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NAS CECIL FIELD, FL
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THIRD QUARTER 2001 OPERATIONS AND MAINTENANCE STATUS REPORT FOR
BIOVENTING AND BIOSPARGING SYSTEMS AT SOUTH FUEL FARM NAS CECIL FIELD FL
12/1/2001
CH2MHILL CONSTRUCTORS INC

**Third Quarter 2001
Operations and Maintenance
Status Report**

**Bioventing and Biosparging Systems
South Fuel Farm
Naval Air Station Cecil Field
Jacksonville, Florida**

**Contract No. N62467-98-D-0995
Contract Task Order No. 0062**

June 1, 2001 – September 30, 2001

Submitted to:

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

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December 2001

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Acronym List

ABB ES	ABB Environmental Services, Inc.
acfm	actual cubic feet per minute
AST	above-ground storage tank
BEI	Bechtel Environmental, Inc.
bls	below land surface
BRAC	Base Realignment and Closure
BTEX	Benzene, Toluene, Ethylbenzene, and Xylene
CCI	CH2M HILL Constructors, Inc.
CTO	Contract Task Order
EMT	earth-mounded tank
EPA	United States Environmental Protection Agency
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
JAJES	J.A. Jones Environmental Services
LNAPL	Light Non-Aqueous Phase Liquids
mg/L	milligrams per liter
MTBE	Methyl-Tert Butyl Ether
MW	Monitoring Well
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Command
O&M	Operation and Maintenance
OVA	organic vapor analyzer
PAHs	Purgeable Aromatic Hydrocarbons
ppb	parts per billion
psig	pounds per square inch gauge
PVC	polyvinyl chloride
RAP	Remedial Action Plan
RWP	Remediation Work Plan
scfm	standard cubic feet per minute
SFF	South Fuel Farm
SOUTHDIV	Department of the Navy, Southern Division
SVE	Soil Vapor Extraction
UST	underground storage tank
VOCs	Volatile Organic Compounds
VEW	Vapor Extraction Well

1.0 Introduction

CH2M HILL Constructors, Inc. (CCI) has been contracted by the Department of the Navy, Southern Division Naval Facilities Engineering Command (NAVFAC), to provide Operation and Maintenance (O&M) services at South Fuel Farm (SFF), Naval Air Station (NAS) Cecil Field, Jacksonville, Florida, under the Response Action Contract No. N62467-98-D-0995, Contract Task Order (CTO) No. 0062. The purpose of this Third Quarter 2001 O&M Report is to provide a summary of activities performed at the site during the period of June 1, 2001, to September 30, 2001.

1.1 Objective

The objective of the remedial action at the SFF site is 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. Bioventing and biosparging is the technology being utilized to achieve this objective.

1.2 Site History

The SFF site is located at the northern edge of the east-west runway at former NAS Cecil Field, in Jacksonville, Florida. The SFF was used as a fuel storage facility for leaded and unleaded gasoline, aviation gasoline, diesel fuel, and jet propellant 5 (JP-5). When fully operational, the facility contained three above-ground storage tanks (ASTs), four underground storage tanks (USTs), and four earth-mounded tanks (EMTs).

In 1983, the three ASTs were removed. In July 1994, the four USTs and three of the four EMTs were excavated. Excessively contaminated soil that was excavated during the tank removals was returned to the excavations. A contamination assessment was conducted to determine the nature and extent of contamination, as required by Chapter 62-770 FAC. A remedial action plan (RAP) was submitted in 1996 specifying the recommended remedial action as enhanced intrinsic remediation through bioventing and biosparging combined with an oxygen barrier wall. Subsequent to RAP submittal, the Base Realignment and Closure (BRAC) Cleanup Team (BCT) agreed to implement remedial action activities for only the northern portion of the SFF site (BEI July 1998). The southern portion of the bioventing and biosparging systems and the oxygen barrier were subsequently deleted from the RAP by the BCT. Soil excavation was chosen as the remedial alternative for the southern portion of the SFF site. CCI/J.A. Jones Environmental Services (CCI/JAJES) performed the soil excavation during the period of October 1998 to February 1999 (CCI April 2001).

Bechtel Environmental, Inc. (BEI) installed the approved bioventing and biosparging systems for the northern portion of the SFF site during the period of December 1997 to March 1998. Startup of the bioventing and biosparging systems occurred on April 6, 1998, (BEI September 1998). BEI performed the O&M of the systems from April 1998 to April 1999. EnSafe, Inc. performed the operations and maintenance of the systems from April 1999 to

May 2001. CCI/JAJES performed the operations and maintenance of the systems from June 2001 to present.

1.3 Remediation System/Technology Description

1.3.1 Bioventing System

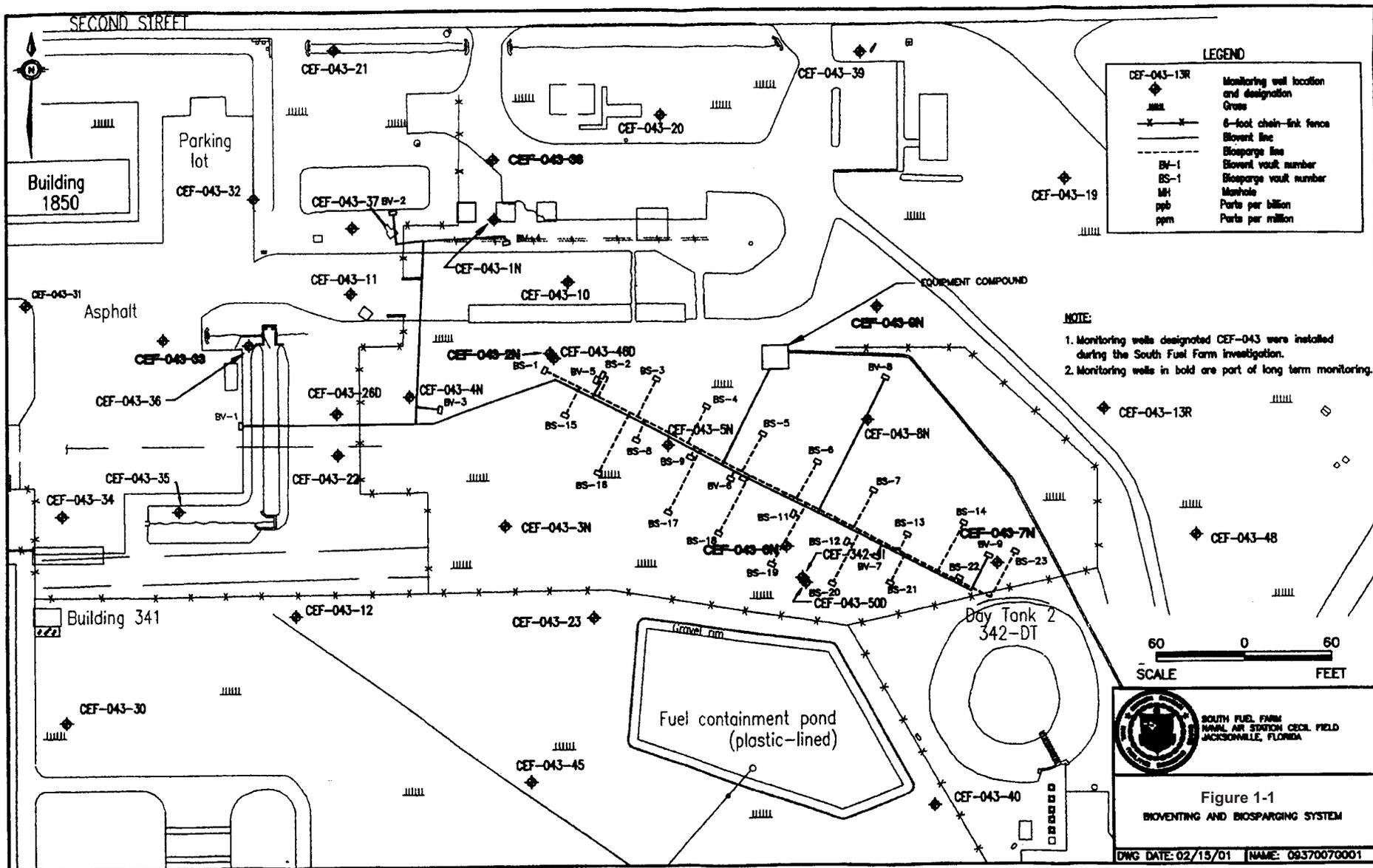
The bioventing system improves intrinsic bioremediation of the contaminated soil by delivering oxygen to the aerobic bacteria in the vadose zone. This is achieved via subgrade wells at a low flow rate to minimize volatilization and stimulate subgrade indigenous microbial activity (ABBES October 1996).

The SFF bioventing system consists of nine 2-inch polyvinyl chloride (PVC) vertical bioventing wells, labeled as BV-1 through BV-9, which are screened from 3 to 8 feet below land surface (bls), and a fenced canopy covered compound containing a blower, inlet air filter, flow meter, pressure and temperature gauges, valving, piping, and system controls. The bioventing system is designed to deliver air to each bioventing well at a flow rate of 4 actual cubic feet per minute (acfm) at a well head pressure of 20 inches of water (ABBES 1996). A map showing the locations of the bioventing wells is provided on Figure 1-1.

1.3.2 Biosparging System

The biosparging system is used to treat the groundwater source plume at the SFF site. This treatment system promotes the optimum environment for microbial activity and growth by injecting controlled volumes of air into the groundwater below the deepest point of contamination at controlled pressures via subgrade wells (ABBES October 1996).

The SFF biosparging system consists of 23 2-inch PVC vertical biosparging wells, labeled as BS-1 through BS-23, which are screened from 27 to 30 feet bls, a fenced canopy covered compound containing a screw type air compressor, receiver tank, air dryer, in-line moisture separator, in-line coalescing oil filter, pressure regulator/gauge, header piping, valves, flow gauge, and system controls. The biosparging system is designed for each biosparging well to operate at a flow rate of 1 acfm at an injection pressure of 15 pounds per square inch gauge (psig) (ABBES October 1996). A map showing the locations of the biosparging wells is provided in Figure 1-1.

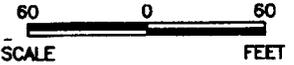


LEGEND

◆	Monitoring well location and designation
	Cruse
—x—x—	8-foot chain-link fence
—	Bioventing line
- - -	Biosparging line
BV-1	Bioventing vault number
BS-1	Biosparging vault number
MH	Manhole
ppb	Parts per billion
ppm	Parts per million

NOTE:

1. Monitoring wells designated CEF-043 were installed during the South Fuel Farm investigation.
2. Monitoring wells in bold are part of long term monitoring.




SOUTH FUEL FARM
 NAVAL AIR STATION CIVIL FIELD
 JACKSONVILLE, FLORIDA

Figure 1-1
BIOVENTING AND BIOSPARGING SYSTEM

DWG DATE: 02/15/01 NAME: 09370070001

2.0 System Performance Monitoring

O&M checks of the system were performed on a weekly basis. System checks were performed to coincide with the O&M check.

During an O&M check, a preventative maintenance checklist (based upon manufacturer's recommendations) was completed, and any required maintenance activity was performed. A system check consists of an O&M check and system performance monitoring, including reading of all meters and gauges.

2.1 Operational Efficiencies

Bioventing System		
	Period	To Date
Hours of Possible Operation:	2928	30576
Hours of Actual Operation:	2920	14647
Percent hours of Operation:	99.7	47.9

Biosparging System		
Hours of Possible Operation:	2928	30576
Hours of Actual Operation:	2920	30348
Percent hours of Operation:	99.7	99.3

2.2 Summary of Maintenance and System Downtime

Bioventing System

During the period of June 1 to September 30, the Bioventing System ran a total of 121.7 days out of a possible 122 days, resulting in 8 hours of downtime. The system downtime is the result of manual shutdowns to install a new electric meter and disconnect switch necessitated by a change in electrical service by the Jacksonville Electric Authority, and for routine equipment maintenance.

Biosparging System

During the period of June 1 to September 30, the Biosparging System ran a total of 121.7 days out of a possible 122 days, resulting in 8 hours of downtime. The system downtime is the result of manual shutdowns to install a new electric meter and disconnect switch necessitated by a change in electrical service by the Jacksonville Electric Authority, and for routine equipment maintenance.

2.3 Pressure/Flow Rate Monitoring

2.3.1 Bioventing System

During the third quarter, the blower discharge pressure averaged 48.2 inches of water. The total air injection flow rate at the blower averaged 76.7 acfm. The data for the bioventing system are tabulated on Table 2-1.

TABLE 2-1
Bioventing System Data

Date	Discharge Pressure (inches of water)	Discharge Temperature (°F)	Air Flow Rate (scfm)
6/20/2001	48	138	80
6/25/2001	48	138	80
7/2/2001	NR	80	75
7/12/2001	48	130	1
7/17/2001	48	134	80
7/24/2001	48	122	75
7/30/2001	48	126	78
8/6/2001	NR	70	NR
8/14/2001	48	135	75
8/23/2001	47	136	75
8/29/2001	47	140	75
9/5/2001	48	138	75
9/11/2001	NR	NR	NR
9/19/2001	50	125	75
9/27/2001	50	120	76

NR = No Reading
scfm = standard cubic feet per minute

2.3.2 Biosparging System

During the third quarter, the injection header discharge pressure averaged 18.4 pounds per square inch gauge (psig). The data for the biosparging system are tabulated on Table 2-2.

TABLE 2-2
Biosparging System Data

Date	Air Compressor Supply Pressure (psig)	Air Compressor Discharge Temperature (°F)	Receiver Tank Supply Pressure (psig)	Header Discharge Pressure (psig)
6/20/2001	40	85	35	18
6/25/2001	40	85	35	18
7/2/2001	40	85	40	20
7/12/2001	40	80	35	18
7/17/2001	42	83	35	18
7/24/2001	44	80	35	18
7/30/2001	42	82	38	18
8/6/2001	45	75	40	18
8/14/2001	45	82	40	18
8/23/2001	45	82	40	18
8/29/2001	45	87	42	18
9/5/2001	46	85	40	18
9/11/2001	50	84	50	20
9/19/2001	50	88	50	19
9/27/2001	57	78	50	19

psig = pounds per square inch gauge

2.4 Water Level Measurements

Depth to water measurements were recorded at selected monitoring wells on a monthly basis during the third quarter. The top of casing elevation, depth to water measurements and calculated water level elevations are provided on Table 2-3.

TABLE 2-3
Groundwater Monitoring Well - Water Level & Free Product Data

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-043-1N	14.05	6/29/2001	78.15	no product	8.00	70.15
		7/19/2001		no product	7.29	70.86
		8/9/2001		no product	5.63	72.52
		9/6/2001		no product	4.98	73.17
CEF-043-2N	13.71	6/29/2001	78.00	no product	8.08	69.92
		7/19/2001		no product	7.39	70.61
		8/9/2001		no product	5.63	72.37
		9/6/2001		no product	5.05	72.95
CEF-043-3N	14.20	6/29/2001	78.26	no product	8.66	69.60
		7/19/2001		no product	7.99	70.27
		8/9/2001		no product	6.71	71.55
		9/6/2001		no product	6.05	72.21
CEF-043-4N	14.18	6/29/2001	78.07	no product	8.73	69.34
		7/19/2001		no product	7.72	70.35
		8/9/2001		no product	5.89	72.18
		9/6/2001		no product	5.39	72.68
CEF-043-5N	14.18	6/29/2001	78.46	no product	8.90	69.56
		7/19/2001		no product	8.05	70.41
		8/9/2001		no product	6.52	71.94
		9/6/2001		no product	5.85	72.61
CEF-043-6N	14.26	6/29/2001	77.79	no product	8.18	69.61
		7/19/2001		no product	7.26	70.53
		8/9/2001		no product	5.85	71.94
		9/6/2001		no product	5.18	72.61
CEF-043-7N	14.45	6/29/2001	77.61	no product	7.92	69.69
		7/19/2001		no product	7.05	70.56
		8/9/2001		no product	4.50	73.11
		9/6/2001		no product	3.05	74.56
CEF-043-8N	14.25	6/29/2001	78.41	no product	8.65	69.76
		7/19/2001		no product	7.48	70.93
		8/9/2001		no product	5.50	72.91
		9/6/2001		no product	5.74	72.67
CEF-043-9N	13.25	6/29/2001	77.50	no product	7.25	70.25
		7/19/2001		no product	6.27	71.23
		8/9/2001		no product	4.12	73.38
		9/6/2001		no product	2.89	74.61
CEF-043-10	14.24	6/29/2001	78.55	no product	8.51	70.04
		7/19/2001		no product	7.71	70.84
		8/9/2001		no product	6.05	72.50
CEF-043-10	14.73	9/6/2001	78.47	no product	5.52	73.03
		6/29/2001		no product	7.90	70.57
		7/19/2001		no product	6.80	71.67
CEF-043-19	14.73	8/9/2001	78.47	no product	4.91	73.56
		9/6/2001		no product	4.27	74.20
		6/29/2001		no product	7.85	70.74
		7/19/2001		no product	7.07	71.52
CEF-043-20	15.00	8/9/2001	78.59	no product	5.26	73.33
		9/6/2001		no product	4.56	74.03
		6/29/2001		no product	6.18	70.53
		7/19/2001		no product	5.61	71.10
CEF-043-21	14.83	8/9/2001	76.71	no product	4.32	72.39
		9/6/2001		no product	3.30	73.41
		6/29/2001		no product	7.02	70.22
		7/19/2001		no product	6.58	70.66
CEF-043-22	14.86	6/29/2001	77.24	no product	7.02	70.22
		7/19/2001		no product	6.58	70.66
		9/6/2001		no product	6.58	70.66

TABLE 2-3
Groundwater Monitoring Well - Water Level & Free Product Data

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-043-32	12.95	8/9/2001	76.53	no product	4.95	72.29
		9/6/2001		no product	4.47	72.77
		6/29/2001		no product	6.14	70.39
		7/19/2001		no product	5.56	70.97
CEF-043-33	13.52	8/9/2001	76.97	no product	4.21	72.32
		9/6/2001		no product	3.71	72.82
		6/29/2001		no product	6.68	70.29
		7/19/2001		no product	6.20	70.77
CEF-043-34	14.42	8/9/2001	76.84	no product	4.91	72.06
		9/6/2001		no product	4.57	72.40
		6/29/2001		no product	6.39	70.45
		7/19/2001		no product	6.04	70.80
CEF-043-38	13.07	8/9/2001	77.62	no product	4.75	72.09
		9/6/2001		no product	4.21	72.63
		6/29/2001		no product	7.35	70.27
		7/19/2001		no product	6.64	70.98
CEF-043-48	13.63	8/9/2001	77.10	no product	5.04	72.58
		9/6/2001		no product	4.35	73.27
		6/29/2001		no product	8.37	68.73
		7/19/2001		no product	6.39	70.71
CEF-043-48 CEF-043-50D	62.91	8/9/2001	77.23	no product	4.19	72.91
		9/6/2001		no product	3.11	73.99
		6/29/2001		no product	8.45	68.78
		7/19/2001		no product	9.87	67.36
		8/9/2001		no product	8.65	68.58
		9/6/2001		no product	7.01	70.22

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

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

3.0 Summary of Sampling and Laboratory Analytical Results

3.1 Soil Monitoring

Soil screening and sampling is conducted on an annual basis. The annual soil screening and sampling event was conducted during the fourth quarter of 2001.

3.2 Groundwater Monitoring

Groundwater sampling is conducted on an annual basis. The annual groundwater sampling event is scheduled to be conducted during the second quarter of 2002.

Field analytical tests were performed on the air and groundwater in selected monitoring wells on a monthly basis during the third quarter.

The air in each monitoring well was tested using an organic vapor analyzer (OVA) for percent methane, percent carbon dioxide, percent oxygen, pressure, and total hydrocarbons. Methane, carbon dioxide and oxygen levels are measured as an indication of biological activity. Pressure is measured as an indication of the influence of the bioventing and biosparging systems. OVA readings are measured as an indication of the levels of hydrocarbon still present. No elevated levels of methane were noted. Elevated carbon dioxide levels and less than ambient oxygen levels were noted in most of the monitoring wells, indicating that biological activity is occurring. Significant pressure readings above ambient atmospheric pressure were not noted in any monitoring wells. Elevated hydrocarbon levels (OVA readings greater than 50 parts per million [ppm] were noted in monitoring wells CEF-043-2N, CEF-043-4N, CEF-043-6N, and CEF-043-22.

The groundwater in each monitoring well was tested for pH, conductivity, turbidity, dissolved oxygen, temperature, and eH. The basic water quality parameters, pH, conductivity, temperature, and turbidity, indicate conditions acceptable for biological activity to occur. The dissolved oxygen levels were greater than 1 milligram per liter (mg/L), which indicates that sufficient oxygen is present for aerobic biological activity.

The results of the field analytical tests are summarized in Table 3-1.

TABLE 3-1
Field Analytical Results

Well Identification	Sample Date	Air					Groundwater					
		Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Pressure (in Hg)	OVA (ppm)	pH	Conductivity (mS/cm)	Turbidity	Dissolved Oxygen (mg/L)	Temperature (oF)	eH (mV)
CEF-043-1N	06/29/2001	0	0	19.8	30	13	6.4	205	305	0.54	26.8	NR
	07/19/2001	0	0.2	20.4	29.8	23.5	5.23	27.9	18	2	25.8	33
	08/09/2001	0	2.9	12.6	29.9	10.7	5.2	45.1	32.5	1.86	27	189
	09/06/2001	0	5.1	13.5	29.8	4.8	6.62	0.4	9.4	3.73	27.2	141
CEF-043-2N	06/29/2001	0	7	13.8	29.9	257	5.8	163	118	0.72	27.3	NR
	07/19/2001	0	0.5	19.8	29.9	80.5	4.97	18.6	32	2.23	26.6	68
	08/09/2001	0.2	4.5	13.2	29.9	110	5	28.3	14.5	2.51	27.7	16
	09/06/2001	0.1	7.6	12.6	29.9	78	6.16	0.37	1.3	3.87	27.8	135
CEF-043-3N	06/29/2001	0	4.6	14	29.9	0	6.7	0.07	82	0.68	26.1	NR
	07/19/2001	0	0.7	19.5	29.8	15.4	4.72	6.6	999	3.27	24.7	233
	08/09/2001	0	4.5	14.2	29.9	2.51	4.8	11	335	5.81	26	277
	09/06/2001	0	5.6	14.7	29.9	3	5.94	0.13	20.4	6.31	26.5	175
CEF-043-4N	06/29/2001	0	4.7	13.8	29.9	0	6.5	0.04	204	0.61	25.6	NR
	07/19/2001	0	1.5	19.2	29.9	3800	5.38	48.8	35	1.64	25.9	37
	08/09/2001	2	17	20.2	29.9	4220	5	74.2	45.9	2.91	26	2
	09/06/2001	3	18.3	0.3	29.9	8300	6.33	0.85	0.6	1.84	26.4	74
CEF-043-5N	06/29/2001	0	0	20.2	29.9	8	6.8	0.07	199	6.39	26.4	NR
	07/19/2001	0	0	20.4	29.9	12.6	4.21	8.5	90	9.83	25.2	325
	08/09/2001	0	0	20.5	29.9	7.4	5.5	8.6	427	9.34	26	223
	09/06/2001	0	0.1	20.5	29.9	2.5	6.75	0.06	105	8.47	27	127
CEF-043-6N	06/29/2001	0	1.6	16.9	29.9	108	6.5	119	76	8.18	26.9	NR
	07/19/2001	0	0.6	19	29.9	74.3	4.9	13	150	3.34	26.4	202
	08/09/2001	0	1	18.2	29.9	32	5.6	12.6	147	7.65	27.72	174
	09/06/2001	0	1.3	18.8	29.9	12	5.71	0.12	13.7	2.69	27.9	50
CEF-043-7N	06/29/2001	0	1.1	17.9	29.9	0	6.8	210	46	0.47	25.8	NR
	07/19/2001	0	0	20.1	29.9	5.2	5.26	21.8	999	1.88	24.08	26
	08/09/2001	0	0.2	20.2	29.9	3.6	5.7	18.2	177	8.09	26.6	246
	09/06/2001	0	1.8	19.6	30	18.5	6.68	0.33	36.3	5	26.9	171
CEF-043-8N	06/29/2001	0	2.7	17.2	29.9	0	7.5	95	52	3.1	24.8	NR
	07/19/2001	0	0.6	19.8	29.9	3.4	4.87	7.2	424	7.69	24.1	230
	08/09/2001	0	2.1	17.9	29.9	2.2	5.5	10	142	8.01	25.7	251
	09/06/2001	0	0.5	20.2	29.9	2.5	5.82	0.09	13.8	6.49	26.5	203
CEF-043-9N	06/29/2001	0	6.2	14.3	29.9	0	7	116	72	0.05	25.3	NR
	07/19/2001	0	0.1	20.3	29.9	5.5	4.67	19.2	86.4	2.92	25.8	37
	08/09/2001	0	1.8	18.8	29.9	3.94	6.3	15	118	9.37	27.4	165
	09/06/2001	0	0.5	20.1	30	5	6.42	0.14	8.2	6.94	27.5	194
CEF-043-10	06/29/2001	0	3.2	15.4	29.9	6	6.8	201	319	0.78	26.7	NR
	07/19/2001	0	3.2	16	29.8	18.5	5.54	19.9	482	2.4	27.9	239
	08/09/2001	0	3.6	14.5	29.9	29	4.5	16.2	129	1.48	30.4	266
	09/06/2001	0	3.4	15.2	29.9	25	5.17	12	57.6	3.71	26.5	316

Well Identification	Sample Date	Air					Groundwater					
		Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Pressure (in Hg)	OVA (ppm)	pH	Conductivity (mS/cm)	Turbidity	Dissolved Oxygen (mg/L)	Temperature (oF)	eH (mV)
CEF-043-19	06/29/2001	0	2	20.3	30	0	7.5	0.06	41	1.8	25.7	NR
	07/19/2001	0	0.1	20.2	29.9	4.1	3.99	3.3	605	5.71	25.1	373
	08/09/2001	0	0.4	20.3	29.9	3.5	4.6	4.5	17.5	3.07	25.1	345
	09/06/2001	0	0.7	20.2	30	2	6.32	0.06	18.7	3.98	26.1	188
CEF-043-20	06/29/2001	0	0.5	19.6	29.8	1	6.3	0.02	162	0.34	25.4	NR
	07/19/2001	0	0	20.9	29.8	12.6	4.71	3.2	942	5.23	25.4	264
	08/09/2001	0	0	20	29.9	24	4.5	3.4	68.6	5.4	27.1	276
	09/06/2001	0	0.2	20.3	29.8	9	6.91	0.02	4.5	5.76	26.7	113
CEF-043-21	06/29/2001	0	1	18.8	29.8	0	6.3	0.22	162	1.62	25.4	NR
	07/19/2001	0	1	19.4	29.8	13.5	5.11	12.6	168	4.79	28.1	234
	08/09/2001	0	0	20	29.9	20.5	5.7	16	171	4.59	33.9	211
	09/06/2001	0	0	20.2	29.8	15	6.53	0.22	5.7	3.75	28.6	125
CEF-043-22	06/29/2001	0	4.6	14	29.9	0	6.8	0.09	407	0.44	25.9	NR
	07/19/2001	0	5.7	13	29.8	244	4.74	5.7	2.9	3.13	24.9	295
	08/09/2001	0	1.1	18.4	29.9	485	4.3	8.2	72.3	3.54	25.8	290
	09/06/2001	0	1.2	19.4	29.9	18	5.21	0.09	22.7	4.31	25.9	178
CEF-043-32	06/29/2001	0	3.7	15.8	29.8	0	5.9	0.4	46	1.85	28.2	NR
	07/19/2001	0	0.4	20.2	29.7	10.4	5.06	26.5	133	3.18	29	245
	08/09/2001	0.1	1.3	18.3	29.9	10.25	5.3	57.2	9	2.87	29.1	242
	09/06/2001	0	1.4	12.1	29.9	15	4.9	0.4	27.6	2.91	26.2	321
CEF-043-33	06/29/2001	0	5.1	14.5	29.8	0	6	0.14	543	0.33	28.3	NR
	07/19/2001	0	0.6	20	29.8	7.4	4.43	14.6	283	0.96	29.21	63
	08/09/2001	0.1	4.4	14.5	29.9	8.2	4.5	13.2	5.7	1.06	30.1	55
	09/06/2001	0	4.7	22	29.9	10	4.41	0.14	12	1.51	27.1	72
CEF-043-34	06/29/2001	0	0	20.4	29.8	2	5.9	0.09	45	0.69	27.2	NR
	07/19/2001	0	0.6	20	29.7	6.8	4.95	10	10.3	1.98	26	201
	08/09/2001	0.1	0	20.8	29.9	8.45	4.9	8.4	35.2	1.88	27.7	175
	09/06/2001	0	0.2	20.6	29.9	13	5.1	0.09	41	2.17	26.9	187
CEF-043-38	06/29/2001	0	2.9	15.7	29.8	1	6.3	0.34	167	1.64	26.9	NR
	07/19/2001	0	0.9	19.5	29.7	14.5	5.36	13.7	618	5.31	26.4	167
	08/09/2001	0.1	3.3	13.1	29.9	14	5.1	30.9	121	5.45	26.8	239
	09/06/2001	0	0.3	20.7	29.9	5.5	6.62	0.34	3.8	6.15	27.9	144
CEF-043-48	06/29/2001	0	0.9	19.4	29.9	0	6.8	0.18	6.53	0.8	23.9	NR
	07/19/2001	0	0.1	20.3	29.9	7.9	4.13	5	380	6.04	24.9	337
	08/09/2001	0	0.2	20.2	29.9	2	5.1	11.5	63.2	7.34	26.1	310
	09/06/2001	0	1.4	19.4	30	2	6.28	0.18	19.2	6.42	27.1	158
CEF-043-50D	06/29/2001	0	0.4	19.2	29.9	2	6.3	0.13	80	1.37	26.7	NR
	07/19/2001	0	0	20.4	29.9	7.2	4.94	14.4	0.8	2.56	25.6	243
	08/09/2001	0	0	20.3	29.9	6.29	5.8	14.4	39.5	3.25	25.9	185
	09/06/2001	0	0.4	20.4	29.9	2.5	5.59	0.14	1.3	2.22	26.3	210

4.0 Conclusions and Recommendations

The field analytical testing indicates that biological activity is occurring at the site. The biosparging injection continues to provide sufficient oxygen, as indicated by the dissolved oxygen readings being greater than 1 mg/L.

During the fourth quarter, the individual well air flow rates and pressures will be measured and adjusted, as needed, to design specifications. The annual soil screening and sampling will be conducted next quarter to evaluate the performance of the remediation system with respect to the soil.

5.0 References

ABB Environmental Services, Inc. (ABBES). October 1996. Remedial Action Plan, South Fuel Farm, Naval Air Station Cecil Field, Jacksonville, Florida.

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