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TECHNICAL MEMORANDUM FOR NO FURTHER ACTION AT OPERABLE UNIT 12 (OU 12) SITE 44 DITCH FROM DEFENSE REUSE AND MARKETING OFFICE TO WASTEWATER TREATMENT PLANT NAS CECIL FIELD FL

1/11/2002

TETRA TECH NUS INC

Technical Memorandum
for
No Further Action

Operable Unit 12, Site 44
Ditch from DRMO to Wastewater Treatment Plant

Naval Air Station Cecil Field
Jacksonville, Florida

Southern Division
Naval Facilities Engineering Command

Contract Number N62467-94-D-0888

Contract Task Order 0078

January 2002

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TECHNICAL MEMORANDUM
FOR NO FURTHER ACTION

OPERABLE UNIT 12, SITE 44
DITCH FROM DRMO TO WASTEWATER TREATMENT PLANT

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Southern Division
Naval Facilities Engineering Command
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North Charleston, South Carolina 29406

Submitted by:
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CONTRACT NUMBER N62467-94-D-0888
CONTRACT TASK ORDER 0078

JANUARY 2002

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The professional opinions rendered in this decision document identified as Technical Memorandum for No Further Action, Operable Unit 12, Site 44, Naval Air Station Cecil Field, Jacksonville, Florida were developed in accordance with commonly accepted procedures consistent with applicable standards of practice. Decision documents are based on information obtained from others and under the supervision of the signing engineer. If conditions are determined to exist differently than those described in this document, then the undersigned professional engineer should be notified to evaluate the effects of any additional information on this project described in this report.

Mark P Speranza

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Date: 1/11/02

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CERTIFICATION OF TECHNICAL
DATA CONFORMITY

The Contractor, Tetra Tech NUS, Inc., hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N62467-94-D-0888 are complete and accurate and comply with all requirements of this contract.

DATE: January 11, 2002

NAME AND TITLE OF CERTIFYING OFFICIAL: Mark Speranza, P.E.
Task Order Manager

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ACRONYMS

µg/kg	Microgram per kilogram
ABB-ES	ABB Environmental Services, Inc.
AOI	Area of Interest
ARCS	Alternative Remedial Contract Strategy
ASTDR	Agency for Toxic Substances and Disease Registry
BCT	BRAC Cleanup Team
bgs	Below ground surface
BRAC	Base Realignment and Closure
BTAG	Biological Technical Assistance Group
CCME	Canadian Council of Ministers of the Environment
CH2M Hill	CH2M Hill Constructors, Inc.
CLEAN	Comprehensive Long-Term Environmental Action Navy
COPC	Chemical of potential concern
CRQL	Contract-Required Quantitation Limit
CTO	Contract Task Order
DRMO	Defense Reutilization and Marketing Office
EBS	Environmental Baseline Survey
EISOPQAM	Environmental Investigations Standard Operating Procedures and Quality Assurance Manual
ESV	Ecological screening value
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FL-PRO	Florida Petroleum Residual Organics
HLA	Harding Lawson Associates
HQ	Hazard quotient
IBDS	Inorganic Background Data Set
LEL	Low effects level
LOAEL	Lowest observed adverse effect level
mg/kg	Milligram per kilogram
MHSPE	Ministry of Housing, Spatial Planning and Environment
NAS	Naval Air Station
NEC	No effect concentration
NFF	North Fuel Farm
NOAEL	No observed adverse effect level
OMOE	Ontario Ministry of Environment and Energy

ORNL	Oak Ridge National Laboratory
OU	Operable Unit
PAET	Probable apparent effect threshold
PAH	Polynuclear aromatic hydrocarbons
PCB	Polychlorinated biphenyl
PEC	Probable effects concentration
PEL	Probable effects level
PRE	Preliminary Risk Evaluation
PSC	Potential Source of Contamination
QA/QC	Quality assurance/quality control
RAC	Remedial Action Contractor
RI	Remedial Investigation
SAR	Sampling and Analysis Report
SCTL	Soil Cleanup Target Level
SEL	Severe effects level
SERA	Screening-level ecological risk assessment
SOUTHNAVFACENGCOM	Southern Division Naval Facilities Engineering Command
SVOC	Semivolatile organic compound
TAL	Target Analyte List
TEL	Threshold effects level
TRPH	Total recoverable petroleum hydrocarbons
TRV	Toxicity reference value
TtNUS	Tetra Tech NUS, Inc.
U.S. EPA	United States Environmental Protection Agency
UCL	Upper confidence limit
UNF	Unnumbered Facility
UST	Underground storage tank
UST	Underground storage tank
VOC	Volatile organic compound
WWTP	Wastewater treatment plant

1.0 INTRODUCTION

This Technical Memorandum for Operable Unit (OU) 12, Site 44, Ditch from the Defense Reutilization and Marketing Office (DRMO) to Wastewater Treatment Plant (WWTP), at Naval Air Station (NAS) Cecil Field, has been prepared by Tetra Tech NUS, Inc. (TtNUS) for the Department of the Navy Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM). The work was conducted under the Comprehensive Long-Term Environmental Action Navy (CLEAN) Program, Contract Number N62467-94-D-0888, Contract Task Order (CTO) 0078. The Base Realignment and Closure (BRAC) Cleanup Team (BCT) elected to delineate, excavate, and dispose of soil at Site 44 that is contaminated with polychlorinated biphenyls (PCBs).

TtNUS performed seven sampling events at Site 44 between June 1999 and April 2000 to supplement the results of previous investigations and to delineate the extent of PCB-contaminated soil. The results of these field investigations were used to develop a dig and haul package (remedial design plan) for a removal action consisting of soil excavation and off-site disposal of the contaminated soil.

This technical memorandum presents information from the previous investigations and summarizes the related field operations, results, conclusions, and recommendations of the investigation conducted by TtNUS during 1999 and 2000 and the activities related to the removal action as described in the Source Removal Report for Site 44 (CH2M Hill, 2001). The results of the investigations and the subsequent removal action indicate that no further action is needed at this site.

2.0 SITE DESCRIPTION

2.1 PHYSICAL SETTING

OU 12, Site 44, the Ditch from the DRMO to the WWTP, is located in the western portion of the Main Base area of NAS Cecil Field (Figure 2-1). The site, originally designated Potential Source of contamination (PSC) 44, consists of areas investigated previously as part of Area of Interest (AOI) 33 (former DRMO Office Area), Unnumbered Facility (UNF) 6 (Aircraft Wash Rack), and Facility 15 (Base WWTP) (Figure 2-2). The PSC 44 ditch is parallel to the western side of the AOI 33 fenced area, turns west along the northern side of a parking lot, and then extends through for approximately 1,100 feet where it enters an inlet to Lake Fretwell located west of Facility 15. The PSC 44 ditch receives stormwater runoff from the western end of the flightline, the AOI 33 DRMO storage area and nearby areas, and the UNF 6 wash rack. The area around AOI 33 and PSC 32, the DRMO Storage Yard, is an industrial setting, and the remaining area through which the ditch extends is generally undeveloped. According to the reuse plan, the Site 44 area will be used for industrial purposes.

2.2 SITE HISTORY

The upstream portion of Site 44, parallel to the fenced area, was initially evaluated as part of AOI 33 during the Environmental Baseline Survey (EBS) (ABB-ES, 1994). From 1961 to 1988, AOI 33 was used to store equipment, hazardous and nonhazardous materials, and other miscellaneous items such as furniture, office equipment, clothing, and aircraft parts. The EBS indicated that hazardous materials were reportedly handled in the area and color-coded the site Gray, indicating that further assessment was required based on the unknown materials that were stored there. The investigation conducted for the AOI 33 Sampling and Analysis Report (SAR) found that surface soil, surface water, and sediment west of the paved area had likely been affected by past site activities (ABB-ES, 1996). No soil samples were collected from beneath the paved area, but groundwater samples from wells in this area did not indicate a risk to human health. The color code for this area, the ditch and associated soil west of the paved area, was changed from Gray to Yellow to indicate that releases of hazardous substances had occurred, and remedial actions were underway but not yet completed. The SAR recommended that the sediments in the ditch west (downstream) of this area be investigated separately from AOI 33. This area was also recommended for a color code of Yellow in the SAR. Additional sampling and analysis were conducted as part of a SAR Addendum in an attempt to delineate the extent of contamination in the ditch area west of the paved area (HLA, 1999b). The SAR Addendum redesignated the paved and fenced area of AOI 33 as PSC 33 and the ditch to the west as PSC 44. The color codes for both of these areas remained Yellow, and additional evaluation and remediation were recommended.

UNF 6, the Aircraft Wash Rack, a concrete area approximately 150 feet square, was built in 1976 as an extension of the flightline apron. Aircraft were washed at this facility using water and various solvents, and wash water was collected by two catch basins on the apron that discharged through on oil-water separator to the sanitary sewage system. A gate valve in the wash rack piping was used to divert storm water underground to the PSC 44 ditch to the northwest. According to the EBS, on at least one occasion the wash water was accidentally discharged to the drainage ditch rather than to the wastewater treatment plant and therefore, the washrack was color-coded Gray to indicate that further assessment of the site was required. The SAR investigation for UNF 6, which included groundwater sampling and sampling of surface water and sediment from the drainage ditch, recommended further evaluation of the ditch and a change in color code to Yellow (HLA, 1999a).

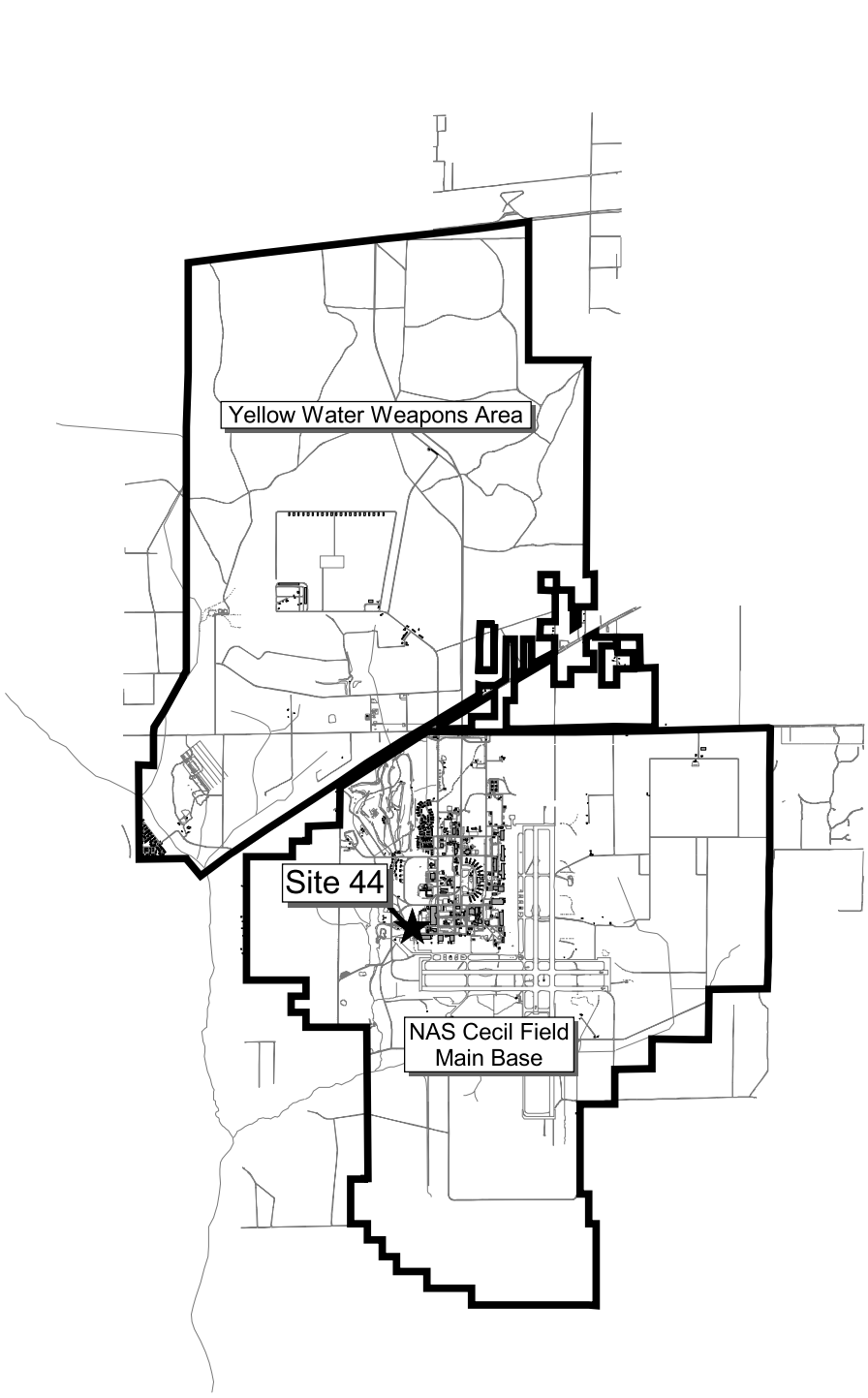
Facility 15, the control building for the WWTP, was constructed in 1942. The treatment plant handled all of the sanitary wastewater needs for the Base. Two underground storage tanks (USTs) for diesel fuel were located on the property. Because of past sewage spills and the presence of USTs, the EBS color-coded the Facility 15 as Gray and recommended that further evaluation of the property be performed. The SAR investigation recommended no further action for Facility 15 and reclassification of the site from Gray to Light Green to indicate that releases of hazardous substances had occurred, but not at concentrations that require a remedial response (HLA, 1998b). Contamination detected in the drainage ditch to the south of the WWTP was not considered site-related, and the SAR recommended further evaluation and the reclassification of the ditch at a color code of Red to indicate that a release had occurred but required actions had not yet been implemented.

Based on the SAR investigations for AOI 33, UNF 6, and Facility 15, it was decided that the entire length of the drainage ditch, from just west of the paved DRMO Office Area (PSC 33) to the inlet to Lake Fretwell, would be designated as PSC 44. In addition, sampling beneath the PSC 33 paved area would be included in the PSC 44 investigation. Contamination beneath the adjoining, separately fenced, paved area to the east, PSC 32 (DRMO Storage Area) necessitated the maintenance of the pavement as an institutional control to prevent exposure to underlying contaminated soil. If contamination was found beneath the pavement at AOI 33, this area would be included with this institutional control requirement.

In May 2001, PSC 44 was designated as OU 12, Site 44.

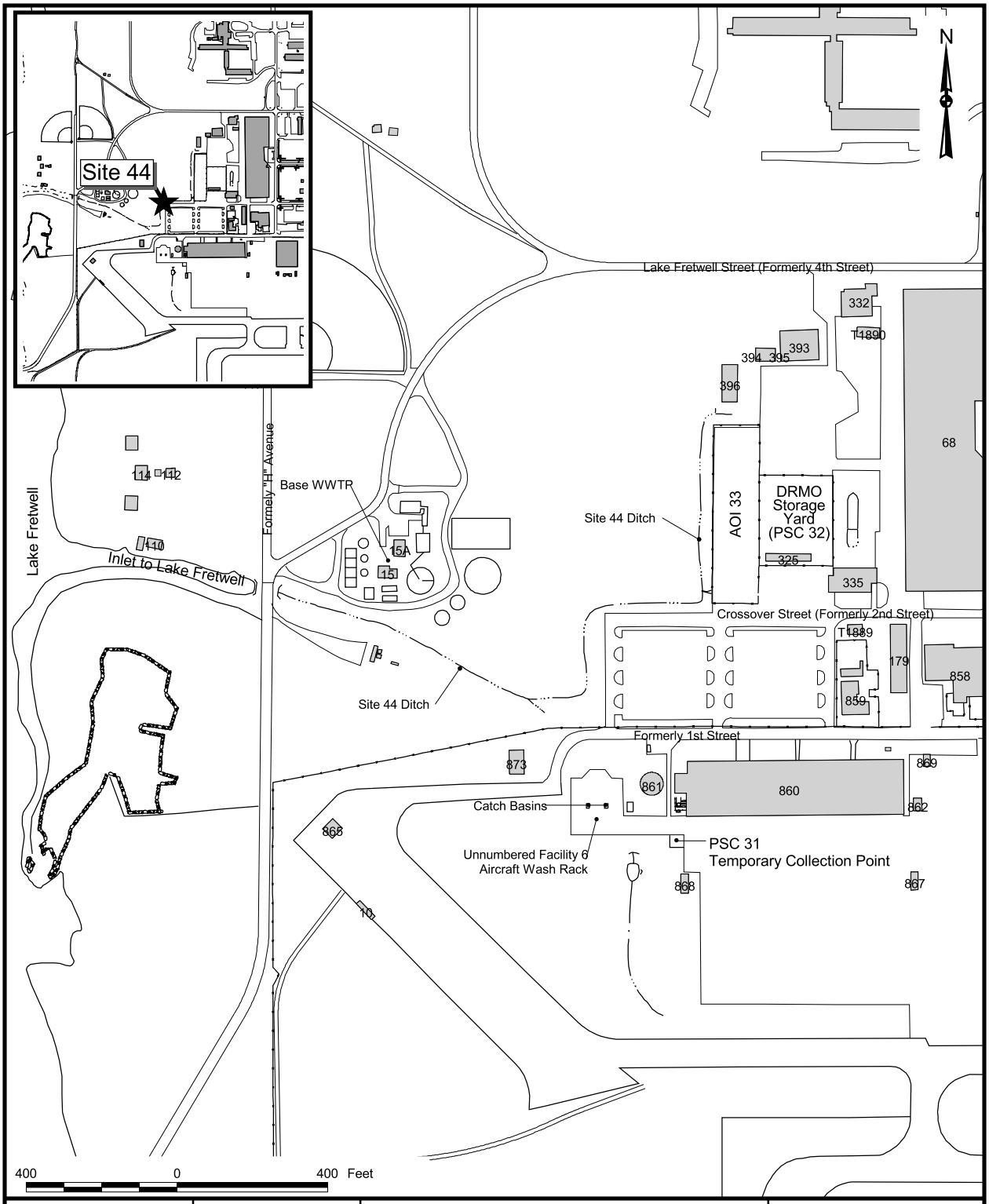
2.3 SITE GEOLOGY AND HYDROGEOLOGY

PSC 44 is located in the vicinity of Site 7, the Former Fire Fighting Training Area. Although no site-specific subsurface investigation was performed at PSC 44, AOI 33, the Aircraft Wash Rack, or the Base WWTP, the geological and hydrogeological characteristics of the site are similar to those described in the Remedial Investigation (RI) Report for Operable Unit (OU) 3, Sites 7 and 8 (ABB-ES, 1997).



DRAWN BY MJJ	DATE 21May01	GENERAL LOCATION MAP OU 12, SITE 44, DITCH FROM DRMO TO WWTP TECHNICAL MEMORANDUM NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 0039
CHECKED BY	DATE		APPROVED BY DATE
COST/SCHEDULE-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 2-1 / REV 0

P:\GIS\NAS_CecilField\PSC44_TechMemo.apr 20Dec01 MJJ Site Location Map Layout



DRAWN BY MJJ	DATE 21May01	SITE LAYOUT MAP OU 12, SITE 44, DITCH FROM DRMO TO WWTP TECHNICAL MEMORANDUM NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 0039
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COST/SCHEDULE-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 2-2 / REV 0

P:\GIS\NAS_CecilField\Site-44_TechMemo.apr 27Dec01 MJJ Facility Location Layout

3.0 PREVIOUS INVESTIGATIONS

Environmental investigations at Site 44 began in 1993 as part of a base-wide EBS. The following reports describe the results of investigations conducted prior to the TtNUS investigation at this site:

- EBS Report (ABB-ES, 1994)
- SAR, Facility 15 (HLA, 1998b)
- SAR, UNF 6 – Aircraft Washrack (HLA, 1999a)
- RI Report for Site 36 - Control Tower TCE Plume and Site 37 - Hangars 13 and 14 DCE Plume (TtNUS, 1999a)
- Sampling and Analysis Report (SAR), Area of Interest 33 (ABB-ES, 1996) and SAR Addendum (HLA, 1999b)

A summary of sampling locations and detected contaminants exceeding criteria from the previous investigations is shown on Figure 3-1.

The SAR for Facility 15 indicated the following:

- The site activities at Facility 15 have not significantly impacted soil, groundwater, or surface water.

- Sediment within the drainage ditch south of Facility 15 has been significantly impacted. The absence of contaminants in other media in the vicinity of Facility 15 indicate that sediment contamination is unlikely to be site related and may have been transported from an upstream source.

- No further assessment of Facility 15 was proposed. However, the drainage ditch in the vicinity of Facility 15 is reclassified from Gray to Red until a separate study to identify the source of contaminants in the sediment within this ditch has been completed.

The SAR for UNF 6 indicated the following:

- Appropriate site operation and management procedures should be undertaken at the Aircraft Washrack in order to ensure that current and future site activities do not result in the release of hazardous substances to the environment.

- Polynuclear aromatic hydrocarbons (PAHs) were detected in the drainage ditch on the northern side of the Aircraft Washrack at concentrations that could potentially represent a hazard to human health

based on a residential surface soil exposure scenario. Therefore, the color code for this site should be reclassified from Gray to Yellow until further evaluation of contaminants in the sediment within this ditch has been completed.

The SAR Addendum for AOI 33 indicated the following:

- The horizontal and vertical extent of PCB contamination on the western side of AOI 33 had not been adequately delineated. Elevated concentrations of PCB contaminants were present in soil and sediment in the area. In addition, ecological screening criteria were exceeded in surface water and sediment samples collected from the drainage ditch (ABB-ES, 1996).

- The BCT redesignated AOI 33 as PSC 33, and the drainage ditch on the western perimeter of PSC 33 was redesignated as PSC 44. Information pertinent to the subsequent evaluation of contamination in the drainage ditch was to be presented in a Technical Memorandum for PSC 44. The color code for PSC 44 remained yellow to indicate that contamination is present and required additional evaluation.

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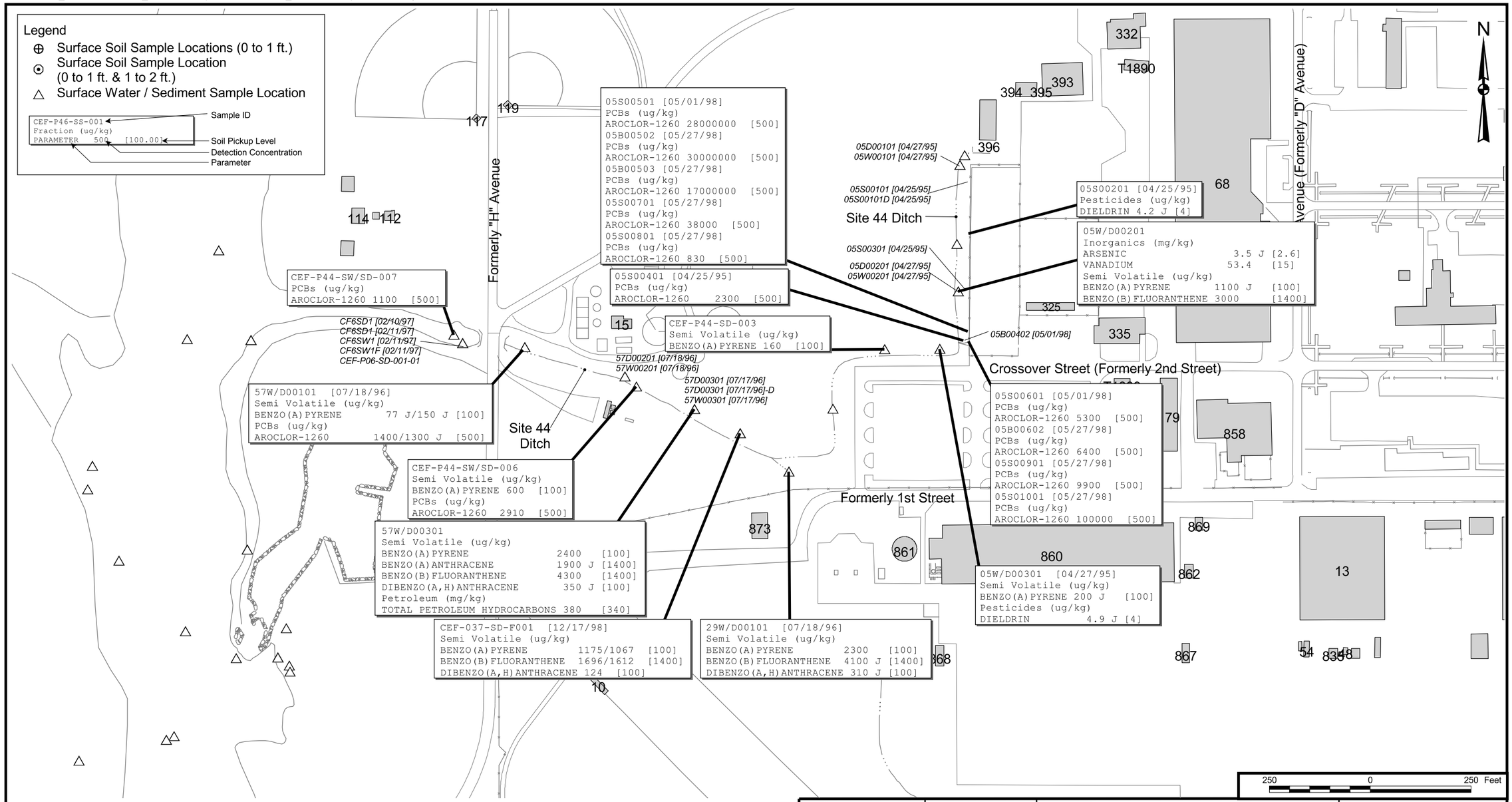

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SAMPLE LOCATION AND EXCEEDANCE MAP
PREVIOUS INVESTIGATIONS
OU 12, SITE 44, DITCH FROM DRMO TO WWTP
TECHNICAL MEMORANDUM
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

CONTRACT NO. 0039	
APPROVED BY	DATE
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4.0 FIELD INVESTIGATION

TtNUS conducted seven sampling and analysis events at Site 44 between June 1999 and April 2000 to delineate the extent of semivolatile organic compound (SVOC), PAH, pesticide, polychlorinated biphenyl (PCB), total petroleum hydrocarbon (TPH), and inorganic contamination in surface and subsurface soil, sediment, and surface water. The field investigation was performed in accordance with the PSC 44 Sampling and Analysis Work Plans (TtNUS 1999b and 2000a). A total of 68 samples were collected over the seven phases of the investigation. The sampling locations are shown in Figures 4-1 and 4-2.

During Phase I, seven sediment, two surface water, and ten surface soil samples were collected to delineate the contamination in and near the ditch from DRMO to the WWTP. Sediment sample CEF-P44-SD-001 was collected north and upgradient of AOI 33, CEF-P44-SD-005 and CEF-P44-SW-005 were collected at the inlet of the culvert that discharges near the previous sample 29W/D00101, CEF-P44-SD-007 and CEF-P44-SW-007 were collected at the inlet of Lake Fretwell, and CEF-P44-SD-002, CEF-P44-SD-004, and CEF-P44-SD-006 were collected in proximity to previous samples 05S00201, 29W/D00101, and 57W/D00201, respectively. Sediment sample CEF-P44-SD-003 was taken equidistant between the previous samples 05W/D00301 and 29W/D00101. Surface water sample CEF-P44-SW-007 and all sediment samples were analyzed for Target Analyte List (TAL) inorganics, SVOCs, PAHs, pesticides, and PCBs. In addition, surface water samples CEF-P44-SW-005 and CEF-P44-SW-007 and five of the sediment samples were analyzed for total recoverable petroleum hydrocarbons (TRPH).

Also during Phase I, the following surface soil samples from the 0- to 1-foot below ground surface (bgs) depth interval were collected: CEF-P44-SS-008, CEF-P44-SS-011, and CEF-P44-SS-017 were collected below the asphalt and base materials from the northern to southern end of AOI-33; CEF-P44-SS-009 and CEF-P44-SS-010 were collected 15 feet north and south, respectively, of the previous soil sample 05S00201; CEF-P44-SS-012 through CEF-P44-SS-015 were collected in the area of previous soil samples 05S00401, 05S00501, and 05S00601; and CEF-P44-SS-016 was collected near previous soil sample 05S00401. Six of the surface soil samples were analyzed for PAHs, and nine of the surface soil samples were analyzed for PCBs.

During Phase II, 15 soil samples were collected, based on the results of Phase I sampling, to further delineate the extent of PCB contamination at Site 44. Relative to previous samples, the following surface soil samples (0- to 1- foot bgs depth interval) were collected: CEF-P44-SS-101 and CEF-P44-SS-102 were taken 15 feet south and west of CEF-P44-SS-010, respectively; CEF-P44-SS-104 through CEF-P44-SS-106 were taken 15 feet north, south, and west of CEF-P44-SS-013, respectively; CEF-P44-SS-108 and CEF-P44-SS-109 were taken 15 feet north and west of 05S00501, respectively; CEF-P44-

SS-112 was taken 15 feet west of 05S00401; CEF-P44-SS-113 was taken 15 feet south of 05S00601; and CEF-P44-SS-114 was taken 15 feet west of CEF-P44-SS-015.

Samples CEF-P44-SS-103, CEF-P44-SS-107, and CEF-P44-SS-115 were taken at 1- to 2-foot bgs depth interval at the previous locations of CEF-P44-SS-010, CEF-P44-SS-013, and CEF-P44-SS-015, respectively. CEF-P44-SU-111 was taken at the 2- to 3-foot bgs depth interval at 05S00601, and CEF-P44-SU-110 was taken at a 3- to 4-foot bgs depth interval at 05S00501. Samples collected in Phase II were analyzed for PCBs.

During Phase III, 13 surface and subsurface soil samples were collected to further delineate the PCB contamination. Relative to previous samples, the following surface soil samples (0- to 1- foot bgs depth interval) were taken: CEF-P44-SS-203 and CEF-P44-SS-204 were collected north and west, respectively, of CEF-P44-SS-104; CEF-P44-SS-210 and CEF-P44-SS-211 were collected west and south, respectively, of CEF-P44-SS-015/SS-115-02; and CEF-P44-SS-202 and CEF-P44-SS-205 through CEF-P44-SS-209 were collected 15 feet due west of CEF-P44-SS-102, CEF-P44-SS-106, CEF-P44-SS -105, CEF-P44-SS-108, CEF-P44-SS-109, and CEF-P44-SS -112, respectively. Sample CEF-P44-SU-213 was taken at a 1- to 2-foot bgs depth interval near previous sample location CEF-P44-SS-108, and samples CEF-P44-SU-201 and CEF-P44-SU-212 were taken at the 2- to 3-foot bgs depth interval at previous sample locations CEF-P44-SS-103 and CEF-P44-SS-015/CEF-P44-SS-115, respectively. Samples collected during this phase of the field investigation were analyzed for PCBs.

During Phase IV, 13 soil samples were collected to further delineate the horizontal and vertical extent of PCB contamination. Relative to previous samples, the following surface soil samples (0- to 1- foot bgs depth interval) were taken: samples CEF-P44-SS-301, CEF-P44-SS-302, CEF-P44-SS-304, and CEF-P44-SS-306 were located 15 feet west of CEF-P44-SS-204, CEF-P44-SS-206, CEF-P44-SS-207, and CEF-P44-SS-209, respectively; sample CEF-P44-SS-303 was taken midway between previous sample locations CEF-P44-SS-302 and CEF-P44-SS-304. CEF-P44-SS-305 was taken midway between previous sample locations CEF-P44-SS-209 and CEF-P44-SS-306.

Samples CEF-P44-SS-307 and CEF-P44-SS-310 were taken at the 1- to 2-foot bgs depth interval at CEF-P44-SS-204 and CEF-P44-SS-206, respectively. At the 2- to 3-foot interval, CEF-P44-SU-311 was sampled midway between CEF-P44-SS-209 and CEF-P44-SU-110, CEF-P44-SU-312 was sampled midway between CEF-P44-SS-209 and CEF-P44-SS-211, and CEF-P44-SU-313 was sampled at CEF-P44-SS-016. Samples CEF-P44-SU-308 and CEF-P44-SU-309 were taken at the 3- to 4-foot interval at CEF-P44-SU-212 and CEF-P44-SS-213, respectively. Samples collected during this phase of the field investigation were analyzed for PCBs.

During Phase V, five soil samples were collected to further delineate the horizontal and vertical extent of PCB contamination. The two samples collected at the 0- to 1-foot bgs depth interval included sample CEF-P44-SS-401, located 15 feet west of previous location CEF-P44-SS-304 and sample CEF-P44-SS-402, located 15 feet west of previous location CEF-P44-SS-305. CEF-P44-SU-403 was collected at a 2- to 3-foot bgs depth interval to establish the vertical extent of contamination at previous location CEF-P44-SS-310. At the 3- to 4-foot bgs depth interval, CEF-P44-SU-404 is located at CEF-P44-SS-310 and CEF-P44-SU-405 is located 15 feet north of CEF-P44-SU-311. Samples collected during this phase of the field investigation were analyzed for PCBs.

During Phase VI, two surface soil samples at the 0 to 1-foot depth interval were collected to further delineate the extent of PCB contamination identified in previous sampling activities. These samples included CEF-P44-SS-501, located 15 feet north of previous location CEF-P44-SS-402, and CEF-P44-SS-502, located 15 feet west of previous location CEF-P44-SS-402. Both samples collected during this phase of the field investigation were analyzed for PCBs.

Finally, during Phase VII, one soil sample CEF-P44-SS-601, located at previous sample location 05S00201 was collected to further delineate the extent of contamination. The sample was collected at the 0- to 1-foot bgs depth interval. This sample was analyzed for pesticides and mercury.

Over the seven phases of sampling, field duplicates of nine soil samples, one sediment sample and one surface water sample were collected for quality assurance/quality control (QA/QC) purposes. Sampling locations for the seven phases of field sampling are shown on Figures 4-1 and 4-2. Analytical results are discussed in Section 5.0 and are included in Appendix A.

Soil and sediment samples were collected as grab samples using disposable equipment. Surface water samples were collected as direct-filled bottles. Sampling activities were performed in accordance with the procedures described in the United States Environmental Protection Agency (U.S. EPA) Region IV Environmental Investigations Standard Operating Procedures and Quality Assurance Manual (EISOPQAM) (U.S. EPA, 1996) and the NAS Cecil Field Base-Wide Generic Work Plan (TtNUS, 1998). As agreed by the BCT, no rinsate and trip blanks were collected. In addition, field blanks were not collected because the decontamination of sampling equipment was minimal.

The samples were analyzed for PAHs using U.S. EPA Method SW-846 8310, for TAL inorganics by U.S. EPA Method SW-846 6010B, for SVOCs using U.S. EPA Method SW-846 8270C, for pesticides using U.S. EPA Method SW-845 8081A, for PCBs using U.S. EPA Method SW-846 8082, and for TRPH using the Florida Petroleum Residual Organics (FL-PRO) method. In Phase VII, mercury was tested using SW 846 method 7071A. Accutest Southeast, in Orlando, Florida, performed the analyses.

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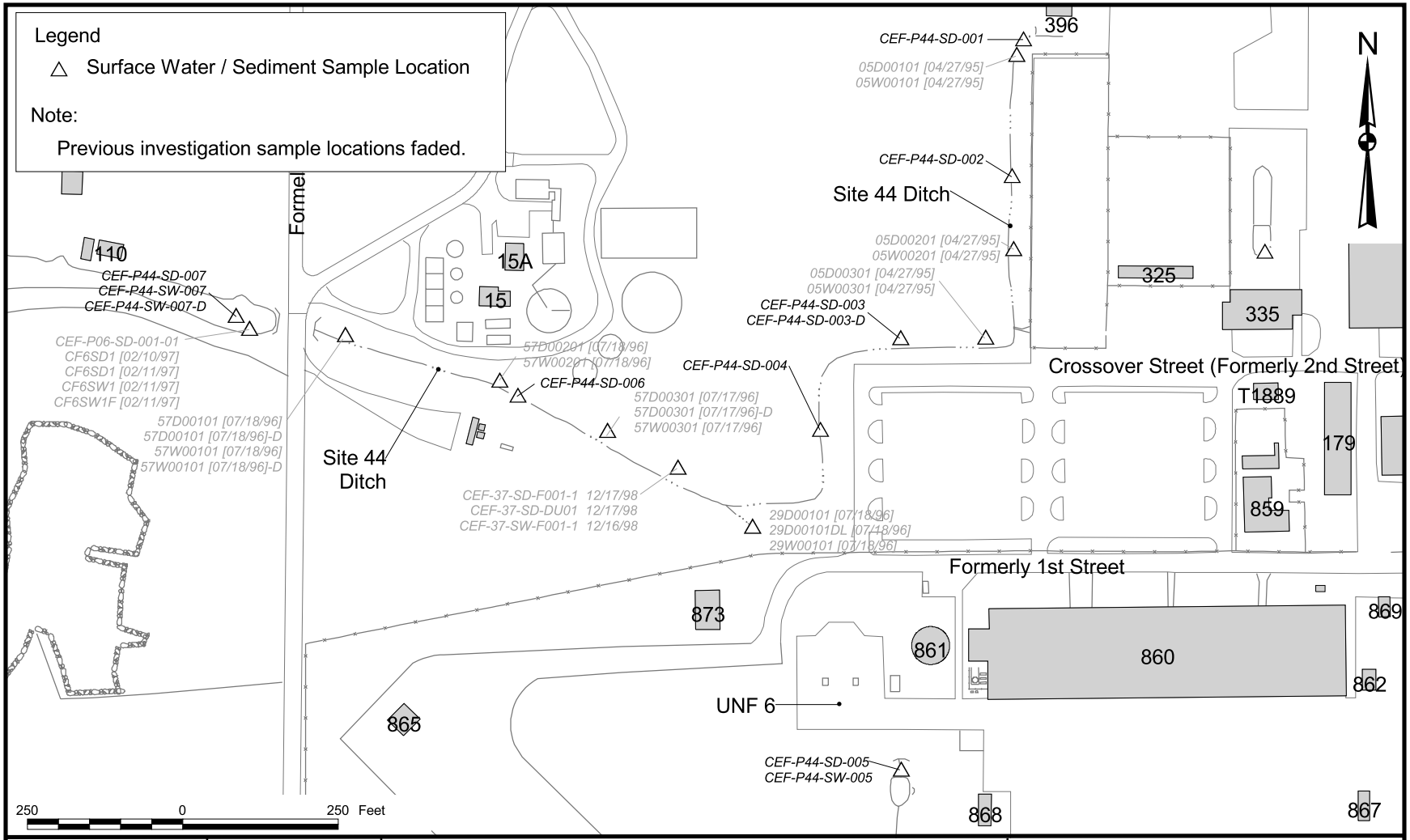

DRAWN BY MJJ	DATE 21May01	SURFACE WATER/SEDIMENT SAMPLE LOCATIONS OU 12, SITE 44, DITCH FROM DRMO TO WWTP TECHNICAL MEMORANDUM NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 0039
CHECKED BY	DATE		APPROVED BY — DATE —
COST/SCHEDULE-AREA			APPROVED BY — DATE —
SCALE AS NOTED			DRAWING NO. FIGURE 4-1 / REV 0

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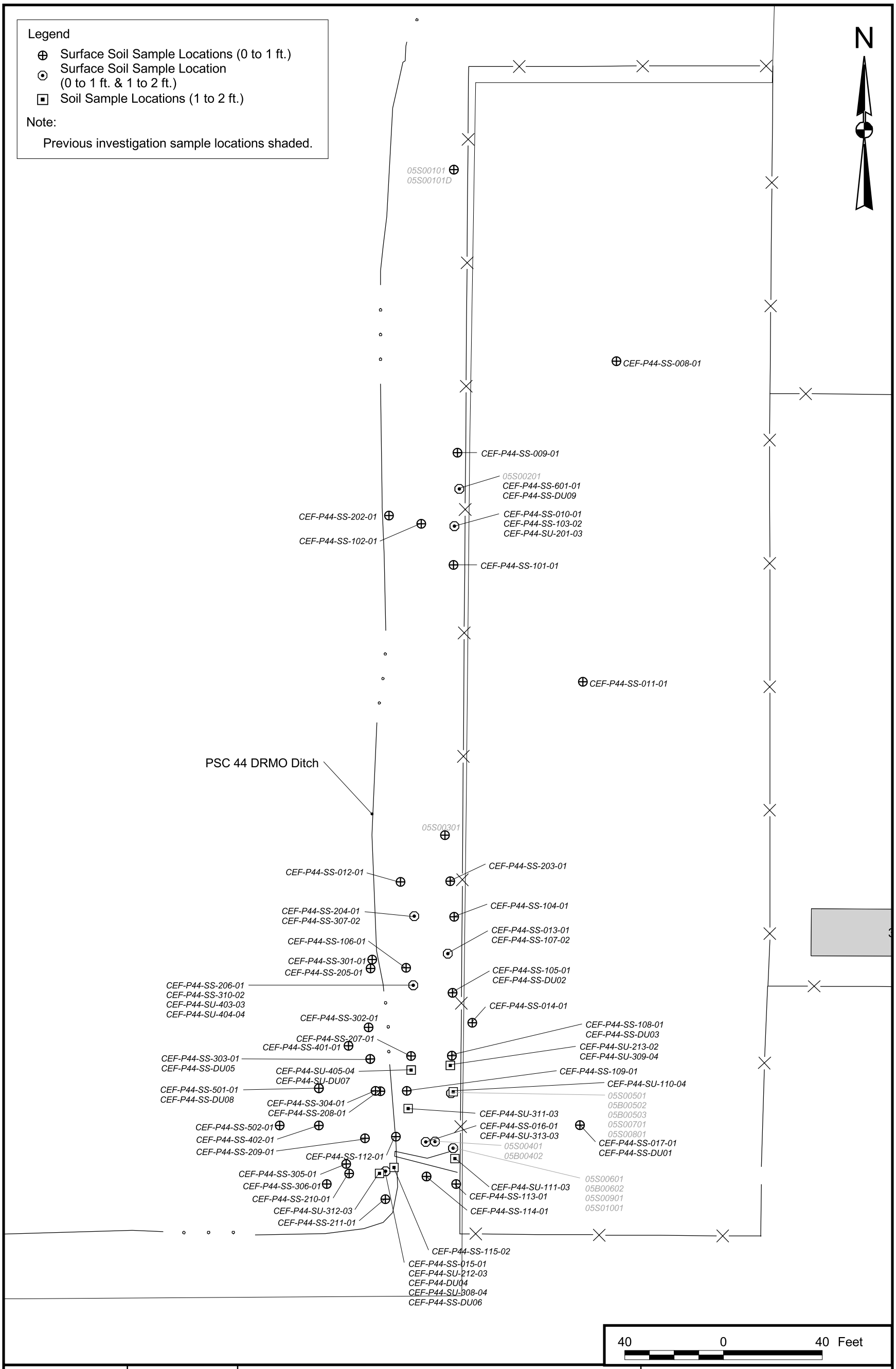

DRAWN BY MJJ	DATE 21May01	SOIL SAMPLE LOCATIONS OU 12, SITE 44, DITCH FROM DRMO TO WWTP TECHNICAL MEMORANDUM NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 0039
CHECKED BY	DATE		APPROVED BY / DATE
COST/SCHEDULE-AREA			APPROVED BY / DATE
SCALE AS NOTED			DRAWING NO. FIGURE 4-2 / REV 0

5.0 NATURE AND EXTENT OF CONTAMINATION

Analytical results for the surface water, sediment, and soil samples collected during Phase I of the seven-phased field investigation are shown on Table 5-1, Table 5-2, and Table 5-3, respectively. Analytical results for the soil samples collected during Phases II through VI of the field investigation are shown on Table 5-4. Complete laboratory data are included in Appendix A. The concentrations of individual samples were screened against the NAS Cecil Field site-specific Inorganic Background Data Set (IBDS) and Florida Department of Environmental Protection (FDEP) Soil Cleanup Target Levels (SCTLs), as provided in Florida Administrative Code (FAC) 62-777. The remediation goal for any site should never be less than the IBDS value. However, if a FDEP criterion is greater than the IBDS value, the FDEP criterion is regarded as the remediation goal.

For soils, the FDEP SCTLs used for comparison in Tables 5-3 and 5-4 were the most restrictive of the residential direct exposure or the leachability to groundwater criteria (FDEP, 1999). Figure 5-1 shows the soil sample locations where the sample results exceeded the most restrictive SCTL.

The results of the sampling and analysis identified the horizontal and vertical extent of PCB contamination in excess of the most restrictive FDEP SCTL. Based on the results of the sampling and analysis, a remedial design (dig and haul package) was prepared for excavation of the delineated areas of PCB contamination.

Three excavation areas were delineated. Two areas totaling 911 square feet were delineated to be excavated to a depth of 3 feet, and a third area of 1,900 square feet was delineated to be excavated to a depth of 1 foot. The estimated volumes of the three areas total 173 cubic yards. The excavation limits are shown on Figure 5-1.

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TABLE 5-1

SURFACE WATER ANALYTICAL RESULTS
OU 12, SITE 44 - DITCH FROM DRMO TO WWTP
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Parameter	CEF-P44			IBDS Value[(1)]	FDEP SWCTL[(2)]
	SW-005	SW-007			
		Sample	Duplicate		
Inorganic Analytes, µg/L					
Aluminum	NA	289	121	1,040	13
Arsenic	NA	3.4U	3.5	5.45	50.0
Barium	NA	30.5	25.8	43.7	48.1 [a]
Iron	NA	1,480	707	3,030	1,000
Selenium	NA	2.0U	2.5	7.6	5.0
Sodium	NA	3,960	3,990	12,200	18,300 [b]
Zinc	NA	36.5	30.7	51.4	[c]

Only detected analytes are reported.
Shaded values indicate concentrations in excess of criteria.
NA = Not Analyzed.
U = Not Detected.
1 IBDS - NAS Cecil Field Inorganic Background Data Set (HLA, 1998).
2 SWCTL - Florida Freshwater Surface Water Cleanup Target Level, FAC 62-777 (FDEP, 1999).
a Not greater than 10% above background.
b 50% above background or 1275, whichever is greater (per FAC 62-302).
c Dependent upon the hardness of the water.

TABLE 5-2

SEDIMENT ANALYTICAL RESULTS
OU 12, SITE 44 - DITCH FROM DRMO TO WWTP
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Parameter	CEF-P44-				IBDS Value[1]	FDEP SCTL[2]	
	SD-001	SD-002	SD-003			Residential Direct Exposure	Leachability to Groundwater
			Sample	Duplicate			
Semivolatile Organic Compounds, µg/kg							
bis(2-ethylhexyl) Phthalate	170 U	200 U	210 U	200 U	NC	76,000	3,600,000
Butylbenzyl phthalate	170 U	200 U	210 U	200 U	NC	15,000,000	310,000
Carbazole	170 U	200 U	210 U	200 U	NC	53,000	600
di-n-Butyl phthalate	170 U	200 U	210 U	200 U	NC	7,300,000	47,000
Polynuclear Aromatic Hydrocarbons, µg/kg							
2-Methylnaphthalene	36 U	42 U	44 U	300	NC	80,000	6,100
Acenaphthene	36 U	42 U	44 U	41 U	NC	1,900,000	2,100
Benzo(a)anthracene	43	6.4 U	55	67	NC	1,400	3,200
Benzo(a)pyrene	47	6.4 U	67	160	NC	100	8,000
Benzo(b)fluoranthene	51	6.4 U	87	200	NC	1,400	10,000
Benzo(g,h,i)perylene	53	8.6 U	41	160	NC	2,300,000	32,000,000
Benzo(k)fluoranthene	5.4 U	6.4 U	140	99	NC	15,000	25,000
Chrysene	52	6.4 U	54	77	NC	140,000	77,000
Dibenzo(a,h)anthracene	8.9 U	10 U	11 U	10 U	NC	100	30,000
Fluoranthene	120	8.6 U	200	63	NC	2,900,000	1,200,000
Indeno(1,2,3-cd)pyrene	31	6.4 U	57	130	NC	1,500	28,000
Phenanthrene	5.4 U	6.4 U	6.7 U	6.3 U	NC	2,000,000	250,000
Pyrene	120	8.9 U	130	72	NC	2,200,000	880,000
Total Recoverable Petroleum Hydrocarbons, mg/kg							
Petroleum Hydrocarbons	NA	NA	100 U	NA	NC	340	340
Pesticides, µg/kg							
4,4'-DDD	3.4 U	11 J	17 U	4.0 U	NC	4,600	4,000
4,4'-DDE	3.4 U	16	17 U	2.8 U	NC	3,300	18,000
Polychlorinated Biphenyls, µg/kg							
Aroclor-1254	34 U	225	42 U	40 U	NC	500[3]	17000[3]
Aroclor-1260	35	99	412	40 J	NC	500[3]	17000[3]
Inorganic Analytes, mg/kg							
Aluminum	2,220	936	7,060	1970	10,200	72000	*
Barium	3.2	4.3	6.9	10.9	36.1	110	1600
Cadmium	0.18 U	0.12 U	0.41 U	0.19 U	2.05	75	8
Chromium	3.0	2.0	6.1	3.4	16.0	210[4]	38[4]
Cobalt	0.11	0.19	0.56	0.19	3.0	4700	*
Copper	1.3	18.5	3.0	16.3	12.5	110	*
Iron	421	261	938	474	3,330	23,000	*
Lead	7.5	23.4	13.1	10.1	44.6	400	*
Manganese	2.9	2.5	3.2	5.6	17.0	1,600	*
Nickel	0.87	0.84	2.6	1.1	7.0	110	130
Silver	0.10 U	0.18U	0.12 U	0.11 U	1.87	390	17
Vanadium	1.9	5.0	4.8	2.6	15.0	15	980
Zinc	8.7	14.5	30.8	10.8	92.1	23,000	6,000

TABLE 5-2

SEDIMENT ANALYTICAL RESULTS
OU 12, SITE 44 - DITCH FROM DRMO TO WWTP
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Parameter	CEF-P44-				IBDS Value[1]	FDEP SCTL[2]	
	SD-004	SD-005	SD-006	SD-007		Residential Direct Exposure	Leachability to Groundwater
Semivolatile Organic Compounds, µg/kg							
bis(2-ethylhexyl) phthalate	220 U	NA	842	320	NC	76,000	3,600,000
Butylbenzyl phthalate	220 U	NA	207	260 U	NC	15,000,000	310,000
Carbazole	220 U	NA	214	260 U	NC	53,000	600
di-n-Butyl phthalate	220 U	NA	241	260 U	NC	7,300,000	47,000
Polynuclear Aromatic Hydrocarbons, µg/kg							
2-Methylnaphthalene	45 U	NA	1200	54 U	NC	80,000	6,100
Acenaphthene	45 U	NA	1700	54 U	NC	1,900,000	2,100
Benzo(a)anthracene	6.8 U	NA	470	8.2 U	NC	1,400	3,200
Benzo(a)pyrene	6.8 U	NA	600	8.2 U	NC	100	8,000
Benzo(b)fluoranthene	6.8 U	NA	780	8.2 U	NC	1,400	10,000
Benzo(g,h,i)perylene	9.2 U	NA	620	11 U	NC	2,300,000	32,000,000
Benzo(k)fluoranthene	6.8 U	NA	400	8.2 U	NC	15,000	25,000
Chrysene	6.8 U	NA	650	58	NC	140,000	77,000
Dibenzo(a,h)anthracene	11 U	NA	67	14 U	NC	100	30,000
Fluoranthene	9.2 U	NA	1400	590	NC	2,900,000	1,200,000
Indeno(1,2,3-cd)pyrene	6.8 U	NA	560	8.2 U	NC	1,500	28,000
Phenanthrene	6.8 U	NA	400	8.2 U	NC	2,000,000	250,000
Pyrene	9.2 U	NA	1200	110	NC	2,200,000	880,000
Total Recoverable Petroleum Hydrocarbons, mg/kg							
TRPH	110 U	802	237	126	NC	340	340
Pesticides, µg/kg							
4,4'-DDD	4.3 U	NA	89 U	52 U	NC	4,600	4,000
4,4'-DDE	4.3 U	NA	89 U	52 U	NC	3,300	18,000
Polychlorinated Biphenyls, µg/kg							
Aroclor-1254	43 U	NA	450 U	260 U	NC	500[3]	17000[3]
Aroclor-1260	43 U	NA	2910	1100	NC	500[3]	17000[3]
Inorganic Analytes, mg/kg							
Aluminum	8,250	NA	1,340	1,920	10,200	72000	*
Barium	6.4	NA	2.7	12.0	36.1	110	1600
Cadmium	0.06 U	NA	0.37 U	1.2	2.05	75	8
Chromium	7.2	NA	18.0	6.0	16.0	210[4]	38[4]
Cobalt	0.45	NA	0.35	0.27	3.0	4700	*
Copper	3.3	NA	4.3	13.5	12.5	110	*
Iron	535	NA	235	477	3330	23,000	*
Lead	9.7	NA	9.7	18.2	44.6	400	*
Manganese	2.5	NA	3.3	3.4	17.0	1,600	*
Nickel	1.5	NA	10.3	1.8	7.0	110	130
Silver	0.12 U	NA	0.13 U	1.7	1.87	390	17
Vanadium	3.7	NA	2.1	2.7	15.0	15	980
Zinc	5.0	NA	10.5	44.3	92.1	23,000	6,000

Shaded values indicate concentrations in excess of FDEP criteria.
NA = Not Analyzed.
NC = No criteria.
U = Not Detected.
1 IBDS - NAS Cecil Field Inorganic Background Data Set (HLA, 1998).
2 SCTLs = Soil Cleanup Target Levels, Florida Administrative Code (FAC) 62-777 (FDEP, 1999).
3 Criterion is for total PCBs.
4 Criterion is for hexavalent chromium.
* Leachability values may be derived using SPLP test to calculate site-specific SCTLs.

TABLE 5-3

PHASE I SOIL ANALYTICAL RESULTS
OU 12, SITE 44 - DITCH FROM DRMO TO WWTP
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

PARAMETER	FDEP SCTL[1]		Region IX Residential Soil PRG[2]	CEF-P44-					
	Residential Direct Exposure	Leachability to Groundwater		SS-008	SS-009	SS-010	SS-011	SS-012	SS-013
Polynuclear Aromatic Hydrocarbons, µg/kg									
2-Methylnaphthalene	80,000	6,100	NC	38 U	36 U	42 U	36 U	NA	NA
Acenaphthene	1,900,000	2,100	3,700,000	38 U	36 U	300	36 U	NA	NA
Benzo(a)anthracene	1,400	3,200	620	5.7 U	43	70	5.5 U	NA	NA
Benzo(a)pyrene	100	8,000	62	5.7 U	48	91	5.5 U	NA	NA
Benzo(b)fluoranthene	1,400	10,000	620	5.7 U	59	120	5.5 U	NA	NA
Benzo(g,h,i)perylene	2,300,000	32,000,000	NC	7.7 U	32	90	7.3 U	NA	NA
Benzo(k)fluoranthene	15,000	25,000	6,200	5.7 U	5.5 U	69	5.5 U	NA	NA
Chrysene	140,000	77,000	62,000	5.7 U	35	94	5.5 U	NA	NA
Fluoranthene	2,900,000	1,200,000	2,300,000	7.7 U	300	1300	7.3 U	NA	NA
Indeno(1,2,3-cd)pyrene	1,500	28,000	620	5.7 U	34	68	5.5 U	NA	NA
Pyrene	2,200,000	880,000	2,300,000	7.7 U	92	250	7.3 U	NA	NA
Polychlorinated Biphenyls, µg/kg									
Aroclor-1254	500[2]	17000[2]	2200	36 U	35 U	200 U	34 U	39 U	920 U
Aroclor-1260	500[2]	17000[2]	2200	36 U	274	1290	34 U	39 U	5020

TABLE 5-3

PHASE I SOIL ANALYTICAL RESULTS
OU 12, SITE 44 - DITCH FROM DRMO TO WWTP
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

PARAMETER	FDEP SCTL[1]		Region IX Residential Soil PRG[2]	CEF-P44-				
	Residential Direct Exposure	Leachability to Groundwater		SS-014	SS-015	SS-016	SS-017	
							Sample	Duplicate
Polynuclear Aromatic Hydrocarbons, µg/kg								
2-Methylnaphthalene	80,000	6,100	NC	NA	NA	35 U	1200	44 U
Acenaphthene	1,900,000	2,100	3,700,000	NA	NA	35 U	39 U	44 U
Benzo(a)anthracene	1,400	3,200	620	NA	NA	5.3 U	41	6.7 U
Benzo(a)pyrene	100	8,000	62	NA	NA	5.3 U	85	6.7 U
Benzo(b)fluoranthene	1,400	10,000	620	NA	NA	5.3 U	130	6.7 U
Benzo(g,h,i)perylene	2,300,000	32,000,000	NC	NA	NA	7.1 U	110	9.0 U
Benzo(k)fluoranthene	15,000	25,000	6,200	NA	NA	5.3 U	73	6.7 U
Chrysene	140,000	77,000	62,000	NA	NA	5.3 U	42	6.7 U
Fluoranthene	2,900,000	1,200,000	2,300,000	NA	NA	7.1 U	140	91
Indeno(1,2,3-cd)pyrene	1,500	28,000	620	NA	NA	5.3 U	76	6.7 U
Pyrene	2,200,000	880,000	2,300,000	NA	NA	7.1 U	120	49
Polychlorinated Biphenyls, µg/kg								
Aroclor-1254	500[3]	17000[3]	2200	60 U	290 U	NA	37 U	42 U
Aroclor-1260	500[3]	17000[3]	2200	60 U	1,070	NA	37 U	136

Shaded values indicate excess of FDEP criteria.
NA = Not Analyzed.
NC = No Criteria.
U = Not Detected.
1 SCTLs = Soil Cleanup Target Levels, FAC 62-777 (FDEP,1999).
2 U.S. EPA Region IX Preliminary Remediation Goals (U.S. EPA, 2000).
2 Criterion for Total PCBs.

TABLE 5-4

PHASES II THROUGH VII SOIL ANALYTICAL RESULTS
OU 12, SITE 44 - DITCH FROM DRMO TO WWTP
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

PARAMETER	FDEP SCTL[1][2]		Region IX Residential Soil PRGs[3]	CEF-P44-					
	Residential Direct Exposure	Leachability to Groundwater		SS-101-01	SS-102-01	SS-103-01	SS-104-01	SS-105-01	
								Sample	Duplicate
Polychlorinated Biphenyls, µg/kg									
Aroclor-1254	500	17,000	2,200	16.2 J	118 J	120 U	990 U	200 U	400 U
Aroclor-1260	500	17,000	2,200	80.8 J	365 J	347	3,290	690	1,740

PARAMETER	FDEP SCTLs[1][2]		Region IX Residential Soil PRGs[3]	CEF-P44-					
	Residential Direct Exposure	Leachability to Groundwater		SS-106-01	SS-107-02	SS-108-01		SS-109-01	SU-110-04
						Sample	Duplicate		
Polychlorinated Biphenyls, µg/kg									
Aroclor-1254	500	17,000	2,200	910 U	36 U	3900 U	3700 U	1900 U	43 U
Aroclor-1260	500	17,000	2,200	2,830	36 U	21,000	23,800	9,440	43 U

PARAMETER	FDEP SCTLs[1][2]		Region IX Residential Soil PRGs[3]	CEF-P44-					
	Residential Direct Exposure	Leachability to Groundwater		SU-111-03	SS-112-01	SS-113-01	SS-114-01	SS-115-02	SU-201-03
Polychlorinated Biphenyls, µg/kg									
Aroclor-1254	500	17,000	2,200	41 U	370 U	37 U	119	2200 U	38 U
Aroclor-1260	500	17,000	2,200	41 U	1,470	59.1	95 U	1,540	38 U

TABLE 5-4

PHASES II THROUGH VII SOIL ANALYTICAL RESULTS
OU 12, SITE 44 - DITCH FROM DRMO TO WWTP
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

PARAMETER	FDEP SCTLs[1][2]		Region IX Residential Soil PRGs[3]	CEF-P44-					
	Residential Direct Exposure	Leachability to Groundwater		SS-202-01	SS-203-01	SS-204-01	SS-205-01	SS-206-01	SS-207-01
Polychlorinated Biphenyls, µg/kg									
Aroclor-1254	500	17,000	2,200	119 J	36 U	8800 U	114 J	430 U	4600 U
Aroclor-1260	500	17,000	2,200	156 J	43.5	35,000	179 J	2,270	9190

PARAMETER	FDEP SCTLs[1][2]		Region IX Residential Soil PRGs[3]	CEF-P44-				
	Residential Direct Exposure	Leachability to Groundwater		SS-208-01	SS-209-01	SS-210-01	SS-211-01	SU-212-03
Polychlorinated Biphenyls, µg/kg								
Aroclor-1254	500	17,000	2,200	49 U	190 U	137 J	380 U	2100 U
Aroclor-1260	500	17,000	2,200	347	890	314 J	380 U	4,500

ANALYSIS	FDEP SCTLs[1][2]		Region IX Residential Soil PRGs[3]	CEF-P44-					
	Residential Direct Exposure	Leachability to Groundwater		SU-212-03		SS-301-01	SS-302-01	SS-303-01	
				Sample	Duplicate			Sample	Duplicate
Polychlorinated Biphenyls, µg/kg									
Aroclor-1254	500	17,000	2,200	460 U	39 U	76 U	42 U	46 U	43 U
Aroclor-1260	500	17,000	2,200	1720	39 U	329	98	164	147

TABLE 5-4

PHASES II THROUGH VII SOIL ANALYTICAL RESULTS
OU 12, SITE 44 - DITCH FROM DRMO TO WWTP
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

ANALYSIS	FDEP SCTLs[1][2]		Region IX Residential Soil PRGs[3]	CEF-P44-					
	Residential Direct Exposure	Leachability to Groundwater		SS-304-01	SS-305-01	SS-306-01	SS-307-02	SU-308-04	
								Sample	Duplicate
Polychlorinated Biphenyls, µg/kg									
Aroclor-1254	500	17,000	2,200	400 U	210 U	43 U	41 U	160 U	40 U
Aroclor-1260	500	17,000	2,200	1,530	704	72.9	41 U	472 J	40 UJ

ANALYSIS	FDEP SCTLs[1][2]		Region IX Residential Soil PRGs[3]	CEF-P44-					
	Residential Direct Exposure	Leachability to Groundwater		SU-309 (3-4)	SU-310 (1-2)	SU-311 (2-3)	SU-312 (2-3)	SU-313 (2-3)	SS-401 (0-1)
Polychlorinated Biphenyls, µg/kg									
Aroclor-1254	500	17,000	2,200	40 U	170 U	210 U	44 U	44 U	70 J
Aroclor-1260	500	17,000	2,200	50.6	503	1,140	44 U	58.7	53.2 J

TABLE 5-4

PHASES II THROUGH VII SOIL ANALYTICAL RESULTS
OU 12, SITE 44 - DITCH FROM DRMO TO WWTP
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

ANALYSIS	FDEP SCTLs[1][2]		Region IX Residential Soil PRGs[3]	CEF-P44-				
	Residential Direct Exposure	Leachability to Groundwater		SS-402-01	SU-403-03	SU-404-04	SU-405-04	
							Sample	Duplicate
Polychlorinated Biphenyls, µg/kg								
Aroclor-1254	500	17,000	2,200	150 U	45 U	40 U	90 U	45 U
Aroclor-1260	500	17,000	2,200	953	45 U	40 U	413 J	98.6 J

ANALYSIS	FDEP SCTLs[1][2]		Region IX Residential Soil PRGs[3]	CEF-P44-				
	Residential Direct Exposure	Leachability to Groundwater		SS-501-01		SS-502-01	SS-601-01	
				Sample	Duplicate		Sample	Duplicate
Polychlorinated Biphenyls, µg/kg								
Aroclor-1254	500	17,000	2,200	68.2 J	80.5 J	67.9 J	NA	NA
Aroclor-1260	500	17,000	2,200	82.1 J	89.2 J	92.5 J	NA	NA

Shaded values indicate concentrations in excess of criteria.
J = Estimated value.
NA = Not Analyzed.
NC = No Criterion.
U = Not detected.
1 SCTLs = Soil Cleanup Target Levels, Florida Administrative Code (FAC) 62-777 (FDEP,1999).
2 Criteria is for Total PCBs.
3 U.S. EPA Region IX Preliminary Remediation Goals (U.S. EPA, 2000).

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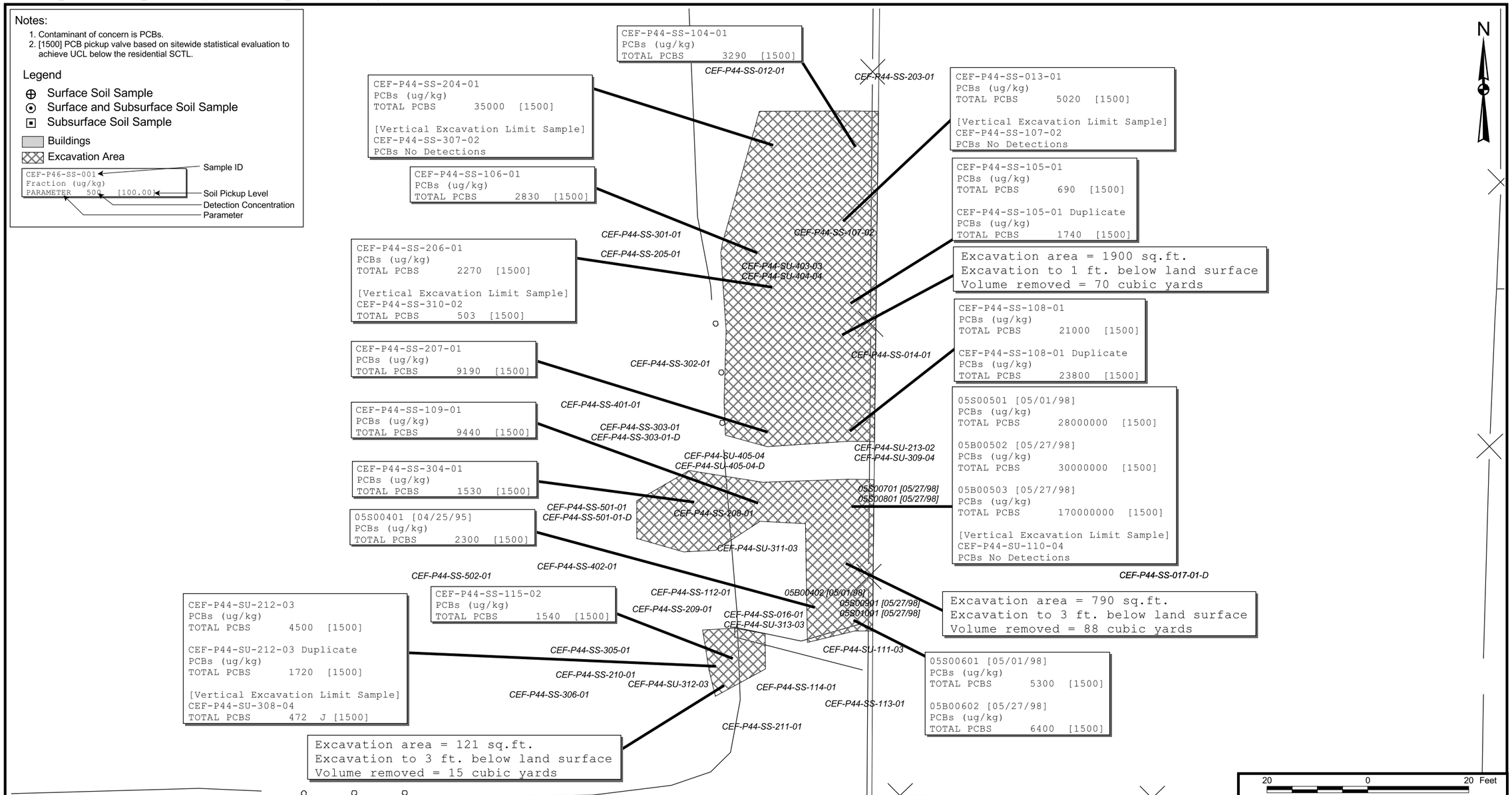
Notes:

1. Contaminant of concern is PCBs.
2. [1500] PCB pickup valve based on sitewide statistical evaluation to achieve UCL below the residential SCTL.

Legend

- Surface Soil Sample
- Surface and Subsurface Soil Sample
- Subsurface Soil Sample
- Buildings
- Excavation Area

CEF-P46-SS-001 — Sample ID
Fraction (ug/kg)
PARAMETER 500 [100.00] — Soil Pickup Level; Detection Concentration; Parameter



DRAWN BY MJJ	DATE 21May01	CONTAMINANTS GREATER THAN SOIL PICKUP LEVEL AND LIMITS OF SOIL EXCAVATION OU 12, SITE 44, DITCH FROM DRMO TO WWTP TECHNICAL MEMORANDUM NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NO. 0039
CHECKED BY	DATE		APPROVED BY / DATE
COST/SCHED-AREA			APPROVED BY / DATE
SCALE AS NOTED			DRAWING NO. FIGURE 5-1 / REV. 0

6.0 RISK EVALUATION / DETERMINATION OF CLEANUP CONCENTRATION

6.1 HUMAN HEALTH RISKS

The results of the sampling at Site 44 identified PCB contamination in excess of the FDEP residential SCTL of 500 µg/kg. The BCT reviewed the analytical results, and a decision was made to delineate the extent of contaminated soil to residential criteria.

It was decided that soil samples with PCB concentrations greater than three times the FDEP residential SCTL would be excavated. Excavation of these soils ensures protection of human health and groundwater. Some soil samples remaining on site after excavation activities have been completed may have concentrations in excess of the residential SCTL, but the exposure concentration was determined to be less than the residential SCTL. If the upper confidence limit (UCL) is less than the residential SCTL, protection of human health is ensured.

The exposure concentration is best represented by the 95 percent UCL of the mean. The excavated sample points were replaced with clean fill from the North Fuel Farm (NFF) (Clean Pile 9). The data for this clean fill are presented in Appendix D of the Source Removal Report (CH2M Hill, 2001). PCBs were not analyzed for in the clean fill. Therefore, to calculate the post-excavation exposure concentration for PCBs, the removed samples were replaced with a PCB concentration of 17 µg/kg, a value equal to one-half its detection limit based on data collected from PSC 44.

Samples with PCB concentrations in excess of 1,500 µg/kg were excavated and disposed in a permitted solid waste disposal facility. The removal of these samples, in combination with other samples that were excavated, resulted in a post-remediation concentration of 235 µg/kg for PCBs, a value less than the PCB residential SCTL of 500 µg/kg (Table 6-1). Therefore, a Human Health Preliminary Risk Evaluation (PRE) is not required.

6.2 ECOLOGICAL RISKS

A screening-level ecological risk assessment (SERA) was conducted to evaluate the potential risks to ecological receptors at Site 44. Steps 1 through 3A of the ecological risk assessment were conducted in accordance with the following documents: U.S. EPA Ecological Risk Assessment Guidance for Superfund (U.S. EPA, 1997), U.S. EPA Region IV Ecological Risk Assessment Bulletins – Supplement to RAGs (U.S. EPA, 1999), U.S. EPA Amended Guidance on Ecological Risk Assessment at Military Bases (U.S. EPA, 2000b), and the Navy Policy for Conducting Ecological Risk Assessments (Department of the Navy, 1999). Steps 1 through 3A consist of the following:

Step 1	Screening-Level Problem Formulation and Ecological Effects Evaluation
Step 2	Screening-Level Exposure Estimate and Risk Calculation
Step 3A	Refinement of Preliminary Chemicals of Potential Concern (COPCs)

6.2.1 Step 1: Screening-Level Problem Formulation and Ecological Effects Evaluation

Site 44 consists of the ditch from the DRMO building to the WWTP (Figure 2-2). The ditch originates at a culvert slightly west of the DRMO building. Runoff from a second culvert enters the ditch downstream of the DRMO culvert. These two culverts receive surface water runoff from parking lots, part of the flightline apron, and numerous buildings in the southwestern portion of NAS Cecil Field. The ditch ultimately drains into Lake Fretwell, slightly west of the WWTP.

The bottom of the ditch is approximately 3 feet below the surrounding ground surface at the upstream end of the ditch and 8 feet below the surrounding ground surface near the WWTP. The top of the ditch varies in width from 6 feet at its headwaters to approximately 15 feet at the WWTP. The bottom of the ditch is generally 5 to 8 feet wide. The amount of water in the ditch is variable, depending on recent rainfall, but water in the downstream portions of the ditch is generally 5 to 8 inches deep, and 3 to 5 feet wide, with a velocity of approximately 0.2 feet per second. Surface water in the upstream portion of the ditch is often absent, except in scattered shallow pools.

The ditch traverses an upland area of pine flatwoods habitat between the DRMO building and the WWTP. The overstory in this wooded area is dominated by longleaf pine (*Pinus palustris*) and slash pine (*Pinus elliottii*). Saw palmetto (*Serenoa repens*), wild grape (*Vitis spp*), and wax myrtle (*Myrica cerifera*) are common throughout this habitat. The ditch in the vicinity of the WWTP is surrounded by open areas of mowed grass and various weeds. There are no wetland habitats at the site, except along the bottom of the ditch.

The banks of the ditch are steeply sloped and thickly vegetated with willow (*Salix spp*), elderberry (*Sambucus canadensis*), blackberry (*Rubus spp*), dog fennel (*Eupatorium capillifolium*), saltbush (*Baccharis halimifolia*), and wax myrtle. The bottom of the ditch in the vicinity of the WWTP is thickly vegetated with various weedy species, resulting in little open water. The bottom of the upstream portions of the ditch is more sparsely vegetated.

The ditch provides limited habitat for minnows, reptiles, amphibians, mammals, and birds. The sparse amount of open water provides only marginal habitat for piscivorous (fish-eating) wading birds, such as herons and egrets (see photographs in Figure 6-1). Although the ditch provides only a small amount of marginal habitat, the ditch drains into Lake Fretwell, which provides a large area of higher quality habitat

for numerous aquatic and wildlife species. Ecological risks from contamination in Lake Fretwell have been previously assessed (TtNUS, 2000c).

The nature and extent of contamination were discussed in Section 5.0. There is no single source of contamination at Site 44. The ditch receives surface runoff from a large area in the southwestern portion of NAS Cecil Field, and contaminant inputs could result from a variety of aviation- and maintenance-related activities.

Aquatic organisms in the ditch, as well as wildlife that occasionally utilize the ditch, could be exposed to contaminants through direct contact with surface water and sediments, incidental ingestion of surface water and sediments, and consumption of contaminated food items.

The preliminary assessment endpoints for this ecological risk assessment were the protection of terrestrial and aquatic biota from adverse effects of chemicals on growth, survival, and reproduction. The preliminary measurement endpoints were chemical concentrations in surface soil, surface water, and sediment associated with adverse effects on growth, survival, and reproduction of soil or sediment-dwelling organisms (surface water and sediment screening levels).

6.2.2 Step 2: Screening-Level Exposure Estimate and Risk Calculation

Maximum concentrations of analytes detected in surface soil, surface water, and sediment were compared to conservative ecological screening values (ESVs). Analytes whose maximum concentrations did not exceed ESVs were dropped from further consideration, and those that exceeded ESVs (or did not have ESVs) were retained as ecological COPCs. The ESVs used for the initial screening were the lowest of those established by U.S. EPA Region IV (U.S. EPA, 1999; 2000c) and the Florida Department of Environmental Protection (FDEP, 1999).

6.2.2.1 Screening Results – Surface Soil

Four SVOCs (2-methylnaphthalene, bis(2-ethylhexyl) phthalate, fluoranthene, and pyrene), two pesticides (dieldrin and endrin aldehyde), PCBs (Aroclor 1254, Aroclor 1260, and total PCBs), and seven inorganic analytes (aluminum, cadmium, chromium, iron, lead, mercury, and zinc) were retained as COPCs in surface soil because the maximum detected concentration exceeded the Region IV ecological screening values. Four pesticides (alpha-chlordane, endosulfan sulfate, gamma-chlordane, and heptachlor epoxide) were retained as COPCs in surface soil because Region IV screening levels were not available for these compounds (Table 6-2).

6.2.2.2 Screening Results – Surface Water

Four inorganic analytes, including aluminum, iron, lead, and thallium, were retained as COPCs in surface water because their maximum concentrations exceeded the Region IV ecological screening values. One volatile organic compound (VOC) (acetone) and three inorganic chemicals (barium, manganese, and vanadium) were retained as COPCs in surface water because no Region IV screening levels were available (Table 6-3).

6.2.2.3 Screening Results – Sediment

Nineteen SVOCs, including 2-methylnaphthalene, acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, butylbenzyl phthalate, chrysene, di-n-butyl phthalate, di-n-octyl phthalate, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene were retained as COPCs in sediment because their maximum concentrations exceeded the ESVs (Table 6-4). Ten pesticides (4,4'-DDD, 4,4'-DDE, 4,4'-DDT, alpha-chlordane, dieldrin, endrin, endrin aldehyde, endrin ketone, gamma-BHC, and gamma-chlordane plus total DDTs, total chlordane, and total endrins), PCBs (Aroclor 1254, Aroclor 1260, and total PCBs), and seven inorganic analytes (cadmium, copper, lead, mercury, nickel, silver, and zinc) were also retained as COPCs because their concentrations exceeded the ESVs. One VOC (2-butanone), two SVOCs (carbazole and dibenzofuran), five pesticides (aldrin, endosulfan I, heptachlor, heptachlor epoxide, and methoxychlor), and 10 inorganics (aluminum, barium, beryllium, cobalt, cyanide, iron, manganese, selenium, thallium, and vanadium) were retained as COPCs in sediment because no Region IV sediment screening values were available (Table 6-4).

6.2.3 Step 3A: Refinement of Preliminary Contaminants of Potential Concern

Subsequent to the initial screening, other factors were considered to further refine COPCs. These factors included food chain modeling, habitat quality, area use factors, toxicological evaluation of COPCs, frequency of detection, background concentrations, and comparisons of COPCs to alternate guidelines (U.S. EPA, 1997; 2000; Department of the Navy, 1999).

Food chain modeling was conducted to investigate potential risks to representative receptors from ingested doses of COPCs that are known to bioaccumulate or biomagnify (U.S. EPA, 2000c). The methods used to model the doses that representative receptors could receive, as well as the selection of toxicity reference values (TRVs) and the calculation sheets for the food chain model, are described and presented in Appendix B. The assessment endpoints associated with the food chain modeling were the protection of vermivorous and piscivorous birds and mammals from adverse effects of COPCs on growth,

survival, and reproduction. The associated measurement endpoints were doses of COPCs associated with adverse effects on growth, survival, and reproduction of these receptor groups.

An inorganic background data set (IBDS) has been developed to represent facility-wide background concentrations of metals at NAS Cecil Field (HLA, 1998). Concentrations of metals in surface soil, surface water, and sediment at PSC 44 were compared to these IBDS values in Step 3A. Surface soil, surface water, and sediment IBDS values for COPCs at Site 44 are shown in Tables 6-2, 6-3, and 6-4, respectively.

Concentrations of COPCs were compared to alternate (usually less conservative) guidelines in Step 3A of this assessment. These alternate guidelines are presented in Appendix B of this report. The use of guidelines that are less conservative than Region IV ESVs values provides balance to the conservative screening-level assessment. Alternative sediment guidelines include values established by various state and federal agencies and publications (Table 6-4). Some alternate toxicity data are available for surface water. Food chain modeling for the shrew was conducted using incidental soil ingestion rates of 3 percent and 10 percent to show a range of risks.

6.2.3.1 Results of Terrestrial Food Chain Modeling

Using maximum concentrations with 3 and 10 percent soil ingestion rates, the least shrew had at least one hazard quotient (HQ) greater than 1.0 for Aroclor 1254, Aroclor 1260, total PCBs, cadmium, chromium, lead, and mercury. Using the 10 percent soil ingestion rate, the least shrew also had an HQ greater than 1.0 for zinc. The northern mockingbird had at least one HQ greater than 1.0 for Aroclor 1254, Aroclor 1260, endrin aldehyde, cadmium, chromium, lead, mercury, and zinc using maximum concentrations (Table 6-5).

Using average concentrations with a 3 percent soil ingestion rate, the least shrew had an HQ greater than 1.0 for Aroclor 1260, total PCBs, and mercury based on the no observed adverse effect level (NOAEL), but only for mercury based on the lowest observed adverse effect level (LOAEL) (Table 6-6). The northern mockingbird had an HQ greater than 1.0 for Aroclor 1260, lead, mercury, and zinc based on the NOAEL, but only for mercury based on the LOAEL (Table 6-6). Using the 10 percent soil ingestion rate, the least shrew had an HQ greater than 1.0 based on the NOAEL for Aroclor 1254, Aroclor 1260, total PCBs, cadmium, and mercury and also for mercury based on the LOAEL.

6.2.3.2 Results of Aquatic Food Chain Model

Using maximum concentrations, the raccoon had at least one HQ greater than 1.0 for Aroclor 1254, Aroclor 1260, total PCBs, copper, lead, mercury, and selenium. The belted kingfisher had at least one

HQ greater than 1.0 for Aroclor 1254, Aroclor 1260, dieldrin, endosulfan I, endrin aldehyde, total PCBs, total endrin, cadmium, copper, mercury, lead, selenium, silver, and zinc (Table 6-7).

Using average concentrations, the raccoon had an HQ greater than 1.0 for Aroclor 1254, Aroclor 1260, total PCBs, and mercury based on the NOAEL but only Aroclor 1260 and total PCBs based on the LOAEL. Based on the NOAEL, the belted kingfisher had an HQ greater than 1.0 for Aroclor 1254, Aroclor 1260, total PCBs, dieldrin, lead, mercury, and selenium, but only Aroclor 1260, total PCBs, and mercury based on the LOAEL (Table 6-8).

6.2.3.3 Step 3A Discussion

6.2.3.3.1 Soil Plants and Invertebrates

Bis(2-ethylhexyl) phthalate

Bis(2-ethylhexyl)phthalate was retained as a COPC because the maximum detected concentration (0.4 mg/kg) exceeded the screening level of 0.1 mg/kg for total phthalates. However, the screening level is the conservative Dutch Target Value, which is indicative of the soil quality level that is ultimately desired (MHSPE, 1994). Moreover, the Dutch Intermediate Value for total phthalates is 30.05 mg/kg, which is approximately 61 times greater than the total concentration of all phthalates detected at PSC 44 (0.495 mg/kg) (see Appendix B). Based on a recent discussion of the Dutch Values in Swartjes (1999), a concentration that is greater than the Target Value, but less than the Intermediate Value, suggests that the soil may be slightly contaminated but requires no further investigation. In addition, all phthalate esters are considered to be common laboratory contaminants so the two detected concentrations of bis(2-ethylhexyl) phthalate are not likely to be site related. For these reasons, risks from bis(2-ethylhexyl) phthalate are expected to be negligible.

2-Methylnaphthalene, Fluoranthene, and Pyrene

2-Methylnaphthalene, fluoranthene, and pyrene were retained as COPCs because their maximum concentrations exceeded the Region IV screening levels of 1.0, 0.1, and 0.1 mg/kg, respectively. The screening level is the Dutch Target Value, which is indicative of the soil quality level that is ultimately desired (MHSPE, 1994) and is, therefore, very conservative. However, the Dutch Intermediate Value for total PAHs is 20.5 mg/kg, which is approximately five times greater than the total concentration of all PAHs detected at PSC 44 (3.9 mg/kg). Based on the 12 PAHs detected at PSC 44, the Dutch Intermediate Value for each individual PAH is 1.7 mg/kg (see Appendix B), which none of the detected PAHs exceed (see Table 6-2). In addition, the total detected concentration of PAHs is less than the alternate benchmark of 20 mg/kg for soil phytotoxicity (Efroymson et al., 1997). Because of the low

detected concentrations, 2-methylnaphthalene, fluoranthene, and pyrene are expected to pose low risks to ecological receptors.

Alpha- and Gamma-Chlordane

Alpha- and gamma-chlordane were retained as COPCs because there were no Region IV screening levels available for these chemicals. However, the total concentration of alpha- and gamma-chlordane detected at PSC 44 (0.00107 mg/kg) is nearly two orders of magnitude less than the Region III Biological Technical Assistance Group (BTAG) screening level for chlordane (0.1 mg/kg) (U.S. EPA, 1995). In addition, alpha- and gamma-chlordane were detected in only one sample (05S00201), and the HQs for the least shrew and northern mockingbird were less than 1.0 in the conservative food chain model using maximum concentrations. Because of the low frequency and detected concentrations of these pesticides, risks from alpha- and gamma-chlordane are expected to be negligible.

Dieldrin and Endrin Aldehyde

Dieldrin and endrin aldehyde were retained as COPCs because the maximum detected concentrations (0.0042 and 0.016 mg/kg, respectively) exceeded the Region IV screening level of 0.0005 mg/kg (Dutch Target Value). However, the maximum total detected concentration of dieldrin and endrin aldehyde (0.02 mg/kg) was almost 100 times less than the Dutch Intermediate Value of 2.0 mg/kg for the total concentration of aldrin, endrin, and dieldrin (see Appendix B). According to the discussion in Swartjes (1999), a concentration that is greater than the Target Value, but less than the Intermediate Value, suggests that the soil may be slightly contaminated but requires no further investigation. In addition, the HQs for dieldrin for the least shrew and the northern mockingbird were less than 1.0 in the conservative food chain model using maximum concentrations. Although endrin aldehyde had an HQ of 1.3 for the northern mockingbird using the maximum concentration and the NOAEL, the HQs for endrin aldehyde in the less conservative food chain model using average concentrations were less than 1.0 for both the least shrew and the northern mockingbird. Due to the low detected concentrations, risks from dieldrin and endrin aldehyde are expected to be negligible.

Endosulfan Sulfate

Endosulfan sulfate was retained as a COPC because there is no surface soil COPC screening level available for this chemical. However, endosulfan sulfate was detected at a low concentration (0.011 mg/kg) in only one sample (05S00201) collected in April 1995. This location was resampled in April 2000, and endosulfan sulfate was not detected in sample CEF-P44-SS-601-01 or its duplicate. In addition, the HQs for the least shrew and northern mockingbird were less than 1.0 in the conservative

food chain model using the maximum detected concentration of endosulfan sulfate. Therefore, it is likely that endosulfan sulfate would cause negligible risk to ecological receptors.

Heptachlor Epoxide

Heptachlor epoxide was retained as a COPC because there was no Region IV screening level available for this chemical. However, the maximum concentration of heptachlor epoxide detected at PSC 44 (0.000048 mg/kg) is over 2,000 times less than the Region III BTAG screening level (0.1 mg/kg) (U.S. EPA, 1995). In addition, heptachlor epoxide was detected in only one sample (05S00201), and the HQs for the least shrew were less than 1.0 in the conservative food chain model using the maximum concentration (NOAELs or LOAELs were not available for the northern mockingbird). Because of the low frequency and detected concentrations of this pesticide, risks from heptachlor epoxide are expected to be negligible.

Aroclor 1254 and Aroclor 1260

Aroclor 1254 and Aroclor 1260 were retained as COPCs because the maximum detected concentrations (0.137 and 1.5 mg/kg, respectively) exceeded the conservative Region IV screening level of 0.02 mg/kg for total PCBs (the Dutch Target Value). However, studies have shown that 1.86 mg/kg of PCBs do not cause toxicity in earthworms or lettuce seeds (Meier et al., 1997). Other studies suggest that a toxicity threshold for soil invertebrates exposed to Aroclor 1254 exists between 500 and 2,500 mg/kg (Parmelee et al., 1997). In addition, the maximum detected concentrations of Aroclor 1254 and Aroclor 1260 at PSC were substantially less than additional toxicity data that indicate adverse affects to soil invertebrates, as presented in Appendix B.

When evaluated using the average food chain model scenario (based on average concentrations and the LOAEL), the HQs for the least shrew and the northern mockingbird were less than 1.0 for Aroclor 1254, Aroclor 1260, and total PCBs. For these reasons, risks from Aroclor 1254 and Aroclor 1260 are expected to be low.

Aluminum

Aluminum was retained as a COPC because the maximum detected concentration (1,160 mg/kg) exceeded the Region IV screening level of 50 mg/kg. This screening level was based on one plant study in which the establishment of white clover in a silt loam (pH 5.0) was reduced approximately 30 percent by the addition of 50 ppm of aluminum sulfate (Efroymson et al., 1997). The aluminum that was applied to the soil in this study would most likely be more available than aluminum in the soil at the site because it is

unlikely that the aluminum at the site was disposed as an aluminum salt. Therefore, the screening level is very conservative. No other toxicity data for aluminum in soil were located.

As summarized in Venugopal and Luckey (1978), aluminum is not readily absorbed through the skin of mammals. Gastrointestinal absorption of ingested aluminum is poor due to the transformation of aluminum salts into insoluble aluminum phosphate. Another factor in the lack of accumulation of aluminum in animals with age, or the absence of any increase in tissue levels of aluminum following fairly high dietary intake, may be that certain organisms possess a homeostatic mechanism for this element. For most terrestrial organisms (e.g., mammals and birds), aluminum compounds are generally not harmful and are considered to be toxicologically inert, except in cases of high experimental doses or prolonged inhalation (Venugopal and Luckey, 1978).

In addition, the maximum detection of aluminum was less than the IBDS value for aluminum of 4,430 mg/kg (Table 6-2). For these reasons, risks from aluminum are expected to be negligible.

Cadmium

Cadmium was retained as a COPC because the maximum detected concentration (1.7 mg/kg) exceeded the Region IV screening level of 1.6 mg/kg, which is the Dutch Maximum Permissible Concentration (Crommenttuijn, 1997). However, the maximum detected concentration of cadmium is less than most of the other benchmarks and toxicity data presented in Appendix B, including the Dutch Intermediate Value (6.0 mg/kg), the Canadian Soil Quality Guideline for Plants and Invertebrates (10 mg/kg), and the Oak Ridge National Laboratory (ORNL) Benchmarks for Plants (4 mg/kg) and Invertebrates (20 mg/kg) (ORNL, 2000). The NOAEL HQs for the least shrew and northern mockingbird in the less conservative food chain model based on average concentrations were less than 1.0. In addition, cadmium was detected in only one sample (05S00201) at a maximum concentration that is less than the IBDS value for NAS Cecil Field (1.72 mg/kg) (Table 6-2). For these reasons, risks from cadmium are expected to be negligible.

Chromium

Chromium (total) was retained as a COPC because the maximum detected concentration (31.6 mg/kg) exceeded the Region IV screening level of 0.4 mg/kg, which was based on an earthworm study in which potassium dichromate [Cr(IV)] was added to the soil as a solution (Efroymson et al., 1997). However, chromium typically occurs in soil as Cr(III) (ASTDR, 1987), which is stable in most soil types (CCME, 1997) and is typically thought to be nontoxic (Eisler, 1986). It is likely that most, if not all, of the chromium that was detected in the soil samples at the site was Cr(III). Moreover, the maximum concentration of total chromium detected at Site 44 is less than most of the other benchmarks and toxicity

data presented in Appendix B. Also, the HQs for the least shrew and northern mockingbird in the less conservative food chain model based on average concentrations were less than 1.0. Therefore, risks from chromium (total) are expected to be negligible.

Iron

Iron was retained as a COPC because the maximum detected concentration (1,120 mg/kg) exceeded the Region IV screening level of 200 mg/kg (ORNL benchmark for soil microorganisms and microbial processes). However, iron is an essential nutrient and one of the most common elements in the earth's crust (fourth most abundant). Potential risks are expected to be low because most iron in surface soil is not bioavailable, and no evidence suggests that it will bioaccumulate or biomagnify in organisms. In addition, the maximum detected concentration is less than the IBDS value for NAS Cecil Field (1490 mg/kg), so iron is not expected to be site related (Table 6-2). For these reasons, risks from iron are expected to be negligible.

Lead

Lead was retained as a COPC because the maximum detected concentration (110 mg/kg) exceeded the Region IV screening level of 50 mg/kg (ORNL benchmark for plants). Although lead was detected in all three surface soil samples, the detected concentrations only exceed the screening level in one sample (05S00201). The lead concentration detected in sample 05S00201 (110 mg/kg) was less than the Canadian Soil Quality Guideline for soil contact (250 mg/kg), the Dutch Intermediate Value (188 mg/kg), and the ORNL benchmark for earthworms (500 mg/kg), as presented in Appendix B. In addition, the only HQ in the less conservative food chain model that exceeded 1.0 was for the northern mockingbird (HQ=1.6, based on the NOAEL). The HQ based on the LOAEL for the northern mockingbird was less than 1.0. Moreover, the maximum detected concentration of lead is less than the IBDS value for NAS Cecil Field (197 mg/kg), so lead is not expected to be site related (Table 6-2).

Mercury

Mercury was retained as a COPC because the maximum detected concentration (2.9 mg/kg) exceeded the Region IV screening level of 0.1 mg/kg (ORNL benchmark for earthworms). This conservative screening level is based on an earthworm study in which mercury was added to the soil as a solution, which is expected to be more bioavailable than mercury in the soil at the site. In addition, the maximum detection of mercury in the soil at the site is less than the Dutch Intermediate Value of 5.15 mg/kg (see Appendix B). Although the HQs for the least shrew and northern mockingbird were greater than 1.0 in the less conservative food chain model (based on the average concentration), mercury was only detected in one sample (05SS00201, collected in April 1995). This location was resampled in April 2000, and

mercury was not detected in sample CEF-P44-SS-601-01 or its duplicate. Therefore, risks from mercury are expected to be negligible.

Zinc

Zinc was retained as a COPC because the maximum detected concentration (126 mg/kg) exceeded the Region IV screening level of 50 mg/kg (ORNL benchmark for plants). However, all the studies used to develop this benchmark consisted of adding zinc to soil as a solution, which is expected to be more bioavailable than the zinc in the soil at the sites (Efroymson et al., 1997). In addition, the maximum concentration of zinc is less than most of the alternate benchmarks and toxicity data presented in Appendix B. Moreover, the only HQ in the less conservative food chain model that exceeded 1.0 was for the northern mockingbird (HQ=1.3, based on the NOAEL). The HQ based on the LOAEL for the northern mockingbird was less than 1.0. Therefore, zinc is expected to pose negligible risks to wildlife or plants.

6.2.3.2.2 Aquatic Receptors

Acetone and 2-Butanone

Acetone was retained as a COPC in surface water and 2-butanone was retained as a COPC in sediment because there were no Region IV screening values available for these chemicals. However, because acetone and 2-butanone are common laboratory chemicals, the relatively low maximum detected concentrations of 3 µg/L and 0.004 mg/kg, respectively, are not likely to be site related, and cause negligible risks to aquatic receptors.

PAHs

Fifteen PAHs (2-methylnaphthalene, acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene) were retained as COPCs in sediment because the maximum detected concentrations exceeded the Region IV screening values; carbazole and dibenzofuran were retained as sediment COPCs because there was no Region IV screening value available for these chemicals. However, as presented in Appendix B, the maximum concentration of each PAH (with the exception of 2-methylnaphthalene) is less than the freshwater higher effect levels for each individual PAH, including the Severe Effect Levels (SELs) (OMOE, 1993) and/or the Probable Apparent Effects Thresholds (PAETs) (Cubbage, et al., 1997). In addition, the maximum detected total concentration of PAHs (34.1 mg/kg) is less than the freshwater higher effect levels for total PAHs, including the OMOE (1993) SEL of 100 mg/kg, the Cubbage et al. (1997) PAET of 400 mg/kg, and the ARCS (1996) No-Effect Concentration (NEC) of 84.6 mg/kg (Appendix B). Also, the high PAHs

detections are well bounded by lower detections in the upstream and downstream direction. As a result, PAHs are expected to pose low risks to benthic invertebrate.

Moreover, foodchain uptake is generally not considered to be a major exposure route for PAHs for aquatic organisms (ATSDR, 1990). PAHs have a strong affinity for organic carbon in sediments, which generally reduces their bioavailability. Although PAHs can accumulate in terrestrial and aquatic organisms, most organisms are able to metabolize and eliminate these compounds; vertebrates can readily metabolize most PAHs (ATSDR, 1990). As a result, PAHs were not evaluated in the food chain model, in accordance with U.S. EPA Region IV policy.

Phthalates

Bis(2-ethylhexyl) phthalate, butylbenzyl phthalate, di-n-butyl phthalate, and di-n-octyl phthalate were retained as COPCs in sediment because the maximum detected concentrations (2.9, 0.21, 2.3, and 0.752 mg/kg, respectively) exceeded the Region IV screening value of 0.182 mg/kg for each phthalate (MacDonald Threshold Effect Level [TEL] for bis(2-ethylhexyl) phthalate was used). However, the maximum detected concentrations of butylbenzyl phthalate, di-n-butyl phthalate, and di-n-octyl phthalate are less than the Probable Effects Level (PEL) for bis(2-ethylhexyl) phthalate (2.6 mg/kg), as presented in Appendix B. The concentration of bis(2-ethylhexyl) phthalate only slightly exceeds the PEL. In addition, all phthalate esters are considered to be common laboratory contaminants so the detected concentrations are not likely to be site-related. For these reasons, bis(2-ethylhexyl) phthalate, butyl benzyl phthalate, di-n-butyl phthalate, and di-n-octyl phthalate are expected to pose negligible risks to benthic invertebrates.

4,4'-DDD, 4,4'-DDE, and 4,4'-DDT

4,4'-DDD, 4,4'-DDE, and 4,4'-DDT were retained as COPCs in sediment because the maximum detected concentrations (0.011, 0.016, and 0.0058 mg/kg, respectively) exceeded the Region IV sediment screening levels of 0.00122, 0.00207, and 0.00119 mg/kg, respectively (MacDonald TELs). However, the maximum concentrations for 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, and total DDTs (0.0328 mg/kg summing maximum detections across samples) were less than all of the higher effect levels, including the MacDonald (1994) PELs, (0.00781, 0.374, 0.00477, and 0.0517 mg/kg, respectively) and the OMOE (1993) SELs (0.06, 0.19, 0.71, and 0.12 mg/kg, respectively). Therefore, 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT are expected to pose negligible risks to benthic invertebrates.

When evaluated in the food chain model using conservative exposure parameters, total DDTs did not have any HQs greater than 1.0 for the raccoon or the belted kingfisher.

Aldrin

Aldrin was retained as a COPC in sediment because there was no Region IV screening value available for this chemical. However, aldrin was detected in only 2 of 15 samples, and the maximum concentration (0.00089 mg/kg) is less than the OMOE (1993) Low Effects Level (LEL) of 0.002 mg/kg. When evaluated in the conservative food chain model scenario, aldrin did not have any HQs greater than 1.0 for the raccoon and belted kingfisher. Therefore, aldrin is expected to pose negligible risks to aquatic receptors.

Alpha-Chlordane and Gamma-Chlordane

Alpha- and gamma-chlordane were retained as COPCs in sediment because the maximum detected concentrations (0.0073 and 0.012 mg/kg, respectively) exceeded the Region IV sediment screening value for chlordane of 0.0005 mg/kg (Long et al., 1991). However, of the five detected concentrations of alpha- and gamma-chlordane, only the maximum detection of alpha-chlordane and two detected concentrations of gamma-chlordane slightly exceed the OMOE (1993) freshwater LEL for chlordane of 0.007 mg/kg. None of the detected concentrations (or the sum of the two chlordanes) of alpha- or gamma-chlordane exceed the OMOE (1993) freshwater SEL of 0.06 mg/kg for chlordane. When evaluated in the conservative food chain model scenario, neither alpha- nor gamma-chlordane (or total chlordanes) had an HQ greater than 1.0 for the raccoon and belted kingfisher. Therefore, alpha- and gamma-chlordane are expected to pose negligible risks to aquatic receptors.

Dieldrin

Dieldrin was retained as a COPC in sediment because the maximum detected concentration (0.0049 mg/kg) exceeded the Region IV sediment screening value of 0.00002 mg/kg (Long et al., 1991). However, the maximum detected concentration only slightly exceeds the MacDonald (1994) PEL of 0.0043 mg/kg, and is substantially less than the OMOE (1993) SEL of 0.91 mg/kg. Moreover, dieldrin was only detected in 1 (05D00301) of 15 samples. When evaluated in the conservative food chain model scenario and based on the LOAEL, dieldrin did not have any HQs greater than 1.0 for the raccoon and belted kingfisher. Because of the low concentration and frequency of detection, risks from dieldrin are expected to be negligible.

Endosulfan I

Endosulfan I was retained as a COPC in sediment because no Region IV screening value was available for this chemical. However, endosulfan I was detected in only one (57D00101) of fifteen samples at a concentration of 0.05 mg/kg, which is less than the higher effect screening levels for most of the other pesticides (Appendix B). When evaluated in the conservative food chain model scenario, the HQs for endosulfan I for the raccoon and were less than 1.0. When evaluated in the average food chain model

scenario, the HQs for endosulfan I for the belted kingfisher were less than 1.0. Potential risks (if any) posed by endosulfan I would be expected to be negligible.

Endrin, Endrin Aldehyde, and Endrin Ketone

Endrin, endrin aldehyde, and endrin ketone were retained as COPCs in sediment because the maximum detected concentrations (0.017, 0.023 and 0.00067 mg/kg, respectively) exceeded the Region IV sediment screening value for endrin of 0.00002 mg/kg (Long et al., 1991). However, neither the maximum detected concentrations nor the total endrin concentration exceed the OMOE (1993) freshwater SEL of 1.3 mg/kg for endrin. The maximum detected concentration of endrin ketone is also less than the OMOE (1993) freshwater LEL of 0.003 mg/kg for endrin. When evaluated using the food chain model, total endrins did not generate HQs greater than 1.0 in the conservative scenario for the raccoon or belted kingfisher. Therefore, endrin, endrin aldehyde, and endrin ketone are expected to pose negligible risks (if any) to aquatic receptors.

Gamma-BHC (lindane)

Gamma-BHC was retained as a COPC in sediment because the maximum detected concentration (0.0011 mg/kg) exceeded the Region IV sediment screening value of 0.00032 mg/kg (MacDonald, 1994). However, the maximum detected concentration is less than the OMOE (1993) LEL of 0.003 mg/kg. Moreover, gamma-BHC was only detected in 2 (05D00101 and 05D00301) of 15 samples. When evaluated in the conservative food chain model scenario, the HQs for gamma-BHC were less than 1.0 for the raccoon and belted kingfisher. For these reasons, risks from, gamma-BHC are expected to be negligible.

Heptachlor and Heptachlor Epoxide

Heptachlor and heptachlor epoxide were retained as COPCs in sediment because there were no Region IV screening values available for these chemicals. However, the maximum detected concentrations (0.00036 and 0.0011 mg/kg, respectively) were less than the OMOE (1993) LEL of 0.005 mg/kg and the Cubbage et al. (1997) AET of 0.26 mg/kg for heptachlor epoxide. When evaluated in the conservative food chain model scenario, the HQs for heptachlor, heptachlor epoxide, and total heptachlors were less than 1.0 for the raccoon and the belted kingfisher. For these reasons, risks from heptachlor and heptachlor epoxide are expected to be negligible.

Methoxychlor

Methoxychlor was retained as a COPC in sediment because no Region IV screening value was available for this chemical. However, methoxyclor was detected in only 3 (05D00101, 05D00301, and 57D00201)

of 15 samples with a maximum concentration of 0.015 mg/kg, which is less than the higher effect screening levels for most of the other pesticides (Appendix B). When evaluated in the conservative food chain model scenario, the HQs for methoxychlor were less than 1.0 for the raccoon and the belted kingfisher. Because of the low concentration and frequency of detection, risks from methoxychlor are expected to be negligible.

Aroclor 1254 and Aroclor 1260

Aroclor 1254 and Aroclor 1260 were retained as COPCs in sediment because the maximum detected concentrations (0.225 and 2.91 mg/kg, respectively) exceeded the Region IV sediment screening value of 0.0216 mg/kg for total PCBs (MacDonald, 1994). However, the maximum concentration of Aroclor 1254 is less than the OMOE (1993) SEL of 0.34 mg/kg and the Cubbage et al. (1997) AET of 0.35 mg/kg (Appendix B). Aroclor 1260 concentrations in four samples (05D00201, 57D00101, CEF-P44-SD-006, and CEF-P44-SD-007) collected in the drainage ditch exceed the OMOE (1993) LEL of 0.005 mg/kg and the SEL of 0.24 mg/kg (presented in Appendix B). The three samples with the greatest PCB concentrations (CEF-P44-SD-007, 57D00101, and CEF-P44-SD-006) are located in the downstream portion of the ditch, in an area that is approximately than 500 feet long (see Figure 4-1). The PCB concentrations in this area decreased from 2.9 mg/kg (CEF-P44-SD-006) in the upstream location to 1.1 mg/kg (CEF-P44-SD-007) in the downstream location. The midstream location had a detection of 1.4 mg/kg (57D00101). Two additional sediment samples (57D00201 and CF6SD1) that were collected close to the upstream and downstream samples in this area had low or non-detected concentrations of PCBs, respectively. Therefore, the Aroclor 1260 contamination in this segment of the stream may be patchy. Sample CF6SD4 was collected along the shoreline of Lake Fretwell approximately 500 feet downstream of the location of the high concentrations of Aroclor 1260, and this sample did not contain Aroclor 1260.

When evaluated in the less conservative food chain model (based on the average concentration and the LOAEL), Aroclor 1260 and total PCBs had HQs slightly greater than 1.0 for the raccoon (HQ = 1.1 for Aroclor 1260 and HQ = 1.3 for total PCBs) and the belted kingfisher (HQ = 2.5 for Aroclor 1260 and HQ = 3.0 for total PCBs). However, the area of Aroclor 1260 contamination at the Site 44 (approximately 1,100 linear feet or approximately 0.13 acres) would comprise only a very small portion of the total home range for the raccoon (96 to 160 acres). The belted kingfisher forages along 3,300 to 6,600 feet of shoreline (U.S. EPA, 1993), but can have foraging ranges up to 20 acres (Fry and Fry, 1992). Because the width of a typical shoreline along which kingfishers would feed is wider than the 3- to 5-foot width of the ditch at Site 44, it can be assumed that the kingfisher would obtain less than 100 percent of its food from the ditch. This would decrease the HQs to less than 1.0. Therefore, Aroclor 1260 is unlikely to pose unacceptable risks (if any) to ecological receptors.

Because of the small area impacted by the Aroclor 1260 contamination, the patchy nature of the contamination, and the small fish community present in the ditch, Aroclor 1254 and Aroclor 1260 are expected to pose low risks to aquatic receptors.

Aluminum

Aluminum was retained as a COPC in sediment because there was no Region IV screening value. Aluminum was retained as a COPC in surface water because the maximum detected concentration (439 µg/L) exceeded the Region IV screening value of 87 µg/L. The maximum detected concentration (15,700 mg/kg) in sediment was much less than both the ARCS (1996) Probable Effect Concentration (PEC) of 58,030 mg/kg and the NEC of 73,160 mg/kg (Appendix B). In surface water, the concentration of aluminum was less than the IBDS value of 1040 µg/L (Table 6-2). Therefore, it is likely that aluminum poses negligible risks (if any) to aquatic receptors.

Barium

Barium was retained as a COPC in sediment and surface water because there were no Region IV screening values available for this chemical. Although barium was detected in all 15 sediment samples, the maximum detected concentration (45.5 mg/kg) is the only concentration that exceeds the IBDS value of 36.1 mg/kg (Table 6-4). Moreover, barium is a common element in sediments, and is not generally associated with significant toxicity (ATSDR, 1997). In surface water, the maximum detected concentration (30.5 µg/l) of barium was less than the IBDS value of 43.7 µg/L (Table 6-3). For these reasons, it is likely that barium poses negligible risks (if any) to aquatic receptors.

Beryllium

Beryllium was retained as a COPC in sediment because there was no Region IV screening value available for this chemical. However, the maximum detected concentration (0.49 mg/kg) is less than the IBDS value of 0.625 mg/kg (Table 6-4) and is not considered to be site-related.

Cadmium

Cadmium was retained as a COPC in sediment because the maximum detected concentration (3.2 mg/kg) exceeded the Region IV screening value of 0.676 mg/kg. The maximum detected concentration is less than all the alternate higher effect levels presented in Appendix B, including the OMOE (1993) SEL of 10 mg/kg, the Cubbage et al. (1997) PAET of 9.3 mg/kg, and the ARCS (1996) PEC of 11.7 mg/kg. In addition, the HQs for cadmium in the conservative food chain model were less than 1.0 for the raccoon. The HQs for the belted kingfisher were less than 1.0 in the less conservative

food chain model based on the average concentration and the NOAEL. Therefore, risks from cadmium are expected to be low.

Cobalt

Cobalt was retained as a COPC in sediment because there were no Region IV screening values available for this chemical. However, the maximum detected concentration (2.3 mg/kg) is less than the IBDS value of 3.0 mg/kg (Table 6-4) and is not considered to be site-related.

Copper

Copper was retained as a COPC in sediment because the maximum detected concentration (61.1 mg/kg) exceeded the Region IV screening value of 18.7 mg/kg. However, the maximum detected concentration is less than all the alternate higher effect levels presented in Appendix B, including the OMOE (1993) SEL of 110 mg/kg, the Cubbage et al. (1997) PAET of 340 mg/kg, and the ARCS (1996) PEC of 77.7 mg/kg. In addition, the HQs for copper in the less conservative food chain model (using average concentrations) were less than 1.0 for the raccoon and the belted kingfisher. Therefore, risks from copper are expected to be negligible.

Cyanide

Cyanide was retained as a COPC in sediment because there were no Region IV screening values available for this chemical. However, the maximum detected concentration (0.23 mg/kg) is less than the IBDS value of 1.23 mg/kg (Table 6-4) and is not considered to be site-related.

Iron

Iron was retained as a COPC in sediment because there was no Region IV screening value; iron was retained as a COPC in surface water because the maximum detected concentration (1,950 µg/L) exceeded the Region IV screening value of 1,000 µg/L. However, the maximum detected concentration (5,900 mg/kg) in sediment was less than the OMOE (1993) LEL of 20,000 mg/kg (Appendix B). In surface water, the concentration of iron was less than the IBDS value of 3,030 µg/L (Table 6-3). Therefore, risks from iron are expected to be negligible.

Lead

Lead was retained as a COPC in sediment because the maximum detected concentration (260 mg/kg) exceeded the Region IV screening value of 30.2 mg/kg (MacDonald, 1994); lead was retained as a COPC in surface water because the maximum detected concentration (12.7 µg/L) exceeded the

Region IV screening value of 2.9 µg/L. However, the maximum detected concentration in sediment was less than the Cubbage et al. (1997) PAET of 490 mg/kg and the ARCS (1996) PEC of 396 mg/kg (Appendix B). In surface water, the concentration of lead only slightly exceeds the IBDS value of 5.35 µg/L in two samples (05W00101 and 05W00201) (Table 6-3). Therefore, risks from lead are expected to be low.

When evaluated in the less conservative food chain model, lead had HQs greater than 1.0 for the belted kingfisher based on the average concentration and the NOAEL. Based on the average concentration and the LOAEL, the HQ for the kingfisher was less than 1.0. Because the ditch supports a small, limited fish community and the kingfisher will obtain less than 10 percent of its food from the ditch, lead is expected to pose negligible risks through the food chain pathway.

Manganese

Manganese was retained as a COPC in sediment and surface water because there were no Region IV screening values available for this chemical. However, the maximum detected concentration (26.6 mg/kg) in sediment was substantially less than all the alternate screening values presented in Appendix B, including the OMOE (1993) LEL of 460 mg/kg, the Cubbage et al. (1997) PAET of 1,400 mg/kg, and the ARCS (1996) NEC of 819 mg/kg. In surface water, the maximum concentration (44.6 µg/L) was less than the IBDS value of 49.3 µg/L (Table 6-3). Therefore, risks from manganese are expected to be negligible.

Mercury

Mercury was retained as a COPC in sediment because the maximum detected concentration (0.75 mg/kg) exceeded the Region IV screening value of 0.13 mg/kg. However, the maximum detected concentration is less than all the alternate freshwater higher effect levels presented in Appendix B, including the OMOE (1993) SEL of 2 mg/kg and the Cubbage et al. (1997) PAET of 1.6 mg/kg. The HQs for mercury in the less conservative food chain model (using average concentrations and the LOAEL) were less than 1.0 for the raccoon, but greater than 1.0 for the belted kingfisher (HQ = 1.7). However, the area of the site comprises only a small portion of the home range of a raccoon (96 to 160 acres) and foraging area for the kingfisher (less than 10 percent) and because the ditch supports a small, limited fish community, mercury is expected to pose low risks through the food chain pathway.

Nickel

Nickel was retained as a COPC in sediment because the maximum detected concentration (37.7mg/kg) exceeded the Region IV screening value of 15.9 mg/kg. However, the maximum detected concentration

is less than all the alternate freshwater higher effect levels presented in Appendix B, including the OMOE (1993) SEL of 75 mg/kg and the ARCs (1996) PEC of 38.5 mg/kg. In addition, the HQs for nickel in the conservative food chain model were less than 1.0 for the raccoon and the belted kingfisher. Therefore, risks from nickel are expected to be negligible.

Selenium

Selenium was retained as a COPC in sediment because there was no Region IV screening value available for this chemical. However, selenium was only detected in 1 (CF6SD1) of 15 sediment samples at a concentration of 2.4 mg/kg, which only slightly exceeds the IBDS value of 2.27 mg/kg (Table 6-4). When evaluated in the less conservative food chain model based on the average concentrations and the NOAEL, the HQs for selenium were less than 1.0 for the raccoon but greater than 1.0 for the kingfisher. However, the LOAEL HQ was less than 1.0. Therefore, risks from selenium are expected to be negligible.

Silver

Silver was retained as a COPC in sediment because the maximum detected concentration (3.9 mg/kg) exceeded the Region IV screening value of 0.733 mg/kg. However, the maximum detected concentration is less than or equal to the Cubbage et al. (1997) AET of 4.5 mg/kg and the PAET of 3.9 mg/kg. In addition, the HQs for silver in the less conservative food chain model were less than 1.0 for the raccoon and the kingfisher. Therefore, risks from silver are expected to be negligible.

Thallium

Thallium was retained as a COPC in sediment because there was no Region IV screening value. Thallium was retained as a COPC in surface water because the maximum detected concentration (5.7 µg/L) exceeded the Region IV screening value of 4.0 µg/L. However, the concentrations (0.77 mg/kg and 5.7 µg/L, respectively) of thallium in sediment and surface water were less than the IBDS values of 2.67 mg/kg and 10.1 µg/L (Table 6-3). Therefore, thallium is not considered to be site related.

Vanadium

Vanadium was retained as a COPC in sediment and surface water because there were no Region IV screening values available for this chemical. Although vanadium was detected in all 15 sediment samples, the maximum detected concentration (53.4 mg/kg) was the only concentration that exceeded the IBDS value of 15 mg/kg. Moreover, vanadium is a common element found in all types of substrates (ATSDR, 1997) and organisms due to its ubiquitous nature (Klaassen et al., 1987). Toxicity data for this element are scarce, but it is not generally considered to be toxic in the environment (Mailman, 1980), and

it is not known to bioaccumulate or biomagnify. In surface water, the maximum detected concentration of vanadium (3 µg/L) was less than the IBDS value of 4.5 µg/L (Table 6-3). Therefore, risks from vanadium are expected to be negligible.

Zinc

Zinc was retained as a COPC in sediment because the maximum detected concentration (430 mg/kg) exceeded the Region IV screening value of 124 mg/kg. However, the maximum detected concentration is less than all the alternate higher effect levels presented in Appendix B, including the OMOE (1993) SEL of 820 mg/kg, the Cubbage et al. (1997) PAET of 1,000 mg/kg, and the ARCS (1996) NEC of 541 mg/kg. In addition, the HQs for zinc in the less conservative food chain model (using average concentrations and the NOAEL) were less than 1.0 for the raccoon and the belted kingfisher. Therefore, risks from zinc are expected to be low.

6.2.4 Screening-Level and Step 3A Uncertainty Analysis

Uncertainties are associated with most steps of a SERA, from selecting endpoints, collecting data, and evaluating toxicity. The following topics summarize some of the uncertainties associated with the SERA that was conducted for Site 44.

Assessment and Measurement Endpoints: Measurement endpoints were used to evaluate the assessment endpoints based on measurements pertaining to representative species or other indicators. There is uncertainty in this prediction because the species or indicators may not accurately represent the assessment endpoints. Species for measurement endpoints are deliberately selected to have higher exposures to the site contaminants, by having small home ranges, high ingestion rates, and low body weights.

Exposure Characterization: The contaminant dose to terrestrial wildlife was calculated using an equation that incorporates ingestion rates, body weights, bioaccumulation factors, and other exposure factors. Because these exposure factors were obtained from literature studies or predicted using various equations, there is uncertainty when they are applied to other sites. There is also uncertainty in the chemical concentration data used for exposure estimates.

Ecological Effects Data: There is uncertainty in some of the ecological effects data because they are typically developed in a laboratory for species that may or may not be present at the site. In addition, for some media (i.e., sediment, soil), often only a few studies are available or the guideline value is based on highly variable data.

Risk Characterization: Risks are projected if an HQ is greater than or equal to unity regardless of the magnitude of the HQ. Also, there is uncertainty in how the predicted risks to a species at the site translate into risk to the population in the area as a whole.

In addition to the above-listed general uncertainties that typically apply to most ERAs, there are a few uncertainties specifically associated with the SERA conducted for Site 44. They are listed as follows:

- The PCBs detected in the drainage ditch sediment samples are causing low risks to aquatic organisms and piscivorous wildlife because the stream is small (with few fish) and the ground vegetation would impede the use of the area by piscivorous wildlife. Also, the areal extent of contamination is relatively small when compared to the home ranges of the raccoon and belted kingfisher. However, potential risks to aquatic organisms and wildlife may increase if the PCBs migrate into Lake Fretwell or if the area of elevated PCB levels increases.

- The PAHs detected in the drainage ditch sediment samples are causing low risks to aquatic organisms because the stream is small and the areal extent of contamination is relatively small. However, potential risks to aquatic organisms may increase if the area of elevated PAH levels increases.

- With the exception of one sample point, the elevated PAHs occur at different locations than the elevated PCB detections. Also, other chemicals were detected at relatively low concentrations in those samples. Therefore, although the Step 3A evaluation focused on single chemicals, the cumulative effects from those chemicals are not expected to occur except at possibly one location.

6.2.5 Ecological Risk Summary and Conclusions

A screening-level ecological risk assessment was performed for OU 12, Site 44. Organic and inorganic chemicals were detected in the surface soil, sediment, and surface water at maximum concentrations that exceeded conservative screening levels and, therefore, they were selected as COPCs. These COPCs were assessed in a less conservative Step 3A evaluation.

The results of the Step 3A analysis indicate that most of the chemicals detected in the surface soil, sediment, and surface water at Site 44 present negligible risks to ecological receptors. However, PCBs and PAHs in the soil and sediments and a few metals in the sediments may pose low risks to ecological receptors. These risks are expected to be relatively small in spatial area.

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TABLE 6-1

ATTAINMENT OF SCTLS
OU 12, SITE 44 - DITCH FROM DRMO TO WWTP
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

nsample	PCBs (PRE)	PCBs (RES)
MIN	17.0000	17.0000
MAX	3,000,000.00	1,470.00
MEAN	118,418.20	230.64
t 0.95, n-1	0.150578464	0.093775344
STANDARD DEVIATION	573,940.22	349.47
COEFFICIENT OF VARIATION	4.85	1.52
n	50	50
UCL $_{0.95}$	130,640.26	235.27
Goal	**1500 OR 500**	**500.00**
remediation level	**17**	**17**
05B00502	3000000	17
05S00501	2800000	17
CEF-P44-SS-204-01	35000	17
CEF-P44-SS-108-01-MAX	23800	17
CEF-P44-SS-109-01	9440	17
CEF-P44-SS-207-01	9190	17
05B00602	6400	17
05S00601	5300	17
CEF-P44-SS-013	5020	17
CEF-P44-SS-104-01	3290	17
CEF-P44-SS-106-01	2830	17
05S00401 [04/25/95]	2300	17
CEF-P44-SS-206-01	2270	17
CEF-P44-SS-105-01-MAX	1740	17
CEF-P44-SS-115-02	1540	17
CEF-P44-SS-304-01	1530	17
CEF-P44-SS-112-01	1470	1470
CEF-P44-SS-010-01	1290	1290
CEF-P44-SS-015	1070	1070
CEF-P44-SS-402-01	953	953
CEF-P44-SS-209-01	890	890
CEF-P44-SS-305-01	704	704
CEF-P44-SU-310-02	503	503
CEF-P44-SS-102-01	483	483
CEF-P44-SS-210-01	451	451
CEF-P44-SS-103-02	347	347
CEF-P44-SS-208-01	347	347
CEF-P44-SS-301-01	329	329
CEF-P44-SS-205-01	293	293
CEF-P44-SS-202-01	275	275
CEF-P44-SS-009-01	274	274
CEF-P44-SS-211-01	190	190
CEF-P44-SS-501-01-MAX	169.7	169.7

TABLE 6-1

ATTAINMENT OF SCTLS
OU 12, SITE 44 - DITCH FROM DRMO TO WWTP
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

nsample	PCBs (PRE)	PCBs (RES)
MIN	17.0000	17.0000
MAX	3,000,000.00	1,470.00
MEAN	118,418.20	230.64
t 0.95, n-1	0.150578464	0.093775344
STANDARD DEVIATION	573,940.22	349.47
COEFFICIENT OF VARIATION	4.85	1.52
n	50	50
UCL $_{0.95}$	130,640.26	235.27
Goal	**1500 OR 500**	**500.00**
remediation level	**17**	**17**
CEF-P44-SS-303-01	164	164
CEF-P44-SS-502-01	160.4	160.4
CEF-P44-SS-017-01-MAX	136	136
CEF-P44-SS-401-01	123.2	123.2
CEF-P44-SS-114-01	119	119
CEF-P44-SS-302-01	98	98
CEF-P44-SS-101-01	97	97
CEF-P44-SS-306-01	72.9	72.9
CEF-P44-SS-113-01	59.1	59.1
CEF-P44-SS-203-01	43.5	43.5
CEF-P44-SS-014	30	30
05S00301 [04/25/95]	25	25
CEF-P44-SS-307-02	20.5	20.5
CEF-P44-SU-213-02	19.5	19.5
CEF-P44-SS-008-01	18	18
CEF-P44-SS-107-02	18	18
CEF-P44-SS-011-01	17	17

Notes:
PRE - Pre-excavation.
RES - Post excavation to meet residential criteria.
All concentrations are in µg/kg.
Bolded samples were excavated.

TABLE 6-2

SELECTION OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN FOR SURFACE SOIL
OU 12, SITE 44 - DITCH FROM DRMO TO WWTP
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Analyte	Frequency of Detection[1]	Range of Detections[1]		Location of Maximum Detection	Average of All Samples	Inorganic Background Data Set Levels[3]	Ecological Screening Value[4]	Maximum Hazard Quotient	COPC Selection (Yes/No)
		Minimum	Maximum[2]						
Semivolatile Organic Compounds (mg/kg)									
2-Methylnaphthalene	1/9	1.2	1.2	CEF-P44-SS-017-01	0.14	NA	1.0[5]	1.2	Yes
Acenaphthene	1/9	0.30	0.30	CEF-P44-SS-010-01	0.10	NA	20	0.015	No
Benzo(a)anthracene	4/9	0.041	0.080	05S00201 [04/25/95]	0.067	NA	1.0[5]	0.080	No
Benzo(a)pyrene	4/9	0.048	0.091	CEF-P44-SS-010-01	0.071	NA	0.1	0.91	No
Benzo(b)fluoranthene	4/9	0.059	0.18	05S00201 [04/25/95]	0.090	NA	1.0[5]	0.18	No
Benzo(g,h,i)perylene	3/9	0.032	0.11	CEF-P44-SS-017-01	0.082	NA	1.0[5]	0.11	No
Benzo(k)fluoranthene	3/9	0.069	0.18	05S00201 [04/25/95]	0.075	NA	1.0[5]	0.18	No
Bis(2-Ethylhexyl)phthalate	2/3	0.058	0.40	05S00201 [04/25/95]	0.22	NA	0.1[6]	4.0	Yes
Butyl Benzyl Phthalate	1/3	0.095	0.10	05S00201 [04/25/95]	0.16	NA	0.1[6]	0.95	No
Chrysene	4/9	0.035	0.10	05S00201 [04/25/95]	0.070	NA	1.0[5]	0.095	No
Fluoranthene	4/9	0.091	1.3	CEF-P44-SS-010-01	0.25	NA	0.1	13.0	Yes
Indeno(1,2,3-cd)pyrene	3/9	0.034	0.076	CEF-P44-SS-017-01	0.077	NA	1.0[5]	0.076	No
Phenanthrene	1/9	0.078	0.078	05S00201 [04/25/95]	0.053	NA	0.1	0.78	No
Pyrene	4/9	0.049	0.25	CEF-P44-SS-010-01	0.10	NA	0.1	2.5	Yes
Pesticides/PCBs (mg/kg)									
4,4'-DDE	2/4	0.00015	0.0017	05S00201 [04/25/95]	0.0046	NA	0.0025[7]	0.68	No
4,4'-DDT	1/4	0.00079	0.00079	05S00201 [04/25/95]	0.0048	NA	0.0025[7]	0.32	No
Alpha-Chlordane	1/4	0.00024	0.00024	05S00201 [04/25/95]	0.0042	NA	NA	NA	Yes
Aroclor-1254	9/30	0.0162	0.137	CEF-P44-SS-210-01	0.063	NA	0.020[8]	6.9	Yes
Aroclor-1260	23/30	0.025	1.5	CEF-P44-SS-112-01	0.28	NA	0.020[8]	73.5	Yes
Dieldrin	1/4	0.0042	0.0042	05S00201 [04/25/95]	0.0037	NA	0.0005	8.4	Yes
Endosulfan Sulfate	1/4	0.011	0.011	05S00201 [04/25/95]	0.0073	NA	NA	NA	Yes
Endrin Aldehyde	2/4	0.0011	0.016	05S00201 [04/25/95]	0.0084	NA	0.001[9]	16.0	Yes
Gamma-Chlordane	1/4	0.00083	0.00083	05S00201 [04/25/95]	0.0043	NA	NA	NA	Yes
Heptachlor Epoxide	1/4	0.000048	0.000048	05S00201 [04/25/95]	0.0022	NA	NA	NA	Yes
Total DDTs [10]							0.0025[7]	1.0	No
Total PCBs							0.020[8]	80.4	Yes

TABLE 6-2

SELECTION OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN FOR SURFACE SOIL
OU 12, SITE 44 - DITCH FROM DRMO TO WWTP
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Analyte	Frequency of Detection[1]	Range of Detections[1]		Location of Maximum Detection	Average of All Samples	Inorganic Background Data Set Levels[3]	Ecological Screening Value[4]	Maximum Hazard Quotient	COPC Selection (Yes/No)
		Minimum	Maximum[2]						
Inorganic Compounds (mg/kg)									
Aluminum	3/3	750	1160	05S00101 [04/25/95]-D	990	4430	50	23.2	Yes
Arsenic	1/3	1.2	1.2	05S00201 [04/25/95]	0.64	9.4	10	0.12	No
Barium	3/3	1.6	7.0	05S00201 [04/25/95]	3.8	14.4	165	0.042	No
Beryllium	2/3	0.04	0.05	05S00301 [04/25/95]	0.038	0.35	1.1	0.045	No
Cadmium	1/3	1.7	1.7	05S00201 [04/25/95]	0.62	1.72	1.6	1.1	Yes
Chromium	3/3	1.2	31.6	05S00201 [04/25/95]	11.5	7.75	0.4	79.0	Yes
Cobalt	1/3	0.28	0.28	05S00201 [04/25/95]	0.14	3.11	20	0.014	No
Copper	3/3	0.26	11.1	05S00201 [04/25/95]	4.4	5.97	40	0.28	No
Iron	3/3	99.6	1120	05S00201 [04/25/95]	546	1490	200	5.6	Yes
Lead	3/3	1.3	110	05S00201 [04/25/95]	38.6	197	50	2.2	Yes
Manganese	3/3	0.59	12.6	05S00201 [04/25/95]	4.9	22	100	0.13	No
Mercury	1/4	2.9	2.9	05S00201 [04/25/95]	0.76	0.16	0.1	29.0	Yes
Nickel	1/3	0.64	0.64	05S00201 [04/25/95]	0.32	3.9	30	0.021	No
Vanadium	2/3	1.3	1.9	05S00201 [04/25/95]	1.1	6.3	2	0.95	No
Zinc	2/3	10.4	126	05S00201 [04/25/95]	45.8	37	50	2.5	Yes

Footnotes:
1 The sample and duplicate were counted as two separate samples when determining the minimum and maximum detected concentrations but were only counted as one sample when determining the frequency of detection and average of all samples (where applicable).
2 The maximum detected concentration was used for screening purposes.
3 Inorganic Background Data Set, NAS Cecil Field.
4 U.S. EPA Region IV Ecological Screening Values (U.S. EPA,1999).
5 Value is for total PAHs.
6 Value is for total phthalates.
7 Value is for total of DDT, DDE, and DDD.
8 Value is for total PCBs.
9 Value is for endrin.
10 Maximum hazard quotient for total DDTs and total PCBs are calculated by summing the maximum hazard quotient for wach parameter within the group.

Notes:
Shading indicates that the chemical was retained as a COPC, the background concentration was greater than the concentration used for screening, and/or the ecological effects quotient was greater than 1.0.
COPC - Chemical of potential concern.
NA - Not available.
PCBs - Polychlorinated biphenyls.

TABLE 6-3

SELECTION OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN FOR SURFACE WATER
OU 12, SITE 44 - DITCH FROM DRMO TO WWTP
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Analyte	Frequency of Detection[1]	Range of Detection[1]		Location of Maximum Detection	Average of All Results	Inorganic Background Data Set Levels[3]	Ecological Screening Value	Maximum Hazard Quotient	COPC Selection (Yes/No)
		Minimum	Maximum[2]						
Volatile Organic Compounds (ug/L)									
1,2-Dichloroethene (total)	2/8	1	2	29W00101 [07/18/96]	3.0	NA	3.2[4,7]	0.63	No
Acetone	2/8	3	3	29W00101 [07/18/96] & 57W00201 [07/18/96]	3.5	NA	NA	NA	Yes
Benzene	2/9	1.6	2	29W00101 [07/18/96]	2.8	NA	53[5]	0.038	No
Chloroform	1/9	2	2	05W00301 [04/27/95]	2.2	NA	289[5]	0.0069	No
Pesticides/PCBs (ug/L)									
gamma-BHC (lindane)	1/9	0.0017	0.0017	05W00101 [04/27/95]	0.022	NA	0.08[4,5]	0.021	No
Inorganics (ug/L)									
Aluminum	8/9	90.2	439	05W00301 [04/27/95]	200	1040	87[5]	5.0	Yes
Arsenic	2/9	3.5	3.6	05W00101 [04/27/95]	1.8	5.45	50[4]	0.072	No
Barium	9/9	18.6	30.5	CEF-P44-SW-007	23.9	43.7	NA	NA	Yes
Chromium (total)	1/9	1	1	05W00301 [04/27/95]	0.87	4.75	194.9[4,5,6]	0.0051	No
Copper	5/9	0.9	3.3	29W00101 [07/18/96] & 57W00301 [07/17/96]	1.8	7.35	11.1[4,5,6]	0.30	No
Iron	9/9	126	1950	29W00101 [07/18/96]	1029	3030	1000[4,5]	2.0	Yes
Lead	3/9	2.8	12.7	05W00201 [04/27/95]	3.5	5.35	2.9[4,5,6]	4.4	Yes
Manganese	9/9	12.1	44.6	05W00101 [04/27/95]	27.4	49.3	NA	NA	Yes
Nickel	1/9	2.5	2.5	57W00201 [07/18/96]	1.0	20	148.14[4,5,6]	0.017	No
Selenium	1/9	2.5	2.5	CEF-P44-SW-007-D	2.0	7.6	5.0[4,5]	0.50	No
Thallium	4/9	2.2	5.7	CF6SW1F [02/11/97]	2.6	10.1	4.0[5]	1.4	Yes
Vanadium	6/9	1.1	3	05W00201 [04/27/95]	1.5	4.5	NA	NA	Yes
Zinc	6/9	15	48.6	29W00101 [07/18/96]	25.8	51.4	99.58[4,5,6]	0.49	No

Footnotes:

1 The sample and duplicate were counted as two separate samples when determining the minimum and maximum detected concentrations but were only counted as one sample when determining the frequency of detection and average of all samples (where applicable).
2 The maximum detected concentration was used for screening purposes.
3 Inorganic Background Data Set, NAS Cecil Field.
4 Criteria for Surface Water Quality Classifications (FDEP, 1996).
5 Amended Guidance on Ecological Risk Assessment at Military Bases (U.S. EPA, 2000).
6 Based on average hardness of 92.9 mg/L as $CaCO_3$; range at PSC 44 = 50.4 to 120.0 mg/L.
7 Value is for 1,1-dichloroethene.

Notes:

Shading indicates that the chemical was retained as a COPC, the background concentration was greater than the concentration used for screening, and/or the ecological effects quotient was greater than 1.0.
COPC - Chemical of potential concern.
NA - Not available.
PCBs - Polychlorinated biphenyls.

TABLE 6-4

SELECTION OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN FOR SEDIMENT
OU 12, SITE 44 - DITCH FROM DRMO TO WWTP
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Analyte	Frequency of Detection[1]	Range of Detection[1]		Location of Maximum Detection	Average of All Samples	Inorganic Background Data Set Levels[3]	Ecological Screening Value	Maximum Hazard Quotient	COPC Selection (Yes/No)
		Minimum	Maximum[2]						
Volatile Organics (mg/kg)									
2-Butanone	2/10	0.003	0.004	57D00101 [07/18/96]-D	0.0075	NA	NA	NA	Yes
Semivolatile Organics (mg/kg)									
2-Methylnaphthalene	3/18	0.3	1.2	CEF-P44-SD-006	0.31	NA	0.0202[4,5]	59.4	Yes
Acenaphthene	2/18	0.929	1.7	CEF-P44-SD-006	0.35	NA	0.00671[4,5]	253	Yes
Anthracene	2/18	0.14	0.17	CEF-37-SD-F001-1 12/17/9	0.18	NA	0.0469[4,5]	3.6	Yes
Benzo(a)anthracene	10/18	0.043	2.1	29D00101 [07/18/96]	0.44	NA	0.0748[4,5]	28.1	Yes
Benzo(a)pyrene	10/18	0.047	2.4	57D00301 [07/17/96]	0.49	NA	0.0888[4,5]	27.0	Yes
Benzo(b)fluoranthene	12/18	0.051	4.3	57D00301 [07/17/96]	0.92	NA	0.0888[4,5,6]	48.4	Yes
Benzo(g,h,i)perylene	8/18	0.041	1.7	57D00301 [07/17/96]	0.37	NA	0.0888[4,5,6]	19.1	Yes
Benzo(k)fluoranthene	10/18	0.065	3.2	05D00201 [04/27/95]	0.51	NA	0.0888[4,5,6]	36.0	Yes
Bis(2-Ethylhexyl)phthalate	9/16	0.13	2.9	57D00301 [07/17/96]	0.52	NA	0.182[4,5]	15.9	Yes
Butyl Benzyl Phthalate	4/16	0.0791	0.21	05D00201 [04/27/95]	0.22	NA	0.182[5,7]	1.2	Yes
Carbazole	5/16	0.0586	0.3	29D00101 [07/18/96] & 57D00301 [07/17/96]	0.19	NA	NA	NA	Yes
Chrysene	12/18	0.052	3.3	57D00301 [07/17/96]	0.61	NA	0.108[4,5]	30.6	Yes
Di-n-butyl phthalate	3/16	0.147	2.3	57D00301 [07/17/96]	0.35	NA	0.182[5,7]	12.6	Yes
Di-n-octyl phthalate	1/16	0.511	0.75	CEF-37-SD-F001-1 12/17/9	0.28	NA	0.182[5,7]	4.1	Yes
Dibenzo(a,h)anthracene	4/18	0.067	0.35	57D00301 [07/17/96]	0.16	NA	0.00622[4,5]	56.3	Yes
Dibenzofuran	1/16	0.0222	0.022	CEF-37-SD-F001-1 12/17/9	0.25	NA	NA	NA	Yes
Dimethyl phthalate	1/16	0.0739	0.074	CEF-37-SD-F001-1 12/17/9	0.25	NA	0.182[5,7]	0.4	No
Fluoranthene	11/18	0.063	6.2	57D00301 [07/17/96]	1.12	NA	0.113[4,5]	54.9	Yes
Fluorene	1/18	0.0674	0.28	CEF-37-SD-F001-1 12/17/9	0.21	NA	0.0212[4,5]	13.1	Yes
Indeno(1,2,3-cd)pyrene	7/18	0.031	1.5	57D00301 [07/17/96]	0.36	NA	0.0888[4,5,6]	16.9	Yes
Phenanthrene	5/18	0.19	1.9	29D00101 [07/18/96]	0.35	NA	0.0867[4,5]	21.9	Yes
Pyrene	11/18	0.072	3.8	57D00301 [07/17/96]	0.81	NA	0.153[4,5]	24.8	Yes
Pesticides/PCBs (mg/kg)									
4,4'-DDD	2/16	0.0015	0.011	CEF-P44-SD-002	0.0094	NA	0.00122[4,5]	9.0	Yes
4,4'-DDE	8/16	0.00034	0.016	CEF-P44-SD-002	0.0087	NA	0.00207[4,5]	7.7	Yes
4,4'-DDT	1/16	0.0058	0.0058	05D00201 [04/27/95]	0.020	NA	0.00119[4,5]	4.9	Yes
Aldrin	2/16	0.00068	0.00089	05D00301 [04/27/95]	0.0045	NA	NA	NA	Yes

TABLE 6-4

SELECTION OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN FOR SEDIMENT
OU 12, SITE 44 - DITCH FROM DRMO TO WWTP
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Analyte	Frequency of Detection[1]	Range of Detection[1]		Location of Maximum Detection	Average of All Samples	Inorganic Background Data Set Levels[3]	Ecological Screening Value	Maximum Hazard Quotient	COPC Selection (Yes/No)
		Minimum	Maximum[2]						
Alpha-Chlordane	5/16	0.0005	0.0073	57D00101 [07/18/96]	0.0075	NA	0.0005[5,8]	14.6	Yes
Aroclor-1254	3/16	0.0222	0.225	CEF-P44-SD-002	0.084	NA	0.0216[4,5]	10.4	Yes
Aroclor-1260	10/16	0.0149	2.91	CEF-P44-SD-006	0.42	NA	0.0216[4,5]	135	Yes
Dieldrin	1/16	0.0049	0.0049	05D00301 [04/27/95]	0.0065	NA	0.00002[5]	245	Yes
Endosulfan I	1/16	0.049	0.05	57D00101 [07/18/96]	0.0074	NA	NA	NA	Yes
Endrin	1/16	0.017	0.017	05D00201 [04/27/95]	0.010	NA	0.00002[5]	850	Yes
Endrin Aldehyde	3/16	0.0012	0.023	05D00201 [04/27/95]	0.011	NA	0.00002[5,9]	1150	Yes
Endrin Ketone	2/16	0.00052	0.00067	29D00101 [07/18/96]	0.0083	NA	0.00002[5,9]	33.5	Yes
Gamma-Chlordane	5/16	0.00032	0.012	05D00201 [04/27/95]	0.0085	NA	0.0005[5,8]	24	Yes
Heptachlor	2/16	0.00019	0.00036	05D00101 [04/27/95]	0.0045	NA	NA	NA	Yes
Heptachlor Epoxide	2/16	0.00076	0.0011	05D00201 [04/27/95]	0.0045	NA	NA	NA	Yes
Methoxychlor	3/16	0.0028	0.015	05D00301 [04/27/95]	0.029	NA	NA	NA	Yes
gamma-BHC (Lindane)	2/16	0.00038	0.0011	05D00101 [04/27/95]	0.0046	NA	0.00032[4,5]	3.4	Yes
Total DDTs [10]							0.00119[4,5]	21.6	Yes
Total PCBs [10]							0.0216[4,5]	145.1	Yes
Total Endrins [10]							0.00002[5]	2033.5	Yes
Total Chlordanes [10]							0.0005[5,8]	38.6	Yes
Inorganics (mg/kg)									
Aluminum	16/16	780	15700	05D00201 [04/27/95]	3716	10200	NA	NA	Yes
Antimony	1/16	0.94	0.94	57D00101 [07/18/96]-D	0.31	15.1	2[5]	0.47	No
Arsenic	3/16	0.91	3.5	05D00201 [04/27/95]	0.58	2.62	7.24[4,5]	0.48	No
Barium	16/16	2.7	45.5	05D00201 [04/27/95]	10.8	36.1	NA	NA	Yes
Beryllium	3/16	0.06	0.49	05D00201 [04/27/95]	0.16	0.625	NA	NA	Yes
Cadmium	7/16	0.38	3.2	05D00201 [04/27/95]	0.74	2.05	0.676[4,5]	4.7	Yes
Chromium	16/16	1.1	29.5	05D00201 [04/27/95]	9.3	16	52.3[4,5]	0.56	No
Cobalt	15/16	0.11	2.3	05D00201 [04/27/95]	0.55	3	NA	NA	Yes
Copper	16/16	1.3	61.1	05D00201 [04/27/95]	10.8	12.5	18.7[4,5]	3.3	Yes
Cyanide	1/10	0.23	0.23	57D00101 [07/18/96]	0.29	1.23	NA	NA	Yes
Iron	16/16	235	5900	05D00201 [04/27/95]	933	3330	NA	NA	Yes
Lead	16/16	3.5	260	05D00201 [04/27/95]	31.7	44.6	30.2[4,5]	8.61	Yes
Manganese	16/16	2.5	26.6	05D00301 [04/27/95]	6.8	17	NA	NA	Yes

TABLE 6-4

SELECTION OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN FOR SEDIMENT
OU 12, SITE 44 - DITCH FROM DRMO TO WWTP
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Analyte	Frequency of Detection[1]	Range of Detection[1]		Location of Maximum Detection	Average of All Samples	Inorganic Background Data Set Levels[3]	Ecological Screening Value	Maximum Hazard Quotient	COPC Selection (Yes/No)
		Minimum	Maximum[2]						
Mercury	2/16	0.07	0.75	57D00101 [07/18/96]	0.083	0.305	0.13[4,5]	5.77	Yes
Nickel	15/16	0.62	37.7	CEF-37-SD-F001-1 12/17/9	3.6	7	15.9[4,5]	2.37	Yes
Selenium	1/16	2.4	2.4	CF6SD1 [02/11/97]	0.57	2.27	NA	NA	Yes
Silver	3/16	0.33	3.9	57D00101 [07/18/96]-D	0.40	1.87	0.733[4,5]	5.3	Yes
Thallium	1/16	0.77	0.77	57D00101 [07/18/96]	0.41	2.67	NA	NA	Yes
Vanadium	16/16	1.3	53.4	05D00201 [04/27/95]	7.0	15	NA	NA	Yes
Zinc	16/16	4	430	05D00201 [04/27/95]	56.4	92.1	124[4,5]	3.5	Yes

Footnotes:

1 The sample and duplicate were counted as two separate samples when determining the minimum and maximum detected concentrations but were only counted as one sample when determining the frequency of detection and average of all samples (where applicable).
2 The maximum detected concentration was used for screening purposes.
3 Inorganic Background Data Set, NAS Cecil Field.
4 Threshold Effect Level (FDEP, 1994).
5 USEPA Region IV Ecological Screening Values (U.S. EPA,1999).
6 Value is for benzo(a)pyrene.
7 Value is for bis(2-ethylhexyl) phthalate.
8 Value is for chlordane.
9 Value is for endrin.
10 Maximum hazard quotient for total DDTs, Total PCBs, Total Endrins, and Total Chlordanes are calculated by summing the maximum hazard quotient for each parameter within the group. Total Heptachlors are not calculated because ecological screening values are not available.

Notes:

Shading indicates that the chemical was retained as a COPC, the background concentration was greater than the concentration used for screening, and/or the ecological effects quotient was greater than 1.0.
COPC - Chemical of potential concern.
NA - Not available.
PCBs - Polychlorinated biphenyls.

TABLE 6-5

TERRESTRIAL WILDLIFE MODEL
SHREW AND MOCKINGBIRD - MAXIMUM HQs
OU 12, SITE 44 - DITCH FROM DRMO TO WWTP
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Parameter	Least Shrew (3%) HQ_{NOAEL}	Least Shrew (3%) HQ_{LOAEL}	Least Shrew (10%) HQ_{NOAEL}	Least Shrew (10%) HQ_{LOAEL}	Northern Mockingbird HQ_{NOAEL}	Northern Mockingbird HQ_{LOAEL}
Pesticides/PCBs						
Alpha-Chlordane	3.2E-05	1.6E-05	3.5E-05	1.7E-05	8.8E-05	1.8E-05
Aroclor-1254	3.1E+00	3.1E-01	3.2E+00	3.2E-01	1.5E+00	1.5E-01
Aroclor-1260	3.3E+01	3.3E+00	3.4E+01	3.4E+00	1.6E+01	1.6E+00
Dieldrin	1.3E-01	1.3E-02	1.4E-01	1.4E-02	4.3E-02	4.3E-03
Endosulfan Sulfate	4.5E-02	4.5E-03	4.8E-02	4.8E-03	8.6E-04	8.6E-05
Endrin Aldehyde	1.1E-01	1.1E-02	1.1E-01	1.1E-02	1.3E+00	1.3E-01
Gamma-Chlordane	1.1E-04	5.6E-05	1.2E-04	6.0E-05	3.0E-04	6.1E-05
Heptachlor Epoxide	3.0E-04	3.0E-05	3.2E-04	3.2E-05		
Total Chlordane	1.4E-04	7.2E-05	1.5E-04	7.7E-05	3.9E-04	7.8E-05
Total PCBs	3.7E+01	3.7E+00	3.8E+01	3.8E+00	1.8E+01	1.8E+00
Inorganic Compounds						
Cadmium	6.7E+00	6.7E-01	6.7E+00	6.7E-01	5.9E+00	4.3E-01
Chromium	3.1E+00	7.7E-01	3.5E+00	8.7E-01	1.3E+01	2.6E+00
Lead	2.3E+00	2.3E-01	2.8E+00	2.8E-01	2.0E+01	2.0E+00
Mercury	3.9E+02	2.3E+02	3.9E+02	2.4E+02	1.2E+03	1.2E+02
Zinc	9.9E-01	4.9E-01	1.0E+00	5.1E-01	1.4E+01	1.5E+00

Notes:
- Blank spaces indicate that an HQ could not be calculated because a NOAEL or LOAEL was not available.
- Cells are shaded if the HQ is greater than 1.0.
- This table only presents the HQs for bioaccumulative compounds that were retained as COPCs after the Step 2: Screening-Level Risk Assessment.
- Two least shrew models with varying soil ingestion rates (3% and 10%) are presented.

HQ - Hazard Quotient
NOAEL - No Observed Adverse Effects Level
LOAEL - Lowest Observed Adverse Effects Level

TABLE 6-6

TERRESTRIAL WILDLIFE MODEL
SHREW AND MOCKINGBIRD - AVERAGE HQs
OU 12, SITE 44 - DITCH FROM DRMO TO WWTP
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Parameter	Least Shrew (3%) HQ_{NOAEL}	Least Shrew (3%) HQ_{LOAEL}	Least Shrew (10%) HQ_{NOAEL}	Least Shrew (10%) HQ_{LOAEL}	Northern Mockingbird HQ_{NOAEL}	Northern Mockingbird HQ_{LOAEL}
Pesticides/PCBs						
Alpha-Chlordane	5.6E-04	2.8E-04	6.0E-04	3.0E-04	1.5E-03	3.0E-04
Aroclor-1254	6.1E-01	6.1E-02	6.5E-01	6.5E-02	2.9E-01	2.9E-02
Aroclor-1260	2.7E+00	2.7E-01	2.9E+00	2.9E-01	1.3E+00	1.3E-01
Dieldrin	1.2E-01	1.2E-02	1.2E-01	1.2E-02	3.8E-02	3.8E-03
Endosulfan Sulfate	3.0E-02	3.0E-03	3.2E-02	3.2E-03	5.7E-04	5.7E-05
Endrin Aldehyde	5.6E-02	5.6E-03	6.0E-02	6.0E-03	6.6E-01	6.6E-02
Gamma-Chlordane	5.8E-04	2.9E-04	6.2E-04	3.1E-04	1.6E-03	3.2E-04
Heptachlor Epoxide	1.4E-02	1.4E-03	1.5E-02	1.5E-03		
Total Chlorane	1.1E-03	5.7E-04	1.2E-03	6.1E-04	3.1E-03	6.2E-04
Total PCBs	3.3E+00	3.3E-01	3.5E+00	3.5E-01	1.6E+00	1.6E-01
Inorganic Compounds						
Cadmium	4.7E-01	4.7E-02	5.0E-01	5.0E-02	4.1E-01	3.0E-02
Chromium	1.7E-01	4.2E-02	3.1E-01	7.8E-02	6.1E-01	1.2E-01
Lead	2.1E-01	2.1E-02	4.1E-01	4.1E-02	1.6E+00	1.6E-01
Mercury	9.2E+00	5.5E+00	1.1E+01	6.8E+00	2.7E+01	2.7E+00
Zinc	9.3E-02	4.7E-02	1.1E-01	5.3E-02	1.3E+00	1.4E-01

Notes:
- Blank spaces indicate that an HQ could not be calculated because a NOAEL or LOAEL was not available.
- Cells are shaded if the HQ is greater than 1.0.
- This table only presents the HQs for bioaccumulative compounds that were retained as COPCs after the Step 2: Screening-Level Risk Assessment.
- Two least shrew models with varying soil ingestion rates (3% and 10%) are presented.

HQ - Hazard Quotient
NOAEL - No Observed Adverse Effects Level
LOAEL - Lowest Observed Adverse Effects Level

TABLE 6-7

TERRESTRIAL WILDLIFE MODEL
RACCOON AND KINGFISHER - MAXIMUM HQS
OU 12, SITE 44 - DITCH FROM DRMO TO WWTP
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Parameter	Raccoon HQ_{NOAEL}	Raccoon HQ_{LOAEL}	Belted Kingfisher HQ_{NOAEL}	Belted Kingfisher HQ_{LOAEL}
Pesticides/PCBs				
4,4'-DDD	3.9E-03	7.8E-04	8.46E-03	1.69E-03
4,4'-DDE	1.5E-01	2.9E-02	3.38E-01	6.77E-02
4,4'-DDT	1.2E-02	2.3E-03	2.66E-02	5.32E-03
Aldrin	7.6E-03	1.5E-03	1.76E-02	3.52E-03
Alpha-Chlordane	7.2E-03	3.6E-03	1.67E-02	8.35E-03
Aroclor-1254	5.8E+00	5.8E-01	1.34E+01	1.34E+00
Aroclor-1260	7.5E+01	7.5E+00	1.74E+02	1.74E+01
Dieldrin	4.2E-01	4.2E-02	9.69E-01	9.69E-02
Endosulfan I	5.7E-01	5.7E-02	1.32E+00	1.32E-01
Endrin	3.2E-01	3.2E-02	7.31E-01	7.31E-02
Endrin Aldehyde	4.3E-01	4.3E-02	9.88E-01	9.88E-02
Endrin Ketone	1.3E-02	1.3E-03	2.88E-02	2.88E-03
Gamma-Chlordane	5.5E-03	2.8E-03	1.28E-02	6.39E-03
Heptachlor	6.2E-03	6.2E-04	1.42E-02	1.42E-03
Heptachlor Epoxide	1.9E-02	1.9E-03	4.35E-02	4.35E-03
Methoxychlor	6.4E-03	3.2E-03	1.48E-02	7.41E-03
Gamma-BHC (lindane)	2.4E-04	2.4E-05	5.44E-04	5.44E-05
Total DDTs	1.6E-01	3.2E-02	3.73E-01	7.47E-02
Total PCBs	8.1E+01	8.1E+00	1.87E+02	1.87E+01
Total Chlordanes	1.3E-02	6.4E-03	2.95E-02	1.47E-02
Total Endrin	7.6E-01	7.6E-02	1.75E+00	1.75E-01
Total Heptachlor	2.5E-02	2.5E-03	5.77E-02	5.77E-03
Inorganics				
Cadmium	7.5E-01	7.5E-02	1.60E+00	1.60E-01
Copper	1.2E+00	9.3E-01	2.61E+00	1.98E+00
Lead	7.6E+00	7.6E-01	1.63E+01	1.63E+00
Mercury	1.2E+01	7.0E+00	2.50E+01	1.50E+01
Nickel	2.2E-01	1.1E-01	4.71E-01	2.36E-01
Selenium	2.8E+00	1.7E+00	6.00E+00	3.64E+00
Silver	5.1E-01	5.1E-02	1.08E+00	1.08E-01
Zinc	6.3E-01	3.2E-01	1.34E+00	6.72E-01

Notes:
- Blank spaces indicates that an HQ could not be calculated because a NOAEL or LOAEL was not available
- Cells are shaded if the HQ is greater than 1.0

HQ - Hazard Quotient
NOAEL - No Observed Adverse Effects Concentration
LOAEL - Lowest Observed Adverse Effects Concentration

TABLE 6-8

TERRESTRIAL WILDLIFE MODEL
RACCOON AND KINGFISHER - AVERAGE HQS
OU 12, SITE 44 - DITCH FROM DRMO TO WWTP
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Parameter	Raccoon HQ_{NOAEL}	Raccoon HQ_{LOAEL}	Belted Kingfisher HQ_{NOAEL}	Belted Kingfisher HQ_{LOAEL}
Pesticides/PCBs				
4,4'-DDD	3.3E-03	6.7E-04	7.2E-03	1.45E-03
4,4'-DDE	7.9E-02	1.6E-02	1.8E-01	3.68E-02
4,4'-DDT	3.9E-02	7.8E-03	9.0E-02	1.80E-02
Aldrin	3.8E-02	7.7E-03	8.8E-02	1.77E-02
Alpha-Chlordane	7.4E-03	3.7E-03	1.7E-02	8.60E-03
Aroclor-1254	2.2E+00	2.2E-01	5.0E+00	5.05E-01
Aroclor-1260	1.1E+01	1.1E+00	2.5E+01	2.49E+00
Dieldrin	5.5E-01	5.5E-02	1.3E+00	1.28E-01
Endosulfan I	8.4E-02	8.4E-03	1.9E-01	1.94E-02
Endrin	1.9E-01	1.9E-02	4.3E-01	4.28E-02
Endrin Aldehyde	2.0E-01	2.0E-02	4.5E-01	4.52E-02
Endrin Ketone	1.5E-01	1.5E-02	3.6E-01	3.56E-02
Gamma-Chlordane	3.9E-03	2.0E-03	9.0E-03	4.52E-03
Heptachlor	7.8E-02	7.8E-03	1.8E-01	1.79E-02
Heptachlor Epoxide	7.7E-02	7.7E-03	1.8E-01	1.78E-02
Methoxychlor	1.3E-02	6.3E-03	2.9E-02	1.45E-02
Gamma-BHC (lindane)	9.8E-04	9.8E-05	2.3E-03	2.26E-04
Total DDTs	1.2E-01	2.4E-02	2.8E-01	5.6E-02
Total PCBs	1.3E+01	1.3E+00	3.0E+01	3.0E+00
Total Endrin	5.4E-01	5.4E-02	1.2E+00	1.2E-01
Inorganics				
Cadmium	1.7E-01	1.7E-02	3.7E-01	3.72E-02
Copper	2.2E-01	1.6E-01	4.6E-01	3.51E-01
Lead	9.3E-01	9.3E-02	2.0E+00	1.98E-01
Mercury	1.3E+00	7.8E-01	2.8E+00	1.67E+00
Nickel	2.1E-02	1.1E-02	4.5E-02	2.27E-02
Selenium	6.6E-01	4.0E-01	1.4E+00	8.57E-01
Silver	5.2E-02	5.2E-03	1.1E-01	1.10E-02
Zinc	8.3E-02	4.1E-02	1.8E-01	8.81E-02

Notes:
- Cells are shaded if the HQ is greater than 1.0
- Blank spaces indicates that an HQ could not be calculated because a NOAEL or LOAEL was not available
- This table only presents the HQs for contaminants that had HQs greater than 1.0 using the maximum input parameters, and were detected above background concentrations

HQ - Hazard Quotient
NOAEL - No Observed Adverse Effects Concentration
LOAEL - Lowest Observed Adverse Effects Concentration

Figure 6-1: Site 44 Ditch in the Vicinity of the WWTP

Figure 6-1: Site 44 Ditch in the Vicinity of the WWTP

Figure 6-1: Site 44 Ditch in the Vicinity of the WWTP

7.0 REMEDIAL ACTIVITIES

The Navy's Remedial Action Contractor (RAC), CH2M Hill Constructors, Inc. (CH2M Hill), conducted the source removal activities for OU 12, Site 44 from September 22 through September 28, 2000. The RAC excavated, transported, and disposed of 292.39 tons of PCB-contaminated soil and restored the site to pre-excavation conditions. Soil samples were collected and analyzed for waste characterization before the excavation was begun. The excavated soil was directly loaded and transported off site for disposal on the same day that it was excavated.

The soil was excavated using a hydraulic track excavator and direct loaded into tarp-covered dump trucks, provided by Beaver Bulk Trucking, for transportation and disposal. Soils were excavated to the horizontal and vertical excavation limits shown on Figure 5-1 and as specified in the Removal Action Design Package, which was included in the Action Memorandum for PSC 44 (TtNUS, 2000b). The excavated soil was transported to the Broadhurst Landfill in Jessup, Georgia.

The material used to backfill the excavation was certified clean fill brought in from the NFF at NAS Cecil Field. The site was then graded and seeded with a mixture of brown millet, rye, bahia grass, fertilizer, and mulch. No confirmatory sampling and analyses were required based on the specifications outlined in the Removal Action Design Package for PSC 44.

Detailed information on the remedial activities, including photographs, copies of the soil manifests, certificates of disposal, and certificate of clean fill, is provided in the Source Removal Report (CH2M Hill, 2001).

8.0 CONCLUSIONS AND RECOMMENDATIONS

8.1 CONCLUSIONS

Conclusions pertaining to OU 12, Site 44, Ditch from DRMO to Wastewater Treatment Plant, are as follows:

- Soil with PCB concentrations in excess of 1,500 µg/kg were excavated and disposed at a permitted solid waste disposal facility. This resulted in a UCL concentration of PCBs below the FDEP residential SCTL of 500 µg/kg.

- The excavated area was restored to pre-excavation conditions with uncontaminated backfill materials.

- Based on analytical data from surface soil, sediment, and surface water samples and available habitat, potential ecological risks associated with Site 44 are expected to be low. The risk management decision also took into account that the drainage ditch along Site 44 provides only limited habitat for piscivorous receptors because of its small size and lack of a large fish population. Terrestrial receptors at the site consist of species acclimated to urban and industrial conditions. As documented in BCT Meeting minutes number 1480 on May 16, 2001, a risk management decision for no further action was made by the BCT concerning sediments contaminated with PCBs and PAHs. The decision was based on the fact that contamination remaining after excavation poses minimal ecological risk and does not warrant further remediation.

8.2 RECOMMENDATIONS

The removal action conducted at OU 12, Site 44 is protective of human health and the environment and utilized permanent solutions for the site. Since the removal action is complete, no further action is warranted. The final recommendation for Site 44 is no further action.

It is also recommended that the color classification of Site 44 be changed from Yellow to Dark Green to denote that releases of hazardous substances have occurred and remedial actions to protect human health and the environment have been taken. This color change should also apply to Facility UNF6. No change is required for Facility 15, currently coded Light Green.

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APPENDIX A

ANALYTICAL LABORATORY RESULTS

PHASE I ANALYTICAL RESULTS

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-07-9-124

TO: **M. SPERANZA** **DATE:** **JULY 19, 1999**

FROM: **GRETCHEN PHIPPS** **COPIES:** **DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION –SEMIVOLATILES, PESTICIDE/PCBs, TPHs AND PAHs**
CTO 078 - NAS, CECIL FIELD
SDG – F4256

SAMPLES: 8/Sediments/

CEF-P44-SD-001	CEF-P44-SD-002	CEF-P44-SD-003
CEF-P44-SD-004	CEF-P44-SD-005	CEF-P44-SD-006
CEF-P44-SD-007	CEF-P44-SD-DU01	

11/Soils/

CEF-P44-SS-008	CEF-P44-SS-009	CEF-P44-SS-010
CEF-P44-SS-011	CEF-P44-SS-012	CEF-P44-SS-013
CEF-P44-SS-014	CEF-P44-SS-015	CEF-P44-SS-016
CEF-P44-SS-017	CEF-P44-SS-DU01	

3/Aqeuous/

CEF-P44-SW-005	CEF-P44-SW-007	CEF-P44-SW-DU01

Overview

The sample set for CTO 078, NAS Cecil Field, SDG F4256, consists of eight (8) sediment, eleven (11) soil and three (3) aqueous environmental samples. Three (3) field duplicate pairs (CEF-P44-SD-003 / CEF-P44-SD-DU01, CEF-P44-SS-017 / CEF-P44-SS-DU01 and CEF-P44-SW-007 / CEF-P44-SW-DU01) were included within this SDG.

All sediments, with exception to sample CEF-P44-SD-005, and all aqueous samples, with exception to sample CEF-P44-SW-005, were analyzed for semivolatiles. All sediments, with exception to sample CEF-P44-SD-005, were analyzed for pesticide and PCBs. All soils and all aqueous samples, with exception to sample CEF-P44-SW-005, were analyzed for PCBs. All sediments, with exception to CEF-P44-SD-001, CEF-P44-SD-002 and CEF-P44-SD-DU01, and all aqueous samples were analyzed for total petroleum hydrocarbons (TPHs). All sediments, with exception to sample CEF-P44-SD-005, all soils with exception to CEF-P44-SS-012, CEF-P44-SS-013, CEF-P44-SS-014 and CEF-P44-SS-015, and all aqueous samples, with exception to sample CEF-P44-SW-005, were analyzed for polynuclear aromatic hydrocarbons (PAHs). The samples were collected by Tetra Tech NUS on June 3 and 4, 1999 and analyzed by Accutest Laboratory. Semivolatile analyses were conducted using SW 846 method 8270C. Pesticide analyses were conducted using SW 846 method 8081A. PCB analyses were conducted using SW 846 method

8082. TPH analyzed were conducted using the Florida-Pro method. PAH analyses were conducted using EPA method 8310.

The data was evaluated based on the following parameters:

- Data Completeness
- Calibration Verifications
- * Holding Times
- * Laboratory Blank Analyses
- Field Duplicate Results
- * Detection Limits
- Surrogate Recoveries

* - All quality control criteria were met for this parameter.

Semivolatiles

Notes

Positive results reported below the Contract Required Quantitation Limit (CRQL) are qualified as estimated, "J".

Pesticides/PCBs

Calibration Verifications

Continuing Calibration Verification (CCV) Percent Differences (%Ds) for 4,4'-DDT and methoxychlor affecting samples CEF-P44-SD-002, CEF-P44-SD-003, CEF-P44-SD-004, CEF-P44-SD-006, CEF-P44-SD-007 and CEF-P44-SD-DU01 were >25% quality control limit. The nondetected results reported for the above listed compounds in the affected samples were qualified as estimated, "UJ".

Surrogate Recoveries

The surrogate percent recovery (%R) for decachlorobiphenyl affecting sample CEF-P44-SS-013 exceeded the upper control limit. No validation action was taken on this basis.

Field Duplicate Results

Field duplicate imprecision (>50%) was noted for Aroclor-1260 affecting field duplicate pairs CEF-P44-SD-003 / CEF-P44-SD-DU01 and CEF-P44-SS-017 / CEF-P44-SS-DU01. The positive and nondetected results reported for Aroclor-1260 in the affected field duplicate pairs were qualified as estimated, "J" and "UJ", respectively.

Notes

Positive results reported below the Contract Required Quantitation Limit (CRQL) are qualified as estimated, "J".

The results reported on the Form 1s were not rounded to the correct significant figures. The results reported on the Electronic Deliverable Data (EDD) contains the correct significant figures.

The Form 1 for sample CEF-P44-SD-002 listed a "J" qualifier that should not have been listed. The laboratory was notified and the Form 1 was amended by the data reviewer.

TPHs

Notes

Positive results reported below the Contract Required Quantitation Limit (CRQL) are qualified as estimated, "J".

Results were not included for sample CEF-P44-SD-DU01. The laboratory was notified and concluded that the sample was not analyzed as requested.

PAHs

Field Duplicate Results

Field duplicate imprecision (>50%) was noted for several compounds affected field duplicate pair CEF-P44-SS-017 / CEF-P44-SS-DU01. The positive and nondetected results reported for the affected compounds in the affected field duplicate pair were qualified as estimated, "J" and "UJ".

Notes

The percent solids were not reported on the Form 1 for sample CEF-P44-SS-016. The laboratory was notified and the Form 1 was amended by the data reviewer.

Executive Summary

Laboratory Performance: CCV %Ds for 4,4'-DDT and methoxychlor affecting several samples were >25%.

Other Factors Affecting Data Quality: Field duplicate imprecision was noted for several PAH compounds affecting one duplicate pair and aroclor-1260 affecting two field duplicate pairs

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Review", February 1994 and the NFESC document entitles "Navy Installation Restoration Laboratory Quality Assurance Guide." (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Gretchen A Phipps

Tetra Tech NUS
Gretchen A. Phipps

Tetra Tech NUS
Joseph A. Samchuck
Quality Control Officer

Attachments:

1. Appendix A - Qualified Analytical Data
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCB D% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = % Solid content is less than 30%

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4256

SAMPLE NUMBER:	CEF-P44-SD-001			CEF-P44-SD-002			CEF-P44-SD-003			CEF-P44-SD-004		
SAMPLE DATE:	06/03/99			06/03/99			06/03/99			06/03/99		
LABORATORY ID:	F4256-1			F4256-2			F4256-3			F4256-4		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	97.4 %			82.5 %			79.0 %			77.1 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
1,2,4-TRICHLOROBENZENE	170	U		200	U		210	U		220	U	
1,2-DICHLOROBENZENE	170	U		200	U		210	U		220	U	
1,3-DICHLOROBENZENE	170	U		200	U		210	U		220	U	
1,4-DICHLOROBENZENE	170	U		200	U		210	U		220	U	
2,4,5-TRICHLOROPHENOL	170	U		200	U		210	U		220	U	
2,4,6-TRICHLOROPHENOL	170	U		200	U		210	U		220	U	
2,4-DICHLOROPHENOL	150	U		180	U		190	U		190	U	
2,4-DIMETHYLPHENOL	340	U		400	U		420	U		430	U	
2,4-DINITROPHENOL	860	U		1000	U		1000	U		1100	U	
2,4-DINITROTOLUENE	170	U		200	U		210	U		220	U	
2,6-DINITROTOLUENE	170	U		200	U		210	U		220	U	
2-CHLORONAPHTHALENE	170	U		200	U		210	U		220	U	
2-CHLOROPHENOL	170	U		200	U		210	U		220	U	
2-METHYLPHENOL	170	U		200	U		210	U		220	U	
2-NITROANILINE	170	U		200	U		210	U		220	U	
2-NITROPHENOL	170	U		200	U		210	U		220	U	
3,3'-DICHLOROBENZIDINE	340	U		400	U		420	U		430	U	
3-NITROANILINE	170	U		200	U		210	U		220	U	
4,6-DINITRO-2-METHYLPHENOL	340	U		400	U		420	U		430	U	
4-BROMOPHENYL PHENYL ETHER	170	U		200	U		210	U		220	U	
4-CHLORO-3-METHYLPHENOL	340	U		400	U		420	U		430	U	
4-CHLOROANILINE	170	U		200	U		210	U		220	U	
4-CHLOROPHENYL PHENYL ETHER	170	U		200	U		210	U		220	U	
4-METHYLPHENOL	170	U		200	U		210	U		220	U	
4-NITROANILINE	170	U		200	U		210	U		220	U	
4-NITROPHENOL	860	U		1000	U		1000	U		1100	U	
BIS(2-CHLOROETHOXY)METHANE	170	U		200	U		210	U		220	U	
BIS(2-CHLOROETHYL)ETHER	170	U		200	U		210	U		220	U	
BIS(2-CHLOROISOPROPYL) ETHER	170	U		200	U		210	U		220	U	
BIS(2-ETHYLHEXYL)PHTHALATE	170	U		200	U		210	U		220	U	
BUTYLBENZYL PHTHALATE	170	U		200	U		210	U		220	U	
CARBAZOLE	170	U		200	U		210	U		220	U	
DI-N-BUTYL PHTHALATE	170	U		200	U		210	U		220	U	
DI-N-OCTYL PHTHALATE	170	U		200	U		210	U		220	U	

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4256

SAMPLE NUMBER:	CEF-P44-SD-001			CEF-P44-SD-002			CEF-P44-SD-003			CEF-P44-SD-004		
SAMPLE DATE:	06/03/99			06/03/99			06/03/99			06/03/99		
LABORATORY ID:	F4256-1			F4256-2			F4256-3			F4256-4		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	97.4 %			82.5 %			79.0 %			77.1 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
DIBENZOFURAN	170	U		200	U		210	U		220	U	
DIETHYL PHTHALATE	170	U		200	U		210	U		220	U	
DIMETHYL PHTHALATE	170	U		200	U		210	U		220	U	
HEXACHLOROBENZENE	170	U		200	U		210	U		220	U	
HEXACHLOROBUTADIENE	170	U		200	U		210	U		220	U	
HEXACHLOROCYCLOPENTADIENE	170	U		200	U		210	U		220	U	
HEXACHLOROETHANE	170	U		200	U		210	U		220	U	
ISOPHORONE	170	U		200	U		210	U		220	U	
N-NITROSO-DI-N-PROPYLAMINE	62	U		73	U		76	U		78	U	
N-NITROSODIPHENYLAMINE	170	U		200	U		210	U		220	U	
NITROBENZENE	170	U		200	U		210	U		220	U	
PENTACHLOROPHENOL	860	U		1000	U		1000	U		1100	U	
PHENOL	170	U		200	U		210	U		220	U	

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4256

SAMPLE NUMBER:	CEF-P44-SD-006			CEF-P44-SD-007			CEF-P44-SD-DU01					
SAMPLE DATE:	06/03/99			06/03/99			06/04/99			/ /		
LABORATORY ID:	F4256-6			F4256-7			F4256-20					
QC_TYPE:	NORMAL			NORMAL			NORMAL					
% SOLIDS:	74.7 %			64.0 %			83.8 %			100.0 %		
UNITS:	UG/KG			UG/KG			UG/KG					
FIELD DUPLICATE OF:							CEF-P44-SD-003					
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
1,2,4-TRICHLOROBENZENE	230	U		260	U		200	U				
1,2-DICHLOROBENZENE	230	U		260	U		200	U				
1,3-DICHLOROBENZENE	230	U		260	U		200	U				
1,4-DICHLOROBENZENE	230	U		260	U		200	U				
2,4,5-TRICHLOROPHENOL	230	U		260	U		200	U				
2,4,6-TRICHLOROPHENOL	230	U		260	U		200	U				
2,4-DICHLOROPHENOL	210	U		230	U		180	U				
2,4-DIMETHYLPHENOL	470	U		520	U		400	U				
2,4-DINITROPHENOL	1200	U		1300	U		990	U				
2,4-DINITROTOLUENE	230	U		260	U		200	U				
2,6-DINITROTOLUENE	230	U		260	U		200	U				
2-CHLORONAPHTHALENE	230	U		260	U		200	U				
2-CHLOROPHENOL	230	U		260	U		200	U				
2-METHYLPHENOL	230	U		260	U		200	U				
2-NITROANILINE	230	U		260	U		200	U				
2-NITROPHENOL	230	U		260	U		200	U				
3,3'-DICHLOROBENZIDINE	470	U		520	U		400	U				
3-NITROANILINE	230	U		260	U		200	U				
4,6-DINITRO-2-METHYLPHENOL	470	U		520	U		400	U				
4-BROMOPHENYL PHENYL ETHER	230	U		260	U		200	U				
4-CHLORO-3-METHYLPHENOL	470	U		520	U		400	U				
4-CHLOROANILINE	230	U		260	U		200	U				
4-CHLOROPHENYL PHENYL ETHER	230	U		260	U		200	U				
4-METHYLPHENOL	230	U		260	U		200	U				
4-NITROANILINE	230	U		260	U		200	U				
4-NITROPHENOL	1200	U		1300	U		990	U				
BIS(2-CHLOROETHOXY)METHANE	230	U		260	U		200	U				
BIS(2-CHLOROETHYL)ETHER	230	U		260	U		200	U				
BIS(2-CHLOROISOPROPYL) ETHER	230	U		260	U		200	U				
BIS(2-ETHYLHEXYL)PHTHALATE	842			320			200	U				
BUTYLBENZYL PHTHALATE	207	J	P	260	U		200	U				
CARBAZOLE	214	J	P	260	U		200	U				
DI-N-BUTYL PHTHALATE	241			260	U		200	U				
DI-N-OCTYL PHTHALATE	230	U		260	U		200	U				

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4256

SAMPLE NUMBER:	CEF-P44-SD-006			CEF-P44-SD-007			CEF-P44-SD-DU01			/ /		
SAMPLE DATE:	06/03/99			06/03/99			06/04/99					
LABORATORY ID:	F4256-6			F4256-7			F4256-20					
QC_TYPE:	NORMAL			NORMAL			NORMAL					
% SOLIDS:	74.7 %			64.0 %			83.8 %			100.0 %		
UNITS:	UG/KG			UG/KG			UG/KG					
FIELD DUPLICATE OF:							CEF-P44-SD-003					
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
DIBENZOFURAN	230	U		260	U		200	U				
DIETHYL PHTHALATE	230	U		260	U		200	U				
DIMETHYL PHTHALATE	230	U		260	U		200	U				
HEXACHLOROBENZENE	230	U		260	U		200	U				
HEXACHLOROBUTADIENE	230	U		260	U		200	U				
HEXACHLOROCYCLOPENTADIENE	230	U		260	U		200	U				
HEXACHLOROETHANE	230	U		260	U		200	U				
ISOPHORONE	230	U		260	U		200	U				
N-NITROSO-DI-N-PROPYLAMINE	84	U		94	U		71	U				
N-NITROSODIPHENYLAMINE	230	U		260	U		200	U				
NITROBENZENE	230	U		260	U		200	U				
PENTACHLOROPHENOL	1200	U		1300	U		990	U				
PHENOL	230	U		260	U		200	U				

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4256

SAMPLE NUMBER:	CEF-P44-SW-007			CEF-P44-SW-DU01								
SAMPLE DATE:	06/04/99			06/04/99			/ /			/ /		
LABORATORY ID:	F4256-9			F4256-21								
QC_TYPE:	NORMAL			NORMAL								
% SOLIDS:	0.0 %			0.0 %			100.0 %			100.0 %		
UNITS:	UG/L			UG/L								
FIELD DUPLICATE OF:				CEF-P44-SW-007								
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
DIBENZOFURAN	5	U		5	U							
DIETHYL PHTHALATE	5	U		5	U							
DIMETHYL PHTHALATE	5	U		5	U							
HEXACHLOROBENZENE	1	U		1	U							
HEXACHLOROBUTADIENE	5	U		5	U							
HEXACHLOROCYCLOPENTADIENE	5	U		5	U							
HEXACHLOROETHANE	5	U		5	U							
ISOPHORONE	5	U		5	U							
N-NITROSO-DI-N-PROPYLAMINE	4	U		4	U							
N-NITROSODIPHENYLAMINE	5	U		5	U							
NITROBENZENE	4	U		4	U							
PENTACHLOROPHENOL	1	U		1	U							
PHENOL	5	U		5	U							

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4256

SAMPLE NUMBER:	CEF-P44-SW-007			CEF-P44-SW-DU01								
SAMPLE DATE:	06/04/99			06/04/99			/ /			/ /		
LABORATORY ID:	F4256-9			F4256-21								
QC_TYPE:	NORMAL			NORMAL								
% SOLIDS:	0.0 %			0.0 %			100.0 %			100.0 %		
UNITS:	UG/L			UG/L								
FIELD DUPLICATE OF:				CEF-P44-SW-007								
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
1,2,4-TRICHLOROBENZENE	5	U		5	U							
1,2-DICHLOROBENZENE	5	U		5	U							
1,3-DICHLOROBENZENE	5	U		5	U							
1,4-DICHLOROBENZENE	5	U		5	U							
2,4,5-TRICHLOROPHENOL	4	U		4	U							
2,4,6-TRICHLOROPHENOL	5	U		5	U							
2,4-DICHLOROPHENOL	4	U		4	U							
2,4-DIMETHYLPHENOL	10	U		10	U							
2,4-DINITROPHENOL	25	U		25	U							
2,4-DINITROTOLUENE	0.2	U		0.2	U							
2,6-DINITROTOLUENE	0.2	U		0.2	U							
2-CHLORONAPHTHALENE	5	U		5	U							
2-CHLOROPHENOL	5	U		5	U							
2-METHYLPHENOL	5	U		5	U							
2-NITROANILINE	5	U		5	U							
2-NITROPHENOL	5	U		5	U							
3,3'-DICHLOROBENZIDINE	7.5	U		7.5	U							
3-NITROANILINE	5	U		5	U							
4,6-DINITRO-2-METHYLPHENOL	25	U		25	U							
4-BROMOPHENYL PHENYL ETHER	5	U		5	U							
4-CHLORO-3-METHYLPHENOL	10	U		10	U							
4-CHLOROANILINE	5	U		5	U							
4-CHLOROPHENYL PHENYL ETHER	5	U		5	U							
4-METHYLPHENOL	5	U		5	U							
4-NITROANILINE	5	U		5	U							
4-NITROPHENOL	15	U		15	U							
BIS(2-CHLOROETHOXY)METHANE	5	U		5	U							
BIS(2-CHLOROETHYL)ETHER	1.5	U		1.5	U							
BIS(2-CHLOROISOPROPYL) ETHER	5	U		5	U							
BIS(2-ETHYLHEXYL)PHTHALATE	5	U		5	U							
BUTYLBENZYL PHTHALATE	5	U		5	U							
CARBAZOLE	4	U		4	U							
DI-N-BUTYL PHTHALATE	5	U		5	U							
DI-N-OCTYL PHTHALATE	5	U		5	U							

Report of Analysis

Client Sample ID:	CEF-P44-SD-001		
Lab Sample ID:	F4256-1	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 3550B/8270C	**Percent Solids:**	97.4
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001847.D	1	06/10/99	ME	06/10/99	OP839	SL115
Run #2							

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
95-57-8	2-Chlorophenol	ND	170	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	340	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	150	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	340	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	860	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	340	ug/kg	
95-48-7	2-Methylphenol	ND	170	ug/kg	
	3&4-Methylphenol	ND	170	ug/kg	
88-75-5	2-Nitrophenol	ND	170	ug/kg	
100-02-7	4-Nitrophenol	ND	860	ug/kg	
87-86-5	Pentachlorophenol	ND	860	ug/kg	
108-95-2	Phenol	ND	170	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	170	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	170	ug/kg	
83-32-9	Acenaphthene	ND	170	ug/kg	
208-96-8	Acenaphthylene	ND	170	ug/kg	
120-12-7	Anthracene	ND	170	ug/kg	
56-55-3	Benzo(a)anthracene	ND	170	ug/kg	
50-32-8	Benzo(a)pyrene	46.3	86	ug/kg	J
205-99-2	Benzo(b)fluoranthene	ND	170	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	170	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	170	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	170	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	170	ug/kg	
91-58-7	2-Chloronaphthalene	ND	170	ug/kg	
106-47-8	4-Chloroaniline	ND	170	ug/kg	
86-74-8	Carbazole	ND	170	ug/kg	
218-01-9	Chrysene	ND	170	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	170	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	170	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	170	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	170	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	170	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	170	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	170	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	170	ug/kg	

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-001		
Lab Sample ID:	F4256-1	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 3550B/8270C	**Percent Solids:**	97.4
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001847.D	1	06/10/99	ME	06/10/99	OP839	SL115
Run #2							

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
606-20-2	2,6-Dinitrotoluene	ND	170	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	340	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	86	ug/kg	
132-64-9	Dibenzofuran	ND	170	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	170	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	170	ug/kg	
84-66-2	Diethyl phthalate	ND	170	ug/kg	
131-11-3	Dimethyl phthalate	ND	170	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	170	ug/kg	
206-44-0	Fluoranthene	ND	170	ug/kg	
86-73-7	Fluorene	ND	170	ug/kg	
118-74-1	Hexachlorobenzene	ND	170	ug/kg	
87-68-3	Hexachlorobutadiene	ND	170	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	170	ug/kg	
67-72-1	Hexachloroethane	ND	170	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	170	ug/kg	
78-59-1	Isophorone	ND	170	ug/kg	
90-12-0	1-Methylnaphthalene	ND	170	ug/kg	
91-57-6	2-Methylnaphthalene	ND	170	ug/kg	
88-74-4	2-Nitroaniline	ND	170	ug/kg	
99-09-2	3-Nitroaniline	ND	170	ug/kg	
100-01-6	4-Nitroaniline	ND	170	ug/kg	
91-20-3	Naphthalene	ND	170	ug/kg	
98-95-3	Nitrobenzene	ND	170	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	62	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	170	ug/kg	
85-01-8	Phenanthrene	ND	170	ug/kg	
129-00-0	Pyrene	ND	170	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	170	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	91%		25-121%
4165-62-2	Phenol-d5	97%		24-113%
118-79-6	2,4,6-Tribromophenol	108%		19-122%
4165-60-0	Nitrobenzene-d5	96%		23-120%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-001		
Lab Sample ID:	F4256-1	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 3550B/8270C	**Percent Solids:**	97.4
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001847.D	1	06/10/99	ME	06/10/99	OP839	SL115
Run #2							

ABN TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
321-60-8	2-Fluorobiphenyl	99%		30-115%
1718-51-0	Terphenyl-d14	110%		18-137%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-002		
Lab Sample ID:	F4256-2	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 3550B/8270C	**Percent Solids:**	82.5
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001858.D	1	06/11/99	ME	06/10/99	OP839	SL116
Run #2							

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
95-57-8	2-Chlorophenol	ND	200	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	400	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	180	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	400	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	1000	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	400	ug/kg	
95-48-7	2-Methylphenol	ND	200	ug/kg	
	3&4-Methylphenol	ND	200	ug/kg	
88-75-5	2-Nitrophenol	ND	200	ug/kg	
100-02-7	4-Nitrophenol	ND	1000	ug/kg	
87-86-5	Pentachlorophenol	ND	1000	ug/kg	
108-95-2	Phenol	ND	200	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	200	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	200	ug/kg	
83-32-9	Acenaphthene	ND	200	ug/kg	
208-96-8	Acenaphthylene	ND	200	ug/kg	
120-12-7	Anthracene	ND	200	ug/kg	
56-55-3	Benzo(a)anthracene	116	200	ug/kg	J
50-32-8	Benzo(a)pyrene	139	100	ug/kg	
205-99-2	Benzo(b)fluoranthene	146	200	ug/kg	J
191-24-2	Benzo(g,h,i)perylene	118	200	ug/kg	J
207-08-9	Benzo(k)fluoranthene	136	200	ug/kg	J
101-55-3	4-Bromophenyl phenyl ether	ND	200	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	200	ug/kg	
91-58-7	2-Chloronaphthalene	ND	200	ug/kg	
106-47-8	4-Chloroaniline	ND	200	ug/kg	
86-74-8	Carbazole	ND	200	ug/kg	
218-01-9	Chrysene	152	200	ug/kg	J
111-91-1	bis(2-Chloroethoxy)methane	ND	200	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	200	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	200	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	200	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	200	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	200	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	200	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	200	ug/kg	

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-002		
Lab Sample ID:	F4256-2	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 3550B/8270C	**Percent Solids:**	82.5
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001858.D	1	06/11/99	ME	06/10/99	OP839	SL116
Run #2							

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
606-20-2	2,6-Dinitrotoluene	ND	200	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	400	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	100	ug/kg	
132-64-9	Dibenzofuran	ND	200	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	200	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	200	ug/kg	
84-66-2	Diethyl phthalate	ND	200	ug/kg	
131-11-3	Dimethyl phthalate	ND	200	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	200	ug/kg	
206-44-0	Fluoranthene	232	200	ug/kg	
86-73-7	Fluorene	ND	200	ug/kg	
118-74-1	Hexachlorobenzene	ND	200	ug/kg	
87-68-3	Hexachlorobutadiene	ND	200	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	200	ug/kg	
67-72-1	Hexachloroethane	ND	200	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	124	200	ug/kg	J
78-59-1	Isophorone	ND	200	ug/kg	
90-12-0	1-Methylnaphthalene	ND	200	ug/kg	
91-57-6	2-Methylnaphthalene	ND	200	ug/kg	
88-74-4	2-Nitroaniline	ND	200	ug/kg	
99-09-2	3-Nitroaniline	ND	200	ug/kg	
100-01-6	4-Nitroaniline	ND	200	ug/kg	
91-20-3	Naphthalene	ND	200	ug/kg	
98-95-3	Nitrobenzene	ND	200	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	73	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	200	ug/kg	
85-01-8	Phenanthrene	147	200	ug/kg	J
129-00-0	Pyrene	275	200	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	200	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	79%		25-121%
4165-62-2	Phenol-d5	86%		24-113%
118-79-6	2,4,6-Tribromophenol	98%		19-122%
4165-60-0	Nitrobenzene-d5	83%		23-120%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-002		
Lab Sample ID:	F4256-2	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 3550B/8270C	**Percent Solids:**	82.5
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001858.D	1	06/11/99	ME	06/10/99	OP839	SL116
Run #2							

ABN TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
321-60-8	2-Fluorobiphenyl	89%		30-115%
1718-51-0	Terphenyl-d14	109%		18-137%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-003		
Lab Sample ID:	F4256-3	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 3550B/8270C	**Percent Solids:**	79.0
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001851.D	1	06/10/99	ME	06/10/99	OP839	SL115
Run #2							

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
95-57-8	2-Chlorophenol	ND	210	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	420	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	420	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	1000	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	420	ug/kg	
95-48-7	2-Methylphenol	ND	210	ug/kg	
	3&4-Methylphenol	ND	210	ug/kg	
88-75-5	2-Nitrophenol	ND	210	ug/kg	
100-02-7	4-Nitrophenol	ND	1000	ug/kg	
87-86-5	Pentachlorophenol	ND	1000	ug/kg	
108-95-2	Phenol	ND	210	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	210	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	210	ug/kg	
83-32-9	Acenaphthene	ND	210	ug/kg	
208-96-8	Acenaphthylene	ND	210	ug/kg	
120-12-7	Anthracene	ND	210	ug/kg	
56-55-3	Benzo(a)anthracene	ND	210	ug/kg	
50-32-8	Benzo(a)pyrene	ND	100	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	210	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	210	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	210	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	210	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	210	ug/kg	
91-58-7	2-Chloronaphthalene	ND	210	ug/kg	
106-47-8	4-Chloroaniline	ND	210	ug/kg	
86-74-8	Carbazole	ND	210	ug/kg	
218-01-9	Chrysene	ND	210	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	210	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	210	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	210	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	210	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	210	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	210	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	210	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	210	ug/kg	

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-003		
Lab Sample ID:	F4256-3	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 3550B/8270C	**Percent Solids:**	79.0
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001851.D	1	06/10/99	ME	06/10/99	OP839	SL115
Run #2							

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
606-20-2	2,6-Dinitrotoluene	ND	210	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	420	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	100	ug/kg	
132-64-9	Dibenzofuran	ND	210	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	210	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	210	ug/kg	
84-66-2	Diethyl phthalate	ND	210	ug/kg	
131-11-3	Dimethyl phthalate	ND	210	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	210	ug/kg	
206-44-0	Fluoranthene	ND	210	ug/kg	
86-73-7	Fluorene	ND	210	ug/kg	
118-74-1	Hexachlorobenzene	ND	210	ug/kg	
87-68-3	Hexachlorobutadiene	ND	210	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	210	ug/kg	
67-72-1	Hexachloroethane	ND	210	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	210	ug/kg	
78-59-1	Isophorone	ND	210	ug/kg	
90-12-0	1-Methylnaphthalene	ND	210	ug/kg	
91-57-6	2-Methylnaphthalene	ND	210	ug/kg	
88-74-4	2-Nitroaniline	ND	210	ug/kg	
99-09-2	3-Nitroaniline	ND	210	ug/kg	
100-01-6	4-Nitroaniline	ND	210	ug/kg	
91-20-3	Naphthalene	ND	210	ug/kg	
98-95-3	Nitrobenzene	ND	210	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	76	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	210	ug/kg	
85-01-8	Phenanthrene	ND	210	ug/kg	
129-00-0	Pyrene	ND	210	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	210	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	68%		25-121%
4165-62-2	Phenol-d5	76%		24-113%
118-79-6	2,4,6-Tribromophenol	99%		19-122%
4165-60-0	Nitrobenzene-d5	70%		23-120%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-003		
Lab Sample ID:	F4256-3	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 3550B/8270C	**Percent Solids:**	79.0
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001851.D	1	06/10/99	ME	06/10/99	OP839	SL115
Run #2							

ABN TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
321-60-8	2-Fluorobiphenyl	74%		30-115%
1718-51-0	Terphenyl-d14	116%		18-137%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-004		
Lab Sample ID:	F4256-4	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 3550B/8270C	**Percent Solids:**	77.1
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001843.D	1	06/10/99	ME	06/10/99	OP839	SL115
Run #2							

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
95-57-8	2-Chlorophenol	ND	220	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	430	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	430	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	1100	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	430	ug/kg	
95-48-7	2-Methylphenol	ND	220	ug/kg	
	3&4-Methylphenol	ND	220	ug/kg	
88-75-5	2-Nitrophenol	ND	220	ug/kg	
100-02-7	4-Nitrophenol	ND	1100	ug/kg	
87-86-5	Pentachlorophenol	ND	1100	ug/kg	
108-95-2	Phenol	ND	220	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	220	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	220	ug/kg	
83-32-9	Acenaphthene	ND	220	ug/kg	
208-96-8	Acenaphthylene	ND	220	ug/kg	
120-12-7	Anthracene	ND	220	ug/kg	
56-55-3	Benzo(a)anthracene	ND	220	ug/kg	
50-32-8	Benzo(a)pyrene	ND	110	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	220	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	220	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	220	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	220	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	220	ug/kg	
91-58-7	2-Chloronaphthalene	ND	220	ug/kg	
106-47-8	4-Chloroaniline	ND	220	ug/kg	
86-74-8	Carbazole	ND	220	ug/kg	
218-01-9	Chrysene	ND	220	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	220	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	220	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	220	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	220	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	220	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	220	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	220	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	220	ug/kg	

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-004		
Lab Sample ID:	F4256-4	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 3550B/8270C	**Percent Solids:**	77.1
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001843.D	1	06/10/99	ME	06/10/99	OP839	SL115
Run #2							

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
606-20-2	2,6-Dinitrotoluene	ND	220	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	430	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	110	ug/kg	
132-64-9	Dibenzofuran	ND	220	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	220	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	220	ug/kg	
84-66-2	Diethyl phthalate	ND	220	ug/kg	
131-11-3	Dimethyl phthalate	ND	220	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	220	ug/kg	
206-44-0	Fluoranthene	ND	220	ug/kg	
86-73-7	Fluorene	ND	220	ug/kg	
118-74-1	Hexachlorobenzene	ND	220	ug/kg	
87-68-3	Hexachlorobutadiene	ND	220	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	220	ug/kg	
67-72-1	Hexachloroethane	ND	220	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	220	ug/kg	
78-59-1	Isophorone	ND	220	ug/kg	
90-12-0	1-Methylnaphthalene	ND	220	ug/kg	
91-57-6	2-Methylnaphthalene	ND	220	ug/kg	
88-74-4	2-Nitroaniline	ND	220	ug/kg	
99-09-2	3-Nitroaniline	ND	220	ug/kg	
100-01-6	4-Nitroaniline	ND	220	ug/kg	
91-20-3	Naphthalene	ND	220	ug/kg	
98-95-3	Nitrobenzene	ND	220	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	78	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	220	ug/kg	
85-01-8	Phenanthrene	ND	220	ug/kg	
129-00-0	Pyrene	ND	220	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	220	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	75%		25-121%
4165-62-2	Phenol-d5	81%		24-113%
118-79-6	2,4,6-Tribromophenol	94%		19-122%
4165-60-0	Nitrobenzene-d5	78%		23-120%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-004		
Lab Sample ID:	F4256-4	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 3550B/8270C	**Percent Solids:**	77.1
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001843.D	1	06/10/99	ME	06/10/99	OP839	SL115
Run #2							

ABN TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
321-60-8	2-Fluorobiphenyl	80%		30-115%
1718-51-0	Terphenyl-d14	93%		18-137%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-006		
Lab Sample ID:	F4256-6	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 3550B/8270C	**Percent Solids:**	74.7
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001859.D	1	06/11/99	ME	06/10/99	OP839	SL116
Run #2							

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
95-57-8	2-Chlorophenol	ND	230	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	470	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	210	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	470	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	1200	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	470	ug/kg	
95-48-7	2-Methylphenol	ND	230	ug/kg	
	3&4-Methylphenol	ND	230	ug/kg	
88-75-5	2-Nitrophenol	ND	230	ug/kg	
100-02-7	4-Nitrophenol	ND	1200	ug/kg	
87-86-5	Pentachlorophenol	ND	1200	ug/kg	
108-95-2	Phenol	ND	230	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	230	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	230	ug/kg	
83-32-9	Acenaphthene	ND	230	ug/kg	
208-96-8	Acenaphthylene	ND	230	ug/kg	
120-12-7	Anthracene	ND	230	ug/kg	
56-55-3	Benzo(a)anthracene	1460	230	ug/kg	
50-32-8	Benzo(a)pyrene	1710	120	ug/kg	
205-99-2	Benzo(b)fluoranthene	2140	230	ug/kg	
191-24-2	Benzo(g,h,i)perylene	1540	230	ug/kg	
207-08-9	Benzo(k)fluoranthene	1360	230	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	230	ug/kg	
85-68-7	Butyl benzyl phthalate	207	230	ug/kg	J
91-58-7	2-Chloronaphthalene	ND	230	ug/kg	
106-47-8	4-Chloroaniline	ND	230	ug/kg	
86-74-8	Carbazole	214	230	ug/kg	J
218-01-9	Chrysene	2140	230	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	230	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	230	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	230	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	230	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	230	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	230	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	230	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	230	ug/kg	

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-006		
Lab Sample ID:	F4256-6	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 3550B/8270C	**Percent Solids:**	74.7
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001859.D	1	06/11/99	ME	06/10/99	OP839	SL116
Run #2							

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
606-20-2	2,6-Dinitrotoluene	ND	230	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	470	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	330	120	ug/kg	
132-64-9	Dibenzofuran	ND	230	ug/kg	
84-74-2	Di-n-butyl phthalate	241	230	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	230	ug/kg	
84-66-2	Diethyl phthalate	ND	230	ug/kg	
131-11-3	Dimethyl phthalate	ND	230	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	842	230	ug/kg	
206-44-0	Fluoranthene	3450	230	ug/kg	
86-73-7	Fluorene	ND	230	ug/kg	
118-74-1	Hexachlorobenzene	ND	230	ug/kg	
87-68-3	Hexachlorobutadiene	ND	230	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	230	ug/kg	
67-72-1	Hexachloroethane	ND	230	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	1730	230	ug/kg	
78-59-1	Isophorone	ND	230	ug/kg	
90-12-0	1-Methylnaphthalene	ND	230	ug/kg	
91-57-6	2-Methylnaphthalene	ND	230	ug/kg	
88-74-4	2-Nitroaniline	ND	230	ug/kg	
99-09-2	3-Nitroaniline	ND	230	ug/kg	
100-01-6	4-Nitroaniline	ND	230	ug/kg	
91-20-3	Naphthalene	ND	230	ug/kg	
98-95-3	Nitrobenzene	ND	230	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	84	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	230	ug/kg	
85-01-8	Phenanthrene	1230	230	ug/kg	
129-00-0	Pyrene	4120	230	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	230	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	76%		25-121%
4165-62-2	Phenol-d5	80%		24-113%
118-79-6	2,4,6-Tribromophenol	96%		19-122%
4165-60-0	Nitrobenzene-d5	82%		23-120%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-006		
Lab Sample ID:	F4256-6	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 3550B/8270C	**Percent Solids:**	74.7
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001859.D	1	06/11/99	ME	06/10/99	OP839	SL116
Run #2							

ABN TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
321-60-8	2-Fluorobiphenyl	83%		30-115%
1718-51-0	Terphenyl-d14	119%		18-137%

101224

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-007		
Lab Sample ID:	F4256-7	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 3550B/8270C	**Percent Solids:**	64.0
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001850.D	1	06/10/99	ME	06/10/99	OP839	SL115
Run #2							

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
95-57-8	2-Chlorophenol	ND	260	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	520	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	230	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	520	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	1300	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	520	ug/kg	
95-48-7	2-Methylphenol	ND	260	ug/kg	
	3&4-Methylphenol	ND	260	ug/kg	
88-75-5	2-Nitrophenol	ND	260	ug/kg	
100-02-7	4-Nitrophenol	ND	1300	ug/kg	
87-86-5	Pentachlorophenol	ND	1300	ug/kg	
108-95-2	Phenol	ND	260	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	260	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	260	ug/kg	
83-32-9	Acenaphthene	ND	260	ug/kg	
208-96-8	Acenaphthylene	ND	260	ug/kg	
120-12-7	Anthracene	ND	260	ug/kg	
56-55-3	Benzo(a)anthracene	ND	260	ug/kg	
50-32-8	Benzo(a)pyrene	82.9	130	ug/kg	J
205-99-2	Benzo(b)fluoranthene	ND	260	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	260	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	260	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	260	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	260	ug/kg	
91-58-7	2-Chloronaphthalene	ND	260	ug/kg	
106-47-8	4-Chloroaniline	ND	260	ug/kg	
86-74-8	Carbazole	ND	260	ug/kg	
218-01-9	Chrysene	ND	260	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	260	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	260	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	260	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	260	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	260	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	260	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	260	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	260	ug/kg	

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-007		
Lab Sample ID:	F4256-7	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 3550B/8270C	**Percent Solids:**	64.0
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001850.D	1	06/10/99	ME	06/10/99	OP839	SL115
Run #2							

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
606-20-2	2,6-Dinitrotoluene	ND	260	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	520	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	130	ug/kg	
132-64-9	Dibenzofuran	ND	260	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	260	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	260	ug/kg	
84-66-2	Diethyl phthalate	ND	260	ug/kg	
131-11-3	Dimethyl phthalate	ND	260	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	320	260	ug/kg	
206-44-0	Fluoranthene	ND	260	ug/kg	
86-73-7	Fluorene	ND	260	ug/kg	
118-74-1	Hexachlorobenzene	ND	260	ug/kg	
87-68-3	Hexachlorobutadiene	ND	260	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	260	ug/kg	
67-72-1	Hexachloroethane	ND	260	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	260	ug/kg	
78-59-1	Isophorone	ND	260	ug/kg	
90-12-0	1-Methylnaphthalene	ND	260	ug/kg	
91-57-6	2-Methylnaphthalene	ND	260	ug/kg	
88-74-4	2-Nitroaniline	ND	260	ug/kg	
99-09-2	3-Nitroaniline	ND	260	ug/kg	
100-01-6	4-Nitroaniline	ND	260	ug/kg	
91-20-3	Naphthalene	ND	260	ug/kg	
98-95-3	Nitrobenzene	ND	260	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	94	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	260	ug/kg	
85-01-8	Phenanthrene	ND	260	ug/kg	
129-00-0	Pyrene	ND	260	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	260	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	68%		25-121%
4165-62-2	Phenol-d5	76%		24-113%
118-79-6	2,4,6-Tribromophenol	98%		19-122%
4165-60-0	Nitrobenzene-d5	74%		23-120%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-007		
Lab Sample ID:	F4256-7	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 3550B/8270C	**Percent Solids:**	64.0
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001850.D	1	06/10/99	ME	06/10/99	OP839	SL115
Run #2							

ABN TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
321-60-8	2-Fluorobiphenyl	77%		30-115%
1718-51-0	Terphenyl-d14	104%		18-137%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-DU01		
Lab Sample ID:	F4256-20	**Date Sampled:**	06/04/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 3550B/8270C	**Percent Solids:**	83.8
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001846.D	1	06/10/99	ME	06/10/99	OP839	SL115
Run #2							

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
95-57-8	2-Chlorophenol	ND	200	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	400	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	180	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	400	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	990	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	400	ug/kg	
95-48-7	2-Methylphenol	ND	200	ug/kg	
	3&4-Methylphenol	ND	200	ug/kg	
88-75-5	2-Nitrophenol	ND	200	ug/kg	
100-02-7	4-Nitrophenol	ND	990	ug/kg	
87-86-5	Pentachlorophenol	ND	990	ug/kg	
108-95-2	Phenol	ND	200	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	200	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	200	ug/kg	
83-32-9	Acenaphthene	ND	200	ug/kg	
208-96-8	Acenaphthylene	ND	200	ug/kg	
120-12-7	Anthracene	ND	200	ug/kg	
56-55-3	Benzo(a)anthracene	ND	200	ug/kg	
50-32-8	Benzo(a)pyrene	ND	99	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	200	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	200	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	200	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	200	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	200	ug/kg	
91-58-7	2-Chloronaphthalene	ND	200	ug/kg	
106-47-8	4-Chloroaniline	ND	200	ug/kg	
86-74-8	Carbazole	ND	200	ug/kg	
218-01-9	Chrysene	ND	200	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	200	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	200	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	200	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	200	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	200	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	200	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	200	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	200	ug/kg	

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-DU01		
Lab Sample ID:	F4256-20	**Date Sampled:**	06/04/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 3550B/8270C	**Percent Solids:**	83.8
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001846.D	1	06/10/99	ME	06/10/99	OP839	SL115
Run #2							

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
606-20-2	2,6-Dinitrotoluene	ND	200	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	400	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	99	ug/kg	
132-64-9	Dibenzofuran	ND	200	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	200	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	200	ug/kg	
84-66-2	Diethyl phthalate	ND	200	ug/kg	
131-11-3	Dimethyl phthalate	ND	200	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	200	ug/kg	
206-44-0	Fluoranthene	ND	200	ug/kg	
86-73-7	Fluorene	ND	200	ug/kg	
118-74-1	Hexachlorobenzene	ND	200	ug/kg	
87-68-3	Hexachlorobutadiene	ND	200	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	200	ug/kg	
67-72-1	Hexachloroethane	ND	200	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	200	ug/kg	
78-59-1	Isophorone	ND	200	ug/kg	
90-12-0	1-Methylnaphthalene	ND	200	ug/kg	
91-57-6	2-Methylnaphthalene	ND	200	ug/kg	
88-74-4	2-Nitroaniline	ND	200	ug/kg	
99-09-2	3-Nitroaniline	ND	200	ug/kg	
100-01-6	4-Nitroaniline	ND	200	ug/kg	
91-20-3	Naphthalene	ND	200	ug/kg	
98-95-3	Nitrobenzene	ND	200	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	71	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	200	ug/kg	
85-01-8	Phenanthrene	ND	200	ug/kg	
129-00-0	Pyrene	ND	200	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	200	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	86%		25-121%
4165-62-2	Phenol-d5	93%		24-113%
118-79-6	2,4,6-Tribromophenol	100%		19-122%
4165-60-0	Nitrobenzene-d5	88%		23-120%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-DU01		
Lab Sample ID:	F4256-20	**Date Sampled:**	06/04/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 3550B/8270C	**Percent Solids:**	83.8
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001846.D	1	06/10/99	ME	06/10/99	OP839	SL115
Run #2							

ABN TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
321-60-8	2-Fluorobiphenyl	90%		30-115%
1718-51-0	Terphenyl-d14	105%		18-137%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SW-007		
Lab Sample ID:	F4256-9	**Date Sampled:**	06/04/99
Matrix:	AQ - Ground Water	**Date Received:**	06/05/99
Method:	SW846 3510C/8270C	**Percent Solids:**	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001829.D	1	06/08/99	ME	06/08/99	OP831	SL114
Run #2	H004576.D	1	06/08/99	ME	06/08/99	OP830	SH226

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
95-57-8	2-Chlorophenol	ND [a]	5.0	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND [a]	10	ug/l	
120-83-2	2,4-Dichlorophenol	ND [a]	4.0	ug/l	
105-67-9	2,4-Dimethylphenol	ND [a]	10	ug/l	
51-28-5	2,4-Dinitrophenol	ND [a]	25	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND [a]	25	ug/l	
95-48-7	2-Methylphenol	ND [a]	5.0	ug/l	
	3&4-Methylphenol	ND [a]	5.0	ug/l	
88-75-5	2-Nitrophenol	ND [a]	5.0	ug/l	
100-02-7	4-Nitrophenol	ND [a]	15	ug/l	
87-86-5	Pentachlorophenol	ND	1.0	ug/l	
108-95-2	Phenol	ND [a]	5.0	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND [a]	4.0	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND [a]	5.0	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND [a]	5.0	ug/l	
85-68-7	Butyl benzyl phthalate	ND [a]	5.0	ug/l	
91-58-7	2-Chloronaphthalene	ND [a]	5.0	ug/l	
106-47-8	4-Chloroaniline	ND [a]	5.0	ug/l	
86-74-8	Carbazole	ND [a]	4.0	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND [a]	5.0	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	1.5	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND [a]	5.0	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND [a]	5.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND [a]	5.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND [a]	5.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND [a]	5.0	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.20	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.20	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND [a]	7.5	ug/l	
132-64-9	Dibenzofuran	ND [a]	5.0	ug/l	
84-74-2	Di-n-butyl phthalate	ND [a]	5.0	ug/l	
117-84-0	Di-n-octyl phthalate	ND [a]	5.0	ug/l	
84-66-2	Diethyl phthalate	ND [a]	5.0	ug/l	
131-11-3	Dimethyl phthalate	ND [a]	5.0	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND [a]	5.0	ug/l	
118-74-1	Hexachlorobenzene	ND	1.0	ug/l	

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SW-007		
Lab Sample ID:	F4256-9	**Date Sampled:**	06/04/99
Matrix:	AQ - Ground Water	**Date Received:**	06/05/99
Method:	SW846 3510C/8270C	**Percent Solids:**	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001829.D	1	06/08/99	ME	06/08/99	OP831	SL114
Run #2	H004576.D	1	06/08/99	ME	06/08/99	OP830	SH226

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
87-68-3	Hexachlorobutadiene	ND [a]	5.0	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND [a]	5.0	ug/l	
67-72-1	Hexachloroethane	ND [a]	5.0	ug/l	
78-59-1	Isophorone	ND [a]	5.0	ug/l	
90-12-0	1-Methylnaphthalene	ND [a]	5.0	ug/l	
91-57-6	2-Methylnaphthalene	ND [a]	5.0	ug/l	
88-74-4	2-Nitroaniline	ND [a]	5.0	ug/l	
99-09-2	3-Nitroaniline	ND [a]	5.0	ug/l	
100-01-6	4-Nitroaniline	ND [a]	5.0	ug/l	
98-95-3	Nitrobenzene	ND [a]	4.0	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND [a]	4.0	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND [a]	5.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND [a]	5.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol		48%	21-100%
4165-62-2	Phenol-d5		33%	10-94%
118-79-6	2,4,6-Tribromophenol		82%	10-123%
4165-60-0	Nitrobenzene-d5		91%	35-114%
321-60-8	2-Fluorobiphenyl		83%	43-116%
1718-51-0	Terphenyl-d14		99%	33-141%

(a) Result is from Run# 2

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SW-DU01		
Lab Sample ID:	F4256-21	**Date Sampled:**	06/04/99
Matrix:	AQ - Ground Water	**Date Received:**	06/05/99
Method:	SW846 3510C/8270C	**Percent Solids:**	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001830.D	1	06/08/99	ME	06/08/99	OP831	SL114
Run #2	H004577.D	1	06/08/99	ME	06/08/99	OP830	SH226

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
95-57-8	2-Chlorophenol	ND [a]	5.0	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND [a]	10	ug/l	
120-83-2	2,4-Dichlorophenol	ND [a]	4.0	ug/l	
105-67-9	2,4-Dimethylphenol	ND [a]	10	ug/l	
51-28-5	2,4-Dinitrophenol	ND [a]	25	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND [a]	25	ug/l	
95-48-7	2-Methylphenol	ND [a]	5.0	ug/l	
	3&4-Methylphenol	ND [a]	5.0	ug/l	
88-75-5	2-Nitrophenol	ND [a]	5.0	ug/l	
100-02-7	4-Nitrophenol	ND [a]	15	ug/l	
87-86-5	Pentachlorophenol	ND	1.0	ug/l	
108-95-2	Phenol	ND [a]	5.0	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND [a]	4.0	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND [a]	5.0	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND [a]	5.0	ug/l	
85-68-7	Butyl benzyl phthalate	ND [a]	5.0	ug/l	
91-58-7	2-Chloronaphthalene	ND [a]	5.0	ug/l	
106-47-8	4-Chloroaniline	ND [a]	5.0	ug/l	
86-74-8	Carbazole	ND [a]	4.0	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND [a]	5.0	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	1.5	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND [a]	5.0	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND [a]	5.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND [a]	5.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND [a]	5.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND [a]	5.0	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.20	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.20	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND [a]	7.5	ug/l	
132-64-9	Dibenzofuran	ND [a]	5.0	ug/l	
84-74-2	Di-n-butyl phthalate	ND [a]	5.0	ug/l	
117-84-0	Di-n-octyl phthalate	ND [a]	5.0	ug/l	
84-66-2	Diethyl phthalate	ND [a]	5.0	ug/l	
131-11-3	Dimethyl phthalate	ND [a]	5.0	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND [a]	5.0	ug/l	
118-74-1	Hexachlorobenzene	ND	1.0	ug/l	

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SW-DU01		
Lab Sample ID:	F4256-21	**Date Sampled:**	06/04/99
Matrix:	AQ - Ground Water	**Date Received:**	06/05/99
Method:	SW846 3510C/8270C	**Percent Solids:**	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001830.D	1	06/08/99	ME	06/08/99	OP831	SL114
Run #2	H004577.D	1	06/08/99	ME	06/08/99	OP830	SH226

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
87-68-3	Hexachlorobutadiene	ND [a]	5.0	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND [a]	5.0	ug/l	
67-72-1	Hexachloroethane	ND [a]	5.0	ug/l	
78-59-1	Isophorone	ND [a]	5.0	ug/l	
90-12-0	1-Methylnaphthalene	ND [a]	5.0	ug/l	
91-57-6	2-Methylnaphthalene	ND [a]	5.0	ug/l	
88-74-4	2-Nitroaniline	ND [a]	5.0	ug/l	
99-09-2	3-Nitroaniline	ND [a]	5.0	ug/l	
100-01-6	4-Nitroaniline	ND [a]	5.0	ug/l	
98-95-3	Nitrobenzene	ND [a]	4.0	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND [a]	4.0	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND [a]	5.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND [a]	5.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol		41%	21-100%
4165-62-2	Phenol-d5		28%	10-94%
118-79-6	2,4,6-Tribromophenol		75%	10-123%
4165-60-0	Nitrobenzene-d5		78%	35-114%
321-60-8	2-Fluorobiphenyl		73%	43-116%
1718-51-0	Terphenyl-d14		100%	33-141%

(a) Result is from Run# 2

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4256

SAMPLE NUMBER:	CEF-P44-SD-001	CEF-P44-SD-002	CEF-P44-SD-003	CEF-P44-SD-004
SAMPLE DATE:	06/03/99	06/03/99	06/03/99	06/03/99
LABORATORY ID:	F4256-1	F4256-2	F4256-3	F4256-4
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	97.4 %	82.5 %	79.0 %	77.1 %
UNITS:	UG/KG	UG/KG	UG/KG	UG/KG
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	36	U		42	U		44	U		45	U	
2-METHYLNAPHTHALENE	36	U		42	U		44	U		45	U	
ACENAPHTHENE	36	U		42	U		44	U		45	U	
ACENAPHTHYLENE	73	U		86	U		90	U		92	U	
ANTHRACENE	5.4	U		6.4	U		6.7	U		6.8	U	
BENZO(A)ANTHRACENE	43			6.4	U		55			6.8	U	
BENZO(A)PYRENE	47			6.4	U		67			6.8	U	
BENZO(B)FLUORANTHENE	51			6.4	U		87			6.8	U	
BENZO(G,H,I)PERYLENE	53			8.6	U		41			9.2	U	
BENZO(K)FLUORANTHENE	5.4	U		6.4	U		140			6.8	U	
CHRYSENE	52			6.4	U		54			6.8	U	
DIBENZO(A,H)ANTHRACENE	8.9	U		10	U		11	U		11	U	
FLUORANTHENE	120			8.6	U		200			9.2	U	
FLUORENE	7.3	U		8.6	U		9.0	U		9.2	U	
INDENO(1,2,3-CD)PYRENE	31			6.4	U		57			6.8	U	
NAPHTHALENE	36	U		42	U		44	U		45	U	
PHENANTHRENE	5.4	U		6.4	U		6.7	U		6.8	U	
PYRENE	120			8.9	U		130			9.2	U	

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4256

SAMPLE NUMBER:	CEF-P44-SD-006			CEF-P44-SD-007			CEF-P44-SD-DU01			CEF-P44-SS-008		
SAMPLE DATE:	06/03/99			06/03/99			06/04/99			06/03/99		
LABORATORY ID:	F4256-6			F4256-7			F4256-20			F4256-10		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	74.7 %			64.0 %			83.8 %			91.8 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:							CEF-P44-SD-003					
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	46	U		54	U		41	U		38	U	
2-METHYLNAPHTHALENE	1200			54	U		300			38	U	
ACENAPHTHENE	1700			54	U		41	U		38	U	
ACENAPHTHYLENE	95	U		110	U		84	U		77	U	
ANTHRACENE	7.0	U		8.2	U		6.3	U		5.7	U	
BENZO(A)ANTHRACENE	470			8.2	U		67			5.7	U	
BENZO(A)PYRENE	600			8.2	U		160			5.7	U	
BENZO(B)FLUORANTHENE	780			8.2	U		200			5.7	U	
BENZO(G,H,I)PERYLENE	620			11	U		160			7.7	U	
BENZO(K)FLUORANTHENE	400			8.2	U		99			5.7	U	
CHRYSENE	650			58			77			5.7	U	
DIBENZO(A,H)ANTHRACENE	67			14	U		10	U		9.4	U	
FLUORANTHENE	1400			590			63			7.7	U	
FLUORENE	9.5	U		11	U		8.4	U		7.7	U	
INDENO(1,2,3-CD)PYRENE	560			8.2	U		130			5.7	U	
NAPHTHALENE	46	U		54	U		41	U		38	U	
PHENANTHRENE	400			8.2	U		6.3	U		5.7	U	
PYRENE	1200			110			72			7.7	U	

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4256

SAMPLE NUMBER:	CEF-P44-SS-009			CEF-P44-SS-010			CEF-P44-SS-011			CEF-P44-SS-016		
SAMPLE DATE:	06/03/99			06/03/99			06/04/99			06/04/99		
LABORATORY ID:	F4256-11			F4256-12			F4256-13			F4256-18		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	95.8 %			81.7 %			96.6 %			100.0 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	36	U		42	U		36	U		35	U	
2-METHYLNAPHTHALENE	36	U		42	U		36	U		35	U	
ACENAPHTHENE	36	U		300			36	U		35	U	
ACENAPHTHYLENE	74	U		87	U		73	U		71	U	
ANTHRACENE	5.5	U		6.4	U		5.5	U		5.3	U	
BENZO(A)ANTHRACENE	43			70			5.5	U		5.3	U	
BENZO(A)PYRENE	48			91			5.5	U		5.3	U	
BENZO(B)FLUORANTHENE	59			120			5.5	U		5.3	U	
BENZO(G,H,I)PERYLENE	32			90			7.3	U		7.1	U	
BENZO(K)FLUORANTHENE	5.5	U		69			5.5	U		5.3	U	
CHRYSENE	35			94			5.5	U		5.3	U	
DIBENZO(A,H)ANTHRACENE	9.0	U		11	U		9.0	U		8.6	U	
FLUORANTHENE	300			1300			7.3	U		7.1	U	
FLUORENE	7.4	U		8.7	U		7.3	U		7.1	U	
INDENO(1,2,3-CD)PYRENE	34			68			5.5	U		5.3	U	
NAPHTHALENE	36	U		42	U		36	U		35	U	
PHENANTHRENE	5.5	U		6.4	U		5.5	U		5.3	U	
PYRENE	92			250			7.3	U		7.1	U	

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4256

SAMPLE NUMBER:	CEF-P44-SS-017			CEF-P44-SS-DU01			/ /			/ /		
SAMPLE DATE:	06/04/99			06/04/99								
LABORATORY ID:	F4256-19			F4256-22								
QC_TYPE:	NORMAL			NORMAL								
% SOLIDS:	89.4 %			78.4 %			100.0 %			100.0 %		
UNITS:	UG/KG			UG/KG								
FIELD DUPLICATE OF:				CEF-P44-SS-017								
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	39	U		44	U							
2-METHYLNAPHTHALENE	1200	J	G	44	UJ	G						
ACENAPHTHENE	39	U		44	U							
ACENAPHTHYLENE	79	U		90	U							
ANTHRACENE	5.9	U		6.7	U							
BENZO(A)ANTHRACENE	41	J	G	6.7	UJ	G						
BENZO(A)PYRENE	85	J	G	6.7	UJ	G						
BENZO(B)FLUORANTHENE	130	J	G	6.7	UJ	G						
BENZO(G,H,I)PERYLENE	110	J	G	9.0	UJ	G						
BENZO(K)FLUORANTHENE	73	J	G	6.7	UJ	G						
CHRYSENE	42	J	G	6.7	UJ	G						
DIBENZO(A,H)ANTHRACENE	9.7	U		11	U							
FLUORANTHENE	140			91								
FLUORENE	7.9	U		9.0	U							
INDENO(1,2,3-CD)PYRENE	76	J	G	6.7	UJ	G						
NAPHTHALENE	39	U		44	U							
PHENANTHRENE	5.9	U		6.7	U							
PYRENE	120	J	G	49	J	G						

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4256

SAMPLE NUMBER:	CEF-P44-SW-007	CEF-P44-SW-DU01	/ /	/ /
SAMPLE DATE:	06/04/99	06/04/99		
LABORATORY ID:	F4256-9	F4256-21		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:		CEF-P44-SW-007		

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	2	U		2	U							
2-METHYLNAPHTHALENE	2	U		2	U							
ACENAPHTHENE	1	U		1	U							
ACENAPHTHYLENE	2	U		2	U							
ANTHRACENE	0.7	U		0.7	U							
BENZO(A)ANTHRACENE	0.1	U		0.1	U							
BENZO(A)PYRENE	0.1	U		0.1	U							
BENZO(B)FLUORANTHENE	0.2	U		0.2	U							
BENZO(G,H,I)PERYLENE	0.8	U		0.8	U							
BENZO(K)FLUORANTHENE	0.2	U		0.2	U							
CHRYSENE	0.2	U		0.2	U							
DIBENZO(A,H)ANTHRACENE	0.3	U		0.3	U							
FLUORANTHENE	0.2	U		0.2	U							
FLUORENE	0.2	U		0.2	U							
INDENO(1,2,3-CD)PYRENE	0.4	U		0.4	U							
NAPHTHALENE	1	U		1	U							
PHENANTHRENE	0.6	U		0.6	U							
PYRENE	0.3	U		0.3	U							

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SD-001		
Lab Sample ID:	F4256-1	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	EPA 8310	**Percent Solids:**	97.4
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	07/09/99	SUB	n/a	n/a	R6899
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	36	ug/kg	
208-96-8	Acenaphthylene	ND	73	ug/kg	
120-12-7	Anthracene	ND	5.4	ug/kg	
56-55-3	Benzo(a)anthracene	43	5.4	ug/kg	
50-32-8	Benzo(a)pyrene	47	5.4	ug/kg	
205-99-2	Benzo(b)fluoranthene	51	5.4	ug/kg	
191-24-2	Benzo(g,h,i)perylene	53	7.3	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	5.4	ug/kg	
218-01-9	Chrysene	52	5.4	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	8.9	ug/kg	
206-44-0	Fluoranthene	120	7.3	ug/kg	
86-73-7	Fluorene	ND	7.3	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	31	5.4	ug/kg	
91-20-3	Naphthalene	ND	36	ug/kg	
90-12-0	1-Methylnaphthalene	ND	36	ug/kg	
91-57-6	2-Methylnaphthalene	ND	36	ug/kg	
85-01-8	Phenanthrene	ND	5.4	ug/kg	
129-00-0	Pyrene	120	7.3	ug/kg	

(a) Analyzed By Accutest Southeast Subcontract Lab.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	CEF-P44-SD-002		
Lab Sample ID:	F4256-2	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	EPA 8310	**Percent Solids:**	82.5
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	07/09/99	SUB	n/a	n/a	R6899
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	42	ug/kg	
208-96-8	Acenaphthylene	ND	86	ug/kg	
120-12-7	Anthracene	ND	6.4	ug/kg	
56-55-3	Benzo(a)anthracene	ND	6.4	ug/kg	
50-32-8	Benzo(a)pyrene	ND	6.4	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	6.4	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	8.6	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	6.4	ug/kg	
218-01-9	Chrysene	ND	6.4	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	10	ug/kg	
206-44-0	Fluoranthene	ND	8.6	ug/kg	
86-73-7	Fluorene	ND	8.6	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	6.4	ug/kg	
91-20-3	Naphthalene	ND	42	ug/kg	
90-12-0	1-Methylnaphthalene	ND	42	ug/kg	
91-57-6	2-Methylnaphthalene	ND	42	ug/kg	
85-01-8	Phenanthrene	ND	6.4	ug/kg	
129-00-0	Pyrene	ND	8.9	ug/kg	

(a) Analyzed By Accutest Southeast Subcontract Lab.

ND = Not detected
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N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	CEF-P44-SD-003		
Lab Sample ID:	F4256-3	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	EPA 8310	**Percent Solids:**	79.0
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	07/09/99	SUB	n/a	n/a	R6899
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	44	ug/kg	
208-96-8	Acenaphthylene	ND	90	ug/kg	
120-12-7	Anthracene	ND	6.7	ug/kg	
56-55-3	Benzo(a)anthracene	55	6.7	ug/kg	
50-32-8	Benzo(a)pyrene	67	6.7	ug/kg	
205-99-2	Benzo(b)fluoranthene	87	6.7	ug/kg	
191-24-2	Benzo(g,h,i)perylene	41	9.0	ug/kg	
207-08-9	Benzo(k)fluoranthene	140	6.7	ug/kg	
218-01-9	Chrysene	54	6.7	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	11	ug/kg	
206-44-0	Fluoranthene	200	9.0	ug/kg	
86-73-7	Fluorene	ND	9.0	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	52	6.7	ug/kg	
91-20-3	Naphthalene	ND	44	ug/kg	
90-12-0	1-Methylnaphthalene	ND	44	ug/kg	
91-57-6	2-Methylnaphthalene	ND	44	ug/kg	
85-01-8	Phenanthrene	ND	6.7	ug/kg	
129-00-0	Pyrene	130	9.0	ug/kg	

(a) Analyzed By Accutest Southeast Subcontract Lab.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	CEF-P44-SD-004		
Lab Sample ID:	F4256-4	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	EPA 8310	**Percent Solids:**	77.1
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	07/09/99	SUB	n/a	n/a	R6899
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	45	ug/kg	
208-96-8	Acenaphthylene	ND	92	ug/kg	
120-12-7	Anthracene	ND	6.8	ug/kg	
56-55-3	Benzo(a)anthracene	ND	6.8	ug/kg	
50-32-8	Benzo(a)pyrene	ND	6.8	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	6.8	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	9.2	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	6.8	ug/kg	
218-01-9	Chrysene	ND	6.8	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	11	ug/kg	
206-44-0	Fluoranthene	ND	9.2	ug/kg	
86-73-7	Fluorene	ND	9.2	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	6.8	ug/kg	
91-20-3	Naphthalene	ND	45	ug/kg	
90-12-0	1-Methylnaphthalene	ND	45	ug/kg	
91-57-6	2-Methylnaphthalene	ND	45	ug/kg	
85-01-8	Phenanthrene	ND	6.8	ug/kg	
129-00-0	Pyrene	ND	9.2	ug/kg	

(a) Analyzed By Accutest Southeast Subcontract Lab.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	CEF-P44-SD-006		
Lab Sample ID:	F4256-6	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	EPA 8310	**Percent Solids:**	74.7
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	07/09/99	SUB	n/a	n/a	R6899
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	1700	46	ug/kg	
208-96-8	Acenaphthylene	ND	95	ug/kg	
120-12-7	Anthracene	ND	7.0	ug/kg	
56-55-3	Benzo(a)anthracene	470	7.0	ug/kg	
50-32-8	Benzo(a)pyrene	600	7.0	ug/kg	
205-99-2	Benzo(b)fluoranthene	780	7.0	ug/kg	
191-24-2	Benzo(g,h,i)perylene	620	9.5	ug/kg	
207-08-9	Benzo(k)fluoranthene	400	7.0	ug/kg	
218-01-9	Chrysene	650	7.0	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	67	12	ug/kg	
206-44-0	Fluoranthene	1400	9.5	ug/kg	
86-73-7	Fluorene	ND	9.5	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	560	7.0	ug/kg	
91-20-3	Naphthalene	ND	46	ug/kg	
90-12-0	1-Methylnaphthalene	ND	46	ug/kg	
91-57-6	2-Methylnaphthalene	1200	46	ug/kg	
85-01-8	Phenanthrene	400	7.0	ug/kg	
129-00-0	Pyrene	1200	9.5	ug/kg	

(a) Analyzed By Accutest Southeast Subcontract Lab.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
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N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	CEF-P44-SD-007		
Lab Sample ID:	F4256-7	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	EPA 8310	**Percent Solids:**	64.0
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	07/09/99	SUB	n/a	n/a	R6899
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	54	ug/kg	
208-96-8	Acenaphthylene	ND	110	ug/kg	
120-12-7	Anthracene	ND	8.2	ug/kg	
56-55-3	Benzo(a)anthracene	ND	8.2	ug/kg	
50-32-8	Benzo(a)pyrene	ND	8.2	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	8.2	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	11	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	8.2	ug/kg	
218-01-9	Chrysene	58	8.2	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	14	ug/kg	
206-44-0	Fluoranthene	590	11	ug/kg	
86-73-7	Fluorene	ND	11	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	8.2	ug/kg	
91-20-3	Naphthalene	ND	54	ug/kg	
90-12-0	1-Methylnaphthalene	ND	54	ug/kg	
91-57-6	2-Methylnaphthalene	ND	54	ug/kg	
85-01-8	Phenanthrene	ND	8.2	ug/kg	
129-00-0	Pyrene	110	11	ug/kg	

(a) Analyzed By Accutest Southeast Subcontract Lab.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

00009

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Report of Analysis

Client Sample ID:	CEF-P44-SD-DU01		
Lab Sample ID:	F4256-20	**Date Sampled:**	06/04/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	EPA 8310	**Percent Solids:**	83.8
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	07/09/99	SUB	n/a	n/a	R6899
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	41	ug/kg	
208-96-8	Acenaphthylene	ND	84	ug/kg	
120-12-7	Anthracene	ND	6.3	ug/kg	
56-55-3	Benzo(a)anthracene	67	6.3	ug/kg	
50-32-8	Benzo(a)pyrene	160	6.3	ug/kg	
205-99-2	Benzo(b)fluoranthene	200	6.3	ug/kg	
191-24-2	Benzo(g,h,i)perylene	160	8.4	ug/kg	
207-08-9	Benzo(k)fluoranthene	99	6.3	ug/kg	
218-01-9	Chrysene	77	6.3	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	10	ug/kg	
206-44-0	Fluoranthene	63	8.4	ug/kg	
86-73-7	Fluorene	ND	8.4	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	130	6.3	ug/kg	
91-20-3	Naphthalene	ND	41	ug/kg	
90-12-0	1-Methylnaphthalene	ND	41	ug/kg	
91-57-6	2-Methylnaphthalene	300	41	ug/kg	
85-01-8	Phenanthrene	ND	6.3	ug/kg	
129-00-0	Pyrene	72	7.9	ug/kg	

(a) Analyzed By Accutest Southeast Subcontract Lab.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

00017

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Report of Analysis

Client Sample ID:	CEF-P44-SS-008		
Lab Sample ID:	F4256-10	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	EPA 8310	**Percent Solids:**	91.8
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	07/09/99	SUB	n/a	n/a	R6899
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	38	ug/kg	
208-96-8	Acenaphthylene	ND	77	ug/kg	
120-12-7	Anthracene	ND	5.7	ug/kg	
56-55-3	Benzo(a)anthracene	ND	5.7	ug/kg	
50-32-8	Benzo(a)pyrene	ND	5.7	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	5.7	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	7.7	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	5.7	ug/kg	
218-01-9	Chrysene	ND	5.7	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	9.4	ug/kg	
206-44-0	Fluoranthene	ND	7.7	ug/kg	
86-73-7	Fluorene	ND	7.7	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5.7	ug/kg	
91-20-3	Naphthalene	ND	38	ug/kg	
90-12-0	1-Methylnaphthalene	ND	38	ug/kg	
91-57-6	2-Methylnaphthalene	ND	38	ug/kg	
85-01-8	Phenanthrene	ND	5.7	ug/kg	
129-00-0	Pyrene	ND	7.7	ug/kg	

(a) Analyzed By Accutest Southeast Subcontract Lab.

ND = Not detected
RDL = Reported Detection Limit
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J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	CEF-P44-SS-009		
Lab Sample ID:	F4256-11	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	EPA 8310	**Percent Solids:**	95.8
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	07/09/99	SUB	n/a	n/a	R6899
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	36	ug/kg	
208-96-8	Acenaphthylene	ND	74	ug/kg	
120-12-7	Anthracene	ND	5.5	ug/kg	
56-55-3	Benzo(a)anthracene	43	5.5	ug/kg	
50-32-8	Benzo(a)pyrene	48	5.5	ug/kg	
205-99-2	Benzo(b)fluoranthene	59	5.5	ug/kg	
191-24-2	Benzo(g,h,i)perylene	32	7.4	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	5.5	ug/kg	
218-01-9	Chrysene	35	5.5	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	9.0	ug/kg	
206-44-0	Fluoranthene	300	7.4	ug/kg	
86-73-7	Fluorene	ND	7.4	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	34	5.5	ug/kg	
91-20-3	Naphthalene	ND	36	ug/kg	
90-12-0	1-Methylnaphthalene	ND	36	ug/kg	
91-57-6	2-Methylnaphthalene	ND	36	ug/kg	
85-01-8	Phenanthrene	ND	5.5	ug/kg	
129-00-0	Pyrene	92	8.7	ug/kg	

(a) Analyzed By Accutest Southeast Subcontract Lab.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

00012

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Report of Analysis

Client Sample ID:	CEF-P44-SS-010		
Lab Sample ID:	F4256-12	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	EPA 8310	**Percent Solids:**	81.7
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	07/09/99	SUB	n/a	n/a	R6899
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	300	42	ug/kg	
208-96-8	Acenaphthylene	ND	87	ug/kg	
120-12-7	Anthracene	ND	6.4	ug/kg	
56-55-3	Benzo(a)anthracene	70	6.4	ug/kg	
50-32-8	Benzo(a)pyrene	91	6.4	ug/kg	
205-99-2	Benzo(b)fluoranthene	120	6.4	ug/kg	
191-24-2	Benzo(g,h,i)perylene	90	8.7	ug/kg	
207-08-9	Benzo(k)fluoranthene	69	6.4	ug/kg	
218-01-9	Chrysene	94	6.4	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	11	ug/kg	
206-44-0	Fluoranthene	1300	8.7	ug/kg	
86-73-7	Fluorene	ND	8.7	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	68	6.4	ug/kg	
91-20-3	Naphthalene	ND	42	ug/kg	
90-12-0	1-Methylnaphthalene	ND	42	ug/kg	
91-57-6	2-Methylnaphthalene	ND	42	ug/kg	
85-01-8	Phenanthrene	ND	6.4	ug/kg	
129-00-0	Pyrene	250	8.7	ug/kg	

(a) Analyzed By Accutest Southeast Subcontract Lab.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	CEF-P44-SS-011		
Lab Sample ID:	F4256-13	**Date Sampled:**	06/04/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	EPA 8310	**Percent Solids:**	96.6
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	07/09/99	SUB	n/a	n/a	R6899
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	36	ug/kg	
208-96-8	Acenaphthylene	ND	73	ug/kg	
120-12-7	Anthracene	ND	5.5	ug/kg	
56-55-3	Benzo(a)anthracene	ND	5.5	ug/kg	
50-32-8	Benzo(a)pyrene	ND	5.5	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	5.5	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	7.3	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	5.5	ug/kg	
218-01-9	Chrysene	ND	5.5	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	9.0	ug/kg	
206-44-0	Fluoranthene	ND	7.3	ug/kg	
86-73-7	Fluorene	ND	7.3	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5.5	ug/kg	
91-20-3	Naphthalene	ND	36	ug/kg	
90-12-0	1-Methylnaphthalene	ND	36	ug/kg	
91-57-6	2-Methylnaphthalene	ND	36	ug/kg	
85-01-8	Phenanthrene	ND	5.5	ug/kg	
129-00-0	Pyrene	ND	7.3	ug/kg	

(a) Analyzed By Accutest Southeast Subcontract Lab.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	CEF-P44-SS-016		
Lab Sample ID:	F4256-18	**Date Sampled:**	06/04/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	EPA 8310	**Percent Solids:**	~~n/a~~ 94.5%
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	07/09/99.	SUB	n/a	n/a	R6899
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	35	ug/kg	
208-96-8	Acenaphthylene	ND	71	ug/kg	
120-12-7	Anthracene	ND	5.3	ug/kg	
56-55-3	Benzo(a)anthracene	ND	5.3	ug/kg	
50-32-8	Benzo(a)pyrene	ND	5.3	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	5.3	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	7.1	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	5.3	ug/kg	
218-01-9	Chrysene	ND	5.3	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	8.6	ug/kg	
206-44-0	Fluoranthene	ND	7.1	ug/kg	
86-73-7	Fluorene	ND	7.1	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5.3	ug/kg	
91-20-3	Naphthalene	ND	35	ug/kg	
90-12-0	1-Methylnaphthalene	ND	35	ug/kg	
91-57-6	2-Methylnaphthalene	ND	35	ug/kg	
85-01-8	Phenanthrene	ND	5.3	ug/kg	
129-00-0	Pyrene	ND	7.1	ug/kg	

(a) Analyzed By Accutest Southeast Subcontract Lab.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-017		
Lab Sample ID:	F4256-19	**Date Sampled:**	06/04/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	EPA 8310	**Percent Solids:**	89.4
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	07/09/99	SUB	n/a	n/a	R6899
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	39	ug/kg	
208-96-8	Acenaphthylene	ND	79	ug/kg	
120-12-7	Anthracene	ND	5.9	ug/kg	
56-55-3	Benzo(a)anthracene	41	5.9	ug/kg	
50-32-8	Benzo(a)pyrene	85	5.9	ug/kg	
205-99-2	Benzo(b)fluoranthene	130	5.9	ug/kg	
191-24-2	Benzo(g,h,i)perylene	110	7.9	ug/kg	
207-08-9	Benzo(k)fluoranthene	73	5.9	ug/kg	
218-01-9	Chrysene	42	5.9	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	9.7	ug/kg	
206-44-0	Fluoranthene	140	7.9	ug/kg	
86-73-7	Fluorene	ND	7.9	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	76	5.9	ug/kg	
91-20-3	Naphthalene	ND	39	ug/kg	
90-12-0	1-Methylnaphthalene	ND	39	ug/kg	
91-57-6	2-Methylnaphthalene	1200	39	ug/kg	
85-01-8	Phenanthrene	ND	5.9	ug/kg	
129-00-0	Pyrene	120	7.9	ug/kg	

(a) Analyzed By Accutest Southeast Subcontract Lab.

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E = Indicates value exceeds calibration range

J = Indicates an estimated value
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N = Indicates presumptive evidence of a compound

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ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-DU01		
Lab Sample ID:	F4256-22	**Date Sampled:**	06/04/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	EPA 8310	**Percent Solids:**	78.4
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	07/09/99	SUB	n/a	n/a	R6899
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	44	ug/kg	
208-96-8	Acenaphthylene	ND	90	ug/kg	
120-12-7	Anthracene	ND	6.7	ug/kg	
56-55-3	Benzo(a)anthracene	ND	6.7	ug/kg	
50-32-8	Benzo(a)pyrene	ND	6.7	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	6.7	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	9.0	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	6.7	ug/kg	
218-01-9	Chrysene	ND	6.7	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	11	ug/kg	
206-44-0	Fluoranthene	91	9.0	ug/kg	
86-73-7	Fluorene	ND	9.0	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	6.7	ug/kg	
91-20-3	Naphthalene	ND	44	ug/kg	
90-12-0	1-Methylnaphthalene	ND	44	ug/kg	
91-57-6	2-Methylnaphthalene	ND	44	ug/kg	
85-01-8	Phenanthrene	ND	6.7	ug/kg	
129-00-0	Pyrene	49	9.0	ug/kg	

(a) Analyzed By Accutest Southeast Subcontract Lab.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SW-007		
Lab Sample ID:	F4256-9	**Date Sampled:**	06/04/99
Matrix:	AQ - Ground Water	**Date Received:**	06/05/99
Method:	EPA 8310	**Percent Solids:**	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	07/09/99	SUB	n/a	n/a	R6899
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	1.0	ug/l	
208-96-8	Acenaphthylene	ND	2.0	ug/l	
120-12-7	Anthracene	ND	0.70	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.10	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.10	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.80	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	ug/l	
218-01-9	Chrysene	ND	0.20	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.30	ug/l	
206-44-0	Fluoranthene	ND	0.20	ug/l	
86-73-7	Fluorene	ND	0.20	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.40	ug/l	
91-20-3	Naphthalene	ND	1.0	ug/l	
90-12-0	1-Methylnaphthalene	ND	2.0	ug/l	
91-57-6	2-Methylnaphthalene	ND	2.0	ug/l	
85-01-8	Phenanthrene	ND	0.60	ug/l	
129-00-0	Pyrene	ND	0.30	ug/l	

(a) Analyzed By Accutest Southeast Subcontract Lab.

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N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	CEF-P44-SW-DU01		
Lab Sample ID:	F4256-21	**Date Sampled:**	06/04/99
Matrix:	AQ - Ground Water	**Date Received:**	06/05/99
Method:	EPA 8310	**Percent Solids:**	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	07/09/99	SUB	n/a	n/a	R6899
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	1.0	ug/l	
208-96-8	Acenaphthylene	ND	2.0	ug/l	
120-12-7	Anthracene	ND	0.70	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.10	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.10	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.80	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	ug/l	
218-01-9	Chrysene	ND	0.20	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.30	ug/l	
206-44-0	Fluoranthene	ND	0.20	ug/l	
86-73-7	Fluorene	ND	0.20	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.40	ug/l	
91-20-3	Naphthalene	ND	1.0	ug/l	
90-12-0	1-Methylnaphthalene	ND	2.0	ug/l	
91-57-6	2-Methylnaphthalene	ND	2.0	ug/l	
85-01-8	Phenanthrene	ND	0.60	ug/l	
129-00-0	Pyrene	ND	0.30	ug/l	

(a) Analyzed By Accutest Southeast Subcontract Lab.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

00018

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4256

SAMPLE NUMBER:	CEF-P44-SD-001			CEF-P44-SD-002			CEF-P44-SD-003			CEF-P44-SD-004		
SAMPLE DATE:	06/03/99			06/03/99			06/03/99			06/03/99		
LABORATORY ID:	F4256-1			F4256-2			F4256-3			F4256-4		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	97.4 %			82.5 %			79.0 %			77.1 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	3.4	U		11	J	P	17	U		4.3	U	
4,4'-DDE	3.4	U		16			17	U		4.3	U	
4,4'-DDT	3.4	U		16	UJ	C	34	U		4.3	UJ	C
ALDRIN	1.7	U		8.0	U		8.4	U		2.2	U	
ALPHA-BHC	1.7	U		8.0	U		8.4	U		2.2	U	
ALPHA-CHLORDANE	3.4	U		16	U		17	U		4.3	U	
AROCLOR-1016	34	U		160	U		42	U		43	U	
AROCLOR-1221	34	U		160	U		42	U		43	U	
AROCLOR-1232	34	U		160	U		42	U		43	U	
AROCLOR-1242	34	U		160	U		42	U		43	U	
AROCLOR-1248	34	U		160	U		42	U		43	U	
AROCLOR-1254	34	U		225			42	U		43	U	
AROCLOR-1260	35			99	J	P	412	J	G	43	U	
BETA-BHC	1.7	U		8.0	U		8.4	U		2.2	U	
DELTA-BHC	1.7	U		8.0	U		8.4	U		2.2	U	
DIELDRIN	1.7	U		8.0	U		8.4	U		2.2	U	
ENDOSULFAN I	1.7	U		8.0	U		8.4	U		2.2	U	
ENDOSULFAN II	3.4	U		16	U		17	U		4.3	U	
ENDOSULFAN SULFATE	3.4	U		16	U		17	U		4.3	U	
ENDRIN	3.4	U		16	U		17	U		4.3	U	
ENDRIN ALDEHYDE	3.4	U		16	U		17	U		4.3	U	
ENDRIN KETONE	3.4	U		16	U		17	U		4.3	U	
GAMMA-BHC (LINDANE)	1.7	U		8.0	U		8.4	U		2.2	U	
GAMMA-CHLORDANE	3.4	U		16	U		17	U		4.3	U	
HEPTACHLOR	1.7	U		8.0	U		8.4	U		2.2	U	
HEPTACHLOR EPOXIDE	1.7	U		8.0	U		8.4	U		2.2	U	
METHOXYCHLOR	6.8	U		32	UJ	C	34	U		8.6	UJ	C
TOXAPHENE	170	U		800	U		840	U		220	U	

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4256

SAMPLE NUMBER:	CEF-P44-SD-006			CEF-P44-SD-007			CEF-P44-SD-DU01			CEF-P44-SS-008		
SAMPLE DATE:	06/03/99			06/03/99			06/04/99			06/03/99		
LABORATORY ID:	F4256-6			F4256-7			F4256-20			F4256-10		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	74.7 %			64.0 %			83.8 %			91.8 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:							CEF-P44-SD-003					
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	89	U		52	U		4.0	U				
4,4'-DDE	89	U		52	U		2.8	J	P			
4,4'-DDT	360	UJ	C	104	UJ	C	4.0	UJ	C			
ALDRIN	45	U		26	U		2.0	U				
ALPHA-BHC	45	U		26	U		2.0	U				
ALPHA-CHLORDANE	89	U		52	U		4.0	U				
AROCLOR-1016	450	U		260	U		40	U		36	U	
AROCLOR-1221	450	U		260	U		40	U		36	U	
AROCLOR-1232	450	U		260	U		40	U		36	U	
AROCLOR-1242	450	U		260	U		40	U		36	U	
AROCLOR-1248	450	U		260	U		40	U		36	U	
AROCLOR-1254	450	U		260	U		40	U		36	U	
AROCLOR-1260	2910			1100			40	UJ	G	36	U	
BETA-BHC	45	U		26	U		2.0	U				
DELTA-BHC	45	U		26	U		2.0	U				
DIELDRIN	45	U		26	U		2.0	U				
ENDOSULFAN I	45	U		26	U		2.0	U				
ENDOSULFAN II	89	U		52	U		4.0	U				
ENDOSULFAN SULFATE	89	U		52	U		4.0	U				
ENDRIN	89	U		52	U		4.0	U				
ENDRIN ALDEHYDE	89	U		52	U		4.0	U				
ENDRIN KETONE	89	U		52	U		4.0	U				
GAMMA-BHC (LINDANE)	45	U		26	U		2.0	U				
GAMMA-CHLORDANE	89	U		52	U		4.0	U				
HEPTACHLOR	45	U		26	U		2.0	U				
HEPTACHLOR EPOXIDE	45	U		26	U		2.0	U				
METHOXYCHLOR	180	UJ	C	100	UJ	C	7.9	UJ	C			
TOXAPHENE	4500	U		2600	U		200	U				

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4256

SAMPLE NUMBER:	CEF-P44-SS-009			CEF-P44-SS-010			CEF-P44-SS-011			CEF-P44-SS-012		
SAMPLE DATE:	06/03/99			06/03/99			06/04/99			06/04/99		
LABORATORY ID:	F4256-11			F4256-12			F4256-13			F4256-14		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	95.8 %			81.7 %			96.6 %			84.7 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
AROCLOR-1016	35	U		200	U		34	U		39	U	
AROCLOR-1221	35	U		200	U		34	U		39	U	
AROCLOR-1232	35	U		200	U		34	U		39	U	
AROCLOR-1242	35	U		200	U		34	U		39	U	
AROCLOR-1248	35	U		200	U		34	U		39	U	
AROCLOR-1254	35	U		200	U		34	U		39	U	
AROCLOR-1260	274			1290			34	U		39	U	

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4256

SAMPLE NUMBER:	CEF-P44-SS-013			CEF-P44-SS-014			CEF-P44-SS-015			CEF-P44-SS-017		
SAMPLE DATE:	06/04/99			06/04/99			06/04/99			06/04/99		
LABORATORY ID:	F4256-15			F4256-16			F4256-17			F4256-19		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	90.4 %			55.7 %			57.6 %			89.4 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
AROCLOR-1016	920	U		60	U		290	U		37	U	
AROCLOR-1221	920	U		60	U		290	U		37	U	
AROCLOR-1232	920	U		60	U		290	U		37	U	
AROCLOR-1242	920	U		60	U		290	U		37	U	
AROCLOR-1248	920	U		60	U		290	U		37	U	
AROCLOR-1254	920	U		60	U		290	U		37	U	
AROCLOR-1260	5020			60	U		1070			37	UJ	G

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4256

SAMPLE NUMBER:	CEF-P44-SS-DU01											
SAMPLE DATE:	06/04/99			/ /			/ /			/ /		
LABORATORY ID:	F4256-22											
QC_TYPE:	NORMAL											
% SOLIDS:	78.4 %			100.0 %			100.0 %			100.0 %		
UNITS:	UG/KG											
FIELD DUPLICATE OF:	CEF-P44-SS-017											
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
AROCLOR-1016	42	U										
AROCLOR-1221	42	U										
AROCLOR-1232	42	U										
AROCLOR-1242	42	U										
AROCLOR-1248	42	U										
AROCLOR-1254	42	U										
AROCLOR-1260	136	J	G									

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4256

SAMPLE NUMBER:	CEF-P44-SW-007	CEF-P44-SW-DU01	/ /	/ /
SAMPLE DATE:	06/04/99	06/04/99		
LABORATORY ID:	F4256-9	F4256-21		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:		CEF-P44-SW-007		

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	0.10	U		0.10	U							
4,4'-DDE	0.10	U		0.10	U							
4,4'-DDT	0.10	U		0.10	U							
ALDRIN	0.050	U		0.050	U							
ALPHA-BHC	0.050	U		0.050	U							
ALPHA-CHLORDANE	0.10	U		0.10	U							
AROCLOR-1016	0.50	U		0.50	U							
AROCLOR-1221	0.50	U		0.50	U							
AROCLOR-1232	0.50	U		0.50	U							
AROCLOR-1242	0.50	U		0.50	U							
AROCLOR-1248	0.50	U		0.50	U							
AROCLOR-1254	0.50	U		0.50	U							
AROCLOR-1260	0.50	U		0.50	U							
BETA-BHC	0.050	U		0.050	U							
DELTA-BHC	0.050	U		0.050	U							
DIELDRIN	0.050	U		0.050	U							
ENDOSULFAN I	0.050	U		0.050	U							
ENDOSULFAN II	0.10	U		0.10	U							
ENDOSULFAN SULFATE	0.10	U		0.10	U							
ENDRIN	0.10	U		0.10	U							
ENDRIN ALDEHYDE	0.10	U		0.10	U							
ENDRIN KETONE	0.10	U		0.10	U							
GAMMA-BHC (LINDANE)	0.050	U		0.050	U							
GAMMA-CHLORDANE	0.10	U		0.10	U							
HEPTACHLOR	0.050	U		0.050	U							
HEPTACHLOR EPOXIDE	0.050	U		0.050	U							
METHOXYCHLOR	0.20	U		0.20	U							
TOXAPHENE	2.5	U		2.5	U							

Report of Analysis

Client Sample ID:	CEF-P44-SD-001		
Lab Sample ID:	F4256-1	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 3550B/8081A	**Percent Solids:**	97.4
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	MN03903.D	1	06/15/99	SKW	06/11/99	OP842	GMN162
Run #2							

Pesticide TCL List

CAS No.	Compound	Result	RDL	Units	Q
309-00-2	Aldrin	ND	1.7	ug/kg	
319-84-6	alpha-BHC	ND	1.7	ug/kg	
319-85-7	beta-BHC	ND	1.7	ug/kg	
319-86-8	delta-BHC	ND	1.7	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	1.7	ug/kg	
5103-71-9	alpha-Chlordane	ND	3.4	ug/kg	
5103-74-2	gamma-Chlordane	ND	3.4	ug/kg	
60-57-1	Dieldrin	ND	1.7	ug/kg	
72-54-8	4,4'-DDD	ND	3.4	ug/kg	
72-55-9	4,4'-DDE	ND	3.4	ug/kg	
50-29-3	4,4'-DDT	ND	3.4	ug/kg	
72-20-8	Endrin	ND	3.4	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.4	ug/kg	
7421-93-4	Endrin aldehyde	ND	3.4	ug/kg	
53494-70-5	Endrin ketone	ND	3.4	ug/kg	
959-98-8	Endosulfan-I	ND	1.7	ug/kg	
33213-65-9	Endosulfan-II	ND	3.4	ug/kg	
76-44-8	Heptachlor	ND	1.7	ug/kg	
1024-57-3	Heptachlor epoxide	ND	1.7	ug/kg	
72-43-5	Methoxychlor	ND	6.8	ug/kg	
8001-35-2	Toxaphene	ND	170	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	82%		40-150%
2051-24-3	Decachlorobiphenyl	74%		30-160%

00276

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-001		
Lab Sample ID:	F4256-1	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 8082	**Percent Solids:**	97.4
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB09053.D	1	06/11/99	SKW	06/11/99	OP841	GAB343
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	34	ug/kg	
11104-28-2	Aroclor 1221	ND	34	ug/kg	
11141-16-5	Aroclor 1232	ND	34	ug/kg	
53469-21-9	Aroclor 1242	ND	34	ug/kg	
12672-29-6	Aroclor 1248	ND	34	ug/kg	
11097-69-1	Aroclor 1254	ND	34	ug/kg	
11096-82-5	Aroclor 1260	34.6	34	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	102%		40-150%
2051-24-3	Decachlorobiphenyl	100%		30-160%

(a) All hits confirmed by dual column analysis.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-002		
Lab Sample ID:	F4256-2	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 3550B/8081A	**Percent Solids:**	82.5
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	MN03908.D	4	06/15/99	SKW	06/11/99	OP842	GMN162
Run #2							

Pesticide TCL List

CAS No.	Compound	Result	RDL	Units	Q
309-00-2	Aldrin	ND	8.0	ug/kg	
319-84-6	alpha-BHC	ND	8.0	ug/kg	
319-85-7	beta-BHC	ND	8.0	ug/kg	
319-86-8	delta-BHC	ND	8.0	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	8.0	ug/kg	
5103-71-9	alpha-Chlordane	ND	16	ug/kg	
5103-74-2	gamma-Chlordane	ND	16	ug/kg	
60-57-1	Dieldrin	ND	8.0	ug/kg	
72-54-8	4,4'-DDD [b]	11.4	16	ug/kg	J
72-55-9	4,4'-DDE [b]	16.2	16	ug/kg	
50-29-3	4,4'-DDT	ND	16	ug/kg	
72-20-8	Endrin	ND	16	ug/kg	
1031-07-8	Endosulfan sulfate	ND	16	ug/kg	
7421-93-4	Endrin aldehyde	ND	16	ug/kg	
53494-70-5	Endrin ketone	ND	16	ug/kg	
959-98-8	Endosulfan-I	ND	8.0	ug/kg	
33213-65-9	Endosulfan-II	ND	16	ug/kg	
76-44-8	Heptachlor	ND	8.0	ug/kg	
1024-57-3	Heptachlor epoxide	ND	8.0	ug/kg	
72-43-5	Methoxychlor	ND	32	ug/kg	
8001-35-2	Toxaphene	ND	800	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	76%		40-150%
2051-24-3	Decachlorobiphenyl	72%		30-160%

(a) Dilution required due to matrix interference.
(b) All hits confirmed by dual column analysis.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-002		
Lab Sample ID:	F4256-2	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 8082	**Percent Solids:**	82.5
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB09082.D	4	06/12/99	SKW	06/11/99	OP841	GAB344
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	160	ug/kg	
11104-28-2	Aroclor 1221	ND	160	ug/kg	
11141-16-5	Aroclor 1232	ND	160	ug/kg	
53469-21-9	Aroclor 1242	ND	160	ug/kg	
12672-29-6	Aroclor 1248	ND	160	ug/kg	
11097-69-1	Aroclor 1254 [b]	225	160	ug/kg	J
11096-82-5	Aroclor 1260 [b]	99.3	160	ug/kg	J

GAP 7-9-99

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	83%		40-150%
2051-24-3	Decachlorobiphenyl	130%		30-160%

(a) All hits confirmed by dual column analysis.
(b) Estimated value due to the presence of multiple Arochlor patterns.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-003		
Lab Sample ID:	F4256-3	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 3550B/8081A	**Percent Solids:**	79.0
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	MN03926.D	4	06/16/99	SKW	06/11/99	OP842	GMN163
Run #2							

Pesticide TCL List

CAS No.	Compound	Result	RDL	Units	Q
309-00-2	Aldrin	ND	8.4	ug/kg	
319-84-6	alpha-BHC	ND	8.4	ug/kg	
319-85-7	beta-BHC	ND	8.4	ug/kg	
319-86-8	delta-BHC	ND	8.4	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	8.4	ug/kg	
5103-71-9	alpha-Chlordane	ND	17	ug/kg	
5103-74-2	gamma-Chlordane	ND	17	ug/kg	
60-57-1	Dieldrin	ND	8.4	ug/kg	
72-54-8	4,4'-DDD	ND	17	ug/kg	
72-55-9	4,4'-DDE	ND	17	ug/kg	
50-29-3	4,4'-DDT [b]	ND	34	ug/kg	
72-20-8	Endrin	ND	17	ug/kg	
1031-07-8	Endosulfan sulfate	ND	17	ug/kg	
7421-93-4	Endrin aldehyde	ND	17	ug/kg	
53494-70-5	Endrin ketone	ND	17	ug/kg	
959-98-8	Endosulfan-I	ND	8.4	ug/kg	
33213-65-9	Endosulfan-II	ND	17	ug/kg	
76-44-8	Heptachlor	ND	8.4	ug/kg	
1024-57-3	Heptachlor epoxide	ND	8.4	ug/kg	
72-43-5	Methoxychlor	ND	34	ug/kg	
8001-35-2	Toxaphene	ND	840	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	100%		40-150%
2051-24-3	Decachlorobiphenyl	54%		30-160%

(a) Dilution required due to matrix interference.
(b) Elevated detection limits due to matrix interference.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-003		
Lab Sample ID:	F4256-3	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 8082	**Percent Solids:**	79.0
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB09055.D	1	06/11/99	SKW	06/11/99	OP841	GAB343
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	42	ug/kg	
11104-28-2	Aroclor 1221	ND	42	ug/kg	
11141-16-5	Aroclor 1232	ND	42	ug/kg	
53469-21-9	Aroclor 1242	ND	42	ug/kg	
12672-29-6	Aroclor 1248	ND	42	ug/kg	
11097-69-1	Aroclor 1254	ND	42	ug/kg	
11096-82-5	Aroclor 1260	412	42	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	101%		40-150%
2051-24-3	Decachlorobiphenyl	93%		30-160%

(a) All hits confirmed by dual column analysis.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-004		
Lab Sample ID:	F4256-4	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 3550B/8081A	**Percent Solids:**	77.1
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	MN03910.D	1	06/15/99	SKW	06/11/99	OP842	GMN162
Run #2							

Pesticide TCL List

CAS No.	Compound	Result	RDL	Units	Q
309-00-2	Aldrin	ND	2.2	ug/kg	
319-84-6	alpha-BHC	ND	2.2	ug/kg	
319-85-7	beta-BHC	ND	2.2	ug/kg	
319-86-8	delta-BHC	ND	2.2	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	2.2	ug/kg	
5103-71-9	alpha-Chlordane	ND	4.3	ug/kg	
5103-74-2	gamma-Chlordane	ND	4.3	ug/kg	
60-57-1	Dieldrin	ND	2.2	ug/kg	
72-54-8	4,4'-DDD	ND	4.3	ug/kg	
72-55-9	4,4'-DDE	ND	4.3	ug/kg	
50-29-3	4,4'-DDT	ND	4.3	ug/kg	
72-20-8	Endrin	ND	4.3	ug/kg	
1031-07-8	Endosulfan sulfate	ND	4.3	ug/kg	
7421-93-4	Endrin aldehyde	ND	4.3	ug/kg	
53494-70-5	Endrin ketone	ND	4.3	ug/kg	
959-98-8	Endosulfan-I	ND	2.2	ug/kg	
33213-65-9	Endosulfan-II	ND	4.3	ug/kg	
76-44-8	Heptachlor	ND	2.2	ug/kg	
1024-57-3	Heptachlor epoxide	ND	2.2	ug/kg	
72-43-5	Methoxychlor	ND	8.6	ug/kg	
8001-35-2	Toxaphene	ND	220	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	82%		40-150%
2051-24-3	Decachlorobiphenyl	72%		30-160%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-004		
Lab Sample ID:	F4256-4	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 8082	**Percent Solids:**	77.1
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB09056.D	1	06/11/99	SKW	06/11/99	OP841	GAB343
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	43	ug/kg	
11104-28-2	Aroclor 1221	ND	43	ug/kg	
11141-16-5	Aroclor 1232	ND	43	ug/kg	
53469-21-9	Aroclor 1242	ND	43	ug/kg	
12672-29-6	Aroclor 1248	ND	43	ug/kg	
11097-69-1	Aroclor 1254	ND	43	ug/kg	
11096-82-5	Aroclor 1260	ND	43	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	98%		40-150%
2051-24-3	Decachlorobiphenyl	89%		30-160%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-006		
Lab Sample ID:	F4256-6	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 3550B/8081A	**Percent Solids:**	74.7
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	MN03911.D	20	06/15/99	SKW	06/11/99	OP842	GMN162
Run #2 [a]	MN03927.D	40	06/16/99	SKW	06/11/99	OP842	GMN163

Pesticide TCL List

CAS No.	Compound	Result	RDL	Units	Q
309-00-2	Aldrin	ND	45	ug/kg	
319-84-6	alpha-BHC	ND	45	ug/kg	
319-85-7	beta-BHC	ND	45	ug/kg	
319-86-8	delta-BHC	ND	45	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	45	ug/kg	
5103-71-9	alpha-Chlordane	ND	89	ug/kg	
5103-74-2	gamma-Chlordane	ND	89	ug/kg	
60-57-1	Dieldrin	ND	45	ug/kg	
72-54-8	4,4'-DDD	ND	89	ug/kg	
72-55-9	4,4'-DDE	ND	89	ug/kg	
50-29-3	4,4'-DDT [b]	ND [c]	360	ug/kg	
72-20-8	Endrin	ND	89	ug/kg	
1031-07-8	Endosulfan sulfate	ND	89	ug/kg	
7421-93-4	Endrin aldehyde	ND	89	ug/kg	
53494-70-5	Endrin ketone	ND	89	ug/kg	
959-98-8	Endosulfan-I	ND	45	ug/kg	
33213-65-9	Endosulfan-II	ND	89	ug/kg	
76-44-8	Heptachlor	ND	45	ug/kg	
1024-57-3	Heptachlor epoxide	ND	45	ug/kg	
72-43-5	Methoxychlor	ND	180	ug/kg	
8001-35-2	Toxaphene	ND	4500	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	86%	113%	40-150%
2051-24-3	Decachlorobiphenyl	120%	112%	30-160%

(a) Dilution required due to matrix interference.
(b) Elevated detection limits due to matrix interference.
(c) Result is from Run# 2

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-006		
Lab Sample ID:	F4256-6	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 8082	**Percent Solids:**	74.7
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB09083.D	10	06/12/99	SKW	06/11/99	OP841	GAB344
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	450	ug/kg	
11104-28-2	Aroclor 1221	ND	450	ug/kg	
11141-16-5	Aroclor 1232	ND	450	ug/kg	
53469-21-9	Aroclor 1242	ND	450	ug/kg	
12672-29-6	Aroclor 1248	ND	450	ug/kg	
11097-69-1	Aroclor 1254	ND	450	ug/kg	
11096-82-5	Aroclor 1260	2910	450	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	79%		40-150%
2051-24-3	Decachlorobiphenyl	137%		30-160%

(a) All hits confirmed by dual column analysis.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-007		
Lab Sample ID:	F4256-7	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 3550B/8081A	**Percent Solids:**	64.0
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	MN03912.D	10	06/15/99	SKW	06/11/99	OP842	GMN162
Run #2 [a]	MN03928.D	10	06/16/99	SKW	06/11/99	OP842	GMN163

Pesticide TCL List

CAS No.	Compound	Result	RDL	Units	Q
309-00-2	Aldrin	ND	26	ug/kg	
319-84-6	alpha-BHC	ND	26	ug/kg	
319-85-7	beta-BHC	ND	26	ug/kg	
319-86-8	delta-BHC	ND	26	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	26	ug/kg	
5103-71-9	alpha-Chlordane	ND	52	ug/kg	
5103-74-2	gamma-Chlordane	ND	52	ug/kg	
60-57-1	Dieldrin	ND	26	ug/kg	
72-54-8	4,4'-DDD	ND	52	ug/kg	
72-55-9	4,4'-DDE	ND	52	ug/kg	
50-29-3	4,4'-DDT [b]	ND [c]	100	ug/kg	
72-20-8	Endrin	ND	52	ug/kg	
1031-07-8	Endosulfan sulfate	ND	52	ug/kg	
7421-93-4	Endrin aldehyde	ND	52	ug/kg	
53494-70-5	Endrin ketone	ND	52	ug/kg	
959-98-8	Endosulfan-I	ND	26	ug/kg	
33213-65-9	Endosulfan-II	ND	52	ug/kg	
76-44-8	Heptachlor	ND	26	ug/kg	
1024-57-3	Heptachlor epoxide	ND	26	ug/kg	
72-43-5	Methoxychlor	ND	100	ug/kg	
8001-35-2	Toxaphene	ND	2600	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	98%	109%	40-150%
2051-24-3	Decachlorobiphenyl	108%	67%	30-160%

(a) Dilution required due to matrix interference.
(b) Elevated detection limits due to matrix interference.
(c) Result is from Run# 2

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-007		
Lab Sample ID:	F4256-7	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 8082	**Percent Solids:**	64.0
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB09084.D	5	06/12/99	SKW	06/11/99	OP841	GAB344
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	260	ug/kg	
11104-28-2	Aroclor 1221	ND	260	ug/kg	
11141-16-5	Aroclor 1232	ND	260	ug/kg	
53469-21-9	Aroclor 1242	ND	260	ug/kg	
12672-29-6	Aroclor 1248	ND	260	ug/kg	
11097-69-1	Aroclor 1254	ND	260	ug/kg	
11096-82-5	Aroclor 1260	1100	260	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	98%		40-150%
2051-24-3	Decachlorobiphenyl	150%		30-160%

(a) All hits confirmed by dual column analysis.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-DU01		
Lab Sample ID:	F4256-20	**Date Sampled:**	06/04/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 3550B/8081A	**Percent Solids:**	83.8
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	MN03913.D	1	06/15/99	SKW	06/11/99	OP842	GMN162
Run #2							

Pesticide TCL List

CAS No.	Compound	Result	RDL	Units	Q
309-00-2	Aldrin	ND	2.0	ug/kg	
319-84-6	alpha-BHC	ND	2.0	ug/kg	
319-85-7	beta-BHC	ND	2.0	ug/kg	
319-86-8	delta-BHC	ND	2.0	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	2.0	ug/kg	
5103-71-9	alpha-Chlordane	ND	4.0	ug/kg	
5103-74-2	gamma-Chlordane	ND	4.0	ug/kg	
60-57-1	Dieldrin	ND	2.0	ug/kg	
72-54-8	4,4'-DDD	ND	4.0	ug/kg	
72-55-9	4,4'-DDE	2.8	4.0	ug/kg	J
50-29-3	4,4'-DDT	ND	4.0	ug/kg	
72-20-8	Endrin	ND	4.0	ug/kg	
1031-07-8	Endosulfan sulfate	ND	4.0	ug/kg	
7421-93-4	Endrin aldehyde	ND	4.0	ug/kg	
53494-70-5	Endrin ketone	ND	4.0	ug/kg	
959-98-8	Endosulfan-I	ND	2.0	ug/kg	
33213-65-9	Endosulfan-II	ND	4.0	ug/kg	
76-44-8	Heptachlor	ND	2.0	ug/kg	
1024-57-3	Heptachlor epoxide	ND	2.0	ug/kg	
72-43-5	Methoxychlor	ND	7.9	ug/kg	
8001-35-2	Toxaphene	ND	200	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	77%		40-150%
2051-24-3	Decachlorobiphenyl	61%		30-160%

(a) All hits confirmed by dual column analysis.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-DU01		
Lab Sample ID:	F4256-20	**Date Sampled:**	06/04/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 8082	**Percent Solids:**	83.8
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB09070.D	1	06/11/99	SKW	06/11/99	OP841	GAB343
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	40	ug/kg	
11104-28-2	Aroclor 1221	ND	40	ug/kg	
11141-16-5	Aroclor 1232	ND	40	ug/kg	
53469-21-9	Aroclor 1242	ND	40	ug/kg	
12672-29-6	Aroclor 1248	ND	40	ug/kg	
11097-69-1	Aroclor 1254	ND	40	ug/kg	
11096-82-5	Aroclor 1260	ND	40	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	101%		40-150%
2051-24-3	Decachlorobiphenyl	58%		30-160%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SS-008		
Lab Sample ID:	F4256-10	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 8082	**Percent Solids:**	91.8
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB09059.D	1	06/11/99	SKW	06/11/99	OP841	GAB343
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	36	ug/kg	
11104-28-2	Aroclor 1221	ND	36	ug/kg	
11141-16-5	Aroclor 1232	ND	36	ug/kg	
53469-21-9	Aroclor 1242	ND	36	ug/kg	
12672-29-6	Aroclor 1248	ND	36	ug/kg	
11097-69-1	Aroclor 1254	ND	36	ug/kg	
11096-82-5	Aroclor 1260	ND	36	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	105%		40-150%
2051-24-3	Decachlorobiphenyl	104%		30-160%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SS-009		
Lab Sample ID:	F4256-11	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 8082	**Percent Solids:**	95.8
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB09060.D	1	06/11/99	SKW	06/11/99	OP841	GAB343
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	35	ug/kg	
11104-28-2	Aroclor 1221	ND	35	ug/kg	
11141-16-5	Aroclor 1232	ND	35	ug/kg	
53469-21-9	Aroclor 1242	ND	35	ug/kg	
12672-29-6	Aroclor 1248	ND	35	ug/kg	
11097-69-1	Aroclor 1254	ND	35	ug/kg	
11096-82-5	Aroclor 1260 [b]	274	35	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	84%		40-150%
2051-24-3	Decachlorobiphenyl	88%		30-160%

(a) All hits confirmed by dual column analysis.
(b) PCB pattern appears to be weathered.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SS-010		
Lab Sample ID:	F4256-12	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 8082	**Percent Solids:**	81.7
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB09085.D	5	06/12/99	SKW	06/11/99	OP841	GAB344
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	200	ug/kg	
11104-28-2	Aroclor 1221	ND	200	ug/kg	
11141-16-5	Aroclor 1232	ND	200	ug/kg	
53469-21-9	Aroclor 1242	ND	200	ug/kg	
12672-29-6	Aroclor 1248	ND	200	ug/kg	
11097-69-1	Aroclor 1254	ND	200	ug/kg	
11096-82-5	Aroclor 1260	1290	200	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	87%		40-150%
2051-24-3	Decachlorobiphenyl	160%		30-160%

(a) All hits confirmed by dual column analysis.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SS-011		
Lab Sample ID:	F4256-13	**Date Sampled:**	06/04/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 8082	**Percent Solids:**	96.6
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB09064.D	1	06/11/99	SKW	06/11/99	OP841	GAB343
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	34	ug/kg	
11104-28-2	Aroclor 1221	ND	34	ug/kg	
11141-16-5	Aroclor 1232	ND	34	ug/kg	
53469-21-9	Aroclor 1242	ND	34	ug/kg	
12672-29-6	Aroclor 1248	ND	34	ug/kg	
11097-69-1	Aroclor 1254	ND	34	ug/kg	
11096-82-5	Aroclor 1260	ND	34	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	102%		40-150%
2051-24-3	Decachlorobiphenyl	94%		30-160%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SS-012		
Lab Sample ID:	F4256-14	**Date Sampled:**	06/04/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 8082	**Percent Solids:**	84.7
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB09065.D	1	06/11/99	SKW	06/11/99	OP841	GAB343
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	39	ug/kg	
11104-28-2	Aroclor 1221	ND	39	ug/kg	
11141-16-5	Aroclor 1232	ND	39	ug/kg	
53469-21-9	Aroclor 1242	ND	39	ug/kg	
12672-29-6	Aroclor 1248	ND	39	ug/kg	
11097-69-1	Aroclor 1254	ND	39	ug/kg	
11096-82-5	Aroclor 1260	ND	39	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	99%		40-150%
2051-24-3	Decachlorobiphenyl	102%		30-160%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SS-013		
Lab Sample ID:	F4256-15	**Date Sampled:**	06/04/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 8082	**Percent Solids:**	90.4
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB09086.D	25	06/12/99	SKW	06/11/99	OP841	GAB344
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	920	ug/kg	
11104-28-2	Aroclor 1221	ND	920	ug/kg	
11141-16-5	Aroclor 1232	ND	920	ug/kg	
53469-21-9	Aroclor 1242	ND	920	ug/kg	
12672-29-6	Aroclor 1248	ND	920	ug/kg	
11097-69-1	Aroclor 1254	ND	920	ug/kg	
11096-82-5	Aroclor 1260	5020	920	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	59%		40-150%
2051-24-3	Decachlorobiphenyl	475% [b]		30-160%

(a) All hits confirmed by dual column analysis.
(b) Outside control limits due to matrix interference.

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ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SS-014		
Lab Sample ID:	F4256-16	**Date Sampled:**	06/04/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 8082	**Percent Solids:**	55.7
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB09067.D	1	06/11/99	SKW	06/11/99	OP841	GAB343
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	60	ug/kg	
11104-28-2	Aroclor 1221	ND	60	ug/kg	
11141-16-5	Aroclor 1232	ND	60	ug/kg	
53469-21-9	Aroclor 1242	ND	60	ug/kg	
12672-29-6	Aroclor 1248	ND	60	ug/kg	
11097-69-1	Aroclor 1254	ND	60	ug/kg	
11096-82-5	Aroclor 1260	ND	60	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	93%		40-150%
2051-24-3	Decachlorobiphenyl	74%		30-160%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SS-015		
Lab Sample ID:	F4256-17	**Date Sampled:**	06/04/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 8082	**Percent Solids:**	57.6
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB09087.D	5	06/12/99	SKW	06/11/99	OP841	GAB344
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	290	ug/kg	
11104-28-2	Aroclor 1221	ND	290	ug/kg	
11141-16-5	Aroclor 1232	ND	290	ug/kg	
53469-21-9	Aroclor 1242	ND	290	ug/kg	
12672-29-6	Aroclor 1248	ND	290	ug/kg	
11097-69-1	Aroclor 1254	ND	290	ug/kg	
11096-82-5	Aroclor 1260	1070	290	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	77%		40-150%
2051-24-3	Decachlorobiphenyl	97%		30-160%

(a) All hits confirmed by dual column analysis.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SS-017		
Lab Sample ID:	F4256-19	**Date Sampled:**	06/04/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 8082	**Percent Solids:**	89.4
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB09069.D	1	06/11/99	SKW	06/11/99	OP841	GAB343
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	37	ug/kg	
11104-28-2	Aroclor 1221	ND	37	ug/kg	
11141-16-5	Aroclor 1232	ND	37	ug/kg	
53469-21-9	Aroclor 1242	ND	37	ug/kg	
12672-29-6	Aroclor 1248	ND	37	ug/kg	
11097-69-1	Aroclor 1254	ND	37	ug/kg	
11096-82-5	Aroclor 1260	ND	37	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	92%		40-150%
2051-24-3	Decachlorobiphenyl	51%		30-160%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SS-DU01		
Lab Sample ID:	F4256-22	**Date Sampled:**	06/04/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	SW846 8082	**Percent Solids:**	78.4
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB09071.D	1	06/11/99	SKW	06/11/99	OP841	GAB343
Run #2.							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	42	ug/kg	
11104-28-2	Aroclor 1221	ND	42	ug/kg	
11141-16-5	Aroclor 1232	ND	42	ug/kg	
53469-21-9	Aroclor 1242	ND	42	ug/kg	
12672-29-6	Aroclor 1248	ND	42	ug/kg	
11097-69-1	Aroclor 1254	ND	42	ug/kg	
11096-82-5	Aroclor 1260	136	42	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	88%		40-150%
2051-24-3	Decachlorobiphenyl	46%		30-160%

(a) All hits confirmed by dual column analysis.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SW-007		
Lab Sample ID:	F4256-9	**Date Sampled:**	06/04/99
Matrix:	AQ - Ground Water	**Date Received:**	06/05/99
Method:	SW846 3510C/8081A	**Percent Solids:**	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	MN03803.D	1	06/08/99	SKW	06/08/99	OP833	GMN159
Run #2							

Pesticide TCL List

CAS No.	Compound	Result	RDL	Units	Q
309-00-2	Aldrin	ND	0.050	ug/l	
319-84-6	alpha-BHC	ND	0.050	ug/l	
319-85-7	beta-BHC	ND	0.050	ug/l	
319-86-8	delta-BHC	ND	0.050	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.050	ug/l	
5103-71-9	alpha-Chlordane	ND	0.10	ug/l	
5103-74-2	gamma-Chlordane	ND	0.10	ug/l	
60-57-1	Dieldrin	ND	0.050	ug/l	
72-54-8	4,4'-DDD	ND	0.10	ug/l	
72-55-9	4,4'-DDE	ND	0.10	ug/l	
50-29-3	4,4'-DDT	ND	0.10	ug/l	
72-20-8	Endrin	ND	0.10	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.10	ug/l	
7421-93-4	Endrin aldehyde	ND	0.10	ug/l	
53494-70-5	Endrin ketone	ND	0.10	ug/l	
959-98-8	Endosulfan-I	ND	0.050	ug/l	
33213-65-9	Endosulfan-II	ND	0.10	ug/l	
76-44-8	Heptachlor	ND	0.050	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.050	ug/l	
72-43-5	Methoxychlor	ND	0.20	ug/l	
8001-35-2	Toxaphene	ND	2.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	86%		30-160%
2051-24-3	Decachlorobiphenyl	90%		30-160%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SW-007		
Lab Sample ID:	F4256-9	**Date Sampled:**	06/04/99
Matrix:	AQ - Ground Water	**Date Received:**	06/05/99
Method:	SW846 8082	**Percent Solids:**	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB08962.D	1	06/08/99	SKW	06/08/99	OP832	GAB340
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	0.50	ug/l	
11104-28-2	Aroclor 1221	ND	0.50	ug/l	
11141-16-5	Aroclor 1232	ND	0.50	ug/l	
53469-21-9	Aroclor 1242	ND	0.50	ug/l	
12672-29-6	Aroclor 1248	ND	0.50	ug/l	
11097-69-1	Aroclor 1254	ND	0.50	ug/l	
11096-82-5	Aroclor 1260	ND	0.50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	125%		30-160%
2051-24-3	Decachlorobiphenyl	113%		30-160%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SW-DU01		
Lab Sample ID:	F4256-21	**Date Sampled:**	06/04/99
Matrix:	AQ - Ground Water	**Date Received:**	06/05/99
Method:	SW846 3510C/8081A	**Percent Solids:**	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	MN03804.D	1	06/08/99	SKW	06/08/99	OP833	GMN159
Run #2							

Pesticide TCL List

CAS No.	Compound	Result	RDL	Units	Q
309-00-2	Aldrin	ND	0.050	ug/l	
319-84-6	alpha-BHC	ND	0.050	ug/l	
319-85-7	beta-BHC	ND	0.050	ug/l	
319-86-8	delta-BHC	ND	0.050	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.050	ug/l	
5103-71-9	alpha-Chlordane	ND	0.10	ug/l	
5103-74-2	gamma-Chlordane	ND	0.10	ug/l	
60-57-1	Dieldrin	ND	0.050	ug/l	
72-54-8	4,4'-DDD	ND	0.10	ug/l	
72-55-9	4,4'-DDE	ND	0.10	ug/l	
50-29-3	4,4'-DDT	ND	0.10	ug/l	
72-20-8	Endrin	ND	0.10	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.10	ug/l	
7421-93-4	Endrin aldehyde	ND	0.10	ug/l	
53494-70-5	Endrin ketone	ND	0.10	ug/l	
959-98-8	Endosulfan-I	ND	0.050	ug/l	
33213-65-9	Endosulfan-II	ND	0.10	ug/l	
76-44-8	Heptachlor	ND	0.050	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.050	ug/l	
72-43-5	Methoxychlor	ND	0.20	ug/l	
8001-35-2	Toxaphene	ND	2.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	83%		30-160%
2051-24-3	Decachlorobiphenyl	83%		30-160%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SW-DU01		
Lab Sample ID:	F4256-21	**Date Sampled:**	06/04/99
Matrix:	AQ - Ground Water	**Date Received:**	06/05/99
Method:	SW846 8082	**Percent Solids:**	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB08965.D	1	06/08/99	SKW	06/08/99	OP832	GAB340
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	0.50	ug/l	
11104-28-2	Aroclor 1221	ND	0.50	ug/l	
11141-16-5	Aroclor 1232	ND	0.50	ug/l	
53469-21-9	Aroclor 1242	ND	0.50	ug/l	
12672-29-6	Aroclor 1248	ND	0.50	ug/l	
11097-69-1	Aroclor 1254	ND	0.50	ug/l	
11096-82-5	Aroclor 1260	ND	0.50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	115%		30-160%
2051-24-3	Decachlorobiphenyl	102%		30-160%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4256

SAMPLE NUMBER:	CEF-P44-SD-003			CEF-P44-SD-004			CEF-P44-SD-005			CEF-P44-SD-006		
SAMPLE DATE:	06/03/99			06/03/99			06/03/99			06/03/99		
LABORATORY ID:	F4256-3			F4256-4			F4256-5			F4256-6		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	79.0 %			77.1 %			69.8 %			74.7 %		
UNITS:	MG/KG			MG/KG			MG/KG			MG/KG		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PETROLEUM HYDROCARBONS												
TPH (C8-C40)	100	U		110	U		802			237		

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4256

SAMPLE NUMBER:	CEF-P44-SD-007			/ /			/ /			/ /		
SAMPLE DATE:	06/03/99											
LABORATORY ID:	F4256-7											
QC_TYPE:	NORMAL											
% SOLIDS:	64.0 %			100.0 %			100.0 %			100.0 %		
UNITS:	MG/KG											
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PETROLEUM HYDROCARBONS												
TPH (C8-C40)	126	J	P									

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4256

SAMPLE NUMBER:	CEF-P44-SW-005			CEF-P44-SW-007			CEF-P44-SW-DU01			/ /		
SAMPLE DATE:	06/03/99			06/04/99			06/04/99					
LABORATORY ID:	F4256-8			F4256-9			F4256-21					
QC_TYPE:	NORMAL			NORMAL			NORMAL					
% SOLIDS:	0.0 %			0.0 %			0.0 %			100.0 %		
UNITS:	MG/L			MG/L			MG/L					
FIELD DUPLICATE OF:							CEF-P44-SW-007					
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PETROLEUM HYDROCARBONS												
TPH (C8-C40)	0.5	U		0.5	U		0.5	U				

Report of Analysis

Client Sample ID:	CEF-P44-SD-003		
Lab Sample ID:	F4256-3	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	FLORIDA-PRO	**Percent Solids:**	79.0
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP04191.D	1	06/15/99	SKW	06/15/99	OP829	GOP203
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
	TPH (C8-C40)	ND	100	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	100%		40-140%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-004		
Lab Sample ID:	F4256-4	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	FLORIDA-PRO	**Percent Solids:**	77.1
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP04192.D	1	06/15/99	SKW	06/15/99	OP829	GOP203
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
	TPH (C8-C40)	ND	110	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	105%		40-140%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-005		
Lab Sample ID:	F4256-5	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	FLORIDA-PRO	**Percent Solids:**	69.8
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP04202.D	2	06/16/99	SKW	06/15/99	OP829	GOP204
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
	TPH (C8-C40)	802	240	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	91%		40-140%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SD-006		
Lab Sample ID:	F4256-6	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	FLORIDA-PRO	**Percent Solids:**	74.7
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP04194.D	1	06/15/99	SKW	06/15/99	OP829	GOP203
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
	TPH (C8-C40)	237	110	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	84%		40-140%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

-96 7204

Report of Analysis

Client Sample ID:	CEF-P44-SD-007		
Lab Sample ID:	F4256-7	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
Method:	FLORIDA-PRO	**Percent Solids:**	64.0
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP04195.D	1	06/15/99	SKW	06/15/99	OP829	GOP203
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
	TPH (C8-C40)	126	130	mg/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	81%		40-140%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SW-005		
Lab Sample ID:	F4256-8	**Date Sampled:**	06/03/99
Matrix:	AQ - Ground Water	**Date Received:**	06/05/99
Method:	FLORIDA-PRO	**Percent Solids:**	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP04153.D	1	06/11/99	SKW	06/10/99	OP838	GOP200
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
	TPH (C8-C40)	ND	0.50	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	91%		40-140%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SW-007		
Lab Sample ID:	F4256-9	**Date Sampled:**	06/04/99
Matrix:	AQ - Ground Water	**Date Received:**	06/05/99
Method:	FLORIDA-PRO	**Percent Solids:**	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP04154.D	1	06/11/99	SKW	06/10/99	OP838	GOP200
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
	TPH (C8-C40)	ND	0.50	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	108%		40-140%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P44-SW-DU01		
Lab Sample ID:	F4256-21	**Date Sampled:**	06/04/99
Matrix:	AQ - Ground Water	**Date Received:**	06/05/99
Method:	FLORIDA-PRO	**Percent Solids:**	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP04157.D	1	06/11/99	SKW	06/10/99	OP838	GOP200
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
	TPH (C8-C40)	ND	0.50	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	103%		40-140%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-07-9-118

TO:	**M. SPERANZA**	**DATE:**	**JULY 20, 1999**
FROM:	**JENNIFER MALLE**	**COPIES:**	**DV FILE**

SUBJECT: **INORGANIC DATA VALIDATION TAL METALS**
CTO 078 – CECIL FIELD, FLORIDA
SDG – F4256

SAMPLES: 7/SOIL/

CEF-P44-SD-001 CEF-P44-SD-002 CEF-P44-SD-003
CEF-P44-SD-004 CEF-P44-SD-006 CEF-P44-SD-007
CEF-P44-SD-DU01

2/AQUEOUS

CEF-P44-SW-007 CEF-P44-SW-DU01

Overview

The sample set for CTO 078, Cecil Field, SDG F4256, consists of seven (7) soil environmental samples and two (2) aqueous environmental samples. Two (2) field duplicate pairs (CEF-P44-SD-003 / CEF-P44-SD-DU01 and CEF-P44-SW-007 / CEF-P44-SW-DU01) were included within this SDG.

All samples were analyzed for Target Analyte List (TAL metals). The samples were collected by Tetra Tech NUS on June 3-4, 1999 and analyzed by Accutest Laboratory. TAL analysis was conducted using SW846 method 6010B.

The data was evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
• Calibration Verifications
• Laboratory Blank Analyses
• Field Duplicate Results
• Detection Limits

* - All quality control criteria were met for this parameter.

The following contaminants were detected in the laboratory method/preparation blanks at the following maximum concentrations:

Analyte	Maximum Concentration	Action Level (soil)	Action Level (aqueous)
Aluminum	55 ug/L	27.5 mg/kg	275 ug/L
Antimony	5.2 ug/L	2.6 mg/kg	26 ug/L
Barium	0.60 ug/L	0.3 mg/kg	3.0 ug/L
Beryllium	2.7 ug/L	1.35 mg/kg	13.5 ug/L
Cadmium	0.77 ug/L	0.385 mg/kg	3.85 ug/L
Calcium	40 ug/L	20 mg/kg	200 ug/L
Chromium	1.7 ug/L	0.85 mg/kg	NA
Chromium (1)	6.1 ug/L	NA	30.5 ug/L
Copper	0.90 ug/L	0.45 mg/kg	4.5 ug/L
Iron (1)	37.2 ug/L	NA	186 ug/L
Lead	2.3 ug/L	1.15 mg/kg	11.5 ug/L
Magnesium	35.2 ug/L	17.6 mg/kg	176 ug/L
Manganese	0.80 ug/L	0.4 mg/kg	NA
Manganese (1)	1.6 ug/L	NA	8.0 ug/L
Nickel	1.3 ug/L	0.65 mg/kg	NA
Nickel (1)	6.6 ug/L	NA	33 ug/L
Potassium	119 ug/L	59.5 mg/kg	595 ug/L
Silver	1.3 ug/L	0.65 mg/kg	6.5 ug/L
Thallium	14.6 ug/L	7.3 mg/kg	73 ug/L
Vanadium	0.79 ug/L	0.395 mg/kg	3.95 ug/L
Zinc	1.2 mg/kg	0.6 mg/kg	6 ug/L

(1) Indicates maximum concentration was present in an aqueous preparation blank

Samples affected: All

An action level of 5x the maximum concentration has been used to evaluate the sample data for blank contamination. Sample aliquot, percent solids and dilution factors were taken into consideration when evaluating for blank contamination. Positive results less than the action levels for Aluminum, Antimony, Beryllium, Cadmium, Chromium, Copper, Lead, Nickel, Potassium, Silver, Thallium and Vanadium have been qualified as nondetects, "U". No validation action was taken for the remaining analytes as either the results were nondetected or greater than the blank action level.

Field Duplicate Results

Field duplicate imprecision (>35%) was noted for Iron affecting the aqueous matrix. The positive results reported for Iron in the affected samples were qualified as estimated, "J".

Field duplicate imprecision (>50%) was noted for Aluminum, Calcium, Copper, Iron, and Zinc affecting the soil matrix. The positive results for Aluminum, Calcium, Copper, Iron and Zinc in the affected samples were qualified as estimated, "J".

Notes

The Contract Required Detection Limit (CRDL) Percent Recoveries (% R) for Berylium and Thallium were > 120% quality control limit. However, no validation action was required.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Review", February 1994 and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide " (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Tetra Tech NUS
Jennifer Malle
Environmental Scientist

Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:
1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCB D% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = % Solid content is less than 30%

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4256

SAMPLE NUMBER:	CEF-P44-SD-001			CEF-P44-SD-002			CEF-P44-SD-003			CEF-P44-SD-004		
SAMPLE DATE:	06/03/99			06/03/99			06/03/99			06/03/99		
LABORATORY ID:	F4256-1			F4256-2			F4256-3			F4256-4		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	97.4 %			82.5 %			79.0 %			77.1 %		
UNITS:	MG/KG			MG/KG			MG/KG			MG/KG		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	2220	J	G	936	J	G	7060	J	G	8250	J	G
ANTIMONY	0.25	U	A	0.49	U	A	0.30	U	A	0.31	U	A
ARSENIC	0.35	U		0.42	U		0.44	U		0.45	U	
BARIUM	3.2			4.3			6.9			6.4		
BERYLLIUM	0.18	U	A	0.24	U	A	0.28	U	A	0.28	U	A
CADMIUM	0.18	U	A	0.12	U	A	0.41	U	A	0.06	U	A
CALCIUM	6680	J	G	309	J	G	6790	J	G	252	J	G
CHROMIUM	3.0			2.0			6.1			7.2		
COBALT	0.11			0.19			0.56			0.45		
COPPER	1.3	J	G	18.5	J	G	3.0	J	G	3.3	J	G
IRON	421	J	G	261	J	G	938	J	G	535	J	G
LEAD	7.5			23.4			13.1			9.7		
MAGNESIUM	123			87.1			162			151		
MANGANESE	2.9			2.5			3.2			2.5		
MERCURY	0.04	U		0.05	U		0.05	U		0.05	U	
NICKEL	0.87			0.84			2.6			1.5		
POTASSIUM	34.6	U	A	35.1	U	A	49.5	U	A	128		
SELENIUM	0.21	U		0.25	U		0.26	U		0.26	U	
SILVER	0.10	U	A	0.18	U	A	0.12	U	A	0.12	U	A
SODIUM	23.9			43.7			20.9			33.8		
THALLIUM	0.28	U	A	0.33	U	A	0.34	U	A	0.35	U	A
VANADIUM	1.9			5.0			4.8			3.7		
ZINC	8.7	J	G	14.5	J	G	30.8	J	G	5.0	J	G

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4256

SAMPLE NUMBER:	CEF-P44-SD-006			CEF-P44-SD-007			CEF-P44-SD-DU01			/ /		
SAMPLE DATE:	06/03/99			06/03/99			06/04/99					
LABORATORY ID:	F4256-6			F4256-7			F4256-20					
QC_TYPE:	NORMAL			NORMAL			NORMAL					
% SOLIDS:	74.7 %			64.0 %			83.8 %			100.0 %		
UNITS:	MG/KG			MG/KG			MG/KG					
FIELD DUPLICATE OF:							CEF-P44-SD-003					
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	1340	J	G	1920	J	G	1970	J	G			
ANTIMONY	0.32	U	A	0.46	U	A	0.29	U	A			
ARSENIC	0.46	U		0.54	U		0.41	U				
BARIUM	2.7			12.0			10.9					
BERYLLIUM	0.30	U	A	0.36	U	A	0.29	U	A			
CADMIUM	0.37	U	A	1.2			0.19	U	A			
CALCIUM	249	J	G	666	J	G	2010	J	G			
CHROMIUM	18.0			6.0			3.4					
COBALT	0.35			0.27			0.19					
COPPER	4.3	J	G	13.5	J	G	16.3	J	G			
IRON	235	J	G	477	J	G	474	J	G			
LEAD	9.7			18.2			10.1					
MAGNESIUM	70.3			128			92.0					
MANGANESE	3.3			3.4			5.6					
MERCURY	0.06	U		0.07			0.05	U				
NICKEL	10.3			1.8			1.1					
POTASSIUM	36.4	U	A	45.1	U	A	38.7	U	A			
SELENIUM	0.27	U		0.32	U		0.24	U				
SILVER	0.13	U	A	1.7			0.11	U	A			
SODIUM	20.5	U		23.9	U		21.6					
THALLIUM	0.36	U	A	0.42	U	A	0.32	U	A			
VANADIUM	2.1			2.7			2.6					
ZINC	10.5	J	G	44.3	J	G	10.8	J	G			

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4256

SAMPLE NUMBER:	CEF-P44-SW-007			CEF-P44-SW-DU01								
SAMPLE DATE:	06/04/99			06/04/99			/ /			/ /		
LABORATORY ID:	F4256-9			F4256-21								
QC_TYPE:	NORMAL			NORMAL								
% SOLIDS:	0.0 %			0.0 %			100.0 %			100.0 %		
UNITS:	UG/L			UG/L								
FIELD DUPLICATE OF:				CEF-P44-SW-007								
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	289			121	U	A						
ANTIMONY	3.4	U	A	2.4	U	A						
ARSENIC	3.4	U		3.5								
BARIUM	30.5			25.8								
BERYLLIUM	0.36	U	A	0.68	U	A						
CADMIUM	0.48	U	A	0.33	U	A						
CALCIUM	16900			16800								
CHROMIUM	3.2	U	A	2.5	U	A						
COBALT	0.80	U		0.80	U							
COPPER	2.8	U	A	1.2	U	A						
IRON	1480	J	G	707	J	G						
LEAD	7.3	U	A	3.1	U	A						
MAGNESIUM	1780			1730								
MANGANESE	13.7			14.0								
MERCURY	0.25	U		0.25	U							
NICKEL	1.0	U	A	1.2	U	A						
POTASSIUM	828			758								
SELENIUM	2.0	U		2.5								
SILVER	0.96	U	A	0.96	U	A						
SODIUM	3960			3990								
THALLIUM	5.9	U	A	5.2	U	A						
VANADIUM	2.8	U	A	2.2	U	A						
ZINC	36.5			30.7								

Report of Analysis

Client Sample ID:	CEF-P44-SD-001		
Lab Sample ID:	F4256-1	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
		Percent Solids:	97.4
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed	By	Method
Aluminum	2220	20.5	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Antimony	0.25 U	6.2	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Arsenic	0.35 U	1.0	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Barium	3.2 B	20.5	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Beryllium	0.18 B	0.51	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Cadmium	0.18 B	0.41	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Calcium	6680	513	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Chromium	3.0	1.0	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Cobalt	0.11 B	5.1	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Copper	1.3 B	2.6	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Iron	421	10.3	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Lead	7.5 B	10.3	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Magnesium	123 B	513	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Manganese	2.9	1.5	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Mercury	0.04 U	0.17	mg/kg	1	06/14/99	06/15/99	JK	SW846 7471A
Nickel	0.87 B	4.1	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Potassium	34.6 B	513	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Selenium	0.21 U	10.3	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Silver	0.1 U	1.0	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Sodium	23.9 B	513	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Thallium	0.28 U	1.0	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Vanadium	1.9 B	5.1	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Zinc	8.7	2.1	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID:	CEF-P44-SD-002		
Lab Sample ID:	F4256-2	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
		Percent Solids:	82.5
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed	By	Method
Aluminum	936	24.2	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Antimony	0.49 B	7.3	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Arsenic	0.42 U	1.2	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Barium	4.3 B	24.2	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Beryllium	0.24 B	0.61	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Cadmium	0.12 B	0.48	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Calcium	309 B	606	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Chromium	2.0	1.2	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Cobalt	0.19 B	6.1	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Copper	18.5	3.0	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Iron	261	12.1	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Lead	23.4	12.1	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Magnesium	87.1 B	606	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Manganese	2.5	1.8	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Mercury	0.05 U	0.20	mg/kg	1	06/14/99	06/15/99	JK	SW846 7471A
Nickel	0.84 B	4.8	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Potassium	35.1 B	606	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Selenium	0.25 U	12.1	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Silver	0.18 B	1.2	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Sodium	43.7 B	606	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Thallium	0.33 U	1.2	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Vanadium	5.0 B	6.1	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Zinc	14.5	2.4	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID:	CEF-P44-SD-003		
Lab Sample ID:	F4256-3	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
		Percent Solids:	79.0
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed	By	Method
Aluminum	7060	25.3	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Antimony	0.30 U	7.6	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Arsenic	0.44 U	1.3	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Barium	6.9 B	25.3	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Beryllium	0.28 B	0.63	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Cadmium	0.41 B	0.51	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Calcium	6790	633	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Chromium	6.1	1.3	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Cobalt	0.56 B	6.3	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Copper	3.0 B	3.2	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Iron	938	12.7	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Lead	13.1	12.7	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Magnesium	162 B	633	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Manganese	3.2	1.9	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Mercury	0.05 U	0.21	mg/kg	1	06/14/99	06/15/99	JK	SW846 7471A
Nickel	2.6 B	5.1	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Potassium	49.5 B	633	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Selenium	0.26 U	12.7	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Silver	0.12 U	1.3	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Sodium	20.9 B	633	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Thallium	0.34 U	1.3	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Vanadium	4.8 B	6.3	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Zinc	30.8	2.5	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID: CEF-P44-SD-004
Lab Sample ID: F4256-4
Matrix: SO - Soil
Project: NAS Cecil Field

Date Sampled: 06/03/99
Date Received: 06/05/99
Percent Solids: 77.1

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed	By	Method
Aluminum	8250	25.9	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Antimony	0.31 U	7.8	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Arsenic	0.45 U	1.3	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Barium	6.4 B	25.9	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Beryllium	0.28 B	0.65	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Cadmium	0.06 B	0.52	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Calcium	252 B	649	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Chromium	7.2	1.3	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Cobalt	0.45 B	6.5	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Copper	3.3	3.2	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Iron	535	13.0	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Lead	9.7 B	13.0	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Magnesium	151 B	649	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Manganese	2.5	1.9	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Mercury	0.05 U	0.22	mg/kg	1	06/14/99	06/15/99	JK	SW846 7471A
Nickel	1.5 B	5.2	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Potassium	128 B	649	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Selenium	0.26 U	13.0	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Silver	0.12 U	1.3	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Sodium	33.8 B	649	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Thallium	0.35 U	1.3	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Vanadium	3.7 B	6.5	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Zinc	5.0	2.6	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID:	CEF-P44-SD-006		
Lab Sample ID:	F4256-6	**Date Sampled:**	06/03/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
		Percent Solids:	74.7
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed	By	Method
Aluminum	1340	26.8	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Antimony	0.32 U	8.0	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Arsenic	0.46 U	1.3	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Barium	2.7 B	26.8	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Beryllium	0.30 B	0.67	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Cadmium	0.37 B	0.54	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Calcium	249 B	669	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Chromium	18.0	1.3	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Cobalt	0.35 B	6.7	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Copper	4.3	3.3	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Iron	235	13.4	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Lead	9.7 B	13.4	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Magnesium	70.3 B	669	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Manganese	3.3	2.0	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Mercury	0.06 U	0.22	mg/kg	1	06/14/99	06/15/99	JK	SW846 7471A
Nickel	10.3	5.4	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Potassium	36.4 B	669	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Selenium	0.27 U	13.4	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Silver	0.13 U	1.3	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Sodium	20.5 U	669	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Thallium	0.36 U	1.3	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Vanadium	2.1 B	6.7	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Zinc	10.5	2.7	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID: CEF-P44-SD-007
Lab Sample ID: F4256-7
Matrix: SO - Soil
Project: NAS Cecil Field

Date Sampled: 06/03/99
Date Received: 06/05/99
Percent Solids: 64.0

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed	By	Method
Aluminum	1920	31.2	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Antimony	0.46 B	9.4	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Arsenic	0.54 U	1.6	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Barium	12.0 B	31.2	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Beryllium	0.36 B	0.78	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Cadmium	1.2	0.62	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Calcium	666 B	781	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Chromium	6.0	1.6	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Cobalt	0.27 B	7.8	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Copper	13.5	3.9	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Iron	477	15.6	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Lead	18.2	15.6	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Magnesium	128 B	781	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Manganese	3.4	2.3	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Mercury	0.07 B	0.26	mg/kg	1	06/14/99	06/15/99	JK	SW846 7471A
Nickel	1.8 B	6.2	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Potassium	45.1 B	781	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Selenium	0.32 U	15.6	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Silver	1.7	1.6	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Sodium	23.9 U	781	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Thallium	0.42 U	1.6	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Vanadium	2.7 B	7.8	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Zinc	44.3	3.1	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID:	CEF-P44-SD-DU01		
Lab Sample ID:	F4256-20	**Date Sampled:**	06/04/99
Matrix:	SO - Soil	**Date Received:**	06/05/99
		Percent Solids:	83.8
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed	By	Method
Aluminum	1970	23.9	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Antimony	0.29 U	7.2	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Arsenic	0.41 U	1.2	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Barium	10.9 B	23.9	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Beryllium	0.29 B	0.60	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Cadmium	0.19 B	0.48	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Calcium	2010	597	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Chromium	3.4	1.2	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Cobalt	0.19 B	6.0	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Copper	16.3	3.0	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Iron	474	11.9	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Lead	10.1 B	11.9	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Magnesium	92.0 B	597	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Manganese	5.6	1.8	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Mercury	0.05 U	0.20	mg/kg	1	06/14/99	06/15/99	JK	SW846 7471A
Nickel	1.1 B	4.8	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Potassium	38.7 B	597	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Selenium	0.24 U	11.9	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Silver	0.11 U	1.2	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Sodium	21.6 B	597	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Thallium	0.32 U	1.2	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Vanadium	2.6 B	6.0	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A
Zinc	10.8	2.4	mg/kg	1	06/14/99	06/15/99	JK	SW846 6010A

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID:	CEF-P44-SW-007		
Lab Sample ID:	F4256-9	**Date Sampled:**	06/04/99
Matrix:	AQ - Ground Water	**Date Received:**	06/05/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed	By	Method
Aluminum	289	200	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Antimony	3.4 B	5.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Arsenic	3.4 U	5.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Barium	30.5 B	200	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Beryllium	0.36 B	5.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Cadmium	0.48 B	4.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Calcium	16900	5000	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Chromium	3.2 B	10.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Cobalt	0.80 U	50.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Copper	2.8 B	25.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Iron	1480	100	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Lead	7.3	3.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Magnesium	1780 B	5000	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Manganese	13.7 B	15.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Mercury	0.25 U	1.0	ug/l	1	06/17/99	06/18/99	JK	SW846 7470A
Nickel	1.0 U	40.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Potassium	828 B	5000	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Selenium	2.0 U	5.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Silver	0.96 U	10.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Sodium	3960 B	5000	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Thallium	5.9	5.0	ug/l	1	06/08/99	06/10/99	JK	SW846 6010A
Vanadium	2.8 B	50.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Zinc	36.5	20.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID:	CEF-P44-SW-DU01		
Lab Sample ID:	F4256-21	**Date Sampled:**	06/04/99
Matrix:	AQ - Ground Water	**Date Received:**	06/05/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed	By	Method
Aluminum	121 B	200	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Antimony	2.4 U	5.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Arsenic	3.5 B	5.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Barium	25.8 B	200	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Beryllium	0.68 B	5.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Cadmium	0.33 U	4.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Calcium	16800	5000	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Chromium	2.5 B	10.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Cobalt	0.80 U	50.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Copper	1.2 B	25.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Iron	707	100	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Lead	3.1	3.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Magnesium	1730 B	5000	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Manganese	14.0 B	15.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Mercury	0.25 U	1.0	ug/l	1	06/17/99	06/18/99	JK	SW846 7470A
Nickel	1.2 B	40.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Potassium	758 B	5000	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Selenium	2.5 B	5.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Silver	0.96 U	10.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Sodium	3990 B	5000	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Thallium	5.2	5.0	ug/l	1	06/08/99	06/10/99	JK	SW846 6010A
Vanadium	2.2 B	50.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Zinc	30.7	20.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A

RDL = Reported Detection Limit

PHASE II ANALYTICAL RESULTS

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-09-9-069

TO: **MR. M. SPERANZA** **DATE: OCTOBER 8, 1999**

FROM: **JUSTIN ORBICH** **CC: DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION – PCB**
CTO 078 – NAS CECIL FIELD
SDG F4724

SAMPLES: 17/Solid

CEF-P44-SS-101-01	CEF-P44-SS-102-01
CEF-P44-SS-103-01	CEF-P44-SS-104-01
CEF-P44-SS-105-01	CEF-P44-SS-106-01
CEF-P44-SS-107-01	CEF-P44-SS-108-01
CEF-P44-SS-109-01	CEF-P44-SS-112-01
CEF-P44-SS-113-01	CEF-P44-SS-114-01
CEF-P44-SS-115-01	CEF-P44-SS-DU02
CEF-P44-SS-DU03	CEF-P44-SU-110-04
CEF-P44-SU-111-03	

OVERVIEW

The sample set for CTO 078, SDG F4724 Naval Air Station (NAS) Cecil Field; Florida consists of seventeen (17) solid environmental samples. The samples were analyzed for Polychlorinated Biphenyl (PCB) organic compounds. Two (2) field duplicate pairs (CEF-P44-SS-105-01/CEF-P44-SS-DU02 and CEF-P44-SS-108-01/CEF-P44-SS-DU03) were included within this SDG.

The samples were collected by Tetra Tech, NUS on August 16th, 1999 and analyzed by Accutest Laboratories. All analyses were performed in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria and analyzed according to SW 846 Method 8082 analytical and reporting protocols. The data in this SDG was validated with regard to the following parameters:

* • Data Completeness
* • Holding Times
* • Initial and continuing calibration
* • Laboratory method/field quality control blank results
* • Detection Limits
* • Field Duplicate Precision

The symbol (*) indicates that all quality control criteria were met for this parameter. Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified analytical results are presented in Appendix A.

PCB FRACTION

All quality control parameters were met for this fraction.

MEMO TO: MR. M. SPERANZA
DATE: OCTOBER 8, 1999 – PAGE 2

ADDITIONAL COMMENTS

Several samples contained positive results for compounds below the contract required quantitation limits (CRQL). These results were qualified as estimated (J).

EXECUTIVE SUMMARY

Laboratory performance: None.

Other Factors Affecting Data Quality: None.

MEMO TO: MR. M. SPERANZA
DATE: OCTOBER 8, 1999 – PAGE 3

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (February, 1994), and the NFESC guidelines "Navy Installation Restoration Program Laboratory Quality Assurance Guide" (February, 1996). The text of this report has been formulated to address only those problems affecting data quality.

"I attest that the data referenced herein was validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Justin Orbich

Chemist/Data Validator
Tetra Tech, NUS

Joseph A. Samchuck

Data Validation Quality Assurance Officer
Tetra Tech, NUS

Attachments:
1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCB D% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = % Solid content is less than 30%

DATA QUALIFIER DEFINITIONS:

U - Value is a nondetected result as reported by the laboratory and should not be considered present.

J - Positive result is estimated as a result of a value below the CRQL or a technical noncompliance.

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4724

SAMPLE NUMBER:	CEF-P44-SS-101-01			CEF-P44-SS-102-01			CEF-P44-SS-103-02			CEF-P44-SS-104-01		
SAMPLE DATE:	08/16/99			08/16/99			08/16/99			08/16/99		
LABORATORY ID:	F4724-1			F4724-2			F4724-3			F4724-4		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	92.6 %			94.4 %			86.7 %			84.0 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
AROCLOR-1016	36	U		110	U		120	U		990	U	
AROCLOR-1221	36	U		110	U		120	U		990	U	
AROCLOR-1232	36	U		110	U		120	U		990	U	
AROCLOR-1242	36	U		110	U		120	U		990	U	
AROCLOR-1248	36	U		110	U		120	U		990	U	
AROCLOR-1254	16.2	J	P	118	J	P	120	U		990	U	
AROCLOR-1260	80.8	J	P	365	J	P	347			3290		

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4724

SAMPLE NUMBER:	CEF-P44-SS-105-01			CEF-P44-SS-106-01			CEF-P44-SS-107-02			CEF-P44-SS-108-01		
SAMPLE DATE:	08/16/99			08/16/99			08/16/99			08/16/99		
LABORATORY ID:	F4724-5			F4724-6			F4724-7			F4724-8		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	85.1 %			73.1 %			92.1 %			85.9 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
AROCLOR-1016	200	U		910	U		36	U		3900	U	
AROCLOR-1221	200	U		910	U		36	U		3900	U	
AROCLOR-1232	200	U		910	U		36	U		3900	U	
AROCLOR-1242	200	U		910	U		36	U		3900	U	
AROCLOR-1248	200	U		910	U		36	U		3900	U	
AROCLOR-1254	200	U		910	U		36	U		3900	U	
AROCLOR-1260	690			2830			36	U		21000		

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4724

SAMPLE NUMBER:	CEF-P44-SS-109-01			CEF-P44-SS-112-01			CEF-P44-SS-113-01			CEF-P44-SS-114-01		
SAMPLE DATE:	08/16/99			08/16/99			08/16/99			08/16/99		
LABORATORY ID:	F4724-9			F4724-12			F4724-13			F4724-14		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	70.1 %			72.6 %			90.0 %			35.0 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
AROCLOR-1016	1900	U		370	U		37	U		95	U	
AROCLOR-1221	1900	U		370	U		37	U		95	U	
AROCLOR-1232	1900	U		370	U		37	U		95	U	
AROCLOR-1242	1900	U		370	U		37	U		95	U	
AROCLOR-1248	1900	U		370	U		37	U		95	U	
AROCLOR-1254	1900	U		370	U		37	U		119		
AROCLOR-1260	9440			1470			59.1			95	U	

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4724

SAMPLE NUMBER:	CEF-P44-SS-115-02			CEF-P44-SS-DU02			CEF-P44-SS-DU03			CEF-P44-SU-110-04		
SAMPLE DATE:	08/16/99			08/16/99			08/16/99			08/16/99		
LABORATORY ID:	F4724-15			F4724-16			F4724-17			F4724-10		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	76.0 %			83.3 %			89.0 %			77.3 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
AROCLOR-1016	2200	U		400	U		3700	U		43	U	
AROCLOR-1221	2200	U		400	U		3700	U		43	U	
AROCLOR-1232	2200	U		400	U		3700	U		43	U	
AROCLOR-1242	2200	U		400	U		3700	U		43	U	
AROCLOR-1248	2200	U		400	U		3700	U		43	U	
AROCLOR-1254	2200	U		400	U		3700	U		43	U	
AROCLOR-1260	1540			1740			23800			43	U	

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4724

SAMPLE NUMBER:	CEF-P44-SU-111-03			/ /			/ /			/ /		
SAMPLE DATE:	08/16/99											
LABORATORY ID:	F4724-11											
QC_TYPE:	NORMAL											
% SOLIDS:	82.2 %			100.0 %			100.0 %			100.0 %		
UNITS:	UG/KG											
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
AROCLOR-1016	41	U										
AROCLOR-1221	41	U										
AROCLOR-1232	41	U										
AROCLOR-1242	41	U										
AROCLOR-1248	41	U										
AROCLOR-1254	41	U										
AROCLOR-1260	41	U										

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-101-01		
Lab Sample ID:	F4724-1	**Date Sampled:**	08/16/99
Matrix:	SO - Soil	**Date Received:**	08/18/99
Method:	SW846 8082	**Percent Solids:**	92.6
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB10304.D	1	08/23/99	NF	08/20/99	OP933	GAB387
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	36	ug/kg	
11104-28-2	Aroclor 1221	ND	36	ug/kg	
11141-16-5	Aroclor 1232	ND	36	ug/kg	
53469-21-9	Aroclor 1242	ND	36	ug/kg	
12672-29-6	Aroclor 1248	ND	36	ug/kg	
11097-69-1	Aroclor 1254 [b]	16.2	36	ug/kg	J
11096-82-5	Aroclor 1260 [b]	80.8	36	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	99%		40-150%
2051-24-3	Decachlorobiphenyl	125%		30-160%

(a) All hits confirmed by dual column analysis.
(b) Estimated value due to the presence of multiple Arochlor patterns.

000004

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-102-01		
Lab Sample ID:	F4724-2	**Date Sampled:**	08/16/99
Matrix:	SO - Soil	**Date Received:**	08/18/99
Method:	SW846 8082	**Percent Solids:**	94.4
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB10289.D	3	08/23/99	NF	08/20/99	OP933	GAB387
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	110	ug/kg	
11104-28-2	Aroclor 1221	ND	110	ug/kg	
11141-16-5	Aroclor 1232	ND	110	ug/kg	
53469-21-9	Aroclor 1242	ND	110	ug/kg	
12672-29-6	Aroclor 1248	ND	110	ug/kg	
11097-69-1	Aroclor 1254 [b]	118	110	ug/kg	J
11096-82-5	Aroclor 1260 [b]	365	110	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	84%		40-150%
2051-24-3	Decachlorobiphenyl	111%		30-160%

(a) All hits confirmed by dual column analysis.
(b) Estimated value due to the presence of multiple Arochlor patterns.

000005

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-103-02		
Lab Sample ID:	F4724-3	**Date Sampled:**	08/16/99
Matrix:	SO - Soil	**Date Received:**	08/18/99
Method:	SW846 8082	**Percent Solids:**	86.7
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB10290.D	3	08/23/99	NF	08/20/99	OP933	GAB387
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	120	ug/kg	
11104-28-2	Aroclor 1221	ND	120	ug/kg	
11141-16-5	Aroclor 1232	ND	120	ug/kg	
53469-21-9	Aroclor 1242	ND	120	ug/kg	
12672-29-6	Aroclor 1248	ND	120	ug/kg	
11097-69-1	Aroclor 1254	ND	120	ug/kg	
11096-82-5	Aroclor 1260	347	120	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	80%		40-150%
2051-24-3	Decachlorobiphenyl	108%		30-160%

(a) All hits confirmed by dual column analysis.

000065

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-104-01		
Lab Sample ID:	F4724-4	**Date Sampled:**	08/16/99
Matrix:	SO - Soil	**Date Received:**	08/18/99
Method:	SW846 8082	**Percent Solids:**	84.0
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB10291.D	25	08/23/99	NF	08/20/99	OP933	GAB387
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	990	ug/kg	
11104-28-2	Aroclor 1221	ND	990	ug/kg	
11141-16-5	Aroclor 1232	ND	990	ug/kg	
53469-21-9	Aroclor 1242	ND	990	ug/kg	
12672-29-6	Aroclor 1248	ND	990	ug/kg	
11097-69-1	Aroclor 1254	ND	990	ug/kg	
11096-82-5	Aroclor 1260	3290	990	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	56%		40-150%
2051-24-3	Decachlorobiphenyl	564% [b]		30-160%

(a) All hits confirmed by dual column analysis.
(b) Outside control limits due to matrix interference.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-105-01		
Lab Sample ID:	F4724-5	**Date Sampled:**	08/16/99
Matrix:	SO - Soil	**Date Received:**	08/18/99
Method:	SW846 8082	**Percent Solids:**	85.1
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB10292.D	5	08/23/99	NF	08/20/99	OP933	GAB387
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	200	ug/kg	
11104-28-2	Aroclor 1221	ND	200	ug/kg	
11141-16-5	Aroclor 1232	ND	200	ug/kg	
53469-21-9	Aroclor 1242	ND	200	ug/kg	
12672-29-6	Aroclor 1248	ND	200	ug/kg	
11097-69-1	Aroclor 1254	ND	200	ug/kg	
11096-82-5	Aroclor 1260	690	200	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	68%		40-150%
2051-24-3	Decachlorobiphenyl	108%		30-160%

(a) All hits confirmed by dual column analysis.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-106-01		
Lab Sample ID:	F4724-6	**Date Sampled:**	08/16/99
Matrix:	SO - Soil	**Date Received:**	08/18/99
Method:	SW846 8082	**Percent Solids:**	73.1
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB10293.D	20	08/23/99	NF	08/20/99	OP933	GAB387
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	910	ug/kg	
11104-28-2	Aroclor 1221	ND	910	ug/kg	
11141-16-5	Aroclor 1232	ND	910	ug/kg	
53469-21-9	Aroclor 1242	ND	910	ug/kg	
12672-29-6	Aroclor 1248	ND	910	ug/kg	
11097-69-1	Aroclor 1254	ND	910	ug/kg	
11096-82-5	Aroclor 1260	2830	910	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	58%		40-150%
2051-24-3	Decachlorobiphenyl	125%		30-160%

(a) All hits confirmed by dual column analysis.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-107-02		
Lab Sample ID:	F4724-7	**Date Sampled:**	08/16/99
Matrix:	SO - Soil	**Date Received:**	08/18/99
Method:	SW846 8082	**Percent Solids:**	92.1
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB10305.D	1	08/23/99	NF	08/20/99	OP933	GAB387
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	36	ug/kg	
11104-28-2	Aroclor 1221	ND	36	ug/kg	
11141-16-5	Aroclor 1232	ND	36	ug/kg	
53469-21-9	Aroclor 1242	ND	36	ug/kg	
12672-29-6	Aroclor 1248	ND	36	ug/kg	
11097-69-1	Aroclor 1254	ND	36	ug/kg	
11096-82-5	Aroclor 1260	ND	36	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	102%		40-150%
2051-24-3	Decachlorobiphenyl	113%		30-160%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-108-01		
Lab Sample ID:	F4724-8	**Date Sampled:**	08/16/99
Matrix:	SO - Soil	**Date Received:**	08/18/99
Method:	SW846 8082	**Percent Solids:**	85.9
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB10294.D	100	08/23/99	NF	08/20/99	OP933	GAB387
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	3900	ug/kg	
11104-28-2	Aroclor 1221	ND	3900	ug/kg	
11141-16-5	Aroclor 1232	ND	3900	ug/kg	
53469-21-9	Aroclor 1242	ND	3900	ug/kg	
12672-29-6	Aroclor 1248	ND	3900	ug/kg	
11097-69-1	Aroclor 1254	ND	3900	ug/kg	
11096-82-5	Aroclor 1260	21000	3900	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	0% [b]		40-150%
2051-24-3	Decachlorobiphenyl	0% [b]		30-160%

(a) All hits confirmed by dual column analysis.
(b) Outside control limits due to dilution.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-109-01		
Lab Sample ID:	F4724-9	**Date Sampled:**	08/16/99
Matrix:	SO - Soil	**Date Received:**	08/18/99
Method:	SW846 8082	**Percent Solids:**	70.1
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB10296.D	40	08/23/99	NF	08/20/99	OP933	GAB387
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	1900	ug/kg	
11104-28-2	Aroclor 1221	ND	1900	ug/kg	
11141-16-5	Aroclor 1232	ND	1900	ug/kg	
53469-21-9	Aroclor 1242	ND	1900	ug/kg	
12672-29-6	Aroclor 1248	ND	1900	ug/kg	
11097-69-1	Aroclor 1254	ND	1900	ug/kg	
11096-82-5	Aroclor 1260	9440	1900	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	0% [b]		40-150%
2051-24-3	Decachlorobiphenyl	0% [b]		30-160%

(a) All hits confirmed by dual column analysis.
(b) Outside control limits due to dilution.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

000012

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-112-01		
Lab Sample ID:	F4724-12	**Date Sampled:**	08/16/99
Matrix:	SO - Soil	**Date Received:**	08/18/99
Method:	SW846 8082	**Percent Solids:**	72.6
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB10297.D	8	08/23/99	NF	08/20/99	OP933	GAB387
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	370	ug/kg	
11104-28-2	Aroclor 1221	ND	370	ug/kg	
11141-16-5	Aroclor 1232	ND	370	ug/kg	
53469-21-9	Aroclor 1242	ND	370	ug/kg	
12672-29-6	Aroclor 1248	ND	370	ug/kg	
11097-69-1	Aroclor 1254	ND	370	ug/kg	
11096-82-5	Aroclor 1260	1470	370	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	78%		40-150%
2051-24-3	Decachlorobiphenyl	121%		30-160%

(a) All hits confirmed by dual column analysis.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

000015

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-113-01		
Lab Sample ID:	F4724-13	**Date Sampled:**	08/16/99
Matrix:	SO - Soil	**Date Received:**	08/18/99
Method:	SW846 8082	**Percent Solids:**	90.0
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB10308.D	1	08/24/99	NF	08/20/99	OP933	GAB387
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	37	ug/kg	
11104-28-2	Aroclor 1221	ND	37	ug/kg	
11141-16-5	Aroclor 1232	ND	37	ug/kg	
53469-21-9	Aroclor 1242	ND	37	ug/kg	
12672-29-6	Aroclor 1248	ND	37	ug/kg	
11097-69-1	Aroclor 1254	ND	37	ug/kg	
11096-82-5	Aroclor 1260	59.1	37	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	105%		40-150%
2051-24-3	Decachlorobiphenyl	136%		30-160%

(a) All hits confirmed by dual column analysis.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	CEF-P44-SS-114-01		
Lab Sample ID:	F4724-14	**Date Sampled:**	08/16/99
Matrix:	SO - Soil	**Date Received:**	08/18/99
Method:	SW846 8082	**Percent Solids:**	35.0
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB10311.D	1	08/24/99	NF	08/20/99	OP933	GAB387
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	95	ug/kg	
11104-28-2	Aroclor 1221	ND	95	ug/kg	
11141-16-5	Aroclor 1232	ND	95	ug/kg	
53469-21-9	Aroclor 1242	ND	95	ug/kg	
12672-29-6	Aroclor 1248	ND	95	ug/kg	
11097-69-1	Aroclor 1254	119	95	ug/kg	
11096-82-5	Aroclor 1260	ND	95	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	97%		40-150%
2051-24-3	Decachlorobiphenyl	64%		30-160%

(a) All hits confirmed by dual column analysis.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

000017

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-115-02		
Lab Sample ID:	F4724-15	**Date Sampled:**	08/16/99
Matrix:	SO - Soil	**Date Received:**	08/18/99
Method:	SW846 8082	**Percent Solids:**	76.0
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB10299.D	10	08/23/99	NF	08/20/99	OP933	GAB387
Run #2 [b]	AB10300.D	50	08/23/99	NF	08/20/99	OP933	GAB387

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND [c]	2200	ug/kg	
11104-28-2	Aroclor 1221	ND [c]	2200	ug/kg	
11141-16-5	Aroclor 1232	ND [c]	2200	ug/kg	
53469-21-9	Aroclor 1242	ND [c]	2200	ug/kg	
12672-29-6	Aroclor 1248	ND [c]	2200	ug/kg	
11097-69-1	Aroclor 1254	ND [c]	2200	ug/kg	
11096-82-5	Aroclor 1260	1540	440	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	72%	0% [d]	40-150%
2051-24-3	Decachlorobiphenyl	93%	0% [d]	30-160%

(a) All hits confirmed by dual column analysis.
(b) Dilution required due to matrix interference.
(c) Result is from Run# 2
(d) Outside control limits due to dilution.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

000013

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-DU02		
Lab Sample ID:	F4724-16	**Date Sampled:**	08/16/99
Matrix:	SO - Soil	**Date Received:**	08/18/99
Method:	SW846 8082	**Percent Solids:**	83.3
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB10301.D	10	08/23/99	NF	08/20/99	OP933	GAB387
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	400	ug/kg	
11104-28-2	Aroclor 1221	ND	400	ug/kg	
11141-16-5	Aroclor 1232	ND	400	ug/kg	
53469-21-9	Aroclor 1242	ND	400	ug/kg	
12672-29-6	Aroclor 1248	ND	400	ug/kg	
11097-69-1	Aroclor 1254	ND	400	ug/kg	
11096-82-5	Aroclor 1260	1740	400	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	62%		40-150%
2051-24-3	Decachlorobiphenyl	116%		30-160%

(a) All hits confirmed by dual column analysis.

00001

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-DU03		
Lab Sample ID:	F4724-17	**Date Sampled:**	08/16/99
Matrix:	SO - Soil	**Date Received:**	08/18/99
Method:	SW846 8082	**Percent Solids:**	89.0
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB10302.D	100	08/23/99	NF	08/20/99	OP933	GAB387
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	3700	ug/kg	
11104-28-2	Aroclor 1221	ND	3700	ug/kg	
11141-16-5	Aroclor 1232	ND	3700	ug/kg	
53469-21-9	Aroclor 1242	ND	3700	ug/kg	
12672-29-6	Aroclor 1248	ND	3700	ug/kg	
11097-69-1	Aroclor 1254	ND	3700	ug/kg	
11096-82-5	Aroclor 1260	23800	3700	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	0% [b]		40-150%
2051-24-3	Decachlorobiphenyl	0% [b]		30-160%

(a) All hits confirmed by dual column analysis.
(b) Outside control limits due to dilution.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SU-110-04		
Lab Sample ID:	F4724-10	**Date Sampled:**	08/16/99
Matrix:	SO - Soil	**Date Received:**	08/18/99
Method:	SW846 8082	**Percent Solids:**	77.3
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB10306.D	1	08/23/99	NF	08/20/99	OP933	GAB387
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	43	ug/kg	
11104-28-2	Aroclor 1221	ND	43	ug/kg	
11141-16-5	Aroclor 1232	ND	43	ug/kg	
53469-21-9	Aroclor 1242	ND	43	ug/kg	
12672-29-6	Aroclor 1248	ND	43	ug/kg	
11097-69-1	Aroclor 1254	ND	43	ug/kg	
11096-82-5	Aroclor 1260	ND	43	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	106%		40-150%
2051-24-3	Decachlorobiphenyl	120%		30-160%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SU-111-03		
Lab Sample ID:	F4724-11	**Date Sampled:**	08/16/99
Matrix:	SO - Soil	**Date Received:**	08/18/99
Method:	SW846 8082	**Percent Solids:**	82.2
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB10307.D	1	08/23/99	NF	08/20/99	OP933	GAB387
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	41	ug/kg	
11104-28-2	Aroclor 1221	ND	41	ug/kg	
11141-16-5	Aroclor 1232	ND	41	ug/kg	
53469-21-9	Aroclor 1242	ND	41	ug/kg	
12672-29-6	Aroclor 1248	ND	41	ug/kg	
11097-69-1	Aroclor 1254	ND	41	ug/kg	
11096-82-5	Aroclor 1260	ND	41	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	109%		40-150%
2051-24-3	Decachlorobiphenyl	126%		30-160%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

000014

PHASE III ANALYTICAL RESULTS

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-11-9-018

TO: **MR. M. SPERANZA** **DATE: DECEMBER 15, 1999**

FROM: **JUSTIN ORBICH** **CC: DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION –PCB**
CTO 078 – NAS CECIL FIELD
SDG F5095

SAMPLES: 14/Soil

CEF-P44-DU04	CEF-P44-SS-202-01
CEF-P44-SS-203-01	CEF-P44-SS-204-01
CEF-P44-SS-205-01	CEF-P44-SS-206-01
CEF-P44-SS-207-01	CEF-P44-SS-208-01
CEF-P44-SS-209-01	CEF-P44-SS-210-01
CEF-P44-SS-211-01	CEF-P44-SU-201-3
CEF-P44-SU-212-3	CEF-P44-SU-213-02

OVERVIEW

The sample set for CTO 078, SDG F5095 Naval Air Station (NAS) Cecil Field; Florida consists of fourteen (14) soil environmental samples. The samples were analyzed for Polychlorinated Biphenyl (PCB) organic compounds. One (1) field duplicate pair (CEF-P44-SU-212-03/CEF-P44-DU04) was included within this SDG.

The samples were collected by Tetra Tech, NUS on and October 15th, 1999 and analyzed by Accutest Laboratories. All analyses were performed in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria and analyzed according to SW 846 Method 8082 analytical and reporting protocols. The data in this SDG was validated with regard to the following parameters:

* • Data Completeness
* • Holding Times
* • Initial/continuing calibrations
* • Laboratory method/field quality control blank results
* • Detection Limits
  • Field Duplicate Precision

The symbol (*) indicates that all quality control criteria were met for this parameter. Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified analytical results are presented in Appendix A.

PCB FRACTION

It should be noted the laboratory analyzed samples CEF-P44-DU04 and CEF-P44-SS-207-01 at a 10X dilution.

It should be noted the laboratory analyzed samples CEF-P44-SS-204-01 at a 200X dilution.

It should be noted the laboratory analyzed samples CEF-P44-SS-207-01 and CEF-P44-SU-212-03 at a 100X and 50X dilution, respectively, thus causing elevated detection limits.

It should be noted the laboratory analyzed samples CEF-P44-SS-209-01 and CEF-P44-SS-211-01 at a 4X and 5X dilution, respectively, thus causing elevated detection limits.

It should be noted in samples CEF-P44-SS-202-01, CEF-P44-SS-205-01, and CEF-P44-SS-210-01 the results for AROCLOR-1254 and -1260 were reported as estimated due to multiple AROCLOR patterns.

The surrogate Percent Recoveries (%Rs) were zero percent for tetrachloro-m-xylene and decachlorobiphenyl in samples CEF-P44-SS-204-01 and CEFF-P44-SS-207-01 due to sample dilutions. No action was warranted since the surrogates were diluted out.

It should be noted the laboratory analyzed the duplicate sample, CEF-P44-DU04, at a 10X dilution. However, the associated sample, CEF-P44-SU-212-03, was analyzed at a 50X.

ADDITIONAL COMMENTS

Positive results reported below the CRQL are qualified as estimated (J).

EXECUTIVE SUMMARY

Laboratory performance: None.

Other Factors Affecting Data Quality: Several samples were analyzed at a dilution. Several samples were qualified as estimated due to multiple AROCLOR patterns. The field duplicate pair exceeded the quality control limit for several compounds.

MEMO TO: MR. M. SPERANZA
DATE: DECEMBER 15, 1999 – PAGE 3

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (February, 1994), and the NFESC "Navy Installation Restoration Program Laboratory Quality Assurance Guide" (February, 1996). The text of this report has been formulated to address only those problems affecting data quality.

"I attest that the data referenced herein was validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Justin Orbich

Chemist/Data Validator
Tetra Tech, NUS

Joseph A. Samchuck

Data Validation Quality Assurance Officer
Tetra Tech, NUS

Attachments:
1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCB D% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = % Solid content is less than 30%

DATA QUALIFIER DEFINITIONS:

U - Value is a nondetected result as reported by the laboratory and should not be considered present.

J - Positive result is estimated as a result of a value below the CRQL or a technical noncompliance.

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F5095

SAMPLE NUMBER:	CEF-P44-DU04			CEF-P44-SS-202-01			CEF-P44-SS-203-01			CEF-P44-SS-204-01		
SAMPLE DATE:	10/15/99			10/15/99			10/15/99			10/15/99		
LABORATORY ID:	F5095-14			F5095-10			F5095-2			F5095-11		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	72.3 %			66.0 %			92.5 %			75.9 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:	CEF-P44-SU-212-03											
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
AROCLOR-1016	460	U		50	U		36	U		8800	U	
AROCLOR-1221	460	U		50	U		36	U		8800	U	
AROCLOR-1232	460	U		50	U		36	U		8800	U	
AROCLOR-1242	460	U		50	U		36	U		8800	U	
AROCLOR-1248	460	U		50	U		36	U		8800	U	
AROCLOR-1254	460	U		119	J	P	36	U		8800	U	
AROCLOR-1260	1720			156	J	P	43.5			35000		

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F5095

SAMPLE NUMBER:	CEF-P44-SS-205-01			CEF-P44-SS-206-01			CEF-P44-SS-207-01			CEF-P44-SS-208-01		
SAMPLE DATE:	10/15/99			10/15/99			10/15/99			10/15/99		
LABORATORY ID:	F5095-12			F5095-3			F5095-4			F5095-5		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	73.1 %			77.9 %			71.9 %			67.6 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
AROCLOR-1016	46	U		430	U		4600	U		49	U	
AROCLOR-1221	46	U		430	U		4600	U		49	U	
AROCLOR-1232	46	U		430	U		4600	U		49	U	
AROCLOR-1242	46	U		430	U		4600	U		49	U	
AROCLOR-1248	46	U		430	U		4600	U		49	U	
AROCLOR-1254	114	J	P	430	U		4600	U		49	U	
AROCLOR-1260	179	J	P	2270			9190			347		

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F5095

SAMPLE NUMBER:	CEF-P44-SS-209-01			CEF-P44-SS-210-01			CEF-P44-SS-211-01			CEF-P44-SU-201-3		
SAMPLE DATE:	10/15/99			10/15/99			10/15/99			10/15/99		
LABORATORY ID:	F5095-6			F5095-13			F5095-7			F5095-1		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	69.0 %			29.1 %			43.7 %			87.4 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
AROCLOR-1016	190	U		110	U		380	U		38	U	
AROCLOR-1221	190	U		110	U		380	U		38	U	
AROCLOR-1232	190	U		110	U		380	U		38	U	
AROCLOR-1242	190	U		110	U		380	U		38	U	
AROCLOR-1248	190	U		110	U		380	U		38	U	
AROCLOR-1254	190	U		137	J	P	380	U		38	U	
AROCLOR-1260	890			314	J	P	380	U		38	U	

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F5095

SAMPLE NUMBER:	CEF-P44-SU-212-03			CEF-P44-SU-213-02			/ /			/ /		
SAMPLE DATE:	10/15/99			10/15/99								
LABORATORY ID:	F5095-8			F5095-9								
QC_TYPE:	NORMAL			NORMAL								
% SOLIDS:	80.4 %			86.2 %			100.0 %			100.0 %		
UNITS:	UG/KG			UG/KG								
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
AROCLOR-1016	2100	U		39	U							
AROCLOR-1221	2100	U		39	U							
AROCLOR-1232	2100	U		39	U							
AROCLOR-1242	2100	U		39	U							
AROCLOR-1248	2100	U		39	U							
AROCLOR-1254	2100	U		39	U							
AROCLOR-1260	4500			39	U							

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-DU04	**Date Sampled:**	10/15/99
Lab Sample ID:	F5095-14	**Date Received:**	10/18/99
Matrix:	SO - Soil	**Percent Solids:**	72.3
Method:	SW846 8082		
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB11017.D	10	10/19/99	SKW	10/18/99	OP1031	GAB415
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	460	ug/kg	
11104-28-2	Aroclor 1221	ND	460	ug/kg	
11141-16-5	Aroclor 1232	ND	460	ug/kg	
53469-21-9	Aroclor 1242	ND	460	ug/kg	
12672-29-6	Aroclor 1248	ND	460	ug/kg	
11097-69-1	Aroclor 1254	ND	460	ug/kg	
11096-82-5	Aroclor 1260	1720	460	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	88%		40-150%
2051-24-3	Decachlorobiphenyl	78%		30-160%

(a) All hits confirmed by dual column analysis.

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blan
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-202-01		
Lab Sample ID:	F5095-10	**Date Sampled:**	10/15/99
Matrix:	SO - Soil	**Date Received:**	10/18/99
Method:	SW846 8082	**Percent Solids:**	66.0
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB11013.D	1	10/19/99	SKW	10/18/99	OP1031	GAB415
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	50	ug/kg	
11104-28-2	Aroclor 1221	ND	50	ug/kg	
11141-16-5	Aroclor 1232	ND	50	ug/kg	
53469-21-9	Aroclor 1242	ND	50	ug/kg	
12672-29-6	Aroclor 1248	ND	50	ug/kg	
11097-69-1	Aroclor 1254 [b]	119	50	ug/kg	J
11096-82-5	Aroclor 1260 [b]	156	50	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	109%		40-150%
2051-24-3	Decachlorobiphenyl	81%		30-160%

(a) All hits confirmed by dual column analysis.
(b) Estimated value due to the presence of multiple Arochlor patterns.

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-203-01		
Lab Sample ID:	F5095-2	**Date Sampled:**	10/15/99
Matrix:	SO - Soil	**Date Received:**	10/18/99
Method:	SW846 8082	**Percent Solids:**	92.5
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB10996.D	1	10/19/99	SKW	10/18/99	OP1031	GAB415
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	36	ug/kg	
11104-28-2	Aroclor 1221	ND	36	ug/kg	
11141-16-5	Aroclor 1232	ND	36	ug/kg	
53469-21-9	Aroclor 1242	ND	36	ug/kg	
12672-29-6	Aroclor 1248	ND	36	ug/kg	
11097-69-1	Aroclor 1254	ND	36	ug/kg	
11096-82-5	Aroclor 1260 [b]	43.5	36	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	117%		40-150%
2051-24-3	Decachlorobiphenyl	120%		30-160%

(a) All hits confirmed by dual column analysis.
(b) PCB pattern appears to be weathered.

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-204-01		
Lab Sample ID:	F5095-11	**Date Sampled:**	10/15/99
Matrix:	SO - Soil	**Date Received:**	10/18/99
Method:	SW846 8082	**Percent Solids:**	75.9
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB11037.D	200	10/20/99	SKW	10/18/99	OP1031	GAB416
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	8800	ug/kg	
11104-28-2	Aroclor 1221	ND	8800	ug/kg	
11141-16-5	Aroclor 1232	ND	8800	ug/kg	
53469-21-9	Aroclor 1242	ND	8800	ug/kg	
12672-29-6	Aroclor 1248	ND	8800	ug/kg	
11097-69-1	Aroclor 1254	ND	8800	ug/kg	
11096-82-5	Aroclor 1260	35000	8800	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	0% [b]		40-150%
2051-24-3	Decachlorobiphenyl	0% [b]		30-160%

(a) All hits confirmed by dual column analysis.
(b) Outside control limits due to dilution.

000014

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-205-01		
Lab Sample ID:	F5095-12	**Date Sampled:**	10/15/99
Matrix:	SO - Soil	**Date Received:**	10/18/99
Method:	SW846 8082	**Percent Solids:**	73.1
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB11015.D	1	10/19/99	SKW	10/18/99	OP1031	GAB415
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	46	ug/kg	
11104-28-2	Aroclor 1221	ND	46	ug/kg	
11141-16-5	Aroclor 1232	ND	46	ug/kg	
53469-21-9	Aroclor 1242	ND	46	ug/kg	
12672-29-6	Aroclor 1248	ND	46	ug/kg	
11097-69-1	Aroclor 1254 [b]	114	46	ug/kg	J
11096-82-5	Aroclor 1260 [b]	179	46	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	106%		40-150%
2051-24-3	Decachlorobiphenyl	81%		30-160%

(a) All hits confirmed by dual column analysis.
(b) Estimated value due to the presence of multiple Arochlor patterns.

00015

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-206-01		
Lab Sample ID:	F5095-3	**Date Sampled:**	10/15/99
Matrix:	SO - Soil	**Date Received:**	10/18/99
Method:	SW846 8082	**Percent Solids:**	77.9
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB11003.D	10	10/19/99	SKW	10/18/99	OP1031	GAB415
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	430	ug/kg	
11104-28-2	Aroclor 1221	ND	430	ug/kg	
11141-16-5	Aroclor 1232	ND	430	ug/kg	
53469-21-9	Aroclor 1242	ND	430	ug/kg	
12672-29-6	Aroclor 1248	ND	430	ug/kg	
11097-69-1	Aroclor 1254	ND	430	ug/kg	
11096-82-5	Aroclor 1260	2270	430	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	81%		40-150%
2051-24-3	Decachlorobiphenyl	104%		30-160%

(a) All hits confirmed by dual column analysis.

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-207-01		
Lab Sample ID:	F5095-4	**Date Sampled:**	10/15/99
Matrix:	SO - Soil	**Date Received:**	10/18/99
Method:	SW846 8082	**Percent Solids:**	71.9
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB11038.D	100	10/20/99	SKW	10/18/99	OP1031	GAB416
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	4600	ug/kg	
11104-28-2	Aroclor 1221	ND	4600	ug/kg	
11141-16-5	Aroclor 1232	ND	4600	ug/kg	
53469-21-9	Aroclor 1242	ND	4600	ug/kg	
12672-29-6	Aroclor 1248	ND	4600	ug/kg	
11097-69-1	Aroclor 1254	ND	4600	ug/kg	
11096-82-5	Aroclor 1260	9190	4600	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	0% [b]		40-150%
2051-24-3	Decachlorobiphenyl	0% [b]		30-160%

(a) All hits confirmed by dual column analysis.
(b) Outside control limits due to dilution.

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-208-01		
Lab Sample ID:	F5095-5	**Date Sampled:**	10/15/99
Matrix:	SO - Soil	**Date Received:**	10/18/99
Method:	SW846 8082	**Percent Solids:**	67.6
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB11005.D	1	10/19/99	SKW	10/18/99	OP1031	GAB415
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	49	ug/kg	
11104-28-2	Aroclor 1221	ND	49	ug/kg	
11141-16-5	Aroclor 1232	ND	49	ug/kg	
53469-21-9	Aroclor 1242	ND	49	ug/kg	
12672-29-6	Aroclor 1248	ND	49	ug/kg	
11097-69-1	Aroclor 1254	ND	49	ug/kg	
11096-82-5	Aroclor 1260	347	49	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	106%		40-150%
2051-24-3	Decachlorobiphenyl	95%		30-160%

(a) All hits confirmed by dual column analysis.

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-209-01		
Lab Sample ID:	F5095-6	**Date Sampled:**	10/15/99
Matrix:	SO - Soil	**Date Received:**	10/18/99
Method:	SW846 8082	**Percent Solids:**	69.0
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB11035.D	4	10/20/99	SKW	10/18/99	OP1031	GAB416
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	190	ug/kg	
11104-28-2	Aroclor 1221	ND	190	ug/kg	
11141-16-5	Aroclor 1232	ND	190	ug/kg	
53469-21-9	Aroclor 1242	ND	190	ug/kg	
12672-29-6	Aroclor 1248	ND	190	ug/kg	
11097-69-1	Aroclor 1254	ND	190	ug/kg	
11096-82-5	Aroclor 1260	890	190	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	91%		40-150%
2051-24-3	Decachlorobiphenyl	80%		30-160%

(a) All hits confirmed by dual column analysis.

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-210-01		
Lab Sample ID:	F5095-13	**Date Sampled:**	10/15/99
Matrix:	SO - Soil	**Date Received:**	10/18/99
Method:	SW846 8082	**Percent Solids:**	29.1
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB11016.D	1	10/19/99	SKW	10/18/99	OP1031	GAB415
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	110	ug/kg	
11104-28-2	Aroclor 1221	ND	110	ug/kg	
11141-16-5	Aroclor 1232	ND	110	ug/kg	
53469-21-9	Aroclor 1242	ND	110	ug/kg	
12672-29-6	Aroclor 1248	ND	110	ug/kg	
11097-69-1	Aroclor 1254 [b]	137	110	ug/kg	J
11096-82-5	Aroclor 1260 [b]	314	110	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	106%		40-150%
2051-24-3	Decachlorobiphenyl	61%		30-160%

(a) All hits confirmed by dual column analysis.
(b) Estimated value due to the presence of multiple Arochlor patterns.

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-211-01		
Lab Sample ID:	F5095-7	**Date Sampled:**	10/15/99
Matrix:	SO - Soil	**Date Received:**	10/18/99
Method:	SW846 8082	**Percent Solids:**	43.7
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB11036.D	5	10/20/99	SKW	10/18/99	OP1031	GAB416
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	380	ug/kg	
11104-28-2	Aroclor 1221	ND	380	ug/kg	
11141-16-5	Aroclor 1232	ND	380	ug/kg	
53469-21-9	Aroclor 1242	ND	380	ug/kg	
12672-29-6	Aroclor 1248	ND	380	ug/kg	
11097-69-1	Aroclor 1254	ND	380	ug/kg	
11096-82-5	Aroclor 1260	ND	380	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	106%		40-150%
2051-24-3	Decachlorobiphenyl	86%		30-160%

(a) Dilution required due to matrix interference.

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SU-201-3		
Lab Sample ID:	F5095-1	**Date Sampled:**	10/15/99
Matrix:	SO - Soil	**Date Received:**	10/18/99
Method:	SW846 8082	**Percent Solids:**	87.4
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB10995.D	1	10/19/99	SKW	10/18/99	OP1031	GAB415
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	38	ug/kg	
11104-28-2	Aroclor 1221	ND	38	ug/kg	
11141-16-5	Aroclor 1232	ND	38	ug/kg	
53469-21-9	Aroclor 1242	ND	38	ug/kg	
12672-29-6	Aroclor 1248	ND	38	ug/kg	
11097-69-1	Aroclor 1254	ND	38	ug/kg	
11096-82-5	Aroclor 1260	ND	38	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	108%		40-150%
2051-24-3	Decachlorobiphenyl	84%		30-160%

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SU-212-03		
Lab Sample ID:	F5095-8	**Date Sampled:**	10/15/99
Matrix:	SO - Soil	**Date Received:**	10/18/99
Method:	SW846 8082	**Percent Solids:**	80.4
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB11008.D	50	10/19/99	SKW	10/18/99	OP1031	GAB415
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	2100	ug/kg	
11104-28-2	Aroclor 1221	ND	2100	ug/kg	
11141-16-5	Aroclor 1232	ND	2100	ug/kg	
53469-21-9	Aroclor 1242	ND	2100	ug/kg	
12672-29-6	Aroclor 1248	ND	2100	ug/kg	
11097-69-1	Aroclor 1254	ND	2100	ug/kg	
11096-82-5	Aroclor 1260	4500	2100	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	62%		40-150%
2051-24-3	Decachlorobiphenyl	75%		30-160%

(a) All hits confirmed by dual column analysis.

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SU-213-02	**Date Sampled:**	10/15/99
Lab Sample ID:	F5095-9	**Date Received:**	10/18/99
Matrix:	SO - Soil	**Percent Solids:**	86.2
Method:	SW846 8082		
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB11012.D	1	10/19/99	SKW	10/18/99	OP1031	GAB415
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	39	ug/kg	
11104-28-2	Aroclor 1221	ND	39	ug/kg	
11141-16-5	Aroclor 1232	ND	39	ug/kg	
53469-21-9	Aroclor 1242	ND	39	ug/kg	
12672-29-6	Aroclor 1248	ND	39	ug/kg	
11097-69-1	Aroclor 1254	ND	39	ug/kg	
11096-82-5	Aroclor 1260	ND	39	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	108%		40-150%
2051-24-3	Decachlorobiphenyl	72%		30-160%

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blan
N = Indicates presumptive evidence of a compound

PHASE IV ANALYTICAL RESULTS

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-01-0-045

TO: **MARK SPERANZA** **DATE: FEBRUARY 21, 2000**

FROM: **JUSTIN ORBICH** **CC: DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION –PCB**
CTO 078 – NAS CECIL FIELD
SDG F5389

SAMPLES: 15/ Soil

CEF-P44-SS-301-01	CEF-P44-SS-302-01
CEF-P44-SS-303-01	CEF-P44-SS-304-01
CEF-P44-SS-305-01	CEF-P44-SS-306-01
CEF-P44-SS-307-02	CEF-P44-SS-DU05
CEF-P44-SS-DU06	CEF-P44-SU-308-04
CEF-P44-SU-309-04	CEF-P44-SU-310-02
CEF-P44-SU-311-03	CEF-P44-SU-312-03
CEF-P44-SU-313-03	

OVERVIEW

The sample set for CTO 078, SDG F5389 Naval Air Station (NAS) Cecil Field; Florida consists of fifteen (15) soil environmental samples. The samples were analyzed for Polychlorinated Biphenyl (PCB) organic compounds. Two field duplicate pairs (CEF-P44-SS-303-01/CEF-P44-SS-DU05 and CEF-P44-SU-308-04/CEF-P44-SS-DU06) were included within this SDG.

The samples were collected by Tetra Tech, NUS on and November 30th, 1999 and analyzed by Accutest Laboratories. All analyses were performed in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria and analyzed according to SW 846 Method 8082 analytical and reporting protocols. The data in this SDG was validated with regard to the following parameters:

- * Data Completeness
- * Holding Times
- * Initial/continuing calibrations
- * Laboratory method/field quality control blank results
- * Detection Limits
- Field Duplicate Precision

The symbol (*) indicates that all quality control criteria were met for this parameter. Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified analytical results are presented in Appendix A.

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PCB FRACTION

The Relative Percent Difference (RPD) for AROCLOR-1260 exceeded the 25% quality control limit for the field duplicate pair (CEF-P44-SU-308-04/CEF-P44-SS-DU06). The positive and nondetected results were qualified as estimated (J) and (UJ), respectively.

It should be noted that sample CEF-P44-SS-301-01 was analyzed at a 2X dilution thus causing elevated reporting limits.

It should be noted that sample CEF-P44-SS-308-04 was analyzed at a 4X dilution thus causing elevated reporting limits.

It should be noted that samples CEF-P44-SS-304-01, CEF-P44-SS-305-01, and CWF-P44-SU-311-03 were analyzed at a 2X dilution thus causing elevated reporting limits.

It should be noted in the field duplicate pair (CEF-P44-SU-308-04/CEF-P44-SS-DU06) the original sample was analyzed at a 4X dilution, however, the associated duplicate was analyzed at a straight dilution.

ADDITIONAL COMMENTS

Positive results reported below the reporting limit are qualified as estimated (J).

EXECUTIVE SUMMARY

Laboratory performance: None.

Other Factors Affecting Data Quality: The RPD for one field duplicate pair exceeded the quality control limit for AROCLOR-1260. Several samples were analyzed at a dilution causing elevated reporting limits.

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The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (February, 1994), and the NFESC "Navy Installation Restoration Program Laboratory Quality Assurance Guide" (February, 1996). The text of this report has been formulated to address only those problems affecting data quality.

"I attest that the data referenced herein was validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Justin Orbich

Chemist/Data Validator
Tetra Tech, NUS

Joseph A. Samchuck

Data Validation Quality Assurance Officer
Tetra Tech, NUS

Attachments:
1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCB D% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = % Solid content is less than 30%

DATA QUALIFIER DEFINITIONS:

U	-	Value is a nondetected result as reported by the laboratory and should not be considered present.
J	-	Positive result is estimated as a result of a value below the CRQL or a technical noncompliance.
UJ	-	Nondetected result is considered to be estimated as a result of technical noncompliances.

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F5389

SAMPLE NUMBER:	CEF-P44-SS-301-01			CEF-P44-SS-302-01			CEF-P44-SS-303-01			CEF-P44-SS-304-01		
SAMPLE DATE:	11/30/99			11/30/99			11/30/99			11/30/99		
LABORATORY ID:	F5389-1			F5389-2			F5389-3			F5389-4		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	57.9 %			78.3 %			72.5 %			41.2 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
AROCLOR-1016	76	U		42	U		46	U		400	U	
AROCLOR-1221	76	U		42	U		46	U		400	U	
AROCLOR-1232	76	U		42	U		46	U		400	U	
AROCLOR-1242	76	U		42	U		46	U		400	U	
AROCLOR-1248	76	U		42	U		46	U		400	U	
AROCLOR-1254	76	U		42	U		46	U		400	U	
AROCLOR-1260	329			98			164			1530		

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F5389

SAMPLE NUMBER:	CEF-P44-SS-305-01			CEF-P44-SS-306-01			CEF-P44-SS-307-02			CEF-P44-SS-DU05		
SAMPLE DATE:	11/30/99			11/30/99			11/30/99			11/30/99		
LABORATORY ID:	F5389-5			F5389-6			F5389-7			F5389-14		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	80.0 %			78.0 %			81.8 %			77.8 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:										CEF-P44-SS-303-01		
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
AROCLOR-1016	210	U		43	U		41	U		43	U	
AROCLOR-1221	210	U		43	U		41	U		43	U	
AROCLOR-1232	210	U		43	U		41	U		43	U	
AROCLOR-1242	210	U		43	U		41	U		43	U	
AROCLOR-1248	210	U		43	U		41	U		43	U	
AROCLOR-1254	210	U		43	U		41	U		43	U	
AROCLOR-1260	704			72.9			41	U		147		

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F5389

SAMPLE NUMBER:	CEF-P44-SS-DU06			CEF-P44-SU-308-04			CEF-P44-SU-309-04			CEF-P44-SU-310-02		
SAMPLE DATE:	11/30/99			11/30/99			11/30/99			11/30/99		
LABORATORY ID:	F5389-15			F5389-8			F5389-9			F5389-10		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	83.1 %			81.0 %			84.0 %			78.1 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:	CEF-P44-SU-308-04											
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
AROCLOR-1016	40	U		160	U		40	U		170	U	
AROCLOR-1221	40	U		160	U		40	U		170	U	
AROCLOR-1232	40	U		160	U		40	U		170	U	
AROCLOR-1242	40	U		160	U		40	U		170	U	
AROCLOR-1248	40	U		160	U		40	U		170	U	
AROCLOR-1254	40	U		160	U		40	U		170	U	
AROCLOR-1260	40	UJ	G	472	J	G	50.6			503		

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F5389

SAMPLE NUMBER:	CEF-P44-SU-311-03			CEF-P44-SU-312-03			CEF-P44-SU-313-03			/ /		
SAMPLE DATE:	11/30/99			11/30/99			11/30/99					
LABORATORY ID:	F5389-11			F5389-12			F5389-13					
QC_TYPE:	NORMAL			NORMAL			NORMAL					
% SOLIDS:	80.2 %			76.3 %			75.3 %			100.0 %		
UNITS:	UG/KG			UG/KG			UG/KG					
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
AROCLOR-1016	210	U		44	U		44	U				
AROCLOR-1221	210	U		44	U		44	U				
AROCLOR-1232	210	U		44	U		44	U				
AROCLOR-1242	210	U		44	U		44	U				
AROCLOR-1248	210	U		44	U		44	U				
AROCLOR-1254	210	U		44	U		44	U				
AROCLOR-1260	1140			44	U		58.7					

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Report of Analysis

Client Sample ID:	CEF-P44-SS-301-01		
Lab Sample ID:	F5389-1	**Date Sampled:**	11/30/99
Matrix:	SO - Soil	**Date Received:**	12/01/99
Method:	SW846 8082	**Percent Solids:**	57.9
Project:	NAS Cecil Field-PSC44		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB11516.D	2	12/09/99	SKW	12/08/99	OP1135	GAB435
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	76	ug/kg	
11104-28-2	Aroclor 1221	ND	76	ug/kg	
11141-16-5	Aroclor 1232	ND	76	ug/kg	
53469-21-9	Aroclor 1242	ND	76	ug/kg	
12672-29-6	Aroclor 1248	ND	76	ug/kg	
11097-69-1	Aroclor 1254	ND	76	ug/kg	
11096-82-5	Aroclor 1260 [b]	329	76	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	98%		40-150%
2051-24-3	Decachlorobiphenyl	122%		30-160%

(a) All hits confirmed by dual column analysis.
(b) PCB pattern appears to be weathered.

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	CEF-P44-SS-302-01		
Lab Sample ID:	F5389-2	**Date Sampled:**	11/30/99
Matrix:	SO - Soil	**Date Received:**	12/01/99
Method:	SW846 8082	**Percent Solids:**	78.3
Project:	NAS Cecil Field-PSC44		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB11479.D	1	12/08/99	SKW	12/08/99	OP1135	GAB434
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	42	ug/kg	
11104-28-2	Aroclor 1221	ND	42	ug/kg	
11141-16-5	Aroclor 1232	ND	42	ug/kg	
53469-21-9	Aroclor 1242	ND	42	ug/kg	
12672-29-6	Aroclor 1248	ND	42	ug/kg	
11097-69-1	Aroclor 1254	ND	42	ug/kg	
11096-82-5	Aroclor 1260 [b]	98.0	42	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	103%		40-150%
2051-24-3	Decachlorobiphenyl	102%		30-160%

(a) All hits confirmed by dual column analysis.
(b) PCB pattern appears to be weathered.

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	CEF-P44-SS-303-01		
Lab Sample ID:	F5389-3	**Date Sampled:**	11/30/99
Matrix:	SO - Soil	**Date Received:**	12/01/99
Method:	SW846 8082	**Percent Solids:**	72.5
Project:	NAS Cecil Field-PSC44		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB11480.D	1	12/08/99	SKW	12/08/99	OP1135	GAB434
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	46	ug/kg	
11104-28-2	Aroclor 1221	ND	46	ug/kg	
11141-16-5	Aroclor 1232	ND	46	ug/kg	
53469-21-9	Aroclor 1242	ND	46	ug/kg	
12672-29-6	Aroclor 1248	ND	46	ug/kg	
11097-69-1	Aroclor 1254	ND	46	ug/kg	
11096-82-5	Aroclor 1260 [b]	164	46	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	110%		40-150%
2051-24-3	Decachlorobiphenyl	100%		30-160%

(a) All hits confirmed by dual column analysis.
(b) PCB pattern appears to be weathered.

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	CEF-P44-SS-304-01		
Lab Sample ID:	F5389-4	**Date Sampled:**	11/30/99
Matrix:	SO - Soil	**Date Received:**	12/01/99
Method:	SW846 8082	**Percent Solids:**	41.2
Project:	NAS Cecil Field-PSC44		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB11517.D	5	12/09/99	SKW	12/08/99	OP1135	GAB435
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	400	ug/kg	
11104-28-2	Aroclor 1221	ND	400	ug/kg	
11141-16-5	Aroclor 1232	ND	400	ug/kg	
53469-21-9	Aroclor 1242	ND	400	ug/kg	
12672-29-6	Aroclor 1248	ND	400	ug/kg	
11097-69-1	Aroclor 1254	ND	400	ug/kg	
11096-82-5	Aroclor 1260 [b]	1530	400	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	69%		40-150%
2051-24-3	Decachlorobiphenyl	105%		30-160%

(a) All hits confirmed by dual column analysis.
(b) PCB pattern appears to be weathered.

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	CEF-P44-SS-305-01		
Lab Sample ID:	F5389-5	**Date Sampled:**	11/30/99
Matrix:	SO - Soil	**Date Received:**	12/01/99
Method:	SW846 8082	**Percent Solids:**	80.0
Project:	NAS Cecil Field-PSC44		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB11518.D	5	12/09/99	SKW	12/08/99	OP1135	GAB435
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	210	ug/kg	
11104-28-2	Aroclor 1221	ND	210	ug/kg	
11141-16-5	Aroclor 1232	ND	210	ug/kg	
53469-21-9	Aroclor 1242	ND	210	ug/kg	
12672-29-6	Aroclor 1248	ND	210	ug/kg	
11097-69-1	Aroclor 1254	ND	210	ug/kg	
11096-82-5	Aroclor 1260 [b]	704	210	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	89%		40-150%
2051-24-3	Decachlorobiphenyl	92%		30-160%

(a) All hits confirmed by dual column analysis.
(b) PCB pattern appears to be weathered.

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	CEF-P44-SS-306-01		
Lab Sample ID:	F5389-6	**Date Sampled:**	11/30/99
Matrix:	SO - Soil	**Date Received:**	12/01/99
Method:	SW846 8082	**Percent Solids:**	78.0
Project:	NAS Cecil Field-PSC44		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB11483.D	1	12/08/99	SKW	12/08/99	OP1135	GAB434
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	43	ug/kg	
11104-28-2	Aroclor 1221	ND	43	ug/kg	
11141-16-5	Aroclor 1232	ND	43	ug/kg	
53469-21-9	Aroclor 1242	ND	43	ug/kg	
12672-29-6	Aroclor 1248	ND	43	ug/kg	
11097-69-1	Aroclor 1254	ND	43	ug/kg	
11096-82-5	Aroclor 1260	72.9	43	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	100%		40-150%
2051-24-3	Decachlorobiphenyl	84%		30-160%

(a) All hits confirmed by dual column analysis.

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	CEF-P44-SS-307-02		
Lab Sample ID:	F5389-7	**Date Sampled:**	11/30/99
Matrix:	SO - Soil	**Date Received:**	12/01/99
Method:	SW846 8082	**Percent Solids:**	81.8
Project:	NAS Cecil Field-PSC44		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB11486.D	1	12/08/99	SKW	12/08/99	OP1135	GAB434
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	41	ug/kg	
11104-28-2	Aroclor 1221	ND	41	ug/kg	
11141-16-5	Aroclor 1232	ND	41	ug/kg	
53469-21-9	Aroclor 1242	ND	41	ug/kg	
12672-29-6	Aroclor 1248	ND	41	ug/kg	
11097-69-1	Aroclor 1254	ND	41	ug/kg	
11096-82-5	Aroclor 1260	ND	41	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	101%		40-150%
2051-24-3	Decachlorobiphenyl	86%		30-160%

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	CEF-P44-SS-DU05		
Lab Sample ID:	F5389-14	**Date Sampled:**	11/30/99
Matrix:	SO - Soil	**Date Received:**	12/01/99
Method:	SW846 8082	**Percent Solids:**	77.8
Project:	NAS Cecil Field-PSC44		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB11497.D	1	12/09/99	SKW	12/08/99	OP1135	GAB434
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	43	ug/kg	
11104-28-2	Aroclor 1221	ND	43	ug/kg	
11141-16-5	Aroclor 1232	ND	43	ug/kg	
53469-21-9	Aroclor 1242	ND	43	ug/kg	
12672-29-6	Aroclor 1248	ND	43	ug/kg	
11097-69-1	Aroclor 1254	ND	43	ug/kg	
11096-82-5	Aroclor 1260 [b]	147	43	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	82%		40-150%
2051-24-3	Decachlorobiphenyl	76%		30-160%

(a) All hits confirmed by dual column analysis.
(b) PCB pattern appears to be weathered.

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	CEF-P44-SS-DU06		
Lab Sample ID:	F5389-15	**Date Sampled:**	11/30/99
Matrix:	SO - Soil	**Date Received:**	12/01/99
Method:	SW846 8082	**Percent Solids:**	83.1
Project:	NAS Cecil Field-PSC44		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB11498.D	1	12/09/99	SKW	12/08/99	OP1135	GAB434
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	40	ug/kg	
11104-28-2	Aroclor 1221	ND	40	ug/kg	
11141-16-5	Aroclor 1232	ND	40	ug/kg	
53469-21-9	Aroclor 1242	ND	40	ug/kg	
12672-29-6	Aroclor 1248	ND	40	ug/kg	
11097-69-1	Aroclor 1254	ND	40	ug/kg	
11096-82-5	Aroclor 1260	ND	40	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	85%		40-150%
2051-24-3	Decachlorobiphenyl	77%		30-160%

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

000018

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SU-308-04		
Lab Sample ID:	F5389-8	**Date Sampled:**	11/30/99
Matrix:	SO - Soil	**Date Received:**	12/01/99
Method:	SW846 8082	**Percent Solids:**	81.0
Project:	NAS Cecil Field-PSC44		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB11519.D	4	12/09/99	SKW	12/08/99	OP1135	GAB435
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	160	ug/kg	
11104-28-2	Aroclor 1221	ND	160	ug/kg	
11141-16-5	Aroclor 1232	ND	160	ug/kg	
53469-21-9	Aroclor 1242	ND	160	ug/kg	
12672-29-6	Aroclor 1248	ND	160	ug/kg	
11097-69-1	Aroclor 1254	ND	160	ug/kg	
11096-82-5	Aroclor 1260	472	160	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	85%		40-150%
2051-24-3	Decachlorobiphenyl	87%		30-160%

(a) All hits confirmed by dual column analysis.

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	CEF-P44-SU-309-04		
Lab Sample ID:	F5389-9	**Date Sampled:**	11/30/99
Matrix:	SO - Soil	**Date Received:**	12/01/99
Method:	SW846 8082	**Percent Solids:**	84.0
Project:	NAS Cecil Field-PSC44		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB11520.D	1	12/09/99	SKW	12/08/99	OP1135	GAB435
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	40	ug/kg	
11104-28-2	Aroclor 1221	ND	40	ug/kg	
11141-16-5	Aroclor 1232	ND	40	ug/kg	
53469-21-9	Aroclor 1242	ND	40	ug/kg	
12672-29-6	Aroclor 1248	ND	40	ug/kg	
11097-69-1	Aroclor 1254	ND	40	ug/kg	
11096-82-5	Aroclor 1260	50.6	40	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	110%		40-150%
2051-24-3	Decachlorobiphenyl	92%		30-160%

(a) All hits confirmed by dual column analysis.

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	CEF-P44-SU-310-02		
Lab Sample ID:	F5389-10	**Date Sampled:**	11/30/99
Matrix:	SO - Soil	**Date Received:**	12/01/99
Method:	SW846 8082	**Percent Solids:**	78.1
Project:	NAS Cecil Field-PSC44		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB11521.D	4	12/09/99	SKW	12/08/99	OP1135	GAB435
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	170	ug/kg	
11104-28-2	Aroclor 1221	ND	170	ug/kg	
11141-16-5	Aroclor 1232	ND	170	ug/kg	
53469-21-9	Aroclor 1242	ND	170	ug/kg	
12672-29-6	Aroclor 1248	ND	170	ug/kg	
11097-69-1	Aroclor 1254	ND	170	ug/kg	
11096-82-5	Aroclor 1260	503	170	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	67%		40-150%
2051-24-3	Decachlorobiphenyl	79%		30-160%

(a) All hits confirmed by dual column analysis.

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	CEF-P44-SU-311-03		
Lab Sample ID:	F5389-11	**Date Sampled:**	11/30/99
Matrix:	SO - Soil	**Date Received:**	12/01/99
Method:	SW846 8082	**Percent Solids:**	80.2
Project:	NAS Cecil Field-PSC44		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB11522.D	5	12/09/99	SKW	12/08/99	OP1135	GAB435
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	210	ug/kg	
11104-28-2	Aroclor 1221	ND	210	ug/kg	
11141-16-5	Aroclor 1232	ND	210	ug/kg	
53469-21-9	Aroclor 1242	ND	210	ug/kg	
12672-29-6	Aroclor 1248	ND	210	ug/kg	
11097-69-1	Aroclor 1254	ND	210	ug/kg	
11096-82-5	Aroclor 1260	1140	210	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	85%		40-150%
2051-24-3	Decachlorobiphenyl	88%		30-160%

(a) All hits confirmed by dual column analysis.

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	CEF-P44-SU-312-03		
Lab Sample ID:	F5389-12	**Date Sampled:**	11/30/99
Matrix:	SO - Soil	**Date Received:**	12/01/99
Method:	SW846 8082	**Percent Solids:**	76.3
Project:	NAS Cecil Field-PSC44		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB11495.D	1	12/09/99	SKW	12/08/99	OP1135	GAB434
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	44	ug/kg	
11104-28-2	Aroclor 1221	ND	44	ug/kg	
11141-16-5	Aroclor 1232	ND	44	ug/kg	
53469-21-9	Aroclor 1242	ND	44	ug/kg	
12672-29-6	Aroclor 1248	ND	44	ug/kg	
11097-69-1	Aroclor 1254	ND	44	ug/kg	
11096-82-5	Aroclor 1260	ND	44	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	81%		40-150%
2051-24-3	Decachlorobiphenyl	71%		30-160%

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	CEF-P44-SU-313-03		
Lab Sample ID:	F5389-13	**Date Sampled:**	11/30/99
Matrix:	SO - Soil	**Date Received:**	12/01/99
Method:	SW846 8082	**Percent Solids:**	75.3
Project:	NAS Cecil Field-PSC44		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB11496.D	1	12/09/99	SKW	12/08/99	OP1135	GAB434
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	44	ug/kg	
11104-28-2	Aroclor 1221	ND	44	ug/kg	
11141-16-5	Aroclor 1232	ND	44	ug/kg	
53469-21-9	Aroclor 1242	ND	44	ug/kg	
12672-29-6	Aroclor 1248	ND	44	ug/kg	
11097-69-1	Aroclor 1254	ND	44	ug/kg	
11096-82-5	Aroclor 1260	58.7	44	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	77%		40-150%
2051-24-3	Decachlorobiphenyl	67%		30-160%

(a) All hits confirmed by dual column analysis.

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

000016

PHASE V ANALYTICAL RESULTS

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-02-0-067

TO: **MR. M. SPERANZA** **DATE: FEBRUARY 28, 1999**

FROM: **JUSTIN ORBICH** **CC: DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION – PEST/PCB**
CTO 078 – NAS CECIL FIELD
SDG F5708

SAMPLES: 6/Soil

CEF-P44-SS-401-01	CEF-P44-SS-402-01
CEF-P44-SU-403-03	CEF-P44-SU-404-04
CEF-P44-SU-405-04	CEF-P44-SU-DU07

OVERVIEW

The sample set for CTO 078, SDG F5708 Naval Air Station (NAS) Cecil Field; Florida consists of six (6) soil environmental samples. The samples were analyzed for Target Compound List (TCL) pesticide/PCB organic compounds. One (1) field duplicate pair (CEF-P44-SU-405-04/CEF-P44-SU-DU07) was included within this SDG.

The samples were collected by Tetra Tech, NUS on January 21st, 2000 and analyzed by Accutest Laboratories. All analyses were performed in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria and analyzed according to SW 846 Method 8081A and 8082 analytical and reporting protocols. The data in this SDG was validated with regard to the following parameters:

- * Data Completeness
- * Holding Times
- * Initial/continuing calibrations
- * Laboratory method/field quality control blank results
- * Detection Limits
- Field Duplicate Precision

The symbol (*) indicates that all quality control criteria were met for this parameter. Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified analytical results are presented in Appendix A.

PESTICIDE/PCB FRACTION

The field duplicate pair (CEF-P44-SU-405-04/CEF-P44-SU-DU07) Relative Percent Difference (RPD) exceeded the 50% quality control limit for AROCLOR-1260. The positive result was qualified as estimated (J).

Sample CEF-P44-SS-402-01 was analyzed at a 4X dilution thus causing elevated reporting limits.

Sample CEF-P44-SU-405-04 was analyzed at a 2X dilution thus causing elevated reporting limits.

MEMO TO: MR. M. SPERANZA
DATE: FEBRUARY 13, 2000 – PAGE 2

ADDITIONAL COMMENTS

Positive results reported below the RL are qualified as estimated (J).

EXECUTIVE SUMMARY

Laboratory performance: None.

Other Factors Affecting Data Quality: Several samples were analyzed at a dilution.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (February, 1994), and the NFESC "Navy Installation Restoration Program Laboratory Quality Assurance Guide" (February, 1996). The text of this report has been formulated to address only those problems affecting data quality.

"I attest that the data referenced herein was validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Justin Orbich

Chemist/Data Validator
Tetra Tech, NUS

Joseph A. Samchuck

Data Validation Quality Assurance Officer
Tetra Tech, NUS

Attachments:
1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

DATA QUALIFIER DEFINITIONS:

U - Value is a nondetected result as reported by the laboratory and should not be considered present.

J - Positive result is estimated as a result of a value below the CRQL or a technical noncompliance.

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCB D% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = % Solid content is less than 30%

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F5708

SAMPLE NUMBER:	CEF-P44-SS-401-01			CEF-P44-SS-402-01			CEF-P44-SU-403-03			CEF-P44-SU-404-04		
SAMPLE DATE:	01/21/00			01/21/00			01/21/00			01/21/00		
LABORATORY ID:	F5708-1			F5708-2			F5708-4			F5708-3		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	86.4 %			88.8 %			74.4 %			83.4 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
AROCLOR-1016	38	U		150	U		45	U		40	U	
AROCLOR-1221	38	U		150	U		45	U		40	U	
AROCLOR-1232	38	U		150	U		45	U		40	U	
AROCLOR-1242	38	U		150	U		45	U		40	U	
AROCLOR-1248	38	U		150	U		45	U		40	U	
AROCLOR-1254	70	J	P	150	U		45	U		40	U	
AROCLOR-1260	53.2	J	P	953			45	U		40	U	

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F5708

SAMPLE NUMBER:	CEF-P44-SU-405-04	CEF-P44-SU-DU07		
SAMPLE DATE:	01/21/00	01/21/00	/ /	/ /
LABORATORY ID:	F5708-5	F5708-6		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	73.7 %	74.3 %	100.0 %	100.0 %
UNITS:	UG/KG	UG/KG		
FIELD DUPLICATE OF:		CEF-P44-SU-405-04		

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
AROCLOR-1016	90	U		45	U							
AROCLOR-1221	90	U		45	U							
AROCLOR-1232	90	U		45	U							
AROCLOR-1242	90	U		45	U							
AROCLOR-1248	90	U		45	U							
AROCLOR-1254	90	U		45	U							
AROCLOR-1260	413	J	G	98.6	J	G						

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-401-01		
Lab Sample ID:	F5708-1	**Date Sampled:**	01/21/00
Matrix:	SO - Soil	**Date Received:**	01/24/00
Method:	SW846 8082	**Percent Solids:**	86.4
Project:	NAS Cecil Field-PSC44 PO#N0039-P98655A-01		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB12127.D	1	02/03/00	SKW	01/31/00	OP1253	GAB457
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	38	ug/kg	
11104-28-2	Aroclor 1221	ND	38	ug/kg	
11141-16-5	Aroclor 1232	ND	38	ug/kg	
53469-21-9	Aroclor 1242	ND	38	ug/kg	
12672-29-6	Aroclor 1248	ND	38	ug/kg	
11097-69-1	Aroclor 1254 [b]	70.0	38	ug/kg	J
11096-82-5	Aroclor 1260 [b]	53.2	38	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	112%		50-144%
2051-24-3	Decachlorobiphenyl	143%		10-180%

(a) All hits confirmed by dual column analysis.
(b) Estimated value due to the presence of multiple Arochlor patterns.

000002

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-402-01		
Lab Sample ID:	F5708-2	**Date Sampled:**	01/21/00
Matrix:	SO - Soil	**Date Received:**	01/24/00
Method:	SW846 8082	**Percent Solids:**	88.8
Project:	NAS Cecil Field-PSC44 PO#N0039-P98655A-01		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB12128.D	4	02/03/00	SKW	01/31/00	OP1253	GAB457
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	150	ug/kg	
11104-28-2	Aroclor 1221	ND	150	ug/kg	
11141-16-5	Aroclor 1232	ND	150	ug/kg	
53469-21-9	Aroclor 1242	ND	150	ug/kg	
12672-29-6	Aroclor 1248	ND	150	ug/kg	
11097-69-1	Aroclor 1254	ND	150	ug/kg	
11096-82-5	Aroclor 1260 [b]	953	150	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	95%		50-144%
2051-24-3	Decachlorobiphenyl	135%		10-180%

(a) All hits confirmed by dual column analysis.
(b) PCB pattern appears to be weathered.

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SU-403-03		
Lab Sample ID:	F5708-4	**Date Sampled:**	01/21/00
Matrix:	SO - Soil	**Date Received:**	01/24/00
Method:	SW846 8082	**Percent Solids:**	74.4
Project:	NAS Cecil Field-PSC44 PO#N0039-P98655A-01		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB12130.D	1	02/03/00	SKW	01/31/00	OP1253	GAB457
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	45	ug/kg	
11104-28-2	Aroclor 1221	ND	45	ug/kg	
11141-16-5	Aroclor 1232	ND	45	ug/kg	
53469-21-9	Aroclor 1242	ND	45	ug/kg	
12672-29-6	Aroclor 1248	ND	45	ug/kg	
11097-69-1	Aroclor 1254	ND	45	ug/kg	
11096-82-5	Aroclor 1260	ND	45	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	113%		50-144%
2051-24-3	Decachlorobiphenyl	126%		10-180%

000005

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SU-404-04		
Lab Sample ID:	F5708-3	**Date Sampled:**	01/21/00
Matrix:	SO - Soil	**Date Received:**	01/24/00
Method:	SW846 8082	**Percent Solids:**	83.4
Project:	NAS Cecil Field-PSC44 PO#N0039-P98655A-01		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB12129.D	1	02/03/00	SKW	01/31/00	OP1253	GAB457
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	40	ug/kg	
11104-28-2	Aroclor 1221	ND	40	ug/kg	
11141-16-5	Aroclor 1232	ND	40	ug/kg	
53469-21-9	Aroclor 1242	ND	40	ug/kg	
12672-29-6	Aroclor 1248	ND	40	ug/kg	
11097-69-1	Aroclor 1254	ND	40	ug/kg	
11096-82-5	Aroclor 1260	ND	40	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	111%		50-144%
2051-24-3	Decachlorobiphenyl	128%		10-180%

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SU-405-04		
Lab Sample ID:	F5708-5	**Date Sampled:**	01/21/00
Matrix:	SO - Soil	**Date Received:**	01/24/00
Method:	SW846 8082	**Percent Solids:**	73.7
Project:	NAS Cecil Field-PSC44 PO#N0039-P98655A-01		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB12131.D	2	02/03/00	SKW	01/31/00	OP1253	GAB457
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	90	ug/kg	
11104-28-2	Aroclor 1221	ND	90	ug/kg	
11141-16-5	Aroclor 1232	ND	90	ug/kg	
53469-21-9	Aroclor 1242	ND	90	ug/kg	
12672-29-6	Aroclor 1248	ND	90	ug/kg	
11097-69-1	Aroclor 1254	ND	90	ug/kg	
11096-82-5	Aroclor 1260 [b]	413	90	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	95%		50-144%
2051-24-3	Decachlorobiphenyl	120%		10-180%

(a) All hits confirmed by dual column analysis.
(b) PCB pattern appears to be weathered.

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SU-DU07		
Lab Sample ID:	F5708-6	**Date Sampled:**	01/21/00
Matrix:	SO - Soil	**Date Received:**	01/24/00
Method:	SW846 8082	**Percent Solids:**	74.3
Project:	NAS Cecil Field-PSC44 PO#N0039-P98655A-01		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB12134.D	1	02/03/00	SKW	01/31/00	OP1253	GAB457
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	45	ug/kg	
11104-28-2	Aroclor 1221	ND	45	ug/kg	
11141-16-5	Aroclor 1232	ND	45	ug/kg	
53469-21-9	Aroclor 1242	ND	45	ug/kg	
12672-29-6	Aroclor 1248	ND	45	ug/kg	
11097-69-1	Aroclor 1254	ND	45	ug/kg	
11096-82-5	Aroclor 1260	98.6	45	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	108%		50-144%
2051-24-3	Decachlorobiphenyl	117%		10-180%

(a) All hits confirmed by dual column analysis.

000007

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

PHASE VI ANALYTICAL RESULTS

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**M. SPERANZA**	**DATE:**	**MARCH 6, 2000**
FROM:	**GRETCHEN PHIPPS**	**COPIES:**	**DV FILE**
SUBJECT:	**ORGANIC DATA VALIDATION – PCBs** **CTO 078 - NAS, CECIL FIELD** **SDG – F5878**		
SAMPLES:	3/Soils/		

CEF-P44-SS-501-01 CEF-P44-SS-502-01
CEF-P44-SS-DU08

Overview

The sample set for CTO 078, NAS Cecil Field, SDG F5878, consists of three (3) soil environmental samples. One (1) unidentified duplicate sample (CEF-P44-SS-DU08) was included within this SDG.

All samples were analyzed for PCBs. The samples were collected by Tetra Tech NUS on February 11, 2000 and analyzed by Accutest Laboratory. PCB analyses were conducted using SW 846 method 8082.

The data was evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
* • Calibration Verifications
* • Laboratory Blank Analyses
* • Detection Limits

* - All quality control criteria were met for this parameter.

Other Factors Affecting Data Quality

Aroclor 1254 and Aroclor 1260 were qualified as estimated, "J", by the laboratory due to multiple Aroclor patterns.

Executive Summary

Laboratory Performance: None.

Other Factors Affecting Data Quality: Aroclor 1254 and Aroclor 1260 were qualified as estimated, "J", by the laboratory due to multiple Aroclor patterns.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Review", February 1994 and the NFESC document entitles "Navy Installation Restoration Laboratory Quality Assurance Guide." (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Gretchen A Phipps

Tetra Tech NUS
Gretchen A. Phipps

Tetra Tech NUS
Joseph A. Samchuck
Quality Control Officer

Attachments:

1. Appendix A - Qualified Analytical Data
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCD% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F5878

SAMPLE NUMBER:	CEF-P44-SS-501-01			CEF-P44-SS-502-01			CEF-P44-SS-DU08			/ /		
SAMPLE DATE:	02/11/00			02/11/00			02/11/00					
LABORATORY ID:	F5878-1			F5878-2			F5878-3					
QC_TYPE:	NORMAL			NORMAL			NORMAL					
% SOLIDS:	92.9 %			80.2 %			92.1 %			100.0 %		
UNITS:	UG/KG			UG/KG			UG/KG					
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
AROCLOR-1016	36	U		42	U		36	U				
AROCLOR-1221	36	U		42	U		36	U				
AROCLOR-1232	36	U		42	U		36	U				
AROCLOR-1242	36	U		42	U		36	U				
AROCLOR-1248	36	U		42	U		36	U				
AROCLOR-1254	68.2	J	Q	67.9	J	Q	80.5	J	Q			
AROCLOR-1260	82.1	J	Q	92.5	J	Q	89.2	J	Q			

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-501-01		
Lab Sample ID:	F5878-1	**Date Sampled:**	02/11/00
Matrix:	SO - Soil	**Date Received:**	02/12/00
Method:	SW846 8082	**Percent Solids:**	92.9
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB12336.D	1	02/16/00	SKW	02/15/00	OP1299	GAB466
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	36	ug/kg	
11104-28-2	Aroclor 1221	ND	36	ug/kg	
11141-16-5	Aroclor 1232	ND	36	ug/kg	
53469-21-9	Aroclor 1242	ND	36	ug/kg	
12672-29-6	Aroclor 1248	ND	36	ug/kg	
11097-69-1	Aroclor 1254 [b]	68.2	36	ug/kg	J
11096-82-5	Aroclor 1260 [b]	82.1	36	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	104%		50-144%
2051-24-3	Decachlorobiphenyl	131%		10-180%

(a) All hits confirmed by dual column analysis.
(b) Estimated value due to the presence of multiple Arochlor patterns.

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-502-01		
Lab Sample ID:	F5878-2	**Date Sampled:**	02/11/00
Matrix:	SO - Soil	**Date Received:**	02/12/00
Method:	SW846 8082	**Percent Solids:**	80.2
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB12337.D	1	02/16/00	SKW	02/15/00	OP1299	GAB466
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	42	ug/kg	
11104-28-2	Aroclor 1221	ND	42	ug/kg	
11141-16-5	Aroclor 1232	ND	42	ug/kg	
53469-21-9	Aroclor 1242	ND	42	ug/kg	
12672-29-6	Aroclor 1248	ND	42	ug/kg	
11097-69-1	Aroclor 1254 [b]	67.9	42	ug/kg	J
11096-82-5	Aroclor 1260 [b]	92.5	42	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	104%		50-144%
2051-24-3	Decachlorobiphenyl	139%		10-180%

(a) All hits confirmed by dual column analysis.
(b) Estimated value due to the presence of multiple Arochlor patterns.

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-DU08		
Lab Sample ID:	F5878-3	**Date Sampled:**	02/11/00
Matrix:	SO - Soil	**Date Received:**	02/12/00
Method:	SW846 8082	**Percent Solids:**	92.1
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AB12349.D	1	02/16/00	SKW	02/15/00	OP1299	GAB466
Run #2							

PCB List

CAS No.	Compound	Result	RL	Units	Q
12674-11-2	Aroclor 1016	ND	36	ug/kg	
11104-28-2	Aroclor 1221	ND	36	ug/kg	
11141-16-5	Aroclor 1232	ND	36	ug/kg	
53469-21-9	Aroclor 1242	ND	36	ug/kg	
12672-29-6	Aroclor 1248	ND	36	ug/kg	
11097-69-1	Aroclor 1254 [b]	80.5	36	ug/kg	J
11096-82-5	Aroclor 1260 [b]	89.2	36	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	100%		50-144%
2051-24-3	Decachlorobiphenyl	129%		10-180%

(a) All hits confirmed by dual column analysis.
(b) Estimated value due to the presence of multiple Arochlor patterns.

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

PHASE VII ANALYTICAL RESULTS

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**M. SPERANZA**	**DATE:**	**APRIL 25, 2000**
FROM:	**GRETCHEN PHIPPS**	**COPIES:**	**DV FILE**
SUBJECT:	**INORGANIC DATA VALIDATION – MERCURY** **CTO 078 - CECIL FIELD** **SDG – F6218**		
SAMPLES:	2/Soil/		
	CEF-P44-SS-601-01	CEF-P44-SS-DU09	

Overview

The sample set for CTO 078, Cecil Field, SDG F6218, consists of two (2) soil environmental samples. One (1) field duplicate pair was included within this SDG.

The samples were analyzed for mercury. The samples were collected by Tetra Tech NUS on April 5, 2000 and analyzed by Accutest Laboratory. Mercury analyses were conducted using SW 846 method 7071A.

The data was evaluated based on the following parameters:

- * Data Completeness
- * Holding Times
- * Calibration Verifications
- Laboratory Blank Analyses
- * Field Duplicate Precision

* - All quality control criteria were met for this parameter.

Laboratory Blank Analyses

The following contaminant was present in a laboratory method / preparation blanks at the following maximum concentration:

Affected samples: All

Analyte	Maximum Concentration	Action Level(soil)
Mercury	0.17µg/L	0.14 mg/kg

An action level of 5X the maximum concentration has been used to evaluate the sample data for blank contamination. Sample aliquot, percent solids and dilution factors were taken into consideration when determining blank contamination. Positive results less than the blank action level for mercury were qualified, "U", as a result of blank contamination.

Executive Summary

Laboratory Performance: Mercury was present in the laboratory method / preparation blanks.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Review", February 1994 and the NFESC document entitles "Navy Installation Restoration Laboratory Quality Assurance Guide." (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Gretchen A. Phipps

Tetra Tech NUS
Gretchen A. Phipps

Tetra Tech NUS
Joseph A. Samchuck
Quality Control Officer

Attachments:

1. Appendix A - Qualified Analytical Data
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCD% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop

CTO078-NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F6218

SAMPLE NUMBER:	CEF-P44-SS-601-01			CEF-P44-SS-DU09								
SAMPLE DATE:	04/05/00			04/05/00			/ /			/ /		
LABORATORY ID:	F6218-1			F6218-2								
QC_TYPE:	NORMAL			NORMAL								
% SOLIDS:	91.9 %			92.5 %			100.0 %			100.0 %		
UNITS:	MG/KG			MG/KG								
FIELD DUPLICATE OF:				CEF-P44-SS-601-01								
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
MERCURY	0.09	U	A	0.10	U	A						

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-601-01		
Lab Sample ID:	F6218-1	**Date Sampled:**	04/05/00
Matrix:	SO - Soil	**Date Received:**	04/06/00
		Percent Solids:	91.9
Project:	NAS Cecil Field-PSC44		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Mercury	0.09 B	0.18	mg/kg	1	04/10/00	04/11/00	JK	SW846 7471A

RL = Reporting Limit

000003

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-DU09		
Lab Sample ID:	F6218-2	**Date Sampled:**	04/05/00
Matrix:	SO - Soil	**Date Received:**	04/06/00
		Percent Solids:	92.5
Project:	NAS Cecil Field-PSC44		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Mercury	0.10 B	0.16	mg/kg	1	04/10/00	04/11/00	JK	SW846 7471A

RL = Reporting Limit

000005

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-04-0-057

TO: **MARK SPERANZA** **DATE: APRIL 27, 2000**

FROM: **JUSTIN ORBICH** **CC: DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION – PEST**
CTO 078 – NAS CECIL FIELD
SDG F6218

SAMPLES: 2/Surface Soil

CEF-P44-SS-601-01 CEF-P44-SS-DU09

OVERVIEW

The sample set for CTO 078, SDG F6218 Naval Air Station (NAS) Cecil Field; Florida consists of two (2) surface soil environmental sample. The sample was analyzed for Target Compound List (TCL) pesticide organic compounds. One (1) field duplicate (CEF-P44-SS-601-01/CEF-P44-SS-DU09) was included within this SDG.

The sample was collected by Tetra Tech, NUS on April 5th, 2000 and analyzed by Accutest Laboratories. All analyses were performed in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria and analyzed according to SW 846 Method 8081A analytical and reporting protocols. The data in this SDG was validated with regard to the following parameters:

* • Data Completeness
* • Holding Times
* • Initial/continuing calibrations
* • Laboratory method/field quality control blank results
* • Field Duplicate Precision
* • Detection Limits

The symbol (*) indicates that all quality control criteria were met for this parameter. Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified analytical results are presented in Appendix A.

PESTICIDE FRACTION

Samples CEF-P44-SS-601-01 and CEF-P44-SS-DU09 were analyzed at an 8X dilution thus causing elevated reporting limits.

MEMO TO: MARK SPERANZA
DATE: APRIL 27, 2000 – PAGE 2

EXECUTIVE SUMMARY

Laboratory performance: None.

Other Factors Affecting Data Quality: Several samples were analyzed at an 8X dilution.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (October, 1999), and the NFESC guidelines "Navy Installation Restoration Program Laboratory Quality Assurance Guide" (February, 1996). The text of this report has been formulated to address only those problems affecting data quality.

"I attest that the data referenced herein was validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Justin Orbich

Chemist/Data Validator
Tetra Tech, NUS

Joseph A. Samchuck

Data Validation Quality Assurance Officer
Tetra Tech, NUS

Attachments:
1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

DATA QUALIFIER DEFINITIONS:

U - Value is a nondetected result as reported by the laboratory and should not be considered present.

J - Positive result is estimated as a result of a value below the CRQL or a technical noncompliance.

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCB D% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = % Solid content is less than 30%

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F6218

SAMPLE NUMBER:	CEF-P44-SS-601-01			CEF-P44-SS-DU09								
SAMPLE DATE:	04/05/00			04/05/00			/ /			/ /		
LABORATORY ID:	F6218-1			F6218-2								
QC_TYPE:	NORMAL			NORMAL								
% SOLIDS:	91.9 %			92.5 %			100.0 %			100.0 %		
UNITS:	UG/KG			UG/KG								
FIELD DUPLICATE OF:				CEF-P44-SS-601-01								
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	29	U		29	U							
4,4'-DDE	29	U		29	U							
4,4'-DDT	29	U		29	U							
ALDRIN	14	U		14	U							
ALPHA-BHC	14	U		14	U							
ALPHA-CHLORDANE	29	U		29	U							
BETA-BHC	14	U		14	U							
DELTA-BHC	14	U		14	U							
DIELDRIN	14	U		14	U							
ENDOSULFAN I	14	U		14	U							
ENDOSULFAN II	29	U		29	U							
ENDOSULFAN SULFATE	29	U		29	U							
ENDRIN	29	U		29	U							
ENDRIN ALDEHYDE	29	U		29	U							
ENDRIN KETONE	29	U		29	U							
GAMMA-BHC (LINDANE)	14	U		14	U							
GAMMA-CHLORDANE	29	U		29	U							
HEPTACHLOR	14	U		14	U							
HEPTACHLOR EPOXIDE	14	U		14	U							
METHOXYCHLOR	58	U		58	U							
TOXAPHENE	1400	U		1400	U							

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-601-01		
Lab Sample ID:	F6218-1	**Date Sampled:**	04/05/00
Matrix:	SO - Soil	**Date Received:**	04/06/00
Method:	SW846 3550B/8081A	**Percent Solids:**	91.9
Project:	NAS Cecil Field-PSC44		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	ST04188.D	8	04/10/00	SKW	04/09/00	OP1437	GST154
Run #2							

Pesticide TCL List

CAS No.	Compound	Result	RL	Units	Q
309-00-2	Aldrin	ND	14	ug/kg	
319-84-6	alpha-BHC	ND	14	ug/kg	
319-85-7	beta-BHC	ND	14	ug/kg	
319-86-8	delta-BHC	ND	14	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	14	ug/kg	
5103-71-9	alpha-Chlordane	ND	29	ug/kg	
5103-74-2	gamma-Chlordane	ND	29	ug/kg	
60-57-1	Dieldrin	ND	14	ug/kg	
72-54-8	4,4'-DDD	ND	29	ug/kg	
72-55-9	4,4'-DDE	ND	29	ug/kg	
50-29-3	4,4'-DDT	ND	29	ug/kg	
72-20-8	Endrin	ND	29	ug/kg	
1031-07-8	Endosulfan sulfate	ND	29	ug/kg	
7421-93-4	Endrin aldehyde	ND	29	ug/kg	
53494-70-5	Endrin ketone	ND	29	ug/kg	
959-98-8	Endosulfan-I	ND	14	ug/kg	
33213-65-9	Endosulfan-II	ND	29	ug/kg	
76-44-8	Heptachlor	ND	14	ug/kg	
1024-57-3	Heptachlor epoxide	ND	14	ug/kg	
72-43-5	Methoxychlor	ND	58	ug/kg	
8001-35-2	Toxaphene	ND	1400	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	96%		50-144%
2051-24-3	Decachlorobiphenyl	107%		10-180%

(a) Dilution required due to matrix interference.

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

000002

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P44-SS-DU09		
Lab Sample ID:	F6218-2	**Date Sampled:**	04/05/00
Matrix:	SO - Soil	**Date Received:**	04/06/00
Method:	SW846 3550B/8081A	**Percent Solids:**	92.5
Project:	NAS Cecil Field-PSC44		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	ST04191.D	8	04/10/00	SKW	04/09/00	OP1437	GST154
Run #2							

Pesticide TCL List

CAS No.	Compound	Result	RL	Units	Q
309-00-2	Aldrin	ND	14	ug/kg	
319-84-6	alpha-BHC	ND	14	ug/kg	
319-85-7	beta-BHC	ND	14	ug/kg	
319-86-8	delta-BHC	ND	14	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	14	ug/kg	
5103-71-9	alpha-Chlordane	ND	29	ug/kg	
5103-74-2	gamma-Chlordane	ND	29	ug/kg	
60-57-1	Dieldrin	ND	14	ug/kg	
72-54-8	4,4'-DDD	ND	29	ug/kg	
72-55-9	4,4'-DDE	ND	29	ug/kg	
50-29-3	4,4'-DDT	ND	29	ug/kg	
72-20-8	Endrin	ND	29	ug/kg	
1031-07-8	Endosulfan sulfate	ND	29	ug/kg	
7421-93-4	Endrin aldehyde	ND	29	ug/kg	
53494-70-5	Endrin ketone	ND	29	ug/kg	
959-98-8	Endosulfan-I	ND	14	ug/kg	
33213-65-9	Endosulfan-II	ND	29	ug/kg	
76-44-8	Heptachlor	ND	14	ug/kg	
1024-57-3	Heptachlor epoxide	ND	14	ug/kg	
72-43-5	Methoxychlor	ND	58	ug/kg	
8001-35-2	Toxaphene	ND	1400	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	101%		50-144%
2051-24-3	Decachlorobiphenyl	87%		10-180%

(a) Dilution required due to matrix interference.

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

APPENDIX B

ECOLOGICAL RISK ASSESSMENT

B.1 FOOD CHAIN MODELING

B.2 ALTERNATE BENCH MARKS/TOXICITY DATA

B.1 FOOD CHAIN MODELING

APPENDIX B.1
FOOD CHAIN MODELING

Food chain modeling was conducted as part of COPC refinement. The objective of the food chain modeling was to investigate potential risks to representative receptors from screening-level COPCs that are known to bioaccumulate or biomagnify (U.S. EPA, 2000a). Toxicity reference values (TRVs), which are contaminant doses associated with adverse effects on growth, survival, and reproduction, were obtained for comparison to doses that the receptors may receive in the environment. TRVs were preferentially selected that represent a threshold for sublethal effects, such as impairment of reproduction or growth. Since toxicity data for the specific receptors chosen herein were not available, toxicity data from laboratory species were extrapolated to receptor species. The TRVs were obtained from wildlife toxicity data that were summarized by Sample et al. (1996). TRVs used in this ecological risk assessment and their sources are presented in Table B-1.

Food chain modeling was limited to COPCs that are known to bioaccumulate or biomagnify (U.S. EPA, 2000a). U.S. EPA Region IV considers chemicals in this category to consist of those so designated in U.S. EPA's (2000b) *Appendix to Bioaccumulation Testing and Interpretation for the Purpose of Sediment Quality Assessment, Status and Needs, Chemical-Specific Summary Tables*, with the exception of PAHs. U.S. EPA Region IV does not consider PAHs to bioaccumulate unless they are present in percent levels in the soil or sediment. COPCs at Site 44 that are known to bioaccumulate or biomagnify consist of pesticides, PCBs, and metals. The remaining COPCs are not known to bioaccumulate or biomagnify and were not included in the food chain model.

REPRESENTATIVE RECEPTORS

Representative ecological receptors used in the food chain model for Site 44 consisted of the least Shrew (*Cryptotis parva*), Northern mockingbird (*Mimus polyglottus*), raccoon (*Procyon lotor*) and belted kingfisher (*Ceryle alcyon*), all of which are found at NAS Cecil Field and could forage at Site 44. Information regarding these representative receptors is presented below and in Table B-2.

Least shrew (Cryptotis parva)

The least shrew inhabits pine flatwoods and other habitats in Florida (Abrahamson and Hartnett, 1990; Brown, 1997), and is expected to be present at Site 44. It weighs about 3.5 to 6.5 g (Choate et al, 1994). This species uses runways and burrows of other animals, but also makes its own tunnels in loose, soft soils. Least shrews consume large numbers of insects and other invertebrates, and are food items for predators such as owls, hawks, weasels, and skunks (Brown, 1997). Using Nagy's (1987) equation for

mammals, the expected food consumption of the least shrew is 0.954 g dry mass/day. This equates to 3.3 g fresh mass/day based on 71 percent moisture content in food items. The 71 percent moisture value is the average of moisture contents in earthworms (84 percent), crickets and grasshoppers (69 percent) and adult beetles (61 percent) (U.S. EPA, 1993). Home ranges for the least shrew usually vary from approximately 0.4-1.4 ha (1-3.5 acres) (Choate and Fleharty, 1973) but home ranges in some studies have been reported to be as small as 0.5 acre (Choate et al, 1994).

Northern Mockingbrid (*Mimus polyglottus*)

The northern mockingbird is a familiar songbird known to be present at Site 44. Mockingbirds in Florida are non-migratory and highly territorial throughout the year. Body mass averages 49 g (Derrickson and Breitwisch, 1992). The diet of adult mockingbirds is about 50 percent invertebrates (especially beetles, ants, bees, grasshoppers), and 50 percent fruit. The proportion of animal prey in the diet increases to approximately 85 percent during the breeding season and decreases in winter to approximately 13 percent (Derrickson and Breitwisch, 1992). Using Nagy's (1987) equation for passerine birds (commonly known as "song birds"), the expected food consumption for a mockingbird is 10.9 g dry mass/day. This equates to 37.6 g fresh mass/day based on 71 percent moisture content in food items. Average territory sizes of mockingbirds in south-central Florida varied from 0.31 ha (0.8 acres) in winter to 1.27 ha (3.1 acres) during the May and June breeding season (Derrickson and Breitwisch, 1992).

Raccoon (Procyon lotor)

The raccoon was selected as a representative mammalian that preys on aquatic organisms. The raccoon is found in a variety of habitats, and particularly in swamps, floodplain forests, and marshes. The raccoon is an opportunistic feeder that will consume terrestrial and aquatic plants and animals. Crustaceans are common forage items for raccoons while fish usually comprise less than 3 percent of the diet (U.S. EPA, 1993). Using Nagy's (1987) equation for mammals, the expected food consumption of the raccoon is 214 g dry mass/day. This equates to 856 g fresh mass/day based on 75 percent moisture content in food items (aquatic organisms). The size of a raccoon's home range depends on factors such as age, sex, habitat, food sources, and season. A literature review of several studies reported home ranges of up to 6,000 acres, although values of 200 to 600 acres were most common (U.S. EPA, 1993). Raccoon home ranges on a Georgia coastal island were 160 acres for males and 96 acres for females (Lotze, 1979).

Belted Kingfisher (*Ceryle alcyon*)

The kingfisher (*Ceryle alcyon*) was selected as a representative avian piscivore. The species is common in Florida and its range includes most of North America. Kingfishers are typically found along rivers, streams, seacoasts, estuaries, and along the edges of lakes and ponds. They prefer waters that are free

of thick vegetation that obscures the view of the water and water that is not completely overshadowed by trees. Fish are the preferred prey, commonly comprising about 90 to 95 percent of the diet, and are usually less than 18 cm in length. Kingfishers will also consume crustaceans and other aquatic organisms when fish are sparse. Based on a body weight of 136 g and a food ingestion rate of 0.5 g/g-day, the food ingestion rate for the kingfisher is calculated as 68 g/day. Breeding populations in Florida are non-migratory. The area within which kingfishers normally forage is variable, but most studies cited by U.S. EPA (1993) indicate that kingfishers typically forage along 1 to 2 kilometers (3,280 to 6,560 feet) of shoreline. Also, Fry & Fry (1992) estimated a foraging range of 8 Ha (20 acres) for the kingfisher.

Incidental ingestion of sediment was included in the dose equations for raccoon but was assumed to be negligible for the kingfisher. Incidental ingestion of sediment is negligible for birds of prey (Sample and Suter, 1994). Furthermore, the kingfisher captures prey primarily from the water column, rather than by probing on or near the sediment substrate, and probably ingests negligible amounts of sediment.

Exposure Estimate and Risk Calculation

The following equation presents the food chain model that was used for the mammals and birds that were selected for modeling:

$$CDI = \frac{[(Cf * If) + (Cs * Is) + (Cw * Iw)] * H}{BW}$$

where:

CDI	=	Chronic daily intake (mg/kg-day)
Cf	=	Contaminant concentration in food (earthworm or fish) (mg/kg)
If	=	Ingestion rate of food (kg/day)
Cs	=	Contaminant concentration in surface soil or sediment (mg/kg)
Is	=	Rate of incidental surface soil or sediment ingestion (kg/day)
Cw	=	Contaminant concentration in surface water (mg/L)
Iw	=	Ingestion rate of surface water (L/day)
H	=	Contaminated area/home range area (unitless)
BW	=	Body weight (kg)

For soil, the chemical concentrations in earthworms are calculated using the following equation:

$$Ce = BAF_e * Cs$$

Where:

Ce = Chemical concentration in earthworm

BAF_e = Soil-to-earthworm bioaccumulation factor (unitless)

For sediment, the chemical concentrations in fish are calculated using the following equation:

$$Cfs\ (metals) = BAF_f * Cs$$

Where:

Cfs = Chemical concentration in fish

BAF_f = Sediment-to-fish bioaccumulation factor (unitless)

$$Cfs\ (organics) = \frac{(BSAF\ * Cs * \%\ Lipids\ in\ Fish)}{(\%\ Total\ Organic\ Carbon\ in\ Sediment}$$

Where:

BSAF = Biota-Sediment Accumulation Factor

The bioaccumulation factors are presented in Table B-3. Exposure parameters (e.g., body weight, ingestion rate) for the representative receptors are shown in Table B-2. The percent lipids are assumed to be 3.56 based on an average of percent lipids in whole fish from U.S. EPA, 1997.

The risk characterization is the final phase of a risk assessment that compares the exposure to the ecological effects. It is at this phase that the likelihood of adverse effects occurring as a result of exposure to a stressor. A Hazard Quotient (HQ) approach will be used to characterize the risk to terrestrial receptors. This approach characterizes the potential effects by comparing exposure concentration with the effects data. The HQ for the terrestrial wildlife model is calculated as follows:

$$HQ = \frac{CDI}{TRV}$$

Where:

HQ	=	Hazard Quotient, (unitless)
CDI	=	Chronic daily intake dose, (mg/kg-day)
TRV	=	Toxicity Reference Value, (mg/kg-day)

An HQ of less than 1.0 is considered to indicate that potential risks to the ecological receptors are low. An HQ of greater than 1.0 at this stage in the risk assessment process is considered to indicate that potential risks to the ecological receptors may occur. The HQ is not an expression of probability, and the

meaning of values greater than 1.0 must be interpreted in light of attendant uncertainties in risk management.

An example calculation is presented at the end of this Appendix and the calculation spreadsheets for the different receptors are presented as Tables B-4 through B-13.

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TABLE B-1
TOXICITY REFERENCE VALUES (TRVs)
OU 12, SITE 44, DITCH FROM DRMO TO WWTP
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Chemical	Test Species	Endpoint	Study Duration	NOAEL (mg/kg/day)	LOAEL (mg/kg/day)	Reference
Pesticides/PCBs						
Aldrin	rat	reproduction	3 generations (>1 year)	0.2	1	Treon and Cleveland, 1955[c]
Dieldrin	rat	reproduction	3 generations (>1 year)	0.02[b]	0.2	Treon and Cleveland, 1955[c]
	barn owl	reproduction	2 years	0.077	ND	Mandenhall et al., 1983[c]
4,4'-DDD[a]	brown pelican	reproduction	5 years	0.0028[b]	0.028	Anderson et al., 1975[c]
	rat	reproduction	2 years	0.8	4	Fitzhugh, 1948[c]
4,4'-DDE[a]	brown pelican	reproduction	5 years	0.0028[b]	0.028	Anderson et al., 1975[c]
	rat	reproduction	2 years	0.8	4	Fitzhugh, 1948[c]
4,4'-DDT[a]	brown pelican	reproduction	5 years	0.0028[b]	0.028	Anderson et al., 1975[c]
	rat	reproduction	2 years	0.8	4	Fitzhugh, 1948[c]
Alpha-chlordane[d]	mouse	reproduction	6 generations (> 1 yr)	4.6	9.2	Keplinger et al., 1968[c]
	red-winged blackbird	mortality	84 days	2.14	10.7	Stickel et al., 1983[c]
Aroclor-1254	ring-necked pheasant	reproduction	17 weeks	0.18[b]	1.8	Dahlgren et al., 1972[c]
	old field mouse	reproduction	12 months	0.068[b]	0.68	McCoy et al., 1995[c]
Aroclor-1260[e]	ring-necked pheasant	reproduction	17 weeks	0.18[b]	1.8	Dahlgren et al., 1972[c]
	old field mouse	reproduction	12 months	0.068[b]	0.68	McCoy et al., 1995[c]
Endosulfan I[f]	rat	reproduction, blood chemistry	30 days	0.15	ND	Dikshith et al., 1984[c]
	gray partridge	reproduction	4 weeks	10	ND	Abiola, 1992[c]
Endrin	mouse	reproduction	120 days	0.092[b]	0.92	Good and Ware, 1969[c]
	screech owl	reproduction	> 83 days	0.01[b]	0.1	Fleming et al., 1982[c]
Endrin Aldehyde[g]	mouse	reproduction	120 days	0.092[b]	0.92	Good and Ware, 1969[c]
	screech owl	reproduction	> 83 days	0.01[b]	0.1	Fleming et al., 1982[c]
Endrin ketone[g]	mouse	reproduction	120 days	0.092[b]	0.92	Good and Ware, 1969[c]
	screech owl	reproduction	> 83 days	0.01[b]	0.1	Fleming et al., 1982[c]
Heptachlor	mink	reproduction	181 days	0.1[b]	1	Crum et al., 1993[c]
Heptachlor Epoxide[h]	mink	reproduction	181 days	0.1[b]	1	Crum et al., 1993[c]
Gamma-BHC	rat	reproduction	3 generations (> 1 yr)	8	ND	Palmer et al., 1978[c]
	mallard duck	reproduction	8 weeks	2[b]	20	Chakravarty and Lahiri, 1986[c]
Gamma-chlordane[d]	mouse	reproduction	6 generations (> 1 yr)	4.6	9.2	Keplinger et al., 1968[c]
	red-winged blackbird	mortality	84 days	2.14	10.7	Stickel et al., 1983[c]
Methoxychlor	rat	reproduction	11 months	4	8	Gray et al., 1988[c]

TABLE B-1
TOXICITY REFERENCE VALUES (TRVs)
OU 12, SITE 44, DITCH FROM DRMO TO WWTP
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Chemical	Test Species	Endpoint	Study Duration	NOAEL (mg/kg/day)	LOAEL (mg/kg/day)	Reference
Inorganics						
Cadmium	rat	reproduction	6 weeks	1	10	Sutou et al., 1980 [c]
	mallard duck	reproduction	90 days	1.45	20	White and Finley, 1978 [c]
Copper	mink	reproduction	357 days	11.7	15.14	Aulerich et al., 1982[c]
	1-day old chicks	growth, mortality	10 weeks	47	61.7	Mehring et al., 1960[c]
Lead	rat	reproduction	3 generations (> 1 yr)	8	80	Azar et al., 1973 [c]
	Japanese quail	reproduction	12 weeks	1.13	11.3	Edens et al., 1976 [c]
Mercury	mallard duck	reproduction	3 generations (> 1 yr)	0.0064	0.064	Heinz, 1979 [c]
	mink	mortality, weight loss, ataxia	93 days	0.015	0.025	Wobeser et al., 1976 [c]
Selenium	rat	reproduction	2 generations (1 yr)	0.2	0.33	Rosenfeld and Beath, 1954 [c]
	mallard duck	reproduction	100 days	0.4	0.8	Heinz et al., 1989 [c]
Silver	mouse	systemic	subchronic	18.1[l]	ND	Rungby, 1984[c]
Zinc	rat	reproduction	1-16 days of gestation	160	320	Schlicker and Cox, 1968[c]
	white leghorn hens	reproduction	44 weeks	14.5	131	Stahl et al., 1990[c]

a 4,4'-DDT used as a surrogate.
b NOAEL not determined (adverse effects at all test concentrations); Sample et al (1996) estimated the NOAEL by multiplying the LOAEL by 0.1
c See Sample et al (1996) for full citation and details of study.
d Chlordane used as a surrogate.
e Aroclor-1254 used as a surrogate.
f Endosulfan used as a surrogate.
g Endrin used as a surrogate.
h Heptachlor used as a surrogate.
l Subchronic value will be multiplied by 0.1 to estimate a chronic NOAEL from the subchronic value
ND LOAEL not determined (no adverse effects at any test concentration); NOAEL x 10 assumed as LOAEL concentration.

TABLE B-2

EXPOSURE PARAMETERS FOR REPRESENTATIVE ECOLOGICAL RECEPTORS
OU 12, SITE 44, DITCH FROM DRMO TO WWTP
NAS CECIL FIELD
JACKSONVILLE, FLORIA

Receptor	Body Weight (grams)	Food Ingestion (grams/day)	Water Ingestion (L/day)	Assumed Diet for Exposure Assessment[2]	Home Range (acres)
Raccoon (*Procyon lotor*)	3990[1]	856[1]	0.3312[1]	fish and invertebrates 9.4% sediment[1]	96 to 160[1]
Belted kingfisher (*Ceryle alcyon*)	136[1]	68[1]	15[1]	100% fish Sediment: None(4)	1 to 2 km 20[3]
Least shrew (*Cryptotis parva*)	5.5[5]	3.3[6]	NA	soil invertebrates 3% soil[7] 10% soil[13]	0.5 to 3.5[8]
Northern mockingbird (*Mimus polyglottus*)	49[9]	37.6[10]	NA	invertebrates and vegetation 2% soil[11]	Not available[12]

1 EPA (1993)

2 The food chain model assumed that the food items of the raccoon and kingfisher are 100 percent fish because sediment to fish BSAFs are available. The food items for the shrew and mockingbird are 100 percent earthworms to be conservative because earthworms typically accumulate more contaminants from soil than plants.

3 Fry and Fry (1992)

4 Sample and Suter (1994)

5 Nowak (1991), Cothran et al (1991)

6 Calculated using mammal equation Nagy (1987); converted to fresh weight assuming 71 percent water content in food items

7 EPA (2000c)

8 Choate and Fleharty (1973), Choate et al (1994)

9 Derrickson and Breitwisch (1992)

10 Calculated using passerine equation Nagy (1987); converted to fresh weight assuming 71 percent water content in food items

11 Diet from Derrickson and Breitwisch (1992)

12 Home range data not available, but based on non-migratory and territorial nature of this species (Derrickson and Breitwisch, 1992), home range is assumed to be larger than PSC 44

13 10 percent incidental soil for the shrew was recommended by the University of Florida in a letter dated October 15, 2001 to Ms. Ligia Mora-Applegate of Florida Department of Environmental Protection.

TABLE B-3

TERRESTRIAL WILDLIFE MODEL SPREADSHEET
PLANT, INVERTEBRATE, AND FISH UPTAKE FACTORS

Contaminants	Soil to Plant Uptake Factors[1,2]		Soil to Earthworm Uptake Factors[3]		Sediment to Fish Uptake Factors[5]
	Conservative[4]	Average[4]	Conservative[4]	Average[4]	
Pesticides/ PCBs					
4,4'-DDD	3.30E-03	3.30E-03	1.00E+00	1.00E+00	2.80E-01
4,4'-DDE	3.80E-03	3.80E-03	1.00E+00	1.00E+00	7.70E+00
4,4'-DDT	1.60E-03	1.60E-03	1.00E+00	1.00E+00	1.67E+00
Aldrin	1.40E-01	1.40E-01	1.00E+00	1.00E+00	1.80E+00
Alpha-Chlordane	5.00E-03	5.00E-03	1.00E+00	1.00E+00	4.77E+00
Aroclor-1254	2.50E-03	2.50E-03	2.55E+00	1.07E+00	1.85E+00
Aroclor-1260	5.90E-04	5.90E-04	2.55E+00	1.07E+00	1.85E+00
Dieldrin	1.70E-02	1.70E-02	1.00E+00	1.00E+00	1.80E+00
Gamma-Chlordane	5.00E-03	5.00E-03	1.00E+00	1.00E+00	2.22E+00
Heptachlor	2.50E-02	2.50E-02	1.00E+00	1.00E+00	1.80E+00
Endosulfan I	6.70E-02	6.70E-02	1.00E+00	1.00E+00	1.80E+00
Endosulfan Sulfate	6.70E-02	6.70E-02	1.00E+00	1.00E+00	1.80E+00
Endrin	1.70E-02	1.70E-02	1.00E+00	1.00E+00	1.80E+00
Endrin Aldehyde	1.70E-02	1.70E-02	1.00E+00	1.00E+00	1.80E+00
Endrin Ketone	1.70E-02	1.70E-02	1.00E+00	1.00E+00	1.80E+00
Heptachlor Epoxide	5.70E-03	5.70E-03	1.00E+00	1.00E+00	1.80E+00
Methoxychlor	2.20E-02	2.20E-02	1.00E+00	1.00E+00	1.80E+00
gamma-BHC (Lindane)	5.50E-02	5.50E-02	1.00E+00	1.00E+00	1.80E+00
Inorganics					
Cadmium	9.75E-01	1.76E-01	6.51E+00	1.23E+00	1.00E+00
Chromium	2.52E-02	1.23E-02	5.06E-01	4.90E-02	1.00E+00
Copper	1.88E-01	3.72E-02	2.45E-01	8.24E-02	1.00E+00
Lead	1.40E-01	1.17E-02	2.44E-01	4.26E-02	1.00E+00
Mercury	1.50E+00	1.96E-01	3.30E+00	2.71E-01	1.00E+00
Nickel	4.23E-01	5.40E-03	7.57E-01	1.69E-01	1.00E+00
Selenium	9.04E-01	2.02E-01	2.14E-01	1.58E-01	1.00E+00
Silver	1.10E-02	4.20E-03	2.45E+00	3.27E-01	1.00E+00
Zinc	5.46E-01	1.10E-01	2.06E+00	5.12E-01	1.00E+00

Notes:

1 - ORNL (2000) for organics; only one value is available for conservative and average exposures

2 - Sample et al., (1997) for inorganics; conservative value is 90th percentile; average value is median value

3 - Sample et al., (1998) for all chemicals; conservative value is 90th percentile; average value is median value

4 - Conservative and average refers to the exposure scenarios for which the uptake factors are used

5 - USEPA, 1997 for both tha average and conservative exposures

The plant and invertebrate uptake factors from Sample (1997 and 1998) were multiplied by 0.3 and 0.16 to convert the uptake factors for plants and earthworms, respectively, from dry weight to wet weight

Default value of 1 is assigned to parameters without uptake factors

TABLE B-4

TERRESTRIAL WILDLIFE MODEL HAZARD QUOTIENT CALCULATION
OU 12, SITE 44, DITCH FROM DRMO TO WWTP
LEAST SHREW (3%)- MAXIMUM CONCENTRATIONS
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Parameter	Max. Soil Concentration (mg/kg)	Max. SW Concentration (mg/L)	Biotransfer Factor (soil to inv.)	Invertebrate Concentration (mg/kg)	Dose (mg/kg-day)	NOAEL (mg/kg-day)	LOAEL (mg/kg-day)	NOAEL HQ_n	LOAEL HQ_l
Pesticides/PCBs									
Alpha-Chlordane	2.40E-04	0.00E+00	1.00E+00	2.40E-04	1.48E-04	4.58E+00	9.16E+00	3.24E-05	1.62E-05
Aroclor-1254	1.37E-01	0.00E+00	2.55E+00	3.49E-01	2.12E-01	6.80E-02	6.80E-01	3.11E+00	3.11E-01
Aroclor-1260	1.47E+00	0.00E+00	2.55E+00	3.74E+00	2.27E+00	6.80E-02	6.80E-01	3.34E+01	3.34E+00
Dieldrin	4.20E-03	0.00E+00	1.00E+00	4.20E-03	2.60E-03	2.00E-02	2.00E-01	1.30E-01	1.30E-02
Endosulfan Sulfate	1.10E-02	0.00E+00	1.00E+00	1.10E-02	6.80E-03	1.50E-01	1.50E+00	4.53E-02	4.53E-03
Endrin Aldehyde	1.60E-02	0.00E+00	1.00E+00	1.60E-02	9.89E-03	9.20E-02	9.20E-01	1.07E-01	1.07E-02
Gamma-Chlordane	8.30E-04	0.00E+00	1.00E+00	8.30E-04	5.13E-04	4.58E+00	9.16E+00	1.12E-04	5.60E-05
Heptachlor Epoxide	4.80E-05	0.00E+00	1.00E+00	4.80E-05	2.97E-05	1.00E-01	1.00E+00	2.97E-04	2.97E-05
Inorganics									
Cadmium	1.70E+00	0.00E+00	6.51E+00	1.11E+01	6.67E+00	1.00E+00	1.00E+01	6.67E+00	6.67E-01
Chromium	3.16E+01	1.00E-03	5.06E-01	1.60E+01	1.02E+01	3.28E+00	1.31E+01	3.10E+00	7.73E-01
Lead	1.10E+02	1.27E-02	2.44E-01	2.68E+01	1.81E+01	8.00E+00	8.00E+01	2.26E+00	2.26E-01
Mercury	2.90E+00	0.00E+00	3.30E+00	9.57E+00	5.79E+00	1.50E-02	2.50E-02	3.86E+02	2.32E+02
Zinc	1.26E+02	4.86E-02	2.06E+00	2.60E+02	1.58E+02	1.60E+02	3.20E+02	9.88E-01	4.94E-01

Notes:
Cells are shaded if the HQ is greater than 1.0.

TABLE B-5

TERRESTRIAL WILDLIFE MODEL HAZARD QUOTIENT CALCULATION
OU 12, SITE 44, DITCH FROM DRMO TO WWTP
LEAST SHREW (3%)- AVERAGE CONCENTRATIONS
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Parameter	Avg. All Soil Concentration (mg/kg)	Avg. SW Concentration (mg/L)	Biotransfer Factor (soil to inv.)	Invertebrate Concentration (mg/kg)	Dose (mg/kg-day)	NOAEL (mg/kg-day)	LOAEL (mg/kg-day)	NOAEL HQ_n	LOAEL HQ_l
Pesticides/PCBs									
Alpha-Chlordane	4.16E-03	0.00E+00	1.00E+00	4.16E-03	2.57E-03	4.58E+00	9.16E+00	5.61E-04	2.81E-04
Aroclor-1254	6.34E-02	0.00E+00	1.07E+00	6.76E-02	4.17E-02	6.80E-02	6.80E-01	6.13E-01	6.13E-02
Aroclor-1260	2.79E-01	0.00E+00	1.07E+00	2.98E-01	1.84E-01	6.80E-02	6.80E-01	2.70E+00	2.70E-01
Dieldrin	3.73E-03	0.00E+00	1.00E+00	3.73E-03	2.31E-03	2.00E-02	2.00E-01	1.15E-01	1.15E-02
Endosulfan Sulfate	7.31E-03	0.00E+00	1.00E+00	7.31E-03	4.52E-03	1.50E-01	1.50E+00	3.01E-02	3.01E-03
Endrin Aldehyde	8.37E-03	0.00E+00	1.00E+00	8.37E-03	5.17E-03	9.20E-02	9.20E-01	5.62E-02	5.62E-03
Gamma-Chlordane	4.31E-03	0.00E+00	1.00E+00	4.31E-03	2.66E-03	4.58E+00	9.16E+00	5.81E-04	2.91E-04
Heptachlor Epoxide	2.24E-03	0.00E+00	1.00E+00	2.24E-03	1.38E-03	1.00E-01	1.00E+00	1.38E-02	1.38E-03
Inorganics									
Cadmium	6.20E-01	0.00E+00	1.23E+00	7.65E-01	4.70E-01	1.00E+00	1.00E+01	4.70E-01	4.70E-02
Chromium	1.15E+01	8.70E-04	4.90E-02	5.64E-01	5.46E-01	3.28E+00	1.31E+01	1.66E-01	4.15E-02
Lead	3.86E+01	3.50E-03	4.26E-02	1.64E+00	1.68E+00	8.00E+00	8.00E+01	2.10E-01	2.10E-02
Mercury	7.64E-01	0.00E+00	2.71E-01	2.07E-01	1.38E-01	1.50E-02	2.50E-02	9.20E+00	5.52E+00
Zinc	4.58E+01	2.58E-02	5.12E-01	2.34E+01	1.49E+01	1.60E+02	3.20E+02	9.31E-02	4.65E-02

Notes:
Cells are shaded if the HQ is greater than 1.0.

TABLE B-6

TERRESTRIAL WILDLIFE MODEL HAZARD QUOTIENT CALCULATION
OU 12, SITE 44, DITCH FROM DRMO TO WWTP
LEAST SHREW (10%)- MAXIMUM CONCENTRATIONS
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Parameter	Max. Soil Concentration (mg/kg)	Max. SW Concentration (mg/L)	Biotransfer Factor (soil to inv.)	Invertebrate Concentration (mg/kg)	Dose (mg/kg-day)	NOAEL (mg/kg-day)	LOAEL (mg/kg-day)	NOAEL HQ_n	LOAEL HQ_l
Pesticides/PCBs									
Alpha-Chlordane	2.40E-04	0.00E+00	1.00E+00	2.40E-04	1.58E-04	4.58E+00	9.16E+00	3.46E-05	1.73E-05
Aroclor-1254	1.37E-01	0.00E+00	2.55E+00	3.49E-01	2.17E-01	6.80E-02	6.80E-01	3.20E+00	3.20E-01
Aroclor-1260	1.47E+00	0.00E+00	2.55E+00	3.74E+00	2.33E+00	6.80E-02	6.80E-01	3.43E+01	3.43E+00
Dieldrin	4.20E-03	0.00E+00	1.00E+00	4.20E-03	2.77E-03	2.00E-02	2.00E-01	1.39E-01	1.39E-02
Endosulfan Sulfate	1.10E-02	0.00E+00	1.00E+00	1.10E-02	7.26E-03	1.50E-01	1.50E+00	4.84E-02	4.84E-03
Endrin Aldehyde	1.60E-02	0.00E+00	1.00E+00	1.60E-02	1.06E-02	9.20E-02	9.20E-01	1.15E-01	1.15E-02
Gamma-Chlordane	8.30E-04	0.00E+00	1.00E+00	8.30E-04	5.48E-04	4.58E+00	9.16E+00	1.20E-04	5.98E-05
Heptachlor Epoxide	4.80E-05	0.00E+00	1.00E+00	4.80E-05	3.17E-05	1.00E-01	1.00E+00	3.17E-04	3.17E-05
Inorganics									
Cadmium	1.70E+00	0.00E+00	6.51E+00	1.11E+01	6.74E+00	1.00E+00	1.00E+01	6.74E+00	6.74E-01
Chromium	3.16E+01	1.00E-03	5.06E-01	1.60E+01	1.15E+01	3.28E+00	1.31E+01	3.50E+00	8.74E-01
Lead	1.10E+02	1.27E-02	2.44E-01	2.68E+01	2.27E+01	8.00E+00	8.00E+01	2.83E+00	2.83E-01
Mercury	2.90E+00	0.00E+00	3.30E+00	9.57E+00	5.92E+00	1.50E-02	2.50E-02	3.94E+02	2.37E+02
Zinc	1.26E+02	4.86E-02	2.06E+00	2.60E+02	1.63E+02	1.60E+02	3.20E+02	1.02E+00	5.11E-01

Notes:
Cells are shaded if the HQ is greater than 1.0.

TABLE B-7

TERRESTRIAL WILDLIFE MODEL HAZARD QUOTIENT CALCULATION
OU 12, SITE 44, DITCH FROM DRMO TO WWTP
LEAST SHREW (10%)- AVERAGE CONCENTRATIONS
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Parameter	Avg. All Soil Concentration (mg/kg)	Avg. SW Concentration (mg/L)	Biotransfer Factor (soil to inv.)	Invertebrate Concentration (mg/kg)	Dose (mg/kg-day)	NOAEL (mg/kg-day)	LOAEL (mg/kg-day)	NOAEL HQ_n	LOAEL HQ_l
Pesticides/PCBs									
Alpha-Chlordane	4.16E-03	0.00E+00	1.00E+00	4.16E-03	2.75E-03	4.58E+00	9.16E+00	5.99E-04	3.00E-04
Aroclor-1254	6.34E-02	0.00E+00	1.07E+00	6.76E-02	4.44E-02	6.80E-02	6.80E-01	6.52E-01	6.52E-02
Aroclor-1260	2.79E-01	0.00E+00	1.07E+00	2.98E-01	1.95E-01	6.80E-02	6.80E-01	2.87E+00	2.87E-01
Dieldrin	3.73E-03	0.00E+00	1.00E+00	3.73E-03	2.46E-03	2.00E-02	2.00E-01	1.23E-01	1.23E-02
Endosulfan Sulfate	7.31E-03	0.00E+00	1.00E+00	7.31E-03	4.82E-03	1.50E-01	1.50E+00	3.21E-02	3.21E-03
Endrin Aldehyde	8.37E-03	0.00E+00	1.00E+00	8.37E-03	5.52E-03	9.20E-02	9.20E-01	6.00E-02	6.00E-03
Gamma-Chlordane	4.31E-03	0.00E+00	1.00E+00	4.31E-03	2.84E-03	4.58E+00	9.16E+00	6.21E-04	3.10E-04
Heptachlor Epoxide	2.24E-03	0.00E+00	1.00E+00	2.24E-03	1.48E-03	1.00E-01	1.00E+00	1.48E-02	1.48E-03
Inorganics									
Cadmium	6.20E-01	0.00E+00	1.23E+00	7.65E-01	4.96E-01	1.00E+00	1.00E+01	4.96E-01	4.96E-02
Chromium	1.15E+01	8.70E-04	4.90E-02	5.64E-01	1.03E+00	3.28E+00	1.31E+01	3.14E-01	7.83E-02
Lead	3.86E+01	3.50E-03	4.26E-02	1.64E+00	3.30E+00	8.00E+00	8.00E+01	4.13E-01	4.13E-02
Mercury	7.64E-01	0.00E+00	2.71E-01	2.07E-01	1.70E-01	1.50E-02	2.50E-02	1.13E+01	6.80E+00
Zinc	4.58E+01	2.58E-02	5.12E-01	2.34E+01	1.68E+01	1.60E+02	3.20E+02	1.05E-01	5.25E-02

Notes:
Cells are shaded if the HQ is greater than 1.0.

TABLE B-8

TERRESTRIAL WILDLIFE MODEL HAZARD QUOTIENT CALCULATION
OU 12, SITE 44, DITCH FROM DRMO TO WWTP
NORTHERN MOCKINGBIRD - MAXIMUM CONCENTRATIONS
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Parameter	Max. Soil Concentration (mg/kg)	Max. SW Concentration (mg/L)	Biotransfer Factor (soil to inv.)	Invertebrate Concentration (mg/kg)	Dose (mg/kg-day)	NOAEL (mg/kg-day)	LOAEL (mg/kg-day)	NOAEL EEQn	LOAEL EEQ_l
Pesticides/PCBs									
Alpha-Chlordane	2.40E-04	0.00E+00	1.00E+00	2.40E-04	1.88E-04	2.14E+00	1.07E+01	8.78E-05	1.76E-05
Aroclor-1254	1.37E-01	0.00E+00	2.55E+00	3.49E-01	2.70E-01	1.80E-01	1.80E+00	1.50E+00	1.50E-01
Aroclor-1260	1.47E+00	0.00E+00	2.55E+00	3.74E+00	2.89E+00	1.80E-01	1.80E+00	1.61E+01	1.61E+00
Dieldrin	4.20E-03	0.00E+00	1.00E+00	4.20E-03	3.29E-03	7.70E-02	7.70E-01	4.27E-02	4.27E-03
Endosulfan Sulfate	1.10E-02	0.00E+00	1.00E+00	1.10E-02	8.61E-03	1.00E+01	1.00E+02	8.61E-04	8.61E-05
Endrin Aldehyde	1.60E-02	0.00E+00	1.00E+00	1.60E-02	1.25E-02	1.00E-02	1.00E-01	1.25E+00	1.25E-01
Gamma-Chlordane	8.30E-04	0.00E+00	1.00E+00	8.30E-04	6.50E-04	2.14E+00	1.07E+01	3.04E-04	6.07E-05
Heptachlor Epoxide	4.80E-05	0.00E+00	1.00E+00	4.80E-05	3.76E-05	NV	NV	-	-
Inorganics									
Cadmium	1.70E+00	0.00E+00	6.51E+00	1.11E+01	8.52E+00	1.45E+00	2.00E+01	5.88E+00	4.26E-01
Chromium	3.16E+01	1.00E-03	5.06E-01	1.60E+01	1.28E+01	1.00E+00	5.00E+00	1.28E+01	2.55E+00
Lead	1.10E+02	1.27E-02	2.44E-01	2.68E+01	2.22E+01	1.13E+00	1.13E+01	1.97E+01	1.97E+00
Mercury	2.90E+00	0.00E+00	3.30E+00	9.57E+00	7.39E+00	6.40E-03	6.40E-02	1.15E+03	1.15E+02
Zinc	1.26E+02	4.86E-02	2.06E+00	2.60E+02	2.01E+02	1.45E+01	1.31E+02	1.39E+01	1.54E+00

Notes:
Cells are shaded if the HQ is greater than 1.0.
NV - No Value Established

TABLE B-9

TERRESTRIAL WILDLIFE MODEL HAZARD QUOTIENT CALCULATION
OU 12, SITE 44, DITCH FROM DRMO TO WWTP
NORTHERN MOCKINGBIRD- AVERAGE CONCENTRATIONS
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Parameter	Avg. All Soil Concentration (mg/kg)	Avg. SW Concentration (mg/L)	Biotransfer Factor (soil to inv.)	Invertebrate Concentration (mg/kg)	Dose (mg/kg-day)	NOAEL (mg/kg-day)	LOAEL (mg/kg-day)	NOAEL EEQn	LOAEL EEQ_l
Pesticides/PCBs									
Alpha-Chlordane	4.16E-03	0.00E+00	1.00E+00	4.16E-03	3.26E-03	2.14E+00	1.07E+01	1.52E-03	3.04E-04
Aroclor-1254	6.34E-02	0.00E+00	1.07E+00	6.76E-02	5.28E-02	1.80E-01	1.80E+00	2.94E-01	2.94E-02
Aroclor-1260	2.79E-01	0.00E+00	1.07E+00	2.98E-01	2.33E-01	1.80E-01	1.80E+00	1.29E+00	1.29E-01
Dieldrin	3.73E-03	0.00E+00	1.00E+00	3.73E-03	2.92E-03	7.70E-02	7.70E-01	3.79E-02	3.79E-03
Endosulfan Sulfate	7.31E-03	0.00E+00	1.00E+00	7.31E-03	5.72E-03	1.00E+01	1.00E+02	5.72E-04	5.72E-05
Endrin Aldehyde	8.37E-03	0.00E+00	1.00E+00	8.37E-03	6.55E-03	1.00E-02	1.00E-01	6.55E-01	6.55E-02
Gamma-Chlordane	4.31E-03	0.00E+00	1.00E+00	4.31E-03	3.37E-03	2.14E+00	1.07E+01	1.58E-03	3.15E-04
Heptachlor Epoxide	2.24E-03	0.00E+00	1.00E+00	2.24E-03	1.75E-03	NV	NV	-	-
Inorganics									
Cadmium	6.20E-01	0.00E+00	1.23E+00	7.65E-01	5.96E-01	1.45E+00	2.00E+01	4.11E-01	2.98E-02
Chromium	1.15E+01	8.70E-04	4.90E-02	5.64E-01	6.10E-01	1.00E+00	5.00E+00	6.10E-01	1.22E-01
Lead	3.86E+01	3.50E-03	4.26E-02	1.64E+00	1.85E+00	1.13E+00	1.13E+01	1.64E+00	1.64E-01
Mercury	7.64E-01	0.00E+00	2.71E-01	2.07E-01	1.71E-01	6.40E-03	6.40E-02	2.67E+01	2.67E+00
Zinc	4.58E+01	2.58E-02	5.12E-01	2.34E+01	1.87E+01	1.45E+01	1.31E+02	1.29E+00	1.43E-01

Notes:

Cells are shaded if the HQ is greater than 1.0.

NV - No Value Established

TABLE B-10

TERRESTRIAL WILDLIFE MODEL HAZARD QUOTIENT CALCULATION
OU 12, SITE 44, DITCH FROM DRMO TO WWTP
BELTED KINGFISHER- MAXIMUM CONCENTRATIONS
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Parameter	Max. Sed. Concentration (mg/kg)	Max. SW Concentration (mg/L)	Biotransfer Factor (sed to fish)	Fish Concentration (mg/kg)	Dose (mg/kg-day)	NOAEL (mg/kg-day)	LOAEL (mg/kg-day)	NOAEL HQ_n	LOAEL HQ_l
Pesticides/PCBs									
4,4'-DDD	1.10E-02	0.00E+00	2.80E-01	1.35E-02	6.77E-03	8.00E-01	4.00E+00	8.46E-03	1.69E-03
4,4'-DDE	1.60E-02	0.00E+00	7.70E+00	5.41E-01	2.71E-01	8.00E-01	4.00E+00	3.38E-01	6.77E-02
4,4'-DDT	5.80E-03	0.00E+00	1.67E+00	4.25E-02	2.13E-02	8.00E-01	4.00E+00	2.66E-02	5.32E-03
Aldrin	8.90E-04	0.00E+00	1.80E+00	7.04E-03	3.52E-03	2.00E-01	1.00E+00	1.76E-02	3.52E-03
Alpha-Chlordane	7.30E-03	0.00E+00	4.77E+00	1.53E-01	7.65E-02	4.58E+00	9.16E+00	1.67E-02	8.35E-03
Aroclor-1254	2.25E-01	0.00E+00	1.85E+00	1.83E+00	9.14E-01	6.80E-02	6.80E-01	1.34E+01	1.34E+00
Aroclor-1260	2.91E+00	0.00E+00	1.85E+00	2.36E+01	1.18E+01	6.80E-02	6.80E-01	1.74E+02	1.74E+01
Dieldrin	4.90E-03	0.00E+00	1.80E+00	3.87E-02	1.94E-02	2.00E-02	2.00E-01	9.69E-01	9.69E-02
Endosulfan I	5.00E-02	0.00E+00	1.80E+00	3.95E-01	1.98E-01	1.50E-01	1.50E+00	1.32E+00	1.32E-01
Endrin	1.70E-02	0.00E+00	1.80E+00	1.34E-01	6.72E-02	9.20E-02	9.20E-01	7.31E-01	7.31E-02
Endrin Aldehyde	2.30E-02	0.00E+00	1.80E+00	1.82E-01	9.09E-02	9.20E-02	9.20E-01	9.88E-01	9.88E-02
Endrin Ketone	6.70E-04	0.00E+00	1.80E+00	5.30E-03	2.65E-03	9.20E-02	9.20E-01	2.88E-02	2.88E-03
Gamma-Chlordane	1.20E-02	0.00E+00	2.22E+00	1.17E-01	5.85E-02	4.58E+00	9.16E+00	1.28E-02	6.39E-03
Heptachlor	3.60E-04	0.00E+00	1.80E+00	2.85E-03	1.42E-03	1.00E-01	1.00E+00	1.42E-02	1.42E-03
Heptachlor Epoxide	1.10E-03	0.00E+00	1.80E+00	8.70E-03	4.35E-03	1.00E-01	1.00E+00	4.35E-02	4.35E-03
Methoxychlor	1.50E-02	0.00E+00	1.80E+00	1.19E-01	5.93E-02	4.00E+00	8.00E+00	1.48E-02	7.41E-03
Gamma-BHC (lindane)	1.10E-03	1.70E-06	1.80E+00	8.70E-03	4.35E-03	8.00E+00	8.00E+01	5.44E-04	5.44E-05
Inorganics									
Cadmium	3.20E+00	0.00E+00	1.00E+00	3.20E+00	1.60E+00	1.00E+00	1.00E+01	1.60E+00	1.60E-01
Copper	6.11E+01	3.30E-03	1.00E+00	6.11E+01	3.06E+01	1.17E+01	1.54E+01	2.61E+00	1.98E+00
Lead	2.60E+02	1.27E-02	1.00E+00	2.60E+02	1.30E+02	8.00E+00	8.00E+01	1.63E+01	1.63E+00
Mercury	7.50E-01	0.00E+00	1.00E+00	7.50E-01	3.75E-01	1.50E-02	2.50E-02	2.50E+01	1.50E+01
Nickel	3.77E+01	2.50E-03	1.00E+00	3.77E+01	1.89E+01	4.00E+01	8.00E+01	4.71E-01	2.36E-01
Selenium	2.40E+00	2.50E-03	1.00E+00	2.40E+00	1.20E+00	2.00E-01	3.30E-01	6.00E+00	3.64E+00
Silver	3.90E+00	0.00E+00	1.00E+00	3.90E+00	1.95E+00	1.81E+00	1.81E+01	1.08E+00	1.08E-01
Zinc	4.30E+02	4.86E-02	1.00E+00	4.30E+02	2.15E+02	1.60E+02	3.20E+02	1.34E+00	6.72E-01

Notes:
Shaded cells are EEQs that are greater than 1.0

TABLE B-11

TERRESTRIAL WILDLIFE MODEL HAZARD QUOTIENT CALCULATION
OU 12, SITE 44, DITCH FROM DRMO TO WWTP
BELTED KINGFISHER- AVERAGE CONCENTRATIONS
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Parameter	Avg. All Sed. Concentration (mg/kg)	Avg. All SW Concentration (mg/L)	Biotransfer Factor (sed to fish)	Fish Concentration (mg/kg)	Dose (mg/kg-day)	NOAEL (mg/kg-day)	LOAEL (mg/kg-day)	NOAEL HQ_n	LOAEL HQ_l
Pesticides/PCBs									
4,4'-DDD	9.40E-03	0.00E+00	2.80E-01	1.16E-02	5.78E-03	8.00E-01	4.00E+00	7.23E-03	1.45E-03
4,4'-DDE	8.70E-03	0.00E+00	7.70E+00	2.94E-01	1.47E-01	8.00E-01	4.00E+00	1.84E-01	3.68E-02
4,4'-DDT	1.96E-02	0.00E+00	1.67E+00	1.44E-01	7.20E-02	8.00E-01	4.00E+00	9.00E-02	1.80E-02
Aldrin	4.47E-03	0.00E+00	1.80E+00	3.53E-02	1.77E-02	2.00E-01	1.00E+00	8.84E-02	1.77E-02
Alpha-Chlordane	7.52E-03	0.00E+00	4.77E+00	1.58E-01	7.88E-02	4.58E+00	9.16E+00	1.72E-02	8.60E-03
Aroclor-1254	8.44E-02	0.00E+00	1.85E+00	6.86E-01	3.43E-01	6.80E-02	6.80E-01	5.05E+00	5.05E-01
Aroclor-1260	4.16E-01	0.00E+00	1.85E+00	3.38E+00	1.69E+00	6.80E-02	6.80E-01	2.49E+01	2.49E+00
Dieldrin	6.46E-03	0.00E+00	1.80E+00	5.11E-02	2.55E-02	2.00E-02	2.00E-01	1.28E+00	1.28E-01
Endosulfan I	7.37E-03	0.00E+00	1.80E+00	5.83E-02	2.91E-02	1.50E-01	1.50E+00	1.94E-01	1.94E-02
Endrin	9.96E-03	0.00E+00	1.80E+00	7.88E-02	3.94E-02	9.20E-02	9.20E-01	4.28E-01	4.28E-02
Endrin Aldehyde	1.05E-02	0.00E+00	1.80E+00	8.32E-02	4.16E-02	9.20E-02	9.20E-01	4.52E-01	4.52E-02
Endrin Ketone	8.28E-03	0.00E+00	1.80E+00	6.55E-02	3.28E-02	9.20E-02	9.20E-01	3.56E-01	3.56E-02
Gamma-Chlordane	8.49E-03	0.00E+00	2.22E+00	8.28E-02	4.14E-02	4.58E+00	9.16E+00	9.03E-03	4.52E-03
Heptachlor	4.52E-03	0.00E+00	1.80E+00	3.57E-02	1.79E-02	1.00E-01	1.00E+00	1.79E-01	1.79E-02
Heptachlor Epoxide	4.50E-03	0.00E+00	1.80E+00	3.56E-02	1.78E-02	1.00E-01	1.00E+00	1.78E-01	1.78E-02
Methoxychlor	2.94E-02	0.00E+00	1.80E+00	2.33E-01	1.16E-01	4.00E+00	8.00E+00	2.91E-02	1.45E-02
Gamma-BHC (lindane)	4.58E-03	2.20E-05	1.80E+00	3.62E-02	1.81E-02	8.00E+00	8.00E+01	2.26E-03	2.26E-04
Inorganics									
Cadmium	7.44E-01	0.00E+00	1.00E+00	7.44E-01	3.72E-01	1.00E+00	1.00E+01	3.72E-01	3.72E-02
Copper	1.08E+01	1.82E-03	1.00E+00	1.08E+01	5.40E+00	1.17E+01	1.54E+01	4.62E-01	3.51E-01
Lead	3.17E+01	3.46E-03	1.00E+00	3.17E+01	1.58E+01	8.00E+00	8.00E+01	1.98E+00	1.98E-01
Mercury	8.34E-02	0.00E+00	1.00E+00	8.34E-02	4.17E-02	1.50E-02	2.50E-02	2.78E+00	1.67E+00
Nickel	3.63E+00	1.00E-03	1.00E+00	3.63E+00	1.81E+00	4.00E+01	8.00E+01	4.53E-02	2.27E-02
Selenium	5.65E-01	2.04E-03	1.00E+00	5.65E-01	2.83E-01	2.00E-01	3.30E-01	1.41E+00	8.57E-01
Silver	3.98E-01	0.00E+00	1.00E+00	3.98E-01	1.99E-01	1.81E+00	1.81E+01	1.10E-01	1.10E-02
Zinc	5.64E+01	2.58E-02	1.00E+00	5.64E+01	2.82E+01	1.60E+02	3.20E+02	1.76E-01	8.81E-02

Notes:
Shaded cells are EEQs that are greater than 1.0

TABLE B-12

TERRESTRIAL WILDLIFE MODEL HAZARD QUOTIENT CALCULATION
OU 12, SITE 44, DITCH FROM DRMO TO WWTP
RACCOON - CONSERVATIVE INPUTS
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Parameter	Max. Sed. Concentration (mg/kg)	Max. SW Concentration (mg/L)	Biotransfer Factor (sed to fish)	Fish Concentration (mg/kg)	Dose (mg/kg-day)	NOAEL (mg/kg-day)	LOAEL (mg/kg-day)	NOAEL HQ_n	LOAEL HQ_l
Pesticides/PCBs									
4,4'-DDD	1.10E-02	0.00E+00	2.80E-01	1.35E-02	3.12E-03	8.00E-01	4.00E+00	3.91E-03	7.81E-04
4,4'-DDE	1.60E-02	0.00E+00	7.70E+00	5.41E-01	1.16E-01	8.00E-01	4.00E+00	1.46E-01	2.91E-02
4,4'-DDT	5.80E-03	0.00E+00	1.67E+00	4.25E-02	9.25E-03	8.00E-01	4.00E+00	1.16E-02	2.31E-03
Aldrin	8.90E-04	0.00E+00	1.80E+00	7.04E-03	1.53E-03	2.00E-01	1.00E+00	7.64E-03	1.53E-03
Alpha-Chlordane	7.30E-03	0.00E+00	4.77E+00	1.53E-01	3.30E-02	4.58E+00	9.16E+00	7.20E-03	3.60E-03
Aroclor-1254	2.25E-01	0.00E+00	1.85E+00	1.83E+00	3.97E-01	6.80E-02	6.80E-01	5.84E+00	5.84E-01
Aroclor-1260	2.91E+00	0.00E+00	1.85E+00	2.36E+01	5.13E+00	6.80E-02	6.80E-01	7.55E+01	7.55E+00
Dieldrin	4.90E-03	0.00E+00	1.80E+00	3.87E-02	8.41E-03	2.00E-02	2.00E-01	4.21E-01	4.21E-02
Endosulfan I	5.00E-02	0.00E+00	1.80E+00	3.95E-01	8.58E-02	1.50E-01	1.50E+00	5.72E-01	5.72E-02
Endrin	1.70E-02	0.00E+00	1.80E+00	1.34E-01	2.92E-02	9.20E-02	9.20E-01	3.17E-01	3.17E-02
Endrin Aldehyde	2.30E-02	0.00E+00	1.80E+00	1.82E-01	3.95E-02	9.20E-02	9.20E-01	4.29E-01	4.29E-02
Endrin Ketone	6.70E-04	0.00E+00	1.80E+00	5.30E-03	1.15E-03	9.20E-02	9.20E-01	1.25E-02	1.25E-03
Gamma-Chlordane	1.20E-02	0.00E+00	2.22E+00	1.17E-01	2.53E-02	4.58E+00	9.16E+00	5.53E-03	2.77E-03
Heptachlor	3.60E-04	0.00E+00	1.80E+00	2.85E-03	6.18E-04	1.00E-01	1.00E+00	6.18E-03	6.18E-04
Heptachlor Epoxide	1.10E-03	0.00E+00	1.80E+00	8.70E-03	1.89E-03	1.00E-01	1.00E+00	1.89E-02	1.89E-03
Methoxychlor	1.50E-02	0.00E+00	1.80E+00	1.19E-01	2.57E-02	4.00E+00	8.00E+00	6.44E-03	3.22E-03
Gamma-BHC (lindane)	1.10E-03	1.70E-06	1.80E+00	8.70E-03	1.89E-03	8.00E+00	8.00E+01	2.36E-04	2.36E-05
Inorganics									
Cadmium	3.20E+00	0.00E+00	1.00E+00	3.20E+00	7.51E-01	1.00E+00	1.00E+01	7.51E-01	7.51E-02
Copper	6.11E+01	3.30E-03	1.00E+00	6.11E+01	1.43E+01	1.17E+01	1.54E+01	1.22E+00	9.31E-01
Lead	2.60E+02	1.27E-02	1.00E+00	2.60E+02	6.10E+01	8.00E+00	8.00E+01	7.63E+00	7.63E-01
Mercury	7.50E-01	0.00E+00	1.00E+00	7.50E-01	1.76E-01	1.50E-02	2.50E-02	1.17E+01	7.04E+00
Nickel	3.77E+01	2.50E-03	1.00E+00	3.77E+01	8.85E+00	4.00E+01	8.00E+01	2.21E-01	1.11E-01
Selenium	2.40E+00	2.50E-03	1.00E+00	2.40E+00	5.63E-01	2.00E-01	3.30E-01	2.82E+00	1.71E+00
Silver	3.90E+00	0.00E+00	1.00E+00	3.90E+00	9.15E-01	1.81E+00	1.81E+01	5.06E-01	5.06E-02
Zinc	4.30E+02	4.86E-02	1.00E+00	4.30E+02	1.01E+02	1.60E+02	3.20E+02	6.31E-01	3.15E-01

Notes:
Shaded cells are EEQs that are greater than 1.0

TABLE B-13

TERRESTRIAL WILDLIFE MODEL HAZARD QUOTIENT CALCULATION
OU 12, SITE 44, DITCH FROM DRMO TO WWTP
RACCOON - AVERAGE INPUTS
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Parameter	Avg. All Sed. Concentration (mg/kg)	Avg. All SW Concentration (mg/L)	Biotransfer Factor (sed to fish)	Fish Concentration (mg/kg)	Dose (mg/kg-day)	NOAEL (mg/kg-day)	LOAEL (mg/kg-day)	NOAEL HQ_n	LOAEL HQ_l
Pesticides/PCBs									
4,4'-DDD	9.40E-03	0.00E+00	2.80E-01	1.16E-02	2.67E-03	8.00E-01	4.00E+00	3.34E-03	6.68E-04
4,4'-DDE	8.70E-03	0.00E+00	7.70E+00	2.94E-01	6.33E-02	8.00E-01	4.00E+00	7.91E-02	1.58E-02
4,4'-DDT	1.96E-02	0.00E+00	1.67E+00	1.44E-01	3.13E-02	8.00E-01	4.00E+00	3.91E-02	7.82E-03
Aldrin	4.47E-03	0.00E+00	1.80E+00	3.53E-02	7.67E-03	2.00E-01	1.00E+00	3.84E-02	7.67E-03
Alpha-Chlordane	7.52E-03	0.00E+00	4.77E+00	1.58E-01	3.40E-02	4.58E+00	9.16E+00	7.42E-03	3.71E-03
Aroclor-1254	8.44E-02	0.00E+00	1.85E+00	6.86E-01	1.49E-01	6.80E-02	6.80E-01	2.19E+00	2.19E-01
Aroclor-1260	4.16E-01	0.00E+00	1.85E+00	3.38E+00	7.34E-01	6.80E-02	6.80E-01	1.08E+01	1.08E+00
Dieldrin	6.46E-03	0.00E+00	1.80E+00	5.11E-02	1.11E-02	2.00E-02	2.00E-01	5.54E-01	5.54E-02
Endosulfan I	7.37E-03	0.00E+00	1.80E+00	5.83E-02	1.27E-02	1.50E-01	1.50E+00	8.44E-02	8.44E-03
Endrin	9.96E-03	0.00E+00	1.80E+00	7.88E-02	1.71E-02	9.20E-02	9.20E-01	1.86E-01	1.86E-02
Endrin Aldehyde	1.05E-02	0.00E+00	1.80E+00	8.32E-02	1.81E-02	9.20E-02	9.20E-01	1.96E-01	1.96E-02
Endrin Ketone	8.28E-03	0.00E+00	1.80E+00	6.55E-02	1.42E-02	9.20E-02	9.20E-01	1.55E-01	1.55E-02
Gamma-Chlordane	8.49E-03	0.00E+00	2.22E+00	8.28E-02	1.79E-02	4.58E+00	9.16E+00	3.91E-03	1.96E-03
Heptachlor	4.52E-03	0.00E+00	1.80E+00	3.57E-02	7.76E-03	1.00E-01	1.00E+00	7.76E-02	7.76E-03
Heptachlor Epoxide	4.50E-03	0.00E+00	1.80E+00	3.56E-02	7.73E-03	1.00E-01	1.00E+00	7.73E-02	7.73E-03
Methoxychlor	2.94E-02	0.00E+00	1.80E+00	2.33E-01	5.05E-02	4.00E+00	8.00E+00	1.26E-02	6.32E-03
Gamma-BHC (lindane)	4.58E-03	2.20E-05	1.80E+00	3.62E-02	7.86E-03	8.00E+00	8.00E+01	9.82E-04	9.82E-05
Inorganics									
Cadmium	7.44E-01	0.00E+00	1.00E+00	7.44E-01	1.75E-01	1.00E+00	1.00E+01	1.75E-01	1.75E-02
Copper	1.08E+01	1.82E-03	1.00E+00	1.08E+01	2.54E+00	1.17E+01	1.54E+01	2.17E-01	1.65E-01
Lead	3.17E+01	3.46E-03	1.00E+00	3.17E+01	7.43E+00	8.00E+00	8.00E+01	9.29E-01	9.29E-02
Mercury	8.34E-02	0.00E+00	1.00E+00	8.34E-02	1.96E-02	1.50E-02	2.50E-02	1.31E+00	7.83E-01
Nickel	3.63E+00	1.00E-03	1.00E+00	3.63E+00	8.51E-01	4.00E+01	8.00E+01	2.13E-02	1.06E-02
Selenium	5.65E-01	2.04E-03	1.00E+00	5.65E-01	1.33E-01	2.00E-01	3.30E-01	6.64E-01	4.02E-01
Silver	3.98E-01	0.00E+00	1.00E+00	3.98E-01	9.34E-02	1.81E+00	1.81E+01	5.16E-02	5.16E-03
Zinc	5.64E+01	2.58E-02	1.00E+00	5.64E+01	1.32E+01	1.60E+02	3.20E+02	8.27E-02	4.14E-02

Notes:
Shaded cells are EEQs that are greater than 1.0

EXAMPLE CALCULATION OF HAZARD QUOTIENT
FOR THE RACCOON
USING THE MAXIMUM SEDIMENT CONCENTRATION OF AROCLOR-1254

The predicted dose (PD) for all representative receptors =

$$[C_{sediment} * FI * SA) + (C_{water}\ W * FI) + (C_{food} * FA * FI)]/BW$$

Where:
$C_{sediment}$ = Chemical concentration in the sediment
F_I = Fraction Ingested (100 percent) = 1.0
SA = Incidential Sediment Ingestion Rate (9.4% of food ingestion rate)
C_{water} = Chemical concentration in the water
W = Water Ingestion Rate
C_{food} = Chemical concentration in the fish
FA = Water Ingestion Rate
BW = Body Weight

Concentrations of organic compounds in food items of the raccoon were derived from sediment data using the following equation: $TBP = BSAF(C_s/f_{oc})f_l$.

BSAF for Aroclor-1254 = 1.85 (Table B-3)
C_s = 0.225 mg/kg (Table B-12)
f_{oc} = assumed to be 0.8104 percent = 0.008104
f_l for fish (assumed food of the raccoon) = 3.56 percent = 0.0356 (see Appendix B text)

Using the above values, TBP = 1.85 * (0.225/0.008104) * 0.0356 = 1.83 mg/kg. Thus, the predicted concentration of Aroclor-1254 in food items (i.e., prey) of the raccoon (C_{food}) = 1.83 mg/kg.

$C_{sediment}$ = 0.225 mg/kg (Table B-12)
FI = 100 percent = 1.0
SA = 0.08046 mg/kg (Table B-2)
C_{water}= 0 ug/L (Table B-12)
W = 0.3312 L/day (Table B-2)
C_{food} = 1.83 mg/kg (derivation shown above)
FA = 0.856 kg/day (Table B-2)
BW = 3.99 kg (Table B-2)

Using the above values,
PD = [(0.225 mg/kg * 1.0 * 0.08046 kg/day) + (0.3312 mg/kg * 0 ug/L) +(0.856 kg/day * 1.83)] ÷ 3.99 kg
PD = (0.01810 mg/day + 1.566 mg/day) ÷ 3.99 kg = 0.397 mg/kg/day

The mammalian NOAEL for Aroclor-1254 is 0.068 mg/kg/day (Table B-1).
Thus, the HQ (based on the NOAEL) = 0.397 mg/kg/day ÷ 0.068 mg/kg/day = 5.84.

B.2 ALTERNATE BENCH MARKS/TOXICITY DATA

APPENDIX B.2
ALTERNATE BENCHMARKS/TOXICITY DATA

This appendix presents the additional benchmarks/toxicity data that were used to evaluate the chemicals, which were retained as COPCs after the initial screening, to determine if the concentrations warrant further evaluation.

Sediment Benchmarks

Several of the sediment risk screening levels (i.e., ER-Ls, and LELs), that are used to select COPCs, are conservative because chemicals detected at concentrations below these levels are not expected to cause any adverse impacts to the benthic community. Because they are conservative, the sediment risk-screening levels are frequently less than background sediment concentrations. Since the objective of the risk screening is to determine if the chemicals at the site are causing a risk to ecological receptors, less conservative screening benchmarks (i.e., ER-Ms and PELs) were used to further evaluate the risk associated with chemicals that exceeded the conservative screening levels. The following paragraphs discuss the less conservative screening levels that were used to further evaluate chemicals retained as COPCs after the initial screening. Table B-14 presents the sediment benchmarks that are discussed in this ERA.

The Florida Department of Environmental Protection (MacDonald, 1994) has developed screening values in a manner similar to Long et al. (1995), except that the Florida values also incorporate chemical concentrations observed or predicted to be associated with no adverse biological effects (no effects data). Both sets of screening values were developed for estuarine and marine waters to protect aquatic organisms, including benthic macroinvertebrates, fish, and shellfish (Long et al., 1995). These guidelines establish the following two effects levels:

Threshold Effects Level (TEL): The TEL is the geometric mean of the 15th percentile in the effects data set and the 50th percentile in the no effects data set. It represents the upper limit of the range of sediment contaminant concentrations that are dominated by no effects data.

Probable Effects Level (PEL): The PEL is the geometric mean of the 50th percentile in the effects data set and the 85th percentile in the no effects data set. It represents the lower limit of the range of sediment contaminant concentrations that are usually or always associated with adverse biological effects.

The sediment screening level for a few of the chemicals is the Apparent Effects Threshold (AET), as presented in the Creation and Analysis of Freshwater Sediment Quality Values in Washington State (Cubbage et al., 1997). The AET is defined as the concentration of a given chemical above which

statistically significant ($p<0.05$) biological effects are always expected to occur (Cubbage et al., 1997). The study also generates Probable AETs (PAETs), which were defined as the 95th percentile of values from all stations with no significant biological effects and concentrations greater that the lowest hit level (Cubbage et al., 1997). The AETs and PAETs in Cubbage et al. (1997) are based on Microtox® bioassays or bioassays using amphipods, *Hyalella azteca*. The AETs/PAETs based on Microtox® bioassays are typically lower than the AETs based on amphipods. However, because one of the assessment endpoints for this SERA are benthic macroinvertebrates, the AETs/PAETs based on amphipods are more appropriate screening levels for determining the need for further evaluation of the chemicals at the sites. Table B-3 presents the AETs and PAETs based on amphipods.

The National Biological Service produced a set of benchmarks for the USEPA Great Lakes National Program Office as part of the Assessment and Remediation of Contaminated Sediment (ARCS) Project (USEPA, 1996 as cited in Jones, et al., 1997). The benchmarks were developed with the same procedures that were used to develop the ER-Ls and ER-Ms (Long et al., 1995), the TELs and PELs (MacDonald, 1994), and the AETs (Cubbage et al., 1997). The ARCS Threshold Effect Level (TEL) is similar to the ER-L and TEL. The ARCS Probable Effect Level (PEL) is similar to the ER-M and PEL. Finally, the high No Effect Concentration (NEC) is similar to the AET.

Finally, note that the freshwater and saltwater sediment benchmarks are often used interchangably because some studies have indicated that the relative sensitivities of saltwater and freshwater benthic invertebrates are similar.

Soil Chemical-Specific Alternate Benchmarks/Toxicity Data

The following sections discuss the alternate benchmarks that were used in the Step 3a evaluation for terrestrial plants and invertebrates. After the initial screening of chemicals was conducted, alternate benchmarks were used to re-evaluate the chemicals that were selected as COPCs to determine their potential for causing risks to ecological receptors. The following section presents the sources of the alternate benchmarks and is followed by chemical-specific sections that present the actual benchmarks. Also, the chemical-specific sections present additional toxicity data that was obtained from the literature.

- Dutch Intervention Values and Target Values – Soil Quality Standards (MHSPE, 1994)
- Canadian Soil Quality Guidelines (CCME, 1997)
- Oak Ridge National Laboratory Toxicological Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision (Efroymson R.A. et al., 1997a)
- Oak Ridge National Laboratory Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision (Efroymson R.A. et al., 1997b)

The Intervention Values and Target Values – Soil Quality Standards were developed by the Netherlands Ministry of Housing, Spatial Planning, and Environment, Department of Soil Protection and will be referred to as the Dutch Screening Values (MHSPE, 1994). The Dutch Screening Values for surface soil consist of Target Values and Intervention Values. The Target Values are the soil quality levels that are ultimately desired (MHSPE, 1994). The values for heavy metals, arsenic, and fluoride were derived from analysis of field data from relatively pollution-free rural areas. The Intervention Values indicate the "concentration levels of the contaminants in the soil above which the functionality of the soil for human, plant, or animal life is seriously impaired or threatened" (MHSPE, 1994). The "ecotoxicological effects are quantified in terms of the concentrations in the soil at which 50% of the species actually (or potentially) occurring may undergo adverse effects" (MHSPE, 1994). The following equation is used to determine the criteria that indicate the need for further investigation (MHSPE, 1994):

Criteria (Intermediate Value) = (Intervention Value+Target Value)/2

The Canadian Soil Quality Guidelines were developed by the Canadian Council of Ministers of the Environment (CCME, 1997). They are derived using toxicological data to determine the threshold level for key receptors (CCME, 1997). The values are calculated for four land uses: agricultural, residential/parkland, commercial, and industrial. Exposure from direct soil contact is used to derive guidelines for the residential/parkland, commercial, and industrial land uses (CCME, 1997). However, the soil guidelines for the agricultural land use incorporates direct soil contact as well as soil and food ingestion (CCME, 1997). A more detailed discussion of the derivation of the soil quality guidelines is presented in A Protocol for the Derivation of Environmental and Human Health Soil Quality Guidelines (CCME, 1996).

The Toxicological Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision (Efroymson R.A., et al., 1997a) and the Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision (Efroymson R.A. et al., 1997b) were developed by the Oak Ridge National Laboratory (ORNL). These benchmarks were intended to be used as screening values, and as such, may be overly conservative. They are based on a 20 percent reduction in growth, reproduction, or activity (for invertebrates) or growth and yield (for plants) as the threshold for significant effects (Efroymson R.A. et al., 1997a, b).

4,4'-DDD, 4,4'-DDE, and 4,4'-DDT

The soil screening level of 0.667 mg/kg, which was calculated as discussed above as the average of the Target Value (0.0025 mg/kg) and the Intervention Value (4.0 mg/kg), was designated as the Intermediate Value (MHSPE, 1994). The original Intermediate Value was for total DDTs so the value was further divided by 3 to obtain a screening level of 0.667 for each individual "DDT" compound (i.e., 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT). However, if only one of the DDTs was present then the screening level would be 2.0 mg/kg.

Dieldrin and Endrin

The soil screening level of 0.005 mg/kg is the Target Value for total "drins", which includes aldrin, dieldrin, and endrins. The Intermediate Value for total "drins" is 2.0 mg/kg, which was calculated as discussed above as the average of the Target Value (0.005 mg/kg) and the Intervention Value (4 mg/kg).

Phthalates

The soil screening level of 0.1 mg/kg is the Target Value for total phthalates. The Intermediate Value for total phthalates is 30.05 mg/kg, which was calculated as discussed above as the average of the Target Value (0.1 mg/kg) and the Intervention Value (60 mg/kg).

PAHs

The soil screening level of 0.1 mg/kg, is the Target Value for total PAHs divided by 10 for the number of PAHs accounted for in that Target Value. The Intermediate Value for total PAHs is 20.5 mg/kg, which was calculated as discussed above as the average of the Target Value (1 mg/kg) and the Intervention Value (40 mg/kg).

PCBs

The soil screening level of 0.073 mg/kg, which was calculated as discussed in Section 4.4.2.1.1 of this report as the average of the Target Value (0.02 mg/kg) and the Intervention Value (1.0 mg/kg), was designated as the Intermediate Value (MHSPE, 1994). The original Intermediate Value was for total PCBs so the value was further divided by 7 to obtain a screening level of 0.073 mg/kg for each individual PCB compound. However, if only one of the PCBs was present then the screening level would be 0.51 mg/kg. The following bullets present some alternate benchmarks and toxicity data for PCBs:

- A large and significant decline in total microarthropod abundance was observed between Aroclor-1254 concentrations of 500 and 2,500 mg/kg. Therefore, the toxic threshold for PCBs lies somewhere between those concentrations (Parmelee et al., 1997).
- A 14-day laboratory bioassay with crickets yielded an LC50 value of 1,200 mg/kg for Aroclor-1254 (Paine et al., 1993).

- It was reported in Parmelee et al., (1997) that Rhett et al., (1988) reported LC50s of 530 mg/kg after 14 days and 366 mg/kg after 28 days for earthworms.
- 144 mg/kg was not toxic to two earthworm species after a 14-day laboratory bioassay, the EC50 for cocoon production was approximately 98 mg/kg, and the NOEC for cocoon production was approximately 72 mg/kg (Meier et al., 1997).
- 144 mg/kg inhibited lettuce seed germination, while germination was not inhibited at 108 mg/kg (Meier et al., 1997).

Aluminum

The soil screening level for aluminum of 50 mg/kg was based on one plant study in which the establishment of white clover in a silt loam (pH 5.0) was reduced by approximately 30% by the addition of 50 ppm of aluminum sulfate (Efroymson et al., 1997b). The aluminum that was applied to the soil in this study would most likely be more available than aluminum in soil at the site because it is unlikely that the aluminum at the site was disposed of as an aluminum salt. Therefore, the screening level is very conservative. No other toxicity data for aluminum in soil were located.

Antimony

The soil screening level of 5 mg/kg for antimony was based on one plant study that listed unspecified toxic effects on plants grown in surface soil with the addition of 5 ppm antimony in the form of a salt (Efroymson et al., 1997b). Because the antimony at the site was most likely not disposed of as a salt, the antimony that was applied to the soil in this study would most likely be more available than antimony in the soil at the site. No other toxicity data for antimony in soil were located.

Arsenic

The soil screening level for arsenic (19 mg/kg) was the Canadian Soil Quality Guideline and was set to protect plants and invertebrates through soil contact (CCME, 1993). The following bullets present some alternate benchmarks and toxicity data for arsenic:

- Dutch Target Value of 29 mg/kg, which was based primarily on background concentrations for metals, and the Dutch Ecological Intervention Value of 40 mg/kg, which was defined as the Hazardous Concentration 50 (i.e., 50% of the ecosystem is threatened) (Swartjes, 1999)
- ORNL benchmark for earthworms of 60 mg/kg (Efroymson et al., 1997a). The study used to develop this benchmark was based on potassium arsenate as a solution being added to a soil. The arsenic in the solution would be more bioavailable than the arsenic in the soil at the sites.
- ORNL benchmark for plants of 10 mg/kg (Efroymson et al., 1997b). All of the studies used to develop the benchmark consisted of adding arsenic as a solution to the soil. The arsenic in the solution would be more bioavailable than the arsenic in the soil at the sites.

Cadmium

The soil screening level for cadmium (3.8 mg/kg) was the Canadian Soil Quality Guideline and was set to protect mammalian and avian species through the food chain pathway (CCME, 1993). The Canadian Soil Quality Guideline set to protect plants and invertebrates through soil contact was 10 mg/kg. The following bullets present some other screening levels and toxicity data for cadmium:

- Dutch Target Value of 0.08 mg/kg, which was based primarily on background concentrations for metals, and the Dutch Ecological Intervention Value of 12 mg/kg, which was defined as the Hazardous Concentration 50 (i.e., 50% of the ecosystem is threatened) (Swartjes, 1999)

- ORNL benchmark for earthworms of 20 mg/kg (Efroymson et al., 1997a). This value was based on 18 available concentrations so confidence in the benchmark is moderate (Efroymson et al., 1997a). However, most of the studies consisted of adding a cadmium solution to soil.

- ORNL benchmark for plants of 4 mg/kg (Efroymson et al., 1997b). This value was based on 74 available concentrations so confidence in the benchmark is high (Efroymson et al., 1997b). However, most of the studies consisted of adding a cadmium solution to soil.

Chromium

The soil screening level for chromium (0.4 mg/kg) was based on an earthworm study in which potassium dichromate [Cr(IV)] was added to the soil as a solution (Efroymson et al., 1997a). The result was a 75% decrease in earthworms at the 2 ppm concentration, which was divided by 5 to obtain the benchmark of 0.4 mg/kg (Efroymson et al., 1997a). It was reported that chromium in soil typically occurs as Cr(III) (ASTDR, 1987), which is stable in most soils (CCME, 1997). Therefore, it was likely that most, if not all, of the chromium that was detected in the soil samples at the site was Cr(III). The following bullets present other screening levels and toxicity data for chromium:

- Canadian Soil Quality Guideline of 64 mg/kg, which was based on nutrient and energy cycling (CCME, 1997)
- Dutch Target Value of 100 mg/kg, which was based primarily on background concentrations for metals, and the Dutch Ecological Intervention Value of 230 mg/kg, which was defined as the Hazardous Concentration 50 (i.e., 50% of the ecosystem is threatened) (Swartjes, 1999)
- 1,000 mg/kg total chromium decreased growth and cocoon production (CCME, 1997)
- 671 to 1,400 mg/kg was the LC50 (lethal concentration at which 50 percent of the test organisms die) for earthworms (CCME, 1997)
- 21 and 31 mg/kg decreased yields by 50% in tomatoes and oats, respectively (CCME, 1997)
- 81 to 397 mg/kg reduced germination by 50% in radish and lettuce (CCME, 1997)

- 32 ppm chromium nitrate added to soil reduced growth of earthworms by 30%, while the cocoons/worm/week, the percentage of fertile cocoons, and juveniles/worm/week were reduced by 28%, 22%, and 51%, respectively, with 100 ppm chromium nitrate added to the soil (Efroymson et al., 1997a).
- 625 ppm of potassium chromium sulfate added to soil reduced the number of cocoons and hatchlings by 55%. Also, the mass gain of juveniles was reduced by 34% by 2,500 ppm Cr(III), but not by 625 ppm Cr(III) (Efroymson et al., 1997a).

Copper

The soil screening level for copper (63 mg/kg) was the Canadian Soil Quality Guideline and was set to protect plants, invertebrates, mammalian, and avian species through the food chain pathway (CCME, 1993). The following bullets present some other screening levels and toxicity data for copper:

- Dutch Target Value of 36 mg/kg, which was based primarily on background concentrations for metals, and the Dutch Ecological Intervention Value of 190 mg/kg, which was defined as the Hazardous Concentration 50 (i.e., 50% of the ecosystem is threatened) (Swartjes, 1999)
- Earthworm cocoon production was inhibited at 65 mg/kg (Ma, 1984)
- 50 mg/kg interfered with reproductive activity of earthworms (Hopkin, 1989)
- For earthworms, the NOEC (mortality) was 210 mg/kg, the NOEC (cocoon production) was 32 mg/kg, the LC50 was 555 mg/kg, and the EC50 (cocoon production) was 53.3 mg/kg (Spurgeon et al., 1994)
- 50 mg/kg caused an 18% reduction in radicle elongation in paper birch, but had no effect on several pine species (CCME, 1997)

Lead

The soil screening level for lead (70 mg/kg) was the Canadian Soil Quality Guideline and was set to protect mammalian and avian species through the food chain pathway (CCME, 1993). The following bullets present some alternate benchmarks and toxicity data for lead:

- The Canadian Soil Quality Guideline of 250 mg/kg for soil contact (ie., plants and invertebrates)
- Dutch Target Value of 85 mg/kg, which was based primarily on background concentrations for metals, and the Dutch Ecological Intervention Value of 290 mg/kg, which was defined as the Hazardous Concentration 50 (i.e., 50% of the ecosystem is threatened) (Swartjes, 1999)
- ORNL benchmark for earthworms of 500 mg/kg (Efroymson et al., 1997a)
- ORNL benchmark for plants of 50 mg/kg (Efroymson et al., 1997b). All of the studies used to develop the benchmark consisted of adding lead chloride as a solution to the soil. The lead in the solution would be more bioavailable than the lead in the soil at the sites.

- For earthworms, the NOEC (mortality) was 2,190 mg/kg, the OEC (cocoon production) was 1810 mg/kg, the LC50 was 3,760 mg/kg, and the EC50 (cocoon production) was 1,940 mg/kg (Spurgeon et al., 1994)
- NOEC for reproduction of 500 mg/kg in earthworms (Ma, 1983 as cited in Spurgeon et al., 1994)
- NOEC for reproduction of 200 mg/kg in earthworms (Bengtsson et al., 1986 as cited in Spurgeon et al., 1994)
- 100 mg/kg had no effects on plants (CCME, 1997)
- 50 to 500 mg/kg caused various reductions in weight, yield, root elongation in various plants (CCME, 1997)
- For radish and lettuce, the NOEC was 416-421 mg/kg, the LOEC was 740-974 mg/kg, the EC50 (seedling emergence) was 876-1,236 mg/kg, and the EC25 was 667-833 mg/kg (CCME, 1997)
- 150 mg/kg caused a 38-45% reduction in shoot dry weight and height of a red spruce (CCME, 1997)
- 1,179 mg/kg caused reduction in root dry weight and height of a loblolly pine (CCME, 1997)

Manganese

The soil screening level for manganese (500 mg/kg) was based on a plant study in which manganese sulfate was added to the soil as a solution (Efroymson et al., 1997b). The result was a 29% decrease in stem weight (Efroymson et al., 1997b). Manganese may bind tightly to soil, depending upon the soil type, and would likely be less bioavailable than the manganese sulfate in the study. No toxicity studies on soil invertebrates were located.

Mercury

The soil screening value of 0.1 mg/kg was based on potential impacts to earthworms (Efroymson et al., 1997a). The study used to develop the screening value evaluated mercury added to the soil as a solution, which is expected to be more bioavailable than mercury in soil. The following bullets present toxicity data from other studies to give a range of toxicity information:

- Dutch Target Value of 0.3 mg/kg, which was based primarily on background concentrations for metals, and the Dutch Ecological Intervention Value of 10 mg/kg, which was defined as the Hazardous Concentration 50 (i.e., 50% of the ecosystem is threatened) (Swartjes, 1999)
- For earthworms, 25 mg/kg (methylmercury) was fatal in 12 weeks; at 5 mg/kg (methylmercury), 21% died; at 0.79 mg/kg (inorganic mercury), 50 % died; at 5 mg/kg (inorganic mercury), 100 % died (Eisler, 1987)
- For earthworms, at 130-250 mg/kg, 25% died; at 60-700 mg/kg, 50% died (CCME, 1997)
- Mixture of mercury (10 mg/kg) and cobalt (20 mg/kg) caused a slight check in increase of body weight and development to maturity for earthworms, and a reduction of about 65% in rate of cocoon production (Lee, 1985).

- For earthworms, 0.5 ppm (added as solution) caused a 65% decrease in survival and a 40% decrease in cocoon production; 12.5 mg/kg (methylmercury - added as solution) caused a 21% decrease in survival; 2.5 mg/kg (methylmercury - added as solution) had no effect (Efroymson et al., 1997a)
- For plants, 7 to 8 mg/kg caused a 50% reduction in bloom, decrease in growth; 7 to 1000 mg/kg cause a 50% decrease in a variety of growth endpoints (CCME, 1997)
- For plants, 0.3 ppm (added as a solution) caused an unspecified toxic response; 34.9 ppm was a NOEC; 64 ppm caused a 19% decrease in seedling height; 103 ppm caused a 20% decrease in germination (Efroymson et al., 1997b)

Nickel

The soil screening value for nickel (30 mg/kg) was based on a plant study in which nickel sulfate was added to the soil as a solution (Efroymson et al., 1997b). The result was an 88% reduction in shoot weights (Efroymson et al., 1997b). The following bullets present some other screening levels and toxicity data for nickel:

- Canadian Soil Quality Guideline of 50 mg/kg (CCME, 1997)
- Dutch Target Value of 35 mg/kg, which was based primarily on background concentrations for metals, and the Dutch Ecological Intervention Value of 210 mg/kg, which was defined as the Hazardous Concentration 50 (i.e., 50% of the ecosystem is threatened) (Swartjes, 1999)
- ORNL benchmark for earthworms of 200 mg/kg (Efroymson et al., 1997a)
- 100 mg/kg had no effect, 200 mg/kg decreased growth, and 400 mg/kg totally inhibited cocoon production of earthworms from nickel added to horse manure (Lee, 1985)
- 757 mg/kg was the LC50, and 1,200 to 12,000 mg/kg reduced growth and survival of earthworms (Eisler, 1998)
- 1,300 mg/kg produced normal yields of celery, lettuce, and beets (Eisler, 1998)

Selenium

The screening value for selenium (1 mg/kg) was based on a plant study in which sodium selenate was added to the soil as a solution (Efroymson et al., 1997b). The results were various reductions in shoot weights (Efroymson et al., 1997b). The following bullets present some other screening levels for selenium:

- Dutch Target Value of 0.7 mg/kg, which was based primarily on background concentrations for metals, and the Dutch Ecological Intervention Value of 5 mg/kg, which was defined as the Hazardous Concentration 50 (i.e., 50% of the ecosystem is threatened) (Swartjes, 1999)
- ORNL benchmark for earthworms of 70 mg/kg (Efroymson et al., 1997a)

Thallium

The screening value for thallium (1 mg/kg) was based on a plant study in which thallium was added to the soil as a solution (Efroymson et al., 1997b). The results were unspecified toxic effects on plants (Efroymson et al., 1997b). The only other screening level for thallium was the Canadian Soil Quality Guideline of 1 mg/kg (CCME, 1999).

Zinc

The soil screening value for zinc (200 mg/kg) was the Canadian Soil Quality Guideline and was set to protect plants, invertebrates, mammalian, and avian species through the food chain pathway (CCME, 1993). It was also the same value as the ORNL benchmark for earthworms (Efroymson et al., 1997a). The following bullets present some other screening levels and toxicity data for zinc:

- Dutch Target Value of 140 mg/kg, which was based primarily on background concentrations for metals, and the Dutch Ecological Intervention Value of 720 mg/kg, which was defined as the Hazardous Concentration 50 (i.e., 50% of the ecosystem is threatened) (Swartjes, 1999)
- ORNL benchmark for plants of 50 mg/kg (Efroymson et al., 1997b). All of the studies used to develop the benchmark consisted of adding zinc as a solution to the soil. The zinc as a solution would be more bioavailable than the zinc in the soil at the sites.
- For earthworms, the NOEC (mortality) was 289 mg/kg, the NOEC (cocoon production) was 199 mg/kg, the LC50 was 745 mg/kg and the EC50 (cocoon production) was 276 mg/kg (Spurgeon et al., 1994)
- EC10 and EC50 (reproduction) of 136 to 1,059 mg/kg, and 261 to 2,178 mg/kg, respectively (depending on soil type) for springtails (Smit and Van Gestel, 1998)
- 1,100 mg/kg caused a 50% reduction in body weight, a cessation of cocoon production, inhibition of development, and decreased growth rate for earthworms (Lee, 1985)
- No worms were found in soil with 470 mg/kg of zinc; a LC50 of 662 mg/kg was calculated for earthworms (Eisler, 1993)
- LC50 of 80 mg/kg for earthworms (CCME, 1997)
- 50 mg/kg caused a 50% decrease in seed yield for turnips (CCME, 1997)
- 10 mg kg had no effect of seeds produced, and 115 mg/kg had no effect on leaf weight (Efroymson et al., 1997b)
- 25 mg/kg to 1,000 mg/kg caused various percentages of decreased plant, leaf, and/or root weight (Efroymson et al., 1997b)

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SEDIMENT ECOLOGICAL EFFECTS LEVELS
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Parameter	Long et al., 1995		OMOE, 1993		Cubbage et al., 1997			ARCS, 1996			MacDonald, 1994	
	ER-L	ER-M	LEL	SEL[1]	AET	PAET	FSQV	TEC	PEC	NEC	TEL	PEL
Semivolatiles (mg/kg)												
Acenaphthene	0.016	0.5	-	-	100	77	3.5	-	-	-	0.00671	0.0889
Anthracene	0.0853	1.1	0.22	3.7	41	28	2.1	0.032	0.548	1.7	0.0469	0.245
Benzo(a)anthracene	0.261	1.6	0.32	14.8	33	14	5	0.26	4.2	3.5	0.0748	0.693
Benzo(b)fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	-	-	0.24	13.4	-	-	-	-	-	-	-	-
Total Benzofluoranthenes	-	-	-	-	34	20	11	-	-	-	-	-
Benzo(g,h,i)perylene	-	-	0.17	3.2	21	4.9	1.2	0.29	6.3	3.8	-	-
Benzo(a)pyrene	0.43	1.6	0.37	14.4	25	9.7	7	0.35	0.394	0.44	0.0888	0.763
Chrysene	0.384	2.8	0.34	4.6	39	19	7.4	0.5	5.2	4	0.108	0.846
Dibenzo(a,h)anthracene	0.0634	0.26	0.06	1.3	3.5	2.2	0.23		0.028	0.87	0.00622	0.135
Fluoranthene	0.6	5.1	0.75	10.2	130	75	11	0.064	0.834	7.5	0.113	1.494
Fluorene	0.019	0.54	0.19	1.6	96	73	3.6	0.035	0.652	1.8	0.0212	0.144
Indeno(1,2,3-cd)pyrene	-	-	0.2	3.2	15	4.1	0.73	0.078	0.837	3.8	-	-
2-Methylnaphthalene	0.07	0.67	-	-	-	-	-	-	-	-	0.0202	0.201
Phenanthrene	0.24	1.5	0.56	9.5	210	110	5.7				0.0867	0.544
Pyrene	0.665	2.6	0.49	8.5	85	46	9.6	0.57	3.225	6.1	0.153	1.398
bis(2-Ethylhexyl) phthalate	-	-	-	-	-	-	0.64	-	-	-	0.182	2.647
Butylbenzyl Phthalate	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-butyl phthalate	-	-	-	-	0.043	0.042	-	-	-	-	-	-
Di-n-octyl phthalate	-	-	-	-	-	-	-	-	-	-	-	-
Carbazole	-	-	-	-	1.8	1.6	0.14	-	-	-	-	-

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SEDIMENT ECOLOGICAL EFFECTS LEVELS
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Parameter	Long et al., 1995		OMOE, 1993		Cubbage et al., 1997			ARCS, 1996			MacDonald, 1994	
	ER-L	ER-M	LEL	SEL[1]	AET	PAET	FSQV	TEC	PEC	NEC	TEL	PEL
Pesticides/PCBs (mg/kg)												
4,4'-DDD	-	-	0.008	0.06	-	-	-	-	-	-	0.00122	0.00781
4,4'-DDE	0.0022	0.027	0.005	0.19	-	-	-	-	-	-	0.00207	0.374
4,4'-DDT	-	-	-	-	-	-	-	-	-	-	0.00119	0.00477
Total DDT	0.00158	0.0461	0.007	0.12	-	-	-	-	-	-	0.00389	0.0517
Aldrin	-	-	0.002	0.08	-	-	-	-	-	-	-	-
Aroclor-1254	-	-	0.06	0.34	0.35	0.24	0.0073	-	-	-	-	-
Aroclor-1260	-	-	0.005	0.24	-	-	-	-	-	-	-	-
Total PCBs	0.0227	0.18	0.07	5.3	0.82	0.45	0.021	0.032	0.245	0.194	0.0216	0.189
BHC	-	-	0.003	0.12	-	-	-	-	-	-	-	-
gamma-BHC (Lindane)	-	-	0.003	0.01	-	-	-	-	-	-	0.00032	0.00099
Chlordane	-	-	0.007	0.06	-	-	-	-	-	-	0.00226	0.00479
alpha-Chlordane	-	-	-	-	-	-	-	-	-	-	-	-
gamma-Chlordane	-	-	-	-	-	-	-	-	-	-	-	-
Dieldrin	-	-	0.002	0.91	-	-	-	-	-	-	0.00072	0.0043
Endosulfan I	-	-	-	-	-	-	-	-	-	-	-	-
Endrin	-	-	0.003	1.3	-	-	-	-	-	-	-	-
Endrin Aldehyde	-	-	-	-	-	-	-	-	-	-	-	-
Endrin Ketone	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor Epoxide	-	-	0.005	0.05	0.26	0.26	-	-	-	-	-	-
Methoxychlor	-	-	-	-	-	-	-	-	-	-	-	-

TABLE B-14

SEDIMENT ECOLOGICAL EFFECTS LEVELS

Parameter	Long et al., 1995		OMOE, 1993		Cubbage et al., 1997			ARCS, 1996			MacDonald, 1994	
	ER-L	ER-M	LEL	SEL[1]	AET	PAET	FSQV	TEC	PEC	NEC	TEL	PEL
Inorganics (mg/kg)												
Aluminum	-	-	-	-	-	-	-	-	58030	73160	-	-
Barium	-	-	-	-	-	-	-	-	-	-	-	-
Beryllium	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	1.2	9.6	0.6	10	12	9.3	0.0051	0.592	11.7	41.1	0.68	4.21
Cobalt	-	-	-	-	-	-	-	-	-	-	-	-
Copper	34	270	16	110	840	340	0.39	28	77.7	54.8	18.7	108
Cyanide	-	-	-	-	-	-	-	-	-	-	-	-
Iron	-	-	20000	40000	-	-	-	-	-	-	-	-
Lead	46.7	218	31	250	720	490	0.45	34.2	396	68.7	30.2	112
Manganese	-	-	460	1100	1800	1400	-	1673	1081	819		-
Mercury	0.15	0.71	0.2	2	2.7	1.6	0.00041	-	-	-	0.13	0.7
Nickel	20.9	51.6	16	75	-	-	-	39.6	38.5	37.9	15.9	42.8
Selenium	-	-	-	-	-	-	-	-	-	-	-	-
Silver	1	3.7	-	-	4.5	3.9	0.0061	-	-	-	0.73	1.77
Thallium	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	150	410	120	820	3200	1000	0.41	159	1532	541	124	271

- = Not available.
1 Values assume 1% organic carbon.

ER-L = Effects-Range Low; ER-M = Effects-Range Median
LEL = Lowest Effects Level; SEL = Severe Effects Level
AET = Apparent Effect Threshold; PAET = Probable Apparent Effect Threshold; FSQV = Freshwater Sediment Quality Value
TEC = Threshold Effect Concentration; PEC = Probable Effects Concentration; NEC = high No Effect Concentration
TEL = Threshold Effect Level; PEL = Probable Effect Level

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