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NSWC WHITE OAK
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Record of Decision

Naval Surface Warfare Center – White Oak
Site 11 Soils

Engineering Field Activity Chesapeake
Naval Facilities Engineering Command

United States Environmental Protection Agency
Region III

Maryland Department of the Environment

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RECORD OF DECISION

SITE NAME AND LOCATION

Naval Surface Warfare Center – White Oak
Site 11 Soils
Silver Spring, Maryland
EPA RCRA ID No. MD0170023444

1.0 DECLARATION

1.1 STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) presents the determination that no further action for subsurface soils (hereafter, soils) is necessary to protect human health and the environment at Navy Installation Restoration Site 11, Industrial Wastewater Disposal 100 Area at the Naval Surface Warfare Center - White Oak (NSWC - White Oak) ("the Site") in Silver Spring, Maryland. This determination has been made in accordance with the Resource Conservation and Recovery Act (RCRA), the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). In 1997, ownership of the property occupied by Site 11 was transferred from the Department of the Navy (Navy) to the General Services Administration (GSA).

This decision is based on information contained in the Administrative Record file for the Site. The Maryland Department of the Environment (MDE) concurs with the selected remedy.

The U.S. Environmental Protection Agency (EPA) and the Navy recognize that publication and successful implementation of this ROD shall constitute fulfillment of requirements related to soil at Navy Installation Restoration Site 11 as required by the RCRA Section 7003 Administrative Order for the Site (First Amended Administrative Order to the Department of the Navy, the Former Naval Surface Warfare Center - White Oak, June 2, 1998).

1.2 DESCRIPTION OF THE SELECTED REMEDY

A no-further-action alternative is the selected remedy for Site 11 soils. No response action is necessary at this site to protect human health and the environment. Site 11 is known as the Industrial Wastewater Disposal 100 Area. The site consists of subsurface soil and waste associated with leaching wells within the 100 Area of NSWC White Oak. The leaching wells were used for the subsurface disposal of wastewater, therefore there were no impacts to surface soil through their operation. A 1996 removal action eliminated potentially unacceptable risk associated with contaminated soil at Site 11. Post-removal verification sampling and subsequent remedial investigation activities support the no-further-action remedial alternative. Groundwater underlying and downgradient of Site 11 will be addressed under subsequent operable units and RODs.

1.3 STATUTORY DETERMINATIONS

The no-further-action remedy selection is based upon post-removal verification sampling and the risk assessment results from the Remedial Investigation for Site 11, which indicate that no further action is necessary for Site 11 soils to be protective of human health and the environment. A 5-year review will not be necessary for Site 11 soils since the remedy will not result in hazardous substances, pollutants, or contaminants remaining on site above levels that allow for unlimited use and unrestricted exposure.

1.4 ROD DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section of this ROD. Additional information can be found in the Administrative Record file for the Site.

- Potential chemicals of concern (PCOCs) and their respective concentrations (page 11).
- Baseline risk presented by the PCOCs (page 13).
- Current and reasonably anticipated future land use assumptions (page 9).
- Potential land use that will be available at the site because of the selected remedy (page 14).
- Key factor(s) that led to selection of the remedy (i.e., how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision) (page14).

William F. Boudra

Captain William Boudra
U.S. Navy, Engineering Field Activity Chesapeake
Washington, District of Columbia

July 11, 2002
Date

Abraham Ferdas, Director
Hazardous Site Cleanup Division
U.S. EPA - Region III

7/24/02
Date

2.0 DECISION SUMMARY

2.1 SITE NAME, LOCATION, AND DESCRIPTION

The former NSWC White Oak was originally established in 1944 as the Naval Ordnance Laboratory, with a mission to carry out research on military mines and explosives. The former facility is located in Prince George's and Montgomery Counties, approximately 5 miles north of Washington, D.C., off New Hampshire Avenue in Silver Spring, Maryland (see **Figure 2-1**). Through the years, the mission was expanded to include research involving torpedoes and projectiles. In September 1974, the facility combined with the Naval Weapons Laboratory, Dahlgren, Virginia, to become the Naval Surface Weapons Center, which was renamed the Naval Surface Warfare Center, Dahlgren Division, in 1988. After that time, the facility functioned as the principal Navy research, development, test, and evaluation center for surface warfare weapon systems, ordnance technology, strategic systems, and underwater weapons systems.

In response to the Base Realignment and Closure (BRAC) Act, NSWC White Oak was closed in 1997. Approximately 662 acres of the approximately 712-acre property were subsequently transferred to the GSA in the fall of 1997, and the remaining area in the southeastern portion of the facility was transferred to the U.S. Army in February 1998. The GSA has plans to reuse and develop the subject property for nonresidential purposes; one of the major tenants will be the U.S. Food and Drug Administration (FDA). The property transferred to the U.S. Army will be used in conjunction with ongoing activities at the adjacent Adelphi Research Laboratory.

The EPA RCRA identification number for NSWC White Oak is MD0170023444.

For purposes of CERCLA and the NCP, the Navy is the lead agency for the facility, pursuant to Executive Order 12580 and a Memorandum of Understanding signed by the Navy and the GSA in July 1997; MDE is the support agency. Additionally, EPA is exercising its authorities under Section 7003 of RCRA under which it issued an administrative order to the Navy. In accordance with these authorities, the Navy and EPA are jointly selecting the response actions at the former NSWC White Oak facility.

2.2 SITE HISTORY, ENFORCEMENT ACTIVITIES, AND INVESTIGATIONS

2.2.1 Site History

Site 11, also known as Industrial Wastewater Disposal Area 100, comprises approximately 16 acres and reportedly included up to 14 leaching (or dry) wells. These wells were reportedly used to dispose of an estimated 20,000 gallons of liquid wastes generated by NSWC White Oak laboratories between 1951 and 1976. The wastes of concern were reported to include acids, metals, photographic wastes, solvents [including trichloroethylene (TCE)], and organic explosive compounds. The liquid wastes were conveyed from the laboratories to the wells by subsurface piping. Through their operation, subsurface soil and groundwater were potentially impacted and are the media of concern associated with Site 11. Surface soil would not have been impacted by the leaching well operation. This ROD addresses subsurface soil contamination; groundwater will be addressed in a separate ROD.

Site 11 is located entirely within property currently owned by the GSA.

2.2.2 Enforcement Activities

On June 2, 1998, EPA issued an Administrative Order to the Navy, pursuant to Section 7003 of RCRA, 42 U.S.C.§ 6973, that required the Navy to

(1) undertake "'Interim Measures' (IM) at the facility to prevent or mitigate threats to human health and/or the environment;

(2) perform a [RCRA Facility Investigation (RFI)] to determine fully the nature and any release of hazardous wastes, solid wastes and/or hazardous constituents at and/or from the Facility; and

(3) perform a [RCRA Corrective Measures Study (CMS)] to identify and evaluate alternatives for corrective action necessary to prevent or mitigate migration or releases of hazardous wastes, solid wastes and/or hazardous constituents at and/or from the Facility."

EPA's RCRA 7003 Order provides the framework for completing the investigation and remediation of the former NSWC White Oak facility under RCRA. The Order also recognizes that "EPA and the Navy intend to integrate the Navy's CERCLA response obligations and RCRA corrective action obligations" at the facility.

This ROD addresses Solid Waste Management Units (SWMUs) 10 through 19, identified in the Order as Site 11.

2.2.3 Site Investigations

Numerous investigations have been completed at NSWC White Oak over the last 18 years. The work from previous studies and investigations related to Site 11 is outlined below.

Site 11 was identified as a Navy Installation Restoration Program (IRP) site in an Initial Assessment Study (IAS) conducted by the Navy's Naval Energy and Environmental Support Activity (NEESA) in 1984. The purpose of the IAS was to identify sites at NSWC White Oak that would undergo potential environmental investigation. The IAS included a records search, on-site survey, and site ranking and identified 14 sites as needing further investigation.

Investigation activities have been conducted at Site 11 since 1987 to meet the requirements of both a CERCLA remedial investigation (RI) and a RCRA RFI. The term "RI" is used throughout this document to refer to the activities of these investigations. The investigative activities focused on characterizing subsurface soil, groundwater, surface water, and sediment at or adjacent to Site 11.

The Confirmation Study Verification Phase for NSWC White Oak was conducted in September 1985 by Malcolm-Pirnie (Malcolm-Pirnie, 1987). The study was conducted to confirm the findings of the IAS and to obtain additional information in characterizing site hazards. The study involved the installation of groundwater monitoring wells, the drilling of soil borings in areas of suspected soil contamination, and the collection of soil, surface water, groundwater, and sediment samples to characterize site contaminants. Site contamination was found in subsurface soil and groundwater. The study concluded that sufficient contamination existed to warrant additional study.

In accordance with the Code of Maryland Regulations, COMAR Title 26, hazardous waste generators that store hazardous waste for longer than 90 days are required to obtain a permit as a treatment, storage, and disposal facility (TSDF). Additionally, under the provisions of the Hazardous and Solid Waste Amendments (HSWA) to RCRA, TSDFs seeking final permits are required to initiate corrective actions for releases of hazardous wastes or constituents from SWMUs. NSWC White Oak operated under an interim status for on-site storage of hazardous waste. The Navy first submitted an application for a final (Part B) permit to Maryland in 1985, and made subsequent resubmissions and modifications. The last permit application was submitted in 1992.

Following the submission of the revised RCRA Part B permit application in 1988, a RCRA facility assessment (RFA) was conducted by an EPA contractor in November 1990 (Kearney/Centaur Division, 1990). The RFA identified 97 SWMUs and 19 areas of concern (AOCs) at NSWC White Oak. All 14 of the IRP sites identified in the IAS were identified as SWMUs or AOCs. In the RFA report, 40 SWMUs were recommended for an RFI to assess the presence and migration of potential contaminants of concern (PCOCs). SWMUs 10 through 19 were associated with Site 11.

In September 1992, Malcolm-Pirnie completed an RFA review for the Navy that evaluated the applicability of the general recommendations of the RFA to the individual SWMUs. Generally, for those SWMUs that were being investigated under the IRP, it was concluded that the planned level of effort was sufficient to address potential impacts from those SWMUs. It was also concluded that some level of sampling would probably be required for most of the SWMUs and AOCs that were recommended for an RFI or verification sampling.

An RI was conducted at the base in two phases between January 1989 and March 1992 (Malcolm-Pirnie, 1992). The RI was conducted to further characterize hazards associated with the identified sites and to aid in the development of remedial action plans for each. The RI involved the placement of additional groundwater monitoring wells at all sites; collection of surface and subsurface soil, sediment, surface water, and groundwater samples throughout the areas of investigation; collection of ecological data at all sites; completion of soil gas surveys at Sites 2, 3, 9, and 11; and completion of slug tests and aquifer pumping tests at Site 11.

The results of the RI confirmed the presence of contamination at Site 11. The analytical data were used in the calculation of potential risk, based on exposure to groundwater. The calculated risks were determined to be high enough to support the development of a feasibility study (FS) for the site. A draft FS completed by Malcolm-Pirnie in March 1993 (Malcolm-Pirnie, 1993) outlined the proposed remedial strategies for the site. The FS evaluated the previous site characterization data to determine the most effective means to reduce environmental hazards at NSWC White Oak. Risk associated with groundwater contamination identified at Site 11 will be addressed through another ROD.

A Design Verification Sampling and Analysis Plan (DVSAP) was submitted in January 1995 (HNUS, 1995a) and B&R Environmental [formerly Halliburton NUS (HNUS)] was retained by Engineering Field Activity Chesapeake (EFACHES), to prepare remedial designs for Sites 2, 3, 4, 8, 9, and 11. Activities associated with the Design Verification Study included record reviews, terrain conductivity surveys, test pit excavation, and subsurface soil and sediment sampling. The results of the activities were then used to develop remedial design plans for the six IRP sites. Two reports were issued addressing the various findings of the study: a final report for Sites 8, 9, and 11 (HNUS, 1995b) and a draft report for Sites 2, 3, 4, and 9 (HNUS, 1995c).

The Base Realignment and Closure Act of 1990 (BRAC II) directed the Secretary of Defense to close or realign those installations recommended by the BRAC commission. The Community Environmental Response Facilitation Act (CERFA) of 1992 directed federal agencies with jurisdiction over certain real property to terminate federal government operations and to identify "uncontaminated" parcels of the real property. In 1995, NSWC White Oak was selected for closure on the BRAC IV list. A Phase I Environmental Baseline Survey (EBS) was conducted by EA Engineering Science and Technology (EA) to assess the existing environmental information related to storage, release, treatment, or disposal of hazardous substances or petroleum products and to document the environmental condition of the property. The EBS also addressed actions required prior to property transfer to ensure compliance with requirements of CERCLA 120(h), applicable state and real estate laws, compliance programs, and the Department of Defense (DOD) policy *Environmental Requirements for Federal Agency-to-Agency Property Transfer at BRAC Installations* (DOD, 1995). The EBS was finalized and submitted in April 1996 (EA, 1996).

Source removal activities were completed at Sites 8, 9, and 11 during 1996 to address contaminant sources that may be impacting groundwater at NSWC White Oak. The activities included the excavation and off-site disposal of waste and contaminated media from these sites in conjunction with the findings of the Design Verification Study (B&R Environmental, 1995). The activities included the removal of five leaching wells (LW-2, LW-4, LW-5, LW-12, and LW-13) and surrounding subsurface soil from Site 11. Subsurface soil sampling was performed following the completion of waste and soil removal activities to verify the removal of contamination. The results of confirmation sampling performed during the removal action are compiled in the Post-Removal Action Report (Tetra Tech NUS, Inc., 2001).

A facility-wide groundwater investigation was competed in the spring and summer of 1997. The investigation included the sampling of all existing groundwater monitoring wells and piezometers and the installation and sampling of new temporary and permanent groundwater monitoring wells in areas of the base proposed for reuse. The groundwater quality was similar to that found during previous studies (B&R Environmental, 1997b).

An investigation to characterize background soil, sediment, groundwater, and surface water quality was performed in the fall of 1997. A final background report was published in 1998 (TtNUS, 1998).

During 1995, in conjunction with the Design Verification Study, a wetlands delineation and forest stand inventory were conducted for Sites 2, 3, 4, 7, 8, 9, and 11. The delineation was performed in accordance with

the delineation criteria in the 1987 U.S. Army Corps of Engineers (USACOE) Wetlands Delineation Manual (USACOE, 1987). Wetland areas were identified within or adjacent to five of the seven IRP sites investigated, however none were identified at Site 11 (HNUS, 1997).

Because of a proposal to relocate the Naval Sea Systems Command (NAVSEA) Headquarters to the NSWC White Oak property, geotechnical investigations and utility surveys were conducted within the 100 Area (IRP Site 11) of the base in 1994 (Smith, Hinchman & Gryllis, 1994). (Following placement of NSWC White Oak on the BRAC list, the NAVSEA headquarters were relocated to the Washington Navy Yard, Washington, D.C.) During the NAVSEA Headquarters design, a subsurface exploration program consisting of 41 test borings was undertaken. Water levels were measured within the soil borings and a geotechnical laboratory testing program was performed to aid in determining soil conditions and foundation requirements. Recommendations for foundations and utilities were presented in the report and preliminary design.

After plans were made to consolidate the headquarters of the U.S. Food and Drug Administration (FDA) at NSWC White Oak, GSA developed an Environmental Impact Statement (EIS) to evaluate the potential impact of the project on the human environment (GSA, 1997). The EIS provides background information on site geology, soil, topography, water resources, etc. at the former NSWC White Oak property that is now in the possession of GSA.

2.3 COMMUNITY PARTICIPATION

In accordance with Sections 113 and 117 of CERCLA, 42 U.S.C. Sections 9613 and 9617, the Navy, in conjunction with EPA, issued a Proposed Plan on January 25, 2002 that presented the preferred remedy for Site 11. The Proposed Plan and the RI for Site 11 became available for review by the public at that time and are among the documents that comprise the Administrative Record file for NSWC White Oak, which is maintained at EFACHES at the Washington Navy Yard, Washington D.C. In addition, the Proposed Plan and RI for Site 11 and all other documents relevant to the remedy selection for Site 11 were made available to the public in January 2002 in an information repository for NSWC White Oak that is maintained at the Montgomery County Public Library, White Oak Branch in Silver Spring, Maryland. The notice of the availability of these documents, the public comment period, and a public meeting was published in the *PG Journal, Montgomery Journal, Silver Spring Gazette, College Park Gazette,* and *Burtonsville Gazette* in January 2002. The public comment period was held from January 25, 2002 to February 25, 2002, and a public meeting was held on February 6, 2002. Additional community involvement is detailed in Section 3.0.

2.4 SCOPE AND ROLE OF RESPONSE ACTION

Although the NSWC White Oak facility is not on CERCLA's National Priorities List (NPL), in its response actions at the Site, the Navy has been guided by the NCP provisions pertaining to remedial actions. Section 300.430(a) (1)(ii)(A) of the NCP, 40 C.F.R. Section 300.340(a)(1)(ii)(A) provides that CERCLA NPL sites "should generally be remediated in operable units when early actions are necessary or appropriate to achieve significant risk reduction quickly, when phase analysis or response is necessary or appropriate given the size or complexity of the site, or to expedite the completion of the total cleanup." Site 11 is the second site at NSWC White Oak for which a ROD is being prepared.

No response action is necessary for soils at Site 11 to protect human health and the environment. Site 11 consists of subsurface soil and waste associated with leaching wells within the 100 Area of NSWC White Oak. Groundwater underlying and downgradient of Site 11 will be addressed under a subsequent ROD. Sediment contamination identified adjacent to Site 11 during prior investigations will be addressed during the further characterization of Site 47.

The Navy has prepared a contingency plan to address the possibility that leaching wells and or associated soils may be encountered during excavation activities. The contingency plan provides for investigations if the leaching wells are encountered to confirm that any leaching well and/or associated soils encountered do not present an unacceptable risk.

2.5 SITE CHARACTERISTICS

2.5.1 Physical Setting

The former NSWC-White Oak is located approximately five miles northeast of Washington, D.C., near the boundary between the Piedmont and Coastal Plain physiographic provinces. The facility lies in gently rolling terrain. The topographic expression of the area is typical of a deeply incised, dendritic stream channel pattern. Paint Branch and its tributaries dominate local drainage patterns.

The highest elevation of White Oak is approximately 398 feet above mean sea level. The lowest elevation is roughly 145 feet above mean sea level. The terrain of the western portion of the facility slopes generally eastward toward Paint Branch with about 3.5 percent grade. Similar grades are encountered in the eastern portion of the facility, but slopes are more generally southward or are locally influenced by proximity to Paint Branch and its tributary drainages. Near stream channels, the ground slopes increase to as much as 65 percent. Two west-east flowing, intermittent streams, located east of Site 11, flow into Paint Branch. One northwest-southeast flowing stream located at the western end of Site 11 discharges offsite and eventually flows into Paint Branch.

The surficial geology of Site 11 is illustrated in **Figure 2-2.** Generally, the Upland Sand and Gravel Formation exists in the central and southern regions of Site 11, and the saprolite of the Wissahickon Formation exists in the northern region. **Figures 2-3** and **2-4** represent subsurface cross sections of Site 11. A thin layer of the Upland Sand and Gravel thickens to the south and southeast and varies in thickness from 2 to 30 feet. It consists of brown silt and red-brown, fine to medium sand with some gravel. Clayey silt seams less than 1 foot thick and interbedded with fine gravel occur near the base of the unit. The saprolite of the Wissahickon Formation varies in thickness from 5 to 55 feet (and possibly greater). The saprolite grades from a micaceous silt or silty sand with varying amounts of clay and schist fragments to a severely weathered schist with relief texture. The competent bedrock is a wide gneiss and begins at approximately 23 to 47 feet below grade.

2.5.2 Conceptual Site Models

Figure 2-5 provides a conceptual site model (CSM) for human receptors. The CSM illustrates contaminant sources, release mechanisms, exposure pathways, migration routes, and potential receptors and provides a basis for the risk assessments summarized later in this ROD and, as a result, the basis for necessary response actions. In this case, the subsurface soil at Site 11 would be the source of contamination.

Human receptors under the current land use scenario (vacant industrial complex) and reasonably anticipated future land use scenarios include a full-time worker, maintenance/utility worker, construction workers, adult recreational user, adolescent trespasser, and daycare center child. Although residential use is not reasonably anticipated, future residential use was still evaluated to determine whether land use controls would be needed. Current and potential future land and resource uses are discussed further in Section 2.6. Potential risks to human health are identified in Section 2.7.1. Current and potential future land and resource uses are discussed further in Section 2.6. It is anticipated that the property will be nonresidential in the future.

Ecological receptors on the property would not be exposed to subsurface soil, the media addressed by this ROD.

2.5.3 Scoping of the Remedial Investigation

The leaching wells at Site 11 were used for liquid waste disposal into the subsurface soil until 1976. Original construction for each well consisted of an 8-foot diameter brick or concrete well, approximately 9 feet in depth. Each well was accessible through a 24-inch diameter manhole cover. One supply line transported wastewater to each well.

A geophysical survey was conducted to confirm the presence or absence of the leaching wells at site 11

that were not removed during the Removal Action conducted during the fall of 1996. Based on the results of the geophysical survey, suspected leaching well locations were confirmed in the field by excavation with a backhoe. Electromagnetic survey data were also collected to determine the presence or absence of leaching wells. Anomalies suspected to be leaching wells were further investigated by test pitting.

Subsurface soil samples collected for the DVSAP (HNUS, 1995a) were used in the RFI. Nine subsurface soil samples were collected and analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), metals, explosives, and miscellaneous parameters. Because the sources of contamination at Site 11 were the wastes that were disposed in the leaching wells, it was assumed that surface soils were not impacted; consequently, surface soil samples were not collected. Source removal activities were completed at Site 11 during 1996 to address contaminant sources that were potentially impacting groundwater. Subsurface soil sampling was performed to verify the removal of contamination. Data from these samples, presented in the Post-Removal Action Report (TtNUS, 2001), were used in the Human Health Risk Assessment Addendum to evaluate potential risk at Site 11 under existing conditions.

2.5.4 Nature and Extent of Contamination

In the subsurface soil that remains at Site 11 following the removal action, VOCs, SVOCs, and metals have been detected. No VOCs were detected at concentrations greater than the EPA Region 3 residential direct contact risk-based concentrations (RBC). Many were only detected in one of 46 samples. Benzo[a]pyrene was the only SVOC detected at a concentration greater than its RBC. Benzo[a]pyrene was detected at a concentration greater than its soil-to-groundwater screening level, but it was not detected in groundwater.

Maximum concentrations of several metals exceeded residential direct contact RBCs, but only cadmium, mercury, and silver were present at concentrations significantly greater than background.

2.5.5 Summary

A risk assessment for Site 11 was performed to evaluate potential risks for exposure to soil at the site. Potential receptors include full-time workers, maintenance/utility workers, construction workers, adult recreational users, adolescent trespassers, daycare center children, and hypothetical child and adult residents. The receptors were quantitatively evaluated for exposure to the existing soil by dermal contact and ingestion and qualitatively for exposure to air assumed to be impacted by emissions from soil.

The list of PCOCs for Site 11 soils includes the following:

- Benzo(a)pyrene
- Cadmium
- Mercury
- Silver.

Quantitative estimates of noncarcinogenic and carcinogenic risks [Hazard Indices (HIs) and incremental cancer risks (ICRs), respectively] were developed for the potential receptors.

The cumulative ICRs and HIs from exposure to subsurface soil for all receptors were less than the EPA target levels [i.e., ICRs were less than 1.0×10^{-4} for carcinogens and HIs were less than unity (one) for noncarcinogens].

In summary, no significant potential health hazards were found to be associated with exposure to subsurface soil at Site 11.

2.6 CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

The majority of the property occupied by Site 11 is open space with a large number of buildings and paved roads and parking areas. The GSA, which owns the property, has plans to use Site 11 for nonresidential

purposes. The buildings constructed as part of this development will be leased to the FDA. Nonetheless, for the purposes of the site assessment, the site was evaluated assuming the possibility of future residential use.

Groundwater known to contain contaminants released from Site 11 is not used as a potable water source at this time and there is no known plan to use the impacted groundwater. In addition, water for occupants of the former NSWC White Oak is (and is expected to continue to be) supplied by a local municipal water authority. A ROD will be developed for Site 11 groundwater in the future.

2.7 SUMMARY OF SITE RISKS

2.7.1 Summary of Human Health Risk Assessment

The baseline risk assessment estimates the risks the site would pose if no action were taken beyond the source removal already completed. It can provide the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by a remedial action. It can also be used to support the determination that no additional remedial action is necessary to protect human health, which is the case for soils at Site 11. This section of the ROD summarizes the results of the baseline risk assessment for Site 11. The risk assessment in the RI Report contains an evaluation of all potential chemicals of concern (PCOCs) and exposure pathways, including those that do not pose unacceptable risks to human health. PCOCs are those chemicals that are identified as a potential threat to human health and are evaluated further in the baseline risk assessment. COCs are a subset of the PCOCs that are identified in the RI as needing to be addressed by a response action. No COCs were identified for Site 11 soils; therefore, no action is warranted to protect human health. The following subsections summarize the risk assessment in the RI.

2.7.1.1 Potential Contaminants of Concern

The selection of PCOCs is a qualitative screening process that identifies those site related chemicals in the risk assessment that dominate overall potential risks. In this evaluation, a chemical was selected as a PCOC and retained for further risk evaluation if the maximum detected concentration exceeded the PCOC screening level and, for inorganics, if the chemical was determined to be present at concentrations above background. The PCOC screening levels are based on EPA Region 3 risk-based concentrations (RBCs) (EPA, 2001a) for residential land use and correspond to a systemic Hazard Quotient of 0.1 (for noncarcinogens) or a lifetime cancer risk of 1E-6 (for carcinogens). The Region 3 RBCs were developed using protective default exposure scenarios suggested by EPA (EPA, 1991) and the most current available reference doses and cancer slope factors (EPA, 2001b). PCOCs for soil are also identified using site-specific screening levels for transfers from soil to air, which have been developed using the EPA Soil Screening Guidance (EPA, 1996). The soil screening levels (SSLs) are used to screen out chemicals detected at insignificant concentrations and to justify the elimination of the inhalation exposure pathway, which consists of the generation of fugitive dust and volatile emissions. SSLs for migration from soil to groundwater developed by EPA Region (EPA, Region 3, September 2001) are not used for PCOC selection but are presented to evaluate the potential for migration of contaminants from soil to groundwater. Chemicals with concentrations exceeding the SSLs may potentially migrate from the soil to groundwater in sufficient quantities to pose concerns about groundwater quality.

Frequency of detection is used to exclude chemicals when data sets of 20 samples or greater are available. Generally, a detection rate of five percent or less justifies elimination of the chemical from further consideration provided that the concentrations detected are not representative of a "hot spot" area. Chemicals eliminated from further evaluation at this step are assumed to present minimal risks to potential human receptors.

The essential nutrients calcium, magnesium, potassium, and sodium are not identified as PCOCs. These inorganic chemicals are naturally abundant in environmental matrices and are only toxic at high doses.

Inorganic constituents found at concentrations indicative of background levels are not considered to be site-related contaminants and are not retained as PCOCs. Facility-specific background data are used to determine whether detected chemicals are present at naturally occurring levels. The chemical concentrations in soil and groundwater were compared to basewide background concentrations by the Wilcoxon Rank Sum

Test at the 80 percent confidence level. If the Wilcoxon test determined that the concentration of an inorganic constituent was significantly greater than background and the concentration was greater than its residential RBC, that chemical was retained as a PCOC. The inorganic chemicals in soil samples at Site 11 found to be within naturally occurring levels by the Wilcoxon Rank Sum Test were aluminum, arsenic, barium, chromium, cobalt, iron, lead, magnesium, manganese, nickel, potassium, selenium, thallium, vanadium, and zinc.

Chemicals eliminated from further evaluation at this step are assumed to present minimal risks to potential human receptors and are not considered further in the risk assessment.

PCOCs for subsurface soil are those chemicals reported at maximum concentrations greater than screening levels based on EPA Region 3 RBCs for residential soil ingestion, EPA generic SSLs for transfers from soil to air (inhalation), and basewide background levels for inorganics.

The following chemicals were retained as PCOCs in soils:

- Benzo[a]pyrene
- Cadmium
- Mercury
- Silver.

A summary of the PCOC selection process for subsurface soil is presented in **Table 2-1**.

2.7.1.2 Exposure Assessment

This section presents a summary of the exposure assessment in the RI Report. The exposure assessment defines and evaluates the type and magnitude of human exposure to the chemicals present at or migrating from a site. The exposure assessment is designed to depict the physical setting of the site, identify potentially exposed populations, and estimate chemical intakes under the identified exposure scenarios. Actual or potential exposures are based on the most likely pathways of contaminant release and transport, as well as human activity patterns. A complete exposure pathway has three components: a source of chemicals that can be released into the environment, a route of contaminant transport through an environmental medium, and an exposure or contact point for a human receptor.

A human health exposure assessment defines and evaluates, quantitatively or qualitatively, the type or magnitude of human exposure to PCOCs identified in environmental media at a site under investigation. The potential human receptors evaluated for exposure to soil at Site 11 include full-time workers, maintenance/utility workers, construction workers, adult recreational users, adolescent trespassers, daycare center children, and child and adult residents. These receptors may also be exposed to other environmental media, but for the purpose of this ROD, only risks associated with exposure to soils are being considered. Reasonable Maximum Exposure (RME) and Central Tendency Exposure (CTE) risk were evaluated for each receptor. The RME scenario represents the highest level of human exposure that could reasonably be expected to occur, and the CTE scenario portrays the average human exposure.

Pathway-specific information for these receptors, such as the values of exposure parameters used to quantify exposure, are presented in the RI. The values of the exposure parameters presented in these tables are identical to the values employed in the RFI, with the exception of the soil-to-skin adherence factors and dermal absorption factors used to evaluate risks for dermal contact with soil. The values of these factors have been updated to reflect recent EPA guidance provided in the Exposure Factors Handbook (EPA 1997).

The exposure point concentration (EPC), which is calculated for PCOCs only, is a reasonable maximum estimate of the chemical concentration that is likely to be contacted over time and is used to calculate estimated exposure intakes. The 95 percent upper confidence limit (UCL), which is based on the distribution of a data set, is considered to be the best estimate of the exposure concentration for data sets with 10 or more samples. The methodology for calculating the 95% UCLs is presented in the RFI. The 95 percent UCL is used as the EPC for soil . The EPCs for the chemicals identified as PCOCs in soil at Site 11 are presented in **Table 2-2**.

2.7.1.3 Toxicity Assessment

This section provides the methodologies and results for the characterization of the potential human health risks associated with the potential exposure to soil and groundwater at Site 11. The toxicity assessment identifies the potential adverse health effects in exposed populations. Toxicity values approved by EPA are used to characterize the potential risk.

The toxicity value used to evaluate carcinogenic effects is the cancer slope factor. The cancer slope factor is an upper-bound estimate of the probability of development of cancer over a lifetime based on a given dose. It is based on dose-response data from human and/or animal studies. **Table 2-3** provides carcinogenic risk information that is relevant to the PCOCs. At this time, slope factors are not available for the dermal route of exposure. Thus, the dermal slope factors used in the assessment have been extrapolated from oral values. An adjustment factor is sometimes applied, and is dependent upon how well the chemical is absorbed via the oral route. However, an adjustment for benzo[a]pyrene was not necessary.

The toxicity value used to evaluate noncarcinogenic effects is the reference dose. The reference dose 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. **Table 2-4** provides noncarcinogenic risk information that is relevant to the PCOCs. A reference dose is not available for benzo[a]pyrene. Also, references doses are not available for the dermal route of exposure. As was the case with the carcinogenic compounds, dermal reference doses can be extrapolated from the oral reference doses by applying an appropriate adjustment factor. Adjustments are particularly important for chemicals with less than 50% absorption via the ingestion route.

2.7.1.4 Risk Characterization

Quantitative estimates of risk are calculated using intake and toxicity values according to risk assessment methods outlined in current EPA guidance (EPA, 1989). Lifetime cancer risks are expressed in the form of dimensionless probabilities, referred to as ICRs, which are derived using published cancer slope factors (CSFs). Noncarcinogenic risk estimates are presented in the form of HQs that are derived using published reference doses (RfDs).

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

$$ICR = (CDI)/(SF)$$

where:

ICR = a unitless probability (e.g. 2×10^{-5}) of an individual's developing cancer

CDI = chronic daily intake averaged over 70 years (mg/kg-day)

SF = slope factor, expressed as $(mg/kg\text{-}day)^{-1}$.

These risks are probabilities that usually are expressed in scientific notation (e.g. 1×10^{-6}). An excess lifetime cancer risk of 1×10^{-6} indicates that an individual experiencing the reasonable maximum exposure estimate has a 1 in 1,000,000 chance of developing cancer as a result of site-related exposure. This is referred to as an "excess lifetime cancer risk" because it would be in addition to the risks of cancer individuals face from other causes such as smoking or overexposure to the sun. The chance of an individual's developing cancer from all other causes has been estimated to be as high as one in three.

In order to interpret the quantitative risks and to aid risk managers in determining the need for remediation at a site, quantitative risk estimates are compared to typical benchmarks. EPA has defined the range of 1×10^{-6} to 1×10^{-4} as the ICR "target range" for most hazardous waste facilities addressed under CERCLA. Cumulative

ICRs greater than $1x10^{-4}$ generally will indicate that some degree of remediation is required, and ICRs below $1x10^{-6}$ normally will not result in remedial efforts. Whenever ICRs fall between $1x10^{-4}$ and $1x10^{-6}$, decisions for remediation will be made on a case-specific basis. Individual chemicals contributing significantly to risks above the target range are considered to be chemicals of concern.

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

HQ = (Estimated Exposure Intake) / (RfD)

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

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

The calculations of the ICRs and HQs for all receptors and exposure routes are provided in the **Tables 2-5** to **2-20**.

2.7.1.5 Uncertainty Analysis

A significant uncertainty associated with the Site 11 soils risk assessment is that, it assumed future residents, full-time workers, recreational users, trespassers, and daycare center children would be exposed to subsurface soil. This assumption tends to overestimate potential risks for these receptors because it is unlikely that they would be exposed to subsurface soil in the course of their normal anticipated activities at the site. This scenario also assumes subsurface soil would be brought to the surface in some future excavation project and be regularly contacted by these receptors. If subsurface soil were brought to the surface, it is likely that it would be mixed with surface soil (which has not been impacted by site activities) and the contaminant concentrations in subsurface soil would likely be reduced by mixing with surface soil. For these reasons (i.e., the low potential for exposure and the likelihood of lower concentrations), the calculated risks are likely to be overestimated.

2.7.1.6 Assessment of Risk from Exposure to Subsurface Soils

This section summarizes of the results of the risk characterization for Site 11 soils.

Estimated HIs from exposure to subsurface soils at Site 11 under the RME and CTE exposure conditions are summarized below and presented in **Tables 2-21** and **2-22**, respectively. The cumulative HIs (the sum of HQs for each COPC) for all receptors are less than the EPA target of unity (one) for noncarcinogenic health effects. Therefore, no adverse noncarcinogenic health effects are expected from exposure to subsurface soils at Site 11 under the RME and CTE exposure conditions specified in the RI and Site 11 HHRA.

Hazard Index
Cumulative Risk Summary – Reasonable Maximum Exposure

	Full Time Worker	Maintenance/ Utility Worker	Construction Worker	Adult Recreational User	Adolescent Trespasser	Day Care Center Child	Adult Resident	Child Resident
Total Risk	0.0081	0.0012	0.025	0.00075	0.0029	0.041	0.011	0.099

Hazard Index
Cumulative Risk Summary – Central Tendency Exposure

	Full Time Worker	Maintenance/ Utility Worker	Construction Worker	Adult Recreational User	Adolescent Trespasser	Day Care Center Child	Adult Resident	Child Resident
Total Risk	0.0031	0.00029	0.012	0.00013	0.00063	0.015	0.0034	0.031

Estimated cancer risks (ICRs) from exposure to subsurface soils at Site 11 under the RME and CTE exposure conditions are summarized below and presented in **Tables 2-23** and **2-24**, respectively. For the RME, the cumulative cancer risks for workers, recreational users, and trespassers are less than $1.0x10^{-6}$. The risk calculated for the daycare center child is $1.0x10^{-6}$ and the total residential risk (adult + child) is $2.7x10^{-6}$. For the CTE, potential risks for all receptors are less than $1.0x10^{-6}$. Risks for the RME and CTE scenarios are two to three orders of magnitude less than $1.0x10^{-4}$, the point that generally triggers the need for remediation.

Incremental Cancer Risk
Cumulative Risk Summary – Reasonable Maximum Exposure

	Full Time Worker	Maintenance/ Utility Worker	Construction Worker	Adult Recreational User	Adolescent Trespasser	Day Care Center Child	Adult Resident	Child Resident
Total Risk	7.1×10^{-7}	1.2×10^{-7}	6.7×10^{-8}	1.3×10^{-7}	1.2×10^{-7}	1.0×10^{-6}	9.5×10^{-7}	1.8×10^{-6}

Incremental Cancer Risk
Cumulative Risk Summary – Central Tendency Exposure

	Full Time Worker	Maintenance/ Utility Worker	Construction Worker	Adult Recreational User	Adolescent Trespasser	Day Care Center Child	Adult Resident	Child Resident
Total Risk	7.1×10^{-8}	9.2×10^{-9}	3.1×10^{-8}	4.3×10^{-9}	1.6×10^{-8}	1.3×10^{-7}	6.3×10^{-8}	1.6×10^{-7}

2.7.1.7 Conclusions of Human Health Risk Assessment

The risk assessment for Site 11 soils was performed to evaluate potential risks for exposure to soil at the site. Potential receptors considered include full-time workers, maintenance/utility workers, construction workers, adult recreational users, adolescent trespassers, daycare center children, and hypothetical child and adult residents. The receptors were quantitatively evaluated for exposure to soil by dermal contact and ingestion and qualitatively for exposure to air assumed to be impacted by emissions from soil.

The list of PCOCs for Site 11 soils includes the following:

- Benzo[a]pyrene
- Cadmium
- Mercury
- Silver

Quantitative estimates of noncarcinogenic and carcinogenic risks (HIs and ICRs, respectively) were developed for the potential receptors.

The cumulative ICRs and HIs from exposure to soils for all receptors were less than the EPA target levels [i.e., ICRs were less than $1.0x10^{-4}$ for carcinogens and HIs were less than unity (one) for noncarcinogens].

In summary, no significant potential health hazards were found to be associated with exposure to soil at Site 11.

2.7.2 Summary of Ecological Risk Assessment

The focus of the investigation at Site 11 was on subsurface soils because the industrial wastewater was discharged via subsurface piping to the wells beneath the ground surface, and surface soils were not impacted. Ecological receptors would primarily be impacted by exposure to soils at the ground surface to a depth of two feet. Based on this information and RFI data, the Navy has concluded that Site 11 soils are not adversely impacting ecological receptors.

2.8 SELECTED REMEDY

The results of the risk assessment conducted as part of the RI indicate that, based on available information, soils associated with Site 11 do not present unacceptable risk to human health and the environment. In this case, the Navy, with the support of the EPA, selects a remedy of no further action. There are no costs associated with this remedy. Based on available information, the Navy and EPA believe that this remedy will be protective of human health and the environment and is cost effective.

2.9 DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for Site 11 soils at the former NSWC White Oak, Silver Spring, Maryland was released for public comment on January 25, 2002. The Proposed Plan identified no further action as the preferred alternative. The Navy reviewed all comments received during the public comment period. It was determined that no significant changes to the remedy, as originally identified in the Proposed Plan, were necessary or appropriate.

During the continuing groundwater investigation at Site 11 in May 2002, two of the leaching wells were located and subsurface soil samples were collected. One well, 11LW14, was much smaller than the general design plans had indicated (the well was three feet deep by four feet square). The May 2002 investigation determined that the earlier subsurface soil sampling was performed at the location now known to be 11LW10. The information from these leaching wells will be used in the assessment of the potential contamination in Site 11 groundwater.

3.0 RESPONSIVENESS SUMMARY

3.1 OVERVIEW

This Responsiveness Summary provides a summary of comments received during the public comment period for Site 11 soils, along with responses to those comments. The public comment period for the proposed remedy for Site 11 soils began on January 25, 2002 and ended on February 25, 2002. A public meeting was held on February 6, 2002 at the former NSWC White Oak, Silver Spring, Maryland to describe the proposed remedy and to solicit and accept either written comments or verbal comments. This Responsiveness Summary was prepared in accordance with guidance in "Community Relations in Superfund: A Handbook" (OSWER Directive 9320.3B, January 1992).

3.2 BACKGROUND ON COMMUNITY INVOLVEMENT

The Navy has had a comprehensive community relations program for NSWC White Oak since research activities commenced at the Base. Recent community relations activities have been conducted in accordance with the NSWC White Oak Community Relations Plan, originally developed in 1991 and revised in 1998 and 2000. These activities have included regular technical and Restoration Advisory Board (RAB) meetings with local officials, the distribution of fact sheets, site tours for the community, the establishment of the information repository at the local library, and the development of a web-page for the dissemination of information to the White Oak community.

The Navy organized a Technical Review Committee (TRC) in 1989 to review and discuss the NSWC White Oak environmental issues with local community officials and concerned citizens. The TRC was reorganized into the RAB in 1995. The RAB consists of representatives of the Navy, EPA, MDE, the Prince George's County Health Department, Maryland-National Park and Planning Commission, and members of the community. The RAB has met frequently since its inception and now meets quarterly. The RAB has been assisting in the planning and review of environmental investigation, remedial alternative evaluation, and remediation activities. The RI and Proposed Plan for Site 11 soils were discussed at the RAB meetings.

RAB meeting minutes and reports presenting the findings of the investigations are maintained at the local information repository. The repository is located at the Montgomery County Public Library, White Oak Branch, located at 11701 New Hampshire Avenue, New Hampshire Avenue, Silver Spring, Maryland. The Administrative Record for NSWC White Oak is located at the Engineering Field Activity Chesapeake, Washington Navy Yard, 1314 Harwood Street, S.E, Washington, District of Columbia.

Community relations activities for the final selected remedy include the items below:

- The documents concerning the investigation and analysis of Site 11 soils were presented at the RAB meetings and copies were provided to RAB members for review, discussion, and comment.
- The documents concerning the investigation and analysis of Site 11 soils, as well as copies of the Proposed Plan, were placed in the information repository.
- The Navy mailed copies of the Proposed Plan to members of the RAB.
- Newspaper announcements on the availability of documents and the public meeting and comment period were published in the *PG Journal, Montgomery Journal, Burtonsville Gazette, College Park Gazette,* and *Silver Spring Gazette.*
- The Navy established a 30-day public comment period for this Proposed Plan starting January 25, 2001 and ending February 25, 2002.
- A public meeting was held on February 6, 2002 to present the Proposed Plan and to answer questions concerning Site 11 soils.

3.3 SUMMARY OF COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND NAVY RESPONSES

One comment letter was received from a community group that supported the No Further Action decision. The letter is included as Appendix A.

No other formal comments were received during the public comment period. Questions were received during the public meeting of February 6, 2002. A summary of the questions and responses provided at the meeting are listed below.

The Navy and the EPA have taken the comments received at the public meeting into consideration and continue to believe that the no-further-action alternative adequately and appropriately addresses Site 11 soils in a cost-effective and responsible manner.

Comments received during public meeting

Did the amount of excavation vary with the five wells that were removed?

Yes, the amount that was excavated varied with the nature and volume of waste in each well.

Was the verification sampling protocol similar to that at Site 8?

Yes.

The wells that have not been found may have been removed during construction, but what was the manner of the investigation conducted to try to find these wells?

A significant effort was made to find these wells, in the form of review of historical drawings, electromagnetic (EM) surveys, geophysical surveys, test pits, and soil borings.

Are construction workers currently working on site aware that wells may still be present on site?

The Navy has dealt with the possibility that wells may be encountered during demolition activities by implementing a contingency plan. This contingency plan, which includes a map of likely locations of any wells, has been given to GSA and the contractors.

How did the on-site buildings connect to the leaching wells?

Sink and floor drains in the building led through terra cotta piping to the wells.

LIST OF ACRONYMS

AOC	Area of Concern
BRAC	Base Realignment and Closure
B&R Environmental	Brown & Root Environmental
CDI	Chronic Daily Intake
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERFA	Community Environmental Response Facilitation Act
CMS	Corrective Measures Study
COCs	Chemicals of Concern
CSFs	Cancer Slope Factors
CSM	Conceptual Site Model
CTE	Central Tendency Exposure
DOD	Department of Defense
DVSAP	Design Verification Sampling and Analysis Plan
EA	EA Engineering Science and Technology
EBS	Environmental Baseline Survey
EFACHES	Engineering Field Activity Chesapeake
EIS	Environmental Impact Statement
EPA	United States Environmental Protection Agency
EPC	Exposure Point Concentration
ERA	Ecological Risk Assessment
FDA	United States Food and Drug Administration
FS	Feasibility Study
GSA	General Services Administration
HI	Hazard Index
HNUS	Halliburton NUS Corporation
HSWA	Hazardous and Solid Waste Amendments
HQ	Hazard Quotient
IAS	Initial Assessment Study
ICR	Incremental Cancer Risk
IM	Interim Measures
IRP	Installation Restoration Program
MDE	Maryland Department of the Environment
Navy	Department of the Navy
NCP	National Oil and Hazardous Substances Pollution Contingency Plan (NCP)
NEESA	Naval Energy and Environmental Support Activity
NPL	National Priorities List

NSWC	Naval Surface Warfare Center
PCBs	Polychlorinated Biphenyls
PCOCs	Potential Chemicals of Concern
RAB	Remedial Action Board
RBCs	Risk-Based Concentrations
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RfDs	Reference Doses
RFI	RCRA Remedial Feasibility Investigation
RI	Remedial Investigation
RME	Reasonable Maximum Exposure
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SERA	Screening-Level Ecological Risk Assessment
SSLs	Soil Screening Levels
SVOCs	Semivolatile Organic Compounds
SWMU	Solid Waste Management Unit
TCE	Trichloroethene
TRC	Technical Review Committee
TSDF	Treatment, Storage, and Disposal Facility
TtNUS	Tetra Tech NUS, Inc.
UCL	95% Upper Confidence Limit of the Mean
USACOE	U.S. Army Corps of Engineers
VOCs	Volatile Organic Compounds

TABLE 2-1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN
SITE 11 - INDUSTRIAL WASTEWATER DISPOSAL AREA 100
FORMER NSWC - WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Subsurface Soil

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects[1]	Concentration Used for Screening[2]	Background Value[3]	Risk-Based PCOC Screening Level[4]		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection[5]
75-35-4	1,1-Dichloroethene	0.002	J	0.002	J	mg/kg	DL12-11-01	1/46	0.00575 - 0.012	0.002	NA	1.1	C	0.07 0.000018	SSL-INH SSL-MIGR	No	BSL, FREQ
78-93-3	2-Butanone	0.003	J	0.003	J	mg/kg	11-SB11-1214	1/46	0.00575 - 0.012	0.003	NA	4700	N	NA 0.4	SSL-INH SSL-MIGR	No	BSL, FREQ
108-10-1	4-Methyl-2-pentanone	0.006	J	0.006	J	mg/kg	DL12-11-04	1/45	0.011 - 0.028	0.006	NA	630	N	NA 0.065	SSL-INH SSL-MIGR	No	BSL, FREQ
67-64-1	Acetone	0.0585		0.21	J	mg/kg	11-SB10-1012	4/46	0.011 - 0.028	0.21	NA	780	N	100000 0.12	SSL-INH SSL-MIGR	No	BSL
71-43-2	Benzene	0.007	J	0.007	J	mg/kg	11-SB10-1012	1/46	0.00575 - 0.012	0.007	NA	12	C	0.8 0.00009	SSL-INH SSL-MIGR	No	BSL, FREQ
75-15-0	Carbon disulfide	0.00164	J	0.0147		mg/kg	LW12-11-12	4/46	0.00575 - 0.012	0.0147	NA	780	N	720 0.95	SSL-INH SSL-MIGR	No	BSL
108-90-7	Chlorobenzene	0.011	J	0.011	J	mg/kg	11-SB10-1012	1/46	0.00575 - 0.012	0.011	NA	160	N	130 0.04	SSL-INH SSL-MIGR	No	BSL, FREQ
100-41-4	Ethylbenzene	0.001	J	0.02	J	mg/kg	11-SB10-1012	3/46	0.00575 - 0.012	0.02	NA	780	N	400 0.75	SSL-INH SSL-MIGR	No	BSL
75-09-2	Methylene chloride	0.00989		0.0124		mg/kg	DL01-11-03R	2/46	0.00241 - 0.013	0.0124	NA	85	C	13 0.00095	SSL-INH SSL-MIGR	No	BSL, FREQ
127-18-4	Tetrachloroethene (PCE)	0.001	J	0.001	J	mg/kg	DL12-11-01	1/46	0.00575 - 0.012	0.001	NA	12	C	11 0.0024	SSL-INH SSL-MIGR	No	BSL, FREQ
108-88-3	Toluene	0.003	J	0.003	J	mg/kg	11-SB10-1012	1/46	0.00575 - 0.012	0.003	NA	1600	N	650 0.44	SSL-INH SSL-MIGR	No	BSL, FREQ
79-01-6	Trichloroethene (TCE)	0.031		0.031		mg/kg	LW5-11-01	1/46	0.00575 - 0.012	0.031	NA	58	C	5 0.00077	SSL-INH SSL-MIGR	No	BSL, FREQ
75-69-4	Trichlorofluoromethane	0.002	J	0.002	J	mg/kg	DL12-11-01	1/36	0.00575 - 0.008	0.002	NA	2300	N	NA 1.1	SSL-INH SSL-MIGR	No	BSL, FREQ
1330-20-7	Xylenes	0.003	J	0.13	J	mg/kg	11-SB10-1012	3/46	0.00575 - 0.012	0.13	NA	16000	N	410 8.5	SSL-INH SSL-MIGR	No	BSL
83-32-9	Acenapthene	0.051	J	0.051	J	mg/kg	DL01-11-02R	1/46	0.37 - 0.508	0.051	NA	470	N	NA 5.2	SSL-INH SSL-MIGR	No	BSL, FREQ
56-55-3	Benzo(a)anthracene	0.043	J	0.18	J	mg/kg	DL01-11-02R	5/46	0.37 - 0.508	0.18	NA	0.87	C	NA 0.073	SSL-INH SSL-MIGR	No	BSL
50-32-8	Benzo(a)pyrene	0.047	J	0.22		mg/kg	LW13-11-01	6/46	0.1 - 0.508	0.22	NA	0.087	C	NA 0.019	SSL-INH SSL-MIGR	Yes	ASL
205-99-2	Benzo(b)fluoranthene	0.043	J	0.18	J	mg/kg	LW13-11-01	5/46	0.37 - 0.508	0.18	NA	0.87	C	NA 0.23	SSL-INH SSL-MIGR	No	BSL
129-00-0	Benzo(g,h,i)perylene	0.086	J	0.086	J	mg/kg	DL01-11-02R	1/46	0.37 - 0.508	0.086	NA	230(6)	N	NA 34(6)	SSL-INH SSL-MIGR	No	BSL, FREQ
207-08-9	Benzo(k)fluoranthene	0.045	J	0.19	J	mg/kg	LW13-11-01	3/46	0.048 - 0.508	0.19	NA	8.7	C	NA 2.3	SSL-INH SSL-MIGR	No	BSL
117-81-7	bis(2-Ethylhexyl)phthalate	0.043	J	0.34	J	mg/kg	11-SB10-1012	13/46	0.37 - 0.508	0.34	NA	46	C	31000 140	SSL-INH SSL-MIGR	No	BSL
218-01-9	Chrysene	0.046	J	0.22	J	mg/kg	LW13-11-01	7/46	0.37 - 0.508	0.22	NA	87	C	NA 7.3	SSL-INH SSL-MIGR	No	BSL

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SITE 11 - INDUSTRIAL WASTEWATER DISPOSAL AREA 100
FORMER NSWC - WHITE OAK, SILVER SPRING, MARYLAND
PAGE 2 OF 3

Scenario Timeframe: Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Subsurface Soil

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects[1]	Concentration Used for Screening[2]	Background Value[3]	Risk-Based PCOC Screening Level[4]		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection[5]
84-74-2	di-n-Butylphthalate	0.042	J	0.055	J	mg/kg	DL12-11-01	2/46	0.37 - 0.508	0.055	NA	780	N	2300 250	SSL-INH SSL-MIGR	No	BSL, FREQ
206-44-0	Fluoranthene	0.065	J	0.46		mg/kg	DL01-11-02R	6/46	0.37 - 0.508	0.46	NA	310	N	NA 310	SSL-INH SSL-MIGR	No	BSL
86-73-7	Fluorene	0.043	J	0.054	J	mg/kg	DL01-11-02R	2/46	0.37 - 0.508	0.054	NA	310	N	NA 6.8	SSL-INH SSL-MIGR	No	BSL, FREQ
118-74-1	Hexachlorobenzene	0.19	J	0.19	J	mg/kg	11-SB10-1012	1/46	0.37 - 0.508	0.19	NA	0.4	C	1 0.0026	SSL-INH SSL-MIGR	No	BSL, FREQ
193-39-5	Indeno(1,2,3-cd)pyrene	0.081	J	0.081	J	mg/kg	DL01-11-02R	1/46	0.37 - 0.508	0.081	NA	0.87	C	NA 1.1	SSL-INH SSL-MIGR	No	BSL, FREQ
129-00-0	Phenanthrene	0.046	J	0.44	J	mg/kg	DL01-11-02R	7/46	0.37 - 0.508	0.44	NA	230(6)	N	NA 34(6)	SSL-INH SSL-MIGR	No	BSL
129-00-0	Pyrene	0.046	J	0.48		mg/kg	LW13-11-01	12/46	0.049 - 0.508	0.48	NA	230	N	NA 34	SSL-INH SSL-MIGR	No	BSL
7429-90-5	Aluminum	1340		29000		mg/kg	DL12-11-07	46/46	---	29000	NA	7800	N	NA NA	SSL-INH SSL-MIGR	No	BKG
7440-36-0	Antimony	0.245		1.6	L	mg/kg	11-SB10-1012	13/46	0.186 - 2.94	1.6	NA	3.1	N	NA 0.66	SSL-INH SSL-MIGR	No	BSL
7440-38-2	Arsenic	0.5	L	12.5		mg/kg	DL12-11-03	39/46	0.19 - 0.789	12.5	NA	0.43	C	750 0.0013	SSL-INH SSL-MIGR	No	BKG
7440-39-3	Barium	2.5	L	453		mg/kg	DL12-11-09	44/46	1 - 2.1	453	NA	550	N	690000 110	SSL-INH SSL-MIGR	No	BSL,BKG
7440-41-7	Beryllium	0.131		1.34		mg/kg	LW12-11-12	39/46	0.07 - 0.82	1.34	NA	16	N	1300 58	SSL-INH SSL-MIGR	No	BSL
7440-43-9	Cadmium	0.074		25.8	L	mg/kg	11-SB10-1012	34/46	0.058 - 1.3	25.8	NA	3.9	N	1800 1.4	SSL-INH SSL-MIGR	Yes	ASL
7440-70-2	Calcium	99.2		98200		mg/kg	DL01-11-02R	45/46	41	98200	NA	NA		NA NA	SSL-INH SSL-MIGR	No	NUT
18540-29-9	Chromium	1.1	L	62.7		mg/kg	DL12-11-04	46/46	---	62.7	NA	23(7)	N	270 2.1	SSL-INH SSL-MIGR	No	BKG
7440-48-4	Cobalt	0.133		19.2		mg/kg	11-SB01-1416	37/46	0.12 - 4.2	19.2	NA	160	N	NA NA	SSL-INH SSL-MIGR	No	BSL,BKG
7440-50-8	Copper	5.11		121		mg/kg	11-SB10-1012	45/46	1.5	121	NA	310	N	NA 530	SSL-INH SSL-MIGR	No	BSL
7439-89-6	Iron	2520		63800		mg/kg	11-SB01-1416	46/46	---	63800	NA	2300	N	NA NA	SSL-INH SSL-MIGR	No	BKG
7439-92-1	Lead	2.31		285		mg/kg	LW5-11-03	46/46	---	285	NA	400(8)		NA NA	SSL-INH SSL-MIGR	No	BSL,BKG
7439-95-4	Magnesium	51.7		58800		mg/kg	DL01-11-02R	44/46	6 - 12.4	58800	NA	NA		NA NA	SSL-INH SSL-MIGR	No	NUT, BKG
7439-96-5	Manganese	9.6		511		mg/kg	LW13-11-05	45/46	2.2	511	NA	160(9)	N	NA 48	SSL-INH SSL-MIGR	No	BKG

TABLE 2-1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF POTENTIAL CONSTITUENTS OF CONCERN
SITE 11 - INDUSTRIAL WASTEWATER DISPOSAL AREA 100
FORMER NSWC - WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Subsurface Soil

CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Nondetects[1]	Concentration Used for Screening[2]	Background Value[3]	Risk-Based PCOC Screening Level[4]		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection[5]
7439-97-6	Mercury	0.05		4.04		mg/kg	DL12-11-04	37/46	0.052 - 0.061	4.04	NA	2.3(10)	N	NA NA	SSL-INH SSL-MIGR	Yes	ASL
7440-02-0	Nickel	0.472		19.3		mg/kg	11-SB01-1416	39/46	1.5 - 5.9	19.3	NA	160	N	13000 7	SSL-INH SSL-MIGR	No	BSL,BKG
7440-09-7	Potassium	104		2050		mg/kg	11-SB01-1416	42/46	18 - 62.2	2050	NA	NA		NA NA	SSL-INH SSL-MIGR	No	NUT, BKG
7782-49-2	Selenium	0.287		1.84		mg/kg	LW4-11-03	23/43	0.245 - 0.908	1.84	NA	39	N	NA 0.95	SSL-INH SSL-MIGR	No	BSL,BKG
7440-22-4	Silver	0.254		57.3		mg/kg	LW5-11-03	22/46	0.072 - 0.748	57.3	NA	39	N	NA 1.6	SSL-INH SSL-MIGR	Yes	ASL
7440-23-5	Sodium	21.9		512		mg/kg	LW12-11-11	28/46	17.5 - 134	512	NA			NA NA	SSL-INH SSL-MIGR	No	NUT
7440-28-0	Thallium	0.29		0.807		mg/kg	DL12-11-09	6/46	0.24 - 1.78	0.807	NA	0.55	N	NA 0.18	SSL-INH SSL-MIGR	No	BKG
7440-62-2	Vanadium	2.93		84.1		mg/kg	DL12-11-03	45/46	1.7	84.1	NA	55	N	NA 260	SSL-INH SSL-MIGR	No	BKG
7440-66-6	Zinc	4.88		200	L	mg/kg	11-SB10-1012	44/46	3.4 - 10.2	200	NA	2300	N	NA 680	SSL-INH SSL-MIGR	No	BSL,BKG

Footnotes:
1 Values presented are sample-specific quantitation limits.
2 The maximum detected concentration is used for screening purposes.
3 To determine whether metal concentrations are within background levels, a comparison of site concentrations with Base-wide background data was made by means of the Wilcoxon Rank Sum Test. If the Wilcoxon Test determined that a constituent concentration was not significanty different from background, that chemical was not selected as a PCOC.
4 The risk-based soil COPC screening level for residential land use is presented. The value is based on a target hazard quotient of 0.1 for noncarcinogens (denoted with a "N" flag) or an incremental cancer risk of 1E-6 for carcinogens (denoted with a "C" flag) (USEPA, Region III, September, 2001).
5 The chemical is selected as a PCOC if the maximum detected concentration exceeds the risk-based PCOC screening level.
6 Pyrene is used as a surrogate for benzo(g,h,i)perylene and phenanthrene.
7 Hexavalent Chromium.
8 OSWER soil screening level for residential land use (USEPA, July 1994).
9 Manganese-Nonfood.
10 Mercury as Mercuric Chloride.

Associated Samples:

LW12-11-08	DL12-11-01	LW4-11-01D	DL01-11-02R	11-SB01-1416
LW12-11-09	DL12-11-02	LW4-11-02	DL01-11-03R	11-LW-03
LW12-11-10	DL12-11-03	LW4-11-03	DL01-11-04R	11-SB05-1416
LW12-11-11	DL12-11-04	LW4-11-04	LW02-11-01	11-LW-06
LW12-11-12	DL12-11-05	LW4-11-05	LW02-11-02	11-SB07-0607
LW13-11-01	DL12-11-06	LW5-11-01	LW02-11-03	11-SB08-1416
LW13-11-02	DL12-11-07	LW5-11-02	LW02-11-04	11-SB09-1416
LW13-11-03	DL12-11-08	LW5-11-03	LW02-11-05	11-SB10-1012
LW13-11-04	DL12-11-09	LW5-11-04		11-SB11-1214
LW13-11-05	LW4-11-01	LW5-11-05		

Definitions:
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
J = Estimated Value
K = Value Estimated with a High Bias
L = Value Estimated with a Low Bias
N = Noncarcinogen
NA = Not Applicable/Not Available.
PCOC = Potential Constituent of Concern
SSL-INH = Soil Screening Level for transfers from soil to air (inhalation) (USEPA, May 1996)
SSL-MIGR = Soil Screening Level for migration from soil to groundwater, Dilution and Attenuation Factor (DAF) of 1 (USEPA Region 3, September 2001)

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

For Elimination as a PCOC:
BKG = Within background levels
BSL = Below PCOC Screening Level
FREQ = chemical detected in less than 5 percent of the samples
NUT = Essential Nutrient

TABLE 2-2
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
SITE 11 - INDUSTRIAL WASTEWATER DISPOSAL AREA 100
FORMER NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Current / Future
Medium: Soil
Exposure Medium: Subsurface Soil
Exposure Point: Surbsurface Soil

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)pyrene	mg/kg	1.20E-01	NA	2.20E-01		mg/kg	1.52E-01	95% UCL-T	W - Test (1)	1.52E-01	95% UCL-T	W - Test (1)
Cadmium	mg/kg	9.90E-01	NA	2.68E+01	L	mg/kg	9.73E-01	95% UCL-T	W - Test (1)	9.73E-01	95% UCL-T	W - Test (1)
Mercury	mg/kg	4.90E-01	NA	4.04E+00		mg/kg	8.45E-01	95% UCL-T	W - Test (1)	8.45E-01	95% UCL-T	W - Test (1)
Silver	mg/kg	3.08E+00	NA	5.73E+01		mg/kg	1.18E+01	95% UCL-T	W - Test (1)	1.18E+01	95% UCL-T	W - Test (1)

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

(1) Data were undefined (i.e., Shapiro-Wilk W Test indicates data are neither normally nor lognormally distributed). Therefore, as per the Workplan (TtNUS, August 1998), the data are assumed to be lognormally distributed.

TABLE 2-3
CANCER TOXICITY DATA – ORAL/DERMAL
SITE 11 - INDUSTRIAL WASTEWATER DISPOSAL AREA 100
FORMER NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Chemical of Potential Concern	Oral CSF	Oral to Dermal Adjustment Factor(1)	Adjusted Dermal Cancer Slope Factor(2)	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date(3)
Benzo(a)pyrene	7.3E+00	1	7.30E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	9/25/2001

(1) USEPA, 2000
(2) CSFdermal = CSForal/(Oral to Dermal Adjustment Factor)
(3) Dates of IRIS, HEAST, or NCEA.

Notes:
CSF = Cancer Slope Factor
IRIS = Integrated Risk Information System, on-line database search (USEPA, accesse

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

TABLE 2-4
NON-CANCER TOXICITY DATA – ORAL/DERMAL
SITE 11 - INDUSTRIAL WASTEWATER DISPOSAL AREA 100
FORMER NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD	Oral RfD Units	Oral to Dermal Adjustment Factor[1]	Adjusted Dermal RfD[2]	Dermal RfD Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ[3]
Cadmium	chronic	5.0E-04	mg/kg-day	0.025	1.25E-05	mg/kg-day	Kidney	10	IRIS	09/25/01
Mercury	chronic	3.0E-04	mg/kg-day	0.07	2.10E-05	mg/kg-day	CNS	1,000	IRIS	09/25/01
Silver	chronic	5.0E-03	mg/kg-day	0.04	2.00E-04	mg/kg-day	Argyria	3	IRIS	09/25/01

(1) USEPA, 2000
(2) RfD dermal = RfDoral x (Oral to Dermal Adjustment Factor)
(3) Dates of IRIS, HEAST, or NCEA
(4) Developed by USEPA Region III based weighted average of RfDs of thallium compounds listed in IRIS.

Notes: RfD = Reference dose
CNS = Central Nervous System
IRIS = Integrated Risk Information System, on-line database search (USEPA, accessed online)
HEAST = Health Effects Assessment Summary Tables (USEPA, July 1997)
NA = Not applicable since an oral RfD is not available for this compound data
NOAEL = No Observed Adverse Effect Level

TABLE 2-5

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - FULL TIME WORKER - SUBSURFACE SOIL - RME

SITE 11 - INDUSTRIAL WASTEWATER DISPOSAL AREA 100

FORMER NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Full Time Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Subsurface Soil	Benzo(a)pyrene	3.9E-07		3.2E-07	7.1E-07	Benzo(a)pyrene					
			Cadmium					Cadmium	Kidney	1.9E-03		4.8E-04	2.4E-03
			Mercury					Mercury	CNS	2.8E-03		2.5E-04	3.0E-03
			Silver					Silver	Argyria	2.3E-03		3.6E-04	2.7E-03
						Total Risk Across Surface Soil	7.1E-07					Total Hazard Index Across All Media and All Exposure Routes	8.1E-03

Total Kidney HI =	2.4E-03
Total CNS HI =	3.0E-03
Total Argyria HI =	2.7E-03

TABLE 2-6
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - FULL TIME WORKER - SUBSURFACE SOIL - CTE
SITE 11 - INDUSTRIAL WASTEWATER DISPOSAL AREA 100
FORMER NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Full Time Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Subsurface Soil	Benzo(a)pyrene	6.1E-08		1.0E-08	7.1E-08	Benzo(a)pyrene					
			Cadmium					Cadmium	Kidney	8.3E-04		4.2E-05	8.8E-04
			Mercury					Mercury	CNS	1.2E-03		2.2E-05	1.2E-03
			Silver					Silver	Argyria	1.0E-03		3.2E-05	1.0E-03
						Total Risk Across Surface Soil	7.1E-08					Total Hazard Index Across All Media and All Exposure Routes	3.1E-03

Total Kidney HI =	8.8E-04
Total CNS HI =	1.2E-03
Total Argyria HI =	1.0E-03

TABLE 2-7

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - MAINTENANCE / UTILITY WORKER - SUBSURFACE SOIL - RME

SITE 11 - INDUSTRIAL WASTEWATER DISPOSAL AREA 100

FORMER NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Subsurface Soil	Benzo(a)pyrene	5.6E-08		6.9E-08	1.2E-07	Benzo(a)pyrene					
			Cadmium					Cadmium	Kidney	2.7E-04		1.0E-04	3.8E-04
			Mercury					Mercury	CNS	4.0E-04		5.4E-05	4.5E-04
			Silver					Silver	Argyria	3.3E-04		7.9E-05	4.1E-04
						Total Risk Across Surface Soil	1.2E-07					Total Hazard Index Across All Media and All Exposure Routes	1.2E-03

Total Kidney HI =	3.8E-04
Total CNS HI =	4.5E-04
Total Argyria HI =	4.1E-04

TABLE 2-8
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - MAINTENANCE / UTILITY WORKER - SUBSURFACE SOIL - CTE
SITE 11 - INDUSTRIAL WASTEWATER DISPOSAL AREA 100
FORMER NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Maintenance / Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Subsurface Soil	Benzo(a)pyrene	5.0E-09		4.1E-09	9.2E-09	Benzo(a)pyrene					
			Cadmium					Cadmium	Kidney	6.8E-05		1.7E-05	8.6E-05
			Mercury					Mercury	CNS	9.9E-05		9.0E-08	1.1E-04
			Silver					Silver	Argyria	8.3E-05		1.3E-05	9.6E-05
						Total Risk Across Surface Soil	9.2E-09					Total Hazard Index Across All Media and All Exposure Routes	2.9E-04

Total Kidney HI =	8.6E-05
Total CNS HI =	1.1E-04
Total Argyria HI =	9.6E-05

TABLE 2-9
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CONSTRUCTION WORKER - SUBSURFACE SOIL - RME
SITE 11 - INDUSTRIAL WASTEWATER DISPOSAL AREA 100
FORMER NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Subsurface Soil	Benzo(a)pyrene	5.4E-08		1.4E-08	6.7E-08	Benzo(a)pyrene					
			Cadmium					Cadmium	Kidney	6.6E-03		5.2E-04	7.1E-03
			Mercury					Mercury	CNS	9.5E-03		2.7E-04	9.8E-03
			Silver					Silver	Argyria	8.0E-03		3.9E-04	8.4E-03
						Total Risk Across Surface Soil	6.7E-08					Total Hazard Index Across All Media and All Exposure Routes	2.5E-02

Total Kidney HI =	7.1E-03
Total CNS HI =	9.8E-03
Total Argyria HI =	8.4E-03

TABLE 2-10
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CONSTRUCTION WORKER - SUBSURFACE SOIL - CTE
SITE 11 - INDUSTRIAL WASTEWATER DISPOSAL AREA 100
FORMER NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Subsurface Soil	Benzo(a)pyrene	2.7E-08		4.6E-09	3.1E-08	Benzo(a)pyrene					
			Cadmium					Cadmium	Kidney	3.3E-03		1.7E-04	3.5E-03
			Mercury					Mercury	CNS	4.8E-03		9.0E-05	4.8E-03
			Silver					Silver	Argyria	4.0E-03		1.3E-04	4.1E-03
							Total Risk Across Surface Soil 3.1E-08						Total Hazard Index Across All Media and All Exposure Routes 1.2E-02

Total Kidney HI =	3.5E-03
Total CNS HI =	4.8E-03
Total Argyria HI =	4.1E-03

TABLE 2-11
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADULT RECREATIONAL USER - SUBSURFACE SOIL - RME
SITE 11 - INDUSTRIAL WASTEWATER DISPOSAL AREA 100
FORMER NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Adult Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Subsurface Soil	Benzo(a)pyrene	3.0E-08		1.0E-07	1.3E-07	Benzo(a)pyrene					
			Cadmium					Cadmium	Kidney	1.2E-04		1.3E-04	2.5E-04
			Mercury					Mercury	CNS	1.6E-04		6.8E-05	2.4E-04
			Silver					Silver	Argyria	1.5E-04		1.0E-04	2.5E-04
						Total Risk Across Surface Soil	1.3E-07					Total Hazard Index Across All Media and All Exposure Routes	7.5E-04

Total Kidney HI =	2.5E-04
Total CNS HI =	2.4E-04
Total Argyria HI =	2.5E-04

TABLE 2-12
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADULT RECREATIONAL USER - SUBSURFACE SOIL - CTE
SITE 11 - INDUSTRIAL WASTEWATER DISPOSAL AREA 100
FORMER NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Adult Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Subsurface Soil	Benzo(a)pyrene	2.2E-09		2.1E-09	4.3E-09	Benzo(a)pyrene					
			Cadmium					Cadmium	Kidney	3.0E-05		8.8E-06	3.9E-05
			Mercury					Mercury	CNS	4.4E-05		4.5E-06	4.9E-05
			Silver					Silver	Argyria	3.7E-05		6.7E-06	4.4E-05
						Total Risk Across Surface Soil	4.3E-09					Total Hazard Index Across All Media and All Exposure Routes	1.3E-04

Total Kidney HI =	3.9E-05
Total CNS HI =	4.9E-05
Total Argyria HI =	4.4E-05

TABLE 2-13
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADOLESCENT TRESPASSER - SUBSURFACE SOIL - RME
SITE 11 - INDUSTRIAL WASTEWATER DISPOSAL AREA 100
FORMER NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Adolescent Trespasser
Receptor Age: 7-16 Years

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Subsurface Soil	Benzo(a)pyrene	6.3E-08		6.7E-08	1.2E-07	Benzo(a)pyrene					
			Cadmium					Cadmium	Kidney	6.4E-04		2.5E-04	9.0E-04
			Mercury					Mercury	CNS	9.3E-04		1.3E-04	1.1E-03
			Silver					Silver	Argyria	7.8E-04		1.9E-04	9.7E-04
						Total Risk Across Surface Soil	1.2E-07					Total Hazard Index Across All Media and All Exposure Routes	2.9E-03

Total Kidney HI =	9.0E-04
Total CNS HI =	1.1E-03
Total Argyria HI =	9.7E-04

TABLE 2-14
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADOLESCENT TRESPASSER - SUBSURFACE SOIL - CTE
SITE 11 - INDUSTRIAL WASTEWATER DISPOSAL AREA 100
FORMER NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Adolescent Trespasser
Receptor Age: 7-16 Years

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Subsurface Soil	Benzo(a)pyrene	1.2E-08		4.2E-09	1.6E-08	Benzo(a)pyrene					
			Cadmium					Cadmium	Kidney	1.6E-04		1.7E-05	1.8E-04
			Mercury					Mercury	CNS	2.3E-04		8.7E-06	2.4E-04
			Silver					Silver	Argyria	2.0E-04		1.3E-05	2.1E-04
						Total Risk Across Surface Soil	1.6E-08					Total Hazard Index Across All Media and All Exposure Routes	6.3E-04

Total Kidney HI =	1.8E-04
Total CNS HI =	2.4E-04
Total Argyria HI =	2.1E-04

TABLE 2-15
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - DAY CARE CENTER CHILD - SUBSURFACE SOIL - RME
SITE 11 - INDUSTRIAL WASTEWATER DISPOSAL AREA 100
FORMER NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Day Care Child
Receptor Age: Child (0-6 Years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Subsurface Soil	Benzo(a)pyrene	4.3E-07		5.9E-07	1.0E-06	Benzo(a)pyrene					
			Cadmium					Cadmium	Kidney	8.9E-03		3.7E-03	1.3E-02
			Mercury					Mercury	CNS	1.3E-02		1.9E-03	1.5E-02
			Silver					Silver	Argyria	1.1E-02		2.8E-03	1.4E-02
						Total Risk Across Surface Soil	1.0E-06					Total Hazard Index Across All Media and All Exposure Routes	4.1E-02

Total Kidney HI =	1.3E-02
Total CNS HI =	1.5E-02
Total Argyria HI =	1.4E-02

TABLE 2-16
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - DAY CARE CENTER CHILD - SUBSURFACE SOIL - CTE
SITE 11 - INDUSTRIAL WASTEWATER DISPOSAL AREA 100
FORMER NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Day Care Child
Receptor Age: Child (0-6 Years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Subsurface Soil	Benzo(a)pyrene	9.5E-08		3.5E-08	1.3E-07	Benzo(a)pyrene					
			Cadmium					Cadmium	Kidney	3.9E-03		4.4E-04	4.3E-03
			Mercury					Mercury	CNS	5.5E-03		2.3E-04	5.9E-03
			Silver					Silver	Argyria	4.7E-03		3.3E-04	5.1E-03
						Total Risk Across Surface Soil	1.3E-07					Total Hazard Index Across All Media and All Exposure Routes	1.5E-02

Total Kidney HI =	4.3E-03
Total CNS HI =	5.9E-03
Total Argyria HI =	5.1E-03

TABLE 2-17
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - FUTURE ADULT RESIDENT - SUBSURFACE SOIL - RME
SITE 11 - INDUSTRIAL WASTEWATER DISPOSAL AREA 100
FORMER NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Subsurface Soil	Benzo(a)pyrene	5.2E-07		4.3E-07	9.5E-07	Benzo(a)pyrene					
			Cadmium					Cadmium	Kidney	2.7E-03		6.7E-04	3.3E-03
			Mercury					Mercury	CNS	3.9E-03		3.5E-04	4.2E-03
			Silver					Silver	Argyria	3.2E-03		5.1E-04	3.7E-03
						Total Risk Across Surface Soil	9.5E-07					Total Hazard Index Across All Media and All Exposure Routes	1.1E-02

Total Kidney HI =	3.3E-03
Total CNS HI =	4.2E-03
Total Argyria HI =	3.7E-03

TABLE 2-18
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - FUTURE ADULT RESIDENT - SUBSURFACE SOIL - CTE
SITE 11 - INDUSTRIAL WASTEWATER DISPOSAL AREA 100
FORMER NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Subsurface Soil	Benzo(a)pyrene	5.1E-08		1.2E-08	6.3E-08	Benzo(a)pyrene					
			Cadmium					Cadmium	Kidney	6.9E-04		6.4E-05	9.6E-04
			Mercury					Mercury	CNS	1.3E-03		3.3E-05	1.3E-03
			Silver					Silver	Argyria	1.1E-03		4.9E-05	1.1E-03
						Total Risk Across Surface Soil	6.3E-08					Total Hazard Index Across All Media and All Exposure Routes	3.4E-03

Total Kidney HI =	9.6E-04
Total CNS HI =	1.3E-03
Total Argyria HI =	1.1E-03

TABLE 2-19
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - FUTURE CHILD RESIDENT - SUBSURFACE SOIL - RME
SITE 11 - INDUSTRIAL WASTEWATER DISPOSAL AREA 100
FORMER NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child (0 - 6 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Subsurface Soil	Benzo(a)pyrene	1.2E-08		5.5E-07	1.8E-08	Benzo(a)pyrene					
			Cadmium					Cadmium	Kidney	2.5E-02		3.5E-03	2.8E-02
			Mercury					Mercury	CNS	3.6E-02		1.8E-03	3.8E-02
			Silver					Silver	Argyria	3.0E-02		2.6E-03	3.3E-02
						Total Risk Across Surface Soil	1.8E-06					Total Hazard Index Across All Media and All Exposure Routes	9.9E-02

Total Kidney HI =	2.8E-02
Total CNS HI =	3.8E-02
Total Argyria HI =	3.3E-02

TABLE 2-20
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - FUTURE CHILD RESIDENT - SUBSURFACE SOIL - CTE
SITE 11 - INDUSTRIAL WASTEWATER DISPOSAL AREA 100
FORMER NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child (0 - 6 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Subsurface Soil	Benzo(a)pyrene	1.4E-07		2.5E-08	1.6E-07	Benzo(a)pyrene					
			Cadmium					Cadmium	Kidney	8.3E-03		4.7E-04	8.8E-03
			Mercury					Mercury	CNS	1.2E-02		2.4E-04	1.2E-02
			Silver					Silver	Argyria	1.0E-02		3.5E-04	1.0E-02
						Total Risk Across Surface Soil	1.6E-07					Total Hazard Index Across All Media and All Exposure Routes	3.1E-02

Total Kidney HI =	8.8E-03
Total CNS HI =	1.2E-02
Total Argyria HI =	1.0E-02

TABLE 2-21

CUMULATIVE RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE
ADDENDUM FOR POST-REMOVAL SUBSURFACE SOIL
SITE 11 - INDUSTRIAL WASTEWATER DISPOSAL AREA 100
FORMER NSWC - WHITE OAK, SILVER SPRING, MARYLAND

HAZARD INDEX

Exposure Route	Full Time Worker	Maintenance/Utility Worker	Construction Worker	Adult Recreational User	Adolescent Trespasser	Day Care Center Child	Adult Resident	Child Resident
Incidental Ingestion of Subsurface Soil	7.0E-03	1.0E-03	2.4E-02	4.5E-04	2.4E-03	3.3E-02	9.8E-03	9.1E-02
Dermal Contact with Subsurface Soil	1.1E-03	2.4E-04	1.2E-03	3.0E-04	5.7E-04	8.5E-03	1.5E-03	7.9E-03
Total Risk for Soil:	**8.1E-03**	**1.2E-03**	**2.5E-02**	**7.5E-04**	**2.9E-03**	**4.1E-02**	**1.1E-02**	**9.9E-02**

TABLE 2-22

CUMULATIVE RISK SUMMARY - CENTRAL TENDENCY EXPOSURE
ADDENDUM FOR POST-REMOVAL SUBSURFACE SOIL
SITE 11 - INDUSTRIAL WASTEWATER DISPOSAL AREA 100
FORMER NSWC - WHITE OAK, SILVER SPRING, MARYLAND

HAZARD INDEX

Exposure Route	Full Time Worker	Maintenance/Utility Worker	Construction Worker	Adult Recreational User	Adolescent Trespasser	Day Care Center Child	Adult Resident	Child Resident
Incidental Ingestion of Subsurface Soil	3.1E-03	2.5E-04	1.2E-02	1.1E-04	5.9E-04	1.4E-02	3.3E-03	3.0E-02
Dermal Contact with Subsurface Soil	9.6E-05	3.9E-05	3.9E-04	2.0E-05	3.8E-05	9.9E-04	1.5E-04	1.1E-03
Total Risk for Soil:	**3.1E-03**	**2.9E-04**	**1.2E-02**	**1.3E-04**	**6.3E-04**	**1.5E-02**	**3.4E-03**	**3.1E-02**

TABLE 2-23

CUMULATIVE RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE
ADDENDUM FOR POST-REMOVAL SUBSURFACE SOIL
SITE 11 - INDUSTRIAL WASTEWATER DISPOSAL AREA 100
FORMER NSWC - WHITE OAK, SILVER SPRING, MARYLAND

INCREMENTAL CANCER RISK

Exposure Route	Full Time Worker	Maintenance/Utility Worker	Construction Worker	Adult Recreational User	Adolescent Trespasser	Day Care Center Child	Adult Resident	Child Resident
Incidental Ingestion of Subsurface Soil	3.9E-07	5.6E-08	5.4E-08	3.0E-08	5.3E-08	4.3E-07	5.2E-07	1.2E-06
Dermal Contact with Subsurface Soil	3.2E-07	6.9E-08	1.4E-08	1.0E-07	6.7E-08	5.9E-07	4.3E-07	5.5E-07
Total Risk for Soil:	**7.1E-07**	**1.2E-07**	**6.7E-08**	**1.3E-07**	**1.2E-07**	**1.0E-06**	**9.5E-07**	**1.8E-06**

TABLE 2-24

CUMULATIVE RISK SUMMARY - CENTRAL TENDENCY EXPOSURE
ADDENDUM FOR POST-REMOVAL SUBSURFACE SOIL
SITE 11 - INDUSTRIAL WASTEWATER DISPOSAL AREA 100
FORMER NSWC - WHITE OAK, SILVER SPRING, MARYLAND

INCREMENTAL CANCER RISK

Exposure Route	Full Time Worker	Maintenance/Utility Worker	Construction Worker	Adult Recreational User	Adolescent Trespasser	Day Care Center Child	Adult Resident	Child Resident
Incidental Ingestion of Subsurface Soil	6.1E-08	5.0E-09	2.7E-08	2.2E-09	1.2E-08	9.5E-08	5.1E-08	1.4E-07
Dermal Contact with Subsurface Soil	1.0E-08	4.1E-09	4.6E-09	2.1E-09	4.2E-09	3.5E-08	1.2E-08	2.5E-08
Total Risk for Soil:	**7.1E-08**	**9.2E-09**	**3.1E-08**	**4.3E-09**	**1.6E-08**	**1.3E-07**	**6.3E-08**	**1.6E-07**

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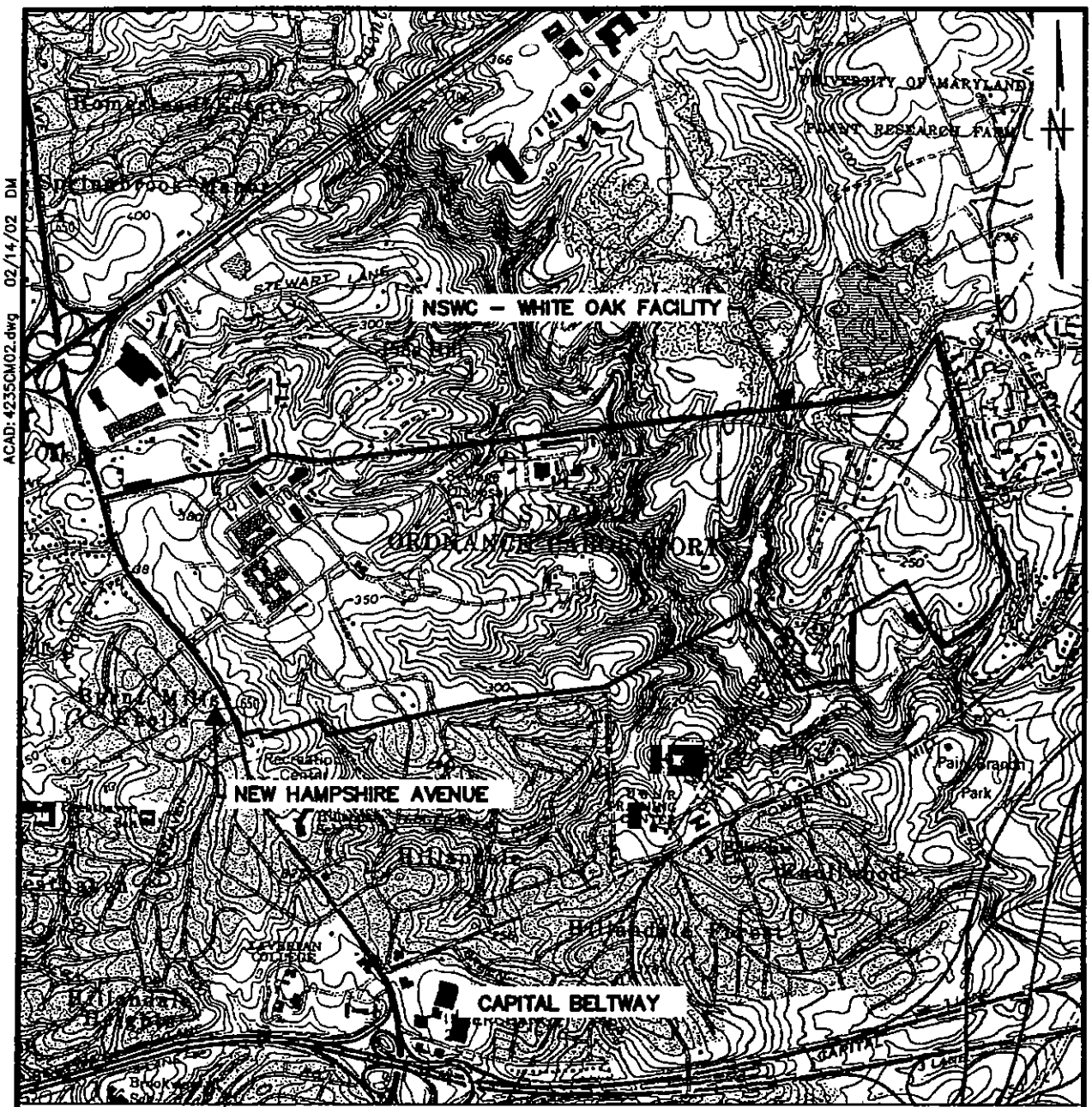


QUADRANGLE LOCATION

0 2000 4000

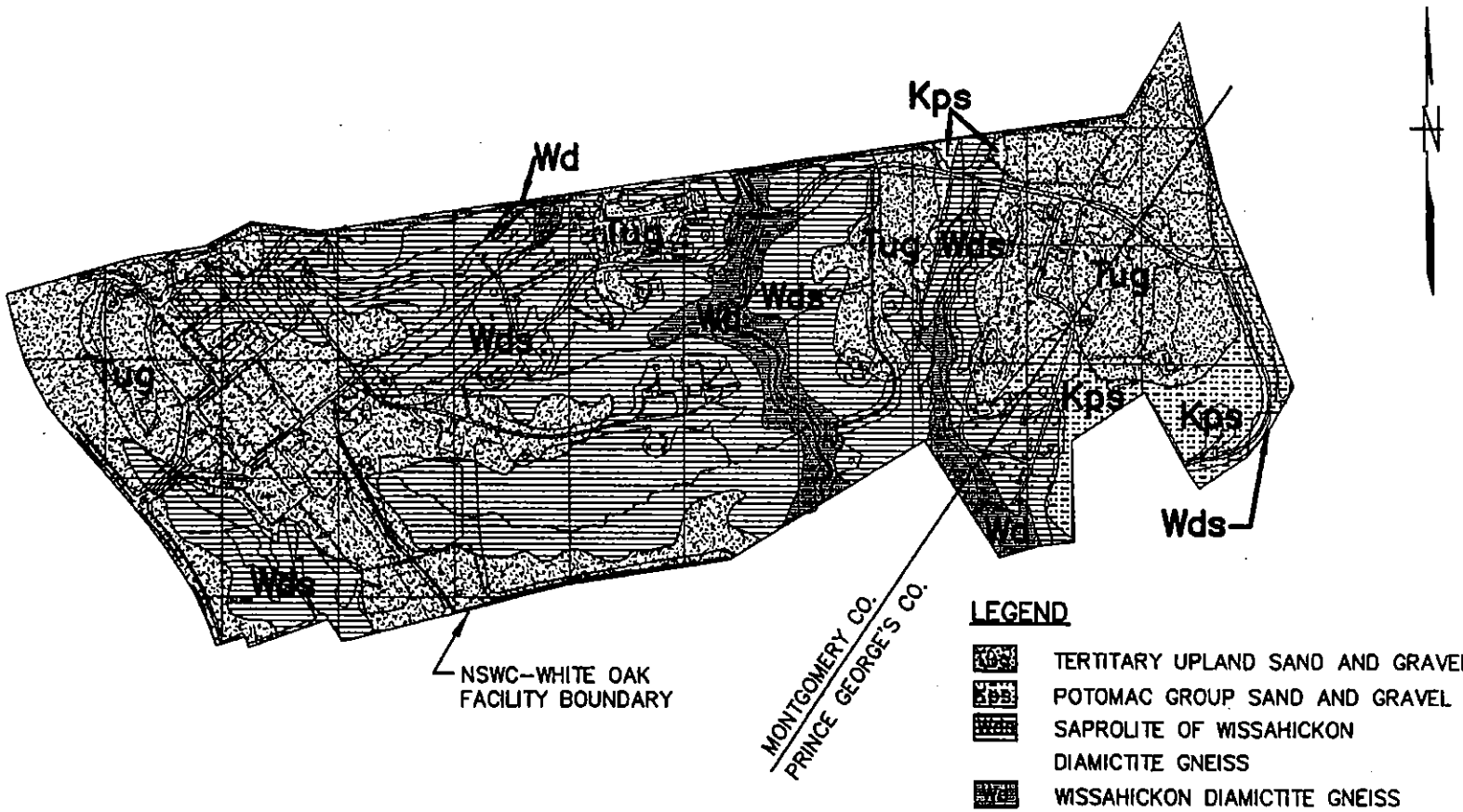
SCALE IN FEET

SOURCE: U.S.G.S QUADRANGLE MAP, BELTSVILLE, MD. PHOTOREVISED 1979.

DRAWN BY DM DATE 2/14/02	Tetra Tech NUS, Inc.	CONTRACT NO. 4235	OWNER NO. ----
CHECKED BY DATE	FACILITY VICINITY MAP SITE 11 – INDUSTRIAL WASTEWATER DISPOSAL AREA 100 FORMER NSWC – WHITE OAK SILVER SPRING, MARYLAND	APPROVED BY	DATE
COST/SCHED-AREA		APPROVED BY	DATE
SCALE AS NOTED		DRAWING NO. FIGURE 2-1	REV. 0

FORM CADD NO. TtNUS_AV.DWG - REV 0 - 1/22/99

ACAD: 4235cm01.dwg 02/14/02 DM

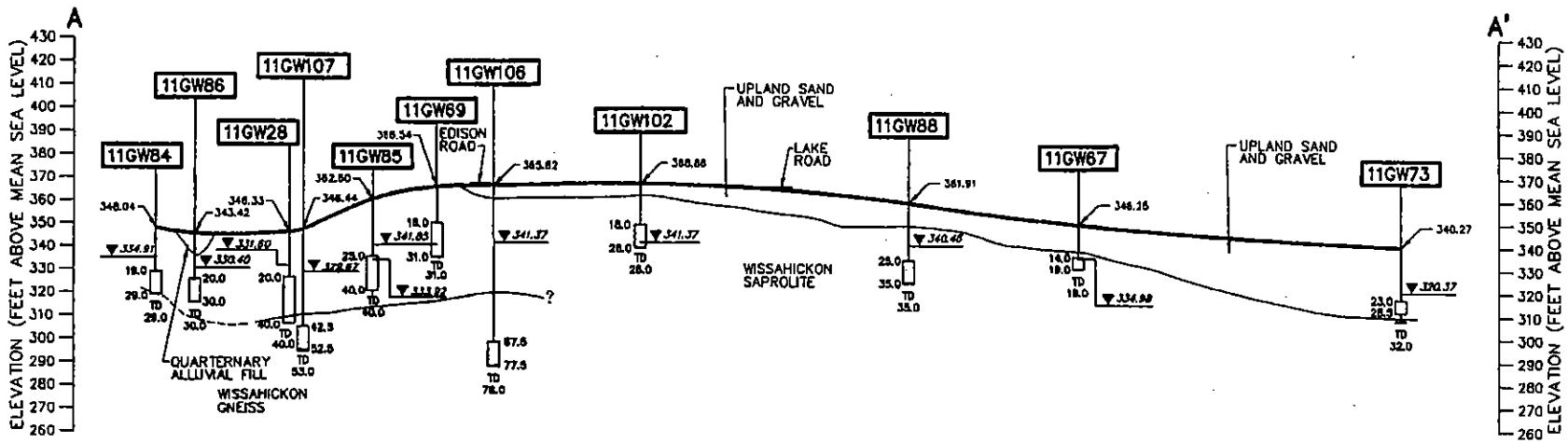


MODIFIED FROM WITHINGTON AND FROELICH, 1974

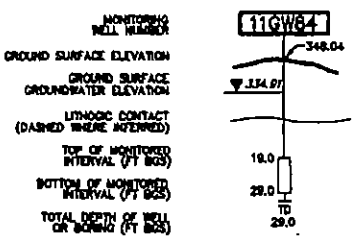
DRAWN BY DM DATE 2/14/02	Tetra Tech NUS, Inc.	CONTRACT NO. 4235	OWNER NO. ----
CHECKED BY DATE	SURFICIAL GEOLOGY MAP FORMER NSWC – WHITE OAK SILVER SPRING, MARYLAND	APPROVED BY	DATE
COST/SCHED-AREA		APPROVED BY	DATE
SCALE AS NOTED		DRAWING NO. FIGURE 2-2	REV. 0

FORM CADD NO. T4NUS_AH.DWG - REV 0 - 1/22/98

ACAD: .001.dwg 02/14/02 DM



LEGEND:



0 250 500
HORIZONTAL SCALE IN FEET

0 50 100
VERTICAL SCALE IN FEET

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY DM DATE 2/14/02
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

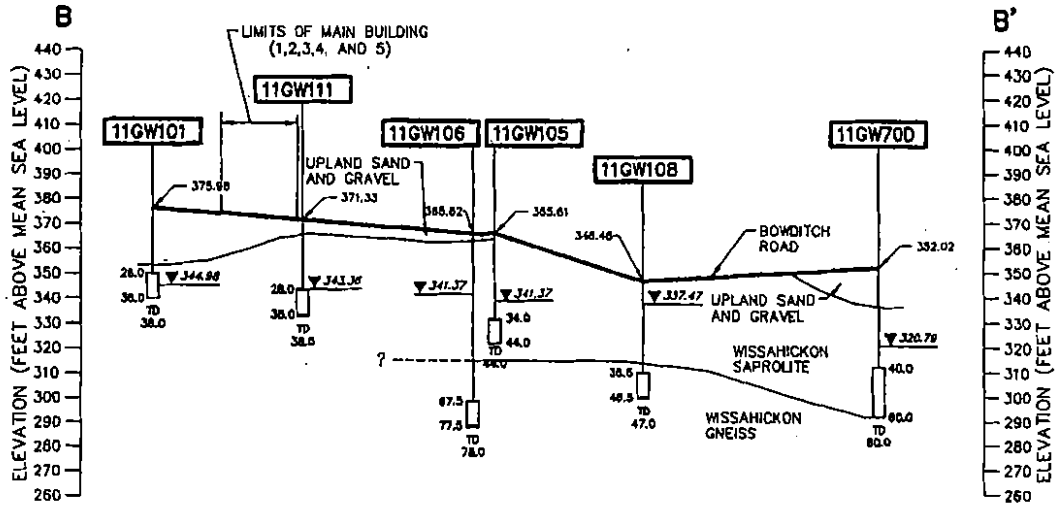
Tetra Tech NUS, Inc.

CROSS SECTION A-A'
SITE 11
FORMER NSWC-WHITE OAK
SILVER SPRING, MARYLAND

CONTRACT NO. 4235
OWNER NO. ----
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 2-3
REV. 0

FORM CADD NO. TTNUS-DWING - REV 0 - 9/9/98

ACAD: 2X02.dwg 02/14/02 DM



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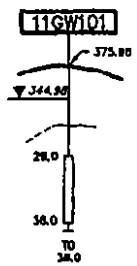
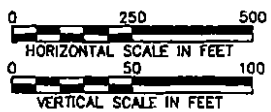




NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

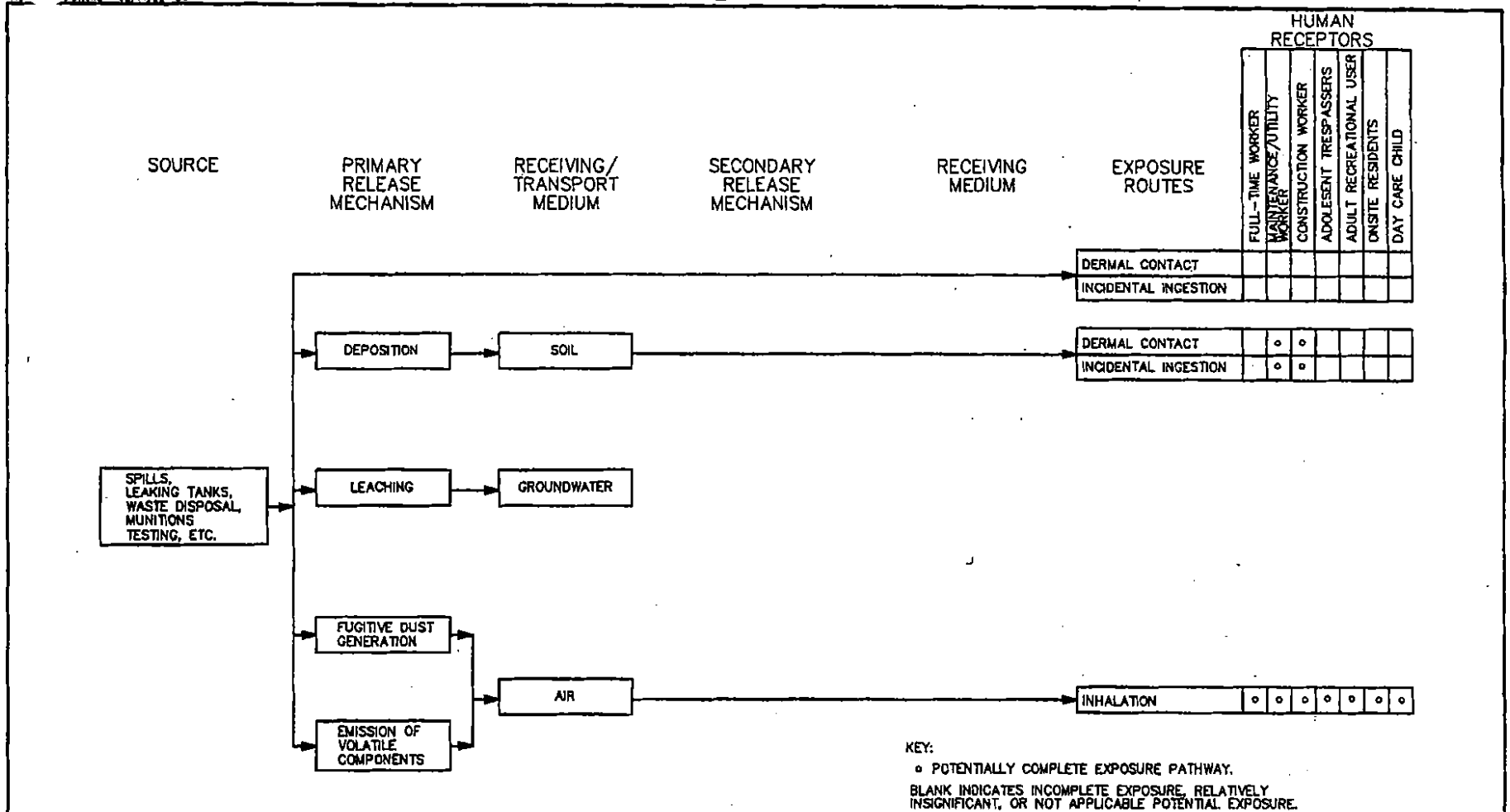
DRAWN BY DM DATE 2/14/02
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

Tetra Tech NUS, Inc.

CROSS SECTION B–B'
SITE 11 CMS
FORMER NSWC – WHITE OAK
SILVER SPRING, MARYLAND

CONTRACT NO. 4235
OWNER NO. ----
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 2–4
REV. 0

FORM CADD NO. TTNUS-BRDWG - REV 0 - 9/9/96



KEY:

o POTENTIALLY COMPLETE EXPOSURE PATHWAY.

BLANK INDICATES INCOMPLETE EXPOSURE, RELATIVELY INSIGNIFICANT, OR NOT APPLICABLE POTENTIAL EXPOSURE.

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY DM DATE 2/14/02
CHECKED BY DATE
COST/SCHED-AREA
SCALE NOT TO SCALE

Tetra Tech NUS, Inc.

CONCEPTUAL SITE MODEL
FORMER NSWC – WHITE OAK
SILVER SPRING, MARYLAND

CONTRACT NO. 4235
OWNER NO. ----
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 2-5
REV. 0

APPENDIX A

LABQUEST PARTNERSHIP
10733 KINLOCH ROAD SILVER SPRING, MD 20903

MARCH 4, 2002

Mr. Walter Legg
BRAC Environmental Coordinator
Engineering Field Activity Chesapeake
1314 Harwood Street, SE
Washington Navy Yard
Washington, D. C. 20374-5018

Dear Mr. Legg:

I am writing this letter to provide LABQUEST's comments on the Proposed Plan for Site 8--Abandoned Chemical Disposal Pit -- and Proposed Plan for Site 11 Soils--Industrial Wastewater Disposal Area 100 -- of January 2002. For both plans, we support the Department of Navy's decision that No Further Action (NFA) is required.

We are very appreciative of the thorough engineering process that was used for these sites. The care that was taken during the removal action for Sites 8 and 11 resulted in sites that are now safe for the community and the new Food and Drug Administration (FDA) project at the Federal Research Center at White Oak. Your concern for the community was demonstrated in many ways, but most recently when your team met with the home owners adjacent to Site 8. This alerted these homeowners, most of whom are new to Hillandale after Site 8 removal action occurred and were unaware of the site, that a proposed plan was being published and a public meeting was planned. LABQUEST, the community and these homeowners very much appreciate the effort, which was made on your own time, to ensure all aspects of Site 8 were understood. You showed patience and caring as you answered their questions. Also, your concern for the ongoing demolition and construction work for FDA is demonstrated by the contingency plan you have in place, which assures the Navy will conduct any future investigations in real time should the contractors deem an environmental investigation is required.

The BRAC Clean-up Team (BCT) of Mr. Bruce Beach, USEPA; Mr. Jeff Thornburg, MDE; contractors (especially Scott Nesbit), and yourself have worked in a professional manner to clean these sites and develop these proposed plans for NFA. LABQUEST sincerely appreciates your efforts and commends you for the results that have been achieved at these sites and across the WO-FRC. Your actions have allowed the FDA project to reach the

construction stage without serious environmental issues and with the statement that it is safe to construct and occupy the new buildings for FDA.

Thank you very much.

Sincerely

Betsy Bretz
Chairperson
LABQUEST Partnership

STATE OF MARYLAND
LETTER OF CONCURRENCE

MDE

MARYLAND DEPARTMENT OF THE ENVIRONMENT

2500 Broening Highway • Baltimore, Maryland 21224
(410) 631-3000 • 1-800-633-6101 • http://www.mde.state.md.us

Parris N. Glendening
Governor

Merrylin Zaw-Mon
Acting Secretary

July 19, 2002

Mr. Walter Legg
Engineering Field Activity Chesapeake
Washington Navy Yard, Building 212
1314 Harwood Street SE
Washington DC 20374-5018

Re: Final Record of Decision for Site 11 Soils, Former Naval Surface Warfare Center (NSWC) White Oak, Silver Spring, Maryland, dated July 2002

Dear Mr. Legg:

The Federal Facilities Section (FFS) of the Maryland Department of the Environment's Waste Management Administration has reviewed the above-referenced submittal. This Record of Decision (ROD) documents the Navy's determination that no further action for subsurface soils is necessary to protect human health and the environment at Site 11 of the former NSWC White Oak Facility in Silver Spring, Maryland.

The site consists of subsurface soil and waste associated with leaching wells within the Building 100 area of NSWC White Oak. The leaching wells were used for the subsurface disposal of wastewater; therefore, there were no impacts to surface soil through their operation. A 1996 removal action eliminated potentially unacceptable risk associated with contaminated subsurface soil at Site 11. Post removal verification sampling and subsequent remedial investigation activities support a no further action alternative. The risk assessment conducted as part of the remedial investigation indicated that Site 11 does not present an unacceptable risk to human health and the environment. Groundwater underlying and downgradient of Site 11 soils will be addressed under subsequent operable units and RODs. However, the Navy has prepared a contingency plan to address the possibility that leaching wells and or associated soils may be encountered during excavation activities. The contingency plan provides for investigations if the leaching wells are encountered to confirm that any leaching well and/or associated soils encountered do not pose an unacceptable risk.

Comments received during the public comment period supported the Navy's decision that no further action is required. Therefore, based upon the acceptable level of protection to human health and the environment associated with the soil at Site 11, the FFS concurs with the selected remedy.

If you have any questions, please contact me at (410) 631-3440.

Sincerely,

Eric Lemasta for

Mark A. Callaghan
Remedial Project Manager
Federal/NPL Superfund Division

MAC:bjm

cc: Mr. Bruce Beech
Mr. Richard Collins
Mr. Karl Kalbacher
Ms. Hilary Miller