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NAS CECIL FIELD, FL  
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ANNUAL GROUNDWATER MONITORING LETTER REPORT YEAR 3 FOR BUILDING 199  
TANK 199 NAS CECIL FIELD FL  
2/22/2002  
TETRA TECH NUS INC



**TETRA TECH NUS, INC.**

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Document Tracking No. 02JAX0056

February 22, 2002

Project Number 0394

Commander, Southern Division  
Naval Facilities Engineering Command  
ATTN: Mr. Wayne Hansel (Mail Code ES24)  
2155 Eagle Drive  
North Charleston, South Carolina 29406

Reference: Clean Contract No. N62467-94-D0888  
Contract Task Order No. 0108

Subject: Annual Groundwater Monitoring Report, Year 3 (January 2002)  
Building 199, Tank 199  
Naval Air Station Cecil Field  
Jacksonville, Florida

Dear Mr. Hansel:

Tetra Tech NUS, Inc. (TtNUS) is pleased to submit this second annual Groundwater Monitoring Letter Report for the referenced Contract Task Order (CTO) for the Tank 199 site. This groundwater monitoring report was prepared for the U.S. Navy Southern Division Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) under the Comprehensive Long-term Environmental Action Navy (CLEAN) Contract Number N62467-94-D-0888. The objective of this task is to perform annual monitoring of the groundwater associated with Tank 199 (Figure 1) at the former Naval Air Station Cecil Field (NASCF), Jacksonville, Florida.

This work was initiated to comply with the issuance of the Monitoring Only Plan (MOP) Approval Order (Attachment A) by the Florida Department of Environmental Protection (FDEP). The FDEP directed that SOUTHNAVFACENGCOM complete the monitoring program pursuant to Rule 62-770.690(7), Florida Administrative Code (FAC). Following a review of groundwater monitoring data for April 2000, the FDEP issued a modification to the MOP (Attachment B) to change the monitoring frequency from semi-annual to annual.

Field activities and groundwater analytical results for the year 2002 are summarized in this report. The work was performed in general accordance with the Base-wide Generic Work Plan Volumes I and II (TtNUS, 1998).

**FIELD OPERATIONS**

Depth-to-water measurements were obtained at nine site-monitoring wells on January 8, 2002. For brevity, these wells will be referred in an abbreviated form. For example, MW-1S will be used in this report instead of the unabbreviated CEF-199-1S. Water level depths in the wells ranged

from 3.57 (MW-6S) to 4.69 (MW-10S) feet below top of casing (btoc). Groundwater elevation data is provided in Table 1. The top-of-casing elevations of the monitoring wells were resurveyed since the last annual report was submitted. It is unclear whether previous survey data referred to original wells MW-1S and MW-4S or to their replacements. The data in Table I has been adjusted from the last annual report to reflect the new survey data.

A groundwater elevation contour map generated from the data, shown as Figure 2, indicates that the water table in the area of concern is higher at the former source area (MW-1S) than in all four compass directions surrounding it, which infers a radial flow outward from the source. The steepest hydraulic gradient is to the east-southeast and south-southeast, which are generally the same flow directions inferred from previous site investigations.

On January 8, 2002, TtNUS collected groundwater samples from the three monitoring wells listed in the MOP (MW-1S, -4S, and -7S). Following collection, the groundwater samples were shipped to Accutest Laboratories in Orlando, Florida for analysis of volatile organic compounds (VOCs) by Environmental Protection Agency (EPA) Method SW846 8021B, for polynuclear aromatic hydrocarbons (PAHs) by EPA Method SW846 8310, and for total recoverable petroleum hydrocarbons (TRPH) using the Florida-Petroleum Range Organics (FL-PRO) analytical method. The analytical results for this event are summarized in Table 2. A copy of the laboratory report is provided as Attachment C.

## RESULTS

Benzene was reported at a concentration of 1.9 micrograms per liter ( $\mu\text{g/L}$ ) (1.8  $\mu\text{g/L}$  in the duplicate) in a sample collected from the source area well (MW-1S). This concentration exceeds the FDEP Groundwater Cleanup Target Level (GCTL) of 1.0  $\mu\text{g/L}$ . This was the only value exceeding GCTLs in the analyses. Other constituents of concern reported at values above laboratory detection limits but below GCTLs in the MW-1S sample included some VOCs, PAHs, and TRPH. In the previous sampling event (January 5, 2001), TRPH was reported at a value of 28.4 milligrams per liter (mg/L) in MW-1S.

No analyzed constituents were reported in samples collected from the perimeter wells (MW-4S and MW-7S). A historical summary of groundwater analytical data for the sampling events conducted between 1996 and 2002 is provided in Table 3. Figure 3 illustrates the TRPH and benzene data for the last three sampling events.

## CONCLUSIONS and RECOMMENDATIONS

TtNUS concludes that annual monitoring at Tank 199 should be continued for the following reasons:

- Benzene values are slightly above GCTLs at the source.
- Naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene values all showed slight increases in the source area between 2001 and 2002, even though all three were below GCTLs.
- TRPH concentrations at the source were reported at 28.5 mg/L in January 2001.

TtNUS recommends continued annual sampling with the following modifications:

- TtNUS recommends that perimeter well MW-4S be deleted from the annual sampling plan since no constituents of concern (other than trace concentrations of TRPH) have been detected in samples collected from this well for six consecutive sampling events dating back to December 1996.

Mr. Wayne Hansel  
SOUTHNAVFACENGCOM  
February 22, 2002 – Page 3

- Perimeter well MW-7S will be sufficient for downgradient monitoring per Rule 62-770.690(7)(a), FAC, since it appears to be the most directly downgradient of the two perimeter wells.
- Delete VOCs from the sample list for the perimeter wells, since the reported VOCs for the last two rounds have been reported non-detect.
- Delete TRPH from the sample list for the perimeter wells, since the reported TRPH for the last two sampling events have been below 1 mg/L.
- Delete PAHs from the sample list for the source and perimeter wells since there have been no detections above respective GCTLs for the last two sampling events.

If you have any questions with regard to this submittal, please contact me at (412) 921-7231.

Very truly yours,

  
Joseph W. Logan  
Task Order Manager

  
Debbie Wroblewski  
Program Manager

JL/llk

Attachments (9)

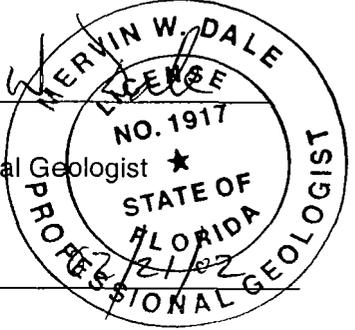
cc: N. Ugolini, SOUTHDIV (CD only)  
D. Vaughn-Wright, USEPA  
D. Grabka, FDEP (2 copies)  
D. Wroblewski, TtNUS (w/o attachments)  
M. Speranza, TtNUS  
M. Perry, TtNUS (CTO 0108 File Copy)

## PROFESSIONAL REVIEW CERTIFICATION

The Annual Groundwater Monitoring Report, Year 3 (January 2002) for Building 199, Tank 199 was prepared using sound hydrogeologic principles and judgment. This report is based on the groundwater monitoring activities and associated information detailed in the text and appended to this report. If conditions are determined to exist that differ from those described, the undersigned geologist should be notified to evaluate the effects of any additional information on the monitoring activities described in this report. This report was developed for Building 199, Tank 199 at the former NAS Cecil Field, Jacksonville, Florida, and should not be construed to apply to any other site.

  
Mervin W. Dale  
Florida Professional Geologist ★  
P.G. No. 0001917

Date \_\_\_\_\_



## TABLES

**TABLE 1**  
**GROUNDWATER ELEVATION DATA**  
**TANK 199**  
**NAVAL AIR STATION CECIL FIELD**  
**JACKSONVILLE, FLORIDA**  
**PAGE 1 OF 1**

Monitoring Well Identification	Well Depth (feet, BTOC)	Top-of-Casing Elevation (feet, msl)	January 5, 2001		Top of Casing Elevation (feet, msl) Resurveyed 6/14/01	January 8, 2002	
			Depth to Water (feet, BTOC)	Water-Level Elevation (feet, msl)		Depth to Water (feet, BTOC)	Water-Level Elevation (feet, msl)
CEF-199-1S	11.36	77.93	4.85	73.08 <sup>D</sup>	76.78	4.58	72.20
CEF-199-3S	NA	75.98	3.74	72.24	74.64	3.59	71.05
CEF-199-4S	11.52	77.16	4.23	72.93 <sup>D</sup>	75.83	4.09	71.74
CEF-199-5S	NA	76.05	3.75	72.30	74.71	3.70	71.01
CEF-199-6S	NA	75.48	2.93	72.55	74.14	3.57	70.57
CEF-199-7S	13.24	77.14	4.11	73.03 <sup>D</sup>	75.80	3.69	72.11
CEF-199-8S	NA	77.42	4.90	72.52 <sup>D</sup>	76.08	4.62	71.46
CEF-199-9S	NA	77.07	4.58	72.49	75.73	4.30	71.43
CEF-199-10S	NA	77.66	4.96	72.70	76.32	4.69	71.63

Notes:

msl = mean sea level  
 BTOC = below top of casing  
 D = data not used in figure  
 NA = not available

TABLE 2

**SUMMARY OF DETECTIONS - JANUARY 2002**  
**TANK 199**  
**NAVAL AIR STATION CECIL FIELD**  
**JACKSONVILLE, FLORIDA**

Analyte	Contaminated Well		Perimeter Monitoring Wells		MOP Approval Order Action Levels for Contaminated Well/Perimeter Wells	Milestone Objectives for CEF- 199-1S at the end of the 3rd Year	NADSC <sup>2</sup> /GCTL <sup>1</sup>
	CEF-199-1S	CEF-199-1S Duplicate	CEF-199-4S	CEF-199-7S			
Date Sample Collected	1/8/2002	1/8/2002	1/8/2002	1/8/2002			
<b>Volatle Organic Compounds (EPA Method 8021B) (µg/L)</b>							
Benzene	<b>1.9</b>	<b>1.8</b>	<1.0	<1.0	100/1	7	100/1
Toluene	0.58J	0.54J	<1.0	<1.0	400/40	None	400/40
Ethylbenzene	1.5	1.4	<1.0	<1.0	300/30	None	300/30
1,2-Dichlorobenzene	2.1	2.0	<1.0	<1.0	None	None	/600
<b>Polynuclear Aromatic Hydrocarbons (EPA Method 8310) (µg/L)</b>							
1-Methylnaphthalene	17.8	13.0	<2.0	<2.0	None	None	200/20
2-Methylnaphthalene	15.2	10.6	<2.0	<2.0	None	None	200/20
Naphthalene	10.3	6.4	<2.0	<2.0	200/20	40	200/20
Fluorene	3.6J	2.7J	<2.0	<2.0	None	None	
Phenanthrene	<4.0	<4.0	<2.0	<2.0	None	None	2100/210
<b>Total Recoverable Petroleum Hydrocarbons (FL-PRO) (mg/L)</b>							
TRPH	1.59	1.58	<0.25	<0.28	None	8	50/5

## Notes:

Values exceeding milestones, NADSC or GCTL, are in bold.

U = not detected and value next to modifier indicates the reporting limit for that compound.

J = estimated.

NR = not reported.

µg/L = micrograms per liter.

mg/L = milligrams per liter.

< = less than.

EPA = Environmental Protection Agency.

FL-PRO = Florida Petroleum Range Organics.

<sup>1</sup>GCTL=Groundwater Cleanup Target Levels based on Chapter 62-770, Florida Administrative Code.

<sup>2</sup>NADSC=Natural Attenuation Default Source Concentrations as promulgated in Chapter 62-770.690.

TABLE 3

SUMMARY OF POSITIVE DETECTIONS IN GROUNDWATER  
TANK 199  
NAVAL AIR STATION CECIL FIELD  
JACKSONVILLE, FLORIDA  
PAGE 1 OF 3

Location Duplicate, as noted Sample Date Well Depth, feet	FDEP GCTL FAC 62-777	CEF-199-1S (Source)						
		12/96	12/98	7/99	2/00	1/01	1/02	Duplicate 1/02
<b>Volatile Organic Compounds (µg/L)</b>								
BENZENE	1	<b>8.1</b>	<b>3.1</b>	<b>7.0</b>	<b>1.7</b>	0.53	<b>1.9</b>	<b>1.8</b>
ETHYLBENZENE	30	11	5	7	4.7	2.8	1.5	1.4
TOLUENE	40	4.5	ND	ND	ND	1 U	0.58J	0.54J
XYLENES	20	<b>52</b>	1	ND	ND	3 U	3 U	3 U
1,4-DICHLOROBENZENE	75	NA	NA	41	ND	1 U	1 U	1 U
1,2-DICHLOROBENZENE	600	NA	NA	7	ND	1 U	2.1	2.0
<b>Semivolatile Organic Compounds (µg/L)</b>								
NAPHTHALENE	20	NA	NA	<b>57</b>	<b>33</b>	4.2	10.3	6.4
1-METHYLNAPHTHALENE	20	NA	NA	<b>96</b>	<b>53</b>	4.3	17.8	13.0
2-METHYLNAPHTHALENE	20	NA	NA	<b>83</b>	<b>61</b>	2.5	15.2	10.6
FLUORENE	280	NA	NA	11	0.3	4 U	3.6J	2.7J
ANTHRACENE	2100	NA	NA	2.8	ND	4 U	2 U	2 U
BENZO(A)ANTHRACENE	0.2	NA	NA	<b>3</b>	ND	0.4 U	0.2 U	0.2 U
<b>Total Petroleum Hydrocarbons (mg/L)</b>								
TRPH (C8-C40)	5	NA	NA	<b>5.4</b>	3.7	<b>28.4</b>	1.59	1.58

## Notes:

GCTL - Groundwater Cleanup Target Level,  
 Bold values are greater than GCTL.  
 µg/L - microgram per liter.  
 mg/L - milligram per liter,  
 NA - Not analyzed.  
 ND - Not detected.  
 U - Undetected at detection limit shown.  
 J - Estimated.

TABLE 3

SUMMARY OF POSITIVE DETECTIONS IN GROUNDWATER  
TANK 199  
NAVAL AIR STATION CECIL FIELD  
JACKSONVILLE, FLORIDA  
PAGE 2 OF 3

Location Duplicate, as noted Sample Date Well Depth, feet	FDEP GCTL FAC 62-777	CEF-199-4S (Perimeter)				
		12/98	7/99	2/00	1/01	1/02
<b>Volatile Organic Compounds (µg/L)</b>						
BENZENE	1	ND	ND	ND	1 U	1 U
ETHYLBENZENE	30	ND	ND	ND	1 U	1 U
TOLUENE	40	ND	ND	ND	1 U	1 U
XYLENES	20	ND	ND	ND	3 U	3 U
1,4-DICHLOROBENZENE	75	NA	ND	ND	1 U	1 U
1,2-DICHLOROBENZENE	600	NA	ND	ND	1 U	1 U
<b>Semivolatile Organic Compounds (µg/L)</b>						
NAPHTHALENE	20	NA	ND	ND	2 U	2 U
1-METHYLNAPHTHALENE	20	NA	ND	ND	2 U	2 U
2-METHYLNAPHTHALENE	20	NA	ND	ND	2 U	2 U
FLUORENE	280	NA	ND	ND	2 U	2 U
ANTHRACENE	2100	NA	ND	ND	2 U	2 U
BENZO(A)ANTHRACENE	0.2	NA	ND	ND	0.2 U	0.2 U
<b>Total Petroleum Hydrocarbons (mg/L)</b>						
TRPH (C8-C40)	5	NA	ND	ND	0.258	0.25 U

## Notes:

GCTL - Groundwater Cleanup Target Level,  
Bold values are greater than GCTL.  
µg/L - microgram per liter.  
mg/L - milligram per liter,  
NA - Not analyzed.  
ND - Not detected.  
U - Undetected at detection limit shown.  
J - Estimated.

TABLE 3

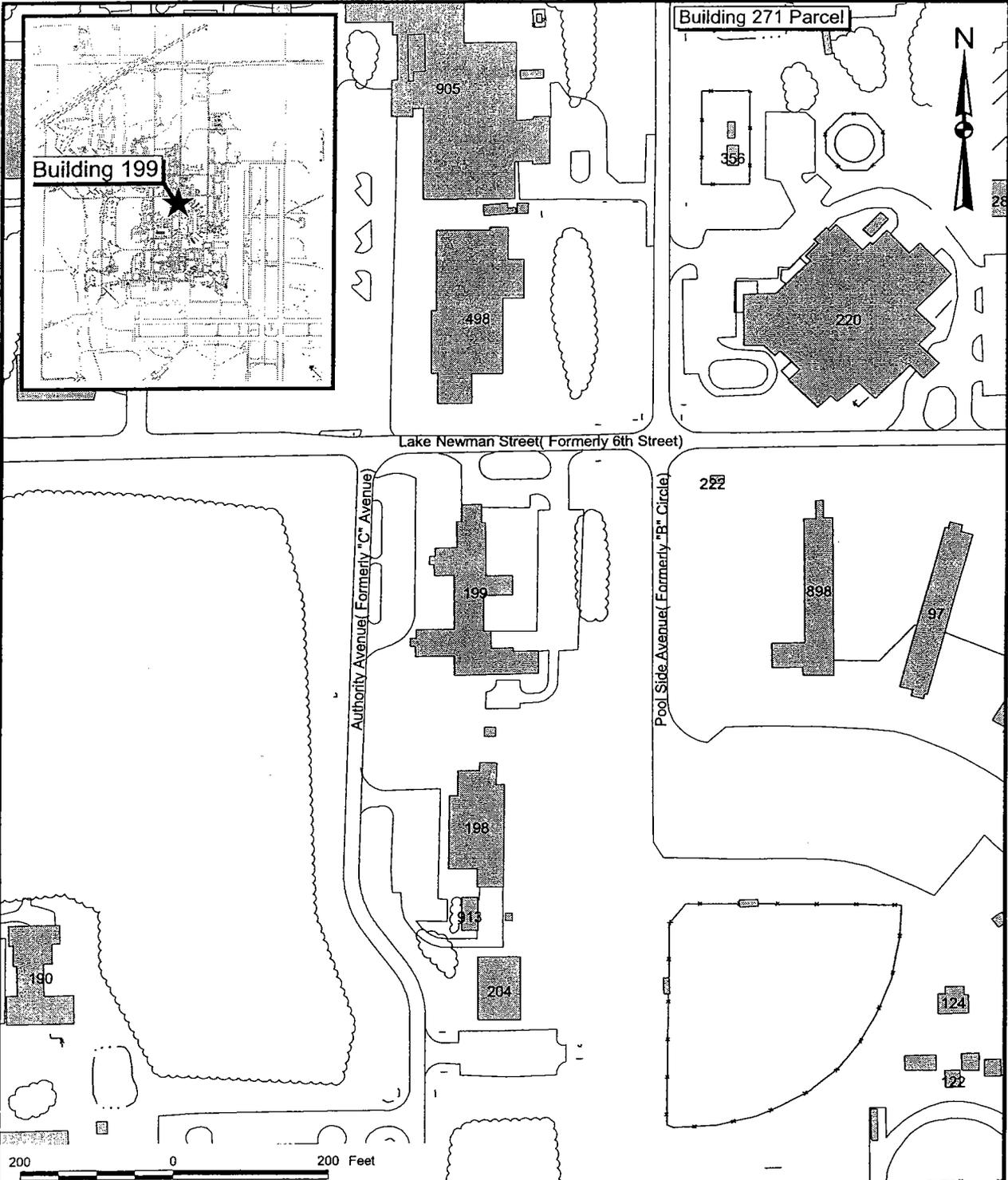
**SUMMARY OF POSITIVE DETECTIONS IN GROUNDWATER  
TANK 199  
NAVAL AIR STATION CECIL FIELD  
JACKSONVILLE, FLORIDA  
PAGE 3 OF 3**

Location Duplicate, as noted Sample Date Well Depth, feet	FDEP GCTL FAC 62-777	CEF-199-7S (Perimeter)			
		7/99	2/00	1/01	1/02
<b>Volatile Organic Compounds (µg/L)</b>					
BENZENE	1	ND	ND	1 U	1 U
ETHYLBENZENE	30	ND	ND	1 U	1 U
TOLUENE	40	ND	ND	1 U	1 U
XYLENES	20	ND	ND	3 U	3 U
1,4-DICHLOROBENZENE	75	ND	ND	1 U	1 U
1,2-DICHLOROBENZENE	600	ND	ND	1 U	1 U
<b>Semivolatile Organic Compounds (µg/L)</b>					
NAPHTHALENE	20	ND	ND	2.2 U	2 U
1-METHYLNAPHTHALENE	20	ND	ND	2.2 U	2 U
2-METHYLNAPHTHALENE	20	ND	ND	2.2 U	2 U
FLUORENE	280	ND	ND	2.2 U	2 U
ANTHRACENE	2100	ND	ND	2.2 U	2 U
BENZO(A)ANTHRACENE	0.2	ND	ND	0.22 U	0.2 U
<b>Total Petroleum Hydrocarbons (mg/L)</b>					
TRPH (C8-C40)	5	ND	ND	0.480	.28 U

## Notes:

GCTL - Groundwater Cleanup Target Level,  
 Bold values are greater than GCTL.  
 µg/L - microgram per liter.  
 mg/L - milligram per liter,  
 NA - Not analyzed.  
 ND - Not detected.  
 U - Undetected at detection limit shown.  
 J - Estimated.

## FIGURES

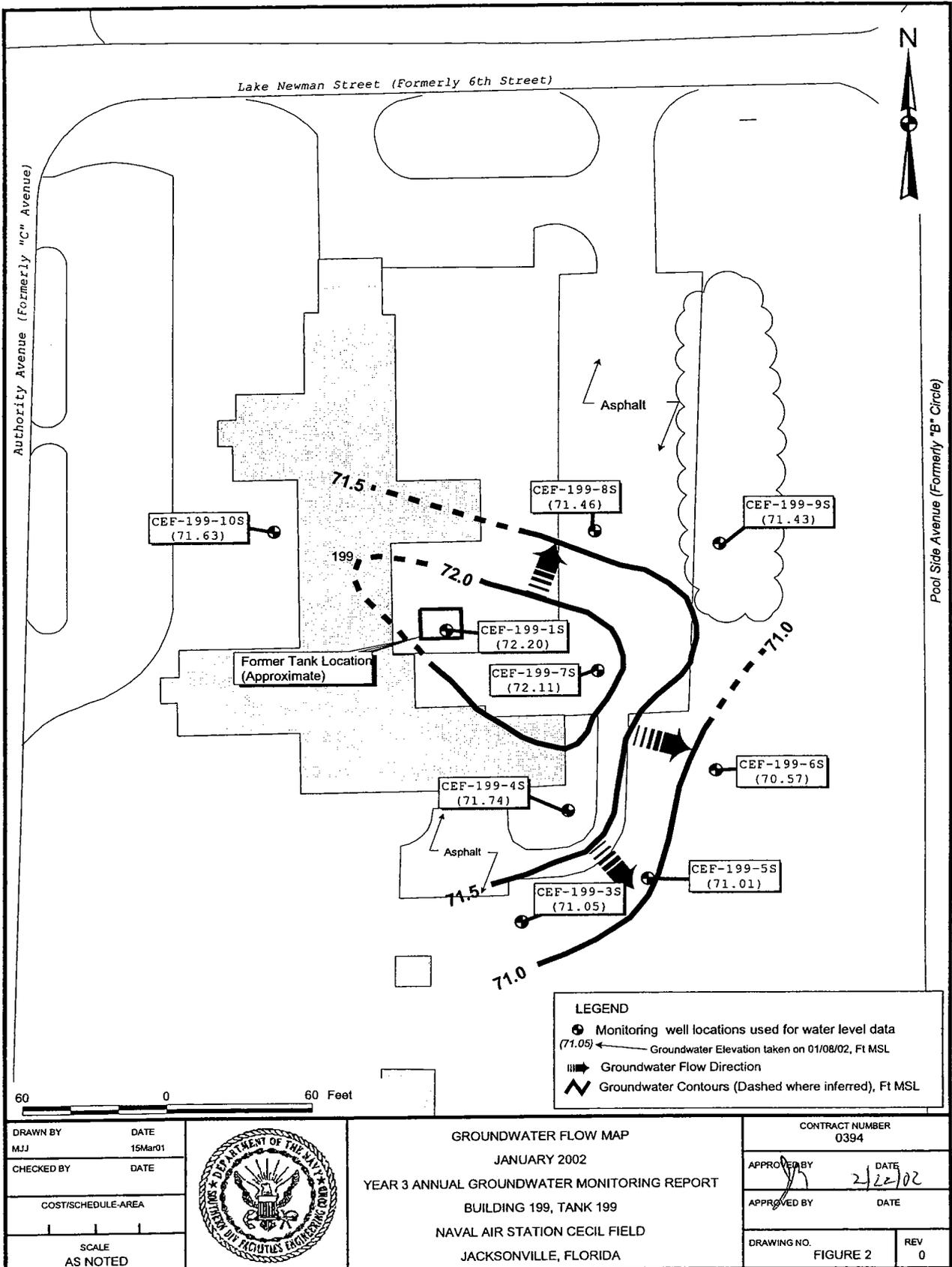


DRAWN BY MJJ	DATE 27Feb01
CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE AS NOTED	



SITE LOCATION MAP  
 JANUARY 2002  
 YEAR 3 ANNUAL GROUNDWATER MONITORING REPORT  
 BUILDING 199, TANK 199  
 NAVAL AIR STATION CECIL FIELD  
 JACKSONVILLE, FLORIDA

CONTRACT NUMBER 0039	
APPROVED BY <i>JR</i>	DATE 2/22/02
APPROVED BY	DATE
DRAWING NO. FIGURE 1	REV 0





**ATTACHMENT A**  
**MONITORING ONLY PLAN APPROVAL ORDER**



Department of  
Environmental Protection

Jeb Bush  
Governor

Twin Towers Building  
2800 Blair Stone Road  
Tallahassee, Florida 32399-2400

David B. Strub  
Secretary

May 10, 1999

**CERTIFIED MAIL**  
**RETURN RECEIPT REQUESTED**

Commanding Officer  
Mr. Bryan Kizer, Code 1842  
SOUTHNAVFACENGCOM  
Post Office Box 190010  
North Charleston, SC 29419-0068

Subject: Monitoring Only Plan  
Approval Order  
Facility 199, Naval Air Station Cecil Field

Dear Mr. Kizer:

The Bureau of Waste Cleanup has completed the review of the Site Assessment Report Addendum and Monitoring Only Proposal for Natural Attenuation dated February 1999 (received February 26, 1999), submitted for this site. Pursuant to Rule 62-770.690, Florida Administrative Code (F.A.C.), the Department approves the monitoring only proposal. Pursuant to Rule 62-770.690(7), F.A.C., you are required to complete the monitoring program outlined below. The first sampling event should be performed within 60 days of receipt of this Monitoring Only Plan Approval Order (Order). Water-level measurements should be made immediately prior to each sampling event. The analytical results (laboratory report), chain of custody, cumulative summary table of the analytical results, site map(s) illustrating the most recent analytical results, and the water-level elevation information (cumulative summary table and most recent flow interpretation map), should be submitted to the Department within 60 days of sample collection.

Monitoring Wells  
CEF-199-1S and  
CEF-199-4S

Parameters  
602, 8310, and  
FL-Pro

Frequency  
Semi-annual

If concentrations of chemicals of concern in any of the designated wells increase above the action levels listed below, the well or wells must be resampled no later than 30 days after the initial positive results are known. If the results of the

*"Protect, Conserve and Manage Florida's Environment and Natural Resources"*

Mr. Bryan Kizer  
Page Two  
May 10, 1999

resampling confirm the initial sampling results, then a proposal must be submitted, as described in Rule 62-770.690(7)(f), F.A.C.

Contaminated well:

MW-CEF-199-1S: 100 µg/l Benzene; 300 µg/l Ethylbenzene;  
400µg/l Toluene; and 200 µg/l Naphthalene.

Perimeter wells:

MW-CEF-199-4S and MW-CEF-199-7S: 1 µg/l Benzene; 30 µg/l  
Ethylbenzene; 40 µg/l Toluene; 20 µg/l Naphthalene.

The approved Remedial Action by Natural Attenuation monitoring period is 5 years. "Milestone" objectives should be established if monitoring is projected to take greater than one year. The following are the "milestone" objectives that will be used for annual evaluation of remediation progress by natural attenuation. An explanation of the progress relative to these milestone objectives, and the need for corrective action (if applicable), should be provided in the annual evaluation:

<u>Benzene</u>	<u>MW-CEF- 199-1S</u>
End of year 1	10
End of year 2	7
End of year 3	5
End of year 4	3
End of year 5	ND

<u>Naphthalene</u>	
End of year 1	50
End of year 2	40
End of year 3	30
End of year 4	25
End of year 5	20

<u>TRPH</u>	
End of year 1	10
End of year 2	8
End of year 3	7
End of year 4	6
End of year 5	4

If the applicable No Further Action criteria in Rule 62-770.680, F.A.C., are achieved at the end of the monitoring period, a Site Rehabilitation Completion Report, summarizing the

**ATTACHMENT B**

**FDEP LETTER APPROVING CHANGE IN SAMPLING FREQUENCY**



# Department of Environmental Protection

Jeb Bush  
Governor

Twin Towers Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

David B. Struhs  
Secretary

August 29, 2000

Commanding Officer  
Mr. Nick Ugolini, Code 1843  
SOUTHNAVFACENGCOM  
Post Office Box 190010  
North Charleston, SC 29419-0068

RE: Building 199, Groundwater Sampling Results - Event 2,  
Naval Air Station Cecil Field, Florida.

Dear Mr. Ugolini:

I have completed the technical review of the Groundwater Sampling Results, dated April 2000 (received August 25, 2000) submitted for the above-referenced site. FDEP concurs that sampling frequency can be reduced to annual groundwater monitoring in 2000/2001.

If you have any concerns regarding this letter, please contact me at (850) 921-9991.

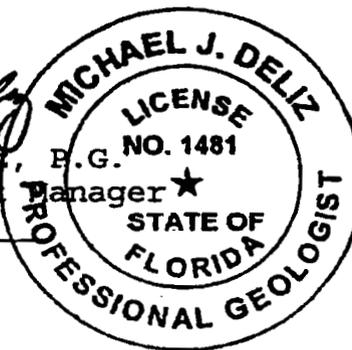
Sincerely,

*Michael J. Deliz*

Michael J. Deliz, P.G. NO. 1481  
Remedial Project Manager ★

Date

29-AUG-00



CC: Debbie Vaughn-Wright, USEPA - Atlanta  
John Flowe, City of Jacksonville  
Scott Glass, SOUTHNAVFACENGCOM  
Mark Speranza, TTNUS - Pittsburgh

TJB B JJC JJC ESN ESN

**ATTACHMENT C**  
**GROUNDWATER ANALYTICAL REPORT**  
**JANUARY 2002**

## Sample Summary

Tetra Tech, NUS

Job No: F11973

NAS Cecil Field 0039

Project No: WORK RELEASE#CF-29

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
F11973-1	01/08/02	15:45 RM	01/09/02	AQ	Ground Water	CEF-199-GW-4S-02
F11973-2	01/08/02	14:40 RM	01/09/02	AQ	Ground Water	CEF-199-GW-1S-02
F11973-3	01/08/02	00:00 RM	01/09/02	AQ	Ground Water	CEF-199-GW-DUP-01-02
F11973-4	01/08/02	13:50 RM	01/09/02	AQ	Ground Water	CEF-199-GW-7S-02

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## Report of Analysis

Client Sample ID: CEF-199-GW-4S-02  
 Lab Sample ID: F11973-1  
 Matrix: AQ - Ground Water  
 Method: SW846 8021B  
 Project: NAS Cecil Field 0039

Date Sampled: 01/08/02  
 Date Received: 01/09/02  
 Percent Solids: n/a

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF016103.D	1	01/12/02	KW	n/a	n/a	GEF500
Run #2							

## Purgeable Aromatics, Full List

CAS No.	Compound	Result	RL	Units	Q
71-43-2	Benzene	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
1330-20-7	Xylenes (total)	ND	3.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
352-33-0	1-Chloro-4-fluorobenzene	93%		80-120%
98-08-8	aaa-Trifluorotoluene	100%		70-127%

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-199-GW-4S-02	Date Sampled:	01/08/02
Lab Sample ID:	F11973-1	Date Received:	01/09/02
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	EPA 8310 SW846 3510C		
Project:	NAS Cecil Field 0039		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AA009966.D	1	01/11/02	MRE	01/10/02	OP4496	GAA443
Run #2							

## Polynuclear Aromatic Hydrocarbons

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	4.0	ug/l	
208-96-8	Acenaphthylene	ND	4.0	ug/l	
120-12-7	Anthracene	ND	2.0	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	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	0.20	ug/l	
218-01-9	Chrysene	ND	2.0	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	ug/l	
206-44-0	Fluoranthene	ND	2.0	ug/l	
86-73-7	Fluorene	ND	2.0	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	ug/l	
91-20-3	Naphthalene	ND	2.0	ug/l	
90-12-0	1-Methylnaphthalene	ND	2.0	ug/l	
91-57-6	2-Methylnaphthalene	ND	2.0	ug/l	
85-01-8	Phenanthrene	ND	2.0	ug/l	
129-00-0	Pyrene	ND	2.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	68%		33-141%
92-94-4	p-Terphenyl	48%		31-122%

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-199-GW-4S-02 Lab Sample ID: F11973-1 Matrix: AQ - Ground Water Method: FLORIDA-PRO SW846 3510C Project: NAS Cecil Field 0039	Date Sampled: 01/08/02 Date Received: 01/09/02 Percent Solids: n/a
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP19333.D	1	01/16/02	SKW	01/15/02	OP4511	GOP720
Run #2							

CAS No.	Compound	Result	RL	Units	Q
	TPH (C8-C40)	ND	0.25	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits	
84-15-1	o-Terphenyl	98%		55-130%	

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-199-GW-1S-02	Date Sampled:	01/08/02
Lab Sample ID:	F11973-2	Date Received:	01/09/02
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846 8021B		
Project:	NAS Cecil Field 0039		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 <sup>a</sup>	EF016111.D	1	01/14/02	KW	n/a	n/a	GEF501
Run #2							

Purgeable Aromatics, Full List

CAS No.	Compound	Result	RL	Units	Q
71-43-2	Benzene	1.9	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
95-50-1	1,2-Dichlorobenzene	2.1	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	1.5	1.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	ug/l	
108-88-3	Toluene	0.58	1.0	ug/l	J
1330-20-7	Xylenes (total)	ND	3.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
352-33-0	1-Chloro-4-fluorobenzene	100%		80-120%
98-08-8	aaa-Trifluorotoluene	103%		70-127%

(a) All hits confirmed by dual column analysis.

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

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

## Report of Analysis

Client Sample ID:	CEF-199-GW-1S-02	Date Sampled:	01/08/02
Lab Sample ID:	F11973-2	Date Received:	01/09/02
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	EPA 8310 SW846 3510C		
Project:	NAS Cecil Field 0039		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AA009967.D	1	01/11/02	MRE	01/10/02	OP4496	GAA443
Run #2 <sup>a</sup>	AA009979.D	2	01/14/02	MRE	01/10/02	OP4496	GAA444

## Polynuclear Aromatic Hydrocarbons

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND <sup>b</sup>	8.0	ug/l	
208-96-8	Acenaphthylene	ND <sup>b</sup>	8.0	ug/l	
120-12-7	Anthracene	ND	2.0	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	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	0.20	ug/l	
218-01-9	Chrysene	ND	2.0	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	ug/l	
206-44-0	Fluoranthene	ND	2.0	ug/l	
86-73-7	Fluorene	3.6 <sup>b</sup>	4.0	ug/l	J
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	ug/l	
91-20-3	Naphthalene	10.3 <sup>b</sup>	4.0	ug/l	
90-12-0	1-Methylnaphthalene	17.8 <sup>b</sup>	4.0	ug/l	
91-57-6	2-Methylnaphthalene	15.2 <sup>b</sup>	4.0	ug/l	
85-01-8	Phenanthrene	ND <sup>b</sup>	4.0	ug/l	
129-00-0	Pyrene	ND	2.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	98%	100%	33-141%
92-94-4	p-Terphenyl	107%	97%	31-122%

(a) All hits confirmed by spectral match using a diode array detector.

(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-199-GW-1S-02 Lab Sample ID: F11973-2 Matrix: AQ - Ground Water Method: FLORIDA-PRO SW846 3510C Project: NAS Cecil Field 0039	Date Sampled: 01/08/02 Date Received: 01/09/02 Percent Solids: n/a
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP19334.D	1	01/16/02	SKW	01/15/02	OP4511	GOP720
Run #2							

CAS No.	Compound	Result	RL	Units Q
	TPH (C8-C40)	1.59	0.28	mg/l
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	100%		55-130%

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-199-GW-DUP-01-02		Date Sampled:	01/08/02
Lab Sample ID:	F11973-3		Date Received:	01/09/02
Matrix:	AQ - Ground Water		Percent Solids:	n/a
Method:	SW846 8021B			
Project:	NAS Cecil Field 0039			

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 <sup>a</sup>	EF016112.D	1	01/14/02	KW	n/a	n/a	GEF501
Run #2							

## Purgeable Aromatics, Full List

CAS No.	Compound	Result	RL	Units	Q
71-43-2	Benzene	1.8	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
95-50-1	1,2-Dichlorobenzene	2.0	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	1.4	1.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	ug/l	
108-88-3	Toluene	0.54	1.0	ug/l	J
1330-20-7	Xylenes (total)	ND	3.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
352-33-0	1-Chloro-4-fluorobenzene	96%		80-120%
98-08-8	aaa-Trifluorotoluene	102%		70-127%

(a) All hits confirmed by dual column analysis.

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

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

## Report of Analysis

Client Sample ID:	CEF-199-GW-DUP-01-02	Date Sampled:	01/08/02
Lab Sample ID:	F11973-3	Date Received:	01/09/02
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	EPA 8310 SW846 3510C		
Project:	NAS Cecil Field 0039		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AA009968.D	1	01/11/02	MRE	01/10/02	OP4496	GAA443
Run #2 <sup>a</sup>	AA009980.D	2	01/14/02	MRE	01/10/02	OP4496	GAA444

## Polynuclear Aromatic Hydrocarbons

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND <sup>b</sup>	8.0	ug/l	
208-96-8	Acenaphthylene	ND <sup>b</sup>	8.0	ug/l	
120-12-7	Anthracene	ND	2.0	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	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	0.20	ug/l	
218-01-9	Chrysene	ND	2.0	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	ug/l	
206-44-0	Fluoranthene	ND	2.0	ug/l	
86-73-7	Fluorene	2.7 <sup>b</sup>	4.0	ug/l	J
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	ug/l	
91-20-3	Naphthalene	6.4 <sup>b</sup>	4.0	ug/l	
90-12-0	1-Methylnaphthalene	13.0 <sup>b</sup>	4.0	ug/l	
91-57-6	2-Methylnaphthalene	10.6 <sup>b</sup>	4.0	ug/l	
85-01-8	Phenanthrene	ND <sup>b</sup>	4.0	ug/l	
129-00-0	Pyrene	ND	2.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	121%	127%	33-141%
92-94-4	p-Terphenyl	86%	87%	31-122%

(a) All hits confirmed by spectral match using a diode array detector.

(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-199-GW-DUP-01-02	Date Sampled:	01/08/02
Lab Sample ID:	F11973-3	Date Received:	01/09/02
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	FLORIDA-PRO SW846 3510C		
Project:	NAS Cecil Field 0039		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP19335.D	1	01/16/02	SKW	01/15/02	OP4511	GOP720
Run #2							

CAS No.	Compound	Result	RL	Units	Q
	TPH (C8-C40)	1.58	0.28	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits	
84-15-1	o-Terphenyl	106%		55-130%	

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-199-GW-7S-02	Date Sampled: 01/08/02
Lab Sample ID: F11973-4	Date Received: 01/09/02
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: SW846 8021B	
Project: NAS Cecil Field 0039	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF016100.D	1	01/12/02	KW	n/a	n/a	GEF500
Run #2							

## Purgeable Aromatics, Full List

CAS No.	Compound	Result	RL	Units	Q
71-43-2	Benzene	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
1330-20-7	Xylenes (total)	ND	3.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
352-33-0	1-Chloro-4-fluorobenzene	91%		80-120%
98-08-8	aaa-Trifluorotoluene	101%		70-127%

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-199-GW-7S-02		Date Sampled:	01/08/02	
Lab Sample ID:	F11973-4		Date Received:	01/09/02	
Matrix:	AQ - Ground Water		Percent Solids:	n/a	
Method:	EPA 8310 SW846 3510C				
Project:	NAS Cecil Field 0039				

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AA009969.D	1	01/11/02	MRE	01/10/02	OP4496	GAA443
Run #2							

## Polynuclear Aromatic Hydrocarbons

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	4.0	ug/l	
208-96-8	Acenaphthylene	ND	4.0	ug/l	
120-12-7	Anthracene	ND	2.0	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	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	0.20	ug/l	
218-01-9	Chrysene	ND	2.0	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	ug/l	
206-44-0	Fluoranthene	ND	2.0	ug/l	
86-73-7	Fluorene	ND	2.0	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	ug/l	
91-20-3	Naphthalene	ND	2.0	ug/l	
90-12-0	1-Methylnaphthalene	ND	2.0	ug/l	
91-57-6	2-Methylnaphthalene	ND	2.0	ug/l	
85-01-8	Phenanthrene	ND	2.0	ug/l	
129-00-0	Pyrene	ND	2.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	78%		33-141%
92-94-4	p-Terphenyl	83%		31-122%

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-199-GW-7S-02	Date Sampled: 01/08/02
Lab Sample ID: F11973-4	Date Received: 01/09/02
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: FLORIDA-PRO SW846 3510C	
Project: NAS Cecil Field 0039	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP19336.D	1	01/16/02	SKW	01/15/02	OP4511	GOP720
Run #2							

CAS No.	Compound	Result	RL	Units	Q
	TPH (C8-C40)	ND	0.28	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits	
84-15-1	o-Terphenyl	104%		55-130%	

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