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NAS CECIL FIELD, FL  
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SAMPLING AND ANALYSIS OUTLINE AND REPORT FOR FACILITY 312LS BASE  
REALIGNMENT AND CLOSURE ZONE D INDUSTRIAL AND FLIGHT LINE AREA REVISION 1  
NAS CECIL FIELD FL  
1/1/1999  
HARDING LAWSON ASSOCIATES

**SAMPLING AND ANALYSIS OUTLINE AND REPORT**

**FACILITY 312LS**

**BASE REALIGNMENT AND CLOSURE**

**ZONE D, INDUSTRIAL AND FLIGHT LINE AREA**

**NAVAL AIR STATION CECIL FIELD  
JACKSONVILLE, FLORIDA**

**Unit Identification Code: N60200**

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**Revision 1.0**

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## GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
BCT	Base Realignment and Closure cleanup team
CLP	Contract Laboratory Program
EBS	environmental baseline survey
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
$\mu\text{g}/\ell$	micrograms per liter
NAS	Naval Air Station
PRE	preliminary risk evaluation
RBC	risk-based concentration
SAO	sampling and analysis outline
TAL	target analyte list
TCL	target compound list
$\mu\text{g}/\ell$	micrograms per liter
USEPA	U.S. Environmental Protection Agency

## 1.0 INTRODUCTION

Facility 312LS is a lift station located near the intersection of 4th Street and the north-south flight line area at Naval Air Station (NAS) Cecil Field. Facility 312LS is located northeast of Facility 312.

Facility 312 is an aircraft corrosion control facility. An aircraft wash rack is located to the east of Facility 312. Wastewater from Facility 312 and wash and rinse water from the wash rack are routed through an oil-water separator to Facility 312LS. Wastewater is pumped from Facility 312LS to the base wastewater treatment plant.

Facility 312 was color-coded 7/Gray in the NAS Cecil Field Environmental Baseline Survey (EBS) (ABB Environmental Services, Inc. [ABB-ES], 1994a) due to concerns that contaminated wastewater routed through the facility could potentially be released to the groundwater. No other environmental concerns were noted in the EBS Report. This report outlines the plan for assessment of Facility 312LS, and provides conclusions and recommendations based upon data collected during the assessment.

## 2.0 SAMPLING AND ANALYSIS OUTLINE

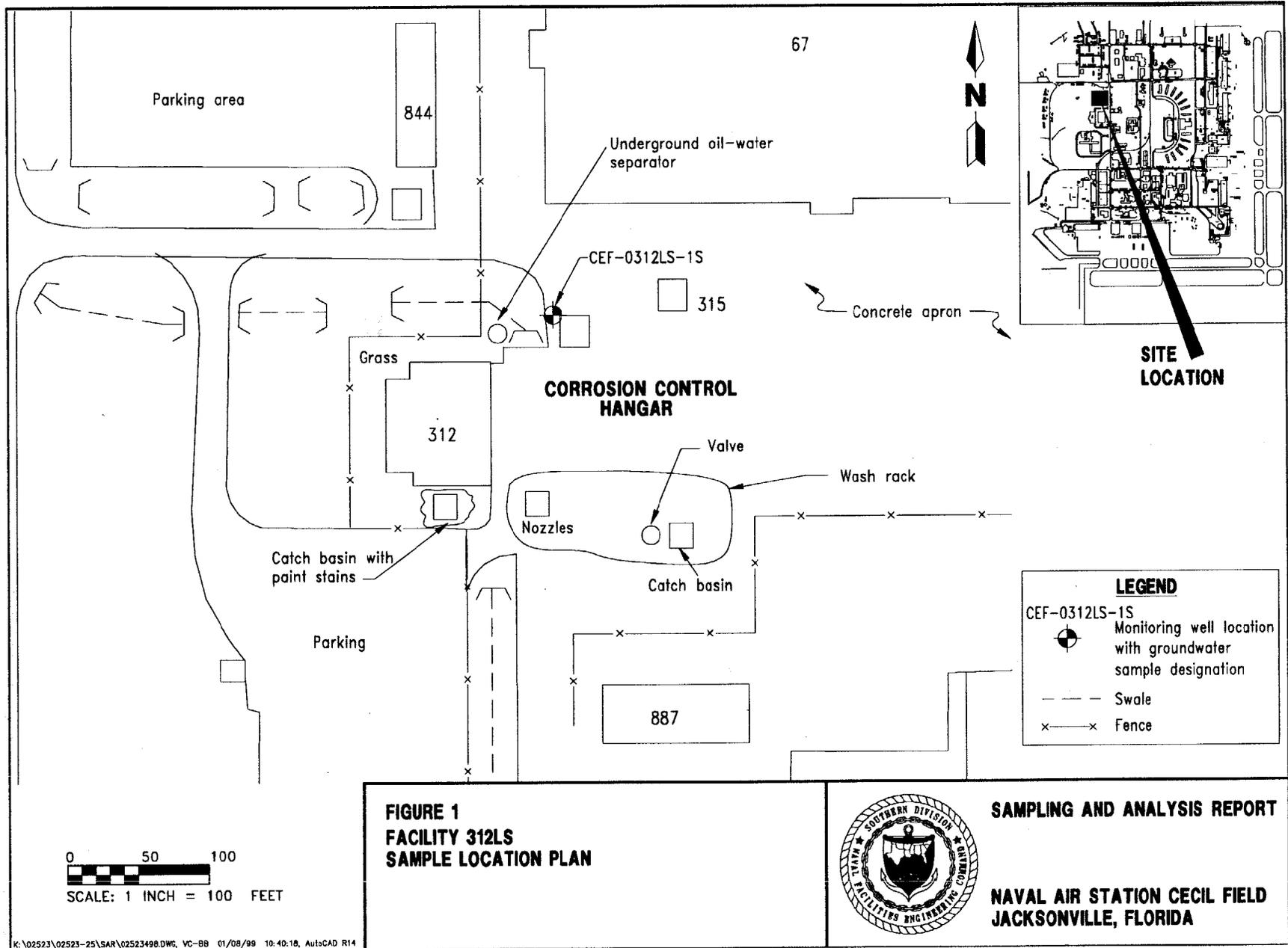
The Base Realignment and Closure cleanup team (BCT) regards lift stations as potential pathways for wastewater contaminants to enter the groundwater. A Phase II Sampling and Analysis Outline (SAO) to assess whether or not groundwater has been contaminated by wastewater seeping from Facility 312LS was presented during the BCT meeting on December 17, 1996, and approved by the BCT (ABB-ES, 1995a).

The SAO for assessment of shallow groundwater at 312LS included installation of one shallow groundwater monitoring well, and collection and analysis of one groundwater sample to be analyzed for the full Contract Laboratory Program (CLP) suite of target compound list (TCL) organics and target analyte list (TAL) inorganics. A separate contamination assessment plan has been prepared to evaluate potential releases of petroleum products from the oil-water separator and associated underground waste-oil holding tank (Harding Lawson Associates [HLA], 1998). The results of the Phase II Sampling and Analysis program are discussed below.

## 3.0 PHASE II INVESTIGATION

One groundwater monitoring well was installed downgradient (east) of Facility 312LS. The well was completed at a depth of 16 feet below land surface. The groundwater flow direction in this area is likely to be east-southeast, based on the groundwater flow model produced for NAS Cecil Field by the U.S. Geological Survey. One groundwater sample was collected from the monitoring well. Field activities were undertaken in general conformance with the Project Operations Plan (ABB-ES, 1994b).

The groundwater sample was analyzed for the full CLP suite of TCL organics and TAL inorganics. A site plan indicating the location of the monitoring well and



**FIGURE 1**  
**FACILITY 312LS**  
**SAMPLE LOCATION PLAN**



**SAMPLING AND ANALYSIS REPORT**

**NAVAL AIR STATION CECIL FIELD**  
**JACKSONVILLE, FLORIDA**

surface soil sample is presented on Figure 1. The soil boring log is included in Appendix A.

#### 4.0 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 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, 1995b). Site background information and rationale for sample collection and analysis are detailed in the EBS Report (ABB-ES, 1994a).

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.

4.1 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  $1 \times 10^{-6}$ . 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  $1 \times 10^{-6}$ ). For noncarcinogens, the HQs are summed to determine the cumulative noncancer risk or hazard index (HI).

Eight inorganic analytes were detected in the groundwater sample collected in the study area. Calcium and manganese were the only inorganic analytes detected at concentrations in excess of the NAS Cecil Field screening criteria for inorganics. Calcium is a naturally occurring element in groundwater at NAS Cecil Field, and is also an essential nutrient. There are no RBCs or GCTLs for calcium. Manganese was detected at a concentration of 130 micrograms per liter ( $\mu\text{g}/\ell$ ), which exceeds the FDEP GCTL of 50  $\mu\text{g}/\ell$ . The groundwater monitoring well was subsequently repurged, and filtered and unfiltered groundwater samples were collected and analyzed for manganese to ensure that suspended solids would not influence the analysis. The manganese concentration in both samples was below the NAS Cecil

Field screening criteria for inorganics. No organic compounds were detected in groundwater.

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 compounds or analytes were detected at concentrations in excess of GCTLs. Therefore, no HI or ELCR was calculated in association with a potential groundwater exposure scenario.

**4.2 ECOLOGICAL PRELIMINARY RISK EVALUATION.** Potential exposure pathways and ecological habitat associated with Facility 312LS were characterized by HLA ecological risk assessors in June 1996. Facility 312LS is located within a developed flight line industrial area and is surrounded by maintained grass and pavement.

No exposure pathway from groundwater to surface water was identified in the study area. Therefore, no further ecological risk evaluation for groundwater was conducted.

## **5.0 CONCLUSIONS AND RECOMMENDATIONS**

Analytes detected in groundwater collected downgradient of Facility 312LS do not represent a hazard to human health or the environment at the detected concentrations. No other environmental concerns have been identified for this facility.

Based upon the findings of this evaluation, the color-code for Facility 312LS should be reclassified to 3/Light Green to indicate that inorganic analytes have been detected at concentrations that exceed background data set values, but do not represent a hazard to human health or the environment. No remedial action or further evaluation is recommended. Appropriate site operation and management procedures should be undertaken in order to ensure that current and future site activities do not result in release of hazardous substances to the environment.

## REFERENCES

- ABB Environmental Services, Inc. (ABB-ES). 1994a. *Base Realignment and Closure Environmental Baseline Survey Report, Naval Air Station Cecil Field, Jacksonville, Florida*. Prepared for SOUTHNAVFACENGCOC, North Charleston, South Carolina (November).
- ABB-ES. 1994b. *Project Operations Plan for Cecil Field and Health and Safety Plan*. Prepared for Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOC), North Charleston, South Carolina (December).
- ABB-ES. 1995a. *Sampling and Analysis Outline, Facility 312LS, Base Realignment and Closure, Zone C, Developed Nonindustrial Area, Group VI, Naval Air Station Cecil Field, Jacksonville, Florida*. Prepared for SOUTHNAVFACENGCOC, North Charleston, South Carolina (October).
- ABB-ES. 1995b. Minutes of September 25, 1995, conference call to discuss preliminary risk evaluations.
- Florida Department of Environmental Protection. 1998. *Brownfields Cleanup Criteria Rule: Chapter 62-785, Florida Administrative Code*. Tallahassee, Florida.
- Harding Lawson Associates. 1998. *Contamination Assessment Plan, Base Realignment and Closure, Oil-Water Separator and Miscellaneous Tank Sites, Naval Air Station Cecil Field, Jacksonville, Florida*. Prepared for SOUTHNAVFACENGCOC, North Charleston, South Carolina (August).
- Hoaglin, D.C., F. Mosteller, and J.W. Tukey. 1983. *Understanding Robust and Exploratory Data Analysis*. New York: John Wiley and Sons, Inc.
- U.S. Environmental Protection Agency (USEPA). 1994. Memorandum from USEPA Region IV. Subject: "Amended Guidance on Preliminary Risk Evaluations (PREs) for the Purpose of Reaching a Finding of Suitability to Lease (FOSL)." Atlanta, Georgia (December 20).
- USEPA. 1995. *Supplemental Guidance to RAGS. Region IV bulletins*. USEPA Region IV Waste Management Division. Atlanta, Georgia.
- 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-312-LS-1S	BORING NO. CEF-312-LS-1S
CLIENT: SOUTHDIVNAVFACENCOM		PROJECT NO: 02523-28	
CONTRACTOR: Custom Drilling		DATE STARTED: 12-3-97	COMPLTD: 12-3-97
METHOD: Hollow Stem Auger	CASE SIZE: 2"	SCREEN INT.: 6-16	PROTECTION LEVEL: .010 in.
TOC ELEV.: FT.	MONITOR INST.: PID	TOT DPTH: 16FT.	DPTH TO $\nabla$ 8 FT.
LOGGED BY: R. Holloway	WELL DEVELOPMENT DATE:		SITE: Facility 312 LS

DEPTH F.T.	LABORATORY SAMPLE ID.	RECOVERY SAMPLE	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
1			0	SILTY SAND: light to dark gray, fine- to very fine- grained, sub-rounded to sub-angular		SM		posthole
2								
3			0					posthole
4								
5			0	CLAYEY SAND: reddish yellow, very fine-grained, sub- rounded to sub-angular, iron oxide staining on clay		SC	4,5,7,6	
6								
7			0				6,6,6,6	
8								
9			0				6,4,3,4	$\nabla$
10								
11			0	SILTY SAND: yellowish brown, fine-to very fine-grained, sub-rounded to sub-angular, wet		SM	3,2,1,2	
12								
13			0				2,4,3,1	
14								
15			0				1,1,2,1	
16								
17								
18								
19								
20								

TD = 16' bis

**Preliminary Human Health Risk Evaluation Table for Analytes Detected in Groundwater  
Facility 312LS, Naval Air Station Cecil Field**

Analyte <sup>1</sup>	CF312MW1S	99G00102	Screening Values			Calculated Risk Values <sup>2</sup>	
			BKGRD	GCTL	RBC(T)	ELCR	HQ
<b>Inorganic Analytes</b>							
*Aluminum	320		13100	200	37000	n	
*Antimony	8		44.5	6	15	n	
*Calcium	94000		81100				
*Iron	1200		7760	300	11000	n	
Magnesium	3400		10000				
*Manganese	130	46	96.2	50	840	n	
Manganese (Dissolved)		47					
Potassium	1700		4330				
Sodium	2000		16500	160000			

**Notes:**

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

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

\*= Background screening criteria or GCTLs 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

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 312LS  
GROUNDWATER -- ANALYTICAL DATA -- REPORT REQUEST NO. 10523

Lab Sample Number: B7C2801180  
Site: BRACGREY  
Locator: CEF3121S  
Collect Date: 27-MAR-97

VALUE QUAL UNITS DL

BRAC VOLATILES

1,1,1-Trichloroethane	1 U	ug/l	1
1,1,2,2-Tetrachloroethane	1 U	ug/l	1
1,1,2-Trichloroethane	1 U	ug/l	1
1,1-Dichloroethane	1 U	ug/l	1
1,1-Dichloroethene	1 U	ug/l	1
1,2-Dichlorobenzene	10 U	ug/l	10
1,2-Dichloroethane	1 U	ug/l	1
1,2-Dichloropropane	1 U	ug/l	1
1,3-Dichlorobenzene	1 U	ug/l	1
1,4-Dichlorobenzene	10 U	ug/l	10
Benzene	1 U	ug/l	1
Bromodichloromethane	1 U	ug/l	1
Bromoform	1 U	ug/l	1
Bromomethane	1 U	ug/l	1
Carbon tetrachloride	1 U	ug/l	1
Chlorobenzene	1 U	ug/l	1
Chloroethane	1 U	ug/l	1
Chloroform	1 U	ug/l	1
Chloromethane	1 U	ug/l	1
Dibromochloromethane	1 U	ug/l	1
Ethyl benzene	1 U	ug/l	1
Methyl chloride	1 U	ug/l	1
Tetrachloroethene	1 U	ug/l	1
Toluene	1 U	ug/l	1
Trichloroethene	1 U	ug/l	1
Vinyl chloride	1 U	ug/l	1
cis-1,3-Dichloropropene	1 U	ug/l	1
Xylenes (total)	1 U	ug/l	1
trans-1,2-Dichloroethene	1 U	ug/l	1
trans-1,3-Dichloropropene	1 U	ug/l	1

BRAC SEMIVOLATILES

Phenol	10 U	ug/l	10
bis(2-Chloroethyl) ether	10 U	ug/l	10
1,3-Dichlorobenzene	1 U	ug/l	1
1,4-Dichlorobenzene	10 U	ug/l	10
1,2-Dichlorobenzene	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	2 U	ug/l	2
Hexachlorobutadiene	10 U	ug/l	10
4-Chloro-3-methylphenol	10 U	ug/l	10
2-Methylnaphthalene	2 U	ug/l	2

NAS CECIL FIELD -- FACILITY 312LS  
 GROUNDWATER -- ANALYTICAL DATA -- REPORT REQUEST NO. 10523

Lab Sample Number: B7C2801180  
 Site: BRACGREY  
 Locator: CEF3121S  
 Collect Date: 27-MAR-97

VALUE QUAL UNITS DL

2,4,6-Trichlorophenol	10 U	ug/l	10
2-Chloronaphthalene	10 U	ug/l	10
Dimethylphthalate	10 U	ug/l	10
Acenaphthylene	2 U	ug/l	2
2,4-Dinitrophenol	50 U	ug/l	50
4-Nitrophenol	50 U	ug/l	50
2,4-Dinitrotoluene	10 U	ug/l	10
Diethylphthalate	10 U	ug/l	10
4-Chlorophenyl-phenylether	10 U	ug/l	10
Fluorene	2 U	ug/l	2
4,6-Dinitro-2-methylphenol	50 U	ug/l	50
4-Bromophenyl-phenylether	10 U	ug/l	10
Hexachlorobenzene	10 U	ug/l	10
Pentachlorophenol	50 U	ug/l	50
Phenanthrene	2 U	ug/l	2
Anthracene	2 U	ug/l	2
Di-n-butylphthalate	10 U	ug/l	10
Fluoranthene	.2 U	ug/l	.2
Pyrene	.2 U	ug/l	.2
3,3-Dichlorobenzidine	50 U	ug/l	50
Benzo (a) anthracene	.1 U	ug/l	.1
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	.1 U	ug/l	.1
Benzo (k) fluoranthene	.15 U	ug/l	.15
Benzo (a) pyrene	.1 U	ug/l	.1
Indeno (1,2,3-cd) pyrene	.1 U	ug/l	.1
Dibenzo (a,h) anthracene	.2 U	ug/l	.2
Benzo (g,h,i) perylene	.2 U	ug/l	.2
Arsenic	5 U	ug/l	5
Cadmium	5 U	ug/l	5
Chromium	50 U	ug/l	50
Lead	5 U	ug/l	5
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

NAS CECIL FIELD -- FACILITY 312LS  
GROUNDWATER -- ANALYTICAL DATA -- REPORT REQUEST NO. 10522

Lab Sample Number: JR38618  
Site: BRAC  
Locator: 99G00102  
Collect Date: 28-OCT-98

VALUE QUAL UNITS DL

Manganese	.046	mg/l	.01
Manganese-DISS	.047	mg/l	.01

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