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NAS CECIL FIELD, FL
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SAMPLING AND ANALYSIS REPORT FOR FACILITY 290 BASE REALIGNMENT AND
CLOSURE ZONE H UNDEVELOPED EASTERN AREA NAS CECIL FIELD FL
5/1/1999
HARDING LAWSON ASSOCIATES

SAMPLING AND ANALYSIS REPORT
FACILITY 290
BASE REALIGNMENT AND CLOSURE
ZONE H, UNDEVELOPED EASTERN AREA

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Unit Identification Code: N60200

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TABLE OF CONTENTS

Sampling and Analysis Report
Facility 290
Base Realignment and Closure
Zone H, Undeveloped Eastern Area
Naval Air Station Cecil Field, Jacksonville, Florida

<u>Chapter</u>	<u>Title</u>	<u>Page No.</u>
1.0	INTRODUCTION	1
2.0	PHASE II INVESTIGATION	1
3.0	PRELIMINARY RISK EVALUATION	3
3.1	PUBLIC HEALTH PRE	3
3.2	ECOLOGICAL PRE	4
4.0	CONCLUSIONS AND RECOMMENDATIONS	4
	REFERENCES	5
	APPENDICES	

Appendix A: Soil Boring Log and Preliminary Risk Evaluation Table
Appendix B: Laboratory Analytical Data

LIST OF FIGURES

<u>Figure</u>	<u>Title</u>	<u>Page No.</u>
1	Facility 290, Transmitter Building	2

GLOSSARY

ABB-ES	ABB Environmental Services, Inc
AST	aboveground storage tank
BCT	Base Realignment and Closure cleanup team
ELCR	excess lifetime cancer risk
FDEP	Florida Department of Environmental Protection
GCTL	groundwater target cleanup level
HI	hazard index
HLA	Harding Lawson Associates
HQ	hazard quotient
NAS	Naval Air Station
PRE	preliminary risk evaluation
RBC	risk-based concentration
SAO	sampling and analysis outline
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank

1.0 INTRODUCTION

Harding Lawson Associates (HLA), under contract to the Southern Division, Naval Facilities Engineering Command, has completed the Phase II Sampling and Analysis program for Facility 290 at Naval Air Station (NAS) Cecil Field. Facility 290 is a radio transmitting station located along Perimeter Road, southeast of the intersection of Runways 36R and 9R. This report summarizes the related field operations, results, conclusions, and recommendations of the Phase II investigation.

An underground storage tank (UST) for a diesel powered standby generator was formerly located at Facility 290A, approximately 100 feet northwest of Facility 290. The UST was removed in 1995, and a closure assessment report produced by Innovative Services International indicates there was no soil or groundwater contamination associated with the UST. An aboveground storage tank (AST) is presently used for diesel fuel storage for the standby generator. A confirmatory Sampling Report (HLA, 1998) indicates there is no soil or groundwater contamination associated with the AST, and recommends no further action until the AST is removed.

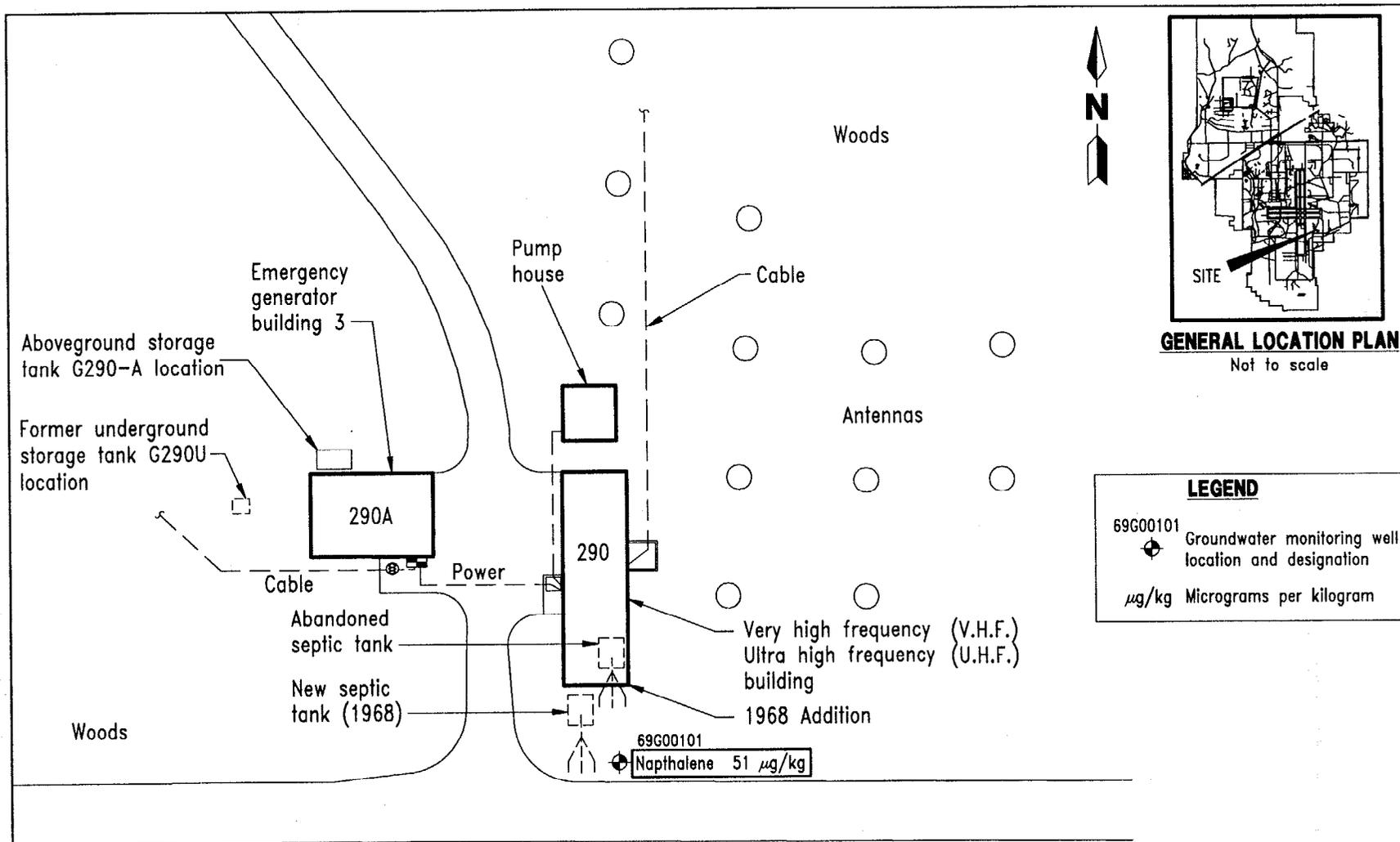
Other potential environmental concerns identified for the facility include the presence of one active septic system and one abandoned septic system on the south side of the building. The Base Realignment and Closure cleanup team (BCT) regards septic tank and leachfield systems as potential pathways for contaminants to enter the groundwater, if improperly used. Small amounts of lubricants, degreasers, and solder are reported to have been used on site for maintenance of electronic components.

A Sampling and Analysis Outline (SAO) for the assessment of groundwater assessment of groundwater downgradient of the septic systems was prepared by HLA (then ABB-ES) and approved by the BCT (ABB-ES, 1996). The results of the Phase II Sampling and Analysis program developed in the SAO are discussed below.

2.0 PHASE II INVESTIGATION

Field activities were undertaken in general conformance with the Project Operations Plan (ABB-ES, 1994b). The Phase II investigation included the installation of one groundwater monitoring well to a depth of 15 feet below land surface, downgradient of the septic system. The groundwater flow direction at this site is likely to be south-southeast, based on the groundwater flow model produced for NAS Cecil Field by the U.S. Geological Survey.

A general site plan indicating the location of the monitoring well is presented on Figure 1. The soil boring log is included in Appendix A. One groundwater sample was collected and analyzed for the full Contract Laboratory program suite of target compound list organics and target analyte list inorganics.



GENERAL LOCATION PLAN
 Not to scale

LEGEND

- 69G00101 Groundwater monitoring well location and designation
- µg/kg Micrograms per kilogram

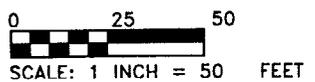


FIGURE 1
FACILITY 290
TRANSMITTER BUILDING



SAMPLING AND ANALYSIS REPORT

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

3.0 PRELIMINARY RISK EVALUATION

A preliminary risk evaluation (PRE) was conducted to assess potential risks to human and ecological receptors posed by contaminants in groundwater. Primary exposure pathways were evaluated to determine those pathways that potentially contribute to human health and ecological risks. The evaluation was conducted in general conformance with methodology provided in the U.S. Environmental Protection Agency (USEPA) Region IV memorandum entitled "Amended Guidance on Preliminary Risk Evaluation (PREs) for the Purpose of Reaching a Finding of Suitability to Lease (FOSL)" (USEPA, 1994), USEPA Region IV bulletins on ecological risk assessment (USEPA, 1995), and minutes of meetings with the USEPA and the Florida Department of Environmental Protection (FDEP) concerning PREs (ABB-ES, 1995). Site background information and rationale for sample collection and analysis are detailed in the Environmental Baseline Survey Report (ABB-ES, 1994a) and the SAO (ABB-ES, 1996).

Inorganic analytes were compared to NAS Cecil Field screening criteria for inorganics established by the NAS Cecil Field partnering team. The NAS Cecil Field screening criteria were determined by using the nonparametric upper-outside value cutoffs as described in *Understanding Robust and Exploratory Data Analysis* (Hoaglin et al., 1983). These screening values were developed from data collected throughout NAS Cecil Field. No risk evaluation is conducted for inorganic analytes detected below NAS Cecil Field screening criteria for inorganics.

3.1 PUBLIC HEALTH PRE. All detected analytes were compared to readily available risk-based screening values to assess the likelihood of adverse human health effects associated with potential exposure to groundwater. Risk-based screening values were obtained from USEPA Region III Risk-Based Concentrations (RBCs) (USEPA, 1998) and FDEP Groundwater Cleanup Target Levels (GCTLs) (FDEP, 1998).

Most screening values published in the references listed above are based on toxicity constants and standard human exposure scenarios and correspond to fixed levels of risk. The designated level of risk for noncarcinogenic chemicals is based on a hazard quotient (HQ) of 1. The level of risk for carcinogenic chemicals is based on an excess lifetime cancer risk (ELCR) of 1×10^{-6} . Cancer and noncancer risks associated with industrial and residential land use are estimated by dividing the maximum detected analyte concentration by the corresponding USEPA Region III RBC value at the designated level of risk (HQ of 1 or ELCR of 1×10^{-6}). For noncarcinogens, the HQs are summed to determine the cumulative noncancer risk or hazard index (HI).

Eleven inorganic analytes, 2 volatile organic compounds, 3 semivolatile organic compounds, and 2 pesticide compounds were detected in the groundwater sample collected in the study area. Naphthalene was the only analyte detected at a concentration in excess of NAS Cecil Field inorganic background data set values and GCTLs.

Concentrations of detected analytes in groundwater have been compared with RBCs for tap water and GCTLs and, where applicable, with NAS Cecil Field inorganic background data set (see Appendix A). No carcinogenic analytes were detected at concentrations in excess of GCTLs, therefore, no ELCR was calculated. A HI of less than 1 was calculated based upon the detected concentration of naphthalene.

3.2 ECOLOGICAL PRE. Potential exposure pathways and ecological habitat associated with Facility 290 were characterized by HLA ecological risk assessors in June 1996. No complete exposure pathway to groundwater was identified within the study area. Therefore, no further ecological risk evaluation is required for Facility 290.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Naphthalene was detected in a groundwater sample collected downgradient of septic systems at Facility 290. The detected concentration exceeds the Florida GCTL, but does not present a hazard to human health. Underground and aboveground fuel storage tanks located northwest of Facility 290 have been evaluated separately, and do not appear to have impacted groundwater.

Based upon the information obtained for this assessment, site activities in the vicinity of Facility 290 may have resulted in the release of organic compounds to groundwater. Further evaluation is required to verify the presence of naphthalene in groundwater, and determine the source and extent of contamination. Therefore, the color classification for Facility 290 should be changed from 7/Grey to 5/Yellow, to indicate that there has been a release of contaminants, and that further evaluation is required.

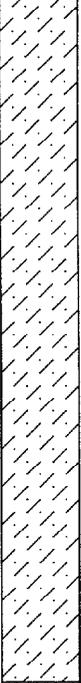
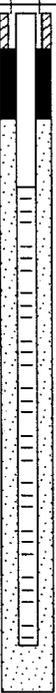
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- USEPA. 1998. *Risk-Based Concentration Table*. Region III. Philadelphia, Pennsylvania.

APPENDIX A

SOIL BORING LOG AND PRELIMINARY RISK EVALUATION TABLE

TITLE: NAS Cecil Field BRAC		LOG of WELL: CEF-290-1S	BORING NO.: CEF-290-1S
CLIENT: SOUTHDIYNAVFACENGCOM		PROJECT NO.: 08520-85	
CONTRACTOR: Alliance Environmental, Inc.		DATE STARTED: 12-11-95	COMPLTD: 12-11-95
METHOD: Auger	CASE SIZE: 2 in.	SCREEN INT.: 4 - 14 ft.	PROTECTION LEVEL: D
TOC ELEV.: FEET.	MONITOR INST.: PID	TOT DPTH: 15.0 FEET.	DPTH TO ∇: 5.5 FEET.
LOGGED BY: R. Holloway	WELL DEVELOPMENT DATE:	SITE: 69 - 290 Radio Trans. St.	

DEPTH F.T.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
2.0				SILTY SAND (SM): 100%, very dark gray to dark yellowish brown, quartz, fine- to very fine-grained, subrounded to subangular, well sorted; trace, organics.		SM	posthole	
4.0			posthole					
5			0			3,5,5,8		
10								
15								
20								
25								
30								

**Preliminary Human Health Risk Evaluation Table for Analytes Detected in Groundwater
Facility 290, Naval Air Station Cecil Field**

Analyte ¹	Samples			Screening Values		Calculated Risk Values ²		
	69G00101	69G00101F	BKGRD	GCTL	RBC(T)	ELCR	HQ	
Acetone	4			700	3700 n			
2-Methylnaphthalene	7			20	1500 n			
Acenaphthene	2			20	2200 n			
*Naphthalene	51			20	1500 n		0.03	
Endosulfan II	0.0052			42	220 n			
beta-BHC	0.0043			0.02	0.037 c			
Aluminum	1350	824	13100	200	37000 n			
Barium	5.9	6.2	88.2	2000	2600 n			
Calcium	41200	40300	81100					
Chromium	3.1	2.2	18	100	180 n			
Iron	511	409	7760	300	11000 n			
Magnesium	10600	10400	10000					
Manganese	13.4	13.9	96.2	50	840 n			
Potassium	1120	1070	4330					
Sodium	4450	4240	16500	160000				
Vanadium	13	12	20.2	49	260 n			
Zinc	5.3		76.8	5000	11000 n			
Cyanide		10	22	200	730 n			
Sum=								0.03

Notes:

¹ All detected analytes are reported. Concentrations and screening values are expressed in ug/l

²ELCR and HQ are only calculated for analytes detected at concentrations in excess of BKGRD and GWCTL

*= Background screening criteria and GWCTLs have been exceeded

BKGRD= NAS Cecil Field Inorganic Background Data Set

GCTL = Groundwater Cleanup Target Levels, FDEP, Chapter 62-785, Florida Administrative Code

RBC(T)= Risk-based Concentration (Tap Water), USEPA Region III, April 1998

n=non-carcinogenic risk

c=carcinogenic risk

ELCR = calculated excess lifetime cancer risk, based on RBC(T) values.

(ELCR = maximum detected concentration/RBC(T) * 1E-06)

HQ = calculated Hazard Quotient for non-carcinogenic analytes

(HQ=maximum detected concentration/RBC(T))

APPENDIX B

LABORATORY ANALYTICAL DATA

NAS CECIL FIELD FACILITY 290
 GROUNDWATER -- VOLATILES -- REPORT REQUEST NO. 11010

Lab Sample Number: C4A6K
 Site: CECILBRAC2
 Locator: 69G00101
 Collect Date: 05-JUN-96

VALUE QUAL UNITS DL

CLP VOLATILES 90-SOW

Chloromethane	2 U	ug/l	2
Bromomethane	2 U	ug/l	2
Vinyl chloride	2 U	ug/l	2
Chloroethane	2 U	ug/l	2
Methylene chloride	1 U	ug/l	1
Acetone	4	ug/l	2
Carbon disulfide	1 U	ug/l	1
1,1-Dichloroethene	1 U	ug/l	1
1,1-Dichloroethane	1 U	ug/l	1
1,2-Dichloroethene (total)	1 U	ug/l	1
Chloroform	1 U	ug/l	1
1,2-Dichloroethane	1 U	ug/l	1
2-Butanone	2 U	ug/l	2
1,1,1-Trichloroethane	1 U	ug/l	1
Carbon tetrachloride	1 U	ug/l	1
Bromodichloromethane	1 U	ug/l	1
1,2-Dichloropropane	1 U	ug/l	1
cis-1,3-Dichloropropene	1 U	ug/l	1
Trichloroethene	1 U	ug/l	1
Dibromochloromethane	1 U	ug/l	1
1,1,2-Trichloroethane	1 U	ug/l	1
Benzene	1 U	ug/l	1
trans-1,3-Dichloropropene	1 U	ug/l	1
Bromoform	1 U	ug/l	1
4-Methyl-2-pentanone	2 U	ug/l	2
2-Hexanone	2 U	ug/l	2
Tetrachloroethene	1 U	ug/l	1
Toluene	1 U	ug/l	1
1,1,2,2-Tetrachloroethane	1 U	ug/l	1
Chlorobenzene	1 U	ug/l	1
Ethylbenzene	1 U	ug/l	1
Styrene	1 U	ug/l	1
Xylenes (total)	1 U	ug/l	1

U = NOT DETECTED J = ESTIMATED VALUE
 UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
 R = RESULT IS REJECTED AND UNUSABLE

NAS CECIL FIELD -- FACILITY 290
 GROUNDWATER -- SEMIVOLATILES -- REPORT REQUEST NO. 11011

Lab Sample Number: C4A6K
 Site: CECILBRAC2
 Locator: 69G00101
 Collect Date: 05-JUN-96

VALUE QUAL UNITS DL

CLP SEMIVOLATILES 90-SOW

Phenol	10 U	ug/l	10
bis(2-Chloroethyl) ether	10 U	ug/l	10
2-Chlorophenol	10 U	ug/l	10
1,3-Dichlorobenzene	10 U	ug/l	10
1,4-Dichlorobenzene	10 U	ug/l	10
1,2-Dichlorobenzene	10 U	ug/l	10
2-Methylphenol	10 U	ug/l	10
2,2-oxybis(1-Chloropropane)	10 U	ug/l	10
4-Methylphenol	10 U	ug/l	10
N-Nitroso-di-n-propylamine	10 U	ug/l	10
Hexachloroethane	10 U	ug/l	10
Nitrobenzene	10 U	ug/l	10
Isophorone	10 U	ug/l	10
2-Nitrophenol	10 U	ug/l	10
2,4-Dimethylphenol	10 U	ug/l	10
bis(2-Chloroethoxy) methane	10 U	ug/l	10
2,4-Dichlorophenol	10 U	ug/l	10
1,2,4-Trichlorobenzene	10 U	ug/l	10
Naphthalene	51	ug/l	10
4-Chloroaniline	10 U	ug/l	10
Hexachlorobutadiene	10 U	ug/l	10
4-Chloro-3-methylphenol	10 U	ug/l	10
2-Methylnaphthalene	7 J	ug/l	10
Hexachlorocyclopentadiene	10 U	ug/l	10
2,4,6-Trichlorophenol	10 U	ug/l	10
2,4,5-Trichlorophenol	25 U	ug/l	25
2-Chloronaphthalene	10 U	ug/l	10
2-Nitroaniline	25 U	ug/l	25
Dimethylphthalate	10 U	ug/l	10
Acenaphthylene	10 U	ug/l	10
2,6-Dinitrotoluene	10 U	ug/l	10
3-Nitroaniline	25 U	ug/l	25
Acenaphthene	2 J	ug/l	10
2,4-Dinitrophenol	25 U	ug/l	25
4-Nitrophenol	25 U	ug/l	25
Dibenzofuran	10 U	ug/l	10
2,4-Dinitrotoluene	10 U	ug/l	10
Diethylphthalate	10 U	ug/l	10
4-Chlorophenyl-phenylether	10 U	ug/l	10
Fluorene	10 U	ug/l	10
4-Nitroaniline	25 U	ug/l	25
4,6-Dinitro-2-methylphenol	25 U	ug/l	25
N-Nitrosodiphenylamine	10 U	ug/l	10
4-Bromophenyl-phenylether	10 U	ug/l	10
Hexachlorobenzene	10 U	ug/l	10
Pentachlorophenol	25 U	ug/l	25
Phenanthrene	10 U	ug/l	10
Anthracene	10 U	ug/l	10
Carbazole	10 U	ug/l	10
Di-n-butylphthalate	10 U	ug/l	10

NAS CECIL FIELD -- FACILITY 290
 GROUNDWATER -- SEMIVOLATILES -- REPORT REQUEST NO. 11011

Lab Sample Number: C4A6K
 Site: CECILBRAC2
 Locator: 69G00101
 Collect Date: 05-JUN-96

VALUE QUAL UNITS DL

	VALUE	QUAL	UNITS	DL
Fluoranthene	10	U	ug/l	10
Pyrene	10	U	ug/l	10
Butylbenzylphthalate	10	U	ug/l	10
3,3-Dichlorobenzidine	10	U	ug/l	10
Benzo (a) anthracene	10	U	ug/l	10
Chrysene	10	U	ug/l	10
bis(2-Ethylhexyl) phthalate	10	U	ug/l	10
Di-n-octylphthalate	10	U	ug/l	10
Benzo (b) fluoranthene	10	U	ug/l	10
Benzo (k) fluoranthene	10	U	ug/l	10
Benzo (a) pyrene	10	U	ug/l	10
Indeno (1,2,3-cd) pyrene	10	U	ug/l	10
Dibenzo (a,h) anthracene	10	U	ug/l	10
Benzo (g,h,i) perylene	10	U	ug/l	10

U = NOT DETECTED J = ESTIMATED VALUE
 UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
 R = RESULT IS REJECTED AND UNUSABLE

NAS CECIL FIELD -- FACILITY 290
GROUNDWATER -- PESTICIDES/PCBS -- REPORT REQUEST NO. 11012

Lab Sample Number: C4A6K
Site: CECILBRAC2
Locator: 69G00101
Collect Date: 05-JUN-96

VALUE QUAL UNITS DL

CLP PESTICIDES/PCBS 90-SOW

alpha-BHC	.05 U	ug/l	.05
beta-BHC	.0043 J	ug/l	.05
delta-BHC	.05 U	ug/l	.05
gamma-BHC (Lindane)	.05 U	ug/l	.05
Heptachlor	.05 U	ug/l	.05
Aldrin	.05 U	ug/l	.05
Heptachlor epoxide	.05 U	ug/l	.05
Endosulfan I	.05 U	ug/l	.05
Dieldrin	.1 U	ug/l	.1
4,4-DDE	.1 U	ug/l	.1
Endrin	.1 U	ug/l	.1
Endosulfan II	.0052 J	ug/l	.1
4,4-DDD	.1 U	ug/l	.1
Endosulfan sulfate	.1 U	ug/l	.1
4,4-DDT	.1 U	ug/l	.1
Methoxychlor	.5 U	ug/l	.5
Endrin ketone	.1 U	ug/l	.1
Endrin aldehyde	.1 U	ug/l	.1
alpha-Chlordane	.05 U	ug/l	.05
gamma-Chlordane	.05 U	ug/l	.05
Toxaphene	5 U	ug/l	5
Aroclor-1016	1 U	ug/l	1
Aroclor-1221	2 U	ug/l	2
Aroclor-1232	1 U	ug/l	1
Aroclor-1242	1 U	ug/l	1
Aroclor-1248	1 U	ug/l	1
Aroclor-1254	1 U	ug/l	1
Aroclor-1260	1 U	ug/l	1

U = NOT DETECTED J = ESTIMATED VALUE
UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R = RESULT IS REJECTED AND UNUSABLE

NAS CECIL FIELD -- FACILITY 290
 GROUNDWATER -- INORGANICS (UNFILTERED) -- REPORT REQUEST NO. 11013

Lab Sample Number: C4A6K
 Site: CECILBRAC2
 Locator: 69G00101
 Collect Date: 05-JUN-96

VALUE QUAL UNITS DL

CLP METALS AND CYANIDE

Aluminum	1350		ug/l
Antimony	2	U	ug/l
Arsenic	3	U	ug/l
Barium	5.9	J	ug/l
Beryllium	1	U	ug/l
Cadmium	1	U	ug/l
Calcium	41200		ug/l
Chromium	3.1	J	ug/l
Cobalt	1	U	ug/l
Copper	2	U	ug/l
Iron	511		ug/l
Lead	2	U	ug/l
Magnesium	10600		ug/l
Manganese	13.4	J	ug/l
Mercury	.1	U	ug/l
Nickel	2	U	ug/l
Potassium	1120	J	ug/l
Selenium	4	U	ug/l
Silver	3	U	ug/l
Sodium	4450	J	ug/l
Thallium	2	U	ug/l
Vanadium	13	J	ug/l
Zinc	5.3	J	ug/l
Cyanide	3	U	ug/l

U = NOT DETECTED J = ESTIMATED VALUE
 UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
 R = RESULT IS REJECTED AND UNUSABLE

NAS CECIL FIELD -- FACILITY 290
 GROUNDWATER -- INORGANICS (FILTERED) -- REPORT REQUEST NO. 11015

Lab Sample Number: C4A6KF
 Site: CECILBRAC2
 Locator: 69G0010F
 Collect Date: 05-JUN-96

VALUE QUAL UNITS DL

CLP METALS AND CYANIDE

Element	Value	Qual	Units	DL
Aluminum	824		ug/l	200
Antimony	2	U	ug/l	60
Arsenic	3	U	ug/l	10
Barium	6.2	J	ug/l	200
Beryllium	1	U	ug/l	5
Cadmium	1	U	ug/l	5
Calcium	40300		ug/l	5000
Chromium	2.2	J	ug/l	10
Cobalt	1	U	ug/l	50
Copper	2	U	ug/l	25
Iron	409		ug/l	100
Lead	2	U	ug/l	3
Magnesium	10400		ug/l	5000
Manganese	13.9	J	ug/l	15
Mercury	.1	U	ug/l	.2
Nickel	2	U	ug/l	40
Potassium	1070	J	ug/l	5000
Selenium	4	U	ug/l	5
Silver	3	U	ug/l	10
Sodium	4240	J	ug/l	5000
Thallium	2	U	ug/l	10
Vanadium	12	J	ug/l	50
Zinc	3	U	ug/l	20
Cyanide	10		ug/l	10

U = NOT DETECTED J = ESTIMATED VALUE
 UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
 R = RESULT IS REJECTED AND UNUSABLE

NAS CECIL FIELD -- FACILITY 290
GROUNDWATER -- TPH -- REPORT REQUEST NO. 11014

Lab Sample Number: A6F0601330
Site: CECILBRAC2
Locator: 69G00101
Collect Date: 05-JUN-96

VALUE QUAL UNITS DL

TPH
Total petroleum hydrocarbons .5 U mg/l .5

U = NOT DETECTED J = ESTIMATED VALUE
UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R = RESULT IS REJECTED AND UNUSABLE