

N60200.AR.004033
NAS CECIL FIELD, FL
5090.3a

THIRD QUARTER 2004 OPERATION AND MAINTENANCE STATUS REPORT FOR
NUTRIENT INJECTION SYSTEM AT BUILDING 9 FORMER TANKS 9L1 AND 9L2 NAS CECIL
FIELD FL
12/1/2004
TERRAINE INC ENVIRONMENTAL SERVICES

**THIRD QUARTER 2004
Operation and Maintenance Status
Report**

July 1, 2004 – September 30, 2004

**NUTRIENT INJECTION SYSTEM
BUILDING 9**

Former Tanks 9L1 and 9L2

**Naval Air Station Cecil Field
Jacksonville, Florida**

**Contract No. N62467-02-G-0352
Contract Task Order No. 0001**

Submitted to:

**U.S. Naval Facilities
Engineering Command
Southern Division**

Prepared by:

Terraine, Inc.

2656 NW 97th Ave. Miami, FL 33172

December 2004

SIGNATURE PAGE

We, James L. Young and Karen L. Baer, do hereby affirm that the information contained in this report is accurate and correct to the best of our knowledge and belief.

James L. Young, P.G., REM President/CEO TERRAINE, Inc.	Date	<u>PG-FL2090, REM-6089</u> Registration Nos.
--------------------------------------------------------------	------	-------------------------------------------------



Karen L. Baer Field Superintendent TERRAINE, Inc.	Date
---------------------------------------------------------	------

TABLE OF CONTENTS

Signature Page i
 Table of Contents..... ii
 Acronyms iv
 Executive Summary v
 Scope v
 Conclusion/Recommendations..... v
 1.0. Introduction 1
 1.1 Purpose 1
 1.2 Site Location and Description..... 1
 2.0 Investigation and Methodology Summary 2
 2.1 System Performance Monitoring 2
 2.2 Summary of Maintenance 2
 2.3 Water Level Measurements 2
 2.4 Groundwater Sampling..... 2
 2.4.1 Methodology 2
 2.4.2 Chemical Analysis Suite 2
 2.5 Soil Sampling 3
 2.4.2 Chemical Analysis Suite 3
 2.6 Investigative Derived Waste..... 3
 3.0 Summary of Sampling and Laboratory Analytical Results 4
 3.1 Data Validation 4
 3.2 Groundwater Monitoring..... 4
 3.2.1 BTEX/MTBE 4
 3.2.2 PAHs 4
 3.2.3 TRPH..... 4
 3.2.4 OVA..... 4
 4.0 Conclusions and Recommendations..... 5
 5.0 References 6

Appendix A - Figures

Site Location Map, Building 9..... Figure 1
 Site Map, Building 9 Figure 2

Appendix B - Tables

Groundwater Monitoring Well—Water Level and Free Product Data Table 1
 Monitoring Well Field Measurements..... Table 2
 Groundwater Analytical Results Table 3
 Soil Analytical Results..... Table 4

Appendix C

Groundwater Sampling Logs.....

Appendix D

Post Active Remediation Monitoring Plan Approval Order.....

ACRONYMS

BGS	Below ground surface
BOA	Blanket Ordering Agreement
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
°C	Degrees Celsius
CTO	Contract Task Order
DO	Dissolved Oxygen
EPA	U.S. Environmental Protection Agency
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FID	Flame Ionization Detector
FL PRO	Florida Petroleum Residual Organic
Ft.	Feet
Gal/min.	Gallons per minute
GCTL	Groundwater Cleanup Target Levels
IDW	Investigation Derived Waste
LNAPL	Light Non-Aqueous Phase Liquid
μS/cm	Microsiemens per centimeter
mg/kg	Milligrams per kilogram
mg/L	milligrams per liter
mS/cm	Millisiemens per centimeter
MTBE	Methyl-tert-butyl-ether
mV	millivolts
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Command
ND	Non Detect
NGVD	National Geodetic Vertical Datum
NM	Not measured
NR	Not recorded
NS	Not sampled
NTU	Nephelometric Turbidity Units
O&M	Operation and Maintenance
ORP	Oxidation Reduction Potential
OVA	Organic Vapor Analyzer
PAHs	Polynuclear Aromatic Hydrocarbons
SCTL	Soil Cleanup Target Level
TERRAINE	Terraine, Inc.
TRPH	Total Recoverable Petroleum Hydrocarbons

EXECUTIVE SUMMARY

SCOPE

The objective of the remedial action at the Building 9 site was to reduce the concentrations of petroleum-related contaminants in the groundwater and unsaturated soils to target levels specified by Florida Administrative Code (FAC) 62-777. Nutrient injection, using the *PHOSter Nutrient Injection System*, was the technology being used to achieve this objective.

Due to the substantial reduction of contaminant concentrations in wells within the area of influence of the nutrient injection system, the Florida Department of Environmental Protection (FDEP) approved deactivating the remediation system on approximately October 15, 2004 and a Post Active Remediation Monitoring Plan Approval Order was issued on October 18, 2004. In accordance with this order, the nutrient injection system was shut off on November 1, 2004 and Post Active Remediation Monitoring will begin in December, 2004.

The purpose of this quarterly O&M Report is to provide a summary of activities performed at the site during the period of July 1, 2004 to September 30, 2004.

CONCLUSIONS AND RECOMMENDATIONS

Based on laboratory analytical results to date, it is concluded that nutrient injection was an effective remediation technology to enhance the biodegradation of contaminants such as BTEX, naphthalene, and TRPH at the Building 9 site.

The following is recommended for the site as outlined in the FDEP Post Active Remediation Monitoring Plan Approval Order Letter:

- Sample groundwater from CEF-9-2S, CEF-9-3S, CEF-9-5S, CEF-9-7D, and CEF-9-9S for BTEX, PAHs, and TRPH on a quarterly basis for a period of one (1) year.

OPERATIONS AND MAINTENANCE STATUS REPORT

BUILDING 9

NAVAL AIR STATION, CECIL FIELD

JACKSONVILLE, FLORIDA

SEPTEMBER 2004

<i>PREPARED FOR:</i>	Mr. Nick Ugolini - SOUTHDIV
<i>PREPARED BY:</i>	TERRAINE, Inc.
<i>PERIOD OF PERFORMANCE:</i>	July 1, 2004 – September 30, 2004
<i>FIELD TEAM:</i>	Karen Baer, Larry Wolski
<i>CONTRACT NUMBER:</i>	N62467-02-G-0352
<i>TASK ORDER NUMBER:</i>	0001
<i>TASK ORDER MANAGER:</i>	James L. Young, P.G.; REM
<i>SUBMITTAL DATE:</i>	December 2004

1.0 INTRODUCTION

Terraine, Inc. (TERRAINE) has been contracted by the Department of the Navy, Southern Division Naval Facilities Engineering Command (Southern Division, NAVFAC), to provide Operation and Maintenance (O&M) services at Building 9, Naval Air Station (NAS) Cecil Field, Jacksonville, Florida, under the **Basic Ordering Agreement (BOA) No. N62467-02-G-0352, Contract Task Order (CTO) No. 0001**. The purpose of this Third Quarter 2004 O&M Report is to provide a summary of activities performed at the site during the period of July 1, 2004 to September 30, 2004.

1.1 Purpose

The objective of the remedial action at the Building 9 site was to reduce the concentrations of petroleum-related contaminants in the groundwater and unsaturated soils to target levels specified by Florida Administrative Code (FAC) 62-777. Nutrient injection, using the *PHOSter Nutrient Injection System*, was the technology being used to achieve this objective. A system description and a site background and history summary are included in the First Quarter 2004 Operations and Maintenance Status Report submitted by TERRAINE.

Due to the substantial reduction of contaminant concentrations in wells within the area of influence of the nutrient injection system, the Florida Department of Environmental Protection (FDEP) approved deactivating the remediation system on approximately October 15, 2004. The system was shut off on November 1, 2004.

1.2 Site Location and Description

A base map illustrating the site location at NAS Cecil Field is included in **Figure 1, Appendix A**. A site map is included in **Figure 2, Appendix A**.

2.0 INVESTIGATION AND METHODOLOGY SUMMARY

2.1 System Performance Monitoring

The system was shut down for monthly system checks on July 19, August 23, and September 21, 2004. Otherwise, the system did not experience any downtime.

2.2 Summary of Maintenance

One (1) nitrous oxide cylinder was replaced on July 19, August 23, and September 21, 2004.

2.3 Water Level Measurements

Depth-to-water measurements were recorded on September 20, 2004 at the monitoring wells which were sampled which included CEF-9-2S, CEF-9-3S, CEF-9-5S, CEF-9-7D, and CEF-9-9S. The top-of-casing elevation, depth-to-water measurements, and calculated water level elevations are provided in **Table 1, Appendix B**. The locations of the wells are shown on **Figure 2, Appendix A**.

Light Non-Aqueous Phase Liquid (LNAPL) was not noted in any monitoring well during the monitoring period.

2.4 Groundwater Sampling

2.4.1 Methodology

Groundwater sampling was conducted at Building 9 on September 20, 2004. Five (5) wells (CEF-9-2S, CEF-9-3S, CEF-9-5S, CEF-9-7D, and CEF-9-9S) were purged and sampled using the low-flow methodology. Purging of wells consisted of removing groundwater with a Nomad[®] submersible pump at a flow rate of approximately 100 mL/min until field parameters (temperature, pH, conductivity, turbidity, Dissolved Oxygen (DO) and Oxidation Reduction Potential (ORP) had stabilized. Water levels in the 2-inch wells were continuously monitored to maintain drawdown at less than 0.3 feet.

Field analytical tests using Hach[®] kits were performed during the 3rd Quarter 2004 sampling event. Groundwater from each of the five monitoring wells was tested for carbon dioxide, alkalinity, ferrous iron, and hydrogen sulfide.

The results from the field parameters and field analytical tests are summarized on **Table 2, Appendix B**. Copies of the groundwater purging/sampling logs including all field parameter measurements are provided in **Appendix C**.

2.4.2 Chemical Analysis Suite

Groundwater samples from the monitoring wells were laboratory analyzed for the following analyte suite:

- Benzene, Ethylbenzene, Toluene, and Xylenes (BTEX) and Methyl-Tert-Butyl-Ether (MTBE) by U.S. Environmental Protection Agency (EPA) Method 8260B.
- Polynuclear Aromatic Hydrocarbons (PAHs) by EPA Method 8270C.
- Total Recoverable Petroleum Hydrocarbons (TRPH) by Florida Petroleum Residual Organic (FL-PRO).
- Nitrate, Nitrite, and Orthophosphate by EPA series 300.0.

2.5 Soil Sampling

2.5.1 Methodology

Quarterly soil-screening and sampling was conducted on September 20, 2004 during the monitoring period. One soil boring, labeled SB-4, was installed in the vicinity of ground water monitoring well (CEF-9-9S). The location of SB-4 is shown in **Figure 2, Appendix A**. The soil was screened using an Organic Vapor Analyzer (OVA) equipped with a Flame Ionization Detector (FID) and a sample was collected for laboratory analysis on September 20, 2004. The water table was encountered 6 feet below land surface.

2.5.2 Chemical Analysis Suite

Soil collected from soil boring SB-4 was laboratory analyzed for the following analyte suite:

- BTEX and MTBE by U.S. Environmental Protection Agency (EPA) Method 8260B
- PAHs by EPA Method 8270C
- TRPH by Florida Petroleum Residual Organic (FL-PRO)

2.6 Investigative Derived Waste

Purge water collected from the monitoring wells was collected and containerized. All investigative derived waste (IDW) was stored on site in 55-gallon drums and transported to Industrial Water Services in Jacksonville, Florida by Environmental Remediation Services on September 22, 2004.

3.0 SUMMARY OF SAMPLING AND LABORATORY ANALYTICAL RESULTS

3.1 Data Validation

A cursory review of quality control data was performed. This review evaluated data completeness, holding time compliance, laboratory blank contamination, and detection limits. The validation process results in qualifiers that are shown with the analyte concentrations in **Tables 3 and 4, Appendix B**. Due to nitrate detections in the equipment blank, nitrate data from groundwater sampled from monitoring wells CEF-9-2S, CEF-9-3S, and CEF-9-9S were rejected.

3.2 Groundwater Monitoring

3.2.1 BTEX/MTBE

BTEX and MTBE were not detected in groundwater sampled during the 3rd Quarter Sampling Event.

3.2.2 PAHs

PAHs were not detected in groundwater samples collected from monitoring wells on September 20, 2004.

3.2.3 TRPH

TRPH was detected in groundwater sampled from one (1) well (CEF-9-3S, 470 µg/L). This concentration is less than the Groundwater Cleanup Target Level (GCTL) of 5000 µg/L per Chapter 62-777.

3.2.4 Nitrite/Orthophosphate

Nitrite was detected in groundwater sampled from monitoring wells CEF-9-2S and CEF-9-3S. Orthophosphate was detected in groundwater from all wells sampled.

Groundwater analytical results are summarized in **Table 3, Appendix B**.

3.3 Soil Monitoring

3.3.1 BTEX/MTBE

BTEX and MTBE were not detected in soil collected from soil boring SB-4 during the 3rd Quarter Sampling Event.

3.3.2 PAHs

PAHs were not detected in soil collected from soil boring SB-4 during the 3rd Quarter Sampling Event.

3.3.3 TRPH

TRPH was not detected in soil collected from soil boring SB-4 during the 3rd Quarter Sampling Event. Soil analytical results are summarized in **Table 4, Appendix B**.

3.3.4 OVA

OVA readings, taken at two, four, and six feet below land surface (bls) from soil boring SB-4 indicated no detection of organic vapors.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Laboratory analysis of the soil sample collected from soil boring SB-04 indicated that all contaminant concentrations were below the Leachability and Direct Exposure Residential Soil Cleanup Target Levels (SCTL).

Second quarter 2004 analytical laboratory results indicate that contaminant concentrations in groundwater sampled from all monitoring wells were below the applicable GCTLs. LNAPL was not noted in any monitoring well during the monitoring period.

Based on these results, it is concluded that nutrient injection was an effective remediation technology to enhance the biodegradation of contaminants such as BTEX, naphthalene, and TRPH at the Building 9 site.

The following is recommended for the site as outlined in the FDEP Post Active Remediation Monitoring Plan Approval Order Letter dated October 18, 2004 included in **Appendix D**:

- Sample groundwater from CEF-9-2S, CEF-9-3S, CEF-9-5S, CEF-9-7D, and CEF-9-9S for BTEX, PAHs, and TRPH on a quarterly basis for a period of one (1) year.

5.0 REFERENCES

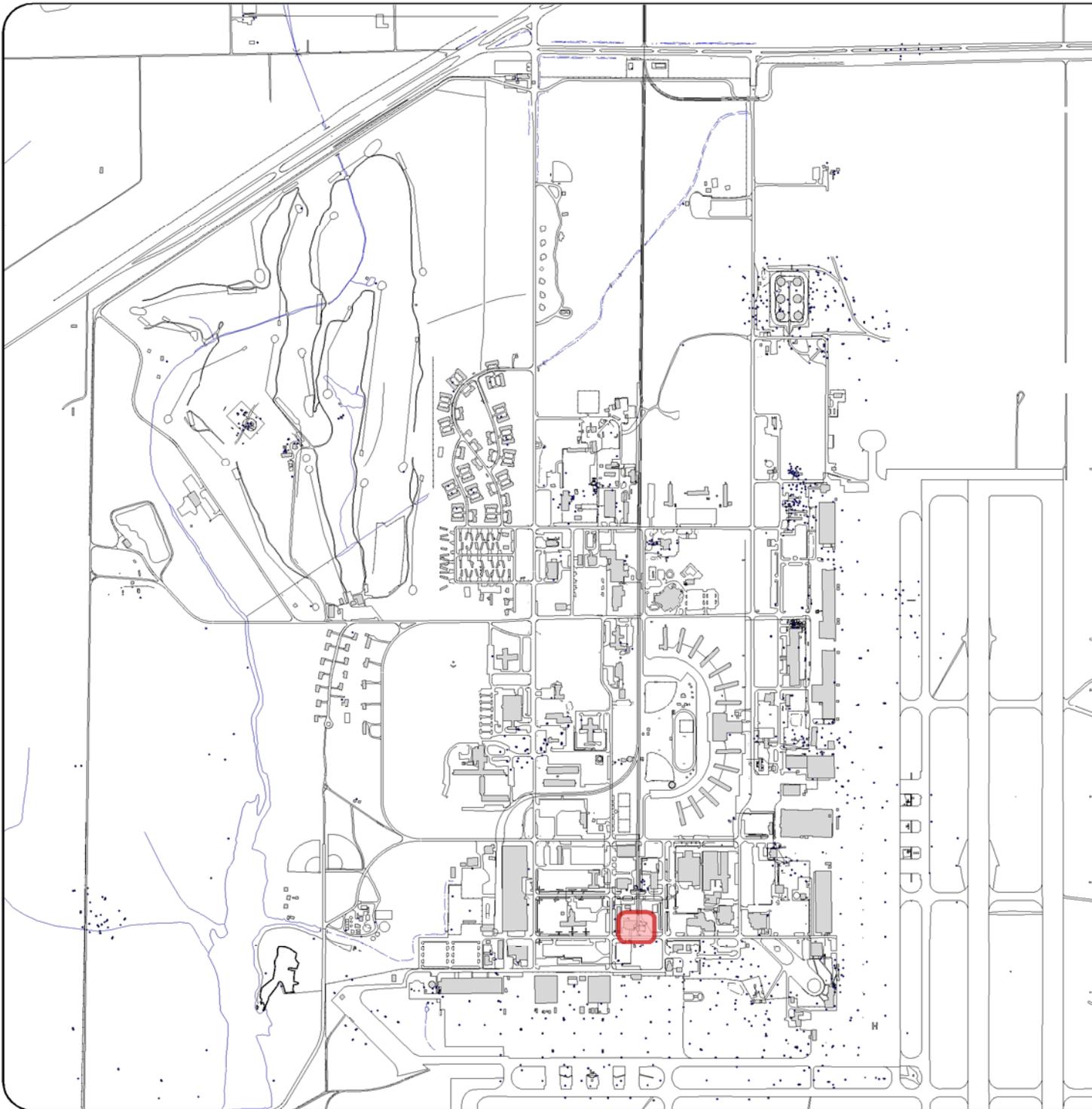
Terraine, Inc. First Quarter 2004 Operation and Maintenance Status Report, Nutrient Injection System, Building 9, Naval Air Station Cecil Field, Jacksonville, Florida.

APPENDIX A

FIGURES

Figure 1 *Site Location Map, Building 9*

Figure 2 *Site Map, Building 9*



NOTES

Sources: Environmental IR Gateway (www.sdirport.com)

LEGEND

 APPROXIMATE SITE BOUNDARY

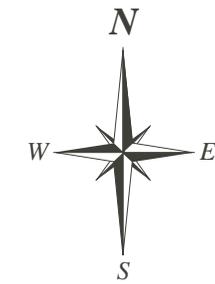
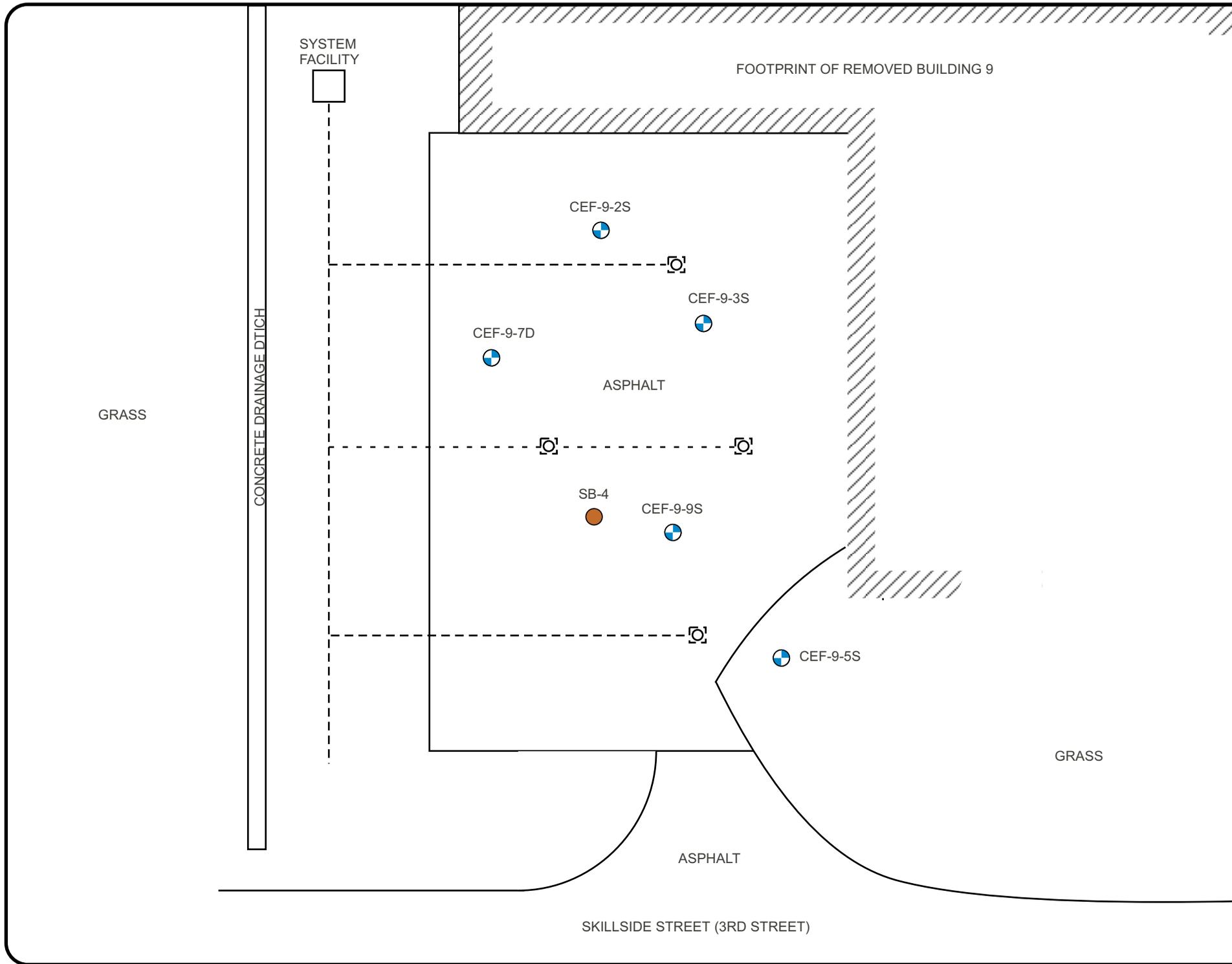
0  0.25 0.5
APPROXIMATE SCALE IN MILES



**NAS CECIL FIELD
FIGURE 1: SITE LOCATION MAP
BUILDING 9**

Prepared For:
U.S. Naval Facilities Engineering
Command, Southern Division

DWN BY: LFW	CHK BY: KBG
SCALE: SEE LEGEND	APR BY: JLY
DATE: 10/12/04	FILE: N/A



NOTES

DASHED LINE INDICATES SUBSURFACE FEATURES

LEGEND

- INJECTION LINE
-  INJECTION WELL
-  MONITORING WELL
-  SOIL BORING



**NAS CECIL FIELD
FIGURE 2: SITE MAP
BUILDING 9**

Prepared For:
U.S. Naval Facilities Engineering
Command, Southern Division

DWN BY: KLB	CHK BY:
SCALE: MAP NOT TO SCALE	APR BY: JLY
DATE: 08-24-2004	FILE: 04-41001

APPENDIX B

TABLES

Table 1 *Groundwater Monitoring Well – Water and Free Product Data*

Table 2 *Monitoring Well Field Measurements*

Table 3 *Groundwater Analytical Results*

Table 4 *Soil Analytical Results*

TABLE 1
GROUNDWATER MONITORING WELL - WATER LEVEL & FREE PRODUCT DATA

BUILDING 9 NUTRIENT INJECTION SYSTEM
 NAS CECIL FIELD
 JACKSONVILLE, FLORIDA

Well Identification	Well Total Depth (feet bgs)	Date	Top of Casing Elevation (Feet)	Depth to Product (Feet)	Depth to Water (Feet)	Water Level Elevation (Feet)
CEF-9-2S	14.45	12/18/2000	78.74	no product	7.93	70.81
		3/13/2003		no product	4.18	74.56
		6/9/2003		no product	5.35	73.39
		9/2/2003		no product	4.57	74.17
		12/10/2003		no product	7.88	70.86
		3/16/2004		no product	8.63	70.11
		6/9/2004		no product	10.11	68.63
		9/20/2004		no product	7.55	71.19
CEF-9-3S	15.54	12/18/2000	78.81	no product	8.04	70.77
		3/13/2003		no product	4.28	74.53
		6/9/2003		no product	5.30	73.51
		9/2/2003		no product	4.74	74.07
		12/10/2003		no product	8.02	70.79
		3/16/2004		no product	8.94	69.87
		6/9/2004		no product	10.08	68.73
		9/20/2004		no product	7.42	71.39
CEF-9-5S	13.72	12/18/2000	78.93	no product	8.34	70.59
		3/13/2003		no product	4.57	74.36
		6/9/2003		no product	5.50	73.43
		9/2/2003		no product	5.10	73.83
		12/10/2003		no product	8.35	70.58
		3/16/2004		no product	9.10	69.83
		6/9/2004		no product	10.10	68.83
		9/20/2004		no product	7.20	71.73
CEF-9-7D	29.23	12/18/2000	78.59	no product	7.83	70.76
		3/13/2003		no product	4.05	74.54
		6/9/2003		no product	4.90	73.69
		9/2/2003		no product	4.82	73.77
		12/10/2003		no product	7.80	70.79
		3/16/2004		no product	8.64	69.95
		6/9/2004		no product	10.00	68.59
		9/20/2004		no product	7.50	71.09
CEF-9-9S	14.23	12/18/2000	78.89	no product	8.39	70.50
		3/13/2003		no product	4.34	74.55
		6/9/2003		no product	5.40	73.49
		9/2/2003		no product	4.94	73.95
		12/10/2003		no product	8.12	70.77
		3/16/2004		no product	9.02	69.87
		6/9/2004		no product	10.26	68.63
		9/20/2004		no product	7.33	71.56

BGS = below ground surface

Elevation is referenced to National Geodetic Vertical Datum 1929 (NGVD 1929)

Depth to product measured from top of casing

Depth to water measured from top of casing

TABLE 2
GROUNDWATER FIELD ANALYTICAL RESULTS

BUILDING 9 NUTRIENT INJECTION SYSTEM
NAS CECIL FIELD
JACKSONVILLE, FLORIDA

	Date	pH	Conductivity (mS/cm)	Temperature (°C)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	Carbon Dioxide (mg/L)	Alkalinity as CaCO ₃ (mg/L)	Ferrous Iron (mg/L)	Hydrogen Sulfide (mg/L)
CEF-9-2S	12/18/2000	6.19	0.192	27.20	0.0	NA	NR	80	1.2	0.3
	3/13/2003	6.48	0.148	22.2	0.4	-73.00	117	40	1.4	0.3
	6/9/2003	6.46	0.23	26.14	4.65	NM	181	25	ND	ND
	9/2/2003	6.40	0.43	29.56	6.71	54.00	80	30	ND	0.1
	12/10/2003	5.70	0.24	24.68	3.93	-208.00	168	20	ND	0.1
	3/16/2004	5.88	0.149	22.90	4.40	NM	80	30	ND	ND
	6/9/2004	5.91	0.186	26.14	0.81	38.40	108	0.8	45	0.3
	9/20/2004	5.78	0.407	28.11	0.18	99.70	88	40	0.2	0.1
CEF-9-3S	12/18/2000	6.49	0.348	25.40	0.0	NA	17	160	3.4	0.5
	3/13/2003	6.32	0.206	22.4	1.1	-29.00	64	20	1.0	0.3
	6/9/2003	6.07	0.187	26.68	2.32	24.00	124	10	ND	ND
	9/2/2003	6.00	0.537	28.78	1.98	117.00	74	35	ND	ND
	12/10/2003	5.36	0.112	25.40	1.66	-250.00	43	15	ND	0.1
	3/16/2004	4.76	0.999	22.09	0.00	293.00	26	ND	0.2	ND
	6/9/2004	5.39	0.436	26.99	0.24	214.80	26	5	ND	ND
	9/20/2004	6.02	0.644	28.60	0.13	58.10	50	35	ND	ND
CEF-9-5S	12/18/2000	6.20	0.186	22.70	0.0	NA	10	100	ND	0.1
	3/13/2003	3.93	0.277	20.36	5.44	256.00	68	140	ND	ND
	6/9/2003	6.52	0.138	24.91	0.0	-20.00	122	40	2.0	ND
	9/2/2003	5.96	0.354	28.02	1.7	-35.00	68	85	ND	ND
	12/10/2003	6.30	0.385	24.65	0.0	166.00	42	40	0.1	ND
	3/16/2004	6.01	0.318	20.97	0.0	158.00	30	15	ND	ND
	6/9/2004	5.48	0.139	24.32	0.5	133.00	52	20	0.4	ND
	9/20/2004	5.16	0.249	26.27	1.7	134.00	84	35	ND	ND
CEF-9-7D	12/18/2000	7.45	0.264	25.20	0.1	NA	8	85	ND	0.1
	3/13/2003	3.90	0.043	23.92	2.20	349.00	115	15	0.2	ND
	6/9/2003	5.07	0.041	24.43	0	5.00	118	10	0.2	ND
	9/2/2003	4.71	0.125	26.37	0.14	158.00	152	ND	0.6	ND
	12/10/2003	4.89	0.145	24.41	0.00	220.00	104	5	0.8	ND
	3/16/2004	5.11	0.729	24.3	5.20	NM	130	10	0.4	ND
	6/9/2004	4.52	0.87	24.82	0.01	208.00	120	5	0.4	ND
	9/20/2004	6.34	0.171	25.81	0.00	-77.00	90	40	1.4	ND
CEF-9-9S	12/18/2001	5.31	0.121	26.30	0.0	NA	NR	NR	NR	NR
	3/13/2003	5.81	0.205	22.5	0.3	-14.00	53	10	1.0	0.5
	6/9/2003	4.88	0.259	25.81	0.00	-33.00	242	5	ND	ND
	9/2/2003	3.85	0.787	28.93	1.52	292.00	54	ND	ND	ND
	12/10/2003	4.49	0.79	25.42	0.79	-218.00	62	10	0.2	0.5
	3/16/2004	4.63	0.999	22.13	0.00	246.00	59	ND	0.8	ND
	6/9/2004	4.75	0.346	26.53	0.25	276.30	47	10	0.4	0.1
	9/20/2004	4.69	0.252	28.32	0.07	33.20	41	15	0.5	ND

NA = Not available
 NM =Not Measured
 NR = No Reading
 ND = Non Detect

TABLE 3
GROUNDWATER ANALYTICAL RESULTS

BUILDING 9 NUTRIENT INJECTION SYSTEM
NAS CECIL FIELD
JACKSONVILLE, FLORIDA

Well Identification	Sample Date	Benzene	Ethyl Benzene	Toluene	Xylene	BETX	Methyl tert-butyl ether	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo (a) anthracene	Chrysene	Benzo (b) fluoranthene	Benzo (k) fluoranthene	Benzo (e) pyrene	Indeno (1, 2, 3-cd) pyrene	Dibenzo (a,h) anthracene	1-Methylnaphthalene	2-Methylnaphthalene	Benzo (g,h,i) perylene	Nitrate	Nitrite	Phosphate	TRPH			
CEF-9-2S	12/18/2000	<1.0	6.9	<1.0	1.7	8.6	NA	1.4	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	-	-	<0.20	<0.60	<0.40	<1.0	<530			
	3/13/2003	2.80	40.5	2.5	37.4	83.2	<1.0	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	-	-	<2.4	<0.100	<0.100	<0.100	2620			
	6/9/2003	<1.0	1.3	<1.0	2	3.3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.12	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<1.0	<1.0	<1.0	2.94	<0.10	<0.100	994			
	9/2/2003	<1.00	<1.0	<1.0	<1.0	<1.0	<1.0	0.22	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	4.07	<0.10	<0.10	<200		
	12/10/2003	<1.00	<1.0	<1.0	<3.0	<1.0	<1.0	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.100	0.25	<0.100	<250			
	3/16/2004	<1.00	<1.0	<1.0	<3.0	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.100	<0.100	<0.10	205			
	9/20/2004	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.17	<5.43	<2.17	<1.09	<5.43	<1.09	<1.09	<5.43	<0.217	<2.17	<0.217	<0.217	<0.217	<0.217	<0.217	<0.217	<0.217	<0.217	<0.020	<0.005	0.021 ?	680		
CEF-9-3S	12/18/2000	18	130	8.9	170	326.9	NA	29	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	-	-	<0.20	<0.60	<0.40	<1.0	1500				
	3/13/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	-	-	<2.5	<0.100	<0.100	<0.100	385			
	6/9/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.11	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<1.0	<1.0	<1.0	<1.0	2.15	<0.10	<0.10	894			
	9/2/2003	<1.00	<1.0	<1.0	<1.0	<1.0	<1.0	0.22	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	8.18	<0.1	<0.1	552		
	12/10/2003	<1.00	<1.0	<1.0	<1.0	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	29.8	0.12	<0.1	520 B			
	3/16/2004	<1.00	<1.0	<1.0	<3.0	<1.0	<1.0	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	22.0	<0.30	<0.100	<100		
	9/20/2004	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.04	<5.10	<2.04	<2.04	<5.10	<1.02	<1.02	<5.10	<0.204	<2.04	<0.204	<0.204	<0.204	<0.204	<0.204	<0.204	<2.04	<2.04	<2.04	11.5	0.082	0.008?	220		
CEF-9-5S	12/18/2000	<1.0	<1.0	<1.0	0.52	0.52	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	-	-	<0.20	0.09	<0.40	<1.0	<530				
	3/13/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	-	-	<2.5	<0.100	<0.100	<0.100	<211			
	6/9/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.11	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<1.0	<1.0	<1.0	<1.0	0.13	<0.10	<0.100	<222			
	9/2/2003	<1.00	<1.0	<1.0	<1.0	<1.0	<1.0	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<200			
	12/10/2003	<1.00	<1.0	<1.0	<1.0	<1.0	<1.0	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<200			
	3/16/2004	<1.00	<1.0	<1.0	<3.0	<1.0	<1.0	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	0.69	<0.10	<0.100	<111			
	9/20/2004	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.04	<5.10	<2.04	<2.04	<5.10	<1.02	<1.02	<5.10	<0.204	<2.04	<0.204	<0.204	<0.204	<0.204	<0.204	<2.04	<2.04	<2.04	0.04	<0.005	0.011?	<200			
CEF-9-7D	12/18/2000	<1.0	<1.0	<1.0	<1.0	<4.0	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	-	-	<0.20	0.30	<0.40	<1.0	<500				
	3/13/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	-	-	<2.4	<0.100	<0.100	<0.100	<211			
	6/9/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.12	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<1.0	<1.0	<1.0	<1.0	0.13	<0.10	<0.100	<222			
	9/2/2003	<1.00	<1.0	<1.0	<1.0	<1.0	<1.0	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<200			
	12/10/2003	<1.00	<1.0	<1.0	<3.0	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.100	<0.100	<0.100	<200			
	3/16/2004	<1.00	<1.0	<1.0	<3.0	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.100	<0.100	<0.100	<100			
	9/20/2004	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.04	<5.10	<2.04	<2.04	<5.10	<1.02	<1.02	<5.10	<0.204	<2.04	<0.204	<0.204	<0.204	<0.204	<0.204	<2.04	<2.04	<2.04	<2.04	<0.020	<0.005	0.010 ?	<220		
CEF-9-9S	1/18/2001	24	210	99	640	973	<1.0	63	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	-	-	<0.20	<0.60	<0.40	<1.0	2300				
	3/13/2003	<1.0	2.3	<1.0	3.0	5.3	<1.0	11.5	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	-	-	<2.4	1.3	<0.100	<0.100	446				
	6/9/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	11.9	<1.0	<1.0	<1.0	<1.0	<1.0	0.11	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<1.0	<1.0	<1.0	3.63	4.43	<1.0	2.91	<0.10	<0.100	500	
	9/2/2003	<1.00	<1.0	<1.0	<1.0	<1.0	<1.0	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	15.4	<0.1	<0.1	<200			
	12/10/2003	<1.00	<1.0	<1.0	<1.0	<1.0	<1.0	2.73	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	1.27	1.56	<0.10	8.51	<0.1	<0.1	592 B
	3/16/2004	<1.00	<1.0	<1.0	<1.0	<1.0	<1.0	1.86	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	1.09	1.40	<0.11	11.0	<0.30	<0.100	153	
	9/20/2004	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	1.931	<5.49	<2.20	<2.20	<5.49	<1.10	<1.10	<5.49	<0.220	<2.20	<0.220	<0.220	<0.220	<0.220	<0.220	<2.20									

TABLE 4
SOIL ANALYTICAL RESULTS
 BUILDING 9 NUTRIENT INJECTION SYSTEM
 NAS CECIL FIELD
 JACKSONVILLE, FLORIDA

Soil Boring Number	Sample Date	Benzene	Ethyl Benzene	Toluene	Xylene	BTEX	Methyl tert-butyl ether	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo (b) anthracene	Chrysene	Benzo (k) fluoranthene	Benzo (e) fluoranthene	Benzo (a) pyrene	Indeno (1,2,3-cd) pyrene	Benzo (a,h) anthracene	Benzo (g,h,i) perylene	TRPH (mg/kg)	
SB-4	1/4/2001	<0.11	<0.11	0.15	3.2	3.35	<0.11	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.019	0.01185	<0.019	0.05	0.024	0.0121	0.0235	0.014	0.0636	0.0275	220	
	6/27/2001	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
	9/20/2001	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
	12/12/2001	<0.0012	<0.0012	<0.0012	<0.0035	<0.0071	<0.0012	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.021	<0.021	<0.021	0.045	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	1100	
	3/7/2002	<0.0012	<0.0012	<0.0012	<0.0035	<0.0071	<0.0012	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.015	0.01	<0.020	0.027	0.017	0.01	0.029	0.024	0.038	0.03	340	
	6/20/2002	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
	9/28/2002	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
	12/10/2002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.004	<0.0412	<0.0412	<0.0412	<0.00864	<0.0263	<0.0272	<0.00864	<0.0111	<0.00535	<0.00618	<0.0074	<0.00412	<0.0177	<0.0123	<0.0313	17.6	
	3/14/2003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.075	<0.075	<0.075	<0.075	<0.075	<0.075	<0.075	<0.075	<0.075	<0.075	<0.075	<0.075	<0.075	<0.075	<0.075	<0.075	37.6
	6/9/2003	<0.0011	<0.0011	<0.0011	0.0018	0.0018	<0.005	<0.071	<0.071	<0.071	<0.071	<0.071	<0.071	<0.071	<0.071	<0.071	<0.071	<0.071	<0.071	<0.071	<0.071	<0.071	<0.071	<0.071	35.9
	9/4/2003	<0.001	<0.001	<0.001	<0.0009	<0.001	<0.004	<0.0033	<0.0033	<0.0033	<0.0033	<0.0033	<0.0033	<0.0033	<0.0033	<0.0033	<0.0033	<0.0033	<0.0033	<0.0033	<0.0033	<0.0033	<0.0033	<0.0033	11
	12/11/2003	<0.0009	<0.0009	0.001	0.0023	0.0033	<0.005	0.00495	<0.0033	<0.0033	<0.0033	<0.0033	<0.0033	<0.0033	<0.0033	<0.0033	<0.0033	0.00891	<0.0033	<0.0033	0.0119	<0.0033	0.0119	26.6	
	3/18/2004	<0.0012	<0.0012	<0.0012	0.0021	0.0021	<0.006	<0.00406	<0.00406	<0.00406	<0.00406	<0.00406	<0.00406	<0.00406	<0.00406	<0.00406	<0.00406	<0.00406	<0.00406	<0.00406	<0.00406	<0.00406	<0.00406	<0.00406	<12.3
	6/8/2004	<0.00458	<0.00458	<0.00458	<0.00458	<0.00458	<0.00458	<0.0998	<0.0998	<0.0998	<0.0998	<0.0998	<0.0998	<0.0998	<0.0998	<0.0998	<0.0998	<0.0998	<0.0998	<0.0998	<0.0998	<0.0998	<0.0998	<0.0998	18
9/20/2004	<0.00414Y	<0.00414Y	<0.00414Y	<0.00414Y	<0.00414Y	<0.00414Y	<0.100Y	<0.100Y	<0.100Y	<0.100Y	<0.100Y	<0.100Y	<0.100Y	<0.100Y	<0.100Y	<0.100Y	<0.100Y	<0.100Y	<0.100Y	<0.100Y	<0.100Y	<0.100Y	<0.100Y	<2.7Y	
Direct Exposure Residential ¹		1.1	1100	380	5900	n/a	3200	40	1100	1900	2200	2000	18000	2900	2200	1.4	140	1.4	15	0.1	1.5	0.1	2300	340	
Leachability from GW Criteria ¹		0.0007	0.6	0.5	0.2	n/a	0.2	1.7	27	2.1	160	250	2500	1200	880	3.2	77	10	25	8	28	30	32000	340	

All values reported in mg/kg

Method 8310 compounds are the average of duplicate runs

1 = Ch 62-777 F.A.C Soil cleanup Target Level (SCTLs) reported in mg/kg

Shaded values indicate the compounds that exceed the SCTLs

NS = Not Sampled

J3= the reported value failed to meet the established quality control criteria for either precision and/or accuracy.

Y= Sample was received into laboratory out of acceptable temperature range.

APPENDIX C

September 2004 Groundwater Sampling Logs

GROUNDWATER PURGING & SAMPLING LOG



Project Information

Project No: 04-41001/2	Project Name: Building 9 - Cecil Field LTM/RAO	
Technician 1:	Technician 2: Larry Wolski	Weather: Cloudy
Sampling ID: 04-41001/2:CEF-9-2S:9/20/04		
Notes:		

Well Information

Well ID: CEF-9-2S	Sampling Date: 9/20/2004	
Well Diam (in): 2.0	Total Well Depth (ft): 14.45	Well Screen Interval (ft):
TOC Elevation (ft msl): 78.74	Northing: 0	Easting: 0
Static Depth to Water (ft): 7.55	Well Capacity (gal): 0.00	

Purge Setup

Purge Method: Nomad Submersible	Tubing Material: PPE	Pump Set at (ft): 10.00
pH Meter: YSI 556 MPS	Cond. Meter: YSI 556MPS	DO Meter: YSI 556 MPS
Turb. Meter: Hach 2100P		
Purge Start: 10:23	Purge End: 10:30	Total Volume Purged (gal): 1.80

Purging Data

Time	Water Level (ft)	Vol Purged (gal)	Pump Rate (gal/min)	DO (mg/L)	Temp (°C)	SEC (µS/cm)	pH	ORP (mV)	Turbidity (NTU)	Color	Odor
10:25	8.52	1.30	0.65	0.32	28.37	417.0	5.79	112.1	33.10	turbid	none
10:27	8.19	1.60	0.15	0.42	28.24	410.0	5.79	106.0	31.70		
10:30	8.14	1.80	0.07	0.18	28.14	407.0	5.78	101.0	30.70		

Sampling Data

<u>Sample Information</u>		<u>Final Purge Readings</u>		<u>Hach Field Data (mg/L)</u>		<u>CHEMetrics Field Data (mg/L)</u>	
Sample Date:	9/20/2004	DO (mg/L):	0.18	DO:		DO High Range:	
Sample Start Time:	10:35	Temp (°C):	28.11	CO2:	88	DO High Range:	
Sample End Time:	10:50	SEC (uS/cm):	407	Alkalinity:	40	CO2 High Range:	
Field Filtered:	<input type="checkbox"/>	pH:	5.78	Ferrous Iron:	0.2	CO2 Low Range:	
Duplicate:	<input type="checkbox"/>	ORP (mV):	99.7	H2S:	0.1		
		Turb (NTU):	30.3	Manganese:			
				Sulfate:		Alkalinity High Range:	
				Sulfide:		Alkalinity Low Range:	
				Nitrate:			
<u>Lab Analyses/Methods:</u>		<u>Technician Initials</u>					
"BTEX/MTBE, Nitrate/Nitrite, Orthophosphate, PAHs, TRPH"							

GROUNDWATER PURGING & SAMPLING LOG



Project Information

Project No: 04-41001/2	Project Name: Building 9 - Cecil Field LTM/RAO	
Technician 1:	Technician 2: Larry Wolski	Weather: "Cloudy, Cool"
Sampling ID: 04-41001/2:CEF-9-3S:9/20/04		
Notes:		

Well Information

Well ID: CEF-9-3S	Sampling Date: 9/20/2004	
Well Diam (in): 2.0	Total Well Depth (ft): 15.54	Well Screen Interval (ft):
TOC Elevation (ft msl): 78.81	Northing: 0	Easting: 0
Static Depth to Water (ft): 7.42	Well Capacity (gal): 0.00	

Purge Setup

Purge Method: Nomad Submersible	Tubing Material: PPE	Pump Set at (ft): 10.00
pH Meter: YSI 556 MPS	Cond. Meter: YSI 556MPS	DO Meter: YSI 556 MPS
Turb. Meter: Hach 2100P	Purge Start: 10:53	
Purge End: 11:20	Total Volume Purged (gal): 1.80	

Purging Data

Time	Water Level (ft)	Vol Purged (gal)	Pump Rate (gal/min)	DO (mg/L)	Temp (°C)	SEC (µS/cm)	pH	ORP (mV)	Turbidity (NTU)	Color	Odor
11:09	7.68	1.40	0.09	0.18	28.49	635.0	6.04	77.6	41.60	clear	none
11:12	7.12	1.60	0.07	0.17	28.61	641.0	6.03	67.3	41.20		
11:14	7.69	1.80	0.05	0.12	28.60	644.0	6.03	59.9	38.10		

Sampling Data

<u>Sample Information</u>		<u>Final Purge Readings</u>		<u>Hach Field Data (mg/L)</u>		<u>CHEMetrics Field Data (mg/L)</u>	
Sample Date:	9/20/2004	DO (mg/L):	0.13	DO:		DO High Range:	
Sample Start Time:	11:20	Temp (°C):	28.6	CO2:	50	DO High Range:	
Sample End Time:	11:28	SEC (uS/cm):	644	Alkalinity:	35	CO2 High Range:	
Field Filtered:	<input type="checkbox"/>	pH:	6.02	Ferrous Iron:	0	CO2 Low Range:	
Duplicate:	<input type="checkbox"/>	ORP (mV):	58.1	H2S:	0		
		Turb (NTU):	38	Manganese:			
				Sulfate:		Alkalinity High Range:	
				Sulfide:		Alkalinity Low Range:	
				Nitrate:			
<u>Lab Analyses/Methods:</u>		<u>Technician Initials</u>					
"BTEX/MTBE, Nitrate/Nitrite, Orthophosphate, PAHs, TRPH"							

GROUNDWATER PURGING & SAMPLING LOG



Project Information

Project No: 04-41001/2	Project Name: Building 9 - Cecil Field LTM/RAO	
Technician 1: Karen Baer	Technician 2:	Weather: "Cloudy, Sunny"
Sampling ID: 04-41001/2:CEF-9-5S:9/20/04		
Notes:		

Well Information

Well ID: CEF-9-5S	Sampling Date: 9/20/2004	
Well Diam (in): 2.0	Total Well Depth (ft): 13.72	Well Screen Interval (ft):
TOC Elevation (ft msl): 78.93	Northing: 0	Easting: 0
Static Depth to Water (ft): 7.20	Well Capacity (gal): 0.00	

Purge Setup

Purge Method: Nomad Submersible	Tubeing Material: PPE	Pump Set at (ft): 9.00	
pH Meter: Horiba U-22	Cond. Meter: Horiba U-22	DO Meter: Horiba U-22	Turb. Meter: Hach 2100P
Purge Start: 10:17	Purge End: 10:36	Total Volume Purged (gal): 2.40	

Purging Data

Time	Water Level (ft)	Vol Purged (gal)	Pump Rate (gal/min)	DO (mg/L)	Temp (°C)	SEC (µS/cm)	pH	ORP (mV)	Turbidity (NTU)	Color	Odor
10:20	7.35	1.00	0.33	2.09	26.44	241.0	4.80	150.0	112.00	turbid	none
10:23	7.40	1.40	0.13	1.94	26.59	242.0	4.92	145.0	61.90		
10:27	7.35	1.70	0.10	1.89	26.59	244.0	5.00	142.0	43.40		
10:30	7.35	2.00	0.10	1.79	26.55	246.0	5.07	139.0	32.40		
10:33	7.35	2.20	0.10	1.81	26.53	248.0	5.10	138.0	24.80		
10:36	7.35	2.40	0.10	1.64	26.40	249.0	5.15	136.0	21.60		

Sampling Data

<u>Sample Information</u>		<u>Final Purge Readings</u>		<u>Hach Field Data (mg/L)</u>		<u>CHEMetrics Field Data (mg/L)</u>	
Sample Date:	9/20/2004	DO (mg/L):	1.66	DO:		DO High Range:	
Sample Start Time:	10:38	Temp (°C):	26.27	CO2:	84	DO High Range:	
Sample End Time:	10:50	SEC (uS/cm):	249	Alkalinity:	35	CO2 High Range:	
Field Filtered:	<input type="checkbox"/>	pH:	5.16	Ferrous Iron:	0	CO2 Low Range:	
Duplicate:	<input type="checkbox"/>	ORP (mV):	134	H2S:	0		
		Turb (NTU):	18.6	Manganese:			
<u>Lab Analyses/Methods:</u>		<u>Technician Initials</u>		Sulfate:		Alkalinity High Range:	
"BTEX/MTBE, Nitrate/Nitrite, Orthophosphate, PAHs, TRPH"				Sulfide:		Alkalinity Low Range:	
				Nitrate:			

GROUNDWATER PURGING & SAMPLING LOG



Project Information

Project No: 04-41001/2	Project Name: Building 9 - Cecil Field LTM/RAO	
Technician 1: Karen Baer	Technician 2:	Weather: Cloudy
Sampling ID: 04-41001/2:CEF-9-7D:9/20/04		
Notes:		

Well Information

Well ID: CEF-9-7D	Sampling Date: 9/20/2004	
Well Diam (in): 2.0	Total Well Depth (ft): 29.23	Well Screen Interval (ft):
TOC Elevation (ft msl): 78.59	Northing: 0	Easting: 0
Static Depth to Water (ft): 7.50	Well Capacity (gal): 0.00	

Purge Setup

Purge Method: Nomad Submersible	Tube Material: PPE	Pump Set at (ft): 26.00	
pH Meter: Horiba U-22	Cond. Meter: Horiba U-22	DO Meter: Horiba U-22	Turb. Meter: Hach 2100P
Purge Start: 11:08	Purge End: 11:25	Total Volume Purged (gal): 2.50	

Purging Data

Time	Water Level (ft)	Vol Purged (gal)	Pump Rate (gal/min)	DO (mg/L)	Temp (°C)	SEC (µS/cm)	pH	ORP (mV)	Turbidity (NTU)	Color	Odor
11:10	7.55	0.50	0.25	0.00	25.52	207.0	6.24	-48.0	106.00	turbid	none
11:15	7.55	1.30	0.16	0.00	25.66	192.0	6.32	-64.0	77.30		
11:17	7.55	1.60	0.15	0.00	25.67	180.0	6.40	-73.0	43.10		
11:20	7.55	2.00	0.13	0.00	25.68	170.0	6.39	-75.0	28.00		
11:25	7.55	2.50	0.12	0.00	25.80	171.0	6.35	-77.0	17.20		

Sampling Data

<u>Sample Information</u>		<u>Final Purge Readings</u>		<u>Hach Field Data (mg/L)</u>		<u>CHEMetrics Field Data (mg/L)</u>	
Sample Date:	9/20/2004	DO (mg/L):	0	DO:		DO High Range:	
Sample Start Time:	11:27	Temp (°C):	25.81	CO2:	90	DO High Range:	
Sample End Time:	11:44	SEC (uS/cm):	171	Alkalinity:	40	CO2 High Range:	
Field Filtered:	<input type="checkbox"/>	pH:	6.34	Ferrous Iron:	1.4	CO2 Low Range:	
Duplicate:	<input type="checkbox"/>	ORP (mV):	-77	H2S:	0		
		Turb (NTU):	17.5	Manganese:			
<u>Lab Analyses/Methods:</u>		<u>Technician Initials</u>		Sulfate:		Alkalinity High Range:	
"BTEX/MTBE, Nitrate/Nitrite, Orthophosphate, PAHs, TRPH"				Sulfide:		Alkalinity Low Range:	
				Nitrate:			

GROUNDWATER PURGING & SAMPLING LOG



Project Information

Project No: 04-41001/2	Project Name: Building 9 - Cecil Field LTM/RAO	
Technician 1:	Technician 2: Larry Wolski	Weather: "Cloudy, Cool"
Sampling ID: 04-41001/2:CEF-9-9S:9/20/04		
Notes:		

Well Information

Well ID: CEF-9-9S	Sampling Date: 9/20/2004	
Well Diam (in): 2.0	Total Well Depth (ft): 14.23	Well Screen Interval (ft):
TOC Elevation (ft msl): 78.89	Northing: 0	Easting: 0
Static Depth to Water (ft): 7.33	Well Capacity (gal): 0.00	

Purge Setup

Purge Method: Nomad Submersible	Tubing Material: PPE	Pump Set at (ft): 10.00
pH Meter: YSI 556 MPS	Cond. Meter: YSI 556MPS	DO Meter: YSI 556 MPS
Turb. Meter: Hach 2100P	Purge Start: 11:42	Purge End: 11:50
Total Volume Purged (gal): 1.70		

Purging Data

Time	Water Level (ft)	Vol Purged (gal)	Pump Rate (gal/min)	DO (mg/L)	Temp (°C)	SEC (µS/cm)	pH	ORP (mV)	Turbidity (NTU)	Color	Odor
11:46	7.72	1.20	0.30	0.15	28.34	245.0	4.69	84.0	6.08	clear	none
11:48	7.62	1.50	0.15	0.10	28.31	249.0	4.70	50.3	3.58		
11:50	7.58	1.70	0.20	0.07	28.31	252.0	4.69	36.0	3.58		

Sampling Data

<u>Sample Information</u>		<u>Final Purge Readings</u>		<u>Hach Field Data (mg/L)</u>		<u>CHEMetrics Field Data (mg/L)</u>	
Sample Date:	9/20/2004	DO (mg/L):	0.07	DO:		DO High Range:	
Sample Start Time:	11:53	Temp (°C):	28.32	CO2:	41	DO High Range:	
Sample End Time:	12:10	SEC (uS/cm):	252	Alkalinity:	15	CO2 High Range:	
Field Filtered:	<input type="checkbox"/>	pH:	4.69	Ferrous Iron:	0.5	CO2 Low Range:	
Duplicate:	<input type="checkbox"/>	ORP (mV):	33.2	H2S:	0		
		Turb (NTU):	3.56	Manganese:			
<u>Lab Analyses/Methods:</u>		<u>Technician Initials</u>		Sulfate:		Alkalinity High Range:	
"BTEX/MTBE, Nitrate/Nitrite, Orthophosphate, PAHs, TRPH"				Sulfide:		Alkalinity Low Range:	
				Nitrate:			

APPENDIX D

Post Active Remediation Monitoring Plan Approval Order



Department of Environmental Protection

JEO BUSII
Governor

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

Colleen M. Castille
Secretary

October 13, 2004

Mr. Nick Ugolini
Code ES42 (UST RPM)
Southern Division
Naval Facilities Engineering Command
P.O. Box 190010
North Charleston, South Carolina 29419-9010

RE: First Quarter 2004 Operation and Maintenance Status Report,
January 1, 2004 - March 31, 2004, Nutrient Injection System,
Building 9, Former Tanks 9L1 and 9L2, Naval Air Station
Cecil Field, Jacksonville, Florida

Dear Mr. Ugolini:

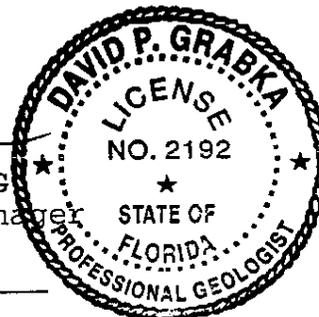
I have completed my review of the First Quarter 2004
Operation and Maintenance Status Report, January 1, 2004 - March
31, 2004, Nutrient Injection System, Building 9, Former Tanks 9L1
and 9L2, Naval Air Station Cecil Field, Jacksonville, dated May
2004 (received June 10, 2004, prepared and submitted by
Terraine, Inc. A Post-Active Remediation Monitoring Plan
Approval Order signed by Doug Jones, Bureau Chief, is attached.

If I can be of any further assistance with this matter,
please contact me at (850) 245-8997.

Sincerely,


David P. Grabka, P.G.
Remedial Project Manager

13 October 2004
Date

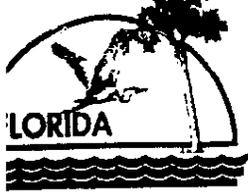


cc: Mark Davidson, SouthDiv, Charleston
John Flowe, City of Jacksonville
Mike Fitzsimmons, FDEP, Northeast District
Doyle Brittain, USEPA Region 4
James Young, Terraine, Inc.
Mark Speranza, Tetra Tech NUS, Pittsburgh
Mike Halil, CH2M Hill, Jacksonville

JJC 

ESN ESN

"More Protection, Less Process."



Department of Environmental Protection

Jeb Bush
Governor

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

Colleen M. Castille
Secretary

October 18, 2004

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Commanding Officer
Attn: Mr. Nick Ugolini, Code ES42
Southern Division
Naval Facilities Engineering Command
Post Office Box 190010
North Charleston, South Carolina 29419-9010

Subject: Post Active Remediation Monitoring Plan Approval Order
Building 9, Tanks 9L1 and 9L2
Naval Air Station Cecil Field
Jacksonville, Duval County

Dear Mr. Ugolini:

The Bureau of Waste Cleanup has reviewed the First Quarter 2004, Operations and Maintenance Status Report, Nutrient Injection System, Building 9, Former Tanks 9L1 and 9L2 and request for post-active remediation monitoring, dated May 2004 (received June 10, 2004), prepared and submitted by Terraine, Inc., for the petroleum product discharge discovered at this site. Pursuant to Rule 62-770.750, Florida Administrative Code (F.A.C.), the Florida Department of Environmental Protection (Department) approves the Post Active Remediation Monitoring Plan. Pursuant to Rule 62-770.750(4), F.A.C., you are required to complete the monitoring program outlined below. The first sampling event must be performed within 60 days of receipt of this Post Active Remediation Monitoring Plan Approval Order (Order). Water-level measurements must 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), must be submitted to the Department within 60 days of sample collection.

The monitoring wells to be sampled, the sampling parameters, and the sampling frequency are as follows:

<u>Monitoring Wells</u>	<u>Contaminants of Concern</u>	<u>Frequency</u>	<u>Duration</u>
CEF-9-2S; CEF-9-3S; CEF-9-5S; CEF-9-7D; and CEF-9-9S	BTEX, PAHs and TRPH	Quarterly	One year

"More Protection. Less Process"

Printed on recycled paper.

If concentrations of contaminants 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 resampling confirm the initial sampling results, then a proposal as described in Rule 62-770.750(4)(e), F.A.C., must be submitted to the Department.

Contaminated wells:

CEF-9-2S; CEF-9-3S and CEF-9-9S: Natural Attenuation Default Concentrations, Table V, Chapter 62-777, Florida Administrative Code.

Perimeter wells (temporary points of compliance):

CEF-9-5S and CEF-9-7D: Groundwater Criteria, Table I, Chapter 62-777, Florida Administrative Code.

If the applicable No Further Action criteria in Rule 62-770.680, F.A.C., are met at the end of the monitoring period (for at least the last two sampling events), a Site Rehabilitation Completion Report, summarizing the monitoring program and containing documentation supporting the opinion that the cleanup objectives have been achieved, must be submitted as required in Rule 62-770.750(6), F.A.C. If the applicable No Further Action criteria in Rule 62-770.680, F.A.C., are not met following one year of monitoring, then a report summarizing the monitoring program must be submitted, including a proposal as described in Rule 62-770.750(4)(e), F.A.C.

Legal Issues

The Department's Order shall become final unless a timely petition for an administrative proceeding (hearing) is filed under Sections 120.569 and 120.57, Florida Statutes (F.S.), within 21 days of receipt of this Order. The procedures for petitioning for a hearing are set forth below.

Persons affected by this Order have the following options:

- (A) If you choose to accept the Department's decision regarding the First Quarter 2004 Operation and Maintenance Status Report you do not have to do anything. This Order is final and effective as of the date on the top of the first page of this Order.
- (B) If you choose to challenge the decision, you may do the following:
 - (1) File a request for an extension of time to file a petition for hearing with the Agency Clerk in the Office of General Counsel of the Department within 21 days of receipt of this Order; such a request should be made if you wish to meet with the Department in an attempt to informally resolve any disputes without first filing a petition for hearing; or
 - (2) File a petition for administrative hearing with the Agency Clerk in the Office of General Counsel of the Department within 21 days of receipt of this Order.

Please be advised that mediation of this decision pursuant to Section 120.573, F.S., is not available.

How to Request an Extension of Time to File a Petition for Administrative Hearing

For good cause shown, pursuant to Rule 62-110.106(4), F.A.C., the Department may grant a request for an extension of time to file a petition for hearing. Such a request must be filed (received) by the Agency Clerk in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, within 21 days of receipt of this Order. Petitioner, if different from addressee, shall mail a copy of the request to addressee at the time of filing. Timely filing a request for an extension of time tolls the time period within which a petition for administrative hearing must be made.

How to File a Petition for Administrative Hearing

A person whose substantial interests are affected by this Order may petition for an administrative proceeding (hearing) under Sections 120.569 and 120.57, F.S. The petition must contain the information set forth below and must be filed (received) by the Agency Clerk in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, within 21 days of receipt of this Order. Petitioner, if different from addressee, shall mail a copy of the petition to addressee at the time of filing. Failure to file a petition within this time period shall waive the right of anyone who may request an administrative hearing under Sections 120.569 and 120.57, F.S.

Pursuant to Subsections 120.54(5)(b)4. and 120.569(2), F.S., and Rule 28-106.201, F.A.C., a petition for administrative hearing shall contain the following information:

- (a) The name, address, and telephone number of each petitioner, the name, address, and telephone number of the petitioner's representative, if any, the site owner's name and address, if different from the petitioner, the FDEP facility number, and the name and address of the facility;
- (b) A statement of when and how each petitioner received notice of the Department's action or proposed action;
- (c) An explanation of how each petitioner's substantial interests are or will be affected by the Department's action or proposed action;
- (d) A statement of the material facts disputed by the petitioner, or a statement that there are no disputed facts;
- (e) A statement of the ultimate facts alleged, including a statement of the specific facts the petitioner contends warrant reversal or modification of the Department's action or proposed action;
- (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the Department's action or proposed action, including an explanation of how the alleged facts relate to the specific rules or statutes; and
- (g) A statement of the relief sought by the petitioner, stating precisely the action petitioner wishes the Department to take with respect to the Department's action or proposed action.

This Order is final and effective as of the date on the top of the first page of this Order. Timely filing a petition for administrative hearing postpones the date this Order takes effect until the Department issues either a final order pursuant to an administrative hearing or an Order Responding to Supplemental Information provided to the Department pursuant to meetings with the Department.

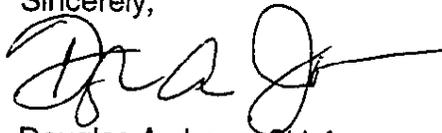
Judicial Review

Any party to this Order has the right to seek judicial review of it under Section 120.68, F.S., by filing a notice of appeal under Rule 9.110 of the Florida Rules of Appellate Procedure with the Agency Clerk in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate district court of appeal. The notice of appeal must be filed within 30 days after this Order is filed with the clerk of the Department (see below).

Questions

Any questions regarding the Department's review of your First Quarter 2004 Operation and Maintenance Status Report should be directed to David P. Grabka at (850) 245-8997. Questions regarding legal issues should be referred to the Department's Office of General Counsel at (850) 245-2242. Contact with any of the above does not constitute a petition for administrative hearing or request for an extension of time to file a petition for administrative hearing.

Sincerely,

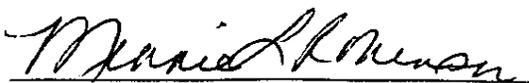


Douglas A. Jones, Chief
Bureau of Waste Cleanup
Division of Waste Management

DAJ/dpg

cc: David P. Grabka, FDEP – BWC
File

FILING AND ACKNOWLEDGMENT
FILED, on this date, pursuant to
§120.52 Florida Statutes, with the
designated Department Clerk, receipt
of which is hereby acknowledged.



Clerk
(or Deputy Clerk)



Date