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FINAL TECHNICAL MEMORANDUM FOR NO FURTHER ACTION AT POTENTIAL SOURCE OF CONTAMINATION 40 ABANDONED WASTEWATER TREATMENT PLANT FORMERLY SITE A-4 FACILITY 682 NAS CECIL FIELD FL

7/6/2001

TETRA TECH NUS INC

Technical Memorandum
for
No Further Action

Potential Source of Contamination 40
Abandoned Wastewater
Treatment Plant
Formerly Site A-4, Facility 682

Naval Air Station Cecil Field
Jacksonville, Florida

Southern Division
Naval Facilities Engineering Command
Contract Number N62467-94-D-0888
Contract Task Order 0078

July 2001

TECHNICAL MEMORANDUM
FOR NO FURTHER ACTION

POTENTIAL SOURCE OF CONTAMINATION 40
ABANDONED WASTEWATER TREATMENT PLANT
FORMERLY SITE A-4, FACILITY 682

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29406

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

JULY 2001

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The professional opinions rendered in this decision document identified as Technical Memorandum for No Further Action, Potential Source of Contamination 40, 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 Speranza

Mark Speranza, P.E.
Professional Engineer No. PE0050304

Date: 7/6/01

Mark Speranza

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: July 6, 2001

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.
BaP	Benzo(a)pyrene
BCT	BRAC Cleanup Team
bgs	Below ground surface
BRAC	Base Realignment and Closure
BSAF	Biota-sediment accumulation factor
CLEAN	Comprehensive Long-Term Environmental Action Navy
COPC	Chemical of potential concern
CTO	Contract Task Order
EBS	Environmental Baseline Survey
EISOPQAM	Environmental Investigations Standard Operating Procedures and Quality Assurance Manual
ER-L	Effects range – low
ESV	Ecological screening value
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
GCTL	Groundwater Cleanup Target Level
HLA	Harding Lawson Associates
HQ	Hazard Quotient
IBDS	Inorganic Background Data Set
MDL	Method detection limit
mg/kg	Milligram per kilogram
NAS	Naval Air Station
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NOAA	National Oceanic and Atmospheric Administration
PAH	Polyaromatic hydrocarbons
PCB	Polychlorinated biphenyl
PRE	Preliminary risk evaluation
PSC	Potential source of contamination
QA/QC	Quality assurance/quality control
RAC	Remedial action contractor
SAOR	Sampling and Analysis Outline and Report
SAR	Sampling and Analysis Report
SCTL	Soil Cleanup Target Level

SOUTHNAVFACENGCOM	Southern Division Naval Facilities Engineering Command
SVOC	Semivolatile organic compound
TAL	Target Analyte List
TEL	Threshold effects level
TRV	Toxicity reference value
TtNUS	Tetra Tech NUS, Inc.
U.S. EPA	United States Environmental Protection Agency
UCL	Upper confidence limit
VOC	Volatile organic compound

1.0 INTRODUCTION

This Technical Memorandum for Potential Source of Contamination (PSC) 40, Abandoned Wastewater Treatment Plant (Formerly Site A-4, Facility 682), 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) agreed to delineate, excavate, and dispose of soil at PSC 40 that is contaminated with metals.

TtNUS performed three sampling events at PSC 40 between May and October 1999 to supplement the results of previous investigations and to delineate the extent of metals-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 metals-contaminated surface soil.

This technical memorandum presents information from the previous investigations and summarizes the related field operations, results, conclusions, and recommendations of the PSC investigation conducted by TtNUS during 1999 and the activities related to the removal action as described in the Source Removal Report for PSC 40 (CH2M Hill, 2000). The results of the investigation and the subsequent removal action indicate that no further action is needed at this site.

2.0 SITE DESCRIPTION

2.1 PHYSICAL SETTING

PSC 40 is an abandoned wastewater treatment facility primarily located in the southwestern section of the Yellow Water Weapons Area North Quadrant (YWN) west of the Yellow Water Weapons Complex (Figure 2-1). According to the BRAC NAS Cecil Field Environmental Baseline Survey (EBS) Report (ABB-ES, 1994), the site includes an Imhoff Tank, a subsurface concrete vault, two shallow sludge drying beds, and two wastewater lagoons (Figure 2-2).

2.2 SITE HISTORY

Historical information indicates that, at one time, wastewater from barracks, offices, and light industrial facilities located within the Yellow Water Weapons Area was pumped to the Imhoff Tank of the wastewater treatment facility. Partially clarified wastewater was then pumped from the top of the Imhoff Tank to a mounded leach field, and the settled solids were pumped to two sludge drying beds. Water released during consolidation of the sludge was captured by an underdrain and directed to the leach field. In 1974, the treatment plant was abandoned and the Imhoff Tank was backfilled with soil.

The abandoned wastewater treatment facility was recommended in the EBS, along with Installation Restoration (IR) Site 14 and several nearby dumpsites, for consideration as an area of environmental concern within YWN. These sites were color-coded Gray to indicate that additional evaluation was required.

Due to a lack of information regarding waste types and quantities at the site, a Sampling and Analysis Report (SAR) for assessment of surface water, sediment, surface soil, and groundwater was prepared by ABB Environmental Services, Inc. (ABB-ES) and approved by the BCT. The site was designated as Site A-4, Building 682 by ABB-ES. A preliminary risk evaluation (PRE) was also conducted to assess the potential risks to human receptors. The results were reported in the SAR, Site A-4, Facility 682 (ABB-ES, 1996).

2.3 SITE GEOLOGY AND HYDROGEOLOGY

No site-specific geological investigation was performed at PSC 40. The site is located between Operable Unit 5, Site 14 and Operable Unit 5, Site 15 in the Yellow Water Weapons Area. The geological and hydrogeological characteristics of the site are assumed to be similar to those described in the Remedial Investigation Report for Operable Unit 5, Sites 14 and 15 (ABB-ES, 1997).

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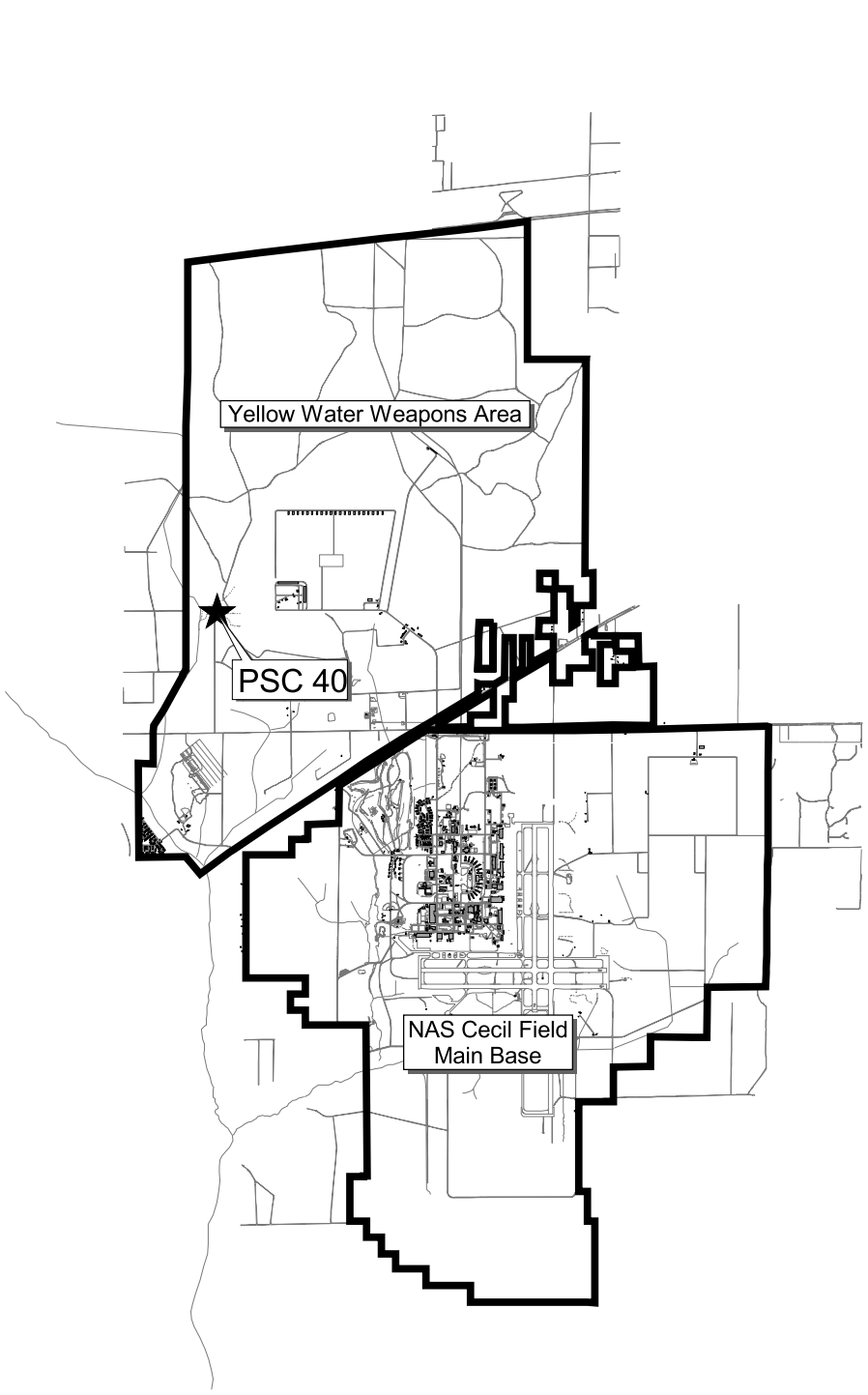

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SCALE AS NOTED			DRAWING NO. FIGURE 2-1 / REV 0

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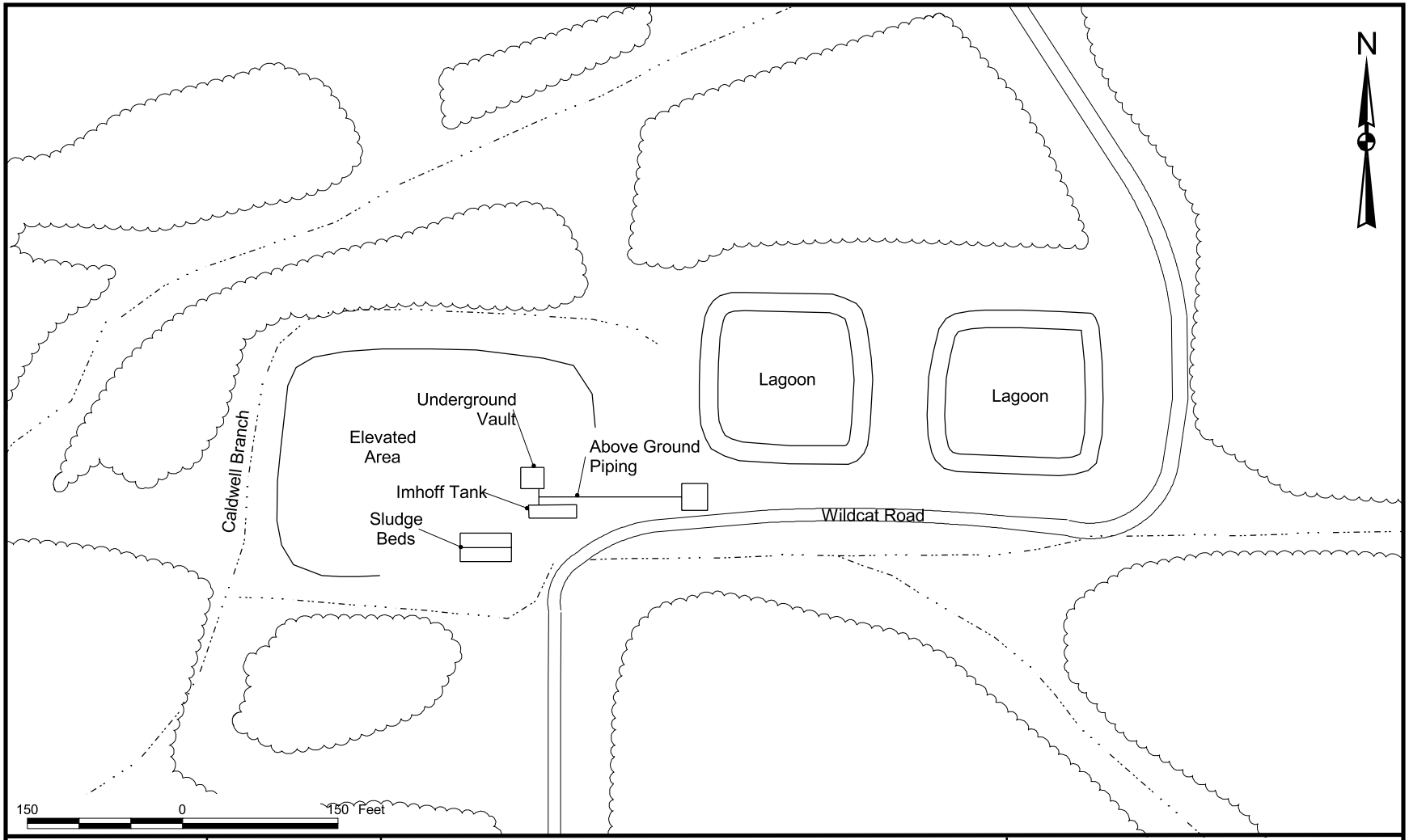

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3.0 PREVIOUS INVESTIGATIONS

Environmental investigations at PSC 40 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, Site A-4, Facility 682 (ABB-ES, 1996)
- SAOR, Yellow Water Weapons Area (HLA, 1999)

The SAR (ABB-ES, 1996) indicated the following:

- Human health screening criteria for antimony, barium, cadmium, lead, manganese, nickel, selenium, and vanadium were exceeded in surface soil samples collected in the study area. Potential ecological risks associated with surface soil were not evaluated.

- Human health screening criteria for aluminum, iron, lead, and vanadium were exceeded in groundwater samples collected in the study area.

- A qualitative comparison between concentrations of analytes detected in surface water and sediment and ecological screening criteria indicated a relatively low risk to ecological receptors from exposure to these media.

- Additional sampling and analysis were recommended to determine the areal extent of surface soil and groundwater contamination. Additional surface water and sediment samples were also recommended to determine whether the Caldwell Branch of Rowell Creek or its minor tributaries have been affected.

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

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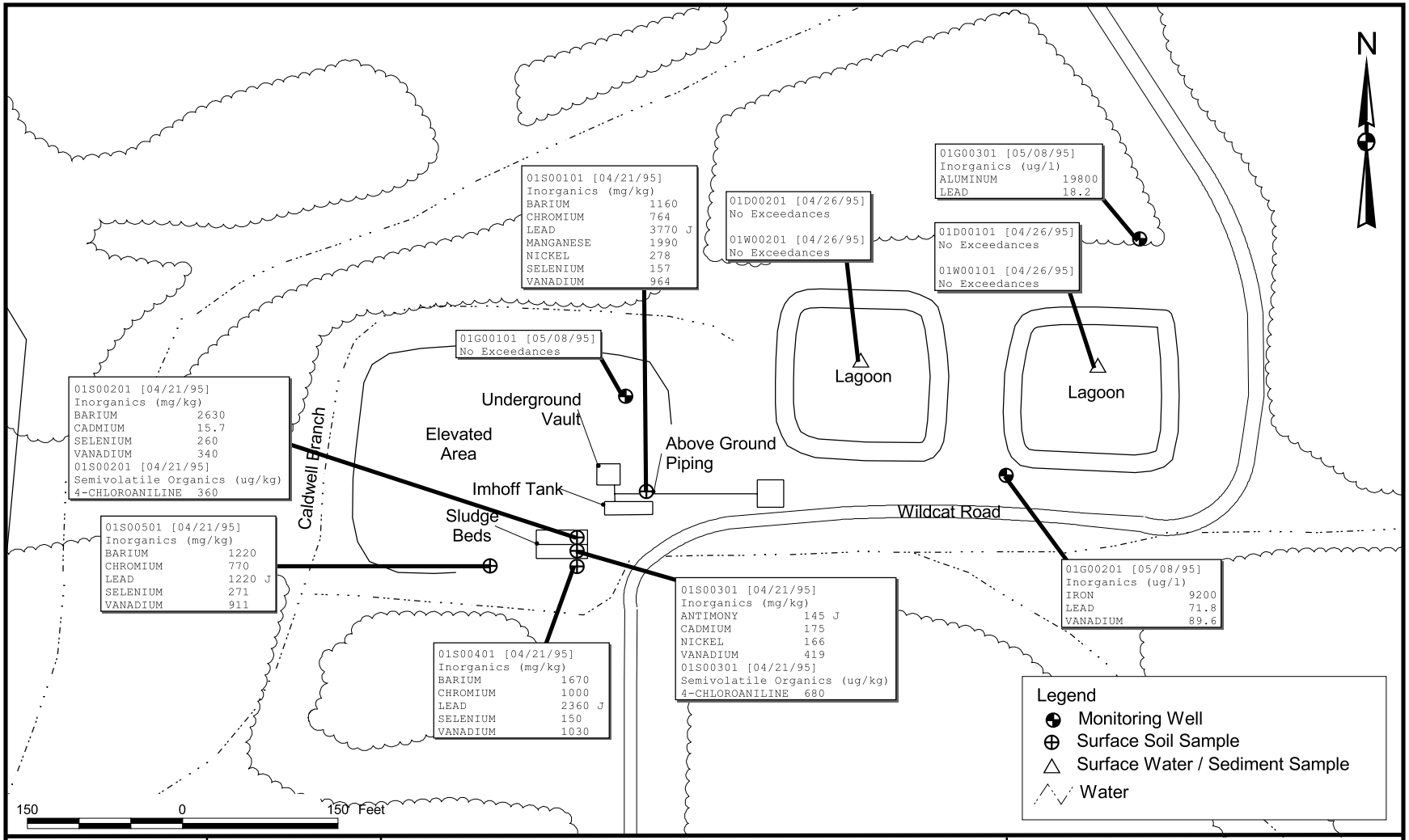

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COST/SCHEDULE-AREA		YELLOW WATER WEAPONS AREA		APPROVED BY / DATE
SCALE		TECHNICAL MEMORANDUM		DRAWING NO.
AS NOTED		NAVAL AIR STATION CECIL FIELD		FIGURE 3-1
		JACKSONVILLE, FLORIDA		REV 0

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4.0 FIELD INVESTIGATION

TtNUS conducted three sampling and analysis events at PSC 40 between May and October 1999. The field investigation was required to delineate soil contamination identified in the previous sampling activities and was performed in accordance with the three PSC 40 Sampling and Analysis Work Plans (TtNUS, 1999). A total of 23 surface soil samples, 4 groundwater samples, and 3 sediment samples were collected over the three events.

- During Phase I, three surface soil samples (CEF-P40-SS-002 through CEF-P40-SS-004) were collected on the south bank of the stream located south of the abandoned wastewater treatment plant and, eight surface soil samples (CEF-P40-SS-005 through CEF-P40-SS-012) were collected in the elevated mound section of the abandoned treatment plant. These samples were analyzed for polynuclear aromatic hydrocarbons (PAHs) and Target Analyte List (TAL) inorganics.

- Also during Phase I, one sediment sample (CEF-P40-SD-001) was collected from a drainage ditch downgradient of the abandoned treatment facility, and two sediment samples (CEF-P40-SD-013 and CEF-P40-SD-014) were collected, one from each of the lagoons on the eastern portion of the site. Sample CEF-P40-SD-001 was analyzed for PAHs and TAL inorganics, and samples SD-013 and SD-014 were analyzed for Target Compound List (TCL) volatile organic compounds (VOCs) and pesticides, PAHs, and TAL metals.

- Two surface water samples were proposed to be collected, one in association with each of the lagoon samples, and analyzed for the same parameters, but standing water was not present in the lagoons when the sampling occurred.

- Four existing groundwater monitoring wells at the site (CEF-682-01, CEF-682-02, CEF-682-03, and CEF-682-04) were sampled as part of Phase I activities. Groundwater samples were analyzed for TCL VOCs, semivolatile organic compounds (SVOCs), and pesticides, PAHs, and TAL metals.

- During Phase II, four surface soil samples were collected from the 0- to 1-foot depth interval (CEF-P40-SS-101 to CEF-P40-SS-104) to identify the horizontal extent of contamination. In addition, four surface soil samples were collected from the 1- to 2-foot depth interval (CEF-P40-SS-105 to CEF-P40-SS-108) to identify the vertical extent of contamination. Samples CEF-P40-SS-101-01 through SS-104-01 and SS-105-02 were analyzed for silver. Sample CEF-P40-SS-106-02 was analyzed for lead, SS-107-02 was analyzed for antimony and cadmium, and SS-108-02 was analyzed for chromium and vanadium.

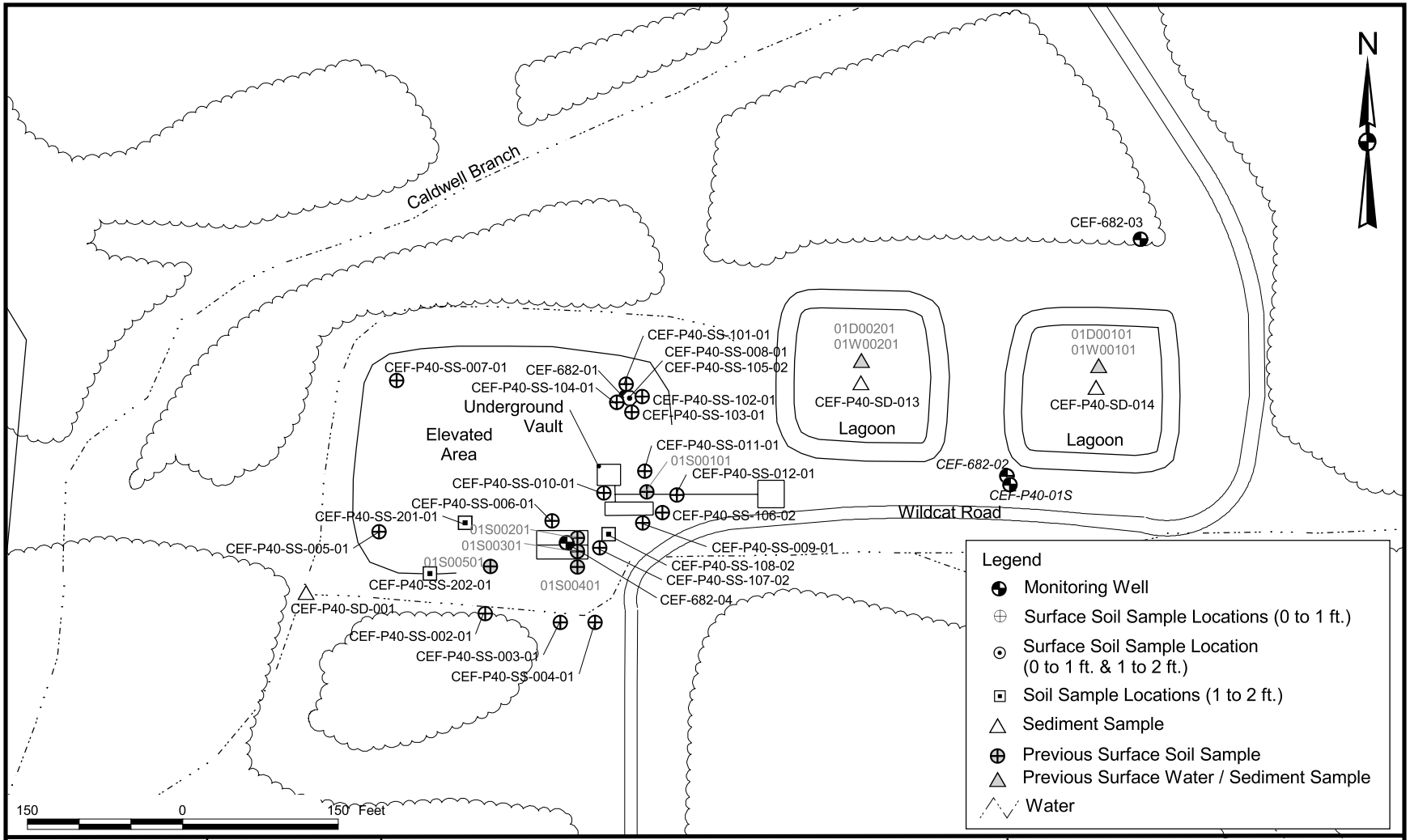
- During Phase III, two surface soil samples were collected from the 0- to 1-foot depth interval (CEF-P40-SS-201 and CEF-P40-SS-202) to complete horizontal delineation of the extent of contamination. CEF-P40-SS-201-01 and SS-201-01 were analyzed for barium, chromium, lead, and vanadium,

Over the three phases of sampling, three duplicate surface soil samples, one duplicate sediment sample, and one duplicate groundwater sample were collected for quality assurance/quality control (QA/QC) purposes.

Sampling locations for all three phases of field sampling are shown on Figure 4-1. Analytical results are discussed in Section 5.0 and are included in Appendix A.

Surface soil and sediment samples were collected as grab samples using plastic, disposable trowels. The groundwater samples were collected using low-flow techniques; however, inorganic analyses were run on both filtered and unfiltered samples. Sampling activities were performed in accordance with the procedures described in the U.S. Environmental Protection Agency (U.S. EPA) Region IV Environmental Investigations Standard Operating Procedures and Quality Assurance Manual (EISOPAQM) (U.S. EPA Region IV, 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 sampling equipment was disposable.

Accutest Southeast, in Orlando, Florida, performed analyses for PAHs by U.S. EPA Method SW-846 8310, for VOCs by U.S. EPA Method SW-846 8260B, for SVOCs by U.S. EPA Method SW-846 8270C, for pesticides by U.S. EPA Method SW-846 8081A, and for TAL inorganics by U.S. EPA Method SW-846 6010B.



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SCALE AS NOTED			DRAWING NO. FIGURE 4-1 / REV 0

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5.0 NATURE AND EXTENT OF CONTAMINATION

Analytical results for the groundwater, sediment, and soil samples collected during the three-phased field investigation are shown on Tables 5-1 through 5-5. 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 the Florida Department of Environmental Protection (FDEP) criteria, as proposed 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.

In Table 5-1, FDEP groundwater cleanup target levels (GCTLs) and IBDS values were used for comparison with groundwater results. For well CEF-682-04, both the IBDS value and FDEP GCTL for silver were exceeded in the unfiltered sample; however, the silver concentration in the filtered sample was significantly below both of these criteria, and both duplicate samples (filtered and unfiltered) indicated the silver to be undetected.

CEF-682-02 produced a highly turbid sample that exceeded criteria for aluminum, beryllium, iron, lead, and vanadium for the unfiltered sample. Although concentrations in the filtered sample from CEF-682-02 did not exceed criteria, a second well, CEF-P40-1S, was installed approximately 10 feet south of the CEF-682-02 location in late November 2000, and filtered and unfiltered samples were collected in December 2000. Samples from CEF-P40-01S were analyzed for the five analytes (aluminum, beryllium, iron, lead, and vanadium) that exceeded cleanup criteria in the original unfiltered sample from CEF-682-02. Iron in the filtered sample from CEF-P40-01S exceeded the IBDS value of 7,760 µg/L, although the unfiltered iron concentration (8,840 µg/L) did not exceed the IBDS value.

Tables 5-2 and 5-3 present PAH and inorganic results, respectively for sediment samples collected as part of this investigation. Discussion of these samples is included in the screening ecological risk assessment, presented in Section 6.2.

As shown in Tables 5-4 and 5-5, soil sample results were compared to the more restrictive of the FDEP residential direct exposure or the leachability to groundwater soil cleanup target levels (SCTLs) for PAHs and the more restrictive of the SCTLs (residential or leachability to groundwater) or IBDS values, whichever is greater.

The results of the sampling and analysis identified the horizontal and vertical extent of metals contamination in excess of the more restrictive FDEP SCTL or the IBDS value if that value was higher

TABLE 5-1

ANALYTICAL RESULTS FOR GROUNDWATER
PSC 40, ABANDONED WASTEWATER TREATMENT PLANT
TECHNICAL MEMORANDUM
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Parameter	FDEP GCTL	IBDS Concentration	CEF-682-01		CEF-682-02		CEF-682-03		CEF-682-04				CEF-P40-01S**	
			Total	Filtered	Total	Filtered	Total	Filtered	Total		Filtered		Total	Filtered
									Sample	Duplicate	Sample	Duplicate		
Inorganic Analytes, ug/L														
Aluminum	200	13,100	6180	87.2 U	**79,500**	473	421 U	40.9 U	12,400	487	841	33.2 U	830	142
Antimony	6.0	44.5	2.4 U	2.4 U	2.4 U	2.7 U	4.5 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	NA	NA
Arsenic	50.0	7.1	3.4 U	3.4 U	13.6	3.4 U	3.4 U	3.4 U	3.4 U	3.4 U	3.4 U	3.4 U	NA	NA
Barium	2000	88.2	73.7	65.9	1960	38.8	23.5	22.9	22.9	23.4	11.5	23.3	NA	NA
Beryllium	4.0	3.5	2.3 U	1.3 U	**18.8**	1.3 U	1.3 U	1.2 U	2.3 U	0.36 U	1.3 U	0.45 U	0.49	0.43
Cadmium	5.0	6.0	0.33 U	0.33 U	0.67 U	0.33 U	0.35 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	NA	NA
Calcium	NC	81,100	13,900	14,700	40,800	2870	63,400	62,500	2230	63,500	2030	61,400	NA	NA
Chromium	100	18.0	6.8 U	14.8	80.0	3.9 U	3.0 U	1.4 U	10.6	1.7 U	3.2 U	3.7 U	NA	NA
Cobalt	420	12.8	1.1 U	0.8 U	5.3 U	0.8 U	0.8 U	0.8 U	1.6 U	0.8 U	0.8 U	0.8 U	NA	NA
Copper	1000	12.5	0.75 U	0.75 U	18.9	0.77 U	0.75 U	0.75 U	6.3	1.3 U	0.75 U	0.86 U	NA	NA
Iron	300	7760	4810	4340	**66,600**	4490	332	251 U	2820	317	1150	391	7650	**8840**
Lead	15.0	5.35	2.3 U	1.6 U	**126**	1.6 U	1.6 U	1.6 U	4.7 U	1.6 U	1.6 U	1.6 U	1.2 U	1.2 U
Magnesium	NC	10,000	6650	6940	19,500	1440	1390	1380	669	1440	352	1460	NA	NA
Manganese	50	150 *	33.3	33.5	111	9.2	6.1	6.0 U	12.7	5.5 U	9.2	5.8 U	NA	NA
Mercury	2.0	0.34	0.25 U	0.25 U	0.44	0.25 U	0.39	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	NA	NA
Nickel	100	24.5	1.8 U	7.4 U	26.0	3.1 U	2.3 U	1.1 U	3.8 U	1.1 U	2.3 U	1.0 U	NA	NA
Potassium	NC	4330	1260	1010	2710	631	586 U	527 U	1770	561	1490	550	NA	NA
Selenium	50.0	7.0	2.0 U	2.0 U	7.7 U	2.0 U	6.5 U	5.2 U	2.0 U	6.4	2.0 U	5.9	NA	NA
Silver	100.0	6.0	1.6 U	1.3 U	0.96 U	1.6 U	1.6 U	0.96 U	**156**	0.96 U	1.2 U	0.96 U	NA	NA
Sodium	160,000	16,500	8170	9210	7740	6740	1890	1790	12,100	1870	13,700	1900	NA	NA
Thallium	2.0	13.3	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	7.6 U	2.7 U	5.3 U	NA	NA
Vanadium	49.0	20.2	6.3	0.91 U	**429**	25.6	7.2	6.1	14.1	7.3	4.6 U	6.7	1.5	1.0
Zinc	5000	76.8	22.1 U	33.2 U	120	35.8 U	32.8 U	30.0 U	59.8	20.6	62.5	24.5	NA	NA

Shaded values indicate concentrations in excess of criteria (secondary MCL criteria are not considered).
NA - Not Analyzed
NC - No Criteria
IBDS Concentration = NAS Cecil Field Inorganic Background Data Set (HLA, 1998).
FDEP GCTL = Florida Department of Environmental Protection Groundwater Cleanup Target Level, FAC Chapter 62-777 (FDEP, 1999).
* Revised IBDS value for manganese in groundwater
** Well CEF-P40-1S was installed in November 2000 to investigate high turbidity and exceedances of GCTLs in unfiltered groundwater from CEF-682-02. A groundwater sample was collected in December 2000 and analyzed for the five analytes that exceeded GCTLs in the May 1999 sample from CEF-682-02.

TABLE 5-2

POLYNUCLEAR AROMATIC HYDROCARBON ANALYTICAL RESULTS FOR SEDIMENT
PSC 40, FORMER SITE A-4, FACILITY 682, ABANDONED WASTEWATER TREATMENT PLANT
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Parameter	FDEP SCTL	CEF-P40-			
		SD-001	SD-013	SD-014	
				Sample	Duplicate
Polynuclear Aromatic Hydrocarbons (PAHs), ug/kg					
1-Methylnaphthalene	2,200	48 U	41 U	43 U	40 U
2-Methylnaphthalene	6,100	48 U	41 U	810	40 U
Acenaphthene	2,100	48 U	41 U	43 U	40 U
Acenaphthylene	27,000	99 U	84 U	88 U	82 U
Anthracene	2,500,000	7.4 U	6.3 U	6.6 U	6.1 U
Benzo(a)anthracene	1,400	7.4 U	6.3 U	6.6 U	6.1 U
Benzo(a)pyrene	100	7.4 U	6.3 U	6.6 U	6.1 U
Benzo(b)fluroanthene	1,400	7.4 U	6.3 U	6.6 U	6.1 U
Benzo(g,h,i)perylene	2,300,000	9.9 U	8.4 U	8.8 U	8.2 U
Benzo(k)fluoranthene	15,000	7.4 U	6.3 U	6.6 U	6.1 U
Chrysene	77,000	7.4 U	140	8000	6.1 U
Dibenzo(a,h)anthracene	100	12 U	10 U	11 U	10 U
Fluoranthene	1,200,000	9.9 U	8.4 U	8.8 U	8.2 U
Fluorene	160,000	9.9 U	8.4 U	8.8 U	8.2 U
Indeno(1,2,2-cd)pyrene	1,500	63 U	53 U	6.6 U	6.1 U
Naphthalene	1,700	48 U	41 U	690	40 U
Phenanthrene	250,000	7.4 U	6.3 U	6.6 U	6.1 U
Pyrene	880,000	9.9 U	8.4 U	8.8 U	8.2 U

Shaded values indicate concentrations in excess of criteria.
IBDS = NAS Cecil Field Inorganic Background Data Set (HLA, 1998).
FDEP = Florida Department of Environmental Protection
SCTL = Lowest of residential and leachability to groundwater Soil Cleanup Target Level, FAC Chapter 62-777 (FDEP, 1999).
CEF-P40-SD-001 was analyzed for PAHs and inorganics. CEF-P40-SD-013 and SD-014 were analyzed for VOCs, pesticides, PAHs, inorganics. No VOCs or pesticides were detected in these samples.

TABLE 5-3

INORGANIC ANALYTICAL RESULTS FOR SEDIMENT
PSC 40, FORMER SITE A-4, FACILITY 682, ABANDONED WASTEWATER TREATMENT PLANT
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Parameter	FDEP SCTL	IBDS Concentration	CEF-P40-			
			SD-001	SD-013	SD-014	
					Sample	Duplicate
Inorganic Analytes, mg/kg						
Aluminum	72,000	10,200	3690	3010	4090	6320
Antimony	5.0	15.1	0.28 U	0.38	0.31 U	0.38
Arsenic	0.8	2.0	0.40 U	0.47 U	0.45 U	0.48 U
Barium	110	36.1	13.0	14.8	7.5	11.1
Beryllium	63.0	0.625	0.40	0.21	0.20	0.16
Cadmium	8.0	2.05	0.10	0.33	0.04	0.05 U
Calcium	NC	5920	326	574	421	554
Chromium	38.0	16.0	8.3	9.1	4.0	7.0
Cobalt	4700	3.0	0.34	0.22	0.22	0.34
Copper	110	12.5	31.7	12.8	3.3	3.1
Iron	23,000	3330	822	1240	786	1090
Lead	400	44.6	53.2	23.3	7.2	8.3
Magnesium	NC	379	129	147	139	201
Manganese	1600	17.0	3.3	3.4	2.8	3.9
Mercury	2.1	0.2	0.05 U	0.06 U	0.05 U	0.06 U
Nickel	110	7.0	3.0	1.3	0.87	1.8
Potassium	NC	289	61.5	46.1	55.0	76.0
Selenium	5.0	2.27	0.30	0.28 U	0.26 U	0.28 U
Silver	17.0	1.87	0.12	0.22	0.12 U	0.22
Sodium	NC	388	21.4	39.3	20.8	36.8
Thallium	NC	2.84	0.31 U	0.37 U	0.35 U	0.38 U
Vanadium	15.0	15.0	4.3	3.7	4.0	5.7
Zinc	6000	92.1	9.4	20.8	10.9	6.4

Shaded values indicate concentrations in excess of criteria.
NC = No criterion
IBDS = NAS Cecil Field Inorganic Background Data Set (HLA, 1998).
FDEP = Florida Department of Environmental Protection
SCTL = Lowest of residential and leachability to groundwater Soil Cleanup Target Level, FAC Chapter 62-777 (FDEP, 1999).
CEF-P40-SD-001 was analyzed for PAHs and inorganics. CEF-P40-SD-013 and SD-014 were analyzed for VOCs, pesticides, PAHs, inorganics. No VOCs or pesticides were detected in these samples.

TABLE 5-4

POLYNUCLEAR AROMATIC HYDROCARBON ANALYTICAL RESULTS FOR SURFACE SOIL
PSC 40, FORMER SITE A-4, FACILITY 682, ABANDONED WASTEWATER TREATMENT PLANT
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Parameter	FDEP SCTL		CEF-P40-					
	Residential Direct Exposure	Leachability to Groundwater	SS-002-01	SS-003-01	SS-004-01	SS-005-01	SS-006-01	SS-007-01
Polynuclear Aromatic Hydrocarbons (PAHs), ug/kg								
1-Methylnaphthalene	68,000	2,200	50 U	54 U	53 U	53 U	54 U	54 U
2-Methylnaphthalene	83,000	6,100	50 U	54 U	53 U	53 U	54 U	54 U
Acenaphthene	1,900,000	2,100	50 U	54 U	53 U	53 U	54 U	54 U
Acenaphthylene	1,100,000	27,000	100 U	110 U	110 U	110 U	110 U	110 U
Anthracene	18,000,000	2,500,000	7.6 U	8.1 U	8.1 U	8.1 U	8.2 U	8.2 U
Benzo(a)anthracene	1,400	3,200	7.6 U	8.1 U	8.1 U	8.1 U	8.2 U	8.2 U
Benzo(a)pyrene	100	8,000	7.6 U	8.1 U	8.1 U	8.1 U	8.2 U	8.2 U
Benzo(b)fluroanthene	1,400	10,000	7.6 U	8.1 U	8.1 U	8.1 U	8.2 U	8.2 U
Benzo(g,h,i)perylene	2,300,000	32,000,000	10 U	11 U	11 U	11 U	11 U	11 U
Benzo(k)fluoranthene	15,000	25,000	7.6 U	8.1 U	8.1 U	8.1 U	8.2 U	8.2 U
Chrysene	140,000	77,000	7.6 U	8.1 U	8.1 U	8.1 U	8.2 U	8.2 U
Dibenzo(a,h)anthracene	100	30,000	12 U	13 U	13 U	13 U	13 U	13 U
Fluoranthene	2,900,000	1,200,000	10 U	11 U	11 U	11 U	11 U	11 U
Fluorene	160,000	2,200,000	10 U	11 U	11 U	11 U	11 U	11 U
Indeno(1,2,2-cd)pyrene	1,500	28,000	7.6 U	8.1 U	8.1 U	69 U	8.2 U	8.2 U
Naphthalene	40,000	1,700	50 U	54 U	54 U	54 U	54 U	54 U
Phenanthrene	2,000,000	250,000	7.6 U	8.1 U	8.1 U	8.1 U	8.2 U	8.2 U
Pyrene	2,200,000	880,000	10 U	11 U	11 U	11 U	11 U	11 U

TABLE 5-4

POLYNUCLEAR AROMATIC HYDROCARBON ANALYTICAL RESULTS FOR SURFACE SOIL
PSC 40, FORMER SITE A-4, FACILITY 682, ABANDONED WASTEWATER TREATMENT PLANT
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Parameter	FDEP SCTL		CEF-P40-					
	Residential Direct Exposure	Leachability to Groundwater	SS-008-01		SS-009-01	SS-010-01	SS-011-01	SS-012-01
			Sample	Duplicate				
Polynuclear Aromatic Hydrocarbons (PAHs), ug/kg								
1-Methylnaphthalene	68,000	2,200	54 U	52 U	54 U	53 U	53 U	53 U
2-Methylnaphthalene	83,000	6,100	54 U	52 U	54 U	53 U	53 U	53 U
Acenaphthene	1,900,000	2,100	54 U	52 U	54 U	53 U	53 U	53 U
Acenaphthylene	1,100,000	27,000	110 U	110 U	110 U	110 U	110 U	110 U
Anthracene	18,000,000	2,500,000	8.1 U	8.0 U	8.3 U	8.1 U	8.0 U	8.0 U
Benzo(a)anthracene	1,400	3,200	8.1 U	8.0 U	8.3 U	8.1 U	8.0 U	8.0 U
Benzo(a)pyrene	100	8,000	8.1 U	8.0 U	8.3 U	8.1 U	8.0 U	8.0 U
Benzo(b)fluroanthene	1,400	10,000	8.1 U	8.0 U	8.3 U	8.1 U	8.0 U	8.0 U
Benzo(g,h,i)perylene	2,300,000	32,000,000	11 U	11 U	11 U	11 U	11 U	11 U
Benzo(k)fluoranthene	15,000	25,000	8.1 U	8.0 U	8.3 U	8.1 U	8.0 U	8.0 U
Chrysene	140,000	77,000	8.1 U	8.0 U	67	8.1 U	66	8.0 U
Dibenzo(a,h)anthracene	100	30,000	13 U	13 U	14 U	13 U	13 U	13 U
Fluoranthene	2,900,000	1,200,000	11 U	11 U	11 U	11 U	11 U	11 U
Fluorene	160,000	2,200,000	11 U	11 U	11 U	11 U	11 U	11 U
Indeno(1,2,2-cd)pyrene	1,500	28,000	8.1 U	8.0 U	70 U	8.1 U	8.0 U	8.0 U
Naphthalene	40,000	1,700	54 U	52 U	54 U	54 U	53 U	53 U
Phenanthrene	2,000,000	250,000	8.1 U	8.0 U	8.3 U	8.1 U	8.0 U	8.0 U
Pyrene	2,200,000	880,000	11 U	11 U	11 U	11 U	11 U	11 U

FDEP SCTL = Florida Department of Environemntal Protection Soil Target Cleanup Level, FAC 62-777 (FDEP, 1999)
Samples CEF-P40-SS-101-01 to SS-108-02, SS-201-01, and SS-202-01 were analyzed for selected metals only.
U = Not detected at or above detection limit (associated value)

TABLE 5-5

INORGANIC ANALYTICAL RESULTS IN SOIL
PSC 40, FORMER SITE A-4, FACILITY 682, ABANDONED WASTEWATER TREATMENT PLANT
NAVAL AIR STATION CEICL FIELD
JACKSONVILLE, FLORIDA

Parameter	FDEP SCTL		IBDS Concentration	CEF-P40-				
	Residential Direct Exposure	Leachability to Groundwater		SS-002-01	SS-003-01	SS-004-01	SS-005-01	SS-006-01
Inorganic Analytes (mg/kg)								
Aluminum	72,000	NC	4,430	1,720	421	593	6,190	887
Antimony	26.0	5.0	9.44	0.27 U	0.25 U	0.25 U	0.25 U	0.25 U
Arsenic	0.80	29.0	2.04	0.39 U	0.36 U	0.36 U	1.6	0.36 U
Barium	110	1,600	14.4	13.1	4.2	4.1	13.7	6.3
Beryllium	120	63.0	0.35	0.32 U	0.24 U	0.24 U	0.29 U	0.24 U
Cadmium	75.0	8.0	1.72	0.04 U	0.05 U	0.03 U	0.09 U	0.09 U
Calcium	NC	NC	9.44	426	234	258	267	440
Chromium	210	38.0	7.75	5.1 J	1.2 J	1.2	6.6 J	4.2 J
Cobalt	4,700	NC	3.11	0.19 U	0.18 U	0.15 U	0.37 U	0.13 U
Copper	110	NC	5.97	5.3	4.5	4.1	5.1	8.6
Iron	23,000	NC	1,490	1,130	220	324	6,510	794
Lead	400	NC	197	23.2	6.3	9.8	9.3	13.2
Magnesium	NC	NC	329	98.2	58.4	67.7	162	103
Manganese	1,600	NC	22.0	5.2	1.4	2.1	3.0	8.0
Mercury	3.4	2.1	0.16	0.05 U	0.04 U	0.04 U	0.04 U	0.04 U
Nickel	110	130	3.89	2.1	0.56 U	0.49 U	1.4	0.65 U
Potassium	NC	NC	102	68.7	32.4 U	31.7 U	62.5 U	42.1 U
Selenium	390	5.0	1.68	0.23 U	0.26 U	0.21 U	0.45 U	0.21 U
Silver	390	17.0	2.13	0.11 U	0.18 U	0.11 U	0.13 U	0.17 U
Sodium	NC	NC	343	17.1 U	25.8 U	16.1 U	16.1 U	16.0 U
Thallium	NC	NC	2.84	0.30 U	0.28 U	0.28 U	0.28 U	0.28 U
Vanadium	15.0	980	6.3	2.0	1.2	1.4	13.6	1.5
Zinc	23,000	6,000	37.0	4.1 J	3.7 J	4.5 J	4.9 J	6.0 J

TABLE 5-5

INORGANIC ANALYTICAL RESULTS IN SOIL
PSC 40, FORMER SITE A-4, FACILITY 682, ABANDONED WASTEWATER TREATMENT PLANT
NAVAL AIR STATION CEICL FIELD
JACKSONVILLE, FLORIDA

Parameter	FDEP SCTL		IBDS Concentration	CEF-P40-				
	Residential Direct Exposure	Leachability to Groundwater		SS-007-01	SS-008-01		SS-009-01	SS-010-01
					Sample	Duplicate		
Inorganic Analytes (mg/kg)								
Aluminum	72,000	NC	4,430	1,460	2,040	2,320	3,660	1,260
Antimony	26.0	5.0	9.44	0.25 U	0.25 U	0.42 U	0.25 U	0.25 U
Arsenic	0.80	29.0	2.04	0.36 U	0.36 U	0.37 U	0.36 U	0.36 U
Barium	110	1,600	14.4	4.6	9.5	8.5	6.9	4.2
Beryllium	120	63.0	0.35	0.30 U	0.18 U	0.15 U	0.17 U	0.15 U
Cadmium	75.0	8.0	1.72	0.10 U	0.16 U	0.07 U	0.23 U	0.12 U
Calcium	NC	NC	9.44	334	657	749	1,900	353
Chromium	210	38.0	7.75	1.9 J	2.1 J	3.8 J	4.1 J	1.6 J
Cobalt	4,700	NC	3.11	0.14 U	0.26 U	0.28 U	0.30 U	0.15 U
Copper	110	NC	5.97	5.7	3.2	1.9	4.5	2.6
Iron	23,000	NC	1,490	794	2,360	2,640	1,020	657
Lead	400	NC	197	6.5	6.5	6.3	6.6	4.3
Magnesium	NC	NC	329	89.6	185	199	145	82.9
Manganese	1,600	NC	22.0	2.7	14.5	14.7	5.5	11.3
Mercury	3.4	2.1	0.16	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
Nickel	110	130	3.89	0.57	0.59 U	1.5	1.2	0.54 U
Potassium	NC	NC	102	33.3	43.2 U	44.1 U	57.0 U	33.4 U
Selenium	390	5.0	1.68	0.21 U	0.38 U	0.25 U	0.33 U	0.21 U
Silver	390	17.0	2.13	1.8 J	**49.3 J**	0.16 U	0.25 U	0.29 U
Sodium	NC	NC	343	15.9 U	31.1 U	30.9 U	36.2 U	33.8 U
Thallium	NC	NC	2.84	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Vanadium	15.0	980	6.3	2.2	2.6	2.8	4.3	1.7
Zinc	23,000	6,000	37.0	5.9 J	7.0 J	6.3 J	10.9 J	7.3 J

TABLE 5-5

INORGANIC ANALYTICAL RESULTS IN SOIL
PSC 40, FORMER SITE A-4, FACILITY 682, ABANDONED WASTEWATER TREATMENT PLANT
NAVAL AIR STATION CEICL FIELD
JACKSONVILLE, FLORIDA

Parameter	FDEP SCTL		IBDS Concentration	CEF-P40-				
	Residential Direct Exposure	Leachability to Groundwater		SS-011-01	SS-012-01	SS-101-01	SS-102-01	SS-103-01
Inorganic Analytes (mg/kg)								
Aluminum	72,000	NC	4,430	2,540	2,200	NA	NA	NA
Antimony	26.0	5.0	9.44	0.25 U	0.25 U	NA	NA	NA
Arsenic	0.80	29.0	2.04	0.37 U	0.37 U	NA	NA	NA
Barium	110	1,600	14.4	12.9	8.3	NA	NA	NA
Beryllium	120	63.0	0.35	0.20 U	0.14 U	NA	NA	NA
Cadmium	75.0	8.0	1.72	0.15 U	0.23 U	NA	NA	NA
Calcium	NC	NC	9.44	684	602	NA	NA	NA
Chromium	210	38.0	7.75	2.6 J	2.5 J	NA	NA	NA
Cobalt	4,700	NC	3.11	0.34 U	0.18 U	NA	NA	NA
Copper	110	NC	5.97	3.0	7.2	NA	NA	NA
Iron	23,000	NC	1,490	5,110	978	NA	NA	NA
Lead	400	NC	197	4.5	22.6	NA	NA	NA
Magnesium	NC	NC	329	248	135	NA	NA	NA
Manganese	1,600	NC	22.0	30.5	8.1	NA	NA	NA
Mercury	3.4	2.1	0.16	0.04 U	0.04 U	NA	NA	NA
Nickel	110	130	3.89	0.62 U	1.0	NA	NA	NA
Potassium	NC	NC	102	41.2 U	52.1 U	NA	NA	NA
Selenium	390	5.0	1.68	0.50 U	0.35 U	NA	NA	NA
Silver	390	17.0	2.13	0.36 U	0.23 U	0.12 U	0.12	0.11 U
Sodium	NC	NC	343	37.0 U	39.8 U	NA	NA	NA
Thallium	NC	NC	2.84	0.28 U	0.28 U	NA	NA	NA
Vanadium	15.0	980	6.3	3.1	2.8	NA	NA	NA
Zinc	23,000	6,000	37.0	5.5	11.6 J	NA	NA	NA

TABLE 5-5

INORGANIC ANALYTICAL RESULTS IN SOIL
PSC 40, FORMER SITE A-4, FACILITY 682, ABANDONED WASTEWATER TREATMENT PLANT
NAVAL AIR STATION CEICL FIELD
JACKSONVILLE, FLORIDA

Parameter	FDEP SCTL		IBDS Concentration	CEF-P40-				
	Residential Direct Exposure	Leachability to Groundwater		SS-104-01		SS-105-02	SS-106-02	SS-107-02
				Sample	Duplicate			
Inorganic Analytes (mg/kg)								
Aluminum	72,000	NC	4,430	NA	NA	NA	NA	NA
Antimony	26.0	5.0	9.44	NA	NA	NA	NA	0.57 U
Arsenic	0.80	29.0	2.04	NA	NA	NA	NA	NA
Barium	110	1,600	14.4	NA	NA	NA	NA	NA
Beryllium	120	63.0	0.35	NA	NA	NA	NA	NA
Cadmium	75.0	8.0	1.72	NA	NA	NA	NA	0.71
Calcium	NC	NC	9.44	NA	NA	NA	NA	NA
Chromium	210	38.0	7.75	NA	NA	NA	NA	NA
Cobalt	4,700	NC	3.11	NA	NA	NA	NA	NA
Copper	110	NC	5.97	NA	NA	NA	NA	NA
Iron	23,000	NC	1,490	NA	NA	NA	NA	NA
Lead	400	NC	197	NA	NA	NA	13.5	NA
Magnesium	NC	NC	329	NA	NA	NA	NA	NA
Manganese	1,600	NC	22.0	NA	NA	NA	NA	NA
Mercury	3.4	2.1	0.16	NA	NA	NA	NA	NA
Nickel	110	130	3.89	NA	NA	NA	NA	NA
Potassium	NC	NC	102	NA	NA	NA	NA	NA
Selenium	390	5.0	1.68	NA	NA	NA	NA	NA
Silver	390	17.0	2.13	0.11 U	0.10 U	0.11 U	NA	NA
Sodium	NC	NC	343	NA	NA	NA	NA	NA
Thallium	NC	NC	2.84	NA	NA	NA	NA	NA
Vanadium	15.0	980	6.3	NA	NA	NA	NA	NA
Zinc	23,000	6,000	37.0	NA	NA	NA	NA	NA

TABLE 5-5

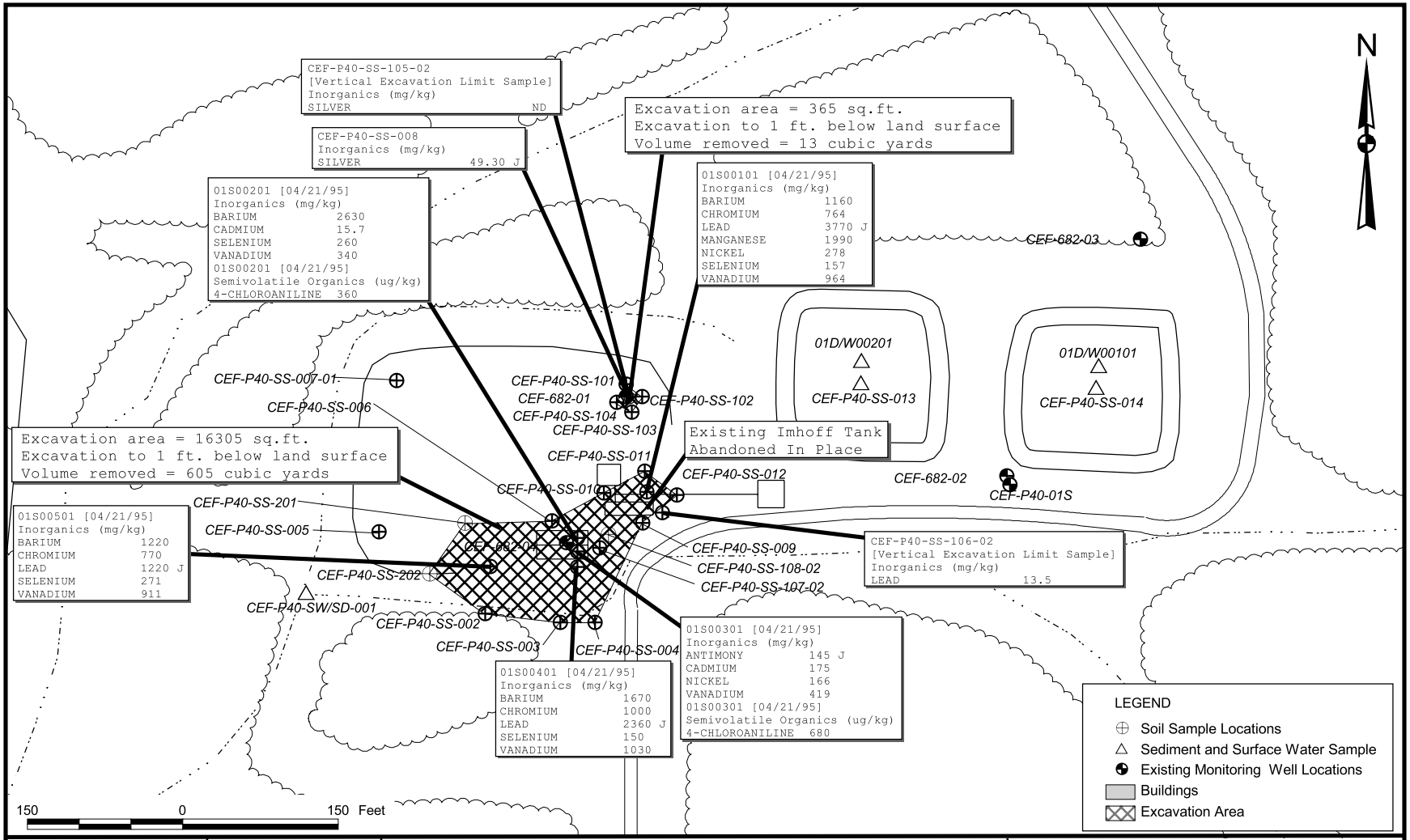
INORGANIC ANALYTICAL RESULTS IN SOIL
PSC 40, FORMER SITE A-4, FACILITY 682, ABANDONED WASTEWATER TREATMENT PLANT
NAVAL AIR STATION CEICL FIELD
JACKSONVILLE, FLORIDA

Parameter	FDEP SCTL		IBDS Concentration	CEF-P40-			
	Residential Direct Exposure	Leachability to Groundwater		SS-108-02	SS-201-01		SS-202-01
					Sample	Duplicate	
Inorganic Analytes (mg/kg)							
Aluminum	72,000	NC	4,430	NA	NA	NA	NA
Antimony	26.0	5.0	9.44	NA	NA	NA	NA
Arsenic	0.80	29.0	2.04	NA	NA	NA	NA
Barium	110	1,600	14.4	NA	6.6	7.2	3.0
Beryllium	120	63.0	0.35	NA	NA	NA	NA
Cadmium	75.0	8.0	1.72	NA	NA	NA	NA
Calcium	NC	NC	9.44	NA	NA	NA	NA
Chromium	210	38.0	7.75	3.9 U	2.4	2.6	1.8
Cobalt	4,700	NC	3.11	NA	NA	NA	NA
Copper	110	NC	5.97	NA	NA	NA	NA
Iron	23,000	NC	1,490	NA	NA	NA	NA
Lead	400	NC	197	NA	4.3 J	13.9 J	7.2 J
Magnesium	NC	NC	329	NA	NA	NA	NA
Manganese	1,600	NC	22.0	NA	NA	NA	NA
Mercury	3.4	2.1	0.16	NA	NA	NA	NA
Nickel	110	130	3.89	NA	NA	NA	NA
Potassium	NC	NC	102	NA	NA	NA	NA
Selenium	390	5.0	1.68	NA	NA	NA	NA
Silver	390	17.0	2.13	NA	NA	NA	NA
Sodium	NC	NC	343	NA	NA	NA	NA
Thallium	NC	NC	2.84	NA	NA	NA	NA
Vanadium	15.0	980	6.3	3.1	3.5	4.5	2.9
Zinc	23,000	6,000	37.0	NA	NA	NA	NA

FDEP SCTL = Florida Department of Environemntal Protection Soil Target Cleanup Level, FAC 62-777 (FDEP, 1999)
IBDS = NAS Cecil Field Inorganic Background Data Set (HLA, 1998)
NC = No criterion
NA = Not analyzed
U = Not detected
J = Estimated concentration

than the corresponding 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 metals contamination.

Two excavation areas were delineated. One small area of approximately 365 square feet was delineated in the area of the silver exceedance detected during the May 1999 investigation by TtNUS. A second area of approximately 16,305 square feet was delineated based on exceedances found during previous investigations by HLA (see Section 3.0). The estimated volumes for 1-foot-deep excavations in each delineated area of contamination were approximately 13 cubic yards for the smaller area and 604 cubic yards for the larger area. Soil sample exceedances of criteria and delineated excavation limits are shown on Figure 5-1.



DRAWN BY MJJ	DATE 04Oct00	CONTAMINANTS GREATER THAN CRITERIA AND LIMITS OF SOIL EXCAVATION PSC 40, ABANDONED WASTEWATER TREATMENT PLANT YELLOW WATER WEAPONS AREA 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 5-1 / REV 0

P:\GIS\NAS_CecilField\PCS40_TechMemo.apr 07Jun01MJJ Layout 5-1

6.0 RISK EVALUATION

6.1 PRELIMINARY RISK EVALUATION

The SAR prepared by ABB-ES (ABB-ES, 1996) included a PRE to assess the potential risk to human and ecological receptors posed by contaminants in groundwater, surface water, sediment, and surface soil. As part of the PRE, primary exposure pathways were evaluated to determine those pathways that potentially contribute to human health and ecological risks.

6.1.1 Human Heath Preliminary Risk Evaluation

The detected organic compounds and inorganic analytes were compared to readily available risk-based screening levels to assess the likelihood of adverse human health effects associated with potential exposure to surface soil, sediment, surface water, or groundwater.

The SAR (ABB-ES, 1996) indicated that arsenic, beryllium, and lead were detected in groundwater samples collected in the study area at concentrations in excess of FDEP Groundwater Cleanup Target Levels (GCTLs) and that the lagoons in the study area may represent a potential exposure pathway to groundwater for ecological receptors during extended periods of low precipitation. The results of the surface soil sampling at PSC 40 indicated that human health screening criteria were exceeded for antimony, beryllium, cadmium, chromium, lead, manganese, and vanadium (ABB-ES, 1996).

6.1.2 Ecological Preliminary Risk Evaluation

The SAR (ABB-ES, 1996) also indicated that, based on a qualitative comparison between concentrations of analytes detected in surface water and sediment samples and ecological screening criteria, there is relatively low risk to ecological receptors from exposure to these media. Potential ecological risks associated with exposure to surface soil were not evaluated (ABB-ES, 1996).

6.2 ECOLOGICAL RISKS

A screening ecological risk assessment was conducted by TtNUS to evaluate the potential risks from surface water, sediment, and surface soil to ecological receptors at PSC 40. The ecological assessment was conducted in accordance with the guidance described by U.S. EPA (U. S. EPA, 1997) and U.S. EPA Region IV (U. S. EPA, 2000a; 2000b) and the Navy (Department of the Navy, 1999) for Steps 1 through 3a of ecological risk assessments. 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 Evaluation

Step 3a Refinement of Preliminary Contaminants of Concern

6.2.1 Problem Formulation and Ecological Effects Evaluation

Ecological habitats at PSC 40 consist primarily of pine flatwoods and mixed hardwood and pine forest. Planted pine flatwoods exist east of the two ponds that form the eastern extent of PSC 40. Trees in a large area of pine flatwoods immediately south of the site have been recently harvested. An extensive area of mesic pine flatwoods merges with mixed pines and hardwoods north and west of the site. Pines, oaks, sweetgum, and other hardwood species dominate this area. The two ponds were originally created for use as wastewater lagoons, and each is approximately one-half acre in size. A 6-foot-high berm, created by soil removed when the ponds were dug, surrounds each pond. The source of surface water in the ponds is rainfall and runoff from the berms that surround the ponds. Because the ponds are not stream fed and are dependent on rainfall, the depth of water in the ponds is seasonally variable. The ponds contain standing water throughout most years, but they dry out during periods of extreme drought and were dry (but mucky) during a site visit in June 1999. Shallow (less than 1 foot) depths are apparently not uncommon, but discussions with Cecil Field personnel indicate that the dry conditions encountered in the June 1999 sampling period are rare.

Cattail, rushes, and other emergent aquatic vegetation species have become established in the ponds. Fish populations have not become permanently established because the ponds do not provide permanent standing water.

A small ditch (i.e., wet-weather stream) is located west of the site and contained no water during sampling activities conducted in May 1999. Although the topography in the vicinity of PSC 40 is largely flat, this ditch presumably receives surface water runoff from the site. The ditch drains surface water into Caldwell Branch approximately 600 feet southwest of PSC 40, and Caldwell Branch flows into Yellow Water Creek approximately 7,000 feet south of the site.

Animal receptors that utilize the vicinity of PSC 40 consist of the species typically found in forested habitats throughout NAS Cecil Field. In addition, aquatic invertebrates and amphibians occur in the ponds and stream when surface water is present. These organisms serve as prey items for wading birds, waterfowl, and other wildlife species.

The nature and extent of contamination were discussed in Section 5.0. Aquatic organisms in the ponds and in the stream near the site, as well as wildlife that utilize these aquatic habitats, 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. Terrestrial animals could be

exposed to soil contaminants through ingestion of contaminated food items. Terrestrial animals could also incidentally ingest soil while grooming fur, preening feathers, digging, grazing close to the soil, or feeding on items to which soil has adhered (such as roots and tubers). Terrestrial vegetation could be exposed to contaminants via root translocation. Exposure to contaminants in the soil via dermal contact may occur but is unlikely to represent a major exposure pathway because fur, feathers, and chitinous exoskeletons probably minimize transfer of contaminants across dermal tissue. In addition, little information is available (e.g., absorption factors) to evaluate dermal exposures to wildlife.

One surface water sample was collected from each of the two ponds. Two sediment samples were collected from each pond, and one sediment sample was collected from the wet-weather stream west of the site (Figure 4-1). Surface soil samples evaluated include the two samples remaining at the site following excavation activities (see Figure 5-1). All analytes detected in surface water and sediment samples collected from the ponds and from the stream near PSC 40 and in post-excavation soil samples were assessed. The objective of this assessment was to determine if exposure to contaminants present in surface water, sediment, and soil is likely to result in declines in ecological receptor populations.

6.2.2 Exposure Estimate and Risk Calculation

Maximum concentrations of analytes detected in surface water, sediment, and surface soil were compared to conservative ecological screening values (ESVs) to determine if the analytes should be selected as an ecological contaminant of potential concern (COPC). The ESVs used for the initial screening were the lowest of those established by U.S. EPA Region IV (U. S. EPA, 2000a; 2000b) and FDEP (FDEP, 1994; 1996).

Toxic doses of COPCs were also compared to modeled ingested doses for representative receptors, based on maximum detected concentrations of COPCs. The methods used to model the doses that representative receptors could receive, as well as the selection of toxicity reference values (TRVs), are described in Appendix B.

6.2.3 Refinement of Preliminary Contaminants of Concern

Subsequent to the initial screening, other factors were considered to further refine COPCs. These factors included background data for inorganics, toxicological evaluation of COPCs, frequency of detection, and comparisons of COPCs to alternate guidelines (U. S. EPA, 1997; Department of the Navy, 1999).

6.2.4 Results and Discussion

The results of the "screening-level" comparisons and food chain modeling are presented in Tables 6-1 through 6-4 and are discussed below.

6.2.4.1 Surface Water

Maximum surface water concentrations of iron and lead slightly exceeded their ESVs (Table 6-1) but were less than NAS Cecil Field IBDS values (HLA, 1998). ESVs were not available for barium and manganese, but their maximum concentrations were less than IBDS values. No other analytes were detected in surface water at concentrations that exceeded ESVs.

6.2.4.2 Sediment

Inorganics. Sediment ESVs were not available for seven metals, but maximum concentrations of these metals were less than their respective NAS Cecil Field background values (Table 6-2). Copper and lead were the only metals for which detected concentrations exceeded their ESVs, and these exceedances existed only in one sample. Moreover, the hazard quotients (HQs) were relatively low (copper HQ = 1.7; lead HQ = 1.8. The maximum concentration of copper was less than the National Oceanic and Atmospheric Administration (NOAA) threshold effects level (TEL) in freshwater sediments (Buchman, 1999) and less than the effects range-low (ER-L) value (Long, et al., 1995) (Table 6-3). The maximum concentration of lead only slightly exceeded its sediment hi-cut value and was only slightly elevated relative to most sediment guideline values (Table 6-3). The copper HQs for upper-level representative receptors were less than 1.0 (Table 6-4). Lead food chain HQs were greater than 1.0, however, for the raccoon and kingfisher, with values of 1.43 (raccoon) and 23.5 (kingfisher) based on maximum detected concentrations (Table 6-4). When HQs for lead were calculated using mean concentrations, the kingfisher HQ decreased to 9.55, and the raccoon HQ decreased to 0.579. As described in Appendix B, potential risks using the food chain model were based on the assumption that concentrations of metals in food items of representative receptors were equal to sediment concentrations. This assumption was used because biota-sediment accumulation factors (BSAFs) do not exist for inorganic compounds, and this assumption is probably overly conservative for lead. In addition, the raccoon and kingfisher have large home ranges, but the HQs were calculated by assuming that these representative receptors foraged exclusively at PSC 40. The HQs in Table 6-4 would be considerably less if more realistic area-use factors were used. In summary, copper and lead concentrations only slightly exceeded the most conservative ESVs and were not greatly elevated relative to their background values. In addition, food chain HQs for copper and lead were relatively low, and concentrations of other metals were less than their respective ESVs and/or background values. For these reasons, metals in sediments are not believed to pose significant potential risks to ecological receptors.

TABLE 6-1

SURFACE WATER ANALYTES COMPARED TO ECOLOGICAL SCREENING VALUES
PSC 40
ABANDONED WASTEWATER TREATMENT PLANT
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Parameter	Sample 01W00101	Sample 01W00201	Ecological Screening Value	Maximum Hazard Quotient[a]	IBDS Value[b]	Exceeds ESV and IBDS Value ?
Pesticides/Polychlorinated Biphenyls (µg/L)						
Gamma-BHC (lindane)	0.0006	ND	0.063	0.01	NA	No
Inorganics (µg/L)						
Barium	2	2.8	NA	NA	43.7	No
Chromium	ND	0.91	11	0.08	4.75	No
Copper	0.61	0.87	6.54	0.13	7.35	No
Iron	255	1170	1,000	1.17	3,030	No
Lead	1.52	2.1	1.32	1.6	5.35	No
Manganese	6.45	10.5	NA	NA	49.3	No
Zinc	17.35	ND	58.91	0.3	51.4	No

NA Not available or not applicable
ND Not detected
Sample 01W00101 collected from eastern pond; sample 01W00201 collected from western pond.
a Maximum Hazard Quotient = Maximum Concentration \ Ecological Screening Value.
b NAS Cecil Field Inorganic Background Data Set (HLA, 1998).

TABLE 6-2

SEDIMENT ANALYTES COMPARED TO ECOLOGICAL SCREENING VALUES
PSC 40
ABANDONED WASTEWATER TREATMENT PLANT
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Parameter	Frequency of Detection	Range of Detections	Location of Maximum Detection	Ecological Screening Value (ESV)	Maximum Hazard Quotient[a]	IBDS Value[b]	Exceeds ESV and IBDS Value ?
Volatile Organic Compounds (ug/kg)							
2-Butanone	2 / 4	3 - 4	01D00101	NA	NA	NA	Yes
Semivolatile Organic Compounds (ug/kg)							
2-Methylnaphthalene	1 / 5	415	CEF-P40-SD-014	20.2	20.5	NA	Yes
Chrysene	2 / 5	140 - 4001.525	CEF-P40-SD-014	108	37.1	NA	Yes
Di-n-butyl phthalate	1 / 2	76	01D00201	182[c]	0.4	NA	No
Naphthalene	1 / 5	355	CEF-P40-SD-014	34.6	10.3	NA	Yes
Pesticides/Polychlorinated Biphenyls (ug/kg)							
4,4'-DDE	2 / 4	0.46 - 1.4	01D00201	2.07	0.7	NA	No
Aldrin	2 / 4	0.052 - 0.152	01D00101	NA	NA	NA	Yes
Alpha-Chlordane	1 / 4	0.058	01D00201	0.5[d]	0.1	NA	No
Dieldrin	1 / 4	0.06	01D00201	0.02	3.0	NA	Yes
Endosulfan II	1 / 4	0.215	01D00101	NA	NA	NA	Yes
Endrin Aldehyde	1 / 4	0.11	01D00201	0.02[e]	5.5	NA	Yes
Gamma-Chlordane	2 / 4	0.118 - 0.35	01D00201	0.5[d]	0.7	NA	No
beta-BHC	1 / 4	0.089	01D00201	0.32[f]	0.3	NA	No
gamma-BHC (Lindane)	1 / 4	0.074	01D00101	0.32	0.2	NA	No
Inorganics (mg/kg)							
Aluminum	5 / 5	1030 - 9580	01D00101	NA	NA	10200	No
Antimony	1 / 5	0.74	01D00201	2	0.4	15.1	No
Barium	5 / 5	4.7 - 16.05	01D00101	NA	NA	36.1	No
Beryllium	1 / 5	0.115	01D00101	NA	NA	0.625	No
Chromium	5 / 5	4 - 9.1	CEF-P40-SD-013	52.3	0.2	16.0	No
Cobalt	1 / 5	0.425	01D00101	NA	NA	3.0	No
Copper	5 / 5	3.2 - 31.7	CEF-P40-SD-001	18.7	1.7	12.5	Yes
Iron	5 / 5	525 - 1240	CEF-P40-SD-013	NA	NA	3330	No
Lead	5 / 5	7.75 - 53.2	CEF-P40-SD-001	30.2	1.8	44.6	Yes
Manganese	5 / 5	1.6 - 3.4	CEF-P40-SD-013	NA	NA	17.0	No
Nickel	4 / 5	1.005 - 3	CEF-P40-SD-001	15.9	0.2	7.0	No
Vanadium	5 / 5	1.5 - 6.4	01D00101	NA	NA	15.0	No
Zinc	3 / 5	8.65 - 20.8	CEF-P40-SD-013	124	0.2	92.1	No

a Maximum Hazard Quotient = Maximum Concentration divided by Ecological Screening Value.
b NAS Cecil Field Inorganic Background Data set (HLA, 1998).
c Bis (2-Ethylhexyl) phthalate used as a surrogate.
d Chlordane used as a surrogate.
e Endrin used as a surrogate.
f gamma-BHC used as a surrogate.
Results for samples and associated duplicates are included as averages.

TABLE 6-3

COMPARISON OF SEDIMENT CHEMICALS OF POTENTIAL CONCERN (COPCs)
TO ECOLOGICAL SCREENING VALUES
PSC 40
ABANDONED WASTEWATER TREATMENT PLANT
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

COPC	Maximum	FDEP/ Region IV ESV	ER-L/ER-M	FDEP TEL/PEL	TEC/PEC	Ontario MOE	NOAA TEL/PEL	Other
Semivolatile Organic Compounds (µg/kg)								
2-Methylnaphthalene	415[a]	20.2	70/670	20.2/201	NA	NA	NA	NA
Chrysene	4001.5[a]	108	384/2800	108/846	500/5200	340/4600	57.1/862	NA
Naphthalene	355[a]	34.6	160/2100	34.6/391	32.8/687.4	NA	NA	480[b]
Total PAHs	4771.5[a]	1684	4022/44,792	1684/16,770	3553/13,660	4000/100,000	NA	NA
Pesticides/Polychlorinated Biphenyls (µg/kg)								
Aldrin	0.152[a]	NA	NA	NA	NA	2/80	NA	NA
Dieldrin	0.06	0.02	NA	0.715/4.3	NA	2/910	2.85/6.67	52[c]
Endosulfan II	0.215[a]	NA	NA	NA	NA	NA	NA	14[b]
Endrin aldehyde[d]	0.11	0.02	NA	NA	NA	3/1300	2.67/62.4	20[c]
Inorganics (mg/kg)								
Copper	31.7	18.7	34/270	18.7/108	28/77.7	16/110	35.7/197	NA
Lead	53.2	30.2	46.7/218	30.2/112	34.2/396	31/250	35/91.3	NA

NA	Not Available
ER-L & ER-M	Effects Range-Low and Effects Range-Median (Long, et al; 1995)
FDEP TEL & PEL	Threshold Effects Level and Probable Effects Level (FDEP, 1994).
TEC & PEC	Threshold Effects Concentration and Probable Effects Concentration, Assessment and Remediation of Contaminated Sediments Program (EPA 1996a).
Ontario MOE	Ontario Ministry of the Environment: Lowest effect level / Severe effect level (Jones, et al; 1997).
NOAA TEL & PEL	Threshold Effects Level and Probable Effects Level in freshwater sediments (Buchman, 1999).
a	Average of original and duplicate samples.
b	Sediment Quality Benchmark (EPA, 1996b).
c	Sediment Quality Criteria (EPA, 1996b).
d	Sediment guidelines not available for endrin aldehyde; all guideline values shown are for total endrin.

TABLE 6-4

RESULTS OF FOOD CHAIN MODELING
PSC 40
ABANDONED WASTEWATER TREATMENT PLANT
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Ecological Contaminant Of Potential Concern	Raccoon		Kingfisher		Bullfrog	
	NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ
Semivolatile Organic Compounds						
2-Methylnaphthalene	1.86E-01	1.86E-02	2.70E-02	2.70E-03	1.18E-01	1.18E-02
Chrysene	5.77E-01	5.77E-02	7.54E-02	7.54E-03	3.52E-01	3.52E-02
Naphthalene	3.94E-02	1.97E-02	6.69E-03	6.69E-04	3.12E-02	3.12E-03
Pesticides/PCBs (mg/kg)						
Aldrin	6.00E-04	1.20E-04	NA	NA	NA	NA
Dieldrin	2.37E-03	2.37E-04	9.12E-04	9.12E-05	NA	NA
Endosulfan II	1.13E-03	1.13E-04	2.52E-05	2.52E-06	NA	NA
Endrin aldehyde	9.44E-04	9.44E-05	1.29E-02	1.29E-03	NA	NA
Inorganics						
Copper	5.81E-01	4.49E-01	3.37E-01	2.57E-01	NA	NA
Lead	**1.43E+00**	1.43E-01	**2.35E+01**	**2.35E+00**	NA	NA
Lead Average	5.79E-01	5.79E-02	**9.55E+00**	9.55E-01	NA	NA

NA = NOAEL and LOAEL not available.
Note: Bolded items indicate HQs greater than 1.0.

Pesticides and Polychlorinated Biphenyls (PCBs). PCBs were not detected in sediments. ESVs were not available from U. S. EPA Region IV or FDEP for the pesticides aldrin and endosulfan II. However, the maximum concentration of aldrin was less than the lowest effect level available (Table 6-3). Similarly, the maximum concentration of endosulfan II was less than the U. S. EPA sediment quality benchmark for this compound (Table 6-3). Maximum concentrations of dieldrin and endrin aldehyde exceeded the most conservative ESVs but were less than all other available sediment guidelines (Table 6-3). Concentrations of all other pesticides were less than their ESVs. All pesticide HQs were less than 1.0 in the food chain modeling, but TRVs were not available in all cases.

As shown in Appendix A, laboratory method detection limits for pesticides in sediments generally ranged from 2.2 to 4.5 µg/kg for samples in which pesticides were not detected. These values exceed the most conservative ESVs. However, the detection limits are generally lower than available "less conservative" screening values such as ER-Ms and PELs. Thus, the detection limits for most "non-detected" pesticides in sediment, although slightly elevated, are sufficient to conclude that significant risks are not posed by these pesticides.

The detection limits for toxaphene, however, were 220 and 230 µg/kg. U.S. EPA Region IV and FDEP sediment screening values are not available for toxaphene, but the U.S. EPA sediment quality benchmark is 28 µg/kg. The identification and quantification of toxaphene in environmental samples are complicated by changes in the numbers and relative sizes of constituent peaks (components) due to the difference in their rates of degradation, sorption, and volatilization in the environment. Furthermore, contamination from other organochlorine pesticides, which are also complex multi-isomeric chemicals, often interferes with the analysis of toxaphene. Hence, quantification of toxaphene almost invariably involves rigorous sample preparation and cleanup procedures prior to analysis (ATSDR, 1997). The default reporting limit for toxaphene, using the SW-846 8081A analytical method, is 170 µg/kg. Toxaphene detection limits in PSC 40 sediment samples were slightly elevated above this value due to a correction for moisture content. The laboratory would have reported a detection of toxaphene if it had been present at a concentration between the method detection limit (MDL) (15 ug/kg, as reported by the laboratory) and the reporting limit (170 ug/kg). For this reason, although detection limits (220 to 230 µg/kg) were greater than its ESV (28 µg/kg), toxaphene should not be considered a COPC at PSC 40.

Based on the information presented above, pesticides in sediments are not believed to pose significant potential risks to ecological receptors PSC 40.

Semivolatile Organic Compounds. SVOCs with concentrations that exceeded ESVs consisted of 2-methylnaphthalene, chrysene, and naphthalene. Each of these three compounds was elevated only in the sample collected in May 1999 from the eastern pond. However, these compounds were not detected

in the duplicate of this sample. A firm conclusion regarding the large discrepancy between the original sample and its duplicate is not available, but the discrepancy is probably the result of incomplete mixing. The concentrations of 2-methylnaphthalene (812 ug/kg) and chrysene (8,014 ug/kg) in the original sample exceed all available sediment guidelines shown in Table 6-3, and the concentration of naphthalene (691 ug/kg) exceeds most of the guidelines. The average concentrations calculated using the original sample and its duplicate are greater than some guidelines and less than others (Table 6-3). The value for total PAHs in this sample (based on the average of the original sample and its duplicate) slightly exceeded the ER-L and was much less than the ER-M value for total PAHs (Table 6-3). Similarly, the value for total PAHs in this sample exceeded the TEL and was well below the PEL (Table 6-3). Food chain HQs for these PAH compounds were less than 1.0 (Table 6-4) and, thus, they would not be expected to significantly bioaccumulate in higher organisms at the concentrations observed here.

In conclusion, concentrations of 2-methylnaphthalene, chrysene, and naphthalene in a sediment sample collected from the eastern pond indicate potential risks to sediment dwelling receptors. However, as discussed above, the ponds are occasionally dry, which limits their value for aquatic habitat. In addition, concentrations of these PAHs do not pose risks to upper level receptors in the food chain. Furthermore, each of the ponds is surrounded by a berm that prevents the migration of sediment contaminants to other areas, and SVOCs were not detected in sediments from the stream west of the ponds. For these reasons, SVOCs in sediments are not believed to pose significant potential risks to ecological receptors.

Volatile Organic Compounds. An ESV was not available for 2-butanone, the only VOC detected in sediments. Although the lack of toxicity data precludes a complete assessment of 2-butanone, concentrations of this compound were relatively low (3 to 4 µg/kg). Furthermore, 2-butanone is typically regarded as a common laboratory contaminant. Because of this, and since VOCs generally do not accumulate in animal tissue (Suter, 1993), VOCs in sediments are not believed to pose significant potential risks to ecological receptors.

6.2.4.3 Surface Soil

Two surface soil samples were collected from locations that were not excavated during remedial activities conducted in March 2000. Table 6-5 compares the analytical results of these two samples with ecological screening values established by U.S. EPA Region IV (U.S. EPA, 2000a; U.S. EPA, 2000b). PAHs were not detected in either of these two samples. The detection limits for PAHs in these samples (see Appendix A) were adequately low enough to conclude that ecological risks from PAHs are negligible. Aluminum, chromium, iron, and vanadium were the only metals with maximum concentrations exceeding ecological screening values (Table 6-5).

TABLE 6-5

CONTAMINANTS OF POTENTIAL CONCERN
SURFACE SOIL
PSC 40, FORMER SITE A-4, ABANDONED WASTEWATER TREATMENT PLANT
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Parameter	Frequency of Detection	Range of Detected Values		Location of Maximum	Ecological Screening Value[a]	Maximum Hazard Quotient	Selected as COPC? (Yes/No)	IBDS Concentration[b]
		Minimum	Maximum					
Inorganics (mg/kg)								
Aluminum	2/2	1460	6190	CEF-P40-SS-005	50	123.80	Yes	4430
Arsenic	1/2	1.6	1.6	CEF-P40-SS-005	10	0.16	No	2.04
Barium	2/2	4.6	13.7	CEF-P40-SS-005	165	0.08	No	14.4
Chromium	2/2	1.9	6.6	CEF-P40-SS-005	0.4	16.50	Yes	7.75
Copper	2/2	5.1	5.7	CEF-P40-SS-007	40	0.14	No	5.97
Iron	2/2	794	6510	CEF-P40-SS-005	200	32.55	Yes	1490
Lead	2/2	6.5	9.3	CEF-P40-SS-005	50	0.19	No	197
Manganese	2/2	2.7	3	CEF-P40-SS-005	100	0.03	No	22.0
Nickel	1/2	1.4	1.4	CEF-P40-SS-005	30	0.05	No	3.89
Silver	1/2	1.8	1.8	CEF-P40-SS-007	2.0	0.90	No	2.13
Vanadium	2/2	2.2	13.6	CEF-P40-SS-005	2.0	6.80	Yes	6.3
Zinc	2/2	4.9	5.9	CEF-P40-SS-007	50	0.12	No	37.0

a U.S. EPA (2000a; 2000b)
b Inorganic Background Data Set (HLA, 1998)

The Region IV ecological screening value for chromium (0.4 mg/kg) was taken from a literature review by Friday (1998) of several sources and is based on a study of hexavalent chromium, the most toxic form of this metal. The lowest screening value for *total* chromium in Friday's (1998) review was 64 mg/kg, and this value is a soil guideline recommended by the Canadian government (CCME, 1997). Surface soil concentrations of chromium at PSC 40 were well below 64 mg/kg. In addition, the maximum concentration of chromium (6.6 mg/kg) was less than the IBDS value for soil (7.75 mg/kg) (Table 6-5). For these reasons, chromium is not retained as a final contaminant of ecological concern.

Concentrations of aluminum, iron, and vanadium exceeded IBDS values in sample CEF-P40-SS-005, but not in sample CEF-P40-SS-007 (Table 6-5). These chemicals do not biomagnify in the food chain and are not chemicals for which bioaccumulation is a concern (U.S. EPA, 2000c). The major exposure route of concern for these three metals is direct contact. Unfortunately, few guidelines are available to evaluate the potential toxicity of these metals in soils. The 50 mg/kg screening value for aluminum is based on toxicity to plants (Efroymson, et al, 1997a). Aluminum concentrations at PSC 40 also exceeded a 600 mg/kg toxicity value that is based on toxicity to soil microorganisms (Efroymson, et al, 1997b). No other guidelines were available for aluminum. The 2.0 mg/kg screening value for vanadium is based on toxicity to plants (Efroymson, et al, 1997a). Vanadium concentrations were less than the 20 mg/kg toxicity guideline that is based on toxicity to soil microorganisms (Efroymson, et al, 1997b), and were well below the 130 mg/kg soil screening value established by the Canadian government (CCME, 1997). No other guidelines were available for vanadium in soil, and no alternate guidelines were available for iron in soil. The 200 mg/kg screening value for iron is based on toxicity to soil microorganisms (Efroymson, et al, 1997b).

In summary, PAHs were not detected in either of two soil samples collected at the site. Surface soil concentrations of all metals except aluminum, iron, and vanadium were either less than ecological screening values or were less than background values. Concentrations of aluminum, iron, and vanadium exceeded background values only in sample CEF-P40-SS-005. Aluminum, iron, and vanadium do not biomagnify or significantly bioaccumulate, and thus, potential risks from these metals are limited to direct contact. Few guidelines exist with which the potential toxicity of these metals in soils can be evaluated, but based on available data, potential risks to plants and/or soil microorganisms exist in the vicinity of sample CEF-P40-SS-005.

7.0 REMEDIAL ACTIVITIES

The Navy's Remedial Action Contractor (RAC), CH2MHill Contractors, Inc., conducted the source removal activities for PSC 40 from March 13 through March 31, 2000. The RAC characterized, transported, and disposed of 1,096 tons of excavated metals-contaminated soil and restored the site to pre-excavation conditions. In additional, the sand drying beds located within the excavation area and associated with the former treatment plant were overexcavated as part of this remedial activity. The excavated soil was transported and disposed off site between March 21 and March 30, 2000.

The soil was excavated using a track excavator and then stockpiled and direct loaded into trucks, provided by Pritchett Trucking, for transportation and disposal. Soils were excavated to the horizontal excavation limits shown on Figure 5-1 and the vertical excavation limit of 1 foot below ground surface (bgs), as specified in the Dig and Haul Package for PSC 40 (TtNUS, 2000). The excavated soil was transported to the Chesser Island Road Landfill in Folkston, Georgia.

The material used to backfill the excavation was clean fill brought in from the Dallas Harts Borrow Pit in Jacksonville, Florida. The site was then graded and seeded with a mixture of rye and bahia grass. A drainage ditch located within the excavation area was backfilled, graded, and sodded to prevent sediment erosion. No confirmatory sampling and analyses were required, based on the specifications outlined in the Dig and Haul Package for PSC 40. A final inspection was conducted on April 7, 2000.

Detailed information on the remedial activities, including photographs, copies of the soil manifests, certificates of disposal, and certificate of clean fill, are provided in the Source Removal Report (CH2M Hill, 2000).

8.0 CONCLUSIONS AND RECOMMENDATIONS

8.1 CONCLUSIONS

Conclusions pertaining to PSC 40, Abandoned Wastewater Treatment Plant, are as follows:

- Areas of soil where antimony, barium, cadmium, chromium, lead, manganese, nickel, selenium, vanadium, and 4-chloroaniline were detected at concentrations in excess of the most restrictive of the FDEP residential or leachability to groundwater SCTLs (or the IBDS value for antimony) have been excavated and disposed at a permitted solid waste disposal facility.

- The excavated area was restored to pre-excavation conditions with clean fill, and the drainage ditch was sodded to prevent further erosion.

- Antimony, barium, cadmium, chromium, lead, manganese, nickel, selenium, vanadium, and 4-chloroaniline concentrations in the soil samples collected outside the excavation area were not detected in excess of FDEP SCTLs.

- Potential ecological risks to plants and soil microorganisms exist in the vicinity to surface soil sample CEF-P49-SS-005-01. Aluminum, iron, and vanadium concentrations in this sample exceed ecological screening values and IBDS concentrations. However, as documented in BCT meeting minute number 1479 on May 16, 2001, a risk management decision of no further action for surface soil was made by the BCT. This decision was based on the limited extent of potential risks (in the vicinity of one sample) and because biomagnification and bioaccumulation are not a concern with these contaminants.

- Total metals concentrations in groundwater samples from the site were less than cleanup criteria.

- Since the removal action has been conducted, no contaminants or pathways pose a threat to the public health, welfare, or the environment.

8.2 RECOMMENDATIONS

The removal action conducted at PSC 40 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 recommendation for PSC 40 is no further action.

It is also recommended that the color classification of PSC 40 be changed 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.

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APPENDIX A

ANALYTICAL LABORATORY RESULTS

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-07-9-137

TO: **M. SPERANZA** **DATE:** **JULY 20, 1999**

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

SUBJECT: **ORGANIC DATA VALIDATION –VOLATILES, SEMIVOLATILES, PESTICIDES AND PAHs**
CTO 078 - NAS CECIL FIELD, FLORIDA
SDG – F4221

SAMPLES: 4/Sediments/

CEF-P40-SD-001	CEF-P40-SD-013	CEF-P40-SD-014
CEF-P40-SD-DU02		

12/Soils/

CEF-P40-SS-002	CEF-P40-SS-003	CEF-P40-SS-004
CEF-P40-SS-005	CEF-P40-SS-006	CEF-P40-SS-007
CEF-P40-SS-008	CEF-P40-SS-009	CEF-P40-SS-010
CEF-P40-SS-011	CEF-P40-SS-012	CEF-P40-SS-DU01

2/Aqueous/

CEF-P40-GW-68202 ~~CEF-A24-GW-MW01~~

Overview

The sample set for CTO 078, NAS Cecil Field, SDG F4221, consists of four (4) sediment, twelve (12) soil and two (2) aqueous environmental samples. Two (2) field duplicate pairs (CEF-P40-SD-014 / CEF-P40-SD-DU02 and CEF-P40-SS-008 / CEF-P40-SS-DU01) were included within this SDG.

All aqueous and sediment samples, with exception to sample CEF-P40-SD-001, were analyzed for target compound list (TCL) volatile organics. Sample CEF-P40-GW-68202 was analyzed for semivolatile organics. Samples CEF-P40-GW-68202, CEF-P40-SD-013 and CEF-P40-SD-014 were analyzed for pesticides. All samples, with exception to CEF-A24-GW-MW01 were analyzed for polynuclear aromatic hydrocarbons (PAHs). The samples were collected by Tetra Tech NUS on May 28, 1999 and analyzed by Accutest Laboratory under Naval Facilities Engineering Service Center (NRESC) Quality Assurance / Quality Control (QA/ QC) criteria. Volatile analyses were conducted using SW 846 method 8260B. Semivolatile analyses were conducted using SW 846 method 8270C. Pesticide analyses were conducted using SW 846 method 8082. PAH analyses were conducted using EPA method 8010A.

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.

Volatiles

Calibration Verifications

The initial calibration and continuing calibration verifications (CCVs) relative response factors (RRFs) for acetone affecting all samples were <0.05 quality control limit. A CCV RRF for 2-butanone affecting the aqueous matrix was <0.05 quality control limit. The initial calibration and a CCV %RSDs for acetone were >30% quality control limit. The nondetected results reported for acetone in all samples were qualified as rejected, "UR". The nondetected results reported for 2-butanone in the aqueous samples were qualified as rejected, "UR".

PCBs

Calibration Verifications

The CCV Percent Differences (%Ds) for 4,4-DDT and methoxychlor were >25% quality control limit on both columns. The nondetected results reported for the above listed compounds were qualified as estimated, "UJ".

PAHs

Field Duplicate Results

Field duplicate imprecision (>50%) was noted for 2-methylnaphthalene, chrysene and naphthalene in field duplicate pair CEF-P40-SD-014 / CEF-P40-SD-DU02. The positive and nondetected results reported for the above listed compounds in the affected field duplicate pair were qualified as estimated, "J", and "UJ", respectively.

Notes

The laboratory listed an incorrect reporting limit for indeno(1,2,3-cd)pyrene on the Form 1 for samples CEF-P40-SD-001, CEF-P40-SD-013, CEF-P40-SS-005 and CEF-P40-SS-009. The laboratory was contacted and confirmed the correct reporting limits. The Form 1s were amended by the data reviewer.

The reporting limits on the Form 1s and the EDD were not consistent. The reporting limits on the Form 1s were rounded to the correct significant figures. The EDD was corrected by the data reviewer.

Executive Summary

Laboratory Performance: The initial calibration and continuing calibration verifications (CCVs) relative response factors (RRFs) for acetone affecting all samples were <0.05 quality control limit. A CCV RRF for 2-butanone affecting the aqueous matrix was <0.05 quality control limit. The initial calibration and a CCV %RSDs for acetone were >30% quality control limit. The CCV Percent Differences (%Ds) for 4,4-DDT and methoxychlor were >25% quality control limit on both columns.

Other Factors Affecting Data Quality: Field duplicate imprecision (>50%) was noted for 2-methylnaphthalene, chrysene and naphthalene in field duplicate pair CEF-P40-SD-014 / CEF-P40-SD-DU02.

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

APPENIDX A
QUALIFIED ANALYTICAL RESULTS

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: F4221

SAMPLE NUMBER:	CEF-P40-SD-013			CEF-P40-SD-014			CEF-P40-SD-DU02					
SAMPLE DATE:	05/28/99			05/28/99			05/28/99			/ /		
LABORATORY ID:	F4221-13			F4221-14			F4221-16					
QC_TYPE:	NORMAL			NORMAL			NORMAL					
% SOLIDS:	73.4 %			77.2 %			71.7 %			100.0 %		
UNITS:	UG/KG			UG/KG			UG/KG					
FIELD DUPLICATE OF:							CEF-P40-SD-014					
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
1,1,1-TRICHLOROETHANE	3.1	U		2.4	U		4	U				
1,1,2,2-TETRACHLOROETHANE	3.1	U		2.4	U		4	U				
1,1,2-TRICHLOROETHANE	3.1	U		2.4	U		4	U				
1,1-DICHLOROETHANE	3.1	U		2.4	U		4	U				
1,1-DICHLOROETHENE	3.1	U		2.4	U		4	U				
1,2-DICHLOROETHANE	3.1	U		2.4	U		4	U				
1,2-DICHLOROPROPANE	3.1	U		2.4	U		4	U				
2-BUTANONE	16	U		12	U		20	U				
2-HEXANONE	16	U		12	U		20	U				
4-METHYL-2-PENTANONE	16	U		12	U		20	U				
ACETONE	78	UR	C	60	UR	C	100	UR	C			
BENZENE	3.1	U		2.4	U		4	U				
BROMODICHLOROMETHANE	3.1	U		2.4	U		4	U				
BROMOFORM	3.1	U		2.4	U		4	U				
BROMOMETHANE	7.8	U		6	U		10	U				
CARBON DISULFIDE	7.8	U		6	U		10	U				
CARBON TETRACHLORIDE	3.1	U		2.4	U		4	U				
CHLOROBENZENE	3.1	U		2.4	U		4	U				
CHLOROETHANE	7.8	U		6	U		10	U				
CHLOROFORM	3.1	U		2.4	U		4	U				
CHLOROMETHANE	7.8	U		6	U		10	U				
CIS-1,2-DICHLOROETHENE	3.1	U		2.4	U		4	U				
CIS-1,3-DICHLOROPROPENE	3.1	U		2.4	U		4	U				
DIBROMOCHLOROMETHANE	3.1	U		2.4	U		4	U				
ETHYLBENZENE	3.1	U		2.4	U		4	U				
METHYLENE CHLORIDE	7.8	U		6	U		10	U				
STYRENE	3.1	U		2.4	U		4	U				
TETRACHLOROETHENE	3.1	U		2.4	U		4	U				
TOLUENE	3.1	U		2.4	U		4	U				
TRANS-1,2-DICHLOROETHENE	3.1	U		2.4	U		4	U				
TRANS-1,3-DICHLOROPROPENE	3.1	U		2.4	U		4	U				
TRICHLOROETHENE	3.1	U		2.4	U		4	U				
VINYL CHLORIDE	7.8	U		6	U		10	U				

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4221

SAMPLE NUMBER:	CEF-A24-GW-MW01			CEF-P40-GW-68202			/ /			/ /		
SAMPLE DATE:	05/28/99			05/28/99								
LABORATORY ID:	F4221-18			F4221-17								
QC_TYPE:	NORMAL			NORMAL								
% SOLIDS:	0.0 %			0.0 %			100.0 %			100.0 %		
UNITS:	UG/L			UG/L								
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
1,1,1-TRICHLOROETHANE	1	U		1	U							
1,1,2,2-TETRACHLOROETHANE	1	U		1	U							
1,1,2-TRICHLOROETHANE	1	U		1	U							
1,1-DICHLOROETHANE	1	U		1	U							
1,1-DICHLOROETHENE	1	U		1	U							
1,2-DICHLOROETHANE	1	U		1	U							
1,2-DICHLOROPROPANE	1	U		1	U							
2-BUTANONE	5	UR	C	5	UR	C						
2-HEXANONE	5	U		5	U							
4-METHYL-2-PENTANONE	5	U		5	U							
ACETONE	5	UR	C	5	UR	C						
BENZENE	1	U		1	U							
BROMODICHLOROMETHANE	1	U		1	U							
BROMOFORM	1	U		1	U							
BROMOMETHANE	1	U		1	U							
CARBON DISULFIDE	5	U		5	U							
CARBON TETRACHLORIDE	1	U		1	U							
CHLOROBENZENE	1	U		1	U							
CHLOROETHANE	1	U		1	U							
CHLOROFORM	1	U		1	U							
CHLOROMETHANE	1	U		1	U							
CIS-1,2-DICHLOROETHENE	1	U		1	U							
CIS-1,3-DICHLOROPROPENE	1	U		1	U							
DIBROMOCHLOROMETHANE	1	U		1	U							
ETHYLBENZENE	1	U		1	U							
METHYLENE CHLORIDE	5	U		5	U							
STYRENE	1	U		1	U							
TETRACHLOROETHENE	1	U		1	U							
TOLUENE	1	U		1	U							
TRANS-1,2-DICHLOROETHENE	1	U		1	U							
TRANS-1,3-DICHLOROPROPENE	1	U		1	U							
TRICHLOROETHENE	1	U		1	U							
VINYL CHLORIDE	1	U		1	U							

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4221

SAMPLE NUMBER:	CEF-P40-GW-68202			/ /			/ /			/ /		
SAMPLE DATE:	05/28/99											
LABORATORY ID:	F4221-17											
QC_TYPE:	NORMAL											
% SOLIDS:	0.0 %			100.0 %			100.0 %			100.0 %		
UNITS:	UG/L											
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
1,2,4-TRICHLOROBENZENE	100	U										
1,2-DICHLOROBENZENE	100	U										
1,3-DICHLOROBENZENE	100	U										
1,4-DICHLOROBENZENE	100	U										
2,4,5-TRICHLOROPHENOL	80	U										
2,4,6-TRICHLOROPHENOL	100	U										
2,4-DICHLOROPHENOL	80	U										
2,4-DIMETHYLPHENOL	200	U										
2,4-DINITROPHENOL	500	U										
2,4-DINITROTOLUENE	4	U										
2,6-DINITROTOLUENE	4	U										
2-CHLORONAPHTHALENE	100	U										
2-CHLOROPHENOL	100	U										
2-METHYLNAPHTHALENE	100	U										
2-METHYLPHENOL	100	U										
2-NITROANILINE	100	U										
2-NITROPHENOL	100	U										
3,3'-DICHLOROBENZIDINE	150	U										
3-NITROANILINE	100	U										
4,6-DINITRO-2-METHYLPHENOL	500	U										
4-BROMOPHENYL PHENYL ETHER	100	U										
4-CHLORO-3-METHYLPHENOL	200	U										
4-CHLOROANILINE	100	U										
4-CHLOROPHENYL PHENYL ETHER	100	U										
4-METHYLPHENOL	100	U										
4-NITROANILINE	100	U										
4-NITROPHENOL	300	U										
BIS(2-CHLOROETHOXY)METHANE	100	U										
BIS(2-CHLOROETHYL)ETHER	30	U										
BIS(2-CHLOROISOPROPYL) ETHER	100	U										
BIS(2-ETHYLHEXYL)PHTHALATE	100	U										
BUTYLBENZYL PHTHALATE	100	U										
CARBAZOLE	80	U										

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4221

SAMPLE NUMBER:	CEF-P40-GW-68202			/ /			/ /			/ /		
SAMPLE DATE:	05/28/99											
LABORATORY ID:	F4221-17											
QC_TYPE:	NORMAL											
% SOLIDS:	0.0 %			100.0 %			100.0 %			100.0 %		
UNITS:	UG/L											
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
DI-N-OCTYL PHTHALATE	100	U										
DIBENZOFURAN	100	U										
DIETHYL PHTHALATE	100	U										
DIMETHYL PHTHALATE	100	U										
HEXACHLOROBENZENE	20	U										
HEXACHLOROBUTADIENE	100	U										
HEXACHLOROCYCLOPENTADIENE	100	U										
HEXACHLOROETHANE	100	U										
ISOPHORONE	100	U										
N-NITROSO-DI-N-PROPYLAMINE	80	U										
N-NITROSODIPHENYLAMINE	100	U										
NITROBENZENE	80	U										
PENTACHLOROPHENOL	20	U										
PHENOL	100	U										

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4221

SAMPLE NUMBER:	CEF-P40-GW-68202			/ /			/ /			/ /		
SAMPLE DATE:	05/28/99											
LABORATORY ID:	F4221-17											
QC_TYPE:	NORMAL											
% SOLIDS:	0.0 %			100.0 %			100.0 %			100.0 %		
UNITS:	UG/L											
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	1.0	U										
2-METHYLNAPHTHALENE	1.0	U										
ACENAPHTHENE	1.0	U										
ACENAPHTHYLENE	2.0	U										
ANTHRACENE	0.15	U										
BENZO(A)ANTHRACENE	0.15	U										
BENZO(A)PYRENE	0.15	U										
BENZO(B)FLUORANTHENE	0.15	U										
BENZO(G,H,I)PERYLENE	0.20	U										
BENZO(K)FLUORANTHENE	0.15	U										
CHRYSENE	0.15	U										
DIBENZO(A,H)ANTHRACENE	0.25	U										
FLUORANTHENE	0.20	U										
FLUORENE	0.20	U										
INDENO(1,2,3-CD)PYRENE	0.15	U										
NAPHTHALENE	1.0	U										
PHENANTHRENE	0.15	U										
PYRENE	0.20	U										

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4221

SAMPLE NUMBER:	CEF-P40-SD-001			CEF-P40-SD-013			CEF-P40-SD-014			CEF-P40-SD-DU02		
SAMPLE DATE:	05/28/99			05/28/99			05/28/99			05/28/99		
LABORATORY ID:	F4221-1			F4221-13			F4221-14			F4221-16		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	86.7 %			73.4 %			77.2 %			71.7 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:										CEF-P40-SD-014		
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	48	U		41	U		43	U		40	U	
2-METHYLNAPHTHALENE	48	U		41	U		810	J	G	40	UJ	G
ACENAPHTHENE	48	U		41	U		43	U		40	U	
ACENAPHTHYLENE	99	U		84	U		88	U		82	U	
ANTHRACENE	7.4	U		6.3	U		6.6	U		6.1	U	
BENZO(A)ANTHRACENE	7.4	U		6.3	U		6.6	U		6.1	U	
BENZO(A)PYRENE	7.4	U		6.3	U		6.6	U		6.1	U	
BENZO(B)FLUORANTHENE	7.4	U		6.3	U		6.6	U		6.1	U	
BENZO(G,H,I)PERYLENE	9.9	U		8.4	U		8.8	U		8.2	U	
BENZO(K)FLUORANTHENE	7.4	U		6.3	U		6.6	U		6.1	U	
CHRYSENE	7.4	U		140			8000	J	G	6.1	UJ	G
DIBENZO(A,H)ANTHRACENE	12	U		10	U		11	U		10	U	
FLUORANTHENE	9.9	U		8.4	U		8.8	U		8.2	U	
FLUORENE	9.9	U		8.4	U		8.8	U		8.2	U	
INDENO(1,2,3-CD)PYRENE	7.4	U		6.3	U		6.6	U		6.1	U	
NAPHTHALENE	48	U		41	U		690	J	G	40	UJ	G
PHENANTHRENE	7.4	U		6.3	U		6.6	U		6.1	U	
PYRENE	9.9	U		8.4	U		8.8	U		8.2	U	

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4221

SAMPLE NUMBER:	CEF-P40-SS-002			CEF-P40-SS-003			CEF-P40-SS-004			CEF-P40-SS-005		
SAMPLE DATE:	05/28/99			05/28/99			05/28/99			05/28/99		
LABORATORY ID:	F4221-2			F4221-3			F4221-4			F4221-5		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	89.6 %			95.6 %			95.0 %			95.2 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	50	U		54	U		53	U		53	U	
2-METHYLNAPHTHALENE	50	U		54	U		53	U		53	U	
ACENAPHTHENE	50	U		54	U		53	U		53	U	
ACENAPHTHYLENE	100	U		110	U		110	U		110	U	
ANTHRACENE	7.6	U		8.1	U		8.1	U		8.1	U	
BENZO(A)ANTHRACENE	7.6	U		8.1	U		8.1	U		8.1	U	
BENZO(A)PYRENE	7.6	U		8.1	U		8.1	U		8.1	U	
BENZO(B)FLUORANTHENE	7.6	U		8.1	U		8.1	U		8.1	U	
BENZO(G,H,I)PERYLENE	10	U		11	U		11	U		11	U	
BENZO(K)FLUORANTHENE	7.6	U		8.1	U		8.1	U		8.1	U	
CHRYSENE	7.6	U		8.1	U		8.1	U		8.1	U	
DIBENZO(A,H)ANTHRACENE	12	U		13	U		13	U		13	U	
FLUORANTHENE	10	U		11	U		11	U		11	U	
FLUORENE	10	U		11	U		11	U		11	U	
INDENO(1,2,3-CD)PYRENE	7.6	U		8.1	U		8.1	U		8.1	U	
NAPHTHALENE	50	U		54	U		53	U		53	U	
PHENANTHRENE	7.6	U		8.1	U		8.1	U		8.1	U	
PYRENE	10	U		11	U		11	U		11	U	

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4221

SAMPLE NUMBER:	CEF-P40-SS-006			CEF-P40-SS-007			CEF-P40-SS-008			CEF-P40-SS-009		
SAMPLE DATE:	05/28/99			05/28/99			05/28/99			05/28/99		
LABORATORY ID:	F4221-6			F4221-7			F4221-8			F4221-9		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	95.9 %			96.0 %			95.5 %			96.9 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	54	U		54	U		54	U		54	U	
2-METHYLNAPHTHALENE	54	U		54	U		54	U		54	U	
ACENAPHTHENE	54	U		54	U		54	U		54	U	
ACENAPHTHYLENE	110	U		110	U		110	U		110	U	
ANTHRACENE	8.2	U		8.2	U		8.1	U		8.3	U	
BENZO(A)ANTHRACENE	8.2	U		8.2	U		8.1	U		8.3	U	
BENZO(A)PYRENE	8.2	U		8.2	U		8.1	U		8.3	U	
BENZO(B)FLUORANTHENE	8.2	U		8.2	U		8.1	U		8.3	U	
BENZO(G,H,I)PERYLENE	11	U		11	U		11	U		11	U	
BENZO(K)FLUORANTHENE	8.2	U		8.2	U		8.1	U		8.3	U	
CHRYSENE	8.2	U		8.2	U		8.1	U		67		
DIBENZO(A,H)ANTHRACENE	13	U		13	U		13	U		14	U	
FLUORANTHENE	11	U		11	U		11	U		11	U	
FLUORENE	11	U		11	U		11	U		11	U	
INDENO(1,2,3-CD)PYRENE	8.2	U		8.2	U		8.1	U		8.3	U	
NAPHTHALENE	54	U		54	U		54	U		54	U	
PHENANTHRENE	8.2	U		8.2	U		8.1	U		8.3	U	
PYRENE	11	U		11	U		11	U		11	U	

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4221

SAMPLE NUMBER:	CEF-P40-SS-010			CEF-P40-SS-011			CEF-P40-SS-012			CEF-P40-SS-DU01		
SAMPLE DATE:	05/28/99			05/28/99			05/28/99			05/28/99		
LABORATORY ID:	F4221-10			F4221-11			F4221-12			F4221-15		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	95.3 %			94.4 %			94.1 %			93.8 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:										CEF-P40-SS-008		
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	54	U		53	U		53	U		52	U	
2-METHYLNAPHTHALENE	54	U		53	U		53	U		52	U	
ACENAPHTHENE	54	U		53	U		53	U		52	U	
ACENAPHTHYLENE	110	U		110	U		110	U		110	U	
ANTHRACENE	8.1	U		8.0	U		8.0	U		8.0	U	
BENZO(A)ANTHRACENE	8.1	U		8.0	U		8.0	U		8.0	U	
BENZO(A)PYRENE	8.1	U		8.0	U		8.0	U		8.0	U	
BENZO(B)FLUORANTHENE	8.1	U		8.0	U		8.0	U		8.0	U	
BENZO(G,H,I)PERYLENE	11	U		11	U		11	U		11	U	
BENZO(K)FLUORANTHENE	8.1	U		8.0	U		8.0	U		8.0	U	
CHRYSENE	8.1	U		66			8.0	U		8.0	U	
DIBENZO(A,H)ANTHRACENE	14	U		13	U		13	U		13	U	
FLUORANTHENE	11	U		11	U		11	U		11	U	
FLUORENE	11	U		11	U		11	U		11	U	
INDENO(1,2,3-CD)PYRENE	8.1	U		8.0	U		8.0	U		8.0	U	
NAPHTHALENE	53	U		53	U		53	U		52	U	
PHENANTHRENE	8.1	U		8.0	U		8.0	U		8.0	U	
PYRENE	11	U		11	U		11	U		11	U	

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4221

SAMPLE NUMBER:	CEF-P40-GW-68202			/ /			/ /			/ /		
SAMPLE DATE:	05/28/99											
LABORATORY ID:	F4221-17											
QC_TYPE:	NORMAL											
% SOLIDS:	0.0 %			100.0 %			100.0 %			100.0 %		
UNITS:	UG/L											
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	1.0	U										
4,4'-DDE	1.0	U										
4,4'-DDT	1.0	U										
ALDRIN	0.50	U										
ALPHA-BHC	0.50	U										
ALPHA-CHLORDANE	1.0	U										
BETA-BHC	0.50	U										
DELTA-BHC	0.50	U										
DIELDRIN	0.50	U										
ENDOSULFAN I	0.50	U										
ENDOSULFAN II	1.0	U										
ENDOSULFAN SULFATE	1.0	U										
ENDRIN	1.0	U										
ENDRIN ALDEHYDE	1.0	U										
ENDRIN KETONE	1.0	U										
GAMMA-BHC (LINDANE)	0.50	U										
GAMMA-CHLORDANE	1.0	U										
HEPTACHLOR	0.50	U										
HEPTACHLOR EPOXIDE	0.50	U										
METHOXYCHLOR	2.0	U										
TOXAPHENE	25	U										

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4221

SAMPLE NUMBER:	CEF-P40-SD-013			CEF-P40-SD-014								
SAMPLE DATE:	05/28/99			05/28/99			/ /			/ /		
LABORATORY ID:	F4221-13			F4221-14								
QC_TYPE:	NORMAL			NORMAL								
% SOLIDS:	73.4 %			77.2 %			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												
4,4'-DDD	4.5	U		4.3	U							
4,4'-DDE	4.5	U		4.3	U							
4,4'-DDT	4.5	UJ	C	4.3	UJ	C						
ALDRIN	2.3	U		2.2	U							
ALPHA-BHC	2.3	U		2.2	U							
ALPHA-CHLORDANE	4.5	U		4.3	U							
BETA-BHC	2.3	U		2.2	U							
DELTA-BHC	2.3	U		2.2	U							
DIELDRIN	2.3	U		2.2	U							
ENDOSULFAN I	2.3	U		2.2	U							
ENDOSULFAN II	4.5	U		4.3	U							
ENDOSULFAN SULFATE	4.5	U		4.3	U							
ENDRIN	4.5	U		4.3	U							
ENDRIN ALDEHYDE	4.5	U		4.3	U							
ENDRIN KETONE	4.5	U		4.3	U							
GAMMA-BHC (LINDANE)	2.3	U		2.2	U							
GAMMA-CHLORDANE	4.5	U		4.3	U							
HEPTACHLOR	2.3	U		2.2	U							
HEPTACHLOR EPOXIDE	2.3	U		2.2	U							
METHOXYCHLOR	9.1	UJ	C	8.6	UJ	C						
TOXAPHENE	230	U		220	U							

Report of Analysis

Client Sample ID:	CEF-P40-SD-001		
Lab Sample ID:	F4221-1	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
Method:	EPA 8310	Percent Solids:	86.7
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	06/30/99	SUB	n/a	n/a	R6896
Run #2							

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	48	ug/kg	
208-96-8	Acenaphthylene	ND	99	ug/kg	
120-12-7	Anthracene	ND	7.4	ug/kg	
56-55-3	Benzo(a)anthracene	ND	7.4	ug/kg	
50-32-8	Benzo(a)pyrene	ND	7.4	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	7.4	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	9.9	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	7.4	ug/kg	
218-01-9	Chrysene	ND	7.4	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	12	ug/kg	
206-44-0	Fluoranthene	ND	9.9	ug/kg	
86-73-7	Fluorene	ND	9.9	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	63	ug/kg	
91-20-3	Naphthalene	ND	48	ug/kg	
90-12-0	1-Methylnaphthalene	ND	48	ug/kg	
91-57-6	2-Methylnaphthalene	ND	48	ug/kg	
85-01-8	Phenanthrene	ND	7.4	ug/kg	
129-00-0	Pyrene	ND	9.9	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	p-Terphenyl-d14	%		-%

(a) Analyzed By Accutest Southeast Subcontract Lab.

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

Report of Analysis

Client Sample ID:	CEF-P40-SS-002		
Lab Sample ID:	F4221-2	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
Method:	EPA 8310	Percent Solids:	89.6
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	06/30/99	SUB	n/a	n/a	R6896
Run #2							

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	50	ug/kg	
208-96-8	Acenaphthylene	ND	100	ug/kg	
120-12-7	Anthracene	ND	7.6	ug/kg	
56-55-3	Benzo(a)anthracene	ND	7.6	ug/kg	
50-32-8	Benzo(a)pyrene	ND	7.6	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	7.6	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	10	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	7.6	ug/kg	
218-01-9	Chrysene	ND	7.6	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	12	ug/kg	
206-44-0	Fluoranthene	ND	10	ug/kg	
86-73-7	Fluorene	ND	10	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	7.6	ug/kg	
91-20-3	Naphthalene	ND	50	ug/kg	
90-12-0	1-Methylnaphthalene	ND	50	ug/kg	
91-57-6	2-Methylnaphthalene	ND	50	ug/kg	
85-01-8	Phenanthrene	ND	7.6	ug/kg	
129-00-0	Pyrene	ND	10	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	p-Terphenyl-d14	%		-%

(a) Analyzed By Accutest Southeast Subcontract Lab.

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

Report of Analysis

Client Sample ID:	CEF-P40-SS-003		
Lab Sample ID:	F4221-3	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
Method:	EPA 8310	Percent Solids:	95.6
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	06/30/99	SUB	n/a	n/a	R6896
Run #2							

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	54	ug/kg	
208-96-8	Acenaphthylene	ND	110	ug/kg	
120-12-7	Anthracene	ND	8.1	ug/kg	
56-55-3	Benzo(a)anthracene	ND	8.1	ug/kg	
50-32-8	Benzo(a)pyrene	ND	8.1	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	8.1	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	11	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	8.1	ug/kg	
218-01-9	Chrysene	ND	8.1	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	13	ug/kg	
206-44-0	Fluoranthene	ND	11	ug/kg	
86-73-7	Fluorene	ND	11	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	8.1	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	8.1	ug/kg	
129-00-0	Pyrene	ND	11	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	p-Terphenyl-d14	%		-%

(a) Analyzed By Accutest Southeast Subcontract Lab.

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

Report of Analysis

Client Sample ID:	CEF-P40-SS-004		
Lab Sample ID:	F4221-4	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
Method:	EPA 8310	Percent Solids:	95.0
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	06/30/99	SUB	n/a	n/a	R6896
Run #2							

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	53	ug/kg	
208-96-8	Acenaphthylene	ND	110	ug/kg	
120-12-7	Anthracene	ND	8.1	ug/kg	
56-55-3	Benzo(a)anthracene	ND	8.1	ug/kg	
50-32-8	Benzo(a)pyrene	ND	8.1	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	8.1	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	11	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	8.1	ug/kg	
218-01-9	Chrysene	ND	8.1	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	13	ug/kg	
206-44-0	Fluoranthene	ND	11	ug/kg	
86-73-7	Fluorene	ND	11	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	8.1	ug/kg	
91-20-3	Naphthalene	ND	53	ug/kg	
90-12-0	1-Methylnaphthalene	ND	53	ug/kg	
91-57-6	2-Methylnaphthalene	ND	53	ug/kg	
85-01-8	Phenanthrene	ND	8.1	ug/kg	
129-00-0	Pyrene	ND	11	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	p-Terphenyl-d14	%		-%

(a) Analyzed By Accutest Southeast Subcontract Lab.

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

Report of Analysis

Client Sample ID:	CEF-P40-SS-005		
Lab Sample ID:	F4221-5	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
Method:	EPA 8310	Percent Solids:	95.2
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	06/30/99	SUB	n/a	n/a	R6896
Run #2							

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	53	ug/kg	
208-96-8	Acenaphthylene	ND	110	ug/kg	
120-12-7	Anthracene	ND	8.1	ug/kg	
56-55-3	Benzo(a)anthracene	ND	8.1	ug/kg	
50-32-8	Benzo(a)pyrene	ND	8.1	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	8.1	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	11	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	8.1	ug/kg	
218-01-9	Chrysene	ND	8.1	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	13	ug/kg	
206-44-0	Fluoranthene	ND	11	ug/kg	
86-73-7	Fluorene	ND	11	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	69	ug/kg	
91-20-3	Naphthalene	ND	53	ug/kg	
90-12-0	1-Methylnaphthalene	ND	53	ug/kg	
91-57-6	2-Methylnaphthalene	ND	53	ug/kg	
85-01-8	Phenanthrene	ND	8.1	ug/kg	
129-00-0	Pyrene	ND	11	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	p-Terphenyl-d14	%		-%

(a) Analyzed By Accutest Southeast Subcontract Lab.

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

Report of Analysis

Client Sample ID:	CEF-P40-SS-006		
Lab Sample ID:	F4221-6	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
Method:	EPA 8310	Percent Solids:	95.9
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	06/30/99	SUB	n/a	n/a	R6896
Run #2							

CAS No.	Compound	Result	RL	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	ND	8.2	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	13	ug/kg	
206-44-0	Fluoranthene	ND	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	ND	11	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	p-Terphenyl-d14	%		-%

(a) Analyzed By Accutest Southeast Subcontract Lab.

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

Report of Analysis

Client Sample ID:	CEF-P40-SS-007		
Lab Sample ID:	F4221-7	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
Method:	EPA 8310	Percent Solids:	96.0
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	06/30/99	SUB	n/a	n/a	R6896
Run #2							

CAS No.	Compound	Result	RL	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	ND	8.2	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	13	ug/kg	
206-44-0	Fluoranthene	ND	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	ND	11	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	p-Terphenyl-d14	%		-%

(a) Analyzed By Accutest Southeast Subcontract Lab.

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

Report of Analysis

Client Sample ID:	CEF-P40-SS-008		
Lab Sample ID:	F4221-8	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
Method:	EPA 8310	Percent Solids:	95.5
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	06/30/99	SUB	n/a	n/a	R6896
Run #2							

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	54	ug/kg	
208-96-8	Acenaphthylene	ND	110	ug/kg	
120-12-7	Anthracene	ND	8.1	ug/kg	
56-55-3	Benzo(a)anthracene	ND	8.1	ug/kg	
50-32-8	Benzo(a)pyrene	ND	8.1	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	8.1	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	11	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	8.1	ug/kg	
218-01-9	Chrysene	ND	8.1	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	13	ug/kg	
206-44-0	Fluoranthene	ND	11	ug/kg	
86-73-7	Fluorene	ND	11	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	8.1	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	8.1	ug/kg	
129-00-0	Pyrene	ND	11	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	p-Terphenyl-d14	%		-%

(a) Analyzed By Accutest Southeast Subcontract Lab.

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

Report of Analysis

Client Sample ID:	CEF-P40-SS-009		
Lab Sample ID:	F4221-9	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
Method:	EPA 8310	Percent Solids:	96.9
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	06/30/99	SUB	n/a	n/a	R6896
Run #2							

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	54	ug/kg	
208-96-8	Acenaphthylene	ND	110	ug/kg	
120-12-7	Anthracene	ND	8.3	ug/kg	
56-55-3	Benzo(a)anthracene	ND	8.3	ug/kg	
50-32-8	Benzo(a)pyrene	ND	8.3	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	8.3	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	11	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	8.3	ug/kg	
218-01-9	Chrysene	67	8.3	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	14	ug/kg	
206-44-0	Fluoranthene	ND	11	ug/kg	
86-73-7	Fluorene	ND	11	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	70	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	8.3	ug/kg	
129-00-0	Pyrene	ND	11	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	p-Terphenyl-d14	%		-%

(a) Analyzed By Accutest Southeast Subcontract Lab.

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

Report of Analysis

Client Sample ID:	CEF-P40-SS-010		
Lab Sample ID:	F4221-10	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
Method:	EPA 8310	Percent Solids:	95.3
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	06/30/99	SUB	n/a	n/a	R6896
Run #2							

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	53	ug/kg	
208-96-8	Acenaphthylene	ND	110	ug/kg	
120-12-7	Anthracene	ND	8.1	ug/kg	
56-55-3	Benzo(a)anthracene	ND	8.1	ug/kg	
50-32-8	Benzo(a)pyrene	ND	8.1	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	8.1	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	11	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	8.1	ug/kg	
218-01-9	Chrysene	ND	8.1	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	13	ug/kg	
206-44-0	Fluoranthene	ND	11	ug/kg	
86-73-7	Fluorene	ND	11	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	8.1	ug/kg	
91-20-3	Naphthalene	ND	53	ug/kg	
90-12-0	1-Methylnaphthalene	ND	53	ug/kg	
91-57-6	2-Methylnaphthalene	ND	53	ug/kg	
85-01-8	Phenanthrene	ND	8.1	ug/kg	
129-00-0	Pyrene	ND	11	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	p-Terphenyl-d14	%		-%

(a) Analyzed By Accutest Southeast Subcontract Lab.

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

Report of Analysis

Client Sample ID:	CEF-P40-SS-011		
Lab Sample ID:	F4221-11	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
Method:	EPA 8310	Percent Solids:	94.4
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	06/30/99	SUB	n/a	n/a	R6896
Run #2							

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	53	ug/kg	
208-96-8	Acenaphthylene	ND	110	ug/kg	
120-12-7	Anthracene	ND	8.0	ug/kg	
56-55-3	Benzo(a)anthracene	ND	8.0	ug/kg	
50-32-8	Benzo(a)pyrene	ND	8.0	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	8.0	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	11	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	8.0	ug/kg	
218-01-9	Chrysene	66	8.0	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	13	ug/kg	
206-44-0	Fluoranthene	ND	11	ug/kg	
86-73-7	Fluorene	ND	11	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	8.0	ug/kg	
91-20-3	Naphthalene	ND	53	ug/kg	
90-12-0	1-Methylnaphthalene	ND	53	ug/kg	
91-57-6	2-Methylnaphthalene	ND	53	ug/kg	
85-01-8	Phenanthrene	ND	8.0	ug/kg	
129-00-0	Pyrene	ND	11	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	p-Terphenyl-d14	%		-%

(a) Analyzed By Accutest Southeast Subcontract Lab.

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

Report of Analysis

Client Sample ID:	CEF-P40-SS-012		
Lab Sample ID:	F4221-12	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
Method:	EPA 8310	Percent Solids:	94.1
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	06/30/99	SUB	n/a	n/a	R6896
Run #2							

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	53	ug/kg	
208-96-8	Acenaphthylene	ND	110	ug/kg	
120-12-7	Anthracene	ND	8.0	ug/kg	
56-55-3	Benzo(a)anthracene	ND	8.0	ug/kg	
50-32-8	Benzo(a)pyrene	ND	8.0	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	8.0	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	11	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	8.0	ug/kg	
218-01-9	Chrysene	ND	8.0	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	13	ug/kg	
206-44-0	Fluoranthene	ND	11	ug/kg	
86-73-7	Fluorene	ND	11	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	8.0	ug/kg	
91-20-3	Naphthalene	ND	53	ug/kg	
90-12-0	1-Methylnaphthalene	ND	53	ug/kg	
91-57-6	2-Methylnaphthalene	ND	53	ug/kg	
85-01-8	Phenanthrene	ND	8.0	ug/kg	
129-00-0	Pyrene	ND	11	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	p-Terphenyl-d14	%		-%

(a) Analyzed By Accutest Southeast Subcontract Lab.

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

Report of Analysis

Client Sample ID:	CEF-P40-SD-013		
Lab Sample ID:	F4221-13	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
Method:	SW846 8260B	Percent Solids:	73.4
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K003227.D	1	06/02/99	CJP	n/a	n/a	VK75
Run #2							

VOA TCL List

CAS No.	Compound	Result	RL	Units	Q
67-64-1	Acetone	ND	78	ug/kg	
71-43-2	Benzene	ND	3.1	ug/kg	
75-27-4	Bromodichloromethane	ND	3.1	ug/kg	
75-25-2	Bromoform	ND	3.1	ug/kg	
108-90-7	Chlorobenzene	ND	3.1	ug/kg	
75-00-3	Chloroethane	ND	7.8	ug/kg	
67-66-3	Chloroform	ND	3.1	ug/kg	
75-15-0	Carbon disulfide	ND	7.8	ug/kg	
56-23-5	Carbon tetrachloride	ND	3.1	ug/kg	
75-34-3	1,1-Dichloroethane	ND	3.1	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	3.1	ug/kg	
107-06-2	1,2-Dichloroethane	ND	3.1	ug/kg	
78-87-5	1,2-Dichloropropane	ND	3.1	ug/kg	
124-48-1	Dibromochloromethane	ND	3.1	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	3.1	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	3.1	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	3.1	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	3.1	ug/kg	
100-41-4	Ethylbenzene	ND	3.1	ug/kg	
591-78-6	2-Hexanone	ND	16	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	16	ug/kg	
74-83-9	Methyl bromide	ND	7.8	ug/kg	
74-87-3	Methyl chloride	ND	7.8	ug/kg	
75-09-2	Methylene chloride	ND	7.8	ug/kg	
78-93-3	Methyl ethyl ketone	ND	16	ug/kg	
100-42-5	Styrene	ND	3.1	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	3.1	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	3.1	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	3.1	ug/kg	
127-18-4	Tetrachloroethylene	ND	3.1	ug/kg	
108-88-3	Toluene	ND	3.1	ug/kg	
79-01-6	Trichloroethylene	ND	3.1	ug/kg	
75-01-4	Vinyl chloride	ND	7.8	ug/kg	
1330-20-7	Xylene (total)	ND	9.3	ug/kg	

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

Report of Analysis

Client Sample ID:	CEF-P40-SD-013		
Lab Sample ID:	F4221-13	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
Method:	SW846 8260B	Percent Solids:	73.4
Project:	NAS Cecil Field		

VOA TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%		80-120%
2037-26-5	Toluene-D8	98%		81-117%
460-00-4	4-Bromofluorobenzene	108%		74-121%
17060-07-0	1,2-Dichloroethane-D4	96%		80-120%

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

Report of Analysis

Client Sample ID:	CEF-P40-SD-013		
Lab Sample ID:	F4221-13	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
Method:	EPA 8310	Percent Solids:	73.4
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	06/30/99	SUB	n/a	n/a	R6896
Run #2							

CAS No.	Compound	Result	RL	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	ND	6.3	ug/kg	
50-32-8	Benzo(a)pyrene	ND	6.3	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	6.3	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	8.4	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	6.3	ug/kg	
218-01-9	Chrysene	140	6.3	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	10	ug/kg	
206-44-0	Fluoranthene	ND	8.4	ug/kg	
86-73-7	Fluorene	ND	8.4	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	53	ug/kg	
91-20-3	Naphthalene	ND	41	ug/kg	
90-12-0	1-Methylnaphthalene	ND	41	ug/kg	
91-57-6	2-Methylnaphthalene	ND	41	ug/kg	
85-01-8	Phenanthrene	ND	6.3	ug/kg	
129-00-0	Pyrene	ND	8.4	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	p-Terphenyl-d14	%		-%

(a) Analyzed By Accutest Southeast Subcontract Lab.

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

Report of Analysis

Client Sample ID:	CEF-P40-SD-013		
Lab Sample ID:	F4221-13	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
Method:	SW846 3550B/8081A	Percent Solids:	73.4
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	MN03901.D	1	06/15/99	SKW	06/11/99	OP842	GMN162
Run #2							

Pesticide TCL List

CAS No.	Compound	Result	RL	Units	Q
309-00-2	Aldrin	ND	2.3	ug/kg	
319-84-6	alpha-BHC	ND	2.3	ug/kg	
319-85-7	beta-BHC	ND	2.3	ug/kg	
319-86-8	delta-BHC	ND	2.3	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	2.3	ug/kg	
5103-71-9	alpha-Chlordane	ND	4.5	ug/kg	
5103-74-2	gamma-Chlordane	ND	4.5	ug/kg	
60-57-1	Dieldrin	ND	2.3	ug/kg	
72-54-8	4,4'-DDD	ND	4.5	ug/kg	
72-55-9	4,4'-DDE	ND	4.5	ug/kg	
50-29-3	4,4'-DDT	ND	4.5	ug/kg	
72-20-8	Endrin	ND	4.5	ug/kg	
1031-07-8	Endosulfan sulfate	ND	4.5	ug/kg	
7421-93-4	Endrin aldehyde	ND	4.5	ug/kg	
53494-70-5	Endrin ketone	ND	4.5	ug/kg	
959-98-8	Endosulfan-I	ND	2.3	ug/kg	
33213-65-9	Endosulfan-II	ND	4.5	ug/kg	
76-44-8	Heptachlor	ND	2.3	ug/kg	
1024-57-3	Heptachlor epoxide	ND	2.3	ug/kg	
72-43-5	Methoxychlor	ND	9.1	ug/kg	
8001-35-2	Toxaphene	ND	230	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	75%		40-150%
2051-24-3	Decachlorobiphenyl	70%		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

Report of Analysis

Client Sample ID:	CEF-P40-SD-014		
Lab Sample ID:	F4221-14	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
Method:	SW846 8260B	Percent Solids:	77.2
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K003228.D	1	06/02/99	CJP	n/a	n/a	VK75
Run #2							

VOA TCL List

CAS No.	Compound	Result	RL	Units	Q
67-64-1	Acetone	ND	60	ug/kg	
71-43-2	Benzene	ND	2.4	ug/kg	
75-27-4	Bromodichloromethane	ND	2.4	ug/kg	
75-25-2	Bromoform	ND	2.4	ug/kg	
108-90-7	Chlorobenzene	ND	2.4	ug/kg	
75-00-3	Chloroethane	ND	6.0	ug/kg	
67-66-3	Chloroform	ND	2.4	ug/kg	
75-15-0	Carbon disulfide	ND	6.0	ug/kg	
56-23-5	Carbon tetrachloride	ND	2.4	ug/kg	
75-34-3	1,1-Dichloroethane	ND	2.4	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	2.4	ug/kg	
107-06-2	1,2-Dichloroethane	ND	2.4	ug/kg	
78-87-5	1,2-Dichloropropane	ND	2.4	ug/kg	
124-48-1	Dibromochloromethane	ND	2.4	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	2.4	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	2.4	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	2.4	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	2.4	ug/kg	
100-41-4	Ethylbenzene	ND	2.4	ug/kg	
591-78-6	2-Hexanone	ND	12	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	12	ug/kg	
74-83-9	Methyl bromide	ND	6.0	ug/kg	
74-87-3	Methyl chloride	ND	6.0	ug/kg	
75-09-2	Methylene chloride	ND	6.0	ug/kg	
78-93-3	Methyl ethyl ketone	ND	12	ug/kg	
100-42-5	Styrene	ND	2.4	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	2.4	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.4	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	2.4	ug/kg	
127-18-4	Tetrachloroethylene	ND	2.4	ug/kg	
108-88-3	Toluene	ND	2.4	ug/kg	
79-01-6	Trichloroethylene	ND	2.4	ug/kg	
75-01-4	Vinyl chloride	ND	6.0	ug/kg	
1330-20-7	Xylene (total)	ND	7.1	ug/kg	

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

Report of Analysis

Client Sample ID:	CEF-P40-SD-014		
Lab Sample ID:	F4221-14	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
Method:	SW846 8260B	Percent Solids:	77.2
Project:	NAS Cecil Field		

VOA TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		80-120%
2037-26-5	Toluene-D8	93%		81-117%
460-00-4	4-Bromofluorobenzene	100%		74-121%
17060-07-0	1,2-Dichloroethane-D4	92%		80-120%

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

Report of Analysis

Client Sample ID:	CEF-P40-SD-014		
Lab Sample ID:	F4221-14	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
Method:	EPA 8310	Percent Solids:	77.2
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	06/30/99	SUB	n/a	n/a	R6896
Run #2							

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	43	ug/kg	
208-96-8	Acenaphthylene	ND	88	ug/kg	
120-12-7	Anthracene	ND	6.6	ug/kg	
56-55-3	Benzo(a)anthracene	ND	6.6	ug/kg	
50-32-8	Benzo(a)pyrene	ND	6.6	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	6.6	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	8.8	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	6.6	ug/kg	
218-01-9	Chrysene	8000	6.6	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	11	ug/kg	
206-44-0	Fluoranthene	ND	8.8	ug/kg	
86-73-7	Fluorene	ND	8.8	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	6.6	ug/kg	
91-20-3	Naphthalene	690	43	ug/kg	
90-12-0	1-Methylnaphthalene	ND	43	ug/kg	
91-57-6	2-Methylnaphthalene	810	43	ug/kg	
85-01-8	Phenanthrene	ND	6.6	ug/kg	
129-00-0	Pyrene	ND	8.8	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	p-Terphenyl-d14	%		-%

(a) Analyzed By Accutest Southeast Subcontract Lab.

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

Report of Analysis

Client Sample ID:	CEF-P40-SD-014		
Lab Sample ID:	F4221-14	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
Method:	SW846 3550B/8081A	Percent Solids:	77.2
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	MN03902.D	1	06/15/99	SKW	06/11/99	OP842	GMN162
Run #2							

Pesticide TCL List

CAS No.	Compound	Result	RL	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	78%		40-150%
2051-24-3	Decachlorobiphenyl	78%		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

Report of Analysis

Client Sample ID:	CEF-P40-SS-DU01		
Lab Sample ID:	F4221-15	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
Method:	EPA 8310	Percent Solids:	93.8
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	06/30/99	SUB	n/a	n/a	R6896
Run #2							

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	52	ug/kg	
208-96-8	Acenaphthylene	ND	110	ug/kg	
120-12-7	Anthracene	ND	8.0	ug/kg	
56-55-3	Benzo(a)anthracene	ND	8.0	ug/kg	
50-32-8	Benzo(a)pyrene	ND	8.0	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	8.0	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	11	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	8.0	ug/kg	
218-01-9	Chrysene	ND	8.0	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	13	ug/kg	
206-44-0	Fluoranthene	ND	11	ug/kg	
86-73-7	Fluorene	ND	11	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	8.0	ug/kg	
91-20-3	Naphthalene	ND	52	ug/kg	
90-12-0	1-Methylnaphthalene	ND	52	ug/kg	
91-57-6	2-Methylnaphthalene	ND	52	ug/kg	
85-01-8	Phenanthrene	ND	8.0	ug/kg	
129-00-0	Pyrene	ND	11	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	p-Terphenyl-d14	%		-%

(a) Analyzed By Accutest Southeast Subcontract Lab.

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

Report of Analysis

Client Sample ID:	CEF-P40-SD-DU02		
Lab Sample ID:	F4221-16	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
Method:	SW846 8260B	Percent Solids:	71.7
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K003229.D	1	06/02/99	CJP	n/a	n/a	VK75
Run #2							

VOA TCL List

CAS No.	Compound	Result	RL	Units	Q
67-64-1	Acetone	ND	100	ug/kg	
71-43-2	Benzene	ND	4.0	ug/kg	
75-27-4	Bromodichloromethane	ND	4.0	ug/kg	
75-25-2	Bromoform	ND	4.0	ug/kg	
108-90-7	Chlorobenzene	ND	4.0	ug/kg	
75-00-3	Chloroethane	ND	10	ug/kg	
67-66-3	Chloroform	ND	4.0	ug/kg	
75-15-0	Carbon disulfide	ND	10	ug/kg	
56-23-5	Carbon tetrachloride	ND	4.0	ug/kg	
75-34-3	1,1-Dichloroethane	ND	4.0	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	4.0	ug/kg	
107-06-2	1,2-Dichloroethane	ND	4.0	ug/kg	
78-87-5	1,2-Dichloropropane	ND	4.0	ug/kg	
124-48-1	Dibromochloromethane	ND	4.0	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	4.0	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	4.0	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	4.0	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	4.0	ug/kg	
100-41-4	Ethylbenzene	ND	4.0	ug/kg	
591-78-6	2-Hexanone	ND	20	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	20	ug/kg	
74-83-9	Methyl bromide	ND	10	ug/kg	
74-87-3	Methyl chloride	ND	10	ug/kg	
75-09-2	Methylene chloride	ND	10	ug/kg	
78-93-3	Methyl ethyl ketone	ND	20	ug/kg	
100-42-5	Styrene	ND	4.0	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	4.0	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	4.0	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	4.0	ug/kg	
127-18-4	Tetrachloroethylene	ND	4.0	ug/kg	
108-88-3	Toluene	ND	4.0	ug/kg	
79-01-6	Trichloroethylene	ND	4.0	ug/kg	
75-01-4	Vinyl chloride	ND	10	ug/kg	
1330-20-7	Xylene (total)	ND	12	ug/kg	

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

Report of Analysis

Client Sample ID:	CEF-P40-SD-DU02		
Lab Sample ID:	F4221-16	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
Method:	SW846 8260B	Percent Solids:	71.7
Project:	NAS Cecil Field		

VOA TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		80-120%
2037-26-5	Toluene-D8	94%		81-117%
460-00-4	4-Bromofluorobenzene	102%		74-121%
17060-07-0	1,2-Dichloroethane-D4	97%		80-120%

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

Report of Analysis

Client Sample ID:	CEF-P40-SD-DU02		
Lab Sample ID:	F4221-16	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
Method:	EPA 8310	Percent Solids:	71.7
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	06/30/99	SUB	n/a	n/a	R6896
Run #2							

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	40	ug/kg	
208-96-8	Acenaphthylene	ND	82	ug/kg	
120-12-7	Anthracene	ND	6.1	ug/kg	
56-55-3	Benzo(a)anthracene	ND	6.1	ug/kg	
50-32-8	Benzo(a)pyrene	ND	6.1	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	6.1	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	8.2	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	6.1	ug/kg	
218-01-9	Chrysene	ND	6.1	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	10	ug/kg	
206-44-0	Fluoranthene	ND	8.2	ug/kg	
86-73-7	Fluorene	ND	8.2	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	6.1	ug/kg	
91-20-3	Naphthalene	ND	40	ug/kg	
90-12-0	1-Methylnaphthalene	ND	40	ug/kg	
91-57-6	2-Methylnaphthalene	ND	40	ug/kg	
85-01-8	Phenanthrene	ND	6.1	ug/kg	
129-00-0	Pyrene	ND	8.2	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	p-Terphenyl-d14	%		-%

(a) Analyzed By Accutest Southeast Subcontract Lab.

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

Report of Analysis

Client Sample ID:	CEF-P40-GW-68202		
Lab Sample ID:	F4221-17	Date Sampled:	05/28/99
Matrix:	AQ - Ground Water	Date Received:	06/01/99
Method:	SW846 8260B	Percent Solids:	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G0009006.D	1	06/02/99	CJP	n/a	n/a	VG245
Run #2							

VOA TCL List

CAS No.	Compound	Result	RL	Units	Q
67-64-1	Acetone	ND	5.0	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
75-15-0	Carbon disulfide	ND	5.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
591-78-6	2-Hexanone	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	ug/l	
74-83-9	Methyl bromide	ND	1.0	ug/l	
74-87-3	Methyl chloride	ND	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-01-4	Vinyl chloride	ND	1.0	ug/l	
1330-20-7	Xylene (total)	ND	3.0	ug/l	

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

Report of Analysis

Client Sample ID:	CEF-P40-GW-68202		
Lab Sample ID:	F4221-17	Date Sampled:	05/28/99
Matrix:	AQ - Ground Water	Date Received:	06/01/99
Method:	SW846 8260B	Percent Solids:	n/a
Project:	NAS Cecil Field		

VOA TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	95%		80-116%
17060-07-0	1,2-Dichloroethane-D4	108%		74-120%
2037-26-5	Toluene-D8	101%		80-120%
460-00-4	4-Bromofluorobenzene	99%		86-115%

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

Report of Analysis

Client Sample ID:	CEF-P40-GW-68202		
Lab Sample ID:	F4221-17	Date Sampled:	05/28/99
Matrix:	AQ - Ground Water	Date Received:	06/01/99
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 [a]	L001824.D	20	06/07/99	ME	06/01/99	OP819	SL113
Run #2 [a]	H004568.D	20	06/07/99	ME	06/01/99	OP818	SH225

ABN TCL List

CAS No.	Compound	Result	RL	Units	Q
95-57-8	2-Chlorophenol	ND [b]	100	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND [b]	200	ug/l	
120-83-2	2,4-Dichlorophenol	ND [b]	80	ug/l	
105-67-9	2,4-Dimethylphenol	ND [b]	200	ug/l	
51-28-5	2,4-Dinitrophenol	ND [b]	500	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND [b]	500	ug/l	
95-48-7	2-Methylphenol	ND [b]	100	ug/l	
	3&4-Methylphenol	ND [b]	100	ug/l	
88-75-5	2-Nitrophenol	ND [b]	100	ug/l	
100-02-7	4-Nitrophenol	ND [b]	300	ug/l	
87-86-5	Pentachlorophenol	ND	20	ug/l	
108-95-2	Phenol	ND [b]	100	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND [b]	80	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND [b]	100	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND [b]	100	ug/l	
85-68-7	Butyl benzyl phthalate	ND [b]	100	ug/l	
91-58-7	2-Chloronaphthalene	ND [b]	100	ug/l	
106-47-8	4-Chloroaniline	ND [b]	100	ug/l	
86-74-8	Carbazole	ND [b]	80	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND [b]	100	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	30	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND [b]	100	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND [b]	100	ug/l	
95-50-1	1,2-Dichlorobenzene	ND [b]	100	ug/l	
541-73-1	1,3-Dichlorobenzene	ND [b]	100	ug/l	
106-46-7	1,4-Dichlorobenzene	ND [b]	100	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	4.0	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	4.0	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND [b]	150	ug/l	
132-64-9	Dibenzofuran	ND [b]	100	ug/l	
84-74-2	Di-n-butyl phthalate	ND [b]	100	ug/l	
117-84-0	Di-n-octyl phthalate	ND [b]	100	ug/l	
84-66-2	Diethyl phthalate	ND [b]	100	ug/l	
131-11-3	Dimethyl phthalate	ND [b]	100	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND [b]	100	ug/l	
118-74-1	Hexachlorobenzene	ND	20	ug/l	

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

Report of Analysis

Client Sample ID:	CEF-P40-GW-68202		
Lab Sample ID:	F4221-17	Date Sampled:	05/28/99
Matrix:	AQ - Ground Water	Date Received:	06/01/99
Method:	SW846 3510C/8270C	Percent Solids:	n/a
Project:	NAS Cecil Field		

ABN TCL List

CAS No.	Compound	Result	RL	Units	Q
87-68-3	Hexachlorobutadiene	ND [b]	100	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND [b]	100	ug/l	
67-72-1	Hexachloroethane	ND [b]	100	ug/l	
78-59-1	Isophorone	ND [b]	100	ug/l	
90-12-0	1-Methylnaphthalene	ND [b]	100	ug/l	
91-57-6	2-Methylnaphthalene	ND [b]	100	ug/l	
88-74-4	2-Nitroaniline	ND [b]	100	ug/l	
99-09-2	3-Nitroaniline	ND [b]	100	ug/l	
100-01-6	4-Nitroaniline	ND [b]	100	ug/l	
98-95-3	Nitrobenzene	ND [b]	80	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND [b]	80	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND [b]	100	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND [b]	100	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol		34%	21-100%
4165-62-2	Phenol-d5		29%	10-94%
118-79-6	2,4,6-Tribromophenol		27%	10-123%
4165-60-0	Nitrobenzene-d5		80%	35-114%
321-60-8	2-Fluorobiphenyl		72%	43-116%
1718-51-0	Terphenyl-d14		83%	33-141%

(a) Elevated detection limits due to matrix interference, dilution required during sample prep.
(b) Result is from Run# 2

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

Report of Analysis

Client Sample ID:	CEF-P40-GW-68202		
Lab Sample ID:	F4221-17	Date Sampled:	05/28/99
Matrix:	AQ - Ground Water	Date Received:	06/01/99
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	06/30/99	SUB	n/a	n/a	R6896
Run #2							

CAS No.	Compound	Result	RL	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	0.15	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.15	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.15	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.15	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.15	ug/l	
218-01-9	Chrysene	ND	0.15	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.25	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	0.15	ug/l	
91-20-3	Naphthalene	ND	1.0	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	ug/l	
85-01-8	Phenanthrene	ND	0.15	ug/l	
129-00-0	Pyrene	ND	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	p-Terphenyl-d14	%		-%

(a) Analyzed By Accutest Southeast Subcontract Lab.

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

Report of Analysis

Client Sample ID:	CEF-P40-GW-68202		
Lab Sample ID:	F4221-17	Date Sampled:	05/28/99
Matrix:	AQ - Ground Water	Date Received:	06/01/99
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 [a]	MN03750.D	1	06/03/99	SKW	06/02/99	OP821	GMN156
Run #2							

Pesticide TCL List

CAS No.	Compound	Result	RL	Units	Q
309-00-2	Aldrin	ND	0.50	ug/l	
319-84-6	alpha-BHC	ND	0.50	ug/l	
319-85-7	beta-BHC	ND	0.50	ug/l	
319-86-8	delta-BHC	ND	0.50	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.50	ug/l	
5103-71-9	alpha-Chlordane	ND	1.0	ug/l	
5103-74-2	gamma-Chlordane	ND	1.0	ug/l	
60-57-1	Dieldrin	ND	0.50	ug/l	
72-54-8	4,4'-DDD	ND	1.0	ug/l	
72-55-9	4,4'-DDE	ND	1.0	ug/l	
50-29-3	4,4'-DDT	ND	1.0	ug/l	
72-20-8	Endrin	ND	1.0	ug/l	
1031-07-8	Endosulfan sulfate	ND	1.0	ug/l	
7421-93-4	Endrin aldehyde	ND	1.0	ug/l	
53494-70-5	Endrin ketone	ND	1.0	ug/l	
959-98-8	Endosulfan-I	ND	0.50	ug/l	
33213-65-9	Endosulfan-II	ND	1.0	ug/l	
76-44-8	Heptachlor	ND	0.50	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.50	ug/l	
72-43-5	Methoxychlor	ND	2.0	ug/l	
8001-35-2	Toxaphene	ND	25	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	91%		30-160%
2051-24-3	Decachlorobiphenyl	41%		30-160%

(a) Elevated detection limits due to matrix interference, dilution required during sample prep.

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

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-07-9-141

TO:	**M. SPERANZA**	**DATE:**	**JULY 22, 1999**
FROM:	**JENNIFER MALLE**	**COPIES:**	**DV FILE**

SUBJECT: **INORGANIC DATA VALIDATION TAL METALS**
CTO 078 – CECIL FIELD, FLORIDA
SDG – F4221

SAMPLES: 16/SOIL/

CEF-P40-SD-001	CEF-P40-SD-013	CEF-P40-SD-014	CEF-P40-SD-DU02
CEF-P40-SS-002	CEF-P40-SS-003	CEF-P40-SS-004	CEF-P40-SS-005
CEF-P40-SS-006	CEF-P40-SS-007	CEF-P40-SS-008	CEF-P40-SS-009
CEF-P40-SS-010	CEF-P40-SS-011	CEF-P40-SS-012	CEF-P40-SS-DU01

3/AQUEOUS/

~~CEF-A24-GW-MW01~~	CEF-P40-GW-68202	CEF-P40-GW-68202-F

Overview

The sample set for CTO 078, Cecil Field, SDG F4221, consists of sixteen (16) soil environmental samples and three (3) aqueous environmental samples. Two (2) field duplicate pairs (CEF-P40-SD-014 / CEF-P40-SD-DU02 and CEF-P40-SS-008 / CEF-P40-SS-DU01) were included within this SDG.

All samples except for CEF-A24-GW-MW01 were analyzed for Target Analyte List (TAL metals). Sample CEF-A24-GW-MW01 was analyzed for lead. The samples were collected by Tetra Tech NUS on May 28, 1999 and analyzed by Accutest Laboratory under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) Criteria. TAL metals and Lead analyses were conducted using SW846 method 6010B.

The data was evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
• Initial and Continuing Calibration Recoveries
• Laboratory Blank Analyses
• Field Duplicate Results
* • Detection Limits

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

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%

APPENDIX A

Qualified Analytical Results

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4221

SAMPLE NUMBER:	CEF-A24-GW-MW01			CEF-P40-GW-68202			CEF-P40-GW-68202-F			/ /		
SAMPLE DATE:	05/28/99			05/28/99			05/28/99					
LABORATORY ID:	F4221-18			F4221-17			F4221-17A					
QC_TYPE:	NORMAL			NORMAL			NORMAL					
% SOLIDS:	0.0 %			0.0 %			0.0 %			100.0 %		
UNITS:	UG/L			UG/L			UG/L					
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM				79500			473					
ANTIMONY				2.4	U		2.7	U	A			
ARSENIC				13.6			3.4	U				
BARIUM				1960			38.8					
BERYLLIUM				18.8			1.3	U	A			
CADMIUM				0.67	U	A	0.33	U				
CALCIUM				40800			2870					
CHROMIUM				80.0			3.9	U	A			
COBALT				5.3	U	A	0.80	U				
COPPER				18.9			0.77	U	A			
IRON				66600			4490					
LEAD	1.6	U		126			1.6	U				
MAGNESIUM				19500			1440					
MANGANESE				111			9.2					
MERCURY				0.44			0.25	U				
NICKEL				26.0			3.1	U	A			
POTASSIUM				2710			631					
SELENIUM				7.7	U	A	2.0	U				
SILVER				0.96	U		1.6	U	A			
SODIUM				7740			6740					
THALLIUM				2.7	U		2.7	U				
VANADIUM				429			25.6					
ZINC				120			35.8	U	A			

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4221

SAMPLE NUMBER:	CEF-P40-SD-001			CEF-P40-SD-013			CEF-P40-SD-014			CEF-P40-SD-DU02		
SAMPLE DATE:	05/28/99			05/28/99			05/28/99			05/28/99		
LABORATORY ID:	F4221-1			F4221-13			F4221-14			F4221-16		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	86.7 %			73.4 %			77.2 %			71.7 %		
UNITS:	MG/KG			MG/KG			MG/KG			MG/KG		
FIELD DUPLICATE OF:										CEF-P40-SD-014		
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	3690			3010			4090			6320		
ANTIMONY	0.28	U		0.38	U	A	0.31	U		0.38	U	A
ARSENIC	0.40	U		0.47	U		0.45	U		0.48	U	
BARIUM	13.0			14.8			7.5			11.1		
BERYLLIUM	0.40	U	A	0.21	U	A	0.20	U	A	0.16	U	A
CADMIUM	0.10	U	A	0.33	U	A	0.04	U	A	0.05	U	
CALCIUM	326			574			421			554		
CHROMIUM	8.3	J	G	9.1	J	G	4.0	J	G	7.0	J	G
COBALT	0.34	U	A	0.22	U	A	0.22	U	A	0.34	U	A
COPPER	31.7			12.8			3.3			3.1		
IRON	822			1240			786			1090		
LEAD	53.2			23.3			7.2			8.3		
MAGNESIUM	129			147			139			201		
MANGANESE	3.3			3.4			2.8			3.9		
MERCURY	0.05	U		0.06	U		0.05	U		0.06	U	
NICKEL	3.0			1.3			0.87	U	A	1.8		
POTASSIUM	61.5	U	A	46.1	U	A	55.0	U	A	76.0	U	A
SELENIUM	0.30	U	A	0.28	U		0.26	U		0.28	U	
SILVER	0.12	U	A	0.22	U	A	0.12	U		0.22	U	A
SODIUM	21.4	U	A	39.3	U	A	20.8	U	A	36.8	U	
THALLIUM	0.31	U		0.37	U		0.35	U		0.38	U	A
VANADIUM	4.3			3.7			4.0			5.7		
ZINC	9.4	J	G	20.8			10.9	J	G	6.4	J	G

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4221

SAMPLE NUMBER:	CEF-P40-SS-002			CEF-P40-SS-003			CEF-P40-SS-004			CEF-P40-SS-005		
SAMPLE DATE:	05/28/99			05/28/99			05/28/99			05/28/99		
LABORATORY ID:	F4221-2			F4221-3			F4221-4			F4221-5		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	89.6 %			95.6 %			95.0 %			95.2 %		
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	1720			421			593			6190		
ANTIMONY	0.27	U		0.25	U		0.25	U		0.25	U	
ARSENIC	0.39	U		0.36	U		0.36	U		1.6		
BARIUM	13.1			4.2			4.1			13.7		
BERYLLIUM	0.32	U	A	0.24	U	A	0.24	U	A	0.29	U	A
CADMIUM	0.04	U		0.05	U	A	0.03	U		0.09	U	A
CALCIUM	426			234			258			267		
CHROMIUM	5.1	J	G	1.2	J	G	1.2			6.6	J	G
COBALT	0.19	U	A	0.18	U	A	0.15	U	A	0.37	U	A
COPPER	5.3			4.5			4.1			5.1		
IRON	1130			220			324			6510		
LEAD	23.2			6.3			9.8			9.3		
MAGNESIUM	98.2			58.4			67.7			162		
MANGANESE	5.2			1.4			2.1			3.0		
MERCURY	0.05	U		0.04	U		0.04	U		0.04	U	
NICKEL	2.1			0.56	U	A	0.49	U	A	1.4		
POTASSIUM	68.7			32.4	U	A	31.7	U	A	62.5	U	A
SELENIUM	0.23	U		0.26	U	A	0.21	U		0.45	U	A
SILVER	0.11	U	A	0.18	U	A	0.11	U	A	0.13	U	A
SODIUM	17.1	U		25.8	U	A	16.1	U		16.1	U	
THALLIUM	0.30	U		0.28	U		0.28	U		0.28	U	
VANADIUM	2.0			1.2			1.4			13.6		
ZINC	4.1	J	G	3.7	J	G	4.5	J	G	4.9	J	G

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4221

SAMPLE NUMBER:	CEF-P40-SS-006			CEF-P40-SS-007			CEF-P40-SS-008			CEF-P40-SS-009		
SAMPLE DATE:	05/28/99			05/28/99			05/28/99			05/28/99		
LABORATORY ID:	F4221-6			F4221-7			F4221-8			F4221-9		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	95.9 %			96.0 %			95.5 %			96.9 %		
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	887			1460			2040			3660		
ANTIMONY	0.25	U		0.25	U		0.25	U		0.25	U	
ARSENIC	0.36	U		0.36	U		0.36	U		0.36	U	
BARIUM	6.3			4.6			9.5			6.9		
BERYLLIUM	0.24	U	A	0.30	U	A	0.18	U	A	0.17	U	A
CADMIUM	0.09	U	A	0.10	U	A	0.16	U	A	0.23	U	A
CALCIUM	440			334			657			1900		
CHROMIUM	4.2	J	G	1.9	J	G	2.1	J	G	4.1	J	G
COBALT	0.13	U	A	0.14	U	A	0.26	U	A	0.30	U	A
COPPER	8.6			5.7			3.2			4.5		
IRON	794			794			2360			1020		
LEAD	13.2			6.5			6.5			6.6		
MAGNESIUM	103			89.6			185			145		
MANGANESE	8.0			2.7			14.5			5.5		
MERCURY	0.04	U		0.04	U		0.04	U		0.04	U	
NICKEL	0.65	U	A	0.57	U	A	0.59	U	A	1.2		
POTASSIUM	42.1	U	A	33.3	U	A	43.2	U	A	57.0	U	A
SELENIUM	0.21	U		0.21	U		0.38	U	A	0.33	U	A
SILVER	0.17	U	A	1.8	J	G	49.3	J	G	0.25	U	A
SODIUM	16.0	U		15.9	U		31.1	U	A	36.2	U	A
THALLIUM	0.28	U		0.28	U		0.28	U		0.28	U	
VANADIUM	1.5			2.2			2.6			4.3		
ZINC	6.0	J	G	5.9	J	G	7.0	J	G	10.9	J	G

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4221

SAMPLE NUMBER:	CEF-P40-SS-010			CEF-P40-SS-011			CEF-P40-SS-012			CEF-P40-SS-DU01		
SAMPLE DATE:	05/28/99			05/28/99			05/28/99			05/28/99		
LABORATORY ID:	F4221-10			F4221-11			F4221-12			F4221-15		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	95.3 %			94.4 %			94.1 %			93.8 %		
UNITS:	MG/KG			MG/KG			MG/KG			MG/KG		
FIELD DUPLICATE OF:										CEF-P40-SS-008		
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	1260			2540			2200			2320		
ANTIMONY	0.25	U		0.25	U		0.25	U		0.42	U	A
ARSENIC	0.36	U		0.37	U		0.37	U		0.37	U	
BARIUM	4.2			12.9			8.3			8.5		
BERYLLIUM	0.15	U	A	0.20	U	A	0.14	U	A	0.15	U	A
CADMIUM	0.12	U	A	0.15	U	A	0.23	U	A	0.07	U	A
CALCIUM	353			684			602			749		
CHROMIUM	1.6	J	G	2.6	J	G	2.5	J	G	3.8	J	G
COBALT	0.15	U	A	0.34	U	A	0.18	U	A	0.28	U	A
COPPER	2.6			3.0			7.2			1.9		
IRON	657			5110			978			2640		
LEAD	4.3			4.5			22.6			6.3		
MAGNESIUM	82.9			248			135			199		
MANGANESE	11.3			30.5			8.1			14.7		
MERCURY	0.04	U		0.04	U		0.04	U		0.04	U	
NICKEL	0.54	U	A	0.62	U	A	1.0			1.5		
POTASSIUM	33.4	U	A	41.2	U	A	52.1	U	A	44.1	U	A
SELENIUM	0.21	U		0.50	U	A	0.35	U	A	0.25	U	A
SILVER	0.29	U	A	0.36	U	A	0.23	U	A	0.16	U	A
SODIUM	33.8	U	A	37.0	U	A	39.8	U	A	30.9	U	A
THALLIUM	0.28	U		0.28	U		0.29	U		0.29	U	
VANADIUM	1.7			3.1			2.8			2.8		
ZINC	7.3	J	G	5.5	J	G	11.6	J	G	6.3	J	G

Report of Analysis

Client Sample ID:	CEF-P40-SD-001		
Lab Sample ID:	F4221-1	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
		Percent Solids:	86.7
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Aluminum	3690	23.1	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Antimony	0.28 U	6.9	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Arsenic	0.40 U	1.2	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Barium	13.0 B	23.1	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Beryllium	0.40 B	0.58	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Cadmium	0.1 B	0.46	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Calcium	326 B	577	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Chromium	8.3	1.2	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Cobalt	0.34 B	5.8	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Copper	31.7	2.9	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Iron	822	11.5	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Lead	53.2	11.5	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Magnesium	129 B	577	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Manganese	3.3	1.7	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Mercury	0.05 U	0.19	mg/kg	1	06/03/99	06/04/99	JK	SW846 7471A
Nickel	3.0 B	4.6	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Potassium	61.5 B	577	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Selenium	0.30 B	11.5	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Silver	0.12 B	1.2	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Sodium	21.4 B	577	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Thallium	0.31 U	1.2	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Vanadium	4.3 B	5.8	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Zinc	9.4	2.3	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CEF-P40-SS-002		
Lab Sample ID:	F4221-2	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
		Percent Solids:	89.6
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Aluminum	1720	22.3	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Antimony	0.27 U	6.7	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Arsenic	0.39 U	1.1	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Barium	13.1 B	22.3	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Beryllium	0.32 B	0.56	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Cadmium	0.04 U	0.45	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Calcium	426 B	558	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Chromium	5.1	1.1	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Cobalt	0.19 B	5.6	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Copper	5.3	2.8	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Iron	1130	11.2	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Lead	23.2	11.2	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Magnesium	98.2 B	558	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Manganese	5.2	1.7	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Mercury	0.05 U	0.19	mg/kg	1	06/03/99	06/04/99	JK	SW846 7471A
Nickel	2.1 B	4.5	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Potassium	68.7 B	558	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Selenium	0.23 U	11.2	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Silver	0.11 B	1.1	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Sodium	17.1 U	558	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Thallium	0.30 U	1.1	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Vanadium	2.0 B	5.6	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Zinc	4.1	2.2	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CEF-P40-SS-003		
Lab Sample ID:	F4221-3	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
		Percent Solids:	95.6
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Aluminum	421	20.9	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Antimony	0.25 U	6.3	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Arsenic	0.36 U	1.0	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Barium	4.2 B	20.9	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Beryllium	0.24 B	0.52	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Cadmium	0.05 B	0.42	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Calcium	234 B	523	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Chromium	1.2	1.0	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Cobalt	0.18 B	5.2	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Copper	4.5	2.6	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Iron	220	10.5	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Lead	6.3 B	10.5	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Magnesium	58.4 B	523	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Manganese	1.4 B	1.6	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Mercury	0.04 U	0.17	mg/kg	1	06/03/99	06/04/99	JK	SW846 7471A
Nickel	0.56 B	4.2	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Potassium	32.4 B	523	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Selenium	0.26 B	10.5	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Silver	0.18 B	1.0	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Sodium	25.8 B	523	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Thallium	0.28 U	1.0	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Vanadium	1.2 B	5.2	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Zinc	3.7	2.1	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CEF-P40-SS-004		
Lab Sample ID:	F4221-4	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
		Percent Solids:	95.0
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Aluminum	593	21.1	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Antimony	0.25 U	6.3	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Arsenic	0.36 U	1.1	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Barium	4.1 B	21.1	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Beryllium	0.24 B	0.53	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Cadmium	0.03 U	0.42	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Calcium	258 B	526	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Chromium	1.2	1.1	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Cobalt	0.15 B	5.3	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Copper	4.1	2.6	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Iron	324	10.5	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Lead	9.8 B	10.5	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Magnesium	67.7 B	526	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Manganese	2.1	1.6	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Mercury	0.04 U	0.18	mg/kg	1	06/03/99	06/04/99	JK	SW846 7471A
Nickel	0.49 B	4.2	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Potassium	31.7 B	526	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Selenium	0.21 U	10.5	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Silver	0.11 B	1.1	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Sodium	16.1 U	526	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Thallium	0.28 U	1.1	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Vanadium	1.4 B	5.3	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Zinc	4.5	2.1	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CEF-P40-SS-005		
Lab Sample ID:	F4221-5	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
		Percent Solids:	95.2
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Aluminum	6190	21.0	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Antimony	0.25 U	6.3	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Arsenic	1.6	1.1	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Barium	13.7 B	21.0	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Beryllium	0.29 B	0.53	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Cadmium	0.09 B	0.42	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Calcium	267 B	525	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Chromium	6.6	1.1	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Cobalt	0.37 B	5.3	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Copper	5.1	2.6	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Iron	6510	10.5	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Lead	9.3 B	10.5	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Magnesium	162 B	525	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Manganese	3.0	1.6	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Mercury	0.04 U	0.18	mg/kg	1	06/03/99	06/04/99	JK	SW846 7471A
Nickel	1.4 B	4.2	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Potassium	62.5 B	525	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Selenium	0.45 B	10.5	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Silver	0.13 B	1.1	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Sodium	16.1 U	525	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Thallium	0.28 U	1.1	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Vanadium	13.6	5.3	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Zinc	4.9	2.1	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CEF-P40-SS-006		
Lab Sample ID:	F4221-6	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
		Percent Solids:	95.9
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Aluminum	887	20.9	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Antimony	0.25 U	6.3	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Arsenic	0.36 U	1.0	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Barium	6.3 B	20.9	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Beryllium	0.24 B	0.52	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Cadmium	0.09 B	0.42	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Calcium	440 B	521	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Chromium	4.2	1.0	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Cobalt	0.13 B	5.2	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Copper	8.6	2.6	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Iron	794	10.4	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Lead	13.2	10.4	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Magnesium	103 B	521	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Manganese	8.0	1.6	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Mercury	0.04 U	0.17	mg/kg	1	06/03/99	06/04/99	JK	SW846 7471A
Nickel	0.65 B	4.2	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Potassium	42.1 B	521	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Selenium	0.21 U	10.4	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Silver	0.17 B	1.0	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Sodium	16.0 U	521	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Thallium	0.28 U	1.0	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Vanadium	1.5 B	5.2	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Zinc	6.0	2.1	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CEF-P40-SS-007		
Lab Sample ID:	F4221-7	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
		Percent Solids:	96.0
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Aluminum	1460	20.8	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Antimony	0.25 U	6.2	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Arsenic	0.36 U	1.0	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Barium	4.6 B	20.8	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Beryllium	0.30 B	0.52	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Cadmium	0.1 B	0.42	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Calcium	334 B	521	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Chromium	1.9	1.0	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Cobalt	0.14 B	5.2	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Copper	5.7	2.6	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Iron	794	10.4	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Lead	6.5 B	10.4	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Magnesium	89.6 B	521	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Manganese	2.7	1.6	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Mercury	0.04 U	0.17	mg/kg	1	06/03/99	06/04/99	JK	SW846 7471A
Nickel	0.57 B	4.2	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Potassium	33.3 B	521	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Selenium	0.21 U	10.4	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Silver	1.8	1.0	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Sodium	15.9 U	521	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Thallium	0.28 U	1.0	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Vanadium	2.2 B	5.2	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A
Zinc	5.9	2.1	mg/kg	1	06/03/99	06/04/99	JK	SW846 6010A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CEF-P40-SS-008		
Lab Sample ID:	F4221-8	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
		Percent Solids:	95.5
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Aluminum	2040	20.9	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Antimony	0.25 U	6.3	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Arsenic	0.36 U	1.0	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Barium	9.5 B	20.9	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Beryllium	0.18 B	0.52	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Cadmium	0.16 B	0.42	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Calcium	657	524	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Chromium	2.1	1.0	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Cobalt	0.26 B	5.2	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Copper	3.2	2.6	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Iron	2360	10.5	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Lead	6.5 B	10.5	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Magnesium	185 B	524	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Manganese	14.5	1.6	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Mercury	0.04 U	0.17	mg/kg	1	06/07/99	06/08/99	JK	SW846 7471A
Nickel	0.59 B	4.2	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Potassium	43.2 B	524	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Selenium	0.38 B	10.5	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Silver	49.3	1.0	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Sodium	31.1 B	524	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Thallium	0.28 U	1.0	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Vanadium	2.6 B	5.2	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Zinc	7.0	2.1	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CEF-P40-SS-009		
Lab Sample ID:	F4221-9	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
		Percent Solids:	96.9
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Aluminum	3660	20.6	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Antimony	0.25 U	6.2	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Arsenic	0.36 U	1.0	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Barium	6.9 B	20.6	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Beryllium	0.17 B	0.52	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Cadmium	0.23 B	0.41	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Calcium	1900	516	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Chromium	4.1	1.0	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Cobalt	0.30 B	5.2	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Copper	4.5	2.6	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Iron	1020	10.3	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Lead	6.6 B	10.3	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Magnesium	145 B	516	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Manganese	5.5	1.5	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Mercury	0.04 U	0.17	mg/kg	1	06/07/99	06/08/99	JK	SW846 7471A
Nickel	1.2 B	4.1	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Potassium	57.0 B	516	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Selenium	0.33 B	10.3	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Silver	0.25 B	1.0	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Sodium	36.2 B	516	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Thallium	0.28 U	1.0	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Vanadium	4.3 B	5.2	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Zinc	10.9	2.1	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CEF-P40-SS-010		
Lab Sample ID:	F4221-10	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
		Percent Solids:	95.3
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Aluminum	1260	21.0	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Antimony	0.25 U	6.3	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Arsenic	0.36 U	1.0	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Barium	4.2 B	21.0	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Beryllium	0.15 B	0.52	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Cadmium	0.12 B	0.42	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Calcium	353 B	525	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Chromium	1.6	1.0	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Cobalt	0.15 B	5.2	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Copper	2.6 B	2.6	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Iron	657	10.5	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Lead	4.3 B	10.5	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Magnesium	82.9 B	525	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Manganese	11.3	1.6	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Mercury	0.04 U	0.17	mg/kg	1	06/07/99	06/08/99	JK	SW846 7471A
Nickel	0.54 B	4.2	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Potassium	33.4 B	525	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Selenium	0.21 U	10.5	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Silver	0.29 B	1.0	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Sodium	33.8 B	525	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Thallium	0.28 U	1.0	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Vanadium	1.7 B	5.2	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Zinc	7.3	2.1	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CEF-P40-SS-011		
Lab Sample ID:	F4221-11	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
		Percent Solids:	94.4
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Aluminum	2540	21.2	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Antimony	0.25 U	6.4	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Arsenic	0.37 U	1.1	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Barium	12.9 B	21.2	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Beryllium	0.20 B	0.53	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Cadmium	0.15 B	0.42	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Calcium	684	530	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Chromium	2.6	1.1	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Cobalt	0.34 B	5.3	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Copper	3.0	2.6	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Iron	5110	10.6	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Lead	4.5 B	10.6	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Magnesium	248 B	530	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Manganese	30.5	1.6	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Mercury	0.04 U	0.18	mg/kg	1	06/07/99	06/08/99	JK	SW846 7471A
Nickel	0.62 B	4.2	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Potassium	41.2 B	530	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Selenium	0.50 B	10.6	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Silver	0.36 B	1.1	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Sodium	37.0 B	530	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Thallium	0.28 U	1.1	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Vanadium	3.1 B	5.3	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Zinc	5.5	2.1	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CEF-P40-SS-012		
Lab Sample ID:	F4221-12	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
		Percent Solids:	94.1
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Aluminum	2200	21.3	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Antimony	0.25 U	6.4	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Arsenic	0.37 U	1.1	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Barium	8.3 B	21.3	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Beryllium	0.14 B	0.53	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Cadmium	0.23 B	0.43	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Calcium	602	531	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Chromium	2.5	1.1	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Cobalt	0.18 B	5.3	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Copper	7.2	2.7	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Iron	978	10.6	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Lead	22.6	10.6	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Magnesium	135 B	531	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Manganese	8.1	1.6	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Mercury	0.04 U	0.18	mg/kg	1	06/07/99	06/08/99	JK	SW846 7471A
Nickel	1.0 B	4.3	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Potassium	52.1 B	531	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Selenium	0.35 B	10.6	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Silver	0.23 B	1.1	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Sodium	39.8 B	531	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Thallium	0.29 U	1.1	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Vanadium	2.8 B	5.3	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Zinc	11.6	2.1	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CEF-P40-SD-013		
Lab Sample ID:	F4221-13	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
		Percent Solids:	73.4
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Aluminum	3010	27.2	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Antimony	0.38 B	8.2	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Arsenic	0.47 U	1.4	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Barium	14.8 B	27.2	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Beryllium	0.21 B	0.68	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Cadmium	0.33 B	0.54	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Calcium	574 B	681	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Chromium	9.1	1.4	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Cobalt	0.22 B	6.8	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Copper	12.8	3.4	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Iron	1240	13.6	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Lead	23.3	13.6	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Magnesium	147 B	681	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Manganese	3.4	2.0	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Mercury	0.06 U	0.23	mg/kg	1	06/07/99	06/08/99	JK	SW846 7471A
Nickel	1.3 B	5.4	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Potassium	46.1 B	681	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Selenium	0.28 U	13.6	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Silver	0.22 B	1.4	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Sodium	39.3 B	681	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Thallium	0.37 U	1.4	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Vanadium	3.7 B	6.8	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Zinc	20.8	2.7	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CEF-P40-SD-014		
Lab Sample ID:	F4221-14	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
		Percent Solids:	77.2
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Aluminum	4090	25.9	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Antimony	0.31 U	7.8	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Arsenic	0.45 U	1.3	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Barium	7.5 B	25.9	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Beryllium	0.20 B	0.65	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Cadmium	0.04 B	0.52	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Calcium	421 B	648	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Chromium	4.0	1.3	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Cobalt	0.22 B	6.5	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Copper	3.3	3.2	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Iron	786	13.0	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Lead	7.2 B	13.0	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Magnesium	139 B	648	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Manganese	2.8	1.9	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Mercury	0.05 U	0.22	mg/kg	1	06/07/99	06/08/99	JK	SW846 7471A
Nickel	0.87 B	5.2	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Potassium	55.0 B	648	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Selenium	0.26 U	13.0	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Silver	0.12 U	1.3	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Sodium	20.8 B	648	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Thallium	0.35 U	1.3	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Vanadium	4.0 B	6.5	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Zinc	10.9	2.6	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CEF-P40-SS-DU01		
Lab Sample ID:	F4221-15	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
		Percent Solids:	93.8
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Aluminum	2320	21.3	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Antimony	0.42 B	6.4	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Arsenic	0.37 U	1.1	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Barium	8.5 B	21.3	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Beryllium	0.15 B	0.53	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Cadmium	0.07 B	0.43	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Calcium	749	533	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Chromium	3.8	1.1	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Cobalt	0.28 B	5.3	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Copper	1.9 B	2.7	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Iron	2640	10.7	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Lead	6.3 B	10.7	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Magnesium	199 B	533	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Manganese	14.7	1.6	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Mercury	0.04 U	0.18	mg/kg	1	06/07/99	06/08/99	JK	SW846 7471A
Nickel	1.5 B	4.3	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Potassium	44.1 B	533	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Selenium	0.25 B	10.7	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Silver	0.16 B	1.1	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Sodium	30.9 B	533	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Thallium	0.29 U	1.1	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Vanadium	2.8 B	5.3	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Zinc	6.3	2.1	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CEF-P40-SD-DU02		
Lab Sample ID:	F4221-16	Date Sampled:	05/28/99
Matrix:	SO - Soil	Date Received:	06/01/99
		Percent Solids:	71.7
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Aluminum	6320	27.9	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Antimony	0.38 B	8.4	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Arsenic	0.48 U	1.4	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Barium	11.1 B	27.9	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Beryllium	0.16 B	0.70	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Cadmium	0.05 U	0.56	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Calcium	554 B	697	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Chromium	7.0	1.4	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Cobalt	0.34 B	7.0	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Copper	3.1 B	3.5	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Iron	1090	13.9	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Lead	8.3 B	13.9	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Magnesium	201 B	697	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Manganese	3.9	2.1	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Mercury	0.06 U	0.23	mg/kg	1	06/10/99	06/11/99	JK	SW846 7471A
Nickel	1.8 B	5.6	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Potassium	76.0 B	697	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Selenium	0.28 U	13.9	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Silver	0.22 B	1.4	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Sodium	36.8 B	697	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Thallium	0.38 U	1.4	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Vanadium	5.7 B	7.0	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A
Zinc	6.4	2.8	mg/kg	1	06/07/99	06/08/99	JK	SW846 6010A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CEF-P40-GW-68202		
Lab Sample ID:	F4221-17	Date Sampled:	05/28/99
Matrix:	AQ - Ground Water	Date Received:	06/01/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Aluminum	79500	200	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Antimony	2.4 U	5.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Arsenic	13.6	5.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Barium	1960	200	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Beryllium	18.8	5.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Cadmium	0.67 B	4.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Calcium	40800	5000	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Chromium	80.0	10.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Cobalt	5.3 B	50.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Copper	18.9 B	25.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Iron	66600	100	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Lead	126	3.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Magnesium	19500	5000	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Manganese	111	15.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Mercury	0.44 B	1.0	ug/l	1	06/09/99	06/10/99	JK	SW846 7470A
Nickel	26.0 B	40.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Potassium	2710 B	5000	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Selenium	7.7	5.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Silver	0.96 U	10.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Sodium	7740	5000	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Thallium	2.7 U	5.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Vanadium	429	50.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Zinc	120	20.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CEF-P40-GW-68202		
Lab Sample ID:	F4221-17A	Date Sampled:	05/28/99
Matrix:	AQ - Groundwater Filtered	Date Received:	06/01/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Aluminum	473	200	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Antimony	2.7 B	5.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Arsenic	3.4 U	5.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Barium	38.8 B	200	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Beryllium	1.3 B	5.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Cadmium	0.33 U	4.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Calcium	2870 B	5000	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Chromium	3.9 B	10.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Cobalt	0.80 U	50.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Copper	0.77 B	25.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Iron	4490	100	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Lead	1.6 U	3.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Magnesium	1440 B	5000	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Manganese	9.2 B	15.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Mercury	0.25 U	1.0	ug/l	1	06/09/99	06/10/99	JK	SW846 7470A
Nickel	3.1 B	40.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Potassium	631 B	5000	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Selenium	2.0 U	5.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Silver	1.6 B	10.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Sodium	6740	5000	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Thallium	2.7 U	5.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Vanadium	25.6 B	50.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Zinc	35.8	20.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A

RL = Reporting Limit

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-07-9-119

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

FROM: **TERRI L. SOLOMON** **COPIES:** **DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION – VOLATILE ORGANIC COMPOUNDS, SEMIVOLATILE ORGANIC COMPOUNDS, PESTICIDES, POLYNUCLEAR AROMATIC HYDROCARBONS**
CTO 078 –NAS CECIL FIELD, FLORIDA
SDG – F4240

SAMPLES: 1/Aqueous/

CEF-P40-GW-DU01

Overview

The sample set for CTO 078, Cecil Field, SDG F4240, consists of one (1) aqueous environmental sample.

The sample was analyzed for volatile organic compounds (VOAs), semivolatile organic compounds (SVOAs), pesticides and polynuclear aromatic hydrocarbons (PAHs). The sample was collected by Tetra Tech NUS on June 2, 1999 and analyzed by Accutest Laboratories under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. All analyses were conducted using SW-846 methods 8260B, 8270C, 8081A and 8310. These data were evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
* • Initial and Continuing Calibration Results
* • Laboratory Blank Analyses
* • Surrogate Recoveries
* • Detection Limits

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

Notes

The percent relative standard deviations (%RSDs) for the VOA and pesticide analyses were not included within the data package. The laboratory was contacted and the missing forms were provided.

Several %RSDs and percent differences (%Ds) were outside the quality control limits on one column for the PAH analyses. However, no validation action was warranted as all sample results were nondetects.

Sample CEF-P40-GW-DU01 is a duplicate of sample CEF-P40-GW-68204. However, the original sample was not included within this SDG. Therefore, a comparison of field duplicate precision was not made.

Executive Summary

Laboratory Performance: None.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic 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
Terri L. Solomon
Chemist

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.

APPENDIX A
Qualified Analytical Results

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4240

SAMPLE NUMBER:	CEF-P40-GW-DU01											
SAMPLE DATE:	06/02/99			/ /			/ /			/ /		
LABORATORY ID:	F4240-1											
QC_TYPE:	NORMAL											
% SOLIDS:	0.0 %			100.0 %			100.0 %			100.0 %		
UNITS:	UG/L											
FIELD DUPLICATE OF:	CEF-P40-GW-68204											
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
1,1,1-TRICHLOROETHANE	1	U										
1,1,2,2-TETRACHLOROETHANE	1	U										
1,1,2-TRICHLOROETHANE	1	U										
1,1-DICHLOROETHANE	1	U										
1,1-DICHLOROETHENE	1	U										
1,2-DICHLOROETHANE	1	U										
1,2-DICHLOROPROPANE	1	U										
2-BUTANONE	5	U										
2-HEXANONE	5	U										
4-METHYL-2-PENTANONE	5	U										
ACETONE	5	U										
BENZENE	1	U										
BROMODICHLOROMETHANE	1	U										
BROMOFORM	1	U										
BROMOMETHANE	1	U										
CARBON DISULFIDE	5	U										
CARBON TETRACHLORIDE	1	U										
CHLOROBENZENE	1	U										
CHLOROETHANE	1	U										
CHLOROFORM	1	U										
CHLOROMETHANE	1	U										
CIS-1,2-DICHLOROETHENE	1	U										
CIS-1,3-DICHLOROPROPENE	1	U										
DIBROMOCHLOROMETHANE	1	U										
ETHYLBENZENE	1	U										
METHYLENE CHLORIDE	5	U										
STYRENE	1	U										
TETRACHLOROETHENE	1	U										
TOLUENE	1	U										
TRANS-1,2-DICHLOROETHENE	1	U										
TRANS-1,3-DICHLOROPROPENE	1	U										
TRICHLOROETHENE	1	U										
VINYL CHLORIDE	1	U										

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4240

SAMPLE NUMBER:	CEF-P40-GW-DU01											
SAMPLE DATE:	06/02/99			/ /			/ /			/ /		
LABORATORY ID:	F4240-1											
QC_TYPE:	NORMAL											
% SOLIDS:	0.0 %			100.0 %			100.0 %			100.0 %		
UNITS:	UG/L											
FIELD DUPLICATE OF:	CEF-P40-GW-68204											
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	0.10	U										
4,4'-DDE	0.10	U										
4,4'-DDT	0.10	U										
ALDRIN	0.050	U										
ALPHA-BHC	0.050	U										
ALPHA-CHLORDANE	0.10	U										
BETA-BHC	0.050	U										
DELTA-BHC	0.050	U										
DIELDRIN	0.050	U										
ENDOSULFAN I	0.050	U										
ENDOSULFAN II	0.10	U										
ENDOSULFAN SULFATE	0.10	U										
ENDRIN	0.10	U										
ENDRIN ALDEHYDE	0.10	U										
ENDRIN KETONE	0.10	U										
GAMMA-BHC (LINDANE)	0.050	U										
GAMMA-CHLORDANE	0.10	U										
HEPTACHLOR	0.050	U										
HEPTACHLOR EPOXIDE	0.050	U										
METHOXYCHLOR	0.20	U										
TOXAPHENE	2.5	U										

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4240

SAMPLE NUMBER:	CEF-P40-GW-DU01											
SAMPLE DATE:	06/02/99			/ /			/ /			/ /		
LABORATORY ID:	F4240-1											
QC_TYPE:	NORMAL											
% SOLIDS:	0.0 %			100.0 %			100.0 %			100.0 %		
UNITS:	UG/L											
FIELD DUPLICATE OF:	CEF-P40-GW-68204											
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	1	U										
2-METHYLNAPHTHALENE	1	U										
ACENAPHTHENE	1	U										
ACENAPHTHYLENE	2	U										
ANTHRACENE	0.15	U										
BENZO(A)ANTHRACENE	0.15	U										
BENZO(A)PYRENE	0.15	U										
BENZO(B)FLUORANTHENE	0.2	U										
BENZO(G,H,I)PERYLENE	0.2	U										
BENZO(K)FLUORANTHENE	0.15	U										
CHRYSENE	0.15	U										
DIBENZO(A,H)ANTHRACENE	0.25	U										
FLUORANTHENE	0.2	U										
FLUORENE	0.2	U										
INDENO(1,2,3-CD)PYRENE	0.15	U										
NAPHTHALENE	1	U										
PHENANTHRENE	0.15	U										
PYRENE	0.2	U										

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4240

SAMPLE NUMBER:	CEF-P40-GW-DU01											
SAMPLE DATE:	06/02/99			/ /			/ /			/ /		
LABORATORY ID:	F4240-1											
QC_TYPE:	NORMAL											
% SOLIDS:	0.0 %			100.0 %			100.0 %			100.0 %		
UNITS:	UG/L											
FIELD DUPLICATE OF:	CEF-P40-GW-68204											
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
1,2,4-TRICHLOROBENZENE	5	U										
1,2-DICHLOROBENZENE	5	U										
1,3-DICHLOROBENZENE	5	U										
1,4-DICHLOROBENZENE	5	U										
2,4,5-TRICHLOROPHENOL	4	U										
2,4,6-TRICHLOROPHENOL	5	U										
2,4-DICHLOROPHENOL	4	U										
2,4-DIMETHYLPHENOL	10	U										
2,4-DINITROPHENOL	25	U										
2,4-DINITROTOLUENE	0.2	U										
2,6-DINITROTOLUENE	0.2	U										
2-CHLORONAPHTHALENE	5	U										
2-CHLOROPHENOL	5	U										
2-METHYLNAPHTHALENE	5	U										
2-METHYLPHENOL	5	U										
2-NITROANILINE	5	U										
2-NITROPHENOL	5	U										
3,3'-DICHLOROBENZIDINE	7.5	U										
3-NITROANILINE	5	U										
4,6-DINITRO-2-METHYLPHENOL	25	U										
4-BROMOPHENYL PHENYL ETHER	5	U										
4-CHLORO-3-METHYLPHENOL	10	U										
4-CHLOROANILINE	5	U										
4-CHLOROPHENYL PHENYL ETHER	5	U										
4-METHYLPHENOL	5	U										
4-NITROANILINE	5	U										
4-NITROPHENOL	15	U										
BIS(2-CHLOROETHOXY)METHANE	5	U										
BIS(2-CHLOROETHYL)ETHER	1.5	U										
BIS(2-CHLOROISOPROPYL) ETHER	5	U										
BIS(2-ETHYLHEXYL)PHTHALATE	5	U										
BUTYLBENZYL PHTHALATE	5	U										
CARBAZOLE	4	U										

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4240

SAMPLE NUMBER:	CEF-P40-GW-DU01			
SAMPLE DATE:	06/02/99	/ /	/ /	/ /
LABORATORY ID:	F4240-1			
QC_TYPE:	NORMAL			
% SOLIDS:	0.0 %	100.0 %	100.0 %	100.0 %
UNITS:	UG/L			
FIELD DUPLICATE OF:	CEF-P40-GW-68204			

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
DI-N-OCTYL PHTHALATE	5	U										
DIBENZOFURAN	5	U										
DIETHYL PHTHALATE	5	U										
DIMETHYL PHTHALATE	5	U										
HEXACHLOROBENZENE	1	U										
HEXACHLOROBUTADIENE	5	U										
HEXACHLOROCYCLOPENTADIENE	5	U										
HEXACHLOROETHANE	5	U										
ISOPHORONE	5	U										
N-NITROSO-DI-N-PROPYLAMINE	4	U										
N-NITROSODIPHENYLAMINE	5	U										
NITROBENZENE	4	U										
PENTACHLOROPHENOL	1	U										
PHENOL	5	U										

Report of Analysis

Client Sample ID:	CEF-P40-GW-DU01		
Lab Sample ID:	F4240-1	Date Sampled:	06/02/99
Matrix:	AQ - Ground Water	Date Received:	06/03/99
Method:	SW846 8260B	Percent Solids:	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G0009028.D	1	06/05/99	CJP	n/a	n/a	VG247
Run #2							

VOA TCL List

CAS No.	Compound	Result	RL	Units	Q
67-64-1	Acetone	ND	5.0	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
75-15-0	Carbon disulfide	ND	5.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
591-78-6	2-Hexanone	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	ug/l	
74-83-9	Methyl bromide	ND	1.0	ug/l	
74-87-3	Methyl chloride	ND	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-01-4	Vinyl chloride	ND	1.0	ug/l	
1330-20-7	Xylene (total)	ND	3.0	ug/l	

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

Report of Analysis

Client Sample ID:	CEF-P40-GW-DU01		
Lab Sample ID:	F4240-1	Date Sampled:	06/02/99
Matrix:	AQ - Ground Water	Date Received:	06/03/99
Method:	SW846 8260B	Percent Solids:	n/a
Project:	NAS Cecil Field		

VOA TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	96%		80-116%
17060-07-0	1,2-Dichloroethane-D4	95%		74-120%
2037-26-5	Toluene-D8	98%		80-120%
460-00-4	4-Bromofluorobenzene	100%		86-115%

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

Report of Analysis

Client Sample ID:	CEF-P40-GW-DU01		
Lab Sample ID:	F4240-1	Date Sampled:	06/02/99
Matrix:	AQ - Ground Water	Date Received:	06/03/99
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	L001828.D	1	06/08/99	ME	06/08/99	OP831	SL114
Run #2	H004573.D	1	06/08/99	ME	06/08/99	OP830	SH226

ABN TCL List

CAS No.	Compound	Result	RL	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
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

Report of Analysis

Client Sample ID:	CEF-P40-GW-DU01		
Lab Sample ID:	F4240-1	Date Sampled:	06/02/99
Matrix:	AQ - Ground Water	Date Received:	06/03/99
Method:	SW846 3510C/8270C	Percent Solids:	n/a
Project:	NAS Cecil Field		

ABN TCL List

CAS No.	Compound	Result	RL	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		52%	21-100%
4165-62-2	Phenol-d5		36%	10-94%
118-79-6	2,4,6-Tribromophenol		85%	10-123%
4165-60-0	Nitrobenzene-d5		100%	35-114%
321-60-8	2-Fluorobiphenyl		87%	43-116%
1718-51-0	Terphenyl-d14		102%	33-141%

(a) Result is from Run# 2

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

Report of Analysis

Client Sample ID:	CEF-P40-GW-DU01		
Lab Sample ID:	F4240-1	Date Sampled:	06/02/99
Matrix:	AQ - Ground Water	Date Received:	06/03/99
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	06/30/99	SUB	n/a	n/a	R6896
Run #2							

CAS No.	Compound	Result	RL	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	0.15	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.15	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.15	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.15	ug/l	
218-01-9	Chrysene	ND	0.15	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.25	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	0.15	ug/l	
91-20-3	Naphthalene	ND	1.0	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	ug/l	
85-01-8	Phenanthrene	ND	0.15	ug/l	
129-00-0	Pyrene	ND	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	p-Terphenyl-d14	%		-%

(a) Analyzed By Accutest Southeast Subcontract Lab.

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

Report of Analysis

Client Sample ID:	CEF-P40-GW-DU01		
Lab Sample ID:	F4240-1	Date Sampled:	06/02/99
Matrix:	AQ - Ground Water	Date Received:	06/03/99
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	MN03799.D	1	06/08/99	SKW	06/08/99	OP833	GMN159
Run #2							

Pesticide TCL List

CAS No.	Compound	Result	RL	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	88%		30-160%
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

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-07-9-122

TO:	**M. SPERANZA**	**DATE:**	**JULY 19, 1999**
FROM:	**TERRI L. SOLOMON**	**COPIES:**	**DV FILE**

SUBJECT: **INORGANIC DATA VALIDATION – TAL METALS**
CTO 078 – NAS CECIL FIELD, FLORIDA
SDG – F4240

SAMPLES: 2/Aqueous/

CEF-P40-GW-DU01 CEF-P40-GW-DU01-F

Overview

The sample set for CTO 078, NAS Cecil Field, SDG F4240, consists of two (2) aqueous environmental samples.

Sample CEF-P40-GW-DU01 was analyzed for Target Analyte List (TAL) metals. Sample CEF-P40-GW-DU01-F was analyzed for dissolved TAL metals. The samples were collected by Tetra Tech NUS on June 2, 1999 and analyzed by Accutest Laboratories under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. All metals analyses were conducted using SW-846 method 6010A / 7470A. These data were evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
* • Initial and Continuing Calibration Recoveries
• Laboratory Blank Analyses
* • Detection Limits

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

Laboratory Blank Analyses

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

Analyte	Maximum Concentration	Action Level (aqueous)
aluminum	55.0 ug/L	275 ug/L
antimony	4.0 ug/L	20.0 ug/L
barium	0.50 ug/L	2.5 ug/L
beryllium	1.5 ug/L	7.5 ug/L
cadmium	0.70 ug/L	3.5 ug/L
calcium	40.0 ug/L	200 ug/L
chromium(1)	6.1 ug/L	30.5 ug/L
copper	0.90 ug/L	4.5 ug/L
iron(1)	37.2 ug/L	186 ug/L
lead	2.3 ug/L	11.5 ug/L
magnesium	35.2 ug/L	176 ug/L
manganese(1)	1.6 ug/L	8.0 ug/L
nickel(1)	6.6 ug/L	33.0 ug/L
potassium	96.6 ug/L	483 ug/L
thallium	13.9 ug/L	69.5 ug/L

Samples affected: All

(1) Maximum concentration present in an aqueous preparation blank.

An action level of 5X the maximum concentration has been used to evaluate the sample data for blank contamination. Sample aliquot and dilution factors were taken into consideration when evaluating for blank contamination. Positive results less than the action level for aluminum, beryllium, chromium, copper, manganese, nickel and thallium have been qualified as nondetected "U". No action was taken for the remaining analytes since either the results were either greater than the action level or were nondetects.

Notes

Samples CEF-P40-GW-DU01 and CEF-P40-GW-DU01-F are duplicates to samples CEF-P40-GW-68204 and CEF-P40-GW-68204-F, respectively. However, the original samples were not included within this SDG. Therefore, a comparison of field duplicates was not made.

Executive Summary

Laboratory Performance: Several analytes were 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 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
Terri L. Solomon
Chemist

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%

APPENDIX A
Qualified Analytical Results

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4240

SAMPLE NUMBER:	CEF-P40-GW-DU01			CEF-P40-GW-DU01-F								
SAMPLE DATE:	06/02/99			06/02/99			/ /			/ /		
LABORATORY ID:	F4240-1			F4240-1A								
QC_TYPE:	NORMAL			NORMAL								
% SOLIDS:	0.0 %			0.0 %			100.0 %			100.0 %		
UNITS:	UG/L			UG/L								
FIELD DUPLICATE OF:	CEF-P40-GW-68204			CEF-P40-GW-68204-F								
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	487			33.2	U	A						
ANTIMONY	2.4	U		2.4	U							
ARSENIC	3.4	U		3.4	U							
BARIUM	23.4			23.3								
BERYLLIUM	0.36	U		0.45	U	A						
CADMIUM	0.33	U		0.33	U							
CALCIUM	63500			61400								
CHROMIUM	1.7	U	A	3.7	U	A						
COBALT	0.80	U		0.80	U							
COPPER	1.3	U	A	0.86	U	A						
IRON	317			391								
LEAD	1.6	U		1.6	U							
MAGNESIUM	1440			1460								
MANGANESE	5.5	U	A	5.8	U	A						
MERCURY	0.25	U		0.25	U							
NICKEL	1.1	U	A	1	U							
POTASSIUM	561			550								
SELENIUM	6.4			5.9								
SILVER	0.96	U		0.96	U							
SODIUM	1870			1900								
THALLIUM	7.6	U	A	5.3	U	A						
VANADIUM	7.3			6.7								
ZINC	20.6			24.5								

Report of Analysis

Client Sample ID:	CEF-P40-GW-DU01		
Lab Sample ID:	F4240-1	Date Sampled:	06/02/99
Matrix:	AQ - Ground Water	Date Received:	06/03/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Aluminum	487	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	3.4 U	5.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Barium	23.4 B	200	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Beryllium	0.36 U	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	63500	5000	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Chromium	1.7 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	1.3 B	25.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Iron	317	100	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Lead	1.6 U	3.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Magnesium	1440 B	5000	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Manganese	5.5 B	15.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Mercury	0.25 U	1.0	ug/l	1	06/08/99	06/09/99	JK	SW846 7470A
Nickel	1.1 B	40.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Potassium	561 B	5000	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Selenium	6.4	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	1870 B	5000	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Thallium	7.6	5.0	ug/l	1	06/08/99	06/10/99	JK	SW846 6010A
Vanadium	7.3 B	50.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Zinc	20.6	20.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CEF-P40-GW-DU01		
Lab Sample ID:	F4240-1A	Date Sampled:	06/02/99
Matrix:	AQ - Groundwater Filtered	Date Received:	06/03/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Aluminum	33.2 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	3.4 U	5.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Barium	23.3 B	200	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Beryllium	0.45 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	61400	5000	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Chromium	3.7 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	0.86 B	25.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Iron	391	100	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Lead	1.6 U	3.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Magnesium	1460 B	5000	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Manganese	5.8 B	15.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Mercury	0.25 U	1.0	ug/l	1	06/08/99	06/09/99	JK	SW846 7470A
Nickel	1.0 U	40.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Potassium	550 B	5000	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Selenium	5.9	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	1900 B	5000	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Thallium	5.3	5.0	ug/l	1	06/08/99	06/10/99	JK	SW846 6010A
Vanadium	6.7 B	50.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A
Zinc	24.5	20.0	ug/l	1	06/08/99	06/09/99	JK	SW846 6010A

RL = Reporting Limit

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-07-9-111

TO:	**M. SPERANZA**	**DATE:**	**JULY 15,1999**
FROM:	**TERRI L. SOLOMON**	**COPIES:**	**DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION – VOA / SVOA / PESTICIDES**
CTO 078 –NAS CECIL FIELD, FLORIDA
SDG – F4216

SAMPLES: 3/Aqueous/

CEF-P40-GW-68201 CEF-P40-GW-68203 CEF-P40-GW-68204

Overview

The sample set for CTO 078, Cecil Field, SDG F4216, consists of three (3) aqueous environmental samples. No field duplicate pairs were included within this SDG.

All samples were analyzed for volatile organic compounds (VOAs), semivolatile organic compounds (SVOAs) and pesticides. The samples were collected by Tetra Tech NUS on May 27, 1999 and analyzed by Accutest under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. All analyses were conducted using SW-846 methods 8260B, 8270C and 8081A. These data were evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
* • Initial and Continuing Calibration Results
* • Laboratory Blank Analyses
* • Surrogate Recoveries
* • Detection Limits

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

Notes

Initial calibration %RSDs for the VOA and SVOA analyses were not included within the data package. The laboratory was contacted and the missing information was provided.

The %Ds for delta-BHC and 4,4"-DDT were outside the laboratory control limits on one column. No validation actions were warranted as all sample results reported were nondetects.

Executive Summary

Laboratory Performance: None.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic 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)."

Terri L. Solomon

Tetra Tech NUS
Terri L. Solomon
Chemist

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.

APPENDIX A
Qualified Analytical Results

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4216

SAMPLE NUMBER:	CEF-P40-GW-68201			CEF-P40-GW-68203			CEF-P40-GW-68204					
SAMPLE DATE:	05/27/99			05/27/99			05/27/99			/ /		
LABORATORY ID:	F4216-1			F4216-3			F4216-2					
QC_TYPE:	NORMAL			NORMAL			NORMAL					
% SOLIDS:	0.0 %			0.0 %			0.0 %			100.0 %		
UNITS:	UG/L			UG/L			UG/L					
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
1,1,1-TRICHLOROETHANE	1	U		1	U		1	U				
1,1,2,2-TETRACHLOROETHANE	1	U		1	U		1	U				
1,1,2-TRICHLOROETHANE	1	U		1	U		1	U				
1,1-DICHLOROETHANE	1	U		1	U		1	U				
1,1-DICHLOROETHENE	1	U		1	U		1	U				
1,2-DICHLOROETHANE	1	U		1	U		1	U				
1,2-DICHLOROPROPANE	1	U		1	U		1	U				
2-BUTANONE	5	U		5	U		5	U				
2-HEXANONE	5	U		5	U		5	U				
4-METHYL-2-PENTANONE	5	U		5	U		5	U				
ACETONE	5	U		5	U		5	U				
BENZENE	1	U		1	U		1	U				
BROMODICHLOROMETHANE	1	U		1	U		1	U				
BROMOFORM	1	U		1	U		1	U				
BROMOMETHANE	1	U		1	U		1	U				
CARBON DISULFIDE	5	U		5	U		5	U				
CARBON TETRACHLORIDE	1	U		1	U		1	U				
CHLOROBENZENE	1	U		1	U		1	U				
CHLOROETHANE	1	U		1	U		1	U				
CHLOROFORM	1	U		1	U		1	U				
CHLOROMETHANE	1	U		1	U		1	U				
CIS-1,2-DICHLOROETHENE	1	U		1	U		1	U				
CIS-1,3-DICHLOROPROPENE	1	U		1	U		1	U				
DIBROMOCHLOROMETHANE	1	U		1	U		1	U				
ETHYLBENZENE	1	U		1	U		1	U				
METHYLENE CHLORIDE	5	U		5	U		5	U				
STYRENE	1	U		1	U		1	U				
TETRACHLOROETHENE	1	U		1	U		1	U				
TOLUENE	1	U		1	U		1	U				
TRANS-1,2-DICHLOROETHENE	1	U		1	U		1	U				
TRANS-1,3-DICHLOROPROPENE	1	U		1	U		1	U				
TRICHLOROETHENE	1	U		1	U		1	U				
VINYL CHLORIDE	1	U		1	U		1	U				

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4216

SAMPLE NUMBER:	CEF-P40-GW-68201			CEF-P40-GW-68203			CEF-P40-GW-68204					
SAMPLE DATE:	05/27/99			05/27/99			05/27/99			/ /		
LABORATORY ID:	F4216-1			F4216-3			F4216-2					
QC_TYPE:	NORMAL			NORMAL			NORMAL					
% SOLIDS:	0.0 %			0.0 %			0.0 %			100.0 %		
UNITS:	UG/L			UG/L			UG/L					
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
1,2,4-TRICHLOROBENZENE	5	U		5	U		5	U				
1,2-DICHLOROBENZENE	5	U		5	U		5	U				
1,3-DICHLOROBENZENE	5	U		5	U		5	U				
1,4-DICHLOROBENZENE	5	U		5	U		5	U				
2,4,5-TRICHLOROPHENOL	4	U		4	U		4	U				
2,4,6-TRICHLOROPHENOL	5	U		5	U		5	U				
2,4-DICHLOROPHENOL	4	U		4	U		4	U				
2,4-DIMETHYLPHENOL	10	U		10	U		10	U				
2,4-DINITROPHENOL	25	U		25	U		25	U				
2,4-DINITROTOLUENE	0.2	U		0.2	U		0.2	U				
2,6-DINITROTOLUENE	0.2	U		0.2	U		0.2	U				
2-CHLORONAPHTHALENE	5	U		5	U		5	U				
2-CHLOROPHENOL	5	U		5	U		5	U				
2-METHYLNAPHTHALENE	5	U		5	U		5	U				
2-METHYLPHENOL	5	U		5	U		5	U				
2-NITROANILINE	5	U		5	U		5	U				
2-NITROPHENOL	5	U		5	U		5	U				
3,3'-DICHLOROBENZIDINE	7.5	U		7.5	U		7.5	U				
3-NITROANILINE	5	U		5	U		5	U				
4,6-DINITRO-2-METHYLPHENOL	25	U		25	U		25	U				
4-BROMOPHENYL PHENYL ETHER	5	U		5	U		5	U				
4-CHLORO-3-METHYLPHENOL	10	U		10	U		10	U				
4-CHLOROANILINE	5	U		5	U		5	U				
4-CHLOROPHENYL PHENYL ETHER	5	U		5	U		5	U				
4-METHYLPHENOL	5	U		5	U		5	U				
4-NITROANILINE	5	U		5	U		5	U				
4-NITROPHENOL	15	U		15	U		15	U				
BIS(2-CHLOROETHOXY)METHANE	5	U		5	U		5	U				
BIS(2-CHLOROETHYL)ETHER	1.5	U		1.5	U		1.5	U				
BIS(2-CHLOROISOPROPYL) ETHER	5	U		5	U		5	U				
BIS(2-ETHYLHEXYL)PHTHALATE	5	U		5	U		5	U				
BUTYLBENZYL PHTHALATE	5	U		5	U		5	U				
CARBAZOLE	4	U		4	U		4	U				

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4216

SAMPLE NUMBER:	CEF-P40-GW-68201			CEF-P40-GW-68203			CEF-P40-GW-68204					
SAMPLE DATE:	05/27/99			05/27/99			05/27/99			/ /		
LABORATORY ID:	F4216-1			F4216-3			F4216-2					
QC_TYPE:	NORMAL			NORMAL			NORMAL					
% SOLIDS:	0.0 %			0.0 %			0.0 %			100.0 %		
UNITS:	UG/L			UG/L			UG/L					
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
DI-N-OCTYL PHTHALATE	5	U		5	U		5	U				
DIBENZOFURAN	5	U		5	U		5	U				
DIETHYL PHTHALATE	5	U		5	U		5	U				
DIMETHYL PHTHALATE	5	U		5	U		5	U				
HEXACHLOROBENZENE	1	U		1	U		1	U				
HEXACHLOROBUTADIENE	5	U		5	U		5	U				
HEXACHLOROCYCLOPENTADIENE	5	U		5	U		5	U				
HEXACHLOROETHANE	5	U		5	U		5	U				
ISOPHORONE	5	U		5	U		5	U				
N-NITROSO-DI-N-PROPYLAMINE	4	U		4	U		4	U				
N-NITROSODIPHENYLAMINE	5	U		5	U		5	U				
NITROBENZENE	4	U		4	U		4	U				
PENTACHLOROPHENOL	1	U		1	U		1	U				
PHENOL	5	U		5	U		5	U				

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4216

SAMPLE NUMBER:	CEF-P40-GW-68201			CEF-P40-GW-68203			CEF-P40-GW-68204			/ /		
SAMPLE DATE:	05/27/99			05/27/99			05/27/99					
LABORATORY ID:	F4216-1			F4216-3			F4216-2					
QC_TYPE:	NORMAL			NORMAL			NORMAL					
% SOLIDS:	0.0 %			0.0 %			0.0 %			100.0 %		
UNITS:	UG/L			UG/L			UG/L					
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	0.1	U		0.1	U		0.1	U				
4,4'-DDE	0.1	U		0.1	U		0.1	U				
4,4'-DDT	0.1	U		0.1	U		0.1	U				
ALDRIN	0.05	U		0.05	U		0.05	U				
ALPHA-BHC	0.05	U		0.05	U		0.05	U				
ALPHA-CHLORDANE	0.1	U		0.1	U		0.1	U				
BETA-BHC	0.05	U		0.05	U		0.05	U				
DELTA-BHC	0.05	U		0.05	U		0.05	U				
DIELDRIN	0.05	U		0.05	U		0.05	U				
ENDOSULFAN I	0.05	U		0.05	U		0.05	U				
ENDOSULFAN II	0.1	U		0.1	U		0.1	U				
ENDOSULFAN SULFATE	0.1	U		0.1	U		0.1	U				
ENDRIN	0.1	U		0.1	U		0.1	U				
ENDRIN ALDEHYDE	0.1	U		0.1	U		0.1	U				
ENDRIN KETONE	0.1	U		0.1	U		0.1	U				
GAMMA-BHC (LINDANE)	0.05	U		0.05	U		0.05	U				
GAMMA-CHLORDANE	0.1	U		0.1	U		0.1	U				
HEPTACHLOR	0.05	U		0.05	U		0.05	U				
HEPTACHLOR EPOXIDE	0.05	U		0.05	U		0.05	U				
METHOXYCHLOR	0.2	U		0.2	U		0.2	U				
TOXAPHENE	2.5	U		2.5	U		2.5	U				

Report of Analysis

Client Sample ID:	CEF-P40-GW-68201		
Lab Sample ID:	F4216-1	Date Sampled:	05/27/99
Matrix:	AQ - Ground Water	Date Received:	05/28/99
Method:	SW846 8260B	Percent Solids:	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G0008985.D	1	06/01/99	CJP	n/a	n/a	VG245
Run #2							

VOA TCL List

CAS No.	Compound	Result	RL	Units	Q
67-64-1	Acetone	ND	5.0	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
75-15-0	Carbon disulfide	ND	5.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
591-78-6	2-Hexanone	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	ug/l	
74-83-9	Methyl bromide	ND	1.0	ug/l	
74-87-3	Methyl chloride	ND	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-01-4	Vinyl chloride	ND	1.0	ug/l	
1330-20-7	Xylene (total)	ND	3.0	ug/l	

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

Report of Analysis

Client Sample ID:	CEF-P40-GW-68201		
Lab Sample ID:	F4216-1	Date Sampled:	05/27/99
Matrix:	AQ - Ground Water	Date Received:	05/28/99
Method:	SW846 8260B	Percent Solids:	n/a
Project:	NAS Cecil Field		

VOA TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	95%		80-116%
17060-07-0	1,2-Dichloroethane-D4	94%		74-120%
2037-26-5	Toluene-D8	102%		80-120%
460-00-4	4-Bromofluorobenzene	97%		86-115%

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

Report of Analysis

Client Sample ID:	CEF-P40-GW-68201		
Lab Sample ID:	F4216-1	Date Sampled:	05/27/99
Matrix:	AQ - Ground Water	Date Received:	05/28/99
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	L001821.D	1	06/07/99	ME	06/01/99	OP819	SL113
Run #2	H004565.D	1	06/07/99	ME	06/01/99	OP818	SH225

ABN TCL List

CAS No.	Compound	Result	RL	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
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

Report of Analysis

Client Sample ID:	CEF-P40-GW-68201		
Lab Sample ID:	F4216-1	Date Sampled:	05/27/99
Matrix:	AQ - Ground Water	Date Received:	05/28/99
Method:	SW846 3510C/8270C	Percent Solids:	n/a
Project:	NAS Cecil Field		

ABN TCL List

CAS No.	Compound	Result	RL	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		49%	21-100%
4165-62-2	Phenol-d5		32%	10-94%
118-79-6	2,4,6-Tribromophenol		85%	10-123%
4165-60-0	Nitrobenzene-d5		89%	35-114%
321-60-8	2-Fluorobiphenyl		82%	43-116%
1718-51-0	Terphenyl-d14		103%	33-141%

(a) Result is from Run# 2

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

Report of Analysis

Client Sample ID:	CEF-P40-GW-68201		
Lab Sample ID:	F4216-1	Date Sampled:	05/27/99
Matrix:	AQ - Ground Water	Date Received:	05/28/99
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	MN03747.D	1	06/03/99	SKW	06/02/99	OP821	GMN156
Run #2							

Pesticide TCL List

CAS No.	Compound	Result	RL	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	77%		30-160%
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

Report of Analysis

Client Sample ID:	CEF-P40-GW-68203		
Lab Sample ID:	F4216-3	Date Sampled:	05/27/99
Matrix:	AQ - Ground Water	Date Received:	05/28/99
Method:	SW846 8260B	Percent Solids:	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G0008987.D	1	06/01/99	CJP	n/a	n/a	VG245
Run #2							

VOA TCL List

CAS No.	Compound	Result	RL	Units	Q
67-64-1	Acetone	ND	5.0	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
75-15-0	Carbon disulfide	ND	5.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
591-78-6	2-Hexanone	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	ug/l	
74-83-9	Methyl bromide	ND	1.0	ug/l	
74-87-3	Methyl chloride	ND	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-01-4	Vinyl chloride	ND	1.0	ug/l	
1330-20-7	Xylene (total)	ND	3.0	ug/l	

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

Report of Analysis

Client Sample ID:	CEF-P40-GW-68203		
Lab Sample ID:	F4216-3	Date Sampled:	05/27/99
Matrix:	AQ - Ground Water	Date Received:	05/28/99
Method:	SW846 8260B	Percent Solids:	n/a
Project:	NAS Cecil Field		

VOA TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	95%		80-116%
17060-07-0	1,2-Dichloroethane-D4	96%		74-120%
2037-26-5	Toluene-D8	100%		80-120%
460-00-4	4-Bromofluorobenzene	98%		86-115%

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

Report of Analysis

Client Sample ID:	CEF-P40-GW-68203		
Lab Sample ID:	F4216-3	Date Sampled:	05/27/99
Matrix:	AQ - Ground Water	Date Received:	05/28/99
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	L001823.D	1	06/07/99	ME	06/01/99	OP819	SL113
Run #2	H004567.D	1	06/07/99	ME	06/01/99	OP818	SH225

ABN TCL List

CAS No.	Compound	Result	RL	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
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

Report of Analysis

Client Sample ID:	CEF-P40-GW-68203		
Lab Sample ID:	F4216-3	Date Sampled:	05/27/99
Matrix:	AQ - Ground Water	Date Received:	05/28/99
Method:	SW846 3510C/8270C	Percent Solids:	n/a
Project:	NAS Cecil Field		

ABN TCL List

CAS No.	Compound	Result	RL	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		52%	21-100%
4165-62-2	Phenol-d5		34%	10-94%
118-79-6	2,4,6-Tribromophenol		83%	10-123%
4165-60-0	Nitrobenzene-d5		99%	35-114%
321-60-8	2-Fluorobiphenyl		87%	43-116%
1718-51-0	Terphenyl-d14		100%	33-141%

(a) Result is from Run# 2

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

Report of Analysis

Client Sample ID:	CEF-P40-GW-68203		
Lab Sample ID:	F4216-3	Date Sampled:	05/27/99
Matrix:	AQ - Ground Water	Date Received:	05/28/99
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	MN03749.D	1	06/03/99	SKW	06/02/99	OP821	GMN156
Run #2							

Pesticide TCL List

CAS No.	Compound	Result	RL	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	62%		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

Report of Analysis

Client Sample ID:	CEF-P40-GW-68204		
Lab Sample ID:	F4216-2	Date Sampled:	05/27/99
Matrix:	AQ - Ground Water	Date Received:	05/28/99
Method:	SW846 8260B	Percent Solids:	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G0008986.D	1	06/01/99	CJP	n/a	n/a	VG245
Run #2							

VOA TCL List

CAS No.	Compound	Result	RL	Units	Q
67-64-1	Acetone	ND	5.0	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
75-15-0	Carbon disulfide	ND	5.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
591-78-6	2-Hexanone	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	ug/l	
74-83-9	Methyl bromide	ND	1.0	ug/l	
74-87-3	Methyl chloride	ND	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-01-4	Vinyl chloride	ND	1.0	ug/l	
1330-20-7	Xylene (total)	ND	3.0	ug/l	

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

Report of Analysis

Client Sample ID:	CEF-P40-GW-68204		
Lab Sample ID:	F4216-2	Date Sampled:	05/27/99
Matrix:	AQ - Ground Water	Date Received:	05/28/99
Method:	SW846 8260B	Percent Solids:	n/a
Project:	NAS Cecil Field		

VOA TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	97%		80-116%
17060-07-0	1,2-Dichloroethane-D4	94%		74-120%
2037-26-5	Toluene-D8	102%		80-120%
460-00-4	4-Bromofluorobenzene	98%		86-115%

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

Report of Analysis

Client Sample ID:	CEF-P40-GW-68204		
Lab Sample ID:	F4216-2	Date Sampled:	05/27/99
Matrix:	AQ - Ground Water	Date Received:	05/28/99
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	L001822.D	1	06/07/99	ME	06/01/99	OP819	SL113
Run #2	H004566.D	1	06/07/99	ME	06/01/99	OP818	SH225

ABN TCL List

CAS No.	Compound	Result	RL	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
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

Report of Analysis

Client Sample ID:	CEF-P40-GW-68204		
Lab Sample ID:	F4216-2	Date Sampled:	05/27/99
Matrix:	AQ - Ground Water	Date Received:	05/28/99
Method:	SW846 3510C/8270C	Percent Solids:	n/a
Project:	NAS Cecil Field		

ABN TCL List

CAS No.	Compound	Result	RL	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		29%	10-94%
118-79-6	2,4,6-Tribromophenol		84%	10-123%
4165-60-0	Nitrobenzene-d5		80%	35-114%
321-60-8	2-Fluorobiphenyl		71%	43-116%
1718-51-0	Terphenyl-d14		102%	33-141%

(a) Result is from Run# 2

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

Report of Analysis

Client Sample ID:	CEF-P40-GW-68204		
Lab Sample ID:	F4216-2	Date Sampled:	05/27/99
Matrix:	AQ - Ground Water	Date Received:	05/28/99
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	MN03748.D	1	06/03/99	SKW	06/02/99	OP821	GMN156
Run #2							

Pesticide TCL List

CAS No.	Compound	Result	RL	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	91%		30-160%
2051-24-3	Decachlorobiphenyl	85%		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

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-07-9-130

TO: **MR. M. SPERANZA** **DATE: JULY 26, 1999**

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

SUBJECT: **ORGANIC DATA VALIDATION –PAH**
CTO 078 – NAS CECIL FIELD
SDG F4216

SAMPLES: 3/Aqueous

CEF-P40-GW-68201 CEF-P40-GW-68203
CEF-P40-GW-68204

OVERVIEW

The sample set for CTO 078, SDG F4216, Naval Air Station (NAS) Cecil Field; Florida consists of three (3) aqueous environmental samples. The environmental samples were analyzed for Target Compound List (TCL) Polynuclear Aromatic Hydrocarbon (PAH) organic compounds. No field duplicate pairs were included within this SDG.

The samples were collected by Tetra Tech, NUS on May 27th, 1999 and analyzed by Accutest Laboratories. The PAH samples were analyzed by Accutest Southeast subcontracted Lab. 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 8310 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

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.

PAH FRACTION

All quality control parameters were met for this fraction.

MEMO TO: **MR. M. SPERANZA**
DATE: **JULY 26, 1999 – PAGE 2**

EXECUTIVE SUMMARY

Laboratory performance: None.

Other Factors Affecting Data Quality: None.

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

DATA QUALIFIER DEFINITIONS:

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

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%

APPENDIX A

Qualified Analytical Results

NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4216

SAMPLE NUMBER:	CEF-P40-GW-68201			CEF-P40-GW-68203			CEF-P40-GW-68204			/ /		
SAMPLE DATE:	05/27/99			05/27/99			05/27/99					
LABORATORY ID:	F4216-1			F4216-3			F4216-2					
QC_TYPE:	NORMAL			NORMAL			NORMAL					
% SOLIDS:	100.0 %			100.0 %			100.0 %			100.0 %		
UNITS:	UG/L			UG/L			UG/L					
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	1	U		1	U		1	U				
2-METHYLNAPHTHALENE	1	U		1	U		1	U				
ACENAPHTHENE	1	U		1	U		1	U				
ACENAPHTHYLENE	2	U		2	U		2	U				
ANTHRACENE	0.15	U		0.15	U		0.15	U				
BENZO(A)ANTHRACENE	0.15	U		0.15	U		0.15	U				
BENZO(A)PYRENE	0.15	U		0.15	U		0.15	U				
BENZO(B)FLUORANTHENE	0.15	U		0.15	U		0.15	U				
BENZO(G,H,I)PERYLENE	0.2	U		0.2	U		0.2	U				
BENZO(K)FLUORANTHENE	0.15	U		0.15	U		0.15	U				
CHRYSENE	0.15	U		0.15	U		0.15	U				
DIBENZO(A,H)ANTHRACENE	0.25	U		0.25	U		0.25	U				
FLUORANTHENE	0.2	U		0.2	U		0.2	U				
FLUORENE	0.2	U		0.2	U		0.2	U				
INDENO(1,2,3-CD)PYRENE	0.15	U		0.15	U		0.15	U				
NAPHTHALENE	1	U		1	U		1	U				
PHENANTHRENE	0.15	U		0.15	U		0.15	U				
PYRENE	0.2	U		0.2	U		0.2	U				

Report of Analysis

Client Sample ID:	CEF-P40-GW-68201		
Lab Sample ID:	F4216-1	Date Sampled:	05/27/99
Matrix:	AQ - Ground Water	Date Received:	05/28/99
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	07/08/99	SUB	n/a	n/a	R6899
Run #2							

CAS No.	Compound	Result	RL	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	0.15	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.15	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.15	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.15	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.15	ug/l	
218-01-9	Chrysene	ND	0.15	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.25	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	0.15	ug/l	
91-20-3	Naphthalene	ND	1.0	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	ug/l	
85-01-8	Phenanthrene	ND	0.15	ug/l	
129-00-0	Pyrene	ND	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	p-Terphenyl-d14	%		-%

(a) Analyzed By Accutest Southeast Subcontract Lab.

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

Report of Analysis

Client Sample ID:	CEF-P40-GW-68203		
Lab Sample ID:	F4216-3	Date Sampled:	05/27/99
Matrix:	AQ - Ground Water	Date Received:	05/28/99
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	07/08/99	SUB	n/a	n/a	R6899
Run #2							

CAS No.	Compound	Result	RL	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	0.15	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.15	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.15	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.15	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.15	ug/l	
218-01-9	Chrysene	ND	0.15	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.25	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	0.15	ug/l	
91-20-3	Naphthalene	ND	1.0	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	ug/l	
85-01-8	Phenanthrene	ND	0.15	ug/l	
129-00-0	Pyrene	ND	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	p-Terphenyl-d14	%		-%

(a) Analyzed By Accutest Southeast Subcontract Lab.

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

Report of Analysis

Client Sample ID:	CEF-P40-GW-68204		
Lab Sample ID:	F4216-2	Date Sampled:	05/27/99
Matrix:	AQ - Ground Water	Date Received:	05/28/99
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	07/08/99	SUB	n/a	n/a	R6899
Run #2							

CAS No.	Compound	Result	RL	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	0.15	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.15	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.15	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.15	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.15	ug/l	
218-01-9	Chrysene	ND	0.15	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.25	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	0.15	ug/l	
91-20-3	Naphthalene	ND	1.0	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	ug/l	
85-01-8	Phenanthrene	ND	0.15	ug/l	
129-00-0	Pyrene	ND	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	p-Terphenyl-d14	%		-%

(a) Analyzed By Accutest Southeast Subcontract Lab.

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

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-07-9-104

TO:	**M. SPERANZA**	**DATE:**	**JULY 22, 1999**
FROM:	**JENNIFER MALLE**	**COPIES:**	**DV FILE**
SUBJECT:	**INORGANIC DATA VALIDATION-TAL METALS CTO 078 – NAS CECIL FIELD, FLORIDA SDG – F4216**		

SAMPLES: 6/AQUEOUS/

CEF-P40-GW-68201	CEF-P40-GW-68201-F	CEF-P40-GW-68203
CEF-P40-GW-68203-F	CEF-P40-GW-68204	CEF-P40-GW-68204-F

Overview

The sample set for CTO 078, Cecil Field, SDG F4216, consists of six (6) aqueous environmental samples. No field duplicate pairs were included within this SDG.

The samples were analyzed for Target Analyte List (TAL) metals The samples were collected by Tetra Tech NUS on May 27, 1999 and analyzed by Accutest Laboratory under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. TAL analyses were conducted using SW846 method 6010B.

The data was evaluated based on the following parameters:

- Data Completeness
- * Holding Times
- Initial and Continuing Calibration Recoveries
- Laboratory Blank Analyses
- * 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 (aqueous)
Aluminum	93.0 ug/L	465 ug/L
Antimony	6.4 ug/L	32.0 ug/L
Barium [1]	1.1 ug/L	5.5 ug/L
Beryllium	2.8 ug/L	14.0 ug/L
Cadmium	0.80 ug/L	4.0 ug/L
Calcium [1]	124 ug/L	620.0 ug/L
Chromium	2.1 ug/L	10.5 ug/L
Cobalt	1.2 ug/L	6.0 ug/L
Copper	1.0 ug/L	5.0 ug/L
Iron [1]	57.7 ug/L	288.5 ug/L
Lead	1.7 ug/L	8.5 ug/L
Magnesium	35.8 ug/L	179.0 ug/L
Manganese [1]	1.2 ug/L	6.0 ug/L
Nickel	1.7 ug/L	8.5 ug/L
Potassium	122.0 ug/L	610.0 ug/L
Selenium	2.9 ug/L	14.5 ug/L
Silver	2.2 ug/L	11.0 ug/L
Sodium	229.0 ug/L	1145 ug/L
Thallium [1]	5.9 ug/L	29.5 ug/L
Vanadium	1.0 ug/L	5.0 ug/L
Zinc [1]	7.2 ug/L	36.0 ug/L

Samples affected: All

[1] Maximum concentration present in an aqueous preparation blank

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, cobalt, iron, lead, nickel, potassium, selenium, silver and vanadium have been qualified as a nondetect, "U".

Notes

The Continuing Calibration Verification (CCV) Percent Recovery (%R) for Selenium was > 110% quality control limit. However, no validation action was required since all sample values were nondetected.

The Contract Required Detection Limit (CRDL) Percent Recoveries (%Rs) for antimony, arsenic and thallium were > 120%. No validation action was required.

The data package was incomplete due to missing raw data. The laboratory was contacted and the missing information was provided.

Executive Summary

Laboratory Performance: Several analytes were 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 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.

APPENDIX A

Qualified Analytical Results

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4216

SAMPLE NUMBER:	CEF-P40-GW-68201			CEF-P40-GW-68201-F			CEF-P40-GW-68203			CEF-P40-GW-68203-F		
SAMPLE DATE:	05/27/99			05/27/99			05/27/99			05/27/99		
LABORATORY ID:	F4216-1			F4216-1A			F4216-3			F4216-3A		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	6180			87.2	U	A	421	U	A	40.9	U	A
ANTIMONY	2.4	U		2.4	U		4.5	U	A	2.4	U	
ARSENIC	3.4	U		3.4	U		3.4	U		3.4	U	
BARIUM	73.7			65.9			23.5			22.9		
BERYLLIUM	2.3	U	A	1.3	U	A	1.3	U	A	1.2	U	A
CADMIUM	0.33	U		0.33	U		0.35	U	A	0.33	U	
CALCIUM	13900			14700			63400			62500		
CHROMIUM	6.8	U	A	14.8			3.0	U	A	1.4	U	A
COBALT	1.1	U	A	0.8	U		0.8	U		0.80	U	
COPPER	0.75	U		0.75	U		0.75	U		0.75	U	
IRON	4810			4340			332			251	U	A
LEAD	2.3	U	A	1.6	U		1.6	U		1.6	U	
MAGNESIUM	6650			6940			1390			1380		
MANGANESE	33.3			33.5			6.1			6.0	U	A
MERCURY	0.25	U		0.25	U		0.39			0.25	U	
NICKEL	1.8	U	A	7.4	U	A	2.3	U	A	1.1	U	A
POTASSIUM	1260			1010			586	U	A	527	U	A
SELENIUM	2.0	U		2.0	U		6.5	U	A	5.2	U	A
SILVER	1.6	U	A	1.3	U	A	1.6	U	A	0.96	U	
SODIUM	8170			9210			1890			1790		
THALLIUM	2.7	U		2.7	U		2.7	U		2.7	U	
VANADIUM	6.3			0.91	U	A	7.2			6.1		
ZINC	22.1	U	A	33.2	U	A	32.8	U	A	30	U	A

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4216

SAMPLE NUMBER:	CEF-P40-GW-68204			CEF-P40-GW-68204-F			/ /			/ /		
SAMPLE DATE:	05/27/99			05/27/99								
LABORATORY ID:	F4216-2			F4216-2A								
QC_TYPE:	NORMAL			NORMAL								
% SOLIDS:	0.0 %			0.0 %			100.0 %			100.0 %		
UNITS:	UG/L			UG/L								
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	12400			841								
ANTIMONY	2.4	U		2.4	U							
ARSENIC	3.4	U		3.4	U							
BARIUM	22.9			11.5								
BERYLLIUM	2.3	U	A	1.3	U	A						
CADMIUM	0.33	U		0.33	U							
CALCIUM	2230			2030								
CHROMIUM	10.6			3.2	U	A						
COBALT	1.6	U	A	0.8	U							
COPPER	6.3			0.75	U							
IRON	2820			1150								
LEAD	4.7	U	A	1.6	U							
MAGNESIUM	669			352								
MANGANESE	12.7			9.2								
MERCURY	0.25	U		0.25	U							
NICKEL	3.8	U	A	2.3	U	A						
POTASSIUM	1770			1490								
SELENIUM	2.0	U		2.0	U							
SILVER	156			1.2	U	A						
SODIUM	12100			13700								
THALLIUM	2.7	U		2.7	U							
VANADIUM	14.1			4.6	U	A						
ZINC	59.8			62.5								

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%

Report of Analysis

Client Sample ID:	CEF-P40-GW-68201		
Lab Sample ID:	F4216-1	Date Sampled:	05/27/99
Matrix:	AQ - Ground Water	Date Received:	05/28/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Aluminum	6180	200	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Antimony	2.4 U	5.0	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Arsenic	3.4 U	5.0	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Barium	73.7 B	200	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Beryllium	2.3 B	5.0	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Cadmium	0.33 U	4.0	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Calcium	13900	5000	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Chromium	6.8 B	10.0	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Cobalt	1.1 B	50.0	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Copper	0.75 U	25.0	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Iron	4810	100	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Lead	2.3 B	3.0	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Magnesium	6650	5000	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Manganese	33.3	15.0	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Mercury	0.25 U	1.0	ug/l	1	06/09/99	06/10/99	JK	SW846 7470A
Nickel	1.8 B	40.0	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Potassium	1260 B	5000	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Selenium	2.0 U	5.0	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Silver	1.6 B	10.0	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Sodium	8170	5000	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Thallium	2.7 U	5.0	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Vanadium	6.3 B	50.0	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Zinc	22.1	20.0	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CEF-P40-GW-68201		
Lab Sample ID:	F4216-1A	Date Sampled:	05/27/99
Matrix:	AQ - Groundwater Filtered	Date Received:	05/28/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Aluminum	87.2 B	200	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Antimony	2.4 U	5.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Arsenic	3.4 U	5.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Barium	65.9 B	200	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Beryllium	1.3 B	5.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Cadmium	0.33 U	4.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Calcium	14700	5000	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Chromium	14.8	10.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Cobalt	0.80 U	50.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Copper	0.75 U	25.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Iron	4340	100	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Lead	1.6 U	3.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Magnesium	6940	5000	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Manganese	33.5	15.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Mercury	0.25 U	1.0	ug/l	1	06/09/99	06/10/99	JK	SW846 7470A
Nickel	7.4 B	40.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Potassium	1010 B	5000	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Selenium	2.0 U	5.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Silver	1.3 B	10.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Sodium	9210	5000	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Thallium	2.7 U	5.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Vanadium	0.91 B	50.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Zinc	33.2	20.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CEF-P40-GW-68203		
Lab Sample ID:	F4216-3	Date Sampled:	05/27/99
Matrix:	AQ - Ground Water	Date Received:	05/28/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Aluminum	421	200	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Antimony	4.5 B	5.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Arsenic	3.4 U	5.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Barium	23.5 B	200	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Beryllium	1.3 B	5.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Cadmium	0.35 B	4.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Calcium	63400	5000	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Chromium	3.0 B	10.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Cobalt	0.80 U	50.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Copper	0.75 U	25.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Iron	332	100	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Lead	1.6 U	3.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Magnesium	1390 B	5000	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Manganese	6.1 B	15.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Mercury	0.39 B	1.0	ug/l	1	06/09/99	06/10/99	JK	SW846 7470A
Nickel	2.3 B	40.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Potassium	586 B	5000	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Selenium	6.5	5.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Silver	1.6 B	10.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Sodium	1890 B	5000	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Thallium	2.7 U	5.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Vanadium	7.2 B	50.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Zinc	32.8	20.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CEF-P40-GW-68203		
Lab Sample ID:	F4216-3A	Date Sampled:	05/27/99
Matrix:	AQ - Groundwater Filtered	Date Received:	05/28/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Aluminum	40.9 B	200	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Antimony	2.4 U	5.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Arsenic	3.4 U	5.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Barium	22.9 B	200	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Beryllium	1.2 B	5.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Cadmium	0.33 U	4.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Calcium	62500	5000	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Chromium	1.4 B	10.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Cobalt	0.80 U	50.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Copper	0.75 U	25.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Iron	251	100	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Lead	1.6 U	3.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Magnesium	1380 B	5000	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Manganese	6.0 B	15.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Mercury	0.25 U	1.0	ug/l	1	06/09/99	06/10/99	JK	SW846 7470A
Nickel	1.1 B	40.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Potassium	527 B	5000	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Selenium	5.2	5.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Silver	0.96 U	10.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Sodium	1790 B	5000	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Thallium	2.7 U	5.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Vanadium	6.1 B	50.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Zinc	30.0	20.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CEF-P40-GW-68204		
Lab Sample ID:	F4216-2	Date Sampled:	05/27/99
Matrix:	AQ - Ground Water	Date Received:	05/28/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Aluminum	12400	200	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Antimony	2.4 U	5.0	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Arsenic	3.4 U	5.0	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Barium	22.9 B	200	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Beryllium	2.3 B	5.0	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Cadmium	0.33 U	4.0	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Calcium	2230 B	5000	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Chromium	10.6	10.0	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Cobalt	1.6 B	50.0	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Copper	6.3 B	25.0	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Iron	2820	100	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Lead	4.7	3.0	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Magnesium	669 B	5000	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Manganese	12.7 B	15.0	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Mercury	0.25 U	1.0	ug/l	1	06/09/99	06/10/99	JK	SW846 7470A
Nickel	3.8 B	40.0	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Potassium	1770 B	5000	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Selenium	2.0 U	5.0	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Silver	156	10.0	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Sodium	12100	5000	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Thallium	2.7 U	5.0	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Vanadium	14.1 B	50.0	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A
Zinc	59.8	20.0	ug/l	1	06/04/99	06/04/99	JK	SW846 6010A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CEF-P40-GW-68204		
Lab Sample ID:	F4216-2A	Date Sampled:	05/27/99
Matrix:	AQ - Groundwater Filtered	Date Received:	05/28/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Aluminum	841	200	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Antimony	2.4 U	5.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Arsenic	3.4 U	5.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Barium	11.5 B	200	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Beryllium	1.3 B	5.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Cadmium	0.33 U	4.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Calcium	2030 B	5000	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Chromium	3.2 B	10.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Cobalt	0.80 U	50.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Copper	0.75 U	25.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Iron	1150	100	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Lead	1.6 U	3.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Magnesium	352 B	5000	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Manganese	9.2 B	15.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Mercury	0.25 U	1.0	ug/l	1	06/09/99	06/10/99	JK	SW846 7470A
Nickel	2.3 B	40.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Potassium	1490 B	5000	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Selenium	2.0 U	5.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Silver	1.2 B	10.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Sodium	13700	5000	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Thallium	2.7 U	5.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Vanadium	4.6 B	50.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A
Zinc	62.5	20.0	ug/l	1	06/04/99	06/08/99	JK	SW846 6010A

RL = Reporting Limit

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-09-9-102

TO:	**M. SPERANZA**	**DATE:**	**SEPTEMBER 12, 1999**
FROM:	**GRETCHEN PHIPPS**	**COPIES:**	**DV FILE**

SUBJECT: **INORGANIC DATA VALIDATION – SELECT METALS**
CTO 078 - CECIL FIELD
SDG – F4797 ~~AND F4799~~

SAMPLES: **F4797**

9/Soils/

CEF-P40-SS-101-01	CEF-P40-SS-102-01
CEF-P40-SS-103-01	CEF-P40-SS-104-01
CEF-P40-SS-105-02	CEF-P40-SS-106-02
CEF-P40-SS-107-02	CEF-P40-SS-108-02
CEF-P40-SS-DU03	

~~F4799~~

4/Soils/

~~CEF-A24-SS-101-01~~	CEF-A24-SS-102-01
~~CEF-A24-SS-103-01~~	CEF-A24-SS-DU02

Overview

The sample set for CTO 078, Cecil Field, SDG F4797 and SDG F4799 consists of thirteen (13) soil environmental samples. Two (2) field duplicate pairs (CEF-P40-SS-104-01 / CEF-P40-SS-DU03 and CEF-A24-SS-102-01 / CEF-A24-SS-DU02) were included within this SDG.

All samples in SDG F4797, with exception to samples CEF-P40-SS-106-02, CEF-P40-SS-107-02 and CEF-P40-SS-108-02, were analyzed for silver. Sample CEF-P40-SS-106-02 was analyzed for lead. Sample CEF-P40-SS-107-02 was analyzed for antimony and cadmium. Sample CEF-P40-SS-108-02 was analyzed for chromium and vanadium. All samples in SDG F4799 were analyzed for lead. The samples were collected by Tetra Tech NUS on August 24, 1999 and analyzed by Accutest Laboratory under Naval Facilities Engineering Service Center (NFESC) Quality Assurance / Quality Control (QA / QC) criteria. Metals analyses were analyzed using SW 846 method 6010B..

The data was evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
* • Calibration Verifications

- Laboratory Blank Analyses
- * Field Duplicate Imprecision
- * Detection Limits

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

Laboratory Blank Analyses

The following contaminants were present in a laboratory method / preparation blanks at the following maximum concentration:

Affected samples: SDG F4797

Analyte	Maximum Concentration	Action Level(soil)
Antimony	5.0µg/L	2.5 mg/kg
Cadmium	1.2µg/L	0.6 mg/kg
Lead	2.1µg/L	1.05 mg/kg
Chromium(1)	1.6 mg/kg	8.0 mg/kg
Vanadium	0.95µg/L	0.475 mg/kg

(1) Maximum concentration present in a soil preparation blank.

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 antimony and chromium were qualified, "U", as a result of blank contamination. No action was taken for the remaining analytes as either the results were greater than the blank action level or were nondetected.

Laboratory Blank Analyses

The following contaminants were present in a laboratory method / preparation blanks at the following maximum concentration:

Affected samples: SDG F4799

Analyte	Maximum Concentration	Action Level(soil)
Lead	3.1µg/L	1.55 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. No action was taken as either the results were greater than the blank action level or were nondetected.

Notes

A comparison of the positive results in the field duplicate pairs is included in Appendix C.

Executive Summary

Laboratory Performance: Several analytes were 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

APPENIDX A
QUALIFIED ANALYTICAL RESULTS

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%

SOIL DATA
Accutest, NJ
SDG: F4799

SAMPLE NUMBER:	CEF-A24-SS-101-01			CEF-A24-SS-102-01			CEF-A24-SS-103-01			CEF-A24-SS-DU02		
SAMPLE DATE:	08/24/99			08/24/99			08/24/99			08/24/99		
LABORATORY ID:	F4799-1			F4799-2			F4799-3			F4799-4		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	34.2 %			33.6 %			39.4 %			33.6 %		
UNITS:	MG/KG			MG/KG			MG/KG			MG/KG		
FIELD DUPLICATE OF:										CEF-A24-SS-102-01		
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
LEAD	34.1			29.3			30.2			30.9		

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4797

SAMPLE NUMBER:	CEF-P40-SS-101-01			CEF-P40-SS-102-01			CEF-P40-SS-103-01			CEF-P40-SS-104-01		
SAMPLE DATE:	08/24/99			08/24/99			08/24/99			08/24/99		
LABORATORY ID:	F4797-1			F4797-2			F4797-3			F4797-4		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	81.6 %			84.9 %			83.5 %			89.5 %		
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												
SILVER	0.12	U		0.12			0.11	U		0.11	U	

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4797

SAMPLE NUMBER:	CEF-P40-SS-105-02			CEF-P40-SS-106-02			CEF-P40-SS-107-02			CEF-P40-SS-108-02		
SAMPLE DATE:	08/24/99			08/24/99			08/24/99			08/24/99		
LABORATORY ID:	F4797-5			F4797-6			F4797-7			F4797-8		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	87.6 %			89.4 %			97.1 %			89.5 %		
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												
ANTIMONY							0.57	U	A			
CADMIUM							0.71					
CHROMIUM										3.9	U	A
LEAD				13.5								
SILVER	0.11	U										
VANADIUM										3.1		

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4797

SAMPLE NUMBER:	CEF-P40-SS-DU03											
SAMPLE DATE:	08/24/99			/ /			/ /			/ /		
LABORATORY ID:	F4797-9											
QC_TYPE:	NORMAL											
% SOLIDS:	90.5 %			100.0 %			100.0 %			100.0 %		
UNITS:	MG/KG											
FIELD DUPLICATE OF:	CEF-P40-SS-104-01											
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
SILVER	0.10	U										

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P40-SS-101-01		
Lab Sample ID:	F4797-1	**Date Sampled:**	08/24/99
Matrix:	SO - Soil	**Date Received:**	08/26/99
		Percent Solids:	81.6
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed By		Method
Silver	0.12 U	1.2	mg/kg	1	08/31/99	09/01/99	SJL	SW846 6010A

RDL = Reported Detection Limit

000003

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P40-SS-102-01		
Lab Sample ID:	F4797-2	**Date Sampled:**	08/24/99
Matrix:	SO - Soil	**Date Received:**	08/26/99
		Percent Solids:	84.9
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed	By	Method
Silver	0.12 B	1.2	mg/kg	1	08/31/99	09/01/99	SJL	SW846 6010A

RDL = Reported Detection Limit

000004

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P40-SS-103-01		
Lab Sample ID:	F4797-3	**Date Sampled:**	08/24/99
Matrix:	SO - Soil	**Date Received:**	08/26/99
		Percent Solids:	83.5
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed By		Method
Silver	0.11 U	1.2	mg/kg	1	08/31/99	09/01/99	SJL	SW846 6010A

RDL = Reported Detection Limit

000005

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P40-SS-104-01		
Lab Sample ID:	F4797-4	**Date Sampled:**	08/24/99
Matrix:	SO - Soil	**Date Received:**	08/26/99
		Percent Solids:	89.5
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed By		Method
Silver	0.11 U	1.1	mg/kg	1	08/31/99	09/01/99	SJL	SW846 6010A

RDL = Reported Detection Limit

000006

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P40-SS-105-02		
Lab Sample ID:	F4797-5	**Date Sampled:**	08/24/99
Matrix:	SO - Soil	**Date Received:**	08/26/99
		Percent Solids:	87.6
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed By		Method
Silver	0.11 U	1.1	mg/kg	1	08/31/99	09/01/99	SJL	SW846 6010A

RDL = Reported Detection Limit

000007

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P40-SS-106-02		
Lab Sample ID:	F4797-6	**Date Sampled:**	08/24/99
Matrix:	SO - Soil	**Date Received:**	08/26/99
		Percent Solids:	89.4
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed By		Method
Lead	13.5	11.2	mg/kg	1	08/28/99	08/30/99	JK	SW846 6010A

RDL = Reported Detection Limit

000008

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P40-SS-107-02		
Lab Sample ID:	F4797-7	**Date Sampled:**	08/24/99
Matrix:	SO - Soil	**Date Received:**	08/26/99
		Percent Solids:	97.1
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed	By	Method
Antimony	0.57 B	6.2	mg/kg	1	08/28/99	08/30/99	JK	SW846 6010A
Cadmium	0.71	0.41	mg/kg	1	08/28/99	08/30/99	JK	SW846 6010A

RDL = Reported Detection Limit

000009

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P40-SS-108-02'		
Lab Sample ID:	F4797-8	**Date Sampled:**	08/24/99
Matrix:	SO - Soil	**Date Received:**	08/26/99
		Percent Solids:	89.5
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed	By	Method
Chromium	3.9	1.0	mg/kg	1	08/31/99	09/01/99	SJL	SW846 6010A
Vanadium	3.1 B	5.2	mg/kg	1	08/31/99	09/01/99	SJL	SW846 6010A

RDL = Reported Detection Limit

000010

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-P40-SS-DU03		
Lab Sample ID:	F4797-9	**Date Sampled:**	08/24/99
Matrix:	SO - Soil	**Date Received:**	08/26/99
		Percent Solids:	90.5
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed By		Method
Silver	0.10 U	1.1	mg/kg	1	08/31/99	09/01/99	SJL	SW846 6010A

RDL = Reported Detection Limit

000011

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-11-9-001

TO: **M. SPERANZA** **DATE:** **NOVEMBER 23, 1999**

FROM: **JENNIFER M. MALLE** **COPIES:** **DV FILE**

SUBJECT: **INORGANIC DATA VALIDATION –BARIUM, CHROMIUM, LEAD AND VANADIUM**
CTO-078 NAS CECIL FIELD
SDG- F5073

SAMPLES: 3/Soil/

CEF-P40-SS-201-01 CEF-P40-SS-202-01 CEF-P40-SS-DU04

Overview

The sample set for CTO 078, NAS Cecil Field, SDG F5073, consists of three (3) soil environmental samples. One field duplicate pair (CEF-P40-SS-201-01/ CEF-P40-SS-DU04) was included within this SDG.

The samples were analyzed for selected metals consisting of barium, chromium, lead and vanadium. The samples were collected by Tetra Tech NUS on October 12, 1999 and analyzed by Accutest Laboratories in accordance with Naval Facilities Engineering Service Center (NFESC) Navy Installation Restoration Laboratory Quality Assurance Guide, (February 1996). Metal analyses were conducted using SW846 method 6010B series.

All metals analyses were conducted using Inductively Coupled Plasma (ICP) methodologies.

The data was evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
  • Laboratory Blank Analyses
* • Calibration Verification
  • Field Duplicate Precision
* • Detection Limits

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

Laboratory Blank Analyses

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

Affected samples: All

Analyte	Maximum Concentration	Action Level (soil)
Barium	1.4 ug/L	0.7 mg/kg
Chromium	1.2 ug/L	0.6 mg/kg
Lead	4.6 ug/L	2.3 mg/kg
Vanadium	1.4 ug/L	0.7 mg/kg

An action level of 5X the maximum concentration was used to evaluate the sample data for blank contamination. Sample aliquot, percent solids and dilution factors were taken into consideration in evaluation for blank contamination. No validation action was required for any of the analytes, as the results reported were all greater than the action level.

Field Duplicate Precision

Field duplicate imprecision greater than the 50% quality control limits was noted for lead. Positive results reported for lead were qualified as estimated, "J".

Executive Summary

Laboratory Performance: Barium, chromium, lead and vanadium were present in the laboratory/preparation method blanks.

Other Factors Affecting Data Quality: Lead was qualified as estimated for field duplicate imprecision.

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 M. 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

APPENDIX A

Qualified Analytical Results

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F5073

SAMPLE NUMBER:	CEF-P40-SS-201-01	CEF-P40-SS-202-01	CEF-P40-SS-DU04	
SAMPLE DATE:	10/12/99	10/12/99	10/12/99	/ /
LABORATORY ID:	F5073-1	F5073-2	F5073-3	
QC_TYPE:	NORMAL	NORMAL	NORMAL	
% SOLIDS:	89.2 %	90.6 %	90.5 %	100.0 %
UNITS:	MG/KG	MG/KG	MG/KG	
FIELD DUPLICATE OF:			CEF-P40-SS-201-01	

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
BARIUM	6.6			3.0			7.2					
CHROMIUM	2.4			1.8			2.6					
LEAD	4.3	J	G	7.2	J	G	13.9	J	G			
VANADIUM	3.5			2.9			4.5					

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%

Report of Analysis

Client Sample ID:	CEF-P40-SS-201-01		
Lab Sample ID:	F5073-1	**Date Sampled:**	10/12/99
Matrix:	SO - Soil	**Date Received:**	10/14/99
		Percent Solids:	89.2
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Barium	6.6 B	21.8	mg/kg	1	10/15/99	10/18/99	JK	SW846 6010A
Chromium	2.4	1.1	mg/kg	1	10/15/99	10/18/99	JK	SW846 6010A
Lead	4.3 B	10.9	mg/kg	1	10/15/99	10/18/99	JK	SW846 6010A
Vanadium	3.5 B	5.4	mg/kg	1	10/15/99	10/18/99	JK	SW846 6010A

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CEF-P40-SS-202-01		
Lab Sample ID:	F5073-2	**Date Sampled:**	10/12/99
Matrix:	SO - Soil	**Date Received:**	10/14/99
		Percent Solids:	90.6
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Barium	3.0 B	20.4	mg/kg	1	10/15/99	10/18/99	JK	SW846 6010A
Chromium	1.8	1.0	mg/kg	1	10/15/99	10/18/99	JK	SW846 6010A
Lead	7.2 B	10.2	mg/kg	1	10/15/99	10/18/99	JK	SW846 6010A
Vanadium	2.9 B	5.1	mg/kg	1	10/15/99	10/18/99	JK	SW846 6010A

00010

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CEF-P40-SS-DU04		
Lab Sample ID:	F5073-3	**Date Sampled:**	10/12/99
Matrix:	SO - Soil	**Date Received:**	10/14/99
		Percent Solids:	90.5
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By		Method
Barium	7.2 B	22.1	mg/kg	1	10/15/99	10/18/99	JK	SW846 6010A
Chromium	2.6	1.1	mg/kg	1	10/15/99	10/18/99	JK	SW846 6010A
Lead	13.9	11.0	mg/kg	1	10/15/99	10/18/99	JK	SW846 6010A
Vanadium	4.5 B	5.5	mg/kg	1	10/15/99	10/18/99	JK	SW846 6010A

RL = Reporting Limit

Tetra Tech NUS

INTERNAL CORRESPONDENCE

TO:	**M. SPERANZA**	**DATE:**	**JANAUARY 16, 2001**
FROM:	**GRETCHEN PHIPPS**	**COPIES:**	**DV FILE**

SUBJECT: **INORGANIC DATA VALIDATION – METALS**
CTO 078 - NAS CECIL FIELD
SDG – F8303

SAMPLES: 2/Aqueous/

CEF-P40-GW-01S-01 CEF-P40-GF-01S-01

Overview

The sample set for CTO 078, Cecil Field, SDG F7265 consists of two (2) aqueous environmental samples.

The samples were analyzed for aluminum, beryllium, iron, lead and vanadium. The samples were collected by Tetra Tech NUS on December 5, 2000 and analyzed by Accutest Laboratory under Naval Facilities Engineering Service Center (NFESC) Quality Assurance / Quality Control (QA / QC) criteria. Metals analyses were conducted using SW 846 method 6010B.

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.

Laboratory Blank Analyses

The following contaminants were detected in the laboratory blanks at the following maximum concentration:

Analyte	Maximum Concentration	Action Level
Beryllium	0.88 µg/L	4.4 µg/L
Iron[1]	128 µg/L	640 µg/L
Lead	1.7 µg/L	8.5 µg/L

[1] Maximum concentration present in an aqueous preparation blank.

An action level of 5X the maximum concentration was used to established to evaluate for blank contamination. Sample aliquot and dilution factors were taken into consideration when evaluating for blank contamination. Positive results less than the blank action level for beryllium were qualified, "U", as a result of blank contamination.

Notes

The Form 1s were incorrectly reported to the laboratory reporting limit. The laboratory was notified and resubmitted corrected Form 1s reported to the Instrument Detection Limits (IDLs).

Executive Summary

Laboratory Performance: Beryllium, iron and lead were present in laboratory 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 entitled "Navy IRCDQM." (September 1999).

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

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

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

APPENDIX A
QUALIFIED ANALYTICAL RESULTS

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
WATER DATA
Accutest, NJ
SDG: F8303

SAMPLE NUMBER:	CEF-P40-GF-01S-01			CEF-P40-GW-01S-01								
SAMPLE DATE:	12/05/00			12/05/00			/ /			/ /		
LABORATORY ID:	F8303-2			F8303-1								
QC_TYPE:	NORMAL			NORMAL								
% SOLIDS:	0.0 %			0.0 %			100.0 %			100.0 %		
UNITS:	UG/L			UG/L								
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	142			830								
BERYLLIUM	0.43	U	A	0.49	U	A						
IRON	8840			7650								
LEAD	1.2	U		1.2	U							
VANADIUM	0.98			1.5								

Report of Analysis

Client Sample ID:	CEF-P40-GW-01S-01		
Lab Sample ID:	F8303-1	Date Sampled:	12/05/00
Matrix:	AQ - Ground Water	Date Received:	12/06/00
		Percent Solids:	n/a
Project:	NAS Cecil Field 0039		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Aluminum	830	200	ug/l	1	12/08/00	12/12/00	JK	SW846 6010B
Beryllium	< 5.0	5.0	ug/l	1	12/08/00	12/12/00	JK	SW846 6010B
Iron	7650	300	ug/l	1	12/08/00	12/12/00	JK	SW846 6010B
Lead	< 5.0	5.0	ug/l	1	12/08/00	12/12/00	JK	SW846 6010B
Vanadium	< 50	50	ug/l	1	12/08/00	12/12/00	JK	SW846 6010B

RL = Reporting Limit

Report of Analysis

Client Sample ID:	CEF-P40-GF-01S-01		
Lab Sample ID:	F8303-2	Date Sampled:	12/05/00
Matrix:	AQ - Ground Water	Date Received:	12/06/00
		Percent Solids:	n/a
Project:	NAS Cecil Field 0039		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method
Aluminum	< 200	200	ug/l	1	12/08/00	12/12/00	JK	SW846 6010B
Beryllium	< 5.0	5.0	ug/l	1	12/08/00	12/12/00	JK	SW846 6010B
Iron	8840	300	ug/l	1	12/08/00	12/12/00	JK	SW846 6010B
Lead	< 5.0	5.0	ug/l	1	12/08/00	12/12/00	JK	SW846 6010B
Vanadium	< 50	50	ug/l	1	12/08/00	12/12/00	JK	SW846 6010B

RL = Reporting Limit

APPENDIX B

FOOD CHAIN MODELING

APPENDIX B
FOOD CHAIN MODELING

Contaminant exposure via the food chain was modeled to investigate potential risks to representative receptors. 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 usually not available, toxicity data from laboratory species were extrapolated to receptor species. The TRVs were preferentially obtained from ORNL wildlife toxicity data (Sample et al., 1996), and are presented in Tables B-1 and B-2.

Following discussions with Region 4 EPA, VOCs were not included in food chain modeling, since analytes with log K_{ow} values less than 3.5 (VOCs) generally do not accumulate in animal tissue (Suter, 1993).

Representative Receptors

Representative ecological receptors used in the food chain model for PSC 40 consisted of the raccoon (*Procyon lotor*), belted kingfisher (*Ceryle alcyon*), and bullfrog (*Rana catesbeiana*), all of which are found at NAS Cecil Field and could forage at PSC 40. Information regarding these representative receptors is presented below and in Table B-3.

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 (EPA, 1993). 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 (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 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. 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. Breeding populations in Florida are non-migratory. Territory size is variable but usually ranges from 0.4 to 2.2 km of shoreline (EPA, 1993).

Bullfrog (*Rana catesbeiana*)

The bullfrog was selected as a representative amphibian. It is common in Florida and the eastern United States. The bullfrog is an indiscriminate and aggressive predator, feeding on crayfish, insects, small fish, snails, and occasionally small birds, small mammals, and young snakes (EPA, 1993). Frogs are also quite sensitive to contaminants and thus, provide a conservative measure of potential risks.

Exposure Estimate And Risk Calculation

Chemicals whose maximum concentrations did not exceed ecological screening values (ESVs) were dropped from further consideration, while those that equaled or exceeded ESVs were retained as ecological chemicals of potential concern (COPCs). The following equation was then used to estimate contaminant intake from ingestion for representative wildlife species:

$$\text{PD ingestion} = [(C_{sediment} * FI * SA * F) + (C_{water} * W * FI) + (C_{food} * F * FA * FI)]/WR$$

where: PD = predicted dose from the ingestion food items and the incidental ingestion of sediment (mg/kg/day)

$C_{sediment}$ = concentration in sediment (mg/kg)

FI = fractional intake (portion of home range that overlaps affected area; assumed to be 100%)

SA = portion of diet consisting of sediment

F = food consumed (kg/day)

C_{water} = concentration in water (mg/L)

W = water consumed (L/day)

FA = portion of diet consisting of prey

C_{food} = contaminant concentration in food (mg/kg)

WR = weight of receptor (kg)

Exposure parameters (e.g., body weight, ingestion rate) for the representative receptors are shown in Table B-3. Most exposure parameters were obtained from the *Wildlife Exposure Factors Handbook: Volumes I and II* (EPA, 1993). Wet weight food ingestion rates shown in Table B-3 were calculated as follows:

- raccoon: 856 grams of food/gram body weight/day (g/g bw/day) calculated using mammal equation for food ingestion (g/day): $0.235 \times bw^{0.822}$ (U.S. EPA, 1993); converted to wet weight assuming 75 percent water content in food items (aquatic organisms)

- kingfisher: 0.5 g/g/bw/day (U.S. EPA, 1993)

- bullfrog: 0.04 g/g bw/day (U.S. EPA, 1993)

Contaminant concentrations in food items of the raccoon, kingfisher, and bullfrog (C_{food} in the equation shown above) were calculated using sediment concentrations and biota sediment accumulation factors (BSAFs) (Table B-4). The BSAFs were preferentially obtained from *The Incidence and Severity of Sediment Contamination in Surface Waters of the United States* (EPA, 1997). If BSAFs were not available from EPA (1997), values were obtained from ERED (1998). Values of 1.0 were assumed where BSAFs were not available from either of these two sources.

The following equation (EPA, 1997) was used to estimate tissue concentrations (i.e., the theoretical bioaccumulation potential) of organic compounds in food items of the raccoon, kingfisher, and bullfrog:

$$TBP = BSAF(C_s/f_{oc})f_l$$

Where TBP = theoretical bioaccumulation potential (mg/kg)

C_s = chemical concentration in sediment (mg/kg)

BSAF = biota-sediment accumulation factor (ratio of the concentration of a chemical in tissue, normalized to lipid, to the concentration of the chemical in surface sediment, normalized to organic carbon)

f_{oc} = total organic carbon (TOC) content of sediment expressed as a decimal fraction

f_l = organism lipid content expressed as a decimal fraction

Site-specific TOC data were not available, so a value of 1 percent was assumed for the formula above (i.e, $f_{oc} = 0.01$). Site-specific tissue data were not available, so lipid values in food items of the raccoon, kingfisher, and bullfrog were assumed as follows. A lipid value of 1.3 percent was

used for food items of the kingfisher, and was based on largemouth bass (*Micropterus salmoides*) (Sullivan and Otwell, 1992). This was the highest value from among three fish species [largemouth bass, bluegill (*Lepomis macrochirus*), and pumpkinseed (*Lepomis macrochirus*)] that are known to occur in creeks at NAS Cecil Field. Although adult largemouth bass would be too large to be preyed upon by the kingfisher, minnows and juvenile bass could be prey items. A lipid value of 2.2 percent was used for food items of the raccoon and bullfrog. This was the highest value available from among 12 crustacean species (Sullivan and Otwell, 1992). Since BSAFs do not exist for inorganic compounds, concentrations of inorganic compounds (i.e., metals) in food items of the raccoon, kingfisher, and bullfrog were assumed to be equal to sediment concentrations. This is a conservative assumption since accumulation transfer through the food chain does not occur for most metals.

Hazard quotients (HQs) are presented for each PAH compound that was a COPC at PSC 40 (Tables B-5 through B-7) and are defined as the ratio of the modeled dose to the TRV.

TABLE B-1

TOXICITY REFERENCE VALUES (TRVs) FOR THE RACCOON
PSC 40
NAS CECIL FIELD
JACKSONVILLE, FLORIDA

Chemical	Test Species	Endpoint	NOAEL Derived TRV (mg/kg/day)	LOAEL Derived TRV (mg/kg/day)	NOAEL Source	LOAEL Source
Semivolatile Organic Compounds						
2-Methylnaphthalene [a]	Mouse	Reproduction	1	10	Sample et al., 1996	Sample et al., 1996
Chrysene [a]	Mouse	Reproduction	1	10	Sample et al., 1996	Sample et al., 1996
Naphthalene	Mouse	Tumors	1.3	2.6	ERT, 1997	ERT, 1997
Pesticides						
Aldrin	Rat	Reproduction	0.2	1.0	Sample et al., 1996	Sample et al., 1996
Dieldrin	Rat	Reproduction	0.02	0.2	Sample et al., 1996	Sample et al., 1996
Endosulfan II [b]	Rat	Reproduction	0.15	1.5	Sample et al., 1996	NOAEL * 10
Endrin aldehyde [c]	Mouse	Reproduction	0.092	0.92	Sample et al., 1996	Sample et al., 1996
Metals						
Copper	Mink	Reproduction	11.7	15.14	Sample et al., 1996	Sample et al., 1996
Lead	Rat	Reproduction	8.0	80	Sample et al., 1996	Sample et al., 1996

a = Benzo(a)pyrene value used as a surrogate.
b = Endosulfan value used as a surrogate.
c = Endrin value used as a surrogate.

TABLE B-2

TOXICITY REFERENCE VALUES (TRVs) FOR THE KINGFISHER AND BULLFROG NAS CECIL FIELD JACKSONVILLE, FLORIDA

Chemical	Test Species	Endpoint	NOAEL Derived TRV (mg/kg/day)	LOAEL Derived TRV (mg/kg/day)	NOAEL Source	LOAEL Source
SEMIVOLATILE ORGANIC COMPOUNDS						
2-Methylnaphthalene[a]	European starling	Immune dysfunction	10	100	Trust et al., 1994	Trust et al., 1994
	Bullfrog	Not provided[b]	0.3	3.0	ERT, 1997	NOAEL * 10
Chrysene[a]	European starling	Immune dysfunction	10	100	Trust et al., 1994	Trust et al., 1994
	Bullfrog	Not provided[b]	0.3	3.0	ERT, 1997	NOAEL * 10
Naphthalene[a]	European starling	Immune dysfunction	10	100	Trust et al., 1994	Trust et al., 1994
	Bullfrog	Not provided[b]	0.3	3.0	ERT, 1997	NOAEL * 10
PESTICIDES/PCBs						
Aldrin	NA					
Dieldrin	Barn owl	Reproduction	0.077	0.77	Sample et al., 1996	NOAEL * 10
Endosulfan II [c]	Partridge	Reproduction	10	100	Sample et al., 1996	NOAEL * 10
Endrin aldehyde [d]	Screech owl	Reproduction	0.01	0.1	Sample et al., 1996	Sample et al., 1996
METALS						
Copper	Chicken	Growth	47	61.7	Sample et al., 1996	Sample et al., 1996
Lead	Japanese quail	Reproduction	1.13	11.3	Sample et al., 1996	Sample et al., 1996

NA = Not Available.

a. 7,12-dimethylbenz(a)anthracene value used as a surrogate.

b. Test end point not provided by ERT (1997).

c. Endosulfan value used as a surrogate.

d. Endrin value used as a surrogate.

TABLE B-3

EXPOSURE PARAMETERS FOR REPRESENTATIVE ECOLOGICAL RECEPTORS
PSC 40
NAS CECIL FIELD
JACKSONVILLE, FLORIA

Receptor	Representative Group	Body Weight[1] (grams)	Water Ingestion[1] (grams/day)	Food Ingestion[1,2] (grams/day)	Assumed Diet for Exposure Assessment[1]	Home Range[1] (acres)
Raccoon (*Procyon lotor*)	Omnivorous Mammal	3990	344	856	90.6% aquatic invertebrates 9.4% sediment	96 to 160
Belted kingfisher (*Ceryle alcyon*)	Piscivorous Bird	136	15	68	100% fish soil, sdiment: none[3]	0.4 to 2.2 km[4]
Bullfrog (*Rana catesbeiana*)	Amphibian	249[5]	none	9.96	94.1% aquatic invertebrates 5.9% sediment[6]	23 square meters

Note: Although water ingestion rates are shown above, PAH compounds were not detected in surface water at PSC 40. Thus, surface water was not incorporated into the doses for representatives at PSC 40.

1 Exposure parameters are from EPA (1993).

2 Food ingestion includes intended food items and incidentally ingested sediment. For example, a raccoon would be expected to consume 776 g invertebrates plus 80 g sediment per day.

3 Sample and Suter (1994).

4 Kilometers of shoreline (home range acreage not available).

5 Based on body weights in an Arkansas population.

6 Based on Eastern painted turtle (sediment ingestion not available for bullfrog).

TABLE B-4

BIOTA SEDIMENT ACCUMULATION FACTORS
PSC 40
NAS CECIL FIELD, JACKSONVILLE, FLORIDA

Chemical	BSAF	Source
2-Methylnapthalene	1.0	*
Chrysene	0.29	Hansen, 1995
Naphthalene	0.29	Hansen, 1995
Aldrin	1.8	Hansen, 1995
Dieldrin	1.8	Hansen, 1995
Endosulfan II	1.8	Hansen, 1995
Endrin Aldehyde [a]	1.8	Hansen, 1995

* BSAF was unavailable; 1.0 was assumed.
a Endrin value used as a surrogate.

TABLE B-5

Bullfrog

Body Weight	0.2490000 kg	
Food Ingestion Rate	0.0099600 kg/day	94.1% prey
Water Ingestion Rate	0.0000000 kg/day	
Sediment Ingestion Rate	0.0099600 kg/day	5.9% sediment

Maximum Concentrations

Chemical	Sediment Concentration (mg/kg)	Water Concentration (mg/L)	Crustacean Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	LOAEL (mg/kg/day)	NOAEL HQ	LOAEL HQ
Semivolatile Organic Compounds								
2-METHYLNAPHTHALENE	0.415	0	0.913	0.035345	0.3	3	1.18E-01	1.18E-02
CHRYSENE	4.001525	0	2.55297295	0.105538	0.3	3	3.52E-01	3.52E-02
NAPHTHALENE	0.355	0	0.22649	0.009363	0.3	3	3.12E-02	3.12E-03
Pesticides/PCBs (mg/kg)								
ALDRIN	0.000152	0	0.00060192	2.3E-05	0	0	NA	NA
DIELDRIN	0.00006	0	0.0002376	9.08E-06	0	0	NA	NA
ENDOSULFAN II	0.000215	0	0.0008514	3.26E-05	0	0	NA	NA
ENDRIN ALDEHYDE	0.00011	0	0.0004356	1.67E-05	0	0	NA	NA
Inorganics								
Copper	31.7	0.00087	31.7	1.268	0	0	NA	NA
LEAD	53.2	0.0021	53.2	2.128	0	0	NA	NA

NA = NOAEL and LOAEL not available.

TABLE B-6

Kingfisher

Body Weight	0.1360000 kg	
Food Ingestion Rate	0.0680000 kg/day	100% fish
Water Ingestion Rate	0.0150000 kg/day	
Sediment Ingestion Rate	0.0000000 kg/day	

Maximum Concentrations

Chemical	Sediment Concentration (mg/kg)	Water Concentration (mg/L)	Fish Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	LOAEL (mg/kg/day)	NOAEL HQ	LOAEL HQ
Semivolatile Organic Compounds								
2-METHYLNAPHTHALENE	0.415	0	0.5395	0.26975	10	100	2.70E-02	2.70E-03
CHRYSENE	4.001525	0	1.508574925	0.7542875	10	100	7.54E-02	7.54E-03
NAPHTHALENE	0.355	0	0.133835	0.0669175	10	100	6.69E-03	6.69E-04
Pesticides/PCBs (mg/kg)								
ALDRIN	0.000152	0	0.00035568	0.0001778	0	0	NA	NA
DIELDRIN	0.00006	0	0.0001404	0.0000702	0.077	0.77	9.12E-04	9.12E-05
ENDOSULFAN II	0.000215	0	0.0005031	0.0002516	10	100	2.52E-05	2.52E-06
ENDRIN ALDEHYDE	0.00011	0	0.0002574	0.0001287	0.01	0.1	1.29E-02	1.29E-03
Inorganics								
Copper	31.7	0.00087	31.7	15.850096	47	61.7	3.37E-01	2.57E-01
LEAD	53.2	0.0021	53.2	26.600232	1.13	11.3	2.35E+01	2.35E+00

NA = NOAEL and LOAEL not available.

TABLE B-7

Raccoon

Body Weight	3.9900 kg	
Food Ingestion Rate	0.8560 kg/day	90.6% prey
Water Ingestion Rate	0.3440 kg/day	
Sed Ingestion Rate	0.8560 kg/day	9.4% sediment

Maximum Concentrations

Chemical	Sediment Concentration (mg/kg)	Water Concentration (mg/L)	Crustacean Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	LOAEL (mg/kg/day)	NOAEL HQ	LOAEL HQ
Semivolatile Organic Compounds								
2-METHYLNAPHTHALENE	0.4150	0	0.913	0.185828804	1	10	1.86E-01	1.86E-02
CHRYSENE	4.0015	0	2.55297295	0.576917578	1	10	5.77E-01	5.77E-02
NAPHTHALENE	0.3550	0	0.22649	0.051181922	1.3	2.6	3.94E-02	1.97E-02
Pesticides/PCBs (mg/kg)								
ALDRIN	0.0002	0	0.00060192	0.00012006	0.2	1	6.00E-04	1.20E-04
DIELDRIN	0.0001	0	0.0002376	4.73923E-05	0.02	0.2	2.37E-03	2.37E-04
ENDOSULFAN II	0.0002	0	0.0008514	0.000169822	0.15	1.5	1.13E-03	1.13E-04
ENDRIN ALDEHYDE	0.0001	0	0.0004356	8.68858E-05	0.092	0.92	9.44E-04	9.44E-05
Inorganics								
Copper	31.7000	0.00087	31.7	6.800877013	11.7	15.14	5.81E-01	4.49E-01
Lead	53.2000	0.0021	53.2	11.41351439	8	80	1.43E+00	1.43E-01

EXAMPLE CALCULATION OF HAZARD QUOTIENT
FOR THE RACCOON
USING THE MAXIMUM SEDIMENT CONCENTRATION OF CHRYSENE

(See Appendix B text for definitions of the terms in the following two equations).

The predicted dose (PD) for all representative receptors =
$[C_{sediment} * FI * SA * F) + (C_{water}\ W * FI) + (C_{food} * F * FA * FI)]/WR$

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 chrysene = 0.29 (Table B-4)
C_s = 4.0015 mg/kg (Table B-7)
f_{oc} = assumed to be 1.0 percent = 0.01
f_l for crustaceans (assumed food of the raccoon) = 2.2 percent = 0.022 (see Appendix B text)

Using the above values, TBP = 0.29 * (4.0015/0.01) * 0.022 = 2.553 mg/kg. Thus, the predicted concentration of chrysene in food items (i.e., prey) of the raccoon (C_{food}) = 2.553 mg/kg.

$C_{sediment}$ = 4.0015 mg/kg (Table B-7)
FI = 100 percent = 1.0
SA = 9.4% = 0.094 (Table B-7)
F = 0.856 kg/day (Table B-7)
C_{water}= 0.0 (Table B-7)
C_{food} = 2.553 mg/kg (derivation shown above)
FA = 90.6% = 0.906 (Table B-7)
WR = 3.99 kg (Table B-4)

Using the above values,
PD = [(4.0015 mg/kg * 1.0 * 0.094 * 0.856 kg/day) + (2.553 mg/kg * 0.856 kg/day * 0.906 * 1.0)] ÷ 3.99 kg
PD = (0.3220 mg/day + 1.980 mg/day) ÷ 3.99 kg = 0.5769 mg/kg/day

The mammalian NOAEL for chrysene is 1.0 mg/kg/day (Table B-1).
Thus, the HQ (based on the NOAEL) = 0.5769 mg/kg/day ÷ 1.0 mg/kg/day = 0.5769 or 5.77E-01.

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