detected in less than 5 percent of the samples collected at a site under investigation will not be selected as a COPC. This screen will only be used when at least 20 samples are collected at the site and only when the available data indicate that a contamination hot spot is not present at the site.

For evaluating risks from exposure to media of concern at Site 32, the exposure units are defined as follows:

- For current and future construction workers, the entire onshore area, to the specified depth will be the exposure unit for this receptor. The study area will be the entire onshore soils over all of Site 32 down to the groundwater table or 10 feet below the asphalt subbase, whichever is shallower (also includes shallow groundwater).

- For current recreational users, the exposure unit will be the entire Site 32 intertidal offshore area, which includes sediment (0 to 6 inches deep) and surface water in the intertidal area. Seep water (undiluted) will be considered as intertidal surface water at low tide for risk assessment purposes. The concentrations of surface water in the intertidal area at mid to high tide will be evaluated as concentrations detected in surface water and/or as diluted seep concentrations.

- For future recreational users, the exposure unit will be the entire Site 32 intertidal offshore area, which includes sediment (0 to 6 inches deep) and surface water in the intertidal area, plus soil 0 to 2 feet below the asphalt subbase over the entire Site 32 onshore area. Seep water (undiluted) will be considered as intertidal surface water at low tide for risk assessment purposes. The concentrations of surface water in the intertidal area at mid to high tide will be evaluated as concentrations detected in surface water and/or as diluted seep concentrations.

- For future residents, the exposure units (EUs) will consist of 1-acre decision units 0 to 2 feet below the asphalt subbase over the entire Site 32 onshore area. These EUs are expected to represent typical shorefront or near-shorefront properties and will include any fresh groundwater under the site, if present. The maximum number of EUs, taking into account the building areas located at Site 32, would be 14. However, if, upon examination of the analytical data, the detected chemicals and concentrations in different 1-acre EUs are found to be similar, those EUs will be combined into a single EU for purposes of risk evaluation. In this way, the number of EUs and risk calculations can be reduced.

- For future occupational workers, the exposure unit will consist of the entire Site 32 onshore area 0 to 2 feet below the asphalt subbase.

Essential Nutrients (calcium, magnesium, iron, and potassium) will not be selected as COPCs, unless present at notably high concentrations. Based on historical information available for the site, no unusual use or disposal of these constituents occurred at the sites under investigation.

Tentatively Identified Compounds (TICS) will not be selected as COPCs for purposes of quantitative risk assessment. TICs present at significant concentrations will be evaluated qualitatively in the uncertainty section.

Background Comparison- Chemicals found at concentrations indicative of facility background levels are not considered to be site-related contaminants and will not be retained as COPCs for the quantitative risk assessment. The use of facility background soil data will determine whether detected chemicals are present at naturally occurring levels. Conventional statistical methods [e.g., Bartlett's Test for homogeneity, T-test, Wilcoxon Rank Sum Test, comparison of maximum detected concentrations to background upper tolerance limits (UTLs) or upper confidence limits (UCLs), etc.] will be employed to compare site concentrations to available facility background data. The background study and data to be used are found in the Facility Background Development for Portsmouth Naval Shipyard (TtNUS, Inc., May 2000). In addition, the reader is directed to the supplemental technical memorandum on the Procedure for the Evaluation of Potential Background Soil and Groundwater Data Sets (TtNUS, Inc., November 1998). The elimination of chemicals (naturally occurring and anthropogenic, e.g., PAHs, pesticides, herbicides) on the basis of background levels at PNS reflects current Navy policy (Department of the Navy, September 2000).

The COPC selection process will proceed as follows:

1) **Step 1-** The maximum detected concentration of an analyte will be compared with the toxicity screening values previously defined. If the maximum detected concentration is less than the screening value, the parameter will not be selected for quantitative risk assessment. Additionally, essential nutrients and TICs will not be selected as COPCs.

2) **Step 2-** A chemical detected at a maximum concentration exceeding toxicity screening values but at a frequency of detection of less than 5 percent will not be selected as a COPC. As noted previously, this frequency screen will only be utilized when at least 20 samples are collected at a site and only when the available data indicate that a concentration hot spot is not present at the site.

3) **Step 3**- A chemical detected at a maximum concentration greater than the toxicity screening value but determined to be within background levels (using one or more of the background tests described above) will not be selected as a COPC.

The results of the COPC selection will be summarized in a table prepared according to RAGS Part D guidance (RAGS-D Table 2.1). Additionally, maximum chemical concentrations will also be compared to soil screening levels (SSLs) for groundwater protection and potential federal and state Applicable or Relevant and Appropriate Requirements (ARARs) [e.g., federal and state drinking water Maximum Contaminant Levels (MCLs)] in a separate table. Exceedances of SSLs and ARARs will be identified in tables and discussed in the qualitative component of the baseline risk assessment. However, COPCs will not be selected on the basis of ARARs or groundwater protection SSLs.

3.0 CALCULATION OF THE EXPOSURE POINT CONCENTRATION

The following items summarize the protocol used in calculating the exposure point concentration (EPC) for media at the sites under investigation:

One-half the sample quantitation limit will be used as a surrogate concentration for non-detect results. Duplicates will be averaged for purposes of calculating the EPC for groundwater and soil.

For the calculation of the EPC for soil, intertidal surface water (i.e., seep), and intertidal sediment, if the dataset contains greater than 10 analytical results, the Shapiro Wilk test will be used to determine the distribution of the dataset (normal, lognormal, undefined). If the distribution is undefined, the EPC will be based on the "best fit" distribution. The 95 percent UCL on the mean will be calculated and used as the EPC unless the value exceeds the maximum detected concentration. In this case, the maximum detected concentration will be used as the EPC for the reasonable maximum exposure (RME) and central tendency exposure (CTE) cases (USEPA, Region I, August 1994).

For the calculation of the EPC for soil, intertidal surface water, and intertidal sediment, if the dataset contains 10 or fewer analytical results, the maximum detected concentration will be used as the EPC for RME and CTE cases. Use of the maximum values is recommended because it is often difficult to define the distribution of a dataset when fewer than 10 samples are available.

In accordance with USEPA guidance for the IEUBK Model (USEPA, February 1994) and the TRW Adult Lead Model (USEPA, April 1999), average lead concentrations are used to estimate blood lead levels from exposure to lead. This is because the first step in the model calculations is to develop a central estimate of blood lead concentrations, which requires an “appropriate average concentration” for an individual.

The determination of EPCs for groundwater will follow recommendations provided in USEPA Region I Risk Update 5 (USEPA, August 1999). Risk Update 5 states that "the highest temporal average concentration may be used as the reasonable maximum exposure (RME) point concentrations for use in Superfund Risk Assessments to evaluate risks to potential groundwater users. The RME groundwater concentration is to be based on the highest of the temporal average concentrations of each contaminant in each well provided that a sufficient number of sampling events have been obtained over a sufficient period of time so as to characterize a temporal average exposure concentration for a given well." The Risk Update states that the minimum number of sampling events needed to characterize a temporal average cannot be specified because of differing conditions and fluctuations in the water table. In addition, if it is determined (by an USEPA risk assessor and hydrogeologist) that there are insufficient data to generate temporal average concentrations, "USEPA Region I advocates the maximum groundwater exposure point concentration be utilized for RME risk evaluation purposes."

Data collected in the groundwater monitoring program conducted from December 1996 to November 1997 (TtNUS, Inc., August 1999), the 1998 SSI, and data obtained from the proposed Site 32 RI will be used to determine the EPCs for groundwater. Based on a review of groundwater data from these investigations, it will be determined whether there are sufficient data to use temporal averaging for determining groundwater EPCs. If sufficient data are available for temporal averaging, a temporal average will be calculated for each monitoring well and the maximum temporal average for a chemical will be identified as the maximum dataset concentration for risk assessment for the RME and CTE cases. (For nondetects, one-half the detection limit will be used in the calculation of the temporal average.) If the maximum temporal average or the average of well-specific averages for a constituent exceeds the maximum detected concentration, the maximum concentration will be used for risk assessment purposes (i.e., the EPC for risk assessment shall not exceed the maximum positive detection reported for a dataset). If, as stated above, it is determined that there are insufficient data to generate temporal average concentrations, the maximum detected groundwater concentration will be used for risk evaluation purposes for the RME and CTE.

EPCs and the rationale for the selection of the EPC values will be presented in the risk assessment in a RAGS-D Table 3.1 format.

4.0 CALCULATION OF THE CHEMICAL INTAKES

The exposure assessment defines and evaluates the exposures potentially incurred by a receptor population. In order to have an exposure, several factors must be present: There must be a source of

contamination; there must be a mechanism through which a receptor can come into contact with the contaminants; and there must actually (or potentially) be a receptor present at the point of contact.

1) Exposure Assessment Overview

The following items summarize the basic exposure assessment assumptions:

- The receptors that will be evaluated include the adult and small child (0 to 6 years old) recreational user, the adult and child resident, the occupational worker (e.g., the typical industrial/commercial or landscaper or maintenance worker performing routine activities), and the construction worker (i.e., remediation and excavation). The state of Maine only provides guidance for the evaluation of the residential and industrial/commercial receptors. Note that, because the site is paved and residents do not currently use groundwater, there is not a complete exposure pathway for current transient residents at Site 32 to soils and groundwater at the site. There may be a current recreational user in the intertidal area, and their potential risks from exposure to site contaminants would be evaluated by this exposure pathway. There is little exposed sediment in the mid-to high tide area because this area is very rocky. Sediment is exposed in the low to mid-tide area. The most likely recreational exposure in the Site 32 area is at the boat ramp. A summary of the current and potential future receptors at Site 32 is provided in the following table.

	Current	Future
Onshore	• Construction worker (exposed to shallow groundwater and soil to water table). • A complete exposure pathway to soil and groundwater does not exist for residents occupational workers, or recreational users because the site is paved. Exposure for any of these receptors to sediment or surface water in the intertidal area is considered under the recreational scenario (see below).	• Hypothetical residents (exposed to soil 0 to 2 feet below subbase, plus any fresh groundwater present at site.). • Recreational users (exposed to soil 0 to 2 feet below subbase). • Construction worker (exposed to shallow groundwater and soil to water table or 10 feet, whichever is shallower). • Occupational worker (exposed to soil 0 to 2 feet below subbase). • For informational purposes of the risk managers, soil 2 to 10 feet below subbase will be considered for the resident, recreational user, and occupational workers (to address the possibility that subsurface soil becomes surface soil after excavation). The contamination in soils deeper than 10 feet will be addressed in the uncertainty section of the risk assessment, if contamination is found there.
Offshore	• Recreational users (exposed to 0 to 6 inches only in sediment and surface water in the intertidal area). • Ecological (risk was evaluated in the EERA).	• Hypothetical resident (exposed to 0 to 6 inches in intertidal sediment and surface water during recreation; i.e. same as recreational scenarios). • Recreational users (exposed to 0 to 6 inches in intertidal sediment and surface water).

- The exposure routes include the following:

  - Ingestion of soil, intertidal surface water (i.e., seep water), and intertidal sediment. If any groundwater at the site is determined to be fresh water, future residential ingestion of the fresh groundwater will also be evaluated).

  - Dermal contact with intertidal surface water, intertidal sediment, and groundwater. Dermal contact with groundwater will be evaluated for construction workers if the water is fresh or saline/brackish and for future residents, only for fresh groundwater. Drmal contact with intertidal media will be evaluated for a recreational user.

  - Inhalation of air and dust particulates and vapors from soil.

  The potentially complete exposure pathways are as follows:

Receptors	Exposure Routes
Potentially Complete Exposure Pathways	
Construction Workers (current / future)	• Ingestion of surface and subsurface soil • Dermal contact with surface and subsurface soil • Dermal contact with groundwater • Inhalation of air/dust particulates and vapors (surface and subsurface soil) [1]
Occupational Worker (current / future) (e.g., typical industrial or commercial worker or landscaper, or maintenance worker)	• Ingestion of surface and subsurface soil[2] • Dermal contact with surface and subsurface soil[2] • Inhalation of air/dust particulates and vapors (surface soil and subsurface soil) [1,2]
Recreational Users (current / future)	• Ingestion of subsurface and surface soil[2], intertidal surface waterand sediment[1] • Dermal contact with subsurface and surface soil[2], intertidal surface waterand sediment. • Inhalation of air/dust particulates and vapors (surface and subsurface soil)[1,2]
Residents (future)	• Ingestion of surface and subsurface soil[2] and groundwater[3] • Dermal contact with surface and subsurface soil[3] and groundwater[3] • Inhalation of air/dust particulates and vapors (surface and subsurface soil[2])

[1] Denotes a pathway that will be evaluated only for chemicals that have a concentration above that presented in the Soil Screening Guidance (USEPA, May 1996).

[2] For informational purposes, an evaluation of residents, recreational users, and occupational workers for exposure to combined surface/subsurface soil will be included in an appendix to the risk assessment.

[3] Exposure to groundwater for future residents will be evaluated only for site groundwater that is determined to be fresh water (i.e., not saline or brackish).

Air

The air exposure pathway is based on the scenario that a receptor is immersed in air that contains suspended particulates and volatile organic vapors originating from soil from the source areas. Initially, a qualitative comparison of maximum detected soil concentrations and USEPA generic SSLs for inhalation based on intermedia transfer (from soil to air) will be performed to determine whether additional quantitative analysis of this exposure pathway is warranted. The SSLs are based on residential land use and are therefore conservative. The risk assessor will review the site conditions versus the environmental conditions assumed in the SSL guidance to assure the SSLs are conservative for the site conditions. The uncertainty involved in the qualitative evaluation and subsequent quantitative evaluation, if necessary, will be addressed in the uncertainty section of the risk assessment. The exposure factors and equation used to evaluate the inhalation through soil pathway, if necessary, are provided in RAGS-D Tables 4.1 in Attachment 1.

Soil

Receptors may come into direct contact with soil contaminated by the release of chemicals from the source areas. The individual may be exposed through incidental ingestion, dermal contact, or by inhalation of particulates and vapors released from soils, as noted in the preceding paragraph. The soil risk assessment will primarily focus on exposure of recreational users, residents, and occupational workers to surface soil and on exposure of construction workers to combined surface and subsurface soil. Exposure of recreational users, residents, and occupational workers to combined surface and subsurface soil will be calculated for informational purposes, and results will be provided in an appendix to the risk assessment.

Exposure to soil via dermal contact will be evaluated according to guidance in Risk Assessment Guidance for Superfund: Volume I, Human Health Evaluation Manual, Part E, Supplemental Guidance for Dermal Risk Assessment) Interim Guidance, June 2000.

Groundwater

The majority of the groundwater at the site appears to be saline or brackish. However, fresh groundwater may be present in the southeastern portion of the site. The future potential residential use of groundwater will be quantitatively evaluated in the risk assessment for fresh groundwater only. It will be assumed that future residents may be exposed via ingestion and dermal contact.

It will be assumed that construction workers may come into contact with groundwater (saline or freshwater) during excavation activities or repair of utility lines. Therefore, dermal contact exposure to

groundwater will be evaluated for the construction worker if the groundwater is relatively shallow (less than 15 feet). Dermal contact with groundwater will use guidance specified in Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance (USEPA, September 2001).

Exposure factors and equations used to evaluate exposure to groundwater for residents and construction workers are provided in Attachment 1.

Intertidal Surface Water and Sediment

As discussed previously, undiluted seep water will be considered as intertidal surface water at low tide and surface water in the intertidal area at mid to high tide will be evaluated as surface water and/or diluted seep water for risk assessment purposes. If COPCs are identified in intertidal surface water or sediment, potential risks will be evaluated assuming that incidental ingestion of or dermal contact with intertidal surface water or sediment is possible by individuals recreating (e.g., walking) within the study areas. However, the seeps are intermittent because of tidal influences. The risk assessment for intertidal surface water and sediment will primarily focus on exposure of recreational users (and residents assumed to be recreational users) to these media. Exposure to intertidal surface water and sediment via dermal contact will be evaluated according to RAGS-Part E guidance (USEPA, September 2001).

2) Quantification of Exposure

Estimates of exposure are based on the contaminant concentrations at the exposure points and on scenario-specific assumptions and intake parameters. The most recent USEPA guidance (for example, the Exposure Factors Handbook, August 1997, the new USEPA dermal guidance, September 2001, and the most recent Region I Risk Updates, August 1999) will be used to estimate intakes. In general, standard default parameters (USEPA, March 25, 1991 and USEPA Region I, August 1994), which combine mid-range and upper-end exposure factors, will be used to assess the RME. CTE is assessed primarily by the use of mid-range exposure factors presented in current risk assessment guidance (USEPA, May 1989, May 5, 1993, and USEPA, September 2001) and USEPA Region I Risk Updates. The equations and exposure parameters that will be used to quantify intakes and intake parameters are presented in the RAGS-D tables provided in Attachment 1.

5.0 TOXICITY ASSESSMENT

The objective of the toxicity assessment is 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 are defined for the identified constituents of concern. Quantitative toxicity values determined during this component of the risk assessment are 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.

5.1 Toxicity Criteria for Oral and Inhalation Exposures

Oral and inhalation RfDs and CSFs to be used in the site-specific risk assessments will be obtained from the following primary USEPA literature sources:

- Integrated Risk Information System (IRIS, online).
- Annual Health Effects Assessment Summary Tables (HEAST, July 1997.)
- National Center for Environmental Assessment (NCEA) Superfund Health Risk Technical Support Center.

Although RfDs and CSFs can be found in several toxicological sources, USEPA's IRIS online database is the preferred source of toxicity values. This database is continuously updated, and presented values have been verified by USEPA RfD and Carcinogenic Risk Assessment Verification Endeavor (CRAVE) work groups. The USEPA Region III RBC and Region IX PRG tables are also used as a source of toxicity criteria. These tables are updated yearly and reflect recent changes in IRIS.

It may be necessary to develop toxicity criteria for potential COPCs lacking toxicity criteria. The need to do so will be determined on a case-by-case basis. The need for such criteria will be based on

- The occurrence and distribution of a chemical in site media. Is the chemical really significant in terms of concentration? Frequency of detection?

- Is the chemical site related? An artifact of the analysis?

- Would remedial decisions be potentially affected if the chemical were not evaluated quantitatively in the baseline risk assessment? Would a qualitative assessment in the uncertainty section adequately serve the purposes of the RI/FS?

5.2 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 the dermal route 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.

The adjustment to an absorbed dose will be made using chemical-specific gastrointestinal absorption efficiencies published in USEPA dermal guidance (USEPA, September 2001) using the following equations:

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

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

where: ABS_{GI} = absorption efficiency in the gastrointestinal tract
RfD_{dermal} = reference dose for the dermal route of exposure
RfD_{oral} = reference dose for the oral route of exposure
CSF_{dermal} = cancer slope factor for the dermal route of exposure
CSF_{oral} = cancer slope factor of the oral route of exposure

As noted above, the preceding adjustment of the oral toxicity criteria (i.e., reference doses, cancer slope factors) is necessary so that the dermal route of exposure may be quantitatively evaluated in the baseline

risk assessment. An explanation of this procedure and the need for this procedure are presented in Appendix A of USEPA RAGS Part A.

5.3 Toxicity Criteria for Carcinogenic Effects of Dioxins/Furans

If chlorinated dibenzo-p-dioxins (CDDs) and chlorinated-dibenzofurans (CDFs) are selected as COPCs, they will be evaluated using toxicity equivalence factors (TEFs) that relate to the toxicity of various congeners to the toxicity of 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) (USEPA, 1989). USEPA developed TEFs based on a variety of approaches including structure-activity relationships and available toxicological information. The equivalent oral CSF for these chemicals is derived by multiplying the CSF for 2,3,7,8-TCDD by the TEF. For Site 29 at PNS, USEPA Region I has approved the use of the World Health Organization (WHO) TEF values published in "Toxic Equivalency Factors (TEFs) for PCBs, PCDDs, PCDFs for Humans and Wildlife," Environmental Health Perspectives, (Volume 106, Number 12, December 1998) will be used in the Site 32 risk assessment.

5.4 Analysis of PCB Congeners and Dioxin-Like PCBs

The analysis of seeps and sediment samples collected in the 1996/1997 seep and sediment monitoring offshore of Site 32 included an analysis of PCB congeners as described in PCBs: Cancer Dose-Response Assessment and Application to Environmental Mixtures (USEPA, September 1996). If risks for PCB congeners in these seep and sediment samples are evaluated in the risk assessment, the methodology used to evaluate the congeners will be as follows:

- The seep and sediment samples were analyzed for 24 chlorobiphenyl congeners. These congeners are classified as either dioxin-like or nondioxin-like, as specified in the USEPA guidance.

- The maximum concentrations of the congeners identified in each medium (in seep and sediment samples) are summed to produce a total congener maximum concentration.

- The total congener maximum concentration is then multiplied by a factor of two (2X) to produce a total maximum PCB concentration. The multiplication factor of 2X is an empirically determined value that accounts for the fact that the 24 congeners are representative of a larger number of chlorobiphenyl congeners than are indicated by the laboratory analysis. Therefore, this multiplier is used so that risks from PCBs are not underestimated in the risk assessment.

- If either the total maximum chlorobiphenyl congener concentration or the total maximum PCB concentration exceeds the screening toxicity values for PCBs for any medium, PCBs will be included in the list of COPCs for that medium.

- If PCBs are selected as COPCS, they will be separated into dioxin-like and nondioxin-like PCB congeners. The maximum concentrations of the congeners are summed to produce a total dioxin-like maximum concentration for each medium.

- The total dioxin-like maximum concentration is subtracted from the total maximum PCB concentration for each medium. The difference of the total dioxin-like concentration from the total PCB concentration is the total maximum nondioxin-like concentration. These calculations will be presented in an appendix to the risk assessment.

- The total maximum nondioxin-like concentration used in the risk assessment will be treated as a PCB [i.e., will be combined with the PCB carcinogenic slope factor (2 $mg/kg\text{-}day)^{-1}$ to estimate carcinogenic risks].

- To calculate risks for the dioxin-like PCB congeners, it will be first be necessary to apply TEFs to the individual dioxin-like PCB congener concentrations, as specified in the USEPA guidance. The individual dioxin-like PCB congener concentrations will be multiplied by the TEFs to produce a dioxin toxic equivalent (TEQ) for each (see Section 5.3). The individual TEQs will then be summed, and the total dioxin-like TEQ will be used in risk assessment calculations. The derivation of the total dioxin-like TEQ will be presented in an appendix to the risk assessment.

When evaluating risks from dermal contact with seeps and sediments, absorption and transport characteristics of PCBs will be applied to nondioxin-like congeners and the absorption characteristics of 2,3,7,8-TCDD will be applied to dioxin-like congeners. For example, for dermal contact with sediment, a dermal absorption factor of 0.03 (USEPA, June 2000) will be used for dioxin-like congeners.

5.5 Toxicity of Chromium

Based on available data for Site 32, the total chromium concentrations are mostly trivalent chromium because the hexavalent chromium concentrations were very low. Both total and hexavalent chromium concentrations were less than screening levels. The Navy does not believe that additional analysis for hexavalent chromium is needed because it is not a concern for the site. Therefore, the analysis for chromium in all media at the site will be performed for total chromium. Because chromium at the site has

been found to be mainly trivalent chromium (based on the available hexavalent chromium concentrations), it will be assumed that total chromium is 90 percent trivalent chromium and 10 percent hexavalent chromium for risk assessment purposes. In the risk assessment, total chromium will be partitioned into trivalent and hexavalent chromium by a ratio of the exposure point concentration for total chromium. For example, if the concentration of total chromium in soil is 100 mg/kg, the exposure point concentration for trivalent chromium would be 90 mg/kg and the concentration of hexavalent chromium would be 10 mg/kg in risk assessment calculations. This assumes that chromium would be selected as a COPC. Note that, for COPC screening, it will be conservatively assumed that total chromium is 100 percent hexavalent chromium. If chromium is selected as a COPC, the EPC will be partitioned as described above.

6.0 RISK EVALUATION PROTOCOL FOR LEAD

In addition to the quantitative risk evaluation described in the preceding paragraphs, lead (if selected as a COPC) will be evaluated using the USEPA Integrated Exposure Uptake Biokinetic (IEUBK) Model for lead (Version 99d, USEPA, February 1994 and Windows Version, Model 1.0, May 2001). Exposure of adults (workers and recreational users) to lead will be evaluated by the adult exposure model presented in the following USEPA document: Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soils (USEPA, December 1996). The following paragraphs provide a brief overview of these models.

The IEUBK model is recommended by USEPA for the evaluation of childhood lead exposures assuming a residential land use scenario. The IEUBK is designed to estimate blood-lead levels in children (under 7 years of age) based on either default or site-specific input values for air, drinking water, diet, dust, and soil exposure. Studies indicate that infants and young children are extremely susceptible to adverse effects from exposure to lead. Considerable behavioral and developmental impairments have been noted in children with elevated blood-lead levels. The results of the IEUBK modeling are given in terms of the probability that exposed children will exceed a 10 ug/dL blood-lead level. This probability is typically compared to the USEPA goal of limiting the childhood risk of exceeding a 10 ug/dL blood-lead concentration to 5 percent. The 400 mg/kg Region 9 PRG for lead for residential land use is based on the IEUBK model. Default exposure parameters for the IEUBK Model are provided in Attachment 2.

The USEPA TRW model focuses on assessing risks associated with non-residential adult exposures to lead in soils. The model was originally published to provide guidance on the calculation of soil clean-up levels based on protecting adults (specifically, women of childbearing age) using a conservative approach that relates the lead level in the environment with the blood-lead level of a developing fetus.

Detailed information with respect to how this approach may be used to evaluate lead exposures in a baseline risk assessment is found in a USEPA technical memorandum from Pat Van Leeuwen and Paul White to Mark Maddaloni entitled “Use of TRW Interim Adult Lead Methodology in Risk Assessment,” (dated April 7, 1999). Additional guidance on the use of the model is provided in the TRW guidance Frequently Asked Questions (FAQs) on the Adult Lead Model (USEPA, April 1999). The output of the model is the risk (i.e., the probability) that elevated fetal blood-lead concentrations (i.e., concentrations greater than 10 ug/dL) will result due to exposures to women of childbearing age. Exposure parameters for the TRW Adult Lead Model are provided in Attachment 2.

APPENDIX D.4

DATA QUALITY WORKSHEETS AND DETECTION LIMIT EVALUATION TABLES

DATA USEABILITY WORKSHEET
Site: PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, CTO 166
Medium: SOIL/SEDIMENT

Requirement	Comment
Field Sampling	
Discuss sampling problems and field conditions that affect data usability.	• Soil sample percent completeness values for several analytical fractions were less than the sample percent completeness goal of 90 percent defined in the Site 32 QAPP (2008 report). The percent completeness goals were not achieved because collection of subsurface soil samples at borings for TAL metals, SVOCs, and PCB analysis (TP-SB115 to TP-SB123) was problematic because fill material consisted of rocks with little to no soil below the zero to one foot depth interval. Because little to no soil exists in the fill material at the aforementioned locations, observations during boring advancement are sufficient to define the nature and extent of soil contamination. Two SVOC soil results (3,3'-dichlorobenzidine and pentachlorophenol for sample TPSS1160001) or 0.25 percent of SVOC soil results were qualified as rejected due to severe matrix spike noncompliance. • Poor-to-low soil recovery made it difficult to collect all of the Shelby tube samples for engineering parameters. The poor-to-low soil recovery was also the cause for the slightly lower than target sample collection completeness for semivolatile (SVOC) and pesticide/polychlorinated biphenyl (PCB) completeness. The laboratory completeness objectives were met for all of the Site 32 samples. It should be noted all of the nondetcted antimony results collected in 1998, 2003, and 2006 were rejected in soil. The impact of the rejection of the antimony data will be evaluated further as part of the risk assessment (2003 report). • Completeness was 100% or greater for 1998 samples. • All critical samples were collected.
Are samples representative of receptor exposure for this medium (e.g. sample depth, grab vs composite, filtered vs unfiltered, low flow, etc.)?	• Yes, samples are representative of receptor exposure for this medium. • Maine's Definition of surface soil is 0 to 1 foot. This definition for surface soil was followed especially because of the lack of data collected from the 1 to 2 foot depth interval.
Assess the effect of field QC results on data usability.	• The rates of qualification for field duplicate precision were a little more significant than expected in the sediment; therefore, precision differences between copper concentrations in one sediment duplicate pair was further investigated by the laboratory. The

DATA USEABILITY WORKSHEET (continued)
Site: PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, CTO 166
Medium: SOIL/SEDIMENT

Requirement	Comment
	samples were reanalyzed and showed more acceptable duplicate precision between the original and the duplicate and did not require qualification. The extreme difference in arsenic concentrations in one soil duplicate pair could not be further evaluated by the laboratory. The maximum concentration of arsenic was detected in the duplicate sample at a concentration approximately 100 times greater than the other site soil concentrations (2003 report). As discussed in Section 1 of the OU7 RI, this arsenic value was determined to be erroneous and was not used in the risk assessment. • Field duplicate imprecision for the 2008 data set was noted above; qualified data were not rejected and are therefore considered acceptable for risk assessment use. • It is interpreted that overall there was little to no effect of field QC results on OU7 data usability.
Summarize the effect of field sampling issues on the risk assessment, if applicable.	• Field sampling issues appear to have had little effect on the Risk Assessment. • Maine's Definition of surface soil is 0 to 1 foot. This definition was used especially due to the lack of data collected from the 1 to 2 foot depth interval.
Analytical Techniques	
Were the analytical methods appropriate for quantitative risk assessment?	• Most nondetected values were less than the screening level. The reporting limits from the historical data were the CLP CRQLs, which were in most case much higher than the detection limits. Most nondetected values were less than the screening levels. However, several soil samples had very high detection limits (more than 10 times greater than the screening level) (2003 report). • Total and dissolved aluminum, copper, and silver, as well as total nickel, benzo(a)pyrene, and dibenzo(a,h)anthracene non-detected results exceeded minimum screening levels specified in the laboratory SOW for the Site 32 Phase II RI (2008 report). • Portsmouth Naval Shipyard is an active facility it is also on the NPL. For RCRA/ CERCLA combined investigations it is acceptable to use either SW-846 or CLP methods. • SW-846 analysis methods were utilized. The TCL list

DATA USEABILITY WORKSHEET (continued)
Site: PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, CTO 166
Medium: SOIL/SEDIMENT

Requirement	Comment
	included all the compounds that are believed to be site-related contaminants.
Were detection limits adequate?	• Yes, most nondetected values were less than the screening level. The reporting limits from the historical data were the CLP CRQLs, which were in most case much higher than the detection limits. Most nondetected values were less than the screening levels. However, several soil samples had very high detection limits (more than 10 times greater than the screening level) (2003 report). • Elevated detection limits in the 2008 report are summarized above. • Please see the associated detection limit exceedance tables in this appendix for chemical-specific excceedance percentages.
Summarize the effect of analytical technique issues on the risk assessment, if applicable.	• If detection limits are not low enough using the nondetect values as inputs to UCL calculation will artificially inflate EPC. • Sample quantitation limits for some compounds (e.g. PAHs) have the potential to inflate the EPC because of the practice of incorporating nondetected results into calculated parameters.
Data Quality Objectives	
Precision - How were duplicates handled?	• Precision was measured by the calculation of Relative Percent Differences (RPDs). • Precision objectives for duplicate samples were ± 50% for soil samples. Failures in meeting the precision objectives resulted in qualification of the data. Arsenic results were qualified as estimated (J) due to field duplicate imprecision. • In preparing EPCs soil duplicate sample results were averaged. For samples in which one result was positive and one was nondetected, the positive result was reported if the positive result was less than the nondetected result. If the positive result was greater than the nondetect, the values were averaged using ½ the nondetected result.
Accuracy - How were split samples handled?	• Accuracy was measured by the calculation of percent recovery for Matrix Spike/Matrix Spike Duplicate samples and Surrogate Spike compounds. • Failures in meeting the accuracy objectives resulted in qualification of the data. Based on the rates of

DATA USEABILITY WORKSHEET (continued)
Site: PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, CTO 166
Medium: SOIL/SEDIMENT

Requirement	Comment
	qualification for quality control measures (surrogate, matrix spike, blank spike, and internal standard recoveries) for each fraction seem to indicate these qualifications should not impact the data usability. Antimony results in the 2003 data set were rejected due to low matrix spike recovery.
Representativeness - Indicate any problems associated with data representativeness (e.g., trip blank or rinsate blank contamination, COC problems, etc.).	• Numerous analytes were detected in field and rinsate blanks in the 2003 data. No data were qualified on this basis. No negative effects on representativeness are anticipated. • In the 2008 data, field duplicate imprecision was noted for copper and lead in all soil samples, several SVOCs in samples TPSS1200001 and TPSS1200001-D, 2-methylnapthlene in samples TPSD1160004 and TPSD1160004-D, and acenapthene and copper in samples TPSD1191216 and TPSD1191216-D. Field duplicate imprecision was consistent with previous site data and indicates that fill material at Site 32 is heterogeneous.
Completeness - Indicate any problems associated with data completeness (e.g., incorrect sample analysis, incomplete sample records, problems with field procedures, etc.).	• Soil sample collection completeness percentages of 47 percent, 72 percent, and 47 percent for the SVOC, PCB, and TAL metal fractions, respectively, were less than the 90 percent completeness goal defined in the Site 32 RI QAPP. The percent completeness did not meet project goals because fill material at 16 locations (TP-SB115 to TP-SB123) consisted of rocks with little to no soil below the zero to one foot depth interval. Because little to no soil exists at these locations, observations during boring advancement are sufficient for these locations (2008 report). • Poor-to-low soil recovery made it difficult to collect all of the Shelby tube samples for engineering parameters. The poor-to-low soil recovery was also the cause for the slightly lower than target completeness for semivolatile (SVOC) and pesticide/polychlorinated biphenyl (PCB) completeness.
Comparability - Indicate any problems associated with data comparability.	• Data collected over time were analyzed by the same analytical methods and reported in a similar fashion (i.e., same units, data package deliverable, and same data validation guidance was used). • However as analytical methods were updated and data validation guidance was updated these revised

DATA USEABILITY WORKSHEET (continued)
Site: PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, CTO 166
Medium: SOIL/SEDIMENT

Requirement	Comment
	methods were used.
Were the DQOs specified in the QAPP satisfied?	• Planning documents outlined sampling, analysis, and quality control requirements and these plans were followed. • As a result of investigation data gaps were identified and additional samples were collected to fill those gaps.
Summarize the effect of DQO issues on the risk assessment, if applicable.	• No DQOs issues were identified. See above text.
Data Validation and Interpretation	
What are the data validation requirements for this region?	• USEPA National Functional Guidelines for Organic and Inorganic Data Review and; • USEPA Region I Volatile/Semivolatile Data Validation Functional Guidelines, Part II Dec 1996. • All data was validated.
What method or guidance was used to validate the data?	• OU7 data were validated in accordance with the USEPA National Functional Guidelines for Organic and Inorganic Data Review and USEPA Region I Volatile/Semivolatile Data Validation Functional Guidelines, Part II Dec 1996.
Was the data validation method consistent with regional guidance? Discuss any discrepancies.	• Yes, however Region I worksheets are not available for all of the data validation letters.
Were all data qualifiers defined? Discuss those which were not.	• Yes for OU7 all data qualifiers are defined in RI report.
Which qualifiers represent usable data?	• U, UJ, and J
Which qualifiers represent unusable data?	• UR and R
How are tentatively identified compounds handled?	• TICs were not used in the Risk Assessment. TICs are evaluated in the uncertainty section, if necessary.

DATA USEABILITY WORKSHEET (continued)
Site: PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, CTO 166
Medium: SOIL/SEDIMENT

Requirement	Comment
Summarize the effect of data validation and interpretation issues on the risk assessment, if applicable.	• Rejected cyanide and antimony results may cause so data gaps. Additionally the data points available to calculate the EPC is significantly reduced.
Additional notes:	• PAH results in two sediment samples were qualified as estimated due to holding time exceedance. These data were considered to be acceptable for risk assessment use.

Note: The purpose of this Worksheet is to succinctly summarize the data usability analysis and conclusions.

The primary references for this worksheet: Site 32 Phase I Data Package, January 2004; Site 32 Phase II RI Data Package, June 2009.

DATA USEABILITY WORKSHEET
Site: PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, CTO 55
Medium: GROUNDWATER

Requirement	Comment
Field Sampling	
Discuss sampling problems and field conditions that affect data usability.	• All critical samples were collected. There were no notable sampling problems or conditions that affected data usability.
Are samples representative of receptor exposure for this medium (e.g. sample depth, grab vs composite, filtered vs unfiltered, low flow, etc.)?	• Yes, the samples are representative of receptor exposure for groundwater. Because the water is saline only dermal contact was evaluated.
Assess the effect of field QC results on data usability.	• Field duplicate imprecision was noted for several metals results in the 1998 data; results for these metals were qualified as estimated (J) in the associated samples. • Some SVOC and metals results were qualified due to field duplicate imprecision in the 2003 data. • It is interpreted that overall there was little to no effect of field QC results on groundwater data usability.
Summarize the effect of field sampling issues on the risk assessment, if applicable.	• Field Sampling issues do not appear to have effected the risk assessment.
Analytical Techniques	
Were the analytical methods appropriate for quantitative risk assessment?	• Yes, in general detection limits were lower than screening criteria. Detection limits for antimony and arsenic in some samples exceeded criteria. • Portsmouth Naval Shipyard is an active facility it is also on the NPL. For RCRA/CERCLA combined investigations it is acceptable to use either SW-846 or CLP methods. • SW-846 analysis methods were used for laboratory analysis.
Were detection limits adequate?	• Yes, in general any elevated detection limits did not appear to affect risk assessment results. Please see the associated detection limit exceedance tables in this appendix for chemical-specific excceedance percentages.
Summarize the effect of analytical technique issues on the risk assessment, if applicable.	• If detection limits are not low enough using the nondetects as inputs to the UCL calculation will artificially inflate EPC. • Sample quantitation limits for some compounds (e.g. PAHs) have the potential to inflate the EPC because of the practice of reporting results below the reporting limit down to the MDL.

DATA USEABILITY WORKSHEET (continued)
Site: PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, CTO 166
Medium: GROUNDWATER

Requirement	Comment
Data Quality Objectives	
Precision - How were duplicates handled?	• Precision was measured by the calculation of Relative Percent Differences (RPDs). • Precision objectives for duplicate samples were ± 30% for aqueous samples. Failures in meeting the precision objectives resulted in qualification of the data. Some metals results were qualified as estimated (J) and (UJ) (1998 samples). Some SVOC and miscellaneous results were qualified as estimated in the 2003 data. No precision issues were noted for 2008 data. • In preparing EPCs groundwater duplicate sample results were averaged.
Accuracy - How were split samples handled?	• Accuracy was measured by the calculation of percent recovery for Matrix Spike/Matrix Spike Duplicate samples and Surrogate Spike recoveries. • Accuracy objectives were 75% to 125% recovery. Failures in meeting the accuracy objectives resulted in qualification of the data. Some metals, VOC, and pesticide/PCB groundwater data (less than 4%/fraction) were qualified as estimated (J or UJ) due to QC measures (2003 data). Some VOC and SVOC results were qualified due to surrogate recoveries and MS/MSD recoveries; some metals results were qualified due to MS recoveries (1998 data). Some results for barium and thallium were qualified due to MS percent recoveries less than minimum quality control levels in the 2008 data. • Field duplicates were a single homogenized sample split into two portions.
Representativeness – Indicate any problems associated with data Representativeness (e.g., trip blank or rinsate blank contamination, COC problems, etc.).	• Numerous metals concentrations in blanks caused data to be qualified as non-detected (2003 data). Several VOC, SVOC, and metals analytes were detected in field blanks (1998 data). Results for these compounds within defined action levels were qualified as undetected. 2008 sample data were determined to be representative of site conditions. • The 1998 samples were located in areas of

DATA USEABILITY WORKSHEET (continued)
Site: PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, CTO 166
Medium: GROUNDWATER

Requirement	Comment
	likely contamination and were therefore biased. This was taken into account in the sampling plan for the 2003 samples to create a stratified random sampling plan for the site.
Completeness - Indicate any problems associated with data completeness (e.g., incorrect sample analysis, incomplete sample records, problems with field procedures, etc.).	• Nondetected selenium results were rejected, and nondetected results for several SVOC analytes in two samples were rejected due to surrogate spike recovery (2003 data). These data points were lost during data validation. Selenium was rejected in the 1996/1997 data in several samples. • No data points were lost as a result of field sampling problems, sample shipment, or sample analysis problems for 1998 and 2008 data. Completeness exceeded the 90% target level for 2003 data.
Comparability - Indicate any problems associated with data comparability.	• Data collected over time were analyzed by the same analytical methods and reported in a similar fashion (i.e., same units, data package deliverable, same data validation guidance used). • No comparability issues were detected (1998 data).
Were the DQOs specified in the QAPP satisfied?	• Yes, the data included in the OU7 RI sufficiently satisfied the previous DQOs outlined in the previous QAPP document (TtNUS, November 2008). • Planning documents outlined sampling, analysis, and quality control requirements and these plans were followed.
Summarize the effect of DQO issues on the risk assessment, if applicable.	• No DQOs issues were identified. See above text.
Data Validation and Interpretation	
What are the data validation requirements for this region?	• USEPA National Functional Guidelines for Organic and Inorganic Data Review and; • USEPA Region I Volatile/Semivolatile Data Validation Functional Guidelines, Part II Dec 1996. • All data was validated.
What method or guidance was used to validate the data?	• Groundwater data was validated in accordance with the USEPA National

DATA USEABILITY WORKSHEET (continued)
Site: PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, CTO 166
Medium: GROUNDWATER

Requirement	**Comment**
	Functional Guidelines for Organic and Inorganic Data Review and USEPA Region I Volatile/Semivolatile Data Validation Functional Guidelines, Part II Dec 1996.
Was the data validation method consistent with regional guidance? Discuss any discrepancies.	• Region I worksheets are not available for all data validation reports.
Were all data qualifiers defined? Discuss those which were not.	• Yes, all relevant data qualifiers are defined in the OU7 RI.
Which qualifiers represent usable data?	• U, UJ, J
Which qualifiers represent unusable data?	• UR and R
How are tentatively identified compounds handled?	• TICs were not used in the Risk Assessment. TICs are evaluated in the uncertainty section, if applicable.
Summarize the effect of data validation and interpretation issues on the risk assessment, if applicable.	• Rejected results may cause some data gaps. Additionally the data points available to calculate the EPC for these analytes are reduced. However, the majority of results for a given analyte were not rejected.
Additional notes:	None

Note: The purpose of this Worksheet is to succinctly summarize the data usability analysis and conclusions.

DATA USEABILITY WORKSHEET
Site: PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, CTO 55
Medium: SURFACE/SEEP WATER

Requirement	Comment
Field Sampling	
Discuss sampling problems and field conditions that affect data usability.	• 2003 SW Data - All critical samples were collected. No sampling problems or field conditions obviously affected data usability. • 1996/1997 Seep Data. All critical samples were collected; however, it was difficult to not to collect sand that the seep water was running over when attempting to collect the seep water samples. Therefore, most of the samples are not purely seep water and the sand included in the samples may have affected analytical results.
Are samples representative of receptor exposure for this medium (e.g. sample depth, grab vs composite, filtered vs unfiltered, low flow, etc.)?	• Yes, the surface water (2003) samples are representative of receptor exposure for surface/seep water. Because the seep water data were collected in 1996/1997 only, these results are presented in the Uncertainty Analysis of the OU7 RI.
Assess the effect of field QC results on data usability.	• Numerous analytes were detected in the field blanks. Field blank data were not used to qualify sample data. No qualifications were noted in surface water due to field duplicate imprecision. • It is interpreted that overall there was little to no effect of field QC results on surface water data usability.
Summarize the effect of field sampling issues on the risk assessment, if applicable.	• Field Sampling issues do not appear to have effected the risk assessment.
Analytical Techniques	
Were the analytical methods appropriate for quantitative risk assessment?	• Yes, in general detection limits were lower than screening criteria. • Portsmouth Naval Shipyard is an active facility it is also on the NPL. For RCRA/ CERCLA combined investigations it is acceptable to use either SW-846 or CLP methods. • SW-846 analysis methods were used for laboratory analysis.
Were detection limits adequate?	• Yes, in general detection limits were elevated in a small percentage of samples. The risk assessment does not appear to be affected. Please see the associated detection limit exceedance tables in this appendix for chemical-specific excceedance percentages.
Summarize the effect of analytical technique issues on the risk assessment, if applicable.	• If detection limits are not low enough using the nondetected concentration as an input to EPC calculation will artificially inflate EPC.

DATA USEABILITY WORKSHEET (continued)
Site: PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, CTO 166
Medium: SURFACE/SEEP WATER

Requirement	Comment
	• Sample quantitation limits for some compounds (e.g. PAHs) have the potential to inflate the EPC because of the practice of reporting results below the reporting limit down to the MDL.
Data Quality Objectives	
Precision - How were duplicates handled?	• Precision was measured by the calculation of Relative Percent Differences (RPDs). • Precision objectives for duplicate samples were ± 30% for aqueous samples. No qualifications in surface water were noted due to precision. • In preparing EPCs surface water and seep water duplicate sample results were averaged.
Accuracy - How were split samples handled?	• Accuracy was measured by the calculation of percent recovery for Matrix Spike/Matrix Spike Duplicate (MS/MSD) and Laboratory Control Sample (LCS) recoveries and Surrogate Spike recoveries. • Accuracy objectives were 75% to 125% recovery. Failures in meeting the accuracy objectives resulted in qualification of the data. Some metals and pesticide/PCB results e qualified as estimated (J and UJ) due to MS/MSD and LCS recoveries, respectively, in surface water.
Representativeness – Indicate any problems associated with data Representativeness (e.g., trip blank or rinsate blank contamination, COC problems, etc.).	• No data representative issues were raised when evaluating the 2003 surface water data.
Completeness - Indicate any problems associated with data completeness (e.g., incorrect sample analysis, incomplete sample records, problems with field procedures, etc.).	• The calculated percent completeness for analytical surface water data collected in 2003 is 90%. Several SVOC results were rejected due to matrix interference. • For the 2003 surface water data, no data points were lost as a result of field sampling problems, sample shipment, or sample analysis problems.
Comparability - Indicate any problems associated with data comparability.	• For the 2003 surface water data comparability problems were not detected.

DATA USEABILITY WORKSHEET (continued)
Site: PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, CTO 166
Medium: SURFACE/SEEP WATER

Requirement	**Comment**
Were the DQOs specified in the QAPP satisfied?	• 2003 DQO pertaining to the surface water data were satistified. • 1996 DQOs were not identified
Summarize the effect of DQO issues on the risk assessment, if applicable.	• No DQOs issues were identified. See above text.
Data Validation and Interpretation	
What are the data validation requirements for this region?	• USEPA National Functional Guidelines for Organic and Inorganic Data Review and; • USEPA Region I Volatile/Semivolatile Data Validation Functional Guidelines, Part II Dec 1996. • All data was validated.
What method or guidance was used to validate the data?	• surface water and seep data was validated in accordance with the USEPA National Functional Guidelines for Organic and Inorganic Data Review and USEPA Region I Volatile/Semivolatile Data Validation Functional Guidelines, Part II Dec 1996.
Was the data validation method consistent with regional guidance? Discuss any discrepancies.	• Yes, however Region I worksheets are not filled out to the extent they would be if the EPA was the client and the data validation memorandum is not in the Region I format.
Were all data qualifiers defined? Discuss those which were not.	• Yes, all data qualifiers are defined in the data validation memoranda.
Which qualifiers represent usable data?	• U, UJ, J
Which qualifiers represent unusable data?	• UR and R
How are tentatively identified compounds handled?	• TICs were not used in the Risk Assessment. TICs are evaluated in the uncertainty section, if necessary.
Summarize the effect of data validation and interpretation issues on the risk assessment, if applicable.	None
Additional notes:	None

Note: The purpose of this Worksheet is to succinctly summarize the data usability analysis and conclusions.

DATA USEABILITY WORKSHEET (continued)
Site: PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE, CTO 166
Medium: SURFACE/SEEP WATER

The primary references for this document are the Site 32 Phase 1 Remedial Investigation Data Package (TtNUS, January 2004) and the Seep/Sediment Summary Report for Data Collected Between December 1996 and November 1997 (TtNUS, August 2000).

Table 1
Groundwater Detection Limit Evaluation
Portsmouth Naval Shipyard
Kittery, Maine

Parameter	Minimum Screening Level		Number of Non-Detects Exceeding Screening Levels	Number of Analyses	Percent Exceeding
Volatile Organics (ug/L)					
1,1,1-TRICHLOROETHANE	NC		0	7	0.0%
1,1,2,2-TETRACHLOROETHANE	NC		0	7	0.0%
1,1,2-TRICHLOROETHANE	NC		0	7	0.0%
1,1,2-TRICHLOROTRIFLUOROETHANE	NC		0	7	0.0%
1,1-DICHLOROETHANE	NC		0	7	0.0%
1,1-DICHLOROETHENE	NC		0	7	0.0%
1,2-DICHLOROETHANE	NC		0	7	0.0%
1,2-DICHLOROPROPANE	NC		0	7	0.0%
2-BUTANONE	NC		0	7	0.0%
2-HEXANONE	NC		0	7	0.0%
4-METHYL-2-PENTANONE	NC		0	7	0.0%
ACETONE	NC		0	7	0.0%
BENZENE	NC		0	7	0.0%
BROMODICHLOROMETHANE	NC		0	7	0.0%
BROMOFORM	NC		0	7	0.0%
BROMOMETHANE	NC		0	7	0.0%
CARBON DISULFIDE	NC		0	7	0.0%
CARBON TETRACHLORIDE	NC		0	7	0.0%
CHLOROBENZENE	NC		0	7	0.0%
CHLORODIBROMOMETHANE	NC		0	7	0.0%
CHLOROETHANE	NC		0	7	0.0%
CHLOROFORM	NC		0	7	0.0%
CHLOROMETHANE	NC		0	7	0.0%
CIS-1,3-DICHLOROPROPENE	NC		0	7	0.0%
ETHYLBENZENE	NC		0	7	0.0%
METHYLENE CHLORIDE	NC		0	7	0.0%
STYRENE	NC		0	7	0.0%
TETRACHLOROETHENE	NC		0	7	0.0%
TOLUENE	NC		0	7	0.0%
TOTAL 1,2-DICHLOROETHENE	NC		0	7	0.0%
TOTAL XYLENES	NC		0	7	0.0%
TRANS-1,3-DICHLOROPROPENE	NC		0	7	0.0%
TRICHLOROETHENE	NC		0	7	0.0%
VINYL CHLORIDE	NC		0	7	0.0%
Semivolatile Organics (ug/L)					
1,2,4-TRICHLOROBENZENE	190	N	0	20	0.0%
1,2-DICHLOROBENZENE	3400	N	0	20	0.0%
1,3-DICHLOROBENZENE	1900	N	0	20	0.0%
1,4-DICHLOROBENZENE	2600	N	0	20	0.0%
2,2'-OXYBIS(1-CHLOROPROPANE)	NC		0	20	0.0%
2,4,5-TRICHLOROPHENOL	NC		0	20	0.0%
2,4,6-TRICHLOROPHENOL	2100	C	0	20	0.0%
2,4-DICHLOROPHENOL	200	N	0	20	0.0%
2,4-DIMETHYLPHENOL	3100	N	0	20	0.0%
2,4-DINITROPHENOL	1600	N	0	20	0.0%
2,4-DINITROTOLUENE	810	N	0	20	0.0%
2,6-DINITROTOLUENE	590	N	0	20	0.0%
2-CHLORONAPHTHALENE	NC		0	20	0.0%
2-CHLOROPHENOL	1000	N	0	20	0.0%
2-METHYLNAPHTHALENE	720	N	0	34	0.0%
2-METHYLPHENOL	12000	N	0	20	0.0%
2-NITROANILINE	NC		0	20	0.0%
2-NITROPHENOL	790	N	0	20	0.0%
3,3'-DICHLOROBENZIDINE	94	C	0	20	0.0%

Table 1
Groundwater Detection Limit Evaluation
Portsmouth Naval Shipyard
Kittery, Maine

Parameter	Minimum Screening Level		Number of Non-Detects Exceeding Screening Levels	Number of Analyses	Percent Exceeding
3-NITROANILINE	NC		0	20	0.0%
4,6-DINITRO-2-METHYLPHENOL	36	N	0	20	0.0%
4-BROMOPHENYL PHENYL ETHER	NC		0	20	0.0%
4-CHLORO-3-METHYLPHENOL	NC		0	20	0.0%
4-CHLOROANILINE	NC		0	20	0.0%
4-CHLOROPHENYL PHENYL ETHER	NC		0	20	0.0%
4-METHYLPHENOL	1200	N	0	20	0.0%
4-NITROANILINE	NC		0	20	0.0%
4-NITROPHENOL	660	N	0	20	0.0%
ACENAPHTHENE	10000	N	0	34	0.0%
ACENAPHTHYLENE	10000	N	0	34	0.0%
ANTHRACENE	28000	N	0	34	0.0%
BAP EQUIVALENT-HALFND	0.1	C	6	34	17.6%
BAP EQUIVALENT-POS	0.1	C	0	34	0.0%
BENZO(A)ANTHRACENE	2	C	6	34	17.6%
BENZO(A)PYRENE	0.1	C	6	34	17.6%
BENZO(B)FLUORANTHENE	1	C	6	34	17.6%
BENZO(G,H,I)PERYLENE	NC		0	34	0.0%
BENZO(K)FLUORANTHENE	NC		0	34	0.0%
BIS(2-CHLOROETHOXY)METHANE	NC		0	20	0.0%
BIS(2-CHLOROETHYL)ETHER	540	C	0	20	0.0%
BIS(2-ETHYLHEXYL)PHTHALATE	320	N	0	20	0.0%
BUTYL BENZYL PHTHALATE	NC		0	20	0.0%
CARBAZOLE	NC		0	20	0.0%
CHRYSENE	190	C	0	34	0.0%
DI-N-BUTYL PHTHALATE	3100	N	0	20	0.0%
DI-N-OCTYL PHTHALATE	NC		0	20	0.0%
DIBENZO(A,H)ANTHRACENE	0.07	C	33	34	97.1%
DIBENZOFURAN	NC		0	20	0.0%
DIETHYL PHTHALATE	200000	N	0	20	0.0%
DIMETHYL PHTHALATE	NC		0	20	0.0%
FLUORANTHENE	200	N	0	34	0.0%
FLUORENE	5200	N	0	34	0.0%
HEXACHLOROBENZENE	2	C	6	20	30.0%
HEXACHLOROBUTADIENE	10	N	3	20	15.0%
HEXACHLOROCYCLOPENTADIENE	NC		0	20	0.0%
HEXACHLOROETHANE	29	N	0	20	0.0%
HIGH MOLECULAR WEIGHT PAHS	NC		0	34	0.0%
INDENO(1,2,3-CD)PYRENE	1	C	6	34	17.6%
ISOPHORONE	93000	N	0	20	0.0%
LOW MOLECULAR WEIGHT PAHS	NC		0	34	0.0%
N-NITROSO-DI-N-PROPYLAMINE	NC		0	20	0.0%
N-NITROSODIPHENYLAMINE	NC		0	20	0.0%
NAPHTHALENE	730	N	0	34	0.0%
NITROBENZENE	NC		0	20	0.0%
PENTACHLOROPHENOL	12	C	6	20	30.0%
PHENANTHRENE	270	N	0	34	0.0%
PHENOL	130000	N	0	20	0.0%
PYRENE	1700	N	0	34	0.0%
Pesticides/PCBs (ug/L)					
4,4'-DDD	10	C	0	34	0.0%
4,4'-DDE	8.3	C	0	34	0.0%
4,4'-DDT	1.1	N	0	34	0.0%
ALDRIN	8.2	N	0	34	0.0%
ALPHA-BHC	NC		0	34	0.0%

Table 1
Groundwater Detection Limit Evaluation
Portsmouth Naval Shipyard
Kittery, Maine

Parameter	Minimum Screening Level		Number of Non-Detects Exceeding Screening Levels	Number of Analyses	Percent Exceeding
ALPHA-CHLORDANE	6	N	0	34	0.0%
AROCLOR-1016	NC		0	34	0.0%
AROCLOR-1221	NC		0	34	0.0%
AROCLOR-1232	NC		0	34	0.0%
AROCLOR-1242	NC		0	34	0.0%
AROCLOR-1248	NC		0	34	0.0%
AROCLOR-1254	NC		0	34	0.0%
AROCLOR-1260	NC		0	34	0.0%
BETA-BHC	NC		0	34	0.0%
DELTA-BHC	NC		0	34	0.0%
DIELDRIN	1.6	C	0	34	0.0%
ENDOSULFAN I	NC		0	34	0.0%
ENDOSULFAN II	NC		0	34	0.0%
ENDOSULFAN SULFATE	NC		0	34	0.0%
ENDRIN	11	N	0	34	0.0%
ENDRIN ALDEHYDE	NC		0	34	0.0%
ENDRIN KETONE	NC		0	34	0.0%
GAMMA-BHC (LINDANE)	19	N	0	34	0.0%
GAMMA-CHLORDANE	6	N	0	34	0.0%
HEPTACHLOR	8.2	C	0	34	0.0%
HEPTACHLOR EPOXIDE	NC		0	34	0.0%
METHOXYCHLOR	NC		0	34	0.0%
TOTAL AROCLOR HALFND	0.64	C	0	34	0.0%
TOTAL AROCLOR ZEROND	0.64	C	0	34	0.0%
TOXAPHENE	NC		0	34	0.0%
Petroleum Hydrocarbons (ug/L)					
DIESEL RANGE ORGANICS	NC		0	21	0.0%
GASOLINE RANGE ORGANICS	NC		0	7	0.0%
Inorganics (ug/L)					
ALUMINUM	2580000	N	0	48	0.0%
ANTIMONY	155	N	0	48	0.0%
ARSENIC	774	N	0	48	0.0%
BARIUM	36100	N	0	48	0.0%
BERYLLIUM	36.1	N	0	48	0.0%
CADMIUM	64.5	N	0	48	0.0%
CALCIUM	NC		0	48	0.0%
CHROMIUM	25800	N	0	48	0.0%
COBALT	1940	N	0	48	0.0%
COPPER	103000	N	0	48	0.0%
IRON	1810000	N	0	48	0.0%
LEAD	1340		0	48	0.0%
MAGNESIUM	NC		0	48	0.0%
MANGANESE	2480	N	0	48	0.0%
MERCURY	54.2	N	0	48	0.0%
NICKEL	10300	N	0	48	0.0%
POTASSIUM	NC		0	48	0.0%
SELENIUM	12900	N	0	48	0.0%
SILICON	NC		0	13	0.0%
SILVER	860	N	0	48	0.0%
SODIUM	NC		0	48	0.0%
THALLIUM	168	N	0	48	0.0%
VANADIUM	12900	N	0	48	0.0%
ZINC	1290000	N	0	48	0.0%
Filtered Inorganics (ug/L)					
ALUMINUM	2580000	N	0	30	0.0%

Table 1
Groundwater Detection Limit Evaluation
Portsmouth Naval Shipyard
Kittery, Maine

Parameter	Minimum Screening Level		Number of Non-Detects Exceeding Screening Levels	Number of Analyses	Percent Exceeding
ANTIMONY	155	N	0	30	0.0%
ARSENIC	774	N	0	30	0.0%
BARIUM	36100	N	0	30	0.0%
BERYLLIUM	36.1	N	0	30	0.0%
CADMIUM	64.5	N	0	30	0.0%
CALCIUM	NC		0	30	0.0%
CHROMIUM	25800	N	0	30	0.0%
COBALT	1940	N	0	30	0.0%
COPPER	103000	N	0	30	0.0%
IRON	1810000	N	0	30	0.0%
LEAD	1340		0	30	0.0%
MAGNESIUM	NC		0	30	0.0%
MANGANESE	2480	N	0	30	0.0%
MERCURY	54.2	N	0	30	0.0%
NICKEL	10300	N	0	30	0.0%
POTASSIUM	NC		0	30	0.0%
SELENIUM	12900	N	0	30	0.0%
SILICON	NC		0	13	0.0%
SILVER	860	N	0	30	0.0%
SODIUM	NC		0	30	0.0%
THALLIUM	168	N	0	30	0.0%
VANADIUM	12900	N	0	30	0.0%
ZINC	1290000	N	0	30	0.0%
Miscellaneous Parameters					
ALKALINITY MG/L	NC		0	14	0.0%
BROMIDE MG/L	NC		0	21	0.0%
CARBONATE ALKALINITY MG/L	NC		0	21	0.0%
CHLORIDE MG/L	NC		0	21	0.0%
CYANIDE UG/L	NC		0	21	0.0%
NITRATE MG/L	NC		0	21	0.0%
PH S.U.	NC		0	21	0.0%
SALINITY PPT	NC		0	7	0.0%
SULFATE MG/L	NC		0	21	0.0%
TOTAL DISSOLVED SOLIDS MG/L	NC		0	13	0.0%
TOTAL ORGANIC CARBON MG/L	NC		0	21	0.0%
TOTAL ORGANIC HALIDES MG/L	NC		0	10	0.0%
TOTAL SUSPENDED SOLIDS MG/L	NC		0	27	0.0%
Field Parameters					
DISSOLVED OXYGEN MG/L	NC		0	14	0.0%
OXIDATION REDUCTION POTENTIAL MV	NC		0	14	0.0%
PH S.U.	NC		0	14	0.0%
SALINITY PPT	NC		0	14	0.0%
SPECIFIC CONDUCTANCE MS/CM	NC		0	14	0.0%
TEMPERATURE C	NC		0	14	0.0%
TURBIDITY NTU	NC		0	14	0.0%

Bolded and shaded parameters indicated that at least one non-detected result exceeds the corresponding screening level for that parameter.

C= Carcinogenic
N = Noncarcinogenic
NC = Not Calculated

Table 2
Subsurface Soil Detection Limit Evaluation
Portsmouth Naval Shipyard
Kittery, Maine

Parameter	Minimum Screening Level		Number of Non-Detects Exceeding Screening Levels	Number of Analyses	Percent Exceeding
Volatile Organics (ug/kg)					
1,1,1-TRICHLOROETHANE	900000		0	32	0.0%
1,1,2,2-TETRACHLOROETHANE	580		0	32	0.0%
1,1,2-TRICHLOROETHANE	970		0	32	0.0%
1,1,2-TRICHLOROTRIFLUOROETHANE	930000		0	32	0.0%
1,1-DICHLOROETHANE	3400		0	32	0.0%
1,1-DICHLOROETHENE	25000		0	32	0.0%
1,2-DICHLOROETHANE	360		0	32	0.0%
1,2-DICHLOROPROPANE	930		0	32	0.0%
2-BUTANONE	2800000		0	32	0.0%
2-HEXANONE	NC		0	32	0.0%
4-METHYL-2-PENTANONE	530000		0	32	0.0%
ACETONE	6100000		0	32	0.0%
BENZENE	830		0	32	0.0%
BROMODICHLOROMETHANE	280		0	32	0.0%
BROMOFORM	52000		0	32	0.0%
BROMOMETHANE	790		0	32	0.0%
CARBON DISULFIDE	67000		0	32	0.0%
CARBON TETRACHLORIDE	250		0	32	0.0%
CHLOROBENZENE	13000		0	32	0.0%
CHLORODIBROMOMETHANE	470		0	32	0.0%
CHLOROETHANE	1200000		0	32	0.0%
CHLOROFORM	280		0	32	0.0%
CHLOROMETHANE	2100		0	32	0.0%
CIS-1,3-DICHLOROPROPENE	NC		0	32	0.0%
ETHYLBENZENE	5700		0	32	0.0%
METHYLENE CHLORIDE	11000		0	32	0.0%
STYRENE	650000		0	32	0.0%
TETRACHLOROETHENE	570		0	32	0.0%
TOLUENE	500000		0	32	0.0%
TOTAL 1,2-DICHLOROETHENE	70000		0	32	0.0%
TOTAL XYLENES	60000		0	32	0.0%
TRANS-1,3-DICHLOROPROPENE	NC		0	32	0.0%
TRICHLOROETHENE	71		0	32	0.0%
VINYL CHLORIDE	60		0	32	0.0%
Semivolatile Organics (ug/kg)					
1,2,4-TRICHLOROBENZENE	8700	N	0	78	0.0%
1,2-DICHLOROBENZENE	200000	N	0	78	0.0%
1,3-DICHLOROBENZENE	NC	N	0	78	0.0%
1,4-DICHLOROBENZENE	2600	N	0	78	0.0%
2,2'-OXYBIS(1-CHLOROPROPANE)	3500		0	81	0.0%
2,4,5-TRICHLOROPHENOL	610000		0	81	0.0%
2,4,6-TRICHLOROPHENOL	6100	C	0	81	0.0%
2,4-DICHLOROPHENOL	18000	N	0	81	0.0%
2,4-DIMETHYLPHENOL	120000	N	0	81	0.0%
2,4-DINITROPHENOL	12000	N	0	81	0.0%
2,4-DINITROTOLUENE	1600	N	1	81	1.2%
2,6-DINITROTOLUENE	6100	N	0	81	0.0%
2-CHLORONAPHTHALENE	630000		0	81	0.0%
2-CHLOROPHENOL	39000	N	0	81	0.0%
2-METHYLNAPHTHALENE	31000	N	0	81	0.0%
2-METHYLPHENOL	310000	N	0	81	0.0%
2-NITROANILINE	120		38	81	46.9%
2-NITROPHENOL	NC	N	0	81	0.0%
3,3'-DICHLOROBENZIDINE	1100	C	1	81	1.2%

Table 2
Subsurface Soil Detection Limit Evaluation
Portsmouth Naval Shipyard
Kittery, Maine

Parameter	Minimum Screening Level		Number of Non-Detects Exceeding Screening Levels	Number of Analyses	Percent Exceeding
3-NITROANILINE	1.4E+08		0	81	0.0%
4,6-DINITRO-2-METHYLPHENOL	610	N	35	81	43.2%
4-BROMOPHENYL PHENYL ETHER	NC		0	81	0.0%
4-CHLORO-3-METHYLPHENOL	NC		0	81	0.0%
4-CHLOROANILINE	2400		0	81	0.0%
4-CHLOROPHENYL PHENYL ETHER	NC		0	81	0.0%
4-METHYLPHENOL	31000	N	0	81	0.0%
4-NITROANILINE	24000		0	81	0.0%
4-NITROPHENOL	NC	N	0	81	0.0%
ACENAPHTHENE	340000	N	0	81	0.0%
ACENAPHTHYLENE	340000	N	0	81	0.0%
ANTHRACENE	1700000	N	0	81	0.0%
BAP EQUIVALENT-HALFND	15	C	14	81	17.3%
BAP EQUIVALENT-POS	15	C	0	81	0.0%
BENZO(A)ANTHRACENE	150	C	7	81	8.6%
BENZO(A)PYRENE	15	C	19	81	23.5%
BENZO(B)FLUORANTHENE	150	C	6	81	7.4%
BENZO(G,H,I)PERYLENE	170000		0	81	0.0%
BENZO(K)FLUORANTHENE	1500		0	81	0.0%
BIS(2-CHLOROETHOXY)METHANE	18000		0	81	0.0%
BIS(2-CHLOROETHYL)ETHER	190	C	35	81	43.2%
BIS(2-ETHYLHEXYL)PHTHALATE	35000	N	0	81	0.0%
BUTYL BENZYL PHTHALATE	260000		0	81	0.0%
CARBAZOLE	NC		0	81	0.0%
CHRYSENE	15000	C	0	81	0.0%
DI-N-BUTYL PHTHALATE	610000	N	0	81	0.0%
DI-N-OCTYL PHTHALATE	NC		0	81	0.0%
DIBENZO(A,H)ANTHRACENE	15	C	49	81	60.5%
DIBENZOFURAN	NC		0	81	0.0%
DIETHYL PHTHALATE	4900000	N	0	81	0.0%
DIMETHYL PHTHALATE	NC		0	81	0.0%
FLUORANTHENE	230000	N	0	81	0.0%
FLUORENE	230000	N	0	81	0.0%
HEXACHLOROBENZENE	300	C	33	81	40.7%
HEXACHLOROBUTADIENE	6100	N	0	81	0.0%
HEXACHLOROCYCLOPENTADIENE	2900		0	81	0.0%
HEXACHLOROETHANE	6100	N	0	81	0.0%
HIGH MOLECULAR WEIGHT PAHS	NC		0	81	0.0%
INDENO(1,2,3-CD)PYRENE	150	C	6	81	7.4%
ISOPHORONE	510000	N	0	81	0.0%
LOW MOLECULAR WEIGHT PAHS	NC		0	81	0.0%
N-NITROSO-DI-N-PROPYLAMINE	69		47	81	58.0%
N-NITROSODIPHENYLAMINE	99000		0	81	0.0%
NAPHTHALENE	3900	N	0	81	0.0%
NITROBENZENE	4400		0	81	0.0%
PENTACHLOROPHENOL	3000	C	1	81	1.2%
PHENANTHRENE	170000	N	0	81	0.0%
PHENOL	1800000	N	0	81	0.0%
PYRENE	170000	N	0	81	0.0%
Pesticides/PCBs (ug/kg)					
4,4'-DDD	2000	C	0	74	0.0%
4,4'-DDE	1400	C	0	74	0.0%
4,4'-DDT	1700	N	0	74	0.0%
ALDRIN	29	N	6	74	8.1%
ALPHA-BHC	77		4	74	5.4%

Table 2
Subsurface Soil Detection Limit Evaluation
Portsmouth Naval Shipyard
Kittery, Maine

Parameter	Minimum Screening Level		Number of Non-Detects Exceeding Screening Levels	Number of Analyses	Percent Exceeding
ALPHA-CHLORDANE	1600	N	0	74	0.0%
AROCLOR-1016	390		1	96	1.0%
AROCLOR-1221	170		3	96	3.1%
AROCLOR-1232	170		2	96	2.1%
AROCLOR-1242	220		2	96	2.1%
AROCLOR-1248	220		2	96	2.1%
AROCLOR-1254	110		2	96	2.1%
AROCLOR-1260	220		0	96	0.0%
BETA-BHC	270		0	74	0.0%
DELTA-BHC	NC		0	74	0.0%
DIELDRIN	30	C	6	74	8.1%
ENDOSULFAN I	37000		0	74	0.0%
ENDOSULFAN II	37000		0	74	0.0%
ENDOSULFAN SULFATE	37000		0	74	0.0%
ENDRIN	1800	N	0	74	0.0%
ENDRIN ALDEHYDE	1800		0	74	0.0%
ENDRIN KETONE	1800		0	74	0.0%
GAMMA-BHC (LINDANE)	520	N	0	74	0.0%
GAMMA-CHLORDANE	1600	N	0	74	0.0%
HEPTACHLOR	110	C	4	74	5.4%
HEPTACHLOR EPOXIDE	53		4	74	5.4%
METHOXYCHLOR	31000		0	74	0.0%
TOTAL AROCLOR	220		0	74	0.0%
TOTAL AROCLOR HALFND	220	C	0	96	0.0%
TOTAL AROCLOR ZEROND	220	C	0	96	0.0%
TOXAPHENE	440		8	74	10.8%
Petroleum Hydrocarbons (mg/kg)					
DIESEL RANGE ORGANICS	NC		0	30	0.0%
GASOLINE RANGE ORGANICS	NC		0	31	0.0%
Dioxins/Furans (ng/kg)					
1,2,3,4,6,7,8,9-OCDD	15000		0	15	0.0%
1,2,3,4,6,7,8,9-OCDF	15000		0	15	0.0%
1,2,3,4,6,7,8-HPCDD	450		0	15	0.0%
1,2,3,4,6,7,8-HPCDF	450		0	15	0.0%

Table 2
Subsurface Soil Detection Limit Evaluation
Portsmouth Naval Shipyard
Kittery, Maine

Parameter	Minimum Screening Level		Number of Non-Detects Exceeding Screening Levels	Number of Analyses	Percent Exceeding
1,2,3,4,7,8,9-HPCDF	450		0	15	0.0%
1,2,3,4,7,8-HXCDD	45		0	15	0.0%
1,2,3,4,7,8-HXCDF	45		0	15	0.0%
1,2,3,6,7,8-HXCDD	45		0	15	0.0%
1,2,3,6,7,8-HXCDF	45		0	15	0.0%
1,2,3,7,8,9-HXCDD	45		0	15	0.0%
1,2,3,7,8,9-HXCDF	45		0	15	0.0%
1,2,3,7,8-PECDD	4.5		0	15	0.0%
1,2,3,7,8-PECDF	150		0	15	0.0%
2,3,4,6,7,8-HXCDF	45		0	15	0.0%
2,3,4,7,8-PECDF	15		0	15	0.0%
2,3,7,8-TCDD	4.5		0	15	0.0%
2,3,7,8-TCDF	NC		0	15	0.0%
TEQ WHO-2005	4.5		0	15	0.0%
TEQ WHO-2005 - HALFND	4.5		0	15	0.0%
TOTAL HPCDD	NC		0	15	0.0%
TOTAL HPCDF	NC		0	15	0.0%
TOTAL HXCDD	NC		0	15	0.0%
TOTAL HXCDF	NC		0	15	0.0%
TOTAL PECDD	NC		0	15	0.0%
TOTAL PECDF	NC		0	15	0.0%
TOTAL TCDD	NC		0	15	0.0%
TOTAL TCDF	NC		0	15	0.0%
Inorganics (mg/kg)					
ALUMINUM	7700	N	0	85	0.0%
ANTIMONY	3.1	N	1	85	1.2%
ARSENIC	0.39	N	1	97	1.0%
BARIUM	1500	N	0	85	0.0%
BERYLLIUM	16	N	0	85	0.0%
CADMIUM	7	N	0	85	0.0%
CALCIUM	NC		0	85	0.0%
CHROMIUM	276	N	0	85	0.0%
COBALT	2.3	N	0	85	0.0%
COPPER	310	N	0	85	0.0%
IRON	5500	N	0	85	0.0%
LEAD	40		0	85	0.0%
MAGNESIUM	NC		0	85	0.0%
MANGANESE	7090	N	0	85	0.0%
MERCURY	0.43	N	0	85	0.0%
NICKEL	150	N	0	85	0.0%
POTASSIUM	NC		0	85	0.0%
SELENIUM	39	N	0	85	0.0%
SILVER	39	N	0	85	0.0%
SODIUM	NC		0	85	0.0%
THALLIUM	0.51	N	68	85	80.0%
VANADIUM	55	N	0	85	0.0%
ZINC	2300	N	0	85	0.0%

Table 2
Subsurface Soil Detection Limit Evaluation
Portsmouth Naval Shipyard
Kittery, Maine

Parameter	Minimum Screening Level		Number of Non-Detects Exceeding Screening Levels	Number of Analyses	Percent Exceeding
Miscellaneous Parameters					
SIEVE 1" %	NC		0	5	0.0%
SIEVE 1-1/2" %	NC		0	4	0.0%
SIEVE 1/2" %	NC		0	5	0.0%
SIEVE 3/4" %	NC		0	5	0.0%
SIEVE 3/8" %	NC		0	5	0.0%
SIEVE NO. 004 %	NC		0	5	0.0%
SIEVE NO. 010 %	NC		0	5	0.0%
SIEVE NO. 020 %	NC		0	5	0.0%
SIEVE NO. 040 %	NC		0	5	0.0%
SIEVE NO. 060 %	NC		0	5	0.0%
SIEVE NO. 100 %	NC		0	5	0.0%
SIEVE NO. 200 %	NC		0	5	0.0%
TOTAL SOLIDS %	NC		0	51	0.0%
BULK DENSITY LB/F3	NC		0	5	0.0%
CATION EXCHANGE CAPACITY MEQ/100	NC		0	4	0.0%
CYANIDE MG/KG	NC		0	29	0.0%
HEXAVALENT CHROMIUM	23		0	4	0.0%
TOTAL ORGANIC CARBON MG/KG	NC		0	29	0.0%
PH S.U.	NC		0	29	0.0%
POROSITY S.U.	NC		0	5	0.0%

Bolded and shaded parameters indicated that at least one non-detected result exceeds the corresponding screening level for that parameter.

C= Carcinogenic
N = Noncarcinogenic
NC = Not Calculated

Table 3
Sediment Detection Limit Evaluation
Portsmouth Naval Shipyard
Kittery, Maine

Parameter	Minimum Screening Level		Number of Non-Detects Exceeding Screening Levels	Number of Analyses	Percent Exceeding
Semivolatile Organics (ug/kg)					
1,1-BIPHENYL	110000	C	0	66	0.0%
1-METHYLNAPHTHALENE	110000	C	0	66	0.0%
1-METHYLPHENANTHRENE	910000	N	0	66	0.0%
2,3,5-TRIMETHYLNAPHTHALENE	910000	N	0	66	0.0%
2,6-DIMETHYLNAPHTHALENE	910000	N	0	66	0.0%
2-METHYLNAPHTHALENE	180000	N	0	72	0.0%
ACENAPHTHENE	2700000	N	0	72	0.0%
ACENAPHTHYLENE	2700000	N	0	72	0.0%
ANTHRACENE	1.4E+07	N	0	72	0.0%
BAP EQUIVALENT-HALFND	162		0	72	0.0%
BAP EQUIVALENT-POS	162		0	72	0.0%
BENZO(A)ANTHRACENE	2000	C	0	72	0.0%
BENZO(A)PYRENE	162	C	0	72	0.0%
BENZO(B)FLUORANTHENE	1620	C	0	72	0.0%
BENZO(E)PYRENE	910000	N	0	66	0.0%
BENZO(G,H,I)PERYLENE	1400000	N	0	72	0.0%
BENZO(K)FLUORANTHENE	16200	C	0	53	0.0%
CHRYSENE	162000	C	0	72	0.0%
DIBENZO(A,H)ANTHRACENE	162	C	0	72	0.0%
DIBENZOTHIOPHENE	NC		0	47	0.0%
FLUORANTHENE	1.1E+07	N	0	72	0.0%
FLUORENE	1800000	N	0	72	0.0%
HIGH MOLECULAR WEIGHT PAHS	NC		0	72	0.0%
INDENO(1,2,3-CD)PYRENE	1620	C	0	72	0.0%
LOW MOLECULAR WEIGHT PAHS	NC		0	72	0.0%
NAPHTHALENE	910000	N	0	72	0.0%
PERYLENE	5600000	N	0	66	0.0%
PHENANTHRENE	8400000	N	0	72	0.0%
PYRENE	8400000	N	0	72	0.0%
TOTAL PAHS	NC		0	19	0.0%
TOTAL PAHS ECO	NC		0	47	0.0%
Alkylated PAHs (ug/kg)					
C1-CHRYSENES	NC		0	47	0.0%
C1-DIBENZOTHIOPHENES	NC		0	47	0.0%
C1-FLUORANTHENES/PYRENES	NC		0	47	0.0%
C1-FLUORENES	NC		0	47	0.0%
C1-NAPHTHALENES	NC		0	47	0.0%
C1-PHENANTHRENES/ANTHRACENES	NC		0	47	0.0%
C2-CHRYSENES	NC		0	47	0.0%
C2-DIBENZOTHIOPHENES	NC		0	47	0.0%
C2-FLUORENES	NC		0	47	0.0%
C2-NAPHTHALENES	NC		0	47	0.0%
C2-PHENANTHRENES/ANTHRACENES	NC		0	47	0.0%
C3-CHRYSENES	NC		0	47	0.0%
C3-DIBENZOTHIOPHENES	NC		0	47	0.0%
C3-FLUORENES	NC		0	47	0.0%
C3-NAPHTHALENES	NC		0	47	0.0%
C3-PHENANTHRENES/ANTHRACENES	NC		0	47	0.0%
C4-CHRYSENES	NC		0	47	0.0%
C4-NAPHTHALENES	NC		0	47	0.0%
C4-PHENANTHRENES/ANTHRACENES	NC		0	47	0.0%
Pesticides/PCBs (ug/kg)					
1,2,3,4-TETRACHLOROBENZENE	NC		0	47	0.0%
1,2,4,5-TETRACHLOROBENZENE	17000	N	0	47	0.0%

Table 3
Sediment Detection Limit Evaluation
Portsmouth Naval Shipyard
Kittery, Maine

Parameter	Minimum Screening Level		Number of Non-Detects Exceeding Screening Levels	Number of Analyses	Percent Exceeding
2,4'-DDD	37000	C	0	47	0.0%
2,4'-DDE	26000	C	0	66	0.0%
2,4'-DDT	26000	C	0	66	0.0%
4,4'-DDD	37000	C	0	66	0.0%
4,4'-DDE	26000	C	0	66	0.0%
4,4'-DDT	26000	C	0	66	0.0%
ALDRIN	190	C	0	66	0.0%
ALPHA-BHC	1100	C	0	47	0.0%
ALPHA-CHLORDANE	20000	C	0	66	0.0%
BETA-BHC	4000	C	0	47	0.0%
CHLORPYRIFOS	170000	N	0	47	0.0%
CIS-NONACHLOR	NC		0	47	0.0%
DELTA-BHC	NC		0	47	0.0%
DIELDRIN	210	C	0	47	0.0%
ENDOSULFAN II	340000	N	0	47	0.0%
ENDRIN	17000	N	0	47	0.0%
GAMMA-BHC (LINDANE)	6500	C	0	66	0.0%
GAMMA-CHLORDANE	20000	C	0	47	0.0%
HEPTACHLOR	740	C	0	66	0.0%
HEPTACHLOR EPOXIDE	360	C	0	66	0.0%
HEXACHLOROBENZENE	2100	C	0	66	0.0%
MIREX	1800	C	0	66	0.0%
OXYCHLORDANE	NC		0	47	0.0%
PCB-101	NC		0	19	0.0%
PCB-101/90	NC		0	47	0.0%
PCB-105	NC		0	66	0.0%
PCB-114	NC		0	47	0.0%
PCB-118	NC		0	66	0.0%
PCB-126	NC		0	47	0.0%
PCB-128	NC		0	66	0.0%
PCB-138	NC		0	19	0.0%
PCB-138/160	NC		0	47	0.0%
PCB-149/123	NC		0	47	0.0%
PCB-153	NC		0	19	0.0%
PCB-153/132	NC		0	47	0.0%
PCB-156	NC		0	47	0.0%
PCB-167	NC		0	47	0.0%
PCB-169	NC		0	47	0.0%
PCB-170	NC		0	19	0.0%
PCB-170/190	NC		0	47	0.0%
PCB-18	NC		0	19	0.0%
PCB-18/17	NC		0	47	0.0%
PCB-180	NC		0	66	0.0%
PCB-185	NC		0	19	0.0%
PCB-187	NC		0	47	0.0%
PCB-189	NC		0	47	0.0%
PCB-195	NC		0	19	0.0%
PCB-195/208	NC		0	47	0.0%
PCB-201	NC		0	19	0.0%
PCB-201/157/173	NC		0	47	0.0%
PCB-206	NC		0	66	0.0%
PCB-209	NC		0	47	0.0%
PCB-28	NC		0	66	0.0%
PCB-29	NC		0	19	0.0%
PCB-44	NC		0	66	0.0%

Table 3
Sediment Detection Limit Evaluation
Portsmouth Naval Shipyard
Kittery, Maine

Parameter	Minimum Screening Level		Number of Non-Detects Exceeding Screening Levels	Number of Analyses	Percent Exceeding
PCB-50	NC		0	19	0.0%
PCB-52	NC		0	66	0.0%
PCB-66	NC		0	66	0.0%
PCB-77	NC		0	47	0.0%
PCB-8	NC		0	19	0.0%
PCB-8/5	NC		0	47	0.0%
PCB-81	NC		0	47	0.0%
PCB-87	NC		0	19	0.0%
PENTACHLOROANISOLE	NC		0	47	0.0%
PENTACHLOROBENZENE	45000	N	0	47	0.0%
TEQ PCB	NC		0	47	0.0%
TEQ PCB-HH-HALFND	NC		0	66	0.0%
TEQ PCB BIRD	NC		0	47	0.0%
TEQ PCB BIRD HALFND	NC		0	47	0.0%
TEQ PCB FISH	NC		0	47	0.0%
TEQ PCB FISH HALFND	NC		0	47	0.0%
TEQ PCB HALFND	NC		0	47	0.0%
TOTAL AROCLOR	1200	C	0	19	0.0%
TOTAL DDT HALFND	NC		0	47	0.0%
TOTAL DDT POS	NC		0	47	0.0%
TOTAL PCB CONGENERS	1200	C	0	66	0.0%
TOTAL PCB CONGENERS-HH-HALFND	NC		0	66	0.0%
TRANS-NONACHLOR	NC		0	66	0.0%
AVS/SEM (mg/kg)					
ACID VOLATILE SULFIDE	NC		0	33	0.0%
CADMIUM	78000	N	0	52	0.0%
COPPER	8000000	N	0	52	0.0%
LEAD	400000	0	0	52	0.0%
NICKEL	510000	N	0	52	0.0%
ZINC	6E+07	N	0	52	0.0%
HF Metals (mg/kg)					
ALUMINUM	2E+08	N	0	50	0.0%
ARSENIC	5900	C	0	50	0.0%
CADMIUM	78000	N	0	50	0.0%
CHROMIUM	NC		0	50	0.0%
COPPER	8000000	N	0	50	0.0%
IRON	1.4E+08	N	0	50	0.0%
LEAD	400000	0	0	50	0.0%
MANGANESE	610000	N	0	50	0.0%
MERCURY	NC		0	50	0.0%
NICKEL	510000	N	0	50	0.0%
SILVER	130000	N	0	50	0.0%
ZINC	6E+07	N	0	50	0.0%
Inorganics (mg/kg)					
ALUMINUM	2E+08	N	0	22	0.0%
ARSENIC	5900	C	0	22	0.0%
CADMIUM	78000	N	0	22	0.0%
CHROMIUM	NC		0	22	0.0%
COPPER	8000000	N	0	121	0.0%
IRON	1.4E+08	N	0	22	0.0%
LEAD	400000	0	0	22	0.0%
MANGANESE	610000	N	0	22	0.0%
MERCURY	NC		0	19	0.0%
NICKEL	510000	N	0	99	0.0%
SILVER	130000	N	0	22	0.0%

Table 3
Sediment Detection Limit Evaluation
Portsmouth Naval Shipyard
Kittery, Maine

Parameter	Minimum Screening Level		Number of Non-Detects Exceeding Screening Levels	Number of Analyses	Percent Exceeding
ZINC	6E+07	N	0	22	0.0%
Miscellaneous Parameters					
CYANIDE	4010000	N	0	15	0.0%
ORGANIC MATTER %	NC		0	10	0.0%
PERCENT CLAY %	NC		0	50	0.0%
PERCENT GRAVEL %	NC		0	14	0.0%
PERCENT SAND %	NC		0	50	0.0%
PERCENT SILT %	NC		0	50	0.0%
PH S.U.	NC		0	15	0.0%
TOTAL ORGANIC CARBON %	NC		0	61	0.0%
TOTAL SOLIDS %	NC		0	80	0.0%

Bolded and shaded parameters indicated that at least one non-detected result exceeds the corresponding screening level for that parameter.

C= Carcinogenic
N = Noncarcinogenic
NC = Not Calculated

Table 4
Seep Water Detection Limit Evaluation
Portsmouth Naval Shipyard
Kittery, Maine

Paramter	Minimum Screening Level		Number of Non-Detects Exceeding Screening Levels	Number of Analyses	Percent Exceeding
Semivolatile Organics (ng/L)					
1,1-BIPHENYL	870000	N	0	19	0.0%
1-METHYLNAPHTHALENE	27000	C	0	19	0.0%
1-METHYLPHENANTHRENE	65000	N	0	19	0.0%
2,3,5-TRIMETHYLNAPHTHALENE	70000	N	0	19	0.0%
2,6-DIMETHYLNAPHTHALENE	180000	N	0	19	0.0%
2-METHYLNAPHTHALENE	60000	N	0	19	0.0%
ACENAPHTHENE	880000	N	0	19	0.0%
ACENAPHTHYLENE	720000	N	0	19	0.0%
ANTHRACENE	2400000	N	0	19	0.0%
BAP EQUIVALENT-HALFND	500	C	0	19	0.0%
BAP EQUIVALENT-POS	500	C	0	19	0.0%
BENZO(A)ANTHRACENE	5000	C	0	19	0.0%
BENZO(A)PYRENE	500	C	0	19	0.0%
BENZO(B)FLUORANTHENE	5000	C	0	19	0.0%
BENZO(E)PYRENE	NC		0	19	0.0%
BENZO(G,H,I)PERYLENE	16000	N	0	19	0.0%
CHRYSENE	500000	C	0	19	0.0%
DIBENZO(A,H)ANTHRACENE	500	C	0	19	0.0%
FLUORANTHENE	180000	N	0	19	0.0%
FLUORENE	4600000	C	0	19	0.0%
HIGH MOLECULAR WEIGHT PAHS	NC		0	19	0.0%
INDENO(1,2,3-CD)PYRENE	5000	C	0	19	0.0%
LOW MOLECULAR WEIGHT PAHS	NC		0	19	0.0%
NAPHTHALENE	530000	N	0	19	0.0%
PERYLENE	NC		0	19	0.0%
PHENANTHRENE	240000	N	0	19	0.0%
PYRENE	1600000	C	0	19	0.0%
TOTAL PAHS	NC		0	15	0.0%
Pesticides/PCBs (ng/L)					
2,4'-DDE	NC		0	19	0.0%
2,4'-DDT	23000	C	0	19	0.0%
4,4'-DDD	NC		0	19	0.0%
4,4'-DDE	23000	C	0	19	0.0%
4,4'-DDT	23000	C	0	19	0.0%
ALDRIN	300	C	0	19	0.0%
ALPHA-CHLORDANE	2000	C	0	19	0.0%
GAMMA-BHC (LINDANE)	2100	C	0	19	0.0%
HEPTACHLOR	400	C	0	19	0.0%
HEPTACHLOR EPOXIDE	80	C	0	19	0.0%
HEXACHLOROBENZENE	5000	C	0	19	0.0%
MIREX	64	C	0	19	0.0%
PCB-101	NC		0	19	0.0%
PCB-105	NC		0	19	0.0%
PCB-118	NC		0	19	0.0%
PCB-128	NC		0	19	0.0%
PCB-138	NC		0	19	0.0%
PCB-153	NC		0	19	0.0%
PCB-170	NC		0	19	0.0%
PCB-18	NC		0	19	0.0%
PCB-180	NC		0	19	0.0%
PCB-185	NC		0	19	0.0%
PCB-195	NC		0	19	0.0%
PCB-201	NC		0	19	0.0%
PCB-206	NC		0	19	0.0%

Table 4
Seep Water Detection Limit Evaluation
Portsmouth Naval Shipyard
Kittery, Maine

Paramter	Minimum Screening Level		Number of Non-Detects Exceeding Screening Levels	Number of Analyses	Percent Exceeding
PCB-28	NC		0	19	0.0%
PCB-29	NC		0	19	0.0%
PCB-44	NC		0	19	0.0%
PCB-50	NC		0	19	0.0%
PCB-52	NC		0	19	0.0%
PCB-66	NC		0	19	0.0%
PCB-8	NC		0	19	0.0%
PCB-87	NC		0	19	0.0%
TEQ PCB-HH-HALFND	NC		0	19	0.0%
TOTAL AROCLOR	4000	C	0	18	0.0%
TOTAL PCB CONGENERS	4000	C	0	18	0.0%
TOTAL PCB CONGENERS-HH-HALFND	NC		0	19	0.0%
TRANS-NONACHLOR	NC		0	19	0.0%
Inorganics (ug/L)					
ALUMINUM	130000	N	0	19	0.0%
ARSENIC	4.9	C	17	19	89.5%
CADMIUM	27	N	0	19	0.0%
CHROMIUM	NC		0	19	0.0%
COPPER	5200	N	0	19	0.0%
IRON	91000	N	0	19	0.0%
LEAD	950	0	0	19	0.0%
MANGANESE	1120	N	0	19	0.0%
MERCURY	NC		0	19	0.0%
NICKEL	2010	N	0	19	0.0%
SILVER	320	N	0	19	0.0%
ZINC	40200	N	0	19	0.0%
Filtered Inorganics (ug/L)					
ALUMINUM	130000	N	0	19	0.0%
ARSENIC	4.9	C	17	19	89.5%
CADMIUM	27	N	0	19	0.0%
CHROMIUM	NC		0	19	0.0%
COPPER	5200	N	0	19	0.0%
IRON	91000	N	0	19	0.0%
LEAD	950		0	19	0.0%
MANGANESE	1120	N	0	19	0.0%
MERCURY	NC		0	19	0.0%
NICKEL	2010	N	0	19	0.0%
SILVER	320	N	0	19	0.0%
ZINC	40200	N	0	19	0.0%
Miscellaneous Parameters					
CYANIDE	NC		0	17	0.0%

Bolded and shaded parameters indicated that at least one non-detected result exceeds the

C= Carcinogenic
N = Noncarcinogenic
NC = Not Calculated

Table 5
Surface Soil Detection Limit Evaluation
Portsmouth Naval Shipyard
Kittery, Maine

Parameter	Minimum Screening Value		Number of Non-Detects Exceeding Screening Levels	Number of Analyses	Percent Exceeding
Volatile Organics (ug/kg)					
1,1,1-TRICHLOROETHANE	900000	N	0	17	0.0%
1,1,2,2-TETRACHLOROETHANE	580	C	0	17	0.0%
1,1,2-TRICHLOROETHANE	970	C	0	17	0.0%
1,1,2-TRICHLOROTRIFLUOROETHANE	930000	sat	0	16	0.0%
1,1-DICHLOROETHANE	3400	C	0	17	0.0%
1,1-DICHLOROETHENE	25000	N	0	17	0.0%
1,2-DICHLOROETHANE	360	C	0	17	0.0%
1,2-DICHLOROPROPANE	930	C	0	17	0.0%
2-BUTANONE	2800000	N	0	17	0.0%
2-HEXANONE	NC		0	17	0.0%
4-METHYL-2-PENTANONE	530000	N	0	17	0.0%
ACETONE	6100000	N	0	17	0.0%
BENZENE	830	C	0	17	0.0%
BROMODICHLOROMETHANE	280	C	0	17	0.0%
BROMOFORM	52000	C	0	17	0.0%
BROMOMETHANE	790	N	0	17	0.0%
CARBON DISULFIDE	67000	N	0	17	0.0%
CARBON TETRACHLORIDE	250	C	0	17	0.0%
CHLOROBENZENE	13000	N	0	17	0.0%
CHLORODIBROMOMETHANE	470	C	0	17	0.0%
CHLOROETHANE	1200000	sat	0	17	0.0%
CHLOROFORM	280	C	0	17	0.0%
CHLOROMETHANE	2100	C	0	17	0.0%
CIS-1,3-DICHLOROPROPENE	NC		0	17	0.0%
ETHYLBENZENE	5700	C	0	17	0.0%
METHYLENE CHLORIDE	11000	C	0	17	0.0%
STYRENE	650000	N	0	17	0.0%
TETRACHLOROETHENE	570	C	0	17	0.0%
TOLUENE	500000	N	0	17	0.0%
TOTAL 1,2-DICHLOROETHENE	70000	N	0	17	0.0%
TOTAL XYLENES	60000	N	0	17	0.0%
TRANS-1,3-DICHLOROPROPENE	NC		0	17	0.0%
TRICHLOROETHENE	71	C	0	17	0.0%
VINYL ACETATE	98000	N	0	1	0.0%
VINYL CHLORIDE	60	C	0	17	0.0%
Semivolatile Organics (ug/kg)					
1,2,4-TRICHLOROBENZENE	8700	N	0	46	0.0%
1,2-DICHLOROBENZENE	200000	N	0	46	0.0%
1,3-DICHLOROBENZENE	NC		0	46	0.0%
1,4-DICHLOROBENZENE	2600	C	2	46	4.3%
2,2'-OXYBIS(1-CHLOROPROPANE)	3500	C	2	57	3.5%
2,4,5-TRICHLOROPHENOL	610000	N	0	57	0.0%
2,4,6-TRICHLOROPHENOL	6100	N	2	57	3.5%
2,4-DICHLOROPHENOL	18000	N	0	57	0.0%
2,4-DIMETHYLPHENOL	120000	N	0	57	0.0%
2,4-DINITROPHENOL	12000	N	2	57	3.5%
2,4-DINITROTOLUENE	1600	C	2	57	3.5%
2,6-DINITROTOLUENE	6100	N	2	57	3.5%
2-CHLORONAPHTHALENE	630000	N	0	57	0.0%
2-CHLOROPHENOL	39000	N	0	57	0.0%
2-METHYLNAPHTHALENE	31000	N	0	57	0.0%
2-METHYLPHENOL	310000	N	0	57	0.0%
2-NITROANILINE	120	N	31	57	54.4%
2-NITROPHENOL	NC		0	57	0.0%

Table 5
Surface Soil Detection Limit Evaluation
Portsmouth Naval Shipyard
Kittery, Maine

Parameter	Minimum Screening Value		Number of Non-Detects Exceeding Screening Levels	Number of Analyses	Percent Exceeding
3,3'-DICHLOROBENZIDINE	1100	C	2	57	3.5%
3-NITROANILINE	1.4E+08	N	0	57	0.0%
4,6-DINITRO-2-METHYLPHENOL	610	N	24	57	42.1%
4-BROMOPHENYL PHENYL ETHER	NC		0	57	0.0%
4-CHLORO-3-METHYLPHENOL	NC		0	57	0.0%
4-CHLOROANILINE	2400	C	2	57	3.5%
4-CHLOROPHENYL PHENYL ETHER	NC		0	57	0.0%
4-HYDROXY-4-METHYL-2-PENTANONE	NC		0	1	0.0%
4-METHYLPHENOL	31000	N	0	57	0.0%
4-NITROANILINE	24000	C	0	57	0.0%
4-NITROPHENOL	NC		0	57	0.0%
ACENAPHTHENE	340000	N	0	57	0.0%
ACENAPHTHYLENE	340000		0	57	0.0%
ANTHRACENE	1700000	N	0	57	0.0%
BAP EQUIVALENT-HALFND	15		14	57	24.6%
BAP EQUIVALENT-POS	15		0	57	0.0%
BENZO(A)ANTHRACENE	150	C	3	57	5.3%
BENZO(A)PYRENE	15	C	16	57	28.1%
BENZO(B)FLUORANTHENE	150	C	2	57	3.5%
BENZO(G,H,I)PERYLENE	170000		0	57	0.0%
BENZO(K)FLUORANTHENE	1500	C	1	57	1.8%
BENZOIC ACID	2.4E+07	N	0	1	0.0%
BENZYL ALCOHOL	3100000	N	0	1	0.0%
BIS(2-CHLOROETHOXY)METHANE	18000	N	0	57	0.0%
BIS(2-CHLOROETHYL)ETHER	190	C	20	57	35.1%
BIS(2-ETHYLHEXYL)PHTHALATE	35000	C	0	57	0.0%
BUTYL BENZYL PHTHALATE	260000	C	0	57	0.0%
CARBAZOLE	NC		0	56	0.0%
CHRYSENE	15000	C	0	57	0.0%
DI-N-BUTYL PHTHALATE	610000	N	0	57	0.0%
DI-N-OCTYL PHTHALATE	NC		0	57	0.0%
DIBENZO(A,H)ANTHRACENE	15	C	36	57	63.2%
DIBENZOFURAN	NC		0	57	0.0%
DIETHYL PHTHALATE	4900000	N	0	57	0.0%
DIMETHYL PHTHALATE	NC		0	57	0.0%
FLUORANTHENE	230000	N	0	57	0.0%
FLUORENE	230000	N	0	57	0.0%
HEXACHLOROBENZENE	300	C	20	57	35.1%
HEXACHLOROBUTADIENE	6100	N	2	57	3.5%
HEXACHLOROCYCLOPENTADIENE	2900	N	2	57	3.5%
HEXACHLOROETHANE	6100	N	2	57	3.5%
HIGH MOLECULAR WEIGHT PAHS	NC		0	57	0.0%
INDENO(1,2,3-CD)PYRENE	150	C	5	57	8.8%
ISOPHORONE	510000	C	0	57	0.0%
LOW MOLECULAR WEIGHT PAHS	NC		0	57	0.0%
N-NITROSO-DI-N-PROPYLAMINE	69	C	32	57	56.1%
N-NITROSODIPHENYLAMINE	99000	C	0	57	0.0%
NAPHTHALENE	3900	C	2	57	3.5%
NITROBENZENE	4400	C	2	57	3.5%
PENTACHLOROPHENOL	3000	C	2	57	3.5%
PHENANTHRENE	170000		0	57	0.0%
PHENOL	1800000	N	0	57	0.0%
PYRENE	170000	N	0	57	0.0%
Pesticides/PCBs (ug/kg)					
4,4'-DDD	2000	C	0	46	0.0%

Table 5
Surface Soil Detection Limit Evaluation
Portsmouth Naval Shipyard
Kittery, Maine

Parameter	Minimum Screening Value		Number of Non-Detects Exceeding Screening Levels	Number of Analyses	Percent Exceeding
4,4'-DDE	1400	C	0	46	0.0%
4,4'-DDT	1700	C	0	46	0.0%
ALDRIN	29	C	0	46	0.0%
ALPHA-BHC	77	C	0	46	0.0%
ALPHA-CHLORDANE	1600		0	46	0.0%
AROCLOR-1016	390	N	0	67	0.0%
AROCLOR-1221	170	C	7	67	10.4%
AROCLOR-1232	170	C	6	67	9.0%
AROCLOR-1242	220	C	3	67	4.5%
AROCLOR-1248	220	C	1	67	1.5%
AROCLOR-1254	110	N	7	67	10.4%
AROCLOR-1260	220	C	3	67	4.5%
BETA-BHC	270	C	0	46	0.0%
DELTA-BHC	NC		0	46	0.0%
DIELDRIN	30	C	0	46	0.0%
ENDOSULFAN I	37000		0	46	0.0%
ENDOSULFAN II	37000		0	46	0.0%
ENDOSULFAN SULFATE	37000		0	46	0.0%
ENDRIN	1800	N	0	46	0.0%
ENDRIN ALDEHYDE	1800		0	45	0.0%
ENDRIN KETONE	1800		0	46	0.0%
GAMMA-BHC (LINDANE)	520	C	0	46	0.0%
GAMMA-CHLORDANE	1600		0	46	0.0%
HEPTACHLOR	110	C	0	46	0.0%
HEPTACHLOR EPOXIDE	53	C	0	46	0.0%
METHOXYCHLOR	31000	N	0	46	0.0%
TOTAL AROCLOR	220	C	0	46	0.0%
TOTAL AROCLOR HALFND	NC		0	67	0.0%
TOTAL AROCLOR ZEROND	NC		0	67	0.0%
TOXAPHENE	440	C	5	46	10.9%
Petroleum Hydrocarbons (mg/kg)					
DIESEL RANGE ORGANICS	NC		0	13	0.0%
GASOLINE RANGE ORGANICS	NC		0	13	0.0%
Dioxins/Furans (ng/kg)					
1,2,3,4,6,7,8,9-OCDD	15000		0	13	0.0%
1,2,3,4,6,7,8,9-OCDF	15000		0	13	0.0%
1,2,3,4,6,7,8-HPCDD	450		0	13	0.0%
1,2,3,4,6,7,8-HPCDF	450		0	13	0.0%
1,2,3,4,7,8,9-HPCDF	450		0	13	0.0%
1,2,3,4,7,8-HXCDD	45		0	13	0.0%
1,2,3,4,7,8-HXCDF	45		0	13	0.0%
1,2,3,6,7,8-HXCDD	45		0	13	0.0%
1,2,3,6,7,8-HXCDF	45		0	13	0.0%
1,2,3,7,8,9-HXCDD	45		0	13	0.0%
1,2,3,7,8,9-HXCDF	45		0	13	0.0%
1,2,3,7,8-PECDD	4.5		0	13	0.0%
1,2,3,7,8-PECDF	150		0	13	0.0%
2,3,4,6,7,8-HXCDF	45		0	13	0.0%
2,3,4,7,8-PECDF	15		0	13	0.0%
2,3,7,8-TCDD	4.5	C	0	13	0.0%
2,3,7,8-TCDF	NC		0	13	0.0%
TEQ WHO-1998	NC		0	13	0.0%
TEQ WHO-1998 - HALFND	NC		0	13	0.0%
TEQ WHO-2005	NC		0	13	0.0%
TEQ WHO-2005 - HALFND	4.5		0	13	0.0%

Table 5
Surface Soil Detection Limit Evaluation
Portsmouth Naval Shipyard
Kittery, Maine

Parameter	Minimum Screening Value		Number of Non-Detects Exceeding Screening Levels	Number of Analyses	Percent Exceeding
TOTAL HPCDD	NC		0	13	0.0%
TOTAL HPCDF	NC		0	13	0.0%
TOTAL HXCDD	NC		0	13	0.0%
TOTAL HXCDF	NC		0	13	0.0%
TOTAL PECDD	NC		0	13	0.0%
TOTAL PECDF	NC		0	13	0.0%
TOTAL TCDD	NC		0	13	0.0%
TOTAL TCDF	NC		0	13	0.0%
Inorganics (mg/kg)					
ALUMINUM	7700	N	0	57	0.0%
ANTIMONY	3.1	N	1	57	1.8%
ARSENIC	0.39	C	1	61	1.6%
BARIUM	1500	N	0	57	0.0%
BERYLLIUM	16	N	0	57	0.0%
CADMIUM	7	N	0	57	0.0%
CALCIUM	NC		0	57	0.0%
CHROMIUM	276	C	0	57	0.0%
COBALT	2.3	N	0	57	0.0%
COPPER	310	N	0	57	0.0%
CYANIDE	160	N	0	17	0.0%
IRON	5500	N	0	57	0.0%
LEAD	40	N	0	57	0.0%
MAGNESIUM	NC		0	57	0.0%
MANGANESE	7090	N	0	57	0.0%
MERCURY	0.43	N	0	57	0.0%
NICKEL	150	N	0	57	0.0%
POTASSIUM	NC		0	57	0.0%
SELENIUM	39	N	0	57	0.0%
SILVER	39	N	0	57	0.0%
SODIUM	NC		0	57	0.0%
THALLIUM	0.51	N	37	57	64.9%
VANADIUM	55	N	0	57	0.0%
ZINC	2300	N	0	57	0.0%
Miscellaneous Parameters					
CATION EXCHANGE CAPACITY MEQ/1	NC		0	2	0.0%
CYANIDE MG/KG	NC		0	17	0.0%
HEXAVALENT CHROMIUM MG/KG	23		0	2	0.0%
PH S.U.	NC		0	17	0.0%
TOTAL ORGANIC CARBON %	NC		0	1	0.0%
TOTAL ORGANIC CARBON MG/KG	NC		0	18	0.0%
TOTAL SOLIDS %	NC		0	28	0.0%

Bolded and shaded parameters indicated that at least one non-detected result exceeds the corresponding screening level for that parameter.

C= Carcinogenic
N = Noncarcinogenic
NC = Not Calculated

Table 6
Surface Water Detection Limit Evaluation
Portsmouth Naval Shipyard
Kittery, Maine

Parameter	Minimum Screening Level		Number of Non-Detects Exceeding Screening Levels	Number of Analyses	Percent Exceeding
Semivolatile Organics (ug/L)					
1,2,4-TRICHLOROBENZENE	240	C	0	7	0.0%
1,2-DICHLOROBENZENE	2400	N	0	7	0.0%
1,3-DICHLOROBENZENE	NC		0	7	0.0%
1,4-DICHLOROBENZENE	270	C	0	7	0.0%
2,2'-OXYBIS(1-CHLOROPROPANE)	59	C	0	7	0.0%
2,4,5-TRICHLOROPHENOL	25000	C	0	7	0.0%
2,4,6-TRICHLOROPHENOL	120	C	0	7	0.0%
2,4-DICHLOROPHENOL	130	N	0	7	0.0%
2,4-DIMETHYLPHENOL	1400	N	0	7	0.0%
2,4-DINITROPHENOL	240	N	0	7	0.0%
2,4-DINITROTOLUENE	18	C	0	7	0.0%
2,6-DINITROTOLUENE	110	N	0	7	0.0%
2-CHLORONAPHTHALENE	12000	C	0	7	0.0%
2-CHLOROPHENOL	390	N	0	7	0.0%
2-METHYLNAPHTHALENE	60	N	0	7	0.0%
2-METHYLPHENOL	4100	N	0	7	0.0%
2-NITROANILINE	2900	C	0	7	0.0%
2-NITROPHENOL	NC		0	7	0.0%
3,3'-DICHLOROBENZIDINE	5	C	0	7	0.0%
3-NITROANILINE	NC		0	7	0.0%
4,6-DINITRO-2-METHYLPHENOL	9.9	N	0	7	0.0%
4-BROMOPHENYL PHENYL ETHER	NC		0	7	0.0%
4-CHLORO-3-METHYLPHENOL	NC		0	7	0.0%
4-CHLOROANILINE	26	C	0	7	0.0%
4-CHLOROPHENYL PHENYL ETHER	NC		0	7	0.0%
4-METHYLPHENOL	410	N	0	7	0.0%
4-NITROANILINE	320	C	0	7	0.0%
4-NITROPHENOL	NC		0	7	0.0%
ACENAPHTHENE	880	N	0	7	0.0%
ACENAPHTHYLENE	720	N	0	7	0.0%
ANTHRACENE	2400	N	0	7	0.0%
BAP EQUIVALENT-HALFND	0.5	C	0	7	0.0%
BAP EQUIVALENT-POS	0.5	C	0	7	0.0%
BENZO(A)ANTHRACENE	5	C	0	7	0.0%
BENZO(A)PYRENE	0.5	C	0	7	0.0%
BENZO(B)FLUORANTHENE	5	C	0	7	0.0%
BENZO(G,H,I)PERYLENE	16	N	0	7	0.0%
BENZO(K)FLUORANTHENE	NC		0	7	0.0%
BIS(2-CHLOROETHOXY)METHANE	2700	C	0	7	0.0%
BIS(2-CHLOROETHYL)ETHER	6	C	0	7	0.0%
BIS(2-ETHYLHEXYL)PHTHALATE	53	C	0	7	0.0%
BUTYL BENZYL PHTHALATE	360	C	0	7	0.0%
CARBAZOLE	NC		0	7	0.0%
CHRYSENE	500	C	0	7	0.0%
DI-N-BUTYL PHTHALATE	2500	N	0	7	0.0%
DI-N-OCTYL PHTHALATE	NC		0	7	0.0%
DIBENZO(A,H)ANTHRACENE	0.5	C	0	7	0.0%
DIBENZOFURAN	NC		0	7	0.0%
DIETHYL PHTHALATE	71000	N	0	7	0.0%
DIMETHYL PHTHALATE	NC		0	7	0.0%
FLUORANTHENE	180	N	0	7	0.0%
FLUORENE	4600	C	0	7	0.0%
HEXACHLOROBENZENE	5	C	0	7	0.0%

Table 6
Surface Water Detection Limit Evaluation
Portsmouth Naval Shipyard
Kittery, Maine

Parameter	Minimum Screening Level		Number of Non-Detects Exceeding Screening Levels	Number of Analyses	Percent Exceeding
HEXACHLOROBUTADIENE	6	C	0	7	0.0%
HEXACHLOROCYCLOPENTADIENE	390	C	0	7	0.0%
HEXACHLOROETHANE	89	C	0	7	0.0%
HIGH MOLECULAR WEIGHT PAHS	NC		0	7	0.0%
INDENO(1,2,3-CD)PYRENE	5	C	0	7	0.0%
ISOPHORONE	6100	C	0	7	0.0%
LOW MOLECULAR WEIGHT PAHS	NC		0	7	0.0%
N-NITROSO-DI-N-PROPYLAMINE	0.9	C	7	7	100.0%
N-NITROSODIPHENYLAMINE	530	C	0	7	0.0%
NAPHTHALENE	530	N	0	7	0.0%
NITROBENZENE	1800	C	0	7	0.0%
PENTACHLOROPHENOL	0.9	C	7	7	100.0%
PHENANTHRENE	240	N	0	7	0.0%
PHENOL	30000	N	0	7	0.0%
PYRENE	1600	C	0	7	0.0%
Pesticides/PCBs (ug/L)					
4,4'-DDD	NC		0	7	0.0%
4,4'-DDE	23	C	0	7	0.0%
4,4'-DDT	23	C	0	7	0.0%
ALDRIN	0.3	C	0	7	0.0%
ALPHA-BHC	0.21	C	0	7	0.0%
ALPHA-CHLORDANE	2	C	0	7	0.0%
AROCLOR-1016	4	C	0	7	0.0%
AROCLOR-1221	4	C	0	7	0.0%
AROCLOR-1232	4	C	0	7	0.0%
AROCLOR-1242	4	C	0	7	0.0%
AROCLOR-1248	4	C	0	7	0.0%
AROCLOR-1254	4	C	0	7	0.0%
AROCLOR-1260	4	C	0	7	0.0%
BETA-BHC	0.73	C	0	7	0.0%
DELTA-BHC	0.21	C	0	7	0.0%
DIELDRIN	0.092	C	0	7	0.0%
ENDOSULFAN I	4400	C	0	7	0.0%
ENDOSULFAN II	4200	C	0	7	0.0%
ENDOSULFAN SULFATE	4300	C	0	7	0.0%
ENDRIN	8.2	N	0	7	0.0%
ENDRIN ALDEHYDE	160	C	0	7	0.0%
ENDRIN KETONE	49	C	0	7	0.0%
GAMMA-BHC (LINDANE)	2.1	C	0	7	0.0%
GAMMA-CHLORDANE	1.6		0	7	0.0%
HEPTACHLOR	0.4	C	0	7	0.0%
HEPTACHLOR EPOXIDE	0.08	C	0	7	0.0%
METHOXYCHLOR	NC		0	7	0.0%
TOTAL AROCLOR HALFND	4	C	0	7	0.0%
TOTAL AROCLOR ZEROND	4	C	0	7	0.0%
TOXAPHENE	1.1	C	0	7	0.0%
Inorganics (ug/L)					
ALUMINUM	130000	N	0	7	0.0%
ANTIMONY	36.6	N	0	7	0.0%
ARSENIC	4.9	C	7	7	100.0%

Table 6
Surface Water Detection Limit Evaluation
Portsmouth Naval Shipyard
Kittery, Maine

Parameter	Minimum Screening Level		Number of Non-Detects Exceeding Screening Levels	Number of Analyses	Percent Exceeding
BARIUM	13000	N	0	7	0.0%
BERYLLIUM	23	N	0	7	0.0%
CADMIUM	27	N	0	7	0.0%
CALCIUM	NC		0	7	0.0%
CHROMIUM	NC		0	7	0.0%
COBALT	39	N	0	7	0.0%
COPPER	5200	N	0	7	0.0%
IRON	91000	N	0	7	0.0%
LEAD	950		0	7	0.0%
MAGNESIUM	NC		0	7	0.0%
MANGANESE	1120	N	0	7	0.0%
MERCURY	NC		0	7	0.0%
NICKEL	2010	N	0	7	0.0%
POTASSIUM	NC		0	7	0.0%
SELENIUM	650	N	0	7	0.0%
SILICON	NC		0	7	0.0%
SILVER	320	N	0	7	0.0%
SODIUM	NC		0	7	0.0%
THALLIUM	8.45	N	7	7	100.0%
VANADIUM	650	N	0	7	0.0%
ZINC	40200	N	0	7	0.0%
Filtered Inorganics (ug/L)					
ALUMINUM	130000	N	0	7	0.0%
ANTIMONY	36.6	N	0	7	0.0%
ARSENIC	4.9	C	7	7	100.0%
BARIUM	13000	N	0	7	0.0%
BERYLLIUM	23	N	0	7	0.0%
CADMIUM	27	N	0	7	0.0%
CALCIUM	NC		0	7	0.0%
CHROMIUM	NC		0	7	0.0%
COBALT	39	N	0	7	0.0%
COPPER	5200	N	0	7	0.0%
IRON	91000	N	0	7	0.0%
LEAD	950		0	7	0.0%
MAGNESIUM	NC		0	7	0.0%
MANGANESE	1120	N	0	7	0.0%
MERCURY	NC		0	7	0.0%
NICKEL	2010	N	0	7	0.0%
POTASSIUM	NC		0	7	0.0%
SELENIUM	650	N	0	7	0.0%
SILICON	NC		0	7	0.0%
SILVER	320	N	0	7	0.0%
SODIUM	NC		0	7	0.0%
THALLIUM	8.45	N	7	7	100.0%
VANADIUM	650	N	0	7	0.0%
ZINC	40200	N	0	7	0.0%

Bolded and shaded parameters indicated that at least one non-detected result exceeds the corresponding screening level for that parameter.

C= Carcinogenic
N = Noncarcinogenic
NC = Not Calculated

APPENDIX D.5

CALCULATED SCREENING LEVEL METHODOLOGY

APPENDIX D.5.1

Risk-Based Screening Level Development Updates for Surface Water and Sediment at Portsmouth Naval Shipyard

RISK-BASED SCREENING LEVEL DEVELOPMENT UPDATES FOR SURFACE WATER AND SEDIMENT AT PORTSMOUTH NAVAL SHIPYARD JULY 2011

Screening levels were calculated for surface water and sediment for Portsmouth Naval Shipyard (PNS) via the methodology found in the 2002 document titled Technical Memorandum Development of Facility-Specific Intertidal Surface Water and Sediment (TtNUS, December 2002) which is presented as Appendix D.5.2. The screening levels developed for sediment and surface water considered residential exposure via ingestion and dermal contact.

The original methodology for the dermal screening level calculations utilized the Risk Assessment Guidance for Superfund (RAGS) Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment Interim Final), September 2001 (U.S. EPA, 2001). In July 2004, RAGS Part E (U.S. EPA, 2001) was updated from an Interim Final to a Final document (U.S. EPA, 2004). None of the changes made to the RAGS Part E guidance between the 2001 Interim Final and the 2004 Final affected screening level calculations; therefore, no updates to the sediment or surface water screening calculations were implemented based on RAGS Part E (U.S. EPA, 2004).

Methodology used to calculate ingestion screening levels were based on the RAGS Volume 1: Human Health Evaluation Manual Part A, Interim Final (U.S. EPA. December, 1989) which has not been updated; therefore, values used from RAGS Part A, such as input parameters, were not updated.

Toxicity criteria (cancer slope factors and reference doses) used in the 2002 screening level calculations were updated with the toxicity values published in the Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites Tables (USEPA, June 2011). For inorganics, in addition to updating the toxicity criteria, the gastrointestinal absorption factor (GIABS) was also updated based on the June 2011 EPA RSL Table. A table containing the updated surface water and sediment screening criteria for PNS is attached at the end of this appendix.

APPENDIX D.5.2

Final Technical Memorandum: Development of Facility-Specific Human Health Risk Screening Levels for Intertidal Surface Water and Sediment

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2002-336-001

PITT-12-2-001

December 2, 2002

Project Number 2833

Mr. Michael Barry
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Mr. Iver McLeod
Maine Department of Environmental Protection
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Reference: Contract No. N62467-94-D-0888 (CLEAN)
Contract Task Order No. 815

Subject: Final Technical Memorandum Development of Facility-Specific Human Health Risk Screening Levels for Intertidal Surface Water and Sediment
Portsmouth Naval Shipyard (PNS), Kittery, Maine

Dear Mr. Barry/Mr. McLeod:

On behalf of the U.S. Navy, Tetra Tech NUS, Inc. is pleased to provide to the U.S. Environmental Protection Agency Region I (USEPA) and to the Maine Department of Environmental Protection (MEDEP) 4 and 3 copies each, respectively, of the Final Technical Memorandum Development of Facility-Specific Human Health Risk Screening Levels for Intertidal Surface Water and Sediment and the response to comments on the Draft Final Technical Memorandum.

If you have any questions, or if additional information is required, please contact Mr. Fred Evans at 610-595-0567 x 159.

Sincerely,

Aaron Bernhardt
Project Manager

AB/kf
Enclosure

EFANE, (Code 1823/FE, F. Evans) (4 copies)
PNS (Code 106.3R, M. Raymond) (4 copies)
NOAA (K. Finkelstein)
ME Dept. of Marine Resources (D. Card)
Mr. Peter Britz
Ms. Diane McNabb
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Ms. Mary Marshall
Mr. Jack McKenna
Dr. Roger Wells
Mr. Onil Roy
PNS Code 100PAO (w/o enclosure)
US Fish & Wildlife Service (K. Munney)
NH Fish & Game (C. McBane)
Mr. Jeff Clifford
Mr. Phil McCarthy
Mr. James Horrigan
Ms. Carolyn Lepage
COMSUBGRU TWO (A. Stackpole) (w/o enclosure)
D. Cohen, TtNUS, Pittsburgh

TECHNICAL MEMORANDUM
DEVELOPMENT OF FACILITY-SPECIFIC HUMAN HEALTH RISK SCREENING LEVELS FOR INTERTIDAL SURFACE WATER AND SEDIMENT PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

1.0 INTRODUCTION

This technical memorandum presents the development of human health screening levels that can be used to select chemicals of potential concern (COPCs) when evaluating human recreational receptor exposure to chemical concentrations in intertidal surface waters (including seeps) and sediments at Portsmouth Naval Shipyard (PNS). In this memorandum, the intertidal area is the area along the shoreline that is exposed at low tide but is under water at high tide. Intertidal waters include surface water in the intertidal zone as well as seep water that is exposed at low tide. The sediments include the sediment located in the intertidal zone, both within and outside the boundary of the seep.

These screening levels are developed for purposes of COPC selection only and are intended for use generically across the shipyard. They can not be used for purposes of estimating site-specific seep/surface water/sediment risks at PNS because the exposure assumptions underlying the screening levels are ***intentionally designed to be very conservative*** and inherently overestimate the potential risk, even for the reasonable maximum exposed (RME) individual. Risks will be calculated using site-specific exposure assumptions as part of a site-specific risk assessment for chemicals that are retained as COPCs. These risk calculations will be presented in separate documents.

A small recreational beach area exists in Clark Cove and boat launch locations exist in two areas (e.g., Topica Pier, Sullivan's Point) around the shipyard. However, human exposure to intertidal surface waters and sediments at PNS is likely to be infrequent because of the rocky nature of much of the shoreline and intertidal area.

2.0 METHODOLOGIES FOR CALCULATING SCREENING LEVELS

The screening levels for intertidal surface water and sediments consider human exposure via the ingestion (incidental) and dermal contact routes of exposure. The screening levels were calculated assuming that the receptor is a resident living in proximity to or on PNS and is exposed

over a 30-year duration, including exposure that may occur during childhood and adolescent years. Therefore, the following three receptors were considered in the evaluation:

- Adult
- Adolescent child (approximately age 7 through 16)
- Young child (approximately age 4 through 6)

The 0 to 3 year old child was not included in the risk assessment because young children are unlikely to play in seeps or sediment since the shore is rocky and not safe for young children. (See Section 4.0 Uncertainty Associated with Screening Levels, for a more detailed discussion.)

2.1 METHODOLOGY FOR CALCULATING DERMAL SCREENING LEVELS

The assessment methodology for the dermal route of exposure considers the most current U.S. Environmental Protection agency (USEPA) guidance, Risk Assessment for Superfund (RAGS), Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim (EPA/540/R/99/005) (USEPA, September 2001) (Attachment 1). The methodology also considers guidance from USEPA Region 1 (and guidance from other USEPA regions) as well as comments from the Maine Department of Environmental Protection (MEDEP) and the Restoration Advisory Board (RAB) in correspondences dated February 8, 2002.

The following equation was used to calculate the dermal absorbed dose hypothetically resulting from dermal exposure to COPCs in the intertidal waters:

$$DAD = (DA_{event} * EV * ED * EF * SA) / (BW * AT)$$

The terms of the equation are defined in the following table:

Parameter	Receptors Adult	Adolescent	Young child
Dermal absorbed dose (DAD) (mg/kg/day)	Calculated	Calculated	Calculated
Adsorbed dose per event (DA_{event}) – (mg/cm^2)	Calculated(1)	Calculated(1)	Calculated(1)
Events/day (EV)	1	1	1
Exposure duration (ED) (years)	17	10	3
Exposure frequency (EF) (days/year)	26	26	26
Skin surface area exposed (SA) – (cm^2)	4500	4290	4000
Body weight (BW) (kg)	70	45	20
Averaging time (AT) for Carcinogens – (days) (AT = 70 yr * 365 days/yr)	25550	25550	25550
Averaging time (AT) for Non-carcinogens – (days) (AT = ED * 365days/yr)	6205	3650	1095

1 - The DA_{event} term is calculated based on the chemical concentration, chemical specific permeability constant, and other intermediate terms as demonstrated in Attachment 1.

An exposure frequency of 26 days/year was used based on the assumption that a receptor may visit the shoreline an average of 2 days per week over the course of the summer (June, July, and August; 13 weeks). The combined exposure duration of 30 years is the duration typically recommended by USEPA for evaluation of the residential land use scenario (USEPA, December 1989) and assumes that the receptor lives on or in close proximity to PNS and routinely visits the shoreline. The skin surface area exposed for the adult, adolescent, and young child assumes that 25 percent, 33 percent, and 50 percent, respectively, of the total skin surface area is directly contacting the water. (The total skin surface areas [50th percentile values] and body weights of

the receptors are based on information presented in RAGS E and the 1997 version of the Exposure Factors Handbook [EFH]) (USEPA; August 1997) (see Attachment 2).

The DA_{event} term (i.e., the absorbed chemical dose per event) is calculated based on the chemical concentration in the surface water, the chemical specific dermal permeability coefficient, the exposure time (a 4 hour exposure time was assumed), and several other intermediate terms and calculations as demonstrated in Attachment 1. Based on comments on the Operable Unit 6 (OU6) Data Quality Objecives (DQOs), a 4-hour exposure time was recommended. Given the rocky nature of most of the PNS shoreline, the low flow of most seeps, and the location of the seeps within the tidal zone, this exposure time is very conservative for some PNS areas and not plausible for other areas. However, because these screening levels were developed for use across the shipyard, they were calculated using assumptions that may be appropriate in some area, but not others (i.e., the screening levels may significantly over-estimate risk in some cases).

The following equation was used to calculate the dermal absorbed dose hypothetically resulting from dermal exposure to COPCs to intertidal sediments:

DAD = (Conc * CF * EV * ED * EF * SA * AF* ABS) / (BW * AT)

The DAD, EV, ED, EF, SA, BW, and AT terms were defined previously for dermal exposure to surface water. ABS (unitless) is the chemical specific absorption factor as specified in RAGS Part E (see Attachment 3). Other terms presented in the equation are defined in the following table:

		Receptors	
Parameter	Adult	Adolescent	Young child
Chemical concentration In sediments (Conc) (mg/kg)	Measured	Measured	Measured
Conversion Factor (CF) (kg/mg)	10^{-6}	10^{-6}	10^{-6}
Sediment adherence factor (AF) – (mg/cm^2)	1	1	1

A sediment adherence factor of 1 mg/cm^2 was selected for the calculation of the screening levels because it was used as the RME adherence factor in past baseline risk assessments conducted for PNS, it is the RME value suggested in the 1992 Dermal Guidance (USEPA, 1992), and because there is no default sediment adherence factor suggested in RAGS Part E. The value is conservative given most of the data and recommendations presented in RAGS Part E and the

fact that much of the shoreline around the shipyard is rocky and sandy. (Selected data are presented in Attachment 3.)

2.2 METHODOLOGY FOR CACULATING INGESTION SCREENING LEVELS

The assessment methodology for the ingestion route of exposure considers USEPA guidance, Risk Assessment for Superfund (RAGS), Volume I: Human Health Evaluation Manual (Part A) Interim Final (EPA/540/1-89/002) (USEPA, December 1989) as well as many of the exposure assumptions already presented for the evaluation for the dermal route of exposure. Also, note that the ingestion pathway considered in this memorandum refers to incidental ingestion only because the intertidal surface water can not be used as a domestic drinking water supply due to salinity.

The following equation was used to calculate the exposure dose hypothetically resulting from ingestion of COPCs in intertidal waters:

Dose = (Conc * IR* ET * ED * EF) / (BW * AT)

The ED, EF, BW, and AT terms were defined above. Other terms presented in the equation are defined in the following table:

Parameter	Adult	Receptors Adolescent	Young Child
Chemical concentration In seep surface water (Conc) (ug/L)	Measured	Measured	Measured
Seep surface water ingestion Rate (IR) – (L/hr)	0.05	0.05	0.05
Exposure time per day (ET) – (hrs/day)	4	4	4

The surface water ingestion rate of 0.05 L/hr was recommended in USEPA, RAGS Part A as the ingestion rate appropriate for a recreational swimming scenario (USEPA, December 1989). Based on the Navy's observations and the lack of a formal swimming area, people do not typically swim in the intertidal areas of PNS (a wading scenario is more typical and plausible) and swimming in the actual seeps is not possible. Consequently, the 0.05 L/hr surface water ingestion rate, which is appropriate for swimming, is conservative when used to develop screening levels.

The following equation was used to calculate the exposure dose hypothetically resulting from ingestion of COPCs in seep sediments:

Dose = (Conc * IR* CF * FI * ED * EF) / (BW * AT)

The ED, EF, CF, BW, and AT terms were defined above. Other terms presented in the equation are defined in the following table:

Parameter	Adult	Receptor Adolescent	Young child
Chemical concentration In Inter-tidal sediment (Conc) (mg/kg)	Measured	Measured	Measured
Fraction ingested from source (FI) – unitless	0.5	0.5	0.5
Sediment ingestion Rate (IR) – (mg/day)	50	100	200

The intertidal sediment ingestion rates for the adult and young child receptors are daily ingestion rates recommended by the USEPA for soil ingestion assuming a residential land use scenario. The sediment ingestion rate for the adolescent receptor is based on professional judgment. The "fraction ingested (FI) from source" term is an adjustment of the ingestion rate based on the assumption that the receptor is not "residing" in the intertidal area.

3.0 CALCULATED SCREENING LEVELS

The screening levels for intertidal surface water and sediments derived using the preceding equations are presented in Table 1. Intertidal surface water screening levels are presented for the ingestion route of exposure, the dermal route of exposure, and the both exposure routes combined, because of the uncertainties associated with some of the dermal values (see Section 4.0). Supporting risk calculation spreadsheets are found in Attachment 1. The screening levels were developed for surface waters and sediments using a two-step process. First, risk estimates are calculated for a 1 ug/L concentration of a chemical in surface water or 1 mg/kg concentration of a chemical in sediment.

The exposure point concentration (EPC) (i.e., 1 ug/L or 1 mg/kg) and resulting risk estimate for that EPC may be used to calculate the screening level using a simple ratio-ing technique:

EPC (ug/L or mg/kg)		Screening Level ??
---	=	---
Risk Estimate for EPC (Cancer risk estimate or hazard index for all receptors exposed)		Target risk (e.g., cancer risk = $1x10^{-6}$ or hazard index of 1)

The screening levels presented in Table 1 are set at the $1x10^{-6}$ for carcinogenic chemicals and at a hazard index of 0.1 for non-carcinogenic chemicals.

4.0 UNCERTAINTY ASSOCIATED WITH SCREENING LEVELS

There are three primary sources of uncertainty that should be considered when using the screening levels developed for the intertidal surface water and sediments.

- ***There are no published data available regarding the appropriate exposure assumptions for an individual potentially exposed to intertidal surface waters and sediments along rocky shorelines such as those existing at PNS.*** Consequently, the screening levels presented in Table 1 were developed, in large part, by adapting USEPA exposure assumptions for soil ingestion and exposure assumptions typically used to evaluate a swimming scenario. Professional judgment and comments received from USEPA, MEDEP, and RAB were also considered in the development of the screening levels. Given that the PNS shoreline is unlikely to attract recreational receptors for long periods of time and given that the potential for exposure is limited by the tides, COPC selection using the screening levels will likely overestimate the potential for risk.

- ***The USEPA RAGS Part E guidance document and associated exposure models are currently designated "interim draft".*** As discussed below and in Attachment 3, there is considerable uncertainty attached to risk estimates/screening levels that may be developed for dermal exposure to certain organic chemicals in water (e.g., polyaromatic hydrocarbons (PAHs), polychlorinated hydrocarbons (PCBs), TCDDs). Page A-40, second paragraph…"Accordingly, the final dose and risk estimates should be considered highly uncertain." Also, the guidance focuses on soils and domestic use of a water supply. There is minimal guidance regarding evaluation of exposure to chemicals in surface waters and sediments during recreational activities. Additionally, information provided during conversations with USEPA (or E-mails from USEPA) indicates that risk management decisions should not be made based on the screening levels or risk estimates calculated

using the RAGS Part E dermal absorption model for certain chemicals in water (e.g., the PAHs, PCBs, TCDDs). (Personal communication from Dr. Ted Simon to Tom Jackman; Personal communication from Dr. Daniel Stralka to Lee Ann Sinagoga, April 26, 2002). USEPA advises that the agency intends to prepare and distribute an "Implementation Memorandum" providing guidance regarding the use of the RAGS Part E dermal absorption model for chemicals in water.

- ***The USEPA RAGS Part E model assumes that the receptor is in constant contact with the water source for the time specified as T_{event}.*** Given the limited nature of the seeps, a receptor is not likely to be constant contact with the seeps. He/she is likely to be sporadically contacting the seep as they recreate along the beach.

RAGS Part E discusses in detail the uncertainties attached to the absorbed doses calculated using the RAGS Part E Model for chemicals in surface water. The uncertainties are very high for the following compounds with permeability coefficients "outside the effective predictive domain of the model":

- PAHs
- PCBs
- TCDD (all dioxins and furans)
- DDT (and degradation by-products)

The RAGS Part E model may over-estimate the absorbed dose for these chemicals. Consequently, the USEPA recommends that the analyst conduct "reality checks" when using the RAGS Part E model to evaluate these chemicals. "Reality checks" may include a comparison of the screening level developed for the ingestion route of exposure versus the screening level developed for the dermal route of exposure. Large differences between these 2 screening levels (i.e., when the dermal screening level is considerably lower than the ingestion screening level) can be (but is not always) an indication of an over-prediction chemical absorption by the RAGS Part E model. A comparison of screening levels versus other standards and criteria commonly used in human health risk assessment also provides perspective.

For example, the screening levels presented for 2,3,78-TCDD, some of the PAH compounds (e.g., benzo(a)pyrene [B(a)p], benzo(b)fluoranthene [B(b)f], dibenzo(ah)anthracene [d(ah)a]), and the PCB compounds on Table 1 (and in Attachment 1) are as follows:

Parameter	Facility-Specific Screening Level Ingestion Route of Exposure (ng/L)	Facility-Specific Screening Level Dermal Route of Exposure (ng/L)	SDWA MCL (ng/L)	USEPA Region 9 Tap-water (PRGs)[1] (ng/L)
B(a)p	1,100	8	200	9.2
B(b)f	11,000	78	200	92
D(ah)a	1100	5.1	200	9.2
2,3,7,8-TCDD	0.053	0.00042	0.03	0.00045
PCBs	4000	34	500	34

1: USEPA Region 9 preliminary remediation goals for tap water.

The preceding table indicates that the screening levels for the ingestion route of exposure are two orders of magnitude greater than screening levels for the dermal route of exposure. All of the calculated dermal screening levels ***are less than*** the current federal Safe Drinking Water Act (SDWA) Maximum Contaminant Levels (MCLs) for drinking water, where available. All of the calculated dermal screening levels ***are less than (or approximate)*** the current USEPA Region 9 preliminary remediation goals (PRGs) for tap water. COPC selection and risk estimation based on these dermal screening levels should be considered highly uncertain***.*** Although the screening levels based on dermal absorption are similar to the tap-water PRGs, this is more of a coincidence than anything else, because the tap-water PRGs do not account for dermal absorption (USEPA, October 2002). The tap-water PRGs were expected to be much lower than the ingestion screening levels developed in this document for several reasons. The PRGs assume that adults and children will drink 2 and 1 liters of water per day, respectively, and they assume that those levels are consumed every day. Humans will not ingest these volumes of intertidal surface water, especially since it is brackish. The screening levels assume that humans will drink 0.2 liters per 4-hour exposure, or approximately 6.7 ounces of intertidal surface water per exposure. This is still a very conservative value, especially for the ingestion of seep water, given the low volume of most of the seeps. It is also unlikely that humans would ingest 6.7 ounces of intertidal surface water while wading along the shoreline.

Additional sources of uncertainty for the screening levels include the following:

- ***The screening levels do not consider exposures to a very young child (0 to 3 years of age).*** However, exposure to children in this age group is not a likely scenario because of the physical nature of the shoreline and intertidal areas (i.e., much of the shoreline is rocky and would be physically hazardous for very young children, the mudflat areas are not conducive to recreational activities). More importantly, the screening levels were derived using exposure assumptions conservative enough to account for the young child who, on a rare occasion, might walk/crawl in the intertidal area of the PNS.

- ***The skin surface adherence factors for solid media (soils or sediments) vary greatly depending on the nature of the media (i.e., silt, sand, mud, etc.).*** For example, soil adherence factors for mud can exceed the 1 mg/cm^2 adherence factor selected for the development of the sediment screening levels. (The geometric mean value for children exposed to mud in the RAGS Part E guidance document is 22 mg/cm^2; the uncertainties associated with this value are significant.) However, the default skin adherence factor recommended for typical childhood exposure to soils in RAGS Part E is 0.2 mg/cm^2. Given that a receptor recreating along the shoreline would contact a variety of different materials ("rock-like", "sand-like", "soil-like", and "mud-like"), the 1 mg/cm^2 is a reasonable and conservative compromise of the adherence factors associated with each of these materials. Additionally, the sediment screening levels were derived using exposure assumptions conservative enough to account for the fact that receptors will occasionally contact "mud-like" media while recreating along the shoreline at the PNS.

- ***The current cancer slope factor for 2,3,7,8-TCDD [$1.5 \times 10^{+5}$ $(mg/kg/day)^{-1}$] is under review and may be increased to $1.0 \times 10^{+6}$ $(mg/kg/day)^{-1}$.*** If the proposed cancer slope factor for 2,3,7,8-TCDD is approved for use in human health risk assessment by the USEPA, the MEDEP, and the Navy, the screening levels presented in Table 1 would decrease by approximately one order of magnitude (see footnotes to Table 1).

- Dermal exposure to chemicals in the intertidal surface water is more likely to occur than the exposure via ingestion because only small amounts of surface water will be incidentally ingested during wading, the most likely exposure scenario. However, because the screening values for some of the organic chemicals (i.e., the carcinogenic PAHs, DDT and related compounds, PCBs, and dioxin) are based on the ingestion exposure route, there are uncertainties in using these screening values to select COPCs for human health risk assessment. These uncertainties are not expected to change the overall conclusions of the

risk evaluation because of the conservative nature of the screening levels and the small amount of exposure to the seeps that is actually expected to occur.

- As summarized below, the human health sediment screening levels that are presented are reasonable when compared to the USEPA soil screening levels (Region 9 PRGs and Region 3 Risk Based Concentrations (RBCs) (USEPA, October 2002)). The sediment screening levels are similar to the industrial Region 9 PRGs and Region 3 RBCs, which is expected under an recreational scenario.

Parameter	Region 9 PRG Soil[1] Residential (mg/kg)	Region 9 PRG Soil[1] Industrial (mg/kg)	Region 3 RBC Soil[1] Residential (mg/kg)	Region 3 RBC Soil[1] Industrial (mg/kg)	Draft PNS Recreational Sediment Screening Level[1] (mg/kg)
Copper	310	4,100	310	8,200	7,400
Zinc	2,300	100,000 (max)	2,300	61,000	60,000
Fluoranthene	230	2,200	310	8,200	18,000
Benzo(a)pyrene	0.062	0.21	0.087	0.78	0.36

1 - The RBCs, PRGs, and screening levels presented in this table for non-carcinogenic compounds are set at a hazard quotient of 0.1. The RBCs and PRGs presented in the Region 9 and Region 3 guidance documents are set at a hazard quotient of 1.

5.0 RECOMMENDED SCREENING LEVELS

Table 1 presents the calculated facility-wide screening levels for intertidal surface waters and intertidal sediments. For sediments, the screening values are the lesser of the actual calculated risk-based concentration (one-tenth the risk-based concentration for the non-carcinogens is considered to address the potential for multiple non-carcinogenic chemicals impacting the same target organ), the soil saturation concentration (if appropriate), or a 100,000 mg/kg ceiling level. The consideration of the soil saturation concentration and a ceiling value of 100,000 mg/kg is recommended in the current USEPA Region 9 PRGs guidance document (USEPA, October 2002). For the intertidal surface waters, the screening values for both the ingestion pathway and dermal contact pathway are presented. As discussed in Section 4.0, there are considerable uncertainties associated with some of the dermal screening levels for exposure to surface water. Therefore, only the ingestion screening levels will be used to select COPCs for PCBs, PAHs, TCDD, and DDT (and by-products). As noted for the sediments, one-tenth the risk-based concentration for the non-carcinogens is considered to address the potential for multiple non-carcinogenic chemicals impacting the same target organ.

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APPENDIX D.5.3

Risk-Based Screening Level Development for the Construction Worker Exposed to Groundwater at Portsmouth Naval Shipyard

RISK-BASED SCREENING LEVEL DEVELOPMENT FOR THE CONSTRUCTION WORKER EXPOSED TO GROUNDWATER AT PORTSMOUTH NAVAL SHIPYARD

JULY 2011

The risk-based concentrations (RBCs) for construction workers were based on exposure dermal exposure to chemicals in groundwater. Developing RBCs was accomplished by calculating a theoretical risk based on an assumed chemical concentration and then back-calculating a RBC utilizing the ratio of the assumed chemical concentration multiplied by a target risk to the calculated theoretical risk. The assumed concentration of chemicals in ground water was 1.0 μg/L (0.001 mg/L). The models and parameters used to estimate intakes, risks, and RBCs are described in the following sections.

Dermal Contact with Groundwater

Dermal contact with groundwater was evaluated by methods and equations provided in Risk Assessment for Superfund, Volume I, Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment (RAGS Part E, USEPA, July 2004).

The following equation is used to assess exposures resulting from dermal contact with groundwater (USEPA, July 2004):

$$DAD_{wi} = (DA_{event})(EV)(ED)(EF)(A) / (BW)(AT)$$

where:

DAD_{wi}	=	dermally absorbed dose of chemical "i" from water (mg/kg/day)
DA_{event}	=	absorbed dose per event (mg/cm^2-event)
EV	=	event frequency (1 event/day)
ED	=	exposure duration (year)
EF	=	exposure frequency (150days/yr)
A	=	skin surface area available for contact (3,300cm^2)
BW	=	body weight (70 kg)
AT	=	averaging time (days)
		for noncarcinogens, AT = ED x 365 days/yr
		for carcinogens, AT = 70 yrs x 365 days/yr

The absorbed dose per event (DA_{event}) was estimated using a nonsteady-state approach for organic compounds and a traditional steady-state approach for inorganics. For organics, the following equations apply:

$$\text{If } t_{event} < t^{*}, \text{ then: } DA_{event} = (2FA)(K_p)(C_{gw})(CF)\left(\sqrt{\frac{6\,\tau\,\text{tevent}}{\pi}}\right)$$

$$\text{If } t_{event} > t^{*}, \text{ then: } DA_{event} = (FA)(K_p)(C_{gw})(CF)\left(\frac{t_{event}}{1+B} + 2\,\tau\left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right)$$

where:

t_{event}	=	duration of event (hours/event)
FA	=	fraction absorbed (dimensionless)
t^{*}	=	time it takes to reach steady-state conditions (hr)
K_p	=	permeability coefficient from water through skin (cm/hr)
C_{wi}	=	concentration of chemical "i" in water (0.001 mg/L)
T	=	lag time (hr)
π	=	constant (dimensionless; equal to 3.1416)
CF	=	conversion factor ($1x10^{-3}$ L/cm^3)
B	=	partitioning constant derived by Bunge Model (dimensionless)

Values for the chemical-specific parameters (t^{*}, K_p, T, and B) were obtained from the current dermal guidance (RAGS-Part E, USEPA, July 2004). The following steady-state equation is used to estimate DA_{event} for inorganics:

$$DA_{event} = (K_p)\,(C_{wi})\,(t_{event})$$

The recommended dermal permeability value for inorganic constituents of 1 x 10^{-3} cm/hour was provided in the USEPA guidance. For most metals, dermal absorption is not a significant pathway because penetration through the skin is minimal. The parameters and calculations used to estimate DA_{event} are presented in Attachment D.2.3.

Toxicity Criteria

Oral Reference Doses (RfDs) and Cancer Slope Factors (CSFs) were obtained from the USEPA RSL table (EPA, June 2011), which lists the toxicity values from a hierarchy of toxicological sources as follows:

1) EPA's Integrated Risk Information System (IRIS) (http://www.epa.gov/iris/)
2) EPA's Provisional Peer Reviewed Toxicity Values (PPRTVs)
3) Other toxicity sources such as:
   - California Environmental Protection Agency (http://www.oehha.ca.gov/risk/chemicalDB//index.asp)
   - the Agency for Toxic Substances and Disease Registry Minimal Risk Levels (http://www.atsdr.cdc.gov/mrls.htm)
   - Annual Health Effects Assessment Summary Tables

Toxicity Criteria for Dermal Exposure

RfDs and CSFs found in literature may be expressed as administered 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 this information is not always readily available, oral dose-response parameters are adjusted to an absorbed dose using chemical-specific absorption efficiencies published in available guidance (RAGS-Part E, USEPA, July 2004) 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

Exposure Assumptions

The assumptions used to develop the construction worker screening levels are as follows:

- Skin Surface Area Available for Contact – 3,300 cm^2

- Exposure Duration – 1 year
- Exposure Frequency – 150 days/year
- Duration of Event – 2 hours/day
- Body Weight – 70 kg
- Averaging Time (Cancer) – 25,550 days
- Averaging Time (Non-Cancer) – 365 days

Theoretical Risk Calculations

Quantitative estimates of risk based on a groundwater concentration of 0.001 mg/L were calculated according to risk assessment methods outlined in USEPA guidance (USEPA, 1989). Incremental lifetime cancer risks are expressed in the form of dimensionless probabilities, referred to as incremental lifetime carcinogenic risks (ILCRs), based on CSFs. Noncarcinogenic risk estimates are presented in the form of Hazard Quotients (HQs) that are determined through a comparison of intakes with published RfDs.

Carcinogenic risk estimates were generated for each chemical using estimated exposure intakes and published CSFs, as follows:

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

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

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

Calculation of Risk-Based Screening Levels

The risk assessment equation for dermal exposure to water is linear in the concentration term; therefore, a risk-based groundwater concentration can be calculated by a ratio of an assumed example concentration (0.001 mg/L) and the theoretical risks calculated from this concentration. A target cancer risk (TCR) of 1×10^{-6} and a target hazard index (THI) of unity (1) were used for calculating risk-based screening levels for this project. Screening Levels were calculated by the following equation.

$$\text{SL} = \frac{\text{C x TCR or THI}}{\text{Risk}}$$

Where:

SL	=	screening level (ug/L).
Cx	=	assumed water concentration on which theoretical risks were calculated.
TCR	=	Target Cancer Risk = 1×10^{-6}
THI	=	Target Hazard Index = 1
Risk	=	Risk calculated from the example concentration.

APPENDIX D.5.4

Lead Screening Level Development Updates for Surface Water and Groundwater at Portsmouth Naval Shipyard

LEAD SCREENING LEVEL DEVELOPMENT UPDATES FOR SURFACE WATER AND GROUNDWATER AT PORTSMOUTH NAVAL SHIPYARD DECEMBER 2009

Lead screening levels were calculated for surface water and groundwater via the methodology found in the 2005 document titled Technical Memorandum: Derivation of Lead Screening Levels for Recreational Users Exposed to Intertidal Surface Water and Construction Workers Exposed to Shallow Groundwater at Portsmouth Naval Shipyard, Kittery, Maine which is presented as Appendix D.5.5. The screening levels developed for surface water and groundwater considered child recreational and construction worker receptors, respectively, exposed through the dermal pathway and incidental ingestion.

Two approaches were utilized to calculate lead screening levels. The first approach utilized the Adult Lead Model (ALM) to calculate a screening level for the construction worker exposed to groundwater. The ALM uses an equation to calculate lead screening levels for soil exposures which was manipulated as described in Appendix D.5.5 to calculate construction worker screening levels to groundwater exposure via the dermal and incidental ingestion pathways. In 2009 the U.S. EPA issued an update to the ALM that changed the values of two constants in the ALM equation including the geometric standard deviation and the baseline lead concentration in blood. The updated groundwater lead screening level presented in this report accounts for the 2009 updates to the geometric standard deviation and baseline lead blood concentration values used in the ALM. The updated lead groundwater screening level calculation is presented in Appendix D.5.7. The second approach used the U.S. EPA Integrated Exposure Uptake Biokinetic Model (IEUBK) for Lead in Children to calculate a surface water screening level. U.S. EPA updated the IEUBK Model in 2009. The updated version of the IEUBK Model and the exposure assumptions described in Appendix D.5.5 were used to calculate the updated lead surface water screening value presented in this report. In the Drinking Water Data Input menu of the 2009 IEUBK Model an ingestion rate of 0.014 L/day was populated for all age ranges and the lead concentration value in water was varied until the resulting probability distribution curve presented results with a lead geometric mean less than 10 ug/dL and a probability that less than 5% of the population would exceed the 10 ug/dL lead blood concentration. The resulting probability distribution curve when using a lead water concentration of 950 ug/L is presented on the following page and meets the aforementioned criteria of producing a lead blood concentration geometric mean less than 10 ug/dL in less than 5% of the population; therefore, 950 ug/L was selected as the updated lead surface water screening level.

APPENDIX D.5.5

Technical Memorandum: Derivation of Lead Screening Levels for Recreational Users Exposed to Intertidal Surface Water and Construction Workers Exposed to Shallow Groundwater at Portsmouth Naval Shipyard, Kittery, Maine (TtNUS, August 2005)

TECHNICAL MEMORANDUM

DERIVATION OF LEAD SCREENING LEVELS FOR RECREATIONAL USERS EXPOSED TO INTERTIDAL SURFACE WATER AND CONSTRUCTION WORKERS EXPOSED TO SHALLOW GROUNDWATER AT PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

This technical memorandum presents the approaches used to develop aqueous lead screening levels for recreational users and construction workers to use in assessing potential human health risks from lead at Installation Restoration Program (IRP) sites at Portsmouth Naval Shipyard (PNS) that have brackish/saline groundwater and the intertidal surface water is saline. The human health screening level for groundwater and intertidal surface water that has been used previously for evaluation of lead at the PNS IRP sites is the Federal Safe Drinking Water Act (SDWA) action level of 15 ug/L. However, many of the IRP sites at PNS have brackish/saline groundwater and the intertidal surface water is saline so a screening level based on a drinking water level is not appropriate for risk screening. This technical memorandum presents alternative screening levels for two receptors hypothetically exposed to lead in aqueous media: 1) a child recreational user exposed to lead in water along the shoreline of a site (intertidal area), and 2) a construction worker exposed to lead in shallow groundwater at a site. The screening levels presented are based on the incidental ingestion route of exposure and dermal contact. Exposure to lead by dermal contact was considered in the calculations even though dermal uptake of lead is typically not considered significant for lead (USEPA, July 2004, ATSDR, online, March 2004). The screening levels presented herein were derived to facilitate human health risk assessment and risk management decisions at PNS. The screening levels were identified based on information developed using the two approaches as described below. Per USEPA guidelines, the screening levels presented in this technical memorandum incorporate exposure factor assumptions reflective of a reasonable maximum exposure (RME) case. The RME case is generally "defined as the highest exposure that is reasonably expected to occur at a site." The intent of the RME is to estimate an exposure that is well above the average but is still within the range of possible exposure possibilities.

1.0 Approach No. 1: Derivation of a Screening Level for a Construction Worker Exposed to Shallow Groundwater Using the Adult Lead Model (ALM)

A screening level for construction workers exposed to lead in water may be developed by estimating an acceptable daily intake based on the Adult Lead Model (ALM) equations. The ALM was developed to estimate blood-lead levels for adults exposed to lead in soil in non-residential exposure scenarios (i.e., industrial and recreational). An industrial soil remediation goal of 800 mg/kg based on the ALM has already been published by the USEPA. This value is expected to be protective of workers who work primarily indoors (i.e., work is not soil contact intensive) and the fetuses of workers. The 800 mg/kg value was based on an ingestion rate of 50 mg-soil per day, 219 days/year (ALM Frequently Asked Questions [FAQs] online at http://www.epa.gov/superfund/programs/lead/almfaq.htm; last updated April 29, 2004).
The ALM makes use of the following equation for calculating screening levels for soil:

General Adult Lead Model (ALM) Equation for Soil Exposures:

$$\textbf{Screening Level(soil)} = \frac{([PbB_{95}fetal/(R*(GSD_i^{1.645}))]-PbB_0)*AT_{S,D}}{BKSF*(IR_{S+D}*AF_{S,D}*EF_{S,D})}$$

where:

$PbB_{fetal,\,0.95}$	95th percentile blood lead concentration (PbB) in fetus (Goal is 10 ug/dL)
$R_{fetal/maternal}$	Fetal/maternal PbB ratio = 0.9
BKSF	Biokinetic Slope Factor = 0.4 ug/dL per ug/day
GSD_i	Geometric standard deviation PbB = 2
PbB_0	Baseline PbB = 2 ug/dL
IR_{S+D}	Total ingestion rate of outdoor soil and indoor dust
$AF_{S,D}$	Absorption fraction (same for soil and dust) = 0.12
$EF_{S,D}$	Exposure frequency = 150 days/yr
$AT_{S,D}$	Averaging time = 365 days/yr

The ALM approach for developing lead screening levels for soil may be used to develop a screening level for construction worker exposures to groundwater by modifying the basic equation for soil presented above, as follows:

Equation for Calculating a Construction Worker Screening Level Based on Incidental Ingestion of Lead in Water:

$$\textbf{Screening Level (iw)} = \frac{([PbB_{95}fetal/(R*(GSD_i^{1.645}))]-PbB_0)*AT_w}{BKSF*(IR_w*AF_w,*EF_{constw})}$$

where:

$PbB_{fetal,\,0.95}$	95th percentile blood lead concentration (PbB) in fetus (Goal is 10 ug/dL)
$R_{fetal/maternal}$	Fetal/maternal PbB ratio = 0.9
BKSF	Biokinetic Slope Factor = 0.4 ug/dL per ug/day
GSD_i	Geometric standard deviation PbB = 2
PbB_0	Baseline PbB = 2 ug/dL
IRw	Water ingestion rate = 0.02 L/day (0.01 L/hour x 2 hours)
AF_w	Absorption fraction for adults (water) = 0.60**
EF_{constw}	Exposure frequency for construction workers = 150 days/yr
AT_w	Averaging time for exposure to water = 365 days/yr

** Bowers, S.B., Beck, B.D., Karam, H.S. Assessing the Relationship Between Environmental Lead Concentrations and Adult Blood Lead Levels, Risk Analysis Vol. 14, No. 2, 1994.

Some of the suggested exposure factors presented above are default values suggested in the ALM model. However, the recommended receptor exposure time (2 hours per day), exposure frequency (150 days/year), and water ingestion rate (0.01 L/hour) are based on professional judgment to a certain extent. The following items provide the rationale for the exposure factor values suggested for these parameters:

- The 2-hour per day groundwater exposure time suggested for the construction worker reflects the fact that the anticipated exposure is expected to be limited. The

recommended value is less than the 4-hour per day exposure time listed for recreational activities in Section 2 of this memorandum and in the *December 2002 Technical Memorandum titled, Human Health Risk Screening Levels for Intertidal Surface Water and Sediment* because the exposure incurred by a construction worker is likely to be sporadic and truly incidental when compared to exposure occurring during recreational activities. For example, receptors often desire/seek exposure to both surface waters and sediments during recreational activities. In contrast, the construction worker contacts the shallow groundwater in an excavation pit on an incidental basis only (e.g., while he/she is retrieving a piece of equipment out of the pit).

- The suggested ingestion rate for the construction worker exposed to groundwater in the excavation pit (0.01L per hour) is less than that suggested for recreational activities (0.05 L per hour) in Section 2 of this memorandum and in the aforementioned December 2002 Technical Memorandum because of the nature of receptor activities. Although relatively constant, direct contact with surface water (and thus incidental ingestion of surface water) while swimming is very likely; constant, direct contact with the shallow groundwater in an excavation pit is very unlikely.

- The construction worker is not anticipated to be exposed to the groundwater in the excavation pit on a daily basis. As indicated in the preceding bullets, it was assumed that exposure would occur *occasionally only* as work tasks require the construction worker to enter the excavation pit. Please note that the 150 days per year exposure frequency is the exposure frequency typically assumed for construction worker exposure to both groundwater and soils for PNS risk assessments conducted in the recent past.

The 2 ug/dL baseline adult blood level selected to compute the screening level for the construction worker is within the summary default parameter value range presented in the January 2003 version of the *Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil (OSWER Directive #9285.7-54).* More importantly, the value is in agreement with data presented for the Northeast Region of the United States in the USEPA document titled, *Blood Lead Concentrations of U.S. Adult Females: Summary Statistics from the Phases 1 and 2 of the National Health and Nutrition Evaluation Survey (NHANES III)* (OSWER #9285.7-52, March 2002, Tables 3a and 3c).

<u>Calculation of Construction Worker Screening Level for Incidental Ingestion of Lead in Water:</u>

$$\textbf{Screening Level (iw)} = \frac{([10\text{ug/dL}/(0.9*(2.0^{1.645}))]-2.0\text{ ug/dL})*365\text{ days/yr}}{0.4\text{ ug/dL per ug/day }*(0.02\text{L/day}*0.6*150\text{ days/yr})}$$

Screening Level (iw) = 800 ug/L

Equation for Calculating a Construction Worker Screening Level Based on Dermal Contact with Lead in Water:

$$\textbf{Screening Level (dw)} = \frac{([PbB_{95}fetal/(R*(GSD_i^{1.645}))]-PbB_0)*AT_w}{BKSF*(Kp*ET*CF*A_s*EF_{constw})}$$

where:

$PbB_{fetal,\ 0.95}$	95th percentile blood lead concentration (PbB) in fetus (Goal is 10 ug/dL)
$R_{fetal/maternal}$	Fetal/maternal PbB ratio = 0.9
BKSF	Biokinetic Slope Factor = 0.4 ug/dL per ug/day
GSD_i	Geometric standard deviation PbB = 2
PbB_0	Baseline PbB = 2 ug/dL
Kp	permeability coefficient = 0.0001 cm/hour
ET	Exposure Time = 2 hr/day
CF	conversion factor (0.001 L/cm^3)
A	skin surface area available for contact = 3,300 cm^2
EF_{constw}	Exposure frequency for construction workers = 150 days/yr
AT_w	Averaging time for exposure to water = 365 days/yr

Most of the exposure factors values presented above are default values presented in the ALM model or were defined in the preceding evaluation of the ingestion route of exposure. The skin surface available for contact (3,300 cm^2) is the recommended value presented in the current version of *USEPA RAGS Part E, Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual, Supplemental Guidance for Dermal Risk Assessment*, for the evaluation of worker exposure to soils (USEPA, July 2004).

Calculation of Construction Worker Screening Level for Dermal Contact with Lead in Water:

$$\textbf{Screening Level (dw)} = \frac{([10ug/dL/(0.9*(2.0^{1.645}))]-2.0\ ug/dL)*365\ days/yr}{0.4ug/dL/ug/day*(0.0001cm/hr*2hr/day*0.001L/cm^3*3{,}300cm^2*150\ days/yr)}$$

Screening Level (dw) = 14,500 ug/L

The preceding calculations and screening levels suggest that receptor intake for the ingestion route of exposure is greater than receptor intake for the dermal contact route of exposure by a factor of approximately 18. A screening level derived assuming receptor contact by *both* the ingestion and dermal routes of exposure would be approximately **750 ug/L** (i.e., a screening level slightly less than the 800 ug/L value derived for the ingestion route of exposure). The calculation of the combined screening level is attached.

2.0 Approach No. 2.0. Derivation of a Screening level for Child Recreational User Exposed to Intertidal Surface Water, Based on the USEPA Integrated Exposure Uptake Biokinetic Model (IEUBK) for Lead in Children

A lead screening level for a child recreational user can be derived using the IEUBK model by use of the Model's Alternate Source Data option. The ***Alternate Source Data option*** allows the user to input lead concentrations from atypical sources (i.e., *alternative lead intakes* not addressed by the Model's main menu options). Examples include the direct ingestion of lead-based paint and the use of cosmetics or home remedies. In the case of PNS, the alternate source would be exposure to lead in river water or seep water by a child recreating in the intertidal area. The child (3 to 7 years of age) is expected to be exposed 4 hours/day, 26 days/year and to incidentally ingest 0.05 L of the saline water per hour. The exposure time (4 hours per day), exposure frequency (26 days per year), and incidental surface water ingestion rate (0.05 Lper hour) factors used to develop the screening level for the recreational-type of exposure are those specified in the aforementioned *December 2002 Human Health Risk Screening Levels for Intertidal Surface Water and Sediment Technical Memorandum.* The exposure time/frequency factors suggested for this analysis and the State of Maine default exposure time/frequency factors for recreational activities (2.6 hours per day and 40 days per year) yield the same overall exposure time when receptor exposure is presented in terms of exposure hours per year (i.e., both sets of time factors yield 104 exposure hours per year).

Depending on the averaging time selected (i.e., 90 days, 180 days, and 365 days) the preceding recommended exposure factors yield screening levels that range from 300 to 700 ug/L as discussed below. The averaging time is the period over which exposure is averaged. (Dermal contact is not included in these calculations because the IEUBK model does not consider dermal contact.)

The ***alternate lead intake value*** input into the Model is calculated as follows:

Step 1. Calculate liters of surface water ingested per year.

0.05 L/hour x 4 hours/day x 26 days/year = 5.2 L/year

Step 2. Calculate the amount of lead ingested per year by assuming a range of possible lead concentrations. If the concentration of lead is assumed to be 300 ug/L, the amount of lead ingested is as follows:

5.2 L/year x 300 ug/L = 1,560 ug/year

Step 3. Calculate the amount of lead ingested per day (the Model requires that the units of Alternate Source Data variable have units of ug/day). This value is calculated by dividing the amount ingested per year by an averaging time. Assumptions concerning averaging time (the period over which exposure is averaged) can vary. A typical averaging time used for lead is 365 days, as shown in Section 3. If 365 days is selected as the averaging time, the alternate lead intake value is:

1,560 ug/year / 365 days/year = 4.3 ug/day

Assuming a shorter averaging time would increase the intake value. For example, if the exposure is assumed to occur during the summer months (as is assumed for the PNS recreational exposure scenario), the averaging time may be 90 days/year and the alternate lead intake value input value becomes:

1,560 ug/year / 90 days/year = 17 ug/day

As demonstrated above, the shorter the averaging time, the larger the daily intake of lead, and, consequently, the smaller the screening level. The effects of averaging time on the value of the screening level are presented in Section 5.0. It should be noted that 180 and 365 days per year averaging times were included in this analysis for purposes of discussion only. As indicated in Section 6, the 90-day averaging time is the basis for the screening level recommended for the recreational user in this technical memorandum because the 90-day averaging time frame most likely reflects how exposure may occur at PNS (i.e., most recreational exposures involving direct contact with surface waters are likely to occur in the warm summer months).

The ***lead screening level*** for a child recreational user's exposure to intertidal surface water is calculated as follows:

Step 1. Enter the alternate lead intake value into the Model and run the Model.

Step 2. Check the Model output to see whether the projected child blood lead level is less than the USEPA goal of 10 ug/dL and the probability of exceeding 10 ug/dL is less than the USEPA goal of 5 percent. Determining the final screening level is a trial and error process which requires several repetitions of process outlined above First, an intertidal surface water concentration must be assumed and a daily intake be derived, as shown above. The daily intake is then entered in the Alternate Source Option menu, the Model run, and the output is compared to the USEPA benchmarks. If the projected blood lead levels or probabilities are not acceptable, a different intertidal surface water concentration is assumed and the process is repeated. The repetitions are continued until acceptable blood lead levels and probabilities are predicted by the model. The intertidal surface water concentration which generates acceptable results is selected as the recommended screening level.

The intertidal surface water screening level developed by this approach has the advantage of being derived directly from the IEUBK model and site-specific assumptions. All of the model's default background levels are used. Thus, background contributions from air, soil, drinking water, diet, and maternal contributions are considered and reflected in the alternate water screening level. In addition, the screening level is not based on sources and extrapolations which may not be completely defensible.

Although the screening level is specific to the child recreational user, it would also be protective of dermal contact by a construction worker, because dermal contact with lead in water is not likely to be an important exposure route due to the low permeabilities of lead from water.

5.0 Uncertainty Analysis

The screening levels presented in this technical memorandum are subject various sources of uncertainty, including the following:

- *The screening level calculated for the recreational receptor did not consider exposures incurred by very young children (i.e., 0 to 3 year old children).* However, exposure to very young children is likely to be very limited because of the physical nature of much of the shoreline and intertidal areas at PNS. In many areas, the shoreline at the facility is

rocky and would be physically hazardous for very young children; very young children would rarely play unsupervised along this type of shoreline due to safety considerations. The mudflat areas of the shoreline are also not conducive to recreational activities or not safe for very young children. Consequently, exposure time and exposure frequency for the very young child are anticipated to be very limited when compared to the older-child age group (3 to 7 years old) considered for the development of the screening level for recreational user. Because of the anticipated significant differences in exposure times and frequencies, the screening level derived for the 3 to 7 year older child would be protective for the very young child who, on a rare occasion, might walk/crawl in the intertidal area of the PNS.

- *The screening levels presented in this memorandum are based on the USEPA's goal of controlling lead exposure in children/fetuses so that no more that 5 percent of receptors experience a blood lead level exceeding 10 ug/dL. However, all health-based goals, standards, or criteria are subject to change over time as new toxicity information becomes available.* The toxicity of lead continues to be actively investigated by the scientific and regulatory community and is the subject of much debate. Both USEPA and State of Maine goals regarding lead exposure may change in the future as more definitive toxicity information becomes available for lead.

- *Standard exposure factors guidelines and recommendations (e.g., recommendations for appropriate exposure frequencies) are limited for the risk evaluation/screening level development for the recreational land use scenario.* A consideration of site-specific conditions and professional judgment is often necessary in the determination of appropriate exposure factors. For example, the screening levels presented in this technical memorandum for the recreational user assume that the receptor in exposed two days per week during the warm weather months (i.e., 26 days over the course of the summer [90 days]). This assumption is based on climatic conditions for the northeast region of the United States and on the fact that much of the shoreline at PNS is not attractive for recreational use. The recommended screening levels would be lower if it was assumed that exposure were to occur more frequently. However, assuming that lead concentrations in the surface water equal the recommended screening level for the recreational user (300 ug/L), lead intakes predicted for the recreational user would only exceed the lead intake associated with routine domestic use of a water supply containing 15 ug/L if it were assumed that the recreational receptor were exposed four days per week during the warm weather months.

6.0 Summary and Recommendations

This technical memorandum presents the approaches used to develop aqueous lead screening levels for recreational users and construction workers to use in assessing potential human health risks from lead at PNS IRP sites which have brackish/saline groundwater and the intertidal surface water is saline. The methods involved the use of the USEPA Adult or Child Lead Models. Screening levels developed by the approaches are presented in the following table. The Navy recommends the lead screening level based on the 90-day averaging time (300 ug/L)) for the recreational user because the 90-day averaging time frame most likely reflects how exposure may occur at PNS (i.e., most recreational exposures involving direct contact with surface waters are likely to occur in the warm summer months). The aqueous lead screening level recommended for construction worker exposure is 750 ug/L.

SUMMARY OF POTENTIAL LEAD SCREENING LEVELS

Approach 1 – Calculation of Screening Levels for Construction Workers Using Equations and Input Parameters from the Adult Lead Model (ALM)		
Incidental Ingestion	Dermal Contact	Incidental Ingestion plus Dermal Contact
800 ug/L	14,500 ug/L	**750 ug/L**
Approach 2 – Calculation of Screening Levels for Incidental Ingestion of Water by Child Recreational Users Using the Child Lead Model (IEUBK)		
Averaging time of 90 days	Averaging time of 180 days	Averaging time of 365 days
300 ug/L	500 ug/L	700 ug/L

References

Agency for Toxic Substances and Disease Registry (ATSDR), accessed on-line March 2004. Toxicological Profile for Lead, U.S. Department of Health and Human Services, Public Health Services (http://www.atsdr. cdc.gov/toxpro2.html).

USEPA, July 2004. Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final, EPA/540/R/99/005, OSWER 9285.7-02EP, PB99-963312.

USEPA, March 2002. Blood Lead Concentrations of U.S. Adult Females: Summary Statistics from the Phases 1 and 2 of the National Health and Nutrition Evaluation Survey (NHANES III) (OSWER #9285.7-52).

Attachments

Check Calculation for Screening Level for Construction Worker.

Responses to Comments on the Technical Memorandum on Derivation of Aqueous Lead Screening Levels, Portsmouth Naval Shipyard (PNS), Kittery, Maine.

Conference Call Notes from the February 3, 2005 Discussion of the Technical Memorandum on Derivation of Aqueous Lead Screening Levels, Portsmouth Naval Shipyard (PNS), Kittery, Maine.

Responses to Follow-up Comments on the Technical Memoradum on Derivation of Aqueous Lead Screening Levels, Portsmouth Naval Shipyard, Kittery, Maine.

APPENDIX D.5.6

Calculated Screening Level Tables

AQUEOUS RISK-BASED SCREENING LEVELS FOR CONSTRUCTION WORKERS
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

CHEMICAL	SCREENING LEVEL (ILCR = 1E-6) (ug/L)	SCREENING LEVEL (HQ = 0.1) (ug/L)	FINAL SCREENING LEVEL (ug/L) (1)	BASIS
Aluminum	--	2580000	2580000	N
Antimony	--	155	155	N
Arsenic	1200	774	774	N
Barium	--	36100	36100	N
Beryllium	--	36.1	36.1	N
Cadmium	--	64.5	64.5	N
Chromium	--	25800	25800	N
Cobalt	--	1940	1940	N
Copper	--	103000	103000	N
Iron	--	1810000	1810000	N
Lead	--	--	1340 (2)	N/A
Manganese	--	2480	2480	N
Mercury	--	54.2	54.2	N
Nickel	--	10300	10300	N
Selenium	--	12900	12900	N
Silver	--	860	860	N
Thallium	--	26	26	N
Vanadium	--	12900	12900	N
Zinc	--	1290000	1290000	N
4,4'-DDD	10	--	10	C
4,4'-DDE	8.3	--	8.3	C
4,4'-DDT	4.4	1.1	1.1	N
Aldrin	11	8.2	8.2	N
alpha-Chlordane	24	6	6	N
Dieldrin	1.6	1.8	1.6	C
Endrin	--	11	11	N
gamma-BHC (Lindane)	40	19	19	N
gamma-Chlordane	24	6	6	N
Heptachlor	8.2	26	8.2	C
PCB (high risk)	0.64	--	0.64	C
1,2,4-Trichlorobenzene	--	190	190	N
1,2-Dichlorobenzene	--	3400	3400	N
1,3-Dichlorobenzene	--	1900	1900	N
1,4-Dichlorobenzene	4700	2600	2600	N
2,4,6-Trichlorophenol	2100	--	2100	C
2,4-Dichlorophenol	--	200	200	N
2,4-Dimethylphenol	--	3100	3100	N
2,4-Dinitrophenol	--	1600	1600	N
2,4-Dinitrotoluene	--	810	810	N
2,6-Dinitrotoluene	--	590	590	N
2-Chlorophenol	--	1000	1000	N
2-Ethoxy ethanol(Cellosolve)	--	2600000	2600000	N
2-Nitrophenol	--	790	790	N
3-Nitrophenol	--	580	580	N
4-Chlorophenol	--	710	710	N
4-Nitrophenol	--	660	660	N
Benzo(a)anthracene	2	--	2	C
Benzo(a)pyrene	0.1	--	0.1	C
Benzo(b)fluoranthene	1	--	1	C
Benzoic acid	--	1200000	1200000	N
Benzyl chloride	690	340	340	N
Bis(2-chloroethyl)ether	540	--	540	C
Chrysene	190	--	190	C
Di-2-ethylhexylphthalate	810	320	320	N
Dibenzo(a,h)anthracene	0.07	--	0.07	C
Dibutyl phthalate	--	3100	3100	N
Dichlorobenzidine, 3,3'	94	--	94	C
Diethyl phthalate	--	200000	200000	N
Dioxane, 1,4-	370000	590000	370000	C
Fluoranthene	--	200	200	N
Hexachlorobenzene	2	4.4	2	C
Hexachlorobutadiene	92	10	10	N
Hexachloroethane	1500	29	29	N
Indeno(1,2,3-CD)pyrene	1	--	1	C
Isophorone	340000	93000	93000	N
m-Cresol	--	12000	12000	N
Naphthalene	--	730	730	N
o-Cresol	--	12000	12000	N
p-Cresol	--	1200	1200	N
Pentachlorophenol	12	62	12	C
Phenanthrene	--	270	270	N
Phenol	--	130000	130000	N
Phenol,4,6-dinitro-2-methyl-	--	36	36	N
TCDD	0.000007	0.000001	0.000001	N
2-Methylnaphthalene	--	720	720	N
Acenaphthene	--	10000	10000	N
Acenaphthylene	--	10000	10000	N
Anthracene	--	28000	28000	N
Bis(2-ethylhexyl)phthalate	810	320	320	N
Di-n-butyl phthalate	--	31000	31000	N
Fluorene	--	5200	5200	N
Pyrene	--	1700	1700	N

Footnotes

1 The Final Screening Level is the minimum value of the ILCR and HQ = 0.1 screening levels for any given compound unless otherwise noted.

2 Screening level for lead was derived from an adaptation of the USEPA's Adult Lead Model as described in the Technical Memorandumon the Derivation of Lead Screening Levels (TtNUS, June 2004) and included in the Remedial Investigation Report for OU1. Examples calculations are included at the end of this appendix.

Acrynomns

C = Carcinogen
HQ = Hazard Quotient
ILCR = Incremental Lifetime Cancer Risk
N = Noncancer

SCREENING LEVELS FOR THE RECREATIONAL RECEPTOR EXPOSED TO INTERTIDAL SURFACE WATERS
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

PARAMETER [1]	SCREENING LEVELS FOR INTERTIDAL SURFACE WATERS [2]	
Semivolatile Organics	**(UG/L)**	
1,1-BIPHENYL	8.7E+03	N
1-METHYLNAPHTHALENE	2.7E+01	C
1-METHYLPHENANTHRENE	6.5E+02	N
2,3,5-TRIMETHYLNAPHTHALENE	7.0E+02	N
2,6-DIMETHYLNAPHTHALENE	1.8E+03	N
2-METHYLNAPHTHALENE	1.2E+03	N
ACENAPHTHENE	8.8E+03	N
ACENAPHTHYLENE	7.2E+03	N
ANTHRACENE	2.4E+04	N
BAP EQUIVALENT [3]	5.0E-01	C
BENZO(A)ANTHRACENE	5.0E+00	C
BENZO(A)PYRENE	5.0E-01	C
BENZO(B)FLUORANTHENE	5.0E+00	C
BENZO(E)PYRENE	NA	
BENZO(G,H,I)PERYLENE	1.6E+02	N
CHRYSENE	5.0E+02	C
DIBENZO(A,H)ANTHRACENE	5.0E-01	C
FLUORANTHENE	1.8E+03	N
FLUORENE	4.3E+03	N
INDENO(1,2,3-CD)PYRENE	5.0E+00	
NAPHTHALENE	5.3E+03	N
PERYLENE	NA	
PHENANTHRENE	2.4E+03	N
PYRENE	1.6E+03	N
Pesticides/PCB's	**(UG/L)**	
2,4'-DDT	2.3E+01	C
4,4'-DDE	2.3E+01	C
4,4'-DDT	2.3E+01	C
ALPHA-CHLORDANE	2.0E+00	C
GAMMA-BHC (LINDANE)	2.0E+00	C
HEPTACHLOR	4.0E-01	C
HEPTACHLOR EPOXIDE	8.0E-02	C
HEXACHLOROBENZENE	5.0E+00	C
MIREX	6.4E-02	C
TEQ PCB [4]	6.1E-05	C
TOTAL PCB CONGENERS [5]	4.0E+00	C
TRANS-NONACHLOR	NA	
Total Metals	**(UG/L)**	
ALUMINUM	1.3E+07	N
ARSENIC	4.9E+00	C
BARIUM	1.3E+05	N
CADMIUM	2.7E+02	N
CALCIUM	NA	
Total Metals	**(UG/L)**	
CHROMIUM [6]	5.7E+02	N
COPPER	5.2E+01	N

SCREENING LEVELS FOR THE RECREATIONAL RECEPTOR EXPOSED TO INTERTIDAL SURFACE WATERS
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

PARAMETER [1]	SCREENING LEVELS FOR INTERTIDAL SURFACE WATERS [2]	
IRON	9.1E+05	N
LEAD [7]	9.5E+02	
MAGNESIUM	NA	
MANGANESE	1.1E+04	N
NICKEL	2.0E+04	N
POTASSIUM	NA	
SILICON	NA	
SILVER	3.2E+03	N
SODIUM	NA	
VANADIUM	6.5E+03	N
ZINC	4.0E+05	N

Footnotes:

1. Please see text in Appendix D for an explanation of screening level development. The list of chemicals presented in this table includes those compounds detected in surface or seep water at OU7.
2. The final screening levels presented on this table correspond to a cancer risk level of 1×10^{-6} or a hazard index of 1.0.
3. Screening vaue for benzo(a)pyrene is presented.
4. Screening value for TCDD is presented.
5. Screening value for high risk PCBs is presented.
6. Screening value presented was calculated using chromium VI toxicity data.
7. The action levels for lead are calculated risk-based concentrations and are based on the exposure assumptions found in the Technical Memorandum Derivation of Lead Screening Levels for Recreational Users Exposed to Intertidal Surface Water and Construction Workers Exposed to Shallow Groundwater at Portsmouth Naval Shipyard, Kittery, Maine

Acroymns

C = Carcinogen
NA = Not applicable/not available
N= Noncarcinogen

SCREENING LEVELS FOR THE RECREATIONAL RECEPTOR EXPOSED TO SEDIMENT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

PARAMETER [1]	SCREENING LEVELS FOR SEDIMENT [2]	
Semivolatile Organics (mg/kg)		
1,1-BIPHENYL	410	C
1-METHYLNAPHTHALENE	110	C
1-METHYLPHENANTHRENE	9100	N
2,3,5-TRIMETHYLNAPHTHALENE	9100	N
2,6-DIMETHYLNAPHTHALENE	9100	N
2-METHYLNAPHTHALENE	1800	N
ACENAPHTHENE	27000	N
ACENAPHTHYLENE	27000	N
ANTHRACENE	140000	N
BAP EQUIVALENT [3]	0.2	C
BENZO(A)ANTHRACENE	2	C
BENZO(A)PYRENE	0.2	C
BENZO(B)FLUORANTHENE	2	C
BENZO(E)PYRENE	9100	N
BENZO(G,H,I)PERYLENE	14000	N
BENZO(K)FLUORANTHENE	16	C
CHRYSENE	160	C
DIBENZO(A,H)ANTHRACENE	0.2	C
DIBENZOTHIOPHENE	NA	
FLUORANTHENE	110000	N
FLUORENE	18000	N
INDENO(1,2,3-CD)PYRENE	2	C
NAPHTHALENE	9100	N
PERYLENE	56000	N
PHENANTHRENE	84000	N
PYRENE	84000	N
Pesticides/PCBs (mg/kg)		
1,2,4,5-TETRACHLOROBENZENE	170	N
Total PCBs	15	C
TCDD	0.00007	C
2,4'-DDD	37	C
2,4'-DDE	26	C
2,4'-DDT	26	C
4,4'-DDD	37	C
4,4'-DDE	26	C
4,4'-DDT	26	C
ALDRIN	0.19	C
ALPHA-BHC	1.1	C
ALPHA-CHLORDANE	20	C
BETA-BHC	4.0	C
CHLOROPYRIFOS	NA	
DIELDRIN	0.21	C
ENDOSULFAN II	3400	N
ENDRIN	170	N
GAMMA-BHC (LINDANE)	6.5	C

SCREENING LEVELS FOR THE RECREATIONAL RECEPTOR EXPOSED TO SEDIMENT
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

PARAMETER [1]	SCREENING LEVELS FOR SEDIMENT [2]	
GAMMA-CHLORDANE	20	C
HEPTACHLOR	0.74	C
HEPTACHLOR EPOXIDE	0.36	C
HEXACHLOROBENZENE	2.1	C
MIREX	1.8	C
PENTACHLOROBENZENE	450	N
TRANS-NONACHLOR	NA	
Inorganics (mg/kg)		
ALUMINUM	2000000	N
ARSENIC	5.9	C
CADMIUM	780	N
CHROMIUM [4]	60	C
COPPER	80000	N
IRON	1400000	N
LEAD [5]	400	
MANGANESE	6100	N
MERCURY	130	N
NICKEL	5100	N
SILVER	1300	N
ZINC	600000	N

Footnotes:

1. Please see text in Appendix D for an explanation of screening level development. The list of chemicals presented in this table includes those compounds detected in surface or seep water at OU7.

2. The final screening levels presented on this table correspond to a cancer risk level of 1×10^{-6} or a hazard index of 1.0.

3. Screening vaue for benzo(a)pyrene is presented.

4. Screening value presented was calculated using chromium VI toxicity data.

5. Value is EPA's OSWER soil screening level for residential land use.

Acroymns

C = Carcinogen
NA = Not applicable/not available
N= Noncarcinogen

APPENDIX D.5.7

Example Screening Level Calculations

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE 1 OF 1

CLIENT PNS		JOB NUMBER	
SUBJECT Lead Screening Level, GW Dermal Contact with GW			
BASED ON		DRAWING NUMBER	
BY L.C.	CHECKED BY MDIL	APPROVED BY	DATE 7-29-11

$$\text{Screening level (dw)} = \frac{\left(\left[PbB_{95\,fetal}/\left(R \times \left(GSD_i^{1.645}\right)\right)\right] - PbB_0\right) \times AT_w}{BKSF \times \left(KP \times ET \times CF \times A \times EF_{constw}\right)}$$

$PbB_{fetal,0.95} = 10$ ug/dL
$R = 0.9$
$BKSF = 0.4$ ug/dL per ug/day
$GSD_i = 1.8$
$PbB_0 = 1$ ug/dL
$K_p = 0.0001$ cm/hr
$ET = 8$ hr/day or 2 hr/day
$CF = 0.001$ L/cm^3
$EF_{constw} = 150$ days/yr.
$AT_w = 365$

$$= \frac{\left(\left[10\text{ ug/dL}/\left(0.9 \times \left(1.8^{1.645}\right)\right)\right] - 1.0\text{ ug/dL}\right) \times 365}{0.4 \times \left(0.0001 \times \underline{\underline{8}}\text{ hr/day} \times 0.001 \times 3300 \times 150\right)}$$

$= 7430$ (assuming 8 hr. ET)

$= 29{,}700$ (assuming 2 hr. ET)

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE 1 OF 1

CLIENT PNS		JOB NUMBER	
SUBJECT Lead Screening Level, CW Ingestion of GW			
BASED ON		DRAWING NUMBER	
BY L.C.	CHECKED BY MDK	APPROVED BY	DATE 7-29-11

$$\text{Screening Level}_{(iw)} = \frac{[(PbB_{95\,fetal}/(R \times (GSD_i^{1.645}))] - PbB_0) \times AT_w}{BKSF \times (IR_w \times AF_w \times EF_{const\,w})}$$

$PbB_{fetal} = 10$ ug/dL
$R = 0.9$
$BKSF = 0.4$ ug/dL per ug/day
$GSD_i = 1.8$
$PbB_0 = 1.0$ ug/dL
$IR_w = 0.02$ L/day
$AF_w = 0.60$
$EF_{const\,w} = 150$ days/yr
$AT_w = 365$ days/yr

$$= \frac{[(10\text{ ug/dL}/(0.9 \times (1.8^{1.645}))] - 1.0\text{ ug/dL}) \times 365\text{ days/yr}}{(0.4\text{ ug/dL per ug/day} \times (0.02\text{ L/day} \times 0.60 \times 150\text{ days/yr}))}$$

$$= \frac{\cancel{8.12}\ 1177}{0.72} = \cancel{11.2}\ \underline{1630}\text{ ug/L}$$

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE 1 OF 1

CLIENT PNS		JOB NUMBER	
SUBJECT Lead Screening Level, CW Ing. + Dermal w/ GW			
BASED ON		DRAWING NUMBER	
BY L.C.	CHECKED BY MDK	APPROVED BY	DATE 7-29-11

Screening Level (combined ingestion and dermal)

$$= \frac{\left(\left[10\ \mu g/dL/(0.9) \times \left(1.8^{1.645}\right)\right] - 1.0\ \mu g/dL\right) \times 365}{\underbrace{\left(0.4\ \mu g/dL \cdot \times \left(0.02\ L/day \times 0.6 \times 150\ day/yr\right)\right)}_{0.72} + \underbrace{\left(0.4 \times \left(0.0001 \times 8 \times 0.001 \times 3300 \times 150\right)\right)}_{0.1584}}$$

(0.4 µg/dL per µg/day)

= 1340. (assuming 8-hr ET)

CLIENT PNS	JOB NUMBER 00383
SUBJECT Calculate Screening Levels for Surface Water	
BASED ON USEPA 1989, 2004	DRAWING NUMBER
BY L. Ciofani / CHECKED BY MDK	APPROVED BY r / DATE 11/13/09

Objective: Calculate Screening Levels for Arsenic in Surface Water.

Dermal DAD = (DAevent × EV × ED × EF × SA) / (BW × AT)

DAD = Dermally absorbed dose (mg/kg/day) - see Appendix D.2
DAevent = Absorbed dose per event (mg/cm²) = Calculated
EV = Events/day = 1
ED = Exposure duration = 17 (adult), 10 (adolescent), 3 (young child) years
EF = Exposure frequency = 26 days/yr.
SA = Skin area exposed = 4500 (adult), 4290 (adolescent), 4000 (young child) cm²
BW = Body weight = 70 (adult), 45 (adolescent), 20 (young child) kg
AT = Averaging time = 70 × 365 for cancer, ED × 365 for non cancer (days)

Cancer

Adult:

$$DAD = \frac{4.0E^{-06} \times 1 \text{ event/day} \times 17 \text{ yrs.} \times 26 \text{ day/yr.} \times 4500 \text{ cm}^2}{70 \text{ kg} \times 25550 \text{ days}}$$

$$= 4.4E^{-06} \text{ mg/kg/day} \checkmark$$

Adolescent:

$$DAD = \frac{4.0E^{-06} \times 1 \text{ event/day} \times 10 \text{ yrs.} \times 26 \text{ day/yr.} \times 4290 \text{ cm}^2}{45 \text{ kg} \times 25550 \text{ days}}$$

$$= 3.9E^{-06} \text{ mg/kg/day} \checkmark$$

CLIENT PNS		JOB NUMBER	
SUBJECT Calculate Screening Levels for Surface Water			
BASED ON USEPA 1989, 2004		DRAWING NUMBER	
BY L. Ciotani	CHECKED BY MDK	APPROVED BY	DATE 11/13/09

Young Child:

$$DAD = \frac{4.0E^{-06} \times 1 \text{ event/day} \times 3 \text{ yrs} \times 26 \text{ day/yr} \times 4000 \text{ cm}^2}{20 \text{ kg} \times 25550 \text{ days}}$$

$$= 2.4E^{-06} \text{ mg/kg/day} \checkmark$$

Sum of adult, adolescent, and child = $1.07E^{-05}$ mg/kg/day

CSF for Arsenic = $1.5 (\text{mg/kg/day})^{-1}$

$1.07E^{-05}$ mg/kg/day $\times$ $1.5 (\text{mg/kg/day})^{-1}$ = $1.61E^{-05}$ ✓ (dermal cancer risk)

Ingestion: Dose = (conc × IR × ET × ED × EF)/(BW × AT)

Conc = Chemical concentration in surface water (mg/L)
IR = Ingestion rate = 0.05 L/hr.
ET = Exposure time = 4 hrs/day

Other terms are previously defined

Cancer

Adult:

$$Dose = \frac{1 \text{ mg/L} \times 0.05 \text{ L/hr} \times 4 \text{ hr/day} \times 17 \text{ yrs} \times 26 \text{ day/yr}}{70 \text{ kg} \times 25550 \text{ days}}$$

$$= 4.9E^{-05} \text{ mg/kg/day} \checkmark$$

Adolescent:

$$Dose = \frac{1 \text{ mg/L} \times 0.05 \text{ L/hr} \times 4 \text{ hr/day} \times 10 \text{ yrs} \times 26 \text{ day/yr}}{45 \text{ kg} \times 25550 \text{ days}}$$

$$= 4.5E^{-05} \text{ mg/kg/day} \checkmark$$

CLIENT PNS	JOB NUMBER 00383
SUBJECT Calculate Screening Levels for Surface Water	
BASED ON USEPA 1989, 2004	DRAWING NUMBER
BY L. Ciofani / CHECKED BY MDK	APPROVED BY / DATE 11/13/09

Young Child:

$$\text{Dose} = \frac{1\text{mg/L} \times 0.05\text{ L/hr} \times 4\text{hr/day} \times 3\text{ yrs} \times 26\text{ day/yr.}}{20\text{ kg} \times 25550\text{ days}}$$

$$= 3.1E^{-05}\text{ mg/kg/day} \checkmark$$

Sum adult, adolescent, and child = $1.25E^{-05}$ mg/kg/day

CSF = 1.5 (mg/kg/day)$^{-1}$

$1.25E^{-05}$ mg/kg/day × 1.5 (mg/kg/day)$^{-1}$ = $1.878E^{-04}$ (ingestion cancer risk)

Dermal risk + ingestion risk = 0.0002036

Final Surface water screening level (cancer) =

$1E^{-06} / 0.0002036 = 4.9E^{-03}$ mg/L ✓

Dermal -

Noncancer

Adult:

$$\text{Dose} = \frac{4.0E^{-06} \times 1\text{event/day} \times 17\text{yrs} \times 26\text{ day/yr} \times 4500\text{ cm}^2}{70\text{ kg} \times 6205\text{ days}}$$

$$= 1.8E^{-05}\text{ mg/kg/day} \checkmark$$

Adolescent:

$$\text{Dose} = \frac{4.0E^{-06} \times 1\text{event/day} \times 10\text{yrs.} \times 26\text{ day/yr} \times 4029\text{ cm}}{45\text{ kg} \times 3650\text{ days}}$$

$$= 2.7E^{-05}\text{ mg/kg/day} \checkmark$$

CLIENT PNS		JOB NUMBER 00383	
SUBJECT Calculate Screening Levels for Surface water			
BASED ON USEPA 1989, 2004		DRAWING NUMBER	
BY L. Ciofani	CHECKED BY MDK	APPROVED BY	DATE 11/13/09

Young Child:

$$\text{Dose} = \frac{4.0E^{-06} \times 1\ \text{event/day} \times 3\ \text{yrs} \times 26\ \text{day/yr} \times 4000\ \text{cm}^2}{20\ \text{kg} \times 1095\ \text{days}}$$

$= 5.7E^{-05}$ mg/kg/day ✓

Most conservative = Young child

RfD = $3.0E^{-04}$ mg/kg/day

$5.7E^{-06}$ mg/kg/day / $3.0E^{-04}$ mg/kg/day

= 0.19

1/0.19 = 5.3 mg/L ✓ (dermal noncancer screening level)

Ingestion - Noncancer

Adult:

$$\text{Dose} = \frac{1\ \text{mg/L} \times 0.05\ \text{L/hr} \times 4\ \text{hr/day} \times 17\ \text{yrs} \times 26\ \text{day/yr}}{70\ \text{kg} \times 6205\ \text{days}}$$

$= 2.0E^{-04}$ mg/kg/day

Adolescent:

$$\text{Dose} = \frac{1\ \text{mg/L} \times 0.05\ \text{L/hr} \times 4\ \text{hr/day} \times 10\ \text{yrs} \times 26\ \text{day/yr}}{45\ \text{kg} \times 3650\ \text{days}}$$

$= 3.2E^{-04}$ mg/kg/day ✓

Young Child

$$\text{Dose} = \frac{1\ \text{mg/L} \times 0.05\ \text{L/hr} \times 4\ \text{hr/day} \times 3\ \text{yrs} \times 26\ \text{day/yr}}{20\ \text{kg} \times 1095\ \text{days}}$$

$= 7.1E^{-04}$ mg/kg/day

Most conservative = young child. RfD = $3E^{-04}$ mg/kg/day

CLIENT PNS		JOB NUMBER 00383	
SUBJECT Calculate Screening Levels for Surface Water			
BASED ON USEPA 1989, 2004		DRAWING NUMBER	
BY L. Ciofani	CHECKED BY MDK	APPROVED BY	DATE 11/13/09

7.1E-04 mg/kg/day / 3E-04 mg/kg/day

= 2.37 (ingestion risk)

1 / 2.37 = 0.42 mg/L (ingestion screening level - noncancer)

dermal + ingestion = 0.19 + 2.37 = 2.56

$\frac{1}{2.56}$ = 0.39 mg/L = Final screening level for surface water - noncancer

CLIENT PNS	JOB NUMBER 00383
SUBJECT Calculate Screening Levels for Sediment	
BASED ON USEPA, 1989, 2004	DRAWING NUMBER
BY L. Ciofani / CHECKED BY MDM	APPROVED BY / DATE 11/4/09

Objective: Calculate Screening Level for TCDD in Sediment.

Dermal

$$DAD = \frac{(Conc \times CF \times EV \times ED \times EF \times SA \times AF \times ABS)}{BW \times AT}$$

DAD = Dermally Absorbed Dose (mg/kg/day)
Conc = Chemical concentration in sediment = 1 mg/kg
CF = Conversion Factor = 10^{-6}
EV = Events/day = 1
ED = Exposure duration = 17 (adult), 10 (adolescent), 3 (young child) years
EF = Exposure frequency = 26 days/year
SA = Skin area exposed = 4500 (adult), 4290 (adolescent), 4000 (young child) cm^2
AF = Adherence Factor = 1 mg/cm^2

ABS = Absorption Factor = chemical specific
BW = Body weight = 70 (adult), 45 (adolescent), 20 (young child) kg
AT = Averaging time = 70 × 365 for cancer, ED × 365 for noncancer (days)

Cancer
Adult:

$$DAD = \frac{1\ mg/kg \times 10^{-6} \times 1 \times 17\ yrs. \times 26\ day \times 4500\ cm^2 \times 1 \times 0.0}{70\ kg \times 25550\ days}$$

$$= 3.3 \times 10^{-8}\ mg/kg/day$$

Adolescent

$$= \frac{1\ mg/kg \times 10^{-6} \times 1 \times 10\ yrs. \times 26\ days \times 1290\ cm^2 \times 1 \times 0.03}{45\ kg \times 25550\ days}$$

$$= 2.9\ E^{-08}\ mg/kg/day$$

CLIENT		JOB NUMBER	
PNS		00383	
SUBJECT: Calculate Screening Levels for Sediment			
BASED ON: USEPA 1989, 2004		DRAWING NUMBER	
BY: L. Ciofani	CHECKED BY: MDK	APPROVED BY	DATE: 11/4/09

Young Child

$$DAD = \frac{1 mg/kg \times 10^{-6} \times 1 \times 3 yrs \times 26 days \times 4000 cm^2 \times 1 \times 0.03}{20 kg \times 25550 days}$$

$= 1.8 E^{-08}$ ✓ mg/kg/day

Sum of adult, adolescent, child = $8.0 E^{-08}$ ✓ mg/kg/day

CSF for TCDD = $1.3 E^{+05} (mg/kg/day)^{-1}$

$8E^{-08}$ mg/kg/day × $1.3E^{+05} (mg/kg/day)^{-1} = 0.0104$ ✓ (dermal risk)

$1 E^{-06} / 0.0104 = 9.6 E^{-05}$ mg/kg ✓

Ingestion =

Dose = (Conc × IR × FI × CF × ED × EF) / BW × AT)

IR = Ingestion Rate (mg/day) = 50 (adult), 100 (adolescent), 200 (young child) mg/day

FI = Fraction Ingested = 0.5

Adult

$(1 mg/kg \times 50 mg/day \times 10^{-6} \times 0.5 \times 17 yr. \times 26 d) / 70 kg \times 25550 days$

$= 6.0E^{-09}$ ✓ mg/kg/day

Adolescent

$(1 \times 100 mg/day \times 10^{-6} \times 0.5 / 10 \times 26 day) / 45 kg \times 25550$ days

$= 1.1 E^{-08}$ ✓ mg/kg/day

CLIENT		JOB NUMBER	
PNS		00383	
SUBJECT	Calculate Screening Levels for Sediment		
BASED ON	USEPA 1989, 2004	DRAWING NUMBER	
BY L. Ciofani	CHECKED BY MDK	APPROVED BY	DATE 11/4/09

Young Child = $(1 \times 200\ mg/d \times 1E-06 \times 0.5 \times 3\ yr \times 26\ d/y) / 20\ kg \times 25550\ d$
$= 1.5\ E-08$ mg/kg/day

Sum adult + adolescent + child = $3.2\ E-08$ mg/kg/day
CSF = $1.3\ E+05\ (mg/kg/day)^{-1}$

$3.2\ E-08$ mg/kg/day $\times 1.3E+05\ (mg/kg/day)^{-1} = 0.00416$

$1\ E-06 / 0.00416 = 0.000240$ (ingestion risk)

Dermal Risk + Ingestion Risk = $0.0104 + 0.00416$

$= 0.0147$

Final sediment screening level (cancer) =

$1E-06 / 0.0147 = 6.8\ E-05$ mg/kg

Dermal
Non-cancer

Adult: $DAD = \dfrac{1\ mg/kg \times 10^{-6} \times 1 \times 17\ yr \times 26\ day \times 4500\ cm^2 \times 1 \times 0.03}{70\ kg \times 6205\ days}$

$= 1.37E-07$ mg/kg/day

Adolescent: $\dfrac{1\ mg/kg \times 10^{-6} \times 1 \times 10\ yr. \times 26\ day \times 4290\ cm^2 \times 1 \times 0.03}{45\ kg \times 3650\ days}$

$= 2.04\ E-07$ mg/kg/day

CLIENT PNS		JOB NUMBER 00383	
SUBJECT Calculate Screening Levels for Sediment - Non-Cancer			
BASED ON USEPA 1989, 2004		DRAWING NUMBER	
BY L. Ciofani	CHECKED BY MDK	APPROVED BY	DATE 11/4/09

Young Child:

$$DAD = \frac{1\,mg/kg \times 10^{-6} \times 1 \times 3\,yr. \times 26\,day \times 4000\,cm^2 \times 1 \times 0.03}{20\,kg \times 1098\,day}$$

$= 4.27\ E-07$ mg/kg/day

young child is the most conservative receptor

RfD = 1.0E-09 mg/kg/day

4.27 E-07 mg/kg/day / 1.0E-09 mg/kg/day

= 427

1/427 = 2.3E-03 mg/kg ✓ (dermal non-cancer screening level)

Ingestion

Adult: $Dose = \frac{1\,mg/kg \times 50\,mg/d \times 0.5 \times 1E-06 \times 17\,yr. \times 26\,d/yr}{70\,kg \times 6205\,d}$

= 2.5E-08 mg/kg/day ✓

Adolescent: $Dose = \frac{1\,mg/kg \times 100\,mg/d \times 0.5 \times 1E-06 \times 10\,yr. \times 26\,d/yr}{45\,kg \times 3650\,d}$

= 7.9 E-08 mg/kg/day ✓

Young Child: $Dose = \frac{1\,mg/kg \times 200\,mg/d \times 0.5 \times 1E-06 \times 3\,yr. \times 26\,d/yr}{20\,kg \times 1095\,d}$

= 3.56E-07 mg/kg/day ✓

CLIENT		JOB NUMBER	
PNS		00383	
SUBJECT			
Calculate Screening Levels for Sediment			
BASED ON		DRAWING NUMBER	
USEPA 1989, 2004			
BY	CHECKED BY	APPROVED BY	DATE
L. Ciofani	MDK		11/04/09

young child is the most conservative receptor

RfD = 1.0E-09 mg/kg/day

3.56E-07 mg/kg/day / 1.0E-09 mg/kg/day

= 356

1/356 = 2.8E-03

(Young Child) Dermal + Ingestion = $\frac{1}{427 + 356}$

= 1.3E-03 mg/kg

Final sediment screening level (non-cancer)

APPENDIX D.6

LEAD MODELING RESULTS

Child Resident
Surface Soil Entire site

LEAD MODEL FOR WINDOWS Version 1.1

==========

Model Version: 1.1 Build9
User Name: LC
Date: 09/18/09
Site Name: OU7
Operable Unit: Portsmouth Naval Shipyard
Run Mode: Site Risk Assessment

Soil/Dust Data

Soil/Dust Data
Mean concentration of lead in surface soil = 510 mg/kg

==========

****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m^3/day)	Lung Absorption (%)	Outdoor Air Pb Conc (µg Pb/m^3)
.5-1	1.000	2.000	32.000	0.100
1-2	2.000	3.000	32.000	0.100
2-3	3.000	5.000	32.000	0.100
3-4	4.000	5.000	32.000	0.100
4-5	4.000	5.000	32.000	0.100
5-6	4.000	7.000	32.000	0.100
6-7	4.000	7.000	32.000	0.100

****** Diet ******

Age	Diet Intake(µg/day)
.5-1	2.260
1-2	1.960
2-3	2.130
3-4	2.040
4-5	1.950
5-6	2.050
6-7	2.220

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 4.000 µg Pb/L

****** Soil & Dust ******

Child Resident

Surface Soil Entire Site.

Multiple Source Analysis Used
Average multiple source concentration: 367.000 µg/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Age	Soil (µg Pb/g)	House Dust (µg Pb/g)
.5-1	510.000	367.000
1-2	510.000	367.000
2-3	510.000	367.000
3-4	510.000	367.000
4-5	510.000	367.000
5-6	510.000	367.000
6-7	510.000	367.000

****** Alternate Intake ******

Age	Alternate (µg Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

****** Maternal Contribution: Infant Model ******

Maternal Blood Concentration: 1.000 µg Pb/dL

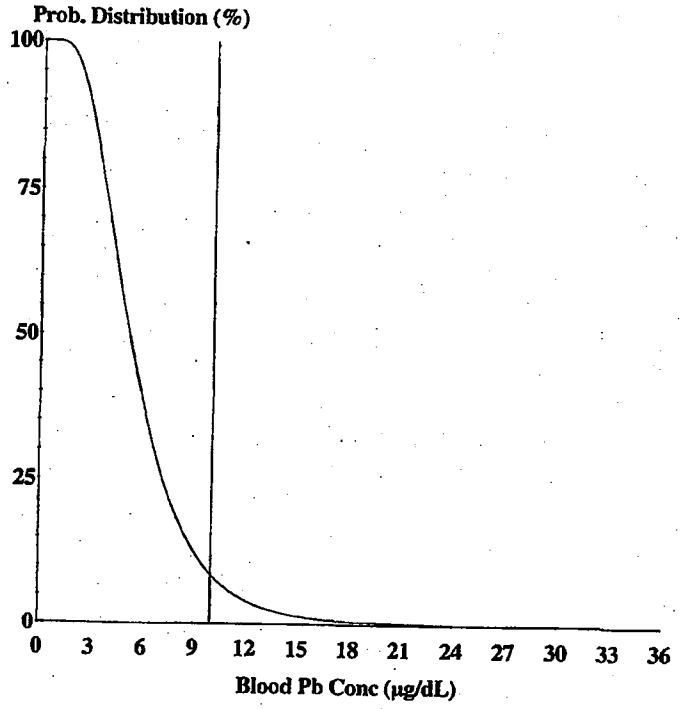
****
CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

Year	Air (µg/day)	Diet (µg/day)	Alternate (µg/day)	Water (µg/day)
.5-1	0.021	0.995	0.000	0.352
1-2	0.034	0.844	0.000	0.861
2-3	0.062	0.935	0.000	0.913
3-4	0.067	0.912	0.000	0.947
4-5	0.067	0.903	0.000	1.019
5-6	0.093	0.962	0.000	1.089
6-7	0.093	1.049	0.000	1.116

Year	Soil+Dust (µg/day)	Total (µg/day)	Blood (µg/dL)
.5-1	9.685	11.053	5.9
1-2	15.046	16.785	6.9
2-3	15.342	17.253	6.4
3-4	15.612	17.538	6.1
4-5	11.985	13.974	5.0
5-6	10.931	13.076	4.2
6-7	10.399	12.657	3.7

Child Resident

Surface Soil Entire Site



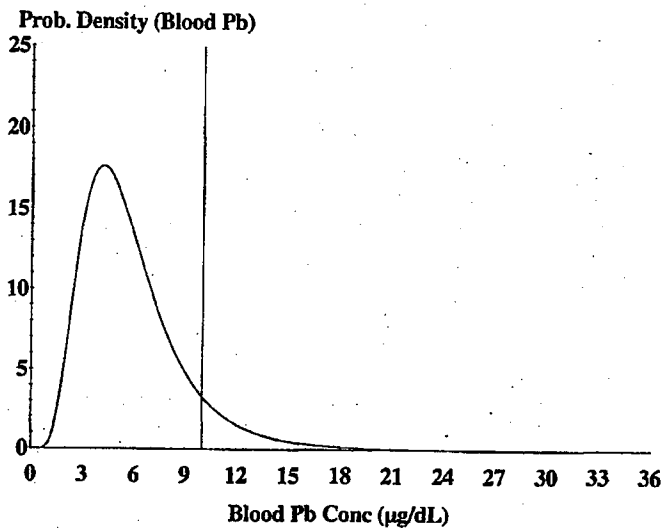
Cutoff = 10.000 µg/dl
Geo Mean = 5.361
GSD = 1.600
% Above = 9.235

Age Range = 0 to 84 months

Run Mode = Site Risk Assessment
Comment = Mean Pb Conc in SS = 510 mg/kg

Child Resident

Surface Soil Entire Site



Cutoff = 10.000 µg/dl
Geo Mean = 5.361
GSD = 1.600
% Above = 9.235
% Below = 90.765

Age Range = 0 to 84 months

Run Mode = Site Risk Assessment
Comment = Mean Pb Conc in SS = 510 mg/kg

Child Resident

Subsurface Soil Entire Site

LEAD MODEL FOR WINDOWS Version 1.1

==========

Model Version: 1.1 Build9
User Name: LC
Date: 09/18/2009
Site Name: OU7
Operable Unit: Portsmouth Naval Shipyard
Run Mode: Site Risk Assessment

Soil/Dust Data
Mean concenctration of lead in subsurface soil = 1600 mg/kg

==========

****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m^3/day)	Lung Absorption (%)	Outdoor Air Pb Conc (µg Pb/m^3)
.5-1	1.000	2.000	32.000	0.100
1-2	2.000	3.000	32.000	0.100
2-3	3.000	5.000	32.000	0.100
3-4	4.000	5.000	32.000	0.100
4-5	4.000	5.000	32.000	0.100
5-6	4.000	7.000	32.000	0.100
6-7	4.000	7.000	32.000	0.100

****** Diet ******

Age	Diet Intake(µg/day)
.5-1	2.260
1-2	1.960
2-3	2.130
3-4	2.040
4-5	1.950
5-6	2.050
6-7	2.220

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 4.000 µg Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used
Average multiple source concentration: 1130.000 µg/g

Child Resident
Subsurface Soil Entire Site

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Age	Soil (µg Pb/g)	House Dust (µg Pb/g)
.5-1	1600.000	1130.000
1-2	1600.000	1130.000
2-3	1600.000	1130.000
3-4	1600.000	1130.000
4-5	1600.000	1130.000
5-6	1600.000	1130.000
6-7	1600.000	1130.000

****** Alternate Intake ******

Age	Alternate (µg Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

****** Maternal Contribution: Infant Model ******

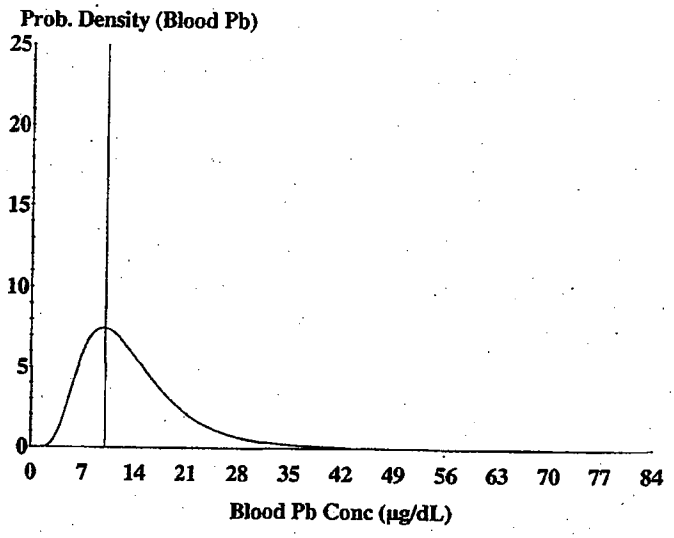
Maternal Blood Concentration: 1.000 µg Pb/dL

****
CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

Year	Air (µg/day)	Diet (µg/day)	Alternate (µg/day)	Water (µg/day)
.5-1	0.021	0.829	0.000	0.293
1-2	0.034	0.684	0.000	0.698
2-3	0.062	0.774	0.000	0.756
3-4	0.067	0.770	0.000	0.800
4-5	0.067	0.801	0.000	0.904
5-6	0.093	0.871	0.000	0.986
6-7	0.093	0.961	0.000	1.022

Year	Soil+Dust (µg/day)	Total (µg/day)	Blood (µg/dL)
.5-1	25.087	26.230	13.6
1-2	37.910	39.326	15.8
2-3	39.507	41.100	14.9
3-4	41.005	42.641	14.5
4-5	33.075	34.847	12.2
5-6	30.787	32.738	10.3
6-7	29.623	31.699	9.1

Child Resident
Subsurface Soil Entire Site



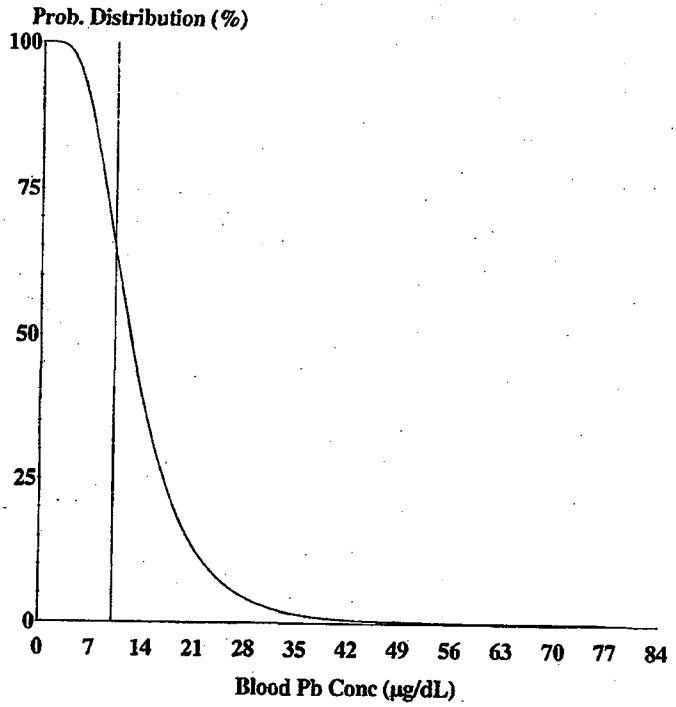
Cutoff = 10.000 µg/dl
Geo Mean = 12.617
GSD = 1.600
% Above = 68.956
% Below = 31.044

Age Range = 0 to 84 months

Run Mode = Site Risk Assessment
Comment = Mean Pb Conc in SB=1600 mg/kg

Child Resident

Subsurface Soil Entire Site



Cutoff = 10.000 µg/dl
Geo Mean = 12.617
GSD = 1.600
% Above = 68.956

Age Range = 0 to 84 months

Run Mode = Site Risk Assessment
Comment = Mean Pb Conc in SB=1600 mg/kg

Calculations of Preliminary Remediation Goals (PRGs)

Surface Soil

Medium: Surface Soil
Site: Operable Unit 7, Portsmouth Naval Shipyard
Location: Kittery, Maine
Receptor: Construction Worker

Calculations of Blood Lead Concentrations (PbBs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee
Version date 6/21/09

[illegible]	[illegible]	[illegible]	[illegible]
PbS	Soil lead concentration	ug/g or ppm	510
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	–	0.9
BKSF	Biokinetic Slope Factor	ug/dL per ug/day	0.4
GSD_i	Geometric standard deviation PbB	–	1.8
PbB_0	Baseline PbB	ug/dL	1.0
IR_S	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.1
IR_{S+D}	Total ingestion rate of outdoor soil and indoor dust	g/day	–
W_S	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	–	–
K_{SD}	Mass fraction of soil in dust	–	–
$AF_{S,D}$	Absorption fraction (same for soil and dust)	–	0.12
$EF_{S,D}$	Exposure frequency (same for soil and dust)	days/yr	150
$AT_{S,D}$	Averaging time (same for soil and dust)	days/yr	365
PbB_{adult}	**PbB of adult worker, geometric mean**	**ug/dL**	**2.0**
$PbB_{fetal,0.95}$	95th percentile PbB among fetuses of adult workers	ug/dL	4.7
PbB_t	Target PbB level of concern (e.g., 10 ug/dL)	ug/dL	**10.0**
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB > PbB_t, assuming lognormal distribution**	**%**	**0.2%**

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

Calculations of Preliminary Remediation Goals (PRGs)

Subsurface Soil

Medium: Subsurface Soil
Site: Operable Unit 7, Portsmouth Naval Shipyard
Location: Kittery, Maine
Receptor: Construction Worker

Calculations of Blood Lead Concentrations (PbBs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee
Version date 6/21/09

Variable	Description of Variable	Units	Value
PbS	Soil lead concentration	ug/g or ppm	1600
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9
BKSF	Biokinetic Slope Factor	ug/dL per ug/day	0.4
GSD_i	Geometric standard deviation PbB	--	1.8
PbB_0	Baseline PbB	ug/dL	1.0
IR_S	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.1
IR_{S+D}	Total ingestion rate of outdoor soil and indoor dust	g/day	--
W_S	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--
K_{SD}	Mass fraction of soil in dust	--	--
$AF_{S,D}$	Absorption fraction (same for soil and dust)	--	0.12
$EF_{S,D}$	Exposure frequency (same for soil and dust)	days/yr	150
$AT_{S,D}$	Averaging time (same for soil and dust)	days/yr	365
PbB_{adult}	**PbB of adult worker, geometric mean**	**ug/dL**	**4.2**
$PbB_{fetal,0.95}$	95th percentile PbB among fetuses of adult workers	ug/dL	9.8
PbB_t	Target PbB level of concern (e.g., 10 ug/dL)	ug/dL	**10.0**
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB > PbB_t, assuming lognormal distribution**	**%**	**4.7%**

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

Calculations of Preliminary Remediation Goals (PRGs)

Surface Soil

Medium: Surface Soil
Site: Operable Unit 7, Portsmouth Naval Shipyard
Location: Kittery, Maine
Receptor: Occupational Worker

Calculations of Blood Lead Concentrations (PbBs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee
Version date 6/21/09

Variable	Description of variable	Units	GSD analysis 1999-2004
PbS	Soil lead concentration	ug/g or ppm	510
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9
BKSF	Biokinetic Slope Factor	ug/dL per ug/day	0.4
GSD_i	Geometric standard deviation PbB	--	1.8
PbB_0	Baseline PbB	ug/dL	1.0
IR_S	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050
IR_{S+D}	Total ingestion rate of outdoor soil and indoor dust	g/day	--
W_S	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--
K_{SD}	Mass fraction of soil in dust	--	--
$AF_{S,D}$	Absorption fraction (same for soil and dust)	--	0.12
$EF_{S,D}$	Exposure frequency (same for soil and dust)	days/yr	250
$AT_{S,D}$	Averaging time (same for soil and dust)	days/yr	365
PbB_{adult}	**PbB of adult worker, geometric mean**	**ug/dL**	**1.8**
$PbB_{fetal,0.95}$	95th percentile PbB among fetuses of adult workers	ug/dL	4.4
PbB_t	Target PbB level of concern (e.g., 10 ug/dL)	ug/dL	**10.0**
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB > PbB_t, assuming lognormal distribution**	**%**	**0.1%**

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

Calculations of Preliminary Remediation Goals (PRGs)

Subsurface Soil

Medium: Subsurface Soil
Site: Operable Unit 7, Portsmouth Naval Shipyard
Location: Kittery, Maine
Receptor: Occupational Worker

Calculations of Blood Lead Concentrations (PbBs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee
Version date 6/21/09

Variable	Description	Units	Value
PbS	Soil lead concentration	ug/g or ppm	1600
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9
BKSF	Biokinetic Slope Factor	ug/dL per ug/day	0.4
GSD_i	Geometric standard deviation PbB	--	1.8
PbB_0	Baseline PbB	ug/dL	1.0
IR_S	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050
IR_{S+D}	Total ingestion rate of outdoor soil and indoor dust	g/day	--
W_S	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--
K_{SD}	Mass fraction of soil in dust	--	--
$AF_{S,D}$	Absorption fraction (same for soil and dust)	--	0.12
$EF_{S,D}$	Exposure frequency (same for soil and dust)	days/yr	250
$AT_{S,D}$	Averaging time (same for soil and dust)	days/yr	365
PbB_{adult}	**PbB of adult worker, geometric mean**	**ug/dL**	**3.6**
$PbB_{fetal,0.95}$	95th percentile PbB among fetuses of adult workers	ug/dL	8.6
PbB_t	Target PbB level of concern (e.g., 10 ug/dL)	ug/dL	**10.0**
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB > PbB_t, assuming lognormal distribution**	**%**	**2.9%**

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

Calculations of Preliminary Remediation Goals (PRGs)

Sediment

Medium: Sediment
Site: Operable Unit 7, Portsmouth Naval Shipyard
Location: Kittery, Maine
Receptor: Adolescent/Adult Recreational User

Calculations of Blood Lead Concentrations (PbBs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee
Version date 6/21/09

Variable	Description of Variable	Units	Statistics from Analysis of NHANES 1999-2004
PbS	Soil lead concentration	ug/g or ppm	187
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9
BKSF	Biokinetic Slope Factor	ug/dL per ug/day	0.4
GSD_i	Geometric standard deviation PbB	--	1.8
PbB_0	Baseline PbB	ug/dL	1.0
IR_S	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050
IR_{S+D}	Total ingestion rate of outdoor soil and indoor dust	g/day	--
W_S	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--
K_{SD}	Mass fraction of soil in dust	--	--
$AF_{S,D}$	Absorption fraction (same for soil and dust)	--	0.12
$EF_{S,D}$	Exposure frequency (same for soil and dust)	days/yr	52
$AT_{S,D}$	Averaging time (same for soil and dust)	days/yr	365
PbB_{adult}	**PbB of adult worker, geometric mean**	ug/dL	**1.1**
$PbB_{fetal,0.95}$	95th percentile PbB among fetuses of adult workers	ug/dL	2.5
PbB_t	Target PbB level of concern (e.g., 10 ug/dL)	ug/dL	**10.0**
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB > PbB_t, assuming lognormal distribution**	%	**0.0033%**

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

. Calculations of Preliminary Remediation Goals (PRGs)

Surface Soil and Sediment

Medium: Surface Soil/Sediment
Site: Operable Unit 7, Portsmouth Naval Shipyard
Location: Kittery, Maine
Receptor: Adolescent/Adult Recreational User

Calculations of Blood Lead Concentrations (PbBs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee
Version date 6/21/09

Variable	Definition of Variable	Units	GSD Data from Analysis of NHANES 1999-2004
PbS	Soil lead concentration	ug/g or ppm	487
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9
BKSF	Biokinetic Slope Factor	ug/dL per ug/day	0.4
GSD_i	Geometric standard deviation PbB	--	1.8
PbB_0	Baseline PbB	ug/dL	1.0
IR_S	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050
IR_{S+D}	Total ingestion rate of outdoor soil and indoor dust	g/day	--
W_S	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--
K_{SD}	Mass fraction of soil in dust	--	--
$AF_{S,D}$	Absorption fraction (same for soil and dust)	--	0.12
$EF_{S,D}$	Exposure frequency (same for soil and dust)	days/yr	52
$AT_{S,D}$	Averaging time (same for soil and dust)	days/yr	365
PbB_{adult}	**PbB of adult worker, geometric mean**	**ug/dL**	**1.2**
$PbB_{fetal,0.95}$	95th percentile PbB among fetuses of adult workers	ug/dL	2.8
PbB_t	Target PbB level of concern (e.g., 10 ug/dL)	ug/dL	**10.0**
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB > PbB_t, assuming lognormal distribution**	**%**	**0.0063%**

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

Calculations of Preliminary Remediation Goals (PRGs)

Subsurface Soil and Sediment

Medium: Subsurface Soil/Sediment
Site: Operable Unit 7, Portsmouth Naval Shipyard
Location: Kittery, Maine
Receptor: Adolescent/Adult Recreational User

Calculations of Blood Lead Concentrations (PbBs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee
Version date 6/21/09

Variable	Description of Variable	Units	Soil and Plant Analysis LANTAMS 1999-2003
PbS	Soil lead concentration	ug/g or ppm	1500
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	–	0.9
BKSF	Biokinetic Slope Factor	ug/dL per ug/day	0.4
GSD_i	Geometric standard deviation PbB	–	1.8
PbB_0	Baseline PbB	ug/dL	1.0
IR_S	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050
IR_{S+D}	Total ingestion rate of outdoor soil and indoor dust	g/day	–
W_S	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	–	–
K_{SD}	Mass fraction of soil in dust	–	–
$AF_{S,D}$	Absorption fraction (same for soil and dust)	–	0.12
$EF_{S,D}$	Exposure frequency (same for soil and dust)	days/yr	52
$AT_{S,D}$	Averaging time (same for soil and dust)	days/yr	365
PbB_{adult}	**PbB of adult worker, geometric mean**	**ug/dL**	**1.5**
$PbB_{fetal,0.95}$	95th percentile PbB among fetuses of adult workers	ug/dL	3.6
PbB_t	Target PbB level of concern (e.g., 10 ug/dL)	ug/dL	**10.0**
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB > PbB_t, assuming lognormal distribution**	**%**	**0.0347%**

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

Recreational User Exposures – Entire Site Surface Soil & Sediment

Adolescent recreational exposures to lead in surface soil and sediment were evaluated using the IEUBK lead model (USEPA, 2009a). The IEUBK model simulates exposures to lead at a single location. In order to use the IEUBK model to estimate exposures to both surface soil and sediment at different locations a weighted lead concentration was calculated following the methodology presented in U.S. EPA's Assessing Intermittent or Variable Exposures at Lead Sites (USEPA, November 2003). The weighted lead concentration for surface soil and sediment was calculated as follows:

$$PbS_w = EF_{sed} \times [(F_{sed} \times Pb_{sed}) + (F_{soil} \times PbS_{soil})] + (EF_{soil} \times PbS_{soil})$$

Where:

PbS_w	=	weighted lead surface soil/sediment concentration (mg/kg)
EF_{sed}	=	exposure frequency or fraction of the days/week receptor is exposed to sediment (1/7 - assumed)
F_{sed}	=	fraction of time a receptor is exposed to sediment when the site is visited (0.5 - assumed)
Pb_{sed}	=	average lead concentration in sediment (187 mg/kg)
EF_{soil}	=	exposure frequency or fraction of the days/week a receptor is exposed to surface soil on days when they are also exposed to sediment $= 1 - F_{sed}$ (6/7 – assumed)
PbS_{soil}	=	average lead concentration in surface soil (510 mg/kg)
F_{soil}	=	fraction of time a receptor is exposed to surface soil on on days when they are also exposed to sediment $= 1 - EF_{soil}$ (0.5 - assumed)

The above equation results in a weighted lead concentration of 487 mg/kg, which was used as the exposure point concentration for surface soil/sediment. Default parameters were used for the rest of the model input parameters. The average concentration of lead in groundwater was not used in this calculation because groundwater is not used as drinking water at OU7. IEUBK model outputs are included in Appendix D.6.

Recreational User Exposures – Entire Site Subsurface Soil & Sediment

Adolescent recreational exposures to lead in subsurface soil and sediment were evaluated using the IEUBK lead model (USEPA, 2009a). The IEUBK model simulates exposures to lead at a single location. In order to use the IEUBK model to estimate exposures to both surface soil and sediment at different locations a weighted lead concentration was calculated following the methodology presented in U.S. EPA's Assessing Intermittent or Variable Exposures at Lead Sites (USEPA, November 2003). The weighted lead concentration for surface soil and sediment was calculated as follows:

$$PbS_w = EF_{sed} \times [(F_{sed} \times Pb_{sed}) + (F_{soil} \times PbS_{soil})] + (EF_{soil} \times PbS_{soil})$$

Where:

PbS_w	=	weighted lead surface soil/sediment concentration (mg/kg)
EF_{sed}	=	exposure frequency or fraction of the days/week receptor is exposed to sediment (1/7 - assumed)
F_{sed}	=	fraction of time a receptor is exposed to sediment when the site is visited (0.5 - assumed)
Pb_{sed}	=	average lead concentration in sediment (187 mg/kg)
EF_{soil}	=	exposure frequency or fraction of the days/week a receptor is exposed to surface soil on days when they are also exposed to sediment $= 1 - F_{sed}$ (6/7 – assumed)
PbS_{soil}	=	average lead concentration in surface soil (1,600 mg/kg)
F_{soil}	=	fraction of time a receptor is exposed to surface soil on on days when they are also exposed to sediment $= 1 - EF_{soil}$ (0.5 - assumed)

The above equation results in a weighted lead concentration of 1,500 mg/kg, which was used as the exposure point concentration for surface soil/sediment. Default parameters were used for the rest of the model input parameters. The average concentration of lead in groundwater was not used in this calculation because groundwater is not used as drinking water at OU7. IEUBK model outputs are included in Appendix D.6.

APPENDIX D.7

ADDITIONAL RISK ESTIMATES

Appendix D.7.1

Additional Receptors Exposed to Subsurface Soil

LIST OF TABLES

ALTERNATE RAGS PART D TABLE 7

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

Table No.	
	REASONABLE MAXIMUM EXPOSURES
7.2A.RME	Occupational Workers - Entire Site Surface/Subsurface Soil
7.2B.RME	Occupational Workers - Former Location of Building 237 Surface/Subsurface Soil
7.3A.RME	Adult Recreational Users - Entire Site Surface/Subsurface Soil & Sediment
7.3B.RME	Adult Recreational Users - Former Location of Building 237 Surface/Subsurface Soil & Sediment
7.4A.RME	Adolescent Recreational Users - Entire Site Surface/Subsurface Soil & Sediment
7.4B.RME	Adolescent Recreational Users - Former Location of Building 237 Surface/Subsurface Soil & Sediment
7.5A.RME	Adult Residents - Entire Site Surface/Subsurface Soil
7.5B.RME	Adult Residents - Former Location of Building 237 Surface/Subsurface Soil
7.6A.RME	Child Residents - Entire Site Surface/Subsurface Soil
7.6B.RME	Child Residents - Former Location of Building 237 Surface/Subsurface Soil
	CENTRAL TENDENCY EXPOSURES
7.2A.CTE	Occupational Workers - Entire Site Surface/Subsurface Soil
7.2B.CTE	Occupational Workers - Former Location of Building 237 Surface/Subsurface Soil
7.3A.CTE	Adult Recreational Users - Entire Site Surface/Subsurface Soil & Sediment
7.3B.CTE	Adult Recreational Users - Former Location of Building 237 Surface/Subsurface Soil & Sediment
7.4A.CTE	Adolescent Recreational Users - Entire Site Surface/Subsurface Soil & Sediment
7.4B.CTE	Adolescent Recreational Users - Former Location of Building 237 Surface/Subsurface Soil & Sediment
7.5A.CTE	Adult Residents - Entire Site Surface/Subsurface Soil
7.5B.CTE	Adult Residents - Former Location of Building 237 Surface/Subsurface Soil
7.6A.CTE	Child Residents - Entire Site Surface/Subsurface Soil
7.6B.CTE	Child Residents - Former Location of Building 237 Surface/Subsurface Soil

ALTERNATE TABLE 7.2A.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Occupational Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.80	mg/kg	6.3E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	4.6E-06	1.8E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	5.2E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.0E-06	1.5E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	1.2E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.3E-04	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.002
				Copper	1,030	mg/kg	3.6E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.0E-03	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.03
				Iron	34,200	mg/kg	1.2E-02	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.3E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.05
				Lead	510	mg/kg	1.8E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	5.0E-04	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	7.3E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.1E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.007
				Thallium	0.480	mg/kg	1.7E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.7E-07	(mg/kg/day)	1.0E-05	(mg/kg/day)	0.05
			Exp. Route Total								5.6E-06					0.1
			Dermal	Benzo(a)pyrene Equivalents	1.80	mg/kg	5.4E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	3.9E-06	1.5E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	4.8E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	9.7E-07	1.4E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	--
				Copper	1,030	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Iron	34,200	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	510	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	--
				Thallium	0.480	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.0E-05	(mg/kg/day)	--
			Exp. Route Total								4.9E-06					--
		Exposure Point Total									1.1E-05					0.1
	Exposure Medium Total										1.1E-05					0.1
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.6E-10	mg/m^3	1.3E-11	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	1.5E-11	3.7E-11	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1248	1.4E-10	mg/m^3	1.1E-11	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	6.3E-12	3.1E-11	(mg/m^3)	NA	(mg/m^3)	--
				Barium	3.0E-8	mg/m^3	2.5E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	7.0E-09	(mg/m^3)	5.0E-04	(mg/m^3)	0.00001
				Copper	9.4E-8	mg/m^3	7.6E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.1E-08	(mg/m^3)	NA	(mg/m^3)	--
				Iron	3.1E-6	mg/m^3	2.5E-07	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	7.1E-07	(mg/m^3)	NA	(mg/m^3)	--
				Lead	4.6E-8	mg/m^3	3.8E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.1E-08	(mg/m^3)	NA	(mg/m^3)	--
				Mercury	1.9E-10	mg/m^3	1.6E-11	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	4.4E-11	(mg/m^3)	3.0E-05	(mg/m^3)	0.0000015
				Thallium	4.4E-11	mg/m^3	3.6E-12	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.0E-11	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								2.1E-11					0.00002
		Exposure Point Total									2.1E-11					0.00002
	Exposure Medium Total										2.1E-11					0.00002
Medium Total											1.1E-05					0.1
Subsurface Soil	Subsurface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.10	mg/kg	3.8E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	2.8E-06	1.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	41.0	mg/kg	1.4E-05	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.9E-05	4.0E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1260	4.60	mg/kg	1.6E-06	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	3.2E-06	4.5E-06	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.2
				2,3,7,8-TCDD Equivalents	0.001	mg/kg	4.5E-10	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	5.9E-05	1.3E-09	(mg/kg/day)	1.0E-09	(mg/kg/day)	1.3
				Antimony	182	mg/kg	6.4E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.8E-04	(mg/kg/day)	4.0E-04	(mg/kg/day)	0.4
				Barium	280	mg/kg	9.8E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.7E-04	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.001
				Cadmium	5.10	mg/kg	1.8E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	5.0E-06	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.005
				Cobalt	15.9	mg/kg	5.6E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.6E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.05
				Copper	6,020	mg/kg	2.1E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	5.9E-03	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.1
				Iron	97,100	mg/kg	3.4E-02	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	9.5E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.1
				Lead	1,600	mg/kg	5.6E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.6E-03	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	969	mg/kg	3.4E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	9.5E-04	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.007
				Mercury	9.40	mg/kg	3.3E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	9.2E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.03
				Nickel	484	mg/kg	1.7E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.7E-04	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.02
				Thallium	0.890	mg/kg	3.1E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	8.7E-07	(mg/kg/day)	1.0E-05	(mg/kg/day)	0.09
				Zinc	2,600	mg/kg	9.1E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.5E-03	(mg/kg/day)	3.0E-01	(mg/kg/day)	0.008
			Exp. Route Total								9.4E-05					2.4

ALTERNATE TABLE 7.2A.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Occupational Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Subsurface Soil	Subsurface Soil	OU7	Dermal	Benzo(a)pyrene Equivalents	1.10	mg/kg	3.3E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	2.4E-06	9.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	41.0	mg/kg	1.3E-05	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.6E-05	3.7E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1260	4.60	mg/kg	1.5E-06	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	3.0E-06	4.2E-06	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.2
				2,3,7,8-TCDD Equivalents	0.001	mg/kg	9.0E-11	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	1.2E-05	2.5E-10	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.3
				Antimony	182	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	6.0E-05	(mg/kg/day)	--
				Barium	280	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	--
				Cadmium	5.10	mg/kg	1.2E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.3E-08	(mg/kg/day)	2.5E-05	(mg/kg/day)	0.001
				Cobalt	15.9	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	--
				Copper	6,020	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Iron	97,100	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	1,600	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	969	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
				Mercury	9.40	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	--
				Nickel	484	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	8.0E-04	(mg/kg/day)	--
				Thallium	0.890	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.0E-05	(mg/kg/day)	--
				Zinc	2,600	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	3.0E-01	(mg/kg/day)	--
			Exp. Route Total								4.4E-05					0.5
		Exposure Point Total									1.4E-04					2.9
	Exposure Medium Total										1.4E-04					2.9
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.0E-10	mg/m^3	8.2E-12	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	9.0E-12	2.3E-11	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1248	3.7E-9	mg/m^3	3.0E-10	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	1.7E-10	8.5E-10	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1260	4.2E-10	mg/m^3	3.4E-11	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	1.9E-11	9.5E-11	(mg/m^3)	NA	(mg/m^3)	--
				2,3,7,8-TCDD Equivalents	1.2E-13	mg/m^3	9.6E-15	(mg/m^3)	3.8E+01	$(ug/m^3)^{-1}$	3.7E-10	2.7E-14	(mg/m^3)	4.0E-08	(mg/m^3)	0.0000007
				Antimony	1.7E-8	mg/m^3	1.3E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	3.8E-09	(mg/m^3)		(mg/m^3)	--
				Barium	2.5E-8	mg/m^3	2.1E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	5.8E-09	(mg/m^3)	5.0E-04	(mg/m^3)	0.00001
				Cadmium	4.6E-10	mg/m^3	3.8E-11	(mg/m^3)	1.8E-03	$(ug/m^3)^{-1}$	6.8E-11	1.1E-10	(mg/m^3)	2.0E-05	(mg/m^3)	0.000005
				Cobalt	1.4E-9	mg/m^3	1.2E-10	(mg/m^3)	9.0E-03	$(ug/m^3)^{-1}$	1.1E-09	3.3E-10	(mg/m^3)	6.0E-06	(mg/m^3)	0.00006
				Copper	5.5E-7	mg/m^3	4.5E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.2E-07	(mg/m^3)	NA	(mg/m^3)	--
				Iron	8.8E-6	mg/m^3	7.2E-07	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.0E-06	(mg/m^3)	NA	(mg/m^3)	--
				Lead	1.5E-7	mg/m^3	1.2E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	3.3E-08	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	8.8E-8	mg/m^3	7.2E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.0E-08	(mg/m^3)	5.0E-05	(mg/m^3)	0.0004
				Mercury	8.5E-10	mg/m^3	7.0E-11	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.0E-10	(mg/m^3)	3.0E-05	(mg/m^3)	0.0000065
				Nickel	4.4E-8	mg/m^3	3.6E-09	(mg/m^3)	2.6E-04	$(ug/m^3)^{-1}$	9.3E-10	1.0E-08	(mg/m^3)	9.0E-05	(mg/m^3)	0.0001
				Thallium	8.1E-11	mg/m^3	6.6E-12	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.8E-11	(mg/m^3)	NA	(mg/m^3)	--
				Zinc	2.4E-7	mg/m^3	1.9E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	5.4E-08	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								2.6E-09					0.0006
		Exposure Point Total									2.6E-09					0.0006
	Exposure Medium Total										2.6E-09					0.0006
Medium Total											1.4E-04					2.9

ALTERNATE TABLE 7.2B.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Occupational Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Aroclor-1254	0.28	mg/kg	9.8E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.0E-07	2.7E-07	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.01
			Exp. Route Total								2.0E-07					0.01
			Dermal	Aroclor-1254	0.28	mg/kg	9.0E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.8E-07	2.5E-07	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.01
			Exp. Route Total								1.8E-07					0.01
		Exposure Point Total									3.8E-07					0.03
	Exposure Medium Total										3.8E-07					0.03
	Air	OU7	Inhalation	Aroclor-1254	2.5E-11	mg/m^3	2.1E-12	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	1.2E-12	5.8E-12	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								1.2E-12					--
		Exposure Point Total									1.2E-12					--
	Exposure Medium Total										1.2E-12					--
Medium Total											3.8E-07					0.03
Subsurface Soil	Subsurface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	0.25	mg/kg	8.7E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	6.4E-07	2.4E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	405.0	mg/kg	1.4E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.0E-04	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.003
			Exp. Route Total								6.4E-07					0.003
			Dermal	Benzo(a)pyrene Equivalents	0.25	mg/kg	7.5E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	5.5E-07	2.1E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	405.0	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
			Exp. Route Total								5.5E-07					--
		Exposure Point Total									1.2E-06					0.003
	Exposure Medium Total										1.2E-06					0.003
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	2.3E-11	mg/m^3	1.9E-12	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	2.0E-12	5.2E-12	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	3.7E-8	mg/m^3	3.0E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	8.4E-09	(mg/m^3)	5.0E-05	(mg/m^3)	0.0002
			Exp. Route Total								2.0E-12					0.0002
		Exposure Point Total									2.0E-12					0.0002
	Exposure Medium Total										2.0E-12					0.0002
Medium Total											1.2E-06					0.003

ALTERNATE TABLE 7.3A.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.80	mg/kg	1.3E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	9.3E-07	6.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	1.1E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.1E-07	5.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	2.4E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.2E-04	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.0006
				Copper	1,030	mg/kg	7.3E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.6E-04	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.009
				Iron	34,200	mg/kg	2.4E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.2E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.02
				Lead	510	mg/kg	3.6E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.8E-04	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	1.5E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	7.4E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.002
				Thallium	0.480	mg/kg	3.4E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.7E-07	(mg/kg/day)	1.0E-05	(mg/kg/day)	0.02
			Exp. Route Total								1.1E-06					0.05
			Dermal	Benzo(a)pyrene Equivalents	1.80	mg/kg	6.6E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	4.8E-07	3.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	5.9E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.2E-07	3.0E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	--
				Copper	1,030	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Iron	34,200	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	510	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	--
				Thallium	0.480	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.0E-05	(mg/kg/day)	--
			Exp. Route Total								6.0E-07					--
		Exposure Point Total									1.7E-06					0.05
	Exposure Medium Total										1.7E-06					0.05
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.9E-10	mg/m^3	7.9E-13	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	8.7E-13	3.9E-12	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1248	1.6E-10	mg/m^3	6.6E-13	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	3.7E-13	3.3E-12	(mg/m^3)	NA	(mg/m^3)	--
				Barium	3.6E-8	mg/m^3	1.5E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	7.3E-10	(mg/m^3)	5.0E-04	(mg/m^3)	0.000001
				Copper	1.1E-7	mg/m^3	4.5E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.3E-09	(mg/m^3)	NA	(mg/m^3)	--
				Iron	3.6E-6	mg/m^3	1.5E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	7.5E-08	(mg/m^3)	NA	(mg/m^3)	--
				Lead	5.4E-8	mg/m^3	2.2E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.1E-09	(mg/m^3)	NA	(mg/m^3)	--
				Mercury	2.2E-10	mg/m^3	9.2E-13	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	4.6E-12	(mg/m^3)	3.0E-05	(mg/m^3)	0.0000002
				Thallium	5.1E-11	mg/m^3	2.1E-13	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.1E-12	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								1.2E-12					0.000002
		Exposure Point Total									1.2E-12					0.000002
	Exposure Medium Total										1.2E-12					0.000002
Medium Total											1.7E-06					0.05
Subsurface Soil	Subsurface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.10	mg/kg	7.7E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	5.7E-07	3.9E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	41.0	mg/kg	2.9E-06	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	5.8E-06	1.4E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1260	4.60	mg/kg	3.2E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	6.5E-07	1.6E-06	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.08
				2,3,7,8-TCDD Equivalents	0.001	mg/kg	9.2E-11	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	1.2E-05	4.6E-10	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.5
				Antimony	182	mg/kg	1.3E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	6.4E-05	(mg/kg/day)	4.0E-04	(mg/kg/day)	0.2
				Barium	280	mg/kg	2.0E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	9.9E-05	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.0005
				Cadmium	5.10	mg/kg	3.6E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.8E-06	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.002
				Cobalt	15.9	mg/kg	1.1E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	5.6E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.02
				Copper	6,020	mg/kg	4.2E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.1E-03	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.05
				Iron	97,100	mg/kg	6.8E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.4E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.05
				Lead	1,600	mg/kg	1.1E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	5.6E-04	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	969	mg/kg	6.8E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.4E-04	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.002
				Mercury	9.40	mg/kg	6.6E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.3E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.01
				Nickel	484	mg/kg	3.4E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.7E-04	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.009
				Thallium	0.890	mg/kg	6.3E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.1E-07	(mg/kg/day)	1.0E-05	(mg/kg/day)	0.03
				Zinc	2,600	mg/kg	1.8E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	9.2E-04	(mg/kg/day)	3.0E-01	(mg/kg/day)	0.003
			Exp. Route Total								1.9E-05					0.9

ALTERNATE TABLE 7.3A.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Subsurface Soil	Subsurface Soil	OU7	Dermal	Benzo(a)pyrene Equivalents	1.10	mg/kg	4.0E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	2.9E-07	2.0E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	41.0	mg/kg	1.6E-06	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	3.2E-06	8.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1260	4.60	mg/kg	1.8E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	3.6E-07	9.1E-07	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.05
				2,3,7,8-TCDD Equivalents	0.001	mg/kg	1.1E-11	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	1.4E-06	5.5E-11	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.05
				Antimony	182	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	6.0E-05	(mg/kg/day)	--
				Barium	280	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	--
				Cadmium	5.10	mg/kg	1.4E-09	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	7.2E-09	(mg/kg/day)	2.5E-05	(mg/kg/day)	0.0003
				Cobalt	15.9	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	--
				Copper	6,020	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Iron	97,100	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	1,600	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	969	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
				Mercury	9.40	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	--
				Nickel	484	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	8.0E-04	(mg/kg/day)	--
				Thallium	0.890	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.0E-05	(mg/kg/day)	--
				Zinc	2,600	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	3.0E-01	(mg/kg/day)	--
			Exp. Route Total								5.3E-06					0.1
		Exposure Point Total									2.4E-05					1.0
	Exposure Medium Total										2.4E-05					1.0
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.2E-10	mg/m^3	4.8E-13	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	5.3E-13	2.4E-12	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1248	4.4E-9	mg/m^3	1.8E-11	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	1.0E-11	9.0E-11	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1260	4.9E-10	mg/m^3	2.0E-12	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	1.1E-12	1.0E-11	(mg/m^3)	NA	(mg/m^3)	--
				2,3,7,8-TCDD Equivalents	1.4E-13	mg/m^3	5.7E-16	(mg/m^3)	3.8E+01	$(ug/m^3)^{-1}$	2.2E-11	2.9E-15	(mg/m^3)	4.0E-08	(mg/m^3)	0.00000007
				Antimony	1.9E-8	mg/m^3	8.0E-11	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	4.0E-10	(mg/m^3)		(mg/m^3)	--
				Barium	3.0E-8	mg/m^3	1.2E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	6.1E-10	(mg/m^3)	5.0E-04	(mg/m^3)	0.000001
				Cadmium	5.4E-10	mg/m^3	2.2E-12	(mg/m^3)	1.8E-03	$(ug/m^3)^{-1}$	4.0E-12	1.1E-11	(mg/m^3)	2.0E-05	(mg/m^3)	0.0000006
				Cobalt	1.7E-9	mg/m^3	7.0E-12	(mg/m^3)	9.0E-03	$(ug/m^3)^{-1}$	6.3E-11	3.5E-11	(mg/m^3)	6.0E-06	(mg/m^3)	0.000006
				Copper	6.4E-7	mg/m^3	2.6E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.3E-08	(mg/m^3)	NA	(mg/m^3)	--
				Iron	1.0E-5	mg/m^3	4.3E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.1E-07	(mg/m^3)	NA	(mg/m^3)	--
				Lead	1.7E-7	mg/m^3	7.0E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	3.5E-09	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	1.0E-7	mg/m^3	4.2E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.1E-09	(mg/m^3)	5.0E-05	(mg/m^3)	0.00004
				Mercury	1.0E-9	mg/m^3	4.1E-12	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.1E-11	(mg/m^3)	3.0E-05	(mg/m^3)	0.0000007
				Nickel	5.2E-8	mg/m^3	2.1E-10	(mg/m^3)	2.6E-04	$(ug/m^3)^{-1}$	5.5E-11	1.1E-09	(mg/m^3)	9.0E-05	(mg/m^3)	0.00001
				Thallium	9.5E-11	mg/m^3	3.9E-13	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.0E-12	(mg/m^3)	NA	(mg/m^3)	--
				Zinc	2.8E-7	mg/m^3	1.1E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	5.7E-09	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								1.6E-10					0.00006
		Exposure Point Total									1.6E-10					0.00006
	Exposure Medium Total										1.6E-10					0.00006
Medium Total											2.4E-05					1.0

ALTERNATE TABLE 7.3A.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Sediment	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.20	mg/kg	6.6E-09	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	4.8E-08	3.3E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				TEQ PCB	0.002	mg/kg	8.8E-12	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	1.1E-06	4.4E-11	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.04
				Total PCB Congeners	0.420	mg/kg	2.3E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	4.6E-09	1.2E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	14.5	mg/kg	7.9E-08	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	1.2E-07	4.0E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.001
				Chromium	150	mg/kg	8.2E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.1E-06	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.000003
				Iron	45,900	mg/kg	2.5E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.3E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.002
				Lead	187	mg/kg	1.0E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	5.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	468	mg/kg	2.6E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.3E-05	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.00009
			Exp. Route Total								1.3E-06					0.05
			Dermal	Benzo(a)pyrene Equivalents	1.20	mg/kg	3.4E-09	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	2.5E-08	1.7E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				TEQ PCB	0.002	mg/kg	1.0E-12	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	1.4E-07	5.2E-12	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.005
				Total PCB Congeners	0.420	mg/kg	1.3E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.6E-09	6.4E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	14.5	mg/kg	9.5E-09	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	1.4E-08	4.8E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0002
				Chromium	150	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.0E-02	(mg/kg/day)	--
				Iron	45,900	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	187	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	468	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
			Exp. Route Total								1.8E-07					0.005
		Exposure Point Total									1.5E-06					0.05
	Exposure Medium Total										1.5E-06					0.05
Medium Total											1.5E-06					0.05

ALTERNATE TABLE 7.3B.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Aroclor-1254	0.28	mg/kg	2.0E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	3.9E-08	9.9E-08	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.005
			Exp. Route Total								3.9E-08					0.005
			Dermal	Aroclor-1254	0.28	mg/kg	1.1E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.2E-08	5.5E-08	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.003
			Exp. Route Total								2.2E-08					0.003
		Exposure Point Total									6.1E-08					0.008
	Exposure Medium Total										6.1E-08					0.008
	Air	OU7	Inhalation	Aroclor-1254	3.0E-11	mg/m^3	1.2E-13	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	7.0E-14	6.1E-13	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								7.0E-14					--
		Exposure Point Total									7.0E-14					--
	Exposure Medium Total										7.0E-14					--
Medium Total											6.1E-08					0.008
Subsurface Soil	Subsurface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	0.25	mg/kg	1.8E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.3E-07	8.8E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	405.0	mg/kg	2.9E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.4E-04	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.001
			Exp. Route Total								1.3E-07					0.001
			Dermal	Benzo(a)pyrene Equivalents	0.25	mg/kg	9.1E-09	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	6.7E-08	4.6E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	405.0	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
			Exp. Route Total								6.7E-08					--
		Exposure Point Total									2.0E-07					0.001
	Exposure Medium Total										2.0E-07					0.001
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	2.7E-11	mg/m^3	1.1E-13	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	1.2E-13	5.5E-13	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	4.3E-8	mg/m^3	1.8E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	8.9E-10	(mg/m^3)	5.0E-05	(mg/m^3)	0.00002
			Exp. Route Total								1.2E-13					0.00002
		Exposure Point Total									1.2E-13					0.00002
	Exposure Medium Total										1.2E-13					0.00002
Medium Total											2.0E-07					0.001

ALTERNATE TABLE 7.3B.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Sediment	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.20	mg/kg	6.6E-09	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	4.8E-08	3.3E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				TEQ PCB	0.002	mg/kg	8.8E-12	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	1.1E-06	4.4E-11	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.04
				Total PCB Congeners	0.420	mg/kg	2.3E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	4.6E-09	1.2E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	14.5	mg/kg	7.9E-08	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	1.2E-07	4.0E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.001
				Chromium	150	mg/kg	8.2E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.1E-06	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.000003
				Iron	45,900	mg/kg	2.5E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.3E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.002
				Lead	187	mg/kg	1.0E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	5.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	468	mg/kg	2.6E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.3E-05	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.00009
			Exp. Route Total								1.3E-06					0.05
			Dermal	Benzo(a)pyrene Equivalents	1.20	mg/kg	3.4E-09	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	2.5E-08	1.7E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				TEQ PCB	0.002	mg/kg	1.0E-12	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	1.4E-07	5.2E-12	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.005
				Total PCB Congeners	0.420	mg/kg	1.3E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.6E-09	6.4E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	14.5	mg/kg	9.5E-09	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	1.4E-08	4.8E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0002
				Chromium	150	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.0E-02	(mg/kg/day)	--
				Iron	45,900	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	187	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	468	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
			Exp. Route Total								1.8E-07					0.005
		Exposure Point Total									1.5E-06					0.05
	Exposure Medium Total										1.5E-06					0.05
Medium Total											1.5E-06					0.05

ALTERNATE TABLE 7.4A.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.80	mg/kg	4.2E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	3.1E-06	9.9E-07	(mg/kg/day)	NA	(mg/kg/day)	--
(Entire Site)				Aroclor-1248	1.50	mg/kg	1.2E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.3E-07	8.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	2.6E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.8E-04	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.0009
				Copper	1,030	mg/kg	8.1E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	5.6E-04	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.01
				Iron	34,200	mg/kg	2.7E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.9E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.03
				Lead	510	mg/kg	4.0E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.8E-04	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	1.6E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.2E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.004
				Thallium	0.480	mg/kg	3.8E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.6E-07	(mg/kg/day)	1.0E-05	(mg/kg/day)	0.03
			Exp. Route Total								3.3E-06					0.07
			Dermal	Benzo(a)pyrene Equivalents	1.80	mg/kg	4.5E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	3.2E-06	1.0E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	1.3E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.7E-07	9.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	--
				Copper	1,030	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Iron	34,200	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	510	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	--
				Thallium	0.480	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.0E-05	(mg/kg/day)	--
			Exp. Route Total								3.5E-06					--
		Exposure Point Total									6.8E-06					0.07
	Exposure Medium Total										6.8E-06					0.07
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.9E-10	mg/m^3	1.7E-12	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	1.9E-12	3.9E-12	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1248	1.6E-10	mg/m^3	4.7E-13	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	2.7E-13	3.3E-12	(mg/m^3)	NA	(mg/m^3)	--
				Barium	3.6E-8	mg/m^3	1.0E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	7.3E-10	(mg/m^3)	5.0E-04	(mg/m^3)	0.000001
				Copper	1.1E-7	mg/m^3	3.2E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.3E-09	(mg/m^3)	NA	(mg/m^3)	--
				Iron	3.6E-6	mg/m^3	1.1E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	7.5E-08	(mg/m^3)	NA	(mg/m^3)	--
				Lead	5.4E-8	mg/m^3	1.6E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.1E-09	(mg/m^3)	NA	(mg/m^3)	--
				Mercury	2.2E-10	mg/m^3	6.6E-13	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	4.6E-12	(mg/m^3)	3.0E-05	(mg/m^3)	0.0000002
				Thallium	5.1E-11	mg/m^3	1.5E-13	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.1E-12	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								2.1E-12					0.000002
		Exposure Point Total									2.1E-12					0.000002
	Exposure Medium Total										2.1E-12					0.000002
Medium Total											6.8E-06					0.07
Subsurface Soil	Subsurface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.10	mg/kg	2.6E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.9E-06	6.0E-07	(mg/kg/day)	NA	(mg/kg/day)	--
(Entire Site)				Aroclor-1248	41.0	mg/kg	3.2E-06	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	6.4E-06	2.2E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1260	4.60	mg/kg	3.6E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	7.2E-07	2.5E-06	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.1
				2,3,7,8-TCDD Equivalents	0.001	mg/kg	1.0E-10	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	1.3E-05	7.1E-10	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.7
				Antimony	182	mg/kg	1.4E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.0E-04	(mg/kg/day)	4.0E-04	(mg/kg/day)	0.2
				Barium	280	mg/kg	2.2E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.5E-04	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.0008
				Cadmium	5.10	mg/kg	4.0E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.8E-06	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.003
				Cobalt	15.9	mg/kg	1.2E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	8.7E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.03
				Copper	6,020	mg/kg	4.7E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.3E-03	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.08
				Iron	97,100	mg/kg	7.6E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	5.3E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.08
				Lead	1,600	mg/kg	1.3E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	8.8E-04	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	969	mg/kg	7.6E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	5.3E-04	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.004
				Mercury	9.40	mg/kg	7.4E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	5.2E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.02
				Nickel	484	mg/kg	3.8E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.7E-04	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.01
				Thallium	0.890	mg/kg	7.0E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.9E-07	(mg/kg/day)	1.0E-05	(mg/kg/day)	0.05
				Zinc	2,600	mg/kg	2.0E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.4E-03	(mg/kg/day)	3.0E-01	(mg/kg/day)	0.005
			Exp. Route Total								2.2E-05					1.4

ALTERNATE TABLE 7.4A.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Subsurface Soil	Subsurface Soil	OU7	Dermal	Benzo(a)pyrene Equivalents	1.10	mg/kg	2.7E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	2.0E-06	6.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
(Entire Site)				Aroclor-1248	41.0	mg/kg	3.6E-06	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	7.3E-06	2.5E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1260	4.60	mg/kg	4.1E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	8.2E-07	2.9E-06	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.1
				2,3,7,8-TCDD Equivalents	0.001	mg/kg	2.5E-11	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	3.2E-06	1.7E-10	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.2
				Antimony	182	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	6.0E-05	(mg/kg/day)	--
				Barium	280	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	--
				Cadmium	5.10	mg/kg	3.2E-09	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.3E-08	(mg/kg/day)	2.5E-05	(mg/kg/day)	0.0009
				Cobalt	15.9	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	--
				Copper	6,020	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Iron	97,100	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	1,600	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	969	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
				Mercury	9.40	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	--
				Nickel	484	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	8.0E-04	(mg/kg/day)	--
				Thallium	0.890	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.0E-05	(mg/kg/day)	--
				Zinc	2,600	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	3.0E-01	(mg/kg/day)	--
			Exp. Route Total								1.3E-05					0.3
		Exposure Point Total									3.6E-05					1.7
	Exposure Medium Total										3.6E-05					1.7
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.2E-10	mg/m^3	1.0E-12	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	1.1E-12	2.4E-12	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1248	4.4E-9	mg/m^3	1.3E-11	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	7.3E-12	9.0E-11	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1260	4.9E-10	mg/m^3	1.4E-12	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	8.2E-13	1.0E-11	(mg/m^3)	NA	(mg/m^3)	--
				2,3,7,8-TCDD Equivalents	1.4E-13	mg/m^3	4.1E-16	(mg/m^3)	3.8E+01	$(ug/m^3)^{-1}$	1.5E-11	2.9E-15	(mg/m^3)	4.0E-08	(mg/m^3)	0.00000007
				Antimony	1.9E-8	mg/m^3	5.7E-11	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	4.0E-10	(mg/m^3)		(mg/m^3)	--
				Barium	3.0E-8	mg/m^3	8.8E-11	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	6.1E-10	(mg/m^3)	5.0E-04	(mg/m^3)	0.000001
				Cadmium	5.4E-10	mg/m^3	1.6E-12	(mg/m^3)	1.8E-03	$(ug/m^3)^{-1}$	2.9E-12	1.1E-11	(mg/m^3)	2.0E-05	(mg/m^3)	0.0000006
				Cobalt	1.7E-9	mg/m^3	5.0E-12	(mg/m^3)	9.0E-03	$(ug/m^3)^{-1}$	4.5E-11	3.5E-11	(mg/m^3)	6.0E-06	(mg/m^3)	0.000006
				Copper	6.4E-7	mg/m^3	1.9E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.3E-08	(mg/m^3)	NA	(mg/m^3)	--
				Iron	1.0E-5	mg/m^3	3.0E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.1E-07	(mg/m^3)	NA	(mg/m^3)	--
				Lead	1.7E-7	mg/m^3	5.0E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	3.5E-09	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	1.0E-7	mg/m^3	3.0E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.1E-09	(mg/m^3)	5.0E-05	(mg/m^3)	0.00004
				Mercury	1.0E-9	mg/m^3	2.9E-12	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.1E-11	(mg/m^3)	3.0E-05	(mg/m^3)	0.0000007
				Nickel	5.2E-8	mg/m^3	1.5E-10	(mg/m^3)	2.6E-04	$(ug/m^3)^{-1}$	3.9E-11	1.1E-09	(mg/m^3)	9.0E-05	(mg/m^3)	0.00001
				Thallium	9.5E-11	mg/m^3	2.8E-13	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.0E-12	(mg/m^3)	NA	(mg/m^3)	--
				Zinc	2.8E-7	mg/m^3	8.1E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	5.7E-09	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								1.1E-10					0.00006
		Exposure Point Total									1.1E-10					0.00006
	Exposure Medium Total										1.1E-10					0.00006
Medium Total											3.6E-05					1.7

ALTERNATE TABLE 7.4A.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Sediment	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.20	mg/kg	2.2E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.6E-07	5.1E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				TEQ PCB	0.002	mg/kg	9.7E-12	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	1.3E-06	6.8E-11	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.07
				Total PCB Congeners	0.420	mg/kg	2.6E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	5.1E-09	1.8E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	14.5	mg/kg	8.8E-08	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	1.3E-07	6.2E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.002
				Chromium	150	mg/kg	9.1E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	6.4E-06	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.000004
				Iron	45,900	mg/kg	2.8E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.0E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.003
				Lead	187	mg/kg	1.1E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	8.0E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	468	mg/kg	2.8E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.0E-05	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.0001
			Exp. Route Total								1.6E-06					0.07
			Dermal	Benzo(a)pyrene Equivalents	1.20	mg/kg	2.3E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.7E-07	5.4E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				TEQ PCB	0.002	mg/kg	2.4E-12	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	3.1E-07	1.7E-11	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.02
				Total PCB Congeners	0.420	mg/kg	2.9E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	5.8E-09	2.0E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	14.5	mg/kg	2.1E-08	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	3.2E-08	1.5E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0005
				Chromium	150	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.0E-02	(mg/kg/day)	--
				Iron	45,900	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	187	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	468	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
			Exp. Route Total								5.1E-07					0.02
		Exposure Point Total									2.1E-06					0.09
	Exposure Medium Total										2.1E-06					0.09
Medium Total											2.1E-06					0.09

ALTERNATE TABLE 7.4B.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Aroclor-1254	0.28	mg/kg	2.2E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	4.4E-08	1.5E-07	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.008
			Exp. Route Total								4.4E-08					0.008
			Dermal	Aroclor-1254	0.28	mg/kg	2.5E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	5.0E-08	1.7E-07	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.009
			Exp. Route Total								5.0E-08					0.009
		Exposure Point Total									9.4E-08					0.02
	Exposure Medium Total										9.4E-08					0.02
	Air	OU7	Inhalation	Aroclor-1254	3.0E-11	mg/m^3	8.8E-14	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	5.0E-14	6.1E-13	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								5.0E-14					--
		Exposure Point Total									5.0E-14					--
	Exposure Medium Total										5.0E-14					--
Medium Total											9.4E-08					0.02
Subsurface Soil	Subsurface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	0.25	mg/kg	5.9E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	4.3E-07	1.4E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	405.0	mg/kg	3.2E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.2E-04	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.002
			Exp. Route Total								4.3E-07					0.002
Subsurface Soil	Subsurface Soil	OU7	Dermal	Benzo(a)pyrene Equivalents	0.25	mg/kg	6.2E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	4.5E-07	1.4E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	405.0	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
			Exp. Route Total								4.5E-07					--
		Exposure Point Total									8.8E-07					0.002
	Exposure Medium Total										8.8E-07					0.002
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	2.7E-11	mg/m^3	2.3E-13	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	2.6E-13	5.5E-13	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	4.3E-8	mg/m^3	1.3E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	8.9E-10	(mg/m^3)	5.0E-05	(mg/m^3)	0.00002
			Exp. Route Total								2.6E-13					0.00002
		Exposure Point Total									2.6E-13					0.00002
	Exposure Medium Total										2.6E-13					0.00002
Medium Total											8.8E-07					0.002

ALTERNATE TABLE 7.4B.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Sediment	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.20	mg/kg	2.2E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.6E-07	5.1E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				TEQ PCB	0.002	mg/kg	9.7E-12	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	1.3E-06	6.8E-11	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.07
				Total PCB Congeners	0.420	mg/kg	2.6E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	5.1E-09	1.8E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	14.5	mg/kg	8.8E-08	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	1.3E-07	6.2E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.002
				Chromium	150	mg/kg	9.1E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	6.4E-06	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.000004
				Iron	45,900	mg/kg	2.8E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.0E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.003
				Lead	187	mg/kg	1.1E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	8.0E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	468	mg/kg	2.8E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.0E-05	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.0001
			Exp. Route Total								1.6E-06					0.07
			Dermal	Benzo(a)pyrene Equivalents	1.20	mg/kg	2.3E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.7E-07	5.4E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				TEQ PCB	0.002	mg/kg	2.4E-12	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	3.1E-07	1.7E-11	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.02
				Total PCB Congeners	0.420	mg/kg	2.9E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	5.8E-09	2.0E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	14.5	mg/kg	2.1E-08	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	3.2E-08	1.5E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0005
				Chromium	150	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.0E-02	(mg/kg/day)	--
				Iron	45,900	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	187	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	468	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
			Exp. Route Total								5.1E-07					0.02
		Exposure Point Total									2.1E-06					0.09
	Exposure Medium Total										2.1E-06					0.09
Medium Total											2.1E-06					0.09

TABLE 7.5A.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.80	mg/kg	1.5E-06	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.1E-05	2.5E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	7.0E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.4E-06	2.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	1.6E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.6E-04	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.002
				Copper	1,030	mg/kg	4.8E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.4E-03	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.04
				Iron	34,200	mg/kg	1.6E-02	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.7E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.07
				Lead	510	mg/kg	2.4E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	7.0E-04	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	9.9E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.9E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.010
				Thallium	0.480	mg/kg	2.3E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	6.6E-07	(mg/kg/day)	1.0E-05	(mg/kg/day)	0.07
			Exp. Route Total								1.3E-05					0.2
			Dermal	Benzo(a)pyrene Equivalents	1.80	mg/kg	8.0E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	5.9E-06	1.3E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	3.9E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	7.9E-07	1.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	--
				Copper	1,030	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Iron	34,200	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	510	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	--
				Thallium	0.480	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.0E-05	(mg/kg/day)	--
			Exp. Route Total								6.7E-06					--
		Exposure Point Total									1.9E-05					0.2
	Exposure Medium Total										1.9E-05					0.2
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.9E-10	mg/m^3	1.2E-10	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	1.3E-10	1.8E-10	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1248	1.6E-10	mg/m^3	5.3E-11	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	3.0E-11	1.5E-10	(mg/m^3)	NA	(mg/m^3)	--
				Barium	3.6E-8	mg/m^3	1.2E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	3.4E-08	(mg/m^3)	5.0E-04	(mg/m^3)	0.00007
				Copper	1.1E-7	mg/m^3	3.6E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.1E-07	(mg/m^3)	NA	(mg/m^3)	--
				Iron	3.6E-6	mg/m^3	1.2E-06	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	3.5E-06	(mg/m^3)	NA	(mg/m^3)	--
				Lead	5.4E-8	mg/m^3	1.8E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	5.2E-08	(mg/m^3)	NA	(mg/m^3)	--
				Mercury	2.2E-10	mg/m^3	7.4E-11	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.1E-10	(mg/m^3)	3.0E-05	(mg/m^3)	0.0000072
				Thallium	5.1E-11	mg/m^3	1.7E-11	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	4.9E-11	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								1.6E-10					0.00008
		Exposure Point Total									1.6E-10					0.00008
	Exposure Medium Total										1.6E-10					0.00008
Medium Total											1.9E-05					0.2
Subsurface Soil	Subsurface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.10	mg/kg	9.5E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	6.9E-06	1.5E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	41.0	mg/kg	1.9E-05	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	3.9E-05	5.6E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1260	4.60	mg/kg	2.2E-06	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	4.3E-06	6.3E-06	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.3
				2,3,7,8-TCDD Equivalents	0.001	mg/kg	6.1E-10	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	7.9E-05	1.8E-09	(mg/kg/day)	1.0E-09	(mg/kg/day)	1.8
				Antimony	182	mg/kg	8.5E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.5E-04	(mg/kg/day)	4.0E-04	(mg/kg/day)	0.6
				Barium	280	mg/kg	1.3E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.8E-04	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.002
				Cadmium	5.10	mg/kg	2.4E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	7.0E-06	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.007
				Cobalt	15.9	mg/kg	7.5E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.2E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.07
				Copper	6,020	mg/kg	2.8E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	8.2E-03	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.2
				Iron	97,100	mg/kg	4.6E-02	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.3E-01	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.2
				Lead	1,600	mg/kg	7.5E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.2E-03	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	969	mg/kg	4.6E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.3E-03	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.009
				Mercury	9.40	mg/kg	4.4E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.3E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.04
				Nickel	484	mg/kg	2.3E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	6.6E-04	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.03
				Thallium	0.890	mg/kg	4.2E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.2E-06	(mg/kg/day)	1.0E-05	(mg/kg/day)	0.1
				Zinc	2,600	mg/kg	1.2E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.6E-03	(mg/kg/day)	3.0E-01	(mg/kg/day)	0.01
			Exp. Route Total								1.3E-04					3.4

TABLE 7.5A.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Subsurface Soil	Subsurface Soil	OU7	Dermal	Benzo(a)pyrene Equivalents	1.10	mg/kg	4.9E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	3.6E-06	7.8E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	41.0	mg/kg	1.1E-05	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.2E-05	3.1E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1260	4.60	mg/kg	1.2E-06	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.4E-06	3.5E-06	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.2
				2,3,7,8-TCDD Equivalents	0.001	mg/kg	7.3E-11	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	9.5E-06	2.1E-10	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.2
				Antimony	182	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	6.0E-05	(mg/kg/day)	--
				Barium	280	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	--
				Cadmium	5.10	mg/kg	9.6E-09	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.8E-08	(mg/kg/day)	2.5E-05	(mg/kg/day)	0.001
				Cobalt	15.9	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	--
				Copper	6,020	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Iron	97,100	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	1,600	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	969	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
				Mercury	9.40	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	--
				Nickel	484	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	8.0E-04	(mg/kg/day)	--
				Thallium	0.890	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.0E-05	(mg/kg/day)	--
				Zinc	2,600	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	3.0E-01	(mg/kg/day)	--
			Exp. Route Total								3.7E-05					0.4
		Exposure Point Total									1.7E-04					3.8
	Exposure Medium Total										1.7E-04					3.8
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.2E-10	mg/m^3	7.1E-11	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	7.8E-11	1.1E-10	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1248	4.4E-9	mg/m^3	1.4E-09	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	8.2E-10	4.2E-09	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1260	4.9E-10	mg/m^3	1.6E-10	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	9.2E-11	4.7E-10	(mg/m^3)	NA	(mg/m^3)	--
				2,3,7,8-TCDD Equivalents	1.4E-13	mg/m^3	4.6E-14	(mg/m^3)	3.8E+01	$(ug/m^3)^{-1}$	1.7E-09	1.3E-13	(mg/m^3)	4.0E-08	(mg/m^3)	0.000003
				Antimony	1.9E-8	mg/m^3	6.4E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.9E-08	(mg/m^3)		(mg/m^3)	--
				Barium	3.0E-8	mg/m^3	9.8E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.9E-08	(mg/m^3)	5.0E-04	(mg/m^3)	0.00006
				Cadmium	5.4E-10	mg/m^3	1.8E-10	(mg/m^3)	1.8E-03	$(ug/m^3)^{-1}$	3.2E-10	5.2E-10	(mg/m^3)	2.0E-05	(mg/m^3)	0.00003
				Cobalt	1.7E-9	mg/m^3	5.6E-10	(mg/m^3)	9.0E-03	$(ug/m^3)^{-1}$	5.0E-09	1.6E-09	(mg/m^3)	6.0E-06	(mg/m^3)	0.0003
				Copper	6.4E-7	mg/m^3	2.1E-07	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	6.2E-07	(mg/m^3)	NA	(mg/m^3)	--
				Iron	1.0E-5	mg/m^3	3.4E-06	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	9.9E-06	(mg/m^3)	NA	(mg/m^3)	--
				Lead	1.7E-7	mg/m^3	5.6E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.6E-07	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	1.0E-7	mg/m^3	3.4E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	9.9E-08	(mg/m^3)	5.0E-05	(mg/m^3)	0.002
				Mercury	1.0E-9	mg/m^3	3.3E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	9.6E-10	(mg/m^3)	3.0E-05	(mg/m^3)	0.000032
				Nickel	5.2E-8	mg/m^3	1.7E-08	(mg/m^3)	2.6E-04	$(ug/m^3)^{-1}$	4.4E-09	5.0E-08	(mg/m^3)	9.0E-05	(mg/m^3)	0.0006
				Thallium	9.5E-11	mg/m^3	3.1E-11	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	9.1E-11	(mg/m^3)	NA	(mg/m^3)	--
				Zinc	2.8E-7	mg/m^3	9.1E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.7E-07	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								1.2E-08					0.003
		Exposure Point Total									1.2E-08					0.003
	Exposure Medium Total										1.2E-08					0.003
Medium Total											1.7E-04					3.8

TABLE 7.5B.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Aroclor-1254	0.28	mg/kg	1.3E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.6E-07	3.8E-07	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.02
			Exp. Route Total								2.6E-07					0.02
			Dermal	Aroclor-1254	0.28	mg/kg	7.3E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.5E-07	2.1E-07	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.01
			Exp. Route Total								1.5E-07					0.01
		Exposure Point Total									4.1E-07					0.03
	Exposure Medium Total										4.1E-07					0.03
	Air	OU7	Inhalation	Aroclor-1254	3.0E-11	mg/m^3	9.8E-12	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	5.6E-12	2.9E-11	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								5.6E-12					--
		Exposure Point Total									5.6E-12					--
	Exposure Medium Total										5.6E-12					--
Medium Total											4.1E-07					0.03
Subsurface Soil	Subsurface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	0.25	mg/kg	2.2E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.6E-06	3.4E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	405.0	mg/kg	1.9E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	5.5E-04	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.004
			Exp. Route Total								1.6E-06					0.004
			Dermal	Benzo(a)pyrene Equivalents	0.25	mg/kg	1.1E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	8.2E-07	1.8E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	405.0	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
			Exp. Route Total								8.2E-07					--
		Exposure Point Total									2.4E-06					0.004
	Exposure Medium Total										2.4E-06					0.004
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	2.7E-11	mg/m^3	1.6E-11	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	1.8E-11	2.6E-11	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	4.3E-8	mg/m^3	1.4E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	4.1E-08	(mg/m^3)	5.0E-05	(mg/m^3)	0.0008
			Exp. Route Total								1.8E-11					0.0008
		Exposure Point Total									1.8E-11					0.0008
	Exposure Medium Total										1.8E-11					0.0008
Medium Total											2.4E-06					0.005

ALTERNATE TABLE 7.6A.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.80	mg/kg	1.1E-05	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	7.7E-05	2.3E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	1.6E-06	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	3.3E-06	1.9E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	3.7E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.3E-03	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.02
				Copper	1,030	mg/kg	1.1E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.3E-02	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.3
				Iron	34,200	mg/kg	3.7E-02	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.4E-01	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.6
				Lead	510	mg/kg	5.6E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	6.5E-03	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	2.3E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.7E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.09
				Thallium	0.480	mg/kg	5.3E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	6.1E-06	(mg/kg/day)	1.0E-05	(mg/kg/day)	0.6
			Exp. Route Total								8.0E-05					1.7
			Dermal	Benzo(a)pyrene Equivalents	1.80	mg/kg	3.8E-06	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	2.8E-05	8.4E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	6.4E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.3E-06	7.5E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	--
				Copper	1,030	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Iron	34,200	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	510	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	--
				Thallium	0.480	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.0E-05	(mg/kg/day)	--
			Exp. Route Total								2.9E-05					--
		Exposure Point Total									1.1E-04					1.7
	Exposure Medium Total										1.1E-04					1.7
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.9E-10	mg/m^3	8.4E-11	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	9.3E-11	1.8E-10	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1248	1.6E-10	mg/m^3	1.3E-11	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	7.5E-12	1.5E-10	(mg/m^3)	NA	(mg/m^3)	--
				Barium	3.6E-8	mg/m^3	2.9E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	3.4E-08	(mg/m^3)	5.0E-04	(mg/m^3)	0.00007
				Copper	1.1E-7	mg/m^3	9.0E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.1E-07	(mg/m^3)	NA	(mg/m^3)	--
				Iron	3.6E-6	mg/m^3	3.0E-07	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	3.5E-06	(mg/m^3)	NA	(mg/m^3)	--
				Lead	5.4E-8	mg/m^3	4.5E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	5.2E-08	(mg/m^3)	NA	(mg/m^3)	--
				Mercury	2.2E-10	mg/m^3	1.8E-11	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.1E-10	(mg/m^3)	3.0E-05	(mg/m^3)	0.0000072
				Thallium	5.1E-11	mg/m^3	4.2E-12	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	4.9E-11	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								1.0E-10					0.00008
		Exposure Point Total									1.0E-10					0.00008
	Exposure Medium Total										1.0E-10					0.00008
Medium Total											1.1E-04					1.7
Subsurface Soil	Subsurface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.10	mg/kg	6.4E-06	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	4.7E-05	1.4E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	41.0	mg/kg	4.5E-05	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	9.0E-05	5.2E-04	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1260	4.60	mg/kg	5.0E-06	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.0E-05	5.9E-05	(mg/kg/day)	2.0E-05	(mg/kg/day)	3
				2,3,7,8-TCDD Equivalents	0.001	mg/kg	1.4E-09	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	1.9E-04	1.7E-08	(mg/kg/day)	1.0E-09	(mg/kg/day)	17
				Antimony	182	mg/kg	2.0E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.3E-03	(mg/kg/day)	4.0E-04	(mg/kg/day)	5.8
				Barium	280	mg/kg	3.1E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.6E-03	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.02
				Cadmium	5.10	mg/kg	5.6E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	6.5E-05	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.07
				Cobalt	15.9	mg/kg	1.7E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.0E-04	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.7
				Copper	6,020	mg/kg	6.6E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	7.7E-02	(mg/kg/day)	4.0E-02	(mg/kg/day)	1.9
				Iron	97,100	mg/kg	1.1E-01	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.2E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	1.8
				Lead	1,600	mg/kg	1.8E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.0E-02	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	969	mg/kg	1.1E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.2E-02	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.09
				Mercury	9.40	mg/kg	1.0E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.2E-04	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.4
				Nickel	484	mg/kg	5.3E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	6.2E-03	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.3
				Thallium	0.890	mg/kg	9.8E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.1E-05	(mg/kg/day)	1.0E-05	(mg/kg/day)	1.1
				Zinc	2,600	mg/kg	2.8E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.3E-02	(mg/kg/day)	3.0E-01	(mg/kg/day)	0.1
			Exp. Route Total								3.3E-04					32

ALTERNATE TABLE 7.6A.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Subsurface Soil	Subsurface Soil	OU7	Dermal	Benzo(a)pyrene Equivalents	1.10	mg/kg	2.3E-06	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.7E-05	5.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	41.0	mg/kg	1.8E-05	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	3.5E-05	2.1E-04	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1260	4.60	mg/kg	2.0E-06	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	4.0E-06	2.3E-05	(mg/kg/day)	2.0E-05	(mg/kg/day)	1
				2,3,7,8-TCDD Equivalents	0.001	mg/kg	1.2E-10	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	1.6E-05	1.4E-09	(mg/kg/day)	1.0E-09	(mg/kg/day)	1.4
				Antimony	182	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	6.0E-05	(mg/kg/day)	--
				Barium	280	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	--
				Cadmium	5.10	mg/kg	1.6E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.8E-07	(mg/kg/day)	2.5E-05	(mg/kg/day)	0.007
				Cobalt	15.9	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	--
				Copper	6,020	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Iron	97,100	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	1,600	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	969	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
				Mercury	9.40	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	--
				Nickel	484	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	8.0E-04	(mg/kg/day)	--
				Thallium	0.890	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.0E-05	(mg/kg/day)	--
				Zinc	2,600	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	3.0E-01	(mg/kg/day)	--
			Exp. Route Total								7.2E-05					2.6
		Exposure Point Total									4.0E-04					34
	Exposure Medium Total										4.0E-04					34
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.2E-10	mg/m^3	5.1E-11	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	5.7E-11	1.1E-10	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1248	4.4E-9	mg/m^3	3.6E-10	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	2.0E-10	4.2E-09	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1260	4.9E-10	mg/m^3	4.0E-11	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	2.3E-11	4.7E-10	(mg/m^3)	NA	(mg/m^3)	--
				2,3,7,8-TCDD Equivalents	1.4E-13	mg/m^3	1.1E-14	(mg/m^3)	3.8E+01	$(ug/m^3)^{-1}$	4.3E-10	1.3E-13	(mg/m^3)	4.0E-08	(mg/m^3)	0.000003
				Antimony	1.9E-8	mg/m^3	1.6E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.9E-08	(mg/m^3)		(mg/m^3)	--
				Barium	3.0E-8	mg/m^3	2.5E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.9E-08	(mg/m^3)	5.0E-04	(mg/m^3)	0.00006
				Cadmium	5.4E-10	mg/m^3	4.5E-11	(mg/m^3)	1.8E-03	$(ug/m^3)^{-1}$	8.1E-11	5.2E-10	(mg/m^3)	2.0E-05	(mg/m^3)	0.00003
				Cobalt	1.7E-9	mg/m^3	1.4E-10	(mg/m^3)	9.0E-03	$(ug/m^3)^{-1}$	1.3E-09	1.6E-09	(mg/m^3)	6.0E-06	(mg/m^3)	0.0003
				Copper	6.4E-7	mg/m^3	5.3E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	6.2E-07	(mg/m^3)	NA	(mg/m^3)	--
				Iron	1.0E-5	mg/m^3	8.5E-07	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	9.9E-06	(mg/m^3)	NA	(mg/m^3)	--
				Lead	1.7E-7	mg/m^3	1.4E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.6E-07	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	1.0E-7	mg/m^3	8.5E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	9.9E-08	(mg/m^3)	5.0E-05	(mg/m^3)	0.002
				Mercury	1.0E-9	mg/m^3	8.2E-11	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	9.6E-10	(mg/m^3)	3.0E-05	(mg/m^3)	0.000032
				Nickel	5.2E-8	mg/m^3	4.2E-09	(mg/m^3)	2.6E-04	$(ug/m^3)^{-1}$	1.1E-09	5.0E-08	(mg/m^3)	9.0E-05	(mg/m^3)	0.0006
				Thallium	9.5E-11	mg/m^3	7.8E-12	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	9.1E-11	(mg/m^3)	NA	(mg/m^3)	--
				Zinc	2.8E-7	mg/m^3	2.3E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.7E-07	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								3.2E-09					0.003
		Exposure Point Total									3.2E-09					0.003
	Exposure Medium Total										3.2E-09					0.003
Medium Total											4.0E-04					34

ALTERNATE TABLE 7.6B.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Aroclor-1254	0.28	mg/kg	3.1E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	6.1E-07	3.6E-06	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.2
			Exp. Route Total								6.1E-07					0.2
			Dermal	Aroclor-1254	0.28	mg/kg	1.2E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.4E-07	1.4E-06	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.07
			Exp. Route Total								2.4E-07					0.07
		Exposure Point Total									8.5E-07					0.2
	Exposure Medium Total										8.5E-07					0.2
	Air	OU7	Inhalation	Aroclor-1254	3.0E-11	mg/m^3	2.5E-12	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	1.4E-12	2.9E-11	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								1.4E-12					--
		Exposure Point Total									1.4E-12					--
	Exposure Medium Total										1.4E-12					--
Medium Total											8.5E-07					0.2
Subsurface Soil	Subsurface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	0.25	mg/kg	1.5E-06	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.1E-05	3.2E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	405.0	mg/kg	4.4E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	5.2E-03	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.04
			Exp. Route Total								1.1E-05					0.04
		OU7	Dermal	Benzo(a)pyrene Equivalents	0.25	mg/kg	5.3E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	3.9E-06	1.2E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	405.0	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
			Exp. Route Total								3.9E-06					--
		Exposure Point Total									1.5E-05					0.04
	Exposure Medium Total										1.5E-05					0.04
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	2.7E-11	mg/m^3	1.2E-11	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	1.3E-11	2.6E-11	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	4.3E-8	mg/m^3	3.6E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	4.1E-08	(mg/m^3)	5.0E-05	(mg/m^3)	0.0008
			Exp. Route Total								1.3E-11					0.0008
		Exposure Point Total									1.3E-11					0.0008
	Exposure Medium Total										1.3E-11					0.0008
Medium Total											1.5E-05					0.04

ALTERNATE TABLE 7.2A.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Occupational Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.80	mg/kg	9.9E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	7.2E-07	7.7E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	8.3E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.7E-07	6.4E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	1.8E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.4E-04	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.0007
				Copper	1,030	mg/kg	5.7E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.4E-04	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.01
				Iron	34,200	mg/kg	1.9E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.5E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.02
				Lead	510	mg/kg	2.8E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.2E-04	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	1.2E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	9.0E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.003
				Thallium	0.480	mg/kg	2.6E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.1E-07	(mg/kg/day)	1.0E-05	(mg/kg/day)	0.02
			Exp. Route Total								8.9E-07					0.06
			Dermal	Benzo(a)pyrene Equivalents	1.80	mg/kg	1.7E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.2E-07	1.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	1.5E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	3.1E-08	1.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	--
				Copper	1,030	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Iron	34,200	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	510	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	--
				Thallium	0.480	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.0E-05	(mg/kg/day)	--
			Exp. Route Total								1.5E-07					--
		Exposure Point Total									1.0E-06					0.06
	Exposure Medium Total										1.0E-06					0.06
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.6E-10	mg/m^3	4.2E-12	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	4.6E-12	3.3E-11	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1248	1.4E-10	mg/m^3	3.5E-12	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	2.0E-12	2.7E-11	(mg/m^3)	NA	(mg/m^3)	--
				Barium	3.0E-8	mg/m^3	7.8E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	6.1E-09	(mg/m^3)	5.0E-04	(mg/m^3)	0.00001
				Copper	9.4E-8	mg/m^3	2.4E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.9E-08	(mg/m^3)	NA	(mg/m^3)	--
				Iron	3.1E-6	mg/m^3	8.0E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	6.2E-07	(mg/m^3)	NA	(mg/m^3)	--
				Lead	4.6E-8	mg/m^3	1.2E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	9.3E-09	(mg/m^3)	NA	(mg/m^3)	--
				Mercury	1.9E-10	mg/m^3	4.9E-12	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	3.8E-11	(mg/m^3)	3.0E-05	(mg/m^3)	0.0000013
				Thallium	4.4E-11	mg/m^3	1.1E-12	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	8.7E-12	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								6.6E-12					0.00001
		Exposure Point Total									6.6E-12					0.00001
	Exposure Medium Total										6.6E-12					0.00001
Medium Total											1.0E-06					0.06
Subsurface Soil	Subsurface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.10	mg/kg	6.1E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	4.4E-07	4.7E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	41.0	mg/kg	2.3E-06	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	4.5E-06	1.8E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1260	4.60	mg/kg	2.5E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	5.1E-07	2.0E-06	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.1
				2,3,7,8-TCDD Equivalents	0.001	mg/kg	7.2E-11	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	9.3E-06	5.6E-10	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.6
				Antimony	182	mg/kg	1.0E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	7.8E-05	(mg/kg/day)	4.0E-04	(mg/kg/day)	0.2
				Barium	280	mg/kg	1.5E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.2E-04	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.0006
				Cadmium	5.10	mg/kg	2.8E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.2E-06	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.002
				Cobalt	15.9	mg/kg	8.8E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	6.8E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.02
				Copper	6,020	mg/kg	3.3E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.6E-03	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.1
				Iron	97,100	mg/kg	5.4E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.2E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.06
				Lead	1,600	mg/kg	8.8E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	6.9E-04	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	969	mg/kg	5.3E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.2E-04	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.003
				Mercury	9.40	mg/kg	5.2E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.0E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.01
				Nickel	484	mg/kg	2.7E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.1E-04	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.01
				Thallium	0.890	mg/kg	4.9E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.8E-07	(mg/kg/day)	1.0E-05	(mg/kg/day)	0.04
				Zinc	2,600	mg/kg	1.4E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.1E-03	(mg/kg/day)	3.0E-01	(mg/kg/day)	0.004
			Exp. Route Total								1.5E-05					1.1

ALTERNATE TABLE 7.2A.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Occupational Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Subsurface Soil	Subsurface Soil	OU7	Dermal	Benzo(a)pyrene Equivalents	1.10	mg/kg	1.0E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	7.6E-08	8.1E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	41.0	mg/kg	4.2E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	8.3E-07	3.2E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1260	4.60	mg/kg	4.7E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	9.4E-08	3.6E-07	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.02
				2,3,7,8-TCDD Equivalents	0.001	mg/kg	2.8E-12	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	3.7E-07	2.2E-11	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.02
				Antimony	182	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	6.0E-05	(mg/kg/day)	--
				Barium	280	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	--
				Cadmium	5.10	mg/kg	3.7E-10	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.9E-09	(mg/kg/day)	2.5E-05	(mg/kg/day)	0.0001
				Cobalt	15.9	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	--
				Copper	6,020	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Iron	97,100	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	1,600	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	969	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
				Mercury	9.40	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	--
				Nickel	484	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	8.0E-04	(mg/kg/day)	--
				Thallium	0.890	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.0E-05	(mg/kg/day)	--
				Zinc	2,600	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	3.0E-01	(mg/kg/day)	--
			Exp. Route Total								1.4E-06					0.04
		Exposure Point Total									1.6E-05					1.1
	Exposure Medium Total										1.6E-05					1.1
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.0E-10	mg/m^3	2.6E-12	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	2.8E-12	2.0E-11	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1248	3.7E-9	mg/m^3	9.6E-11	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	5.5E-11	7.5E-10	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1260	4.2E-10	mg/m^3	1.1E-11	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	6.1E-12	8.4E-11	(mg/m^3)	NA	(mg/m^3)	--
				2,3,7,8-TCDD Equivalents	1.2E-13	mg/m^3	3.0E-15	(mg/m^3)	3.8E+01	$(ug/m^3)^{-1}$	1.2E-10	2.4E-14	(mg/m^3)	4.0E-08	(mg/m^3)	0.0000006
				Antimony	1.7E-8	mg/m^3	4.3E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	3.3E-09	(mg/m^3)		(mg/m^3)	--
				Barium	2.5E-8	mg/m^3	6.5E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	5.1E-09	(mg/m^3)	5.0E-04	(mg/m^3)	0.00001
				Cadmium	4.6E-10	mg/m^3	1.2E-11	(mg/m^3)	1.8E-03	$(ug/m^3)^{-1}$	2.1E-11	9.3E-11	(mg/m^3)	2.0E-05	(mg/m^3)	0.000005
				Cobalt	1.4E-9	mg/m^3	3.7E-11	(mg/m^3)	9.0E-03	$(ug/m^3)^{-1}$	3.3E-10	2.9E-10	(mg/m^3)	6.0E-06	(mg/m^3)	0.00005
				Copper	5.5E-7	mg/m^3	1.4E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.1E-07	(mg/m^3)	NA	(mg/m^3)	--
				Iron	8.8E-6	mg/m^3	2.3E-07	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.8E-06	(mg/m^3)	NA	(mg/m^3)	--
				Lead	1.5E-7	mg/m^3	3.7E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.9E-08	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	8.8E-8	mg/m^3	2.3E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.8E-08	(mg/m^3)	5.0E-05	(mg/m^3)	0.0004
				Mercury	8.5E-10	mg/m^3	2.2E-11	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.7E-10	(mg/m^3)	3.0E-05	(mg/m^3)	0.0000057
				Nickel	4.4E-8	mg/m^3	1.1E-09	(mg/m^3)	2.6E-04	$(ug/m^3)^{-1}$	2.9E-10	8.8E-09	(mg/m^3)	9.0E-05	(mg/m^3)	0.00010
				Thallium	8.1E-11	mg/m^3	2.1E-12	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.6E-11	(mg/m^3)	NA	(mg/m^3)	--
				Zinc	2.4E-7	mg/m^3	6.1E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	4.7E-08	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								8.3E-10					0.0005
		Exposure Point Total									8.3E-10					0.0005
	Exposure Medium Total										8.3E-10					0.0005
Medium Total											1.6E-05					1.1

ALTERNATE TABLE 7.2B.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Occupational Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Aroclor-1254	0.28	mg/kg	1.5E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	3.1E-08	1.2E-07	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.006
			Exp. Route Total								3.1E-08					0.006
			Dermal	Aroclor-1254	0.28	mg/kg	2.9E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	5.7E-09	2.2E-08	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.001
			Exp. Route Total								5.7E-09					0.001
		Exposure Point Total									3.7E-08					0.007
	Exposure Medium Total										3.7E-08					0.007
	Air	OU7	Inhalation	Aroclor-1254	2.5E-11	mg/m^3	6.5E-13	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	3.7E-13	5.1E-12	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								3.7E-13					--
		Exposure Point Total									3.7E-13					--
	Exposure Medium Total										3.7E-13					--
Medium Total											3.7E-08					0.007
Subsurface Soil	Subsurface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	0.25	mg/kg	1.4E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.0E-07	1.1E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	405.0	mg/kg	2.2E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.7E-04	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.001
			Exp. Route Total								1.0E-07					0.001
			Dermal	Benzo(a)pyrene Equivalents	0.25	mg/kg	2.4E-09	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.7E-08	1.8E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	405.0	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
			Exp. Route Total								1.7E-08					--
		Exposure Point Total									1.2E-07					0.001
	Exposure Medium Total										1.2E-07					0.001
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	2.3E-11	mg/m^3	5.8E-13	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	6.4E-13	4.5E-12	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	3.7E-8	mg/m^3	9.5E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	7.4E-09	(mg/m^3)	5.0E-05	(mg/m^3)	0.0001
			Exp. Route Total								6.4E-13					0.0001
		Exposure Point Total									6.4E-13					0.0001
	Exposure Medium Total										6.4E-13					0.0001
Medium Total											1.2E-07					0.001

ALTERNATE TABLE 7.3A.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.80	mg/kg	3.2E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	2.3E-07	3.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	2.6E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	5.3E-08	2.6E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	5.9E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	5.9E-05	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.0003
				Copper	1,030	mg/kg	1.8E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.8E-04	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.005
				Iron	34,200	mg/kg	6.0E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	6.0E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.009
				Lead	510	mg/kg	9.0E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	9.0E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	3.7E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.7E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.001
				Thallium	0.480	mg/kg	8.5E-09	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	8.5E-08	(mg/kg/day)	1.0E-05	(mg/kg/day)	0.008
			Exp. Route Total								2.8E-07					0.02
			Dermal	Benzo(a)pyrene Equivalents	1.80	mg/kg	4.7E-09	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	3.4E-08	4.7E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	4.2E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	8.4E-09	4.2E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	--
				Copper	1,030	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Iron	34,200	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	510	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	--
				Thallium	0.480	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.0E-05	(mg/kg/day)	--
			Exp. Route Total								4.3E-08					--
		Exposure Point Total									3.3E-07					0.02
	Exposure Medium Total										3.3E-07					0.02
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.9E-10	mg/m^3	3.9E-13	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	4.3E-13	3.9E-12	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1248	1.6E-10	mg/m^3	3.3E-13	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	1.9E-13	3.3E-12	(mg/m^3)	NA	(mg/m^3)	--
				Barium	3.6E-8	mg/m^3	7.3E-11	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	7.3E-10	(mg/m^3)	5.0E-04	(mg/m^3)	0.000001
				Copper	1.1E-7	mg/m^3	2.3E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.3E-09	(mg/m^3)	NA	(mg/m^3)	--
				Iron	3.6E-6	mg/m^3	7.5E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	7.5E-08	(mg/m^3)	NA	(mg/m^3)	--
				Lead	5.4E-8	mg/m^3	1.1E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.1E-09	(mg/m^3)	NA	(mg/m^3)	--
				Mercury	2.2E-10	mg/m^3	4.6E-13	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	4.6E-12	(mg/m^3)	3.0E-05	(mg/m^3)	0.0000002
				Thallium	5.1E-11	mg/m^3	1.1E-13	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.1E-12	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								6.2E-13					0.000002
		Exposure Point Total									6.2E-13					0.000002
	Exposure Medium Total										6.2E-13					0.000002
Medium Total											3.3E-07					0.02
Subsurface Soil	Subsurface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.10	mg/kg	1.9E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.4E-07	1.9E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	41.0	mg/kg	7.2E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.4E-06	7.2E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1260	4.60	mg/kg	8.1E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.6E-07	8.1E-07	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.04
				2,3,7,8-TCDD Equivalents	0.001	mg/kg	2.3E-11	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	3.0E-06	2.3E-10	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.2
				Antimony	182	mg/kg	3.2E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.2E-05	(mg/kg/day)	4.0E-04	(mg/kg/day)	0.08
				Barium	280	mg/kg	4.9E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.9E-05	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.0002
				Cadmium	5.10	mg/kg	9.0E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	9.0E-07	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.0009
				Cobalt	15.9	mg/kg	2.8E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.8E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.009
				Copper	6,020	mg/kg	1.1E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.1E-03	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.03
				Iron	97,100	mg/kg	1.7E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.7E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.02
				Lead	1,600	mg/kg	2.8E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.8E-04	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	969	mg/kg	1.7E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.7E-04	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.001
				Mercury	9.40	mg/kg	1.7E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.7E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.006
				Nickel	484	mg/kg	8.5E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	8.5E-05	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.004
				Thallium	0.890	mg/kg	1.6E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.6E-07	(mg/kg/day)	1.0E-05	(mg/kg/day)	0.02
				Zinc	2,600	mg/kg	4.6E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.6E-04	(mg/kg/day)	3.0E-01	(mg/kg/day)	0.002
			Exp. Route Total								4.7E-06					0.4

ALTERNATE TABLE 7.3A.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Subsurface Soil	Subsurface Soil	OU7	Dermal	Benzo(a)pyrene Equivalents	1.10	mg/kg	2.9E-09	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	2.1E-08	2.9E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	41.0	mg/kg	1.2E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.3E-07	1.2E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1260	4.60	mg/kg	1.3E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.6E-08	1.3E-07	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.006
				2,3,7,8-TCDD Equivalents	0.001	mg/kg	7.8E-13	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	1.0E-07	7.8E-12	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.008
				Antimony	182	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	6.0E-05	(mg/kg/day)	--
				Barium	280	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	--
				Cadmium	5.10	mg/kg	1.0E-10	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.0E-09	(mg/kg/day)	2.5E-05	(mg/kg/day)	0.00004
				Cobalt	15.9	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	--
				Copper	6,020	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Iron	97,100	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	1,600	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	969	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
				Mercury	9.40	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	--
				Nickel	484	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	8.0E-04	(mg/kg/day)	--
				Thallium	0.890	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.0E-05	(mg/kg/day)	--
				Zinc	2,600	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	3.0E-01	(mg/kg/day)	--
			Exp. Route Total								3.8E-07					0.01
		Exposure Point Total									5.1E-06					0.5
	Exposure Medium Total										5.1E-06					0.5
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.2E-10	mg/m^3	2.4E-13	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	2.7E-13	2.4E-12	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1248	4.4E-9	mg/m^3	9.0E-12	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	5.1E-12	9.0E-11	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1260	4.9E-10	mg/m^3	1.0E-12	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	5.7E-13	1.0E-11	(mg/m^3)	NA	(mg/m^3)	--
				2,3,7,8-TCDD Equivalents	1.4E-13	mg/m^3	2.9E-16	(mg/m^3)	3.8E+01	$(ug/m^3)^{-1}$	1.1E-11	2.9E-15	(mg/m^3)	4.0E-08	(mg/m^3)	0.00000007
				Antimony	1.9E-8	mg/m^3	4.0E-11	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	4.0E-10	(mg/m^3)		(mg/m^3)	--
				Barium	3.0E-8	mg/m^3	6.1E-11	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	6.1E-10	(mg/m^3)	5.0E-04	(mg/m^3)	0.000001
				Cadmium	5.4E-10	mg/m^3	1.1E-12	(mg/m^3)	1.8E-03	$(ug/m^3)^{-1}$	2.0E-12	1.1E-11	(mg/m^3)	2.0E-05	(mg/m^3)	0.0000006
				Cobalt	1.7E-9	mg/m^3	3.5E-12	(mg/m^3)	9.0E-03	$(ug/m^3)^{-1}$	3.1E-11	3.5E-11	(mg/m^3)	6.0E-06	(mg/m^3)	0.000006
				Copper	6.4E-7	mg/m^3	1.3E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.3E-08	(mg/m^3)	NA	(mg/m^3)	--
				Iron	1.0E-5	mg/m^3	2.1E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.1E-07	(mg/m^3)	NA	(mg/m^3)	--
				Lead	1.7E-7	mg/m^3	3.5E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	3.5E-09	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	1.0E-7	mg/m^3	2.1E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.1E-09	(mg/m^3)	5.0E-05	(mg/m^3)	0.00004
				Mercury	1.0E-9	mg/m^3	2.1E-12	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.1E-11	(mg/m^3)	3.0E-05	(mg/m^3)	0.0000007
				Nickel	5.2E-8	mg/m^3	1.1E-10	(mg/m^3)	2.6E-04	$(ug/m^3)^{-1}$	2.8E-11	1.1E-09	(mg/m^3)	9.0E-05	(mg/m^3)	0.00001
				Thallium	9.5E-11	mg/m^3	2.0E-13	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.0E-12	(mg/m^3)	NA	(mg/m^3)	--
				Zinc	2.8E-7	mg/m^3	5.7E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	5.7E-09	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								7.8E-11					0.00006
		Exposure Point Total									7.8E-11					0.00006
	Exposure Medium Total										7.8E-11					0.00006
Medium Total											5.1E-06					0.5

ALTERNATE TABLE 7.3A.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Sediment	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.20	mg/kg	9.4E-10	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	6.9E-09	9.4E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				TEQ PCB	0.002	mg/kg	1.3E-12	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	1.6E-07	1.3E-11	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.01
				Total PCB Congeners	0.420	mg/kg	3.3E-10	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	6.6E-10	3.3E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	14.5	mg/kg	1.1E-08	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	1.7E-08	1.1E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0004
				Chromium	150	mg/kg	1.2E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.2E-06	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.0000008
				Iron	45,900	mg/kg	3.6E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.6E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0005
				Lead	187	mg/kg	1.5E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.5E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	468	mg/kg	3.7E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.7E-06	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.00003
			Exp. Route Total								1.9E-07					0.01
			Dermal	Benzo(a)pyrene Equivalents	1.20	mg/kg	1.4E-10	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.0E-09	1.4E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				TEQ PCB	0.002	mg/kg	4.3E-14	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	5.6E-09	4.3E-13	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.0004
				Total PCB Congeners	0.420	mg/kg	5.2E-11	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.0E-10	5.2E-10	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	14.5	mg/kg	3.9E-10	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	5.8E-10	3.9E-09	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.00001
				Chromium	150	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.0E-02	(mg/kg/day)	--
				Iron	45,900	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	187	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	468	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
			Exp. Route Total								7.3E-09					0.0004
		Exposure Point Total									1.9E-07					0.01
	Exposure Medium Total										1.9E-07					0.01
Medium Total											1.9E-07					0.01

ALTERNATE TABLE 7.3B.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Aroclor-1254	0.28	mg/kg	4.9E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	9.9E-09	4.9E-08	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.002
			Exp. Route Total								9.9E-09					0.002
			Dermal	Aroclor-1254	0.28	mg/kg	7.9E-10	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.6E-09	7.9E-09	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.0004
			Exp. Route Total								1.6E-09					0.0004
		Exposure Point Total									1.1E-08					0.003
	Exposure Medium Total										1.1E-08					0.003
	Air	OU7	Inhalation	Aroclor-1254	3.0E-11	mg/m^3	6.1E-14	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	3.5E-14	6.1E-13	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								3.5E-14					--
		Exposure Point Total									3.5E-14					--
	Exposure Medium Total										3.5E-14					--
Medium Total											1.1E-08					0.003
Subsurface Soil	Subsurface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	0.25	mg/kg	4.4E-09	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	3.2E-08	4.4E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	405.0	mg/kg	7.1E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	7.1E-05	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.0005
			Exp. Route Total								3.2E-08					0.0005
			Dermal	Benzo(a)pyrene Equivalents	0.25	mg/kg	6.5E-10	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	4.8E-09	6.5E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	405.0	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
			Exp. Route Total								4.8E-09					--
		Exposure Point Total									3.7E-08					0.0005
	Exposure Medium Total										3.7E-08					0.0005
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	2.7E-11	mg/m^3	5.5E-14	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	6.0E-14	5.5E-13	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	4.3E-8	mg/m^3	8.9E-11	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	8.9E-10	(mg/m^3)	5.0E-05	(mg/m^3)	0.00002
			Exp. Route Total								6.0E-14					0.00002
		Exposure Point Total									6.0E-14					0.00002
	Exposure Medium Total										6.0E-14					0.00002
Medium Total											3.7E-08					0.0005

ALTERNATE TABLE 7.3B.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Sediment	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.20	mg/kg	9.4E-10	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	6.9E-09	9.4E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				TEQ PCB	0.002	mg/kg	1.3E-12	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	1.6E-07	1.3E-11	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.01
				Total PCB Congeners	0.420	mg/kg	3.3E-10	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	6.6E-10	3.3E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	14.5	mg/kg	1.1E-08	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	1.7E-08	1.1E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0004
				Chromium	150	mg/kg	1.2E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.2E-06	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.0000008
				Iron	45,900	mg/kg	3.6E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.6E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0005
				Lead	187	mg/kg	1.5E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.5E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	468	mg/kg	3.7E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.7E-06	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.00003
			Exp. Route Total								1.9E-07					0.01
			Dermal	Benzo(a)pyrene Equivalents	1.20	mg/kg	1.4E-10	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.0E-09	1.4E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				TEQ PCB	0.002	mg/kg	4.3E-14	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	5.6E-09	4.3E-13	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.0004
				Total PCB Congeners	0.420	mg/kg	5.2E-11	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.0E-10	5.2E-10	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	14.5	mg/kg	3.9E-10	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	5.8E-10	3.9E-09	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.00001
				Chromium	150	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.0E-02	(mg/kg/day)	--
				Iron	45,900	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	187	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	468	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
			Exp. Route Total								7.3E-09					0.0004
		Exposure Point Total									1.9E-07					0.01
	Exposure Medium Total										1.9E-07					0.01
Medium Total											1.9E-07					0.01

ALTERNATE TABLE 7.4A.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.80	mg/kg	1.1E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	7.7E-07	4.9E-07	(mg/kg/day)	NA	(mg/kg/day)	--
(Entire Site)				Aroclor-1248	1.50	mg/kg	2.9E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	5.9E-08	4.1E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	6.6E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	9.2E-05	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.0005
				Copper	1,030	mg/kg	2.0E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.8E-04	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.007
				Iron	34,200	mg/kg	6.7E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	9.4E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.01
				Lead	510	mg/kg	1.0E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.4E-04	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	4.1E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	5.8E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.002
				Thallium	0.480	mg/kg	9.4E-09	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.3E-07	(mg/kg/day)	1.0E-05	(mg/kg/day)	0.01
			Exp. Route Total								8.3E-07					0.04
			Dermal	Benzo(a)pyrene Equivalents	1.80	mg/kg	4.5E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	3.2E-07	2.1E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	1.3E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.7E-08	1.9E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	--
				Copper	1,030	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Iron	34,200	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	510	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	--
				Thallium	0.480	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.0E-05	(mg/kg/day)	--
			Exp. Route Total								3.5E-07					--
		Exposure Point Total									1.2E-06					0.04
	Exposure Medium Total										1.2E-06					0.04
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.9E-10	mg/m^3	8.5E-13	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	9.3E-13	3.9E-12	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1248	1.6E-10	mg/m^3	2.3E-13	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	1.3E-13	3.3E-12	(mg/m^3)	NA	(mg/m^3)	--
				Barium	3.6E-8	mg/m^3	5.2E-11	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	7.3E-10	(mg/m^3)	5.0E-04	(mg/m^3)	0.000001
				Copper	1.1E-7	mg/m^3	1.6E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.3E-09	(mg/m^3)	NA	(mg/m^3)	--
				Iron	3.6E-6	mg/m^3	5.4E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	7.5E-08	(mg/m^3)	NA	(mg/m^3)	--
				Lead	5.4E-8	mg/m^3	8.0E-11	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.1E-09	(mg/m^3)	NA	(mg/m^3)	--
				Mercury	2.2E-10	mg/m^3	3.3E-13	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	4.6E-12	(mg/m^3)	3.0E-05	(mg/m^3)	0.0000002
				Thallium	5.1E-11	mg/m^3	7.5E-14	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.1E-12	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								1.1E-12					0.000002
		Exposure Point Total									1.1E-12					0.000002
	Exposure Medium Total										1.1E-12					0.000002
Medium Total											1.2E-06					0.04
Subsurface Soil	Subsurface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.10	mg/kg	6.5E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	4.7E-07	3.0E-07	(mg/kg/day)	NA	(mg/kg/day)	--
(Entire Site)				Aroclor-1248	41.0	mg/kg	8.0E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.6E-06	1.1E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1260	4.60	mg/kg	9.0E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.8E-07	1.3E-06	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.06
				2,3,7,8-TCDD Equivalents	0.001	mg/kg	2.5E-11	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	3.3E-06	3.6E-10	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.4
				Antimony	182	mg/kg	3.6E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	5.0E-05	(mg/kg/day)	4.0E-04	(mg/kg/day)	0.1
				Barium	280	mg/kg	5.5E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	7.7E-05	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.0004
				Cadmium	5.10	mg/kg	1.0E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.4E-06	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.001
				Cobalt	15.9	mg/kg	3.1E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.4E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.01
				Copper	6,020	mg/kg	1.2E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.6E-03	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.04
				Iron	97,100	mg/kg	1.9E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.7E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.04
				Lead	1,600	mg/kg	3.1E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.4E-04	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	969	mg/kg	1.9E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.7E-04	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.002
				Mercury	9.40	mg/kg	1.8E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.6E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.009
				Nickel	484	mg/kg	9.5E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.3E-04	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.007
				Thallium	0.890	mg/kg	1.7E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.4E-07	(mg/kg/day)	1.0E-05	(mg/kg/day)	0.02
				Zinc	2,600	mg/kg	5.1E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	7.1E-04	(mg/kg/day)	3.0E-01	(mg/kg/day)	0.002
			Exp. Route Total								5.6E-06					0.7

ALTERNATE TABLE 7.4A.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Subsurface Soil	Subsurface Soil	OU7	Dermal	Benzo(a)pyrene Equivalents	1.10	mg/kg	2.7E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	2.0E-07	1.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
(Entire Site)				Aroclor-1248	41.0	mg/kg	3.6E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	7.3E-07	5.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1260	4.60	mg/kg	4.1E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	8.2E-08	5.7E-07	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.03
				2,3,7,8-TCDD Equivalents	0.001	mg/kg	2.5E-12	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	3.2E-07	3.5E-11	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.03
				Antimony	182	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	6.0E-05	(mg/kg/day)	--
				Barium	280	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	--
				Cadmium	5.10	mg/kg	3.2E-10	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.5E-09	(mg/kg/day)	2.5E-05	(mg/kg/day)	0.0002
				Cobalt	15.9	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	--
				Copper	6,020	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Iron	97,100	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	1,600	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	969	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
				Mercury	9.40	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	--
				Nickel	484	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	8.0E-04	(mg/kg/day)	--
				Thallium	0.890	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.0E-05	(mg/kg/day)	--
				Zinc	2,600	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	3.0E-01	(mg/kg/day)	--
			Exp. Route Total								1.3E-06					0.06
		Exposure Point Total									6.9E-06					0.7
	Exposure Medium Total										6.9E-06					0.7
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.2E-10	mg/m^3	5.2E-13	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	5.7E-13	2.4E-12	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1248	4.4E-9	mg/m^3	6.4E-12	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	3.7E-12	9.0E-11	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1260	4.9E-10	mg/m^3	7.2E-13	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	4.1E-13	1.0E-11	(mg/m^3)	NA	(mg/m^3)	--
				2,3,7,8-TCDD Equivalents	1.4E-13	mg/m^3	2.0E-16	(mg/m^3)	3.8E+01	$(ug/m^3)^{-1}$	7.7E-12	2.9E-15	(mg/m^3)	4.0E-08	(mg/m^3)	0.00000007
				Antimony	1.9E-8	mg/m^3	2.9E-11	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	4.0E-10	(mg/m^3)		(mg/m^3)	--
				Barium	3.0E-8	mg/m^3	4.4E-11	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	6.1E-10	(mg/m^3)	5.0E-04	(mg/m^3)	0.000001
				Cadmium	5.4E-10	mg/m^3	8.0E-13	(mg/m^3)	1.8E-03	$(ug/m^3)^{-1}$	1.4E-12	1.1E-11	(mg/m^3)	2.0E-05	(mg/m^3)	0.0000006
				Cobalt	1.7E-9	mg/m^3	2.5E-12	(mg/m^3)	9.0E-03	$(ug/m^3)^{-1}$	2.2E-11	3.5E-11	(mg/m^3)	6.0E-06	(mg/m^3)	0.000006
				Copper	6.4E-7	mg/m^3	9.4E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.3E-08	(mg/m^3)	NA	(mg/m^3)	--
				Iron	1.0E-5	mg/m^3	1.5E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.1E-07	(mg/m^3)	NA	(mg/m^3)	--
				Lead	1.7E-7	mg/m^3	2.5E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	3.5E-09	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	1.0E-7	mg/m^3	1.5E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.1E-09	(mg/m^3)	5.0E-05	(mg/m^3)	0.00004
				Mercury	1.0E-9	mg/m^3	1.5E-12	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.1E-11	(mg/m^3)	3.0E-05	(mg/m^3)	0.0000007
				Nickel	5.2E-8	mg/m^3	7.6E-11	(mg/m^3)	2.6E-04	$(ug/m^3)^{-1}$	2.0E-11	1.1E-09	(mg/m^3)	9.0E-05	(mg/m^3)	0.00001
				Thallium	9.5E-11	mg/m^3	1.4E-13	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.0E-12	(mg/m^3)	NA	(mg/m^3)	--
				Zinc	2.8E-7	mg/m^3	4.1E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	5.7E-09	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								5.6E-11					0.00006
		Exposure Point Total									5.6E-11					0.00006
	Exposure Medium Total										5.6E-11					0.00006
Medium Total											6.9E-06					0.7

ALTERNATE TABLE 7.4A.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Sediment	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.20	mg/kg	3.1E-09	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	2.3E-08	1.5E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				TEQ PCB	0.002	mg/kg	1.4E-12	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	1.8E-07	1.9E-11	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.02
				Total PCB Congeners	0.420	mg/kg	3.7E-10	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	7.3E-10	5.1E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	14.5	mg/kg	1.3E-08	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	1.9E-08	1.8E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0006
				Chromium	150	mg/kg	1.3E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.8E-06	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.000001
				Iron	45,900	mg/kg	4.0E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	5.6E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0008
				Lead	187	mg/kg	1.6E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.3E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	468	mg/kg	4.1E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	5.7E-06	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.00004
			Exp. Route Total								2.2E-07					0.02
			Dermal	Benzo(a)pyrene Equivalents	1.20	mg/kg	1.3E-09	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	9.6E-09	6.2E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				TEQ PCB	0.002	mg/kg	1.4E-13	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	1.8E-08	1.9E-12	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.002
				Total PCB Congeners	0.420	mg/kg	1.7E-10	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	3.3E-10	2.3E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	14.5	mg/kg	1.2E-09	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	1.8E-09	1.7E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.00006
				Chromium	150	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.0E-02	(mg/kg/day)	--
				Iron	45,900	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	187	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	468	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
			Exp. Route Total								2.9E-08					0.002
		Exposure Point Total									2.5E-07					0.02
	Exposure Medium Total										2.5E-07					0.02
Medium Total											2.5E-07					0.02

ALTERNATE TABLE 7.4B.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Aroclor-1254	0.28	mg/kg	5.5E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.1E-08	7.7E-08	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.004
			Exp. Route Total								1.1E-08					0.004
			Dermal	Aroclor-1254	0.28	mg/kg	2.5E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	5.0E-09	3.5E-08	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.002
			Exp. Route Total								5.0E-09					0.002
		Exposure Point Total									1.6E-08					0.006
	Exposure Medium Total										1.6E-08					0.006
	Air	OU7	Inhalation	Aroclor-1254	3.0E-11	mg/m^3	4.4E-14	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	2.5E-14	6.1E-13	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								2.5E-14					--
		Exposure Point Total									2.5E-14					--
	Exposure Medium Total										2.5E-14					--
Medium Total											1.6E-08					0.006
Subsurface Soil	Subsurface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	0.25	mg/kg	1.5E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.1E-07	6.8E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	405.0	mg/kg	7.9E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.1E-04	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.0008
			Exp. Route Total								1.1E-07					0.0008
Subsurface Soil	Subsurface Soil	OU7	Dermal	Benzo(a)pyrene Equivalents	0.25	mg/kg	6.2E-09	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	4.5E-08	2.9E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	405.0	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
			Exp. Route Total								4.5E-08					--
		Exposure Point Total									1.5E-07					0.0008
	Exposure Medium Total										1.5E-07					0.0008
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	2.7E-11	mg/m^3	1.2E-13	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	1.3E-13	5.5E-13	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	4.3E-8	mg/m^3	6.3E-11	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	8.9E-10	(mg/m^3)	5.0E-05	(mg/m^3)	0.00002
			Exp. Route Total								1.3E-13					0.00002
		Exposure Point Total									1.3E-13					0.00002
	Exposure Medium Total										1.3E-13					0.00002
Medium Total											1.5E-07					0.0008

ALTERNATE TABLE 7.4B.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Sediment	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.20	mg/kg	3.1E-09	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	2.3E-08	1.5E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				TEQ PCB	0.002	mg/kg	1.4E-12	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	1.8E-07	1.9E-11	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.02
				Total PCB Congeners	0.420	mg/kg	3.7E-10	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	7.3E-10	5.1E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	14.5	mg/kg	1.3E-08	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	1.9E-08	1.8E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0006
				Chromium	150	mg/kg	1.3E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.8E-06	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.000001
				Iron	45,900	mg/kg	4.0E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	5.6E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0008
				Lead	187	mg/kg	1.6E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.3E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	468	mg/kg	4.1E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	5.7E-06	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.00004
			Exp. Route Total								2.2E-07					0.02
			Dermal	Benzo(a)pyrene Equivalents	1.20	mg/kg	1.3E-09	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	9.6E-09	6.2E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				TEQ PCB	0.002	mg/kg	1.4E-13	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	1.8E-08	1.9E-12	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.002
				Total PCB Congeners	0.420	mg/kg	1.7E-10	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	3.3E-10	2.3E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	14.5	mg/kg	1.2E-09	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	1.8E-09	1.7E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.00006
				Chromium	150	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.0E-02	(mg/kg/day)	--
				Iron	45,900	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	187	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	468	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
			Exp. Route Total								2.9E-08					0.002
		Exposure Point Total									2.5E-07					0.02
	Exposure Medium Total										2.5E-07					0.02
Medium Total											2.5E-07					0.02

TABLE 7.5A.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.80	mg/kg	1.3E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	9.5E-07	8.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	6.9E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.4E-07	6.9E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	1.5E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.5E-04	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.0008
				Copper	1,030	mg/kg	4.7E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.7E-04	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.01
				Iron	34,200	mg/kg	1.6E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.6E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.02
				Lead	510	mg/kg	2.3E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.3E-04	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	9.6E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	9.6E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.003
				Thallium	0.480	mg/kg	2.2E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.2E-07	(mg/kg/day)	1.0E-05	(mg/kg/day)	0.02
			Exp. Route Total								1.1E-06					0.06
			Dermal	Benzo(a)pyrene Equivalents	1.80	mg/kg	1.9E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.4E-07	1.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	1.1E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.2E-08	1.1E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	--
				Copper	1,030	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Iron	34,200	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	510	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	--
				Thallium	0.480	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.0E-05	(mg/kg/day)	--
			Exp. Route Total								1.6E-07					--
		Exposure Point Total									1.2E-06					0.06
	Exposure Medium Total										1.2E-06					0.06
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.9E-10	mg/m^3	1.9E-11	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	2.1E-11	1.2E-10	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1248	1.6E-10	mg/m^3	1.0E-11	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	5.8E-12	1.0E-10	(mg/m^3)	NA	(mg/m^3)	--
				Barium	3.6E-8	mg/m^3	2.3E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.3E-08	(mg/m^3)	5.0E-04	(mg/m^3)	0.00005
				Copper	1.1E-7	mg/m^3	7.0E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	7.0E-08	(mg/m^3)	NA	(mg/m^3)	--
				Iron	3.6E-6	mg/m^3	2.3E-07	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.3E-06	(mg/m^3)	NA	(mg/m^3)	--
				Lead	5.4E-8	mg/m^3	3.5E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	3.5E-08	(mg/m^3)	NA	(mg/m^3)	--
				Mercury	2.2E-10	mg/m^3	1.4E-11	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.4E-10	(mg/m^3)	3.0E-05	(mg/m^3)	0.0000048
				Thallium	5.1E-11	mg/m^3	3.3E-12	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	3.3E-11	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								2.7E-11					0.00005
		Exposure Point Total									2.7E-11					0.00005
	Exposure Medium Total										2.7E-11					0.00005
Medium Total											1.2E-06					0.06
Subsurface Soil	Subsurface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.10	mg/kg	7.9E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	5.8E-07	5.0E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	41.0	mg/kg	1.9E-06	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	3.8E-06	1.9E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1260	4.60	mg/kg	2.1E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	4.2E-07	2.1E-06	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.1
				2,3,7,8-TCDD Equivalents	0.001	mg/kg	6.0E-11	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	7.7E-06	6.0E-10	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.6
				Antimony	182	mg/kg	8.3E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	8.3E-05	(mg/kg/day)	4.0E-04	(mg/kg/day)	0.2
				Barium	280	mg/kg	1.3E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.3E-04	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.0006
				Cadmium	5.10	mg/kg	2.3E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.3E-06	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.002
				Cobalt	15.9	mg/kg	7.3E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	7.3E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.02
				Copper	6,020	mg/kg	2.8E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.8E-03	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.1
				Iron	97,100	mg/kg	4.4E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.4E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.06
				Lead	1,600	mg/kg	7.3E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	7.3E-04	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	969	mg/kg	4.4E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.4E-04	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.003
				Mercury	9.40	mg/kg	4.3E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.3E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.01
				Nickel	484	mg/kg	2.2E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.2E-04	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.01
				Thallium	0.890	mg/kg	4.1E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.1E-07	(mg/kg/day)	1.0E-05	(mg/kg/day)	0.04
				Zinc	2,600	mg/kg	1.2E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.2E-03	(mg/kg/day)	3.0E-01	(mg/kg/day)	0.004
			Exp. Route Total								1.2E-05					1.1

TABLE 7.5A.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Subsurface Soil	Subsurface Soil	OU7	Dermal	Benzo(a)pyrene Equivalents	1.10	mg/kg	1.2E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	8.6E-08	7.5E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	41.0	mg/kg	3.0E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	6.0E-07	3.0E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1260	4.60	mg/kg	3.4E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	6.7E-08	3.4E-07	(mg/kg/day)	2.0E-05	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	0.001	mg/kg	2.0E-12	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	2.6E-07	2.0E-11	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.02
				Antimony	182	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	6.0E-05	(mg/kg/day)	--
				Barium	280	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	--
				Cadmium	5.10	mg/kg	2.7E-10	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.7E-09	(mg/kg/day)	2.5E-05	(mg/kg/day)	0.0001
				Cobalt	15.9	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	--
				Copper	6,020	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Iron	97,100	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	1,600	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	969	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
				Mercury	9.40	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	--
				Nickel	484	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	8.0E-04	(mg/kg/day)	--
				Thallium	0.890	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.0E-05	(mg/kg/day)	--
				Zinc	2,600	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	3.0E-01	(mg/kg/day)	--
			Exp. Route Total								1.0E-06					0.04
		Exposure Point Total									1.4E-05					1.2
	Exposure Medium Total										1.4E-05					1.2
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.2E-10	mg/m^3	1.2E-11	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	1.3E-11	7.5E-11	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1248	4.4E-9	mg/m^3	2.8E-10	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	1.6E-10	2.8E-09	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1260	4.9E-10	mg/m^3	3.1E-11	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	1.8E-11	3.1E-10	(mg/m^3)	NA	(mg/m^3)	--
				2,3,7,8-TCDD Equivalents	1.4E-13	mg/m^3	8.9E-15	(mg/m^3)	3.8E+01	$(ug/m^3)^{-1}$	3.4E-10	8.9E-14	(mg/m^3)	4.0E-08	(mg/m^3)	0.000002
				Antimony	1.9E-8	mg/m^3	1.2E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.2E-08	(mg/m^3)		(mg/m^3)	--
				Barium	3.0E-8	mg/m^3	1.9E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.9E-08	(mg/m^3)	5.0E-04	(mg/m^3)	0.00004
				Cadmium	5.4E-10	mg/m^3	3.5E-11	(mg/m^3)	1.8E-03	$(ug/m^3)^{-1}$	6.3E-11	3.5E-10	(mg/m^3)	2.0E-05	(mg/m^3)	0.00002
				Cobalt	1.7E-9	mg/m^3	1.1E-10	(mg/m^3)	9.0E-03	$(ug/m^3)^{-1}$	9.8E-10	1.1E-09	(mg/m^3)	6.0E-06	(mg/m^3)	0.0002
				Copper	6.4E-7	mg/m^3	4.1E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	4.1E-07	(mg/m^3)	NA	(mg/m^3)	--
				Iron	1.0E-5	mg/m^3	6.6E-07	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	6.6E-06	(mg/m^3)	NA	(mg/m^3)	--
				Lead	1.7E-7	mg/m^3	1.1E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.1E-07	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	1.0E-7	mg/m^3	6.6E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	6.6E-08	(mg/m^3)	5.0E-05	(mg/m^3)	0.001
				Mercury	1.0E-9	mg/m^3	6.4E-11	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	6.4E-10	(mg/m^3)	3.0E-05	(mg/m^3)	0.000021
				Nickel	5.2E-8	mg/m^3	3.3E-09	(mg/m^3)	2.6E-04	$(ug/m^3)^{-1}$	8.6E-10	3.3E-08	(mg/m^3)	9.0E-05	(mg/m^3)	0.0004
				Thallium	9.5E-11	mg/m^3	6.1E-12	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	6.1E-11	(mg/m^3)	NA	(mg/m^3)	--
				Zinc	2.8E-7	mg/m^3	1.8E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.8E-07	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								2.4E-09					0.002
		Exposure Point Total									2.4E-09					0.002
	Exposure Medium Total										2.4E-09					0.002
Medium Total											1.4E-05					1.2

TABLE 7.5B.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Aroclor-1254	0.28	mg/kg	1.3E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.6E-08	1.3E-07	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.006
			Exp. Route Total								2.6E-08					0.006
			Dermal	Aroclor-1254	0.28	mg/kg	2.0E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	4.1E-09	2.0E-08	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.001
			Exp. Route Total								4.1E-09					0.001
		Exposure Point Total									3.0E-08					0.007
	Exposure Medium Total										3.0E-08					0.007
	Air	OU7	Inhalation	Aroclor-1254	3.0E-11	mg/m^3	1.9E-12	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	1.1E-12	1.9E-11	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								1.1E-12					--
		Exposure Point Total									1.1E-12					--
	Exposure Medium Total										1.1E-12					--
Medium Total											3.0E-08					0.007
Subsurface Soil	Subsurface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	0.25	mg/kg	1.8E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.3E-07	1.1E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	405.0	mg/kg	1.9E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.9E-04	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.001
			Exp. Route Total								1.3E-07					0.001
			Dermal	Benzo(a)pyrene Equivalents	0.25	mg/kg	2.7E-09	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.9E-08	1.7E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	405.0	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
			Exp. Route Total								1.9E-08					--
		Exposure Point Total									1.5E-07					0.001
	Exposure Medium Total										1.5E-07					0.001
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	2.7E-11	mg/m^3	2.7E-12	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	3.0E-12	1.7E-11	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	4.3E-8	mg/m^3	2.8E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.8E-08	(mg/m^3)	5.0E-05	(mg/m^3)	0.0006
			Exp. Route Total								3.0E-12					0.0006
		Exposure Point Total									3.0E-12					0.0006
	Exposure Medium Total										3.0E-12					0.0006
Medium Total											1.5E-07					0.002

ALTERNATE TABLE 7.6A.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.80	mg/kg	1.4E-06	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.0E-05	7.7E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	1.8E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	3.7E-07	6.4E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	4.1E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.4E-03	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.007
				Copper	1,030	mg/kg	1.3E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.4E-03	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.1
				Iron	34,200	mg/kg	4.2E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.5E-01	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.2
				Lead	510	mg/kg	6.2E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.2E-03	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	2.6E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	9.0E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.03
				Thallium	0.480	mg/kg	5.9E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.1E-06	(mg/kg/day)	1.0E-05	(mg/kg/day)	0.2
			Exp. Route Total								1.1E-05					0.6
			Dermal	Benzo(a)pyrene Equivalents	1.80	mg/kg	2.1E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.5E-06	1.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	2.9E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	5.7E-08	1.0E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Barium	335	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	--
				Copper	1,030	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Iron	34,200	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	510	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Mercury	2.10	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	--
				Thallium	0.480	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.0E-05	(mg/kg/day)	--
			Exp. Route Total								1.6E-06					--
		Exposure Point Total									1.2E-05					0.6
	Exposure Medium Total										1.2E-05					0.6
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.9E-10	mg/m^3	2.3E-11	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	2.5E-11	1.2E-10	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1248	1.6E-10	mg/m^3	2.9E-12	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	1.7E-12	1.0E-10	(mg/m^3)	NA	(mg/m^3)	--
				Barium	3.6E-8	mg/m^3	6.5E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.3E-08	(mg/m^3)	5.0E-04	(mg/m^3)	0.00005
				Copper	1.1E-7	mg/m^3	2.0E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	7.0E-08	(mg/m^3)	NA	(mg/m^3)	--
				Iron	3.6E-6	mg/m^3	6.7E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.3E-06	(mg/m^3)	NA	(mg/m^3)	--
				Lead	5.4E-8	mg/m^3	1.0E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	3.5E-08	(mg/m^3)	NA	(mg/m^3)	--
				Mercury	2.2E-10	mg/m^3	4.1E-12	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.4E-10	(mg/m^3)	3.0E-05	(mg/m^3)	0.0000048
				Thallium	5.1E-11	mg/m^3	9.4E-13	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	3.3E-11	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								2.7E-11					0.00005
		Exposure Point Total									2.7E-11					0.00005
	Exposure Medium Total										2.7E-11					0.00005
Medium Total											1.2E-05					0.6
Subsurface Soil	Subsurface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.10	mg/kg	8.7E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	6.4E-06	4.7E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	41.0	mg/kg	5.0E-06	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.0E-05	1.8E-04	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1260	4.60	mg/kg	5.6E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.1E-06	2.0E-05	(mg/kg/day)	2.0E-05	(mg/kg/day)	1.0
				2,3,7,8-TCDD Equivalents	0.001	mg/kg	1.6E-10	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	2.1E-05	5.6E-09	(mg/kg/day)	1.0E-09	(mg/kg/day)	5.6
				Antimony	182	mg/kg	2.2E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	7.8E-04	(mg/kg/day)	4.0E-04	(mg/kg/day)	1.9
				Barium	280	mg/kg	3.4E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.2E-03	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.006
				Cadmium	5.10	mg/kg	6.2E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.2E-05	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.02
				Cobalt	15.9	mg/kg	1.9E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	6.8E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.2
				Copper	6,020	mg/kg	7.4E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.6E-02	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.6
				Iron	97,100	mg/kg	1.2E-02	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.2E-01	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.6
				Lead	1,600	mg/kg	2.0E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	6.8E-03	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	969	mg/kg	1.2E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.1E-03	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.03
				Mercury	9.40	mg/kg	1.1E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.0E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.1
				Nickel	484	mg/kg	5.9E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.1E-03	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.1
				Thallium	0.890	mg/kg	1.1E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.8E-06	(mg/kg/day)	1.0E-05	(mg/kg/day)	0.4
				Zinc	2,600	mg/kg	3.2E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.1E-02	(mg/kg/day)	3.0E-01	(mg/kg/day)	0.04
			Exp. Route Total								3.8E-05					11

ALTERNATE TABLE 7.6A.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Subsurface Soil	Subsurface Soil	OU7	Dermal	Benzo(a)pyrene Equivalents	1.10	mg/kg	1.3E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	9.3E-07	6.8E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1248	41.0	mg/kg	7.9E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.6E-06	2.7E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1260	4.60	mg/kg	8.8E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.8E-07	3.1E-06	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.2
				2,3,7,8-TCDD Equivalents	0.001	mg/kg	5.3E-12	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	6.9E-07	1.9E-10	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.2
				Antimony	182	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	6.0E-05	(mg/kg/day)	--
				Barium	280	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	--
				Cadmium	5.10	mg/kg	7.0E-10	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	2.4E-08	(mg/kg/day)	2.5E-05	(mg/kg/day)	0.0010
				Cobalt	15.9	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	--
				Copper	6,020	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Iron	97,100	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	1,600	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	969	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
				Mercury	9.40	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	--
				Nickel	484	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	8.0E-04	(mg/kg/day)	--
				Thallium	0.890	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.0E-05	(mg/kg/day)	--
				Zinc	2,600	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	3.0E-01	(mg/kg/day)	--
			Exp. Route Total								3.4E-06					0.3
		Exposure Point Total									4.2E-05					11
	Exposure Medium Total										4.2E-05					11
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.2E-10	mg/m^3	1.4E-11	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	1.5E-11	7.5E-11	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1248	4.4E-9	mg/m^3	8.0E-11	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	4.6E-11	2.8E-09	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1260	4.9E-10	mg/m^3	9.0E-12	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	5.1E-12	3.1E-10	(mg/m^3)	NA	(mg/m^3)	--
				2,3,7,8-TCDD Equivalents	1.4E-13	mg/m^3	2.5E-15	(mg/m^3)	3.8E+01	$(ug/m^3)^{-1}$	9.7E-11	8.9E-14	(mg/m^3)	4.0E-08	(mg/m^3)	0.000002
				Antimony	1.9E-8	mg/m^3	3.6E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.2E-08	(mg/m^3)		(mg/m^3)	--
				Barium	3.0E-8	mg/m^3	5.5E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.9E-08	(mg/m^3)	5.0E-04	(mg/m^3)	0.00004
				Cadmium	5.4E-10	mg/m^3	1.0E-11	(mg/m^3)	1.8E-03	$(ug/m^3)^{-1}$	1.8E-11	3.5E-10	(mg/m^3)	2.0E-05	(mg/m^3)	0.00002
				Cobalt	1.7E-9	mg/m^3	3.1E-11	(mg/m^3)	9.0E-03	$(ug/m^3)^{-1}$	2.8E-10	1.1E-09	(mg/m^3)	6.0E-06	(mg/m^3)	0.0002
				Copper	6.4E-7	mg/m^3	1.2E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	4.1E-07	(mg/m^3)	NA	(mg/m^3)	--
				Iron	1.0E-5	mg/m^3	1.9E-07	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	6.6E-06	(mg/m^3)	NA	(mg/m^3)	--
				Lead	1.7E-7	mg/m^3	3.1E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.1E-07	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	1.0E-7	mg/m^3	1.9E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	6.6E-08	(mg/m^3)	5.0E-05	(mg/m^3)	0.001
				Mercury	1.0E-9	mg/m^3	1.8E-11	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	6.4E-10	(mg/m^3)	3.0E-05	(mg/m^3)	0.000021
				Nickel	5.2E-8	mg/m^3	9.5E-10	(mg/m^3)	2.6E-04	$(ug/m^3)^{-1}$	2.5E-10	3.3E-08	(mg/m^3)	9.0E-05	(mg/m^3)	0.0004
				Thallium	9.5E-11	mg/m^3	1.7E-12	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	6.1E-11	(mg/m^3)	NA	(mg/m^3)	--
				Zinc	2.8E-7	mg/m^3	5.1E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.8E-07	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								7.1E-10					0.002
		Exposure Point Total									7.1E-10					0.002
	Exposure Medium Total										7.1E-10					0.002
Medium Total											4.2E-05					11

ALTERNATE TABLE 7.6B.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Aroclor-1254	0.28	mg/kg	3.4E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	6.8E-08	1.2E-06	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.06
			Exp. Route Total								6.8E-08					0.06
			Dermal	Aroclor-1254	0.28	mg/kg	5.4E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.1E-08	1.9E-07	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.009
			Exp. Route Total								1.1E-08					0.009
		Exposure Point Total									7.9E-08					0.07
	Exposure Medium Total										7.9E-08					0.07
	Air	OU7	Inhalation	Aroclor-1254	3.0E-11	mg/m^3	5.5E-13	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	3.1E-13	1.9E-11	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								3.1E-13					--
		Exposure Point Total									3.1E-13					--
	Exposure Medium Total										3.1E-13					--
Medium Total											7.9E-08					0.07
Subsurface Soil	Subsurface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	0.25	mg/kg	2.0E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.4E-06	1.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	405.0	mg/kg	4.9E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.7E-03	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.01
			Exp. Route Total								1.4E-06					0.01
			Dermal	Benzo(a)pyrene Equivalents	0.25	mg/kg	2.9E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	2.1E-07	1.6E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	405.0	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
			Exp. Route Total								2.1E-07					--
		Exposure Point Total									1.7E-06					0.01
	Exposure Medium Total										1.7E-06					0.01
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	2.7E-11	mg/m^3	3.2E-12	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	3.5E-12	1.7E-11	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	4.3E-8	mg/m^3	7.9E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.8E-08	(mg/m^3)	5.0E-05	(mg/m^3)	0.0006
			Exp. Route Total								3.5E-12					0.0006
		Exposure Point Total									3.5E-12					0.0006
	Exposure Medium Total										3.5E-12					0.0006
Medium Total											1.7E-06					0.01

LIST OF TABLES
ALTERNATE RAGS PART D TABLE 9
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

Table No.	
	REASONABLE MAXIMUM EXPOSURES
9.2A.RME	Occupational Workers - Entire Site Surface/Subsurface Soil
9.2B.RME	Occupational Workers - Former Location of Building 237 Surface/Subsurface Soil
9.3A.RME	Adult Recreational Users - Entire Site Surface/Subsurface Soil & Sediment
9.3B.RME	Adult Recreational Users - Former Location of Building 237 Surface/Subsurface Soil & Sediment
9.4A.RME	Adolescent Recreational Users - Entire Site Surface/Subsurface Soil & Sediment
9.4B.RME	Adolescent Recreational Users - Former Location of Building 237 Surface/Subsurface Soil & Sediment
9.5A.RME	Lifetime Recreational Users - Entire Site Surface/Subsurface Soil & Sediment
9.5B.RME	Lifetime Recreational Users - Former Location of Building 237 Surface/Subsurface Soil & Sediment
9.6A.RME	Adult Residents - Entire Site Surface/Subsurface Soil
9.6B.RME	Adult Residents - Former Location of Building 237 Surface/Subsurface Soil
9.7A.RME	Child Residents - Entire Site Surface/Subsurface Soil
9.7B.RME	Child Residents - Former Location of Building 237 Surface/Subsurface Soil
9.8A.RME	Lifetime Residents - Entire Site Surface/Subsurface Soil
9.8B.RME	Lifetime Residents - Former Location of Building 237 Surface/Subsurface Soil
	CENTRAL TENDENCY EXPOSURES
9.2A.CTE	Occupational Workers - Entire Site Surface/Subsurface Soil
9.2B.CTE	Occupational Workers - Former Location of Building 237 Surface/Subsurface Soil
9.3A.CTE	Adult Recreational Users - Entire Site Surface/Subsurface Soil & Sediment
9.3B.CTE	Adult Recreational Users - Former Location of Building 237 Surface/Subsurface Soil & Sediment
9.4A.CTE	Adolescent Recreational Users - Entire Site Surface/Subsurface Soil & Sediment
9.4B.CTE	Adolescent Recreational Users - Former Location of Building 237 Surface/Subsurface Soil & Sediment
9.5A.CTE	Lifetime Recreational Users - Entire Site Surface/Subsurface Soil & Sediment
9.5B.CTE	Lifetime Recreational Users - Former Location of Building 237 Surface/Subsurface Soil & Sediment
9.6A.CTE	Adult Residents - Entire Site Surface/Subsurface Soil
9.6B.CTE	Adult Residents - Former Location of Building 237 Surface/Subsurface Soil
9.7A.CTE	Child Residents - Entire Site Surface/Subsurface Soil
9.7B.CTE	Child Residents - Former Location of Building 237 Surface/Subsurface Soil
9.8A.CTE	Lifetime Residents - Entire Site Surface/Subsurface Soil
9.8B.CTE	Lifetime Residents - Former Location of Building 237 Surface/Subsurface Soil

ALTERNATE TABLE 9.2A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Occupational Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	5E-06	--	4E-06	--	9E-06	NA	--	--	--	--
			Aroclor-1248	1E-06	--	1E-06	--	2E-06	NA	--	--	--	--
			Barium	- -	--	- -	--	- -	Kidney	0.002	--	--	0.002
			Copper	- -	--	- -	--	- -	GS	0.03	--	--	0.03
			Iron	- -	--	- -	--	- -	GS	0.05	--	--	0.05
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Mercury	- -	--	- -	--	- -	Autoimmune	0.007	--	--	0.007
			Thallium	- -	--	- -	--	- -	NA	0.05	--	--	0.05
			Chemical Total	6E-06	--	5E-06	--	1E-05		0.1	--	--	0.1
		Exposure Point Total						1E-05					0.1
	Exposure Medium Total							1E-05					0.1
	Air	OU7	Benzo(a)pyrene Equivalents	--	1E-11	--	--	1E-11	NA	--	--	--	--
			Aroclor-1248	--	6E-12	--	--	6E-12	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.00001	--	0.00001
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.0000015	--	0.0000015
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	2E-11	--	--	2E-11		- -	0.00002	- -	0.00002
		Exposure Point Total						2E-11					0.00002
	Exposure Medium Total							2E-11					0.00002
Medium Total								1E-05					0.1
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	3E-06	--	2E-06	--	5E-06	NA	--	--	--	--
			Aroclor-1248	3E-05	--	3E-05	--	6E-05	NA	--	--	--	--
			Aroclor-1260	3E-06	--	3E-06	--	6E-06	NA	0.2	--	0.2	0.4
			2,3,7,8-TCDD Equivalents	6E-05	--	1E-05	--	7E-05	Developmental	1	--	0.3	2
			Antimony	- -	--	- -	--	- -	Blood	0.4	--	--	0.4
			Barium	- -	--	- -	--	- -	Kidney	0.001	--	--	0.001
			Cadmium	- -	--	- -	--	- -	NA	0.005	--	0.001	0.006
			Cobalt	- -	--	- -	--	- -	Thyroid	0.05	--	--	0.05
			Copper	- -	--	- -	--	- -	GS	0.1	--	--	0.1
			Iron	- -	--	- -	--	- -	GS	0.1	--	--	0.1
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.007	--	--	0.007
			Mercury	- -	--	- -	--	- -	Autoimmune	0.03	--	--	0.03
			Nickel	- -	--	- -	--	- -	Body Weight	0.02	--	--	0.02
			Thallium	- -	--	- -	--	- -	NA	0.09	--	--	0.09
			Zinc	- -	--	- -	--	- -	Blood	0.008	--	--	0.008
			Chemical Total	9E-05	--	4E-05	--	1E-04		2	--	0.5	3
		Exposure Point Total						1E-04					3
	Exposure Medium Total							1E-04					3

ALTERNATE TABLE 9.2A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Occupational Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Air	OU7	Benzo(a)pyrene Equivalents	--	9E-12	--	--	9E-12	NA	--	--	--	--
			Aroclor-1248	--	2E-10	--	--	2E-10	NA	--	--	--	--
			Aroclor-1260	--	2E-11	--	--	2E-11	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	4E-10	--	--	4E-10	NA	--	0.0000007	--	0.0000007
			Antimony	--	- -	--	--	- -	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.00001	--	0.00001
			Cadmium	--	7E-11	--	--	7E-11	NA	--	0.000005	--	0.000005
			Cobalt	--	1E-09	--	--	1E-09	Respiratory	--	0.00006	--	0.00006
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Manganese	--	- -	--	--	- -	CNS	--	0.0004	--	0.0004
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.0000065	--	0.0000065
			Nickel	--	9E-10	--	--	9E-10	Respiratory	--	0.0001	--	0.0001
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Zinc	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	3E-09	--	--	3E-09		- -	0.0006	- -	0.0006
		Exposure Point Total						3E-09					0.0006
	Exposure Medium Total							3E-09					0.0006
Medium Total								1E-04					3
Receptor Total							Receptor Risk Total	1E-04				Receptor HI Total	3

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.04
Total Blood HI	0.5
Total Body Weight HI	0.02
Total CNS HI	0.007
Total Fetotoxicity HI	0.00003
Total GS HI	0.4
Total Kidney HI	0.003
Total Respiratory HI	0.0002
Total None Reported HI	0.0000
Total Thyroid HI	0.05
Total NA HI	0.6
Total Developmental	2

ALTERNATE TABLE 9.2B.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Occupational Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Aroclor-1254	2E-07	--	2E-07	--	4E-07	Immune	0.01	--	0.01	0.03
			Chemical Total	2E-07	--	2E-07	--	4E-07		0.01	--	0.01	0.03
		Exposure Point Total						4E-07					0.03
	Exposure Medium Total							4E-07					0.03
	Air	OU7	Aroclor-1254	--	1E-12	--	--	1E-12	NA	--	--	--	--
			Chemical Total	--	1E-12	--	--	1E-12		- -	--	- -	--
		Exposure Point Total						1E-12					--
	Exposure Medium Total							1E-12					--
Medium Total								4E-07					0.03
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	6E-07	--	5E-07	--	1E-06	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.003	--	--	0.003
			Chemical Total	6E-07	--	5E-07	--	1E-06		0.003	--	--	0.003
		Exposure Point Total						1E-06					0.003
	Exposure Medium Total							1E-06					0.003
	Air	OU7	Benzo(a)pyrene Equivalents	--	2E-12	--	--	2E-12	NA	--	--	--	--
			Manganese	--	- -	--	--	- -	CNS	--	0.0002	--	0.0002
			Chemical Total	--	2E-12	--	--	2E-12		- -	0.0002	- -	0.0002
		Exposure Point Total						2E-12					0.0002
	Exposure Medium Total							2E-12					0.0002
Medium Total								1E-06					0.003
	Exposure Medium Total							2E-12					0.0002
Medium Total								1E-06					0.003
Receptor Total							Receptor Risk Total	2E-06				Receptor HI Total	0.03

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total CNS HI 0.0002

ALTERNATE TABLE 9.3A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	9E-07	--	5E-07	--	1E-06	NA	--	--	--	--
			Aroclor-1248	2E-07	--	1E-07	--	3E-07	NA	--	--	--	--
			Barium	- -	--	- -	--	- -	Kidney	0.0006	--	--	0.0006
			Copper	- -	--	- -	--	- -	GS	0.009	--	--	0.009
			Iron	- -	--	- -	--	- -	GS	0.02	--	--	0.02
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Mercury	- -	--	- -	--	- -	Autoimmune	0.002	--	--	0.002
			Thallium	- -	--	- -	--	- -	NA	0.02	--	--	0.02
			Chemical Total	1E-06	--	6E-07	--	2E-06		0.05	--	--	0.05
		Exposure Point Total						2E-06					0.05
	Exposure Medium Total							2E-06					0.05
	Air	OU7	Benzo(a)pyrene Equivalents	--	9E-13	--	--	9E-13	NA	--	--	--	--
			Aroclor-1248	--	4E-13	--	--	4E-13	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.000001	--	0.000001
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.0000002	--	0.0000002
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	1E-12	--	--	1E-12		- -	0.000002	- -	0.000002
		Exposure Point Total						1E-12					0.000002
	Exposure Medium Total							1E-12					0.000002
Medium Total								2E-06					0.05
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	6E-07	--	3E-07	--	9E-07	NA	--	--	--	--
			Aroclor-1248	6E-06	--	3E-06	--	9E-06	NA	--	--	--	--
			Aroclor-1260	6E-07	--	4E-07	--	1E-06	NA	0.08	--	0.05	0.1
			2,3,7,8-TCDD Equivalents	1E-05	--	1E-06	--	1E-05	Developmental	0.5	--	0.05	0.5
			Antimony	- -	--	- -	--	- -	Blood	0.2	--	--	0.2
			Barium	- -	--	- -	--	- -	Kidney	0.0005	--	--	0.0005
			Cadmium	- -	--	- -	--	- -	NA	0.002	--	0.0003	0.002
			Cobalt	- -	--	- -	--	- -	Thyroid	0.02	--	--	0.02
			Copper	- -	--	- -	--	- -	GS	0.05	--	--	0.05
			Iron	- -	--	- -	--	- -	GS	0.05	--	--	0.05
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.002	--	--	0.002
			Mercury	- -	--	- -	--	- -	Autoimmune	0.01	--	--	0.01
			Nickel	- -	--	- -	--	- -	Body Weight	0.009	--	--	0.009
			Thallium	- -	--	- -	--	- -	NA	0.03	--	--	0.03
			Zinc	- -	--	- -	--	- -	Blood	0.003	--	--	0.003
			Chemical Total	2E-05	--	5E-06	--	2E-05		0.9	--	0.1	1.0
		Exposure Point Total						2E-05					1.0
	Exposure Medium Total							2E-05					1.0

ALTERNATE TABLE 9.3A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Air	OU7	Benzo(a)pyrene Equivalents	--	5E-13	--	--	5E-13	NA	--	--	--	--
			Aroclor-1248	--	1E-11	--	--	1E-11	NA	--	--	--	--
			Aroclor-1260	--	1E-12	--	--	1E-12	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	2E-11	--	--	2E-11	NA	--	0.00000007	--	0.00000007
			Antimony	--	- -	--	--	- -	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.000001	--	0.000001
			Cadmium	--	4E-12	--	--	4E-12	NA	--	0.0000006	--	0.0000006
			Cobalt	--	6E-11	--	--	6E-11	Respiratory	--	0.000006	--	0.000006
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Manganese	--	- -	--	--	- -	CNS	--	0.00004	--	0.00004
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.0000007	--	0.0000007
			Nickel	--	6E-11	--	--	6E-11	Respiratory	--	0.00001	--	0.00001
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Zinc	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	2E-10	--	--	2E-10		- -	0.00006	- -	0.00006
		Exposure Point Total						2E-10					0.00006
	Exposure Medium Total							2E-10					0.00006
Medium Total								2E-05					1.0
Sediment	Sediment	OU7	Benzo(a)pyrene Equivalents	5E-08	--	2E-08	--	7E-08	NA	--	--	--	--
			TEQ PCB	1E-06	--	1E-07	--	1E-06	Developmental	0.04	--	0.005	0.05
			Total PCB Congeners	5E-09	--	3E-09	--	7E-09	NA	--	--	--	--
			Arsenic	1E-07	--	1E-08	--	1E-07	Skin, CVS	0.001	--	0.0002	0.001
			Chromium	- -	--	- -	--	- -	None Reported	0.000003	--	--	0.000003
			Iron	- -	--	- -	--	- -	GS	0.002	--	--	0.002
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.00009	--	--	0.00009
			Chemical Total	1E-06	--	2E-07	--	1E-06		0.05	--	0.005	0.05
		Exposure Point Total						1E-06					0.05
	Exposure Medium Total							1E-06					0.05
Medium Total								1E-06					0.05
Receptor Total							Receptor Risk Total	3E-05				Receptor HI Total	1

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.01
Total Blood HI	0.2
Total Body Weight HI	0.009
Total CNS HI	0.003
Total CVS HI	0.001
Total Fetotoxicity HI	0.000003
Total GS HI	0.1
Total Kidney HI	0.001
Total Respiratory HI	0.00002
Total None Reported HI	0.000003
Total Skin HI	0.001
Total Thyroid HI	0.02
Total NA HI	0.2
Total Developmental HI	0.6

ALTERNATE TABLE 9.3B.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Aroclor-1254	4E-08	--	2E-08	--	6E-08	Immune	0.005	--	0.003	0.008
			Chemical Total	4E-08	--	2E-08	--	6E-08		0.005	--	0.003	0.008
		Exposure Point Total						6E-08					0.008
	Exposure Medium Total							6E-08					0.008
	Air	OU7	Aroclor-1254	--	7E-14	--	--	7E-14	NA	--	--	--	--
			Chemical Total	--	7E-14	--	--	7E-14		- -	--	- -	--
		Exposure Point Total						7E-14					--
	Exposure Medium Total							7E-14					--
Medium Total								6E-08					0.008
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	1E-07	--	7E-08	--	2E-07	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.001	--	--	0.001
			Chemical Total	1E-07	--	7E-08	--	2E-07		0.001	--	--	0.001
		Exposure Point Total						2E-07					0.001
	Exposure Medium Total							2E-07					0.001
	Air	OU7	Benzo(a)pyrene Equivalents	--	1E-13	--	--	1E-13	NA	--	--	--	--
			Manganese	--	- -	--	--	- -	CNS	--	0.00002	--	0.00002
			Chemical Total	--	1E-13	--	--	1E-13		- -	0.00002	- -	0.00002
		Exposure Point Total						1E-13					0.00002
	Exposure Medium Total							1E-13					0.00002
Medium Total								2E-07					0.001
Sediment	Sediment	OU7	Benzo(a)pyrene Equivalents	5E-08	--	2E-08	--	7E-08	NA	--	--	--	--
			TEQ PCB	1E-06	--	1E-07	--	1E-06	Developmental	0.04	--	0.005	0.05
			Total PCB Congeners	5E-09	--	3E-09	--	7E-09	NA	--	--	--	--
			Arsenic	1E-07	--	1E-08	--	1E-07	Skin, CVS	0.001	--	0.0002	0.001
			Chromium	- -	--	- -	--	- -	None Reported	0.000003	--	--	0.000003
			Iron	- -	--	- -	--	- -	GS	0.002	--	--	0.002
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.00009	--	--	0.00009
			Chemical Total	1E-06	--	2E-07	--	1E-06		0.05	--	0.005	0.05
		Exposure Point Total						1E-06					0.05
	Exposure Medium Total							1E-06					0.05
Medium Total								1E-06					0.05
Receptor Total							Receptor Risk Total	2E-06				Receptor HI Total	0.06

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

ALTERNATE TABLE 9.4A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil (Entire Site)	Surface Soil	OU7	Benzo(a)pyrene Equivalents	3E-06	--	3E-06	--	6E-06	NA	--	--	--	--
			Aroclor-1248	2E-07	--	3E-07	--	5E-07	NA	--	--	--	--
			Barium	- -	--	- -	--	- -	Kidney	0.0009	--	--	0.0009
			Copper	- -	--	- -	--	- -	GS	0.01	--	--	0.01
			Iron	- -	--	- -	--	- -	GS	0.03	--	--	0.03
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Mercury	- -	--	- -	--	- -	Autoimmune	0.004	--	--	0.004
			Thallium	- -	--	- -	--	- -	NA	0.03	--	--	0.03
			Chemical Total	3E-06	--	4E-06	--	7E-06		0.07	--	--	0.07
		Exposure Point Total						7E-06					0.07
	Exposure Medium Total							7E-06					0.07
	Air	OU7	Benzo(a)pyrene Equivalents	--	2E-12	--	--	2E-12	NA	--	--	--	--
			Aroclor-1248	--	3E-13	--	--	3E-13	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.000001	--	0.000001
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.0000002	--	0.0000002
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	2E-12	--	--	2E-12		- -	0.000002	- -	0.000002
		Exposure Point Total						2E-12					0.000002
	Exposure Medium Total							2E-12					0.000002
Medium Total								7E-06					0.07
Subsurface Soil (Entire Site)	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	2E-06	--	2E-06	--	4E-06	NA	--	--	--	--
			Aroclor-1248	6E-06	--	7E-06	--	1E-05	NA	--	--	--	--
			Aroclor-1260	7E-07	--	8E-07	--	2E-06	NA	0.1	--	0.1	0.3
			2,3,7,8-TCDD Equivalents	1E-05	--	3E-06	--	2E-05	Developmental	0.7	--	0.2	0.9
			Antimony	- -	--	- -	--	- -	Blood	0.2	--	--	0.2
			Barium	- -	--	- -	--	- -	Kidney	0.0008	--	--	0.0008
			Cadmium	- -	--	- -	--	- -	NA	0.003	--	0.0009	0.004
			Cobalt	- -	--	- -	--	- -	Thyroid	0.03	--	--	0.03
			Copper	- -	--	- -	--	- -	GS	0.08	--	--	0.08
			Iron	- -	--	- -	--	- -	GS	0.08	--	--	0.08
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.004	--	--	0.004
			Mercury	- -	--	- -	--	- -	Autoimmune	0.02	--	--	0.02
			Nickel	- -	--	- -	--	- -	Body Weight	0.01	--	--	0.01
			Thallium	- -	--	- -	--	- -	NA	0.05	--	--	0.05
			Zinc	- -	--	- -	--	- -	Blood	0.005	--	--	0.005
			Chemical Total	2E-05	--	1E-05	--	4E-05		1	--	0.3	2
		Exposure Point Total						4E-05					2
	Exposure Medium Total							4E-05					2

ALTERNATE TABLE 9.4A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Air	OU7	Benzo(a)pyrene Equivalents	--	1E-12	--	--	1E-12	NA	--	--	--	--
(Entire Site)			Aroclor-1248	--	7E-12	--	--	7E-12	NA	--	--	--	--
			Aroclor-1260	--	8E-13	--	--	8E-13	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	2E-11	--	--	2E-11	NA	--	0.00000007	--	0.00000007
			Antimony	--	- -	--	--	- -	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.000001	--	0.000001
			Cadmium	--	3E-12	--	--	3E-12	NA	--	0.0000006	--	0.0000006
			Cobalt	--	4E-11	--	--	4E-11	Respiratory	--	0.000006	--	0.000006
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Manganese	--	- -	--	--	- -	CNS	--	0.00004	--	0.00004
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.0000007	--	0.0000007
			Nickel	--	4E-11	--	--	4E-11	Respiratory	--	0.00001	--	0.00001
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Zinc	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	1E-10	--	--	1E-10		- -	0.00006	- -	0.00006
		Exposure Point Total						1E-10					0.00006
	Exposure Medium Total							1E-10					0.00006
Medium Total								4E-05					2
Sediment	Sediment	OU7	Benzo(a)pyrene Equivalents	2E-07	--	2E-07	--	3E-07	NA	--	--	--	--
			TEQ PCB	1E-06	--	3E-07	--	2E-06	Developmental	0.07	--	0.02	0.08
			Total PCB Congeners	5E-09	--	6E-09	--	1E-08	NA	--	--	--	--
			Arsenic	1E-07	--	3E-08	--	2E-07	Skin, CVS	0.002	--	0.0005	0.003
			Chromium	- -	--	- -	--	- -	None Reported	0.000004	--	--	0.000004
			Iron	- -	--	- -	--	- -	GS	0.003	--	--	0.003
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.0001	--	--	0.0001
			Chemical Total	2E-06	--	5E-07	--	2E-06		0.07	--	0.02	0.09
		Exposure Point Total						2E-06					0.09
	Exposure Medium Total							2E-06					0.09
Medium Total								2E-06					0.09

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.02
Total Blood HI	0.3
Total Body Weight HI	0.01
Total CNS HI	0.004
Total CVS HI	0.003
Total Fetotoxicity HI	0.000003
Total GS HI	0.2
Total Kidney HI	0.002
Total Respiratory HI	0.00002
Total None Reported HI	0.000004
Total Skin HI	0.003
Total Thyroid HI	0.03
Total NA HI	0.08
Total Developmental HI	1.0

ALTERNATE TABLE 9.4B.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Aroclor-1254	4E-08	--	5E-08	--	9E-08	Immune	0.008	--	0.009	0.02
			Chemical Total	4E-08	--	5E-08	--	9E-08		0.008	--	0.009	0.02
		Exposure Point Total						9E-08					0.02
	Exposure Medium Total							9E-08					0.02
	Air	OU7	Aroclor-1254	--	5E-14	--	--	5E-14	NA	--	--	--	--
			Chemical Total	--	5E-14	--	--	5E-14		- -	--	- -	--
		Exposure Point Total						5E-14					--
	Exposure Medium Total							5E-14					--
Medium Total								9E-08					0.02
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	4E-07	--	5E-07	--	9E-07	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.002	--	--	0.002
			Chemical Total	4E-07	--	5E-07	--	9E-07		0.002	--	--	0.002
		Exposure Point Total						9E-07					0.002
	Exposure Medium Total							9E-07					0.002
	Air	OU7	Benzo(a)pyrene Equivalents	--	3E-13	--	--	3E-13	NA	--	--	--	--
			Manganese	--	- -	--	--	- -	CNS	--	0.00002	--	0.00002
			Chemical Total	--	3E-13	--	--	3E-13		- -	0.00002	- -	0.00002
		Exposure Point Total						3E-13					0.00002
	Exposure Medium Total							3E-13					0.00002
Medium Total								9E-07					0.002
Sediment	Sediment	OU7	Benzo(a)pyrene Equivalents	2E-07	--	2E-07	--	3E-07	NA	--	--	--	--
			TEQ PCB	1E-06	--	3E-07	--	2E-06	Developmental	0.07	--	0.02	0.08
			Total PCB Congeners	5E-09	--	6E-09	--	1E-08	NA	--	--	--	--
			Arsenic	1E-07	--	3E-08	--	2E-07	Skin, CVS	0.002	--	0.0005	0.003
			Chromium	- -	--	- -	--	- -	None Reported	0.000004	--	--	0.000004
			Iron	- -	--	- -	--	- -	GS	0.003	--	--	0.003
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.0001	--	--	0.0001
			Chemical Total	2E-06	--	5E-07	--	2E-06		0.07	--	0.02	0.09
		Exposure Point Total						2E-06					0.09
	Exposure Medium Total							2E-06					0.09
Medium Total								2E-06					0.09

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

ALTERNATE TABLE 9.5A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	4E-06	--	4E-06	--	8E-06
			Aroclor-1248	4E-07	--	4E-07	--	8E-07
			Barium	- -	--	- -	--	- -
			Copper	- -	--	- -	--	- -
			Iron	- -	--	- -	--	- -
			Lead	- -	--	- -	--	- -
			Mercury	- -	--	- -	--	- -
			Thallium	- -	--	- -	--	- -
			Chemical Total	4E-06	--	4E-06	--	9E-06
		Exposure Point Total						9E-06
	Exposure Medium Total							9E-06
	Air	OU7	Benzo(a)pyrene Equivalents	--	3E-12	--	--	3E-12
			Aroclor-1248	--	6E-13	--	--	6E-13
			Barium	--	- -	--	--	- -
			Copper	--	- -	--	--	- -
			Iron	--	- -	--	--	- -
			Lead	--	- -	--	--	- -
			Mercury	--	- -	--	--	- -
			Thallium	--	- -	--	--	- -
			Chemical Total	--	3E-12	--	--	3E-12
		Exposure Point Total						3E-12
	Exposure Medium Total							3E-12
Medium Total								9E-06

ALTERNATE TABLE 9.5A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	2E-06	--	2E-06	--	5E-06
			Aroclor-1248	1E-05	--	1E-05	--	2E-05
			Aroclor-1260	1E-06	--	1E-06	--	3E-06
			2,3,7,8-TCDD Equivalents	3E-05	--	5E-06	--	3E-05
			Antimony	- -	--	- -	--	- -
			Barium	- -	--	- -	--	- -
			Cadmium	- -	--	- -	--	- -
			Cobalt	- -	--	- -	--	- -
			Copper	- -	--	- -	--	- -
			Iron	- -	--	- -	--	- -
			Lead	- -	--	- -	--	- -
			Manganese	- -	--	- -	--	- -
			Mercury	- -	--	- -	--	- -
			Nickel	- -	--	- -	--	- -
			Thallium	- -	--	- -	--	- -
			Zinc	- -	--	- -	--	- -
			Chemical Total	4E-05	--	2E-05	--	6E-05
		Exposure Point Total						6E-05
	Exposure Medium Total							6E-05

ALTERNATE TABLE 9.5A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Subsurface Soil	Air	OU7	Benzo(a)pyrene Equivalents	--	2E-12	--	--	2E-12
			Aroclor-1248	--	2E-11	--	--	2E-11
			Aroclor-1260	--	2E-12	--	--	2E-12
			2,3,7,8-TCDD Equivalents	--	4E-11	--	--	4E-11
			Antimony	--	- -	--	--	- -
			Barium	--	- -	--	--	- -
			Cadmium	--	7E-12	--	--	7E-12
			Cobalt	--	1E-10	--	--	1E-10
			Copper	--	- -	--	--	- -
			Iron	--	- -	--	--	- -
			Lead	--	- -	--	--	- -
			Manganese	--	- -	--	--	- -
			Mercury	--	- -	--	--	- -
			Nickel	--	9E-11	--	--	9E-11
			Thallium	--	- -	--	--	- -
			Zinc	--	- -	--	--	- -
			Chemical Total	--	3E-10	--	--	3E-10
		Exposure Point Total						3E-10
	Exposure Medium Total							3E-10
Medium Total								6E-05

ALTERNATE TABLE 9.5A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Sediment	Sediment	OU7	Benzo(a)pyrene Equivalents	2E-07	--	2E-07	--	4E-07
			TEQ PCB	2E-06	--	4E-07	--	3E-06
			Total PCB Congeners	1E-08	--	8E-09	--	2E-08
			Arsenic	3E-07	--	5E-08	--	3E-07
			Chromium	- -	--	- -	--	- -
			Iron	- -	--	- -	--	- -
			Lead	- -	--	- -	--	- -
			Manganese	- -	--	- -	--	- -
			Chemical Total	3E-06	--	7E-07	--	4E-06
		Exposure Point Total						4E-06
	Exposure Medium Total							4E-06
Medium Total								4E-06
Receptor Total							Receptor Risk Total	7E-05

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

ALTERNATE TABLE 9.5B.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Aroclor-1254	8E-08	--	7E-08	--	2E-07
			Chemical Total	8E-08	--	7E-08	--	2E-07
		Exposure Point Total						2E-07
	Exposure Medium Total							2E-07
	Air	OU7	Aroclor-1254	--	1E-13	--	--	1E-13
			Chemical Total	--	1E-13	--	--	1E-13
		Exposure Point Total						1E-13
	Exposure Medium Total							1E-13
Medium Total								2E-07
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	6E-07	--	5E-07	--	1E-06
			Manganese	- -	--	- -	--	- -
			Chemical Total	6E-07	--	5E-07	--	1E-06
		Exposure Point Total						1E-06
	Exposure Medium Total							1E-06
Subsurface Soil	Air	OU7	Benzo(a)pyrene Equivalents	--	4E-13	--	--	4E-13
			Manganese	--	- -	--	--	- -
			Chemical Total	--	4E-13	--	--	4E-13
		Exposure Point Total						4E-13
	Exposure Medium Total							4E-13
Medium Total								1E-06

ALTERNATE TABLE 9.5B.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Sediment	Sediment	OU7	Benzo(a)pyrene Equivalents	2E-07	--	2E-07	--	4E-07
			TEQ PCB	2E-06	--	4E-07	--	3E-06
			Total PCB Congeners	1E-08	--	8E-09	--	2E-08
			Arsenic	3E-07	--	5E-08	--	3E-07
			Chromium	- -	--	- -	--	- -
			Iron	- -	--	- -	--	- -
			Lead	- -	--	- -	--	- -
			Manganese	- -	--	- -	--	- -
			Chemical Total	3E-06	--	7E-07	--	4E-06
		Exposure Point Total						4E-06
	Exposure Medium Total							4E-06
Medium Total								4E-06
Receptor Total							Receptor Risk Total	5E-06

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 9.6A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	1E-05	--	6E-06	--	2E-05	NA	--	--	--	--
			Aroclor-1248	1E-06	--	8E-07	--	2E-06	NA	--	--	--	--
			Barium	- -	--	- -	--	- -	Kidney	0.002	--	--	0.002
			Copper	- -	--	- -	--	- -	GS	0.04	--	--	0.04
			Iron	- -	--	- -	--	- -	GS	0.07	--	--	0.07
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Mercury	- -	--	- -	--	- -	Autoimmune	0.010	--	--	0.010
			Thallium	- -	--	- -	--	- -	NA	0.07	--	--	0.07
			Chemical Total	1E-05	--	7E-06	--	2E-05		0.2	--	--	0.2
		Exposure Point Total						2E-05					0.2
	Exposure Medium Total							2E-05					0.2
	Air	OU7	Benzo(a)pyrene Equivalents	--	1E-10	--	--	1E-10	NA	--	--	--	--
			Aroclor-1248	--	3E-11	--	--	3E-11	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.00007	--	0.00007
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.0000072	--	0.0000072
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	2E-10	--	--	2E-10		- -	0.00008	- -	0.00008
		Exposure Point Total						2E-10					0.00008
	Exposure Medium Total							2E-10					0.00008
Medium Total								2E-05					0.2
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	7E-06	--	4E-06	--	1E-05	NA	--	--	--	--
			Aroclor-1248	4E-05	--	2E-05	--	6E-05	NA	--	--	--	--
			Aroclor-1260	4E-06	--	2E-06	--	7E-06	NA	0.3	--	0.2	0.5
			2,3,7,8-TCDD Equivalents	8E-05	--	1E-05	--	9E-05	Developmental	2	--	0.2	2
			Antimony	- -	--	- -	--	- -	Blood	0.6	--	--	0.6
			Barium	- -	--	- -	--	- -	Kidney	0.002	--	--	0.002
			Cadmium	- -	--	- -	--	- -	NA	0.007	--	0.001	0.008
			Cobalt	- -	--	- -	--	- -	Thyroid	0.07	--	--	0.07
			Copper	- -	--	- -	--	- -	GS	0.2	--	--	0.2
			Iron	- -	--	- -	--	- -	GS	0.2	--	--	0.2
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.009	--	--	0.009
			Mercury	- -	--	- -	--	- -	Autoimmune	0.04	--	--	0.04
			Nickel	- -	--	- -	--	- -	Body Weight	0.03	--	--	0.03
			Thallium	- -	--	- -	--	- -	NA	0.1	--	--	0.1
			Zinc	- -	--	- -	--	- -	Blood	0.01	--	--	0.01
			Chemical Total	1E-04	--	4E-05	--	2E-04		3	--	0.4	4
		Exposure Point Total						2E-04					4
	Exposure Medium Total							2E-04					4

TABLE 9.6A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Air	OU7	Benzo(a)pyrene Equivalents	--	8E-11	--	--	8E-11	NA	--	--	--	--
			Aroclor-1248	--	8E-10	--	--	8E-10	NA	--	--	--	--
			Aroclor-1260	--	9E-11	--	--	9E-11	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	2E-09	--	--	2E-09	NA	--	0.000003	--	0.000003
			Antimony	--	- -	--	--	- -	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.00006	--	0.00006
			Cadmium	--	3E-10	--	--	3E-10	NA	--	0.00003	--	0.00003
			Cobalt	--	5E-09	--	--	5E-09	Respiratory	--	0.0003	--	0.0003
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Manganese	--	- -	--	--	- -	CNS	--	0.002	--	0.002
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.000032	--	0.000032
			Nickel	--	4E-09	--	--	4E-09	Respiratory	--	0.0006	--	0.0006
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Zinc	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	1E-08	--	--	1E-08		- -	0.003	- -	0.003
		Exposure Point Total						1E-08					0.003
	Exposure Medium Total							1E-08					0.003
Medium Total								2E-04					4
Receptor Total							Receptor Risk Total	2E-04				Receptor HI Total	4

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.05
Total Blood HI	0.6
Total Body Weight HI	0.03
Total CNS HI	0.01
Total Fetotoxicity HI	0.0001
Total GS HI	0.5
Total Kidney HI	0.004
Total Respiratory HI	0.0008
Total None Reported HI	0.0000
Total Thyroid HI	0.07
Total NA HI	0.7
Total Developmental HI	2

TABLE 9.6B.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Aroclor-1254	3E-07	--	1E-07	--	4E-07	Immune	0.02	--	0.01	0.03
			Chemical Total	3E-07	--	1E-07	--	4E-07		0.02	--	0.01	0.03
		Exposure Point Total						4E-07					0.03
	Exposure Medium Total							4E-07					0.03
	Air	OU7	Aroclor-1254	--	6E-12	--	--	6E-12	NA	--	--	--	--
			Chemical Total	--	6E-12	--	--	6E-12		- -	--	- -	--
		Exposure Point Total						6E-12					--
	Exposure Medium Total							6E-12					--
Medium Total								4E-07					0.03
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	2E-06	--	8E-07	--	2E-06	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.004	--	--	0.004
			Chemical Total	2E-06	--	8E-07	--	2E-06		0.004	--	--	0.004
		Exposure Point Total						2E-06					0.004
	Exposure Medium Total							2E-06					0.004
	Air	OU7	Benzo(a)pyrene Equivalents	--	2E-11	--	--	2E-11	NA	--	--	--	--
			Manganese	--	- -	--	--	- -	CNS	--	0.0008	--	0.0008
			Chemical Total	--	2E-11	--	--	2E-11		- -	0.0008	- -	0.0008
		Exposure Point Total						2E-11					0.0008
	Exposure Medium Total							2E-11					0.0008
Medium Total								2E-06					0.005
Receptor Total							Receptor Risk Total	3E-06				Receptor HI Total	0.03

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

ALTERNATE TABLE 9.7A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	8E-05	--	3E-05	--	1E-04	NA	--	--	--	--
			Aroclor-1248	3E-06	--	1E-06	--	5E-06	NA	--	--	--	--
			Barium	- -	--	- -	--	- -	Kidney	0.02	--	--	0.02
			Copper	- -	--	- -	--	- -	GS	0.3	--	--	0.3
			Iron	- -	--	- -	--	- -	GS	0.6	--	--	0.6
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Mercury	- -	--	- -	--	- -	Autoimmune	0.09	--	--	0.09
			Thallium	- -	--	- -	--	- -	NA	0.6	--	--	0.6
			Chemical Total	8E-05	--	3E-05	--	1E-04		2	--	--	2
		Exposure Point Total						1E-04					2
	Exposure Medium Total							1E-04					2
	Air	OU7	Benzo(a)pyrene Equivalents	--	9E-11	--	--	9E-11	NA	--	--	--	--
			Aroclor-1248	--	7E-12	--	--	7E-12	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.00007	--	0.00007
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.0000072	--	0.0000072
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	1E-10	--	--	1E-10		- -	0.00008	- -	0.00008
		Exposure Point Total						1E-10					0.00008
	Exposure Medium Total							1E-10					0.00008
Medium Total								1E-04					2
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	5E-05	--	2E-05	--	6E-05	NA	--	--	--	--
			Aroclor-1248	9E-05	--	4E-05	--	1E-04	NA	--	--	--	--
			Aroclor-1260	1E-05	--	4E-06	--	1E-05	NA	3	--	1	4
			2,3,7,8-TCDD Equivalents	2E-04	--	2E-05	--	2E-04	Developmental	17	--	1	18
			Antimony	- -	--	- -	--	- -	Blood	6	--	--	6
			Barium	- -	--	- -	--	- -	Kidney	0.02	--	--	0.02
			Cadmium	- -	--	- -	--	- -	NA	0.07	--	0.007	0.07
			Cobalt	- -	--	- -	--	- -	Thyroid	0.7	--	--	0.7
			Copper	- -	--	- -	--	- -	GS	2	--	--	2
			Iron	- -	--	- -	--	- -	GS	2	--	--	2
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.09	--	--	0.09
			Mercury	- -	--	- -	--	- -	Autoimmune	0.4	--	--	0.4
			Nickel	- -	--	- -	--	- -	Body Weight	0.3	--	--	0.3
			Thallium	- -	--	- -	--	- -	NA	1	--	--	1
			Zinc	- -	--	- -	--	- -	Blood	0.1	--	--	0.1
			Chemical Total	3E-04	--	7E-05	--	4E-04		32	--	3	34
		Exposure Point Total						4E-04					34
	Exposure Medium Total							4E-04					34

ALTERNATE TABLE 9.7A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Air	OU7	Benzo(a)pyrene Equivalents	--	6E-11	--	--	6E-11	NA	--	--	--	--
			Aroclor-1248	--	2E-10	--	--	2E-10	NA	--	--	--	--
			Aroclor-1260	--	2E-11	--	--	2E-11	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	4E-10	--	--	4E-10	NA	--	0.000003	--	0.000003
			Antimony	--	- -	--	--	- -	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.00006	--	0.00006
			Cadmium	--	8E-11	--	--	8E-11	NA	--	0.00003	--	0.00003
			Cobalt	--	1E-09	--	--	1E-09	Respiratory	--	0.0003	--	0.0003
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Manganese	--	- -	--	--	- -	CNS	--	0.002	--	0.002
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.000032	--	0.000032
			Nickel	--	1E-09	--	--	1E-09	Respiratory	--	0.0006	--	0.0006
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Zinc	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	3E-09	--	--	3E-09		- -	0.003	- -	0.003
		Exposure Point Total						3E-09					0.003
	Exposure Medium Total							3E-09					0.003
Medium Total								4E-04					34
Receptor Total							Receptor Risk Total	5E-04				Receptor HI Total	36

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.5
Total Blood HI	6
Total Body Weight HI	0.3
Total CNS HI	0.09
Total Fetotoxicity HI	0.0001
Total GS HI	5
Total Kidney HI	0.04
Total Respiratory HI	0.0008
Total None Reported HI	0.000
Total Thyroid HI	0.7
Total NA HI	6
Total Developmental HI	18

ALTERNATE TABLE 9.7B.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Aroclor-1254	6E-07	--	2E-07	--	9E-07	Immune	0.2	--	0.07	0.2
			Chemical Total	6E-07	--	2E-07	--	9E-07		0.2	--	0.07	0.2
		Exposure Point Total						9E-07					0.2
	Exposure Medium Total							9E-07					0.2
	Air	OU7	Aroclor-1254	--	1E-12	--	--	1E-12	NA	--	--	--	--
			Chemical Total	--	1E-12	--	--	1E-12		- -	--	- -	--
		Exposure Point Total						1E-12					--
	Exposure Medium Total							1E-12					--
Medium Total								9E-07					0.2
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	1E-05	--	4E-06	--	1E-05	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.04	--	--	0.04
			Chemical Total	1E-05	--	4E-06	--	1E-05		0.04	--	--	0.04
		Exposure Point Total						1E-05					0.04
	Exposure Medium Total							1E-05					0.04
	Air	OU7	Benzo(a)pyrene Equivalents	--	1E-11	--	--	1E-11	NA	--	--	--	--
			Manganese	--	- -	--	--	- -	CNS	--	0.0008	--	0.0008
			Chemical Total	--	1E-11	--	--	1E-11		- -	0.0008	- -	0.0008
		Exposure Point Total						1E-11					0.0008
	Exposure Medium Total							1E-11					0.0008
Medium Total								1E-05					0.04
	Exposure Medium Total							1E-11					0.0008
Medium Total								1E-05					0.04
Receptor Total							Receptor Risk Total	2E-05				Receptor HI Total	0.3

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 9.8A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	9E-05	--	3E-05	--	1E-04
			Aroclor-1248	5E-06	--	2E-06	--	7E-06
			Barium	- -	--	- -	--	- -
			Copper	- -	--	- -	--	- -
			Iron	- -	--	- -	--	- -
			Lead	- -	--	- -	--	- -
			Mercury	- -	--	- -	--	- -
			Thallium	- -	--	- -	--	- -
			Chemical Total	9E-05	--	4E-05	--	1E-04
		Exposure Point Total						1E-04
	Exposure Medium Total							1E-04
	Air	OU7	Benzo(a)pyrene Equivalents	--	2E-10	--	--	2E-10
			Aroclor-1248	--	4E-11	--	--	4E-11
			Barium	--	- -	--	--	- -
			Copper	--	- -	--	--	- -
			Iron	--	- -	--	--	- -
			Lead	--	- -	--	--	- -
			Mercury	--	- -	--	--	- -
			Thallium	--	- -	--	--	- -
			Chemical Total	--	3E-10	--	--	3E-10
		Exposure Point Total						3E-10
	Exposure Medium Total							3E-10
Medium Total								1E-04

TABLE 9.8A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	5E-05	--	2E-05	--	7E-05
			Aroclor-1248	1E-04	--	6E-05	--	2E-04
			Aroclor-1260	1E-05	--	6E-06	--	2E-05
			2,3,7,8-TCDD Equivalents	3E-04	--	3E-05	--	3E-04
			Antimony	- -	--	- -	--	- -
			Barium	- -	--	- -	--	- -
			Cadmium	- -	--	- -	--	- -
			Cobalt	- -	--	- -	--	- -
			Copper	- -	--	- -	--	- -
			Iron	- -	--	- -	--	- -
			Lead	- -	--	- -	--	- -
			Manganese	- -	--	- -	--	- -
			Mercury	- -	--	- -	--	- -
			Nickel	- -	--	- -	--	- -
			Thallium	- -	--	- -	--	- -
			Zinc	- -	--	- -	--	- -
			Chemical Total	5E-04	--	1E-04	--	6E-04
		Exposure Point Total						6E-04
	Exposure Medium Total							6E-04

TABLE 9.8A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Subsurface Soil	Air	OU7	Benzo(a)pyrene Equivalents	--	1E-10	--	--	1E-10
			Aroclor-1248	--	1E-09	--	--	1E-09
			Aroclor-1260	--	1E-10	--	--	1E-10
			2,3,7,8-TCDD Equivalents	--	2E-09	--	--	2E-09
			Antimony	--	- -	--	--	- -
			Barium	--	- -	--	--	- -
			Cadmium	--	4E-10	--	--	4E-10
			Cobalt	--	6E-09	--	--	6E-09
			Copper	--	- -	--	--	- -
			Iron	--	- -	--	--	- -
			Lead	--	- -	--	--	- -
			Manganese	--	- -	--	--	- -
			Mercury	--	- -	--	--	- -
			Nickel	--	6E-09	--	--	6E-09
			Thallium	--	- -	--	--	- -
			Zinc	--	- -	--	--	- -
			Chemical Total	--	2E-08	--	--	2E-08
		Exposure Point Total						2E-08
	Exposure Medium Total							2E-08
Medium Total								6E-04
Receptor Total							Receptor Risk Total	7E-04

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 9.8B.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Aroclor-1254	9E-07	--	4E-07	--	1E-06
			Chemical Total	9E-07	--	4E-07	--	1E-06
		Exposure Point Total						1E-06
	Exposure Medium Total							1E-06
	Air	OU7	Aroclor-1254	--	7E-12	--	--	7E-12
			Chemical Total	--	7E-12	--	--	7E-12
		Exposure Point Total						7E-12
	Exposure Medium Total							7E-12
Medium Total								1E-06
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	1E-05	--	5E-06	--	2E-05
			Manganese	- -	--	- -	--	- -
			Chemical Total	1E-05	--	5E-06	--	2E-05
		Exposure Point Total						2E-05
	Exposure Medium Total							2E-05
	Air	OU7	Benzo(a)pyrene Equivalents	--	3E-11	--	--	3E-11
			Manganese	--	- -	--	--	- -
			Chemical Total	--	3E-11	--	--	3E-11
		Exposure Point Total						3E-11
	Exposure Medium Total							3E-11
Medium Total								2E-05
Receptor Total							Receptor Risk Total	2E-05

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

ALTERNATE TABLE 9.2A.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Occupational Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	7E-07	--	1E-07	--	8E-07	NA	--	--	--	--
			Aroclor-1248	2E-07	--	3E-08	--	2E-07	NA	--	--	--	--
			Barium	- -	--	- -	--	- -	Kidney	0.0007	--	--	0.0007
			Copper	- -	--	- -	--	- -	GS	0.01	--	--	0.01
			Iron	- -	--	- -	--	- -	GS	0.02	--	--	0.02
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Mercury	- -	--	- -	--	- -	Autoimmune	0.003	--	--	0.003
			Thallium	- -	--	- -	--	- -	NA	0.02	--	--	0.02
			Chemical Total	9E-07	--	2E-07	--	1E-06		0.06	--	--	0.06
		Exposure Point Total						1E-06					0.06
	Exposure Medium Total							1E-06					0.06
	Air	OU7	Benzo(a)pyrene Equivalents	--	5E-12	--	--	5E-12	NA	--	--	--	--
			Aroclor-1248	--	2E-12	--	--	2E-12	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.00001	--	0.00001
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.0000013	--	0.0000013
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	7E-12	--	--	7E-12		- -	0.00001	- -	0.00001
		Exposure Point Total						7E-12					0.00001
	Exposure Medium Total							7E-12					0.00001
Medium Total								1E-06					0.06
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	4E-07	--	8E-08	--	5E-07	NA	--	--	--	--
			Aroclor-1248	5E-06	--	8E-07	--	5E-06	NA	--	--	--	--
			Aroclor-1260	5E-07	--	9E-08	--	6E-07	NA	0.1	--	0.02	0.1
			2,3,7,8-TCDD Equivalents	9E-06	--	4E-07	--	1E-05	Developmental	0.6	--	0.02	0.6
			Antimony	- -	--	- -	--	- -	Blood	0.2	--	--	0.2
			Barium	- -	--	- -	--	- -	Kidney	0.0006	--	--	0.0006
			Cadmium	- -	--	- -	--	- -	NA	0.002	--	0.0001	0.002
			Cobalt	- -	--	- -	--	- -	Thyroid	0.02	--	--	0.02
			Copper	- -	--	- -	--	- -	GS	0.1	--	--	0.1
			Iron	- -	--	- -	--	- -	GS	0.06	--	--	0.06
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.003	--	--	0.003
			Mercury	- -	--	- -	--	- -	Autoimmune	0.01	--	--	0.01
			Nickel	- -	--	- -	--	- -	Body Weight	0.01	--	--	0.01
			Thallium	- -	--	- -	--	- -	NA	0.04	--	--	0.04
			Zinc	- -	--	- -	--	- -	Blood	0.004	--	--	0.004
			Chemical Total	1E-05	--	1E-06	--	2E-05		1	--	0.04	1
		Exposure Point Total						2E-05					1
	Exposure Medium Total							2E-05					1

ALTERNATE TABLE 9.2A.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Occupational Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Air	OU7	Benzo(a)pyrene Equivalents	--	3E-12	--	--	3E-12	NA	--	--	--	--
			Aroclor-1248	--	5E-11	--	--	5E-11	NA	--	--	--	--
			Aroclor-1260	--	6E-12	--	--	6E-12	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	1E-10	--	--	1E-10	NA	--	0.0000006	--	0.0000006
			Antimony	--	- -	--	--	- -	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.00001	--	0.00001
			Cadmium	--	2E-11	--	--	2E-11	NA	--	0.000005	--	0.000005
			Cobalt	--	3E-10	--	--	3E-10	Respiratory	--	0.00005	--	0.00005
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Manganese	--	- -	--	--	- -	CNS	--	0.0004	--	0.0004
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.0000057	--	0.0000057
			Nickel	--	3E-10	--	--	3E-10	Respiratory	--	0.00010	--	0.00010
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Zinc	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	8E-10	--	--	8E-10		- -	0.0005	- -	0.0005
		Exposure Point Total						8E-10					0.0005
	Exposure Medium Total							8E-10					0.0005
Medium Total								2E-05					1
Receptor Total							Receptor Risk Total	2E-05				Receptor HI Total	1

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.02
Total Blood HI	0.2
Total Body Weight HI	0.01
Total CNS HI	0.003
Total Fetotoxicity HI	0.00002
Total GS HI	0.2
Total Kidney HI	0.001
Total Respiratory HI	0.0001
Total None Reported HI	0.0000
Total Thyroid HI	0.02
Total NA HI	0.2
Total Developmental	0.6

ALTERNATE TABLE 9.2B.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Occupational Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Aroclor-1254	3E-08	--	6E-09	--	4E-08	Immune	0.006	--	0.001	0.007
			Chemical Total	3E-08	--	6E-09	--	4E-08		0.006	--	0.001	0.007
		Exposure Point Total						4E-08					0.007
	Exposure Medium Total							4E-08					0.007
	Air	OU7	Aroclor-1254	--	4E-13	--	--	4E-13	NA	--	--	--	--
			Chemical Total	--	4E-13	--	--	4E-13		- -	--	- -	--
		Exposure Point Total						4E-13					--
	Exposure Medium Total							4E-13					--
Medium Total								4E-08					0.007
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	1E-07	--	2E-08	--	1E-07	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.001	--	--	0.001
			Chemical Total	1E-07	--	2E-08	--	1E-07		0.001	--	--	0.001
		Exposure Point Total						1E-07					0.001
	Exposure Medium Total							1E-07					0.001
	Air	OU7	Benzo(a)pyrene Equivalents	--	6E-13	--	--	6E-13	NA	--	--	--	--
			Manganese	--	- -	--	--	- -	CNS	--	0.0001	--	0.0001
			Chemical Total	--	6E-13	--	--	6E-13		- -	0.0001	- -	0.0001
		Exposure Point Total						6E-13					0.0001
	Exposure Medium Total							6E-13					0.0001
Medium Total								1E-07					0.001
	Exposure Medium Total							6E-13					0.0001
Medium Total								1E-07					0.001
Receptor Total			Receptor Risk Total					2E-07	Receptor HI Total				0.008

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total CNS HI 0.0001

ALTERNATE TABLE 9.3A.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	2E-07	--	3E-08	--	3E-07	NA	--	--	--	--
			Aroclor-1248	5E-08	--	8E-09	--	6E-08	NA	--	--	--	--
			Barium	- -	--	- -	--	- -	Kidney	0.0003	--	--	0.0003
			Copper	- -	--	- -	--	- -	GS	0.005	--	--	0.005
			Iron	- -	--	- -	--	- -	GS	0.009	--	--	0.009
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Mercury	- -	--	- -	--	- -	Autoimmune	0.001	--	--	0.001
			Thallium	- -	--	- -	--	- -	NA	0.008	--	--	0.008
			Chemical Total	3E-07	--	4E-08	--	3E-07		0.02	--	--	0.02
		Exposure Point Total						3E-07					0.02
	Exposure Medium Total							3E-07					0.02
	Air	OU7	Benzo(a)pyrene Equivalents	--	4E-13	--	--	4E-13	NA	--	--	--	--
			Aroclor-1248	--	2E-13	--	--	2E-13	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.000001	--	0.000001
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.0000002	--	0.0000002
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	6E-13	--	--	6E-13		- -	0.000002	- -	0.000002
		Exposure Point Total						6E-13					0.000002
	Exposure Medium Total							6E-13					0.000002
Medium Total								3E-07					0.02
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	1E-07	--	2E-08	--	2E-07	NA	--	--	--	--
			Aroclor-1248	1E-06	--	2E-07	--	2E-06	NA	--	--	--	--
			Aroclor-1260	2E-07	--	3E-08	--	2E-07	NA	0.04	--	0.006	0.05
			2,3,7,8-TCDD Equivalents	3E-06	--	1E-07	--	3E-06	Developmental	0.2	--	0.008	0.2
			Antimony	- -	--	- -	--	- -	Blood	0.08	--	--	0.08
			Barium	- -	--	- -	--	- -	Kidney	0.0002	--	--	0.0002
			Cadmium	- -	--	- -	--	- -	NA	0.0009	--	0.00004	0.0009
			Cobalt	- -	--	- -	--	- -	Thyroid	0.009	--	--	0.009
			Copper	- -	--	- -	--	- -	GS	0.03	--	--	0.03
			Iron	- -	--	- -	--	- -	GS	0.02	--	--	0.02
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.001	--	--	0.001
			Mercury	- -	--	- -	--	- -	Autoimmune	0.006	--	--	0.006
			Nickel	- -	--	- -	--	- -	Body Weight	0.004	--	--	0.004
			Thallium	- -	--	- -	--	- -	NA	0.02	--	--	0.02
			Zinc	- -	--	- -	--	- -	Blood	0.002	--	--	0.002
			Chemical Total	5E-06	--	4E-07	--	5E-06		0.4	--	0.01	0.5
		Exposure Point Total						5E-06					0.5
	Exposure Medium Total							5E-06					0.5

ALTERNATE TABLE 9.3A.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Air	OU7	Benzo(a)pyrene Equivalents	--	3E-13	--	--	3E-13	NA	--	--	--	--
			Aroclor-1248	--	5E-12	--	--	5E-12	NA	--	--	--	--
			Aroclor-1260	--	6E-13	--	--	6E-13	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	1E-11	--	--	1E-11	NA	--	0.00000007	--	0.00000007
			Antimony	--	- -	--	--	- -	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.000001	--	0.000001
			Cadmium	--	2E-12	--	--	2E-12	NA	--	0.0000006	--	0.0000006
			Cobalt	--	3E-11	--	--	3E-11	Respiratory	--	0.000006	--	0.000006
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Manganese	--	- -	--	--	- -	CNS	--	0.00004	--	0.00004
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.0000007	--	0.0000007
			Nickel	--	3E-11	--	--	3E-11	Respiratory	--	0.00001	--	0.00001
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Zinc	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	8E-11	--	--	8E-11		- -	0.00006	- -	0.00006
		Exposure Point Total						8E-11					0.00006
	Exposure Medium Total							8E-11					0.00006
Medium Total								5E-06					0.5
Sediment	Sediment	OU7	Benzo(a)pyrene Equivalents	7E-09	--	1E-09	--	8E-09	NA	--	--	--	--
			TEQ PCB	2E-07	--	6E-09	--	2E-07	Developmental	0.01	--	0.0004	0.01
			Total PCB Congeners	7E-10	--	1E-10	--	8E-10	NA	--	--	--	--
			Arsenic	2E-08	--	6E-10	--	2E-08	Skin, CVS	0.0004	--	0.00001	0.0004
			Chromium	- -	--	- -	--	- -	None Reported	0.0000008	--	--	0.0000008
			Iron	- -	--	- -	--	- -	GS	0.0005	--	--	0.0005
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.00003	--	--	0.00003
			Chemical Total	2E-07	--	7E-09	--	2E-07		0.01	--	0.0004	0.01
		Exposure Point Total						2E-07					0.01
	Exposure Medium Total							2E-07					0.01
Medium Total								2E-07					0.01
Receptor Total							Receptor Risk Total	6E-06				Receptor HI Total	0.5

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.007
Total Blood HI	0.08
Total Body Weight HI	0.004
Total CNS HI	0.001
Total CVS HI	0.0004
Total Fetotoxicity HI	0.000003
Total GS HI	0.06
Total Kidney HI	0.0005
Total Respiratory HI	0.00002
Total None Reported HI	0.0000008
Total Skin HI	0.0004
Total Thyroid HI	0.009
Total NA HI	0.07
Total Developmental HI	0.2

ALTERNATE TABLE 9.3B.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Aroclor-1254	1E-08	--	2E-09	--	1E-08	Immune	0.002	--	0.0004	0.003
			Chemical Total	1E-08	--	2E-09	--	1E-08		0.002	--	0.0004	0.003
		Exposure Point Total						1E-08					0.003
	Exposure Medium Total							1E-08					0.003
	Air	OU7	Aroclor-1254	--	3E-14	--	--	3E-14	NA	--	--	--	--
			Chemical Total	--	3E-14	--	--	3E-14		- -	--	- -	--
		Exposure Point Total						3E-14					--
	Exposure Medium Total							3E-14					--
Medium Total								1E-08					0.003
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	3E-08	--	5E-09	--	4E-08	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.0005	--	--	0.0005
			Chemical Total	3E-08	--	5E-09	--	4E-08		0.0005	--	--	0.0005
		Exposure Point Total						4E-08					0.0005
	Exposure Medium Total							4E-08					0.0005
	Air	OU7	Benzo(a)pyrene Equivalents	--	6E-14	--	--	6E-14	NA	--	--	--	--
			Manganese	--	- -	--	--	- -	CNS	--	0.00002	--	0.00002
			Chemical Total	--	6E-14	--	--	6E-14		- -	0.00002	- -	0.00002
		Exposure Point Total						6E-14					0.00002
	Exposure Medium Total							6E-14					0.00002
Medium Total								4E-08					0.0005
Sediment	Sediment	OU7	Benzo(a)pyrene Equivalents	7E-09	--	1E-09	--	8E-09	NA	--	--	--	--
			TEQ PCB	2E-07	--	6E-09	--	2E-07	Developmental	0.01	--	0.0004	0.01
			Total PCB Congeners	7E-10	--	1E-10	--	8E-10	NA	--	--	--	--
			Arsenic	2E-08	--	6E-10	--	2E-08	Skin, CVS	0.0004	--	0.00001	0.0004
			Chromium	- -	--	- -	--	- -	None Reported	0.0000008	--	--	0.0000008
			Iron	- -	--	- -	--	- -	GS	0.0005	--	--	0.0005
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.00003	--	--	0.00003
			Chemical Total	2E-07	--	7E-09	--	2E-07		0.01	--	0.0004	0.01
		Exposure Point Total						2E-07					0.01
	Exposure Medium Total							2E-07					0.01
Medium Total								2E-07					0.01
Receptor Total							Receptor Risk Total	2E-07				Receptor HI Total	0.02

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

ALTERNATE TABLE 9.4A.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil (Entire Site)	Surface Soil	OU7	Benzo(a)pyrene Equivalents	8E-07	--	3E-07	--	1E-06	NA	--	--	--	--
			Aroclor-1248	6E-08	--	3E-08	--	9E-08	NA	--	--	--	--
			Barium	- -	--	- -	--	- -	Kidney	0.0005	--	--	0.0005
			Copper	- -	--	- -	--	- -	GS	0.007	--	--	0.007
			Iron	- -	--	- -	--	- -	GS	0.01	--	--	0.01
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Mercury	- -	--	- -	--	- -	Autoimmune	0.002	--	--	0.002
			Thallium	- -	--	- -	--	- -	NA	0.01	--	--	0.01
			Chemical Total	8E-07	--	4E-07	--	1E-06		0.04	--	--	0.04
		Exposure Point Total						1E-06					0.04
	Exposure Medium Total							1E-06					0.04
	Air	OU7	Benzo(a)pyrene Equivalents	--	9E-13	--	--	9E-13	NA	--	--	--	--
			Aroclor-1248	--	1E-13	--	--	1E-13	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.000001	--	0.000001
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.0000002	--	0.0000002
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	1E-12	--	--	1E-12		- -	0.000002	- -	0.000002
		Exposure Point Total						1E-12					0.000002
	Exposure Medium Total							1E-12					0.000002
Medium Total								1E-06					0.04
Subsurface Soil (Entire Site)	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	5E-07	--	2E-07	--	7E-07	NA	--	--	--	--
			Aroclor-1248	2E-06	--	7E-07	--	2E-06	NA	--	--	--	--
			Aroclor-1260	2E-07	--	8E-08	--	3E-07	NA	0.06	--	0.03	0.09
			2,3,7,8-TCDD Equivalents	3E-06	--	3E-07	--	4E-06	Developmental	0.4	--	0.03	0.4
			Antimony	- -	--	- -	--	- -	Blood	0.1	--	--	0.1
			Barium	- -	--	- -	--	- -	Kidney	0.0004	--	--	0.0004
			Cadmium	- -	--	- -	--	- -	NA	0.001	--	0.0002	0.002
			Cobalt	- -	--	- -	--	- -	Thyroid	0.01	--	--	0.01
			Copper	- -	--	- -	--	- -	GS	0.04	--	--	0.04
			Iron	- -	--	- -	--	- -	GS	0.04	--	--	0.04
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.002	--	--	0.002
			Mercury	- -	--	- -	--	- -	Autoimmune	0.009	--	--	0.009
			Nickel	- -	--	- -	--	- -	Body Weight	0.007	--	--	0.007
			Thallium	- -	--	- -	--	- -	NA	0.02	--	--	0.02
			Zinc	- -	--	- -	--	- -	Blood	0.002	--	--	0.002
			Chemical Total	6E-06	--	1E-06	--	7E-06		0.7	--	0.06	0.7
		Exposure Point Total						7E-06					0.7
	Exposure Medium Total							7E-06					0.7

ALTERNATE TABLE 9.4A.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil (Entire Site)	Air	OU7	Benzo(a)pyrene Equivalents	--	6E-13	--	--	6E-13	NA	--	--	--	--
			Aroclor-1248	--	4E-12	--	--	4E-12	NA	--	--	--	--
			Aroclor-1260	--	4E-13	--	--	4E-13	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	8E-12	--	--	8E-12	NA	--	0.00000007	--	0.00000007
			Antimony	--	- -	--	--	- -	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.000001	--	0.000001
			Cadmium	--	1E-12	--	--	1E-12	NA	--	0.0000006	--	0.0000006
			Cobalt	--	2E-11	--	--	2E-11	Respiratory	--	0.000006	--	0.000006
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Manganese	--	- -	--	--	- -	CNS	--	0.00004	--	0.00004
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.0000007	--	0.0000007
			Nickel	--	2E-11	--	--	2E-11	Respiratory	--	0.00001	--	0.00001
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Zinc	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	6E-11	--	--	6E-11		- -	0.00006	- -	0.00006
		Exposure Point Total						6E-11					0.00006
	Exposure Medium Total							6E-11					0.00006
Medium Total								7E-06					0.7
Sediment	Sediment	OU7	Benzo(a)pyrene Equivalents	2E-08	--	1E-08	--	3E-08	NA	--	--	--	--
			TEQ PCB	2E-07	--	2E-08	--	2E-07	Developmental	0.02	--	0.002	0.02
			Total PCB Congeners	7E-10	--	3E-10	--	1E-09	NA	--	--	--	--
			Arsenic	2E-08	--	2E-09	--	2E-08	Skin, CVS	0.0006	--	0.00006	0.0006
			Chromium	- -	--	- -	--	- -	None Reported	0.000001	--	--	0.000001
			Iron	- -	--	- -	--	- -	GS	0.0008	--	--	0.0008
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.00004	--	--	0.00004
			Chemical Total	2E-07	--	3E-08	--	3E-07		0.02	--	0.002	0.02
		Exposure Point Total						3E-07					0.02
	Exposure Medium Total							3E-07					0.02
Medium Total								3E-07					0.02
Receptor Total							Receptor Risk Total	8E-06				Receptor HI Total	0.8

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.01
Total Blood HI	0.1
Total Body Weight HI	0.007
Total CNS HI	0.002
Total CVS HI	0.0006
Total Fetotoxicity HI	0.000003
Total GS HI	0.1
Total Kidney HI	0.0008
Total Respiratory HI	0.00002
Total None Reported HI	0.000001
Total Skin HI	0.0006
Total Thyroid HI	0.01
Total NA HI	0.1
Total Developmental HI	0.4

ALTERNATE TABLE 9.4B.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Aroclor-1254	1E-08	--	5E-09	--	2E-08	Immune	0.004	--	0.002	0.006
			Chemical Total	1E-08	--	5E-09	--	2E-08		0.004	--	0.002	0.006
		Exposure Point Total						2E-08					0.006
	Exposure Medium Total							2E-08					0.006
	Air	OU7	Aroclor-1254	--	2E-14	--	--	2E-14	NA	--	--	--	--
			Chemical Total	--	2E-14	--	--	2E-14		- -	--	- -	--
		Exposure Point Total						2E-14					--
	Exposure Medium Total							2E-14					--
Medium Total								2E-08					0.006
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	1E-07	--	5E-08	--	2E-07	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.0008	--	--	0.0008
			Chemical Total	1E-07	--	5E-08	--	2E-07		0.0008	--	--	0.0008
		Exposure Point Total						2E-07					0.0008
	Exposure Medium Total							2E-07					0.0008
	Air	OU7	Benzo(a)pyrene Equivalents	--	1E-13	--	--	1E-13	NA	--	--	--	--
			Manganese	--	- -	--	--	- -	CNS	--	0.00002	--	0.00002
			Chemical Total	--	1E-13	--	--	1E-13		- -	0.00002	- -	0.00002
		Exposure Point Total						1E-13					0.00002
	Exposure Medium Total							1E-13					0.00002
Medium Total								2E-07					0.0008
Sediment	Sediment	OU7	Benzo(a)pyrene Equivalents	2E-08	--	1E-08	--	3E-08	NA	--	--	--	--
			TEQ PCB	2E-07	--	2E-08	--	2E-07	Developmental	0.02	--	0.002	0.02
			Total PCB Congeners	7E-10	--	3E-10	--	1E-09	NA	--	--	--	--
			Arsenic	2E-08	--	2E-09	--	2E-08	Skin, CVS	0.0006	--	0.00006	0.0006
			Chromium	- -	--	- -	--	- -	None Reported	0.000001	--	--	0.000001
			Iron	- -	--	- -	--	- -	GS	0.0008	--	--	0.0008
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.00004	--	--	0.00004
			Chemical Total	2E-07	--	3E-08	--	3E-07		0.02	--	0.002	0.02
		Exposure Point Total						3E-07					0.02
	Exposure Medium Total							3E-07					0.02
Medium Total								3E-07					0.02
Receptor Total							Receptor Risk Total	4E-07				Receptor HI Total	0.03

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

ALTERNATE TABLE 9.5A.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	1E-06	--	4E-07	--	1E-06
			Aroclor-1248	1E-07	--	4E-08	--	1E-07
			Barium	- -	--	- -	--	- -
			Copper	- -	--	- -	--	- -
			Iron	- -	--	- -	--	- -
			Lead	- -	--	- -	--	- -
			Mercury	- -	--	- -	--	- -
			Thallium	- -	--	- -	--	- -
			Chemical Total	1E-06	--	4E-07	--	2E-06
		Exposure Point Total						2E-06
	Exposure Medium Total							2E-06
	Air	OU7	Benzo(a)pyrene Equivalents	--	1E-12	--	--	1E-12
			Aroclor-1248	--	3E-13	--	--	3E-13
			Barium	--	- -	--	--	- -
			Copper	--	- -	--	--	- -
			Iron	--	- -	--	--	- -
			Lead	--	- -	--	--	- -
			Mercury	--	- -	--	--	- -
			Thallium	--	- -	--	--	- -
			Chemical Total	--	2E-12	--	--	2E-12
		Exposure Point Total						2E-12
	Exposure Medium Total							2E-12
Medium Total								2E-06

ALTERNATE TABLE 9.5A.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	6E-07	--	2E-07	--	8E-07
			Aroclor-1248	3E-06	--	1E-06	--	4E-06
			Aroclor-1260	3E-07	--	1E-07	--	4E-07
			2,3,7,8-TCDD Equivalents	6E-06	--	4E-07	--	7E-06
			Antimony	- -	--	- -	--	- -
			Barium	- -	--	- -	--	- -
			Cadmium	- -	--	- -	--	- -
			Cobalt	- -	--	- -	--	- -
			Copper	- -	--	- -	--	- -
			Iron	- -	--	- -	--	- -
			Lead	- -	--	- -	--	- -
			Manganese	- -	--	- -	--	- -
			Mercury	- -	--	- -	--	- -
			Nickel	- -	--	- -	--	- -
			Thallium	- -	--	- -	--	- -
			Zinc	- -	--	- -	--	- -
			Chemical Total	1E-05	--	2E-06	--	1E-05
		Exposure Point Total						1E-05
	Exposure Medium Total							1E-05

ALTERNATE TABLE 9.5A.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Subsurface Soil	Air	OU7	Benzo(a)pyrene Equivalents	--	8E-13	--	--	8E-13
			Aroclor-1248	--	9E-12	--	--	9E-12
			Aroclor-1260	--	1E-12	--	--	1E-12
			2,3,7,8-TCDD Equivalents	--	2E-11	--	--	2E-11
			Antimony	--	- -	--	--	- -
			Barium	--	- -	--	--	- -
			Cadmium	--	3E-12	--	--	3E-12
			Cobalt	--	5E-11	--	--	5E-11
			Copper	--	- -	--	--	- -
			Iron	--	- -	--	--	- -
			Lead	--	- -	--	--	- -
			Manganese	--	- -	--	--	- -
			Mercury	--	- -	--	--	- -
			Nickel	--	5E-11	--	--	5E-11
			Thallium	--	- -	--	--	- -
			Zinc	--	- -	--	--	- -
			Chemical Total	--	1E-10	--	--	1E-10
		Exposure Point Total						1E-10
	Exposure Medium Total							1E-10
Medium Total								1E-05

ALTERNATE TABLE 9.5A.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Sediment	Sediment	OU7	Benzo(a)pyrene Equivalents	3E-08	--	1E-08	--	4E-08
			TEQ PCB	3E-07	--	2E-08	--	4E-07
			Total PCB Congeners	1E-09	--	4E-10	--	2E-09
			Arsenic	4E-08	--	2E-09	--	4E-08
			Chromium	- -	--	- -	--	- -
			Iron	- -	--	- -	--	- -
			Lead	- -	--	- -	--	- -
			Manganese	- -	--	- -	--	- -
			Chemical Total	4E-07	--	4E-08	--	4E-07
		Exposure Point Total						4E-07
	Exposure Medium Total							4E-07
Medium Total								4E-07
Receptor Total							Receptor Risk Total	1E-05

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

ALTERNATE TABLE 9.5B.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Aroclor-1254	2E-08	--	7E-09	--	3E-08
			Chemical Total	2E-08	--	7E-09	--	3E-08
		Exposure Point Total						3E-08
	Exposure Medium Total							3E-08
	Air	OU7	Aroclor-1254	--	6E-14	--	--	6E-14
			Chemical Total	--	6E-14	--	--	6E-14
		Exposure Point Total						6E-14
	Exposure Medium Total							6E-14
Medium Total								3E-08
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	1E-07	--	5E-08	--	2E-07
			Manganese	- -	--	- -	--	- -
			Chemical Total	1E-07	--	5E-08	--	2E-07
		Exposure Point Total						2E-07
	Exposure Medium Total							2E-07
	Air	OU7	Benzo(a)pyrene Equivalents	--	2E-13	--	--	2E-13
			Manganese	--	- -	--	--	- -
			Chemical Total	--	2E-13	--	--	2E-13
		Exposure Point Total						2E-13
	Exposure Medium Total							2E-13
Medium Total								2E-07

ALTERNATE TABLE 9.5B.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Sediment	Sediment	OU7	Benzo(a)pyrene Equivalents	3E-08	--	1E-08	--	4E-08
			TEQ PCB	3E-07	--	2E-08	--	4E-07
			Total PCB Congeners	1E-09	--	4E-10	--	2E-09
			Arsenic	4E-08	--	2E-09	--	4E-08
			Chromium	- -	--	- -	--	- -
			Iron	- -	--	- -	--	- -
			Lead	- -	--	- -	--	- -
			Manganese	- -	--	- -	--	- -
			Chemical Total	4E-07	--	4E-08	--	4E-07
		Exposure Point Total						4E-07
	Exposure Medium Total							4E-07
Medium Total								4E-07
Receptor Total							Receptor Risk Total	7E-07

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 9.6A.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	9E-07	--	1E-07	--	1E-06	NA	--	--	--	--
			Aroclor-1248	1E-07	--	2E-08	--	2E-07	NA	--	--	--	--
			Barium	- -	--	- -	--	- -	Kidney	0.0008	--	--	0.0008
			Copper	- -	--	- -	--	- -	GS	0.01	--	--	0.01
			Iron	- -	--	- -	--	- -	GS	0.02	--	--	0.02
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Mercury	- -	--	- -	--	- -	Autoimmune	0.003	--	--	0.003
			Thallium	- -	--	- -	--	- -	NA	0.02	--	--	0.02
			Chemical Total	1E-06	--	2E-07	--	1E-06		0.06	--	--	0.06
		Exposure Point Total						1E-06					0.06
	Exposure Medium Total							1E-06					0.06
	Air	OU7	Benzo(a)pyrene Equivalents	--	2E-11	--	--	2E-11	NA	--	--	--	--
			Aroclor-1248	--	6E-12	--	--	6E-12	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.00005	--	0.00005
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.0000048	--	0.0000048
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	3E-11	--	--	3E-11		- -	0.00005	- -	0.00005
		Exposure Point Total						3E-11					0.00005
	Exposure Medium Total							3E-11					0.00005
Medium Total								1E-06					0.06
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	6E-07	--	9E-08	--	7E-07	NA	--	--	--	--
			Aroclor-1248	4E-06	--	6E-07	--	4E-06	NA	--	--	--	--
			Aroclor-1260	4E-07	--	7E-08	--	5E-07	NA	0.1	--	0.02	0.1
			2,3,7,8-TCDD Equivalents	8E-06	--	3E-07	--	8E-06	Developmental	0.6	--	0.02	0.6
			Antimony	- -	--	- -	--	- -	Blood	0.2	--	--	0.2
			Barium	- -	--	- -	--	- -	Kidney	0.0006	--	--	0.0006
			Cadmium	- -	--	- -	--	- -	NA	0.002	--	0.0001	0.002
			Cobalt	- -	--	- -	--	- -	Thyroid	0.02	--	--	0.02
			Copper	- -	--	- -	--	- -	GS	0.1	--	--	0.1
			Iron	- -	--	- -	--	- -	GS	0.06	--	--	0.06
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.003	--	--	0.003
			Mercury	- -	--	- -	--	- -	Autoimmune	0.01	--	--	0.01
			Nickel	- -	--	- -	--	- -	Body Weight	0.01	--	--	0.01
			Thallium	- -	--	- -	--	- -	NA	0.04	--	--	0.04
			Zinc	- -	--	- -	--	- -	Blood	0.004	--	--	0.004
			Chemical Total	1E-05	--	1E-06	--	1E-05		1	--	0.04	1
		Exposure Point Total						1E-05					1
	Exposure Medium Total							1E-05					1

TABLE 9.6A.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Air	OU7	Benzo(a)pyrene Equivalents	--	1E-11	--	--	1E-11	NA	--	--	--	--
			Aroclor-1248	--	2E-10	--	--	2E-10	NA	--	--	--	--
			Aroclor-1260	--	2E-11	--	--	2E-11	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	3E-10	--	--	3E-10	NA	--	0.000002	--	0.000002
			Antimony	--	- -	--	--	- -	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.00004	--	0.00004
			Cadmium	--	6E-11	--	--	6E-11	NA	--	0.00002	--	0.00002
			Cobalt	--	1E-09	--	--	1E-09	Respiratory	--	0.0002	--	0.0002
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Manganese	--	- -	--	--	- -	CNS	--	0.001	--	0.001
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.000021	--	0.000021
			Nickel	--	9E-10	--	--	9E-10	Respiratory	--	0.0004	--	0.0004
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Zinc	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	2E-09	--	--	2E-09		- -	0.002	- -	0.002
		Exposure Point Total						2E-09					0.002
	Exposure Medium Total							2E-09					0.002
Medium Total								1E-05					1
Receptor Total							Receptor Risk Total	1E-05				Receptor HI Total	1

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.02
Total Blood HI	0.2
Total Body Weight HI	0.01
Total CNS HI	0.005
Total Fetotoxicity HI	0.00008
Total GS HI	0.2
Total Kidney HI	0.001
Total Respiratory HI	0.0005
Total None Reported HI	0.0000
Total Thyroid HI	0.02
Total NA HI	0.2
Total Developmental HI	0.6

TABLE 9.6B.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Aroclor-1254	3E-08	--	4E-09	--	3E-08	Immune	0.006	--	0.001	0.007
			Chemical Total	3E-08	--	4E-09	--	3E-08		0.006	--	0.001	0.007
		Exposure Point Total						3E-08					0.007
	Exposure Medium Total							3E-08					0.007
	Air	OU7	Aroclor-1254	--	1E-12	--	--	1E-12	NA	--	--	--	--
			Chemical Total	--	1E-12	--	--	1E-12		- -	--	- -	--
		Exposure Point Total						1E-12					--
	Exposure Medium Total							1E-12					--
Medium Total								3E-08					0.007
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	1E-07	--	2E-08	--	2E-07	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.001	--	--	0.001
			Chemical Total	1E-07	--	2E-08	--	2E-07		0.001	--	--	0.001
		Exposure Point Total						2E-07					0.001
	Exposure Medium Total							2E-07					0.001
	Air	OU7	Benzo(a)pyrene Equivalents	--	3E-12	--	--	3E-12	NA	--	--	--	--
			Manganese	--	- -	--	--	- -	CNS	--	0.0006	--	0.0006
			Chemical Total	--	3E-12	--	--	3E-12		- -	0.0006	- -	0.0006
		Exposure Point Total						3E-12					0.0006
	Exposure Medium Total							3E-12					0.0006
Medium Total								2E-07					0.002
	Exposure Medium Total							3E-12					0.0006
Medium Total								2E-07					0.002
Receptor Total							Receptor Risk Total	2E-07				Receptor HI Total	0.009

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

ALTERNATE TABLE 9.7A.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	1E-05	--	2E-06	--	1E-05	NA	--	--	--	--
			Aroclor-1248	4E-07	--	6E-08	--	4E-07	NA	--	--	--	--
			Barium	- -	--	- -	--	- -	Kidney	0.007	--	--	0.007
			Copper	- -	--	- -	--	- -	GS	0.1	--	--	0.1
			Iron	- -	--	- -	--	- -	GS	0.2	--	--	0.2
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Mercury	- -	--	- -	--	- -	Autoimmune	0.03	--	--	0.03
			Thallium	- -	--	- -	--	- -	NA	0.2	--	--	0.2
			Chemical Total	1E-05	--	2E-06	--	1E-05		0.6	--	--	0.6
		Exposure Point Total						1E-05					0.6
	Exposure Medium Total							1E-05					0.6
	Air	OU7	Benzo(a)pyrene Equivalents	--	3E-11	--	--	3E-11	NA	--	--	--	--
			Aroclor-1248	--	2E-12	--	--	2E-12	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.00005	--	0.00005
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.0000048	--	0.0000048
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	3E-11	--	--	3E-11		- -	0.00005	- -	0.00005
		Exposure Point Total						3E-11					0.00005
	Exposure Medium Total							3E-11					0.00005
Medium Total								1E-05					0.6
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	6E-06	--	9E-07	--	7E-06	NA	--	--	--	--
			Aroclor-1248	1E-05	--	2E-06	--	1E-05	NA	--	--	--	--
			Aroclor-1260	1E-06	--	2E-07	--	1E-06	NA	1.0	--	0.2	1
			2,3,7,8-TCDD Equivalents	2E-05	--	7E-07	--	2E-05	Developmental	6	--	0.2	6
			Antimony	- -	--	- -	--	- -	Blood	2	--	--	2
			Barium	- -	--	- -	--	- -	Kidney	0.006	--	--	0.006
			Cadmium	- -	--	- -	--	- -	NA	0.02	--	0.0010	0.02
			Cobalt	- -	--	- -	--	- -	Thyroid	0.2	--	--	0.2
			Copper	- -	--	- -	--	- -	GS	1	--	--	1
			Iron	- -	--	- -	--	- -	GS	0.6	--	--	0.6
			Lead	- -	--	- -	--	- -	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.03	--	--	0.03
			Mercury	- -	--	- -	--	- -	Autoimmune	0.1	--	--	0.1
			Nickel	- -	--	- -	--	- -	Body Weight	0.1	--	--	0.1
			Thallium	- -	--	- -	--	- -	NA	0.4	--	--	0.4
			Zinc	- -	--	- -	--	- -	Blood	0.04	--	--	0.04
			Chemical Total	4E-05	--	3E-06	--	4E-05		11	--	0.3	11
		Exposure Point Total						4E-05					11
	Exposure Medium Total							4E-05					11

ALTERNATE TABLE 9.7A.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Air	OU7	Benzo(a)pyrene Equivalents	--	2E-11	--	--	2E-11	NA	--	--	--	--
			Aroclor-1248	--	5E-11	--	--	5E-11	NA	--	--	--	--
			Aroclor-1260	--	5E-12	--	--	5E-12	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	1E-10	--	--	1E-10	NA	--	0.000002	--	0.000002
			Antimony	--	- -	--	--	- -	NA	--	--	--	--
			Barium	--	- -	--	--	- -	Fetotoxicity	--	0.00004	--	0.00004
			Cadmium	--	2E-11	--	--	2E-11	NA	--	0.00002	--	0.00002
			Cobalt	--	3E-10	--	--	3E-10	Respiratory	--	0.0002	--	0.0002
			Copper	--	- -	--	--	- -	NA	--	--	--	--
			Iron	--	- -	--	--	- -	NA	--	--	--	--
			Lead	--	- -	--	--	- -	NA	--	--	--	--
			Manganese	--	- -	--	--	- -	CNS	--	0.001	--	0.001
			Mercury	--	- -	--	--	- -	CNS, Kidney	--	0.000021	--	0.000021
			Nickel	--	2E-10	--	--	2E-10	Respiratory	--	0.0004	--	0.0004
			Thallium	--	- -	--	--	- -	NA	--	--	--	--
			Zinc	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	7E-10	--	--	7E-10		- -	0.002	- -	0.002
		Exposure Point Total						7E-10					0.002
	Exposure Medium Total							7E-10					0.002
Medium Total								4E-05					11
Receptor Total							Receptor Risk Total	5E-05				Receptor HI Total	12

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.2
Total Blood HI	2
Total Body Weight HI	0.1
Total CNS HI	0.03
Total Fetotoxicity HI	0.00008
Total GS HI	2
Total Kidney HI	0.01
Total Respiratory HI	0.0005
Total None Reported HI	0.000
Total Thyroid HI	0.2
Total NA HI	2
Total Developmental HI	6

ALTERNATE TABLE 9.7B.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Aroclor-1254	7E-08	--	1E-08	--	8E-08	Immune	0.06	--	0.009	0.07
			Chemical Total	7E-08	--	1E-08	--	8E-08		0.06	--	0.009	0.07
		Exposure Point Total						8E-08					0.07
	Exposure Medium Total							8E-08					0.07
	Air	OU7	Aroclor-1254	--	3E-13	--	--	3E-13	NA	--	--	--	--
			Chemical Total	--	3E-13	--	--	3E-13		- -	--	- -	--
		Exposure Point Total						3E-13					--
	Exposure Medium Total							3E-13					--
Medium Total								8E-08					0.07
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	1E-06	--	2E-07	--	2E-06	NA	--	--	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.01	--	--	0.01
			Chemical Total	1E-06	--	2E-07	--	2E-06		0.01	--	--	0.01
		Exposure Point Total						2E-06					0.01
	Exposure Medium Total							2E-06					0.01
	Air	OU7	Benzo(a)pyrene Equivalents	--	3E-12	--	--	3E-12	NA	--	--	--	--
			Manganese	--	- -	--	--	- -	CNS	--	0.0006	--	0.0006
			Chemical Total	--	3E-12	--	--	3E-12		- -	0.0006	- -	0.0006
		Exposure Point Total						3E-12					0.0006
	Exposure Medium Total							3E-12					0.0006
Medium Total								2E-06					0.01
	Exposure Medium Total							3E-12					0.0006
Medium Total								2E-06					0.01
Receptor Total							Receptor Risk Total	2E-06				Receptor HI Total	0.08

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 9.8A.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	1E-05	--	2E-06	--	1E-05
			Aroclor-1248	5E-07	--	8E-08	--	6E-07
			Barium	- -	--	- -	--	- -
			Copper	- -	--	- -	--	- -
			Iron	- -	--	- -	--	- -
			Lead	- -	--	- -	--	- -
			Mercury	- -	--	- -	--	- -
			Thallium	- -	--	- -	--	- -
			Chemical Total	1E-05	--	2E-06	--	1E-05
		Exposure Point Total						1E-05
	Exposure Medium Total							1E-05
	Air	OU7	Benzo(a)pyrene Equivalents	--	5E-11	--	--	5E-11
			Aroclor-1248	--	8E-12	--	--	8E-12
			Barium	--	- -	--	--	- -
			Copper	--	- -	--	--	- -
			Iron	--	- -	--	--	- -
			Lead	--	- -	--	--	- -
			Mercury	--	- -	--	--	- -
			Thallium	--	- -	--	--	- -
			Chemical Total	--	5E-11	--	--	5E-11
		Exposure Point Total						5E-11
	Exposure Medium Total							5E-11
Medium Total								1E-05

TABLE 9.8A.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	7E-06	--	1E-06	--	8E-06
			Aroclor-1248	1E-05	--	2E-06	--	2E-05
			Aroclor-1260	2E-06	--	2E-07	--	2E-06
			2,3,7,8-TCDD Equivalents	3E-05	--	1E-06	--	3E-05
			Antimony	- -	--	- -	--	- -
			Barium	- -	--	- -	--	- -
			Cadmium	- -	--	- -	--	- -
			Cobalt	- -	--	- -	--	- -
			Copper	- -	--	- -	--	- -
			Iron	- -	--	- -	--	- -
			Lead	- -	--	- -	--	- -
			Manganese	- -	--	- -	--	- -
			Mercury	- -	--	- -	--	- -
			Nickel	- -	--	- -	--	- -
			Thallium	- -	--	- -	--	- -
			Zinc	- -	--	- -	--	- -
			Chemical Total	5E-05	--	4E-06	--	6E-05
		Exposure Point Total						6E-05
	Exposure Medium Total							6E-05

TABLE 9.8A.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Subsurface Soil	Air	OU7	Benzo(a)pyrene Equivalents	--	3E-11	--	--	3E-11
			Aroclor-1248	--	2E-10	--	--	2E-10
			Aroclor-1260	--	2E-11	--	--	2E-11
			2,3,7,8-TCDD Equivalents	--	4E-10	--	--	4E-10
			Antimony	--	- -	--	--	- -
			Barium	--	- -	--	--	- -
			Cadmium	--	8E-11	--	--	8E-11
			Cobalt	--	1E-09	--	--	1E-09
			Copper	--	- -	--	--	- -
			Iron	--	- -	--	--	- -
			Lead	--	- -	--	--	- -
			Manganese	--	- -	--	--	- -
			Mercury	--	- -	--	--	- -
			Nickel	--	1E-09	--	--	1E-09
			Thallium	--	- -	--	--	- -
			Zinc	--	- -	--	--	- -
			Chemical Total	--	3E-09	--	--	3E-09
		Exposure Point Total						3E-09
	Exposure Medium Total							3E-09
Medium Total								6E-05
Receptor Total							Receptor Risk Total	7E-05

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 9.8B.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
PORTSMOUTH NAVAL SHIPYARD OPERABLE UNIT 7 REMEDIAL INVESTIGATION

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Aroclor-1254	9E-08	--	1E-08	--	1E-07
			Chemical Total	9E-08	--	1E-08	--	1E-07
		Exposure Point Total						1E-07
	Exposure Medium Total							1E-07
	Air	OU7	Aroclor-1254	--	1E-12	--	--	1E-12
			Chemical Total	--	1E-12	--	--	1E-12
		Exposure Point Total						1E-12
	Exposure Medium Total							1E-12
Medium Total								1E-07
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	2E-06	--	2E-07	--	2E-06
			Manganese	- -	--	- -	--	- -
			Chemical Total	2E-06	--	2E-07	--	2E-06
		Exposure Point Total						2E-06
	Exposure Medium Total							2E-06
	Air	OU7	Benzo(a)pyrene Equivalents	--	6E-12	--	--	6E-12
			Manganese	--	- -			
			Chemical Total	--	6E-12	--	--	6E-12
		Exposure Point Total						6E-12
	Exposure Medium Total							6E-12
Medium Total								2E-06
Receptor Total							Receptor Risk Total	2E-06

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Appendix D.7.2

Recreational Exposure to Surface Water

TABLE 2.7
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - NEAR-SHORE WATER - RECREATIONAL USER - DIRECT CONTACT
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Near-shore Water
Exposure Medium: Near-shore Water

CAS Number	Chemical	Minimum Detected Concentration [1]	Maximum Detected Concentration [1]	Location of Maximum Concentration	Detection Frequency[2]	Range of Detection Limits[3]	Concentration Used for Screening[4]	PNS HHSL for Surface Water[5]	COPC	Rationale for Selection or Deletion[6]
Inorganics (ug/L)										
7429-90-5	ALUMINUM	1800	1800	TP-SW02	1/6	56.3-337	1800	130000 n	No	BSL
7440-39-3	BARIUM	10.2	21.6	OF-63	6/6	--	21.6	13000 n	No	BSL
7440-70-2	CALCIUM	312000	379000	OF-61	6/6	--	379000	N/A	No	NUT
7439-89-6	IRON	2910	2910	TP-SW02	1/6	52.5-369	2910	91000 n	No	BSL
7439-95-4	MAGNESIUM	836000	1090000	OF-61	6/6	--	1090000	N/A	No	NUT
7439-96-5	MANGANESE	32.1 J	32.1 J	TP-SW02	1/6	2-8.6	32.1	1100 n	No	BSL
7440-09-7	POTASSIUM	329000	407000	OF-61	6/6	--	407000	N/A	No	NUT
7440-21-3	SILICON	760 J	4490 J	TP-SW02	6/6	--	4490	N/A	No	NTX
7440-23-5	SODIUM	6550000	8460000	OF-61	6/6	--	8460000	N/A	No	NUT
7440-62-2	VANADIUM	5	5	TP-SW02	1/6	1.8-1.8	5	650 n	No	BSL
7440-66-6	ZINC	44 J	55.2 J	OF-61	4/6	34.5-35.9	55.2	40000 n	No	BSL
Filtered Inorganics (ug/L)										
7440-39-3	BARIUM	10.4	21.8	OF-63	6/6	--	21.8	13000 n	No	BSL
7440-70-2	CALCIUM	324000	378000	OF-61	6/6	--	378000	N/A	No	NUT
7439-95-4	MAGNESIUM	796000	1120000	OF-61	6/6	--	1120000	N/A	No	NUT
7440-09-7	POTASSIUM	333000	416000	OF-61	6/6	--	416000	N/A	No	NUT
7440-21-3	SILICON	715 J	1100 J	OF-63	6/6	--	1100	N/A	No	NTX
7440-23-5	SODIUM	6350000	8590000	OF-61	6/6	--	8590000	N/A	No	NUT
7440-66-6	ZINC	40.4	56.8	OF-61	3/6	25.9-32.6	56.8	40000 n	No	BSL

Shaded chemicals were selected as COPCs.
Shading of the maximum detected concentration indicates that it exceeded the screening criteria.

Notes:
1- Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
2 - Sample and duplicate are counted as one sample when determining frequency of detection.
3 - Values presented are sample-specific quantitation limits.
4 - The maximum detected concentration is used for screening purposes.
5 - Calculated screening levels for intertidal seep water (recreational users) based on USEPA risk assessment guidance (see text).
6 - Rationale Codes

Selection Reason:	Above Screening Levels (ASL)
Deletion Reason:	Essential Nutrient (NUT)
	Below Screening Level (BSL)
	No Toxicity Information (NTX)

Definitions:
COPC = Chemical Of Potential Concern
J = Estimated value
n = Noncarcinogen
N/A = Not Applicable/Not Available
PNS = Portsmouth Naval Shipyard
HHSL = Human Health Screening Level

Associated Samples:

TPOF600503	TPOF630503-F
TPOF600503-F	TPSW010503
TPOF610503	TPSW010503-F
TPOF610503-D	TPSW020503
TPOF610503-F	TPSW020503-F
TPOF610503-F-D	TPSW030503
TPOF630503	TPSW030503-F

TABLE 2.8
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - UNDILUTED SEEP WATER - RECREATIONAL USER DIRECT CONTACT
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Undiluted Seep Water
Exposure Medium: Undiluted Seep Water

CAS Number	Chemical	Minimum Detected Concentration [1]	Maximum Detected Concentration [1]	Location of Maximum Concentration	Detection Frequency[2]	Range of Detection Limits[3]	Concentration Used for Screening[4]	PNS HHSL for Surface Water[5]	COPC	Rationale for Selection or Deletion[6]
Semivolatile Organics (ng/L)										
92-52-4	1,1-BIPHENYL	3.1 J	3.1 J	1017	1/16	3.1-11	3.1	870000 n	No	BSL
90-12-0	1-METHYLNAPHTHALENE	1.8 J	15.9	1016	4/16	11.925-15.9	15.9	27000 c	No	BSL
832-69-9	1-METHYLPHENANTHRENE	0.1 J	16.7	1017	6/16	4.5-7.1	16.7	65000 n	No	BSL
2245-38-	2,3,5-TRIMETHYLNAPHTHALENE	2.9 J	2.9 J	1017	2/16	5.7-9.9	2.9	70000 n	No	BSL
581-42-0	2,6-DIMETHYLNAPHTHALENE	3.6 J	6.7	1017	2/16	5.7-6.4	6.7	180000 n	No	BSL
91-57-6	2-METHYLNAPHTHALENE	1.1 J	13.8	1017	4/16	8.7-29.4	13.8	59000 n	No	BSL
83-32-9	ACENAPHTHENE	0.2	5.5 J	1017	7/16	6-8.1	5.5	880000 n	No	BSL
208-96-8	ACENAPHTHYLENE	0.2 J	24	1020	8/16	8.3-8.3	24	720000 n	No	BSL
120-12-7	ANTHRACENE	0.4 J	45.2	1017	10/16	1.6-2.5	45.2	2400000 n	No	BSL
CALC055	BAP EQUIVALENT[7]	6.2019	241.26	1017	11/16	0.3-5.7	241.26	1100 c	No	BSL
56-55-3	BENZO(A)ANTHRACENE	0.1 J	176	1020	7/16	7-24.1	176	5000 c	No	BSL
50-32-8	BENZO(A)PYRENE	0.2 J	172	1017	10/16	0.3-5.7	172	500 c	No	BSL
205-99-2	BENZO(B)FLUORANTHENE	0.3 J	357	1017	8/16	1.9-13.6	357	5000 c	No	BSL
192-97-2	BENZO(E)PYRENE	0.2 J	120	1017	7/16	2.1-8.5	120	N/A	No	NTX
191-24-2	BENZO(G,H,I)PERYLENE	0.7 J	143	1017	7/16	4.6-8.2	143	16000 n	No	BSL
218-01-9	CHRYSENE	0.6 J	478	1020	9/16	1.2-74.6	478	500000 c	No	BSL
53-70-3	DIBENZO(A,H)ANTHRACENE	6.8 J	29.2	1017	3/16	9.5-23	29.2	500 c	No	BSL
206-44-0	FLUORANTHENE	1.7 J	272	1017	10/16	4.4-10.5	272	180000 n	No	BSL
86-73-7	FLUORENE	0.6 J	11.7	1017	5/16	4.2-12.3	11.7	460000 n	No	BSL
193-39-5	INDENO(1,2,3-CD)PYRENE	0.9 J	107	1017	8/16	7.4-18.4	107	5000 c	No	BSL
91-20-3	NAPHTHALENE	4 J	21.4	1017	3/16	6.6-22.6	21.4	530000 n	No	BSL
198-55-0	PERYLENE	0.3 J	47.7	1020	7/16	3.3-6.1	47.7	18000 n	No	BSL
85-01-8	PHENANTHRENE	28.7	135	1017	4/16	2.8-10.3	135	240000 n	No	BSL
129-00-0	PYRENE	0.7 J	229	1017	11/16	5.4-5.4	229	160000 n	No	BSL
Pesticides/PCBs (ng/L)										
789-02-6	2,4'-DDT	0.1 J	0.9 J	1017	4/16	0.3-3	0.9	23000 c	No	BSL
72-55-9	4,4'-DDE	0.1 J	2	1017	3/16	0.1-2.4	2	23000 c	No	BSL
50-29-3	4,4'-DDT	0.4 J	1.3 J	1018	3/16	0.7-3.7	1.3	23000 c	No	BSL
5103-71-9	ALPHA-CHLORDANE	0.1 J	0.2 J	1016,1017	6/16	0.1-3	0.2	1500 c	No	BSL
58-89-9	GAMMA-BHC (LINDANE)	0.1 J	0.1 J	1018	1/16	1.8-3	0.1	2100 c	No	BSL
76-44-8	HEPTACHLOR	0.1 J	1.2 J	1016	12/16	1.2-3	1.2	440 c	No	BSL
1024-57-3	HEPTACHLOR EPOXIDE	0.1 J	0.9 J	1016	7/16	2.8-3	0.9	77 c	No	BSL
118-74-1	HEXACHLOROBENZENE	0.1 J	0.1 J	1016, 1018, 1020	4/16	1.8-3.8	0.1	5000 c	No	BSL
2385-85-5	MIREX	0.1 J	10.9	1017	5/16	1.2-2.1	10.9	64 c	No	BSL
CALC062	TEQ PCB[8]	0.000006	0.00081	1017	5/16	0.00003-0.000066	0.00081	0.061 c[9]	No	BSL
CALC060	TOTAL PCB CONGENERS[10]	15.9	1027.5	1017	16/16	--	1027.5	4000 c[11]	No	BSL
39765-80-5	TRANS-NONACHLOR	0.1 J	0.2 J	1017	3/16	0.1-3	0.2	N/A	No	NTX

TABLE 2.8
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - UNDILUTED SEEP WATER - RECREATIONAL USER DIRECT CONTACT
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Undiluted Seep Water
Exposure Medium: Undiluted Seep Water

CAS Number	Chemical	Minimum Detected Concentration [1]	Maximum Detected Concentration [1]	Location of Maximum Concentration	Detection Frequency[2]	Range of Detection Limits[3]	Concentration Used for Screening[4]	PNS HHSL for Surface Water[5]	COPC	Rationale for Selection or Deletion[6]
Inorganics (ug/L)										
7429-90-5	ALUMINUM	5 J	343 J	1017	11/16	3-9.1	343	130000 n	No	BSL
7440-38-2	**ARSENIC**	5.2 J	11.7 J	1017	2/16	5-5	11.7	**4.9** c	Yes	ASL
7440-43-9	CADMIUM	0.2 J	0.9 J	1020	8/16	0.2-0.2	0.9	27 n	No	BSL
7440-47-3	**CHROMIUM**	1.2	68	1017	9/16	0.8-0.8	68	**57** n[12]	Yes	ASL
7440-50-8	COPPER	4.3	42.5 J	1017	16/16	--	42.5	5200 n	No	BSL
7439-89-6	IRON	20.4	2175 J	1017	16/16	--	2175	91000 n	No	BSL
7439-92-1	LEAD	3.2 J	9.3 J	1017	8/16	2.9-2.9	9.3	950 [13]	No	BSL
7439-96-5	MANGANESE	2.1	40	1017	15/16	0.9-0.9	40	1100 n	No	BSL
7440-02-0	NICKEL	9.3 J	103	1017	14/15	8-8	103	2000 n	No	BSL
7440-22-4	SILVER	0.6	1.4	1020	5/16	0.5-0.5	1.4	320 n	No	BSL
7440-66-6	ZINC	36.2	213 J	1020	13/16	64-92.5	213	40000 n	No	BSL
Filtered Inorganics (ug/L)										
7429-90-5	ALUMINUM	3.5	105.9	1017	10/16	3-3	105.9	130000 n	No	BSL
7440-38-2	**ARSENIC**	9.3 J	9.7	1017	2/16	5-5	9.7	**4.9** c	Yes	ASL
7440-43-9	CADMIUM	0.2 J	1	1016	14/16	0.2-0.2	1	27 n	No	BSL
7440-47-3	CHROMIUM	1	2.8 J	1016	7/16	0.8-0.8	2.8	57 n	No	BSL
7440-50-8	COPPER	4.5	32.2 J	1020	15/16	2.5-2.5	32.2	5200 n	No	BSL
7439-89-6	IRON	3.5	645	1016	14/16	3-3	645	91000 n	No	BSL
7439-92-1	LEAD	3.2 J	32.1 J	1016	5/16	2.9-2.9	32.1	950 [13]	No	BSL
7439-96-5	MANGANESE	1.1	29	1017	16/16	0.9-0.9	29	1100 n	No	BSL
7440-02-0	NICKEL	11.4	103	1017	14/15	8-8	103	2000 n	No	BSL
7440-22-4	SILVER	0.6 J	1.2 J	1016, 1020	4/16	0.5-0.5	1.2	320 n	No	BSL
7440-66-6	ZINC	18 J	214 J	1020	16/16	--	214	40000 n	No	BSL

Shaded chemicals were selected as COPCs.
Shading of the maximum detected concentration indicates that it exceeded the screening criteria.

Definitions:
c = Carcinogen
COPC = Chemical Of Potential Concern
J = Estimated value
n = Noncarcinogen
N/A = Not Applicable/Not Available

Notes:
1- Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
2 - Sample and duplicate are counted as one sample when determining frequency of detection.
3 - Values presented are sample-specific quantitation limits.
4 - The maximum detected concentration is used for screening purposes.
5 - Calculated screening levels for undiluted seep water for recreational users based on USEPA risk assessment guidance (see text).
6 - Rationale Codes

Selection Reason:	Above Screening Levels (ASL)
Deletion Reason:	Essential Nutrient (NUT)
	Below Screening Level (BSL)
	No Toxicity Information (NTX)

7 - See Appendix D.2 for methodology used in calculating BAP Equivalent results.
8 - See Appendix D.2 for example calculation and methodology used for calculating TEQ PCB.

TABLE 2.8
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - UNDILUTED SEEP WATER - RECREATIONAL USER DIRECT CONTACT
OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Undiluted Seep Water
Exposure Medium: Undiluted Seep Water

CAS Number	Chemical	Minimum Detected Concentration [1]	Maximum Detected Concentration [1]	Location of Maximum Concentration	Detection Frequency[2]	Range of Detection Limits[3]	Concentration Used for Screening[4]	PNS HHSL for Surface Water[5]	COPC	Rationale for Selection or Deletion[6]

9 - Value is for TCDD.
10 - See Appendix D.2 for example calculation and methodology used for calculating Total PCB Congeners.
11 - Value is based on PCB-high risk (CAS # 1336-36-3) toxicitiy information.
12 - Value is for hexavalent chromium.
13 - Calculated screening level for child resident using the IEUBK model. See text for further explanation.

Associated Samples:

BC-1016-SP-0497
BC-1016-SP-0897
BC-1016-SP-1197
BC-1016-SP-1197-D
BC-1016-SP-1197-F
BC-1016-SP-1197-F-D
BC-1016-SP-1296
BC-1016-SP-1296-F
BC-1017-SP-0497
BC-1017-SP-0897
BC-1017-SP-1197
BC-1017-SP-1197-F
BC-1017-SP-1296
BC-1017-SP-1296-F
BC-1018-SP-0497
BC-1018-SP-0897
BC-1018-SP-1197
BC-1018-SP-1197-F
BC-1018-SP-1296
BC-1018-SP-1296-D
BC-1018-SP-1296-F
BC-1018-SP-1296-F-D
BC-1020-SP-0497
BC-1020-SP-0897
BC-1020-SP-0897-D
BC-1020-SP-1197
BC-1020-SP-1197-F
BC-1020-SP-1296
BC-1020-SP-1296-F

TABLE 3.7.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Seep Water
Exposure Medium: Seep Water

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
OU7	Arsenic	ug/L	3.2	NA	11.7	11.7	ug/L	Maximum Concentration	(1)
	Chromium	ug/L	13.9	24.9 (G)	68	24.9	ug/L	95% KM (BCA) UCL	ProUCL

For non-detects, the sample quantitation limit was used as an input to ProUCL; for duplicate sample results, the average value was used in the calculation.

G = Gamma

1. The maximum concentration was used as the EPC because the dataset contained less than 10 samples for each of the COPCs. The UCL is not presented because there were less than three positive detections; therefore, meaningful statistics cannot be calculated.

Exposure point concentrations for the RME scenarios are also the exposure point concentrations for the CTE scenarios.

TABLE 4.16.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE - ADULT RECREATIONAL USERS - UNDILUTED SEEP WATER
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Undiluted Seep Water
Exposure Medium: Undiluted Seep Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Recreational User	Adult	OU7	CW	Chemical Concentration in Water	Max or 95% UCL	ug/L	USEPA, 2002	Chronic Daily Intake (CDI) (mg/kg/day) =
				CR	Contact Rate	0.05	L/hour	USEPA, 1989	
				CF	Conversion factor	0.001	ug/mg	- -	
				ET	Exposure Time	1	hours/event	(1)	CW x CF x CR x ET x EF x ED
				EF	Exposure Frequency	7	events/year	(1)	BW x AT
				ED1	Exposure Duration (Age 6 - 16)	10	years	(2)(3)	
				ED2	Exposure Duration (Age 16 - 30)	14	years	(2)(3)	
				BW	Body Weight	70	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1989	
Dermal	Recreational User	Adult	OU7	DAevent	Absorbed dose per event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) =
				Cw	Chemical Concentration in Water	Max or 95% UCL	mg/kg	USEPA, 2002	
				FA	Fraction Absorbed	Chemical Specific	unitless	USEPA, 2004	DAevent x EV x EF x ED x SA
				CF	Conversion factor	0.001	L/cm^3	- -	BW x AT
				Kp	Permeability coefficient	Chemical Specific	cm/hr	USEPA, 2004	
				τ	Lag time	Chemical Specific	hr/event	USEPA, 2004	For inorganics
				t*	Time it takes to reach steady state	Chemical Specific	hr/event	USEPA, 2004	DAevent = Kp x CW x CF x tevent
				tevent	Duration of event	1	hr/event	(1)	
				B	Bunge model constant	Chemical Specific	unitless	USEPA, 2004	For organics if tevent <= t*
				SA	Skin Surface Available for Contact	3,600	cm2	(4), USEPA, 2004	DAevent= 2 x FA x Kp x Cw x CF x sqrt[(6 x τ x tevent)/pi]
				EV	Event Frequency	1	events/day	(1)	
				EF	Exposure Frequency	7	days/year	(1)	For organics if tevent > t*
				ED1	Exposure Duration (Age 6 - 16)	10	years	(2)(3)	DAevent =FA x Kp x Cw x CF x [tevent/(1+B) +
				ED2	Exposure Duration (Age 16 - 30)	14	years	(2)(3)	2 x τ +(1 + 3B + $3B^2$)/(1+B^2)
				BW	Body Weight	70	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1989	

Notes:
1 - Professional judgement.
2 - Same as adult resident exposures.
3 - Adults were evaluated as one age group (7 - 30 years) for non-mutagenic chemicals. For chemicals that act via the mutagenic mode of action, recreational adults were evaluated as two age groups, 7 - 16 years and 16 - 30 years in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).
4 - Assumes lower legs and feet are exposed.

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.
USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.
USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.
USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Ingestion Intake = (CR x CF x ET x EF x ED)/(BW x AT)
Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake (Age 6 - 30) = 4.70E-09 Cancer Dermal Intake (Age 6 - 30) = 3.38E-01

Mutagenic Chemicals

Cancer Ingestion Intake (Age 6 - 16) = 1.96E-09 Cancer Dermal Intake (Age 6 - 16) = 1.41E-01
Cancer Ingestion Intake (Age 16 - 30) = 2.74E-09 Cancer Dermal Intake (Age 16 - 30) = 1.97E-01

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 1.37E-08 Noncancer Dermal Intake = 9.86E-01

Cancer risk from ingestion = Surface Water concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor
Cancer risk from dermal contact = Surface Water concentration x Cancer Dermal Intake x DAevent x Dermal Cancer Slope Factor
Hazard Index from ingestion = Surface Water concentration x Noncancer Ingestion Intake / Oral Reference Dose
Hazard Index from dermal contact = Surface Water concentration x Noncancer Dermal Intake x DAevent / Dermal Reference Dose

TABLE 4.16.CTE

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURES - ADULT RECREATIONAL USERS - UNDILUTED SEEP WATER

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Undiluted Seep Water
Exposure Medium: Undiluted Seep Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Recreational User	Adult	OU7	CW	Chemical Concentration in Water	Max or 95% UCL	ug/L	USEPA, 2002	Chronic Daily Intake (CDI) (mg/kg/day) =
				CR	Contact Rate	0.05	L/hour	USEPA, 1989	
				CF	Conversion factor	0.001	ug/mg	- -	
				ET	Exposure Time	0.5	hours/event	(1)	CW x CF x CR x ET x EF x ED
				EF	Exposure Frequency	4	events/year	(1)	BW x AT
				ED	Exposure Duration	7	years	(2)	
				BW	Body Weight	70	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,555	days	USEPA, 1989	
Dermal	Recreational User	Adult	OU7	DAevent	Absorbed dose per event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) =
				Cw	Chemical Concentration in Water	Max or 95% UCL	mg/kg	USEPA, 2002	
				FA	Fraction Absorbed	Chemical Specific	unitless	USEPA, 2004	DAevent x EV x EF x ED x SA
				CF	Conversion factor	0.001	L/cm^3	- -	BW x AT
				Kp	Permeability coefficient	Chemical Specific	cm/hr	USEPA, 2004	
				τ	Lag time	Chemical Specific	hr/event	USEPA, 2004	For inorganics
				t*	Time it takes to reach steady state	Chemical Specific	hr/event	USEPA, 2004	DAevent = Kp x CW x CF x tevent
				tevent	Duration of event	0.5	hr/event	(1)	
				B	Bunge model constant	Chemical Specific	unitless	USEPA, 2004	
				SA	Skin Surface Available for Contact	3,600	cm2	(3), USEPA, 2004	DAevent= 2 x FA x Kp x Cw x CF x sqrt[(6 x τ x tevent)/pi]
				EV	Event Frequency	1	events/day	(1)	For organics if tevent <= t*
				EF	Exposure Frequency	4	days/year	(1)	
				ED	Exposure Duration	7	years	(2)	For organics if tevent > t*
				BW	Body Weight	70	kg	USEPA, 1997	DAevent =FA x Kp x Cw x CF x [tevent/(1+B) +
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	2 x τ +(1 + 3B + $3B^2$)/(1+B^2)
				AT-N	Averaging Time (Non-Cancer)	2,555	days	USEPA, 1989	

Notes:

1 - Professional judgement.

2 - Same as proposed adult resident exposures to groundwater in the work plan.

3 - Assumes lower legs and feet are exposed.

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Ingestion Intake = (CR x CF x ET x EF x ED)/(BW x AT)

Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Cancer Ingestion Intake =	3.91E-10	Cancer Dermal Intake =	5.64E-02
Noncancer Ingestion Intake =	3.91E-09	Noncancer Dermal Intake =	5.64E-01

Cancer risk from ingestion = Surface Water concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Surface Water concentration x Cancer Dermal Intake x DAevent x Dermal Cancer Slope Factor

Hazard Index from ingestion = Surface Water concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Surface Water concentration x Noncancer Dermal Intake x DAevent / Dermal Reference Dose

TABLE 4.17.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE - ADOLESCENT RECREATIONAL USERS - UNDILUTED SEEP WATER
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Undiluted Seep Water
Exposure Medium: Undiluted Seep Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Recreational User	Adolescent	OU7	CW	Chemical Concentration in Water	Max or 95% UCL	ug/L	USEPA, 2002	Chronic Daily Intake (CDI) (mg/kg/day) =
				CR	Contact Rate	0.05	L/hour	USEPA, 1989	
				CF	Conversion factor	0.001	ug/mg	- -	
				ET	Exposure Time	1	hours/event	(1)	CW x CF x CR x ET x EF x ED
				EF	Exposure Frequency	7	events/year	(1)	BW x AT
				ED	Exposure Duration (Age 6 - 16)	10	years	(2), USEPA, 1989, 2005	
				BW	Body Weight	45	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,650	days	USEPA, 1989	
Dermal	Recreational User	Adolescent	OU7	DAevent	Absorbed dose per event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) =
				Cw	Chemical Concentration in Water	Max or 95% UCL	mg/kg	USEPA, 2002	
				FA	Fraction Absorbed	Chemical Specific	unitless	USEPA, 2004	DAevent x EV x EF x ED x SA
				CF	Conversion factor	0.001	L/cm^3	- -	BW x AT
				Kp	Permeability coefficient	Chemical Specific	cm/hr	USEPA, 2004	
				τ	Lag time	Chemical Specific	hr/event	USEPA, 2004	For inorganics
				t*	Time it takes to reach steady state	Chemical Specific	hr/event	USEPA, 2004	DAevent = Kp x CW x CF x tevent
				tevent	Duration of event	1	hr/event	(1)	
				B	Bunge model constant	Chemical Specific	unitless	USEPA, 2004	For organics if tevent <= t*
				SA	Skin Surface Available for Contact	2,600	cm2	(3), USEPA, 2004	DAevent= 2 x FA x Kp x Cw x CF x sqrt[(6 x τ x tevent)/pi]
				EV	Event Frequency	1	events/day	(1)	
				EF	Exposure Frequency	7	days/year	(1)	For organics if tevent > t*
				ED	Exposure Duration (Age 6 - 16)	10	years	(2), USEPA, 1989, 2005	DAevent =FA x Kp x Cw x CF x [tevent/(1+B) + 2 x τ +(1 + 3B + $3B^2$)/(1+B^2)
				BW	Body Weight	45	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,650	days	USEPA, 1989	

Notes:
1 - Professional judgement.
2 - For chemicals that act via the mutagenic mode of action the intake will be multiplied by the appropriate age-dependent adjustment factor in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).
3 - Assumes lower legs and feet are exposed.

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.
USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.
USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.
USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Ingestion Intake = (CR x CF x ET x EF x ED)/(BW x AT)

Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake (Age 6 - 30) = 3.04E-09 Cancer Dermal Intake (Age 6 - 30) = 1.58E-01

Mutagenic Chemicals

Cancer Ingestion Intake (Age 6 - 16) = 3.04E-09 Cancer Dermal Intake (Age 6 - 16) = 1.58E-01

Cancer Ingestion Intake (Age 16 - 30) = 0.00E+00 Cancer Dermal Intake (Age 16 - 30) = 0.00E+00

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 2.13E-08 Noncancer Dermal Intake = 1.11E+00

Cancer risk from ingestion = Surface Water concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Surface Water concentration x Cancer Dermal Intake x DAevent x Dermal Cancer Slope Factor

Hazard Index from ingestion = Surface Water concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Surface Water concentration x Noncancer Dermal Intake x DAevent / Dermal Reference Dose

TABLE 4.17.CTE

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURES - ADOLESCENT RECREATIONAL USERS - UNDILUTED SEEP WATER

PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Medium: Undiluted Seep Water
Exposure Medium: Undiluted Seep Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Recreational User	Adolescent	OU7	CW	Chemical Concentration in Water	Max or 95% UCL	ug/L	USEPA, 2002	Chronic Daily Intake (CDI) (mg/kg/day) =
				CR	Contact Rate	0.05	L/hour	USEPA, 1989	
				CF	Conversion factor	0.001	ug/mg	- -	
				ET	Exposure Time	0.5	hours/event	(1)	CW x CF x CR x ET x EF x ED
				EF	Exposure Frequency	4	events/year	(1)	BW x AT
				ED	Exposure Duration	5	years	(1) 1/2 RME	
				BW	Body Weight	45	kg	USEPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	1,825	days	USEPA, 1989	
Dermal	Recreational User	Adolescent	OU7	DAevent	Absorbed dose per event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) =
				Cw	Chemical Concentration in Water	Max or 95% UCL	mg/kg	USEPA, 2002	
				FA	Fraction Absorbed	Chemical Specific	unitless	USEPA, 2004	DAevent x EV x EF x ED x SA
				CF	Conversion factor	0.001	L/cm^3	- -	BW x AT
				Kp	Permeability coefficient	Chemical Specific	cm/hr	USEPA, 2004	
				τ	Lag time	Chemical Specific	hr/event	USEPA, 2004	For inorganics
				t*	Time it takes to reach steady state	Chemical Specific	hr/event	USEPA, 2004	DAevent = Kp x CW x CF x tevent
				tevent	Duration of event	0.5	hr/event	(1)	
				B	Bunge model constant	Chemical Specific	unitless	USEPA, 2004	
				SA	Skin Surface Available for Contact	2,600	cm2	(2)	DAevent= 2 x FA x Kp x Cw x CF x sqrt[(6 x τ x tevent)/pi]
				EV	Event Frequency	1	events/day	(1)	For organics if tevent <= t*
				EF	Exposure Frequency	4	days/year	(1)	
				ED	Exposure Duration	5	years	(1) 1/2 RME	For organics if tevent > t*
				BW	Body Weight	45	kg	USEPA, 1997	DAevent =FA x Kp x Cw x CF x [tevent/(1+B) +
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	2 x τ +(1 + 3B + $3B^2$)/(1+B^2)
				AT-N	Averaging Time (Non-Cancer)	1,825	days	USEPA, 1989	

Notes:

1 - Professional judgement.

2 - Assumes lower legs and feet are exposed.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Ingestion Intake = (CR x CF x ET x EF x ED)/(BW x AT)

Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 4.35E-10 Cancer Dermal Intake = 4.52E-02

Noncancer Ingestion Intake = 6.09E-09 Noncancer Dermal Intake = 6.33E-01

Cancer risk from ingestion = Surface Water concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Surface Water concentration x Cancer Dermal Intake x DAevent x Dermal Cancer Slope Factor

Hazard Index from ingestion = Surface Water concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Surface Water concentration x Noncancer Dermal Intake x DAevent / Dermal Reference Dose

TABLE 7.7.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Recreational Users
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Seep Water	Seep Water	OU7	Ingestion	Arsenic	11.7	ug/L	3.6E-08	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	5.3E-08	2.5E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0008
				Chromium	24.9	ug/L	7.6E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	5.3E-07	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.0000004
			Exp. Route Total								5.3E-08					0.0008
			Dermal	Arsenic	11.7	ug/L	1.9E-09	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	2.8E-09	1.3E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.00004
				Chromium	24.9	ug/L	7.9E-09	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	5.5E-08	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.000003
			Exp. Route Total								2.8E-09					0.00005
		Exposure Point Total									5.6E-08					0.0009
	Exposure Medium Total										5.6E-08					0.0009
Medium Total											5.6E-08					0.0009
Total of Receptor Risks Across All Media											5.6E-08	Total of Receptor Hazards Across All Media				0.0009

TABLE 7.7.CTE

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Recreational Users
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Seep Water	Seep Water	OU7	Ingestion	Arsenic	11.7	ug/L	5.1E-09	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	7.6E-09	7.1E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0002
				Chromium	24.9	ug/L	1.1E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.5E-07	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.00000010
			Exp. Route Total								7.6E-09					0.0002
			Dermal	Arsenic	11.7	ug/L	2.6E-10	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	4.0E-10	3.7E-09	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.00001
				Chromium	24.9	ug/L	1.1E-09	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.6E-08	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0000008
			Exp. Route Total								4.0E-10					0.00001
		Exposure Point Total									8.0E-09					0.0003
	Exposure Medium Total										8.0E-09					0.0003
Medium Total											8.0E-09					0.0003
Total of Receptor Risks Across All Media											8.0E-09	Total of Receptor Hazards Across All Media				0.0003

TABLE 7.8.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Recreational Users
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Seep Water	Seep Water	OU7	Ingestion	Arsenic	11.7	ug/L	5.5E-08	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	8.2E-08	1.6E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0005
				Chromium	24.9	ug/L	1.2E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.4E-07	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.0000002
			Exp. Route Total								8.2E-08					0.0005
			Dermal	Arsenic	11.7	ug/L	4.0E-09	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	5.9E-09	1.2E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.00004
				Chromium	24.9	ug/L	1.7E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.9E-08	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.000003
			Exp. Route Total								5.9E-09					0.00004
		Exposure Point Total									8.8E-08					0.0006
	Exposure Medium Total										8.8E-08					0.0006
Medium Total											8.8E-08					0.0006
Total of Receptor Risks Across All Media											8.8E-08	Total of Receptor Hazards Across All Media				0.0006

TABLE 7.8.CTE

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Recreational Users
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Seep Water	Seep Water	OU7	Ingestion	Arsenic	11.7	ug/L	4.6E-09	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	6.9E-09	4.6E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0002
				Chromium	24.9	ug/L	9.7E-09	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	9.7E-08	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.00000006
			Exp. Route Total								6.9E-09					0.0002
			Dermal	Arsenic	11.7	ug/L	3.3E-10	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	4.9E-10	3.3E-09	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.00001
				Chromium	24.9	ug/L	1.4E-09	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	1.4E-08	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0000007
			Exp. Route Total								4.9E-10					0.00001
		Exposure Point Total									7.4E-09					0.0002
	Exposure Medium Total										7.4E-09					0.0002
Medium Total											7.4E-09					0.0002
Total of Receptor Risks Across All Media											7.4E-09	Total of Receptor Hazards Across All Media				0.0002

TABLE 9.9.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Recreational Users
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Seep Water	Seep Water	OU7	Arsenic	5E-08	--	3E-09	--	6E-08	Skin, CVS	0.0008	- -	0.00004	0.0009
			Chromium	- -	--	- -	--	- -	Fetotoxicity, GS, Bone	0.0000004	- -	0.000003	0.000003
			Chemical Total	5E-08	--	3E-09	--	6E-08		0.0008	- -	0.00005	0.0009
		Exposure Point Total						6E-08					0.0009
	Exposure Medium Total							6E-08					0.0009
Medium Total								6E-08					0.0009
Receptor Total							Receptor Risk Total	6E-08				Receptor HI Total	0.0009

Total CVS HI	0.0009
Total GS HI	0.000003
Total Skin HI	0.0009
Total Fetotoxicity HI	0.000003
Total Bone HI	0.000003

TABLE 9.9.CTE

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Recreational Users
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Seep Water	Seep Water	OU7	Arsenic	8E-09	--	4E-10	--	8E-09	Skin, CVS	0.0002	- -	0.00001	0.0002
			Chromium	- -	--	- -	--	- -	Fetotoxicity, GS, Bone	0.00000010	- -	0.0000008	0.0000009
			Chemical Total	8E-09	--	4E-10	--	8E-09		0.0002	- -	0.00001	0.0003
		Exposure Point Total						8E-09					0.0003
	Exposure Medium Total							8E-09					0.0003
Medium Total								8E-09					0.0003
Receptor Total							Receptor Risk Total	8E-09				Receptor HI Total	0.0003

Total CVS HI	0.0002
Total GS HI	0.0000009
Total Skin HI	0.0002
Total Fetotoxicity HI	0.0000009
Total Bone HI	0.0000009

TABLE 9.10.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Recreational Users
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Seep Water	Seep Water	OU7	Arsenic	8E-08	--	6E-09	--	9E-08	Skin, CVS	0.0005	- -	0.00004	0.0006
			Chromium	- -	--	- -	--	- -	Fetotoxicity, GS, Bone	0.0000002	- -	0.000003	0.000003
			Chemical Total	8E-08	--	6E-09	--	9E-08		0.0005	- -	0.00004	0.0006
		Exposure Point Total						9E-08					0.0006
	Exposure Medium Total							9E-08					0.0006
Medium Total								9E-08					0.0006
Receptor Total							Receptor Risk Total	9E-08				Receptor HI Total	0.0006

Total CVS HI	0.0006
Total GS HI	0.000003
Total Skin HI	0.0006
Total Fetotoxicity HI	0.000003
Total Bone HI	0.000003

TABLE 9.10.CTE

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Recreational Users
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Seep Water	Seep Water	OU7	Arsenic	7E-09	--	5E-10	--	7E-09	Skin, CVS	0.0002	- -	0.00001	0.0002
			Chromium	- -	--	- -	--	- -	Fetotoxicity, GS, Bone	0.00000006	- -	0.0000007	0.0000008
			Chemical Total	7E-09	--	5E-10	--	7E-09		0.0002	- -	0.00001	0.0002
		Exposure Point Total						7E-09					0.0002
	Exposure Medium Total							7E-09					0.0002
Medium Total								7E-09					0.0002
Receptor Total							Receptor Risk Total	7E-09				Receptor HI Total	0.0002

Total CVS HI	0.0002
Total GS HI	0.0000008
Total Skin HI	0.0002
Total Fetotoxicity HI	0.0000008
Total Bone HI	0.0000008

	General UCL Statistics for Data Sets with Non-Detects
User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics			
Number of Valid Data	16	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	14
Number of Missing Values	8	Percent Non-Detects	87.50%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	5.2	Minimum Detected	1.649
Maximum Detected	11.7	Maximum Detected	2.46
Mean of Detected	8.45	Mean of Detected	2.054
SD of Detected	4.596	SD of Detected	0.573
Minimum Non-Detect	5	Minimum Non-Detect	1.609
Maximum Non-Detect	5	Maximum Non-Detect	1.609

Warning: Data set has only 2 Distinct Detected Values.

This may not be adequate enough to compute meaningful and reliable test statistics and estimates.

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	3.244	Mean	1.059
SD	2.353	SD	0.416
95% DL/2 (t) UCL	4.275	95% H-Stat (DL/2) UCL	3.882

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% t UCL	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A
		95% H-UCL	N/A
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	5.606
5% K-S Critical Value	N/A	SD	1.573
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.556
		95% KM (t) UCL	6.581
Assuming Gamma Distribution		95% KM (z) UCL	6.521
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	N/A
Minimum	N/A	95% KM (bootstrap t) UCL	N/A
Maximum	N/A	95% KM (BCA) UCL	N/A
Mean	N/A	95% KM (Percentile Bootstrap) UCL	N/A
Median	N/A	95% KM (Chebyshev) UCL	8.031
SD	N/A	97.5% KM (Chebyshev) UCL	9.08
k star	N/A	99% KM (Chebyshev) UCL	11.14
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (t) UCL	6.581
95% Gamma Approximate UCL	N/A	95% KM (% Bootstrap) UCL	N/A
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Data	16	Number of Detected Data	9
Number of Distinct Detected Data	9	Number of Non-Detect Data	7
Number of Missing Values	8	Percent Non-Detects	43.75%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.2	Minimum Detected	0.182
Maximum Detected	68	Maximum Detected	4.22
Mean of Detected	24.31	Mean of Detected	2.388
SD of Detected	26.42	SD of Detected	1.529
Minimum Non-Detect	0.8	Minimum Non-Detect	-0.223
Maximum Non-Detect	0.8	Maximum Non-Detect	-0.223

Warning: There are only 9 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.821	Shapiro Wilk Test Statistic	0.917
5% Shapiro Wilk Critical Value	0.829	5% Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	13.85	Mean	0.942
SD	22.85	SD	2.028
95% DL/2 (t) UCL	23.86	95% H-Stat (DL/2) UCL	214.2
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	2.552	Mean in Log Scale	0.567
SD	33.64	SD in Log Scale	2.538
95% MLE (t) UCL	17.3	Mean in Original Scale	13.8
95% MLE (Tiku) UCL	19.65	SD in Original Scale	22.89
		95% t UCL	23.83
		95% Percentile Bootstrap UCL	23.4
		95% BCA Bootstrap UCL	26.26
		95% H UCL	1629
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.571	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	42.53		
nu star	10.29		
A-D Test Statistic	0.348	**Nonparametric Statistics**	
5% A-D Critical Value	0.752	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.752	Mean	14.2
5% K-S Critical Value	0.289	SD	21.92
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	5.812
		95% KM (t) UCL	24.39

Assuming Gamma Distribution		95% KM (z) UCL	23.76
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	23.97
Minimum	0.000001	95% KM (bootstrap t) UCL	34.18
Maximum	68	95% KM (BCA) UCL	24.85
Mean	13.67	95% KM (Percentile Bootstrap) UCL	24.04
Median	1.45	95% KM (Chebyshev) UCL	39.53
SD	22.96	97.5% KM (Chebyshev) UCL	50.49
k star	0.131	99% KM (Chebyshev) UCL	72.03
Theta star	104.5		
Nu star	4.185	**Potential UCLs to Use**	
AppChi2	0.796	95% KM (BCA) UCL	24.85
95% Gamma Approximate UCL	71.86		
95% Adjusted Gamma UCL	88.44		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

For additional insight, the user may want to consult a statistician.

Appendix D.7.3

Cumulative Human Health Risks

APPENDIX D.7.3
CUMULATIVE HUMAN HEALTH RISKS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

This appendix presents the cumulative human health risks for site related and background chemicals at Operable Unit (OU) 7, Portsmouth Naval Shipyard, Kittery, Maine. Cumulative human health risks differ from site-specific risks in that cumulative risks include risks from those chemicals with concentrations considered to be reflective of site background whereas the site-specific risks do not. The cumulative site risks are included in this appendix in response to the April 8, 2011 technical discussion for resolution of Maine Department of Environmental Protection (MEDEP) comments on the draft OU7 Remedial Investigation (RI) Report. The meeting summary from the April 8, 2011 discussion is provided in Appendix E. The following provides an explanation on Navy policy regarding background.

Navy Policy on the Use of Background Chemical Levels (Department of Navy, 2004) is to:

1.) identify chemicals in the environment due to site releases;

2.) eliminate from consideration in risk assessments the naturally occurring and anthropogenic chemicals that are present at background levels;

3.) ensure documentation and discussion of potential risk from chemicals eliminated during the background evaluation process; and

4.) develop remediation action levels that are not below background.

Providing cumulative risks meets the MEDEP requirement in the Guidance for Human Health Risk Assessments for Hazardous Substance Sites in Maine (MEDEP, July 2009) which states in section 4 of that document that the MEDEP does not permit the exclusion of inorganic or organic compounds from human health risk assessments based on comparison to background. This appendix serves to fulfill part 3 of the Navy Policy on Background (Department of Navy, 2004) listed above and MEDEP risk assessment guidance (MEDEP, July 2009) which states that chemical concentrations cannot be screened out of a risk assessment due to background.

Cumulative human health risks were calculated in accordance with United States Environmental Protection Agency (EPA) Risk Assessment for Guidance for Superfund (RAGS) as described in Section 6.1 through 6.5.2 of this RI report. RAGS Part D tables for cumulative risks are included in this appendix following this text. The elevated risks noted when comparing cumulative risks (this appendix) to site-specific risks (Appendix D) are primarily due to arsenic, which is within PNS facility background (Appendix B.2)

LIST OF TABLES
RAGS PART D TABLE 7
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

Table No.

REASONABLE MAXIMUM EXPOSURES

7.1C.RME Construction Workers - Entire Site Surface/Subsurface Soil & Groundwater
7.2.C.RME Occupational Workers - Entire Site Surface Soil & Subsurface Soil
7.3.C.RME Adult Recreational Users - Entire Site Surface Soil & Sediment
7.4.C.RME Adolescent Recreational Users - Entire Site Surface Soil & Sediment
7.5.C.RME Adult Residents - Entire Site Surface Soil
7.6.C.RME Child Residents - Entire Site Surface Soil

CENTRAL TENDENCY EXPOSURES

7.1C.CTE Construction Workers - Entire Site Surface/Subsurface Soil & Groundwater
7.2.C.CTE Occupational Workers - Entire Site Surface Soil & Subsurface Soil
7.3.C.CTE Adult Recreational Users - Entire Site Surface Soil & Sediment
7.4.C.CTE Adolescent Recreational Users - Entire Site Surface Soil & Sediment
7.5.C.CTE Adult Residents - Entire Site Surface Soil
7.6.C.CTE Child Residents - Entire Site Surface Soil

TABLE 7.1.C.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Constructon Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.80	mg/kg	5.0E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	3.6E-07	3.5E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	1.2E-5	mg/kg	3.3E-13	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	4.3E-08	2.3E-11	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.02
				Aroclor-1248	1.50	mg/kg	4.2E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	8.3E-08	2.9E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.110	mg/kg	3.0E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	6.1E-09	2.1E-07	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.01
				Aluminum	12,800	mg/kg	3.5E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	2.5E-02	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.02
				Antimony	2.00	mg/kg	5.5E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	3.9E-06	(mg/kg/day)	4.0E-04	(mg/kg/day)	0.010
				Arsenic	20.6	mg/kg	5.7E-07	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	8.6E-07	4.0E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.1
				Barium	335	mg/kg	9.3E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	6.5E-04	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.003
				Cadmium	1.80	mg/kg	5.0E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	3.5E-06	(mg/kg/day)	5.0E-04	(mg/kg/day)	0.007
				Cobalt	10.4	mg/kg	2.9E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	2.0E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.07
				Chromium	62.2	mg/kg	1.7E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	1.2E-04	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.00
				Copper	1,030	mg/kg	2.9E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	2.0E-03	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.05
				Iron	34,200	mg/kg	9.5E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	6.6E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.09
				Lead	2,140	mg/kg	5.9E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	4.1E-03	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	386	mg/kg	1.1E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	7.5E-04	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.03
				Mercury	2.10	mg/kg	5.8E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	4.1E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.01
				Thallium	0.480	mg/kg	1.3E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	9.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	43.7	mg/kg	1.2E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	8.5E-05	(mg/kg/day)	5.0E-03	(mg/kg/day)	0.02
			Exp. Route Total								1.4E-06					0.5
			Dermal	Benzo(a)pyrene Equivalents	1.80	mg/kg	1.9E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.4E-07	1.4E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	1.2E-5	mg/kg	3.0E-14	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	3.9E-09	2.1E-12	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.002
				Aroclor-1248	1.50	mg/kg	1.7E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	3.5E-08	1.2E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.110	mg/kg	1.3E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.6E-09	9.0E-08	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.004
				Aluminum	12,800	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.00000
				Antimony	2.00	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	6.0E-05	(mg/kg/day)	0.0000
				Arsenic	20.6	mg/kg	5.1E-08	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	7.7E-08	3.6E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.01
				Barium	335	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	0.0000
				Cadmium	1.80	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	2.5E-05	(mg/kg/day)	0.0000
				Cobalt	10.4	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0000
				Chromium	62.2	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.000
				Copper	1,030	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.0000
				Iron	34,200	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0000
				Lead	2,140	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	386	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.000
				Mercury	2.10	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	0.0000
				Thallium	0.480	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	43.7	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	5.0E-03	(mg/kg/day)	0.00000
			Exp. Route Total								2.6E-07					0.02
		Exposure Point Total									1.6E-06					0.5
	Exposure Medium Total										1.6E-06					0.5
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.3E-6	mg/m^3	2.5E-09	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	2.7E-09	1.7E-07	(mg/m^3)	NA	(mg/m^3)	--
				2,3,7,8-TCDD Equivalents	8.4E-12	mg/m^3	1.6E-14	(mg/m^3)	3.8E+01	$(ug/m^3)^{-1}$	6.2E-10	1.1E-12	(mg/m^3)	4.0E-08	(mg/m^3)	0.00003
				Aroclor-1248	1.0E-6	mg/m^3	2.1E-09	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	1.2E-09	1.4E-07	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1254	7.7E-8	mg/m^3	1.5E-10	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	8.6E-11	1.1E-08	(mg/m^3)	NA	(mg/m^3)	--
				Aluminum	0.009	mg/m^3	1.8E-05	(mg/m^3)	NA	$(ug/m^3)^{-1}$	--	1.2E-03	(mg/m^3)	5.0E-03	(mg/m^3)	0.2

TABLE 7.1.C.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Constructon Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Air	OU7	Inhalation	Antimony	1.4E-6	mg/m^3	2.7E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	1.9E-07	(mg/m^3)	NA	(mg/m^3)	--
				Arsenic	1.4E-5	mg/m^3	2.8E-08	(mg/m^3)	4.3E-03	(ug/m^3)$^{-1}$	1.2E-07	2.0E-06	(mg/m^3)	1.5E-05	(mg/m^3)	0.1
				Barium	2.3E-4	mg/m^3	4.6E-07	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	3.2E-05	(mg/m^3)	5.0E-04	(mg/m^3)	0.06
				Cadmium	1.3E-6	mg/m^3	2.5E-09	(mg/m^3)	1.8E-03	(ug/m^3)$^{-1}$	4.4E-09	1.7E-07	(mg/m^3)	1.0E-05	(mg/m^3)	0.02
				Cobalt	7.3E-6	mg/m^3	1.4E-08	(mg/m^3)	9.0E-03	(ug/m^3)$^{-1}$	1.3E-07	1.0E-06	(mg/m^3)	6.0E-06	(mg/m^3)	0.2
				Chromium	4.3E-5	mg/m^3	8.5E-08	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	6.0E-06	(mg/m^3)	NA	(mg/m^3)	0.00
				Copper	7.2E-4	mg/m^3	1.4E-06	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	9.9E-05	(mg/m^3)	NA	(mg/m^3)	--
				Iron	0.024	mg/m^3	4.7E-05	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	3.3E-03	(mg/m^3)	NA	(mg/m^3)	--
				Lead	0.001	mg/m^3	2.9E-06	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	2.1E-04	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	2.7E-4	mg/m^3	5.3E-07	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	3.7E-05	(mg/m^3)	5.0E-05	(mg/m^3)	0.7
				Mercury	1.5E-6	mg/m^3	2.9E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	2.0E-07	(mg/m^3)	3.0E-05	(mg/m^3)	0.007
				Thallium	3.4E-7	mg/m^3	6.6E-10	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	4.6E-08	(mg/m^3)	NA	(mg/m^3)	--
				Vanadium	3.1E-5	mg/m^3	6.0E-08	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	4.2E-06	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								2.6E-07					1.4
		Exposure Point Total									2.6E-07					1.4
	Exposure Medium Total										2.6E-07					1.4
Medium Total											1.9E-06					1.9
Subsurface Soil	Subsurface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.10	mg/kg	3.0E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	2.2E-07	2.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	0.001	mg/kg	3.6E-11	(mg/kg/day)	1.3E+05	(mg/kg/day)$^{-1}$	4.7E-06	2.5E-09	(mg/kg/day)	1.0E-09	(mg/kg/day)	2.5
				Aroclor-1248	41.0	mg/kg	1.1E-06	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	2.3E-06	7.9E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.200	mg/kg	5.5E-09	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	1.1E-08	3.9E-07	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.02
				Aroclor-1260	4.60	mg/kg	1.3E-07	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	2.5E-07	8.9E-06	(mg/kg/day)	2.0E-05	(mg/kg/day)	--
				Dieldrin	0.160	mg/kg	4.4E-09	(mg/kg/day)	1.6E+01	(mg/kg/day)$^{-1}$	7.1E-08	3.1E-07	(mg/kg/day)	5.0E-05	(mg/kg/day)	0.006
				Aluminum	11,600	mg/kg	3.2E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	2.2E-02	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.02
				Antimony	182	mg/kg	5.0E-06	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	3.5E-04	(mg/kg/day)	4.0E-04	(mg/kg/day)	0.9
				Arsenic	18.0	mg/kg	5.0E-07	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	7.5E-07	3.5E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.1
				Barium	280	mg/kg	7.7E-06	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	5.4E-04	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.003
				Cadmium	5.10	mg/kg	1.4E-07	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	9.9E-06	(mg/kg/day)	5.0E-04	(mg/kg/day)	0.02
				Chromium	290	mg/kg	8.0E-06	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	5.6E-04	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.0
				Cobalt	15.9	mg/kg	4.4E-07	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	3.1E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.1
				Copper	6,020	mg/kg	1.7E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.2E-02	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.3
				Iron	97,100	mg/kg	2.7E-03	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.9E-01	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.3
				Lead	5,630	mg/kg	1.6E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.1E-02	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	969	mg/kg	2.7E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.9E-03	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.08
				Mercury	9.40	mg/kg	2.6E-07	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.8E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.06
				Nickel	484	mg/kg	1.3E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	9.4E-04	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.05
				Thallium	0.890	mg/kg	2.5E-08	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.7E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	34.8	mg/kg	9.6E-07	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	6.7E-05	(mg/kg/day)	5.0E-03	(mg/kg/day)	0.01
				Zinc	2,600	mg/kg	7.2E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	5.0E-03	(mg/kg/day)	3.0E-01	(mg/kg/day)	0.02
			Exp. Route Total								8.3E-06					4.9
			Dermal	Benzo(a)pyrene Equivalents	1.10	mg/kg	1.2E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	8.7E-08	8.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	0.001	mg/kg	3.2E-12	(mg/kg/day)	1.3E+05	(mg/kg/day)$^{-1}$	4.2E-07	2.3E-10	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.2
				Aroclor-1248	41.0	mg/kg	4.8E-07	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	9.5E-07	3.3E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.200	mg/kg	2.3E-09	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	4.6E-09	1.6E-07	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.008
				Aroclor-1260	4.60	mg/kg	5.3E-08	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	1.1E-07	3.7E-06	(mg/kg/day)	NA	(mg/kg/day)	--

TABLE 7.1.C.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Constructon Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Subsurface Soil	Subsurface Soil	OU7	Ingestion	Dieldrin	0.160	mg/kg	1.3E-09	(mg/kg/day)	1.6E+01	$(mg/kg/day)^{-1}$	2.1E-08	9.3E-08	(mg/kg/day)	5.0E-05	(mg/kg/day)	0.002
				Aluminum	11,600	mg/kg	9.6E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	6.7E-05	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.00007
				Antimony	182	mg/kg	1.5E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	1.1E-06	(mg/kg/day)	6.0E-05	(mg/kg/day)	0.02
				Arsenic	18.0	mg/kg	4.5E-08	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	6.7E-08	3.1E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.01
				Barium	280	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	0.0000
				Cadmium	5.10	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	2.5E-05	(mg/kg/day)	0.000
				Chromium	290	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00
				Cobalt	15.9	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0000
				Copper	6,020	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.0000
				Iron	97,100	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0000
				Lead	5,630	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	969	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.000
				Mercury	9.40	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	0.000
				Nickel	484	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	8.0E-04	(mg/kg/day)	0.000
				Thallium	0.890	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	34.8	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	5.0E-03	(mg/kg/day)	0.00000
				Zinc	2,600	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	3.0E-01	(mg/kg/day)	0.00000
			Exp. Route Total								1.7E-06					0.3
		Exposure Point Total									9.9E-06					5.2
	Exposure Medium Total										9.9E-06					5.2
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	7.7E-7	mg/m^3	1.5E-09	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	1.7E-09	1.1E-07	(mg/m^3)	NA	(mg/m^3)	--
				2,3,7,8-TCDD Equivalents	9.1E-10	mg/m^3	1.8E-12	(mg/m^3)	3.8E+01	$(ug/m^3)^{-1}$	6.8E-08	1.2E-10	(mg/m^3)	4.0E-08	(mg/m^3)	0.003
				Aroclor-1248	2.9E-5	mg/m^3	5.6E-08	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	3.2E-08	3.9E-06	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1254	1.4E-7	mg/m^3	2.7E-10	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	1.6E-10	1.9E-08	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1260	3.2E-6	mg/m^3	6.3E-09	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	3.6E-09	4.4E-07	(mg/m^3)	NA	(mg/m^3)	--
				Dieldrin	1.1E-7	mg/m^3	2.2E-10	(mg/m^3)	4.6E-03	$(ug/m^3)^{-1}$	1.0E-09	1.5E-08	(mg/m^3)	NA	(mg/m^3)	--
				Aluminum	0.008	mg/m^3	1.6E-05	(mg/m^3)	NA	$(ug/m^3)^{-1}$	--	1.1E-03	(mg/m^3)	5.0E-03	(mg/m^3)	0.2
				Antimony	1.3E-4	mg/m^3	2.5E-07	(mg/m^3)	NA	$(ug/m^3)^{-1}$	--	1.7E-05	(mg/m^3)	NA	(mg/m^3)	--
				Arsenic	1.3E-5	mg/m^3	2.5E-08	(mg/m^3)	4.3E-03	$(ug/m^3)^{-1}$	1.1E-07	1.7E-06	(mg/m^3)	1.5E-05	(mg/m^3)	0.1
				Barium	2.0E-4	mg/m^3	3.8E-07	(mg/m^3)	NA	$(ug/m^3)^{-1}$	--	2.7E-05	(mg/m^3)	5.0E-04	(mg/m^3)	0.05
				Cadmium	3.6E-6	mg/m^3	7.0E-09	(mg/m^3)	1.8E-03	$(ug/m^3)^{-1}$	1.3E-08	4.9E-07	(mg/m^3)	1.0E-05	(mg/m^3)	0.05
				Chromium	2.0E-4	mg/m^3	4.0E-07	(mg/m^3)	NA	$(ug/m^3)^{-1}$	--	2.8E-05	(mg/m^3)	NA	(mg/m^3)	0.0
				Cobalt	1.1E-5	mg/m^3	2.2E-08	(mg/m^3)	9.0E-03	$(ug/m^3)^{-1}$	2.0E-07	1.5E-06	(mg/m^3)	6.0E-06	(mg/m^3)	0.3
				Copper	0.004	mg/m^3	8.2E-06	(mg/m^3)	NA	$(ug/m^3)^{-1}$	--	5.8E-04	(mg/m^3)	NA	(mg/m^3)	--
				Iron	0.068	mg/m^3	1.3E-04	(mg/m^3)	NA	$(ug/m^3)^{-1}$	--	9.3E-03	(mg/m^3)	NA	(mg/m^3)	--
				Lead	0.004	mg/m^3	7.7E-06	(mg/m^3)	NA	$(ug/m^3)^{-1}$	--	5.4E-04	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	6.8E-4	mg/m^3	1.3E-06	(mg/m^3)	NA	$(ug/m^3)^{-1}$	--	9.3E-05	(mg/m^3)	5.0E-05	(mg/m^3)	1.9
				Mercury	6.6E-6	mg/m^3	1.3E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	--	9.0E-07	(mg/m^3)	3.0E-05	(mg/m^3)	0.03
				Nickel	3.4E-4	mg/m^3	6.6E-07	(mg/m^3)	2.6E-04	$(ug/m^3)^{-1}$	1.7E-07	4.6E-05	(mg/m^3)	9.0E-05	(mg/m^3)	0.5
				Thallium	6.2E-7	mg/m^3	1.2E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	--	8.5E-08	(mg/m^3)	NA	(mg/m^3)	--
				Vanadium	2.4E-5	mg/m^3	4.8E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	--	3.3E-06	(mg/m^3)	NA	(mg/m^3)	--
				Zinc	0.002	mg/m^3	3.6E-06	(mg/m^3)	NA	$(ug/m^3)^{-1}$	--	2.5E-04	(mg/m^3)	NA	(mg/m^3)	--

TABLE 7.1.C.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Constructon Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Subsurface Soil			Exp. Route Total								5.9E-07					3.1
		Exposure Point Total									5.9E-07					3.1
	Exposure Medium Total										5.9E-07					3.1
Medium Total											1.1E-05					8.3
Groundwater	Groundwater	OU7	Dermal	Manganese	2,820	ug/L	6.7E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	4.7E-04	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.5
			Exp. Route Total								- -					0.5
		Exposure Point Total									- -					0.5
	Exposure Medium Total										- -					0.5
Medium Total											- -					0.5

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 7.2.C.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current
Receptor Population: Occupational Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7 - Entire Site	Ingestion	Benzo(a)pyrene Equivalents	1.80	mg/kg	6.3E-07	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	4.6E-06	1.8E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	1.2E-5	mg/kg	4.2E-12	(mg/kg/day)	1.3E+05	(mg/kg/day)$^{-1}$	5.5E-07	1.2E-11	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.01
				Aroclor-1248	1.50	mg/kg	5.2E-07	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	1.0E-06	1.5E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.110	mg/kg	3.8E-08	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	7.7E-08	1.1E-07	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.005
				Aluminum	12,800	mg/kg	4.5E-03	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.3E-02	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.01
				Antimony	2.00	mg/kg	7.0E-07	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	2.0E-06	(mg/kg/day)	4.0E-04	(mg/kg/day)	0.005
				Arsenic	20.6	mg/kg	7.2E-06	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	1.1E-05	2.0E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.07
				Barium	335	mg/kg	1.2E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	3.3E-04	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.002
				Cadmium	1.80	mg/kg	6.3E-07	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.8E-06	(mg/kg/day)	5.0E-04	(mg/kg/day)	0.004
				Cobalt	10.4	mg/kg	3.6E-06	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.0E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.03
				Chromium	62.2	mg/kg	2.2E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	6.1E-05	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.00
				Copper	1,030	mg/kg	3.6E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.0E-03	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.03
				Iron	34,200	mg/kg	1.2E-02	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	3.3E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.05
				Lead	2,140	mg/kg	7.5E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	2.1E-03	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	386	mg/kg	1.3E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	3.8E-04	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.02
				Mercury	2.10	mg/kg	7.3E-07	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	2.1E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.007
				Thallium	0.480	mg/kg	1.7E-07	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	4.7E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	43.7	mg/kg	1.5E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	4.3E-05	(mg/kg/day)	5.0E-03	(mg/kg/day)	0.009
			Exp. Route Total								1.7E-05					0.2
			Dermal	Benzo(a)pyrene Equivalents	1.80	mg/kg	5.4E-07	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	3.9E-06	1.5E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	1.2E-5	mg/kg	8.3E-13	(mg/kg/day)	1.3E+05	(mg/kg/day)$^{-1}$	1.1E-07	2.3E-12	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.002
				Aroclor-1248	1.50	mg/kg	4.8E-07	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	9.7E-07	1.4E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.110	mg/kg	3.6E-08	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	7.1E-08	9.9E-08	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.005
				Aluminum	12,800	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.00000
				Antimony	2.00	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	6.0E-05	(mg/kg/day)	0.0000
				Arsenic	20.6	mg/kg	1.4E-06	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	2.1E-06	4.0E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.01
				Barium	335	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	0.0000
				Cadmium	1.80	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	2.5E-05	(mg/kg/day)	0.0000
				Cobalt	10.4	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0000
				Chromium	62.2	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.000
				Copper	1,030	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.0000
				Iron	34,200	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0000
				Lead	2,140	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	386	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.000
				Mercury	2.10	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	0.0000
				Thallium	0.480	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	43.7	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	5.0E-03	(mg/kg/day)	0.00000
			Exp. Route Total								7.2E-06					0.02
		Exposure Point Total									2.4E-05					0.3
Exposure Medium Total											2.4E-05					0.3

TABLE 7.2.C.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current
Receptor Population: Occupational Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Air	OU7 - Entire Site	Inhalation	Benzo(a)pyrene Equivalents	1.9E-10	mg/m^3	1.6E-11	(mg/m^3)	1.1E-03	(ug/m^3)$^{-1}$	1.7E-11	4.4E-11	(mg/m^3)	NA	(mg/m^3)	--
				2,3,7,8-TCDD Equivalents	1.3E-15	mg/m^3	1.0E-16	(mg/m^3)	3.8E+01	(ug/m^3)$^{-1}$	4.0E-12	2.9E-16	(mg/m^3)	4.0E-08	(mg/m^3)	7.30983E-09
				Aroclor-1248	1.6E-10	mg/m^3	1.3E-11	(mg/m^3)	5.7E-04	(ug/m^3)$^{-1}$	7.4E-12	3.7E-11	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1254	1.2E-11	mg/m^3	9.6E-13	(mg/m^3)	5.7E-04	(ug/m^3)$^{-1}$	5.5E-13	2.7E-12	(mg/m^3)	NA	(mg/m^3)	--
				Aluminum	1.4E-6	mg/m^3	1.1E-07	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	3.1E-07	(mg/m^3)	5.0E-03	(mg/m^3)	0.00006
				Antimony	2.1E-10	mg/m^3	1.7E-11	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	4.9E-11	(mg/m^3)	NA	(mg/m^3)	--
				Arsenic	2.2E-9	mg/m^3	1.8E-10	(mg/m^3)	4.3E-03	(ug/m^3)$^{-1}$	7.7E-10	5.0E-10	(mg/m^3)	1.5E-05	(mg/m^3)	0.00003
				Barium	3.6E-8	mg/m^3	2.9E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	8.2E-09	(mg/m^3)	5.0E-04	(mg/m^3)	0.00002
				Cadmium	1.9E-10	mg/m^3	1.6E-11	(mg/m^3)	1.8E-03	(ug/m^3)$^{-1}$	2.8E-11	4.4E-11	(mg/m^3)	1.0E-05	(mg/m^3)	0.000004
				Cobalt	1.1E-9	mg/m^3	9.1E-11	(mg/m^3)	9.0E-03	(ug/m^3)$^{-1}$	8.1E-10	2.5E-10	(mg/m^3)	6.0E-06	(mg/m^3)	0.00004
				Chromium	6.6E-9	mg/m^3	5.4E-10	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	1.5E-09	(mg/m^3)	NA	(mg/m^3)	0.00000
				Copper	1.1E-7	mg/m^3	9.0E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	2.5E-08	(mg/m^3)	NA	(mg/m^3)	--
				Iron	3.6E-6	mg/m^3	3.0E-07	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	8.3E-07	(mg/m^3)	NA	(mg/m^3)	--
				Lead	2.3E-7	mg/m^3	1.9E-08	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	5.2E-08	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	4.1E-8	mg/m^3	3.4E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	9.4E-09	(mg/m^3)	5.0E-05	(mg/m^3)	0.0002
				Mercury	2.2E-10	mg/m^3	1.8E-11	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	5.1E-11	(mg/m^3)	3.0E-05	(mg/m^3)	0.000002
				Thallium	5.1E-11	mg/m^3	4.2E-12	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	1.2E-11	(mg/m^3)	NA	(mg/m^3)	--
				Vanadium	4.7E-9	mg/m^3	3.8E-10	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	1.1E-09	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								1.6E-09					0.0003
		Exposure Point Total									1.6E-09					0.0003
	Exposure Medium Total										1.6E-09					0.0003
Medium Total											2.4E-05					0.3
Subsurface Soil	Subsurface Soil	OU7 - Entire Site	Ingestion	Benzo(a)pyrene Equivalents	1.10	mg/kg	3.8E-07	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	2.8E-06	1.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	0.001	mg/kg	4.5E-10	(mg/kg/day)	1.3E+05	(mg/kg/day)$^{-1}$	5.9E-05	1.3E-09	(mg/kg/day)	1.0E-09	(mg/kg/day)	1.3
				Aroclor-1248	41.0	mg/kg	1.4E-05	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	2.9E-05	4.0E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.200	mg/kg	7.0E-08	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	1.4E-07	2.0E-07	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.010
				Aroclor-1260	4.60	mg/kg	1.6E-06	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	3.2E-06	4.5E-06	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.2
				Dieldrin	0.160	mg/kg	5.6E-08	(mg/kg/day)	1.6E+01	(mg/kg/day)$^{-1}$	8.9E-07	1.6E-07	(mg/kg/day)	5.0E-05	(mg/kg/day)	0.003
				Aluminum	11,600	mg/kg	4.1E-03	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.1E-02	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.01
				Antimony	182	mg/kg	6.4E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.8E-04	(mg/kg/day)	4.0E-04	(mg/kg/day)	0.4
				Arsenic	18.0	mg/kg	6.3E-06	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	9.4E-06	1.8E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.06
				Barium	280	mg/kg	9.8E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	2.7E-04	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.001
				Cadmium	5.10	mg/kg	1.8E-06	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	5.0E-06	(mg/kg/day)	5.0E-04	(mg/kg/day)	0.010
				Chromium	290	mg/kg	1.0E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	2.8E-04	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.00
				Cobalt	15.9	mg/kg	5.6E-06	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.6E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.05
				Copper	6,020	mg/kg	2.1E-03	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	5.9E-03	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.1
				Iron	97,100	mg/kg	3.4E-02	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	9.5E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.1
				Lead	5,630	mg/kg	2.0E-03	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	5.5E-03	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	969	mg/kg	3.4E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	9.5E-04	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.04
				Mercury	9.40	mg/kg	3.3E-06	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	9.2E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.03
				Nickel	484	mg/kg	1.7E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	4.7E-04	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.02
				Thallium	0.890	mg/kg	3.1E-07	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	8.7E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	34.8	mg/kg	1.2E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	3.4E-05	(mg/kg/day)	5.0E-03	(mg/kg/day)	0.007
				Zinc	2,600	mg/kg	9.1E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	2.5E-03	(mg/kg/day)	3.0E-01	(mg/kg/day)	0.008
			Exp. Route Total								1.0E-04					2.5

TABLE 7.2.C.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current
Receptor Population: Occupational Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Subsurface Soil	Subsurface Soil	OU7 - Entire Site	Dermal	Benzo(a)pyrene Equivalents	1.10	mg/kg	3.3E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	2.4E-06	9.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	0.001	mg/kg	9.0E-11	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	1.2E-05	2.5E-10	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.3
				Aroclor-1248	41.0	mg/kg	1.3E-05	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.6E-05	3.7E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.200	mg/kg	6.5E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.3E-07	1.8E-07	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.009
				Aroclor-1260	4.60	mg/kg	1.5E-06	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	3.0E-06	4.2E-06	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.2
				Dieldrin	0.160	mg/kg	3.7E-08	(mg/kg/day)	1.6E+01	$(mg/kg/day)^{-1}$	5.9E-07	1.0E-07	(mg/kg/day)	5.0E-05	(mg/kg/day)	0.002
				Aluminum	11,600	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.00000
				Antimony	182	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	6.0E-05	(mg/kg/day)	0.00
				Arsenic	18.0	mg/kg	1.2E-06	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	1.9E-06	3.5E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.01
				Barium	280	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	0.0000
				Cadmium	5.10	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.5E-05	(mg/kg/day)	0.000
				Chromium	290	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00
				Cobalt	15.9	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0000
				Copper	6,020	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.0000
				Iron	97,100	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0000
				Lead	5,630	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	969	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.000
				Mercury	9.40	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	0.000
				Nickel	484	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	8.0E-04	(mg/kg/day)	0.000
				Thallium	0.890	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	34.8	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.0E-03	(mg/kg/day)	0.00000
				Zinc	2,600	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	3.0E-01	(mg/kg/day)	0.00000
			Exp. Route Total								4.6E-05					0.5
		Exposure Point Total									1.5E-04					3.0
	Exposure Medium Total										1.5E-04					3.0
	Air	OU7 - Entire Site	Inhalation	Benzo(a)pyrene Equivalents	1.2E-10	mg/m^3	9.6E-12	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	1.1E-11	2.7E-11	(mg/m^3)	NA	(mg/m^3)	--
				2,3,7,8-TCDD Equivalents	1.4E-13	mg/m^3	1.1E-14	(mg/m^3)	3.8E+01	$(ug/m^3)^{-1}$	4.3E-10	3.2E-14	(mg/m^3)	4.0E-08	(mg/m^3)	0.0000008
				Aroclor-1248	4.4E-9	mg/m^3	3.6E-10	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	2.0E-10	1.0E-09	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1254	2.1E-11	mg/m^3	1.7E-12	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	9.9E-13	4.9E-12	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1260	4.9E-10	mg/m^3	4.0E-11	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	2.3E-11	1.1E-10	(mg/m^3)	NA	(mg/m^3)	--
				Dieldrin	1.7E-11	mg/m^3	1.4E-12	(mg/m^3)	4.6E-03	$(ug/m^3)^{-1}$	6.4E-12	3.9E-12	(mg/m^3)	NA	(mg/m^3)	--
				Aluminum	1.2E-6	mg/m^3	1.0E-07	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.8E-07	(mg/m^3)	5.0E-03	(mg/m^3)	0.00006
				Antimony	1.9E-8	mg/m^3	1.6E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	4.4E-09	(mg/m^3)	NA	(mg/m^3)	--
				Arsenic	1.9E-9	mg/m^3	1.6E-10	(mg/m^3)	4.3E-03	$(ug/m^3)^{-1}$	6.7E-10	4.4E-10	(mg/m^3)	1.5E-05	(mg/m^3)	0.00003
				Barium	3.0E-8	mg/m^3	2.4E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	6.8E-09	(mg/m^3)	5.0E-04	(mg/m^3)	0.00001
				Cadmium	5.4E-10	mg/m^3	4.4E-11	(mg/m^3)	1.8E-03	$(ug/m^3)^{-1}$	8.0E-11	1.2E-10	(mg/m^3)	1.0E-05	(mg/m^3)	0.00001
				Chromium	3.1E-8	mg/m^3	2.5E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	7.1E-09	(mg/m^3)	NA	(mg/m^3)	0.00000
				Cobalt	1.7E-9	mg/m^3	1.4E-10	(mg/m^3)	9.0E-03	$(ug/m^3)^{-1}$	1.2E-09	3.9E-10	(mg/m^3)	6.0E-06	(mg/m^3)	0.00006
				Copper	6.4E-7	mg/m^3	5.2E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.5E-07	(mg/m^3)	NA	(mg/m^3)	--
				Iron	1.0E-5	mg/m^3	8.4E-07	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.4E-06	(mg/m^3)	NA	(mg/m^3)	--
				Lead	6.0E-7	mg/m^3	4.9E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.4E-07	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	1.0E-7	mg/m^3	8.4E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.4E-08	(mg/m^3)	5.0E-05	(mg/m^3)	0.0005
				Mercury	1.0E-9	mg/m^3	8.2E-11	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.3E-10	(mg/m^3)	3.0E-05	(mg/m^3)	0.000008
				Nickel	5.2E-8	mg/m^3	4.2E-09	(mg/m^3)	2.6E-04	$(ug/m^3)^{-1}$	1.1E-09	1.2E-08	(mg/m^3)	9.0E-05	(mg/m^3)	0.0001
				Thallium	9.5E-11	mg/m^3	7.7E-12	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.2E-11	(mg/m^3)	NA	(mg/m^3)	--

TABLE 7.2.C.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current
Receptor Population: Occupational Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Subsurface Soil	Air	OU7 - Entire Site	Inhalation	Vanadium	3.7E-9	mg/m^3	3.0E-10	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	8.5E-10	(mg/m^3)	NA	(mg/m^3)	--
				Zinc	2.8E-7	mg/m^3	2.3E-08	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	6.3E-08	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								3.8E-09					0.0008
		Exposure Point Total									3.8E-09					0.0008
	Exposure Medium Total										3.8E-09					0.0008
Medium Total											1.5E-04					3.0

Notes:

Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 7.3.C.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.80	mg/kg	6.3E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	4.6E-07	3.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	1.2E-5	mg/kg	4.2E-13	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	5.5E-08	2.1E-12	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.002
				Aroclor-1248	1.50	mg/kg	5.3E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.1E-07	2.6E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.110	mg/kg	3.9E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	7.7E-09	1.9E-08	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.0010
				Aluminum	12,800	mg/kg	4.5E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	2.3E-03	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.002
				Antimony	2.00	mg/kg	7.0E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	3.5E-07	(mg/kg/day)	4.0E-04	(mg/kg/day)	0.0009
				Arsenic	20.6	mg/kg	7.3E-07	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	1.1E-06	3.6E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.01
				Barium	335	mg/kg	1.2E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	5.9E-05	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.0003
				Cadmium	1.80	mg/kg	6.3E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	3.2E-07	(mg/kg/day)	5.0E-04	(mg/kg/day)	0.0006
				Cobalt	10.4	mg/kg	3.7E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	1.8E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.006
				Chromium	62.2	mg/kg	2.2E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	1.1E-05	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.000
				Copper	1,030	mg/kg	3.6E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	1.8E-04	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.005
				Iron	34,200	mg/kg	1.2E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	6.0E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.009
				Lead	2,140	mg/kg	7.5E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	3.8E-04	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	386	mg/kg	1.4E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	6.8E-05	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.003
				Mercury	2.10	mg/kg	7.4E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	3.7E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.001
				Thallium	0.480	mg/kg	1.7E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	8.5E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	43.7	mg/kg	1.5E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	7.7E-06	(mg/kg/day)	5.0E-03	(mg/kg/day)	0.002
			Exp. Route Total								1.7E-06					0.04
			Dermal	Benzo(a)pyrene Equivalents	1.80	mg/kg	6.6E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	4.8E-07	3.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	1.2E-5	mg/kg	1.0E-13	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	1.3E-08	5.1E-13	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.0005
				Aroclor-1248	1.50	mg/kg	5.9E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.2E-07	3.0E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.110	mg/kg	4.3E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	8.7E-09	2.2E-08	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.001
				Aluminum	12,800	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.00000
				Antimony	2.00	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	6.0E-05	(mg/kg/day)	0.00000
				Arsenic	20.6	mg/kg	1.7E-07	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	2.6E-07	8.7E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.003
				Barium	335	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	0.00000
				Cadmium	1.80	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	2.5E-05	(mg/kg/day)	0.0000
				Cobalt	10.4	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.00000
				Chromium	62.2	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.000
				Copper	1,030	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.00000
				Iron	34,200	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.00000
				Lead	2,140	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	386	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.0000
				Mercury	2.10	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	0.0000
				Thallium	0.480	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	43.7	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	5.0E-03	(mg/kg/day)	0.00000
			Exp. Route Total								8.8E-07					0.004
		Exposure Point Total									2.6E-06					0.05
Exposure Medium Total											2.6E-06					0.05

TABLE 7.3.C.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.9E-10	mg/m^3	7.9E-13	(mg/m^3)	1.1E-03	(ug/m^3)$^{-1}$	8.7E-13	3.9E-12	(mg/m^3)	NA	(mg/m^3)	--
				2,3,7,8-TCDD Equivalents	1.3E-15	mg/m^3	5.3E-18	(mg/m^3)	3.8E+01	(ug/m^3)$^{-1}$	2.0E-13	2.6E-17	(mg/m^3)	4.0E-08	(mg/m^3)	6.57885E-10
				Aroclor-1248	1.6E-10	mg/m^3	6.6E-13	(mg/m^3)	5.7E-04	(ug/m^3)$^{-1}$	3.7E-13	3.3E-12	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1254	1.2E-11	mg/m^3	4.8E-14	(mg/m^3)	5.7E-04	(ug/m^3)$^{-1}$	2.7E-14	2.4E-13	(mg/m^3)	NA	(mg/m^3)	--
				Aluminum	1.4E-6	mg/m^3	5.6E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	2.8E-08	(mg/m^3)	5.0E-03	(mg/m^3)	0.000006
				Antimony	2.1E-10	mg/m^3	8.8E-13	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	4.4E-12	(mg/m^3)	NA	(mg/m^3)	--
				Arsenic	2.2E-9	mg/m^3	9.0E-12	(mg/m^3)	4.3E-03	(ug/m^3)$^{-1}$	3.9E-11	4.5E-11	(mg/m^3)	1.5E-05	(mg/m^3)	0.000003
				Barium	3.6E-8	mg/m^3	1.5E-10	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	7.3E-10	(mg/m^3)	5.0E-04	(mg/m^3)	0.000001
				Cadmium	1.9E-10	mg/m^3	7.9E-13	(mg/m^3)	1.8E-03	(ug/m^3)$^{-1}$	1.4E-12	3.9E-12	(mg/m^3)	1.0E-05	(mg/m^3)	0.0000004
				Cobalt	1.1E-9	mg/m^3	4.6E-12	(mg/m^3)	9.0E-03	(ug/m^3)$^{-1}$	4.1E-11	2.3E-11	(mg/m^3)	6.0E-06	(mg/m^3)	0.000004
				Chromium	6.6E-9	mg/m^3	2.7E-11	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	1.4E-10	(mg/m^3)	NA	(mg/m^3)	0.000000
				Copper	1.1E-7	mg/m^3	4.5E-10	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	2.3E-09	(mg/m^3)	NA	(mg/m^3)	--
				Iron	3.6E-6	mg/m^3	1.5E-08	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	7.5E-08	(mg/m^3)	NA	(mg/m^3)	--
				Lead	2.3E-7	mg/m^3	9.4E-10	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	4.7E-09	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	4.1E-8	mg/m^3	1.7E-10	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	8.5E-10	(mg/m^3)	5.0E-05	(mg/m^3)	0.00002
				Mercury	2.2E-10	mg/m^3	9.2E-13	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	4.6E-12	(mg/m^3)	3.0E-05	(mg/m^3)	0.0000002
				Thallium	5.1E-11	mg/m^3	2.1E-13	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	1.1E-12	(mg/m^3)	NA	(mg/m^3)	--
				Vanadium	4.7E-9	mg/m^3	1.9E-11	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	9.6E-11	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								8.3E-11					0.00003
		Exposure Point Total									8.3E-11					0.00003
	Exposure Medium Total										8.3E-11					0.00003
Medium Total											2.6E-06					0.05
Sediment	Sediment	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.20	mg/kg	1.0E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	7.5E-08	1.6E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				TEQ PCB	0.002	mg/kg	7.5E-12	(mg/kg/day)	1.3E+05	(mg/kg/day)$^{-1}$	9.8E-07	2.2E-11	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.02
				Total PCBs	0.420	mg/kg	2.0E-09	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	3.9E-09	5.8E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	14.5	mg/kg	6.8E-08	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	1.0E-07	2.0E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0007
				Chromium	150	mg/kg	7.0E-07	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	2.1E-06	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.0007
				Iron	45,900	mg/kg	2.2E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	6.3E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0009
				Lead	187	mg/kg	8.8E-07	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	2.6E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese (Soil)	468	mg/kg	2.2E-06	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	6.4E-06	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.00005
			Exp. Route Total								1.2E-06					0.02
			Dermal	Benzo(a)pyrene Equivalents	1.20	mg/kg	1.1E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	7.8E-08	1.7E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				TEQ PCB	0.002	mg/kg	1.8E-12	(mg/kg/day)	1.3E+05	(mg/kg/day)$^{-1}$	2.3E-07	5.2E-12	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.005
				Total PCBs	0.420	mg/kg	2.2E-09	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	4.4E-09	6.4E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	14.5	mg/kg	1.6E-08	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	2.4E-08	4.8E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0002
				Chromium	150	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	7.5E-05	(mg/kg/day)	0.0000
				Iron	45,900	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.000000
				Lead	187	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese (Soil)	468	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
			Exp. Route Total								3.4E-07					0.005
		Exposure Point Total									1.5E-06					0.03
	Exposure Medium Total										1.5E-06					0.03
Medium Total											1.5E-06					0.03
										Total of Receptor Risks Across All Media	4.1E-06				Total of Receptor Hazards Across All Media	0.08

TABLE 7.4.C.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.80	mg/kg	2.1E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.5E-06	4.9E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	1.2E-5	mg/kg	4.7E-13	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	6.1E-08	3.3E-12	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.003
				Aroclor-1248	1.50	mg/kg	5.9E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.2E-07	4.1E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.110	mg/kg	4.3E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	8.6E-09	3.0E-08	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.002
				Aluminum	12,800	mg/kg	5.0E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	3.5E-03	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.004
				Antimony	2.00	mg/kg	7.8E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	5.5E-07	(mg/kg/day)	4.0E-04	(mg/kg/day)	0.001
				Arsenic	20.6	mg/kg	8.1E-07	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	1.2E-06	5.6E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.02
				Barium	335	mg/kg	1.3E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	9.2E-05	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.0005
				Cadmium	1.80	mg/kg	7.0E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	4.9E-07	(mg/kg/day)	5.0E-04	(mg/kg/day)	0.0010
				Cobalt	10.4	mg/kg	4.1E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	2.8E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.009
				Chromium	62.2	mg/kg	2.4E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	1.7E-05	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.000
				Copper	1,030	mg/kg	4.0E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	2.8E-04	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.007
				Iron	34,200	mg/kg	1.3E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	9.4E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.01
				Lead	2,140	mg/kg	8.4E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	5.9E-04	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	386	mg/kg	1.5E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	1.1E-04	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.004
				Mercury	2.10	mg/kg	8.2E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	5.8E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.002
				Thallium	0.480	mg/kg	1.9E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	1.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	43.7	mg/kg	1.7E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	1.2E-05	(mg/kg/day)	5.0E-03	(mg/kg/day)	0.002
			Exp. Route Total								2.9E-06					0.07
			Dermal	Benzo(a)pyrene Equivalents	1.80	mg/kg	4.5E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	3.2E-06	1.0E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	1.2E-5	mg/kg	2.3E-13	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	3.0E-08	1.6E-12	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.002
				Aroclor-1248	1.50	mg/kg	1.3E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.7E-07	9.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.110	mg/kg	9.8E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.0E-08	6.8E-08	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.003
				Aluminum	12,800	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.00000
				Antimony	2.00	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	6.0E-05	(mg/kg/day)	0.0000
				Arsenic	20.6	mg/kg	3.9E-07	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	5.9E-07	2.7E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.009
				Barium	335	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	0.0000
				Cadmium	1.80	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	2.5E-05	(mg/kg/day)	0.0000
				Cobalt	10.4	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0000
				Chromium	62.2	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.000
				Copper	1,030	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.0000
				Iron	34,200	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0000
				Lead	2,140	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	386	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.000
				Mercury	2.10	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	0.0000
				Thallium	0.480	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	43.7	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	5.0E-03	(mg/kg/day)	0.00000
			Exp. Route Total								4.2E-06					0.01
		Exposure Point Total									7.1E-06					0.08
	Exposure Medium Total										7.1E-06					0.08
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.9E-10	mg/m^3	1.7E-12	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	1.9E-12	3.9E-12	(mg/m^3)	NA	(mg/m^3)	--
				2,3,7,8-TCDD Equivalents	1.3E-15	mg/m^3	3.8E-18	(mg/m^3)	3.8E+01	$(ug/m^3)^{-1}$	1.4E-13	2.6E-17	(mg/m^3)	4.0E-08	(mg/m^3)	6.57885E-10
				Aroclor-1248	1.6E-10	mg/m^3	4.7E-13	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	2.7E-13	3.3E-12	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1254	1.2E-11	mg/m^3	3.4E-14	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	2.0E-14	2.4E-13	(mg/m^3)	NA	(mg/m^3)	--
				Aluminum	1.4E-6	mg/m^3	4.0E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	--	2.8E-08	(mg/m^3)	5.0E-03	(mg/m^3)	0.000006

TABLE 7.4.C.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Air	OU7	Inhalation	Antimony	2.1E-10	mg/m^3	6.3E-13	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	4.4E-12	(mg/m^3)	NA	(mg/m^3)	--
				Arsenic	2.2E-9	mg/m^3	6.5E-12	(mg/m^3)	4.3E-03	(ug/m^3)$^{-1}$	2.8E-11	4.5E-11	(mg/m^3)	1.5E-05	(mg/m^3)	0.000003
				Barium	3.6E-8	mg/m^3	1.0E-10	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	7.3E-10	(mg/m^3)	5.0E-04	(mg/m^3)	0.000001
				Cadmium	1.9E-10	mg/m^3	5.6E-13	(mg/m^3)	1.8E-03	(ug/m^3)$^{-1}$	1.0E-12	3.9E-12	(mg/m^3)	1.0E-05	(mg/m^3)	0.0000004
				Cobalt	1.1E-9	mg/m^3	3.3E-12	(mg/m^3)	9.0E-03	(ug/m^3)$^{-1}$	2.9E-11	2.3E-11	(mg/m^3)	6.0E-06	(mg/m^3)	0.000004
				Chromium	6.6E-9	mg/m^3	1.9E-11	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	1.4E-10	(mg/m^3)	NA	(mg/m^3)	0.000000
				Copper	1.1E-7	mg/m^3	3.2E-10	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	2.3E-09	(mg/m^3)	NA	(mg/m^3)	--
				Iron	3.6E-6	mg/m^3	1.1E-08	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	7.5E-08	(mg/m^3)	NA	(mg/m^3)	--
				Lead	2.3E-7	mg/m^3	6.7E-10	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	4.7E-09	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	4.1E-8	mg/m^3	1.2E-10	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	8.5E-10	(mg/m^3)	5.0E-05	(mg/m^3)	0.00002
				Mercury	2.2E-10	mg/m^3	6.6E-13	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	4.6E-12	(mg/m^3)	3.0E-05	(mg/m^3)	0.0000002
				Thallium	5.1E-11	mg/m^3	1.5E-13	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	1.1E-12	(mg/m^3)	NA	(mg/m^3)	--
				Vanadium	4.7E-9	mg/m^3	1.4E-11	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	9.6E-11	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								6.0E-11					0.00003
		Exposure Point Total									6.0E-11					0.00003
	Exposure Medium Total										6.0E-11					0.00003
Medium Total											7.1E-06					0.08
Sediment	Sediment	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.20	mg/kg	1.1E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	8.0E-08	2.6E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				TEQ PCB	0.002	mg/kg	4.9E-12	(mg/kg/day)	1.3E+05	(mg/kg/day)$^{-1}$	6.3E-07	3.4E-11	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.03
				Total PCBs	0.420	mg/kg	1.3E-09	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	2.6E-09	8.9E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	14.5	mg/kg	4.4E-08	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	6.6E-08	3.1E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.001
				Chromium	150	mg/kg	4.6E-07	(mg/kg/day)	5.0E-01	(mg/kg/day)$^{-1}$	2.3E-07	3.2E-06	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.001
				Iron	45,900	mg/kg	1.4E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	9.8E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.001
				Lead	187	mg/kg	5.7E-07	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	4.0E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese (Soil)	468	mg/kg	1.4E-06	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.0E-05	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.00007
			Exp. Route Total								1.0E-06					0.04
			Dermal	Benzo(a)pyrene Equivalents	1.20	mg/kg	2.3E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	1.7E-07	5.4E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				TEQ PCB	0.002	mg/kg	2.4E-12	(mg/kg/day)	1.3E+05	(mg/kg/day)$^{-1}$	3.1E-07	1.7E-11	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.02
				Total PCBs	0.420	mg/kg	2.9E-09	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	5.8E-09	2.0E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	14.5	mg/kg	2.1E-08	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	3.2E-08	1.5E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0005
				Chromium	150	mg/kg	7.4E-09	(mg/kg/day)	2.0E+01	(mg/kg/day)$^{-1}$	1.5E-07	5.2E-08	(mg/kg/day)	7.5E-05	(mg/kg/day)	0.0007
				Iron	45,900	mg/kg	2.3E-06	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.6E-05	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.00002
				Lead	187	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese (Soil)	468	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
			Exp. Route Total								6.6E-07					0.02
		Exposure Point Total									1.7E-06					0.06
	Exposure Medium Total										1.7E-06					0.06
Medium Total											1.7E-06					0.06

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 7.5.C.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.80	mg/kg	1.5E-06	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.1E-05	2.5E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	1.2E-5	mg/kg	5.6E-12	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	7.3E-07	1.6E-11	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.02
				Aroclor-1248	1.50	mg/kg	7.0E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.4E-06	2.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.110	mg/kg	5.2E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.0E-07	1.5E-07	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.008
				Aluminum	12,800	mg/kg	6.0E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	1.8E-02	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.02
				Antimony	2.00	mg/kg	9.4E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	2.7E-06	(mg/kg/day)	4.0E-04	(mg/kg/day)	0.007
				Arsenic	20.6	mg/kg	9.7E-06	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	1.5E-05	2.8E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.09
				Barium	335	mg/kg	1.6E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	4.6E-04	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.002
				Cadmium	1.80	mg/kg	8.5E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	2.5E-06	(mg/kg/day)	5.0E-04	(mg/kg/day)	0.005
				Cobalt	10.4	mg/kg	4.9E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	1.4E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.05
				Chromium	62.2	mg/kg	2.9E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	8.5E-05	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.00
				Copper	1,030	mg/kg	4.8E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	1.4E-03	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.04
				Iron	34,200	mg/kg	1.6E-02	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	4.7E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.07
				Lead	2,140	mg/kg	1.0E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	2.9E-03	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	386	mg/kg	1.8E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	5.3E-04	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.02
				Mercury	2.10	mg/kg	9.9E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	2.9E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.010
				Thallium	0.480	mg/kg	2.3E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	6.6E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	43.7	mg/kg	2.1E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	6.0E-05	(mg/kg/day)	5.0E-03	(mg/kg/day)	0.01
			Exp. Route Total								2.8E-05					0.3
			Dermal	Benzo(a)pyrene Equivalents	1.80	mg/kg	8.0E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	5.9E-06	1.3E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	1.2E-5	mg/kg	6.7E-13	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	8.8E-08	2.0E-12	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.002
				Aroclor-1248	1.50	mg/kg	3.9E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	7.9E-07	1.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.110	mg/kg	2.9E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	5.8E-08	8.4E-08	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.004
				Aluminum	12,800	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.00000
				Antimony	2.00	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	6.0E-05	(mg/kg/day)	0.0000
				Arsenic	20.6	mg/kg	1.2E-06	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	1.7E-06	3.4E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.01
				Barium	335	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	0.0000
				Cadmium	1.80	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	2.5E-05	(mg/kg/day)	0.0000
				Cobalt	10.4	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0000
				Chromium	62.2	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.000
				Copper	1,030	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.0000
				Iron	34,200	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0000
				Lead	2,140	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	386	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.000
				Mercury	2.10	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	0.0000
				Thallium	0.480	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	43.7	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	5.0E-03	(mg/kg/day)	0.00000
			Exp. Route Total								8.5E-06					0.02
		Exposure Point Total									3.7E-05					0.4
Exposure Medium Total											3.7E-05					0.4

TABLE 7.5.C.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.9E-10	mg/m^3	1.2E-10	(mg/m^3)	1.1E-03	(ug/m^3)$^{-1}$	1.3E-10	4.4E-10	(mg/m^3)	NA	(mg/m^3)	--
				2,3,7,8-TCDD Equivalents	1.3E-15	mg/m^3	4.2E-16	(mg/m^3)	3.8E+01	(ug/m^3)$^{-1}$	1.6E-11	2.9E-15	(mg/m^3)	4.0E-08	(mg/m^3)	0.00000007
				Aroclor-1248	1.6E-10	mg/m^3	5.3E-11	(mg/m^3)	5.7E-04	(ug/m^3)$^{-1}$	3.0E-11	3.7E-10	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1254	1.2E-11	mg/m^3	3.9E-12	(mg/m^3)	5.7E-04	(ug/m^3)$^{-1}$	2.2E-12	2.7E-11	(mg/m^3)	NA	(mg/m^3)	--
				Aluminum	1.4E-6	mg/m^3	4.5E-07	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	3.1E-06	(mg/m^3)	5.0E-03	(mg/m^3)	0.0006
				Antimony	2.1E-10	mg/m^3	7.0E-11	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	4.9E-10	(mg/m^3)	NA	(mg/m^3)	--
				Arsenic	2.2E-9	mg/m^3	7.2E-10	(mg/m^3)	4.3E-03	(ug/m^3)$^{-1}$	3.1E-09	5.1E-09	(mg/m^3)	1.5E-05	(mg/m^3)	0.0003
				Barium	3.6E-8	mg/m^3	1.2E-08	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	8.2E-08	(mg/m^3)	5.0E-04	(mg/m^3)	0.0002
				Cadmium	1.9E-10	mg/m^3	6.3E-11	(mg/m^3)	1.8E-03	(ug/m^3)$^{-1}$	1.1E-10	4.4E-10	(mg/m^3)	1.0E-05	(mg/m^3)	0.00004
				Cobalt	1.1E-9	mg/m^3	3.6E-10	(mg/m^3)	9.0E-03	(ug/m^3)$^{-1}$	3.3E-09	2.6E-09	(mg/m^3)	6.0E-06	(mg/m^3)	0.0004
				Chromium	6.6E-9	mg/m^3	2.2E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	1.5E-08	(mg/m^3)	NA	(mg/m^3)	0.0000
				Copper	1.1E-7	mg/m^3	3.6E-08	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	2.5E-07	(mg/m^3)	NA	(mg/m^3)	--
				Iron	3.6E-6	mg/m^3	1.2E-06	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	8.4E-06	(mg/m^3)	NA	(mg/m^3)	--
				Lead	2.3E-7	mg/m^3	7.5E-08	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	5.3E-07	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	4.1E-8	mg/m^3	1.4E-08	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	9.5E-08	(mg/m^3)	5.0E-05	(mg/m^3)	0.002
				Mercury	2.2E-10	mg/m^3	7.4E-11	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	5.2E-10	(mg/m^3)	3.0E-05	(mg/m^3)	0.00002
				Thallium	5.1E-11	mg/m^3	1.7E-11	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	1.2E-10	(mg/m^3)	NA	(mg/m^3)	--
				Vanadium	4.7E-9	mg/m^3	1.5E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	1.1E-08	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								6.7E-09					0.004
		Exposure Point Total									6.7E-09					0.004
	Exposure Medium Total										6.7E-09					0.004
Medium Total											3.7E-05					0.4
										Total of Receptor Risks Across All Media	3.7E-05				Total of Receptor Hazards Across All Media	0.4

TABLE 7.6.C.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.80	mg/kg	1.1E-05	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	7.7E-05	2.3E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	1.2E-5	mg/kg	1.3E-11	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	1.7E-06	1.5E-10	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.2
				Aroclor-1248	1.50	mg/kg	1.6E-06	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	3.3E-06	1.9E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.110	mg/kg	1.2E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.4E-07	1.4E-06	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.07
				Aluminum	12,800	mg/kg	1.4E-02	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	1.6E-01	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.2
				Antimony	2.00	mg/kg	2.2E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	2.6E-05	(mg/kg/day)	4.0E-04	(mg/kg/day)	0.06
				Arsenic	20.6	mg/kg	2.3E-05	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	3.4E-05	2.6E-04	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.9
				Barium	335	mg/kg	3.7E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	4.3E-03	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.02
				Cadmium	1.80	mg/kg	2.0E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	2.3E-05	(mg/kg/day)	5.0E-04	(mg/kg/day)	0.05
				Cobalt	10.4	mg/kg	1.1E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	1.3E-04	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.4
				Chromium	62.2	mg/kg	6.8E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	8.0E-04	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.0
				Copper	1,030	mg/kg	1.1E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	1.3E-02	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.3
				Iron	34,200	mg/kg	3.7E-02	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	4.4E-01	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.6
				Lead	2,140	mg/kg	2.3E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	2.7E-02	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	386	mg/kg	4.2E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	4.9E-03	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.2
				Mercury	2.10	mg/kg	2.3E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	2.7E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.09
				Thallium	0.480	mg/kg	5.3E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	6.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	43.7	mg/kg	4.8E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	5.6E-04	(mg/kg/day)	5.0E-03	(mg/kg/day)	0.1
			Exp. Route Total								1.2E-04					3.2
			Dermal	Benzo(a)pyrene Equivalents	1.80	mg/kg	3.8E-06	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	2.8E-05	8.4E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	1.2E-5	mg/kg	1.1E-12	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	1.4E-07	1.3E-11	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.01
				Aroclor-1248	1.50	mg/kg	6.4E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.3E-06	7.5E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.110	mg/kg	4.7E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	9.5E-08	5.5E-07	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.03
				Aluminum	12,800	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.0000
				Antimony	2.00	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	6.0E-05	(mg/kg/day)	0.000
				Arsenic	20.6	mg/kg	1.9E-06	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	2.8E-06	2.2E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.07
				Barium	335	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	0.0000
				Cadmium	1.80	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	2.5E-05	(mg/kg/day)	0.000
				Cobalt	10.4	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.000
				Chromium	62.2	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00
				Copper	1,030	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.0000
				Iron	34,200	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.000
				Lead	2,140	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	386	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.00
				Mercury	2.10	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	0.000
				Thallium	0.480	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	43.7	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	5.0E-03	(mg/kg/day)	0.0000
			Exp. Route Total								3.2E-05					0.1
		Exposure Point Total									1.5E-04					3.3
	Exposure Medium Total										1.5E-04					3.3
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.9E-10	mg/m^3	8.4E-11	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	9.3E-11	1.8E-10	(mg/m^3)	NA	(mg/m^3)	--
				2,3,7,8-TCDD Equivalents	1.3E-15	mg/m^3	1.1E-16	(mg/m^3)	3.8E+01	$(ug/m^3)^{-1}$	4.0E-12	1.2E-15	(mg/m^3)	4.0E-08	(mg/m^3)	0.00000003
				Aroclor-1248	1.6E-10	mg/m^3	1.3E-11	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	7.5E-12	1.5E-10	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1254	1.2E-11	mg/m^3	9.6E-13	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	5.5E-13	1.1E-11	(mg/m^3)	NA	(mg/m^3)	--
				Aluminum	1.4E-6	mg/m^3	1.1E-07	(mg/m^3)	NA	$(ug/m^3)^{-1}$	--	1.3E-06	(mg/m^3)	5.0E-03	(mg/m^3)	0.0003

TABLE 7.6.C.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Air	OU7	Inhalation	Antimony	2.1E-10	mg/m^3	1.8E-11	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	2.0E-10	(mg/m^3)	NA	(mg/m^3)	--
				Arsenic	2.2E-9	mg/m^3	1.8E-10	(mg/m^3)	4.3E-03	(ug/m^3)$^{-1}$	7.8E-10	2.1E-09	(mg/m^3)	1.5E-05	(mg/m^3)	0.0001
				Barium	3.6E-8	mg/m^3	2.9E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	3.4E-08	(mg/m^3)	5.0E-04	(mg/m^3)	0.00007
				Cadmium	1.9E-10	mg/m^3	1.6E-11	(mg/m^3)	1.8E-03	(ug/m^3)$^{-1}$	2.8E-11	1.8E-10	(mg/m^3)	1.0E-05	(mg/m^3)	0.00002
				Cobalt	1.1E-9	mg/m^3	9.1E-11	(mg/m^3)	9.0E-03	(ug/m^3)$^{-1}$	8.2E-10	1.1E-09	(mg/m^3)	6.0E-06	(mg/m^3)	0.0002
				Chromium	6.6E-9	mg/m^3	5.5E-10	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	6.4E-09	(mg/m^3)	NA	(mg/m^3)	0.00000
				Copper	1.1E-7	mg/m^3	9.0E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	1.1E-07	(mg/m^3)	NA	(mg/m^3)	--
				Iron	3.6E-6	mg/m^3	3.0E-07	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	3.5E-06	(mg/m^3)	NA	(mg/m^3)	--
				Lead	2.3E-7	mg/m^3	1.9E-08	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	2.2E-07	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	4.1E-8	mg/m^3	3.4E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	4.0E-08	(mg/m^3)	5.0E-05	(mg/m^3)	0.0008
				Mercury	2.2E-10	mg/m^3	1.8E-11	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	2.1E-10	(mg/m^3)	3.0E-05	(mg/m^3)	0.000007
				Thallium	5.1E-11	mg/m^3	4.2E-12	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	4.9E-11	(mg/m^3)	NA	(mg/m^3)	--
				Vanadium	4.7E-9	mg/m^3	3.8E-10	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	4.5E-09	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								1.7E-09					0.001
		Exposure Point Total									1.7E-09					0.001
	Exposure Medium Total										1.7E-09					0.001
Medium Total											1.5E-04					3.3

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 7.1.C.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Constructon Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.80	mg/kg	5.0E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	3.6E-07	3.5E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	1.2E-5	mg/kg	3.3E-13	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	4.3E-08	2.3E-11	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.02
				Aroclor-1248	1.50	mg/kg	4.2E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	8.3E-08	2.9E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.110	mg/kg	3.0E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	6.1E-09	2.1E-07	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.01
				Aluminum	12,800	mg/kg	3.5E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	2.5E-02	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.02
				Antimony	2.00	mg/kg	5.5E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	3.9E-06	(mg/kg/day)	4.0E-04	(mg/kg/day)	0.010
				Arsenic	20.6	mg/kg	5.7E-07	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	8.6E-07	4.0E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.1
				Barium	335	mg/kg	9.3E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	6.5E-04	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.003
				Cadmium	1.80	mg/kg	5.0E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	3.5E-06	(mg/kg/day)	5.0E-04	(mg/kg/day)	0.007
				Cobalt	10.4	mg/kg	2.9E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	2.0E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.07
				Chromium	62.2	mg/kg	1.7E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	1.2E-04	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.00
				Copper	1,030	mg/kg	2.9E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	2.0E-03	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.05
				Iron	34,200	mg/kg	9.5E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	6.6E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.09
				Lead	2,140	mg/kg	5.9E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	4.1E-03	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	386	mg/kg	1.1E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	7.5E-04	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.03
				Mercury	2.10	mg/kg	5.8E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	4.1E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.01
				Thallium	0.480	mg/kg	1.3E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	9.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	43.7	mg/kg	1.2E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	8.5E-05	(mg/kg/day)	5.0E-03	(mg/kg/day)	0.02
			Exp. Route Total								1.4E-06					0.5
			Dermal	Benzo(a)pyrene Equivalents	1.80	mg/kg	6.5E-09	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	4.7E-08	4.5E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	1.2E-5	mg/kg	1.0E-14	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	1.3E-09	7.0E-13	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.0007
				Aroclor-1248	1.50	mg/kg	5.8E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	1.2E-08	4.1E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.110	mg/kg	4.3E-10	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	8.5E-10	3.0E-08	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.001
				Aluminum	12,800	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.00000
				Antimony	2.00	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	6.0E-05	(mg/kg/day)	0.00000
				Arsenic	20.6	mg/kg	1.7E-08	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	2.6E-08	1.2E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.004
				Barium	335	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	0.00000
				Cadmium	1.80	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	2.5E-05	(mg/kg/day)	0.0000
				Cobalt	10.4	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.00000
				Chromium	62.2	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.000
				Copper	1,030	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.00000
				Iron	34,200	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.00000
				Lead	2,140	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	386	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.0000
				Mercury	2.10	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	0.0000
				Thallium	0.480	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	43.7	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	5.0E-03	(mg/kg/day)	0.00000
			Exp. Route Total								8.7E-08					0.006
		Exposure Point Total									1.4E-06					0.5
Exposure Medium Total											1.4E-06					0.5
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.3E-6	mg/m^3	2.5E-09	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	2.7E-09	1.7E-07	(mg/m^3)	NA	(mg/m^3)	--
				2,3,7,8-TCDD Equivalents	8.4E-12	mg/m^3	1.6E-14	(mg/m^3)	3.8E+01	$(ug/m^3)^{-1}$	6.2E-10	1.1E-12	(mg/m^3)	4.0E-08	(mg/m^3)	0.00003
				Aroclor-1248	1.0E-6	mg/m^3	2.1E-09	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	1.2E-09	1.4E-07	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1254	7.7E-8	mg/m^3	1.5E-10	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	8.6E-11	1.1E-08	(mg/m^3)	NA	(mg/m^3)	--
				Aluminum	0.009	mg/m^3	1.8E-05	(mg/m^3)	NA	$(ug/m^3)^{-1}$	--	1.2E-03	(mg/m^3)	5.0E-03	(mg/m^3)	0.2

TABLE 7.1.C.CTE

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Constructon Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Air	OU7	Inhalation	Antimony	1.4E-6	mg/m^3	2.7E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	1.9E-07	(mg/m^3)	NA	(mg/m^3)	--
				Arsenic	1.4E-5	mg/m^3	2.8E-08	(mg/m^3)	4.3E-03	(ug/m^3)$^{-1}$	1.2E-07	2.0E-06	(mg/m^3)	1.5E-05	(mg/m^3)	0.1
				Barium	2.3E-4	mg/m^3	4.6E-07	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	3.2E-05	(mg/m^3)	5.0E-04	(mg/m^3)	0.06
				Cadmium	1.3E-6	mg/m^3	2.5E-09	(mg/m^3)	1.8E-03	(ug/m^3)$^{-1}$	4.4E-09	1.7E-07	(mg/m^3)	1.0E-05	(mg/m^3)	0.02
				Cobalt	7.3E-6	mg/m^3	1.4E-08	(mg/m^3)	9.0E-03	(ug/m^3)$^{-1}$	1.3E-07	1.0E-06	(mg/m^3)	6.0E-06	(mg/m^3)	0.2
				Chromium	4.3E-5	mg/m^3	8.5E-08	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	6.0E-06	(mg/m^3)	NA	(mg/m^3)	0.00
				Copper	7.2E-4	mg/m^3	1.4E-06	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	9.9E-05	(mg/m^3)	NA	(mg/m^3)	--
				Iron	0.024	mg/m^3	4.7E-05	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	3.3E-03	(mg/m^3)	NA	(mg/m^3)	--
				Lead	0.001	mg/m^3	2.9E-06	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	2.1E-04	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	2.7E-4	mg/m^3	5.3E-07	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	3.7E-05	(mg/m^3)	5.0E-05	(mg/m^3)	0.7
				Mercury	1.5E-6	mg/m^3	2.9E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	2.0E-07	(mg/m^3)	3.0E-05	(mg/m^3)	0.007
				Thallium	3.4E-7	mg/m^3	6.6E-10	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	4.6E-08	(mg/m^3)	NA	(mg/m^3)	--
				Vanadium	3.1E-5	mg/m^3	6.0E-08	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	4.2E-06	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								2.6E-07					1.4
		Exposure Point Total									2.6E-07					1.4
	Exposure Medium Total										2.6E-07					1.4
Medium Total											1.7E-06					1.9
Subsurface Soil	Subsurface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.10	mg/kg	3.0E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	2.2E-07	2.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	0.001	mg/kg	3.6E-11	(mg/kg/day)	1.3E+05	(mg/kg/day)$^{-1}$	4.7E-06	2.5E-09	(mg/kg/day)	1.0E-09	(mg/kg/day)	2.5
				Aroclor-1248	41.0	mg/kg	1.1E-06	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	2.3E-06	7.9E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.200	mg/kg	5.5E-09	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	1.1E-08	3.9E-07	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.02
				Aroclor-1260	4.60	mg/kg	1.3E-07	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	2.5E-07	8.9E-06	(mg/kg/day)	2.0E-05	(mg/kg/day)	--
				Dieldrin	0.160	mg/kg	4.4E-09	(mg/kg/day)	1.6E+01	(mg/kg/day)$^{-1}$	7.1E-08	3.1E-07	(mg/kg/day)	5.0E-05	(mg/kg/day)	0.006
				Aluminum	11,600	mg/kg	3.2E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	- -	2.2E-02	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.02
				Antimony	182	mg/kg	5.0E-06	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	- -	3.5E-04	(mg/kg/day)	4.0E-04	(mg/kg/day)	0.9
				Arsenic	18.0	mg/kg	5.0E-07	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	7.5E-07	3.5E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.1
				Barium	280	mg/kg	7.7E-06	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	- -	5.4E-04	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.003
				Cadmium	5.10	mg/kg	1.4E-07	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	- -	9.9E-06	(mg/kg/day)	5.0E-04	(mg/kg/day)	0.02
				Chromium	290	mg/kg	8.0E-06	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	- -	5.6E-04	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.0
				Cobalt	15.9	mg/kg	4.4E-07	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	- -	3.1E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.1
				Copper	6,020	mg/kg	1.7E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	- -	1.2E-02	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.3
				Iron	97,100	mg/kg	2.7E-03	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	- -	1.9E-01	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.3
				Lead	5,630	mg/kg	1.6E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	- -	1.1E-02	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	969	mg/kg	2.7E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	- -	1.9E-03	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.08
				Mercury	9.40	mg/kg	2.6E-07	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	- -	1.8E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.06
				Nickel	484	mg/kg	1.3E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	- -	9.4E-04	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.05
				Thallium	0.890	mg/kg	2.5E-08	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	- -	1.7E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	34.8	mg/kg	9.6E-07	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	- -	6.7E-05	(mg/kg/day)	5.0E-03	(mg/kg/day)	0.01
				Zinc	2,600	mg/kg	7.2E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	- -	5.0E-03	(mg/kg/day)	3.0E-01	(mg/kg/day)	0.02
			Exp. Route Total								8.3E-06					4.9
			Dermal	Benzo(a)pyrene Equivalents	1.10	mg/kg	4.0E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	2.9E-08	2.8E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	0.001	mg/kg	1.1E-12	(mg/kg/day)	1.3E+05	(mg/kg/day)$^{-1}$	1.4E-07	7.6E-11	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.08
				Aroclor-1248	41.0	mg/kg	1.6E-07	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	3.2E-07	1.1E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.200	mg/kg	7.7E-10	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	1.5E-09	5.4E-08	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.003
				Aroclor-1260	4.60	mg/kg	1.8E-08	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	3.6E-08	1.2E-06	(mg/kg/day)	NA	(mg/kg/day)	--

TABLE 7.1.C.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Constructon Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Subsurface Soil	Subsurface Soil	OU7	Dermal	Dieldrin	0.160	mg/kg	4.4E-10	(mg/kg/day)	1.6E+01	(mg/kg/day)$^{-1}$	7.1E-09	3.1E-08	(mg/kg/day)	5.0E-05	(mg/kg/day)	0.0006
				Aluminum	11,600	mg/kg	3.2E-07	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	2.2E-05	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.00002
				Antimony	182	mg/kg	5.0E-09	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	3.5E-07	(mg/kg/day)	6.0E-05	(mg/kg/day)	0.006
				Arsenic	18.0	mg/kg	1.5E-08	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	2.2E-08	1.0E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.003
				Barium	280	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	0.00000
				Cadmium	5.10	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	2.5E-05	(mg/kg/day)	0.0000
				Chromium	290	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.000
				Cobalt	15.9	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0000
				Copper	6,020	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.0000
				Iron	97,100	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0000
				Lead	5,630	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	969	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.000
				Mercury	9.40	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	0.0000
				Nickel	484	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	8.0E-04	(mg/kg/day)	0.000
				Thallium	0.890	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	34.8	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	5.0E-03	(mg/kg/day)	0.00000
				Zinc	2,600	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	3.0E-01	(mg/kg/day)	0.00000
			Exp. Route Total								5.5E-07					0.1
		Exposure Point Total									8.8E-06					5.0
	Exposure Medium Total										8.8E-06					5.0
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	7.7E-7	mg/m^3	1.5E-09	(mg/m^3)	1.1E-03	(ug/m^3)$^{-1}$	1.7E-09	1.1E-07	(mg/m^3)	NA	(mg/m^3)	--
				2,3,7,8-TCDD Equivalents	9.1E-10	mg/m^3	1.8E-12	(mg/m^3)	3.8E+01	(ug/m^3)$^{-1}$	6.8E-08	1.2E-10	(mg/m^3)	4.0E-08	(mg/m^3)	0.003
				Aroclor-1248	2.9E-5	mg/m^3	5.6E-08	(mg/m^3)	5.7E-04	(ug/m^3)$^{-1}$	3.2E-08	3.9E-06	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1254	1.4E-7	mg/m^3	2.7E-10	(mg/m^3)	5.7E-04	(ug/m^3)$^{-1}$	1.6E-10	1.9E-08	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1260	3.2E-6	mg/m^3	6.3E-09	(mg/m^3)	5.7E-04	(ug/m^3)$^{-1}$	3.6E-09	4.4E-07	(mg/m^3)	NA	(mg/m^3)	--
				Dieldrin	1.1E-7	mg/m^3	2.2E-10	(mg/m^3)	4.6E-03	(ug/m^3)$^{-1}$	1.0E-09	1.5E-08	(mg/m^3)	NA	(mg/m^3)	--
				Aluminum	0.008	mg/m^3	1.6E-05	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	1.1E-03	(mg/m^3)	5.0E-03	(mg/m^3)	0.2
				Antimony	1.3E-4	mg/m^3	2.5E-07	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	1.7E-05	(mg/m^3)	NA	(mg/m^3)	--
				Arsenic	1.3E-5	mg/m^3	2.5E-08	(mg/m^3)	4.3E-03	(ug/m^3)$^{-1}$	1.1E-07	1.7E-06	(mg/m^3)	1.5E-05	(mg/m^3)	0.1
				Barium	2.0E-4	mg/m^3	3.8E-07	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	2.7E-05	(mg/m^3)	5.0E-04	(mg/m^3)	0.05
				Cadmium	3.6E-6	mg/m^3	7.0E-09	(mg/m^3)	1.8E-03	(ug/m^3)$^{-1}$	1.3E-08	4.9E-07	(mg/m^3)	1.0E-05	(mg/m^3)	0.05
				Chromium	2.0E-4	mg/m^3	4.0E-07	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	2.8E-05	(mg/m^3)	NA	(mg/m^3)	0.0
				Cobalt	1.1E-5	mg/m^3	2.2E-08	(mg/m^3)	9.0E-03	(ug/m^3)$^{-1}$	2.0E-07	1.5E-06	(mg/m^3)	6.0E-06	(mg/m^3)	0.3
				Copper	0.004	mg/m^3	8.2E-06	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	5.8E-04	(mg/m^3)	NA	(mg/m^3)	--
				Iron	0.068	mg/m^3	1.3E-04	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	9.3E-03	(mg/m^3)	NA	(mg/m^3)	--
				Lead	0.004	mg/m^3	7.7E-06	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	5.4E-04	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	6.8E-4	mg/m^3	1.3E-06	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	9.3E-05	(mg/m^3)	5.0E-05	(mg/m^3)	1.9
				Mercury	6.6E-6	mg/m^3	1.3E-08	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	9.0E-07	(mg/m^3)	3.0E-05	(mg/m^3)	0.03
				Nickel	3.4E-4	mg/m^3	6.6E-07	(mg/m^3)	2.6E-04	(ug/m^3)$^{-1}$	1.7E-07	4.6E-05	(mg/m^3)	9.0E-05	(mg/m^3)	0.5
				Thallium	6.2E-7	mg/m^3	1.2E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	8.5E-08	(mg/m^3)	NA	(mg/m^3)	--
				Vanadium	2.4E-5	mg/m^3	4.8E-08	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	3.3E-06	(mg/m^3)	NA	(mg/m^3)	--
				Zinc	0.002	mg/m^3	3.6E-06	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	2.5E-04	(mg/m^3)	NA	(mg/m^3)	--

TABLE 7.1.C.CTE

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Constructon Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Subsurface Soil			Exp. Route Total								5.9E-07					3.1
		Exposure Point Total									5.9E-07					3.1
	Exposure Medium Total										5.9E-07					3.1
Medium Total											9.4E-06					8.1
Groundwater	Groundwater	OU7	Dermal	Manganese	2,820	ug/L	1.7E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	- -	1.7E-04	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.2
			Exp. Route Total								- -					0.2
		Exposure Point Total									- -					0.2
	Exposure Medium Total										- -					0.2
Medium Total											- -					0.2

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 7.2.C.CTE

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current
Receptor Population: Occupational Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7 - Entire Site	Ingestion	Benzo(a)pyrene Equivalents	1.80	mg/kg	9.9E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	7.2E-07	7.7E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	1.2E-5	mg/kg	6.6E-13	(mg/kg/day)	1.3E+05	(mg/kg/day)$^{-1}$	8.6E-08	5.1E-12	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.005
				Aroclor-1248	1.50	mg/kg	8.3E-08	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	1.7E-07	6.4E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.110	mg/kg	6.1E-09	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	1.2E-08	4.7E-08	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.002
				Aluminum	12,800	mg/kg	7.1E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	5.5E-03	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.005
				Antimony	2.00	mg/kg	1.1E-07	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	8.6E-07	(mg/kg/day)	4.0E-04	(mg/kg/day)	0.002
				Arsenic	20.6	mg/kg	1.1E-06	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	1.7E-06	8.8E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.03
				Barium	335	mg/kg	1.8E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.4E-04	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.0007
				Cadmium	1.80	mg/kg	9.9E-08	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	7.7E-07	(mg/kg/day)	5.0E-04	(mg/kg/day)	0.002
				Cobalt	10.4	mg/kg	5.7E-07	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	4.5E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.01
				Chromium	62.2	mg/kg	3.4E-06	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	2.7E-05	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.000
				Copper	1,030	mg/kg	5.7E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	4.4E-04	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.01
				Iron	34,200	mg/kg	1.9E-03	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.5E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.02
				Lead	2,140	mg/kg	1.2E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	9.2E-04	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	386	mg/kg	2.1E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.7E-04	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.007
				Mercury	2.10	mg/kg	1.2E-07	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	9.0E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.003
				Thallium	0.480	mg/kg	2.6E-08	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	2.1E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	43.7	mg/kg	2.4E-06	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.9E-05	(mg/kg/day)	5.0E-03	(mg/kg/day)	0.004
			Exp. Route Total								2.7E-06					0.1
			Dermal	Benzo(a)pyrene Equivalents	1.80	mg/kg	1.7E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	1.2E-07	1.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	1.2E-5	mg/kg	2.6E-14	(mg/kg/day)	1.3E+05	(mg/kg/day)$^{-1}$	3.4E-09	2.0E-13	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.0002
				Aroclor-1248	1.50	mg/kg	1.5E-08	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	3.1E-08	1.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.110	mg/kg	1.1E-09	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	2.2E-09	8.7E-09	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.0004
				Aluminum	12,800	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.000000
				Antimony	2.00	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	6.0E-05	(mg/kg/day)	0.00000
				Arsenic	20.6	mg/kg	4.5E-08	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	6.7E-08	3.5E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.001
				Barium	335	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	0.00000
				Cadmium	1.80	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	2.5E-05	(mg/kg/day)	0.00000
				Cobalt	10.4	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.00000
				Chromium	62.2	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0000
				Copper	1,030	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.00000
				Iron	34,200	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.00000
				Lead	2,140	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	386	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.0000
				Mercury	2.10	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	0.00000
				Thallium	0.480	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	43.7	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	5.0E-03	(mg/kg/day)	0.000000
			Exp. Route Total								2.3E-07					0.002
		Exposure Point Total									2.9E-06					0.1
Exposure Medium Total											2.9E-06					0.1

TABLE 7.2.C.CTE

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current
Receptor Population: Occupational Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Air	OU7 - Entire Site	Inhalation	Benzo(a)pyrene Equivalents	1.9E-10	mg/m^3	4.9E-12	(mg/m^3)	1.1E-03	(ug/m^3)$^{-1}$	5.4E-12	3.8E-11	(mg/m^3)	NA	(mg/m^3)	--
				2,3,7,8-TCDD Equivalents	1.3E-15	mg/m^3	3.3E-17	(mg/m^3)	3.8E+01	(ug/m^3)$^{-1}$	1.3E-12	2.6E-16	(mg/m^3)	4.0E-08	(mg/m^3)	6.40342E-09
				Aroclor-1248	1.6E-10	mg/m^3	4.1E-12	(mg/m^3)	5.7E-04	(ug/m^3)$^{-1}$	2.3E-12	3.2E-11	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1254	1.2E-11	mg/m^3	3.0E-13	(mg/m^3)	5.7E-04	(ug/m^3)$^{-1}$	1.7E-13	2.3E-12	(mg/m^3)	NA	(mg/m^3)	--
				Aluminum	1.4E-6	mg/m^3	3.5E-08	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	2.7E-07	(mg/m^3)	5.0E-03	(mg/m^3)	0.00005
				Antimony	2.1E-10	mg/m^3	5.5E-12	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	4.3E-11	(mg/m^3)	NA	(mg/m^3)	--
				Arsenic	2.2E-9	mg/m^3	5.7E-11	(mg/m^3)	4.3E-03	(ug/m^3)$^{-1}$	2.4E-10	4.4E-10	(mg/m^3)	1.5E-05	(mg/m^3)	0.00003
				Barium	3.6E-8	mg/m^3	9.2E-10	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	7.2E-09	(mg/m^3)	5.0E-04	(mg/m^3)	0.00001
				Cadmium	1.9E-10	mg/m^3	4.9E-12	(mg/m^3)	1.8E-03	(ug/m^3)$^{-1}$	8.9E-12	3.8E-11	(mg/m^3)	1.0E-05	(mg/m^3)	0.000004
				Cobalt	1.1E-9	mg/m^3	2.9E-11	(mg/m^3)	9.0E-03	(ug/m^3)$^{-1}$	2.6E-10	2.2E-10	(mg/m^3)	6.0E-06	(mg/m^3)	0.00004
				Chromium	6.6E-9	mg/m^3	1.7E-10	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	1.3E-09	(mg/m^3)	NA	(mg/m^3)	0.00000
				Copper	1.1E-7	mg/m^3	2.8E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	2.2E-08	(mg/m^3)	NA	(mg/m^3)	--
				Iron	3.6E-6	mg/m^3	9.4E-08	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	7.3E-07	(mg/m^3)	NA	(mg/m^3)	--
				Lead	2.3E-7	mg/m^3	5.9E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	4.6E-08	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	4.1E-8	mg/m^3	1.1E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	8.2E-09	(mg/m^3)	5.0E-05	(mg/m^3)	0.0002
				Mercury	2.2E-10	mg/m^3	5.8E-12	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	4.5E-11	(mg/m^3)	3.0E-05	(mg/m^3)	0.000001
				Thallium	5.1E-11	mg/m^3	1.3E-12	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	1.0E-11	(mg/m^3)	NA	(mg/m^3)	--
				Vanadium	4.7E-9	mg/m^3	1.2E-10	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	9.3E-10	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								5.2E-10					0.0003
		Exposure Point Total									5.2E-10					0.0003
	Exposure Medium Total										5.2E-10					0.0003
Medium Total											2.9E-06					0.1
Subsurface Soil	Subsurface Soil	OU7 - Entire Site	Ingestion	Benzo(a)pyrene Equivalents	1.10	mg/kg	6.1E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	4.4E-07	4.7E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	0.001	mg/kg	7.2E-11	(mg/kg/day)	1.3E+05	(mg/kg/day)$^{-1}$	9.3E-06	5.6E-10	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.6
				Aroclor-1248	41.0	mg/kg	2.3E-06	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	4.5E-06	1.8E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.200	mg/kg	1.1E-08	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	2.2E-08	8.6E-08	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.004
				Aroclor-1260	4.60	mg/kg	2.5E-07	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	5.1E-07	2.0E-06	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.1
				Dieldrin	0.160	mg/kg	8.8E-09	(mg/kg/day)	1.6E+01	(mg/kg/day)$^{-1}$	1.4E-07	6.9E-08	(mg/kg/day)	5.0E-05	(mg/kg/day)	0.001
				Aluminum	11,600	mg/kg	6.4E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	5.0E-03	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.005
				Antimony	182	mg/kg	1.0E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	7.8E-05	(mg/kg/day)	4.0E-04	(mg/kg/day)	0.2
				Arsenic	18.0	mg/kg	9.9E-07	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	1.5E-06	7.7E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.03
				Barium	280	mg/kg	1.5E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.2E-04	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.0006
				Cadmium	5.10	mg/kg	2.8E-07	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	2.2E-06	(mg/kg/day)	5.0E-04	(mg/kg/day)	0.004
				Chromium	290	mg/kg	1.6E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.2E-04	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.00
				Cobalt	15.9	mg/kg	8.8E-07	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	6.8E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.02
				Copper	6,020	mg/kg	3.3E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	2.6E-03	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.06
				Iron	97,100	mg/kg	5.4E-03	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	4.2E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.06
				Lead	5,630	mg/kg	3.1E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	2.4E-03	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	969	mg/kg	5.3E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	4.2E-04	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.02
				Mercury	9.40	mg/kg	5.2E-07	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	4.0E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.01
				Nickel	484	mg/kg	2.7E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	2.1E-04	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.01
				Thallium	0.890	mg/kg	4.9E-08	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	3.8E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	34.8	mg/kg	1.9E-06	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.5E-05	(mg/kg/day)	5.0E-03	(mg/kg/day)	0.003
				Zinc	2,600	mg/kg	1.4E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.1E-03	(mg/kg/day)	3.0E-01	(mg/kg/day)	0.004
			Exp. Route Total								1.6E-05					1.1

TABLE 7.2.C.CTE

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current
Receptor Population: Occupational Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Subsurface Soil	Subsurface Soil	OU7 - Entire Site	Dermal	Benzo(a)pyrene Equivalents	1.10	mg/kg	1.0E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	7.6E-08	8.1E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	0.001	mg/kg	2.8E-12	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	3.7E-07	2.2E-11	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.02
				Aroclor-1248	41.0	mg/kg	4.2E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	8.3E-07	3.2E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.200	mg/kg	2.0E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	4.1E-09	1.6E-08	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.0008
				Aroclor-1260	4.60	mg/kg	4.7E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	9.4E-08	3.6E-07	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.02
				Dieldrin	0.160	mg/kg	1.2E-09	(mg/kg/day)	1.6E+01	$(mg/kg/day)^{-1}$	1.9E-08	9.1E-09	(mg/kg/day)	5.0E-05	(mg/kg/day)	0.0002
				Aluminum	11,600	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.000000
				Antimony	182	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	6.0E-05	(mg/kg/day)	0.000
				Arsenic	18.0	mg/kg	3.9E-08	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	5.9E-08	3.1E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.001
				Barium	280	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	0.00000
				Cadmium	5.10	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.5E-05	(mg/kg/day)	0.0000
				Chromium	290	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.000
				Cobalt	15.9	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.00000
				Copper	6,020	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.00000
				Iron	97,100	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.00000
				Lead	5,630	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	969	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.0000
				Mercury	9.40	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	0.0000
				Nickel	484	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	8.0E-04	(mg/kg/day)	0.0000
				Thallium	0.890	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	34.8	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	5.0E-03	(mg/kg/day)	0.000000
				Zinc	2,600	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	3.0E-01	(mg/kg/day)	0.000000
			Exp. Route Total								1.5E-06					0.04
		Exposure Point Total									1.8E-05					1.1
	Exposure Medium Total										1.8E-05					1.1
	Air	OU7 - Entire Site	Inhalation	Benzo(a)pyrene Equivalents	1.2E-10	mg/m^3	3.0E-12	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	3.3E-12	2.3E-11	(mg/m^3)	NA	(mg/m^3)	--
				2,3,7,8-TCDD Equivalents	1.4E-13	mg/m^3	3.6E-15	(mg/m^3)	3.8E+01	$(ug/m^3)^{-1}$	1.4E-10	2.8E-14	(mg/m^3)	4.0E-08	(mg/m^3)	0.0000007
				Aroclor-1248	4.4E-9	mg/m^3	1.1E-10	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	6.4E-11	8.8E-10	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1254	2.1E-11	mg/m^3	5.5E-13	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	3.1E-13	4.3E-12	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1260	4.9E-10	mg/m^3	1.3E-11	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	7.2E-12	9.8E-11	(mg/m^3)	NA	(mg/m^3)	--
				Dieldrin	1.7E-11	mg/m^3	4.4E-13	(mg/m^3)	4.6E-03	$(ug/m^3)^{-1}$	2.0E-12	3.4E-12	(mg/m^3)	NA	(mg/m^3)	--
				Aluminum	1.2E-6	mg/m^3	3.2E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.5E-07	(mg/m^3)	5.0E-03	(mg/m^3)	0.00005
				Antimony	1.9E-8	mg/m^3	5.0E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	3.9E-09	(mg/m^3)	NA	(mg/m^3)	--
				Arsenic	1.9E-9	mg/m^3	4.9E-11	(mg/m^3)	4.3E-03	$(ug/m^3)^{-1}$	2.1E-10	3.8E-10	(mg/m^3)	1.5E-05	(mg/m^3)	0.00003
				Barium	3.0E-8	mg/m^3	7.7E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	6.0E-09	(mg/m^3)	5.0E-04	(mg/m^3)	0.00001
				Cadmium	5.4E-10	mg/m^3	1.4E-11	(mg/m^3)	1.8E-03	$(ug/m^3)^{-1}$	2.5E-11	1.1E-10	(mg/m^3)	1.0E-05	(mg/m^3)	0.00001
				Chromium	3.1E-8	mg/m^3	8.0E-10	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	6.2E-09	(mg/m^3)	NA	(mg/m^3)	0.00000
				Cobalt	1.7E-9	mg/m^3	4.4E-11	(mg/m^3)	9.0E-03	$(ug/m^3)^{-1}$	3.9E-10	3.4E-10	(mg/m^3)	6.0E-06	(mg/m^3)	0.00006
				Copper	6.4E-7	mg/m^3	1.7E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.3E-07	(mg/m^3)	NA	(mg/m^3)	--
				Iron	1.0E-5	mg/m^3	2.7E-07	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.1E-06	(mg/m^3)	NA	(mg/m^3)	--
				Lead	6.0E-7	mg/m^3	1.5E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.2E-07	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	1.0E-7	mg/m^3	2.7E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.1E-08	(mg/m^3)	5.0E-05	(mg/m^3)	0.0004
				Mercury	1.0E-9	mg/m^3	2.6E-11	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	2.0E-10	(mg/m^3)	3.0E-05	(mg/m^3)	0.000007
				Nickel	5.2E-8	mg/m^3	1.3E-09	(mg/m^3)	2.6E-04	$(ug/m^3)^{-1}$	3.5E-10	1.0E-08	(mg/m^3)	9.0E-05	(mg/m^3)	0.0001
				Thallium	9.5E-11	mg/m^3	2.4E-12	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	1.9E-11	(mg/m^3)	NA	(mg/m^3)	--

TABLE 7.2.C.CTE

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current
Receptor Population: Occupational Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Subsurface Soil	Air	OU7 - Entire Site	Inhalation	Vanadium	3.7E-9	mg/m^3	9.6E-11	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	7.4E-10	(mg/m^3)	NA	(mg/m^3)	--
				Zinc	2.8E-7	mg/m^3	7.1E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	- -	5.5E-08	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								1.2E-09					0.0007
		Exposure Point Total									1.2E-09					0.0007
	Exposure Medium Total										1.2E-09					0.0007
Medium Total											1.8E-05					1.1

Notes:

Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 7.3.C.CTE

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.80	mg/kg	4.8E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	3.5E-07	1.6E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	1.2E-5	mg/kg	1.1E-13	(mg/kg/day)	1.3E+05	(mg/kg/day)$^{-1}$	1.4E-08	1.1E-12	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.001
				Aroclor-1248	1.50	mg/kg	1.3E-08	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	2.6E-08	1.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.110	mg/kg	9.7E-10	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	1.9E-09	9.7E-09	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.0005
				Aluminum	12,800	mg/kg	1.1E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.1E-03	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.001
				Antimony	2.00	mg/kg	1.8E-08	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.8E-07	(mg/kg/day)	4.0E-04	(mg/kg/day)	0.0004
				Arsenic	20.6	mg/kg	1.8E-07	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	2.7E-07	1.8E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.006
				Barium	335	mg/kg	3.0E-06	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	3.0E-05	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.0001
				Cadmium	1.80	mg/kg	1.6E-08	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.6E-07	(mg/kg/day)	5.0E-04	(mg/kg/day)	0.0003
				Cobalt	10.4	mg/kg	9.2E-08	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	9.2E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.003
				Chromium	62.2	mg/kg	5.5E-07	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	5.5E-06	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.000
				Copper	1,030	mg/kg	9.1E-06	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	9.1E-05	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.002
				Iron	34,200	mg/kg	3.0E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	3.0E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.004
				Lead	2,140	mg/kg	1.9E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.9E-04	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	386	mg/kg	3.4E-06	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	3.4E-05	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.001
				Mercury	2.10	mg/kg	1.8E-08	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.8E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0006
				Thallium	0.480	mg/kg	4.2E-09	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	4.2E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	43.7	mg/kg	3.8E-07	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	3.8E-06	(mg/kg/day)	5.0E-03	(mg/kg/day)	0.0008
			Exp. Route Total								6.6E-07					0.02
			Dermal	Benzo(a)pyrene Equivalents	1.80	mg/kg	1.4E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	1.0E-07	4.7E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	1.2E-5	mg/kg	7.2E-15	(mg/kg/day)	1.3E+05	(mg/kg/day)$^{-1}$	9.4E-10	7.2E-14	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.00007
				Aroclor-1248	1.50	mg/kg	4.2E-09	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	8.4E-09	4.2E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.110	mg/kg	3.1E-10	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	6.2E-10	3.1E-09	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.0002
				Aluminum	12,800	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.000000
				Antimony	2.00	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	6.0E-05	(mg/kg/day)	0.000000
				Arsenic	20.6	mg/kg	1.2E-08	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	1.9E-08	1.2E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0004
				Barium	335	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	0.000000
				Cadmium	1.80	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	2.5E-05	(mg/kg/day)	0.00000
				Cobalt	10.4	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.000000
				Chromium	62.2	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0000
				Copper	1,030	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.000000
				Iron	34,200	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.000000
				Lead	2,140	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	386	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.00000
				Mercury	2.10	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	0.00000
				Thallium	0.480	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	43.7	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	5.0E-03	(mg/kg/day)	0.000000
			Exp. Route Total								1.3E-07					0.0006
		Exposure Point Total									7.9E-07					0.02
Exposure Medium Total											7.9E-07					0.02

TABLE 7.3.C.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.9E-10	mg/m^3	1.2E-12	(mg/m^3)	1.1E-03	(ug/m^3)$^{-1}$	1.3E-12	3.9E-12	(mg/m^3)	NA	(mg/m^3)	--
				2,3,7,8-TCDD Equivalents	1.3E-15	mg/m^3	2.6E-18	(mg/m^3)	3.8E+01	(ug/m^3)$^{-1}$	1.0E-13	2.6E-17	(mg/m^3)	4.0E-08	(mg/m^3)	6.57885E-10
				Aroclor-1248	1.6E-10	mg/m^3	3.3E-13	(mg/m^3)	5.7E-04	(ug/m^3)$^{-1}$	1.9E-13	3.3E-12	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1254	1.2E-11	mg/m^3	2.4E-14	(mg/m^3)	5.7E-04	(ug/m^3)$^{-1}$	1.4E-14	2.4E-13	(mg/m^3)	NA	(mg/m^3)	--
				Aluminum	1.4E-6	mg/m^3	2.8E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	2.8E-08	(mg/m^3)	5.0E-03	(mg/m^3)	0.000006
				Antimony	2.1E-10	mg/m^3	4.4E-13	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	4.4E-12	(mg/m^3)	NA	(mg/m^3)	--
				Arsenic	2.2E-9	mg/m^3	4.5E-12	(mg/m^3)	4.3E-03	(ug/m^3)$^{-1}$	1.9E-11	4.5E-11	(mg/m^3)	1.5E-05	(mg/m^3)	0.000003
				Barium	3.6E-8	mg/m^3	7.3E-11	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	7.3E-10	(mg/m^3)	5.0E-04	(mg/m^3)	0.000001
				Cadmium	1.9E-10	mg/m^3	3.9E-13	(mg/m^3)	1.8E-03	(ug/m^3)$^{-1}$	7.1E-13	3.9E-12	(mg/m^3)	1.0E-05	(mg/m^3)	0.0000004
				Cobalt	1.1E-9	mg/m^3	2.3E-12	(mg/m^3)	9.0E-03	(ug/m^3)$^{-1}$	2.1E-11	2.3E-11	(mg/m^3)	6.0E-06	(mg/m^3)	0.000004
				Chromium	6.6E-9	mg/m^3	1.4E-11	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	1.4E-10	(mg/m^3)	NA	(mg/m^3)	0.000000
				Copper	1.1E-7	mg/m^3	2.3E-10	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	2.3E-09	(mg/m^3)	NA	(mg/m^3)	--
				Iron	3.6E-6	mg/m^3	7.5E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	7.5E-08	(mg/m^3)	NA	(mg/m^3)	--
				Lead	2.3E-7	mg/m^3	4.7E-10	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	4.7E-09	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	4.1E-8	mg/m^3	8.5E-11	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	8.5E-10	(mg/m^3)	5.0E-05	(mg/m^3)	0.00002
				Mercury	2.2E-10	mg/m^3	4.6E-13	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	4.6E-12	(mg/m^3)	3.0E-05	(mg/m^3)	0.0000002
				Thallium	5.1E-11	mg/m^3	1.1E-13	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	1.1E-12	(mg/m^3)	NA	(mg/m^3)	--
				Vanadium	4.7E-9	mg/m^3	9.6E-12	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	9.6E-11	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								4.2E-11					0.00003
		Exposure Point Total									4.2E-11					0.00003
	Exposure Medium Total										4.2E-11					0.00003
Medium Total											7.9E-07					0.02
Sediment	Sediment	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.20	mg/kg	1.4E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	1.0E-08	4.7E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				TEQ PCB	0.002	mg/kg	6.3E-13	(mg/kg/day)	1.3E+05	(mg/kg/day)$^{-1}$	8.1E-08	6.3E-12	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.006
				Total PCBs	0.420	mg/kg	1.6E-10	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	3.3E-10	1.6E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	14.5	mg/kg	5.7E-09	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	8.5E-09	5.7E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0002
				Chromium	150	mg/kg	5.9E-08	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	5.9E-07	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.0002
				Iron	45,900	mg/kg	1.8E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.8E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0003
				Lead	187	mg/kg	7.3E-08	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	7.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese (Soil)	468	mg/kg	1.8E-07	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.8E-06	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.00001
			Exp. Route Total								1.0E-07					0.007
			Dermal	Benzo(a)pyrene Equivalents	1.20	mg/kg	4.2E-10	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	3.0E-09	1.4E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				TEQ PCB	0.002	mg/kg	4.3E-14	(mg/kg/day)	1.3E+05	(mg/kg/day)$^{-1}$	5.6E-09	4.3E-13	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.0004
				Total PCBs	0.420	mg/kg	5.2E-11	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	1.0E-10	5.2E-10	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	14.5	mg/kg	3.9E-10	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	5.8E-10	3.9E-09	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.00001
				Chromium	150	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	7.5E-05	(mg/kg/day)	0.00000
				Iron	45,900	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0000000
				Lead	187	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese (Soil)	468	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
			Exp. Route Total								9.3E-09					0.0004
		Exposure Point Total									1.1E-07					0.007
	Exposure Medium Total										1.1E-07					0.007
Medium Total											1.1E-07					0.007
										Total of Receptor Risks Across All Media	9.0E-07				Total of Receptor Hazards Across All Media	0.03

TABLE 7.4.C.CTE

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.80	mg/kg	5.3E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	3.9E-07	2.5E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	1.2E-5	mg/kg	1.2E-13	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	1.5E-08	1.6E-12	(mg/kg/day)	1.0E-09	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	1.5E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.9E-08	2.1E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.110	mg/kg	1.1E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.2E-09	1.5E-08	(mg/kg/day)	2.0E-05	(mg/kg/day)	--
				Aluminum	12,800	mg/kg	1.3E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	1.8E-03	(mg/kg/day)	1.0E+00	(mg/kg/day)	--
				Antimony	2.00	mg/kg	2.0E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	2.7E-07	(mg/kg/day)	4.0E-04	(mg/kg/day)	--
				Arsenic	20.6	mg/kg	2.0E-07	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	3.0E-07	2.8E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	--
				Barium	335	mg/kg	3.3E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	4.6E-05	(mg/kg/day)	2.0E-01	(mg/kg/day)	--
				Cadmium	1.80	mg/kg	1.8E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	2.5E-07	(mg/kg/day)	5.0E-04	(mg/kg/day)	--
				Cobalt	10.4	mg/kg	1.0E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	1.4E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	--
				Chromium	62.2	mg/kg	6.1E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	8.5E-06	(mg/kg/day)	1.5E+00	(mg/kg/day)	--
				Copper	1,030	mg/kg	1.0E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	1.4E-04	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Iron	34,200	mg/kg	3.3E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	4.7E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	2,140	mg/kg	2.1E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	2.9E-04	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	386	mg/kg	3.8E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	5.3E-05	(mg/kg/day)	2.4E-02	(mg/kg/day)	--
				Mercury	2.10	mg/kg	2.1E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	2.9E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	--
				Thallium	0.480	mg/kg	4.7E-09	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	6.6E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	43.7	mg/kg	4.3E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	6.0E-06	(mg/kg/day)	5.0E-03	(mg/kg/day)	--
			Exp. Route Total								7.3E-07					--
			Dermal	Benzo(a)pyrene Equivalents	1.80	mg/kg	4.5E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	3.2E-07	2.1E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	1.2E-5	mg/kg	2.3E-14	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	3.0E-09	3.2E-13	(mg/kg/day)	1.0E-09	(mg/kg/day)	--
				Aroclor-1248	1.50	mg/kg	1.3E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.7E-08	1.9E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.110	mg/kg	9.8E-10	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.0E-09	1.4E-08	(mg/kg/day)	2.0E-05	(mg/kg/day)	--
				Aluminum	12,800	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	--
				Antimony	2.00	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	6.0E-05	(mg/kg/day)	--
				Arsenic	20.6	mg/kg	3.9E-08	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	5.9E-08	5.5E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	--
				Barium	335	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	--
				Cadmium	1.80	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	2.5E-05	(mg/kg/day)	--
				Cobalt	10.4	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	--
				Chromium	62.2	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	2.0E-02	(mg/kg/day)	--
				Copper	1,030	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Iron	34,200	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Lead	2,140	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	386	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	9.6E-04	(mg/kg/day)	--
				Mercury	2.10	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	--
				Thallium	0.480	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	43.7	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	5.0E-03	(mg/kg/day)	--
			Exp. Route Total								4.2E-07					--
		Exposure Point Total									1.2E-06					--
	Exposure Medium Total										1.2E-06					--
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.9E-10	mg/m^3	8.5E-13	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	9.3E-13	3.9E-12	(mg/m^3)	NA	(mg/m^3)	--
				2,3,7,8-TCDD Equivalents	1.3E-15	mg/m^3	1.9E-18	(mg/m^3)	3.8E+01	$(ug/m^3)^{-1}$	7.1E-14	2.6E-17	(mg/m^3)	4.0E-08	(mg/m^3)	6.57885E-10
				Aroclor-1248	1.6E-10	mg/m^3	2.3E-13	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	1.3E-13	3.3E-12	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1254	1.2E-11	mg/m^3	1.7E-14	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	9.8E-15	2.4E-13	(mg/m^3)	NA	(mg/m^3)	--
				Aluminum	1.4E-6	mg/m^3	2.0E-09	(mg/m^3)	NA	$(ug/m^3)^{-1}$	--	2.8E-08	(mg/m^3)	5.0E-03	(mg/m^3)	0.000006

TABLE 7.4.C.CTE

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Air	OU7	Inhalation	Antimony	2.1E-10	mg/m^3	3.1E-13	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	4.4E-12	(mg/m^3)	NA	(mg/m^3)	--
				Arsenic	2.2E-9	mg/m^3	3.2E-12	(mg/m^3)	4.3E-03	(ug/m^3)$^{-1}$	1.4E-11	4.5E-11	(mg/m^3)	1.5E-05	(mg/m^3)	0.000003
				Barium	3.6E-8	mg/m^3	5.2E-11	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	7.3E-10	(mg/m^3)	5.0E-04	(mg/m^3)	0.000001
				Cadmium	1.9E-10	mg/m^3	2.8E-13	(mg/m^3)	1.8E-03	(ug/m^3)$^{-1}$	5.1E-13	3.9E-12	(mg/m^3)	1.0E-05	(mg/m^3)	0.0000004
				Cobalt	1.1E-9	mg/m^3	1.6E-12	(mg/m^3)	9.0E-03	(ug/m^3)$^{-1}$	1.5E-11	2.3E-11	(mg/m^3)	6.0E-06	(mg/m^3)	0.000004
				Chromium	6.6E-9	mg/m^3	9.7E-12	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	1.4E-10	(mg/m^3)	NA	(mg/m^3)	0.000000
				Copper	1.1E-7	mg/m^3	1.6E-10	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	2.3E-09	(mg/m^3)	NA	(mg/m^3)	--
				Iron	3.6E-6	mg/m^3	5.4E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	7.5E-08	(mg/m^3)	NA	(mg/m^3)	--
				Lead	2.3E-7	mg/m^3	3.4E-10	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	4.7E-09	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	4.1E-8	mg/m^3	6.0E-11	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	8.5E-10	(mg/m^3)	5.0E-05	(mg/m^3)	0.00002
				Mercury	2.2E-10	mg/m^3	3.3E-13	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	4.6E-12	(mg/m^3)	3.0E-05	(mg/m^3)	0.0000002
				Thallium	5.1E-11	mg/m^3	7.5E-14	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	1.1E-12	(mg/m^3)	NA	(mg/m^3)	--
				Vanadium	4.7E-9	mg/m^3	6.8E-12	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	9.6E-11	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								3.0E-11					0.00003
		Exposure Point Total									3.0E-11					0.00003
	Exposure Medium Total										3.0E-11					0.00003
Medium Total											1.2E-06					0.03716
Sediment	Sediment	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.20	mg/kg	1.6E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	1.1E-08	7.3E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				TEQ PCB	0.002	mg/kg	7.0E-13	(mg/kg/day)	1.3E+05	(mg/kg/day)$^{-1}$	9.0E-08	9.7E-12	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.010
				Total PCBs	0.420	mg/kg	1.8E-10	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	3.7E-10	2.6E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	14.5	mg/kg	6.3E-09	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	9.5E-09	8.8E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0003
				Chromium	150	mg/kg	6.5E-08	(mg/kg/day)	5.0E-01	(mg/kg/day)$^{-1}$	3.3E-08	9.1E-07	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.0003
				Iron	45,900	mg/kg	2.0E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	- -	2.8E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0004
				Lead	187	mg/kg	8.1E-08	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	- -	1.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese (Soil)	468	mg/kg	2.0E-07	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	- -	2.8E-06	(mg/kg/day)	1.4E-01	(mg/kg/day)	0.00002
			Exp. Route Total								1.4E-07					0.01
			Dermal	Benzo(a)pyrene Equivalents	1.20	mg/kg	1.3E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	9.6E-09	6.2E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				TEQ PCB	0.002	mg/kg	1.4E-13	(mg/kg/day)	1.3E+05	(mg/kg/day)$^{-1}$	1.8E-08	1.9E-12	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.002
				Total PCBs	0.420	mg/kg	1.7E-10	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	3.3E-10	2.3E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	14.5	mg/kg	1.2E-09	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	1.8E-09	1.7E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.00006
				Chromium	150	mg/kg	4.2E-10	(mg/kg/day)	2.0E+01	(mg/kg/day)$^{-1}$	8.5E-09	5.9E-09	(mg/kg/day)	7.5E-05	(mg/kg/day)	0.00008
				Iron	45,900	mg/kg	1.3E-07	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	- -	1.8E-06	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.000003
				Lead	187	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese (Soil)	468	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	- -	0.0E+00	(mg/kg/day)	5.6E-03	(mg/kg/day)	--
			Exp. Route Total								3.8E-08					0.002
		Exposure Point Total									1.8E-07					0.01
	Exposure Medium Total										1.8E-07					0.01
Medium Total											1.8E-07					0.01

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 7.5.C.CTE

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.80	mg/kg	2.5E-07	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	1.8E-06	8.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	1.2E-5	mg/kg	5.5E-13	(mg/kg/day)	1.3E+05	(mg/kg/day)$^{-1}$	7.1E-08	5.5E-12	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.005
				Aroclor-1248	1.50	mg/kg	6.9E-08	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	1.4E-07	6.9E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.110	mg/kg	5.0E-09	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	1.0E-08	5.0E-08	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.003
				Aluminum	12,800	mg/kg	5.9E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	5.9E-03	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.006
				Antimony	2.00	mg/kg	9.2E-08	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	9.2E-07	(mg/kg/day)	4.0E-04	(mg/kg/day)	0.002
				Arsenic	20.6	mg/kg	9.4E-07	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	1.4E-06	9.4E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.03
				Barium	335	mg/kg	1.5E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.5E-04	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.0008
				Cadmium	1.80	mg/kg	8.2E-08	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	8.2E-07	(mg/kg/day)	5.0E-04	(mg/kg/day)	0.002
				Cobalt	10.4	mg/kg	4.8E-07	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	4.8E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.02
				Chromium	62.2	mg/kg	2.8E-06	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	2.8E-05	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.000
				Copper	1,030	mg/kg	4.7E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	4.7E-04	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.01
				Iron	34,200	mg/kg	1.6E-03	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.6E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.02
				Lead	2,140	mg/kg	9.8E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	9.8E-04	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	386	mg/kg	1.8E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.8E-04	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.007
				Mercury	2.10	mg/kg	9.6E-08	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	9.6E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.003
				Thallium	0.480	mg/kg	2.2E-08	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	2.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	43.7	mg/kg	2.0E-06	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	2.0E-05	(mg/kg/day)	5.0E-03	(mg/kg/day)	0.004
			Exp. Route Total								3.4E-06					0.1
			Dermal	Benzo(a)pyrene Equivalents	1.80	mg/kg	3.7E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	2.7E-07	1.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	1.2E-5	mg/kg	1.9E-14	(mg/kg/day)	1.3E+05	(mg/kg/day)$^{-1}$	2.4E-09	1.9E-13	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.0002
				Aroclor-1248	1.50	mg/kg	1.1E-08	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	2.2E-08	1.1E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.110	mg/kg	8.0E-10	(mg/kg/day)	2.0E+00	(mg/kg/day)$^{-1}$	1.6E-09	8.0E-09	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.0004
				Aluminum	12,800	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.000000
				Antimony	2.00	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	6.0E-05	(mg/kg/day)	0.00000
				Arsenic	20.6	mg/kg	3.2E-08	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	4.8E-08	3.2E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.001
				Barium	335	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	0.00000
				Cadmium	1.80	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	2.5E-05	(mg/kg/day)	0.00000
				Cobalt	10.4	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.00000
				Chromium	62.2	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0000
				Copper	1,030	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.00000
				Iron	34,200	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.00000
				Lead	2,140	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	386	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.0000
				Mercury	2.10	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	0.00000
				Thallium	0.480	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	43.7	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	5.0E-03	(mg/kg/day)	0.000000
			Exp. Route Total								3.4E-07					0.002
		Exposure Point Total									3.8E-06					0.1
Exposure Medium Total											3.8E-06					0.1

TABLE 7.5.C.CTE

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.9E-10	mg/m^3	3.7E-11	(mg/m^3)	1.1E-03	(ug/m^3)$^{-1}$	4.1E-11	1.2E-10	(mg/m^3)	NA	(mg/m^3)	--
				2,3,7,8-TCDD Equivalents	1.3E-15	mg/m^3	8.2E-17	(mg/m^3)	3.8E+01	(ug/m^3)$^{-1}$	3.1E-12	8.2E-16	(mg/m^3)	4.0E-08	(mg/m^3)	0.00000002
				Aroclor-1248	1.6E-10	mg/m^3	1.0E-11	(mg/m^3)	5.7E-04	(ug/m^3)$^{-1}$	5.8E-12	1.0E-10	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1254	1.2E-11	mg/m^3	7.5E-13	(mg/m^3)	5.7E-04	(ug/m^3)$^{-1}$	4.3E-13	7.5E-12	(mg/m^3)	NA	(mg/m^3)	--
				Aluminum	1.4E-6	mg/m^3	8.8E-08	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	8.8E-07	(mg/m^3)	5.0E-03	(mg/m^3)	0.0002
				Antimony	2.1E-10	mg/m^3	1.4E-11	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	1.4E-10	(mg/m^3)	NA	(mg/m^3)	--
				Arsenic	2.2E-9	mg/m^3	1.4E-10	(mg/m^3)	4.3E-03	(ug/m^3)$^{-1}$	6.1E-10	1.4E-09	(mg/m^3)	1.5E-05	(mg/m^3)	0.00009
				Barium	3.6E-8	mg/m^3	2.3E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	2.3E-08	(mg/m^3)	5.0E-04	(mg/m^3)	0.00005
				Cadmium	1.9E-10	mg/m^3	1.2E-11	(mg/m^3)	1.8E-03	(ug/m^3)$^{-1}$	2.2E-11	1.2E-10	(mg/m^3)	1.0E-05	(mg/m^3)	0.00001
				Cobalt	1.1E-9	mg/m^3	7.1E-11	(mg/m^3)	9.0E-03	(ug/m^3)$^{-1}$	6.4E-10	7.1E-10	(mg/m^3)	6.0E-06	(mg/m^3)	0.0001
				Chromium	6.6E-9	mg/m^3	4.3E-10	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	4.3E-09	(mg/m^3)	NA	(mg/m^3)	0.00000
				Copper	1.1E-7	mg/m^3	7.0E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	7.0E-08	(mg/m^3)	NA	(mg/m^3)	--
				Iron	3.6E-6	mg/m^3	2.3E-07	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	2.3E-06	(mg/m^3)	NA	(mg/m^3)	--
				Lead	2.3E-7	mg/m^3	1.5E-08	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	1.5E-07	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	4.1E-8	mg/m^3	2.6E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	2.6E-08	(mg/m^3)	5.0E-05	(mg/m^3)	0.0005
				Mercury	2.2E-10	mg/m^3	1.4E-11	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	1.4E-10	(mg/m^3)	3.0E-05	(mg/m^3)	0.000005
				Thallium	5.1E-11	mg/m^3	3.3E-12	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	3.3E-11	(mg/m^3)	NA	(mg/m^3)	--
				Vanadium	4.7E-9	mg/m^3	3.0E-10	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	3.0E-09	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								1.3E-09					0.001
		Exposure Point Total									1.3E-09					0.001
	Exposure Medium Total										1.3E-09					0.001
Medium Total											3.8E-06					0.1
										Total of Receptor Risks Across All Media	3.8E-06				Total of Receptor Hazards Across All Media	0.1

TABLE 7.6.C.CTE

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	OU7	Ingestion	Benzo(a)pyrene Equivalents	1.80	mg/kg	2.2E-06	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.6E-05	7.7E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	1.2E-5	mg/kg	1.5E-12	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	1.9E-07	5.1E-11	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.05
				Aroclor-1248	1.50	mg/kg	1.8E-07	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	3.7E-07	6.4E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.110	mg/kg	1.3E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	2.7E-08	4.7E-07	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.02
				Aluminum	12,800	mg/kg	1.6E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	5.5E-02	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.05
				Antimony	2.00	mg/kg	2.4E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	8.5E-06	(mg/kg/day)	4.0E-04	(mg/kg/day)	0.02
				Arsenic	20.6	mg/kg	2.5E-06	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	3.8E-06	8.8E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.3
				Barium	335	mg/kg	4.1E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	1.4E-03	(mg/kg/day)	2.0E-01	(mg/kg/day)	0.007
				Cadmium	1.80	mg/kg	2.2E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	7.7E-06	(mg/kg/day)	5.0E-04	(mg/kg/day)	0.02
				Cobalt	10.4	mg/kg	1.3E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	4.4E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.1
				Chromium	62.2	mg/kg	7.6E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	2.7E-04	(mg/kg/day)	1.5E+00	(mg/kg/day)	0.00
				Copper	1,030	mg/kg	1.3E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	4.4E-03	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.1
				Iron	34,200	mg/kg	4.2E-03	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	1.5E-01	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.2
				Lead	2,140	mg/kg	2.6E-04	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	9.1E-03	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	386	mg/kg	4.7E-05	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	1.6E-03	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.07
				Mercury	2.10	mg/kg	2.6E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	9.0E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.03
				Thallium	0.480	mg/kg	5.9E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	2.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	43.7	mg/kg	5.3E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	1.9E-04	(mg/kg/day)	5.0E-03	(mg/kg/day)	0.04
			Exp. Route Total								2.0E-05					1.1
			Dermal	Benzo(a)pyrene Equivalents	1.80	mg/kg	3.2E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	2.3E-06	1.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				2,3,7,8-TCDD Equivalents	1.2E-5	mg/kg	4.9E-14	(mg/kg/day)	1.3E+05	$(mg/kg/day)^{-1}$	6.4E-09	1.7E-12	(mg/kg/day)	1.0E-09	(mg/kg/day)	0.002
				Aroclor-1248	1.50	mg/kg	2.9E-08	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	5.7E-08	1.0E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Aroclor-1254	0.110	mg/kg	2.1E-09	(mg/kg/day)	2.0E+00	$(mg/kg/day)^{-1}$	4.2E-09	7.4E-08	(mg/kg/day)	2.0E-05	(mg/kg/day)	0.004
				Aluminum	12,800	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.00000
				Antimony	2.00	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	6.0E-05	(mg/kg/day)	0.0000
				Arsenic	20.6	mg/kg	8.5E-08	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	1.3E-07	3.0E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.010
				Barium	335	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	1.4E-02	(mg/kg/day)	0.0000
				Cadmium	1.80	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	2.5E-05	(mg/kg/day)	0.0000
				Cobalt	10.4	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0000
				Chromium	62.2	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.000
				Copper	1,030	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.0000
				Iron	34,200	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0000
				Lead	2,140	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	386	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.000
				Mercury	2.10	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	2.1E-05	(mg/kg/day)	0.0000
				Thallium	0.480	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Vanadium	43.7	mg/kg	0.0E+00	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	5.0E-03	(mg/kg/day)	0.00000
			Exp. Route Total								2.5E-06					0.02
		Exposure Point Total									2.3E-05					1.1
Exposure Medium Total											2.3E-05					1.1
	Air	OU7	Inhalation	Benzo(a)pyrene Equivalents	1.9E-10	mg/m^3	3.5E-11	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	3.9E-11	1.2E-10	(mg/m^3)	NA	(mg/m^3)	--
				2,3,7,8-TCDD Equivalents	1.3E-15	mg/m^3	2.3E-17	(mg/m^3)	3.8E+01	$(ug/m^3)^{-1}$	8.9E-13	8.2E-16	(mg/m^3)	4.0E-08	(mg/m^3)	0.00000002
				Aroclor-1248	1.6E-10	mg/m^3	2.9E-12	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	1.7E-12	1.0E-10	(mg/m^3)	NA	(mg/m^3)	--
				Aroclor-1254	1.2E-11	mg/m^3	2.2E-13	(mg/m^3)	5.7E-04	$(ug/m^3)^{-1}$	1.2E-13	7.5E-12	(mg/m^3)	NA	(mg/m^3)	--
				Aluminum	1.4E-6	mg/m^3	2.5E-08	(mg/m^3)	NA	$(ug/m^3)^{-1}$	--	8.8E-07	(mg/m^3)	5.0E-03	(mg/m^3)	0.0002

TABLE 7.6.C.CTE

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Air	OU7	Inhalation	Antimony	2.1E-10	mg/m^3	3.9E-12	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	1.4E-10	(mg/m^3)	NA	(mg/m^3)	--
				Arsenic	2.2E-9	mg/m^3	4.0E-11	(mg/m^3)	4.3E-03	(ug/m^3)$^{-1}$	1.7E-10	1.4E-09	(mg/m^3)	1.5E-05	(mg/m^3)	0.00009
				Barium	3.6E-8	mg/m^3	6.5E-10	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	2.3E-08	(mg/m^3)	5.0E-04	(mg/m^3)	0.00005
				Cadmium	1.9E-10	mg/m^3	3.5E-12	(mg/m^3)	1.8E-03	(ug/m^3)$^{-1}$	6.3E-12	1.2E-10	(mg/m^3)	1.0E-05	(mg/m^3)	0.00001
				Cobalt	1.1E-9	mg/m^3	2.0E-11	(mg/m^3)	9.0E-03	(ug/m^3)$^{-1}$	1.8E-10	7.1E-10	(mg/m^3)	6.0E-06	(mg/m^3)	0.0001
				Chromium	6.6E-9	mg/m^3	1.2E-10	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	4.3E-09	(mg/m^3)	NA	(mg/m^3)	0.00000
				Copper	1.1E-7	mg/m^3	2.0E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	7.0E-08	(mg/m^3)	NA	(mg/m^3)	--
				Iron	3.6E-6	mg/m^3	6.7E-08	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	2.3E-06	(mg/m^3)	NA	(mg/m^3)	--
				Lead	2.3E-7	mg/m^3	4.2E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	1.5E-07	(mg/m^3)	NA	(mg/m^3)	--
				Manganese	4.1E-8	mg/m^3	7.5E-10	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	2.6E-08	(mg/m^3)	5.0E-05	(mg/m^3)	0.0005
				Mercury	2.2E-10	mg/m^3	4.1E-12	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	1.4E-10	(mg/m^3)	3.0E-05	(mg/m^3)	0.000005
				Thallium	5.1E-11	mg/m^3	9.4E-13	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	3.3E-11	(mg/m^3)	NA	(mg/m^3)	--
				Vanadium	4.7E-9	mg/m^3	8.5E-11	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	3.0E-09	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								4.0E-10					0.001
		Exposure Point Total									4.0E-10					0.001
	Exposure Medium Total										4.0E-10					0.001
Medium Total											2.3E-05					1.1

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

LIST OF TABLES
RAGS PART D TABLE 9
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

Table No.

REASONABLE MAXIMUM EXPOSURES

9.1.C.RME Construction Workers - Entire Site Surface/Subsurface Soil & Groundwater
9.2.C.RME Occupational Workers - Entire Site Surface Soil & Subsurface Soil
9.3.C.RME Adult Recreational Users - Entire Site Surface Soil & Sediment
9.4.C.RME Adolescent Recreational Users - Entire Site Surface Soil & Sediment
9.5.C.RME Lifetime Recreational Users - Entire Site Surface Soil & Sediment
9.6.C.RME Adult Residents - Entire Site Surface Soil
9.7.C.RME Child Residents - Entire Site Surface Soil
9.8.C.RME Lifetime Residents - Entire Site Surface Soil

CENTRAL TENDENCY EXPOSURES

9.1.C.CTE Construction Workers - Entire Site Surface/Subsurface Soil & Groundwater
9.2.C.CTE Occupational Workers - Entire Site Surface Soil & Subsurface Soil
9.3.C.CTE Adult Recreational Users - Entire Site Surface Soil & Sediment
9.4.C.CTE Adolescent Recreational Users - Entire Site Surface Soil & Sediment
9.5.C.CTE Lifetime Recreational Users - Entire Site Surface Soil & Sediment
9.6.C.CTE Adult Residents - Entire Site Surface Soil
9.7.C.CTE Child Residents - Entire Site Surface Soil
9.8.C.CTE Lifetime Residents - Entire Site Surface Soil

TABLE 9.1.C.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Constructon Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	4E-07	--	1E-07	--	5E-07	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	4E-08	--	4E-09	--	5E-08	NA	0.02	--	0.002	0.03
			Aroclor-1248	8E-08	--	3E-08	--	1E-07	NA	--	--	--	--
			Aroclor-1254	6E-09	--	3E-09	--	9E-09	Immune	0.01	--	0.004	0.02
			Aluminum	--	--	--	--	--	CNS	0.02	--	0.00000	0.02
			Antimony	--	--	--	--	--	Blood	0.010	--	0.0000	0.010
			Arsenic	9E-07	--	8E-08	--	9E-07	Skin, CVS	0.1	--	0.01	0.1
			Barium	--	--	--	--	--	Kidney	0.003	--	0.0000	0.003
			Cadmium	--	--	--	--	--	NA	0.007	--	0.0000	0.007
			Cobalt	--	--	--	--	--	Thyroid	0.07	--	0.0000	0.07
			Chromium	--	--	--	--	--	0	0.00	--	0.000	0.00
			Copper	--	--	--	--	--	GS	0.05	--	0.0000	0.05
			Iron	--	--	--	--	--	GS	0.09	--	0.0000	0.09
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	0.03	--	0.000	0.03
			Mercury	--	--	--	--	--	Autoimmune	0.01	--	0.0000	0.01
			Thallium	--	--	--	--	--	NA	--	--	--	--
			Vanadium	--	--	--	--	--	Kidney	0.02	--	0.00000	0.02
			Chemical Total	1E-06	--	3E-07	--	2E-06		0.5	--	0.02	0.5
		Exposure Point Total						2E-06					0.5
	Exposure Medium Total							2E-06					0.5
	Air	OU7	Benzo(a)pyrene Equivalents	--	3E-09	--	--	3E-09	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	6E-10	--	--	6E-10	NA	--	0.00003	--	0.00003
			Aroclor-1248	--	1E-09	--	--	1E-09	NA	--	--	--	--
			Aroclor-1254	--	9E-11	--	--	9E-11	NA	--	--	--	--
			Aluminum	--	--	--	--	--	CNS	--	0.2	--	0.2
			Antimony	--	--	--	--	--	NA	--	--	--	--
			Arsenic	--	1E-07	--	--	1E-07	NA	--	0.1	--	0.1
			Barium	--	--	--	--	--	Fetotoxicity	--	0.06	--	0.06
			Cadmium	--	4E-09	--	--	4E-09	NA	--	0.02	--	0.02
			Cobalt	--	1E-07	--	--	1E-07	Respiratory	--	0.2	--	0.2
			Chromium	--	--	--	--	--	0	--	0.00	--	0.00
			Copper	--	--	--	--	--	NA	--	--	--	--
			Iron	--	--	--	--	--	NA	--	--	--	--
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	--	0.7	--	0.7
			Mercury	--	--	--	--	--	CNS, Kidney	--	0.007	--	0.007
			Thallium	--	--	--	--	--	NA	--	--	--	--
			Vanadium	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	--	3E-07	--	--	3E-07		--	1	--	1

TABLE 9.1.C.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Constructon Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil		Exposure Point Total						3E-07					1
	Exposure Medium Total							3E-07					1
Medium Total								2E-06					2
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	2E-07	--	9E-08	--	3E-07	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	5E-06	--	4E-07	--	5E-06	NA	3	--	0.2	3
			Aroclor-1248	2E-06	--	1E-06	--	3E-06	NA	--	--	--	--
			Aroclor-1254	1E-08	--	5E-09	--	2E-08	Immune	0.02	--	0.008	0.03
			Aroclor-1260	3E-07	--	1E-07	--	4E-07	NA	--	--	--	--
			Dieldrin	7E-08	--	2E-08	--	9E-08	Liver	0.006	--	0.002	0.008
			Aluminum	--	--	--	--	--	CNS	0.02	--	0.00007	0.02
			Antimony	--	--	--	--	--	Blood	0.9	--	0.02	0.9
			Arsenic	7E-07	--	7E-08	--	8E-07	Skin, CVS	0.1	--	0.01	0.1
			Barium	--	--	--	--	--	Kidney	0.003	--	0.0000	0.003
			Cadmium	--	--	--	--	--	NA	0.02	--	0.000	0.02
			Chromium	--	--	--	--	--	0	0.0	--	0.00	0.0
			Cobalt	--	--	--	--	--	Thyroid	0.1	--	0.0000	0.1
			Copper	--	--	--	--	--	GS	0.3	--	0.0000	0.3
			Iron	--	--	--	--	--	GS	0.3	--	0.0000	0.3
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	0.08	--	0.000	0.08
			Mercury	--	--	--	--	--	Autoimmune	0.06	--	0.000	0.06
			Nickel	--	--	--	--	--	Body Weight	0.05	--	0.000	0.05
			Thallium	--	--	--	--	--	NA	--	--	--	--
			Vanadium	--	--	--	--	--	Kidney	0.01	--	0.00000	0.01
			Zinc	--	--	--	--	--	Blood	0.02	--	0.00000	0.02
			Chemical Total	8E-06	--	2E-06	--	1E-05		5	--	0.3	5
		Exposure Point Total						1E-05					5
	Exposure Medium Total							1E-05					5
	Air	OU7	Benzo(a)pyrene Equivalents	--	2E-09	--	--	2E-09	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	7E-08	--	--	7E-08	NA	--	0.003	--	0.003
			Aroclor-1248	--	3E-08	--	--	3E-08	NA	--	--	--	--
			Aroclor-1254	--	2E-10	--	--	2E-10	NA	--	--	--	--
			Aroclor-1260	--	4E-09	--	--	4E-09	NA	--	--	--	--
			Dieldrin	--	1E-09	--	--	1E-09	NA	--	--	--	--
			Aluminum	--	--	--	--	--	CNS	--	0.2	--	0.2

TABLE 9.1.C.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Constructon Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Air	OU7	Antimony	--	--	--	--	--	NA	--	--	--	--
			Arsenic	--	1E-07	--	--	1E-07	NA	--	0.1	--	0.1
			Barium	--	--	--	--	--	Fetotoxicity	--	0.05	--	0.05
			Cadmium	--	1E-08	--	--	1E-08	NA	--	0.05	--	0.05
			Chromium	--	--	--	--	--	0	--	0.0	--	0.0
			Cobalt	--	2E-07	--	--	2E-07	Respiratory	--	0.3	--	0.3
			Copper	--	--	--	--	--	NA	--	--	--	--
			Iron	--	--	--	--	--	NA	--	--	--	--
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	--	2	--	2
			Mercury	--	--	--	--	--	CNS, Kidney	--	0.03	--	0.03
			Nickel	--	2E-07	--	--	2E-07	Respiratory	--	0.5	--	0.5
			Thallium	--	--	--	--	--	NA	--	--	--	--
			Vanadium	--	--	--	--	--	NA	--	--	--	--
			Zinc	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	--	6E-07	--	--	6E-07		--	3	--	3
		Exposure Point Total						6E-07					3
	Exposure Medium Total							6E-07					3
Medium Total								1E-05					8
Groundwater	Groundwater	OU7	Manganese	--	--	--	--	--	CNS	--	--	0.5	0.5
			Chemical Total	--	--	--	--	--		--	--	0.5	0.5
		Exposure Point Total						--					0.5
	Exposure Medium Total							--					0.5
Medium Total								--					0.5

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.07
Total Blood HI	0.9
Total Body Weight HI	0.05
Total CNS HI	4
Total CVS HI	0.3
Total Fetotoxicity HI	0.1
Total GS HI	0.7
Total Immune HI	0.04
Total Kidney HI	0.07
Total Liver HI	0.008
Total Respiratory HI	1
Total None Reported HI	0.0
Total Skin HI	0.3

TABLE 9.1.C.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Constructon Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
												Total Thyroid HI	0.2
												Total NA HI	4

TABLE 9.2.C.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current
Receptor Population: Occupational Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7 - Entire Site	Benzo(a)pyrene Equivalents	5E-06	--	4E-06	--	9E-06	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	5E-07	--	1E-07	--	7E-07	NA	0.01	--	0.002	0.01
			Aroclor-1248	1E-06	--	1E-06	--	2E-06	NA	--	--	--	--
			Aroclor-1254	8E-08	--	7E-08	--	1E-07	Immune	0.005	--	0.005	0.01
			Aluminum	--	--	--	--	--	CNS	0.01	--	0.00000	0.01
			Antimony	--	--	--	--	--	Blood	0.005	--	0.0000	0.005
			Arsenic	1E-05	--	2E-06	--	1E-05	Skin, CVS	0.07	--	0.01	0.08
			Barium	--	--	--	--	--	Kidney	0.002	--	0.0000	0.002
			Cadmium	--	--	--	--	--	NA	0.004	--	0.0000	0.004
			Cobalt	--	--	--	--	--	Thyroid	0.03	--	0.0000	0.03
			Chromium	--	--	--	--	--	None Reported	0.00	--	0.000	0.00
			Copper	--	--	--	--	--	GS	0.03	--	0.0000	0.03
			Iron	--	--	--	--	--	GS	0.05	--	0.0000	0.05
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	0.02	--	0.000	0.02
			Mercury	--	--	--	--	--	Autoimmune	0.007	--	0.0000	0.007
			Thallium	--	--	--	--	--	NA	--	--	--	--
			Vanadium	--	--	--	--	--	Kidney	0.009	--	0.00000	0.009
			Chemical Total	2E-05	--	7E-06	--	2E-05		0.2	--	0.02	0.3
		Exposure Point Total						2E-05					0.3
	Exposure Medium Total							2E-05					0.3
	Air	OU7 - Entire Site	Benzo(a)pyrene Equivalents	--	2E-11	--	--	2E-11	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	4E-12	--	--	4E-12	NA	--	7.30983E-09	--	7.30983E-09
			Aroclor-1248	--	7E-12	--	--	7E-12	NA	--	--	--	--
			Aroclor-1254	--	5E-13	--	--	5E-13	NA	--	--	--	--
			Aluminum	--	--	--	--	--	CNS	--	0.00006	--	0.00006
			Antimony	--	--	--	--	--	NA	--	--	--	--
			Arsenic	--	8E-10	--	--	8E-10	NA	--	0.00003	--	0.00003
			Barium	--	--	--	--	--	Fetotoxicity	--	0.00002	--	0.00002
			Cadmium	--	3E-11	--	--	3E-11	NA	--	0.000004	--	0.000004
			Cobalt	--	8E-10	--	--	8E-10	Respiratory	--	0.00004	--	0.00004
			Chromium	--	--	--	--	--	Respiratory	--	0.00000	--	0.00000
			Copper	--	--	--	--	--	NA	--	--	--	--
			Iron	--	--	--	--	--	NA	--	--	--	--
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	--	0.0002	--	0.0002
			Mercury	--	--	--	--	--	CNS, Kidney	--	0.000002	--	0.000002
			Thallium	--	--	--	--	--	NA	--	--	--	--
			Vanadium	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	--	2E-09	--	--	2E-09		--	0.0003	--	0.0003

TABLE 9.2.C.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current
Receptor Population: Occupational Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Air	Exposure Point Total						2E-09					0.0003
	Exposure Medium Total							2E-09					0.0003
Medium Total								2E-05					0.3
Subsurface Soil	Subsurface Soil	OU7 - Entire Site	Benzo(a)pyrene Equivalents	3E-06	--	2E-06	--	5E-06	NA	--	- -	--	--
			2,3,7,8-TCDD Equivalents	6E-05	--	1E-05	--	7E-05	NA	1	- -	0.3	2
			Aroclor-1248	3E-05	--	3E-05	--	6E-05	NA	--	- -	--	--
			Aroclor-1254	1E-07	--	1E-07	--	3E-07	Immune	0.010	- -	0.009	0.02
			Aroclor-1260	3E-06	--	3E-06	--	6E-06	NA	0.23	- -	0.21	0.4
			Dieldrin	9E-07	--	6E-07	--	1E-06	Liver	0.003	- -	0.002	0.005
			Aluminum	- -	--	- -	--	- -	CNS	0.01	- -	0.00000	0.01
			Antimony	- -	--	- -	--	- -	Blood	0.4	- -	0.00	0.4
			Arsenic	9E-06	--	2E-06	--	1E-05	Skin, CVS	0.06	- -	0.01	0.07
			Barium	- -	--	- -	--	- -	Kidney	0.001	- -	0.0000	0.001
			Cadmium	- -	--	- -	--	- -	NA	0.010	- -	0.000	0.01
			Chromium	- -	--	- -	--	- -	None Reported	0.00	- -	0.00	0.0
			Cobalt	- -	--	- -	--	- -	Thyroid	0.05	- -	0.0000	0.05
			Copper	- -	--	- -	--	- -	GS	0.1	- -	0.0000	0.1
			Iron	- -	--	- -	--	- -	GS	0.1	- -	0.0000	0.1
			Lead	- -	--	- -	--	- -	NA	--	- -	--	--
			Manganese	- -	--	- -	--	- -	CNS	0.04	- -	0.000	0.04
			Mercury	- -	--	- -	--	- -	Autoimmune	0.03	- -	0.000	0.03
			Nickel	- -	--	- -	--	- -	Body Weight	0.02	- -	0.000	0.02
			Thallium	- -	--	- -	--	- -	NA	--	- -	--	--
			Vanadium	- -	--	- -	--	- -	Kidney	0.007	- -	0.00000	0.007
			Zinc	- -	--	- -	--	- -	Blood	0.008	- -	0.00000	0.008
			Chemical Total	1E-04	--	5E-05	--	2E-04		2	--	0.5	3
		Exposure Point Total						2E-04					3
	Exposure Medium Total							2E-04					3
	Air	OU7 - Entire Site	Benzo(a)pyrene Equivalents	--	1E-11	--	--	1E-11	NA	- -	--	- -	--
			2,3,7,8-TCDD Equivalents	--	4E-10	--	--	4E-10	NA	- -	0.0000008	- -	0.0000008
			Aroclor-1248	--	2E-10	--	--	2E-10	NA	- -	--	- -	--
			Aroclor-1254	--	1E-12	--	--	1E-12	NA	- -	--	- -	--
			Aroclor-1260	--	2E-11	--	--	2E-11	NA	- -	--	- -	--
			Dieldrin	--	6E-12	--	--	6E-12	NA	- -	--	- -	--
			Aluminum	--	- -	--	--	- -	CNS	- -	0.00006	- -	0.00006

TABLE 9.2.C.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current
Receptor Population: Occupational Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Air	OU7 - Entire Site	Antimony	--	--	--	--	--	NA	--	--	--	--
			Arsenic	--	7E-10	--	--	7E-10	NA	--	0.00003	--	0.00003
			Barium	--	--	--	--	--	Fetotoxicity	--	0.00001	--	0.00001
			Cadmium	--	8E-11	--	--	8E-11	NA	--	0.00001	--	0.00001
			Chromium	--	--	--	--	--	Respiratory	--	--	--	--
			Cobalt	--	1E-09	--	--	1E-09	Respiratory	--	0.00006	--	0.00006
			Copper	--	--	--	--	--	NA	--	--	--	--
			Iron	--	--	--	--	--	NA	--	--	--	--
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	--	0.0005	--	0.0005
			Mercury	--	--	--	--	--	CNS, Kidney	--	0.000008	--	0.000008
			Nickel	--	1E-09	--	--	1E-09	Respiratory	--	0.0001	--	0.0001
			Thallium	--	--	--	--	--	NA	--	--	--	--
			Vanadium	--	--	--	--	--	NA	--	--	--	--
			Zinc	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	--	4E-09	--	--	4E-09		--	0.0008	--	0.0008
		Exposure Point Total						4E-09					0.0008
	Exposure Medium Total							4E-09					0.0008
Medium Total								2E-04					3

Notes:

Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.04
Total Blood HI	0.5
Total Body Weight HI	0.02
Total CNS HI	0.08
Total CVS HI	0.2
Total Fetotoxicity HI	0.00003
Total GS HI	0.4
Total Immune HI	0.03
Total Kidney HI	0.02
Total Liver HI	0.005
Total Respiratory HI	0.0002
Total None Reported HI	0.0
Total Skin HI	0.2
Total Thyroid HI	0.09
Total NA HI	2

TABLE 9.3.C.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	5E-07	--	5E-07	--	9E-07	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	5E-08	--	1E-08	--	7E-08	NA	0.002	--	0.0005	0.003
			Aroclor-1248	1E-07	--	1E-07	--	2E-07	NA	--	--	--	--
			Aroclor-1254	8E-09	--	9E-09	--	2E-08	Immune	0.0010	--	0.001	0.002
			Aluminum	--	--	--	--	--	CNS	0.002	--	0.00000	0.002
			Antimony	--	--	--	--	--	Blood	0.0009	--	0.00000	0.0009
			Arsenic	1E-06	--	3E-07	--	1E-06	Skin, CVS	0.01	--	0.003	0.01
			Barium	--	--	--	--	--	Kidney	0.0003	--	0.00000	0.0003
			Cadmium	--	--	--	--	--	NA	0.0006	--	0.0000	0.0006
			Cobalt	--	--	--	--	--	Thyroid	0.006	--	0.00000	0.006
			Chromium	--	--	--	--	--	0	0.000	--	0.000	0.000
			Copper	--	--	--	--	--	GS	0.005	--	0.00000	0.005
			Iron	--	--	--	--	--	GS	0.009	--	0.00000	0.009
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	0.003	--	0.0000	0.003
			Mercury	--	--	--	--	--	Autoimmune	0.001	--	0.0000	0.001
			Thallium	--	--	--	--	--	NA	--	--	--	--
			Vanadium	--	--	--	--	--	Kidney	0.002	--	0.00000	0.002
			Chemical Total	2E-06	--	9E-07	--	3E-06		0.04	--	0.004	0.05
		Exposure Point Total						3E-06					0.05
	Exposure Medium Total							3E-06					0.05
	Air	OU7	Benzo(a)pyrene Equivalents	--	9E-13	--	--	9E-13	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	2E-13	--	--	2E-13	NA	--	6.57885E-10	--	6.57885E-10
			Aroclor-1248	--	4E-13	--	--	4E-13	NA	--	--	--	--
			Aroclor-1254	--	3E-14	--	--	3E-14	NA	--	--	--	--
			Aluminum	--	--	--	--	--	CNS	--	0.000006	--	0.000006
			Antimony	--	--	--	--	--	NA	--	--	--	--
			Arsenic	--	4E-11	--	--	4E-11	NA	--	0.000003	--	0.000003
			Barium	--	--	--	--	--	Fetotoxicity	--	0.000001	--	0.000001
			Cadmium	--	1E-12	--	--	1E-12	NA	--	0.0000004	--	0.0000004
			Cobalt	--	4E-11	--	--	4E-11	Respiratory	--	0.000004	--	0.000004
			Chromium	--	--	--	--	--	0	--	0.000000	--	0.000000
			Copper	--	--	--	--	--	NA	--	--	--	--

TABLE 9.3.C.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Air	OU7	Iron	--	--	--	--	--	NA	--	--	--	--
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	--	0.00002	--	0.00002
			Mercury	--	--	--	--	--	CNS, Kidney	--	0.0000002	--	0.0000002
			Thallium	--	--	--	--	--	NA	--	--	--	--
			Vanadium	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	--	8E-11	--	--	8E-11		--	0.00003	--	0.00003
		Exposure Point Total						8E-11					0.00003
	Exposure Medium Total							8E-11					0.00003
Medium Total								3E-06					0.05
Sediment	Sediment	OU7	Benzo(a)pyrene Equivalents	8E-08	--	8E-08	--	2E-07	NA	--	--	--	--
			TEQ PCB	1E-06	--	2E-07	--	1E-06	NA	0.02	--	0.005	0.03
			Total PCBs	4E-09	--	4E-09	--	8E-09	0	--	--	--	--
			Arsenic	1E-07	--	2E-08	--	1E-07	Skin, CVS	0.0007	--	0.0002	0.0008
			Chromium	--	--	--	--	--	None Reported	0.0007	--	0.0000	0.0007
			Iron	--	--	--	--	--	GS	0.0009	--	0.000000	0.0009
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese (Soil)	--	--	--	--	--	CNS	0.00005	--	--	0.00005
			Chemical Total	1E-06	--	3E-07	--	1E-06		0.02	--	0.005	0.03
		Exposure Point Total						1E-06					0.03
	Exposure Medium Total							1E-06					0.03
Medium Total								1E-06					0.03
Receptor Total							Receptor Risk Total	4E-06				Receptor HI Total	0.08

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.001
Total Blood HI	0.0009
Total CNS HI	0.005
Total CVS HI	0.02
Total Fetotoxicity HI	0.000001
Total GS HI	0.01
Total Immune HI	0.002
Total Kidney HI	0.002
Total Respiratory HI	0.000004
Total None Reported HI	0.001
Total Skin HI	0.02
Total Thyroid HI	0.006
Total NA HI	0.03

TABLE 9.4.C.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	2E-06	--	3E-06	--	5E-06	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	6E-08	--	3E-08	--	9E-08	NA	0.003	--	0.002	0.005
			Aroclor-1248	1E-07	--	3E-07	--	4E-07	NA	--	--	--	--
			Aroclor-1254	9E-09	--	2E-08	--	3E-08	Immune	0.002	--	0.003	0.005
			Aluminum	--	--	--	--	--	CNS	0.004	--	0.00000	0.004
			Antimony	--	--	--	--	--	Blood	0.001	--	0.0000	0.001
			Arsenic	1E-06	--	6E-07	--	2E-06	Skin, CVS	0.02	--	0.009	0.03
			Barium	--	--	--	--	--	Kidney	0.0005	--	0.0000	0.0005
			Cadmium	--	--	--	--	--	NA	0.0010	--	0.0000	0.001
			Cobalt	--	--	--	--	--	Thyroid	0.009	--	0.0000	0.009
			Chromium	--	--	--	--	--	0	0.000	--	0.000	0.000
			Copper	--	--	--	--	--	GS	0.007	--	0.0000	0.007
			Iron	--	--	--	--	--	GS	0.01	--	0.0000	0.01
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	0.004	--	0.000	0.004
			Mercury	--	--	--	--	--	Autoimmune	0.002	--	0.0000	0.002
			Thallium	--	--	--	--	--	NA	--	--	--	--
			Vanadium	--	--	--	--	--	Kidney	0.002	--	0.00000	0.002
			Chemical Total	3E-06	--	4E-06	--	7E-06		0.07	--	0.01	0.08
		Exposure Point Total						7E-06					0.08
	Exposure Medium Total							7E-06					0.08
	Air	OU7	Benzo(a)pyrene Equivalents	--	2E-12	--	--	2E-12	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	1E-13	--	--	1E-13	NA	--	6.57885E-10	--	6.57885E-10
			Aroclor-1248	--	3E-13	--	--	3E-13	NA	--	--	--	--
			Aroclor-1254	--	2E-14	--	--	2E-14	NA	--	--	--	--
			Aluminum	--	--	--	--	--	CNS	--	0.000006	--	0.000006
			Antimony	--	--	--	--	--	NA	--	--	--	--
			Arsenic	--	3E-11	--	--	3E-11	NA	--	0.000003	--	0.000003
			Barium	--	--	--	--	--	Fetotoxicity	--	0.000001	--	0.000001
			Cadmium	--	1E-12	--	--	1E-12	NA	--	0.0000004	--	0.0000004
			Cobalt	--	3E-11	--	--	3E-11	Respiratory	--	0.000004	--	0.000004
			Chromium	--	--	--	--	--	0	--	0.000000	--	0.000000
			Copper	--	--	--	--	--	NA	--	--	--	--
			Iron	--	--	--	--	--	NA	--	--	--	--
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	--	0.00002	--	0.00002
			Mercury	--	--	--	--	--	CNS, Kidney	--	0.0000002	--	0.0000002
			Thallium	--	--	--	--	--	NA	--	--	--	--
			Vanadium	--	--	--	--	--	NA	--	--	--	--

TABLE 9.4.C.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Air	OU7	Chemical Total	--	6E-11	--	--	6E-11		--	0.00003	--	0.00003
		Exposure Point Total						6E-11					0.00003
	Exposure Medium Total							6E-11					0.00003
Medium Total								7E-06					0.08
Sediment	Sediment	OU7	Benzo(a)pyrene Equivalents	8E-08	--	2E-07	--	2E-07	NA	--	--	--	--
			TEQ PCB	6E-07	--	3E-07	--	9E-07	NA	0.03	--	0.02	0.05
			Total PCBs	3E-09	--	6E-09	--	8E-09	0	--	--	--	--
			Arsenic	7E-08	--	3E-08	--	1E-07	Skin, CVS	0.001	--	0.0005	0.002
			Chromium	2E-07	--	1E-07	--	4E-07	None Reported	0.001	--	0.0007	0.002
			Iron	--	--	--	--	--	GS	0.001	--	0.00002	0.001
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese (Soil)	--	--	--	--	--	CNS	0.00007	--	--	0.00007
			Chemical Total	1E-06	--	7E-07	--	2E-06		0.04	--	0.02	0.06
		Exposure Point Total						2E-06					0.06
	Exposure Medium Total							2E-06					0.06
Medium Total								2E-06					0.06
Receptor Total							Receptor Risk Total	9E-06				Receptor HI Total	0.1

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.002
Total Blood HI	0.001
Total CNS HI	0.008
Total CVS HI	0.03
Total Fetotoxicity HI	0.000001
Total GS HI	0.02
Total Immune HI	0.005
Total Kidney HI	0.003
Total Respiratory HI	0.000004
Total None Reported HI	0.00
Total Skin HI	0.03
Total Thyroid HI	0.009
Total NA HI	0.06

TABLE 9.5.C.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	2E-06	--	4E-06	--	6E-06
			2,3,7,8-TCDD Equivalents	1E-07	--	4E-08	--	2E-07
			Aroclor-1248	2E-07	--	4E-07	--	6E-07
			Aroclor-1254	2E-08	--	3E-08	--	4E-08
			Aluminum	- -	--	- -	--	- -
			Antimony	- -	--	- -	--	- -
			Arsenic	2E-06	--	8E-07	--	3E-06
			Barium	- -	--	- -	--	- -
			Cadmium	- -	--	- -	--	- -
			Cobalt	- -	--	- -	--	- -
			Chromium	- -	--	- -	--	- -
			Copper	- -	--	- -	--	- -
			Iron	- -	--	- -	--	- -
			Lead	- -	--	- -	--	- -
			Manganese	- -	--	- -	--	- -
			Mercury	- -	--	- -	--	- -
			Thallium	- -	--	- -	--	- -
			Vanadium	- -	--	- -	--	- -
			Chemical Total	5E-06	--	5E-06	--	1E-05
		Exposure Point Total						1E-05
	Exposure Medium Total							1E-05

TABLE 9.5.C.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Surface Soil	Air	OU7	Benzo(a)pyrene Equivalents	--	3E-12	--	--	3E-12
			2,3,7,8-TCDD Equivalents	--	3E-13	--	--	3E-13
			Aroclor-1248	--	6E-13	--	--	6E-13
			Aroclor-1254	--	5E-14	--	--	5E-14
			Aluminum	--	- -	--	--	- -
			Antimony	--	- -	--	--	- -
			Arsenic	--	7E-11	--	--	7E-11
			Barium	--	- -	--	--	- -
			Cadmium	--	2E-12	--	--	2E-12
			Cobalt	--	7E-11	--	--	7E-11
			Chromium	--	- -	--	--	- -
			Copper	--	- -	--	--	- -
			Iron	--	- -	--	--	- -
			Lead	--	- -	--	--	- -
			Manganese	--	- -	--	--	- -
			Mercury	--	- -	--	--	- -
			Thallium	--	- -	--	--	- -
			Vanadium	--	- -	--	--	- -
			Chemical Total	--	1E-10	--	--	1E-10
		Exposure Point Total						1E-10
	Exposure Medium Total							1E-10
Medium Total								1E-05

TABLE 9.5.C.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Sediment	Sediment	OU7	Benzo(a)pyrene Equivalents	2E-07	--	2E-07	--	4E-07
			TEQ PCB	2E-06	--	5E-07	--	2E-06
			Total PCBs	7E-09	--	1E-08	--	2E-08
			Arsenic	2E-07	--	6E-08	--	2E-07
			Chromium	2E-07	--	1E-07	--	4E-07
			Iron	- -	--	- -	--	- -
			Lead	- -	--	- -	--	- -
			Manganese (Soil)	- -	--	- -	--	- -
			Chemical Total	2E-06	--	1E-06	--	3E-06
		Exposure Point Total						3E-06
	Exposure Medium Total							3E-06
Medium Total								3E-06
Receptor Total							Receptor Risk Total	1E-05

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 9.6.C.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	1E-05	--	6E-06	--	2E-05	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	7E-07	--	9E-08	--	8E-07	NA	0.02	--	0.002	0.02
			Aroclor-1248	1E-06	--	8E-07	--	2E-06	NA	--	--	--	--
			Aroclor-1254	1E-07	--	6E-08	--	2E-07	Immune	0.008	--	0.004	0.01
			Aluminum	--	--	--	--	--	CNS	0.02	--	0.00000	0.02
			Antimony	--	--	--	--	--	Blood	0.007	--	0.0000	0.007
			Arsenic	1E-05	--	2E-06	--	2E-05	Skin, CVS	0.09	--	0.01	0.1
			Barium	--	--	--	--	--	Kidney	0.002	--	0.0000	0.002
			Cadmium	--	--	--	--	--	NA	0.005	--	0.0000	0.005
			Cobalt	--	--	--	--	--	Thyroid	0.05	--	0.0000	0.05
			Chromium	--	--	--	--	--	0	0.00	--	0.000	0.00
			Copper	--	--	--	--	--	GS	0.04	--	0.0000	0.04
			Iron	--	--	--	--	--	GS	0.07	--	0.0000	0.07
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	0.02	--	0.000	0.02
			Mercury	--	--	--	--	--	Autoimmune	0.010	--	0.0000	0.01
			Thallium	--	--	--	--	--	NA	--	--	--	--
			Vanadium	--	--	--	--	--	Kidney	0.01	--	0.00000	0.01
			Chemical Total	3E-05	--	9E-06	--	4E-05		0.3	--	0.02	0.4
		Exposure Point Total						4E-05					0.4
	Exposure Medium Total							4E-05					0.4

TABLE 9.6.C.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Air	OU7	Benzo(a)pyrene Equivalents	--	1E-10	--	--	1E-10	NA	- -	--	- -	--
			2,3,7,8-TCDD Equivalents	--	2E-11	--	--	2E-11	NA	- -	0.00000007	- -	0.00000007
			Aroclor-1248	--	3E-11	--	--	3E-11	NA	- -	--	- -	--
			Aroclor-1254	--	2E-12	--	--	2E-12	NA	- -	--	- -	--
			Aluminum	--	- -	--	--	- -	CNS	- -	0.0006	- -	0.0006
			Antimony	--	- -	--	--	- -	NA	- -	--	- -	--
			Arsenic	--	3E-09	--	--	3E-09	NA	- -	0.0003	- -	0.0003
			Barium	--	- -	--	--	- -	Fetotoxicity	- -	0.0002	- -	0.0002
			Cadmium	--	1E-10	--	--	1E-10	NA	- -	0.00004	- -	0.00004
			Cobalt	--	3E-09	--	--	3E-09	Respiratory	- -	0.0004	- -	0.0004
			Chromium	--	- -	--	--	- -	0	- -	0.0000	- -	0.0000
			Copper	--	- -	--	--	- -	NA	- -	--	- -	--
			Iron	--	- -	--	--	- -	NA	- -	--	- -	--
			Lead	--	- -	--	--	- -	NA	- -	--	- -	--
			Manganese	--	- -	--	--	- -	CNS	- -	0.002	- -	0.002
			Mercury	--	- -	--	--	- -	CNS, Kidney	- -	0.00002	- -	0.00002
			Thallium	--	- -	--	--	- -	NA	- -	--	- -	--
			Vanadium	--	- -	--	--	- -	NA	- -	--	- -	--
			Chemical Total	--	7E-09	--	--	7E-09		- -	0.004	- -	0.004
		Exposure Point Total						7E-09					0.004
	Exposure Medium Total							7E-09					0.004
Medium Total								4E-05					0.4
Receptor Total							Receptor Risk Total	4E-05				Receptor HI Total	0.4

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.01
Total Blood HI	0.007
Total CNS HI	0.04
Total CVS HI	0.1
Total Fetotoxicity HI	0.0002
Total GS HI	0.1
Total Immune HI	0.01
Total Kidney HI	0.01
Total Respiratory HI	0.0004
Total None Reported HI	0.00
Total Skin HI	0.1
Total Thyroid HI	0.05
Total NA HI	0.02

TABLE 9.7.C.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	8E-05	--	3E-05	--	1E-04	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	2E-06	--	1E-07	--	2E-06	NA	0.2	--	0.01	0.2
			Aroclor-1248	3E-06	--	1E-06	--	5E-06	NA	--	--	--	--
			Aroclor-1254	2E-07	--	9E-08	--	3E-07	Immune	0.07	--	0.03	0.10
			Aluminum	--	--	--	--	--	CNS	0.2	--	0.0000	0.2
			Antimony	--	--	--	--	--	Blood	0.06	--	0.000	0.06
			Arsenic	3E-05	--	3E-06	--	4E-05	Skin, CVS	0.9	--	0.07	1.0
			Barium	--	--	--	--	--	Kidney	0.02	--	0.0000	0.02
			Cadmium	--	--	--	--	--	NA	0.05	--	0.000	0.05
			Cobalt	--	--	--	--	--	Thyroid	0.4	--	0.000	0.4
			Chromium	--	--	--	--	--	0	0.0	--	0.00	0.0
			Copper	--	--	--	--	--	GS	0.3	--	0.0000	0.3
			Iron	--	--	--	--	--	GS	0.6	--	0.000	0.6
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	0.2	--	0.00	0.2
			Mercury	--	--	--	--	--	Autoimmune	0.09	--	0.000	0.09
			Thallium	--	--	--	--	--	NA	--	--	--	--
			Vanadium	--	--	--	--	--	Kidney	0.1	--	0.0000	0.1
			Chemical Total	1E-04	--	3E-05	--	1E-04		3	--	0.1	3
		Exposure Point Total						1E-04					3
	Exposure Medium Total							1E-04					3
	Air	OU7	Benzo(a)pyrene Equivalents	--	9E-11	--	--	9E-11	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	4E-12	--	--	4E-12	NA	--	0.00000003	--	0.00000003
			Aroclor-1248	--	7E-12	--	--	7E-12	NA	--	--	--	--
			Aroclor-1254	--	5E-13	--	--	5E-13	NA	--	--	--	--
			Aluminum	--	--	--	--	--	CNS	--	0.0003	--	0.0003
			Antimony	--	--	--	--	--	NA	--	--	--	--
			Arsenic	--	8E-10	--	--	8E-10	NA	--	0.0001	--	0.0001
			Barium	--	--	--	--	--	Fetotoxicity	--	0.00007	--	0.00007
			Cadmium	--	3E-11	--	--	3E-11	NA	--	0.00002	--	0.00002
			Cobalt	--	8E-10	--	--	8E-10	Respiratory	--	0.0002	--	0.0002
			Chromium	--	--	--	--	--	0	--	0.00000	--	0.00000
			Copper	--	--	--	--	--	NA	--	--	--	--
			Iron	--	--	--	--	--	NA	--	--	--	--
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	--	0.0008	--	0.0008
			Mercury	--	--	--	--	--	CNS, Kidney	--	0.000007	--	0.000007
			Thallium	--	--	--	--	--	NA	--	--	--	--

TABLE 9.7.C.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Air	OU7	Vanadium	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	--	2E-09	--	--	2E-09		--	0.001	--	0.001
		Exposure Point Total						2E-09					0.001
	Exposure Medium Total							2E-09					0.001
Medium Total								1E-04					3

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.09
Total Blood HI	0.06
Total CNS HI	0.4
Total CVS HI	1.0
Total Fetotoxicity HI	0.00007
Total GS HI	1.0
Total Immune HI	0.10
Total Kidney HI	0.1
Total Respiratory HI	0.0002
Total None Reported HI	0.0
Total Skin HI	1.0
Total Thyroid HI	0.4
Total NA HI	0.2

TABLE 9.8.C.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	9E-05	--	3E-05	--	1E-04
			2,3,7,8-TCDD Equivalents	2E-06	--	2E-07	--	3E-06
			Aroclor-1248	5E-06	--	2E-06	--	7E-06
			Aroclor-1254	3E-07	--	2E-07	--	5E-07
			Aluminum	- -	--	- -	--	- -
			Antimony	- -	--	- -	--	- -
			Arsenic	5E-05	--	4E-05	--	9E-05
			Barium	- -	--	- -	--	- -
			Cadmium	- -	--	- -	--	- -
			Cobalt	- -	--	- -	--	- -
			Chromium	- -	--	- -	--	- -
			Copper	- -	--	- -	--	- -
			Iron	- -	--	- -	--	- -
			Lead	- -	--	- -	--	- -
			Manganese	- -	--	- -	--	- -
			Mercury	- -	--	- -	--	- -
			Thallium	- -	--	- -	--	- -
			Vanadium	- -	--	- -	--	- -
			Chemical Total	1E-04	--	7E-05	--	2E-04
		Exposure Point Total						2E-04
	Exposure Medium Total							2E-04

TABLE 9.8.C.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Surface Soil	Air	OU7	Benzo(a)pyrene Equivalents	--	2E-10	--	--	2E-10
			2,3,7,8-TCDD Equivalents	--	2E-11	--	--	2E-11
			Aroclor-1248	--	4E-11	--	--	4E-11
			Aroclor-1254	--	3E-12	--	--	3E-12
			Aluminum	--	- -	--	--	- -
			Antimony	--	- -	--	--	- -
			Arsenic	--	4E-09	--	--	4E-09
			Barium	--	- -	--	--	- -
			Cadmium	--	1E-10	--	--	1E-10
			Cobalt	--	4E-09	--	--	4E-09
			Chromium	--	- -	--	--	- -
			Copper	--	- -	--	--	- -
			Iron	--	- -	--	--	- -
			Lead	--	- -	--	--	- -
			Manganese	--	- -	--	--	- -
			Mercury	--	- -	--	--	- -
			Thallium	--	- -	--	--	- -
			Vanadium	--	- -	--	--	- -
			Chemical Total	--	8E-09	--	--	8E-09
		Exposure Point Total						8E-09
	Exposure Medium Total							8E-09
Medium Total								2E-04

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 9.1.C.CTE

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Constructon Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	4E-07	--	5E-08	--	4E-07	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	4E-08	--	1E-09	--	4E-08	NA	0.02	--	0.0007	0.02
			Aroclor-1248	8E-08	--	1E-08	--	9E-08	NA	--	--	--	--
			Aroclor-1254	6E-09	--	9E-10	--	7E-09	Immune	0.01	--	0.001	0.01
			Aluminum	--	--	--	--	--	CNS	0.02	--	0.00000	0.02
			Antimony	--	--	--	--	--	Blood	0.010	--	0.00000	0.010
			Arsenic	9E-07	--	3E-08	--	9E-07	Skin, CVS	0.1	--	0.004	0.1
			Barium	--	--	--	--	--	Kidney	0.003	--	0.00000	0.003
			Cadmium	--	--	--	--	--	NA	0.007	--	0.0000	0.007
			Cobalt	--	--	--	--	--	Thyroid	0.07	--	0.00000	0.07
			Chromium	--	--	--	--	--	0	0.00	--	0.000	0.00
			Copper	--	--	--	--	--	GS	0.05	--	0.00000	0.05
			Iron	--	--	--	--	--	GS	0.09	--	0.00000	0.09
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	0.03	--	0.0000	0.03
			Mercury	--	--	--	--	--	Autoimmune	0.01	--	0.0000	0.01
			Thallium	--	--	--	--	--	NA	--	--	--	--
			Vanadium	--	--	--	--	--	Kidney	0.02	--	0.00000	0.02
			Chemical Total	1E-06	--	9E-08	--	1E-06		0.5	--	0.006	0.5
		Exposure Point Total						1E-06					0.5
	Exposure Medium Total							1E-06					0.5
	Air	OU7	Benzo(a)pyrene Equivalents	--	3E-09	--	--	3E-09	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	6E-10	--	--	6E-10	NA	--	0.00003	--	0.00003
			Aroclor-1248	--	1E-09	--	--	1E-09	NA	--	--	--	--
			Aroclor-1254	--	9E-11	--	--	9E-11	NA	--	--	--	--
			Aluminum	--	--	--	--	--	CNS	--	0.2	--	0.2
			Antimony	--	--	--	--	--	NA	--	--	--	--
			Arsenic	--	1E-07	--	--	1E-07	NA	--	0.1	--	0.1
			Barium	--	--	--	--	--	Fetotoxicity	--	0.06	--	0.06
			Cadmium	--	4E-09	--	--	4E-09	NA	--	0.02	--	0.02
			Cobalt	--	1E-07	--	--	1E-07	Respiratory	--	0.2	--	0.2
			Chromium	--	--	--	--	--	0	--	0.00	--	0.00
			Copper	--	--	--	--	--	NA	--	--	--	--
			Iron	--	--	--	--	--	NA	--	--	--	--
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	--	0.7	--	0.7
			Mercury	--	--	--	--	--	CNS, Kidney	--	0.007	--	0.007
			Thallium	--	--	--	--	--	NA	--	--	--	--
			Vanadium	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	--	3E-07	--	--	3E-07		--	1	--	1

TABLE 9.1.C.CTE

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Constructon Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil		Exposure Point Total						3E-07					1
	Exposure Medium Total							3E-07					1
Medium Total								2E-06					2
Subsurface Soil	Subsurface Soil	OU7	Benzo(a)pyrene Equivalents	2E-07	--	3E-08	--	3E-07	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	5E-06	--	1E-07	--	5E-06	NA	3	--	0.08	3
			Aroclor-1248	2E-06	--	3E-07	--	3E-06	NA	--	--	--	--
			Aroclor-1254	1E-08	--	2E-09	--	1E-08	Immune	0.02	--	0.003	0.02
			Aroclor-1260	3E-07	--	4E-08	--	3E-07	NA	--	--	--	--
			Dieldrin	7E-08	--	7E-09	--	8E-08	Liver	0.006	--	0.0006	0.007
			Aluminum	--	--	--	--	--	CNS	0.02	--	0.00002	0.02
			Antimony	--	--	--	--	--	Blood	0.9	--	0.006	0.9
			Arsenic	7E-07	--	2E-08	--	8E-07	Skin, CVS	0.1	--	0.003	0.1
			Barium	--	--	--	--	--	Kidney	0.003	--	0.00000	0.003
			Cadmium	--	--	--	--	--	NA	0.02	--	0.0000	0.02
			Chromium	--	--	--	--	--	0	0.0	--	0.000	0.0
			Cobalt	--	--	--	--	--	Thyroid	0.1	--	0.0000	0.1
			Copper	--	--	--	--	--	GS	0.3	--	0.0000	0.3
			Iron	--	--	--	--	--	GS	0.3	--	0.0000	0.3
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	0.08	--	0.000	0.08
			Mercury	--	--	--	--	--	Autoimmune	0.06	--	0.0000	0.06
			Nickel	--	--	--	--	--	Body Weight	0.05	--	0.000	0.05
			Thallium	--	--	--	--	--	NA	--	--	--	--
			Vanadium	--	--	--	--	--	Kidney	0.01	--	0.00000	0.01
			Zinc	--	--	--	--	--	Blood	0.02	--	0.00000	0.02
			Chemical Total	8E-06	--	6E-07	--	9E-06		5	--	0.1	5
		Exposure Point Total						9E-06					5
	Exposure Medium Total							9E-06					5
	Air	OU7	Benzo(a)pyrene Equivalents	--	2E-09	--	--	2E-09	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	7E-08	--	--	7E-08	NA	--	0.003	--	0.003
			Aroclor-1248	--	3E-08	--	--	3E-08	NA	--	--	--	--
			Aroclor-1254	--	2E-10	--	--	2E-10	NA	--	--	--	--
			Aroclor-1260	--	4E-09	--	--	4E-09	NA	--	--	--	--
			Dieldrin	--	1E-09	--	--	1E-09	NA	--	--	--	--
			Aluminum	--	--	--	--	--	CNS	--	0.2	--	0.2

TABLE 9.1.C.CTE

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Constructon Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Air	OU7	Antimony	--	--	--	--	--	NA	--	--	--	--
			Arsenic	--	1E-07	--	--	1E-07	NA	--	0.1	--	0.1
			Barium	--	--	--	--	--	Fetotoxicity	--	0.05	--	0.05
			Cadmium	--	1E-08	--	--	1E-08	NA	--	0.05	--	0.05
			Chromium	--	--	--	--	--	0	--	0.0	--	0.0
			Cobalt	--	2E-07	--	--	2E-07	Respiratory	--	0.3	--	0.3
			Copper	--	--	--	--	--	NA	--	--	--	--
			Iron	--	--	--	--	--	NA	--	--	--	--
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	--	2	--	2
			Mercury	--	--	--	--	--	CNS, Kidney	--	0.03	--	0.03
			Nickel	--	2E-07	--	--	2E-07	Respiratory	--	0.5	--	0.5
			Thallium	--	--	--	--	--	NA	--	--	--	--
			Vanadium	--	--	--	--	--	NA	--	--	--	--
			Zinc	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	--	6E-07	--	--	6E-07		--	3	--	3
		Exposure Point Total						6E-07					3
	Exposure Medium Total							6E-07					3
Medium Total								9E-06					8
Groundwater	Groundwater	OU7	Manganese	--	--	--	--	--	CNS	--	--	0.2	0.2
			Chemical Total	--	--	--	--	--		--	--	0.2	0.2
		Exposure Point Total						--					0.2
	Exposure Medium Total							--					0.2
Medium Total								--					0.2
Receptor Total							Receptor Risk Total	1E-05				Receptor HI Total	10

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.07
Total Blood HI	0.9
Total Body Weight HI	0.05
Total CNS HI	3
Total CVS HI	0.3
Total Fetotoxicity HI	0.1
Total GS HI	0.7
Total Immune HI	0.03
Total Kidney HI	0.07
Total Liver HI	0.007
Total Respiratory HI	1

TABLE 9.1.C.CTE

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Constructon Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
												Total None Reported HI	0.0
												Total Skin HI	0.3
												Total Thyroid HI	0.2
												Total NA HI	3

TABLE 9.2.C.CTE

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current
Receptor Population: Occupational Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7 - Entire Site	Benzo(a)pyrene Equivalents	7E-07	--	1E-07	--	8E-07	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	9E-08	--	3E-09	--	9E-08	NA	0.005	--	0.0002	0.005
			Aroclor-1248	2E-07	--	3E-08	--	2E-07	NA	--	--	--	--
			Aroclor-1254	1E-08	--	2E-09	--	1E-08	Immune	0.002	--	0.0004	0.003
			Aluminum	--	--	--	--	--	CNS	0.005	--	0.000000	0.005
			Antimony	--	--	--	--	--	Blood	0.002	--	0.00000	0.002
			Arsenic	2E-06	--	7E-08	--	2E-06	Skin, CVS	0.03	--	0.001	0.03
			Barium	--	--	--	--	--	Kidney	0.0007	--	0.00000	0.0007
			Cadmium	--	--	--	--	--	NA	0.002	--	0.00000	0.002
			Cobalt	--	--	--	--	--	Thyroid	0.01	--	0.00000	0.01
			Chromium	--	--	--	--	--	None Reported	0.000	--	0.0000	0.000
			Copper	--	--	--	--	--	GS	0.01	--	0.00000	0.01
			Iron	--	--	--	--	--	GS	0.02	--	0.00000	0.02
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	0.007	--	0.0000	0.007
			Mercury	--	--	--	--	--	Autoimmune	0.003	--	0.00000	0.003
			Thallium	--	--	--	--	--	NA	--	--	--	--
			Vanadium	--	--	--	--	--	Kidney	0.004	--	0.000000	0.004
			Chemical Total	3E-06	--	2E-07	--	3E-06		0.1	--	0.002	0.1
		Exposure Point Total						3E-06					0.1
	Exposure Medium Total							3E-06					0.1
	Air	OU7 - Entire Site	Benzo(a)pyrene Equivalents	--	5E-12	--	--	5E-12	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	1E-12	--	--	1E-12	NA	--	6.40342E-09	--	6.40342E-09
			Aroclor-1248	--	2E-12	--	--	2E-12	NA	--	--	--	--
			Aroclor-1254	--	2E-13	--	--	2E-13	NA	--	--	--	--
			Aluminum	--	--	--	--	--	CNS	--	0.00005	--	0.00005
			Antimony	--	--	--	--	--	NA	--	--	--	--
			Arsenic	--	2E-10	--	--	2E-10	NA	--	0.00003	--	0.00003
			Barium	--	--	--	--	--	Fetotoxicity	--	0.00001	--	0.00001
			Cadmium	--	9E-12	--	--	9E-12	NA	--	0.000004	--	0.000004
			Cobalt	--	3E-10	--	--	3E-10	Respiratory	--	0.00004	--	0.00004
			Chromium	--	--	--	--	--	Respiratory	--	0.00000	--	0.00000
			Copper	--	--	--	--	--	NA	--	--	--	--
			Iron	--	--	--	--	--	NA	--	--	--	--
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	--	0.0002	--	0.0002
			Mercury	--	--	--	--	--	CNS, Kidney	--	0.000001	--	0.000001
			Thallium	--	--	--	--	--	NA	--	--	--	--
			Vanadium	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	--	5E-10	--	--	5E-10		--	0.0003	--	0.0003

TABLE 9.2.C.CTE

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current
Receptor Population: Occupational Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Air	Exposure Point Total						5E-10					0.0003
	Exposure Medium Total							5E-10					0.0003
Medium Total								3E-06					0.1
Subsurface Soil	Subsurface Soil	OU7 - Entire Site	Benzo(a)pyrene Equivalents	4E-07	--	8E-08	--	5E-07	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	9E-06	--	4E-07	--	1E-05	NA	0.6	--	0.02	0.6
			Aroclor-1248	5E-06	--	8E-07	--	5E-06	NA	--	--	--	--
			Aroclor-1254	2E-08	--	4E-09	--	3E-08	Immune	0.004	--	0.0008	0.005
			Aroclor-1260	5E-07	--	9E-08	--	6E-07	NA	0.10	--	0.02	0.12
			Dieldrin	1E-07	--	2E-08	--	2E-07	Liver	0.001	--	0.0002	0.002
			Aluminum	--	--	--	--	--	CNS	0.005	--	0.000000	0.005
			Antimony	--	--	--	--	--	Blood	0.2	--	0.000	0.2
			Arsenic	1E-06	--	6E-08	--	2E-06	Skin, CVS	0.03	--	0.001	0.03
			Barium	--	--	--	--	--	Kidney	0.0006	--	0.00000	0.0006
			Cadmium	--	--	--	--	--	NA	0.004	--	0.0000	0.004
			Chromium	--	--	--	--	--	None Reported	0.00	--	0.000	0.00
			Cobalt	--	--	--	--	--	Thyroid	0.02	--	0.00000	0.02
			Copper	--	--	--	--	--	GS	0.06	--	0.00000	0.06
			Iron	--	--	--	--	--	GS	0.06	--	0.00000	0.06
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	0.02	--	0.0000	0.02
			Mercury	--	--	--	--	--	Autoimmune	0.01	--	0.0000	0.01
			Nickel	--	--	--	--	--	Body Weight	0.01	--	0.0000	0.01
			Thallium	--	--	--	--	--	NA	--	--	--	--
			Vanadium	--	--	--	--	--	Kidney	0.003	--	0.000000	0.003
			Zinc	--	--	--	--	--	Blood	0.004	--	0.000000	0.004
			Chemical Total	2E-05	--	1E-06	--	2E-05		1	--	0.04	1
		Exposure Point Total						2E-05					1
	Exposure Medium Total							2E-05					1
	Air	OU7 - Entire Site	Benzo(a)pyrene Equivalents	--	3E-12	--	--	3E-12	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	1E-10	--	--	1E-10	NA	--	0.0000007	--	0.0000007
			Aroclor-1248	--	6E-11	--	--	6E-11	NA	--	--	--	--
			Aroclor-1254	--	3E-13	--	--	3E-13	NA	--	--	--	--
			Aroclor-1260	--	7E-12	--	--	7E-12	NA	--	--	--	--
			Dieldrin	--	2E-12	--	--	2E-12	NA	--	--	--	--
			Aluminum	--	--	--	--	--	CNS	--	0.00005	--	0.00005

TABLE 9.2.C.CTE

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current
Receptor Population: Occupational Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Air	OU7 - Entire Site	Antimony	--	- -	--	--	- -	NA	- -	--	- -	--
			Arsenic	--	2E-10	--	--	2E-10	NA	- -	0.00003	- -	0.00003
			Barium	--	- -	--	--	- -	Fetotoxicity	- -	0.00001	- -	0.00001
			Cadmium	--	3E-11	--	--	3E-11	NA	- -	0.00001	- -	0.00001
			Chromium	--	- -	--	--	- -	Respiratory	- -	0.00000	- -	0.00000
			Cobalt	--	4E-10	--	--	4E-10	Respiratory	- -	0.00006	- -	0.00006
			Copper	--	- -	--	--	- -	NA	- -	--	- -	--
			Iron	--	- -	--	--	- -	NA	- -	--	- -	--
			Lead	--	- -	--	--	- -	NA	- -	--	- -	--
			Manganese	--	- -	--	--	- -	CNS	- -	0.0004	- -	0.0004
			Mercury	--	- -	--	--	- -	CNS, Kidney	- -	0.000007	- -	0.000007
			Nickel	--	3E-10	--	--	3E-10	Respiratory	- -	0.0001	- -	0.0001
			Thallium	--	- -	--	--	- -	NA	- -	--	- -	--
			Vanadium	--	- -	--	--	- -	NA	- -	--	- -	--
			Zinc	--	- -	--	--	- -	NA	- -	--	- -	--
			Chemical Total	--	1E-09	--	--	1E-09		- -	0.0007	- -	0.0007
		Exposure Point Total						1E-09					0.0007
	Exposure Medium Total							1E-09					0.0007
Medium Total								2E-05					1

Notes:

Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.02
Total Blood HI	0.2
Total Body Weight HI	0.01
Total CNS HI	0.04
Total CVS HI	0.06
Total Fetotoxicity HI	0.00003
Total GS HI	0.2
Total Immune HI	0.008
Total Kidney HI	0.008
Total Liver HI	0.002
Total Respiratory HI	0.0002
Total None Reported HI	0.00
Total Skin HI	0.06
Total Thyroid HI	0.04
Total NA HI	0.7

TABLE 9.3.C.CTE

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	3E-07	--	1E-07	--	5E-07	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	1E-08	--	9E-10	--	1E-08	NA	0.001	--	0.00007	0.001
			Aroclor-1248	3E-08	--	8E-09	--	3E-08	NA	--	--	--	--
			Aroclor-1254	2E-09	--	6E-10	--	3E-09	Immune	0.0005	--	0.0002	0.0006
			Aluminum	--	--	--	--	--	CNS	0.001	--	0.000000	0.001
			Antimony	--	--	--	--	--	Blood	0.0004	--	0.000000	0.0004
			Arsenic	3E-07	--	2E-08	--	3E-07	Skin, CVS	0.006	--	0.0004	0.006
			Barium	--	--	--	--	--	Kidney	0.0001	--	0.000000	0.0001
			Cadmium	--	--	--	--	--	NA	0.0003	--	0.00000	0.0003
			Cobalt	--	--	--	--	--	Thyroid	0.003	--	0.000000	0.003
			Chromium	--	--	--	--	--	0	0.000	--	0.0000	0.000
			Copper	--	--	--	--	--	GS	0.002	--	0.000000	0.002
			Iron	--	--	--	--	--	GS	0.004	--	0.000000	0.004
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	0.001	--	0.00000	0.001
			Mercury	--	--	--	--	--	Autoimmune	0.0006	--	0.00000	0.0006
			Thallium	--	--	--	--	--	NA	--	--	--	--
			Vanadium	--	--	--	--	--	Kidney	0.0008	--	0.000000	0.0008
			Chemical Total	7E-07	--	1E-07	--	8E-07		0.02	--	0.0006	0.02
		Exposure Point Total						8E-07					0.02
	Exposure Medium Total							8E-07					0.02
	Air	OU7	Benzo(a)pyrene Equivalents	--	1E-12	--	--	1E-12	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	1E-13	--	--	1E-13	NA	--	6.57885E-10	--	6.57885E-10
			Aroclor-1248	--	2E-13	--	--	2E-13	NA	--	--	--	--
			Aroclor-1254	--	1E-14	--	--	1E-14	NA	--	--	--	--
			Aluminum	--	--	--	--	--	CNS	--	0.000006	--	0.000006
			Antimony	--	--	--	--	--	NA	--	--	--	--
			Arsenic	--	2E-11	--	--	2E-11	NA	--	0.000003	--	0.000003
			Barium	--	--	--	--	--	Fetotoxicity	--	0.000001	--	0.000001
			Cadmium	--	7E-13	--	--	7E-13	NA	--	0.0000004	--	0.0000004
			Cobalt	--	2E-11	--	--	2E-11	Respiratory	--	0.000004	--	0.000004
			Chromium	--	--	--	--	--	0	--	0.000000	--	0.000000
			Copper	--	--	--	--	--	NA	--	--	--	--
			Iron	--	--	--	--	--	NA	--	--	--	--
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	--	0.00002	--	0.00002
			Mercury	--	--	--	--	--	CNS, Kidney	--	0.0000002	--	0.0000002
			Thallium	--	--	--	--	--	NA	--	--	--	--

TABLE 9.3.C.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Vanadium	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	--	4E-11	--	--	4E-11		--	0.00003	--	0.00003
		Exposure Point Total						4E-11					0.00003
	Exposure Medium Total							4E-11					0.00003
Medium Total								8E-07					0.02
Sediment	Sediment	OU7	Benzo(a)pyrene Equivalents	1E-08	--	3E-09	--	1E-08	NA	--	--	--	--
			TEQ PCB	8E-08	--	6E-09	--	9E-08	NA	0.006	--	0.0004	0.007
			Total PCBs	3E-10	--	1E-10	--	4E-10	0	--	--	--	--
			Arsenic	9E-09	--	6E-10	--	9E-09	Skin, CVS	0.0002	--	0.00001	0.0002
			Chromium	--	--	--	--	--	None Reported	0.0002	--	0.00000	0.0002
			Iron	--	--	--	--	--	GS	0.0003	--	0.0000000	0.0003
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese (Soil)	--	--	--	--	--	CNS	0.00001	--	--	0.00001
			Chemical Total	1E-07	--	9E-09	--	1E-07		0.007	--	0.0004	0.007
		Exposure Point Total						1E-07					0.007
	Exposure Medium Total							1E-07					0.007
Medium Total								1E-07					0.007
Receptor Total							Receptor Risk Total	9E-07				Receptor HI Total	0.03

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.0006
Total Blood HI	0.0004
Total CNS HI	0.003
Total CVS HI	0.007
Total Fetotoxicity HI	0.000001
Total GS HI	0.007
Total Immune HI	0.0006
Total Kidney HI	0.0009
Total Respiratory HI	0.000004
Total None Reported HI	0.000
Total Skin HI	0.007
Total Thyroid HI	0.003
Total NA HI	0.008

TABLE 9.4.C.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	4E-07	--	3E-07	--	7E-07	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	2E-08	--	3E-09	--	2E-08	NA	--	--	--	--
			Aroclor-1248	3E-08	--	3E-08	--	6E-08	NA	--	--	--	--
			Aroclor-1254	2E-09	--	2E-09	--	4E-09	Immune	--	--	--	--
			Aluminum	--	--	--	--	--	CNS	--	--	--	--
			Antimony	--	--	--	--	--	Blood	--	--	--	--
			Arsenic	3E-07	--	6E-08	--	4E-07	Skin, CVS	--	--	--	--
			Barium	--	--	--	--	--	Kidney	--	--	--	--
			Cadmium	--	--	--	--	--	NA	--	--	--	--
			Cobalt	--	--	--	--	--	Thyroid	--	--	--	--
			Chromium	--	--	--	--	--	0	--	--	--	--
			Copper	--	--	--	--	--	GS	--	--	--	--
			Iron	--	--	--	--	--	GS	--	--	--	--
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	--	--	--	--
			Mercury	--	--	--	--	--	Autoimmune	--	--	--	--
			Thallium	--	--	--	--	--	NA	--	--	--	--
			Vanadium	--	--	--	--	--	Kidney	--	--	--	--
			Chemical Total	7E-07	--	4E-07	--	1E-06		--	--	--	--
		Exposure Point Total						1E-06					--
	Exposure Medium Total							1E-06					--
	Air	OU7	Benzo(a)pyrene Equivalents	--	9E-13	--	--	9E-13	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	7E-14	--	--	7E-14	NA	--	6.57885E-10	--	6.57885E-10
			Aroclor-1248	--	1E-13	--	--	1E-13	NA	--	--	--	--
			Aroclor-1254	--	1E-14	--	--	1E-14	NA	--	--	--	--
			Aluminum	--	--	--	--	--	CNS	--	0.000006	--	0.000006
			Antimony	--	--	--	--	--	NA	--	--	--	--
			Arsenic	--	1E-11	--	--	1E-11	NA	--	0.000003	--	0.000003
			Barium	--	--	--	--	--	Fetotoxicity	--	0.000001	--	0.000001
			Cadmium	--	5E-13	--	--	5E-13	NA	--	0.0000004	--	0.0000004
			Cobalt	--	1E-11	--	--	1E-11	Respiratory	--	0.000004	--	0.000004
			Chromium	--	--	--	--	--	0	--	0.000000	--	0.000000
			Copper	--	--	--	--	--	NA	--	--	--	--
			Iron	--	--	--	--	--	NA	--	--	--	--
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	--	0.00002	--	0.00002
			Mercury	--	--	--	--	--	CNS, Kidney	--	0.0000002	--	0.0000002
			Thallium	--	--	--	--	--	NA	--	--	--	--
			Vanadium	--	--	--	--	--	NA	--	--	--	--

TABLE 9.4.C.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Chemical Total	--	3E-11	--	--	3E-11		--	0.00003	--	0.00003
		Exposure Point Total						3E-11					0.00003
	Exposure Medium Total							3E-11					0.00003
Medium Total								1E-06					0.03716
Sediment	Sediment	OU7	Benzo(a)pyrene Equivalents	1E-08	--	1E-08	--	2E-08	NA	--	--	--	--
			TEQ PCB	9E-08	--	2E-08	--	1E-07	NA	0.010	--	0.002	0.01
			Total PCBs	4E-10	--	3E-10	--	7E-10	0	--	--	--	--
			Arsenic	9E-09	--	2E-09	--	1E-08	Skin, CVS	0.0003	--	0.00006	0.0004
			Chromium	3E-08	--	8E-09	--	4E-08	None Reported	0.0003	--	0.00008	0.0004
			Iron	--	--	--	--	--	GS	0.0004	--	0.000003	0.0004
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese (Soil)	--	--	--	--	--	CNS	0.00002	--	--	0.00002
			Chemical Total	1E-07	--	4E-08	--	2E-07		0.01	--	0.002	0.01
		Exposure Point Total						2E-07					0.01
	Exposure Medium Total							2E-07					0.01
Medium Total								2E-07					0.01
Receptor Total							Receptor Risk Total	1E-06				Receptor HI Total	0.05

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total CNS HI	0.00400
Total CVS HI	0.0116
Total Fetotoxicity HI	0.000001
Total GS HI	0.0106
Total Kidney HI	0.0014269
Total Respiratory HI	0.000004
Total None Reported HI	0.0004
Total Skin HI	0.0116
Total NA HI	0.01

TABLE 9.5.C.CTE

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	7E-07	--	4E-07	--	1E-06
			2,3,7,8-TCDD Equivalents	3E-08	--	4E-09	--	3E-08
			Aroclor-1248	6E-08	--	4E-08	--	9E-08
			Aroclor-1254	4E-09	--	3E-09	--	7E-09
			Aluminum	--	--	--	--	--
			Antimony	--	--	--	--	--
			Arsenic	6E-07	--	8E-08	--	7E-07
			Barium	--	--	--	--	--
			Cadmium	--	--	--	--	--
			Cobalt	--	--	--	--	--
			Chromium	--	--	--	--	--
			Copper	--	--	--	--	--
			Iron	--	--	--	--	--
			Lead	--	--	--	--	--
			Manganese	--	--	--	--	--
			Mercury	--	--	--	--	--
			Thallium	--	--	--	--	--
			Vanadium	--	--	--	--	--
			Chemical Total	1E-06	--	5E-07	--	2E-06
		Exposure Point Total						2E-06
	Exposure Medium Total							2E-06

TABLE 9.5.C.CTE

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Surface Soil	Air	OU7	Benzo(a)pyrene Equivalents	--	2E-12	--	--	2E-12
			2,3,7,8-TCDD Equivalents	--	2E-13	--	--	2E-13
			Aroclor-1248	--	3E-13	--	--	3E-13
			Aroclor-1254	--	2E-14	--	--	2E-14
			Aluminum	--	- -	--	--	- -
			Antimony	--	- -	--	--	- -
			Arsenic	--	3E-11	--	--	3E-11
			Barium	--	- -	--	--	- -
			Cadmium	--	1E-12	--	--	1E-12
			Cobalt	--	4E-11	--	--	4E-11
			Chromium	--	- -	--	--	- -
			Copper	--	- -	--	--	- -
			Iron	--	- -	--	--	- -
			Lead	--	- -	--	--	- -
			Manganese	--	- -	--	--	- -
			Mercury	--	- -	--	--	- -
			Thallium	--	- -	--	--	- -
			Vanadium	--	- -	--	--	- -
			Chemical Total	--	7E-11	--	--	7E-11
		Exposure Point Total						7E-11
	Exposure Medium Total							7E-11
Medium Total								2E-06

TABLE 9.5.C.CTE

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Sediment	Sediment	OU7	Benzo(a)pyrene Equivalents	2E-08	--	1E-08	--	3E-08
			TEQ PCB	2E-07	--	2E-08	--	2E-07
			Total PCBs	7E-10	--	4E-10	--	1E-09
			Arsenic	2E-08	--	2E-09	--	2E-08
			Chromium	3E-08	--	8E-09	--	4E-08
			Iron	- -	--	- -	--	- -
			Lead	- -	--	- -	--	- -
			Manganese (Soil)	- -	--	- -	--	- -
			Chemical Total	2E-07	--	5E-08	--	3E-07
		Exposure Point Total						3E-07
	Exposure Medium Total							3E-07
Medium Total								3E-07
Receptor Total							Receptor Risk Total	2E-06

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 9.6.C.CTE

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	2E-06	--	3E-07	--	2E-06	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	7E-08	--	2E-09	--	7E-08	NA	0.005	--	0.0002	0.006
			Aroclor-1248	1E-07	--	2E-08	--	2E-07	NA	--	--	--	--
			Aroclor-1254	1E-08	--	2E-09	--	1E-08	Immune	0.003	--	0.0004	0.003
			Aluminum	--	--	--	--	--	CNS	0.006	--	0.000000	0.006
			Antimony	--	--	--	--	--	Blood	0.002	--	0.00000	0.002
			Arsenic	1E-06	--	5E-08	--	1E-06	Skin, CVS	0.03	--	0.001	0.03
			Barium	--	--	--	--	--	Kidney	0.0008	--	0.00000	0.0008
			Cadmium	--	--	--	--	--	NA	0.002	--	0.00000	0.002
			Cobalt	--	--	--	--	--	Thyroid	0.02	--	0.00000	0.02
			Chromium	--	--	--	--	--	0	0.000	--	0.0000	0.000
			Copper	--	--	--	--	--	GS	0.01	--	0.00000	0.01
			Iron	--	--	--	--	--	GS	0.02	--	0.00000	0.02
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	0.007	--	0.0000	0.007
			Mercury	--	--	--	--	--	Autoimmune	0.003	--	0.00000	0.003
			Thallium	--	--	--	--	--	NA	--	--	--	--
			Vanadium	--	--	--	--	--	Kidney	0.004	--	0.000000	0.004
			Chemical Total	3E-06	--	3E-07	--	4E-06		0.1	--	0.002	0.1
		Exposure Point Total						4E-06					0.1
	Exposure Medium Total							4E-06					0.1

TABLE 9.6.C.CTE

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Air	OU7	Benzo(a)pyrene Equivalents	--	4E-11	--	--	4E-11	NA	- -	--	- -	--
			2,3,7,8-TCDD Equivalents	--	3E-12	--	--	3E-12	NA	- -	0.00000002	- -	0.00000002
			Aroclor-1248	--	6E-12	--	--	6E-12	NA	- -	--	- -	--
			Aroclor-1254	--	4E-13	--	--	4E-13	NA	- -	--	- -	--
			Aluminum	--	- -	--	--	- -	CNS	- -	0.0002	- -	0.0002
			Antimony	--	- -	--	--	- -	NA	- -	--	- -	--
			Arsenic	--	6E-10	--	--	6E-10	NA	- -	0.00009	- -	0.00009
			Barium	--	- -	--	--	- -	Fetotoxicity	- -	0.00005	- -	0.00005
			Cadmium	--	2E-11	--	--	2E-11	NA	- -	0.00001	- -	0.00001
			Cobalt	--	6E-10	--	--	6E-10	Respiratory	- -	0.0001	- -	0.0001
			Chromium	--	- -	--	--	- -	0	- -	0.00000	- -	0.00000
			Copper	--	- -	--	--	- -	NA	- -	--	- -	--
			Iron	--	- -	--	--	- -	NA	- -	--	- -	--
			Lead	--	- -	--	--	- -	NA	- -	--	- -	--
			Manganese	--	- -	--	--	- -	CNS	- -	0.0005	- -	0.0005
			Mercury	--	- -	--	--	- -	CNS, Kidney	- -	0.000005	- -	0.000005
			Thallium	--	- -	--	--	- -	NA	- -	--	- -	--
			Vanadium	--	- -	--	--	- -	NA	- -	--	- -	--
			Chemical Total	--	1E-09	--	--	1E-09		- -	0.001	- -	0.001
		Exposure Point Total						1E-09					0.001
	Exposure Medium Total							1E-09					0.001
Medium Total								4E-06					0.1
Receptor Total							Receptor Risk Total	4E-06				Receptor HI Total	0.1

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.003
Total Blood HI	0.002
Total CNS HI	0.01
Total CVS HI	0.03
Total Fetotoxicity HI	0.00005
Total GS HI	0.03
Total Immune HI	0.003
Total Kidney HI	0.005
Total Respiratory HI	0.0001
Total None Reported HI	0.000
Total Skin HI	0.03
Total Thyroid HI	0.02
Total NA HI	0.007

TABLE 9.7.C.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	2E-05	--	2E-06	--	2E-05	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	2E-07	--	6E-09	--	2E-07	NA	0.05	--	0.002	0.05
			Aroclor-1248	4E-07	--	6E-08	--	4E-07	NA	--	--	--	--
			Aroclor-1254	3E-08	--	4E-09	--	3E-08	Immune	0.02	--	0.004	0.03
			Aluminum	--	--	--	--	--	CNS	0.05	--	0.00000	0.05
			Antimony	--	--	--	--	--	Blood	0.02	--	0.0000	0.02
			Arsenic	4E-06	--	1E-07	--	4E-06	Skin, CVS	0.3	--	0.010	0.3
			Barium	--	--	--	--	--	Kidney	0.007	--	0.0000	0.007
			Cadmium	--	--	--	--	--	NA	0.02	--	0.0000	0.02
			Cobalt	--	--	--	--	--	Thyroid	0.1	--	0.0000	0.1
			Chromium	--	--	--	--	--	0	0.00	--	0.000	0.00
			Copper	--	--	--	--	--	GS	0.1	--	0.0000	0.1
			Iron	--	--	--	--	--	GS	0.2	--	0.0000	0.2
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	0.07	--	0.000	0.07
			Mercury	--	--	--	--	--	Autoimmune	0.03	--	0.0000	0.03
			Thallium	--	--	--	--	--	NA	--	--	--	--
			Vanadium	--	--	--	--	--	Kidney	0.04	--	0.00000	0.04
			Chemical Total	2E-05	--	3E-06	--	2E-05		1	--	0.02	1
		Exposure Point Total						2E-05					1
	Exposure Medium Total							2E-05					1
	Air	OU7	Benzo(a)pyrene Equivalents	--	4E-11	--	--	4E-11	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	9E-13	--	--	9E-13	NA	--	0.00000002	--	0.00000002
			Aroclor-1248	--	2E-12	--	--	2E-12	NA	--	--	--	--
			Aroclor-1254	--	1E-13	--	--	1E-13	NA	--	--	--	--
			Aluminum	--	--	--	--	--	CNS	--	0.0002	--	0.0002
			Antimony	--	--	--	--	--	NA	--	--	--	--
			Arsenic	--	2E-10	--	--	2E-10	NA	--	0.00009	--	0.00009
			Barium	--	--	--	--	--	Fetotoxicity	--	0.00005	--	0.00005
			Cadmium	--	6E-12	--	--	6E-12	NA	--	0.00001	--	0.00001
			Cobalt	--	2E-10	--	--	2E-10	Respiratory	--	0.0001	--	0.0001
			Chromium	--	--	--	--	--	0	--	0.00000	--	0.00000
			Copper	--	--	--	--	--	NA	--	--	--	--
			Iron	--	--	--	--	--	NA	--	--	--	--
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	--	0.0005	--	0.0005
			Mercury	--	--	--	--	--	CNS, Kidney	--	0.000005	--	0.000005
			Thallium	--	--	--	--	--	NA	--	--	--	--
			Vanadium	--	--	--	--	--	NA	--	--	--	--

TABLE 9.7.C.CTE

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Air	OU7	Chemical Total	--	4E-10	--	--	4E-10		- -	0.001	- -	0.001
		Exposure Point Total						4E-10					0.001
	Exposure Medium Total							4E-10					0.001
Medium Total								2E-05					1

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Autoimmune HI	0.03
Total Blood HI	0.02
Total CNS HI	0.1
Total CVS HI	0.3
Total Fetotoxicity HI	0.00005
Total GS HI	0.3
Total Immune HI	0.03
Total Kidney HI	0.04
Total Respiratory HI	0.0001
Total None Reported HI	0.00
Total Skin HI	0.3
Total Thyroid HI	0.1
Total NA HI	0.07

TABLE 9.8.C.CTE

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Surface Soil	Surface Soil	OU7	Benzo(a)pyrene Equivalents	2E-05	--	3E-06	--	2E-05
			2,3,7,8-TCDD Equivalents	3E-07	--	2E-09	--	3E-07
			Aroclor-1248	5E-07	--	2E-08	--	5E-07
			Aroclor-1254	4E-08	--	2E-09	--	4E-08
			Aluminum	- -	--	- -	--	- -
			Antimony	- -	--	- -	--	- -
			Arsenic	5E-06	--	5E-08	--	5E-06
			Barium	- -	--	- -	--	- -
			Cadmium	- -	--	- -	--	- -
			Cobalt	- -	--	- -	--	- -
			Chromium	- -	--	- -	--	- -
			Copper	- -	--	- -	--	- -
			Iron	- -	--	- -	--	- -
			Lead	- -	--	- -	--	- -
			Manganese	- -	--	- -	--	- -
			Mercury	- -	--	- -	--	- -
			Thallium	- -	--	- -	--	- -
			Vanadium	- -	--	- -	--	- -
			Chemical Total	2E-05	--	3E-06	--	3E-05
		Exposure Point Total						3E-05
	Exposure Medium Total							3E-05

TABLE 9.8.C.CTE

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

CENTRAL TENDENCY EXPOSURES

OPERABLE UNIT 7, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Surface Soil	Air	OU7	Benzo(a)pyrene Equivalents	--	1E-10	--	--	1E-10
			2,3,7,8-TCDD Equivalents	--	7E-12	--	--	7E-12
			Aroclor-1248	--	1E-11	--	--	1E-11
			Aroclor-1254	--	1E-12	--	--	1E-12
			Aluminum	--	- -	--	--	- -
			Antimony	--	- -	--	--	- -
			Arsenic	--	1E-09	--	--	1E-09
			Barium	--	- -	--	--	- -
			Cadmium	--	5E-11	--	--	5E-11
			Cobalt	--	1E-09	--	--	1E-09
			Chromium	--	- -	--	--	- -
			Copper	--	- -	--	--	- -
			Iron	--	- -	--	--	- -
			Lead	--	- -	--	--	- -
			Manganese	--	- -	--	--	- -
			Mercury	--	- -	--	--	- -
			Thallium	--	- -	--	--	- -
			Vanadium	--	- -	--	--	- -
			Chemical Total	--	3E-09	--	--	3E-09
		Exposure Point Total						3E-09
	Exposure Medium Total							3E-09
Medium Total								3E-05

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Appendix D.8

Subsurface Soil Analytical Results and Summary Statistics for Samples Greater than 10 Feet Below Ground Surface

TABLE 1
SUBSURFACE SOIL RESULTS GREATER THAN 10 FT. BGS
OU7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

SAMPLE	**TP-SB01-1214-98**	**TP-SB02-0911-98**	**TP-SB02-1113-98**	**TP-SB02-1517-98**	**TP-SB03-1315-98**
SACODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**ORIG**
LOCATION	TP-MW01	TP-MW02	TP-MW02	TP-MW02	TP-MW03
SAMPLE DATE	19980622	19980620	19980620	19980620	19980620
Volatile Organics (ug/kg)					
1,1,1-TRICHLOROETHANE	11 U			13 U	13 U
2-BUTANONE	2 J			9 J	13 U
2-HEXANONE	11 U			13 U	13 U
ACETONE	86 U			420 U	1000
BENZENE	11 U			13 U	13 U
CARBON DISULFIDE	11 U			15	3 J
CHLOROFORM	11 U			13 U	13 U
ETHYLBENZENE	11 U			13 U	13 U
METHYLENE CHLORIDE	11 U			13 U	13 U
TETRACHLOROETHENE	11 U			13 U	13 U
TOLUENE	11 U			13 U	13 U
TOTAL XYLENES	11 U			13 U	13 U
TRICHLOROETHENE	11 U			13 U	13 U
Semivolatile Organics (ug/kg)					
1,2,4-TRICHLOROBENZENE	360 U	460 U	460 U	430 U	430 U
1,2-DICHLOROBENZENE	360 U	460 U	460 U	430 U	430 U
1,3-DICHLOROBENZENE	360 U	460 U	460 U	430 U	430 U
1,4-DICHLOROBENZENE	360 U	460 U	460 U	430 U	430 U
2,4-DIMETHYLPHENOL	360 U	460 U	460 U	430 U	430 U
2-METHYLNAPHTHALENE	360 U	390 J	180 J	430 U	430 U
4-HYDROXY-4-METHYL-2-PENTANONE					
4-METHYLPHENOL	360 U	460 U	460 U	430 U	430 U
ACENAPHTHENE	360 U	2400	880	33 J	430 U
ACENAPHTHYLENE	360 U	100 J	460 U	430 U	430 U
ANTHRACENE	360 U	7100	3100	41 J	430 U
BAP EQUIVALENT-HALFND	415.98 U	9337.9	3177.6	326.93	285.282
BAP EQUIVALENT-POS	0 U	9328.3	3175	111.79	70.22
BENZO(A)ANTHRACENE	360 U	9100 J	3300 J	120 J	57 J
BENZO(A)PYRENE	360 U	5700 J	1500 J	85 J	54 J
BENZO(B)FLUORANTHENE	360 U	6000 J	2600 J	97 J	60 J
BENZO(G,H,I)PERYLENE	360 U	830 J	500 J	49 J	42 J
BENZO(K)FLUORANTHENE	360 U	6300	1900 J	87 J	60 J
BIS(2-ETHYLHEXYL)PHTHALATE	360 U	460 UR	460 UR	440	430 U
BUTYL BENZYL PHTHALATE	360 U	460 UR	460 UR	430 U	430 U
CARBAZOLE	360 U	1700	280 J	36 J	430 U
CHRYSENE	360 U	9600 J	2600 J	140 J	62 J
DI-N-BUTYL PHTHALATE	360 U	460 U	460 U	430 U	430 U

TABLE 1
SUBSURFACE SOIL RESULTS GREATER THAN 10 FT. BGS
OU7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

SAMPLE	**TP-SB01-1214-98**	**TP-SB02-0911-98**	**TP-SB02-1113-98**	**TP-SB02-1517-98**	**TP-SB03-1315-98**
SACODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**ORIG**
LOCATION	TP-MW01	TP-MW02	TP-MW02	TP-MW02	TP-MW03
SAMPLE DATE	19980622	19980620	19980620	19980620	19980620
DI-N-OCTYL PHTHALATE	360 U	460 UR	460 UR	430 U	430 U
DIBENZO(A,H)ANTHRACENE	360 U	1800 J	930 J	430 U	430 U
DIBENZOFURAN	360 U	1000	410 J	430 U	430 U
DIETHYL PHTHALATE	360 U	460 U	460 U	430 U	430 U
FLUORANTHENE	360 U	16000	2600	210 J	94 J
FLUORENE	360 U	2100	730	32 J	430 U
HIGH MOLECULAR WEIGHT PAHS	1080	61200	19630	1030	563
INDENO(1,2,3-CD)PYRENE	360 U	3100 J	1500	46 J	41 J
LOW MOLECULAR WEIGHT PAHS	1260	26490	8470	758	1335
NAPHTHALENE	360 U	1400	750	32 J	430 U
PHENANTHRENE	360 U	13000	2600	190 J	45 J
PHENOL	360 U	460 U	460 U	430 U	430 UJ
PYRENE	360 U	19000 J	8700 J	260 J	81 J
Pesticides/PCBs (ug/kg)					
4,4'-DDD	3.7 U	4.5 U	4.5 U	4.4 U	4.3 U
4,4'-DDE	3.7 U	4.5 U	4.5 U	4.4 U	4.3 U
4,4'-DDT	3.7 U	4.5 U	4.5 U	4.4 U	4.3 U
ALDRIN	1.9 U	2.3 U	2.3 U	2.3 U	2.2 U
ALPHA-BHC	1.9 U	2.3 U	2.3 U	2.3 U	2.2 U
ALPHA-CHLORDANE	1.9 U	2.3 U	2.3 U	2.3 U	2.2 U
AROCLOR-1248	37 U	45 U	45 U	44 U	43 U
AROCLOR-1254	37 U	45 U	45 U	44 U	43 U
AROCLOR-1260	37 U	45 U	45 U	44 U	43 U
DIELDRIN	3.7 U	4.5 U	4.5 U	4.4 U	4.3 U
ENDOSULFAN I	1.9 U	2.3 U	2.3 U	2.3 U	2.2 U
ENDOSULFAN SULFATE	3.7 U	4.5 U	4.5 U	4.4 U	4.3 U
ENDRIN ALDEHYDE	3.7 U	4.5 U	4.5 U	4.4 U	4.3 U
TOTAL AROCLOR	0 U	0 U	0 U	0 U	0 U
TOTAL AROCLOR HALFND	148	181	181	171.5	173
TOTAL AROCLOR ZEROND	0 U	0 U	0 U	0 U	0 U
Petroleum Hydrocarbons (mg/kg)					
DIESEL RANGE ORGANICS	5.5 U		6200	320	38
GASOLINE RANGE ORGANICS	2.5 U	2.8 U	30	3 U	3 U
Dioxins/Furans (ng/kg)					
1,2,3,4,6,7,8,9-OCDD					
1,2,3,4,6,7,8,9-OCDF					
1,2,3,4,6,7,8-HPCDD					
1,2,3,4,6,7,8-HPCDF					

TABLE 1
SUBSURFACE SOIL RESULTS GREATER THAN 10 FT. BGS
OU7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

SAMPLE	**TP-SB01-1214-98**	**TP-SB02-0911-98**	**TP-SB02-1113-98**	**TP-SB02-1517-98**	**TP-SB03-1315-98**
SACODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**ORIG**
LOCATION	TP-MW01	TP-MW02	TP-MW02	TP-MW02	TP-MW03
SAMPLE DATE	19980622	19980620	19980620	19980620	19980620
1,2,3,4,7,8,9-HPCDF					
1,2,3,4,7,8-HXCDD					
1,2,3,4,7,8-HXCDF					
1,2,3,6,7,8-HXCDD					
1,2,3,6,7,8-HXCDF					
1,2,3,7,8,9-HXCDD					
1,2,3,7,8,9-HXCDF					
1,2,3,7,8-PECDD					
1,2,3,7,8-PECDF					
2,3,4,6,7,8-HXCDF					
2,3,4,7,8-PECDF					
2,3,7,8-TCDD					
2,3,7,8-TCDF					
TEQ WHO-1998					
TEQ WHO-1998 - HALFND					
TEQ WHO-2005					
TEQ WHO-2005 - HALFND					
TOTAL HPCDD					
TOTAL HPCDF					
TOTAL HXCDD					
TOTAL HXCDF					
TOTAL PECDD					
TOTAL PECDF					
TOTAL TCDD					
TOTAL TCDF					
Inorganics (mg/kg)					
ALUMINUM	6680			9470	7600
ANTIMONY	0.30 UR			0.49 UR	0.40 UR
ARSENIC	6.4 J			8.7 J	5
BARIUM	33.2 J			47.8 J	22.5
BERYLLIUM	0.27 U			0.60 J	0.43 U
CADMIUM	0.35 U			0.56 UJ	0.45 U
CALCIUM	8470 J			22400 J	2400
CHROMIUM	30.4 J			144 J	20 J
COBALT	7.7			12.8	5.1
COPPER	15.7 J			852 J	24.3 J
IRON	14600			46100	12900
LEAD	3.8 U			68.7	13.6 J

TABLE 1
SUBSURFACE SOIL RESULTS GREATER THAN 10 FT. BGS
OU7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

SAMPLE	**TP-SB01-1214-98**	**TP-SB02-0911-98**	**TP-SB02-1113-98**	**TP-SB02-1517-98**	**TP-SB03-1315-98**
SACODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**ORIG**
LOCATION	TP-MW01	TP-MW02	TP-MW02	TP-MW02	TP-MW03
SAMPLE DATE	19980622	19980620	19980620	19980620	19980620
MAGNESIUM	5770			5090	4180
MANGANESE	253			283	143 J
MERCURY	0.04 U			1.2 J	0.25 J
NICKEL	24.1 J			661 J	12.3 J
POTASSIUM	1920			3080	2510
SELENIUM	0.73 U			1.3 U	0.62 U
SILVER	0.41 U			0.66 U	0.52 U
SODIUM	169			2060	3180
THALLIUM	0.49 U			0.79 U	0.63 U
VANADIUM	20.8			39.4	23.4 J
ZINC	24.7 J			364 J	38.7 J
Miscellaneous Parameters					
BULK DENSITY LB/F3					
CATION EXCHANGE CAPACITY MEQ/1					
CYANIDE MG/KG	2 U			2 U	2 U
PH S.U.	8.6			8.7	8.3
POROSITY S.U.					
SIEVE 1" %					
SIEVE 1-1/2" %					
SIEVE 1/2" %					
SIEVE 3/4" %					
SIEVE 3/8" %					
SIEVE NO. 004 %					
SIEVE NO. 010 %					
SIEVE NO. 020 %					
SIEVE NO. 040 %					
SIEVE NO. 060 %					
SIEVE NO. 100 %					
SIEVE NO. 200 %					
TOTAL ORGANIC CARBON %					
TOTAL ORGANIC CARBON MG/KG	8700			10000	14000
TOTAL SOLIDS %					

TABLE 1
SUBSURFACE SOIL RESULTS GREATER THAN 10 FT. BGS
OU7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

SAMPLE	**P-SB03-1315-98-AV**	**TP-SB03-1315-98-D**	**TP-SB03-2325-98**	**TP-SB04-1315-98**	**P-SB04-1315-98-AV**
SACODE	**AVG**	**DUP**	**NORMAL**	**ORIG**	**AVG**
LOCATION	TP-MW03	TP-MW03	TP-MW03	TP-MW04	TP-MW04
SAMPLE DATE	19980620	19980620	19980620	19980618	19980618
Volatile Organics (ug/kg)					
1,1,1-TRICHLOROETHANE	13 U	13 U	14 U	13 U	13 U
2-BUTANONE	13 U	13 U	14 U	13 U	13 U
2-HEXANONE	13 U	13 U	14 U	13 U	13 U
ACETONE	1000	1700 U	6400	80	90
BENZENE	13 U	13 U	14 U	13 U	13 U
CARBON DISULFIDE	4 J	5 J	16	3 J	2.5 J
CHLOROFORM	13 U	13 U	14 U	13 U	13 U
ETHYLBENZENE	13 U	13 U	14 U	13 U	13 U
METHYLENE CHLORIDE	13 U	13 U	14 U	13 U	13 U
TETRACHLOROETHENE	13 U	13 U	14 U	13 U	13 U
TOLUENE	13 U	13 U	14 U	13 U	13 U
TOTAL XYLENES	13 U	13 U	14 U	13 U	13 U
TRICHLOROETHENE	13 U	13 U	14 U	13 U	13 U
Semivolatile Organics (ug/kg)					
1,2,4-TRICHLOROBENZENE	430 U	430 U	460 U	430 U	430 U
1,2-DICHLOROBENZENE	430 U	430 U	460 U	430 U	430 U
1,3-DICHLOROBENZENE	430 U	430 U	460 U	430 U	430 U
1,4-DICHLOROBENZENE	430 U	430 U	460 U	430 U	430 U
2,4-DIMETHYLPHENOL	430 U	430 U	460 U	430 U	430 U
2-METHYLNAPHTHALENE	430 U	430 U	460 U	430 U	430 U
4-HYDROXY-4-METHYL-2-PENTANONE					
4-METHYLPHENOL	430 U	430 U	460 U	430 U	430 U
ACENAPHTHENE	430 U	430 U	460 U	430 U	430 U
ACENAPHTHYLENE	430 U	430 U	460 U	430 U	430 U
ANTHRACENE	430 U	430 U	460 U	30 J	30 J
BAP EQUIVALENT-HALFND	268.57	253.572	531.53 U	92.811	74.26
BAP EQUIVALENT-POS	53.57	36.4	0 U	90.6	74.26
BENZO(A)ANTHRACENE	40 J	23 J	460 U	70 J	50 J
BENZO(A)PYRENE	41.5 J	29 J	460 U	52 J	39 J
BENZO(B)FLUORANTHENE	42.5 J	25 J	460 U	56 J	39 J
BENZO(G,H,I)PERYLENE	42 J	430 U	460 U	430 U	430 U
BENZO(K)FLUORANTHENE	42.5 J	25 J	460 U	40 J	31.5 J
BIS(2-ETHYLHEXYL)PHTHALATE	430 U	430 U	460 U	430 U	430 U
BUTYL BENZYL PHTHALATE	430 U	430 U	460 U	430 U	430 U
CARBAZOLE	430 U	430 U	460 U	430 U	430 U
CHRYSENE	42 J	22 J	460 U	61 J	42.5 J
DI-N-BUTYL PHTHALATE	430 U	430 U	460 U	430 U	430 U

TABLE 1
SUBSURFACE SOIL RESULTS GREATER THAN 10 FT. BGS
OU7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

SAMPLE	**P-SB03-1315-98-AV**	**TP-SB03-1315-98-D**	**TP-SB03-2325-98**	**TP-SB04-1315-98**	**P-SB04-1315-98-AV**
SACODE	**AVG**	**DUP**	**NORMAL**	**ORIG**	**AVG**
LOCATION	TP-MW03	TP-MW03	TP-MW03	TP-MW04	TP-MW04
SAMPLE DATE	19980620	19980620	19980620	19980618	19980618
DI-N-OCTYL PHTHALATE	430 UJ	430 UJ	460 U	430 U	430 UJ
DIBENZO(A,H)ANTHRACENE	430 U	430 U	460 U	23 J	23 J
DIBENZOFURAN	430 U	430 U	460 U	430 U	430 U
DIETHYL PHTHALATE	430 U	430 U	460 U	430 U	430 U
FLUORANTHENE	59.5 J	25 J	460 U	150 J	107.5 J
FLUORENE	430 U	430 U	460 U	24 J	24 J
HIGH MOLECULAR WEIGHT PAHS	451.5	340	1380	476	350
INDENO(1,2,3-CD)PYRENE	33.5 J	26 J	460 U	30 J	30 J
LOW MOLECULAR WEIGHT PAHS	1335	1505	1610	1054	1013
NAPHTHALENE	430 U	430 U	460 U	430 U	430 U
PHENANTHRENE	45 J	430 U	460 U	140 J	99 J
PHENOL	430 UJ	430 UJ	460 UJ	430 UJ	430 UJ
PYRENE	53.5 J	26 J	460 U	120 J	88 J
Pesticides/PCBs (ug/kg)					
4,4'-DDD	4.3 U	4.3 U	4.6 U	4.2 U	4.3 U
4,4'-DDE	4.3 U	4.3 U	4.6 U	4.2 U	4.3 U
4,4'-DDT	4.3 U	4.3 U	4.6 U	3.5 J	3.5 J
ALDRIN	2.2 U	2.2 U	2.4 U	2.2 U	2.25 U
ALPHA-BHC	2.2 U	2.2 U	2.4 U	2.2 U	2.25 U
ALPHA-CHLORDANE	2.2 U	2.2 U	2.4 U	2.2 U	2.25 U
AROCLOR-1248	43 U	43 U	46 U	42 U	43 U
AROCLOR-1254	43 U	43 U	46 U	42 U	43 U
AROCLOR-1260	43 U	43 U	46 U	42 U	43 U
DIELDRIN	4.3 U	4.3 U	4.6 U	4.2 U	4.3 U
ENDOSULFAN I	2.2 U	2.2 U	2.4 U	2.2 U	2.25 U
ENDOSULFAN SULFATE	4.3 U	4.3 U	4.6 U	4.2 U	4.3 U
ENDRIN ALDEHYDE	4.3 U	4.3 U	4.6 U	4.2 U	4.3 U
TOTAL AROCLOR		0 U	0 U	0 U	
TOTAL AROCLOR HALFND	173	173	183	169	172.75
TOTAL AROCLOR ZEROND	0 U	0 U	0 U	0 U	0 U
Petroleum Hydrocarbons (mg/kg)					
DIESEL RANGE ORGANICS	30	22	7.7	22	14.3
GASOLINE RANGE ORGANICS	3 U	3 U	3.8 U	2.5 U	2.75 U
Dioxins/Furans (ng/kg)					
1,2,3,4,6,7,8,9-OCDD					
1,2,3,4,6,7,8,9-OCDF					
1,2,3,4,6,7,8-HPCDD					
1,2,3,4,6,7,8-HPCDF					

TABLE 1
SUBSURFACE SOIL RESULTS GREATER THAN 10 FT. BGS
OU7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

SAMPLE **SACODE** LOCATION SAMPLE DATE	**P-SB03-1315-98-AV** **AVG** TP-MW03 19980620	**TP-SB03-1315-98-D** **DUP** TP-MW03 19980620	**TP-SB03-2325-98** **NORMAL** TP-MW03 19980620	**TP-SB04-1315-98** **ORIG** TP-MW04 19980618	**P-SB04-1315-98-AV** **AVG** TP-MW04 19980618
1,2,3,4,7,8,9-HPCDF					
1,2,3,4,7,8-HXCDD					
1,2,3,4,7,8-HXCDF					
1,2,3,6,7,8-HXCDD					
1,2,3,6,7,8-HXCDF					
1,2,3,7,8,9-HXCDD					
1,2,3,7,8,9-HXCDF					
1,2,3,7,8-PECDD					
1,2,3,7,8-PECDF					
2,3,4,6,7,8-HXCDF					
2,3,4,7,8-PECDF					
2,3,7,8-TCDD					
2,3,7,8-TCDF					
TEQ WHO-1998					
TEQ WHO-1998 - HALFND					
TEQ WHO-2005					
TEQ WHO-2005 - HALFND					
TOTAL HPCDD					
TOTAL HPCDF					
TOTAL HXCDD					
TOTAL HXCDF					
TOTAL PECDD					
TOTAL PECDF					
TOTAL TCDD					
TOTAL TCDF					
Inorganics (mg/kg)					
ALUMINUM	8460	9320	16000	8300	8475
ANTIMONY	0.38 UR	0.36 UR	0.51 UR	0.36 UR	0.385 UR
ARSENIC	4.95	4.9	11.4	4.2	4.55
BARIUM	24.15	25.8	41.8	27	32.85
BERYLLIUM	0.46 U	0.49 U	0.89	0.46 U	0.445 U
CADMIUM	0.445 U	0.44 U	0.53 U	0.42 U	0.45 U
CALCIUM	3450	4500	5540	6150	5885
CHROMIUM	20.9 J	21.8 J	30.6 J	22.6 J	25.7 J
COBALT	5.25	5.4	8.2	5.4	6.2
COPPER	30.25 J	36.2 J	15.6 J	130 J	251.5 J
IRON	13750	14600	25800	14000	15100
LEAD	22.2 J	30.8 J	15.4 J	21.3 J	28.25 J

TABLE 1
SUBSURFACE SOIL RESULTS GREATER THAN 10 FT. BGS
OU7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

SAMPLE	**P-SB03-1315-98-AV**	**TP-SB03-1315-98-D**	**TP-SB03-2325-98**	**TP-SB04-1315-98**	**P-SB04-1315-98-AV**
SACODE	**AVG**	**DUP**	**NORMAL**	**ORIG**	**AVG**
LOCATION	TP-MW03	TP-MW03	TP-MW03	TP-MW04	TP-MW04
SAMPLE DATE	19980620	19980620	19980620	19980618	19980618
MAGNESIUM	4475	4770	6600	4480	4840
MANGANESE	151 J	159 J	268 J	163 J	180.5 J
MERCURY	0.16 J	0.07 J	0.03 J	0.04 J	0.10 J
NICKEL	13.95 J	15.6 J	18.7 J	18.4	25.05
POTASSIUM	2745	2980	4820	2420	2525
SELENIUM	0.615 U	0.61 U	0.74 UJ	0.58 UJ	0.625 UJ
SILVER	0.515 U	0.51 U	0.61 U	0.49 U	0.525 U
SODIUM	3510	3840	5170	3390	3525
THALLIUM	0.625 U	0.62 U	0.74 U	0.59 U	0.63 U
VANADIUM	25.15 J	26.9 J	36.7 J	25.3 J	26.35 J
ZINC	40.85 J	43 J	67.6 K	89.9 J	112.95 J
Miscellaneous Parameters					
BULK DENSITY LB/F3					
CATION EXCHANGE CAPACITY MEQ/1					
CYANIDE MG/KG	2 U	2 U	2 U	2 U	2 U
PH S.U.	8.3	8.3	8	8.2	8.2
POROSITY S.U.					
SIEVE 1" %					
SIEVE 1-1/2" %					
SIEVE 1/2" %					
SIEVE 3/4" %					
SIEVE 3/8" %					
SIEVE NO. 004 %					
SIEVE NO. 010 %					
SIEVE NO. 020 %					
SIEVE NO. 040 %					
SIEVE NO. 060 %					
SIEVE NO. 100 %					
SIEVE NO. 200 %					
TOTAL ORGANIC CARBON %					
TOTAL ORGANIC CARBON MG/KG	14500	15000	19000	13000	12500
TOTAL SOLIDS %					

TABLE 1
SUBSURFACE SOIL RESULTS GREATER THAN 10 FT. BGS
OU7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

SAMPLE	**TP-SB04-1315-98-D**	**TP-SB06-1315-98**	**TP-SB07-1315-98**	**P-SB07-1315-98-AV**	**TP-SB07-1315-98-D**
SACODE	**DUP**	**NORMAL**	**ORIG**	**AVG**	**DUP**
LOCATION	TP-MW04	TP-MW06	TP-MW07	TP-MW07	TP-MW07
SAMPLE DATE	19980618	19980616	19980615	19980615	19980615
Volatile Organics (ug/kg)					
1,1,1-TRICHLOROETHANE	13 U	14 U	12 U	12 U	12 U
2-BUTANONE	13 U	42	12 UJ	12 UJ	12 UJ
2-HEXANONE	13 U	14 UJ	12 UJ	12 UJ	12 UJ
ACETONE	100	410	1700 U	130 J	130 J
BENZENE	13 U	14 U	12 U	12 U	12 U
CARBON DISULFIDE	2 J	14 U	12 U	12 U	12 U
CHLOROFORM	13 U	14 U	12 U	12 U	12 U
ETHYLBENZENE	13 U	14 U	12 U	12 U	12 U
METHYLENE CHLORIDE	13 U	14 U	12 U	12 U	12 U
TETRACHLOROETHENE	13 U	14 U	12 U	12 U	12 U
TOLUENE	13 U	14 U	12 U	12 U	12 U
TOTAL XYLENES	13 U	14 U	12 U	12 U	12 U
TRICHLOROETHENE	13 U	14 U	12 U	12 U	12 U
Semivolatile Organics (ug/kg)					
1,2,4-TRICHLOROBENZENE	430 U	460 U	400 U	400 U	400 U
1,2-DICHLOROBENZENE	430 U	460 U	400 U	400 U	400 U
1,3-DICHLOROBENZENE	430 U	460 U	400 U	400 U	400 U
1,4-DICHLOROBENZENE	430 U	460 U	400 UJ	400 UJ	400 UJ
2,4-DIMETHYLPHENOL	430 U	460 U	400 U	400 U	400 U
2-METHYLNAPHTHALENE	430 U	77 J	38 J	41.5 J	45 J
4-HYDROXY-4-METHYL-2-PENTANONE					
4-METHYLPHENOL	430 U	460 U	400 U	400 U	400 U
ACENAPHTHENE	430 U	460 U	34 J	41.5 J	49 J
ACENAPHTHYLENE	430 U	27 J	400 U	400 U	400 U
ANTHRACENE	430 U	39 J	58 J	64.5 J	71 J
BAP EQUIVALENT-HALFND	269.874	436.73	186.93	214.28	241.2
BAP EQUIVALENT-POS	31.2	206.54	186.74	214.28	240.94
BENZO(A)ANTHRACENE	30 J	160 J	130 J	165 J	200 J
BENZO(A)PYRENE	26 J	160 J	110 J	125 J	140 J
BENZO(B)FLUORANTHENE	22 J	190 J	140 J	160 J	180 J
BENZO(G,H,I)PERYLENE	430 U	54 J	84 J	79 J	74 J
BENZO(K)FLUORANTHENE	23 J	120 J	80 J	100 J	120 J
BIS(2-ETHYLHEXYL)PHTHALATE	430 U	460 U	400 U	400 U	400 U
BUTYL BENZYL PHTHALATE	430 U	460 U	400 U	400 U	400 U
CARBAZOLE	430 U	34 J	38 J	32 J	26 J
CHRYSENE	24 J	190 J	190 J	225 J	260 J
DI-N-BUTYL PHTHALATE	430 U	30 J	400 U	400 U	400 U

TABLE 1
SUBSURFACE SOIL RESULTS GREATER THAN 10 FT. BGS
OU7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

SAMPLE	**TP-SB04-1315-98-D**	**TP-SB06-1315-98**	**TP-SB07-1315-98**	**P-SB07-1315-98-AV**	**TP-SB07-1315-98-D**
SACODE	**DUP**	**NORMAL**	**ORIG**	**AVG**	**DUP**
LOCATION	TP-MW04	TP-MW06	TP-MW07	TP-MW07	TP-MW07
SAMPLE DATE	19980618	19980616	19980615	19980615	19980615
DI-N-OCTYL PHTHALATE	430 UJ	460 UJ	400 UJ	400 UJ	400 UJ
DIBENZO(A,H)ANTHRACENE	430 U	460 U	40 J	46.5 J	53 J
DIBENZOFURAN	430 U	460 U	42 J	46 J	50 J
DIETHYL PHTHALATE	430 U	460 U	400 U	400 U	400 U
FLUORANTHENE	65 J	340 J	780	885	990
FLUORENE	430 U	32 J	40 J	41 J	42 J
HIGH MOLECULAR WEIGHT PAHS	416	1380	1720	2041.5	2363
INDENO(1,2,3-CD)PYRENE	430 U	110 J	89 J	90.5 J	92 J
LOW MOLECULAR WEIGHT PAHS	1348	706	524	564	604
NAPHTHALENE	430 U	61 J	34 J	35.5 J	37 J
PHENANTHRENE	58 J	240 J	120 J	140 J	160 J
PHENOL	430 UJ	460 UJ	400 UJ	400 UJ	400 UJ
PYRENE	56 J	300 J	470	595	720
Pesticides/PCBs (ug/kg)					
4,4'-DDD	4.4 U	4.8 U	4 U	4 U	4 U
4,4'-DDE	4.4 U	4.8 U	4 U	4 U	4 U
4,4'-DDT	4.4 U	4.8 U	4 U	4 U	4 U
ALDRIN	2.3 U	2.5 U	2.1 U	2.1 U	2.1 U
ALPHA-BHC	2.3 U	2.5 U	2.1 U	2.1 U	2.1 U
ALPHA-CHLORDANE	2.3 U	2.5 U	2.1 U	2.1 U	2.1 U
AROCLOR-1248	44 U	48 U	40 U	40 U	40 U
AROCLOR-1254	44 U	48 U	40 U	40 U	40 U
AROCLOR-1260	44 U	48 U	40 U	40 U	40 U
DIELDRIN	4.4 U	4.8 U	4 U	4 U	4 U
ENDOSULFAN I	2.3 U	2.5 U	2.1 U	2.1 U	2.1 U
ENDOSULFAN SULFATE	4.4 U	4.8 U	4 U	4 U	4 U
ENDRIN ALDEHYDE	4.4 U	4.8 U	4 U	4 U	4 U
TOTAL AROCLOR	0 U	0 U	0 U		0 U
TOTAL AROCLOR HALFND	176.5	192.5	161	161	161
TOTAL AROCLOR ZEROND	0 U	0 U	0 U	0 U	0 U
Petroleum Hydrocarbons (mg/kg)					
DIESEL RANGE ORGANICS	6.6	340	1100	1200	1300
GASOLINE RANGE ORGANICS	3 U	3.3 UJ	21	14.1	7.2
Dioxins/Furans (ng/kg)					
1,2,3,4,6,7,8,9-OCDD					
1,2,3,4,6,7,8,9-OCDF					
1,2,3,4,6,7,8-HPCDD					
1,2,3,4,6,7,8-HPCDF					

TABLE 1
SUBSURFACE SOIL RESULTS GREATER THAN 10 FT. BGS
OU7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

SAMPLE **SACODE** LOCATION SAMPLE DATE	**TP-SB04-1315-98-D** **DUP** TP-MW04 19980618	**TP-SB06-1315-98** **NORMAL** TP-MW06 19980616	**TP-SB07-1315-98** **ORIG** TP-MW07 19980615	**P-SB07-1315-98-AV** **AVG** TP-MW07 19980615	**TP-SB07-1315-98-D** **DUP** TP-MW07 19980615
1,2,3,4,7,8,9-HPCDF					
1,2,3,4,7,8-HXCDD					
1,2,3,4,7,8-HXCDF					
1,2,3,6,7,8-HXCDD					
1,2,3,6,7,8-HXCDF					
1,2,3,7,8,9-HXCDD					
1,2,3,7,8,9-HXCDF					
1,2,3,7,8-PECDD					
1,2,3,7,8-PECDF					
2,3,4,6,7,8-HXCDF					
2,3,4,7,8-PECDF					
2,3,7,8-TCDD					
2,3,7,8-TCDF					
TEQ WHO-1998					
TEQ WHO-1998 - HALFND					
TEQ WHO-2005					
TEQ WHO-2005 - HALFND					
TOTAL HPCDD					
TOTAL HPCDF					
TOTAL HXCDD					
TOTAL HXCDF					
TOTAL PECDD					
TOTAL PECDF					
TOTAL TCDD					
TOTAL TCDF					
Inorganics (mg/kg)					
ALUMINUM	8650	8840	11900	10080	8260
ANTIMONY	0.41 UR	10.7 J	0.44 UR	0.425 UR	0.41 UR
ARSENIC	4.9	21	10.7	8.9	7.1
BARIUM	38.7	458	62.9	56.95	51
BERYLLIUM	0.43 U	0.58	1 J	0.77 J	0.54 J
CADMIUM	0.48 U	15.6	0.51 U	0.495 U	0.48 U
CALCIUM	5620	16400	3660 J	4420 J	5180 J
CHROMIUM	28.8 J	47.5 J	42.1 J	42.5 J	42.9 J
COBALT	7	11.8	9.7	9.1	8.5
COPPER	373 J	1500 J	257	292	327
IRON	16200	93000	26600	24150	21700
LEAD	35.2 J	2720 J	291	287.5	284

TABLE 1
SUBSURFACE SOIL RESULTS GREATER THAN 10 FT. BGS
OU7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

SAMPLE	**TP-SB04-1315-98-D**	**TP-SB06-1315-98**	**TP-SB07-1315-98**	**P-SB07-1315-98-AV**	**TP-SB07-1315-98-D**
SACODE	**DUP**	**NORMAL**	**ORIG**	**AVG**	**DUP**
LOCATION	TP-MW04	TP-MW06	TP-MW07	TP-MW07	TP-MW07
SAMPLE DATE	19980618	19980616	19980615	19980615	19980615
MAGNESIUM	5200	8460	6440	6350	6260
MANGANESE	198 J	537 J	223 J	230.5 J	238 J
MERCURY	0.16 J	2.1 J	0.84 J	0.97 J	1.1 J
NICKEL	31.7	86	35.7	34.65	33.6
POTASSIUM	2630	1720	3410 J	2670 J	1930 J
SELENIUM	0.67 UJ	0.70 UJ	0.70 U	1 U	1.3 U
SILVER	0.56 U	2.8	0.59 U	0.9975	1.7
SODIUM	3660	3320	3180	2690	2200
THALLIUM	0.67 U	1 U	0.71 UJ	0.69 UJ	0.67 UJ
VANADIUM	27.4 J	26.6 J	33.9	30.95	28
ZINC	136 J	3620 J	313	310	307
Miscellaneous Parameters					
BULK DENSITY LB/F3					
CATION EXCHANGE CAPACITY MEQ/1					
CYANIDE MG/KG	2 U	2 U	2 U	2 U	2 U
PH S.U.	8.2	7.1	8.2	8.2	8.2
POROSITY S.U.					
SIEVE 1" %					
SIEVE 1-1/2" %					
SIEVE 1/2" %					
SIEVE 3/4" %					
SIEVE 3/8" %					
SIEVE NO. 004 %					
SIEVE NO. 010 %					
SIEVE NO. 020 %					
SIEVE NO. 040 %					
SIEVE NO. 060 %					
SIEVE NO. 100 %					
SIEVE NO. 200 %					
TOTAL ORGANIC CARBON %					
TOTAL ORGANIC CARBON MG/KG	12000	22000	62000	65500	69000
TOTAL SOLIDS %					

TABLE 1
SUBSURFACE SOIL RESULTS GREATER THAN 10 FT. BGS
OU7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

SAMPLE	**TP-SB07-1820-98**	**TP-SB08-1820-98**	**TP-SB09-1315-98**	**TP-SB10-0911-98**	**TP-SB10-1315-98**
SACODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
LOCATION	TP-MW07	TP-SB08	TP-SB09	TP-SB10	TP-SB10
SAMPLE DATE	19980615	19980710	19980609	19980616	19980616
Volatile Organics (ug/kg)					
1,1,1-TRICHLOROETHANE	14 U	13 U	13 U		13 U
2-BUTANONE	14 UJ	4 U	2 J		13 U
2-HEXANONE	1 J	13 U	13 U		13 UJ
ACETONE	170 U	21 U	49 U		18 U
BENZENE	14 U	13 U	13 U		13 UJ
CARBON DISULFIDE	6 J	6 J	5 J		4 J
CHLOROFORM	14 U	13 U	13 U		13 U
ETHYLBENZENE	14 U	13 U	13 U		13 U
METHYLENE CHLORIDE	14 U	15 U	30 U		13 U
TETRACHLOROETHENE	14 U	13 U	13 U		13 U
TOLUENE	14 U	13 U	13 U		13 U
TOTAL XYLENES	14 U	13 U	13 U		13 U
TRICHLOROETHENE	14 U	13 U	13 U		13 UJ
Semivolatile Organics (ug/kg)					
1,2,4-TRICHLOROBENZENE	430 U	430 U	430 U		430 U
1,2-DICHLOROBENZENE	430 U	430 U	430 U		430 U
1,3-DICHLOROBENZENE	430 U	430 U	430 U		430 U
1,4-DICHLOROBENZENE	430 UJ	430 U	430 U		430 U
2,4-DIMETHYLPHENOL	430 U	430 U	430 U		430 U
2-METHYLNAPHTHALENE	430 U	430 U	430 U		430 U
4-HYDROXY-4-METHYL-2-PENTANONE					
4-METHYLPHENOL	430 U	430 U	430 U		430 U
ACENAPHTHENE	430 U	430 U	430 U		430 U
ACENAPHTHYLENE	430 U	430 U	430 U		430 U
ANTHRACENE	430 U	430 U	430 U		430 U
BAP EQUIVALENT-HALFND	496.865 U	139.914	460.787		496.865 U
BAP EQUIVALENT-POS	0 U	137.7	7.1		0 U
BENZO(A)ANTHRACENE	430 U	63 J	37 J		430 U
BENZO(A)PYRENE	430 U	79 J	430 U		430 U
BENZO(B)FLUORANTHENE	430 U	59 J	34 J		430 U
BENZO(G,H,I)PERYLENE	430 U	430 U	430 U		430 U
BENZO(K)FLUORANTHENE	430 U	74 J	43 J		430 U
BIS(2-ETHYLHEXYL)PHTHALATE	430 U	430 U	430 U		430 U
BUTYL BENZYL PHTHALATE	430 U	430 U	35 J		430 U
CARBAZOLE	430 U	430 U	430 U		430 U
CHRYSENE	430 U	64 J	37 J		430 U
DI-N-BUTYL PHTHALATE	430 U	430 U	430 U		430 U

TABLE 1
SUBSURFACE SOIL RESULTS GREATER THAN 10 FT. BGS
OU7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

SAMPLE	**TP-SB07-1820-98**	**TP-SB08-1820-98**	**TP-SB09-1315-98**	**TP-SB10-0911-98**	**TP-SB10-1315-98**
SACODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
LOCATION	TP-MW07	TP-SB08	TP-SB09	TP-SB10	TP-SB10
SAMPLE DATE	19980615	19980710	19980609	19980616	19980616
DI-N-OCTYL PHTHALATE	430 UJ	430 U	430 UJ		430 U
DIBENZO(A,H)ANTHRACENE	430 U	43 J	430 U		430 U
DIBENZOFURAN	430 U	430 U	430 U		430 U
DIETHYL PHTHALATE	430 U	430 U	430 U		430 U
FLUORANTHENE	430 U	89 J	61 J		430 U
FLUORENE	430 U	430 U	430 U		430 U
HIGH MOLECULAR WEIGHT PAHS	1290	458	654		1290
INDENO(1,2,3-CD)PYRENE	430 U	35 J	430 U		430 U
LOW MOLECULAR WEIGHT PAHS	1505	1353	1372		1505
NAPHTHALENE	430 U	430 U	430 U		430 U
PHENANTHRENE	430 U	63 J	82 J		430 U
PHENOL	430 UJ	430 UJ	430 U		430 UJ
PYRENE	430 U	120 J	89 J		430 U
Pesticides/PCBs (ug/kg)					
4,4'-DDD	4.4 U	4.2 U	4.4 U		4.4 U
4,4'-DDE	4.4 U	4.2 U	4.4 U		4.4 U
4,4'-DDT	4.4 U	4.2 U	4.4 U		4.4 U
ALDRIN	2.3 U	2.1 U	2.3 U		2.3 U
ALPHA-BHC	2.3 U	2.1 U	2.3 U		2.3 U
ALPHA-CHLORDANE	2.3 U	2.1 U	2.3 U		2.3 U
AROCLOR-1248	44 U	42 U	44 U		44 U
AROCLOR-1254	44 U	42 U	44 U		44 U
AROCLOR-1260	44 U	42 U	44 U		44 U
DIELDRIN	4.4 U	4.2 U	4.4 U		4.4 U
ENDOSULFAN I	2.3 U	2.1 U	2.3 U		2.3 U
ENDOSULFAN SULFATE	4.4 U	4.2 U	4.4 U		4.4 U
ENDRIN ALDEHYDE	4.4 U	4.2 U	4.4 U		4.4 U
TOTAL AROCLOR	0 U	0 U	0 U		0 U
TOTAL AROCLOR HALFND	177	168	177		176.5
TOTAL AROCLOR ZEROND	0 U	0 U	0 U		0 U
Petroleum Hydrocarbons (mg/kg)					
DIESEL RANGE ORGANICS	14	24 U	7.5	36	14
GASOLINE RANGE ORGANICS	4.6	2.8 U	5 UJ	2.5 UJ	2.8 UJ
Dioxins/Furans (ng/kg)					
1,2,3,4,6,7,8,9-OCDD					
1,2,3,4,6,7,8,9-OCDF					
1,2,3,4,6,7,8-HPCDD					
1,2,3,4,6,7,8-HPCDF					

TABLE 1
SUBSURFACE SOIL RESULTS GREATER THAN 10 FT. BGS
OU7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

SAMPLE	**TP-SB07-1820-98**	**TP-SB08-1820-98**	**TP-SB09-1315-98**	**TP-SB10-0911-98**	**TP-SB10-1315-98**
SACODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
LOCATION	TP-MW07	TP-SB08	TP-SB09	TP-SB10	TP-SB10
SAMPLE DATE	19980615	19980710	19980609	19980616	19980616
1,2,3,4,7,8,9-HPCDF					
1,2,3,4,7,8-HXCDD					
1,2,3,4,7,8-HXCDF					
1,2,3,6,7,8-HXCDD					
1,2,3,6,7,8-HXCDF					
1,2,3,7,8,9-HXCDD					
1,2,3,7,8,9-HXCDF					
1,2,3,7,8-PECDD					
1,2,3,7,8-PECDF					
2,3,4,6,7,8-HXCDF					
2,3,4,7,8-PECDF					
2,3,7,8-TCDD					
2,3,7,8-TCDF					
TEQ WHO-1998					
TEQ WHO-1998 - HALFND					
TEQ WHO-2005					
TEQ WHO-2005 - HALFND					
TOTAL HPCDD					
TOTAL HPCDF					
TOTAL HXCDD					
TOTAL HXCDF					
TOTAL PECDD					
TOTAL PECDF					
TOTAL TCDD					
TOTAL TCDF					
Inorganics (mg/kg)					
ALUMINUM	10500	9040	7460		9400
ANTIMONY	0.37 UR	0.49 UR	0.50 UR		0.43 UR
ARSENIC	8.1	7.3 J	5.7		5.5
BARIUM	30.6	33	22.8		26.4
BERYLLIUM	0.86 J	0.41	0.52 U		0.62
CADMIUM	0.42 U	1	0.58 U		0.49 U
CALCIUM	3950 J	57200 J	2520 J		4840
CHROMIUM	27.7 J	33.3 J	23.2 J		24.3 J
COBALT	7.2	5.8	5.8		6.3
COPPER	9.7	17.8 J	22.7		9.2 J
IRON	20400	14700	16200		16500
LEAD	9.2	59.8 J	13.4		10.3 J

TABLE 1
SUBSURFACE SOIL RESULTS GREATER THAN 10 FT. BGS
OU7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

SAMPLE	**TP-SB07-1820-98**	**TP-SB08-1820-98**	**TP-SB09-1315-98**	**TP-SB10-0911-98**	**TP-SB10-1315-98**
SACODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
LOCATION	TP-MW07	TP-SB08	TP-SB09	TP-SB10	TP-SB10
SAMPLE DATE	19980615	19980710	19980609	19980616	19980616
MAGNESIUM	5410	8840	4280		5120
MANGANESE	202 J	168 J	164 J		173 J
MERCURY	0.08 J	0.24 J	0.05 J		0.01 UJ
NICKEL	18.7	16.3 U	19.3		14.5
POTASSIUM	3730 J	2830	2560 J		3010
SELENIUM	0.65 U	0.78 UJ	0.81 U		0.69 UJ
SILVER	0.49 U	0.65 U	0.67 U		0.57 U
SODIUM	4120	5740	3480		3880
THALLIUM	0.59 UJ	0.93 U	0.81 UJ		0.70 U
VANADIUM	33.3	28.2	24.2		28 J
ZINC	48	78.3 J	56.9		45.7 J
Miscellaneous Parameters					
BULK DENSITY LB/F3					
CATION EXCHANGE CAPACITY MEQ/1					
CYANIDE MG/KG	2 U	2 U	2 UR		2 U
PH S.U.	8.2	8.5	8.1		8.2
POROSITY S.U.					
SIEVE 1" %					
SIEVE 1-1/2" %					
SIEVE 1/2" %					
SIEVE 3/4" %					
SIEVE 3/8" %					
SIEVE NO. 004 %					
SIEVE NO. 010 %					
SIEVE NO. 020 %					
SIEVE NO. 040 %					
SIEVE NO. 060 %					
SIEVE NO. 100 %					
SIEVE NO. 200 %					
TOTAL ORGANIC CARBON %					
TOTAL ORGANIC CARBON MG/KG	19000	2800	11000		11000
TOTAL SOLIDS %					

TABLE 1
SUBSURFACE SOIL RESULTS GREATER THAN 10 FT. BGS
OU7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

SAMPLE	**TP-SB11-1315-98**	**TP-SB13-1315-98**	**TP-SB14-1315-98**	**TP-SB15-1315-98**	**P-SB15-1315-98-AV**
SACODE	**NORMAL**	**NORMAL**	**NORMAL**	**ORIG**	**AVG**
LOCATION	TP-SB11	TP-SB13	TP-SB14	TP-SB15	TP-SB15
SAMPLE DATE	19980716	19980715	19980715	19980710	19980710
Volatile Organics (ug/kg)					
1,1,1-TRICHLOROETHANE	13 U	12 U	14 U	12 UR	12 UR
2-BUTANONE	13 U	65 UJ	14 U	12 UR	12 UR
2-HEXANONE	13 U	12 UJ	14 U	12 UR	12 UR
ACETONE	26 U	2800 J	130	100 U	77 U
BENZENE	13 U	12 U	14 U	12 UR	12 UR
CARBON DISULFIDE	2 J	11 J	3 J	12 UR	12 UR
CHLOROFORM	13 U	12 U	14 U	12 UR	12 UR
ETHYLBENZENE	4 J	12 U	14 U	12 UR	12 UR
METHYLENE CHLORIDE	22 U	25 U	14 U	44 U	42.5 U
TETRACHLOROETHENE	13 U	12 U	14 U	12 UR	12 UR
TOLUENE	1 J	12 U	14 U	12 UR	12 UR
TOTAL XYLENES	18	12 U	14 U	12 UR	12 UR
TRICHLOROETHENE	13 U	12 U	1 J	12 UR	12 UR
Semivolatile Organics (ug/kg)					
1,2,4-TRICHLOROBENZENE	430 U	400 U	460 U	400 U	400 U
1,2-DICHLOROBENZENE	430 U	400 U	460 U	400 U	400 U
1,3-DICHLOROBENZENE	430 U	400 U	460 U	400 U	400 U
1,4-DICHLOROBENZENE	430 U	400 U	460 U	400 U	400 U
2,4-DIMETHYLPHENOL	430 U	400 U	460 U	400 U	400 U
2-METHYLNAPHTHALENE	430 UJ	400 UJ	460 U	400 U	400 U
4-HYDROXY-4-METHYL-2-PENTANONE					
4-METHYLPHENOL	430 U	400 U	460 U	400 U	400 U
ACENAPHTHENE	430 U	400 U	460 U	26 J	23 J
ACENAPHTHYLENE	430 U	24 J	460 U	400 U	400 U
ANTHRACENE	26 J	150 J	35 J	39 J	35 J
BAP EQUIVALENT-HALFND	409.2	379.59	356.388	143.941	141.19
BAP EQUIVALENT-POS	408.9	379.35	124	143.85	141.19
BENZO(A)ANTHRACENE	160 J	220 J	80 J	94 J	89.5 J
BENZO(A)PYRENE	210 J	230 J	100 J	82 J	80 J
BENZO(B)FLUORANTHENE	490	230 J	98 J	98 J	98 J
BENZO(G,H,I)PERYLENE	190 J	35 J	460 U	45 J	43 J
BENZO(K)FLUORANTHENE	210 J	170 J	88 J	58 J	55.5 J
BIS(2-ETHYLHEXYL)PHTHALATE	40 U	130 U	160 U	400 U	400 U
BUTYL BENZYL PHTHALATE	430 U	400 U	43 J	400 U	400 U
CARBAZOLE	430 U	31 J	460 U	21 J	22 J
CHRYSENE	300 J	240 J	88 J	91 J	89 J
DI-N-BUTYL PHTHALATE	430 U	62 J	460 U	400 U	27 J

TABLE 1
SUBSURFACE SOIL RESULTS GREATER THAN 10 FT. BGS
OU7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

SAMPLE	**TP-SB11-1315-98**	**TP-SB13-1315-98**	**TP-SB14-1315-98**	**TP-SB15-1315-98**	**P-SB15-1315-98-AV**
SACODE	**NORMAL**	**NORMAL**	**NORMAL**	**ORIG**	**AVG**
LOCATION	TP-SB11	TP-SB13	TP-SB14	TP-SB15	TP-SB15
SAMPLE DATE	19980716	19980715	19980715	19980710	19980710
DI-N-OCTYL PHTHALATE	430 U	400 UJ	460 U	400 U	400 U
DIBENZO(A,H)ANTHRACENE	110 J	87 J	460 U	37 J	37 J
DIBENZOFURAN	430 U	21 J	460 U	400 U	400 U
DIETHYL PHTHALATE	430 U	400 U	460 U	400 U	400 U
FLUORANTHENE	160 J	390 J	130 J	190 J	190 J
FLUORENE	430 U	40 J	460 U	22 J	22 J
HIGH MOLECULAR WEIGHT PAHS	1100	1577	768	664	670.5
INDENO(1,2,3-CD)PYRENE	220 J	170 J	62 J	52 J	48 J
LOW MOLECULAR WEIGHT PAHS	1186	858	1230	847	830
NAPHTHALENE	430 U	24 J	460 U	400 U	400 U
PHENANTHRENE	85 J	220 J	45 J	160 J	150 J
PHENOL	430 U	400 U	460 U	400 UJ	400 UJ
PYRENE	160 J	410	140 J	170 J	185 J
Pesticides/PCBs (ug/kg)					
4,4'-DDD	4.2 U	3.9 U	4.5 U	5.1 J	5.1 J
4,4'-DDE	4.2 U	3.9 U	4.5 U	4 U	3.95 U
4,4'-DDT	4.2 U	3.9 U	4.5 U	4 U	3.95 U
ALDRIN	2.2 U	2 U	2.3 U	2.1 U	2.05 U
ALPHA-BHC	2.2 U	2 U	2.3 U	2.1 U	2.05 U
ALPHA-CHLORDANE	2.2 U	2 U	2.3 U	2.1 U	2.05 U
AROCLOR-1248	42 U	39 U	45 U	40 U	39.5 U
AROCLOR-1254	42 U	39 U	45 U	40 U	39.5 U
AROCLOR-1260	48	39 U	160	40 U	39.5 U
DIELDRIN	4.2 U	3.9 U	4.5 U	4 U	3.95 U
ENDOSULFAN I	2.2 U	2 U	2.3 U	2.1 U	2.05 U
ENDOSULFAN SULFATE	4.2 U	3.9 U	4.5 U	4 U	3.95 U
ENDRIN ALDEHYDE	4.2 U	3.9 U	4.5 U	4 U	3.95 U
TOTAL AROCLOR	48	0 U	160	0 U	
TOTAL AROCLOR HALFND	174.5	156	318	161	158.75
TOTAL AROCLOR ZEROND	48	0 U	160	0 U	0 U
Petroleum Hydrocarbons (mg/kg)					
DIESEL RANGE ORGANICS		87	56	31 U	50.5 U
GASOLINE RANGE ORGANICS		2.8 U	3 U	2.8 U	2.65 U
Dioxins/Furans (ng/kg)					
1,2,3,4,6,7,8,9-OCDD					
1,2,3,4,6,7,8,9-OCDF					
1,2,3,4,6,7,8-HPCDD					
1,2,3,4,6,7,8-HPCDF					

TABLE 1
SUBSURFACE SOIL RESULTS GREATER THAN 10 FT. BGS
OU7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

SAMPLE **SACODE** LOCATION SAMPLE DATE	**TP-SB11-1315-98** **NORMAL** TP-SB11 19980716	**TP-SB13-1315-98** **NORMAL** TP-SB13 19980715	**TP-SB14-1315-98** **NORMAL** TP-SB14 19980715	**TP-SB15-1315-98** **ORIG** TP-SB15 19980710	**P-SB15-1315-98-AV** **AVG** TP-SB15 19980710
1,2,3,4,7,8,9-HPCDF					
1,2,3,4,7,8-HXCDD					
1,2,3,4,7,8-HXCDF					
1,2,3,6,7,8-HXCDD					
1,2,3,6,7,8-HXCDF					
1,2,3,7,8,9-HXCDD					
1,2,3,7,8,9-HXCDF					
1,2,3,7,8-PECDD					
1,2,3,7,8-PECDF					
2,3,4,6,7,8-HXCDF					
2,3,4,7,8-PECDF					
2,3,7,8-TCDD					
2,3,7,8-TCDF					
TEQ WHO-1998					
TEQ WHO-1998 - HALFND					
TEQ WHO-2005					
TEQ WHO-2005 - HALFND					
TOTAL HPCDD					
TOTAL HPCDF					
TOTAL HXCDD					
TOTAL HXCDF					
TOTAL PECDD					
TOTAL PECDF					
TOTAL TCDD					
TOTAL TCDF					
Inorganics (mg/kg)					
ALUMINUM	5480	6890	9000	11800	10740
ANTIMONY	0.73 U	0.35 UJ	0.39 UJ	0.51 U	0.49 U
ARSENIC	4.5 J	4.4 J	11	9.6 J	10.85 J
BARIUM	16.2	20.3	30.1	42.8	38.55
BERYLLIUM	0.26	0.28	0.47	0.63	0.58
CADMIUM	1.2	0.41 U	0.70 J	0.77 J	0.505 J
CALCIUM	4330	1340	8840	4700 J	3875 J
CHROMIUM	16.7	23.4	28.6	40.7 J	31.25 J
COBALT	3.9	4.1	5.9	9.2	8.5
COPPER	30600 J	5.3 U	67.3 J	39.6 J	26.5 J
IRON	14100	10700	23000	20800	19650
LEAD	577 J	7.4 J	133 J	63 J	34.075 J

TABLE 1
SUBSURFACE SOIL RESULTS GREATER THAN 10 FT. BGS
OU7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

SAMPLE	**TP-SB11-1315-98**	**TP-SB13-1315-98**	**TP-SB14-1315-98**	**TP-SB15-1315-98**	**P-SB15-1315-98-AV**
SACODE	**NORMAL**	**NORMAL**	**NORMAL**	**ORIG**	**AVG**
LOCATION	TP-SB11	TP-SB13	TP-SB14	TP-SB15	TP-SB15
SAMPLE DATE	19980716	19980715	19980715	19980710	19980710
MAGNESIUM	3590	4190	5300	6000	4960
MANGANESE	120	81.8	200	284 J	230 J
MERCURY	0.03 U	0.05 U	1 J	0.06 J	0.07 J
NICKEL	62.5	14.6	36	29.2	24.3
POTASSIUM	1670	1800	2930	3080	2590
SELENIUM	12.2 U	0.57 U	0.63 U	0.69 UJ	0.675 UJ
SILVER	2.3 U	0.13 U	0.48 U	0.58 U	0.565 U
SODIUM	2660	226 U	1580	967	570.25
THALLIUM	0.61 U	0.58 U	0.64 UJ	0.70 U	0.75 U
VANADIUM	17.2 J	20 J	28.9 J	37.8	32.95
ZINC	9630 J	23.1 J	64.5 J	92.5 J	63.5 J
Miscellaneous Parameters					
BULK DENSITY LB/F3					
CATION EXCHANGE CAPACITY MEQ/1					
CYANIDE MG/KG	7.6	2 U	2 U	2 U	2 U
PH S.U.	8.6	8.1	9.6	7.7	7.9
POROSITY S.U.					
SIEVE 1" %					
SIEVE 1-1/2" %					
SIEVE 1/2" %					
SIEVE 3/4" %					
SIEVE 3/8" %					
SIEVE NO. 004 %					
SIEVE NO. 010 %					
SIEVE NO. 020 %					
SIEVE NO. 040 %					
SIEVE NO. 060 %					
SIEVE NO. 100 %					
SIEVE NO. 200 %					
TOTAL ORGANIC CARBON %					
TOTAL ORGANIC CARBON MG/KG	4100	2500	7100	2100 J	2450 J
TOTAL SOLIDS %					

TABLE 1
SUBSURFACE SOIL RESULTS GREATER THAN 10 FT. BGS
OU7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

SAMPLE	**TP-SB15-1315-98-D**	**TP-SB16-1719-98**
SACODE	**DUP**	**NORMAL**
LOCATION	TP-SB15	TP-SB16
SAMPLE DATE	19980710	19980716
Volatile Organics (ug/kg)		
1,1,1-TRICHLOROETHANE	12 UR	12 U
2-BUTANONE	12 UR	12 U
2-HEXANONE	12 UR	12 U
ACETONE	54 U	21 U
BENZENE	12 UR	12 U
CARBON DISULFIDE	12 UR	12 U
CHLOROFORM	12 UR	12 U
ETHYLBENZENE	12 UR	12 U
METHYLENE CHLORIDE	41 U	54
TETRACHLOROETHENE	12 UR	12 U
TOLUENE	12 UR	12 U
TOTAL XYLENES	12 UR	12 U
TRICHLOROETHENE	12 UR	12 U
Semivolatile Organics (ug/kg)		
1,2,4-TRICHLOROBENZENE	400 U	400 U
1,2-DICHLOROBENZENE	400 U	400 U
1,3-DICHLOROBENZENE	400 U	400 U
1,4-DICHLOROBENZENE	400 U	400 U
2,4-DIMETHYLPHENOL	400 U	400 U
2-METHYLNAPHTHALENE	400 U	400 UJ
4-HYDROXY-4-METHYL-2-PENTANONE		
4-METHYLPHENOL	400 U	400 U
ACENAPHTHENE	20 J	400 U
ACENAPHTHYLENE	400 U	400 U
ANTHRACENE	31 J	400 U
BAP EQUIVALENT-HALFND	301.197	462.2 U
BAP EQUIVALENT-POS	101.11	0 U
BENZO(A)ANTHRACENE	85 J	400 U
BENZO(A)PYRENE	78 J	400 U
BENZO(B)FLUORANTHENE	98 J	400 U
BENZO(G,H,I)PERYLENE	41 J	400 U
BENZO(K)FLUORANTHENE	53 J	400 U
BIS(2-ETHYLHEXYL)PHTHALATE	400 U	26 U
BUTYL BENZYL PHTHALATE	400 U	400 U
CARBAZOLE	23 J	400 U
CHRYSENE	87 J	400 U
DI-N-BUTYL PHTHALATE	27 J	400 U

TABLE 1
SUBSURFACE SOIL RESULTS GREATER THAN 10 FT. BGS
OU7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

SAMPLE	**TP-SB15-1315-98-D**	**TP-SB16-1719-98**
SACODE	**DUP**	**NORMAL**
LOCATION	TP-SB15	TP-SB16
SAMPLE DATE	19980710	19980716
DI-N-OCTYL PHTHALATE	400 U	400 U
DIBENZO(A,H)ANTHRACENE	400 U	400 U
DIBENZOFURAN	400 U	400 U
DIETHYL PHTHALATE	400 U	400 U
FLUORANTHENE	190 J	400 U
FLUORENE	400 U	400 U
HIGH MOLECULAR WEIGHT PAHS	840	1200
INDENO(1,2,3-CD)PYRENE	44 J	400 U
LOW MOLECULAR WEIGHT PAHS	991	1400
NAPHTHALENE	400 U	400 U
PHENANTHRENE	140 J	400 U
PHENOL	400 UJ	400 U
PYRENE	200 J	400 U
Pesticides/PCBs (ug/kg)		
4,4'-DDD	2.3 R	3.8 U
4,4'-DDE	3.9 U	3.8 U
4,4'-DDT	3.9 U	3.8 U
ALDRIN	2 U	2 U
ALPHA-BHC	2 U	2 U
ALPHA-CHLORDANE	2 U	2 U
AROCLOR-1248	39 U	38 U
AROCLOR-1254	39 U	38 U
AROCLOR-1260	39 U	38 U
DIELDRIN	3.9 U	3.8 U
ENDOSULFAN I	2 U	2 U
ENDOSULFAN SULFATE	3.9 U	3.8 U
ENDRIN ALDEHYDE	3.9 U	3.8 U
TOTAL AROCLOR	0 U	0 U
TOTAL AROCLOR HALFND	156.5	153
TOTAL AROCLOR ZEROND	0 U	0 U
Petroleum Hydrocarbons (mg/kg)		
DIESEL RANGE ORGANICS	70 U	6 U
GASOLINE RANGE ORGANICS	2.5 U	2.8 U
Dioxins/Furans (ng/kg)		
1,2,3,4,6,7,8,9-OCDD		
1,2,3,4,6,7,8,9-OCDF		
1,2,3,4,6,7,8-HPCDD		
1,2,3,4,6,7,8-HPCDF		

TABLE 1
SUBSURFACE SOIL RESULTS GREATER THAN 10 FT. BGS
OU7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

SAMPLE **SACODE** LOCATION SAMPLE DATE	**TP-SB15-1315-98-D** **DUP** TP-SB15 19980710	**TP-SB16-1719-98** **NORMAL** TP-SB16 19980716
1,2,3,4,7,8,9-HPCDF		
1,2,3,4,7,8-HXCDD		
1,2,3,4,7,8-HXCDF		
1,2,3,6,7,8-HXCDD		
1,2,3,6,7,8-HXCDF		
1,2,3,7,8,9-HXCDD		
1,2,3,7,8,9-HXCDF		
1,2,3,7,8-PECDD		
1,2,3,7,8-PECDF		
2,3,4,6,7,8-HXCDF		
2,3,4,7,8-PECDF		
2,3,7,8-TCDD		
2,3,7,8-TCDF		
TEQ WHO-1998		
TEQ WHO-1998 - HALFND		
TEQ WHO-2005		
TEQ WHO-2005 - HALFND		
TOTAL HPCDD		
TOTAL HPCDF		
TOTAL HXCDD		
TOTAL HXCDF		
TOTAL PECDD		
TOTAL PECDF		
TOTAL TCDD		
TOTAL TCDF		
Inorganics (mg/kg)		
ALUMINUM	9680	3700
ANTIMONY	0.47 U	0.41 UJ
ARSENIC	12.1 J	9.3 J
BARIUM	34.3	19.1
BERYLLIUM	0.53	0.10 U
CADMIUM	0.48 U	0.21 U
CALCIUM	3050 J	789
CHROMIUM	21.8 J	16.4
COBALT	7.8	2.8
COPPER	13.4 J	6.4 J
IRON	18500	8350
LEAD	10.3 U	6.6 U

TABLE 1
SUBSURFACE SOIL RESULTS GREATER THAN 10 FT. BGS
OU7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

SAMPLE	**TP-SB15-1315-98-D**	**TP-SB16-1719-98**
SACODE	**DUP**	**NORMAL**
LOCATION	TP-SB15	TP-SB16
SAMPLE DATE	19980710	19980716
MAGNESIUM	3920	2620
MANGANESE	176 J	59.4
MERCURY	0.08 J	0.02 U
NICKEL	19.4	13.6
POTASSIUM	2100	1120
SELENIUM	0.66 UJ	0.66 U
SILVER	0.55 U	0.16 U
SODIUM	347 U	1980
THALLIUM	0.80 U	0.67 U
VANADIUM	28.1	10.4 J
ZINC	34.5 J	15 J
Miscellaneous Parameters		
BULK DENSITY LB/F3		
CATION EXCHANGE CAPACITY MEQ/1		
CYANIDE MG/KG	2 U	2 U
PH S.U.	8.1	7.6
POROSITY S.U.		
SIEVE 1" %		
SIEVE 1-1/2" %		
SIEVE 1/2" %		
SIEVE 3/4" %		
SIEVE 3/8" %		
SIEVE NO. 004 %		
SIEVE NO. 010 %		
SIEVE NO. 020 %		
SIEVE NO. 040 %		
SIEVE NO. 060 %		
SIEVE NO. 100 %		
SIEVE NO. 200 %		
TOTAL ORGANIC CARBON %		
TOTAL ORGANIC CARBON MG/KG	2800 J	380
TOTAL SOLIDS %		

TABLE 2
DESCRIPTIVE STATISTICS FOR CHEMICALS IN SUBSURFACE SOIL GREATER THAN 10 FT. BGS
OU7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

Chemical	USEPA RSL - Residential Soil[1]	Raw Statistics						
		Frequency of Detection		Mininum Non Detected	Maximum Non Detected	Mininum Detected	Maximum Detected	Sample of Maximum Detected
		Number	Percent					
Volatile Organics (ug/kg)								
2-BUTANONE	2800000	4/15	27%	4	65	2 J	42	TP-SB06-1315-98
2-HEXANONE	NA	1/15	7%	11	14	1 J	1 J	TP-SB07-1820-98
ACETONE	6100000	7/16	44%	18	1700	80	6400	TP-SB03-2325-98
CARBON DISULFIDE	82000	11/15	73%	11	14	2 J	16	TP-SB03-2325-98
ETHYLBENZENE	5400	1/15	7%	11	14	4 J	4 J	TP-SB11-1315-98
METHYLENE CHLORIDE	11000	1/16	6%	11	44	54	54	TP-SB16-1719-98
TOLUENE	500000	1/15	7%	11	14	1 J	1 J	TP-SB11-1315-98
TOTAL XYLENES	63000	1/15	7%	11	14	18	18	TP-SB11-1315-98
TRICHLOROETHENE	2500	1/15	7%	11	14	1 J	1 J	TP-SB14-1315-98
Semivolatile Organics (ug/kg)								
2-METHYLNAPHTHALENE	31000	4/18	22%	360	460	38 J	390 J	TP-SB02-0911-98
ACENAPHTHENE	340000	5/18	28%	360	460	20 J	2400	TP-SB02-0911-98
ACENAPHTHYLENE	340000	3/18	17%	360	460	24 J	100 J	TP-SB02-0911-98
ANTHRACENE	1700000	10/18	56%	360	460	26 J	7100	TP-SB02-0911-98
BAP EQUIVALENT	**15**	13/18	72%	415.98	531.53	92.811	9337.9	TP-SB02-0911-98
BENZO(A)ANTHRACENE	**150**	13/18	72%	360	460	23 J	9100 J	TP-SB02-0911-98
BENZO(A)PYRENE	**15**	12/18	67%	360	460	26 J	5700 J	TP-SB02-0911-98
BENZO(B)FLUORANTHENE	**150**	13/18	72%	360	460	22 J	6000 J	TP-SB02-0911-98
BENZO(G,H,I)PERYLENE	170000	9/18	50%	360	460	35 J	830 J	TP-SB02-0911-98
BENZO(K)FLUORANTHENE	**1500**	13/18	72%	360	460	23 J	6300	TP-SB02-0911-98
BIS(2-ETHYLHEXYL)PHTHALATE	35000	1/16	6%	26	460	440	440	TP-SB02-1517-98
BUTYL BENZYL PHTHALATE	260000	2/16	13%	360	460	35 J	43 J	TP-SB14-1315-98
CARBAZOLE	N/A	7/18	39%	360	460	21 J	1700	TP-SB02-0911-98
CHRYSENE	15000	13/18	72%	360	460	22 J	9600 J	TP-SB02-0911-98
DI-N-BUTYL PHTHALATE	610000	3/18	17%	360	460	27 J	62 J	TP-SB13-1315-98
DIBENZO(A,H)ANTHRACENE	**15**	8/18	44%	360	460	23 J	1800 J	TP-SB02-0911-98
DIBENZOFURAN	7800	4/18	22%	360	460	21 J	1000	TP-SB02-0911-98
FLUORANTHENE	230000	13/18	72%	360	460	25 J	16000	TP-SB02-0911-98
FLUORENE	230000	8/18	44%	360	460	22 J	2100	TP-SB02-0911-98
INDENO(1,2,3-CD)PYRENE	**150**	12/18	67%	360	460	26 J	3100 J	TP-SB02-0911-98
NAPHTHALENE	3600	6/18	33%	360	460	24 J	1400	TP-SB02-0911-98
PHENANTHRENE	170000	13/18	72%	360	460	45 J	13000	TP-SB02-0911-98
PYRENE	170000	13/18	72%	360	460	26 J	19000 J	TP-SB02-0911-98

TABLE 2
DESCRIPTIVE STATISTICS FOR CHEMICALS IN SUBSURFACE SOIL GREATER THAN 10 FT. BGS
OU7
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

Chemical	USEPA RSL - Residential Soil[1]	Raw Statistics						
		Frequency of Detection		Mininum Non Detected	Maximum Non Detected	Mininum Detected	Maximum Detected	Sample of Maximum Detected
		Number	Percent					
Pesticides/PCBs (ug/kg)								
4,4'-DDD	2000	1/18	6%	3.7	4.8	5.1 J	5.1 J	TP-SB15-1315-98
4,4'-DDT	1700	1/18	6%	3.7	4.8	3.5 J	3.5 J	TP-SB04-1315-98
AROCLOR-1260	220	2/18	11%	37	48	48	160	TP-SB14-1315-98
Inorganics (mg/kg)								
ALUMINUM	**7700**	16/16	100%	-	-	3700	16000	TP-SB03-2325-98
ANTIMONY	**3.1**	1/6	17%	0.35	0.73	10.7 J	10.7 J	TP-SB06-1315-98
ARSENIC	**0.39**	16/16	100%	-	-	4.2 J	21	TP-SB06-1315-98
BARIUM	1500	16/16	100%	-	-	16.2 J	458	TP-SB06-1315-98
BERYLLIUM	16	11/16	69%	0.1	0.52	0.26 J	1 J	TP-SB07-1315-98
CADMIUM	**7**	5/16	31%	0.21	0.58	0.7 J	15.6	TP-SB06-1315-98
CALCIUM	N/A	16/16	100%	-	-	789 J	57200 J	TP-SB08-1820-98
CHROMIUM	12000	16/16	100%	-	-	16.4 J	144 J	TP-SB02-1517-98
COBALT	**2.3**	16/16	100%	-	-	2.8	12.8	TP-SB02-1517-98
COPPER	**310**	15/16	94%	5.3	5.3	6.4 J	30600 J	TP-SB11-1315-98
IRON	**5500**	16/16	100%	-	-	8350	93000	TP-SB06-1315-98
LEAD	**400**	14/16	88%	3.8	10.3	7.4 J	2720 J	TP-SB06-1315-98
MAGNESIUM	N/A	16/16	100%	-	-	2620	8840	TP-SB08-1820-98
MANGANESE	**180**	16/16	100%	-	-	59.4 J	537 J	TP-SB06-1315-98
MERCURY	2.3	11/16	69%	0.01	0.05	0.03 J	2.1 J	TP-SB06-1315-98
NICKEL	**150**	15/16	94%	16.3	16.3	12.3 J	661 J	TP-SB02-1517-98
POTASSIUM	N/A	16/16	100%	-	-	1120	4820	TP-SB03-2325-98
SILVER	39	2/16	13%	0.13	2.3	1.7	2.8	TP-SB06-1315-98
SODIUM	N/A	15/16	94%	226	347	169	5740	TP-SB08-1820-98
VANADIUM	**39**	16/16	100%	-	-	10.4 J	39.4	TP-SB02-1517-98
ZINC	**2300**	16/16	100%	-	-	15 J	9630 J	TP-SB11-1315-98

1 - U.S. EPA RSL Table, June 2011. (Screening levels for noncarcinogenic compounds are divided by 10 to correspond to a HI of 0.1).
2 - Sample and duplicate are counted as one sample when determining frequency of detection.
For non-detects, 1/2 sample quantitation limit was used as a proxy concentration.
J = Estimated

Associated Samples

TP-SB01-1214-98	TP-SB03-2325-98	TP-SB07-1820-98	TP-SB13-1315-98
TP-SB02-0911-98	TP-SB04-1315-98	TP-SB08-1820-98	TP-SB14-1315-98
TP-SB02-1113-98	TP-SB04-1315-98-D	TP-SB09-1315-98	TP-SB15-1315-98
TP-SB02-1517-98	TP-SB06-1315-98	TP-SB10-0911-98	TP-SB15-1315-98-D
TP-SB03-1315-98	TP-SB07-1315-98	TP-SB10-1315-98	TP-SB16-1719-98
TP-SB03-1315-98-D	TP-SB07-1315-98-D	TP-SB11-1315-98	

APPENDIX E

RESPONSES TO COMMENTS

E.1 RESPONSES TO USEPA AND MEDEP COMMENTS ON DRAFT OU7 RI REPORT

E.2 SUMMARY AND ACTION ITEMS FROM APRIL 2011 TECHNICAL DISCUSSION ON RESPONSES TO COMMENTS ON THE DRAFT OU7 RI REPORT

E.1 RESPONSES TO USEPA AND MEDEP COMMENTS ON DRAFT OU7 RI REPORT

TETRA TECH

PITT-03-11-011

March 8, 2011

Project Number 112G00383

Mr. Matthew Audet
USEPA, Region 1
5 Post Office Square
Suite 100
Mail Code OSRR07-3
Boston, Massachusetts 02109-3912

Mr. Iver McLeod
Maine Department of Environmental Protection
State House Station 17
Augusta, Maine 04333-0017

Reference: Contract No. N62472-03-D-0057 (CLEAN)
Contract Task Order No. 055

Subject: Responses to Comments on the
Draft Remedial Investigation Report for Operable Unit7 (OU7)
Portsmouth Naval Shipyard (PNS), Kittery, Maine

Dear Mr. Audet/Mr. McLeod:

On behalf of the U.S. Navy, Tetra Tech NUS, Inc. is pleased to provide to the U.S. Environmental Protection Agency Region I (USEPA) and to the Maine Department of Environmental Protection (MEDEP) 2 and 3 copies, respectively, of the responses to USEPA comments dated January 6, 2011, and MEDEP comments dated December 14, 2010 and 1 copy each of the electronic document (on CD).

In accordance with the project schedule, comments are due by **April 7, 2011**.

If you have any comments or questions, or if additional information is required, please contact Ms. Linda Cole at 757.341.2011.

For the Community Restoration Advisory Board (RAB) members; if you have any comments or questions on these issues, they can be provided to the Navy at a RAB meeting, by calling the Public Affairs office at 207.438.1140 or by writing to:

Portsmouth Naval Shipyard
Public Affairs Office
Attn: Danna Eddy
Portsmouth, NH 03804-5000

Sincerely,

Deborah J. Cohen
Project Manager

DJC/clm
Enclosure

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Mr. Doug Bogen
Ms. Michele Dionne
Ms. Mary Marshall
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NH Fish & Game (D. Grout)
Mr. Jon Carter

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NAVFAC MIDLANT PWD ME (Code PRN4, M. Thyng)
(1 copy and 1 CD)
Mr. Jack McKenna (1 copy)
Ms. Carolyn Lepage (1 copy)
Mr. Tim Evans (1 copy)

Without Enclosure
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Mr. Onil Roy
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Y. Walker, NEHC
Ms. Diana McNabb (e-mail)
ATSDR (DOD-EJ/Carole Hossom)
NOAA (K. Finkelstein)
U.S. Fish and Wildlife (K. Munney)

RESPONSES TO MEDEP COMMENTS DATED DECEMBER 14, 2010
DRAFT REMEDIAL INVESTIGATION REPORT FOR OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

1. **Comment:** 1.2, p. 1-2. "Appendix B contains analytical results, including the complete database printout for soil and groundwater…" This is incorrect. Appendix B only contains groundwater results for inorganic analyses. All results must be shown in order for the database to be complete. See Comment 20.

   Response: Appendix B will be updated to include the complete database printout for all media.

2. **Comment:** 1.4, p 1-5 Para. 2: "BGS05 was removed from the background data set and included in the OU7 soil data set." BGS-08 also lies within the site boundaries. Please discuss the rationale for retaining it in the background data set. It appears that it would skew the background comparisons for the site and the "no debris fill" area near former Building 237. The Navy should consider including it in the OU7 soil data set.

   Response: BGS-08 is not within OU7. This facility background sample was collected from a vegetated area west of Newton Street. Estimated coordinates for location of BGS-08 will be corrected so that BGS-08 is within the vegetated area east of Newton Street instead of on Newton Street. The following provides additional information regarding the location of BGS-08.

   The locations for the background samples were approximated from a figure from the RFI Report and entered in the database as estimated locations. The samples were never geo-referenced with actual land features. Based on the approximated coordinates, BGS-08 appears to be in the middle of Newton Street. Based on field logs, BGS-08 was collected from a vegetated area, west of Newton Street. Using the information from the field logs, the location of BGS-08 was geo-referenced with the aerial map. Attachment 1 to these responses to comments is a figure showing the OU7 site boundary and the geo-referenced location of BGS-08. The database coordinates will be updated appropriately.

3. **Comment:** 1.4.1, Onshore Investigations Prior to the RI, p. 1-6. Please provide a brief discussion of the camera survey of the storm drains at OU7 that occurred several years ago and the conclusions drawn from it.

   Response: A discussion of the 2002 storm sewer camera survey will be added to Section 1.4.1. The following text, based on information provided in the March 2003 Site 32 RI QAPP (Revision 0), will be included: "In April 2002, the Navy conducted a storm sewer video camera survey to determine the condition of the storm sewer system that flows through OU7. The survey indicated that a majority of the sewers were in poor condition, with debris, dislocated joints, etc., and that groundwater infiltration was occurring at several locations. The storm sewers have outfalls in the OU7 intertidal area. The outfalls are tidally influenced, and it is likely that the outfalls are points where groundwater from the site is being transported to the Back Channel. Therefore, the Navy considers the storm sewer outfalls as potential groundwater transport pathways in the RI for OU7."

4. **Comment:** 2.2, Shoreline Stabilization, p. 2-2: "The stabilization measure provides for filtering by using multiple layers of increasingly larger material."

   Clarify what the stabilization measure is filtering.

   Response: A revetment structure that is designed to prevent erosion is designed and constructed with several layers of rock and or geotextiles. The purpose of including multiple layers of this material is to create a filter that allows tidal waters and water resulting from wave action to flow in and out of the revetment structure while limiting the amount of fine-grained material migration from behind the revetment structure. To clarify this process the text identified in the comment will be revised to focus

on the desired performance of a revetment structure as follows.

"To ensure the integrity of the revetment structure, the revetment structure was constructed using multiple layers of increasingly larger material that limit the amount of fine-grained material migration through the revetment structure. The migration of the fine-grained material would eventually create voids behind the revetment structure large enough for the revetment structure to sink."

5. **Comment:** 2.3, Data Usability, p. 2-3. "Seep data from 1996 and 1997 is not representative of current conditions because of changes to the shoreline that occurred in 2006. Please indicate the types of changes that occurred - how were the seeps affected? How do current conditions compare to 1996/97 conditions? If this is discussed elsewhere please reference it here.

   Response: The following revision to the text will be made to indicate how conditions have changed and what the current conditions are regarding seeps: "Seep data from 1996 and 1997 are not representative of current conditions because of changes to the shoreline that occurred as part of the 2006 shoreline stabilization. The seeps sampled in 1996 and 1997 (BC-1016, BC-1017, BC-1018, and BC-1020) are no longer present because the area was covered with shoreline controls and outfall pipes located at or near the seeps were exposed. The covered outfall pipes were the main cause for these seeps. Currently minor seeps flowing over sediment can be seen in the low-tide area. The seeps flow over soft sediment, which is difficult to walk on. The mid-to high-tide portion of the shoreline is covered with shoreline controls."

6. **Comment:** 2.3, Data Usability, p. 2-4. "…several soil samples had very high detection limits…"

   Were the data from these samples omitted from the risk assessment and extent of contamination determinations?

   Response: The soil samples with very high detection limits (greater than ten times the screening level) were not omitted from the site dataset and were includes in the risk assessment and extent of contamination determination, as appropriate. The following provides additional information.

   Attachments 2 and 3 of these responses to comments present the detection limit evaluation information for chemicals with detection limits exceeding a screening value for surface and subsurface soil respectively. With the exception of benzo(a)pyrene and dibenzo(a,h)anthracene the samples with elevated detection limits (more than ten times the screening level) were from the 1998 sampling event. The 1998 data were from the SSI; the subsequent RI sampling did not have elevated detection limits for these chemicals. Benzo(a)pyrene and dibenzo(a,h)anthracene had elevated detection limits for samples collected during 1998 and 2003 in both the surface and subsurface soil. Both of these chemicals are carcinogenic PAHs and were evaluated in the nature and extent section as Benzo(a)pyrene Equivalents and selected as COPCs in the risk assessment.

7. **Comment:** 3.2.1 Shoreline Revetment Structure, p. 3-3. The first sentence under Shoreline Revetment Construction indicates that the riprap exists <u>under</u> the filter stone, geotextile and pea-stone ("…riprap underlying filter stone…"). Please correct this.

   Response: The text referenced in the comment will be revised to read as follows.

   "According to as-built details (Appendix A.6), the shoreline revetment is constructed (bottom to top) of pea-stone (used to establish grade), geotextile, and two layers of riprap. The geotextile and lower riprap layer were installed to stabilize the larger exposed riprap layer and to help minimize the migration of fine-grained material from behind the revetment structure to the surface water. The entire revetment structure extends from the low tide elevation to the existing top of slope (variable elevation). The following information is known about the material used to construct the shoreline stabilization revetment."

In addition to making this text change, the material descriptors in the bulleted paragraphs that follow this text will be revised from "filter layer rock" to "lower riprap layer" and "surface layer rock" to "upper riprap layer."

8. **Comment:** 3.2.1 Shoreline Revetment Structure, Surface Layer Rock, p. 3-4, 3rd bullet. Please indicate here, not just in App. A6, that the original large granite blocks on the shoreline were reused as part of the surface layer.

   Response: Text will be added to indicate that the original large granite blocks on the shoreline were reused as part of the surface layer.

9. **Comment:** 3.4.3 Cross-Section Description, D-D', p. 3-9. "Localized pockets of waste material were encountered…" To our knowledge lateral limits of the waste pockets were never determined. Therefore, on Fig. 3-3 draw the waste pockets to indicate that lateral limits are unknown.

   Response: Figure 3-3 will be revised to show the individual waste pockets with approximate boundaries by using dashed lines. The thin intervals of waste only were identified in a small number of borings. Although the lateral extents of individual pockets of waste were not determined, the overall distribution was determined. The borings in which intervals of waste were identified are bounded by borings within 75 to 100 feet that had either no waste or surface fill mixed with waste identified, demonstrating that the waste pockets are localized in nature and do not represent laterally continuous units.

10. **Comment:** 3.5.2, p. 3-13 Para. 2 and Para. 4, and Table 3-1: "*TP-MW-06 was not equipped with a transducer…*"

    The statement should be revised to state that the 2000 data indicated there was no tidal influence rather than tidal lag. It is unusual for this well not to have some tidal influence based on its location in the filled area and its shallow screen in fill with debris, based on the relative response of other wells screened in similar material. Please add the results for MW-06 in October 2008 to the text. Also, the data from 2008 at MW-05 indicate that the Low Tide water elevations are higher than the High Tide elevations, were the readings taken according to the tidal lag in the table? If so, is it possible the lag is incorrect?

    Response: Regarding TP-MW06, the text will be clarified. The third sentence in Section 3.5.2, paragraph 2 will be revised to read: "TP-MW06 was not equipped with a transducer, because the SSI Report (TtNUS, May 2000) indicated TP-MW06 showed less than a ~~0.2~~ 0.02 feet difference between water levels measured at high tide and low tide, indicating that there was no significant tidal ~~lag~~ influence at this well."

    The discussion of the results for TP-MW06 from the October 2008 evaluation will be discussed in the text by adding the following in Section 3.5.2 before the first paragraph on page 3-14: "The water level response observed in TP-MW06 had a change of at least 0.4 foot during the water level measurement period on October 23, 2008. The tidal lag was estimated to be 1 hour 10 minutes for this location."

    Regarding TP-MW05 and Table 3-1, the groundwater elevations presented in Table 3-1 were not measured according to the tidal lag. They were measured coincident with the peak tide (either high or low) within a period of ½ hour before and 1 to 2 ½ hours after of the predicted tide, within the longest estimated tidal lag. The measurements were taken to represent a snapshot of the groundwater flow field. The tidal lag for TP-MW05 is considered correct. Although the well is located adjacent to the shoreline, the well is screened in material with higher fines, and the water levels appear to be damped. The maximum water level change between low and high tide during the 2003 tidal study was approximately 0.2 foot; the difference in head in TP-MW05 between high and low tidal cycles during the 2008 synoptic rounds was less than 0.5 foot. The difference between low and high tide levels may relate to the low tidal influence (reflected in the minimal difference in water levels

between high and low tide) and the measurements occurring at the tide response. This would result in a lower elevation at high tide (i.e., water levels in the well still rising from the previous low tide period) and vice versa for the low tide.

11. **Comment:** 3.5.2, p. 3-13 Para. 3 and Table 3-1. "Tidal effects were observed in the wells equipped with transducers except TP-MW-01 and TP-MW-09…"

    Please clarify the magnitude of decreasing water levels and that no tidal effect was observed in these wells. Based on its location, high hydraulic conductivity and boring log MW-09 would be likely to have tidal effects, however the void reported in the logs must affect this location.

    Response: The following sentence will be added after the first sentence of Section 3.5.2, paragraph 3, for clarification: "No tidal influence was observed in wells TP-MW01 and TP-MW09." In addition the following text as requested will be added to the end of the same paragraph: "The decreasing water levels (less than 0.1 foot decrease observed) in wells TP-MW01 and TP-MW09 was likely related to background trend conditions. Both of these wells are relatively far from stormwater drainage network that could influence them. TP-MW01 (an upgradient well) is distant from the shoreline and within the boundary of the original Seavey Island, reducing potential tidal influence."

12. **Comment:** 3.5.2, p.3-15 Para. 4, Appendix A.4 and Table 3-1. The recovery plots for these two wells are certainly atypical and indicate very fast response times. The data for MW-09 may actually represent the conductivity of the sandpack in the void at that well, and at MW-10 the well may be hydraulically connected to the drainage system across Goodrich Avenue. Please discuss this possibility and how it might affect interpretation of site hydrogeology.

    Response: The Navy agrees with the potential for measuring the permeability of the sand pack in TP-MW09 but also believes this may be true for TP-MW10 rather than being hydraulically connected drainage system across Goodrich Avenue. Due to the enlargement of the borehole of TP-MW10 during drilling, similar conditions relating to measurement of the sand pack permeability likely exist for TP-MW10 as for TP-MW09. The elevation of the drainage system across Goodrich Avenue in the area of TP-MW10 is higher in elevation (by more than 5 feet) than the saturated zone at TP-MW10. Therefore, it is not believed that the drainage system significantly influences well TP-MW10. The following sentence will be added after the last sentence of paragraph 4 to provide additional interpretation: "Additionally, the borehole of TP-MW10 was enlarged during drilling due to the fill material, and void spaces may have developed which were filled with sand during well installation. Therefore, the higher hydraulic conductivities measured in TP-MW09 and TP-MW10 may reflect the permeability of the sand in the void space rather than the formation permeability."

13. **Comment:** 4.0, Nature and Extent, p. 4-1, 1st para. Please indicate that outfall samples were also collected.

    Response: In Section 2.1, intertidal surface water was defined as (outfalls and nearby surface water). For clarity, the second sentence in the first paragraph of Section 4.0 will be revised to read as follows: "Soil and groundwater were investigated for the onshore area of OU7; surface water (outfalls and nearby surface water), seeps, and sediment were investigated in the intertidal portion of the offshore area."

14. **Comment:** 4.1.1, p. 4-1, Table 4-2 & Table 4-3. "Maximum facility background concentrations…are presented." The Site 32 QAPP (Table 1-3) used the "representative" PNS Facility Background values for comparisons of site data to screening criteria. Please revise Table 4-2 and Table 4-3 to these levels rather than the maximum concentrations that are listed.

    Response: For discussion of the nature and extent of contamination in the RI Report, the maximum facility background concentrations were presented to give a general understanding of nature and extent of contamination and help focus on chemicals more likely to be associated with a potential OU7 source. For additional information the representative PNS Facility Background values (95%

UCLs) and range of detected concentrations will be added to Tables 4-2 and 4-3. This additional information does not change the evaluation in the Nature and Extent Section. In addition, the HHRA (Section 6.0) background evaluation is based on a data set to dataset comparison and there is no impact to risk evaluation.

15. **Comment:** 4.1.1, p.4-2. Please indicate the source for the EPA residential soil screening levels.

    Response: The reference for the USEPA RSL table will be added as follows, USEPA Regional Screening Level Table Residential Soil (November 2010).

16. **Comment:** 4.1.1, p. 4-2. "Two PCBs (Aroclor 1248 and Aroclor 1254) were detected at concentrations above background and risk based screening levels in surface and subsurface soils, with Aroclor 1260 only detected at concentrations exceeding facility background and risk based screening levels in subsurface soil."

    Several of the nondetected Aroclors had detection limits higher than USEPA Nov. 2010 Regional Screening Levels (http://www.epa.gov/region9/superfund/prg/). The Navy compares detection limits to screening levels in App. D.4 and shows that there were exceedances of detection limits 1.0% to 3.1% of the time. Does the Navy discuss the uncertainty that these relatively few exceedances add to the human health risk assessment?

    Response: For surface soil 67 samples were analyzed for Aroclors. In surface soil the number of samples that exceeded the screening levels for Aroclors ranged from one to seven. These detection limits were all less than five times the screening levels. For subsurface soil Aroclors were analyzed for in 96 samples. The number of detection limits exceeding the screening level for Aroclors in subsurface soil ranged from one to three and were all less than five times the screening level. Based on the low number of samples that exceeded the screening criteria little uncertainty is anticipated for these few elevated detection limits.

17. **Comment:** 4.1.1, p. 4-2 last paragraph and Table 4-2 and Table 4-3. The discussion of background needs to be removed from the text related to PCBs. The text should note that all Facility Background samples were non-detect for PCBs (see Tables). In addition there is no geologic source or intended use in soils for PCBs.

    Response: The text will be clarified to remove discussion of background related to PCBs.

18. **Comment:** 4.1.1, p. 4-4. The paragraph discussing normal probability plots indicates that there are 27 soil and 23 subsurface soil locations corresponding to data points above an inflection point as shown in App. B.2. Please indicate what locations these are as this information cannot be determined from the probability plots.

    Response: Additional information will be provided in Appendix B for clarity. The sample locations are plotted on the normal probability plots at the end Appendix B.2. Attachments 4 and 5 to these responses to comments provide new Tables B-1 and B-2 that list for each chemical the locations that are greater than background in surface soil and subsurface soil. These tables will be added to Appendix B.2 in the draft final document. The text in Section 4.1.1 will be revised to, "The normal probability plots are presented in Appendix B.2 along with tables summarizing which locations are above an inflection point for each chemical and therefore most likely represent concentrations above background."

19. **Comment:** 4.1.1, pp. 4-3 & 4-4 and App. B.2. "Based on these plots, detected concentrations exceeding risk-based screening levels correspond to areas filled after 1910, …"

    Please include TP-SB115 in this discussion, and correct the text later in the paragraph on page 4-4 to reflect the detection at that location and the Arochlor 1254 screening level. Also, discuss the relative significance of the surface soil PCB detection in the area where no industrial activity took place.

Response: PCBs detected in TP-SB115 slightly exceeded the screening level and does not indicate significant site impact. For clarity, the text will be revised to read as follows: "Based on these plots detected concentrations exceeding risk-based screening levels correspond to areas filled after 1910, with the exception of TP-SB115, TP-SB120, TP-SB15, and TP-SB39. Aroclor-1254 was detected at 280 µg/kg at location TP-SB115 which slightly exceeds the risk-based screening level of 110 µg/kg. Aroclor-1254 was used in capacitor and transformers as well as hydraulic fuels. Trains have diesel/electric engines and transformers which may leak and drip PCBs onto the track. Therefore the slight exceedances of the risk-based screening level in the area with no known industrial use may be related to the railroad."

20. **Comment:** 4.1.2, p. 4-4, para 1.

    a) Figure 4-1 does not show MW-07 and MW-03, please revise as needed.
    b) The analytical database for groundwater presented in App. B.1 is incomplete. The Navy must present results for all analyses even if all the results were non-detect. The detection limits provided with these data are critical to understanding whether or not compounds are definitively below screening levels.
    c) "A copy of the analytical database for groundwater is presented in Appendix B.1 and summarized in Table A.1 of Appendix A.5 presents the OU7 sampling list." Some words are missing. Please correct.
    d) Please provide a reference for the ecological screening levels that are used to derive groundwater screening levels.

    Response:

    a) Figure 4-1 will be revised to show all OU7 monitoring well locations.
    b) Appendix B.1 will be updated to display the full analytical database printout as indicated in the Navy's response to MEDEP Comment No. 1.
    c) The text will be revised to the following, "A copy of the analytical database for groundwater is presented in Appendix B.1 and Table A.1 of Appendix A.5 presents the OU7 sampling list".
    d) The ecological screening references as follow will be added as appropriate

    Buchman, M. F., 1999. NOAA Screening Quick Reference Tables, NOAA HAZMAT Report 99-1, Seattle, WA, Coastal Protection and Restoration Division, National Oceanic and Atmospheric Administration.http://response.restoration.noaa.gov/cpr/sediment/squirt/squirt.html

    Suter, G.W. II. and C.L. Tsao. 1996. Toxicological Benchmarks for Screening Potential Constituents of Concern for Effects on Aquatic Biota:1996 Revision. Environmental Sciences Division, Oak Ridge National Laboratory. ES/ER/TM-96/R2.

    USEPA (United States Environmental Protection Agency), January 1996. ECO Update, Ecotox Thresholds. United States Environmental Protection Agency. Office of Solid Waste and Emergency Response. Intermittent Bulletin, Volume 3, Number 2. EPA540/F-95/038.

    USEPA, May 1996. Quality Criteria for Water - 1986. Office of Water, Regulations and Standards. EPA 440/5-86-001.

    USEPA (U.S. Environmental Protection Agency), 2009. National Recommended Water Quality Criteria: 2009. Office of Water.

21. **Comment:** 4.1.2, p. 4-4, para 2. "VOCs, pesticides, and PCBs were not detected in any of the groundwater samples." All results for toxaphene were nondetect, however even after a dilution factor of 100 detection limits exceeded the ecological screening level of 0.0002 ug/L by factors ranging from 43 – 300. Therefore, toxaphene may present a risk to biota and should not be dismissed. Please discuss this issue within the report. This comment also applies to toxaphene in surface water.

Response: Toxaphene was primarily used in the southern United States to control insect pests on cotton and other crops (ATSDR, September 2010). See Attachment 6 to these responses to comments for additional information on toxaphene. Toxaphene was not detected in any of the soil samples collected at OU7 with detection limits ranging from 25 ug/kg to 3500 ug/kg or in the groundwater or surface water. In addition, no pesticides were identified as chemicals associated with OU7 sources. Therefore, pesticides as a chemical class are not associated with OU7. Based on this, there is no reason to suspect that toxaphene would be present at OU7 or would present a risk to biota from exposure to OU7 media.

22. **Comment:** 4.2.1, p. 4-5. "Inorganics were the only chemicals detected in OU7 surface water." See previous comment regarding toxaphene.

    Response: Please see the Navy's response to MEDEP Comment No. 21.

23. **Comment:** Section 4.2.1, p. 4-5, Para. 2: "Zinc was not detected in the filtered samples from OF-61, OF-63, and TPSW-03 but not at TP-SW02." Should the first part of this sentence read "Zinc was detected…"?

    Response: The first part of the sentence will be changed to "Zinc was detected in the filtered samples from OF-61, OF-63, and TP-SW03."

24. **Comment:** Table 4-2 – Footnote 4. "RBCs for noncarcinogenic compounds are divided by 10 to correspond to a HI of 0.1."

    The RSL for lead has not been divided by 10 for an HI=0.1. Please change 400 mg/kg to 40 mg/kg or clarify why it should remain 400 mg/kg.

    Also, the RSL for metallic vanadium is incorrect. Please update to the Nov. 2010 RSL, 5.5 mg/kg. Therefore, the value presented in the table should be 0.55 mg/kg to correspond to a HI of 0.1.

    Response: The table will be revised to remove "n" notation for lead because USEPA has no consensus on a cancer slope factor (CSF) or a reference dose (RfD) for inorganic lead therefore it is not possible to calculate a classic carcinogenic or noncarcingenic screening level for lead. USEPA evaluates lead exposure using lead-blood modeling. On Table 4-2 the lead RSL is not divided by 10 because the lead RSL was not developed using the typical noncarcinogenic screening level methodology (i.e. blood-lead modeling was used to obtain the lead RSL rather than the use of a RfD).

    The RSL for vanadium and compounds is more representative of the form of vanadium that is likely to be present at the site than metallic vanadium; therefore, the vanadium and compounds value was used rather than the metallic vanadium value. Table 4-2 will be updated using the November 2010 RSLs. The RSL for vanadium and compounds is 390 mg/kg (N) therefore the RSL on Table 4-2 will be updated to 39.0 mg/kg to represent an HI of 0.1. All RSLs will be updated to the November 2010 version of the RSL table for the Draft Final RI Report.

25. **Comment:** Tables 4-5 & 4-6. Please indicate the sources of the ecological screening levels. Some appear to be from National Recommended Water Quality Criteria, some from NOAA SQRT tables, and some from elsewhere.

    Also, please carefully check units of ecological screening levels. Some of the values that appear to be from NOAA SQRT tables, e.g. acenaphthene, are in ug/L while the concentrations for organics found in water are in ng/L.

    Response: For the sources of the ecological screening levels please see the Navy's response to MEDEP Comment No. 20. These sources will be added to Tables 4-5 and 4-6. All units will be reported in ug/L for consistency.

26. **Comment:** Table 4-6. Indicate that shaded chemicals were selected as COPCs.

    Response: Table 4-6 is not a COPC selection table. A footnote will be added to Table 4-6 to indicate that shaded cells indicate that the maximum concentration exceeded the identified screening criteria. Section 4.0 discusses the nature and extent of contamination, selection of COPCs is discussed in Section 6.2.2 with the COPC selection tables presented in Appendix D.

27. **Comment:** 5.2.1, p. 5-6, Para. 2. "One seep was observed east of OU7." Please identify the seep on one of the figures or provide additional detail on its location.

    Response: The text will be revised to read, "One seep was observed east of the shoreline controls (see Figure 1-4 for the location of the shoreline controls)."

28. **Comment:** 5.3.4 Modeling Input Parameters and Appendix C: Why was Arochlor-1254 included in the COPC list and not the other PCB arochlors with higher concentrations in soil at the site?

    Response: All three Aroclors detected at the site (Aroclor-1248, -1254 and -1260) were included and retained during the preliminary COPC screening as shown on Table C.5. However, consistent with the modeling COPC process, in the subsequent step, Aroclor-1248 and Aroclor-1260 were eliminated from further modeling/screening because their cumulative ranking was low. This indicates that these two PCBs are relatively inconsequential with respect to total mass and therefore, potential migration from on to off-shore is negligible at the site from a modeling perspective (e.g. other risks may still be valid based on their detection). The cumulative ranking table will be added to Appendix C.1.

29. **Comment:** 5.3.6 final paragraph: Since the calculated leached value was not carried through the model for most compounds, how does the modeling demonstrate how conservative it is to use the lowest applicable K_d?

    Response: The screening/model is conservative from the perspective that the lower of the calculated leached concentration or the observed groundwater concentration was actually used. This approach allowed lower concentrations of groundwater than actually observed to be screened/modeled. With regard to using the lowest applicable Kd, this was evaluated as part of the uncertainty analysis, with negligible differences in end results. A full range of Kd values were evaluated, as well as assumptions in foc and sediment-soil partitioning assumptions.

30. **Comment:** Table 5-1. Please indicate the sources of the surface water criteria.

    Response: The source of the surface water criteria are noted on Table 5-1 next to the criteria in the Surface Water Criteria Reference column with the references footnoted at the bottom of the table.

31. **Comment:** 6.0, p. 6-1, 3rd paragraph, Table1 (Appendix D) and Figure 6-1. The Conceptual Site Model (CSM) needs to include consideration of the vapor intrusion pathway due to the presence of volatile compounds in soil in some areas of the site. Though the volatile compounds in soil (including some of the more volatile semi-volatile compounds such as naphthalene and 2-methylnaphthalene) may not have been selected as COPCs for direct contact exposure pathways, these compounds could present a risk to occupants of current and/or future buildings at the site. It should be noted that there are some detections of semi-volatile compounds that may also contribute to the vapor intrusion pathway. Please address.

    Response: No further evaluation of vapor intrusion is necessary primarily because site data indicate that a subsurface soil source of sufficiently volatile and toxic chemicals does not exist at OU7. Vapor intrusion requires a source, an inhabited building, and a pathway. A soil source of compounds sufficiently volatile and toxic to pose a vapor intrusion threat is not present at OU7 based on a review of the site data. The majority of soil data concentrations for those compounds sufficiently volatile and toxic to warrant a vapor intrusion concern were reported as not detected. Where such compounds were detected, the concentrations were low and did not show a source. For example, naphthalene

was detected in soil at concentrations ranging from 5 to 2,300 ug/kg. Two detected naphthalene concentrations of 2,300 ug/kg and 1,400 ug/kg at locations TP-SB39 (2 to 5 feet) and TP-SB02 (9 to 11 feet), respectively, were greater than the rest of the naphthalene soil concentration data (all other naphthalene soil concentrations were 750 ug/kg or less). These locations are not near one another, it does not indicate that a naphthalene subsurface soil sources exists.

The HHRA CSM will be updated to include a note that the vapor intrusion pathway for OU7 is not a concern because volatile compounds are not a concern for OU7.

32. **Comment:** 6.2.2, p. 6-9, Former Location of Building 237 Decision Unit. Please provide additional justification for evaluating this exposure point as a separate decision unit. As written, there is no information provided to judge whether this approach is conservative or results in data gaps for this separate decision unit (e.g., insufficient soil or groundwater data).

    Response: Justification for calculating risks on just the clean fill area around the former location of Building 237 was discussed in the Nature and Extent Section 4.1.1. The samples in this area did not contain debris material and the concentrations of total PCBs, lead, and total carcinogenic PAHs did not exceed risk-based screening levels. A statistical comparison of the samples in the clean fill area in the former vicinity of OU7 to the rest of the OU7 data determined that mean concentrations for this area were less than mean concentrations found at the rest of OU7. Additionally, eight samples associated with this area are enough samples to calculate a 95 percent Upper Confidence Limit. The following text will be added as the second sentence of the last paragraph of page 6-9, "As discussed in Section 4.1.1, the area in the former location of Building 237 did not contain debris material and the chemical concentrations in this area were found to be statistically different from the chemical concentrations in the remaining portion of OU7."

33. **Comment:** 6.2.2.1, p. 6-10, Para. 3 & 4. The first sentence in the text needs to be corrected, as there were no detections for PCBs in the Background samples. The conclusion for surface soils near Building 237 also needs to be revised for Arochlor-1254.

    Response: The first sentenced will be revised to the following: "Maximum concentrations of dioxins/furans evaluated as TEQ, and several metals also exceeded USEPA residential RSLs but did not exceed facility background concentrations (see Appendix B.2)".

    The discussion for surface soils near Building 237 will be revised to include Aroclor-1254 along with the corresponding COPC and risk tables in Appendix D.2. The third and fourth sentence of the fourth paragraph will be updated as follows: "Although the maximum concentrations of several contaminants exceeded USEPA residential RSL, with the exception of Aroclor-1254, all of these contaminant concentrations were determined to be within background concentrations. The only contaminant in surface soil from the former location of Building 237 selected as a COPC was Aroclor-1254.

34. **Comment:** 6.2.2, p. 6-10 *ff.* COPC selection for soil and groundwater. As stated in the 2009 MEDEP *Guidance for Human Health Risk Assessment for Hazardous Waste Sites*, "…neither USEPA nor DEP/MeCDC permits the exclusion of inorganic or organic compounds from the human health risk assessment based on comparison to background levels. Compounds that may exist at background concentrations should be quantitatively evaluated in the risk assessment." The decision to forego action for compounds that are present at levels consistent with background is a risk management decision and should occur as part of the feasibility study, not as part of the risk assessment. Though it is recognized that there is some further discussion of the eliminated compounds in the Uncertainty Analysis, the risk assessment lacks a clear presentation of cumulative site risk, including those compounds that the Navy has speculated are present as a result of background conditions. Please include this analysis.

    Response: Navy Background Policy requires that baseline risk assessments should not be conducted on chemicals that are present at levels less than corresponding background

concentrations. Potential risks from chemicals within facility background were calculated using a risk-ratio technique and are provided in Appendix D.7.3.

35. **Comment:** 6.6.1, p. 6-31, Contaminants Eliminated Due to Background, and App. B.2. The evaluation relies on non-detect reporting limits to assess data distributions and in comparison to actual detections at site locations. The associated data plots often describe the distribution of reporting limits (or in some cases reporting limits with a few detections) as if they were actual data. Conclusions regarding background conditions need to be heavily qualified when only a few detections are assessed. Elimination of COPCs by comparing detected concentrations to reporting limits is not appropriate. Compounds which were not detected in background include the PCB Arochlors, dieldrin, and thallium.

    Response: The background evaluation for chemicals not detected in background samples or with few detections was conducted as part of the graphical portion of the background evaluation, and no formal statistical tests were conducted. For surface soil, the evaluation of site samples to background samples that were either non-detect or had few detection was conducted for antimony, Aroclor-1248, Aroclor-1254, dibenzo(a,h)anthracene, and thallium. Antimony and Aroclor-1248 were the only chemicals removed as chemicals of potential concern from the risk assessment based on this comparison. Aroclor-1254 was also detected in less than 5 percent of site samples and therefore regardless of the background evaluation would not be included in risk assessment. The maximum detected site antimony concentration (12.4 mg/kg) was slightly greater than the background antimony concentration (9.4 mg/kg). For subsurface soil, the evaluation of site samples to background samples that were either non-detect or had few detections was conducted for thallium, dieldrin, dibenzo(a,h)anthracene, Aroclor-1260, Aroclor-1248, and antimony. None of the subsurface soil chemicals were removed as chemicals of potential concern from the risk assessment based on the evaluation. Dieldrin and Aroclor-1248 were not evaluated in the risk assessment due to low frequencies of detections. Dieldrin was detected in 1 of 60 samples and Aroclor-1248 was detected in 1 of 80 samples. Conclusions regarding background conditions when there are only a few detected concentrations (less than 10 percent) will be removed from the statistical background analysis in Appendix B.2. However, the discussion of these chemicals in relation to background levels will be included in the nature and extent section (Section 4.0) to provide perspective on the magnitude of site concentration.

36. **Comment:** 6.6.3, p. 6-43, 1st paragraph. Please provide additional details concerning the testing performed to justify the evaluation of total chromium as 100% chromium (III) in the risk assessment. This paragraph implies that a portion of the total chromium is present as chromium (VI) and the assumption that all chromium is chromium (III) may not be appropriate. Please address.

    Response: The SSI provided data to support the determination that hexavalent chromium is not a concern for the site and that chromium III is an appropriate surrogate to use to evaluate total chromium concentrations at the site. The following provides additional clarification and text revisions. The Site 32 RI QAPP stated: "Based on evaluation of the SSI data for soil and groundwater at Site 32, additional analysis for VOCs, hexavalent chromium, cyanide, and DRO/GRO are not required for the Site 32 RI. VOCs, hexavalent chromium, and cyanide concentrations were less than risk screening levels; therefore, these parameters are not a concern for evaluation of human health risk or offshore impact." Therefore, based on the QAPP, trivalent chromium was used as a surrogate for total chromium in the risk assessment. The second sentence of the paragraph will be updated as follows: "Criteria for trivalent chromium were used as a surrogate for total chromium in the risk assessment based on the conclusions in the RI QAPP that hexavalent chromium was not associated with OU7 (because hexavalent chromium concentrations in SSI samples were less than the screening level)."

37. **Comment:** 6.7.3, p. 6-50. Risk drivers should be identified for any receptor with cancer risks greater than 1×10^{-5}, not 1×10^{-4}. Please correct.

Response: Summaries of risks based on USEPA risk ranges and State of Maine risk guideline are described in Sections 6.7.1 and 6.7.2. Tables 6.1 and 6.2 show chemicals that exceed the various risk levels for each receptor. As shown in these tables, the risk drivers based on State of Maine risk guidelines would not change.

Risks drivers are identified in the text based on USEPA risk range and not State of Maine risk guidelines because Maine's risk assessment guidelines are not promulgated.

38. **Comment:** 7.1.1, Para. 2, p. 7-1. "Therefore, the filled area before 1910 can be defined as a separate population from the rest of OU7."

    Please revise the statement to restrict the conclusion to the area filled prior to 1910 in the immediate vicinity of Building 237. Adding a shaded area to one of the figures would help clarify what portion of the site is being considered.

    Response: The text will be revised to clarify that the filled area before 1910 in the immediate vicinity of Building 237 is defined as a separate population. Figure 1-3 shows the area in the vicinity of Former Building 237 and the 1910 shoreline.

39. **Comment:** 7.1.3, p. 7-4. "Offshore concerns for ecological receptors are being addressed as part of OU4." Please indicate here that OU7 is no longer acting as a source of contaminants that may pose unacceptable risk to the offshore area.

    Response: The following sentence will be added to the last paragraph of Section 7.1.3. "OU7 is no longer acting as a source of contaminants that may pose unacceptable risk to the offshore area."

40. **Comment:** References. TtNUS, August 2000 – change November 1996 to November 1997.

    Response: November 1996 will be changed to November 1997.

41. **Comment:** The plots in Appendix B.2 are inconclusive for the various Arochlors(and possibly other compounds), as they compare detection limit values to actual detections. Such comparisons are inappropriate. See Comment 35.

    Response: The plots for the compounds with low frequency of detection (less than 10 percent) will be removed from Appendix B.2. Please see the Navy's response to MEDEP Comment No. 35.

42. **Comment:** App. B.2.

    a. Please place the outlier analysis plots after page B.2.7, not after B.2.9 which discusses the site data-background data comparisons.
    b. Place the site-background comparison plots after p. B.2.9.
    c. Label the site-background comparison plots so the difference between, e.g. the first surface soil plot for aluminum is distinguished from the second surface soil plot for aluminum. Presumably one set of plots is for the area around the former Building 237 area but this is not clear at all.
    d. Place Tables 1-7 at the end of App. B.2, after all the plots.

    Response: The following changes will be made as requested.
    a) The outlier analysis plots will be placed after B.2.7.
    b) The site-background comparison plots will be placed after B.2.9.
    c) The site-background comparison plots will be relabeled so the first presents the comparison between site and background and the second presents the comparison between the area with no debris in the vicinity of former Building 237 and background.
    d) Tables 1 through 7 will be placed at the end of Appendix B.2.

43. **Comment:** App. B.2. The Q-Q plots for the "clean area" need to be labeled as such rather than as "site 32". For the "Site 32" plots, were the data for the area near Building 237 removed or included?

    Response: The Q-Q plots for the area without debris in the vicinity of former Building 237 will be relabeled as "area without debris" rather than "Site 32."

    For the Site 32 plots the data for the area near Building 237 were included in the analysis. The data were included in the analysis to determine which chemicals at all of OU7 exceeded facility background.

44. **Comment:** App. B. 2 It is not clear why the background data for several compounds, e.g. Al, are different for the two comparisons. Please explain why a different group of background data was used to compare to the "clean fill" vs. the entire site. Or are the plots actually comparing the whole Site 32 to the "Clean fill" and they are mislabeled?

    Response: The surface soil plots included background groundwater concentrations along with background soil concentrations. The statistical tests and summary statistics in Table 1 were calculated using only the soil background concentrations. The plots were corrected and are presented in Attachment 7 to these responses to comments. The only visual conclusion affected is that manganese site concentrations in the revised plots appear similar to facility background concentrations. The Shapiro-Wilks test was used to determine if the two data sets are normally or lognormally distributed. The p-values for the Shapiro-Wilks normality tests were greater than 0.05; therefore, at the 5-percent significance level, it can be concluded that the two data sets are normally distributed. The two sample T-Test, Quantile Test, and Slippage Test indicate that site surface soil concentrations are not greater than background concentrations by more than one background standard deviation. Therefore, the final conclusion that site concentrations are not greater than background concentrations did not change. The corrected plots and updated Table 1 will be included in the Draft Final RI Report.

45. **Comment:** Since the intent of the formal statistics was to assess the Building 237 area compared to the site overall, a table comparing the relevant values for the "clean" area and the site would be useful. Further, in addition to plotting both data sets against background, plot them against each other to demonstrate that there is separation between concentrations at the two areas.

    Response: A table comparing the relevant values for the "clean" area and the site will be added along with a plot of the site against the clean fill area.

46. **Comment:** Appendix D-1 RAGS Part D Table 2-2. The COPC table needs to be revised or annotated in the appendix, based on use of non-detect reporting limits in background to rule out COPCs.

    Response: The COPC tables will be revised and references to background based on detection limit comparisons will be removed.

47. **Comment:** Appendix D.1, RAGS Part D Table 4, Tables 4.5.RME through 4.10.RME: Maine recommends a default soil recreational exposure frequency of 90 days/year and a default surface water and sediment exposure frequency of 78 days/year for wading exposures. The exposure frequency of 52 days/year for soil and 7 days/year for sediment and surface water should be changed to 90 days/year and 78 days/year, respectively, or additional site-specific justification should be provided. In addition, the total exposure duration should be 30 years, not 24 years, for a recreational scenario. A fraction ingested (FI) term of 1 (not 0.5) should be used for all media, unless a compelling site-specific justification is provided.

    Response: At the time the work plan was developed for the OU7 risk assessment Maine default soil recreational exposure guidelines did not exist and USEPA default recreational exposure guidelines do not exist; therefore, professional judgment of 52 (1 day per week each year) was used. The Maine

default soil recreational exposure frequency of 90 days/year could be a reasonable estimate for this site in the future if the current land use changed. Therefore, the 52 day exposure to soil assumption for recreational users will be changed to 90 days/year.

The 7 days/year sediment and surface water exposure frequency is based on professional judgment based on current and likely future site conditions. The shoreline controls cover the high- to mid-tide portion of the shoreline and the sediment in this area is soft and hard to walk on. Therefore, the Navy disagrees with using Maine default surface water and sediment guidelines for this site.

As for the lifetime recreational exposure duration being set equal to 30 years, the Navy respectfully disagrees with respect to the surface water and sediment exposures as mentioned above and discussed because a child recreational user from 0 to 6 years of age would have a difficult time accessing the OU7 shoreline and walking along the intertidal area due to the soft sediments and shoreline. Therefore, 24 years is used for the recreational scenario for this receptor.

The Fraction Ingested term was set at "0.5" to account for the receptor only being at the site part of the day.

48. **Comment:** Appendix D.1, RAGS Part D Table 5.1: The oral RfD for Aroclor-1254 (2E-05 mg/kg-day) should be used as a surrogate for Aroclor-1260.

    Response: Aroclor-1254 will be used a surrogate for Acoclor-1260 as requested. However the following text will be added to note the uncertainty associated with using the surrogate. "Aroclors are commercial mixtures of the 209 different individual PCB congeners. The toxicity of a particular PCB mixture (such as an Aroclor) is dependent upon the type and quantity of individual PCB congeners present in the PCB mixture. Aroclor-1254 and Aroclor-1260 consist of different mixtures of PCB congeners; therefore, Aroclor-1254 may not be an appropriate surrogate for Aroclor-1260."

49. **Comment:** App. D. 4. "Please see the associated detection limit exceedance tables in this appendix for chemical-specific exceedance percentages." Please ensure these tables are included in the Draft Final version of the RI report.

    Response: The associated detection limit exceedance tables e-mailed to MEDEP and USEPA on December 10, 2010 will be included in Appendix D.4 in the Draft Final RI report.

50. **Comment:** App. D.4. The last two pages of the Surface/Seep Water Data Usability Worksheets are incorrectly labeled Groundwater. Also, in the last Data Usability Worksheet page change November 2007 to November 1997 in the TtNUS, August 2000 reference.

    Response: The requested revisions will be made.

51. **Comment:** Appendix D.5.2: Do the facility-specific screening levels for sediment and surface water factor in the age-dependent adjustment factors for compounds with a mutagenic mode of action? Many of the exposure assumptions used to calculate the screening values are not consistent with current guidance. For example, the exposure frequency, as mentioned previously, should be 78 days/year for wading exposures, not 26 days/year as detailed in this appendix. In addition, a FI term of 1 should be used, not 0.5. These changes are required for consistency with current guidance and to account for future exposures which may be of greater duration and intensity than those that occur currently. The facility-specific screening levels may not be sufficiently conservative for COPC selection for surface water and sediment.

    Response: Age-dependent adjustment factors for compounds with a mutagenic mode of action were used in the facility-specific screening levels for sediment and surface water. Example calculations for the facility-specific screening levels will be provided in Appendix D of the Draft Final RI. Please see the Navy's response to MEDEP Comment No. 47 pertaining to sediment and surface water exposure assumptions.

RESPONSES TO USEPA COMMENTS DATED JANUARY 6, 2011
DRAFT REMEDIAL INVESTIGATION REPORT FOR OPERABLE UNIT 7
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

1. **Comment:** 6.0, 3rd paragraph: Figure 6-1 could not be found. Please include this figure at the end of § 6.

   Response: Figure 6-1, emailed to USEPA and MEDEP on November 20, 2010, will be included in the Draft Final RI Report.

2. **Comment:** 6.2.1, 2nd paragraph: The end of the 2nd paragraph states that the sample detection limit was used as a surrogate concentration for non-detected results. The ProUCL tables in Appendix D indicate that use of ½ the detection limit is not recommended, suggesting that ½ the detection was used as a substitution value. Please clarify and revise as appropriate. The use of ½ the detection limit or any other arbitrary substitute value is not recommended in the ProUCL guidance, rather EPA would prefer that the EPC be calculated using statistically derived substitution values calculated by ProUCL (i.e. by entering 0, rather than 1 next to the detection limit concentration in the input file). Please recalculate the EPCs using this mode of ProUCL and revise the risk calculations and text. Alternatively, demonstrate in the response to these comments that use of the ½ detection limit substitution value is conservative compared with the results of ProUCL calculations that do not use an arbitrary substitution concentration, but rather the statistically calculated substitution concentration. This should be done with several data sets that showed acceptable and unacceptable risk using ½ the detection limit.

   Response: Consistent with the text on page 6-6, the detection limit was entered into Pro UCL as the value for non-detects based on the Pro UCL Version 4.00.05 User Guide, "The data for variables with nondetect values are provided in two columns. One column consists of the detected numerical values with less than (< DL) values entered as the corresponding detection limits (or reporting limits), and the second column represents their detection status consisting of only 0 (for less than values) and 1 (for detected values) values." One half the detection limit was not used as a surrogate; however, this warning message is produced automatically by Pro UCL. Therefore the EPCs do not need to be recalculated.

3. **Comment:** 6.3.1.1.3: Please state in this section whether volatile organic chemicals were analyzed for in groundwater and whether they were detected.

   Response: VOCs were analyzed for but not detected in SSI. The following text will be added to Section 6.3.1.1.3, "VOCs were not detected in groundwater and therefore the evaluation of the inhalation pathway was not necessary."

4. **Comment:** 6.5.4: Table 6-2 was not found in § 6. Perhaps it is a table in Appendix D or the unnumbered table in § 6.6.2. Please clarify in the text the location of the table.

   Response: Table 6-2, emailed to USEPA and MEDEP on November 20, 2010, will be included in the Draft Final RI Report.

5. **Comment:** 6.6.2, page 6-36: In the first paragraph on page 6-36 change "contaminates" to "contaminants" where it occurs twice. Also change "$1x10^{-0}5$" to "$1x10^{-05}$".

   Response: The text will be corrected to $1x10^{-5}$.

6. **Comment:** 6.6.4: In the first paragraph on page 6-43 change "additively" to "additivity" where it occurs 3 times.

Response: The text will be corrected as recommended.

7. **Comment:** 6.7.2.2: In the first paragraph change "310^{-04}" to "$3x10^{-04}$", if that is correct.

   Response: The text will be change to 3×10^{-4}.

8. **Comment**: 6.7.2.2: Correct the last sentence of the 2nd paragraph where it states that the ILCRs of $3x10^{-05}$ and $4x10^{-05}$ exceeded "both the Maine target level and USEPA target risk range".

   Response: The statement will be corrected so that the text reads that the ILCRs of $3x10^{-5}$ and $4x10^{-5}$ exceeded the Maine target level but are within USEPA target risk range.

9. **Comment:** Appendix B.2:In the text at B.2.1 please describe how non-detects are used in the background determination. It is observed that conclusions concerning background are made for antimony, Aroclor 1248, Aroclor 1254, Aroclor 1260, many PAHs, dieldrin, and mercury from datasets that contain a high proportion of nondetects. Please justify why it is acceptable to use surrogate values for non-detects in determining background. It is unclear whether the text at B.2.1 applies to surface soil or subsurface soil or other media. Please clarify and provide text conclusions for each type of medium.

   Response: For the graphical displays, the Shapiro Wilk Test, and the Slippage Test one half the detection limit was used for non-detects. The Wilcoxon Rank Sum Test, T-Test, Gehan Test, and Quantile test were conducted using Pro UCL and the detection limits were used for non-detects. The background comparison for chemicals with relatively few detections were based only on the graphical evaluation and done to provide perspective on the potential contamination. Comparison of contaminates with few detections will be removed from the background analysis and the discussion will be moved to the nature and extent section to provide perspective on the extent and degree of contamination.

   The background outlier analysis refers to the soil background data only. The first sentence will be changed to, "The Portsmouth soil background data…".

10. **Comment:** Appendix D, Table 6.2: Review of the IRIS database shows that the inhalation unit risk for cadmium should be 1.8E-03 per ug/m^3, rather than 4.2E-03 per ug/m^3. Please revise the table and risk calculations.

    Response: The requested change will be made. The change to Table 6.2 will affect Tables 7.1A.RME, 7.1A.CTE, 9.1A.RME, and 9.1A.CTE in Appendix D.1, Tables 7.2A RME through 7.5A RME and Tables 7.2A.CTE through 7.6A.CTE in Appendix D.7, and Tables and text in Section 6 dealing with the inhalation pathways. These sections and tables will be updated as appropriate based on the updated calculations.

11. **Comment:** Appendix D, Table 6.2: The inhalation unit risk for total chromium should be "NA", rather than 1E-02 per ug/m^3 because the cancer guideline description for trivalent chromium is "D/Not classifiable as to human carcinogenicity". Please revise the table and any cancer risk calculation that used this or other values for unit risk because the text states that all chromium at the site was assumed to be trivalent.

    Response: The inhalation unit risk for total chromium was updated to "NA" after risks were calculated for the draft RI. This update will be made for the Draft Final RI Report. The change to Table 6.2 will affect Tables 7.1A.RME, 7.1A.CTE, 9.1A.RME, and 9.1A.CTE in Appendix D.1, Tables 7.2A RME through 7.5A RME and Tables 7.2A.CTE through 7.6A.CTE in Appendix D.7, and Tables and text in Section 6 dealing with the inhalation pathways. These sections and tables will be updated as appropriate based on the updated calculations.

12. **Comment:** It appears that ½ the detection limit was used as a replacement value for nondetects in

the ProUCL printouts. The use of ½ the detection limit or any other arbitrary substitute value is not recommended in the ProUCL guidance, rather EPA would prefer that the EPC be calculated using statistically derived substitution values calculated by ProUCL by entering 0, rather than 1 next to the detection limit concentration in the input file.

Response: One half the detection limit was not used as a replacement value for nondetects in Pro UCL. Please see the Navy's response to USEPA Comment No. 2 for additional information.

13. **Comment**: In order to provide transparent documentation and for EPA to reproduce the EPC calculations in a representative set of calculations, please provide the input concentrations (including substitute concentrations for non-detects) for all ProUCL calculations. It is preferred that the input concentrations be provided in an Excel file in the same appendix as the ProUCL output.

    Response: No substitute concentrations for nondetects were used for Pro UCL and the data input is the same as provided in the database for OU7 (Appendix B.1). The excel file of the Pro UCL input data will be provided to USEPA separately from the Draft Final RI Report. The excel files will not be included in an appendix of the document because the date provided in these excel files are already provided in the database provided in Appendix B.1.

ATTACHMENTS

Attachment 1: Facility Background BGS-08 Sample Location Map

Attachment 2: Surface Soil Detection Limit Evaluation (to be included in Appendix D.4)

Attachment 3: Subsurface Soil Detection Limit Evaluation (to be included in Appendix D.4)

Attachment 4: Summary of Surface Soil Locations Above Background (to be included in Appendix B.2)

Attachment 5: Summary of Subsurface Soil Locations Above Background (to be included in Appendix B.2)

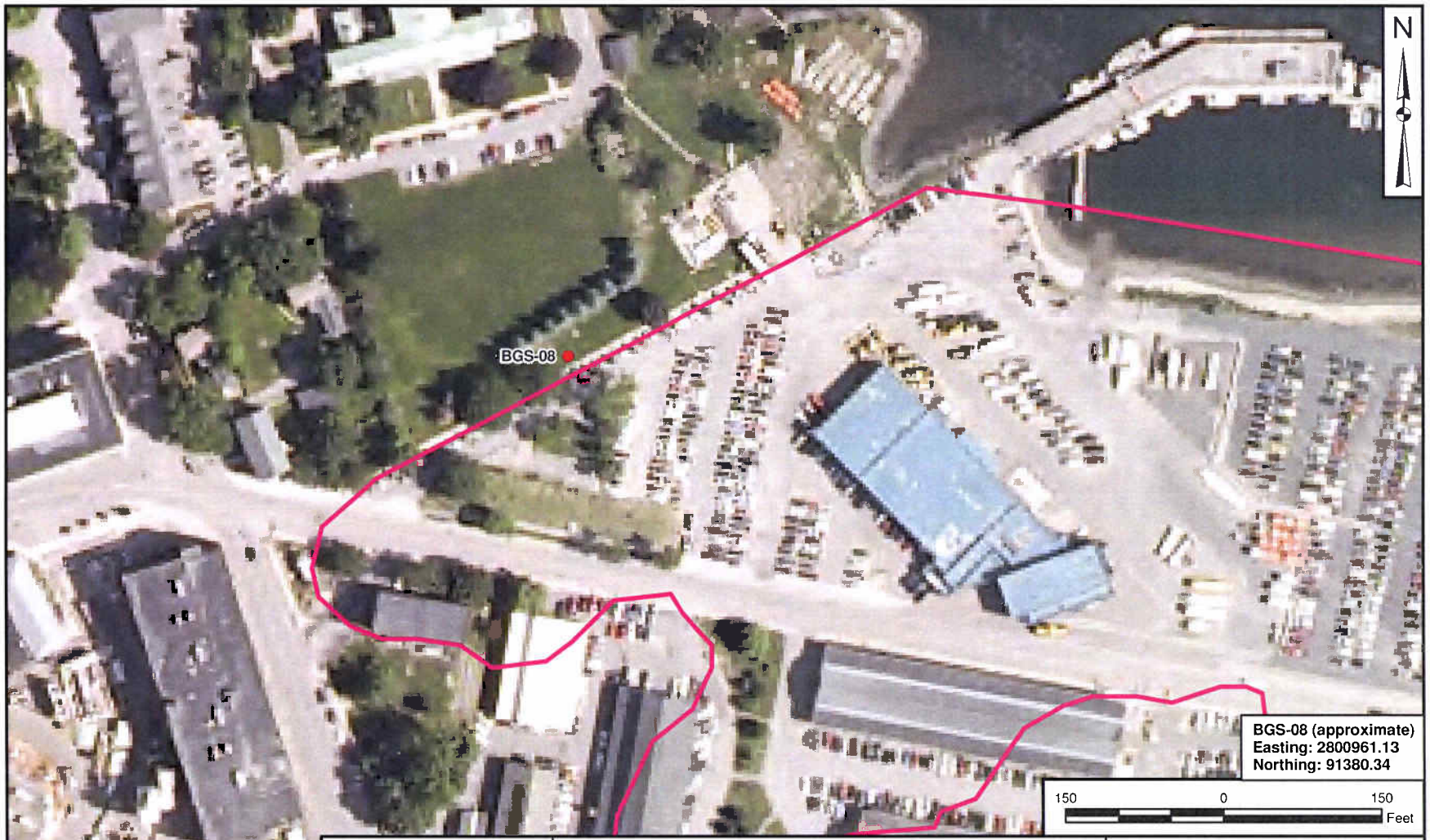
Attachment 6: Toxaphene ATSDR

Attachment 7: Surface Soil Background Plots (to be included in Appendix B.2)

Attachment 1

Facility Background BGS-08 Sample Location Map

PGH P:\GIS\PORTSMOUTH_NSY\MAPDOCS\MXD\OU7_BACKGROUND.MXD 02/16/11 TW



Legend

- Background Location
- OU 7 Boundary

TETRA TECH

FACILITY BACKGROUND BGS-08
SAMPLE LOCATION MAP
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

DRAWN BY: T. WHEATON 02/16/11
CHECKED BY: A. CHRISTIAN 02/16/11
APPROVED BY:

CONTRACT NUMBER: 112G00383
CTO 0055

FIGURE NUMBER	REV
FIGURE 2	0

Attachment 2

Surface Soil Detection Limit Evaluation (to be included in Appendix D.4)

Table 1
Surface Soil Detection Limit Exceedance Evaluation
Portsmouth Naval Shipyard
Kittery, Maine

Parameter	Minimum Screening Value		Number of Non-Detects Exceeding Screening Levels	Number of Analyses	Percent Exceeding	Frequency of Detection	Range of Detections	Range of Nondetects	Number Non-Detects Greater than 10 Times Screening Value	COPC?
Semivolatile Organics (ug/kg)										
1,4-DICHLOROBENZENE	2600	C	2	46	4.3%	0/46	--	32-6900	0	No
2,2'-OXYBIS(1-CHLOROPROPANE)	3500	C	2	57	3.5%	0/57	--	51-6900	0	No
2,4,6-TRICHLOROPHENOL	6100	N	2	57	3.5%	0/57	--	99-6900	0	No
2,4-DINITROPHENOL	12000	N	2	57	3.5%	0/57	--	270-17000	0	No
2,4-DINITROTOLUENE	1600	C	2	57	3.5%	0/57	--	35-6900	0	No
2,6-DINITROTOLUENE	6100	N	2	57	3.5%	0/57	--	42-6900	0	No
2-NITROANILINE	120	N	31	57	54.4%	0/57	--	43-17000	3	No
3,3'-DICHLOROBENZIDINE	1100	C	2	57	3.5%	0/57	--	200-6900	0	No
4,6-DINITRO-2-METHYLPHENOL	610	N	24	57	42.1%	0/57	--	230-17000	2	No
4-CHLOROANILINE	2400	C	2	57	3.5%	0/57	--	36-6900	0	No
BENZO(A)ANTHRACENE	150	C	3	57	5.3%	34/51	5.7-4500	3.8-6600	1	Yes
BENZO(A)PYRENE	15	C	16	57	28.1%	35/51	6-4000	3.8-6600	3	Yes
BENZO(B)FLUORANTHENE	150	C	2	57	3.5%	34/51	4.7-6100	39-6600	1	Yes
BENZO(K)FLUORANTHENE	1500	C	1	57	1.8%	33/51	4.3-3000	68-6600	0	Yes
BIS(2-CHLOROETHYL)ETHER	190	C	20	57	35.1%	0/57	--	3.5-6900	2	No
DIBENZO(A,H)ANTHRACENE	15	C	36	57	63.2%	15/51	3.6-1000	3.6-6900	15	Yes
HEXACHLOROBENZENE	300	C	20	57	35.1%	0/57	--	3.5-6900	2	No
HEXACHLOROBUTADIENE	6100	N	2	57	3.5%	0/57	--	38-6900	0	No
HEXACHLOROCYCLOPENTADIENE	2900	N	2	57	3.5%	0/57	--	40-6900	0	No
HEXACHLOROETHANE	6100	N	2	57	3.5%	0/57	--	35-6900	0	No
INDENO(1,2,3-CD)PYRENE	150	C	5	57	8.8%	29/51	11-2500	3.6-6900	2	Yes
N-NITROSO-DI-N-PROPYLAMINE	69	C	32	57	56.1%	0/57	--	3.5-6900	2	No
NAPHTHALENE	3900	C	2	57	3.5%	12/51	10-490	3.5-6900	0	No
NITROBENZENE	4400	C	2	57	3.5%	0/57	--	52-6900	0	No
PENTACHLOROPHENOL	3000	C	2	57	3.5%	0/57	--	200-17000	0	No
Pesticides/PCBs (ug/kg)										
AROCLOR-1221	170	C	7	67	10.4%	0/57	--	31-600	0	No
AROCLOR-1232	170	C	6	67	9.0%	0/57	--	19-370	0	No
AROCLOR-1242	220	C	3	67	4.5%	0/57	--	13-370	0	No
AROCLOR-1248	220	C	1	67	1.5%	1/60	1500	4.8-300	0	No
AROCLOR-1254	110	N	7	67	10.4%	1/60	280	15-370	0	No
AROCLOR-1260	220	C	3	67	4.5%	8/60	21-210	7.9-370	0	No
TOXAPHENE	440	C	5	46	10.9%	0/57	--	25-1500	0	No
Inorganics (mg/kg)										
ANTIMONY	3.1	N	1	57	1.8%	13/35	0.32-12.4	0.086-5.8	0	No
ARSENIC	0.39	C	1	61	1.6%	55/56	6.2-82.3	2.4-2.4	0	No

Attachment 3

Subsurface Soil Detection Limit Evaluation

Table 2
Subsurface Soil Detection Limit Exceedances Evaluation
Portsmouth Naval Shipyard
Kittery, Maine

Parameter	Minimum Screening Level		Number of Non-Detects Exceeding Screening Levels	Number of Analyses	Percent Exceeding	Frequency of Detection	Range of Detections	Range of Nondetects	Number Non-Detects Greater than 10 Times Screening Value	COPC?
Semivolatile Organics (ug/kg)										
2,4-DINITROTOLUENE	1600	N	1	81	1.2%	0/81	--	36-1900	0	No
2-NITROANILINE	120		38	81	46.9%	0/81	--	44-4700	2	No
3,3'-DICHLOROBENZIDINE	1100	C	1	81	1.2%	0/81	--	200-1900	0	No
4,6-DINITRO-2-METHYLPHENOL	610	N	35	81	43.2%	0/81	--	230-4700	0	No
BENZO(A)ANTHRACENE	150	C	7	81	8.6%	62/81	5.8-5100	53-460	0	Yes
BENZO(A)PYRENE	15	C	19	81	23.5%	61/81	6-4100	3.6-460	6	Yes
BENZO(B)FLUORANTHENE	150	C	6	81	7.4%	62/81	8.5-3200	40-460	0	Yes
BIS(2-CHLOROETHYL)ETHER	190	C	35	81	43.2%	0/81	--	3.6-1900	0	No
DIBENZO(A,H)ANTHRACENE	15	C	49	81	60.5%	29/81	21-750	3.6-1900	18	Yes
HEXACHLOROBENZENE	300	C	33	81	40.7%	0/81	--	3.6-1900	0	No
INDENO(1,2,3-CD)PYRENE	150	C	6	81	7.4%	58/81	4.9-2100	3.6-460	0	Yes
N-NITROSO-DI-N-PROPYLAMINE	69		47	81	58.0%	0/81	--	3.9-1900	1	No
PENTACHLOROPHENOL	3000	C	1	81	1.2%	0/81	--	200-4700	0	No
Pesticides/PCBs (ug/kg)										
ALDRIN	29	N	6	74	8.1%	1/74	2	1.2-140	0	No
ALPHA-BHC	77		4	74	5.4%	1/74	2.8	1.5-170	0	No
AROCLOR-1016	390		1	96	1.0%	0/96	--	13-680	0	No
AROCLOR-1221	170		3	96	3.1%	0/96	--	32-1400	0	No
AROCLOR-1232	170		2	96	2.1%	0/96	--	20-680	0	No
AROCLOR-1242	220		2	96	2.1%	0/96	--	13-680	0	No
AROCLOR-1248	220		2	96	2.1%	1/96	41000	4.9-680	0	No
AROCLOR-1254	110		2	96	2.1%	2/96	160-200	15-680	0	No
DIELDRIN	30	C	6	74	8.1%	2/74	32-160	1.3-150	0	No
HEPTACHLOR	110	C	4	74	5.4%	0/74	--	1.2-140	0	No
HEPTACHLOR EPOXIDE	53		4	74	5.4%	0/74	--	1.4-160	0	No
TOXAPHENE	440		8	74	10.8%	0/74	--	25-3500	0	No
Inorganics (mg/kg)										
ANTIMONY	3.1	N	1	85	1.2%	28/85	0.26-1430	0.093-3.2	0	Yes
ARSENIC	0.39	N	1	97	1.0%	95-87	4.2-65.7	3.9	0	No

Attachment 4

Summary of Surface Soil Locations Above Background

TABLE B-1
SUMMARY OF SURFACE SOIL LOCATIONS ABOVE BACKGROUND
PORTSMOUTH NAVAL SHIPYARD, KITTERY MAINE

Parameter	Locations in Surface Soil Above Inflection Point
ANTIMONY	TP-SB32, TP-MW05, TP-SB28, BG05
AROCLOR 1248	TP-SB120
AROCLOR 1254	TP-SB115
ARSENIC	TP-SB33,TP-SB120,TP-SB119,TP-SB19,TP-SB34,TP-SB38B
BAP HALF ND	TP-SB36,TP-SB19, TP-SB27, TP-SB15, TP-MW02, TP-SB120, TP-SB31
BAP POS	TP-SB31,TP-SB120,TP-SB15,TP-SB19,TP-SB36,TP-SB27
BARIUM	TP-SB27,TP-SB19
BENZO(A)ANTHRACENE	TP-SB27, TP-SB19,TP-SB36, TP-SB15, TP-SB120,TP-SB31
BENZO(A)PYRENE	TP-SB31, TP-SB120, TP-SB15, TP-SB27, TP-SB19,TP-SB36
BENZO(B)FLUROANTHENE	TP-SB120,TP-SB31,TP-SB15,TP-SB19,TP-SB36,TP-SB27,TP-SB37,TP-SB123
BENZO(G,H,I)PERYLENE	TP-SB120, TP-SB31, TP-MW02, TP-SB27, TP-SB19,TP-SB15, TP-SB36
BENZO(K)FLUORANTHENE	TP-SB31, TP-SB120,TP-SB15
CADMIUM	TP-SB23, TP-SB42,TP-SB32, TP-SB19,BGS-05, TP-SB27
COPPER	TP-SB32, TP-SB34,TP-SB19, TP-SB33,TP-SB23,TP-SB18
DIBENZO(A,H)ANTHRACENE	TP-SB31, TP-SB120
INDENO(1,2,3-CD)PYRENE	TP-SB31,TP-SB120, TP-SB27, TP-SB19, TP-SB15,TP-SB36
IRON	TP-SB27,TP-SB23,TP-SB19
MANGANESE	TP-SB19, TP-SB23, TP-SB25
MERCURY	TP-SB09, TP-SB34, TP-SB19
THALLIUM	TP-MW08,TP-MW09, TP-SB24,TP-SB31
VANADIUM	TP-SB23,TP-SB15,TP-SB120,TP-SB09
2,3,4,7,8-PECDF	TP-SB27
TEQ	TP-SB27

Monitoring well locations refer to the collocated soil sample location

Attachment 5

Summary of Subsurface Soil Locations Above Background

TABLE B-2
SUMMARY OF SUBSURFACE SOIL LOCATIONS ABOVE BACKGROUND
PORTSMOUTH NAVAL SHIPYARD, KITTERY MAINE

Parameter	Locations in Above Inflection Point
ANTIMONY	TP-SB24, TP-SB20B, TP-SB36,TP-SB32
AROCLOR 1248	TP-SB108
AROCLOR 1254	TP-SB114, TP-SB99
AROCLOR 1260	TP-SB14, TP-SB112
ARSENIC	TP-SB34
BAP HALF ND	TP-SB39, TP-SB14, TP-TP-MW05, TP-SB36,TP-SB31,TP-SB18
BAP POS	TP-SB39, TP-SB14, TP-TP-MW05, TP-SB36, TP-SB31, TP-SB18
BARIUM	TP-SB37, TP-SB36, TP-SB33B, TP-SB27, TP-SB37, TP-SB33, TP-SB40
BENZO(A)ANTHRACENE	TP-SB39, TP-SB36, TP-SB33B, TP-SB27, TP-SB37, TP-SB33, TP-SB40
BENZO(A)PYRENE	TP-SB39,TP-SB14,TP-SB36,TP-MW05,TP-SB31,TP-SB18
BENZO(B)FLUROANTHENE	TP-SB39,TP-MW05, TP-SB36, TP-SB18,TP-SB31
BENZO(G,H,I)PERYLENE	TP-SB39, TP-MW05, TP-SB31,TP-SB36
BENZO(K)FLUORANTHENE	TP-SB39,TP-SB31,TP-MW05, TP-SB36
CADMIUM	TP-SB37, TP-SB35,40,TP-SB36, 20B, TP-SB35
CHROMIUM	TP-SB35,TP-MW09
COBALT	TP-SB35,TP-SB15
COPPER	TP-SB19,TP-SB35,TP-SB36
DIBENZO(A,H)ANTHRACENE	TP-MW05, TP-SB39
INDENO(1,2,3-CD)PYRENE	TP-SB39,TP-MW05, TP-SB31, TP-SB14, TP-SB36, TP-SB18, TP-SB35
IRON	TP-SB23
LEAD	TP-SB24,TP-SB37
MERCURY	TP-SB37, TP-SB14
NICKEL	TP-SB35, TP-MW09, TP-SB14,TP-SB23
THALLIUM	TP-MW09, TP-SB24
VANADIUM	TP-SB23, MW-01, TP-SB35,TP-SB23
ZINC	TP-SB19,TP-SB35,TP-SB37,TP-SB36, TP-SB14,TP-SB37
DIELDRIN	TP-SB14,TP-SB27
1,2,3,4,6,7,8-HPCDF	TP-SB27

Monitoring well locations refer to the collocated soil sample location

Attachment 6

Toxaphene ATSDR

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

TOXAPHENE

CAS # 8001-35-2

Division of Toxicology and Environmental Medicine ToxFAQs™ September 2010

This fact sheet answers the most frequently asked health questions (FAQs) about toxaphene. For more information, call the ATSDR Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Toxaphene is a pesticide which is currently banned for all uses in the United States. Breathing, eating, or drinking high levels of toxaphene could damage the nervous system, the liver, and kidneys, and even cause death. Toxaphene has been found in at least 68 of the 1,699 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is toxaphene?

Toxaphene is a mixture of hundreds of different chlorinated compounds. It was one of the most heavily used pesticides in the Unites States until 1982, when it was canceled for most uses. All registered uses were banned by 1990. Toxaphene was used primarily in the southern United States to control insect pests on cotton and other crops.

Toxaphene is usually found as a solid or a gas. In its original form, toxaphene is a yellow to amber waxy solid that has a piney odor.

What happens to toxaphene when it enters the environment?

- When released to the environment, it can enter the air, the soil, and water.
- It does not dissolve well in water and evaporates easily.
- Toxaphene is more likely found in air, soil, and sediment at the bottom of lakes or streams, than in surface water.
- Toxaphene can stay in the environment for a long time because it breaks down very slowly.
- Toxaphene can be carried long distances in the air.
- Toxaphene accumulates in fatty tissues of fish and mammals.

How might I be exposed to toxaphene?

- People living near a location with heavy toxaphene contamination, such as a hazardous waste site, may be exposed to higher levels through breathing contaminated air or through direct skin contact with contaminated soil or water.
- People who eat large quantities of fish, shellfish, or wild game animals from areas contaminated with toxaphene may have higher exposure to this substance since these animals tend to accumulate toxaphene in fatty tissues.
- Individuals may be exposed to toxaphene through drinking water contaminated with toxaphene runoff from contaminated soils.

How can toxaphene affect my health?

Breathing, eating, or drinking high amounts of toxaphene could damage the nervous system, liver, and kidneys, and even cause death. However, since toxaphene is no longer used in the United States, most people would not be exposed to high levels of it.

Studies showed that animals which ate food or drank water containing toxaphene had effects on the liver, kidneys, and immune system.

It is not known whether toxaphene can affect reproduction in humans.

How likely is toxaphene to cause cancer?

It is not known whether toxaphene would cause cancer in people. Toxaphene caused liver cancer in mice and possible thyroid cancer in rats that were given large amounts of toxaphene by mouth.

The Department of Health and Human Services (DHHS) has determined that toxaphene may reasonably be anticipated to be a carcinogen. The International Agency for Research on Cancer (IARC) has determined that toxaphene is possibly carcinogenic to humans. The EPA has determined that toxaphene is a probable human carcinogen.

How can toxaphene affect children?

Toxaphene would be expected to affect children in the same manner as adults. It is not known whether children are more susceptible than adults to the effects of toxaphene.

A few studies in animals have shown minor changes in fetal development. We do not know if toxaphene would cause developmental effects in humans.

How can families reduce the risk of exposure to toxaphene?

- ❑ For people who live in areas where surface waters (for example lakes) have been contaminated with toxaphene, consumption of toxaphene-contaminated foods such as fish may need to be reduced.
- ❑ Avoid drinking water contaminated with toxaphene.

Is there a medical test to determine whether I've been exposed to toxaphene?

Toxaphene and some of its breakdown products can be detected in blood, urine, breast milk, and body tissues. Urine and blood tests are the most common tests used. These tests are not available at most doctor' offices, but can be done at special laboratories that have the right equipment.

These tests cannot determine how much toxaphene you have been exposed to, or whether you will experience any health effects.

Has the federal government made recommendations to protect human health?

The EPA has determined that exposure to toxaphene in drinking water at concentrations of 0.004 milligrams per liter (mg/L) for up to 10 days is not expected to cause any adverse effects in a child.

The EPA has determined that lifetime exposure to 0.01 mg/L toxaphene in the drinking water is not expected to cause any adverse noncancer effects if the only source of exposure to toxaphene is the drinking water.

The Food and Drug Administration (FDA) has determined that the concentration of toxaphene in bottled drinking water should not exceed 0.003 mg/L.

The Occupational Safety and Health Administration (OSHA) set a legal limit of 0.5 mg/m^3 for toxaphene in air averaged over an 8 hour work day.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2010. Toxicological Profile for Toxaphene (Draft for Public Comment). Atlanta, GA: U.S. Department of Public Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Environmental Medicine, 1600 Clifton Road NE, Mailstop F-62, Atlanta, GA 30333. Phone: 1-800-232-4636, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

Attachment 7

Surface Soil Background Plots

See Appendix B.2.2 for graphical plots.

E.2 SUMMARY AND ACTION ITEMS FROM APRIL 2011 TECHNICAL DISCUSSION ON RESPONSES TO COMMENTS ON THE DRAFT OU7 RI REPORT

SUMMARY AND ACTION ITEMS FROM TECHNICAL DISCUSSION ON RESPONSES TO COMMENTS ON THE DRAFT OU7 RI REPORT HELD ON APRIL 8, 2011

Participants:

Navy:	Linda Cole (NAVFAC MidLant, RPM)
	Jennifer Corack (Navy and Marine Corps Public Health Center, Technical Support)
	Dawn Hayes (NAVFAC LANT, Technical Support)
MEDEP:	Iver McLeod (MEDEP, RPM)
	Diane Silverman (Maine Center of Disease Control)
Tetra Tech:	Debbie Cohen (Facility Coordinator/PM)
	Anna-Marie Christian (Statistician)
	Matt Kraus (Risk Assessor)

Discussion was held on the March 2011 Responses to MEDEP Comments on the Draft OU7 RI Report. Comment Nos. 34, 16, 47/51, 37, 31, 32, and 36 were discussed. In addition, EPA recent ProUCL update and potential impacts to the OU9 RI Report based on resolution of OU7 RI comments were also discussed. The attached table provides a summary of each item and action items identified.

The meeting summary will be used to document the agreements and action items.

MEDEP has one suggestion on data presentation for Appendix B.2 that will be provided in an email.

At the closure of the conference call, all indicated appreciation for discussion of the concerns to facilitate resolution of comments and revision of the document.

Post-meeting note: A draft of the summary and action items from the technical discussion will be provided to the project team for review and the final will be included in an appendix of the final OU7 RI Report. The suggestion for data presentation for Appendix B.2 was provided in an email on April 8, 2011 and was to use different symbols for samples in which the chemical was detected than samples in which the chemical was not detected. The data presentation for Appendix B.2 were revised.

Comment/Issue	Summary of Conclusions	Action Item
No. 34/Chemical of Potential Concern (COPC) screening based on background. MEDEP requested that the RI Report include information to show cumulative risks that include chemicals screened out based on the background comparison so that risk information is available in the document.	Navy policy is to present baseline risks without chemicals that represent background. A statistical evaluation (in Appendix B.2) was conducted to support identification of chemicals similar to background. The draft OU7 RI provides the evaluation of chemicals screened out based on background in the uncertainty section (Section 6.6). Potential risks for these chemicals were calculated and presented in Appendix D.7.3 Cumulative risks were not provided; however, information is available to calculate cumulative risk. Based on the conference call discussion, the Navy agreed to provide cumulative risk calculation in Appendix D.7. No change to the risk conclusions in Section 7.0 is needed based on the discussion.	Tetra Tech will prepare cumulative risk tables (RAGS Part D tables) to include in Appendix D.7 and any text revisions based on the discussion and provide these to the Navy for distribution to the team.
No. 16/PCBs (Aroclors) as COPCs. Aroclor 1248 and Aroclor 1260 were screened out as COPCs based on frequency of detection; however, there were some samples that had elevated detection limits and the maximum detections were much greater than the screening levels. MEDEP requested that these Aroclors be added as COPCs and included in risk calculations.	A small number of samples had elevated detection limits for these Aroclors and this would not change the conclusions to screen out these chemicals based on low frequency of detection. However, the project team previously identified a PCB hot spot after the 2003 Phase I RI sampling and further investigated the hot spot area as part of the 2008 Phase II RI sampling. Therefore, PCBs were evaluated in the uncertainty section (Section 6.6) in the draft RI and PCBs were included as chemicals of concern (COCs) (Section 6.7.3). The Navy agreed to include Aroclor 1248 and Aroclor 1260 in the calculation of cumulative risks in Appendix D.7 . No change to the risk conclusions in Section 7.0 is needed based on the discussion.	Tetra Tech will prepare cumulative risk tables to include in Appendix D.7 and any text revisions based on the discussion and provide these to the Navy for distribution to the team.
Nos. 47 and 51/Exposure assumptions for intertidal area. MEDEP agrees with the exposure assumptions the Navy proposed based on current site conditions, but is concerned that if site conditions changed, the exposure assumptions may not be valid. MEDEP requested that text be added to clarify the basis for the exposure assumptions, and that these are based on current conditions.	In the past, contaminated fill material at OU7 eroded from the shoreline to offshore sediment that caused contamination in the sediment. A shoreline revetment was placed as part of the 2006 removal action to prevent further erosion. Concerns for future erosion are discussed in the RI (Section 5.3), and the risk conclusions indicate that shoreline controls are needed to prevent contaminated fill along the shoreline from eroding in the future (Section 7.2.1). The controls cover the mid- to high-tide zone of the shoreline and only sediment below the mid-tide level is exposed. The sediment in the low-tide zone is soft, hard to walk on, and only exposed for a short time of the tidal cycle. Therefore, the human health exposure assumptions are valid for current conditions. Information on current shoreline conditions is provided in Section 3.2.1 of the RI. The Navy agreed to include a reference to or additional discussion of the shoreline in the risk section (Section 6.3.5) to provide the basis for the exposure assumptions in the HHRA. Uncertainty related to future shoreline conditions will be discussed in the uncertainty section. No change to the risk conclusions in Section 7.0 is needed based on the discussion.	Tetra Tech will prepare text revisions to expand on the justification for the exposure assumptions for the intertidal area in the HHRA and provide these to the Navy for distribution to the team.
No. 37/Presentation of risk drivers that exceed Maine risk guidelines in the risk assessment. MEDEP requested that text be added to Section 6.7.3 to discuss the carcinogenic risk drivers based on Maine guidelines and not only refer to Tables 6.1 and 6.2 for the information.	The Navy expressed concern with use of Maine risk guidelines for risk management or development of cleanup levels because these guidelines are not promulgated. The Maine risk guidelines are not included as regulatory requirements in the OU2 Feasibility Study (FS) (April 2011) or OU1 Record of Decision (ROD) (September 2010). MEDEP indicated that the information was being requested for the risk assessment (Section 6.7.3) for completeness and was not requesting the Maine risk guidelines to be used for making risk management decisions or developing cleanup levels for OU7. The Navy agreed to include the text noting risk drivers based on Maine risk guidelines with clarification that the Maine guidelines are not regulatory requirements for cleanup. The clarification will also be included in Section 7.0 text. No change to the risk conclusions is needed based on the discussion.	Tetra Tech will prepare text revisions for Sections 6 and 7, and provide these to the Navy for distribution to the team.

Comment/Issue	Summary of Conclusions	Action Item
No. 31/Vapor intrusion evaluation is not necessary for OU7 because volatile contaminant levels are low. MEDEP agrees with the Navy response and requested that supporting information for why vapor intrusion was not a pathway of concern be included in the Section 6 of the RI.	The Navy agreed to include the clarifying text in Section 6.0, based on information in the Navy's response. No change to the risk conclusions is needed based on the discussion.	Tetra Tech will prepare text revisions and provide these to the Navy for distribution to the team.
No. 32/Former Location of Building 237 Decision Unit. MEDEP agreed with the Navy's response and with the information included in the text.	Based on discussion, it was agreed that the text revisions proposed in the March 2011 response to comment is sufficient and no additional revisions are needed.	No additional action required.
No. 36/Hexavalent chromium. MEDEP expressed concern with documentation that hexavalent chromium is not a COPCs for OU7 and that trivalent chromium is an appropriate surrogate for total chromium results.	The decision that hexavalent chromium and other chemicals (VOCs and cyanide) are not COPCs was made as part of the development of the RI sampling plan (in 2003). Hexavalent chromium was not detected in the one surface soil sample that was analyzed for hexavalent chromium and was only detected in one of seven subsurface soil samples at concentrations below the screening value. Based on the hexavalent chromium data from the SSI the OU7 RI QAPP concluded that additional sampling for hexavalent chromium was not required. Therefore, none of the RI samples were analyzed for hexavalent chromium. Text in the RI may need to provide additional clarification as to why hexavalent chromium is not a COPC and that trivalent chromium is an appropriate surrogate for total chromium results in the risk assessment.	MEDEP will review the RI QAPP to see whether they have any further questions. Tetra Tech will review the text and RI QAPP to determine any additional text revisions to clarify use of trivalent chromium as surrogate in the risk assessment. [Post Meeting Note: MEDEP stated in an email dated April 20, 2010 that additional justification for the assumption that trivalent chromium is an appropriate surrogate for total chromium is not needed. Text justifying the use of trivalent chromium as a surrogate will be added to Section 6.6.3].
ProUCL potential change in EPCs based on recent update to program (the current version of ProUCL at the time the risks were calculated was 4.00.04, EPA recent released version 4.1.00).	Approximately six weeks ago, EPA issued a new version of ProUCL, 4.1.00 that addresses an error in EPA's program. Based on the ProUCL 4.1.00 Technical Guidance, "All known software bugs found by the various users and developers of ProUCL 4.00.05 (and earlier versions) and most of the suggestions made by the users have been addressed in ProUCL 4.1.00." To ensure that any of the "software bugs" in the previous version do not adversely impact the risk calculations in the OU7 RI, UCLs for the RI will be recalculated using ProUCL 4.1.00. The updated version may or may not impact the calculation of exposure point concentrations (EPCs). The Navy will confirm whether there are any changes in the calculations in the OU7 RI.	Tetra Tech will evaluate the updated version and provide the information to the Navy for distribution to the team.

Comment/Issue	Summary of Conclusions	Action Item
Draft OU9 RI Report	Some of the comments/issues on the draft OU7 RI Report also related to the draft OU9 RI. The Navy will identify potential changes to the draft OU9 RI Report submitted in February 2011 based on the discussion on the draft OU7 RI Report.	Tetra Tech will make a notation of which comments/issues relate to OU7 and provide the information to the Navy for distribution to the team (1).

(1) To be provided separately from the OU7 RI action items.

ATTACHMENTS

Attachment 1: Pro UCL Evaluation

Attachment 2: Example Background Plots (to be included in Appendix B.2)

Attachment 3: Section 6.0

Attachment 4: RAGS Part D Tables (to be included in Appendix D.7.3)

Attachment 5: Section 7.0

Attachment 1

Pro UCL Evaluation

Evaluation of 95-Percent Upper Confidence Limits Calculated by ProUCL

During a conference call on April 8, 2011, between the Navy and the Maine Department of Environmental Protection (MEDEP), concern was raised by MEDEP that the version of USEPA's ProUCL used to calculate the 95-percent Upper Confidence Limits (UCLs) for the risk assessment in the draft Operable Unit (OU) 7 Remedial Investigation (RI) Report may not have correctly calculated the 95-percent UCLs. As discussed below the version of ProUCL used in the OU7 RI Report may contain bugs and may have incorrectly calculated the 95-percent UCLs. This evaluation compares the 95-percent UCLs calculated in the OU7 draft RI Report with the 95-percent UCLs calculated with the latest version of ProUCL in which the bugs have been corrected.

When work on the OU7 risk assessment for the draft RI Report was conducted the most current version of ProUCL was 4.00.04. After the draft RI Report was submitted, the EPA issued two updated versions of ProUCL, 4.00.05 and 4.1.00. The latest version of ProUCL is 4.1.00 and the accompanying Technical Guide states, "It should be noted that all known software bugs found by the various users and developers of ProUCL 4.00.05 (and earlier versions) and most of the suggestions made by the users have been addressed in ProUCL 4.1.00." To verify that the software bugs in the previous versions of ProUCL do not impact the risk calculations presented in the OU7 draft RI Report, the 95-percent UCLs were recalculated using version 4.1.00. In the risk assessment presented in the draft OU7 RI report, 95-percent UCLs were used to represent the exposure point concentration for receptors exposed to entire site surface soil, entire site subsurface soil, sediment, chemicals eliminated due to background in surface soil, and chemicals eliminated due to background in subsurface soil at OU7. The recalculated 95-percent UCLs using version 4.1.00 will replace the 95-percent UCLs used in the draft OU7 RI Report.

To calculate a representative 95-percent UCL, ProUCL 4.1.00 utilizes various computation methods for data sets with and without non-detected concentrations. Table 1 presents the 95-percent UCLs, data distribution, and UCL computation method by versions 4.00.04 and 4.1.00 by media (entire site surface soil, entire site subsurface soil, sediment, and chemicals eliminated due to background in surface soil and subsurface soil). Changes to the 95-percent UCL, data distribution, and UCL computation method recommended by version 4.1.00 are presented in red text. The 95-percent UCLs and UCL computation method for copper in entire site surface soil and entire site subsurface soil and antimony in entire site surface soil chemicals eliminated due to background are the only changes between the UCLs calculated by versions 4.00.04 and 4.1.00. The 95-percent UCL for copper in entire site surface soil decreased from 1302 mg/kg to 1030 mg/kg and the UCL computation method changed from the 97.5-percent Chebyshev (Mean, Sd) UCL to the 95-percent Chebyshev (Mean, Sd) UCL. The 95-percent UCL for copper in entire site subsurface soil decreased from 9900 mg/kg to 6020 mg/kg and the UCL computation method changed from the 99-percent Chebyshev (Mean, Sd) UCL to the 95-percent Chebyshev (Mean, Sd) UCL.

The 95-percent UCL for antimony in entire site surface soil chemicals eliminated due to background concentrations changed from 2.1 mg/kg to 2.0 mg/kg and the UCL computation method did not change, both versions recommended 95-percent KM (BCA) UCL. The UCLs calculated by ProUCL, version 4.1.00, will be incorporated in the risk assessment presented in the OU7 RI Report.

TABLE 1
COMPARISON OF 95-PERCENT UPPER CONFIDENCE LIMITS
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Exposure Media	Chemical	ProUCL version 4.00.04			ProUCL version 4.1.00		
		95-Percent UCL[1]	Data Distribution	UCL Computation Method	95-Percent UCL[1]	Data Distribution	UCL Computation Method
Entire Site Surface Soil	BAP Equivalent	1.8	Lognormal	97.5% KM (Chebyshev) UCL	1.8	Lognormal	97.5% KM (Chebyshev) UCL
	Barium	335	Nonparametric	95% Chebyshev (Mean, Sd) UCL	335	Nonparametric	95% Chebyshev (Mean, Sd) UCL
	Chromium	62.2	Lognormal	95% Modified-t UCL	62.2	Lognormal	95% Modified-t UCL
	Copper	1302	Nonparametric	97.5% Chebyshev (Mean, Sd) UCL	**1030**	Nonparametric	**95% Chebyshev (Mean, Sd) UCL**
	Iron	34200	Nonparametric	95% Modified-t UCL	34200	Nonparametric	95% Modified-t UCL
	Lead	2140	Lognormal	97.5% KM (Chebyshev) UCL	2140	Lognormal	97.5% KM (Chebyshev) UCL
	Mercury	2.1	Lognormal	97.5% KM (Chebyshev) UCL	2.1	Lognormal	97.5% KM (Chebyshev) UCL
	Thallium	0.48	Gamma	95% KM (t) UCL	0.48	Gamma	95% KM (t) UCL
Entire Site Subsurface Soil	BAP Equivalent	1.1	Nonparametric	95% KM (Chebyshev) UCL	1.1	Nonparametric	95% KM (Chebyshev) UCL
	Aroclor-1260	4.6	Nonparametric	97.5% KM (Chebyshev) UCL	4.6	Nonparametric	97.5% KM (Chebyshev) UCL
	2,3,7,8-TCDD TEQ	0.0013	Nonparametric	99% Chebyshev (Mean, Sd) UCL	0.0013	Nonparametric	99% Chebyshev (Mean, Sd) UCL
	Antimony	182	Lognormal	97.5% KM (Chebyshev) UCL	182	Lognormal	97.5% KM (Chebyshev) UCL
	Barium	280	Nonparametric	95% Chebyshev (Mean, Sd) UCL	280	Nonparametric	95% Chebyshev (Mean, Sd) UCL
	Cadmium	5.1	Nonparametric	95% KM (Chebyshev) UCL	5.1	Nonparametric	95% KM (Chebyshev) UCL
	Chromium	290	Nonparametric	95% Chebyshev (Mean, Sd) UCL	290	Nonparametric	95% Chebyshev (Mean, Sd) UCL
	Cobalt	15.9	Lognormal	95% H-UCL	15.9	Lognormal	95% H-UCL
	Copper	9900	Nonparametric	99% Chebyshev (Mean, Sd) UCL	**6020**	Nonparametric	**95% Chebyshev (Mean, Sd) UCL**
	Iron	97100	Nonparametric	95% Chebyshev (Mean, Sd) UCL	97100	Nonparametric	95% Chebyshev (Mean, Sd) UCL
	Lead	5630	Lognormal	97.5% KM (Chebyshev) UCL	5630	Lognormal	97.5% KM (Chebyshev) UCL
	Manganese	969	Nonparametric	95% Chebyshev (Mean, Sd) UCL	969	Nonparametric	95% Chebyshev (Mean, Sd) UCL
	Mercury	9.4	Lognormal	95% KM (Chebyshev) UCL	9.4	Lognormal	95% KM (Chebyshev) UCL
	Nickel	484	Nonparametric	95% KM (Chebyshev) UCL	484	Nonparametric	95% KM (Chebyshev) UCL
	Thallium	0.89	Gamma	95% KM (t) UCL	0.89	Gamma	95% KM (t) UCL
	Zinc	2600	Lognormal	95% H-UCL	2600	Lognormal	95% H-UCL
Sediment	BAP Equivalent	1.2	Gamma	95% Approximate Gamma UCL	1.2	Gamma	95% Approximate Gamma
	TEQ PCB	0.0016	Nonparametric	99% KM (Chebyshev) UCL	0.0016	Nonparametric	99% KM (Chebyshev) UCL
	Total PCB Congeners	0.42	Gamma	95% Approximate Gamma UCL	0.42	Gamma	95% Approximate Gamma
	Arsenic	14.5	Gamma	95% Approximate Gamma UCL	14.5	Gamma	95% Approximate Gamma
	Chromium	150	Normal	95% Student's t UCL	150	Normal	95% Student's t UCL
	Iron	45900	Nonparametric	95% Modified-t UCL	45900	Nonparametric	95% Modified-t UCL
	Lead	248	Gamma	95% Approximate Gamma UCL	248	Gamma	95% Approximate Gamma
	Manganese	468	Normal	95% Student's t UCL	468	Normal	95% Student's t UCL
Entire Site Surface Soil Chemicals Eliminated due to Background	2,3,7,8-TCDD TEQ	0.000012	Gamma	95% KM (Chebyshev) UCL	0.000012	Gamma	95% KM (Chebyshev) UCL
	Aluminum	12800	Gamma	95% Approximate Gamma UCL	12800	Gamma	95% Approximate Gamma UCL
	Antimony	2.1	Lognormal	95% KM (BCA) UCL	**2.0**	Lognormal	95% KM (BCA) UCL
	Arsenic	20.6	Nonparametric	95% KM (Chebyshev) UCL	20.6	Nonparametric	95% KM (Chebyshev) UCL
	Cadmium	1.8	Lognormal	95% KM (Chebyshev) UCL	1.8	Lognormal	95% KM (Chebyshev) UCL
	Cobalt	10.4	Normal	95% Student's t UCL	10.4	Normal	95% Student's t UCL
	Manganese	386	Normal	95% Student's t UCL	386	Normal	95% Student's t UCL
	Vanadium	43.7	Lognormal	95% Modified-t UCL	43.7	Lognormal	95% Modified-t UCL
Entire Site Subsurface Soil Chemicals Eliminated due to Background	Aluminum	11600	Normal	95% Student's t UCL	11600	Normal	95% Student's t UCL
	Arsenic	18	Gamma	95% Approximate Gamma UCL	18	Gamma	95% Approximate Gamma UCL
	Vanadium	34.8	Gamma	95% Approximate Gamma UCL	34.8	Gamma	95% Approximate Gamma UCL

Sd = Standard deviation
UCL = Upper Confidence Limit

(1) units are mg/kg.
ProUCL version 4.00.04 was used to calculate the exposure point concentrations for the Operable Unit 7 risk assessment.
Values in red text indicate a change from version 4.00.04 and 4.1.00.

Attachment 2

Example Background Plots (to be included in Appendix B.2)

Attachment 3

Section 6.0

6.0 HUMAN HEALTH RISK ASSESSMENT

The human health risk assessment contained in this section was performed to characterize and quantify potential risks to select receptors at OU7 based on current and future land use scenarios.

OU7 consists of the onshore area, where soil and groundwater samples were collected, and the intertidal area adjacent to the site along the shoreline where sediment and surface water samples were collected. Potential receptors at OU7 were identified as current/future construction workers, current/future recreational users (adolescent and adult), future residents (child and adult), and future occupational workers.

Figure 6-1 shows the CSM that was developed for the OU7 HHRA. The CSM indicates all of the receptors and potential pathways by which exposure could occur at OU7. All receptors were evaluated for exposure to surface soil, which was defined as 0 to 1 feet bgs, in accordance with USEPA Region I guidance (USEPA, August 1995). Other assessments at PNS have used 0 to 2 feet bgs as a definition for surface soil; however, no OU7 soil samples were collected between 1 to 2 feet bgs. OU7 site soil is currently paved so any risk evaluations of surface soil assume exposure to uncovered soil for a theoretical future exposure scenario. In addition to surface soil, construction workers were evaluated for exposures to subsurface soil as well as groundwater (for groundwater, dermal contact only). Recreational users were evaluated for exposures to surface soil, surface water, and sediment in the offshore area. Residential exposure to sediment and surface water of the intertidal area was assumed to be the same as recreational exposure to these media, so residents were not evaluated for exposures to intertidal area media. Recreational exposure to near shore surface water is evaluated in the main body of the risk assessment. However, due to uncertainty associated with some of the seep water, risks for two of three recreational exposures to surface water (i.e. undiluted seep water and mid to high tide seep water) are presented in the Uncertainty Analysis (Section 6.6). Occupational worker, recreational, and residential exposures to subsurface soil are also presented in Section 6.6 for informational purposes because contact with subsurface soil for these receptors is not anticipated. No receptors were evaluated for groundwater ingestion because the groundwater at OU7 is saline/brackish and therefore unsuitable for consumption. No evaluation of vapor intrusion is necessary because site data indicate that a subsurface soil source of sufficiently volatile and toxic chemicals does not exist at OU7. Vapor intrusion requires a source, an inhabited building, and a pathway. A soil source of compounds sufficiently volatile and toxic to pose a vapor intrusion threat is not present at OU7. The majority of soil data concentrations for compounds sufficiently volatile and toxic to warrant a vapor intrusion concern were reported as not detected. Where such compounds were detected, the concentrations were low and did not show a source.

Comment [m1]: Highlighted text to address Action Item for MEDEP comment #31.

to reflect average case exposure. The exposure parameters used for the CTE calculations reflect the latest USEPA guidance (see RAGS Part D table 4s in Appendix D.1 and D.7). Therefore, the exposure factors for the CTE differ from those used for the RME, but, in accordance with current USEPA guidance, the exposure point concentrations are the same for the RME and CTE scenarios.

Exposure assumptions used for human receptor exposure to the intertidal area are based on current site conditions. Shoreline controls are needed to prevent erosion of the shoreline. The controls cover the mid- to high-tide zone of the shoreline, and only sediment below the mid-tide level is exposed. The sediment in the low-tide zone is soft and difficult to walk on and is only exposed for a short time of the tidal cycle. Therefore, the exposure assumptions for human exposure to intertidal sediment used in the HHRA are appropriate for current site conditions.

Comment [m3]: Text in Section 6.3.5 updated based on Action Item for MEDEP Comments #47 and 51.

The most recent USEPA guidance is used to estimate intakes. USEPA guidance used for this risk assessment includes USEPA Soil Screening Guidance (USEPA, December 2002a), USEPA Exposure Factors Handbook (USEPA, August 1997), USEPA Child-Specific Exposure Factors Handbook (USEPA, September 2008), and the July 2004 Final USEPA Dermal Guidance.

Exposure intake parameters are used in the equations presented in Appendix D.2 along with the exposure point concentrations previously defined to estimate contaminant intakes. Individual contaminant intakes for each receptor/exposure route combination at OU7 are presented in the risk assessment spreadsheets in Appendix D.1. Example calculations are provided in Appendix D.2.

6.4 TOXICITY ASSESSMENT

The objective of the toxicity assessment is 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 are defined for the identified COCs. Quantitative toxicity values determined during this component of the risk assessment are 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 non-carcinogenic health effects for ingestion and dermal exposures is the reference dose (RfD). The reference concentration (RfC) is used to evaluate non-carcinogenic health effects for inhalation exposures. RfDs and RfCs are estimates of the daily exposure level for the human population that are likely to be without appreciable risk during a portion, or all of a lifetime. They are 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

subsurface soil (5800 µg/kg). Because the deep soil concentration is within one order of magnitude of the concentrations in the surface and subsurface soil, it is not likely that risks for receptors due to cPAHs would be significantly higher if concentrations in deep soil were considered. In addition, it is unlikely that exposure to soils greater than 10 feet would occur at OU7 because groundwater is usually encountered at less than 10 feet bgs at the site.

6.6.1 Uncertainty in Selection of COPCs

Comment [m4]: Highlighted text contains updates based on Action Item for Comment #34.

Chemicals Potentially Attributable to Background

COPCs for OU7 were selected, in part, using available background concentrations for soil and groundwater. A statistical data set-to-data set background comparison was conducted to determine if site concentrations exceeded background concentrations for chemicals with concentrations exceeding screening criteria (see Appendix B.2). However, background data were available for soil and groundwater only. The absence of background data for surface water and sediment may result in retaining chemicals as COPCs that would have been deleted as COPCs based on background data. Therefore, overall site-related risks from surface water and sediment may be overestimated.

Chemicals Eliminated Due to Background

A background screen (i.e., a data set-to-data set comparison) was conducted for chemicals exceeding screening criteria in soil and groundwater at OU7 (see Appendix B.2). The following chemicals were eliminated from COPC selection as a result of the background screen alone:

- Entire Site Surface Soil: **2,3,4,7,8-PECDF, 2,3,7,8-TCDD TEQ**, aluminum, antimony, **arsenic**, cadmium, cobalt, manganese, and vanadium
- Former location of Building 237 Surface Soil: **BAP equivalent, benzo(a)pyrene**, aluminum, **arsenic**, cobalt, iron, manganese, and vanadium
- Entire Site Subsurface Soil: **benzo(k)fluoranthene**, aluminum, **arsenic**, and vanadium
- Former location of Building 237 Subsurface Soil: aluminum, **arsenic**, cobalt, and iron
- Groundwater: manganese

A chemical name is presented in **bold** font if the maximum concentration of the chemical would exceed the unadjusted RSL (i.e., an RSL based on an ILCR = $1x10^{-6}$ or an HI = 1). Risks for 2,3,4,7,8-PECDF

are assessed as part of 2,3,7,8-TCDD TEQ, and risks for benzo(a)pyrene are assessed as part of BAP equivalent. In area-with-no-debris subsurface soil, risks due to benzo(k)fluoranthene were already calculated as part of BAP equivalent.

Cumulative site risks, including those chemicals screened out due to background, were calculated and are presented in Appendix D.7.3. The 95 percent UCL on the mean was used as the EPC for surface and subsurface soil datasets that were evaluated for the entire site exposure scenario. Maximum concentrations were used for surface and subsurface soil in the area-with-no-debris because each of these data sets contained fewer than 10 samples. The maximum concentration was used as the EPC for groundwater. Estimated ILCRs for receptors based on chemicals screened out due to background are less than or within the USEPA target ILCR risk range of $1x10^{-6}$ to $1x10^{-4}$ (no carcinogenic risks were identified for groundwater). Estimated ILCRs for receptors based on chemicals screened out due to background slightly exceed the state of Maine ILCR guideline of $1x10^{-5}$ for child ($4x10^{-5}$), adult ($2x10^{-5}$), and lifetime ($5x10^{-5}$) resident exposed to the entire site surface soil. The background chemical exceedances of the state of Maine ILCR guideline were primarily due to arsenic; estimated ILCRs for these media would not exceed if arsenic risks were not considered. Arsenic is naturally occurring in soil and was detected in 23 of 25 background soil samples. The 95 percent UCL of arsenic in the background soil data set is 23.2 mg/kg. The carcinogenic residential soil screening level for arsenic is 0.39 mg/kg. Risks from chemicals screened out due to background result in an estimated ILCR of $5x10^{-5}$ for the lifetime resident (most conservative receptor); therefore, although the cumulative site risks exceed the state of Maine ILCR guideline, background alone also exceeds that guideline. The background chemicals causing state of Maine ILCR guidance exceedances are evidence of regional contamination or natural site-background rather than site-specific contamination.

The cumulative HI results for non-carcinogenic risks in chemicals eliminated due to background did not exceed the USEPA and state of Maine target non-cancer HI of 1 for the receptors and media evaluated in Appendix D.7.3. Therefore, adverse non-carcinogenic effects are not anticipated for chemicals eliminated due to the background screen.

COPC Screening Levels

The use of screening values based on conservative land use scenarios (i.e., residential land use for soil, recreational land use for surface water and sediment, and construction worker dermal contact for groundwater) corresponding to ILCRs of $1x10^{-6}$ and HIs of 0.1 should ensure that the significant risk contributing chemicals from OU7 were evaluated. The elimination of chemicals that are present at concentrations that correspond to an ILCR less than $1x10^{-6}$ and an HI less than 0.1 should not affect the

Generally, the uncertainty can be assessed quantitatively for many 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) is quite large. Consequently, the values chosen for such variables in the RME scenario have low uncertainty. For many parameters for which limited information exists (i.e., dermal absorption of organic contaminants from soil), greater uncertainty exists.

Many of the exposure parameters used to calculate exposures and risks in this report are selected from a distribution of possible values including USEPA guidance (March 1991, May 1993, August 1997, July 2004). Maine guidelines for risk assessments (MEDEP, 1994) were updated with current USEPA values. For the RME scenario, the value representing the 95th percentile is generally selected for each parameter to ensure that the assessment bounds the actual risks from a postulated exposure. This risk number is used in risk management decisions but does not indicate what a more average or typical exposure might be, or what risk range might be expected for individuals in the exposed population.

To address these issues, the USEPA (February 1992) has suggested the use of the CTE receptor, whose intake variables are often 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. Some of the parameters presented in this risk assessment were estimated using professional judgment, although USEPA does provide limited guidance for the CTE evaluation (USEPA, May 1993).

As noted in Section 6.3.5, the exposure parameters for the intertidal area are based on current site conditions. Uncertainty is associated with future shoreline conditions, because if shoreline conditions changed (e.g., more of the shoreline becomes exposed), it is possible that different exposure assumptions would be more appropriate to evaluate human health risks.

Comment [m5]: Addresses comment #47/51

Exposure Parameters for Seep Water

Uncertainty is associated with the exposure assumptions used for seep water. As noted previously, arsenic and chromium from the undiluted seep water data set was the only surface water COPC for OU7. Undiluted seep water was evaluated according to the exposure assumptions in Tables 4.15 and 4.16 of Appendix D.7.2. Skin surface areas of 3,600 cm^2 and 2,600 cm^2 were used for the adult and adolescent recreational users, respectively. These surface areas assume that the lower legs and feet are exposed (RAGS Part E, July 2004). Undiluted seep water is exposed only during low tide, and the seeps are often as shallow as a thin sheet of water; therefore, dermal contact risks to seep water are very likely overestimated with the exposure assumptions used.

The quantitation of the dermal pathway for PAHs may add additional uncertainty to the risk assessment because it may not be appropriate to use the oral slope factor to evaluate risks from dermal exposure to PAHs (USEPA, December 1989). This is because PAHs are known to cause skin cancer at the point of contact rather than from systemic action.

Uncertainty Associated with Evaluation of Arsenic

Although the more restrictive basis for evaluating risk associated with exposure to arsenic is to assume it is a carcinogen, carcinogenic effects are not the primary health effects expected to be manifested on exposure to arsenic. Scientific information indicates that humans are capable of metabolizing arsenic to expedite its elimination from the body (ATSDR, 1988). Its elimination from the body obviously mitigates the possibility for arsenic to manifest carcinogenic effects. Therefore, evaluating arsenic as a non-carcinogen would be more appropriate. However, arsenic was conservatively evaluated as a carcinogen in this risk assessment. Consequently, risks for this chemical are probably overestimated to some degree.

Specifically, the body methylates the arsenic to form monomethyl arsenic and dimethyl arsenic. A limited capacity exists for the body to methylate arsenic, but this limit is generally reached when the body's intake of arsenic approximately exceeds 500 µg/day. The intake associated with a given amount of arsenic in soil, assuming a soil ingestion rate of 200 mg/day, maybe calculated and related to the 500 µg/day. These concentrations result in intakes that are related to the body's ability to metabolize arsenic. Although some humans may be more sensitive to arsenic, in that they are "poor methylators," the average exposure concentration for the site is usually orders of magnitude less than normal limit of metabolic saturation and is most likely less than levels that would trigger responses in sensitive individuals.

Arsenic was identified as a COPC only in sediment, and arsenic was not identified as a major contributor to the risks calculated for OU7. However, arsenic was eliminated as a COPC due to the background screen in soil, and background arsenic risks in soil exceeded the state of Maine ILCR guideline (see Appendix D.7.4).

Use of Chromium Toxicity Criteria

Some uncertainty is associated with the evaluation of chromium. Criteria for trivalent chromium were used as a surrogate for total chromium in the risk assessment based on the conclusions in the RI QAPP that hexavalent chromium was not associated with OU7 (because hexavalent chromium concentrations in SSI samples were less than the screening level). However, risks due to chromium at OU7 are not

Comment [m6]: Addresses Comment #36

expected to be underestimated because previous chromium testing at the site has found that the chromium present is primarily trivalent chromium (TtNUS, October 2002).

Use of Aluminum, Cobalt, Copper, and Iron Toxicity Criteria

According to USEPA Risk Update Number 5 (USEPA, September 1999), USEPA Region I does not advocate the quantitative evaluation of aluminum, cobalt, copper, and iron. This is because the provisional RfDs for these contaminants are based on allowable intakes rather than adverse effect levels. However, these metals, when selected as COPCs, were included in the quantitative risk evaluation to be conservative. Aluminum was not selected as a COPC at OU7. Cobalt was selected as a COPC in both entire site and clean area subsurface soil. Copper was a COPC for entire site surface and subsurface soil. Iron was selected as a COPC in all soil data sets and sediment. None of these metals was considered to be a risk driver in surface sediment. Cobalt, copper, and iron were major risk contributors to non-carcinogenic risk for the child resident exposed to entire site subsurface soil in the RME and CTE scenarios.

6.6.4 Uncertainty in the Risk Characterization

Uncertainty in risk characterization results primarily from assumptions made regarding additively of effects from exposure to multiple COPCs from various exposure routes. High uncertainty exists when summing cancer risks for several substances across different exposure pathways. This assumes that each substance has 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 additively may not be an appropriate assumption. However, the assumption of additively is made to provide a conservative estimate of risk. Additionally, some contaminants were eliminated as COPCs based on background comparisons alone, as noted in Section 6.2.2 (see Appendix B.2 for further information). Although the site concentrations of some contaminants exceeded background concentrations, uncertainty exists because some contaminants that were risk drivers could still have a considerable background component adding to risks.

Residential risks due to surface water and sediment exposures were assumed to be the same as recreational exposures to these media. Recreational cancer risks for adolescent, adult, and lifetime exposures to sediment were $1x10^{-6}$, $2x10^{-6}$, and $3x10^{-6}$ (i.e., well within the USEPA target cancer range), respectively, and non-cancer HIs for sediment were less than 1. No contaminants with CSFs were identified in surface water, and the non-cancer HIs for the adolescent and adult recreational users were several orders of magnitude less than 1. Although recreational risks due to lead in combined surface soil/sediment exceed USEPA target levels, residential risks due to lead in soil (assessed for the child resident using the IEUBK model) are already recognized to be greater than the USEPA target level. The

adolescent recreational users exposed to subsurface soil and sediment. Risks for occupational workers and adult recreational users exposed to subsurface soil did not exceed the USEPA target of no more than 5 percent of children having a blood-lead concentration greater than 10 µg/dL. Therefore, no adverse effects are anticipated for occupational and adult recreational exposure to OU7 subsurface soil or subsurface soil/sediment.

6.7.3 Human Health Risk Assessment Risk Drivers

Comment [m7]: Highlighted text to address Action Items for Comment #37.

Risk Drivers – Risk Characterization

Based on the non-cancer and cancer evaluations, the following USEPA risk drivers (i.e., contaminants with non-cancer hazard quotients greater than 1.0 or with cancer risks greater than $1x10^{-6}$ in a scenario and medium with total cancer risks greater than $1x10^{-4}$) were identified in the Risk Characterization: 2,3,7,8-TCDD TEQ, cPAHs, and lead in soil. Lead was retained as a risk driver for surface soil and subsurface soil due to hotspot concentrations detected at locations TP-SB27 and TP-SB24. Aroclor-1248 and Aroclor-1260 were also retained as subsurface soil risk drivers due to hot spot concentrations in detected at locations TB-SB108 and TP-SB14, respectively. No additional risk drivers were identified based on the State of Maine ILCR guideline. The State of Maine risk guideline is not a regulatory requirement.

Risk Drivers –Uncertainty Analysis

Based on the non-cancer and cancer evaluations, the following USEPA risk drivers (i.e., contaminants with non-cancer hazard quotients greater than 1.0 or with cancer risks greater than $1x10^{-6}$ in a scenario and medium with total cancer risks greater than $1x10^{-4}$) were identified in the Uncertainty Analysis: 2,3,7,8-TCDD TEQ, antimony, copper, iron, cPAHs, and Aroclor-1260 in soil. Aroclor-1254 and lead were retained as a risk driver because of hot spot concentrations in soil. No additional risk drivers were identified based on the MEDEP ILCR.

Attachment 4

RAGs Part D Tables (to be included in Appendix D.7.3)

APPENDIX D.7.3
CUMULATIVE HUMAN HEALTH RISKS
OPERABLE UNIT 7 REMEDIAL INVESTIGATION
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

This appendix presents the cumulative human health risks for site related and background chemicals at Operable Unit (OU) 7, Portsmouth Naval Shipyard, Kittery, Maine. Cumulative human health risks differ from site-specific risks in that cumulative risks include risks from those chemicals with concentrations considered to be reflective of site background whereas the site-specific risks do not. The cumulative site risks are included in this appendix in response to the April 8, 2011 technical discussion for resolution of Maine Department of Environmental Protection (MEDEP) comments on the draft OU7 Remedial Investigation (RI) Report. The meeting summary from the April 8, 2011 discussion is provided in Appendix E. The following provides an explanation on Navy policy regarding background.

Navy Policy on the Use of Background Chemical Levels (Department of Navy, 2004) is to:

1.) identify chemicals in the environment due to site releases;

2.) eliminate from consideration in risk assessments the naturally occurring and anthropogenic chemicals that are present at background levels;

3.) ensure documentation and discussion of potential risk from chemicals eliminated during the background evaluation process; and

4.) develop remediation action levels that are not below background.

Providing cumulative risks meets the MEDEP requirement in the Guidance for Human Health Risk Assessments for Hazardous Substance Sites in Maine (MEDEP, July 2009) which states in section 4 of that document that the MEDEP does not permit the exclusion of inorganic or organic compounds from human health risk assessments based on comparison to background. This appendix serves to fulfill part 3 of the Navy Policy on Background (Department of Navy, 2004) listed above and MEDEP risk assessment guidance (MEDEP, July 2009) which states that chemical concentrations cannot be screened out of a risk assessment due to background.

Cumulative human health risks were calculated in accordance with United States Environmental Protection Agency (EPA) Risk Assessment for Guidance for Superfund (RAGS) as described in Section 6.1 through 6.5.2 of this RI report. RAGS Part D tables for cumulative risks are included in this appendix following this text. The elevated risks noted when comparing cumulative risks (this appendix) to site-specific risks (Appendix D) are primarily due to arsenic, which is within PNS facility background (Appendix B.2)

LIST OF TABLES
RAGS PART D TABLE 7
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

Table No.	
	REASONABLE MAXIMUM EXPOSURES
7.1C.RME	Construction Workers - Entire Site Surface/Subsurface Soil & Groundwater
7.2.C.RME	Occupational Workers - Entire Site Surface Soil & Subsurface Soil
7.3.C.RME	Adult Recreational Users - Entire Site Surface Soil & Sediment
7.4.C.RME	Adolescent Recreational Users - Entire Site Surface Soil & Sediment
7.5.C.RME	Adult Residents - Entire Site Surface Soil
7.6.C.RME	Child Residents - Entire Site Surface Soil
	CENTRAL TENDENCY EXPOSURES
7.1C.CTE	Construction Workers - Entire Site Surface/Subsurface Soil & Groundwater
7.2.C.CTE	Occupational Workers - Entire Site Surface Soil & Subsurface Soil
7.3.C.CTE	Adult Recreational Users - Entire Site Surface Soil & Sediment
7.4.C.CTE	Adolescent Recreational Users - Entire Site Surface Soil & Sediment
7.5.C.CTE	Adult Residents - Entire Site Surface Soil
7.6.C.CTE	Child Residents - Entire Site Surface Soil

See Appendix D.7.3 for these tables.

Attachment 5

Section 7.0

7.0 SUMMARY AND CONCLUSIONS

This section summarizes the findings of the RI and provides conclusions and recommendations for OU7.

7.1 SUMMARY

The following provides a summary of the nature and extent of contamination, fate and transport of contamination, and the results of the human health risk assessment for OU7.

7.1.1 Nature and Extent of Contamination

The discussion of the nature and extent of contamination at OU7 focuses on the distribution of chemical concentrations across OU7 with consideration of site uses and geological conditions. For the onshore area, soil and groundwater were investigated, and for the offshore area surface water, seeps, and sediment were investigated.

VOCs, SVOCs, pesticides, dioxins/furans, and inorganics were detected in the surface soil and subsurface soil at OU7. Concentrations in the subsurface soil were generally higher than in the surface soil. Based on an evaluation of PAHs (expressed in terms of BAP equivalents), dioxins/furans (expressed as 2,3,7,8-TCDD TEQ), and copper concentrations, locations where risk-based screening level were exceeded correspond to fill activities taking place after 1910, with the exception of TP-SB120, TP-SB15, and TP-SB39. From evaluation of the data, roughly half the locations where concentrations were indicated to be above background levels, debris material was found; therefore the presence of debris material would not delineate contamination. The borings in the area filled before 1910 in the vicinity of former Building 237 neither contain debris material nor have concentrations greater than risk-based screening levels for total PCBs, lead, cPAHs, and dioxins/furans. A statistical comparison of mean concentrations in the area without the debris with the mean concentrations in the rest of OU7 demonstrates that the mean concentrations in the filled area before 1910, with the filling of Jenkin's Gut, in the vicinity of former Building 237, are statistically different than the rest of OU7. Therefore, the filled area before 1910 (see Figure 1-3) in the immediate vicinity of former Building 237 can be defined as a separate population from the rest of OU7.

PAHs and inorganics were detected in groundwater at OU7 whereas VOCs, pesticides, and PCBs were not detected in any groundwater sample. Aluminum, copper, and manganese were detected in fewer than four samples at concentrations exceeding the risk-based screening levels. The groundwater at OU7 is saline/brackish and therefore not potable.

Inorganics were the only chemicals detected in OU7 surface water but were detected at concentrations below the risk-based screening levels. SVOCs, pesticides, PCBs, and inorganics were detected in OU7 seep samples. Arsenic and chromium were the only chemicals to exceed human health risk-based screening levels in these samples. Benzo(b)fluroanthene, chrysene, 4,4-DDE, 4,4-DDT, heptachlor, and heptachlor epoxide were detected at concentrations exceeding ecological risk-based screening levels.

SVOCs, pesticides/PCBs, and inorganics were detected in OU7 sediment. PAHs, PCBs, and inorganics were detected at concentrations exceeding human health risk-based screening levels in these samples whereas anthracene, fluorene, copper and nickel were detected at concentrations greater than the ecological risk-based screening levels. The extent of sediment contamination is bounded.

7.1.2 Fate and Transport of Contaminants

As discussed in Section 5.0, the following general classes of contaminants were identified as exceeding risk-based screening levels are PAHs, PCBs, dioxins/furans, and metals.

The site surface is mostly covered with asphalt/pavement limiting mobilization of contaminants through surface water runoff or infiltration of precipitation. Much of the subsurface soil is in contact with groundwater. The mobility of PAHs via the groundwater pathway at OU7 is not considered significant because PAHs were detected in groundwater infrequently and at levels several orders of magnitude less than the risk-based screening levels. PCBs were not detected in groundwater. Data for OU7 do not indicate significant concentrations of organic chemicals that would facilitate movement of dioxins/furans. Only a small portion of OU7 is covered with flora so exposure from herbivore feeding on the vegetation is not a concern. The fate and transport of inorganics are controlled mainly by the mobility of soil particles and dissolution into water present in their immediate environment. Metals do not undergo any of the degradation reactions that most organic chemicals do; therefore, they are considered to be persistent. The mobility of metals under strong acidic or alkaline conditions is expected to be limited at OU7 because of the buffering action of brackish/saline groundwater. The major fate mechanisms for metals are adsorption to the soil matrix and bioaccumulation.

Shoreline stabilization was conducted in June 2006 to prevent contaminated soil and debris/waste materials from eroding. Current conditions indicate no further erosion is occurring. The long-term stability and functioning of the shoreline controls are necessary to ensure future erosion does not occur. Therefore, if the erosion controls fail there is a potential future. risk to the offshore area.

Contaminant fate and transport modeling was conducted to conservatively estimate potential migration of contamination from soil to intertidal sediment and near-shore surface water. The modeling assumed that the pavement at OU7 was removed and the amount of infiltrating precipitation coming in contact with soil

would be greatly increased compared to current conditions and that the overall groundwater flow conditions and contributions from storm water sewer discharge would not change significantly in the future. The modeling results using unsteady state and steady state parameters indicate that surface water is not being adversely impacted by onshore sources of contamination. Using unsteady state parameters, the modeling conservatively indicates sediment may potentially be impacted through the onshore migration of metal contamination through groundwater. Using steady state parameters, the modeled impacts to sediment do not appear to be high level when compared to sediment criteria. Observed concentrations of metals in sediment are orders of magnitude lower than the modeled results and do not indicate groundwater migration is adversely impacting sediment.

7.1.3 Risk Assessment

As discussed in Section 6.0, analytical data for soil, intertidal water (i.e., combined seep and surface water), intertidal sediment, and groundwater were used in the HHRA for OU7. The receptors evaluated include current and future adult and adolescent recreational users, future adult and child residents, future occupational worker (e.g., the typical industrial/commercial worker performing routine activities), and current and future construction worker (e.g., remediation and excavation). Although there is a temporary housing unit (Building H23) at OU7 and occupational workers are at OU7, these receptors are considered future receptors because the site is covered with asphalt and soil is not currently exposed. The exposure routes include ingestion, dermal contact, and inhalation of air/dust particulates/vapors for soil, and ingestion and dermal contact for intertidal water, surface water, undiluted seep water, sediment, and groundwater. Current potential risks for exposure to media in the intertidal area of OU7 for occupational works or personnel staying at Building H23 are evaluated under the current recreational user scenario. Potentially unacceptable non-carcinogenic health effects were identified for receptors with HIs greater than 1 (the USEPA target risk level and State of Maine risk guideline). Potentially unacceptable carcinogenic health effects were identified for receptors with ILCRs exceeding the USEPA target risk range (1×10^{-6} to 1×10^{-4}) and the State of Maine risk guideline (1×10^{-5}). The State of Maine risk guideline is not a regulatory requirement and will not be used for identifying cleanup goals.

The HHRA evaluated potential risks under current land use conditions and potential future land use conditions for the entire site, and separately for the area filled before 1910 where no debris was found. No COPCs were identified for surface soil in the area filled before 1910 where no debris was found and therefore a quantitative evaluation for the surface soil was not conducted. Adverse receptor effects are not anticipated for the area filled before 1910 where no debris was found from exposure to surface soil. Current and future constructions workers were the only receptors evaluated for subsurface soil exposure in the area filled before 1910 where no debris was found with no adverse effects being anticipated.

Potentially unacceptable non-carcinogenic health effects are not anticipated for future occupational workers, future adult residents, and future child residents exposed to surface soil and for current and future recreational users (adult and adolescent) exposed to surface soil and sediment based on the HIs being less than or equal to 1 for the RME and CTE scenarios. RME and CTE HIs were less than 1 for current and future construction workers exposed to surface soil and for the area-with-no-debris subsurface soil. RME and CTE HIs are greater than 1.0 for current and future construction workers exposed to entire-site soils. Manganese and dioxins/furans (based on 2,3,7,8-TCDD TEQ) in subsurface soil are the main risk contributors.

RME and CTE cancer risk estimates for current and future recreational users, future occupational workers, future residents, and current and future construction workers hypothetically exposed to environmental media evaluated in the Risk Characterization are less than or within USEPA target cancer risk range (1×10^{-6} to 1×10^{-4}). The RME cancer risks for adult residents (2×10^{-5}), child residents (1×10^{-4}) and lifetime residents (1×10^{-4}) exposed to surface soil exceed the State of Maine risk guideline of 1×10^{-5}. CTE cancer risk estimates do not exceed the State of Maine risk guideline. Residential risks exceeding the State of Maine risk guideline are primarily due to cPAHs via ingestion and dermal contact in surface soil.

Lead was a COPC in both surface and subsurface soil for the entire site. Results of the lead evaluation indicate that adverse effects are not likely for future occupational workers, current and future construction workers, or current and future adult recreational users exposed to lead in soil at the study area. However, the results indicate that adverse effects may occur for future residents exposed to surface soil.

Potential risks for exposure to subsurface soil that could be excavated and become surface soil were evaluated as part of the uncertainty analysis. The results showed that HIs would be greater than 1.0 for future occupational workers and future residents. Dixons/furans (based on 2,3,7,8-TCDD TEQ), antimony, copper, and iron are the main risk drivers. Cancer risks would exceed the USEPA target risk range for a future child resident. The main risk contributors are cPAHs, Aroclor 1260, and dioxins/furans. Lead exposure would be unacceptable for residents.

No COPCs were identified for surface water and groundwater. Therefore, there are no unacceptable risks for exposure to these media.

The site is currently and has historically been located within an industrial area of PNS, and no ecological habitat has been identified at the site. Therefore, there are no onshore concerns for ecological risk. Offshore concerns for ecological receptors are being addressed as part of OU4. OU7 is no longer acting as a source of contaminants that may pose unacceptable risk to the offshore area.

7.2 CONCLUSIONS AND RECOMMENDATIONS

Based on evaluation of the nature and extent of contamination, fate and transport of contaminants, and site risks, conclusions and recommendations were identified as described in the following sections.

7.2.1 Conclusions

The site boundary of OU7 was defined by the historical fill lines. The nature and extent of contamination in soil at OU7 has been sufficiently defined to support the FS. Potentially unacceptable risks were found for the current and future construction worker exposed to entire site soil and for the future child resident exposed to surface soil and future child resident, adult resident, and occupational worker exposed to subsurface soil. The main chemicals contributing to risk are dioxins/furans (based on 2,3,7,8-TCDD TEQ), total carcinogenic PAHs (based on BAP equivalents), PCBs (based on Aroclor 1260), antimony, copper, iron, lead, and manganese and are considered the chemicals of concern (COCs) for OU7. Based on the risk evaluation, groundwater, surface water, and sediment are not media of concern for OU7.

The fill area without debris in the vicinity of former Building 237 was determined to have statistically different mean concentrations than the rest of OU7 and adverse human health risks were not found for this area and the extent of contamination was bounded.

Groundwater, surface water, sediment, and soil data from OU7 and modeling conclusions show that migration of contaminants in groundwater from OU7 to the offshore does not pose a current risk and would not pose a future risk

Shoreline stabilization was conducted in June 2006 to prevent contaminated soil and debris/waste materials from eroding. Current conditions indicate no further erosion is occurring. However, the long-term stability and functioning of the shoreline controls are necessary to ensure future erosion does not occur. Therefore, there is a potential future risk to the offshore area from erosion if erosion controls fail in the future.

7.2.2 Recommendations

The Navy recommends that the FS Report for OU7 be prepared to address potentially unacceptable human health risks posed by exposure to soil and potential future risks if erosion occurs in the future. The Navy recommends that remedial action objectives be developed for the portion of OU7 that poses risk to human health and potential future erosion. The average concentrations for the fill area without debris in the vicinity of former Building 237 were determined to be statistically less than the average

concentrations for the rest of OU7. The FS Report for OU7 should also evaluate remedial options for addressing this area separately from the rest of OU7.