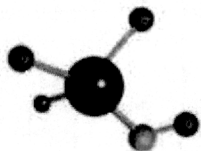


Appendix B

Laboratory Analytical Report



ACCESS
ANALYTICAL, INC.

ANALYTICAL REPORT

CLIENT

F&ME Consultants, Inc.
1825 Blanding Street
Columbia SC 29201

ATTENTION
Christine Cafagna

PROJECT ID
Hilton Head PSD-UST #11399

LABORATORY REPORT NUMBER
2406724

DATE
June 13, 2024

Primary Data Review By

Chris Pafford
Project Manager, EETSE-Atlanta

Secondary Data Review By

Ashley Amick

Project Manager, Access Analytical
aamick@axs-inc.com

PLEASE NOTE:

- Unless otherwise noted, all analysis on this report performed at Eurofins Environment Testing Southeast-Atlanta, LLC (EETSE-Atlanta), 3080 Presidential Drive, Atlanta, GA 30340.
- EETSE-Atlanta is SCDHEC certified laboratory # 98016, NCDENR certified lab # 562, GA certified lab # FL-E87582, NELAP certified laboratory # E87582
- AIHA-LAP, LLC Laboratory ID:100671 for Industrial Hygiene samples (Organics, Metals, PCM Asbestos, Gravimetric), Environmental Lead (Paint, Soil, Dust Wipes, Air), and Environmental Microbiology (Fungal) Direct Examination.
- Local support services for this project are provided by Access Analytical, Inc. All questions regarding this report should be directed to your local Access Analytical representative at 803.781.4243 or toll free at 888.315.4243

Access Lab Report #:

Sub Lab (if applicable):

Client Purchase Order #:

Access Estimate #:

ACCESS ANALYTICAL, INC.

Access Analytical, Inc.

15 Thames Valley Rd. ~ Irmo, SC 29063

Phone: 803-781-4243 / Fax: 803-781-4303 / www.axs-inc.com

SCDHEC Lab Certification # 32571

NELAC Lab ID # E871145

2406724

Chain of Custody Record

Client:

Attn:

Address:

City:

Phone:

Email:

Project Name:

Sampled By (Signature):

Preservatives (see codes):

Bottle Types (see codes):

Requested Lab Analysis:

Vertical text: BTEX, Naphthalene, PAHs, PCBs, DDTs, Endrin

Sample Name:

Date Collected:

Time Collected:

Cs Amp Grab:

Matrix (see codes):

Program Area (see codes):

Total # Containers:

Containers per Test >>

MW-2

6-5-24

1335

G

GW

SAW

5

3

MW-3

1352

2

MW-4

1430

MW-5

1455

MW-6

1300

MW-7

1150

MW-8

1315

MW-10

1215

MW-11

1410

DCW-1

1107

Turnaround Time Requested:

Project Location:

Relinquished By:

Received By:

Date:

Time (24hr):

Samples Received on Ice:

Standard:

Rush *:

*Date Required:

Rush data emailed/faxed by end of business day on date required. Standard TAT is 7-10 business days.

Chain of Custody Page 1 of 2

Received in lab by:

Sample Temp. Received in Lab:

Ref: RT1

Ref: RT2

Preservative Codes / Bottle Types:

Matrix Codes:

Program Area Codes:

Container Type:

Notes / Comments:

White Copy: Lab original / Canary Copy: Client Copy

NOTE: Relinquishing samples via this Chain of Custody document constitutes client acceptance of Access Analytical terms and conditions.

Access Lab Report #:
Sub Lab (if applicable):
Client Purchase Order #:
Access Estimate #:



ACCESS
ANALYTICAL, INC.

Access Analytical, Inc.
15 Thames Valley Rd. ~ Irmo, SC 29063
Phone: 803-781-4243 / Fax: 803-781-4303 / www.axs-inc.com
SCDHEC Lab Certification # 32571
NELAC Lab ID # E871145

2406724
Chain of Custody Record

Client:
Attn:
Address:
City:
Phone:
Email:
Project Name:
Sampled By (Signature):

Preservatives (see codes):
Bottle Types (see codes):

REQUESTED LAB ANALYSIS:
↓
↓

State:
Zip Code:

State:
Zip Code:

Sample Name:
Date Collected:
Time Collected:
C=Comp
G=Grab
Matrix (see codes)
Program Area (see codes)
Total # Containers

Containers per Test >>

Containers per Test >>

Containers per Test >>

Containers per Test >>

Containers per Test >>

Containers per Test >>

Containers per Test >>

Containers per Test >>

Containers per Test >>

Containers per Test >>

Turnaround Time Requested:
Standard
Rush *
*Date Required
Rush data emailed/faxed by end of business day on date required.
Standard TAT is 7-10 business days.

Project Location:
SC
NC
Other (Specify):

Relinquished By:
Received in lab by:

Received By:
Date:
Time (24hr):
Samples Received on Ice:

Chain of Custody Page 2 of 2

White Copy: Lab original / Canary Copy: Client Copy

Preservation Codes / Bottle Types:
*Preservative Codes:
0 = None, 1 = HCL, 2 = HNO3, 3 = H2SO4, 4 = NaOH, 5 = Na2S2O8, 6 = Method 5035 set w/ NaHSO4 & CH3OH, 7 = NaOH/ZnOAC, 8 = H3PO4, 9 = cooled to ≤6°C, 10 = cooled to ≤10°C, 11 = Amm.Cl, 12 = Ascorbic Acid / HCL, 13 = EDA
*Matrix Codes:
GW = ground water, WW = waste water, DW = drinking water, SW = surface/storm water, S = soil, SL = sludge, A = air, IW = industrial waste, O = other (specify in comments section)
*Program Area Codes:
CWA = Clean Water Act (for wastewaters), SDWA = Safe Drinking Water Act (for drinking water), SHW = Solid and Hazardous Wastes (for soils, ground waters and waste samples)
*Container Type: G = Glass, P = Plastic

Notes / Comments

Client: F&ME Consultants, Inc.
Project Name: Hilton Head PSD-UST #11399
Lab ID: 2406724

Case Narrative

Sample Receiving Nonconformance:

Sample information on the Chain of Custody did not match that on the sample bottle labels for sample(s) 2406724-011B (2 of 2) ID on COC="RW-2" and ID on one vial label="RW-5" Sample(s) were logged in using the information on the COC.

Client: F&ME Consultants, Inc.
Project Name: Hilton Head PSD-UST #11399
Lab ID: 2406724-001

Client Sample ID: MW-2
Collection Date: 6/5/2024 1:35:00 PM
Matrix: Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds SW8260D				(SW5030B)					
Benzene	BRL		0.20	1.0	ug/L	377559	1	06/10/2024 14:59	OM
Toluene	0.40	J	0.20	1.0	ug/L	377559	1	06/10/2024 14:59	OM
Ethylbenzene	BRL		0.28	1.0	ug/L	377559	1	06/10/2024 14:59	OM
m,p-Xylene	BRL		0.37	1.0	ug/L	377559	1	06/10/2024 14:59	OM
o-Xylene	BRL		0.27	1.0	ug/L	377559	1	06/10/2024 14:59	OM
Methyl tert-butyl ether	BRL		0.18	1.0	ug/L	377559	1	06/10/2024 14:59	OM
Naphthalene	BRL		1.6	5.0	ug/L	377559	1	06/10/2024 14:59	OM
1,2-Dichloroethane	BRL		0.21	1.0	ug/L	377559	1	06/10/2024 14:59	OM
Ethyl tert-butyl ether	BRL		2.5	10	ug/L	377559	1	06/10/2024 14:59	OM
tert-Amyl methyl ether	BRL		3.0	10	ug/L	377559	1	06/10/2024 14:59	OM
Isopropyl ether	BRL		2.8	10	ug/L	377559	1	06/10/2024 14:59	OM
tert-Butyl Alcohol	BRL		30	100	ug/L	377559	1	06/10/2024 14:59	OM
tert-Amyl alcohol	BRL		34	100	ug/L	377559	1	06/10/2024 14:59	OM
tert-Butyl formate	BRL		33	100	ug/L	377559	1	06/10/2024 14:59	OM
Ethanol	BRL		47	100	ug/L	377559	1	06/10/2024 14:59	OM
3,3-Dimethyl-1-butanol	BRL		34	100	ug/L	377559	1	06/10/2024 14:59	OM
Surr: 4-Bromofluorobenzene	99.9		0	70-126	%REC	377559	1	06/10/2024 14:59	OM
Surr: Dibromofluoromethane	107		0	77-121	%REC	377559	1	06/10/2024 14:59	OM
Surr: Toluene-d8	100		0	78.6-119	%REC	377559	1	06/10/2024 14:59	OM
MICRO-EXTRACTABLE VOLATILE ORGANICS SW8011				(SW8011)					
1,2-Dibromoethane	BRL		0.004	0.020	ug/L	377558	1	06/12/2024 19:44	VF
Surr: 4-Bromofluorobenzene	117		0	69.7-138	%REC	377558	1	06/12/2024 19:44	VF

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- F Analyzed in the lab which is a deviation from the method

- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Client: F&ME Consultants, Inc.
Project Name: Hilton Head PSD-UST #11399
Lab ID: 2406724-002

Client Sample ID: MW-3
Collection Date: 6/5/2024 1:52:00 PM
Matrix: Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds SW8260D (SW5030B)									
Benzene	BRL		0.20	1.0	ug/L	377559	1	06/10/2024 15:22	OM
Toluene	0.36	J	0.20	1.0	ug/L	377559	1	06/10/2024 15:22	OM
Ethylbenzene	BRL		0.28	1.0	ug/L	377559	1	06/10/2024 15:22	OM
m,p-Xylene	BRL		0.37	1.0	ug/L	377559	1	06/10/2024 15:22	OM
o-Xylene	BRL		0.27	1.0	ug/L	377559	1	06/10/2024 15:22	OM
Methyl tert-butyl ether	BRL		0.18	1.0	ug/L	377559	1	06/10/2024 15:22	OM
Naphthalene	BRL		1.6	5.0	ug/L	377559	1	06/10/2024 15:22	OM
1,2-Dichloroethane	BRL		0.21	1.0	ug/L	377559	1	06/10/2024 15:22	OM
Ethyl tert-butyl ether	BRL		2.5	10	ug/L	377559	1	06/10/2024 15:22	OM
tert-Amyl methyl ether	BRL		3.0	10	ug/L	377559	1	06/10/2024 15:22	OM
Isopropyl ether	BRL		2.8	10	ug/L	377559	1	06/10/2024 15:22	OM
tert-Butyl Alcohol	BRL		30	100	ug/L	377559	1	06/10/2024 15:22	OM
tert-Amyl alcohol	BRL		34	100	ug/L	377559	1	06/10/2024 15:22	OM
tert-Butyl formate	BRL		33	100	ug/L	377559	1	06/10/2024 15:22	OM
Ethanol	BRL		47	100	ug/L	377559	1	06/10/2024 15:22	OM
3,3-Dimethyl-1-butanol	BRL		34	100	ug/L	377559	1	06/10/2024 15:22	OM
Surr: 4-Bromofluorobenzene	98.5		0	70-126	%REC	377559	1	06/10/2024 15:22	OM
Surr: Dibromofluoromethane	106		0	77-121	%REC	377559	1	06/10/2024 15:22	OM
Surr: Toluene-d8	98.5		0	78.6-119	%REC	377559	1	06/10/2024 15:22	OM
MICRO-EXTRACTABLE VOLATILE ORGANICS SW8011 (SW8011)									
1,2-Dibromoethane	BRL		0.004	0.020	ug/L	377558	1	06/12/2024 20:19	VF
Surr: 4-Bromofluorobenzene	112		0	69.7-138	%REC	377558	1	06/12/2024 20:19	VF

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- F Analyzed in the lab which is a deviation from the method

- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Client: F&ME Consultants, Inc.
Project Name: Hilton Head PSD-UST #11399
Lab ID: 2406724-003

Client Sample ID: MW-4
Collection Date: 6/5/2024 2:30:00 PM
Matrix: Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds SW8260D				(SW5030B)					
Benzene	BRL		0.20	1.0	ug/L	377559	1	06/10/2024 15:45	OM
Toluene	0.34	J	0.20	1.0	ug/L	377559	1	06/10/2024 15:45	OM
Ethylbenzene	BRL		0.28	1.0	ug/L	377559	1	06/10/2024 15:45	OM
m,p-Xylene	BRL		0.37	1.0	ug/L	377559	1	06/10/2024 15:45	OM
o-Xylene	BRL		0.27	1.0	ug/L	377559	1	06/10/2024 15:45	OM
Methyl tert-butyl ether	BRL		0.18	1.0	ug/L	377559	1	06/10/2024 15:45	OM
Naphthalene	BRL		1.6	5.0	ug/L	377559	1	06/10/2024 15:45	OM
1,2-Dichloroethane	BRL		0.21	1.0	ug/L	377559	1	06/10/2024 15:45	OM
Ethyl tert-butyl ether	BRL		2.5	10	ug/L	377559	1	06/10/2024 15:45	OM
tert-Amyl methyl ether	BRL		3.0	10	ug/L	377559	1	06/10/2024 15:45	OM
Isopropyl ether	BRL		2.8	10	ug/L	377559	1	06/10/2024 15:45	OM
tert-Butyl Alcohol	BRL		30	100	ug/L	377559	1	06/10/2024 15:45	OM
tert-Amyl alcohol	BRL		34	100	ug/L	377559	1	06/10/2024 15:45	OM
tert-Butyl formate	BRL		33	100	ug/L	377559	1	06/10/2024 15:45	OM
Ethanol	BRL		47	100	ug/L	377559	1	06/10/2024 15:45	OM
3,3-Dimethyl-1-butanol	BRL		34	100	ug/L	377559	1	06/10/2024 15:45	OM
Surr: 4-Bromofluorobenzene	100		0	70-126	%REC	377559	1	06/10/2024 15:45	OM
Surr: Dibromofluoromethane	107		0	77-121	%REC	377559	1	06/10/2024 15:45	OM
Surr: Toluene-d8	99.8		0	78.6-119	%REC	377559	1	06/10/2024 15:45	OM
MICRO-EXTRACTABLE VOLATILE ORGANICS SW8011				(SW8011)					
1,2-Dibromoethane	BRL		0.005	0.020	ug/L	377558	1	06/12/2024 15:05	VF
Surr: 4-Bromofluorobenzene	106		0	69.7-138	%REC	377558	1	06/12/2024 15:05	VF

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- F Analyzed in the lab which is a deviation from the method

- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Client: F&ME Consultants, Inc.
Project Name: Hilton Head PSD-UST #11399
Lab ID: 2406724-004

Client Sample ID: MW-5
Collection Date: 6/5/2024 2:55:00 PM
Matrix: Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds SW8260D (SW5030B)									
Benzene	BRL		0.20	1.0	ug/L	377559	1	06/10/2024 16:08	OM
Toluene	0.24	J	0.20	1.0	ug/L	377559	1	06/10/2024 16:08	OM
Ethylbenzene	BRL		0.28	1.0	ug/L	377559	1	06/10/2024 16:08	OM
m,p-Xylene	BRL		0.37	1.0	ug/L	377559	1	06/10/2024 16:08	OM
o-Xylene	BRL		0.27	1.0	ug/L	377559	1	06/10/2024 16:08	OM
Methyl tert-butyl ether	BRL		0.18	1.0	ug/L	377559	1	06/10/2024 16:08	OM
Naphthalene	4.9	J	1.6	5.0	ug/L	377559	1	06/10/2024 16:08	OM
1,2-Dichloroethane	BRL		0.21	1.0	ug/L	377559	1	06/10/2024 16:08	OM
Ethyl tert-butyl ether	BRL		2.5	10	ug/L	377559	1	06/10/2024 16:08	OM
tert-Amyl methyl ether	BRL		3.0	10	ug/L	377559	1	06/10/2024 16:08	OM
Isopropyl ether	BRL		2.8	10	ug/L	377559	1	06/10/2024 16:08	OM
tert-Butyl Alcohol	BRL		30	100	ug/L	377559	1	06/10/2024 16:08	OM
tert-Amyl alcohol	BRL		34	100	ug/L	377559	1	06/10/2024 16:08	OM
tert-Butyl formate	BRL		33	100	ug/L	377559	1	06/10/2024 16:08	OM
Ethanol	BRL		47	100	ug/L	377559	1	06/10/2024 16:08	OM
3,3-Dimethyl-1-butanol	BRL		34	100	ug/L	377559	1	06/10/2024 16:08	OM
Surr: 4-Bromofluorobenzene	101		0	70-126	%REC	377559	1	06/10/2024 16:08	OM
Surr: Dibromofluoromethane	107		0	77-121	%REC	377559	1	06/10/2024 16:08	OM
Surr: Toluene-d8	99.7		0	78.6-119	%REC	377559	1	06/10/2024 16:08	OM
MICRO-EXTRACTABLE VOLATILE ORGANICS SW8011 (SW8011)									
1,2-Dibromoethane	BRL		0.004	0.020	ug/L	377558	1	06/12/2024 15:23	VF
Surr: 4-Bromofluorobenzene	111		0	69.7-138	%REC	377558	1	06/12/2024 15:23	VF

Qualifiers:	* Value exceeds maximum contaminant level	E Estimated value above quantitation range
	BRL Not detected at MDL	S Spike Recovery outside limits due to matrix
	H Holding times for preparation or analysis exceeded	J Estimated value detected below Reporting Limit
	N Analyte not NELAC certified	> Greater than Result value
	B Analyte detected in the associated method blank	< Less than Result value
	F Analyzed in the lab which is a deviation from the method	Narr See case narrative

Client: F&ME Consultants, Inc.
Project Name: Hilton Head PSD-UST #11399
Lab ID: 2406724-005

Client Sample ID: MW-6
Collection Date: 6/5/2024 1:00:00 PM
Matrix: Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds SW8260D				(SW5030B)					
Benzene	BRL		0.20	1.0	ug/L	377559	1	06/10/2024 16:31	OM
Toluene	0.31	J	0.20	1.0	ug/L	377559	1	06/10/2024 16:31	OM
Ethylbenzene	BRL		0.28	1.0	ug/L	377559	1	06/10/2024 16:31	OM
m,p-Xylene	BRL		0.37	1.0	ug/L	377559	1	06/10/2024 16:31	OM
o-Xylene	BRL		0.27	1.0	ug/L	377559	1	06/10/2024 16:31	OM
Methyl tert-butyl ether	BRL		0.18	1.0	ug/L	377559	1	06/10/2024 16:31	OM
Naphthalene	BRL		1.6	5.0	ug/L	377559	1	06/10/2024 16:31	OM
1,2-Dichloroethane	BRL		0.21	1.0	ug/L	377559	1	06/10/2024 16:31	OM
Ethyl tert-butyl ether	BRL		2.5	10	ug/L	377559	1	06/10/2024 16:31	OM
tert-Amyl methyl ether	BRL		3.0	10	ug/L	377559	1	06/10/2024 16:31	OM
Isopropyl ether	BRL		2.8	10	ug/L	377559	1	06/10/2024 16:31	OM
tert-Butyl Alcohol	BRL		30	100	ug/L	377559	1	06/10/2024 16:31	OM
tert-Amyl alcohol	BRL		34	100	ug/L	377559	1	06/10/2024 16:31	OM
tert-Butyl formate	BRL		33	100	ug/L	377559	1	06/10/2024 16:31	OM
Ethanol	BRL		47	100	ug/L	377559	1	06/10/2024 16:31	OM
3,3-Dimethyl-1-butanol	BRL		34	100	ug/L	377559	1	06/10/2024 16:31	OM
Surr: 4-Bromofluorobenzene	99.6		0	70-126	%REC	377559	1	06/10/2024 16:31	OM
Surr: Dibromofluoromethane	106		0	77-121	%REC	377559	1	06/10/2024 16:31	OM
Surr: Toluene-d8	98.8		0	78.6-119	%REC	377559	1	06/10/2024 16:31	OM
MICRO-EXTRACTABLE VOLATILE ORGANICS SW8011				(SW8011)					
1,2-Dibromoethane	BRL		0.004	0.020	ug/L	377558	1	06/12/2024 15:40	VF
Surr: 4-Bromofluorobenzene	109		0	69.7-138	%REC	377558	1	06/12/2024 15:40	VF

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- F Analyzed in the lab which is a deviation from the method

- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Client:	F&ME Consultants, Inc.	Client Sample ID:	MW-7
Project Name:	Hilton Head PSD-UST #11399	Collection Date:	6/5/2024 11:50:00 AM
Lab ID:	2406724-006	Matrix:	Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds SW8260D (SW5030B)									
Benzene	BRL		0.20	1.0	ug/L	377559	1	06/10/2024 16:54	OM
Toluene	BRL		0.20	1.0	ug/L	377559	1	06/10/2024 16:54	OM
Ethylbenzene	BRL		0.28	1.0	ug/L	377559	1	06/10/2024 16:54	OM
m,p-Xylene	BRL		0.37	1.0	ug/L	377559	1	06/10/2024 16:54	OM
o-Xylene	BRL		0.27	1.0	ug/L	377559	1	06/10/2024 16:54	OM
Methyl tert-butyl ether	BRL		0.18	1.0	ug/L	377559	1	06/10/2024 16:54	OM
Naphthalene	BRL		1.6	5.0	ug/L	377559	1	06/10/2024 16:54	OM
1,2-Dichloroethane	BRL		0.21	1.0	ug/L	377559	1	06/10/2024 16:54	OM
Ethyl tert-butyl ether	BRL		2.5	10	ug/L	377559	1	06/10/2024 16:54	OM
tert-Amyl methyl ether	BRL		3.0	10	ug/L	377559	1	06/10/2024 16:54	OM
Isopropyl ether	BRL		2.8	10	ug/L	377559	1	06/10/2024 16:54	OM
tert-Butyl Alcohol	BRL		30	100	ug/L	377559	1	06/10/2024 16:54	OM
tert-Amyl alcohol	BRL		34	100	ug/L	377559	1	06/10/2024 16:54	OM
tert-Butyl formate	BRL		33	100	ug/L	377559	1	06/10/2024 16:54	OM
Ethanol	BRL		47	100	ug/L	377559	1	06/10/2024 16:54	OM
3,3-Dimethyl-1-butanol	BRL		34	100	ug/L	377559	1	06/10/2024 16:54	OM
Surr: 4-Bromofluorobenzene	98.6		0	70-126	%REC	377559	1	06/10/2024 16:54	OM
Surr: Dibromofluoromethane	107		0	77-121	%REC	377559	1	06/10/2024 16:54	OM
Surr: Toluene-d8	99.9		0	78.6-119	%REC	377559	1	06/10/2024 16:54	OM

MICRO-EXTRACTABLE VOLATILE ORGANICS SW8011 (SW8011)									
1,2-Dibromoethane	BRL		0.004	0.020	ug/L	377558	1	06/12/2024 15:58	VF
Surr: 4-Bromofluorobenzene	111		0	69.7-138	%REC	377558	1	06/12/2024 15:58	VF

Qualifiers:	* Value exceeds maximum contaminant level	E Estimated value above quantitation range
	BRL Not detected at MDL	S Spike Recovery outside limits due to matrix
	H Holding times for preparation or analysis exceeded	J Estimated value detected below Reporting Limit
	N Analyte not NELAC certified	> Greater than Result value
	B Analyte detected in the associated method blank	< Less than Result value
	F Analyzed in the lab which is a deviation from the method	Narr See case narrative

Client: F&ME Consultants, Inc.
Project Name: Hilton Head PSD-UST #11399
Lab ID: 2406724-007

Client Sample ID: MW-8
Collection Date: 6/5/2024 1:15:00 PM
Matrix: Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds SW8260D				(SW5030B)					
Benzene	BRL		0.20	1.0	ug/L	377559	1	06/10/2024 17:17	OM
Toluene	0.39	J	0.20	1.0	ug/L	377559	1	06/10/2024 17:17	OM
Ethylbenzene	BRL		0.28	1.0	ug/L	377559	1	06/10/2024 17:17	OM
m,p-Xylene	BRL		0.37	1.0	ug/L	377559	1	06/10/2024 17:17	OM
o-Xylene	BRL		0.27	1.0	ug/L	377559	1	06/10/2024 17:17	OM
Methyl tert-butyl ether	BRL		0.18	1.0	ug/L	377559	1	06/10/2024 17:17	OM
Naphthalene	BRL		1.6	5.0	ug/L	377559	1	06/10/2024 17:17	OM
1,2-Dichloroethane	BRL		0.21	1.0	ug/L	377559	1	06/10/2024 17:17	OM
Ethyl tert-butyl ether	BRL		2.5	10	ug/L	377559	1	06/10/2024 17:17	OM
tert-Amyl methyl ether	BRL		3.0	10	ug/L	377559	1	06/10/2024 17:17	OM
Isopropyl ether	BRL		2.8	10	ug/L	377559	1	06/10/2024 17:17	OM
tert-Butyl Alcohol	BRL		30	100	ug/L	377559	1	06/10/2024 17:17	OM
tert-Amyl alcohol	BRL		34	100	ug/L	377559	1	06/10/2024 17:17	OM
tert-Butyl formate	BRL		33	100	ug/L	377559	1	06/10/2024 17:17	OM
Ethanol	BRL		47	100	ug/L	377559	1	06/10/2024 17:17	OM
3,3-Dimethyl-1-butanol	BRL		34	100	ug/L	377559	1	06/10/2024 17:17	OM
Surr: 4-Bromofluorobenzene	101		0	70-126	%REC	377559	1	06/10/2024 17:17	OM
Surr: Dibromofluoromethane	108		0	77-121	%REC	377559	1	06/10/2024 17:17	OM
Surr: Toluene-d8	99.7		0	78.6-119	%REC	377559	1	06/10/2024 17:17	OM
MICRO-EXTRACTABLE VOLATILE ORGANICS SW8011				(SW8011)					
1,2-Dibromoethane	BRL		0.005	0.020	ug/L	377558	1	06/12/2024 16:15	VF
Surr: 4-Bromofluorobenzene	111		0	69.7-138	%REC	377558	1	06/12/2024 16:15	VF

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- F Analyzed in the lab which is a deviation from the method

- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Client: F&ME Consultants, Inc.
Project Name: Hilton Head PSD-UST #11399
Lab ID: 2406724-008

Client Sample ID: MW-10
Collection Date: 6/5/2024 12:15:00 PM
Matrix: Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
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Volatile Organic Compounds SW8260D

(SW5030B)

Benzene	BRL		0.20	1.0	ug/L	377559	1	06/10/2024 17:39	OM
Toluene	0.33	J	0.20	1.0	ug/L	377559	1	06/10/2024 17:39	OM
Ethylbenzene	BRL		0.28	1.0	ug/L	377559	1	06/10/2024 17:39	OM
m,p-Xylene	BRL		0.37	1.0	ug/L	377559	1	06/10/2024 17:39	OM
o-Xylene	BRL		0.27	1.0	ug/L	377559	1	06/10/2024 17:39	OM
Methyl tert-butyl ether	BRL		0.18	1.0	ug/L	377559	1	06/10/2024 17:39	OM
Naphthalene	BRL		1.6	5.0	ug/L	377559	1	06/10/2024 17:39	OM
1,2-Dichloroethane	BRL		0.21	1.0	ug/L	377559	1	06/10/2024 17:39	OM
Ethyl tert-butyl ether	BRL		2.5	10	ug/L	377559	1	06/10/2024 17:39	OM
tert-Amyl methyl ether	BRL		3.0	10	ug/L	377559	1	06/10/2024 17:39	OM
Isopropyl ether	BRL		2.8	10	ug/L	377559	1	06/10/2024 17:39	OM
tert-Butyl Alcohol	BRL		30	100	ug/L	377559	1	06/10/2024 17:39	OM
tert-Amyl alcohol	BRL		34	100	ug/L	377559	1	06/10/2024 17:39	OM
tert-Butyl formate	BRL		33	100	ug/L	377559	1	06/10/2024 17:39	OM
Ethanol	BRL		47	100	ug/L	377559	1	06/10/2024 17:39	OM
3,3-Dimethyl-1-butanol	BRL		34	100	ug/L	377559	1	06/10/2024 17:39	OM
Surr: 4-Bromofluorobenzene	99.7		0	70-126	%REC	377559	1	06/10/2024 17:39	OM
Surr: Dibromofluoromethane	107		0	77-121	%REC	377559	1	06/10/2024 17:39	OM
Surr: Toluene-d8	100		0	78.6-119	%REC	377559	1	06/10/2024 17:39	OM

MICRO-EXTRACTABLE VOLATILE ORGANICS SW8011

(SW8011)

1,2-Dibromoethane	BRL		0.005	0.020	ug/L	377558	1	06/12/2024 16:32	VF
Surr: 4-Bromofluorobenzene	117		0	69.7-138	%REC	377558	1	06/12/2024 16:32	VF

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- F Analyzed in the lab which is a deviation from the method

- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Client: F&ME Consultants, Inc.
Project Name: Hilton Head PSD-UST #11399
Lab ID: 2406724-009

Client Sample ID: MW-11
Collection Date: 6/5/2024 2:10:00 PM
Matrix: Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds SW8260D				(SW5030B)					
Benzene	BRL		0.20	1.0	ug/L	377559	1	06/10/2024 18:02	OM
Toluene	0.42	J	0.20	1.0	ug/L	377559	1	06/10/2024 18:02	OM
Ethylbenzene	BRL		0.28	1.0	ug/L	377559	1	06/10/2024 18:02	OM
m,p-Xylene	BRL		0.37	1.0	ug/L	377559	1	06/10/2024 18:02	OM
o-Xylene	BRL		0.27	1.0	ug/L	377559	1	06/10/2024 18:02	OM
Methyl tert-butyl ether	BRL		0.18	1.0	ug/L	377559	1	06/10/2024 18:02	OM
Naphthalene	BRL		1.6	5.0	ug/L	377559	1	06/10/2024 18:02	OM
1,2-Dichloroethane	BRL		0.21	1.0	ug/L	377559	1	06/10/2024 18:02	OM
Ethyl tert-butyl ether	BRL		2.5	10	ug/L	377559	1	06/10/2024 18:02	OM
tert-Amyl methyl ether	BRL		3.0	10	ug/L	377559	1	06/10/2024 18:02	OM
Isopropyl ether	BRL		2.8	10	ug/L	377559	1	06/10/2024 18:02	OM
tert-Butyl Alcohol	BRL		30	100	ug/L	377559	1	06/10/2024 18:02	OM
tert-Amyl alcohol	BRL		34	100	ug/L	377559	1	06/10/2024 18:02	OM
tert-Butyl formate	BRL		33	100	ug/L	377559	1	06/10/2024 18:02	OM
Ethanol	BRL		47	100	ug/L	377559	1	06/10/2024 18:02	OM
3,3-Dimethyl-1-butanol	BRL		34	100	ug/L	377559	1	06/10/2024 18:02	OM
Surr: 4-Bromofluorobenzene	98		0	70-126	%REC	377559	1	06/10/2024 18:02	OM
Surr: Dibromofluoromethane	108		0	77-121	%REC	377559	1	06/10/2024 18:02	OM
Surr: Toluene-d8	99.1		0	78.6-119	%REC	377559	1	06/10/2024 18:02	OM
MICRO-EXTRACTABLE VOLATILE ORGANICS SW8011				(SW8011)					
1,2-Dibromoethane	BRL		0.004	0.020	ug/L	377558	1	06/12/2024 16:50	VF
Surr: 4-Bromofluorobenzene	111		0	69.7-138	%REC	377558	1	06/12/2024 16:50	VF

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- F Analyzed in the lab which is a deviation from the method

- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Client: F&ME Consultants, Inc.
Project Name: Hilton Head PSD-UST #11399
Lab ID: 2406724-010

Client Sample ID: DCW-1
Collection Date: 6/5/2024 11:07:00 AM
Matrix: Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds SW8260D (SW5030B)									
Benzene	BRL		0.20	1.0	ug/L	377559	1	06/10/2024 18:25	OM
Toluene	3.0		0.20	1.0	ug/L	377559	1	06/10/2024 18:25	OM
Ethylbenzene	BRL		0.28	1.0	ug/L	377559	1	06/10/2024 18:25	OM
m,p-Xylene	0.69	J	0.37	1.0	ug/L	377559	1	06/10/2024 18:25	OM
o-Xylene	BRL		0.27	1.0	ug/L	377559	1	06/10/2024 18:25	OM
Methyl tert-butyl ether	BRL		0.18	1.0	ug/L	377559	1	06/10/2024 18:25	OM
Naphthalene	BRL		1.6	5.0	ug/L	377559	1	06/10/2024 18:25	OM
1,2-Dichloroethane	BRL		0.21	1.0	ug/L	377559	1	06/10/2024 18:25	OM
Ethyl tert-butyl ether	BRL		2.5	10	ug/L	377559	1	06/10/2024 18:25	OM
tert-Amyl methyl ether	BRL		3.0	10	ug/L	377559	1	06/10/2024 18:25	OM
Isopropyl ether	BRL		2.8	10	ug/L	377559	1	06/10/2024 18:25	OM
tert-Butyl Alcohol	BRL		30	100	ug/L	377559	1	06/10/2024 18:25	OM
tert-Amyl alcohol	BRL		34	100	ug/L	377559	1	06/10/2024 18:25	OM
tert-Butyl formate	BRL		33	100	ug/L	377559	1	06/10/2024 18:25	OM
Ethanol	BRL		47	100	ug/L	377559	1	06/10/2024 18:25	OM
3,3-Dimethyl-1-butanol	BRL		34	100	ug/L	377559	1	06/10/2024 18:25	OM
Surr: 4-Bromofluorobenzene	98.6		0	70-126	%REC	377559	1	06/10/2024 18:25	OM
Surr: Dibromofluoromethane	109		0	77-121	%REC	377559	1	06/10/2024 18:25	OM
Surr: Toluene-d8	101		0	78.6-119	%REC	377559	1	06/10/2024 18:25	OM
MICRO-EXTRACTABLE VOLATILE ORGANICS SW8011 (SW8011)									
1,2-Dibromoethane	BRL		0.004	0.020	ug/L	377558	1	06/12/2024 17:25	VF
Surr: 4-Bromofluorobenzene	115		0	69.7-138	%REC	377558	1	06/12/2024 17:25	VF

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- F Analyzed in the lab which is a deviation from the method

- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Client: F&ME Consultants, Inc.
Project Name: Hilton Head PSD-UST #11399
Lab ID: 2406724-011

Client Sample ID: RW-2
Collection Date: 6/5/2024 3:15:00 PM
Matrix: Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds SW8260D				(SW5030B)					
Benzene	0.23	J	0.20	1.0	ug/L	377559	1	06/10/2024 18:48	OM
Toluene	1.8		0.20	1.0	ug/L	377559	1	06/10/2024 18:48	OM
Ethylbenzene	12		0.28	1.0	ug/L	377559	1	06/10/2024 18:48	OM
m,p-Xylene	BRL		0.37	1.0	ug/L	377559	1	06/10/2024 18:48	OM
o-Xylene	BRL		0.27	1.0	ug/L	377559	1	06/10/2024 18:48	OM
Methyl tert-butyl ether	BRL		0.18	1.0	ug/L	377559	1	06/10/2024 18:48	OM
Naphthalene	17		1.6	5.0	ug/L	377559	1	06/10/2024 18:48	OM
1,2-Dichloroethane	BRL		0.21	1.0	ug/L	377559	1	06/10/2024 18:48	OM
Ethyl tert-butyl ether	BRL		2.5	10	ug/L	377559	1	06/10/2024 18:48	OM
tert-Amyl methyl ether	BRL		3.0	10	ug/L	377559	1	06/10/2024 18:48	OM
Isopropyl ether	BRL		2.8	10	ug/L	377559	1	06/10/2024 18:48	OM
tert-Butyl Alcohol	BRL		30	100	ug/L	377559	1	06/10/2024 18:48	OM
tert-Amyl alcohol	BRL		34	100	ug/L	377559	1	06/10/2024 18:48	OM
tert-Butyl formate	BRL		33	100	ug/L	377559	1	06/10/2024 18:48	OM
Ethanol	BRL		47	100	ug/L	377559	1	06/10/2024 18:48	OM
3,3-Dimethyl-1-butanol	BRL		34	100	ug/L	377559	1	06/10/2024 18:48	OM
Surr: 4-Bromofluorobenzene	105		0	70-126	%REC	377559	1	06/10/2024 18:48	OM
Surr: Dibromofluoromethane	108		0	77-121	%REC	377559	1	06/10/2024 18:48	OM
Surr: Toluene-d8	101		0	78.6-119	%REC	377559	1	06/10/2024 18:48	OM
MICRO-EXTRACTABLE VOLATILE ORGANICS SW8011				(SW8011)					
1,2-Dibromoethane	BRL		0.005	0.020	ug/L	377558	1	06/12/2024 18:17	VF
Surr: 4-Bromofluorobenzene	114		0	69.7-138	%REC	377558	1	06/12/2024 18:17	VF

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- F Analyzed in the lab which is a deviation from the method

- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Client: F&ME Consultants, Inc.
Project Name: Hilton Head PSD-UST #11399
Lab ID: 2406724-012

Client Sample ID: DUPLICATE
Collection Date: 6/5/2024
Matrix: Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds SW8260D				(SW5030B)					
Benzene	0.26	J	0.20	1.0	ug/L	377559	1	06/10/2024 19:11	OM
Toluene	0.64	J	0.20	1.0	ug/L	377559	1	06/10/2024 19:11	OM
Ethylbenzene	12		0.28	1.0	ug/L	377559	1	06/10/2024 19:11	OM
m,p-Xylene	BRL		0.37	1.0	ug/L	377559	1	06/10/2024 19:11	OM
o-Xylene	BRL		0.27	1.0	ug/L	377559	1	06/10/2024 19:11	OM
Methyl tert-butyl ether	BRL		0.18	1.0	ug/L	377559	1	06/10/2024 19:11	OM
Naphthalene	16		1.6	5.0	ug/L	377559	1	06/10/2024 19:11	OM
1,2-Dichloroethane	BRL		0.21	1.0	ug/L	377559	1	06/10/2024 19:11	OM
Ethyl tert-butyl ether	BRL		2.5	10	ug/L	377559	1	06/10/2024 19:11	OM
tert-Amyl methyl ether	BRL		3.0	10	ug/L	377559	1	06/10/2024 19:11	OM
Isopropyl ether	BRL		2.8	10	ug/L	377559	1	06/10/2024 19:11	OM
tert-Butyl Alcohol	BRL		30	100	ug/L	377559	1	06/10/2024 19:11	OM
tert-Amyl alcohol	BRL		34	100	ug/L	377559	1	06/10/2024 19:11	OM
tert-Butyl formate	BRL		33	100	ug/L	377559	1	06/10/2024 19:11	OM
Ethanol	BRL		47	100	ug/L	377559	1	06/10/2024 19:11	OM
3,3-Dimethyl-1-butanol	BRL		34	100	ug/L	377559	1	06/10/2024 19:11	OM
Surr: 4-Bromofluorobenzene	107		0	70-126	%REC	377559	1	06/10/2024 19:11	OM
Surr: Dibromofluoromethane	103		0	77-121	%REC	377559	1	06/10/2024 19:11	OM
Surr: Toluene-d8	98.3		0	78.6-119	%REC	377559	1	06/10/2024 19:11	OM

MICRO-EXTRACTABLE VOLATILE ORGANICS SW8011				(SW8011)					
1,2-Dibromoethane	BRL		0.004	0.020	ug/L	377558	1	06/12/2024 18:34	VF
Surr: 4-Bromofluorobenzene	111		0	69.7-138	%REC	377558	1	06/12/2024 18:34	VF

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- F Analyzed in the lab which is a deviation from the method

- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Client: F&ME Consultants, Inc.
Project Name: Hilton Head PSD-UST #11399
Lab ID: 2406724-013

Client Sample ID: FIELD BLANK
Collection Date: 6/5/2024 10:32:00 AM
Matrix: Aqueous

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds SW8260D				(SW5030B)					
Benzene	BRL		0.20	1.0	ug/L	377559	1	06/10/2024 13:27	OM
Toluene	BRL		0.20	1.0	ug/L	377559	1	06/10/2024 13:27	OM
Ethylbenzene	BRL		0.28	1.0	ug/L	377559	1	06/10/2024 13:27	OM
m,p-Xylene	BRL		0.37	1.0	ug/L	377559	1	06/10/2024 13:27	OM
o-Xylene	BRL		0.27	1.0	ug/L	377559	1	06/10/2024 13:27	OM
Methyl tert-butyl ether	BRL		0.18	1.0	ug/L	377559	1	06/10/2024 13:27	OM
Naphthalene	4.5	J	1.6	5.0	ug/L	377559	1	06/10/2024 13:27	OM
1,2-Dichloroethane	BRL		0.21	1.0	ug/L	377559	1	06/10/2024 13:27	OM
Ethyl tert-butyl ether	BRL		2.5	10	ug/L	377559	1	06/10/2024 13:27	OM
tert-Amyl methyl ether	BRL		3.0	10	ug/L	377559	1	06/10/2024 13:27	OM
Isopropyl ether	BRL		2.8	10	ug/L	377559	1	06/10/2024 13:27	OM
tert-Butyl Alcohol	BRL		30	100	ug/L	377559	1	06/10/2024 13:27	OM
tert-Amyl alcohol	BRL		34	100	ug/L	377559	1	06/10/2024 13:27	OM
tert-Butyl formate	BRL		33	100	ug/L	377559	1	06/10/2024 13:27	OM
Ethanol	BRL		47	100	ug/L	377559	1	06/10/2024 13:27	OM
3,3-Dimethyl-1-butanol	BRL		34	100	ug/L	377559	1	06/10/2024 13:27	OM
Surr: 4-Bromofluorobenzene	100		0	70-126	%REC	377559	1	06/10/2024 13:27	OM
Surr: Dibromofluoromethane	106		0	77-121	%REC	377559	1	06/10/2024 13:27	OM
Surr: Toluene-d8	99.4		0	78.6-119	%REC	377559	1	06/10/2024 13:27	OM
MICRO-EXTRACTABLE VOLATILE ORGANICS SW8011				(SW8011)					
1,2-Dibromoethane	BRL		0.004	0.020	ug/L	377558	1	06/12/2024 18:52	VF
Surr: 4-Bromofluorobenzene	115		0	69.7-138	%REC	377558	1	06/12/2024 18:52	VF

Qualifiers:	* Value exceeds maximum contaminant level	E Estimated value above quantitation range
	BRL Not detected at MDL	S Spike Recovery outside limits due to matrix
	H Holding times for preparation or analysis exceeded	J Estimated value detected below Reporting Limit
	N Analyte not NELAC certified	> Greater than Result value
	B Analyte detected in the associated method blank	< Less than Result value
	F Analyzed in the lab which is a deviation from the method	Narr See case narrative

Client: F&ME Consultants, Inc.
Project Name: Hilton Head PSD-UST #11399
Lab ID: 2406724-014

Client Sample ID: TRIP BLANK
Collection Date: 6/5/2024
Matrix: Aqueous

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds SW8260D				(SW5030B)					
Benzene	BRL		0.20	1.0	ug/L	377559	1	06/10/2024 13:50	OM
Toluene	BRL		0.20	1.0	ug/L	377559	1	06/10/2024 13:50	OM
Ethylbenzene	BRL		0.28	1.0	ug/L	377559	1	06/10/2024 13:50	OM
m,p-Xylene	BRL		0.37	1.0	ug/L	377559	1	06/10/2024 13:50	OM
o-Xylene	BRL		0.27	1.0	ug/L	377559	1	06/10/2024 13:50	OM
Methyl tert-butyl ether	BRL		0.18	1.0	ug/L	377559	1	06/10/2024 13:50	OM
Naphthalene	BRL		1.6	5.0	ug/L	377559	1	06/10/2024 13:50	OM
1,2-Dichloroethane	BRL		0.21	1.0	ug/L	377559	1	06/10/2024 13:50	OM
Ethyl tert-butyl ether	BRL		2.5	10	ug/L	377559	1	06/10/2024 13:50	OM
tert-Amyl methyl ether	BRL		3.0	10	ug/L	377559	1	06/10/2024 13:50	OM
Isopropyl ether	BRL		2.8	10	ug/L	377559	1	06/10/2024 13:50	OM
tert-Butyl Alcohol	BRL		30	100	ug/L	377559	1	06/10/2024 13:50	OM
tert-Amyl alcohol	BRL		34	100	ug/L	377559	1	06/10/2024 13:50	OM
tert-Butyl formate	BRL		33	100	ug/L	377559	1	06/10/2024 13:50	OM
Ethanol	BRL		47	100	ug/L	377559	1	06/10/2024 13:50	OM
3,3-Dimethyl-1-butanol	BRL		34	100	ug/L	377559	1	06/10/2024 13:50	OM
Surr: 4-Bromofluorobenzene	99.2		0	70-126	%REC	377559	1	06/10/2024 13:50	OM
Surr: Dibromofluoromethane	106		0	77-121	%REC	377559	1	06/10/2024 13:50	OM
Surr: Toluene-d8	99.1		0	78.6-119	%REC	377559	1	06/10/2024 13:50	OM

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- F Analyzed in the lab which is a deviation from the method

- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: MW-2 Collection Date: 6/5/2024 1:35:00 PM Lab ID: 2406724-001 Matrix: Groundwater							
Volatile Organic Compounds SW8260D (SW5030B)							
Toluene	0.40	J	0.20	1.0	ug/L	377559	1
Client Sample ID: MW-3 Collection Date: 6/5/2024 1:52:00 PM Lab ID: 2406724-002 Matrix: Groundwater							
Volatile Organic Compounds SW8260D (SW5030B)							
Toluene	0.36	J	0.20	1.0	ug/L	377559	1
Client Sample ID: MW-4 Collection Date: 6/5/2024 2:30:00 PM Lab ID: 2406724-003 Matrix: Groundwater							
Volatile Organic Compounds SW8260D (SW5030B)							
Toluene	0.34	J	0.20	1.0	ug/L	377559	1
Client Sample ID: MW-5 Collection Date: 6/5/2024 2:55:00 PM Lab ID: 2406724-004 Matrix: Groundwater							
Volatile Organic Compounds SW8260D (SW5030B)							
Toluene	0.24	J	0.20	1.0	ug/L	377559	1
Naphthalene	4.9	J	1.6	5.0	ug/L	377559	1
Client Sample ID: MW-6 Collection Date: 6/5/2024 1:00:00 PM Lab ID: 2406724-005 Matrix: Groundwater							
Volatile Organic Compounds SW8260D (SW5030B)							
Toluene	0.31	J	0.20	1.0	ug/L	377559	1
Client Sample ID: MW-8 Collection Date: 6/5/2024 1:15:00 PM Lab ID: 2406724-007 Matrix: Groundwater							
Volatile Organic Compounds SW8260D (SW5030B)							
Toluene	0.39	J	0.20	1.0	ug/L	377559	1
Client Sample ID: MW-10 Collection Date: 6/5/2024 12:15:00 PM Lab ID: 2406724-008 Matrix: Groundwater							
Volatile Organic Compounds SW8260D (SW5030B)							
Toluene	0.33	J	0.20	1.0	ug/L	377559	1
Client Sample ID: MW-11 Collection Date: 6/5/2024 2:10:00 PM Lab ID: 2406724-009 Matrix: Groundwater							
Volatile Organic Compounds SW8260D (SW5030B)							
Toluene	0.42	J	0.20	1.0	ug/L	377559	1
Client Sample ID: DCW-1 Collection Date: 6/5/2024 11:07:00 AM Lab ID: 2406724-010 Matrix: Groundwater							
Volatile Organic Compounds SW8260D (SW5030B)							
Toluene	3.0		0.20	1.0	ug/L	377559	1
m,p-Xylene	0.69	J	0.37	1.0	ug/L	377559	1
Client Sample ID: RW-2 Collection Date: 6/5/2024 3:15:00 PM Lab ID: 2406724-011 Matrix: Groundwater							
Volatile Organic Compounds SW8260D (SW5030B)							
Benzene	0.23	J	0.20	1.0	ug/L	377559	1
Toluene	1.8		0.20	1.0	ug/L	377559	1
Ethylbenzene	12		0.28	1.0	ug/L	377559	1

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: RW-2 Lab ID: 2406724-011 Collection Date: 6/5/2024 3:15:00 PM Matrix: Groundwater							
Volatile Organic Compounds SW8260D				(SW5030B)			
Naphthalene	17		1.6	5.0	ug/L	377559	1
Client Sample ID: DUPLICATE Lab ID: 2406724-012 Collection Date: 6/5/2024 Matrix: Groundwater							
Volatile Organic Compounds SW8260D				(SW5030B)			
Benzene	0.26	J	0.20	1.0	ug/L	377559	1
Toluene	0.64	J	0.20	1.0	ug/L	377559	1
Ethylbenzene	12		0.28	1.0	ug/L	377559	1
Naphthalene	16		1.6	5.0	ug/L	377559	1
Client Sample ID: FIELD BLANK Lab ID: 2406724-013 Collection Date: 6/5/2024 10:32:00 AM Matrix: Aqueous							
Volatile Organic Compounds SW8260D				(SW5030B)			
Naphthalene	4.5	J	1.6	5.0	ug/L	377559	1

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value

- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- F Analyzed in the lab which is a deviation from the method
- < Less than Result value
- J Estimated value detected below Reporting Limit

SAMPLE/COOLER RECEIPT CHECKLIST

1. Client Name: **Access Analytical, Inc**

AES Work Order Number: **2406724**

2. Carrier: FedEx ☐ UPS ☐ USPS ☐ Client ☐ Courier ☒ Other ☐

	Yes	No	N/A	Details	Comments
3. Shipping container/cooler received in good condition?	☒	☐	☐	damaged ☐ leaking ☐ other ☐	
4. Custody seals present on shipping container?	☒	☐	☐		
5. Custody seals intact on shipping container?	☒	☐	☐		
6. Cooler temperature(s) within limits of 0-6°C? [See item 12 for temperature recordings.]	☒	☐	☐		
7. Chain of Custody (COC) present?	☒	☐	☐		
8. Chain of Custody signed, dated, and timed when relinquished and received?	☒	☐	☐		
9. Sampler name and/or signature on COC?	☒	☐	☐		
10. Were all samples received within holding time?	☒	☐	☐		
11. TAT marked on the COC?	☒	☐	☐	If no TAT indicated, proceeded with standard TAT per Terms & Conditions.	

12. Cooler 1 Temperature 0.9 °C Cooler 2 Temperature 1.3 °C Cooler 3 Temperature 0.3 °C Cooler 4 Temperature 0.4 °C
Cooler 5 Temperature _____ °C Cooler 6 Temperature _____ °C Cooler 7 Temperature _____ °C Cooler 8 Temperature _____ °C

13. Comments: _____

I certify that I have completed sections 1-13 (dated initials).

SB 6/7/24

	Yes	No	N/A	Details	Comments
14. Temperature blanks present?	☐	☒	☐		
15. Were sample containers intact upon receipt?	☒	☐	☐		
16. Custody seals present on sample containers?	☒	☐	☐		
17. Custody seals intact on sample containers?	☒	☐	☐		
18. Do sample container labels match the COC?	☐	☒	☐	incomplete info ☐ illegible ☐ no label ☐ other ☒	
19. Are analyses requested indicated on the COC?	☒	☐	☐		
20. Were all of the samples listed on the COC received?	☒	☐	☐	samples received but not listed on COC ☐ samples listed on COC not received ☐	
21. Was the sample collection date/time noted?	☒	☐	☐		
22. Did we receive sufficient sample volume for indicated analyses?	☒	☐	☐		
23. Were samples received in appropriate containers?	☒	☐	☐		
24. Were VOA samples received without headspace (< 1/4" bubble)?	☒	☐	☐		
25. Were trip blanks submitted?	☒	☐	☐	listed on COC ☒ not listed on COC ☐	

26. Comments: _____

I certify that I have completed sections 14-26 (dated initials).

SB 6/7/24

This section only applies to samples where pH can be checked at Sample Receipt.

	Yes	No	N/A	Details	Comments
27. Have containers needing chemical preservation been checked?*	☐	☐	☒		
28. Containers meet preservation guidelines?	☐	☐	☒		
29. Was pH adjusted at Sample Receipt?	☐	☐	☒		

***Note: Certain analyses require chemical preservation but must be checked in the laboratory and not upon Sample Receipt such as Coliforms, VOCs and Oil & Grease/TPH. This also excludes metals by EPA 200.7, 200.8 and 245.1 which will be verified between 16 and 24 hours after preservation.**

I certify that I have completed sections 27-29(dated initials).

SB 6/7/24

Client: F&ME Consultants, Inc.
Project Name: Hilton Head PSD-UST #11399
Workorder: 2406724

ANALYTICAL QC SUMMARY REPORT

BatchID: 377558

Sample ID: MB-377558	Client ID:					Units: ug/L	Prep Date: 06/12/2024	Run No: 547294			
SampleType: MBLK	TestCode: MICRO-EXTRACTABLE VOLATILE ORGANICS SW8011					BatchID: 377558	Analysis Date: 06/12/2024	Seq No: 13073308			
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

1,2-Dibromoethane	BRL	0.020									
Surr: 4-Bromofluorobenzene	5.550	0	5.000		111	70	130				

Sample ID: LCS-377558	Client ID:					Units: ug/L	Prep Date: 06/12/2024	Run No: 547294			
SampleType: LCS	TestCode: MICRO-EXTRACTABLE VOLATILE ORGANICS SW8011					BatchID: 377558	Analysis Date: 06/12/2024	Seq No: 13073309			
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

1,2-Dibromoethane	0.09600	0.020	0.1000		96.0	60	140				
Surr: 4-Bromofluorobenzene	5.405	0	5.000		108	70	130				

Sample ID: LCSD-377558	Client ID:				Units: ug/L	Prep Date: 06/12/2024	Run No: 547294				
SampleType: LCSD	TestCode: MICRO-EXTRACTABLE VOLATILE ORGANICS SW8011				BatchID: 377558	Analysis Date: 06/12/2024	Seq No: 13073310				
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

1,2-Dibromoethane	0.09600	0.020	0.1000		96.0	60	140	0.09600	0	20	
Surr: 4-Bromofluorobenzene	5.588	0	5.000		112	70	130	5.405	0	0	

Sample ID: 2406724-001BMS	Client ID: MW-2	Units: ug/L	Prep Date: 06/12/2024	Run No: 547294							
SampleType: MS	TestCode: MICRO-EXTRACTABLE VOLATILE ORGANICS SW8011	BatchID: 377558	Analysis Date: 06/12/2024	Seq No: 13073360							
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

1,2-Dibromoethane	0.09980	0.020	0.0979		102	67.7	130				
Surr: 4-Bromofluorobenzene	5.689	0	4.892		116	69.7	138				

Sample ID: 2406724-009BDUP	Client ID: MW-11	Units: ug/L			Prep Date: 06/12/2024	Run No: 547294					
SampleType: DUP	TestCode: MICRO-EXTRACTABLE VOLATILE ORGANICS SW8011	BatchID: 377558			Analysis Date: 06/12/2024	Seq No: 13073332					
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

1,2-Dibromoethane	BRL	0.020						0	0	30	
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Qualifiers: > Greater than Result value

BRL Below reporting limit

J Estimated value detected below Reporting Limit

Rpt Lim Reporting Limit

< Less than Result value

E Estimated (value above quantitation range)

N Analyte not NELAC certified

S Spike Recovery outside limits due to matrix

B Analyte detected in the associated method blank

H Holding times for preparation or analysis exceeded

R RPD outside limits due to matrix

Client: F&ME Consultants, Inc.
Project Name: Hilton Head PSD-UST #11399
Workorder: 2406724

ANALYTICAL QC SUMMARY REPORT**BatchID: 377558**

Sample ID: 2406724-009BDUP	Client ID: MW-11	Units: ug/L	Prep Date: 06/12/2024	Run No: 547294
SampleType: DUP	TestCode: MICRO-EXTRACTABLE VOLATILE ORGANICS SW8011	BatchID: 377558	Analysis Date: 06/12/2024	Seq No: 13073332

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Surr: 4-Bromofluorobenzene	5.779	0	5.032		115	69.7	138	5.596	0	0	

Qualifiers:

>	Greater than Result value
BRL	Below reporting limit
J	Estimated value detected below Reporting Limit
Rpt Lim	Reporting Limit

<	Less than Result value
E	Estimated (value above quantitation range)
N	Analyte not NELAC certified
S	Spike Recovery outside limits due to matrix

B	Analyte detected in the associated method blank
H	Holding times for preparation or analysis exceeded
R	RPD outside limits due to matrix

Client: F&ME Consultants, Inc.
Project Name: Hilton Head PSD-UST #11399
Workorder: 2406724

ANALYTICAL QC SUMMARY REPORT**BatchID: 377559**

Sample ID: MB-377559	Client ID:					Units: ug/L	Prep Date: 06/10/2024		Run No: 547093		
SampleType: MBLK	TestCode: Volatile Organic Compounds SW8260D					BatchID: 377559	Analysis Date: 06/10/2024		Seq No: 13067187		
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

1,2-Dichloroethane	BRL	1.0									
3,3-Dimethyl-1-butanol	BRL	100									
Benzene	BRL	1.0									
Ethanol	BRL	100									
Ethyl tert-butyl ether	BRL	10									
Ethylbenzene	BRL	1.0									
Isopropyl ether	BRL	10									
m,p-Xylene	BRL	1.0									
Methyl tert-butyl ether	BRL	1.0									
Naphthalene	BRL	5.0									
o-Xylene	BRL	1.0									
tert-Amyl alcohol	BRL	100									
tert-Amyl methyl ether	BRL	10									
tert-Butyl Alcohol	BRL	100									
tert-Butyl formate	BRL	100									
Toluene	BRL	1.0									
Surr: 4-Bromofluorobenzene	50.30	0	50.00		101	70	126				
Surr: Dibromofluoromethane	53.44	0	50.00		107	77	121				
Surr: Toluene-d8	49.82	0	50.00		99.6	78.6	119				

Sample ID: LCS-377559	Client ID:					Units: ug/L	Prep Date: 06/10/2024		Run No: 547093		
SampleType: LCS	TestCode: Volatile Organic Compounds SW8260D					BatchID: 377559	Analysis Date: 06/10/2024		Seq No: 13067495		
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

1,2-Dichloroethane	53.88	1.0	50.00		108	72.4	127				
3,3-Dimethyl-1-butanol	496.0	100	500.0		99.2	64.3	125				
Benzene	47.10	1.0	50.00		94.2	76.3	122				
Ethanol	411.1	100	500.0		82.2	61.3	129				

Qualifiers:	>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
	BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
	Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: F&ME Consultants, Inc.
Project Name: Hilton Head PSD-UST #11399
Workorder: 2406724

ANALYTICAL QC SUMMARY REPORT**BatchID: 377559**

Sample ID: LCS-377559	Client ID:					Units: ug/L	Prep Date: 06/10/2024	Run No: 547093			
SampleType: LCS	TestCode: Volatile Organic Compounds SW8260D					BatchID: 377559	Analysis Date: 06/10/2024	Seq No: 13067495			
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

Ethyl tert-butyl ether	102.0	10	100.0		102	80.3	123				
Ethylbenzene	51.94	1.0	50.00		104	75	127				
Isopropyl ether	101.6	10	100.0		102	74.7	129				
m,p-Xylene	105.6	1.0	100.0		106	75.5	128				
Methyl tert-butyl ether	48.97	1.0	50.00		97.9	76.1	123				
Naphthalene	43.13	5.0	50.00		86.3	66.7	129				
o-Xylene	54.53	1.0	50.00		109	77.7	124				
tert-Amyl alcohol	450.3	100	500.0		90.1	67.4	132				
tert-Amyl methyl ether	99.66	10	100.0		99.7	76.9	124				
tert-Butyl Alcohol	431.8	100	500.0		86.4	70.6	129				
tert-Butyl formate	447.6	100	500.0		89.5	64.3	129				
Toluene	47.81	1.0	50.00		95.6	74.3	124				
Surr: 4-Bromofluorobenzene	51.39	0	50.00		103	70	126				
Surr: Dibromofluoromethane	51.47	0	50.00		103	77	121				
Surr: Toluene-d8	49.08	0	50.00		98.2	78.6	119				

Sample ID: 2406295-061AMS	Client ID:					Units: ug/L	Prep Date: 06/10/2024		Run No: 547093		
SampleType: MS	TestCode: Volatile Organic Compounds SW8260D					BatchID: 377559	Analysis Date: 06/10/2024		Seq No: 13067219		
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

1,2-Dichloroethane	497.9	10	500.0		99.6	70.5	133				
3,3-Dimethyl-1-butanol	4719	1000	5000		94.4	54.5	132				
Benzene	525.6	10	500.0	83.40	88.4	71.3	133				
Ethanol	3526	1000	5000		70.5	55.3	137				
Ethyl tert-butyl ether	968.4	100	1000		96.8	76	129				
Ethylbenzene	514.8	10	500.0	12.90	100	74.6	131				
Isopropyl ether	967.5	100	1000		96.8	70	133				
m,p-Xylene	1081	10	1000	54.30	103	72.7	133				

Qualifiers:	>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
	BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
	J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
	Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: F&ME Consultants, Inc.
Project Name: Hilton Head PSD-UST #11399
Workorder: 2406724

ANALYTICAL QC SUMMARY REPORT

BatchID: 377559

Sample ID: 2406295-061AMS	Client ID:	Units: ug/L	Prep Date: 06/10/2024	Run No: 547093							
SampleType: MS	TestCode: Volatile Organic Compounds SW8260D	BatchID: 377559	Analysis Date: 06/10/2024	Seq No: 13067219							
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

Methyl tert-butyl ether	466.2	10	500.0		93.2	70.2	130				
Naphthalene	421.9	50	500.0	44.80	75.4	63	134				
o-Xylene	547.6	10	500.0	26.10	104	72.6	132				
tert-Amyl alcohol	4380	1000	5000		87.6	57.2	138				
tert-Amyl methyl ether	945.1	100	1000		94.5	73.4	128				
tert-Butyl Alcohol	4288	1000	5000		85.8	65.6	138				
tert-Butyl formate	4105	1000	5000		82.1	52.2	126				
Toluene	666.6	10	500.0	219.8	89.4	72	134				
Surr: 4-Bromofluorobenzene	510.1	0	500.0		102	70	126				
Surr: Dibromofluoromethane	510.8	0	500.0		102	77	121				
Surr: Toluene-d8	494.8	0	500.0		99.0	78.6	119				

Sample ID: 2406295-061AMSD		Client ID:				Units: ug/L		Prep Date: 06/10/2024		Run No: 547093	
SampleType: MSD		TestCode: Volatile Organic Compounds SW8260D				BatchID: 377559		Analysis Date: 06/10/2024		Seq No: 13067223	
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

1,2-Dichloroethane	494.7	10	500.0		98.9	70.5	133	497.9	0.645	41.4	
3,3-Dimethyl-1-butanol	5019	1000	5000		100	54.5	132	4719	6.17	30	
Benzene	511.2	10	500.0	83.40	85.6	71.3	133	525.6	2.78	42.4	
Ethanol	4194	1000	5000		83.9	55.3	137	3526	17.3	48	
Ethyl tert-butyl ether	975.6	100	1000		97.6	76	129	968.4	0.741	30	
Ethylbenzene	496.5	10	500.0	12.90	96.7	74.6	131	514.8	3.62	27.7	
Isopropyl ether	960.0	100	1000		96.0	70	133	967.5	0.778	34.2	
m,p-Xylene	1034	10	1000	54.30	98.0	72.7	133	1081	4.43	28	
Methyl tert-butyl ether	474.1	10	500.0		94.8	70.2	130	466.2	1.68	29.9	
Naphthalene	431.2	50	500.0	44.80	77.3	63	134	421.9	2.18	47.9	
o-Xylene	532.8	10	500.0	26.10	101	72.6	132	547.6	2.74	27.9	
tert-Amyl alcohol	4808	1000	5000		96.2	57.2	138	4380	9.31	45.7	

Qualifiers: > Greater than Result value

BRL Below reporting limit

J Estimated value detected below Reporting Limit

Rpt Lim Reporting Limit

< Less than Result value

E Estimated (value above quantitation range)

N Analyte not NELAC certified

S Spike Recovery outside limits due to matrix

B Analyte detected in the associated method blank

H Holding times for preparation or analysis exceeded

R RPD outside limits due to matrix

Client: F&ME Consultants, Inc.
Project Name: Hilton Head PSD-UST #11399
Workorder: 2406724

ANALYTICAL QC SUMMARY REPORT**BatchID: 377559**

Sample ID: 2406295-061AMSD	Client ID:				Units: ug/L	Prep Date: 06/10/2024	Run No: 547093				
SampleType: MSD	TestCode: Volatile Organic Compounds SW8260D				BatchID: 377559	Analysis Date: 06/10/2024	Seq No: 13067223				
Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
tert-Amyl methyl ether	958.6	100	1000		95.9	73.4	128	945.1	1.42	35.5	
tert-Butyl Alcohol	4659	1000	5000		93.2	65.6	138	4288	8.30	68.1	
tert-Butyl formate	4104	1000	5000		82.1	52.2	126	4105	0.020	30	
Toluene	637.1	10	500.0	219.8	83.5	72	134	666.6	4.53	42.5	
Surr: 4-Bromofluorobenzene	512.3	0	500.0		102	70	126	510.1	0	0	
Surr: Dibromofluoromethane	503.5	0	500.0		101	77	121	510.8	0	0	
Surr: Toluene-d8	496.4	0	500.0		99.3	78.6	119	494.8	0	0	

Qualifiers: > Greater than Result value
BRL Below reporting limit
J Estimated value detected below Reporting Limit
Rpt Lim Reporting Limit

< Less than Result value
E Estimated (value above quantitation range)
N Analyte not NELAC certified
S Spike Recovery outside limits due to matrix

B Analyte detected in the associated method blank
H Holding times for preparation or analysis exceeded
R RPD outside limits due to matrix

End of Report

Appendix C

Field Sampling Data Sheets for Groundwater Sampling



**Field Data Information Sheet for Groundwater Sampling
Low Flow Purging & Sampling**

Date(mm/dd/yy) <u>6/5/2024</u>	
Field Personnel <u>J. Leary</u>	
General Weather Conditions <u>Sunny</u>	
Ambient Air Temperature F. <u>82</u>	
Facility Name <u>Hilton Head Island PSD</u>	Site ID# <u>11399</u>
Quality Assurance	
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)	
Serial No. <u>14C100356</u>	Serial No. <u>14C100356</u>
pH=4.0 <u>3.96</u>	Standard 1409 <u>1410</u>
pH=7.0 <u>7.08</u>	D.O. 100% <u>100.3%</u>
pH=10.0 <u>10.02</u>	
Temp. C. <u>26.02</u> <u>26.08</u>	
Turbidity - Micro TPW S# 201305158	
NTU - 0.02, 10.0, 1000 (NTU) 0.02, 9.99, 1005	

Well # <u>MW-1</u>	
Well Diameter(d) <u>2</u> inch or <u>0.1667</u> feet	
conversion factor (c): $[3.142 \times (d/2)^2] \times 7.48$	
for a 2 inch well c = <u>0.163</u> gal's/ft	
for a 4 inch well c = <u>0.653</u> gal's/ft	
Total Well Depth(twd) <u>12.0</u> feet	Screen 2-12
Depth to GW (dwg) <u>*5.07</u> feet	*Corrected Water Level
Length of Water Column(lwc=twd-dwg) _____ feet	
1 Csg Volume(lwc x c)= _____ gallons	
3 Csg Volumes = _____ gallons (Std. Purge Volume)	
Volume of Water Purged Before Sampling _____ liters	

Didn't Sample due to 1.62' of Free Product. Free product at 4.88', Water at 6.50'.

Volume Purged (liters)
Time (military)
pH (s.u.)
Specific Cond. (umhos/cm)
Water Temp. (C)
Turbidity (NTU)
Dissolved Oxygen (mg/L)
Water Level (ft.)

nr = not recorded n/a = not applicable



**Field Data Information Sheet for Groundwater Sampling
Low Flow Purging & Sampling**

Date(mm/dd/yy) <u>6/5/2024</u>	
Field Personnel <u>J. Leary</u>	
General Weather Conditions <u>Sunny</u>	
Ambient Air Temperature F. <u>85</u>	
Facility Name <u>Hilton Head Island PSD</u>	Site ID# <u>11399</u>
Quality Assurance	
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)	
Serial No. <u>14C100356</u>	Serial No. <u>14C100356</u>
pH=4.0 <u>3.96</u>	Standard 1409 <u>1410</u>
pH=7.0 <u>7.08</u>	D.O. 100% <u>100.3%</u>
pH=10.0 <u>10.02</u>	
Temp. C. <u>26.02</u> <u>26.08</u>	
Turbidity - Micro TPW S# 201305158	
NTU - 0.02, 10.0, 1000 (NTU) 0.02, 9.99, 1005	

Well # <u>MW-2</u>	
Well Diameter(d) <u>2</u> inch or <u>0.1667</u> feet	
conversion factor (c): $[3.142 \times (d/2)^2] \times 7.48$	
for a 2 inch well c = <u>0.163</u> gal's/ft	
for a 4 inch well c = <u>0.653</u> gal's/ft	
Total Well Depth(twd) <u>13.0</u> feet	Screen <u>3-13</u>
Depth to GW (dwg) <u>6.07</u> feet	
Length of Water Column(lwc=twd-dgw) _____ feet	
1 Csg Volume(lwc x c)= _____ gallons	
3 Csg Volumes = _____ gallons (Std. Purge Volume)	
Volume of Water Purged Before Sampling <u>0.00</u> liters	

No purging required. Sampled with bailer.

	Sample				
Volume Purged (liters)	0.00				
Time (military)	1335				
pH (s.u.)	6.26				
Specific Cond. (umhos/cm)	492				
Water Temp. (C)	24.74				
Turbidity (NTU)	0.68				
Dissolved Oxygen (mg/L)	1.28				
Water Level (ft.)	n/a				
nr = not recorded n/a = not applicable					



Field Data Information Sheet for Groundwater Sampling Low Flow Purging & Sampling

Date(mm/dd/yy) <u>6/5/2024</u>	
Field Personnel <u>J. Leary</u>	
General Weather Conditions <u>Sunny</u>	
Ambient Air Temperature F. <u>85</u>	
Facility Name <u>Hilton Head Island PSD</u>	Site ID# <u>11399</u>
Quality Assurance	
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)	
Serial No. <u>14C100356</u>	Serial No. <u>14C100356</u>
pH=4.0 <u>3.96</u>	Standard 1409 <u>1410</u>
pH=7.0 <u>7.08</u>	D.O. 100% <u>100.3%</u>
pH=10.0 <u>10.02</u>	
Temp. C. <u>26.02</u> <u>26.08</u>	
Turbidity - Micro TPW S# 201305158	
NTU - 0.02, 10.0, 1000 (NTU) 0.02, 9.99, 1005	

Well # <u>MW-3</u>	
Well Diameter(d) <u>2</u> inch or <u>0.1667</u> feet	
conversion factor (c): $[3.142 \times (d/2)^2] \times 7.48$	
for a 2 inch well c = <u>0.163</u> gal's/ft	
for a 4 inch well c = <u>0.653</u> gal's/ft	
Total Well Depth(twd) <u>13.0</u> feet	Screen 3-13
Depth to GW (dwg) <u>5.96</u> feet	
Length of Water Column(lwc=twd-dgw) _____ feet	
1 Csg Volume(lwc x c)= _____ gallons	
3 Csg Volumes = _____ gallons (Std. Purge Volume)	
Volume of Water Purged Before Sampling <u>0.00</u> liters	

No purging required. Sampled with bailer.

	Sample				
Volume Purged (liters)	0.00				
Time (military)	1352				
pH (s.u.)	6.01				
Specific Cond. (umhos/cm)	649				
Water Temp. (C)	24.97				
Turbidity (NTU)	0.36				
Dissolved Oxygen (mg/L)	1.34				
Water Level (ft.)	n/a				
nr = not recorded n/a = not applicable					

**Field Data Information Sheet for Groundwater Sampling
Low Flow Purging & Sampling**

Date(mm/dd/yy)	<u>6/5/2024</u>		
Field Personnel	<u>J. Leary</u>		
General Weather Conditions	<u>Sunny</u>		
Ambient Air Temperature F.	<u>85</u>		
Facility Name	<u>Hilton Head Island PSD</u>	Site ID#	<u>11399</u>
Quality Assurance			
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)			
Serial No.	<u>14C100356</u>	Serial No.	<u>14C100356</u>
pH=4.0	<u>3.96</u>	Standard	<u>1409 1410</u>
pH=7.0	<u>7.08</u>	D.O.	<u>100% 100.3%</u>
pH=10.0	<u>10.02</u>		
Temp. C.	<u>26.02</u>		<u>26.08</u>
Turbidity - Micro TPW S# 201305158			
NTU - <u>0.02, 10.0, 1000</u> (NTU) <u>0.02, 9.99, 1005</u>			

Well #	<u>MW-4</u>		
Well Diameter(d)	<u>2</u> inch or <u>0.1667</u> feet		
conversion factor (c): $[3.142 \times (d/2)^2] \times 7.48$			
	for a 2 inch well c =	<u>0.163</u>	gal's/ft
	for a 4 inch well c =	<u>0.653</u>	gal's/ft
Total Well Depth(twd)	<u>13.0</u> feet	Screen 3-13	
Depth to GW (dwg)	<u>5.63</u> feet		
Length of Water Column(lwc=twd-dgw)		<u> </u> feet	
1 Csg Volume(lwc x c)=		<u> </u> gallons	
3 Csg Volumes =		<u> </u> gallons (Std. Purge Volume)	
Volume of Water Purged Before Sampling		<u>0.00</u>	liters

No purging required. Sampled with bailer.

	Sample				
Volume Purged (liters)	0.00				
Time (military)	1430				
pH (s.u.)	6.28				
Specific Cond. (umhos/cm)	234				
Water Temp. (C)	25.53				
Turbidity (NTU)	2.68				
Dissolved Oxygen (mg/L)	1.32				
Water Level (ft.)	n/a				

nr = not recorded n/a = not applicable

**Field Data Information Sheet for Groundwater Sampling
Low Flow Purging & Sampling**

Date(mm/dd/yy)	<u>6/5/2024</u>		
Field Personnel	<u>J. Leary</u>		
General Weather Conditions	<u>Sunny</u>		
Ambient Air Temperature F.	<u>84</u>		
Facility Name	<u>Hilton Head Island PSD</u>	Site ID#	<u>11399</u>
Quality Assurance			
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)			
Serial No.	<u>14C100356</u>	Serial No.	<u>14C100356</u>
pH=4.0	<u>3.96</u>	Standard	<u>1409 1410</u>
pH=7.0	<u>7.08</u>	D.O.	<u>100% 100.3%</u>
pH=10.0	<u>10.02</u>		
Temp. C.	<u>26.02</u>	<u>26.08</u>	
Turbidity - Micro TPW S# 201305158			
NTU - <u>0.02, 10.0, 1000</u> (NTU) <u>0.02, 9.99, 1005</u>			

Well #	<u>MW-5</u>		
Well Diameter(d)	<u>2</u> inch or <u>0.1667</u> feet		
conversion factor (c): $[3.142 \times (d/2)^2] \times 7.48$			
for a 2 inch well c =	<u>0.163</u> gal's/ft		
for a 4 inch well c =	<u>0.653</u> gal's/ft		
Total Well Depth(twd)	<u>14.0</u> feet	Screen 4-14	
Depth to GW (dwg)	<u>5.42</u> feet		
Length of Water Column(lwc=twd-dgw)		<u> </u> feet	
1 Csg Volume(lwc x c)=		<u> </u> gallons	
3 Csg Volumes =		<u> </u> gallons (Std. Purge Volume)	
Volume of Water Purged Before Sampling		<u>0.00</u> liters	

No purging required. Sampled with bailer.

	Sample				
Volume Purged (liters)	0.00				
Time (military)	1455				
pH (s.u.)	6.05				
Specific Cond. (umhos/cm)	181				
Water Temp. (C)	24.95				
Turbidity (NTU)	25.28				
Dissolved Oxygen (mg/L)	1.18				
Water Level (ft.)	n/a				

nr = not recorded n/a = not applicable



Field Data Information Sheet for Groundwater Sampling Low Flow Purging & Sampling

Date(mm/dd/yy) <u>6/5/2024</u>	
Field Personnel <u>J. Leary</u>	
General Weather Conditions <u>Sunny</u>	
Ambient Air Temperature F. <u>85</u>	
Facility Name <u>Hilton Head Island PSD</u>	Site ID# <u>11399</u>
Quality Assurance	
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)	
Serial No. <u>14C100356</u>	Serial No. <u>14C100356</u>
pH=4.0 <u>3.96</u>	Standard 1409 <u>1410</u>
pH=7.0 <u>7.08</u>	D.O. 100% <u>100.3%</u>
pH=10.0 <u>10.02</u>	
Temp. C. <u>26.02</u>	<u>26.08</u>
Turbidity - Micro TPW S# 201305158	
NTU - 0.02, 10.0, 1000 (NTU) 0.02, 9.99, 1005	

Well # <u>MW-6</u>	
Well Diameter(d) <u>2</u> inch or <u>0.1667</u> feet	
conversion factor (c): $[3.142 \times (d/2)^2] \times 7.48$	
for a 2 inch well c = <u>0.163</u> gal's/ft	
for a 4 inch well c = <u>0.653</u> gal's/ft	
Total Well Depth(twd) <u>14.0</u> feet	Screen 4-14
Depth to GW (dwg) <u>5.78</u> feet	
Length of Water Column(lwc=twd-dgw) _____ feet	
1 Csg Volume(lwc x c)= _____ gallons	
3 Csg Volumes = _____ gallons (Std. Purge Volume)	
Volume of Water Purged Before Sampling <u>0.00</u> liters	

No purging required. Sampled with bailer.

	Sample				
Volume Purged (liters)	0.00				
Time (military)	1300				
pH (s.u.)	6.82				
Specific Cond. (umhos/cm)	437				
Water Temp. (C)	26.12				
Turbidity (NTU)	8.79				
Dissolved Oxygen (mg/L)	2.60				
Water Level (ft.)	n/a				
nr = not recorded n/a = not applicable					



Date(mm/dd/yy)	<u>6/5/2024</u>		
Field Personnel	<u>J. Leary</u>		
General Weather Conditions	<u>Sunny</u>		
Ambient Air Temperature F.	<u>83</u>		
Facility Name	<u>Hilton Head Island PSD</u>	Site ID#	<u>11399</u>
Quality Assurance			
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)			
Serial No.	<u>14C100356</u>	Serial No	<u>14C100356</u>
pH=4.0	<u>3.96</u>	Standard	<u>1409 1410</u>
pH=7.0	<u>7.08</u>	D.O.	<u>100% 100.3%</u>
pH=10.0	<u>10.02</u>		
Temp. C.	<u>26.02</u>	<u>26.08</u>	
Turbidity - Micro TPW S# 201305158			
NTU - 0.02, 10.0, 1000 (NTU) 0.02, 9.99, 1005			

Volume of Water Purged Before Sampling	0.00	liters
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	Sample					
Volume Purged (liters)	0.00					
Time (military)	1150					
pH (s.u.)	6.20					
Specific Cond. (umhos/cm)	458					
Water Temp. (C)	30.63					
Turbidity (NTU)	5.55					
Dissolved Oxygen (mg/L)	2.10					
Water Level (ft.)	n/a					

nr = not recorded n/a = not applicable



**Field Data Information Sheet for Groundwater Sampling
Low Flow Purging & Sampling**

Date(mm/dd/yy) <u>6/5/2024</u>	
Field Personnel <u>J. Leary</u>	
General Weather Conditions <u>Sunny</u>	
Ambient Air Temperature F. <u>85</u>	
Facility Name <u>Hilton Head Island PSD</u>	Site ID# <u>11399</u>
Quality Assurance	
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)	
Serial No. <u>14C100356</u>	Serial No. <u>14C100356</u>
pH=4.0 <u>3.96</u>	Standard 1409 <u>1410</u>
pH=7.0 <u>7.08</u>	D.O. 100% <u>100.3%</u>
pH=10.0 <u>10.02</u>	
Temp. C. <u>26.02</u>	<u>26.08</u>
Turbidity - Micro TPW S# 201305158	
NTU - 0.02, 10.0, 1000 (NTU) 0.02, 9.99, 1005	

Well # <u>MW-8</u>	
Well Diameter(d) <u>2</u> inch or <u>0.1667</u> feet	
conversion factor (c): $[3.142 \times (d/2)^2] \times 7.48$	
for a 2 inch well c = <u>0.163</u> gal's/ft	
for a 4 inch well c = <u>0.653</u> gal's/ft	
Total Well Depth(twd) <u>14.0</u> feet	Screen 4-14
Depth to GW (dwg) <u>5.41</u> feet	
Length of Water Column(lwc=twd-dgw) _____ feet	
1 Csg Volume(lwc x c)= _____ gallons	
3 Csg Volumes = _____ gallons (Std. Purge Volume)	
Volume of Water Purged Before Sampling <u>0.00</u> liters	

No purging required. Sampled with bailer.

	Sample				
Volume Purged (liters)	0.00				
Time (military)	1315				
pH (s.u.)	6.50				
Specific Cond. (umhos/cm)	491				
Water Temp. (C)	26.86				
Turbidity (NTU)	7.14				
Dissolved Oxygen (mg/L)	6.06				
Water Level (ft.)	n/a				
nr = not recorded n/a = not applicable					

**Field Data Information Sheet for Groundwater Sampling
Low Flow Purging & Sampling**

Date(mm/dd/yy)	<u>6/5/2024</u>		
Field Personnel	<u>J. Leary</u>		
General Weather Conditions	<u>Sunny</u>		
Ambient Air Temperature F.	<u>82</u>		
Facility Name	<u>Hilton Head Island PSD</u>	Site ID#	<u>11399</u>
Quality Assurance			
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)			
Serial No.	<u>14C100356</u>	Serial No.	<u>14C100356</u>
pH=4.0	<u>3.96</u>	Standard	<u>1409 1410</u>
pH=7.0	<u>7.08</u>	D.O.	<u>100% 100.3%</u>
pH=10.0	<u>10.02</u>		
Temp. C.	<u>26.02</u>	<u>26.08</u>	
Turbidity - Micro TPW S# 201305158			
NTU - <u>0.02, 10.0, 1000</u> (NTU) <u>0.02, 9.99, 1005</u>			

Well #	<u>MW-9</u>		
Well Diameter(d)	<u>2</u> inch or <u>0.1667</u> feet		
conversion factor (c): $[3.142 \times (d/2)^2] \times 7.48$			
	for a 2 inch well c =	<u>0.163</u>	gal's/ft
	for a 4 inch well c =	<u>0.653</u>	gal's/ft
Total Well Depth(twd)	<u>13.5</u> feet	Screen 3.5-13.5	
Depth to GW (dwg)	<u>*5.32</u> feet	*Corrected Water Level	
Length of Water Column(lwc=twd-dgw) _____ feet			
1 Csg Volume(lwc x c)= _____ gallons			
3 Csg Volumes = _____ gallons (Std. Purge Volume)			
Volume of Water Purged Before Sampling _____ liters			

Didn't Sample due to 1.77' of Free Product. Free product at 5.12', Water at 6.89'.

Volume Purged (liters)
Time (military)
pH (s.u.)
Specific Cond. (umhos/cm)
Water Temp. (C)
Turbidity (NTU)
Dissolved Oxygen (mg/L)
Water Level (ft.)

nr = not recorded n/a = not applicable

**Field Data Information Sheet for Groundwater Sampling
Low Flow Purging & Sampling**

Date(mm/dd/yy)	<u>6/5/2024</u>		
Field Personnel	<u>J. Leary</u>		
General Weather Conditions	<u>Sunny</u>		
Ambient Air Temperature F.	<u>82</u>		
Facility Name	<u>Hilton Head Island PSD</u>	Site ID#	<u>11399</u>
Quality Assurance			
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)			
Serial No.	<u>14C100356</u>	Serial No.	<u>14C100356</u>
pH=4.0	<u>3.96</u>	Standard	<u>1409 1410</u>
pH=7.0	<u>7.08</u>	D.O.	<u>100% 100.3%</u>
pH=10.0	<u>10.02</u>		
Temp. C.	<u>26.02</u>		<u>26.08</u>
Turbidity - Micro TPW S# 201305158			
NTU - <u>0.02, 10.0, 1000</u> (NTU) <u>0.02, 9.99, 1005</u>			

Well #	<u>MW-10</u>		
Well Diameter(d)	<u>2</u> inch or <u>0.1667</u> feet		
conversion factor (c): $[3.142 \times (d/2)^2] \times 7.48$			
for a 2 inch well c =	<u>0.163</u> gal's/ft		
for a 4 inch well c =	<u>0.653</u> gal's/ft		
Total Well Depth(twd)	<u>13.5</u> feet	Screen	<u>3.5-13.5</u>
Depth to GW (dwg)	<u>5.23</u> feet		
Length of Water Column(lwc=twd-dgw)		<u> </u> feet	
1 Csg Volume(lwc x c)=		<u> </u> gallons	
3 Csg Volumes =		<u> </u> gallons (Std. Purge Volume)	
Volume of Water Purged Before Sampling		<u>0.00</u>	liters

No purging required. Sampled with bailer.

	Sample				
Volume Purged (liters)	0.00				
Time (military)	1215				
pH (s.u.)	5.96				
Specific Cond. (umhos/cm)	233				
Water Temp. (C)	27.19				
Turbidity (NTU)	1.57				
Dissolved Oxygen (mg/L)	1.60				
Water Level (ft.)	n/a				

nr = not recorded

**Field Data Information Sheet for Groundwater Sampling
Low Flow Purging & Sampling**

Date(mm/dd/yy)	<u>6/5/2024</u>		
Field Personnel	<u>J. Leary</u>		
General Weather Conditions	<u>Sunny</u>		
Ambient Air Temperature F.	<u>85</u>		
Facility Name	<u>Hilton Head Island PSD</u>	Site ID#	<u>11399</u>
Quality Assurance			
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)			
Serial No.	<u>14C100356</u>	Serial No.	<u>14C100356</u>
pH=4.0	<u>3.96</u>	Standard	<u>1409</u> <u>1410</u>
pH=7.0	<u>7.08</u>	D.O.	<u>100%</u> <u>100.3%</u>
pH=10.0	<u>10.02</u>		
Temp. C.	<u>26.02</u>	<u>26.08</u>	
Turbidity - Micro TPW S# 201305158			
NTU - 0.02, 10.0, 1000 (NTU) 0.02, 9.99, 1005			

Well #	<u>MW-11</u>		
Well Diameter(d)	<u>2</u> inch or <u>0.1667</u> feet		
conversion factor (c): $[3.142 \times (d/2)^2] \times 7.48$			
for a 2 inch well c =	<u>0.163</u> gal's/ft		
for a 4 inch well c =	<u>0.653</u> gal's/ft		
Total Well Depth(twd)	<u>13.0</u> feet	Screen	<u>3-13</u>
Depth to GW (dwg)	<u>4.85</u> feet		
Length of Water Column(lwc=twd-dgw)		<u> </u> feet	
1 Csg Volume(lwc x c)=		<u> </u> gallons	
3 Csg Volumes =		<u> </u> gallons (Std. Purge Volume)	
Volume of Water Purged Before Sampling		<u>0.00</u>	liters

No purging required. Sampled with bailer.

	Sample				
Volume Purged (liters)	0.00				
Time (military)	1410				
pH (s.u.)	6.65				
Specific Cond. (umhos/cm)	488				
Water Temp. (C)	26.97				
Turbidity (NTU)	1.49				
Dissolved Oxygen (mg/L)	7.38				
Water Level (ft.)	n/a				
nr = not recorded n/a = not applicable					

**Field Data Information Sheet for Groundwater Sampling
Low Flow Purging & Sampling**

Date(mm/dd/yy)	<u>6/5/2024</u>		
Field Personnel	<u>J. Leary</u>		
General Weather Conditions	<u>Sunny</u>		
Ambient Air Temperature F.	<u>82</u>		
Facility Name	<u>Hilton Head Island PSD</u>	Site ID#	<u>11399</u>
Quality Assurance			
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)			
Serial No.	<u>14C100356</u>	Serial No.	<u>14C100356</u>
pH=4.0	<u>3.96</u>	Standard	<u>1409 1410</u>
pH=7.0	<u>7.08</u>	D.O.	<u>100% 100.3%</u>
pH=10.0	<u>10.02</u>		
Temp. C.	<u>26.02</u>		<u>26.08</u>
Turbidity - Micro TPW S# 201305158			
NTU - <u>0.02, 10.0, 1000</u> (NTU) <u>0.02, 9.99, 1005</u>			

Well #	<u>MW-12</u>		
Well Diameter(d)	<u>2</u> inch or <u>0.1667</u> feet		
conversion factor (c): $[3.142 \times (d/2)^2] \times 7.48$			
	for a 2 inch well c =	<u>0.163</u>	gal's/ft
	for a 4 inch well c =	<u>0.653</u>	gal's/ft
Total Well Depth(twd)	<u>13.0</u> feet	Screen <u>3-13</u>	
Depth to GW (dwg)	<u>*5.02</u> feet	*Corrected Water Level	
Length of Water Column(lwc=twd-dgw) _____ feet			
1 Csg Volume(lwc x c)= _____ gallons			
3 Csg Volumes = _____ gallons (Std. Purge Volume)			
Volume of Water Purged Before Sampling _____ liters			

Didn't Sample due to 1.69' of Free Product. Free product at 4.83', Water at 6.52'.

Volume Purged (liters)
Time (military)
pH (s.u.)
Specific Cond. (umhos/cm)
Water Temp. (C)
Turbidity (NTU)
Dissolved Oxygen (mg/L)
Water Level (ft.)

nr = not recorded n/a = not applicable



**Field Data Information Sheet for Groundwater Sampling
Low Flow Purging & Sampling**

Date(mm/dd/yy) <u>6/5/2024</u>	
Field Personnel <u>J. Leary</u>	
General Weather Conditions <u>Sunny</u>	
Ambient Air Temperature F. <u>82</u>	
Facility Name <u>Hilton Head Island PSD</u>	Site ID# <u>11399</u>
Quality Assurance	
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)	
Serial No. <u>14C100356</u>	Serial No. <u>14C100356</u>
pH=4.0 <u>3.96</u>	Standard 1409 <u>1410</u>
pH=7.0 <u>7.08</u>	D.O. 100% <u>100.3%</u>
pH=10.0 <u>10.02</u>	
Temp. C. <u>26.02</u>	<u>26.08</u>
Turbidity - Micro TPW S# 201305158	
NTU - 0.02, 10.0, 1000 (NTU) 0.02, 9.99, 1005	

Well # <u>MW-13</u>	
Well Diameter(d) <u>2</u> inch or <u>0.1667</u> feet	
conversion factor (c): $[3.142 \times (d/2)^2] \times 7.48$	
for a 2 inch well c = <u>0.163</u> gal's/ft	
for a 4 inch well c = <u>0.653</u> gal's/ft	
Total Well Depth(twd) <u>13.0</u> feet	Screen 3-13
Depth to GW (dwg) <u>*5.31</u> feet	Corrected Water Level
Length of Water Column(lwc=twd-dgw) _____ feet	
1 Csg Volume(lwc x c)= _____ gallons	
3 Csg Volumes = _____ gallons (Std. Purge Volume)	
Volume of Water Purged Before Sampling _____ liters	

Didn't Sample due to 1.25' of Free Product. Free product at 5.17', Water at 6.42'.

Volume Purged (liters)
Time (military)
pH (s.u.)
Specific Cond. (umhos/cm)
Water Temp. (C)
Turbidity (NTU)
Dissolved Oxygen (mg/L)
Water Level (ft.)

nr = not recorded n/a = not applicable



Date(mm/dd/yy)	6/5/2024		
Field Personnel	J. Leary		
General Weather Conditions	Sunny		
Ambient Air Temperature F.	83		
Facility Name	Hilton Head Island PSD	Site ID#	11399
Quality Assurance			
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)			
Serial No.	14C100356	Serial No.	14C100356
pH=4.0	3.96	Standard	1409 1410
pH=7.0	7.08	D.O.	100% 100.3%
pH=10.0	10.02		
Temp. C.	26.02	26.08	
Turbidity - Micro TPW S# 201305158			
NTU - 0.02, 10.0, 1000 (NTU) 0.02, 9.99, 1005			

Well Diameter(d)	<u>2</u>	inch or	<u>0.1667</u>	feet
conversion factor (c):	[3.142 x (d/2)^2] x 7.48			
for a 2 inch well c =	<u>0.163</u>	gal's/ft		
for a 4 inch well c =	<u>0.653</u>	gal's/ft		

Total Well Depth(twd)	<u>34.0</u>	feet	Screen 29-34
Depth to GW (dwg)	5.36	feet	

Length of Water Column(lwc=twd-dgw) feet

1 Csg Volume(lwc x c)=	_____ gallons
3 Csg Volumes =	_____ gallons (Std. Purge Volume)

Volume of Water Purged Before Sampling _____ liters

Purged and sampled with peristaltic pump. Purged on ground.

	Sample					
Volume Purged (liters)	1.00	2.00	3.50	5.00		
Time (military)	1052	1057	1102	1107		
pH (s.u.)	6.58	6.56	6.55	6.53		
Specific Cond. (umhos/cm)	271	270	270	269		
Water Temp. (C)	24.06	24.21	24.17	24.14		
Turbidity (NTU)	50.76	6.34	2.34	1.14		
Dissolved Oxygen (mg/L)	1.80	1.97	1.54	1.43		
Water Level (ft.)	5.70	5.58	5.59	5.59		

nr = not recorded n/a = not applicable

**Field Data Information Sheet for Groundwater Sampling
Low Flow Purging & Sampling**

Date(mm/dd/yy)	<u>6/5/2024</u>		
Field Personnel	<u>J. Leary</u>		
General Weather Conditions	<u>Sunny</u>		
Ambient Air Temperature F.	<u>82</u>		
Facility Name	<u>Hilton Head Island PSD</u>	Site ID#	<u>11399</u>
Quality Assurance			
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)			
Serial No.	<u>14C100356</u>	Serial No.	<u>14C100356</u>
pH=4.0	<u>3.96</u>	Standard	<u>1409 1410</u>
pH=7.0	<u>7.08</u>	D.O.	<u>100% 100.3%</u>
pH=10.0	<u>10.02</u>		
Temp. C.	<u>26.02</u>	<u>26.08</u>	
Turbidity - Micro TPW S# 201305158			
NTU - <u>0.02, 10.0, 1000</u> (NTU) <u>0.02, 9.99, 1005</u>			

Well #	<u>RW-1</u>		
Well Diameter(d)	<u>4</u> inch or <u>0.3333</u> feet		
conversion factor (c): $[3.142 \times (d/2)^2] \times 7.48$			
	for a 2 inch well c =	<u>0.163</u>	gal's/ft
	for a 4 inch well c =	<u>0.653</u>	gal's/ft
Total Well Depth(twd)	<u>12.0</u> feet	Screen 2-12	
Depth to GW (dwg)	<u>*4.91</u> feet	*Corrected Water Level	
Length of Water Column(lwc=twd-dgw)		<u> </u> feet	
1 Csg Volume(lwc x c)=		<u> </u> gallons	
3 Csg Volumes =		<u> </u> gallons (Std. Purge Volume)	
Volume of Water Purged Before Sampling		<u> </u> liters	

Didn't Sample due to 1.14' of Free Product. Free product at 4.78', Water at 5.92'.

Volume Purged (liters)
Time (military)
pH (s.u.)
Specific Cond. (umhos/cm)
Water Temp. (C)
Turbidity (NTU)
Dissolved Oxygen (mg/L)
Water Level (ft.)

nr = not recorded n/a = not applicable



**Field Data Information Sheet for Groundwater Sampling
Low Flow Purging & Sampling**

Date(mm/dd/yy) <u>6/5/2024</u>	
Field Personnel <u>J. Leary</u>	
General Weather Conditions <u>Sunny</u>	
Ambient Air Temperature F. <u>84</u>	
Facility Name <u>Hilton Head Island PSD</u>	Site ID# <u>11399</u>
Quality Assurance	
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)	
Serial No. <u>14C100356</u>	Serial No. <u>14C100356</u>
pH=4.0 <u>3.96</u>	Standard 1409 <u>1410</u>
pH=7.0 <u>7.08</u>	D.O. 100% <u>100.3%</u>
pH=10.0 <u>10.02</u>	
Temp. C. <u>26.02</u> <u>26.08</u>	
Turbidity - Micro TPW S# 201305158	
NTU - 0.02, 10.0, 1000 (NTU) 0.02, 9.99, 1005	

Well # <u>RW-2</u>	
Well Diameter(d) <u>4</u> inch or <u>0.3333</u> feet	
conversion factor (c): $[3.142 \times (d/2)^2] \times 7.48$	
for a 2 inch well c = <u>0.163</u> gal's/ft	
for a 4 inch well c = <u>0.653</u> gal's/ft	
Total Well Depth(twd) <u>12.0</u> feet	Screen 2-12
Depth to GW (dwg) <u>5.01</u> feet	
Length of Water Column(lwc=twd-dgw) _____ feet	
1 Csg Volume(lwc x c)= _____ gallons	
3 Csg Volumes = _____ gallons (Std. Purge Volume)	
Volume of Water Purged Before Sampling <u>0.00</u> liters	

Fuel Odor. Black specs in water sample. No purging required. Sampled with bailer.

	Sample					
Volume Purged (liters)	0.00	Duplicate				
Time (military)	1515	1520				
pH (s.u.)	6.36	6.35				
Specific Cond. (umhos/cm)	481	468				
Water Temp. (C)	25.74	25.84				
Turbidity (NTU)	12.25	17.62				
Dissolved Oxygen (mg/L)	1.07	4.60				
Water Level (ft.)	n/a	n/a				

nr = not recorded n/a = not applicable

Appendix D

Contractor Checklist

Contractor Checklist

For each report submitted to the UST Management Division, the contractor will be required to verify that all data elements for the required scope of work have been provided. For items not required for the scope of work, the N/A box should be checked. For items required and not completed or provided, the No box should be checked, and a thorough description of the reason must be provided.

Hilton Head Public Service District

UST Permit #11399

Item #	Item	Yes	No	N/A
1	Is Facility Name, Permit #, and address provided?	X		
2	Is UST Owner/Operator name, address, & phone number provided?	X		
3	Is name, address, & phone number of current property owner provided?	X		
4	Is the DHEC Certified UST Site Rehabilitation Contractor's Name, Address, telephone number, and certification number provided?	X		
5	Is the name, address, telephone number, and certification number of the well driller that installed borings/monitoring wells provided?	X		
6	Is the name, address, telephone number, and certification number of the certified laboratory(ies) performing analytical analyses provided?	X		
7	Has the facility history been summarized?	X		
8	Has the regional geology and hydrogeology been described?	X		
9	Are the receptor survey results provided as required?			X
10	Has current use of the site and adjacent land been described?			X
11	Has the site-specific geology and hydrogeology been described?			X
12	Has the primary soil type been described?			X
13	Have field screening results been described?			X
14	Has a description of the soil sample collection and preservation been detailed?			X
15	Has the field screening methodology and procedure been detailed?			X
16	Has the monitoring well installation and development dates been provided?	X		
17	Has the method of well development been detailed?	X		
18	Has justification been provided for the locations of the monitoring wells?			X
19	Have the monitoring wells been labeled in accordance with the UST QAPP guidelines?	X		
20	Has the groundwater sampling methodology been detailed?	X		
21	Have the groundwater sampling dates and groundwater measurements been provided?	X		
22	Has the purging methodology been detailed?	X		
23	Has the volume of water purged from each well been provided along with measurements to verify that purging is complete?	X		
24	If free-product is present, has the thickness been provided?	X		
25	Does the report include a brief discussion of the assessment done and the results?	X		
26	Does the report include a brief discussion of the aquifer evaluation and results?			X
27	Does the report include a brief discussion of the fate & transport models used?			X

Item #	Item	Yes	No	N/A
28	Are the site-conceptual model tables included? (Tier 1 Risk Evaluation)			X
29	Have the exposure pathways been analyzed? (Tier 2 Risk Evaluation)			X
30	Have the SSTLs for each compound and pathway been calculated? (Tier 2 Risk Evaluation)			X
31	Have recommendations for further action been provided and explained?	X		
32	Has the soil analytical data for the site been provided in tabular format?			X
33	Has the potentiometric data for the site been provided in tabular format? (Table 1)	X		
34	Has the current and historical laboratory data been provided in tabular format?	X		
35	Have the aquifer characteristics been provided and summarized on the appropriate form?			X
36	Have the Site conceptual model tables been included? (Tier 1 Risk Evaluation)			X
37	Has the topographic map been provided with all required elements? (Figure 2)	X		
38	Has the site base map been provided with all required elements? (Figure 3)	X		
39	Have the CoC site maps been provided? (Figure 5)	X		
40	Has the site potentiometric map been provided? (Figure 4)	X		
41	Have the geologic cross-sections been provided?			X
42	Have maps showing the predicted migration of the CoCs through time been provided? (Tier 2 Risk Evaluation)			X
43	Has the site survey been provided and include all necessary elements?			X
44	Have the sampling logs, chain of custody forms, and the analytical data package been included with all required elements? (Appendix F)	X		
45	Is the laboratory performing the analyses properly certified?	X		
46	Has the tax map been included with all necessary elements?			X
47	Have the soil boring/field screening logs been provided?	X		
48	Have the well completion logs and SCDHEC Form 1903 been provided?	X		
49	Have the aquifer evaluation forms, data, graphs, equations, etc. been provided?			X
50	Have the disposal manifests been provided?			X
51	Has a copy of the local zoning regulations been provided?			X
52	Has all fate and transport modeling been provided?			X
53	Have copies of all access agreements obtained by the contractor been provided?			X
54	Has a copy of this form been attached to the final report and are explanations for any missing or incomplete data been provided?	X		

Underground Storage Tank Management Division
Explanation for missing and incomplete information?

This image shows a full page of blank, lined paper. It features approximately 20 evenly spaced horizontal black lines across its entire width, typical of notebook or legal stationery. The paper is otherwise completely empty, with no margins, text, or other markings.

Christine A. Carlson

(print name) Christine A. Cafagna

Date July 9, 2024

Appendix E

SCDHEC Groundwater Sampling Notice to Proceed Letter



HILTON HEAD PUBLIC SERVICE DISTRICT
PO BOX 21264
HILTON HEAD ISLAND SC 29925

MAY 22 2024

Re: **Site Specific Work Plan Approval and Groundwater Sampling Notice to Proceed**
Hilton Head Public Service District, 21 Oak Park Drive, Hilton Head Island, SC
UST Permit #11399; CA #68706
Release #2 reported July 27, 2017
Site Specific Work Plan received May 3, 2024
Beaufort County

To Whom It May Concern :

The Underground Storage Tank Management Division (UST Division) of the South Carolina Department of Health and Environmental Control (DHEC) has reviewed and approved the referenced Site Specific Work Plan (SSWP) submitted by your contractor. The groundwater sampling event should begin immediately upon receipt of this letter. All work should be conducted in compliance with the current revision of the UST Quality Assurance Program Plan (QAPP), your contractor's Annual Contractor Quality Assurance Plan, and all applicable regulations. The QAPP is available at scdhec.gov/environment/land-waste/underground-storage-tanks/release-assessment-clean/quality-assurance.

Pursuant to S.C. Code Ann. Section 44-2-40(D), "The SUPERB Account and the SUPERB Financial Responsibility Fund shall provide combined coverage for site rehabilitation and third-party claims, respectively, not to exceed one million dollars per occurrence". **According to UST Division records, approximately \$38,771.64 has been expended from the SUPERB Account to date.** This scope of work, as recommended by your contractor, is anticipated to cost approximately **\$4,521.93**.

The contractor must provide notification to the UST Project Manager via email 4 days prior to initiation of any site rehabilitation activities. If there are any changes to the schedule, the UST Project Manager must be contacted within 24 hours of those changes.

In accordance with Section IV.A.4.c of the SUPERB Site Rehabilitation & Fund Access Regulation (R.61-98), the contractor shall be required to indemnify the property owner, underground storage tank owner/operator and the State of South Carolina from and against all claims, damages, losses and expenses arising out of or resulting from activity conducted by the contractor, its agents, employees or subcontractors.

Your contractor can submit an invoice for direct payment from the State Underground Petroleum Environmental Response Bank (SUPERB) Account for pre-approved costs. **The Monitoring Report, contractor checklist (QAPP Appendix K), and invoice should be submitted to the UST Division within sixty (60) days of the date of this correspondence.** If the invoice is not submitted within 120 days from the date of this letter, monies allocated to pay this invoice will be uncommitted. This means that the invoice will not be processed for payment until all other committed funds are paid or monies become available.

If the report cannot be submitted by the required due date, an extension may be requested by submitting a written request, either via postal mail or email, to my attention prior to the due date. The Department will issue a Notice of Alleged Violation if the report is not submitted by the required due date.

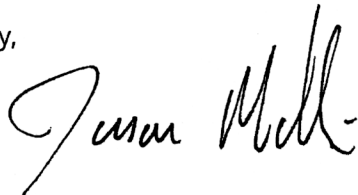
Please note that sections 44-2-110(4) and 44-2-130 of the SUPERB Statute state that the SUPERB Account cannot compensate any costs that are not pre-approved. If for any reason additional tasks will be completed, these additional tasks, and the associated cost, must be pre-approved by the UST Division for the cost to be paid. The UST Division reserves the authority to pay only for work properly performed and/or technically justified and will only pay rates in accordance with established criteria. Further, the UST Division reserves the right to question and/or reject costs if deemed unreasonable and the right to audit project records at any time during the project or after completion of work. **Per Section III.3.b of the SUPERB Site Rehabilitation and Fund Access Regulations (R.61-98), reimbursement for site rehabilitation activities shall in no event exceed the actual costs incurred.**

Please note that applicable South Carolina certification requirements regarding laboratory services, well installation, and report preparation must be satisfied. Any site rehabilitation activity associated with the UST release must be performed by a DHEC-certified site rehabilitation contractor as required by the SUPERB Site Rehabilitation and Fund Access Regulation, R.61-98.

The UST Division grants pre-approval for transportation of virgin petroleum impacted soil and groundwater from the referenced site to a permitted treatment facility. There can be no spillage or leakage in transport. All investigation-derived waste (IDW) must be properly contained and labeled prior to disposal. IDW should not be stored on-site longer than ninety (90) days. A copy of the disposal manifest and/or acceptance letter from the receiving facility that clearly designates the quantity received must be included as an appendix to the report. If the Chemical of Concern (CoC) concentrations based on laboratory analysis is below Risk-Based Screening Levels (RBSLs), please contact the project manager for approval to dispose of soil and/or groundwater on-site. The SUPERB Account will not reimburse for transportation or treatment of soil and/or groundwater with concentrations below RBSLs.

On all correspondence regarding this site, please reference the UST Permit number above. Should you have any questions, please contact me by phone at (803) 898-0605, by fax at (803) 898-0673, or by email at medlinlj@dhec.sc.gov.

Sincerely,



Jason Medlin, Hydrogeologist
Corrective Action & Field Support Section
Underground Storage Tank Management Division
Bureau of Land and Waste Management

enc: Approved Cost Agreement

cc: F&ME Consultants Columbia, 1825 Blanding Street, Columbia, SC 29201 (w/ enc)
Technical file (w/ enc)

Approved Cost Agreement 68706

Facility: 11399 HILTON HEAD PUBLIC SERVICE DISTRICT

MEDLINLJ

PO Number:

<u>Task / Description</u>	<u>Categories</u>	<u>Item Description</u>	<u>Qty / Pct</u>	<u>Unit Price</u>	<u>Amount</u>
A PLAN PREPARATION					
		1.2 SITE SPECIFIC WORK PLAN	1.0000	\$183.220	183.22
D MOB/DEMOB					
		2.2 PERSONNEL	1.0000	\$516.690	516.69
J SAMPLE COLLECTION					
		4.2B NO-PURGE GROUNDWATER	9.0000	\$57.240	515.16
		5.2 GAUGE WELL ONLY	6.0000	\$8.550	51.30
		8.2 FIELD DUPL. (MWS & WWS) & FB	2.0000	\$30.060	60.12
		9.2 GROUNDWATER (LOW FLOW PURGE)	1.0000	\$111.160	111.16
K ANALYSES					
	GW GROUNDWATER	1.2 BTEXNM+OXYGS+1,2 DCA+ETH 8260D	13.0000	\$149.020	1,937.26
		7.2 EDB BY EPA 8011	12.0000	\$55.210	662.52
S REPORT PROJECT MANAGEMENT					
		S REPORT PREP & PROJ. MANAGEMENT	0.1200	\$4,037.430	484.49
Total Amount					4,521.92

TABLES

- 1 - Summary of Groundwater Elevations**
- 2 - Summary of Groundwater COC Analytical Results**
- 3 - Summary of Groundwater Oxygenate Analytical Results**

Table 1
Summary of Groundwater Elevations
HHI PSD Release #2
Hilton Head Island, SC
SCDHEC Permit #11399

Well No.	Date Installed	Date Measured	Screened Interval (feet bgs)	TOC Elevation (feet MSL)	TOC to Product Level (feet MSL)	TOC to Water Level (feet MSL)	Free Product Petroleum (FPP) Thickness (feet)	Water Table Elevation (feet MSL)
MW-1	6/15/2018	06/18/2018	2-12	12.80	5.21	5.48	0.27	7.40
		04/20/2021			5.18	7.93	-	FP
		08/25/2022			3.16	3.29	1.17	9.51
		07/26/2023			5.50	5.55	0.42	7.25
		06/05/2024			4.88	5.07	1.62	7.73
MW-2	6/15/2018	06/18/2018	3-13	14.29	-	6.09	-	8.20
		04/20/2021			-	6.56	-	7.73
		08/25/2022			-	4.35	-	9.94
		07/26/2023			-	6.43	-	7.86
		06/05/2024			-	6.07	-	8.22
MW-3	6/15/2018	06/18/2018	3-13	14.13	-	6.09	-	8.04
		04/20/2021			-	6.50	-	7.63
		08/25/2022			-	4.25	-	9.88
		07/26/2023			-	6.41	-	7.72
		06/05/2024			-	5.96	-	8.17
MW-4	4/19/2021	04/20/2021	3-13	13.17	-	6.14	-	7.03
		08/25/2022			-	3.83	-	9.34
		07/26/2023			-	6.07	-	7.10
		06/05/2024			-	5.63	-	7.54
		04/20/2021			-	5.88	-	7.07
MW-5	4/19/2021	08/25/2022	4-14	12.95	-	3.63	-	9.32
		07/26/2023			-	5.83	-	7.12
		06/05/2024			-	5.42	-	7.53
		04/20/2021			-	6.20	-	7.10
		08/25/2022			-	3.88	-	9.42
MW-6	4/20/2021	07/26/2023	4-14	13.30	-	6.01	-	7.29
		06/05/2024			-	5.78	-	7.52
		04/20/2021			-	5.65	-	6.96
		08/25/2022			-	3.24	-	9.37
		07/26/2023			-	5.65	-	6.96
MW-7	4/20/2021	06/05/2024	3-13	12.61	-	5.10	-	7.51
		04/20/2021			-	5.86	-	7.14
		08/25/2022			-	3.61	-	9.39
		07/26/2023			-	5.72	-	7.28
		06/05/2024			-	5.41	-	7.59
MW-8	4/20/2021	04/20/2021	4-14	13.00	-	5.87	-	7.04
		08/25/2022			-	3.61	-	9.39
		07/26/2023			-	5.72	-	7.28
		06/05/2024			-	5.41	-	7.59
		04/20/2021			-	5.87	-	7.04
MW-9	4/20/2021	08/25/2022	3.5-13.5	12.91	3.52	3.60	0.70	9.31
		07/26/2023			5.74	5.81	0.61	7.10
		06/05/2024			5.12	5.32	1.77	7.59
		04/20/2021			-	5.78	-	6.93
		08/25/2022			-	3.46	-	9.25
MW-10	4/20/2021	07/26/2023	3.5-13.5	12.71	-	5.72	-	6.99
		06/05/2024			-	5.23	-	7.48
		08/25/2022			-	2.75	-	9.71
		07/26/2023			-	5.30	-	7.16
		06/05/2024			-	4.85	-	7.61
MW-11	8/23/2022	08/25/2022	3-13	12.46	-	3.22	-	9.40
		07/26/2023			-	5.39	0.74	7.15
		06/05/2024			4.83	5.02	1.69	7.60
		08/25/2022			3.52	3.58	0.52	9.30
		07/26/2023			5.65	5.75	0.83	7.13
MW-12	8/22/2022	06/05/2024	3-13	12.88	5.17	5.31	1.25	7.57
		04/20/2021			-	5.85	-	7.07
		08/25/2022			-	3.56	-	9.36
		07/26/2023			-	5.76	-	7.16
		06/05/2024			-	5.36	-	7.56
DCW-1	4/19/2021	08/25/2022	29-34	12.92	-	3.17	-	9.30
		07/26/2023			5.25	5.34	0.75	7.13
		06/05/2024			4.78	4.91	1.14	7.56
		08/25/2022			3.22	3.23	0.07	9.32
		07/26/2023			5.42	5.43	0.08	7.12
RW-01	8/23/2022	06/05/2024	2-12	12.47	-	5.01	-	7.54
		08/25/2022			-	5.01	-	7.54
RW-02	8/24/2022	07/26/2023	2-12	12.55	-	5.01	-	7.54
		06/05/2024			-	5.01	-	7.54

Notes: Groundwater data from sampling events on 6/18/18 and 4/20/21 were taken from the AECOM Tier 1 and Tier II reports.
Corrected TOC Water Level and Water Table Elevation due to the presence of free product (Diesel).
Screened Interval measurement is represented in feet below ground surface.
TOC = Top of Casing
(bgs) = below ground surface
FP=Free Product. The corrected TOC Water Table Elevation was not calculated. Taken from the AECOM Tier I report.

Table 2
Summary of Groundwater COC Analytical Results (µg/L)
HHI PSD Release #2
Hilton Head Island, SC
SCDHEC Permit #11399

VOCs									
Sample ID	Sample Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylene (Total) (µg/L)	Naphthalene (µg/L)	MTBE (µg/L)	1,2-DCA (µg/L)	EDB (µg/L)
SCDHEC RBSLs		5	1,000	700	10,000	25	NS	5	0.05
MW-1	6/18/2018	Free Product/Not Sampled (0.07-foot thickness)							
	4/21/2021	Free Product/Not Sampled (Not reported)							
	8/25/2022	Free Product/Not Sampled (1.17-foot thickness)							
	7/26/2023	Free Product/Not Sampled (0.42-foot thickness)							
	6/5/2024	Free Product/Not Sampled (1.62-foot thickness)							
MW-2	6/18/2018	<1	<1	<1	<1	<1	<1	<1	NA
	4/21/2021	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	NA
	8/25/2022	<0.23	<0.55	<0.24	<0.78	<1.1	<0.24	<0.32	NA
	7/26/2023	<0.26	<0.33	<0.24	<0.76	<1.8	<0.23	<0.29	<0.016
	6/5/2024	<0.20	0.40J	<0.28	<0.64	<1.6	<0.18	<0.21	<0.004
MW-3	6/18/2018	<1	<1	<1	<1	<1	<1	<1	NA
	4/22/2021	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	NA
	8/25/2022	<0.23	<0.55	<0.24	<0.78	<1.1	<0.24	<0.32	NA
	7/26/2023	<0.26	<0.33	<0.24	<0.76	<1.8	<0.23	<0.29	<0.015
	6/5/2024	<0.20	0.36J	<0.28	<0.64	<1.6	<0.18	<0.21	<0.004
MW-4	4/22/2021	7.4	<0.40	7.7	21	0.78	<0.40	<0.40	NA
	8/25/2022	<0.23	<0.55	<0.24	<0.78	<1.1	<0.24	<0.32	NA
	7/26/2023	<0.26	<0.33	<0.24	<0.76	<1.8	<0.23	<0.29	<0.015
	6/5/2024	<0.20	0.34J	<0.28	<0.64	<1.6	<0.18	<0.21	<0.005
MW-5	4/22/2021	9.5	<0.40	26	7.9	9.6	<0.40	<0.40	NA
	8/25/2022	<0.23	<0.55	<0.24	<0.78	<1.1	<0.24	<0.32	NA
	7/26/2023	0.53J	<0.33	13	<0.76	32	<0.23	<0.29	<0.015
	6/5/2024	<0.20	0.24J	<0.28	<0.64	4.9J	<0.18	<0.21	<0.004
MW-6	4/22/2021	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	NA
	8/25/2022	<0.23	<0.55	<0.24	<0.78	<1.1	<0.24	<0.32	NA
	7/26/2023	<0.26	<0.33	<0.24	<0.76	<1.8	<0.23	<0.29	<0.016
	6/5/2024	<0.20	0.31J	<0.28	<0.64	<1.6	<0.18	<0.21	<0.004
MW-7	4/22/2021	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	NA
	8/25/2022	<0.23	<0.55	<0.24	<0.78	<1.1	<0.24	<0.32	NA
	7/26/2023	<0.26	<0.33	<0.24	<0.76	<1.8	<0.23	<0.29	<0.015
	6/5/2024	<0.20	<0.20	<0.28	<0.64	<1.6	<0.18	<0.21	<0.004
MW-8	4/22/2021	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	NA
	8/25/2022	<0.23	<0.55	<0.24	<0.78	<1.1	<0.24	<0.32	NA
	7/26/2023	<0.26	<0.33	<0.24	<0.76	<1.8	<0.23	<0.29	<0.016
	6/5/2024	<0.20	0.39J	<0.28	<0.64	<1.6	<0.18	<0.21	<0.005
MW-9	4/22/2021	45	37	60	170	14	1.9	<0.40	NA
	4/22/21 (Dup)	44	34	55	160	14	2.4	<0.40	NA
	8/25/2022	Free Product/Not Sampled (0.07-foot thickness)							
	7/26/2023	Free Product/Not Sampled (0.61-foot thickness)							
	6/5/2024	Free Product/Not Sampled (1.77-foot thickness)							

Table 2
Summary of Groundwater COC Analytical Results (µg/L)
HHI PSD Release #2
Hilton Head Island, SC
SCDHEC Permit #11399

VOCs									
Sample ID	Sample Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylene (Total) (µg/L)	Naphthalene (µg/L)	MTBE (µg/L)	1,2-DCA (µg/L)	EDB (µg/L)
SCDHEC RBSLs		5	1,000	700	10,000	25	NS	5	0.05
MW-10	4/22/2021	<0.40	<0.40	0.65	3.2	<0.40	<0.40	<0.40	NA
	8/25/2022	<0.23	<0.55	<0.24	<0.78	<1.1	<0.24	<0.32	NA
	7/26/2023	<0.26	<0.33	<0.24	<0.76	<1.8	<0.23	<0.29	<0.015
	6/5/2024	<0.20	0.33J	<0.28	<0.64	<1.6	<0.18	<0.21	<0.005
MW-11	8/25/2022	<0.23	<0.55	<0.24	<0.78	<1.1	<0.24	<0.32	NA
	7/26/2023	<0.26	<0.33	<0.24	<0.76	<1.8	<0.23	<0.29	<0.015
	7/26/23 (Dup)	<0.26	<0.33	<0.24	<0.76	<1.8	<0.23	<0.29	<0.015
	6/5/2024	<0.20	0.42J	<0.28	<0.64	<1.6	<0.18	<0.21	<0.004
MW-12	8/25/2022	7.4	<0.55	57	24.36J	53	<0.24	<0.32	
	7/26/2023	Free Product/Not Sampled (0.74-foot thickness)							
	6/5/2024	Free Product/Not Sampled (1.69-foot thickness)							
MW-13	8/25/2022	Free Product/Not Sampled (0.52-foot thickness)							
	7/26/2023	Free Product/Not Sampled (0.83-foot thickness)							
	6/5/2024	Free Product/Not Sampled (1.25-foot thickness)							
DCW-1	4/22/2021	<0.40	0.49	1.6	1.2	1.1	<0.40	<0.40	NA
	8/25/2022	<0.23	<0.55	<0.24	<0.78	<1.1	<0.24	<0.32	NA
	7/26/2023	<0.26	1.9	0.26J	1.22J	<1.8	<0.23	<0.29	<0.015
	6/5/2024	<0.20	3	<0.28	0.69J	<1.6	<0.18	<0.21	<0.004
RW-01	8/25/2022	3.3	<0.55	50	14	35	<0.24	<0.32	NA
	7/26/2023	Free Product/Not Sampled (0.75-foot thickness)							
	6/5/2024	Free Product/Not Sampled (1.14-foot thickness)							
RW-02	8/25/2022	Free Product/Not Sampled (0.07-foot thickness)							
	7/26/2023	Free Product/Not Sampled (0.08-foot thickness)							
	6/5/2024	0.23J	1.8	12	<0.64	17	<0.18	<0.21	<0.005
	6/5/2024 (Dup)	0.26J	0.64J	12	<0.64	16	<0.18	<0.21	<0.004

Notes:

At or above SCDHEC RBSLs as listed in SCDHEC's UST QAPP Revision 4.0.

Bold = CoC detected above MDL.

SCDHEC RBSLs are for a sandy soil and are taken from Table D1 in Appendix D of the SCDHECs Quality Assurance Program Plan (QAPP) Revision 4.0

NA = Not Analyzed

(NS) - No Standard Exists

Concentrations are reported in micrograms per liter (µg/L).

J = Estimated value detected below Reporting Limit

Dup= duplicate sample

Table 3
Summary of Groundwater Oxygenate Analytical Results (µg/L)
HHI PSD Release #2
Hilton Head Island, SC
SCDHEC Permit #11399

Well No.	Date Sampled	tert-Amyl Alcohol (µg/L)	tert-Amylmethyl ether (µg/L)	tert-Butyl Formate (µg/L)	Di-Isopropyl Ether (µg/L)	3,3-Dimethyl-1-Butanol (µg/L)	Ethanol (µg/L)	Ethyl-tert-Butyl Ether (µg/L)	tert-Butyl Alcohol (µg/L)
Action Levels for Groundwater (Oxygenates)	–	240	128	None	150	None	10,000	47	1,400
MW-1	6/18/2018	Free Product/Not Sampled (0.07-foot thickness)							
	4/21/2021	Free Product/Not Sampled (Not reported)							
	8/25/2022	Free Product/Not Sampled (1.17-foot thickness)							
	7/26/2023	Free Product/Not Sampled (0.42-foot thickness)							
	6/5/2024	Free Product/Not Sampled (1.62-foot thickness)							
MW-2	6/18/2018	<100	<10	<50	<1	<100	297	<10	<100
	4/21/2021	<8.0	<0.42	<2.0	<0.40	<8.0	<52	<0.40	<0.40
	8/25/2022	<31	<4.2	<33	<3.0	<40	<53	<3.8	<35
	7/26/2023	<31	<4.2	<33	<2.4	<40	<53	<3.8	<35
	6/5/2024	<34	<3.0	<33	<2.8	<34	<47	<2.5	<30
MW-3	6/18/2018	<100	<10	<50	<1	<100	209	<10	<100
	4/21/2021	<8.0	<0.42	<2.0	<0.40	<8.0	<52	<0.40	<0.40
	8/25/2022	<31	<4.2	<33	<3.0	<40	<53	<3.8	<35
	7/26/2023	<31	<4.2	<33	<2.4	<40	<53	<3.8	<35
	6/5/2024	<34	<3.0	<33	<2.8	<34	<47	<2.5	<30
MW-4	4/21/2021	<8.0	<0.42	<2.0	<0.40	<8.0	<52	<0.40	<0.40
	8/25/2022	<31	<4.2	<33	<3.0	<40	<53	<3.8	<35
	7/26/2023	<31	<4.2	<33	<2.4	<40	<53	<3.8	<35
	6/5/2024	<34	<3.0	<33	<2.8	<34	<47	<2.5	<30
MW-5	4/21/2021	<8.0	<0.42	<2.0	<0.40	<8.0	<52	<0.40	<0.40
	8/25/2022	<31	<4.2	<33	<3.0	<40	<53	<3.8	<35
	7/26/2023	<31	<4.2	<33	<2.4	<40	<53	<3.8	<35
	6/5/2024	<34	<3.0	<33	<2.8	<34	<47	<2.5	<30
MW-6	4/21/2021	<8.0	<0.42	<2.0	<0.40	<8.0	<52	<0.40	<0.40
	8/25/2022	<31	<4.2	<33	<3.0	<40	<53	<3.8	<35
	7/26/2023	<31	<4.2	<33	<2.4	<40	<53	<3.8	<35
	6/5/2024	<34	<3.0	<33	<2.8	<34	<47	<2.5	<30
MW-7	4/21/2021	<8.0	<0.42	<2.0	<0.40	<8.0	<52	<0.40	<0.40
	8/25/2022	<31	<4.2	<33	<3.0	<40	<53	<3.8	<35
	7/26/2023	<31	<4.2	<33	<2.4	<40	<53	<3.8	<35
	6/5/2024	<34	<3.0	<33	<2.8	<34	<47	<2.5	<30
MW-8	4/21/2021	<8.0	<0.42	<2.0	<0.40	<8.0	<52	<0.40	<0.40
	8/25/2022	<31	<4.2	<33	<3.0	<40	<53	<3.8	<35
	7/26/2023	<31	<4.2	<33	<2.4	<40	<53	<3.8	<35
	6/5/2024	<34	<3.0	<33	<2.8	<34	<47	<2.5	<30
MW-9	4/21/2021	<8.0	<0.42	<2.0	<0.40	<8.0	<52	2.4	1.4
	4/22/21 (Dup)	<8.0	<0.42	<2.0	<0.40	<8.0	<52	2.8	1.4
	8/25/2022	Free Product/Not Sampled (0.07-foot thickness)							
	7/26/2023	Free Product/Not Sampled (0.61-foot thickness)							
	6/5/2024	Free Product/Not Sampled (1.77-foot thickness)							

Table 3
Summary of Groundwater Oxygenate Analytical Results (µg/L)
HHI PSD Release #2
Hilton Head Island, SC
SCDHEC Permit #11399

Well No.	Date Sampled	tert-Amyl Alcohol (µg/L)	tert-Amylmethyl ether (µg/L)	tert-Butyl Formate (µg/L)	Di-Isopropyl Ether (µg/L)	3,3-Dimethyl-1-Butanol (µg/L)	Ethanol (µg/L)	Ethyl-tert-Butyl Ether (µg/L)	tert-Butyl Alcohol (µg/L)
MW-10	4/22/2021	<8.0	<0.42	<2.0	<0.40	<8.0	<52	<0.40	<0.40
	8/25/2022	<31	<4.2	<33	<3.0	<40	<53	<3.8	<35
	7/26/2023	<31	<4.2	<33	<2.4	<40	<53	<3.8	<35
	6/5/2024	<34	<3.0	<33	<2.8	<34	<47	<2.5	<30
MW-11	8/25/2022	<31	<4.2	<33	<3.0	<40	<53	<3.8	<35
	7/26/2023	<31	<4.2	<33	<2.4	<40	<53	<3.8	<35
	7/26/2023 (Dup)	<31	<4.2	<33	<2.4	<40	<53	<3.8	<35
	6/5/2024	<34	<3.0	<33	<2.8	<34	<47	<2.5	<30
MW-12	8/25/2022	<31	<4.2	<33	<3.0	<40	<53	<3.8	<35
	7/26/2023	Free Product/Not Sampled (0.74-foot thickness)							
	6/5/2024	Free Product/Not Sampled (1.69-foot thickness)							
MW-13	8/25/2022	Free Product/Not Sampled (0.52-foot thickness)							
	7/26/2023	Free Product/Not Sampled (0.83-foot thickness)							
	6/5/2024	Free Product/Not Sampled (1.25-foot thickness)							
DCW-1	4/22/2021	<8.0	<0.42	<2.0	<0.40	<8.0	<52	<0.40	<0.40
	8/25/2022	<31	<4.2	<33	<3.0	<40	<53	<3.8	<35
	8/25/2022 (Dup)	<31	<4.2	<33	<3.0	<40	<53	<3.8	<35
	7/26/2023	<31	<4.2	<33	<2.4	<40	<53	<3.8	<35
	6/5/2024	<34	<3.0	<33	<2.8	<34	<47	<2.5	<30
RW-1	8/25/2022	<31	<4.2	<33	<3.0	<40	310	<3.8	<35
	7/26/2023	Free Product/Not Sampled (0.75-foot thickness)							
	6/5/2024	Free Product/Not Sampled (1.14-foot thickness)							
RW-2	8/25/2022	Free Product/Not Sampled (0.07-foot thickness)							
	7/26/2023	Free Product/Not Sampled (0.08-foot thickness)							
	6/5/2024	<34	<3.0	<33	<2.8	<34	<47	<2.5	<30
	6/5/2024 (Dup)	<34	<3.0	<33	<2.8	<34	<47	<2.5	<30

Notes: At or above SCDHEC RBSLs as listed in SCDHEC's UST QAPP Revision 4.0.
Bold = CoC detected above MDL
Concentrations are represented in micrograms per liter (µg/L)
NA = Not Analyzed
J = Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
Action Levels for Groundwater Oxygenates taken from SCDHEC QAPP Revision 4.0
Dup= duplicate sample



SC DEPARTMENT of
**ENVIRONMENTAL
SERVICES**

Erin Jezek
Corrective Action & Field Support Section
Underground Storage Tank Management Division
2600 Bull Street
Columbia, SC 29201

HILTON HEAD PUBLIC SERVICE DISTRICT
PO BOX 21264
HILTON HEAD ISLAND SC 29925

MAR 26 2025



Re: **Site Specific Work Plan Request for Groundwater Sampling**
Hilton Head Public Service District, 21 Oak Park Dr, Hilton Head Island, SC
UST Permit #11399
Release reported July 27, 2017
Monitoring report received July 18, 2024
Beaufort County

To Whom It May Concern:

The Underground Storage Tank Management Division (UST Division) of the S.C. Department of Environmental Services (SCDES) has reviewed the referenced report submitted by your contractor. The report documents petroleum chemicals in the soil and/or groundwater above Risk-Based Screening Levels.

Pursuant to S.C. Code Ann. Section 44-2-40(D), "The SUPERB Account and the SUPERB Financial Responsibility Fund shall provide combined coverage for site rehabilitation and third party claims, respectively, not to exceed one million dollars per occurrence". **According to UST Division records, approximately \$43,576.83 has been expended from the SUPERB Account to date.**

Your selected contractor has proposed groundwater sampling as the next appropriate scope of work. To determine what risk the referenced release may pose to human health and the environment, and in accordance with Section 280.65 of the S.C. UST Control Regulations R.61-92, submittal of the Site Specific Work Plan (SSWP) for groundwater sampling may proceed. All work must be conducted in compliance with the current revision of the UST Quality Assurance Program Plan (QAPP), your contractor's Annual Contractor Quality Assurance Plan, and all applicable regulations. The QAPP is available at des.sc.gov/programs/bureau-land-waste-management/underground-storage-tanks/ust-quality-assurance-program-plan-qapp.

Groundwater samples should be collected from all monitoring wells associated with this release along with all water supply wells and surface waters within a 1,000 foot radius of the site. Samples should be analyzed for BTEX, Naphthalene, MTBE, 1,2-DCA, and the 8 oxygenates. Only wells with screens that do not bracket the water table should be purged prior to sampling.

Your contractor must complete the SSWP and submit it within 30 days from the date of this letter. Every component may not be necessary to complete the above scope of work. The State Underground Petroleum Environmental Response Bank (SUPERB) Account allowable cost for each component is included on the Assessment Component Cost Agreement Form. **Please note that approval from SCDES must be issued before work begins.**

If the plan cannot be submitted by the required due date, an extension must be requested by submitting a written request, either via postal mail or email, to my attention prior to the due date. The Department will issue a Notice of Alleged Violation if the report/plan is not submitted by the required due date.

On all correspondence concerning this site, please reference UST Permit number above. Should you have any questions, please contact me by phone at (803) 898-0608, by fax at (803) 898-0673, or by email at erin.jezek@des.sc.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Erin Jezek", written over the word "Sincerely,".

Erin Jezek, Hydrogeologist

cc: F & ME Consultants Columbia, 211 Business Park Blvd, Columbia SC 29203
Technical file



Site-Specific Work Plan for Approved ACQAP
Underground Storage Tank Management Division

RECEIVED

UST DIVISION

To: Erin Jezek, Hydrogeologist (SCDHEC Project Manager)
From: Christine A. Cafagna (Contractor Project Manager)
Contractor: F&ME Consultants, Inc. UST Contractor Certification Number: UCC-0140

Facility Name: Hilton Head Public Service District UST Permit #: 11399

Facility Address: 21 Oak Park Dr., Beaufort, SC 29926

Responsible Party: William C. Davis, Operations Manager

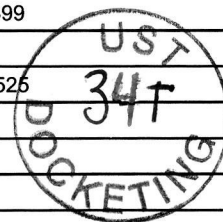
Phone: 843-681-5525

RP Address: PO Box 21264, Beaufort, SC 29925

Property Owner (if different):

Property Owner Address:

Current Use of Property: Water Treatment Facility



Scope of Work (Please check all that apply)

☐ IGWA ☐ Tier II ☒ Groundwater Sampling ☐ GAC
☐ Tier I ☐ Monitoring Well Installation ☐ Other

Analyses (Please check all that apply)

Groundwater/Surface Water:

☒ BTEXNMDCA (8260D) ☐ Lead ☐ BOD ☐ Methane
☒ Oxygenates (8260D) ☐ 8 RCRA Metals ☐ Nitrate ☐ Ethanol
☐ EDB (8011) ☐ TPH ☐ Sulfate ☐ Dissolved Iron
☐ PAH (8270E) ☐ pH ☐ Other

Drinking Water Supply Wells:

☐ BTEXNMDCA (524.2) ☐ Mercury (200.8 245.1 or 245.2) ☐ EDB (504.1)
☐ Oxygenates & Ethanol (8260D) ☐ RCRA Metals (200.8)

Soil:

☐ BTEXNM ☐ Lead ☐ RCRA Metals ☐ TPH-DRO (3550B/8015B) ☐ Grain Size
☐ PAH ☐ Oil & Grease (9071) ☐ TPH-GRO (5030B/8015B) ☐ TOC

Air:

☐ BTEXN

Sample Collection (Estimate the number of samples of each matrix that are expected to be collected.)

_____ Soil _____ Water Supply Wells _____ Equipment 1 _____ Field Blank
11 _____ Monitoring Wells _____ Surface Water 1 _____ Duplicate 1 _____ Trip Blank

Field Screening Methodology

Estimate number and total completed depth for each point, and include their proposed locations on the attached map.

of shallow points proposed: _____ Estimated Footage: _____ feet per point

of deep points proposed: _____ Estimated Footage: _____ feet per point

Field Screening Methodology: _____

Permanent Monitoring Wells

Estimate number and total completed depth for each well, and include their proposed locations on the attached map.

of shallow wells: _____ Estimated Footage: _____ feet per point

of deep wells: _____ Estimated Footage: _____ feet per point

of recovery wells: _____ Estimated Footage: _____ feet per point

Comments, if warranted:

UST Permit #: 11399 Facility Name: Hilton Head Public Service District

Implementation Schedule (Number of calendar days from approval)

Field Work Start-Up: 7 days Field Work Completion: 30 days
Report Submittal: 60 days # of Copies Provided to Property Owners: 1

Aquifer Characterization

Pump Test: ☐ Slug Test: ☐ (Check one and provide explanation below for choice)

Investigation Derived Waste Disposal

Soil: _____ Tons Purge Water: _____ Gallons
Drilling Fluids: _____ Gallons Free-Phase Product: _____ Gallons

Additional Details For This Scope of Work

For example, list wells to be sampled, wells to be abandoned/repared, well pads/bolts/caps to replace, details of AFVR event, etc.

There are a total of sixteen (16) monitoring wells on site (13 shallow wells, 1 deep well, and 2 recovery wells). At the time of the last sampling event on 6-5-2024, five of the wells contained Free-Phase Product (FPP) [MW-1, 9, 12, 13, and RW-1]. We anticipate only gauging these five wells during the groundwater sampling event. This will leave eleven (11) monitoring wells to be sampled (Shallow wells MW-2,3,4,5,6,7,8,10,11, Recovery Well RW-2, and deep well DCW-1). As stated in the DHEC SSWP request for groundwater sampling letter dated 3-26-2025, "only wells with screens that do not bracket the water table should be purged prior to sampling". It is anticipated that the deep well, DCW-1, will be the only well requiring purging before sampling. Low-flow purging methods will be implemented using a peristaltic pump. The purge water from DCW-1 will be disposed of on the ground by the well since the well meets the DHEC QAPP requirements for on-site disposal. The wells not requiring purging before sampling will be sampled with a disposable bailer between each well. To our knowledge, there are no water supply wells or surface waters within a 1000-foot radius of the site that will require sampling.

Compliance With Annual Contractor Quality Assurance Plan (ACQAP)

Yes Laboratory as indicated in ACQAP? (Yes/No) If no, indicate laboratory information below.

Name of Laboratory: _____
SCDHEC Certification Number: _____
Name of Laboratory Director: _____

____ Well Driller as indicated in ACQAP? (Yes/No) If no, indicate driller information below.

Name of Well Driller: _____
SCLLR Certification Number: _____

____ Other variations from ACQAP. Please describe below.

Attachments

1. Attach a copy of the relevant portion of the USGS topographic map showing the site location.
2. Prepare a site base map. This map must be accurately scaled, but does not need to be surveyed. The map must include the following:

North Arrow	Proposed monitoring well locations
Location of property lines	Legend with facility name and address, UST permit number, and bar scale
Location of buildings	Streets or highways (indicate names and numbers)
Previous soil sampling locations	Location of all present and former ASTs and USTs
Previous monitoring well locations	Location of all potential receptors
Proposed soil boring locations	
3. Assessment Component Cost Agreement, SCDHEC Form D-3664



Document Path: C:\Users\shawm.mccuire\Desktop\SCDHEC UST Per IISCDHEC Figure1 Location Map.mxd

DRAWN BY:	CTC
APPROVED BY:	CAC
NOTES:	

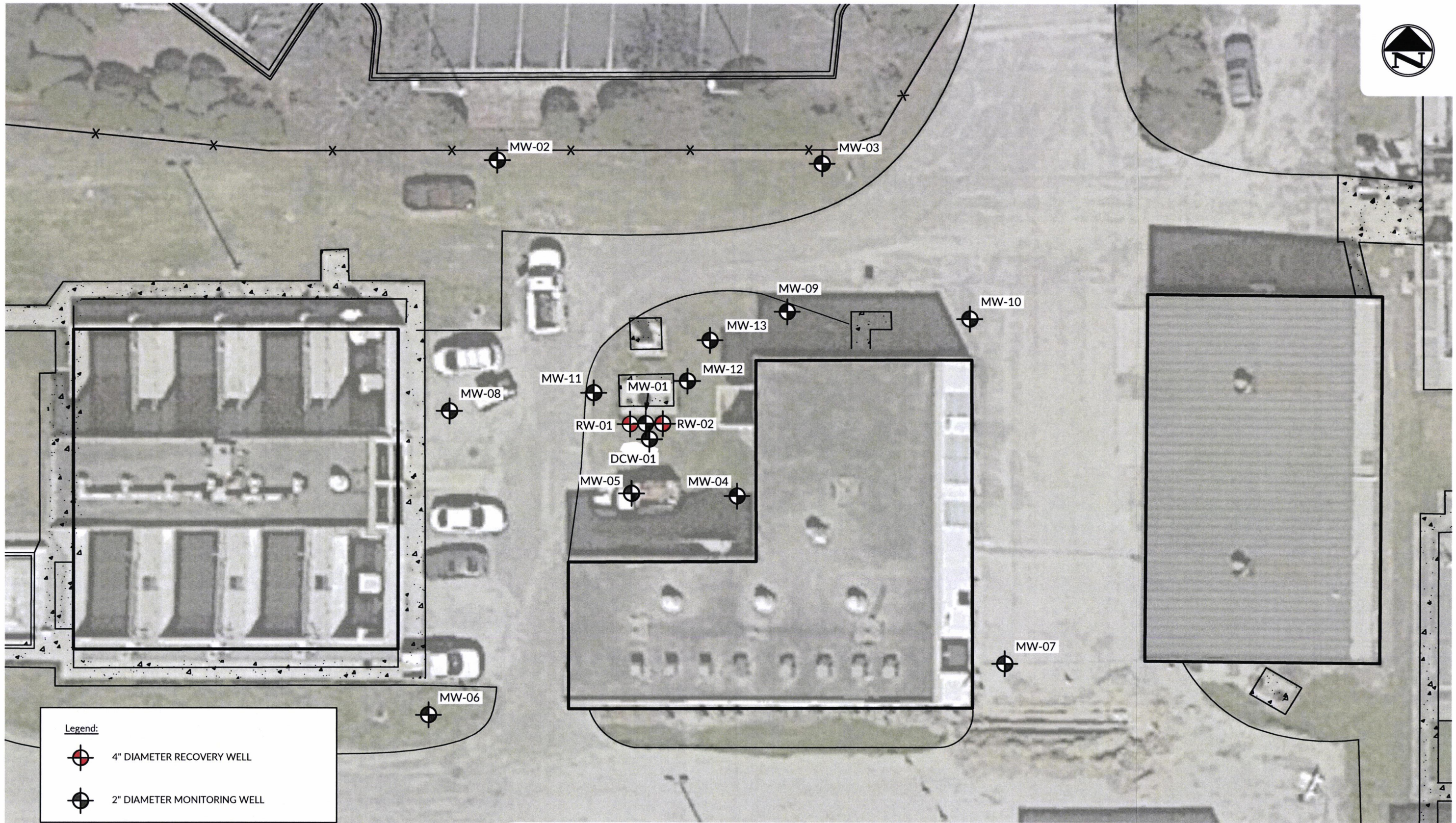
ORIGINAL:	July 2, 2024
REVISIONS:	
1	
2	
3	
SCALE:	As Noted

F&ME
CONSULTANTS
211 BUSINESS PARK BLVD.
COLUMBIA, SC 29203

HHI PSD RELEASE #2 - UST PERMIT# 11399
21 Oak Park Drive
Hilton Head Island, Beaufort County, South Carolina

Appendix B - Site Topo Map

F&ME CONSULTANTS PROJECT NUMBER:	FIGURE NUMBER:
E6687.002	2



Legend:

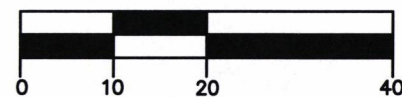


4" DIAMETER RECOVERY WELL



2" DIAMETER MONITORING WELL

GRAPHIC SCALE



DRAWN BY:	CTC	ORIGINAL:
APPROVED BY:	CAC	July 2, 2024
NOTES:		REVISIONS:
		1
		2
		3
		SCALE: 1"=20'



F&ME CONSULTANTS, INC.
211 BUSINESS PARK BLVD.
COLUMBIA, SC 29203

HHI PSD RELEASE #2 - UST PERMIT# 11399
21 Oak Park Drive
Hilton Head Island, Beaufort County, South Carolina

Appendix C - Well Location Plan

F&ME CONSULTANTS
PROJECT NUMBER:

E6687.002

FIGURE
NUMBER:

3



ASSESSMENT COMPONENT INVOICE

South Carolina Department of Health and Environmental Control
Underground Storage Tank Management Division
State Underground Petroleum Environmental Response Bank Account
August 9, 2023

Facility Name: Hilton Head Public Service District

UST Permit #: 11399

Cost Agreement #: N/A

ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL
A. Plan Preparation				
1.2 Site-specific Work Plan	1	each	\$183.22	\$183.22
2.2 Tax Map		each	\$85.50	\$0.00
3.2 QAPP Contractor Addendum (App B)		each	\$250.00	\$0.00
B. Survey				
1.1 Receptor Survey		each	\$673.06	\$0.00
C. Survey				
1.2 Comprehensive Survey		each	\$1,270.36	\$0.00
5.1 Ground Penetrating Radar Survey (100 x 100)		each	\$1,111.57	\$0.00
D. Mob/Demob				
1.2 Equipment	1	each	\$1,245.93	\$0.00
2.2 Personnel		each	\$516.69	\$516.69
3.2 Adverse Terrain Vehicle		each	\$610.75	\$0.00
E. Soil Borings				
1.1 Soil Borings (hand auger)		foot	\$21.80	\$0.00
F. Soil Borings (requiring equipment, push technology, etc) or Field Screening (including sampling and analyst)				
1.2 Standard		per foot	\$33.50	\$0.00
2.2 Fractured Rock		per foot	\$41.40	\$0.00
G.				
H. Well Abandonment				
1.2 2" diameter or less		per foot	\$3.79	\$0.00
2.2 Greater than 2" to 6" diameter		per foot	\$5.50	\$0.00
3.2 Dug/Bored well (up to 6 feet diameter)		per foot	\$18.32	\$0.00
I. Well Installation (in accordance with R.61-71)				
1.2 Water Table (hand augered)		per foot	\$31.40	\$0.00
2.B Water Table (drill rig) 2" Diameter		per foot	\$54.90	\$0.00
2.2 Single-cased 2" Diameter Monitoring Well >50ft		per foot	\$59.80	\$0.00
3.2 Telescoping		per foot	\$84.70	\$0.00
4.2 Rock Drilling		per foot	\$81.80	\$0.00
5.2 2" Rock Coring		per foot	\$88.50	\$0.00
6.2 Multi-sampling ports/screens		per foot	\$59.40	\$0.00
7.2 Recovery Well (4" diameter)		per foot	\$69.60	\$0.00
9.2 Rotosonic (2" diameter)		per foot	\$119.00	\$0.00
10.2 Re-develop Existing Well		per foot	\$13.44	\$0.00
J. Groundwater Sample Collection / Gauging Depth to Water/Product				
1.2 Groundwater Purge		per well	\$73.29	\$0.00
2.2 Air or Vapors		sample	\$14.66	\$0.00
3.2 Water Supply Sample		sample	\$26.87	\$0.00
4.1A HydraSleeve		sample	\$34.20	\$0.00
4.2B No-purge Groundwater Sample/Surface water	10	sample	\$57.24	\$572.40
5.2 Gauge Well only	5	sample	\$8.55	\$42.75
6.2 Sample Below Product		sample	\$14.66	\$0.00
7.2 Passive Diffusion Bag		sample	\$31.75	\$0.00
8.2 Field Duplicates (MWs & WSWs) and Field Bla	2	sample	\$30.06	\$60.12
9.2 Groundwater (low flow purge)	1	sample	\$111.16	\$111.16
10.2 Equipment Blank		sample	\$30.06	\$0.00
11.1 Sample Product		per well	\$52.66	\$0.00

K. Laboratory Analyses-Groundwater					
1.2 BTEXNM+Oxyg's+1,2 DCA+Eth(8260D)	14	per sample	\$149.02		\$2,086.28
2.2 Lead, Filtered		per sample	\$16.85		\$0.00
3.2 Rush EPA Method 8260B		per sample	\$187.62		\$0.00
4.2 Trimethal, Butyl, and Isopropyl Benzenes		per sample	\$34.20		\$0.00
5.2 PAH's		per sample	\$74.02		\$0.00
6.2 Lead		per sample	\$19.54		\$0.00
7.2 EDB by EPA 8011		per sample	\$55.21		\$0.00
8.2 EDB by EPA Method 8011 Rush		per sample	\$83.31		\$0.00
9.2 8 RCRA Metals		per sample	\$77.45		\$0.00
10.2 TPH (9070)		per sample	\$50.09		\$0.00
11.2 PH		per sample	\$6.35		\$0.00
12.2 BOD		per sample	\$24.42		\$0.00
13.2 Ethanol		per sample	\$18.08		\$0.00
K. Analyses-Drinking Water					
14.2 BTEXNM+1,2 DCA (524.2)		per sample	\$151.52		\$0.00
15.2 7-OXYGENATES & ETHANOL (8260D)		per sample	\$112.07		\$0.00
16.2 EDB (504.1)		per sample	\$97.11		\$0.00
17.2 RCRA METALS (200.8)		per sample	\$122.15		\$0.00
K. Analyses-Soil					
18.2 BTEX + Naphth.		per sample	\$78.18		\$0.00
19.2 PAH's		per sample	\$78.22		\$0.00
20.2 8 RCRA Metals		per sample	\$68.89		\$0.00
21.2 TPH-DRO (3550C/8015C)		per sample	\$48.86		\$0.00
22.2 TPH-GRO (5035B/8015C)		per sample	\$43.92		\$0.00
23.2 Grain size/hydrometer		per sample	\$127.04		\$0.00
24.2 Total Organic Carbon		per sample	\$37.38		\$0.00
K. Analyses-Air					
25.2 BTEX + Naphthalene		per sample	\$263.84		\$0.00
K. Hydrocarbon Fuel Identification					
27.1 C3-C44 Whole Oil (ASTM D3328)		per sample	\$465.93		\$0.00
28.1 Fuel Oxygenates (1624 Mod)		per sample	\$398.39		\$0.00
29.1 ALKYL Leads, EDB MMT (8080)		per sample	\$398.39		\$0.00
30.1 C8-C40 Full Scan (ASTM 5739)		per sample	\$629.64		\$0.00
31.1 Simulated Distillation (ASTM 2887)		per sample	\$398.39		\$0.00
32.1 Parent & Alk. PAH Com. (8270 SIM)		per sample	\$723.63		\$0.00
33.1 C3-C10 Piano (8260 MOD)		per sample	\$599.88		\$0.00
34.1 C10+Alkane Fingerprints		per sample	\$599.88		\$0.00
35.1 Expert Data Interpretation & Report		each	\$595.30		\$0.00
L. Aquifer Characterization					
1.2 Pumping Test		per hour	\$28.09		\$0.00
2.2 Slug Test		per test	\$233.31		\$0.00
3.2 Fractured Rock		per test	\$122.15		\$0.00
M. Free Product					
1.1 Free Product Recovery Rate Test		each	\$46.42		\$0.00
N.					
O. Risk Evaluation					
1.2 Tier I Risk Evaluation		each	\$366.45		\$0.00
2.2 Tier II Risk Evaluation		each	\$122.15		\$0.00
P. Survey					
1.1 Subsequent Survey		each	\$297.65		\$0.00
Q. Disposal (gallons or tons)					
1.2 Wastewater		gallon	\$1.19		\$0.00
2.2 Free Product		gallon	\$1.63		\$0.00
3.2 Soil Treatment/Disposal		ton	\$156.25		\$0.00
4.2 Drilling fluids		gallon	\$1.25		\$0.00

R. Miscellaneous (attach receipts)					
		each	\$0.00		\$0.00
		each	\$0.00		\$0.00
		each	\$0.00		\$0.00
T. Tier I Assessment (Use DHEC 3665 form)					
1.2 Southeast Region		standard	\$12,622.56		\$0.00
2.2 All Other Counties		standard	\$13,844.06		\$0.00
U. IGWA (Use DHEC 3666 form)					
1.2 Southeast Region		standard	\$4,353.67		\$0.00
2.2 All Other Counties		standard	\$4,720.01		\$0.00
22. Active Correction Action		PFP	Bid Cost		\$0.00
W. Aggressive Fluid & Vapor Recovery (AFVR)					
1.2 8-hour Event		per event	\$1,787.40		\$0.00
2.1 24-hour Event		per event	\$4,407.78		\$0.00
3.1 48-hour Event		per event	\$7,242.29		\$0.00
4.1 96-hour Event		per event	\$14,482.28		\$0.00
5.1 Off-gas Treatment 8 hour		per event	\$141.17		\$0.00
6.2 Off-gas Treatment 24 hour		per event	\$294.30		\$0.00
7.2 Off-gas Treatment 48 hour		per event	\$386.10		\$0.00
8.1 Off-gas Treatment 96 hour		per event	\$898.84		\$0.00
9.1 Off-gas Treatment 8 hour (w/chlorinated compounds)		per event	\$464.40		\$0.00
10.1 Off-gas Treatment 24 hour (w/chlorinated compounds)		per event	\$540.00		\$0.00
11.1 Off-gas Treatment 48 hour (w/chlorinated compounds)		per event	\$1,080.00		\$0.00
12.1 Off-gas Treatment 96 hour (w/chlorinated compounds)		per event	\$2,160.00		\$0.00
13.2 AFVR Effluent Disposal(w/chlorinated compounds)		gallon	\$0.64		\$0.00
14.2 AFVR Site Reconnaissance		each	\$302.40		\$0.00
15.1 Additional Hook-ups		each	\$29.68		\$0.00
16.2 AFVR Effluent Disposal		gallon	\$0.53		\$0.00
17.2 AFVR Mobilization/Demobilization		each	\$777.60		\$0.00
18.1 Mobilization for absorbents/skimers		each	\$516.69		\$0.00
19.1 Well sock 2" ID well		each	\$36.94		\$0.00
20.1 Well sock 4" ID well		each	\$49.03		\$0.00
21.1 pad (per pad)		each	\$49.95		\$0.00
22.1 3" diameter x 10' length boom		each	\$108.00		\$0.00
23.1 5" diameter x 10' length boom		each	\$132.84		\$0.00
24.1 New FPP recovery skimmer (2" wells)		each	\$791.10		\$0.00
25.1 New FPP recovery skimmer (4" wells)		each	\$1,247.40		\$0.00
26.1 Refurbished FPP recovery skimmer (2" or 4" wells)		each	\$760.32		\$0.00
27.1 Disposal of Absorbents		pound	\$4.10		\$0.00
28.1 Disposal of product from skimmers		gallon	\$0.50		\$0.00
X. Granulated Activated Carbon (GAC) filter system installation & service:					
1.2 New GAC System Installation		each	\$2,320.86		\$0.00
2.2 Refurbished GAC Sys. Install		each	\$1,099.35		\$0.00
3.2 Filter replacement/removal		each	\$427.53		\$0.00
4.2 GAC System removal, cleaning, & refurbishment		each	\$335.92		\$0.00
5.2 GAC System housing		each	\$305.38		\$0.00
6.2 In-line particulate filter		each	\$183.22		\$0.00
7.2 Additional piping & fittings		foot	\$1.84		\$0.00
Y. Well Repair					
1.2 Additional Copies of the Report Delivered		each	\$61.07		\$0.00
2.2 Repair 2x2 MW pad		each	\$61.07		\$0.00
3.2 Repair 4x4 MW pad		each	\$107.49		\$0.00
4.2 Replace well vault		each	\$144.14		\$0.00

5.2 Replace well cover bolts		each	\$3.18	\$0.00
6.2 Replace locking well cap & lock		each	\$18.32	\$0.00
7.2 Replace/Repair stick-up		each	\$163.68	\$0.00
8.2 Convert Flush-mount to Stick-up		each	\$183.22	\$0.00
9.2 Convert Stick-up to Flush-mount		each	\$158.79	\$0.00
10.2 Replace missing/illegible well ID plate		each	\$14.66	\$0.00
11.1 Down-hole Camera		per foot	\$29.25	\$0.00
Z. High Resolution Site Characterization				
1.1 HRSC Screening Equipment Mobilization		each	\$1,468.80	\$0.00
2.1 HRSC Drilling Category 1		per foot	\$31.32	\$0.00
3.1 HRSC Drilling Category 2		per foot	\$36.18	\$0.00
4.1 HRSC Drilling Category 3		per foot	\$29.16	\$0.00
5.1 HRSC 3-D Model		each	\$4,363.20	\$0.00
S. Report Prep & Project Management	12%	percent	\$3,572.62	\$428.71
TOTAL				\$4,001.33

DHEC D-4407 (07/2023)



SC DEPARTMENT of
**ENVIRONMENTAL
SERVICES**

Erin Jezek
Corrective Action & Field Support Section
Underground Storage Tank Management Division
2600 Bull Street
Columbia, SC 29201

HILTON HEAD PUBLIC SERVICE DISTRICT
PO BOX 21264
HILTON HEAD ISLAND SC 29925

JUN 27 2025

Re: **SSWP Approval and GWS Notice to Proceed**

Hilton Head Public Service District, 21 Oak Park Dr, Hilton Head Island, SC
UST Permit #11399 CA# 70143
Release reported July 27, 2017
Site Specific Work Plan received June 17, 2025
Beaufort County



To Whom It May Concern:

The Underground Storage Tank Management Division (UST Division) of the S.C. Department of Environmental Services has reviewed and approved the referenced Site Specific Work Plan (SSWP) submitted by your contractor. The groundwater sampling event should begin immediately upon receipt of this letter. All work should be conducted in compliance with the current revision of the UST Quality Assurance Program Plan (QAPP), your contractor's Annual Contractor Quality Assurance Plan, and all applicable regulations. The QAPP is available at des.sc.gov/programs/bureau-land-waste-management/underground-storage-tanks/ust-quality-assurance-program-plan-qapp.

Pursuant to S.C. Code Ann. Section 44-2-40(D), "The SUPERB Account and the SUPERB Financial Responsibility Fund shall provide combined coverage for site rehabilitation and third-party claims, respectively, not to exceed one million dollars per occurrence". **According to UST Division records, approximately \$43,576.83 has been expended from the SUPERB Account to date.** This scope of work, as recommended by your contractor, is anticipated to cost approximately \$4,001.33.

The contractor must provide notification to the UST Project Manager via email 4 days prior to initiation of any site rehabilitation activities. If there are any changes to the schedule, the UST Project Manager must be contacted within 24 hours of those changes.

In accordance with Section IV.A.4.c of the SUPERB Site Rehabilitation & Fund Access Regulation (R.61-98), the contractor shall be required to indemnify the property owner, underground storage tank owner/operator and the State of South Carolina from and against all claims, damages, losses and expenses arising out of or resulting from activity conducted by the contractor, its agents, employees or subcontractors.

Your contractor can submit an invoice for direct payment from the State Underground Petroleum Environmental Response Bank (SUPERB) Account for pre-approved costs. **The Monitoring Report, contractor checklist (QAPP Appendix K), and invoice should be submitted to the UST Division within sixty (60) days of the date of this correspondence.** If the invoice is not submitted within 120 days from the date of this letter, monies allocated to pay this invoice will be uncommitted. This means that the invoice will not be processed for payment until all other committed funds are paid or monies become available.

If the report cannot be submitted by the required due date, an extension may be requested by submitting a written request, either via postal mail or email, to my attention prior to the due date. The Department will issue a Notice of Alleged Violation if the report is not submitted by the required due date.

Please note that sections 44-2-110(4) and 44-2-130 of the SUPERB Statute state that the SUPERB Account cannot compensate any costs that are not pre-approved. If for any reason additional tasks will be completed, these additional tasks, and the associated cost, must be pre-approved by the UST Division for the cost to be paid. The UST Division reserves the authority to pay only for work properly performed and/or technically justified and will only pay rates in accordance with established criteria. Further, the UST Division reserves the right to question and/or reject costs if deemed unreasonable and the right to audit project records at any time during the project or after completion of work. **Per Section III.3.b of the SUPERB Site Rehabilitation and Fund Access Regulations (R.61-98), reimbursement for site rehabilitation activities shall in no event exceed the actual costs incurred.**

Please note that applicable South Carolina certification requirements regarding laboratory services, well installation, and report preparation must be satisfied. Any site rehabilitation activity associated with the UST release must be performed by a SCDES-certified site rehabilitation contractor as required by the SUPERB Site Rehabilitation and Fund Access Regulation, R.61-98.

The UST Division grants pre-approval for transportation of virgin petroleum impacted soil and groundwater from the referenced site to a permitted treatment facility. There can be no spillage or leakage in transport. All investigation-derived waste (IDW) must be properly contained and labeled prior to disposal. IDW should not be stored on-site longer than ninety (90) days. A copy of the disposal manifest and/or acceptance letter from the receiving facility that clearly designates the quantity received must be included as an appendix to the report. If the Chemical of Concern (CoC) concentrations based on laboratory analysis is below Risk-Based Screening Levels (RBSLs), please contact the project manager for approval to dispose of soil and/or groundwater on-site. The SUPERB Account will not reimburse for transportation or treatment of soil and/or groundwater with concentrations below RBSLs.

The contractor will be responsible for keeping and preserving suitable records of hydrological and other site assessments, site plans, contracts, accounts, invoices, or other transactions related to the cleanup and rehabilitation and the records must be accessible to the department during regular business hours. In addition, this includes all subcontractor agreements, invoices, correspondence, plans, reports, records, including electronic and paper formats. All records must be maintained for 10 years after project completion.

On all correspondence regarding this site, please reference the UST Permit number above. Should you have any questions, please contact me by phone at (803) 898-0608, by fax at (803) 898-0673, or by email at erin.jezek@des.sc.gov.

Sincerely,


Erin Jezek, Hydrogeologist

enc: Approved Cost Agreement

cc: F & ME Consultants Columbia, 211 Business Park Blvd, Columbia SC 29203 (w/ enc)
Technical file (w/ enc)

SUPERB COST AGREEMENT CHECKLIST

!!! Update payment code, task screen, punch list, status, etc. in tracking system !!!

UST Permit Name: Hilton Head Public Service District UST Permit #: 11399
Date Release Reported: 7/27/2017 Release #: 2 Project Manager: Erin Jezek
Priority Class (Circle): Emergency / 1 2A 2B 3A 3B 4A 4B 5
Category: ☐ Assessment ☐ ACA ☒ MNA ☐ FP Recovery
Description of Work: GWS
Cost Agreement #: 70143 Amount Approved: \$4,001.33

Cost Agreement Type

Committed/Currently Funded (WS)
SUPERB Paid to Date: \$43,576.83
Non-committed Contracts (WC)

To SUPERB \$25,000 Deductible (W25)

Committed (CA>\$25K)
Prior total toward \$25K: _____
To complete \$25K: _____
Over \$25K: _____
Non-committed (CA<\$25K): _____

Cost Agreement Duration

☒ 4 Months (120 Days) ☐ 2 Months (60 Days)
☐ Other _____

Payee & Address:

F & ME Consultants Columbia
211 Business Park Blvd
Columbia SC 29203

Contractor Certification #: UCC# 0140

Rate Schedule:

State Lead

IGWA

Tier I

Tier II

Analytical

Sampling

GAC

PO#

O/O Lead

☒ SUPERB Allowable

Analytical

GAC

Other _____

Project Manager: 

Date: 6/20/2025

Accountant: _____

Date: _____

Financial Supervisor: _____

Date: _____

Technical Supervisor: _____

Date: _____



**SC DEPARTMENT of
ENVIRONMENTAL
SERVICES**

ASSESSMENT COMPONENT COST AGREEMENT
South Carolina Department of Environmental Services
Underground Storage Tank Management Division
State Underground Petroleum Environmental Response Bank Account
August 9, 2023

Facility Name: Hilton Head Public Service District

UST Permit #: 11399

Cost Agreement #: 70143

ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL
A. Plan Preparation				
1.2 Site-specific Work Plan	1	each	\$183.22	\$183.22
2.2 Tax Map		each	\$85.50	\$0.00
3.2 QAPP Contractor Addendum (App B)		each	\$250.00	\$0.00
B. Survey				
1.1 Receptor Survey		each	\$673.06	\$0.00
C. Survey				
1.2 Comprehensive Survey		each	\$1,270.36	\$0.00
5.1 Ground Penetrating Radar Survey (100 x 100)		each	\$1,111.57	\$0.00
D. Mob/Demob				
1.2 Equipment		each	\$1,245.93	\$0.00
2.2 Personnel	1	each	\$516.69	\$516.69
3.2 Adverse Terrain Vehicle		each	\$610.75	\$0.00
E. Soil Borings				
1.1 Soil Borings (hand auger)		foot	\$21.80	\$0.00
F. Soil Borings (requiring equipment, push technology, etc) or Field Screening (including sampling and analyst)				
1.2 Standard		per foot	\$33.50	\$0.00
2.2 Fractured Rock		per foot	\$41.40	\$0.00
G.				
H. Well Abandonment				
1.2 2" diameter or less		per foot	\$3.79	\$0.00
2.2 Greater than 2" to 6" diameter		per foot	\$5.50	\$0.00
3.2 Dug/Bored well (up to 6 feet diameter)		per foot	\$18.32	\$0.00
I. Well Installation (In accordance with R.61-71)				
1.2 Water Table (hand augered)		per foot	\$31.40	\$0.00
2.8 Water Table (drill rig) 2" Diameter		per foot	\$54.90	\$0.00
2.2 Single-cased 2" Diameter Monitoring Well >50ft		per foot	\$59.80	\$0.00
3.2 Telescoping		per foot	\$84.70	\$0.00
4.2 Rock Drilling		per foot	\$81.80	\$0.00
5.2 2" Rock Coring		per foot	\$88.50	\$0.00
6.2 Multi-sampling ports/screens		per foot	\$59.40	\$0.00
7.2 Recovery Well (4" diameter)		per foot	\$69.60	\$0.00
9.2 Rotasonic (2" diameter)		per foot	\$119.00	\$0.00
10.2 Re-develop Existing Well		per foot	\$13.44	\$0.00
J. Groundwater Sample Collection / Gauging Depth to Water/Product				
1.2 Groundwater Purge		per well	\$73.29	\$0.00
2.2 Air or Vapors		sample	\$14.66	\$0.00
3.2 Water Supply Sample		sample	\$26.87	\$0.00
4.1A HydraSleeve		sample	\$34.20	\$0.00
4.2B No-purge Groundwater Sample/Surface wa	10	sample	\$57.24	\$572.40
5.2 Gauge Well only	5	sample	\$8.55	\$42.75
6.2 Sample Below Product		sample	\$14.66	\$0.00
7.2 Passive Diffusion Bag		sample	\$31.75	\$0.00
8.2 Field Duplicates (MWs & WSWs) and Field B	2	sample	\$30.06	\$60.12
9.2 Groundwater (low flow purge)	1	sample	\$111.16	\$111.16
10.2 Equipment Blank		sample	\$30.06	\$0.00
11.1 Sample Product		per well	\$52.66	\$0.00
K. Laboratory Analyses-Groundwater				
1.2 BTEXNM+Oxyg's+1,2 DCA+Eth(8260D)	14	per sample	\$149.02	\$2,086.28
2.2 Lead, Filtered		per sample	\$16.85	\$0.00
3.2 Rush EPA Method 8260B		per sample	\$187.62	\$0.00

4.2 Trimethal, Butyl, and Isopropyl Benzenes		per sample	\$34.20	\$0.00
5.2 PAH's		per sample	\$74.02	\$0.00
6.2 Lead		per sample	\$19.54	\$0.00
7.2 EDB by EPA 8011		per sample	\$55.21	\$0.00
8.2 EDB by EPA Method 8011 Rush		per sample	\$83.31	\$0.00
9.2 8 RCRA Metals		per sample	\$77.45	\$0.00
10.2 TPH (9070)		per sample	\$50.09	\$0.00
11.2 PH		per sample	\$6.35	\$0.00
12.2 BOD		per sample	\$24.42	\$0.00
13.2 Ethanol		per sample	\$18.08	\$0.00
K. Analyses-Drinking Water				
14.2 BTEXNM+1,2 DCA (524.2)		per sample	\$151.52	\$0.00
15.2 7-OXYGENATES & ETHANOL (8260D)		per sample	\$112.07	\$0.00
16.2 EDB (504.1)		per sample	\$97.11	\$0.00
17.2 RCRA METALS (200.8)		per sample	\$122.15	\$0.00
K. Analyses-Soil				
18.2 BTEX + Naphth.		per sample	\$78.18	\$0.00
19.2 PAH's		per sample	\$78.22	\$0.00
20.2 8 RCRA Metals		per sample	\$68.89	\$0.00
21.2 TPH-DRO (3550C/8015C)		per sample	\$48.86	\$0.00
22.2 TPH-GRO (5035B/8015C)		per sample	\$43.92	\$0.00
23.2 Grain size/hydrometer		per sample	\$127.04	\$0.00
24.2 Total Organic Carbon		per sample	\$37.38	\$0.00
K. Analyses-Air				
25.2 BTEX + Naphthalene		per sample	\$263.84	\$0.00
K. Hydrocarbon Fuel Identification				
27.1 C3-C44 Whole Oil (ASTM D3328)		per sample	\$465.93	\$0.00
28.1 Fuel Oxygenates (1624 Mod)		per sample	\$398.39	\$0.00
29.1 ALKYL Leads, EDB MMT (8080)		per sample	\$398.39	\$0.00
30.1 C8-C40 Full Scan (ASTM 5739)		per sample	\$629.64	\$0.00
31.1 Simulated Distillation (ASTM 2887)		per sample	\$398.39	\$0.00
32.1 Parent & Alk. PAH Com. (8270 SIM)		per sample	\$723.63	\$0.00
33.1 C3-C10 Piano (8260 MOD)		per sample	\$599.88	\$0.00
34.1 C10+Alkane Fingerprints		per sample	\$599.88	\$0.00
35.1 Expert Data Interpretation & Report		each	\$595.30	\$0.00
L. Aquifer Characterization				
1.2 Pumping Test		per hour	\$28.09	\$0.00
2.2 Slug Test		per test	\$233.31	\$0.00
3.2 Fractured Rock		per test	\$122.15	\$0.00
M. Free Product				
1.1 Free Product Recovery Rate Test		each	\$46.42	\$0.00
N.				
O. Risk Evaluation				
1.2 Tier I Risk Evaluation		each	\$366.45	\$0.00
2.2 Tier II Risk Evaluation		each	\$122.15	\$0.00
P. Survey				
1.1 Subsequent Survey		each	\$297.65	\$0.00
Q. Disposal (gallons or tons)				
1.2 Wastewater		gallon	\$1.19	\$0.00
2.2 Free Product		gallon	\$1.63	\$0.00
3.2 Soil Treatment/Disposal		ton	\$156.25	\$0.00
4.2 Drilling fluids		gallon	\$1.25	\$0.00
R. Miscellaneous (attach receipts)				
		each	\$0.00	\$0.00
		each	\$0.00	\$0.00
		each	\$0.00	\$0.00
T. Tier I Assessment (Use DHEC 3665 form)				
1.2 Southeast Region		standard	\$12,622.56	\$0.00
2.2 All Other Counties		standard	\$13,844.06	\$0.00
U. IGWA (Use DHEC 3666 form)				
1.2 Southeast Region		standard	\$4,353.67	\$0.00

2.2 All Other Counties		standard	\$4,720.01		\$0.00
22. Active Correction Action		PFP	Bid Cost		\$0.00
W. Aggressive Fluid & Vapor Recovery (AFVR)					
1.2 8-hour Event		per event	\$1,787.40		\$0.00
2.1 24-hour Event		per event	\$4,407.78		\$0.00
3.1 48-hour Event		per event	\$7,242.29		\$0.00
4.1 96-hour Event		per event	\$14,482.28		\$0.00
5.1 Off-gas Treatment 8 hour		per event	\$141.17		\$0.00
6.2 Off-gas Treatment 24 hour		per event	\$294.30		\$0.00
7.2 Off-gas Treatment 48 hour		per event	\$386.10		\$0.00
8.1 Off-gas Treatment 96 hour		per event	\$898.84		\$0.00
9.1 Off-gas Treatment 8 hour (w/chlorinated compounds)		per event	\$464.40		\$0.00
10.1 Off-gas Treatment 24 hour (w/chlorinated compounds)		per event	\$540.00		\$0.00
11.1 Off-gas Treatment 48 hour (w/chlorinated compounds)		per event	\$1,080.00		\$0.00
12.1 Off-gas Treatment 96 hour (w/chlorinated compounds)		per event	\$2,160.00		\$0.00
13.2 AFVR Effluent Disposal(w/chlorinated compounds)		gallon	\$0.64		\$0.00
14.2 AFVR Site Reconnaissance		each	\$302.40		\$0.00
15.1 Additional Hook-ups		each	\$29.68		\$0.00
16.2 AFVR Effluent Disposal		gallon	\$0.53		\$0.00
17.2 AFVR Mobilization/Demobilization		each	\$777.60		\$0.00
18.1 Mobilization for absorbents/skimers		each	\$516.69		\$0.00
19.1 Well sock 2" ID well		each	\$36.94		\$0.00
20.1 Well sock 4" ID well		each	\$49.03		\$0.00
21.1 pad (per pad)		each	\$49.95		\$0.00
22.1 3" diameter x 10' length boom		each	\$108.00		\$0.00
23.1 5" diameter x 10' length boom		each	\$132.84		\$0.00
24.1 New FPP recovery skimmer (2" wells)		each	\$791.10		\$0.00
25.1 New FPP recovery skimmer (4" wells)		each	\$1,247.40		\$0.00
26.1 Refurbished FPP recovery skimmer (2" or 4" wells)		each	\$760.32		\$0.00
27.1 Disposal of Absorbents		pound	\$4.10		\$0.00
28.1 Disposal of product from skimmers		gallon	\$0.50		\$0.00
X. Granulated Activated Carbon (GAC) filter system installation & service:					
1.2 New GAC System Installation		each	\$2,320.86		\$0.00
2.2 Refurbished GAC Sys. Install		each	\$1,099.35		\$0.00
3.2 Filter replacement/removal		each	\$427.53		\$0.00
4.2 GAC System removal, cleaning, & refurbishment		each	\$335.92		\$0.00
5.2 GAC System housing		each	\$305.38		\$0.00
6.2 In-line particulate filter		each	\$183.22		\$0.00
7.2 Additional piping & fittings		foot	\$1.84		\$0.00
Y. Well Repair					
1.2 Additional Copies of the Report Delivered		each	\$61.07		\$0.00
2.2 Repair 2x2 MW pad		each	\$61.07		\$0.00
3.2 Repair 4x4 MW pad		each	\$107.49		\$0.00
4.2 Replace well vault		each	\$144.14		\$0.00
5.2 Replace well cover bolts		each	\$3.18		\$0.00
6.2 Replace locking well cap & lock		each	\$18.32		\$0.00
7.2 Replace/Repair stick-up		each	\$163.68		\$0.00
8.2 Convert Flush-mount to Stick-up		each	\$183.22		\$0.00
9.2 Convert Stick-up to Flush-mount		each	\$158.79		\$0.00
10.2 Replace missing/illegible well ID plate		each	\$14.66		\$0.00
11.1 Down-hole Camera		per foot	\$29.25		\$0.00
Z. High Resolution Site Characterization					
1.1 HRSC Screening Equipment Mobilization		each	\$1,468.80		\$0.00
2.1 HRSC Drilling Category 1		per foot	\$31.32		\$0.00
3.1 HRSC Drilling Category 2		per foot	\$36.18		\$0.00
4.1 HRSC Drilling Category 3		per foot	\$29.16		\$0.00
5.1 HRSC 3-D Model		each	\$4,363.20		\$0.00
S. Report Prep & Project Management	12%	percent	\$3,572.62		\$428.71
TOTAL					\$4,001.33

RECEIVED
AUG 25 2025
UST DIVISION



LETTER OF TRANSMITTAL

TO:	Ms. Erin Jazek, Hydrogeologist SCDES – UST Mgmt. Section 2600 Bull St. Columbia, SC 29201
------------	--

DATE:	08/25/25	FME NO.:	E6687.003
ATTN:	Ms. Erin Jazek		
RE:	HHI PSD Site – GW Sampling Report UST ID # 11399		

WE ARE SENDING YOU THE FOLLOWING:	VIA: <u>Hand Delivery</u>
☐ AGREEMENT ☐ INVOICE ☐ PHOTOS ☐ PLANS ☐ PROPOSAL ☐ RECORDS ☐ REPORTS ☐ SAMPLES	
☐ SPECIFICATIONS ☐ SUBMITTAL ☒ OTHER _____	

COPIES	DATE	DESCRIPTION
1	08/22/25	Groundwater Sampling Report, HHI PSD, UST ID 11399

THESE ARE TRANSMITTED AS CHECKED BELOW:
☒ AS REQUESTED ☐ CORRECTED COPY ☐ FOR YOUR USE ☐ RESUBMITTED
☐ OTHER _____

COMMENTS: Erin, If you have any questions or need additional information, please just ask. Christine
--

SIGNED: Christine A. Cafagna
Christine A. Cafagna, ccafagna@fmeconsultants.com





GROUNDWATER SAMPLING REPORT

**HILTON HEAD ISLAND PUBLIC SERVICE DISTRICT
21 OAK PARK DRIVE
HILTON HEAD ISLAND, BEAUFORT COUNTY, SC
SCDES UST PERMIT #11399**

PREPARED FOR:

Hilton Head Island Public Service District (HHI PSD)
21 Oak Park Drive
Hilton Head Island, SC 29926

PREPARED BY:

F&ME Consultants
211 Business Park Blvd.
Columbia, South Carolina 29203

August 22, 2025

F&ME Project No.: E6687.003

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1.	Transmittal Letter.....	1
2.	Introduction	2
3.	Groundwater Sampling Event	3
4.	Sample Analyses.....	4
5.	Results of Analyses	4
6.	Recommendations	5
7.	Acknowledgement.....	6

TABLES

APPENDICES

Appendix A – Figures

Appendix B – Laboratory Analytical Report

Appendix C – Field Sampling Data Sheets for Groundwater Sampling

Appendix D – Contractor Checklist

Appendix E – SCDES Groundwater Sampling Notice to Proceed Letter

TABLES

- 1 Summary of Groundwater Elevations
- 2 Summary of Groundwater COC Analytical Results
- 3 Summary of Groundwater Oxygenate Analytical Results



1. TRANSMITTAL LETTER

August 22, 2025

Mr. Bill Davis, Operations Manager
Hilton Head Island Public Service District (HHI PSD)
21 Oak Park Drive
Hilton Head Island, South Carolina 29926

Re: Groundwater Sampling Report
SCDES UST Permit Number 11399
HHI PSD Release #2 (July 27, 2017)
21 Oak Park Drive
Hilton Head Island, Beaufort County, South Carolina
FME Project No.: E6687.003

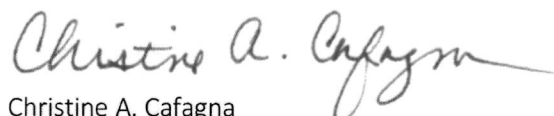
Dear Mr. Davis:

Submitted herein is the Groundwater Sampling Report for work conducted at the above referenced site. The work was initiated upon receipt of the South Carolina Department of Environmental Services (SCDES) Groundwater Sampling Notice to Proceed (NTP) letter dated June 27, 2025, outlining the scope of work requested. This report is submitted by F&ME Consultants, Inc. (FME) for your review on behalf of the site owner, Hilton Head Island Public Service District (HHI PSD). This work is being done under SCDES Cost Agreement (CA) #70143.

If you have any questions, or if we can provide additional information, please do not hesitate to contact us at (803) 254-4540.

Sincerely,

F&ME CONSULTANTS, INC.


Christine A. Cafagna
Senior Environmental Department Manager

Enclosures

Craig A. Piercy, P.G.
Project Geologist



2. INTRODUCTION

Site:

HHI PSD Release #2
21 Oak Park Drive
Hilton Head Island, South Carolina 29926
Beaufort County
SCDES UST Permit #11399
(843) 681-5525
Release Reported: Release #2 (July 27, 2017)

Responsible Party:

Hilton Head Island Public Service District
c/o Mr. Bill Davis
PO Box 21264
Beaufort, South Carolina 29925-1264
(843) 305-0639

This assessment was conducted by:

F&ME Consultants, Inc.
211 Business Park Blvd.
Columbia, South Carolina 29203
(803) 254-4540
UCC-0140, Class I

F&ME Consultants, Inc. (FME) is submitting the following Groundwater Sampling report for the HHI PSD Release #2 site. The HHI PSD Release #2 site (SCDES UST Permit #11399) (Site) is located at 21 Oak Park Drive, Hilton Head Island, Beaufort County, South Carolina. The Site currently operates as the Hilton Head Island Public Service District (HHI PSD).

Acting on behalf of HHI PSD, F&ME Consultants (FME) has completed the groundwater sampling at the Site. Refer to *Appendix A, Figure 1 - Site Vicinity Map*, for the location of the facility and *Figure 2 - Site Topographic Map*, which depicts the relative topography on the site and within the immediate area around the facility. Refer to *Appendix E*, which contains the SCDES groundwater sampling notice to proceed (NTP) letter, for more details regarding SCDES's request.

As outlined in the SCDES Site Specific Work Plan (SSWP) request letter dated March 26, 2025 and the SCDES's groundwater sampling NTP letter dated June 27, 2025, the scope of work included conducting a comprehensive groundwater sampling event on all the monitoring wells associated with Release #2. The locations of monitoring wells sampled during this assessment are provided in *Appendix A, Figure 3 - Well Location Plan*.



3. GROUNDWATER SAMPLING EVENT

On July 23, 2025, F&ME personnel arrived at the site to conduct the comprehensive groundwater sampling event on the (16) monitoring wells within the well network: thirteen (13) shallow monitoring wells (i.e., MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, MW-9, MW-10, MW-11, MW-12, and MW-13), one (1) deep monitoring well (i.e., DCW-1), and two (2) recovery wells (i.e., RW-01 and RW-02). Each well sampled during this event was sampled in a manner consistent with the SCDES's Quality Assurance Project Plan (QAPP) (Rev. No. 4.0) protocols. Refer to *Appendix D*, Contractor Checklist, which documents that data elements for the scope of work have been provided.

Prior to the collection of groundwater levels and water quality samples from the wells on site, each well was opened to allow groundwater to stabilize within each well. Static water levels were measured and recorded. The depth to water reading from each well was recorded to determine if the well screen bracketed the water table. Depths to groundwater and groundwater elevations recorded during the sampling event are included here in *Appendix B*, Field Sampling Data Sheets for Groundwater Sampling. The water level for the wells containing free product petroleum (FPP) were corrected by calculating and subtracting for the thickness of observed petroleum (diesel). Using the shallow groundwater elevations, a groundwater potentiometric map was created for the site. Refer to *Appendix A*, *Figure 4 - Groundwater Potentiometric Map*, which shows the general groundwater contours extrapolated from the observed measurements from the wells obtained during this sampling event. Please note that the deep well (i.e., DCW-1) was not used in developing the depicted groundwater contours.

Groundwater flow direction at the Site is generally in a southerly direction, with a southwesterly component on the western side of the Site and a southeasterly component on the eastern side of the Site. There is a small anomaly or possibly perched water at the location of MW-1, which exhibits a small rise in groundwater elevation. However, excluding MW-1, the groundwater flow direction is generally consistent across the site. MW-1 is located immediately to the south of the diesel tank island and likely exhibits non-homogeneous subsurface conditions or likely a disturbed soil profile (which may explain groundwater elevation anomaly). Refer to Figure 4 of this report.

Well purging was not required for MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, MW-10, MW-11, and RW-02 of the monitoring well network, as the well screens bracketed the measured water table within these shallow wells; therefore, the wells were sampled with a new disposable bailer for each well. Additionally, MW-1, MW-9, MW-12, MW-13, and RW-01 were not sampled as these wells contained observed FPP. The thickness of observed FPP is recorded and depicted on Table 1 and Figure 5. Deep well DCW-1 was the only well requiring purging before sampling during this event. The groundwater analytical results from deep well, DCW-1, have historically been below the SCDES risk-based screening levels (RBSLs); therefore, the purge water was disposed of on the ground beside the deep well. A peristaltic pump with disposable polyethylene tubing was used to purge and sample the deep well using low flow and low volume purging and sampling methods. Since the deep well was able to be sampled with a peristaltic pump with



disposable tubing and not a submersible pump, no equipment blank was collected. Water quality data collected during the purging and sampling of the wells is presented on the Field Sampling Data Sheets for Groundwater Sampling located in Appendix B. Chain-of-custody procedures were properly followed, and each groundwater sample was placed in sample bottles provided by the analytical laboratory, properly sealed, packaged in a cooler filled with ice, and held at FME's office for lab pick up by Eurofins – Columbia, personnel.

Table 1 included within this report documents the depth to groundwater and groundwater elevations recorded during the sampling event and previous sampling events. Screened intervals were originally recorded during well installation and are provided here for informational purposes only. Top of Casing (TOC) elevations were provided by Andrews Engineering after FME's installation of RW-01, RW-02, MW-11, MW-12, and MW-13. It should be noted that the TOC elevations for the remaining wells, which were installed by a previous consultant, AECOM, were taken from AECOM's *Tier II Assessment Report UST Permit #11399*, dated November 2021. The respective water table elevations recorded in *Table 1* were calculated using these elevations and field measurements.

4. SAMPLE ANALYSES

The groundwater samples were picked up by Eurofins - Columbia., who had the samples delivered by Eurofins carrier to the Eurofins Atlanta lab, a South Carolina Certified Laboratory, for groundwater sample analyses of typical petroleum volatile organic compounds (VOC), including benzene, toluene, ethylbenzene, xylenes (BTEX), naphthalene, methyl tertiary butyl ether (MTBE), 1,2-dichloroethane (1,2-DCA), eight (8) oxygenates and ethylene dibromide (EDB). A field duplicate sample was collected from RW-02. Additionally, field blank and trip blank samples were also submitted to the laboratory for analysis for quality assurance/quality control (QA/QC) purposes. As previously stated, an equipment blank was not collected due to the fact that a peristaltic pump with disposable tubing was used to sample the deep well and not a submersible pump. Refer to Appendix C, Laboratory Analytical Report, for a copy of the laboratory analytical results and chain of custody documentation.

5. RESULTS OF ANALYSES

As noted above, five (5) monitoring wells, MW-1, MW-9, MW-12, MW-13, and RW-01, were not sampled due to the presence of free phase product (FPP) within these monitoring wells. FPP thickness in these five (5) wells ranged from 0.55 feet to 1.33 feet at the time of the groundwater sampling event. MW-1 has contained FPP since its installation in 2018 and MW-13 has contained FPP since its installation in 2022. There has been a decrease in FPP thickness in four (4) of five (5) wells containing FPP compared to the last sampling event in June of 2024, with the exception of RW-1 that had a 0.17' increase in FPP.



Analytical results indicate that none of the monitoring wells contains a Chemical of Concern (CoC) that are above SCDES's Risk Based Screening Levels (RBSL). Based on analytical sample results, monitoring wells MW-4, MW-5, MW-7, and MW-11 were found to contain toluene, however, the analyzed concentrations were reported as estimated "J-value" concentration results. "J-values" are estimated concentrations above the method detection limit (MDL) but below the analytical reporting limit (RL). Recovery well RW-02, which during previous sampling events had FPP present, did not have measurable FPP during this event, but rather was sampled and had a recorded "J-value" detection for toluene at 0.29J micrograms per liter (ug/L) and naphthalene at 4.1J ug/L. RW-02 had detections of ethylbenzene recorded at 2.9 ug/L. The duplicate sample results collected from RW-02 were fairly consistent with the "sister" sample collected from RW-02. However, to restate, none of the sampled wells had any petroleum constituent greater than the RBSL.

6. RECOMMENDATIONS

As previously stated, five (5) monitoring wells, MW-1, MW-9, MW-12, MW-13, and RW-01, were not sampled due to the presence of FPP within these monitoring wells. FPP thickness in these five (5) wells ranged from 0.55 feet to 1.33 feet at the time of the groundwater sampling event. MW-1 has contained free product since its installation in 2018 as well as MW-13 since its installation in 2022. RW-02 had FPP present during the sampling event that occurred in August of 2022 and in July of 2023. However, no FPP was recorded in RW-02 during the current sampling event or the previous sampling event that occurred in June of 2024. There has been a decrease in FPP thickness in four (4) of five (5) wells containing FPP compared to the last sampling event in June of 2024, with the exception of RW-1 that had a 0.17' increase in FPP. However, no CoC were detected above the established RBSL during this sampling event and the results were fairly consistent with the previous sampling event.

Based on information obtained during this sampling event, FME recommends a 96-hour aggressive fluid vapor recovery (AFVR) event be conducted on the five (5) monitoring wells that contained FPP during this sampling event (MW-1, MW-9, MW-12, MW-13, and RW-01) along with recovery well RW-02 in order to remove the FPP. Due to equipment constraints, the AFVR extraction will be rotated or staggered to accommodate all six (6) extraction wells during a single event. That is, during the 96-hour AFVR event, three (3) extraction wells will be targeted for part of the AFVR event followed by targeting the remaining three (3) wells. Due to the amount of water to be generated, a temporary "frac tank" will probably be required to manage/hold water during event, prior to disposal.



7. ACKNOWLEDGEMENT

On behalf of Hilton Head Island Public Service District, FME appreciates the opportunity to provide SCDES this groundwater sampling report. If you require additional information or have any questions concerning the information presented in this report, please do not hesitate to contact us at (803) 254-4540.



APPENDICES

- Appendix A – Figures
- Appendix B – Laboratory Analytical Report
- Appendix C – Field Sampling Data Sheets for Groundwater Sampling
- Appendix D – Contractor Checklist
- Appendix E – Groundwater Sampling Notice to Proceed Letter

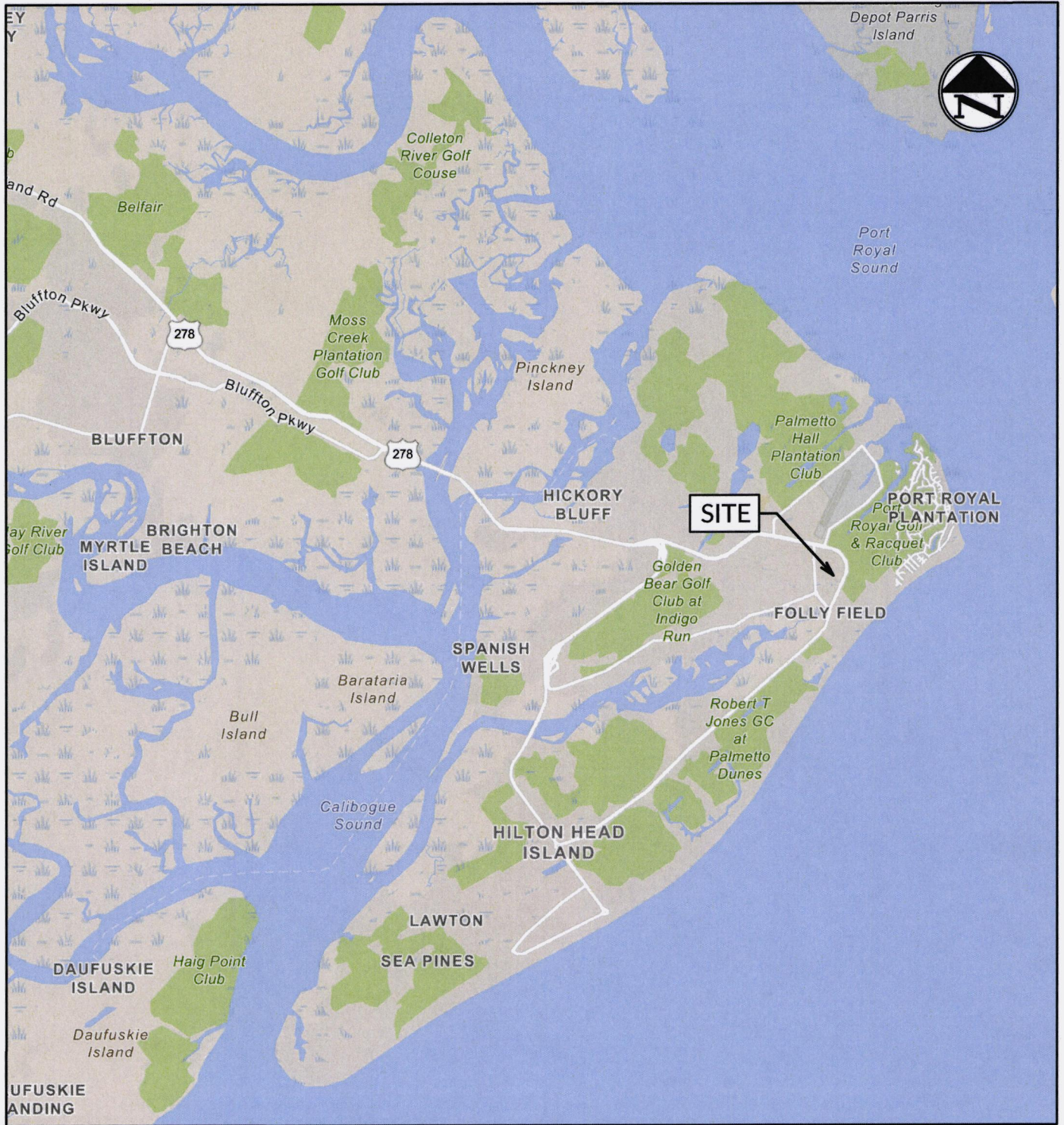
TABLES

- 1 - Summary of Groundwater Elevations
- 2 - Summary of Groundwater COC Analytical Results
- 3 - Summary of Groundwater Oxygenate Analytical Results



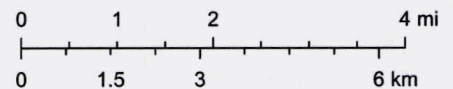
Appendix A

Figures



BEAUFORT COUNTY

1:144,000



DRAWN BY:	CTC
APPROVED BY:	CAC
NOTES:	

ORIGINAL:
August 14, 2025

REVISIONS:

-
-
-

SCALE: As Noted

F&ME
CONSULTANTS

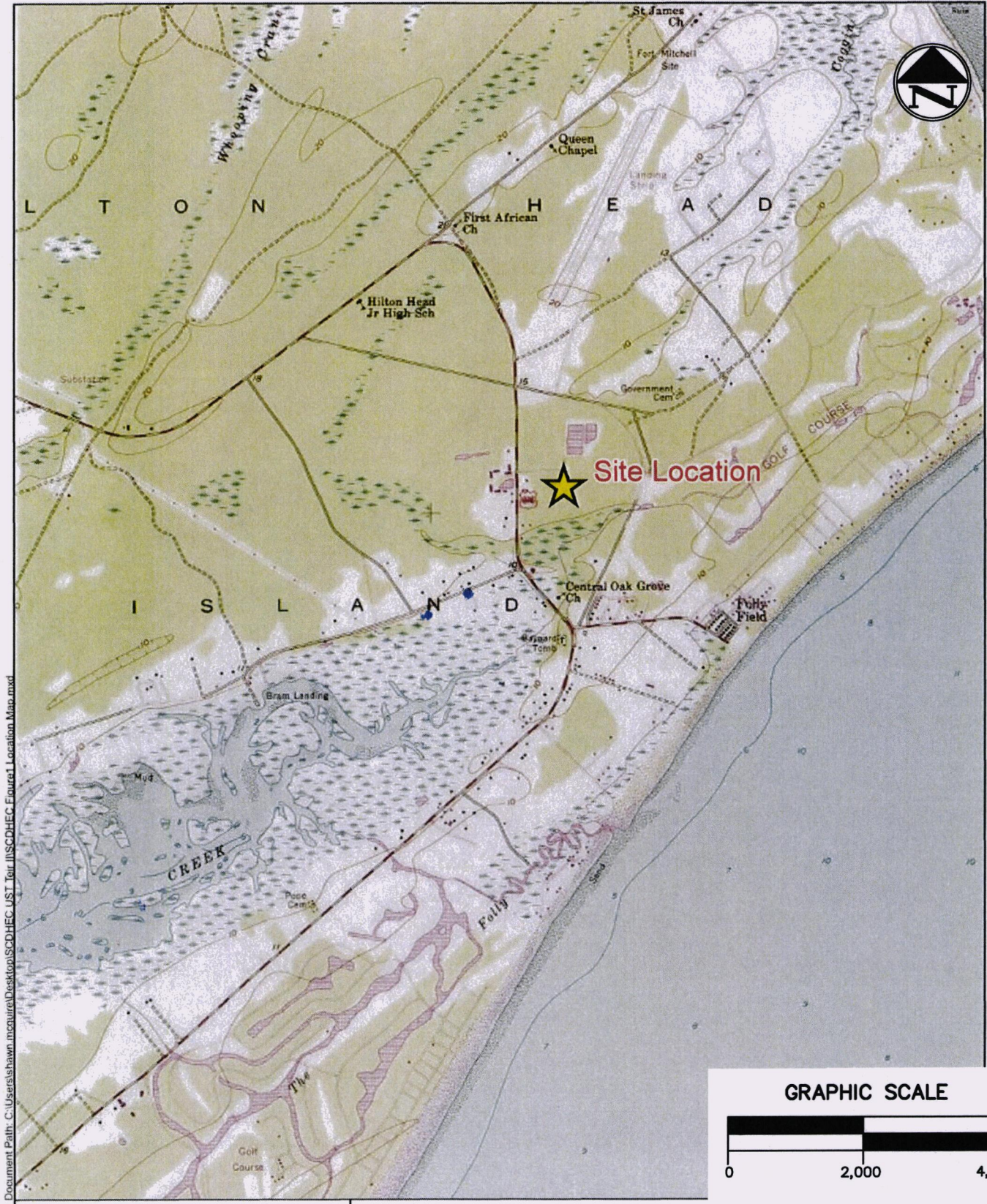
211 BUSINESS PARK BLVD.
COLUMBIA, SC 29203

HHI PSD RELEASE #2 - UST PERMIT# 11399
21 Oak Park Drive
Hilton Head Island, Beaufort County, South Carolina

Appendix A - Site Vicinity Map

F&ME CONSULTANTS
PROJECT NUMBER:
E6687.003

FIGURE
NUMBER:
1



DRAWN BY:	CTC
APPROVED BY:	CAC
NOTES:	

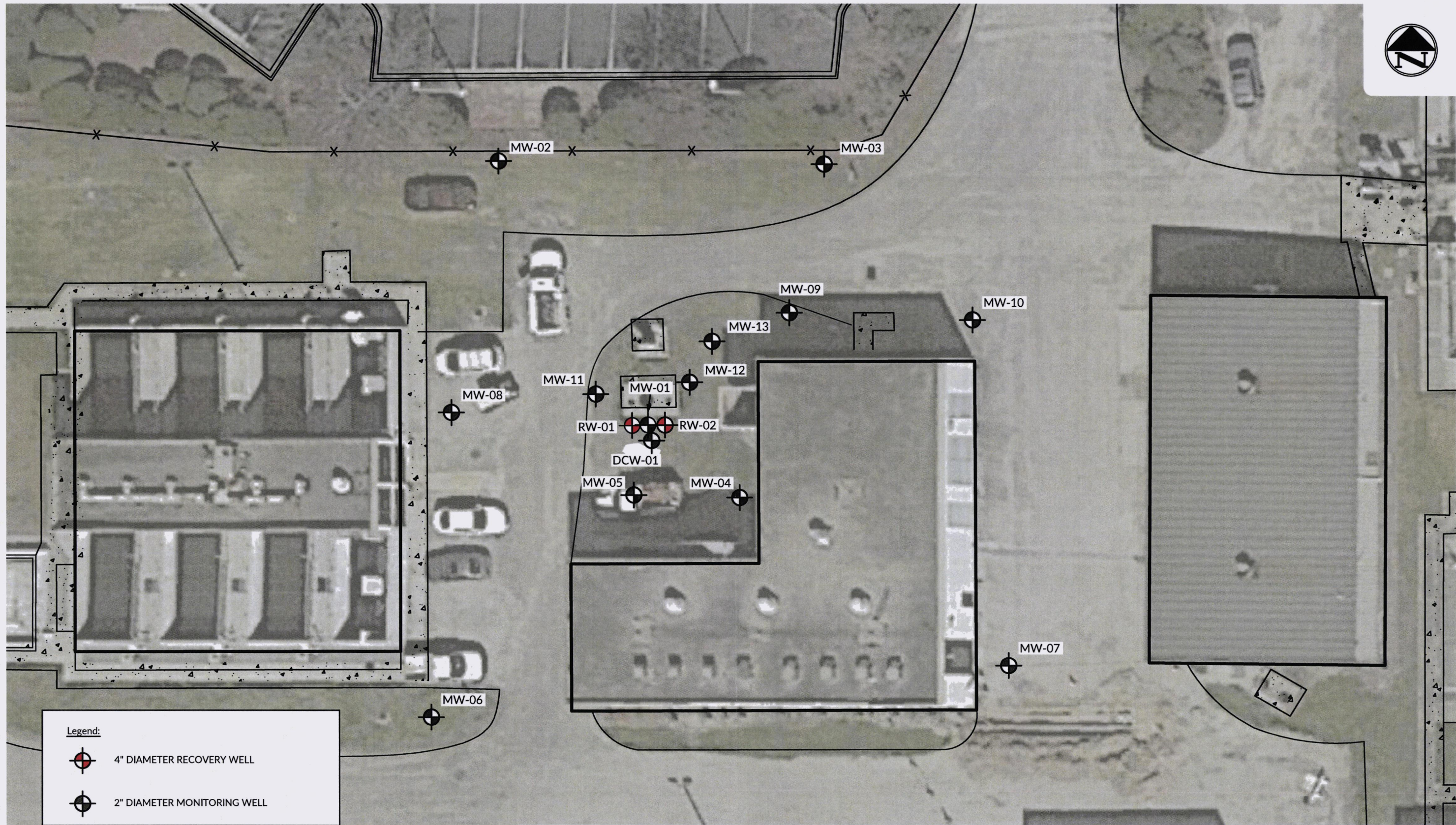
ORIGINAL:	August 14, 2025
REVISIONS:	
1.	
2.	
3.	
SCALE:	As Noted

F&ME
CONSULTANTS
211 BUSINESS PARK BLVD.
COLUMBIA, SC 29203

HHI PSD RELEASE #2 - UST PERMIT# 11399
21 Oak Park Drive
Hilton Head Island, Beaufort County, South Carolina

Appendix B - Site Topo Map

F&ME CONSULTANTS PROJECT NUMBER:	FIGURE NUMBER:
E6687.003	2



Legend:



4" DIAMETER RECOVERY WELL



2" DIAMETER MONITORING WELL

GRAPHIC SCALE



DRAWN BY:	CTC	ORIGINAL:
APPROVED BY:	CAC	August 14, 2025
NOTES:		REVISIONS:
		1
		2
		3
		SCALE: 1"=20'



F&ME CONSULTANTS, INC.
211 BUSINESS PARK BLVD.
COLUMBIA, SC 29203

HHI PSD RELEASE #2 - UST PERMIT# 11399
21 Oak Park Drive
Hilton Head Island, Beaufort County, South Carolina

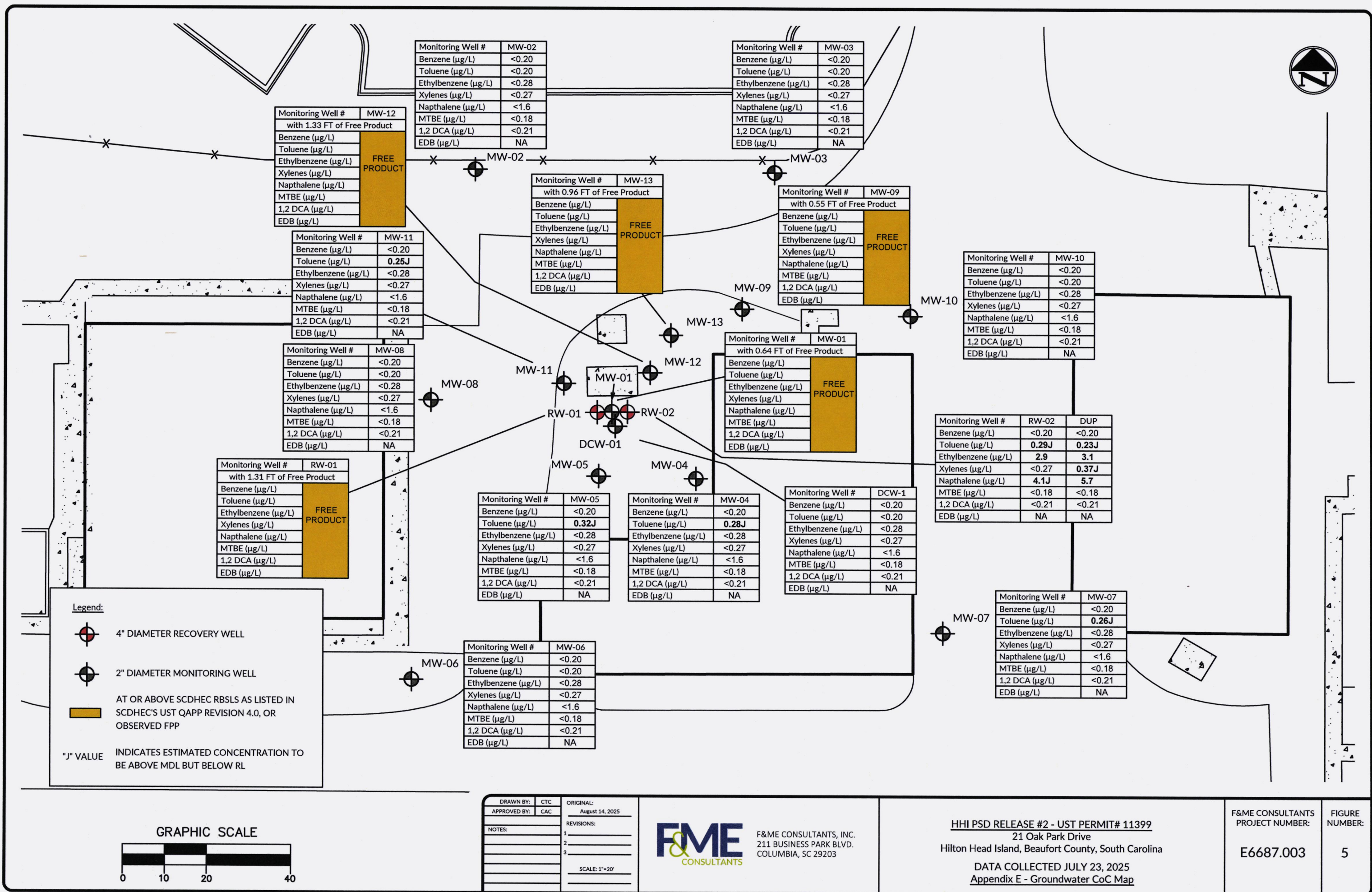
Appendix C - Well Location Plan

F&ME CONSULTANTS
PROJECT NUMBER:

E6687.003

FIGURE
NUMBER:

3



Appendix B

Laboratory Analytical Report

ANALYTICAL REPORT

PREPARED FOR

Attn: Christine Cafagna
F&ME Consultants
211 Business Park Blvd.
Columbia, South Carolina 29203

Generated 7/31/2025 9:48:50 PM

JOB DESCRIPTION

HHI PSD UST

JOB NUMBER

785-977-1

Eurofins Columbia

Job Notes

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization



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Authorized for release by
Angela Martin, Project Manager
angela.martin@et.eurofinsus.com
(803)781-4243

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Definitions/Glossary

Client: F&ME Consultants
Project/Site: HHI PSD UST

Job ID: 785-977-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: F&ME Consultants
Project: HHI PSD UST

Job ID: 785-977-1

Job ID: 785-977-1

Eurofins Columbia

Job Narrative 785-977-1

The analytical test results presented in this report meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page, unless otherwise noted. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable. Regulated compliance samples (e.g. SDWA, NPDES) must comply with associated agency requirements/permits.

- Matrix-specific batch QC (e.g., MS, MSD, SD) may not be reported when insufficient sample volume is available or when site-specific QC samples are not submitted. In such cases, a Laboratory Control Sample Duplicate (LCSD) may be analyzed to provide precision data for the batch.
- For samples analyzed using surrogate and/or isotope dilution analytes, any recoveries falling outside of established acceptance criteria are re-prepared and/or re-analyzed to confirm results, unless the deviation is due to sample dilution or otherwise explained in the case narrative.

Receipt

The samples were received on 7/24/2025 2:00 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 0.7°C.

GC/MS VOA

Method 8260D_UST: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for analytical batch 705-71083 were outside control limits for one or more analytes. See QC Sample Results for detail. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery is within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Eurofins Columbia

Detection Summary

Client: F&ME Consultants
Project/Site: HHI PSD UST

Job ID: 785-977-1

Client Sample ID: MW2

Lab Sample ID: 785-977-1

☐ No Detections.

Client Sample ID: MW3

Lab Sample ID: 785-977-2

☐ No Detections.

Client Sample ID: MW4

Lab Sample ID: 785-977-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Toluene	0.28	J	1.0	0.20	ug/L	1		8260D/UST	Total/NA

Client Sample ID: MW5

Lab Sample ID: 785-977-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Toluene	0.32	J	1.0	0.20	ug/L	1		8260D/UST	Total/NA

Client Sample ID: MW6

Lab Sample ID: 785-977-5

☐ No Detections.

Client Sample ID: MW7

Lab Sample ID: 785-977-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Toluene	0.26	J	1.0	0.20	ug/L	1		8260D/UST	Total/NA

Client Sample ID: MW8

Lab Sample ID: 785-977-7

☐ No Detections.

Client Sample ID: MW10

Lab Sample ID: 785-977-8

☐ No Detections.

Client Sample ID: MW11

Lab Sample ID: 785-977-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Toluene	0.25	J	1.0	0.20	ug/L	1		8260D/UST	Total/NA

Client Sample ID: DCW1

Lab Sample ID: 785-977-10

☐ No Detections.

Client Sample ID: RW2

Lab Sample ID: 785-977-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Toluene	0.29	J	1.0	0.20	ug/L	1		8260D/UST	Total/NA
Ethylbenzene	2.9		1.0	0.28	ug/L	1		8260D/UST	Total/NA
Naphthalene	4.1	J	5.0	1.6	ug/L	1		8260D/UST	Total/NA

Client Sample ID: Duplicate

Lab Sample ID: 785-977-17

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Toluene	0.23	J	1.0	0.20	ug/L	1		8260D/UST	Total/NA
Ethylbenzene	3.1		1.0	0.28	ug/L	1		8260D/UST	Total/NA
Xylenes, Total	0.37	J	1.0	0.27	ug/L	1		8260D/UST	Total/NA
Naphthalene	5.7		5.0	1.6	ug/L	1		8260D/UST	Total/NA

Client Sample ID: Field Blank

Lab Sample ID: 785-977-19

☐ No Detections.

This Detection Summary does not include radiochemical test results.

Eurofins Columbia

Detection Summary

Client: F&ME Consultants
Project/Site: HHI PSD UST

Job ID: 785-977-1

Client Sample ID: Trip Blank

Lab Sample ID: 785-977-20

☐ No Detections.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

This Detection Summary does not include radiochemical test results.

Eurofins Columbia

Client Sample Results

Client: F&ME Consultants
Project/Site: HHI PSD UST

Job ID: 785-977-1

Client Sample ID: MW2

Lab Sample ID: 785-977-1

Date Collected: 07/23/25 14:06

Matrix: Water

Date Received: 07/24/25 14:00

Method: SW846 8260D/UST - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.20	ug/L			07/29/25 12:45	1
Toluene	ND		1.0	0.20	ug/L			07/29/25 12:45	1
Ethylbenzene	ND		1.0	0.28	ug/L			07/29/25 12:45	1
Xylenes, Total	ND		1.0	0.27	ug/L			07/29/25 12:45	1
Naphthalene	ND		5.0	1.6	ug/L			07/29/25 12:45	1
Methyl tert-butyl ether	ND		1.0	0.18	ug/L			07/29/25 12:45	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			07/29/25 12:45	1
Tert-amyl methyl ether	ND		10	3.1	ug/L			07/29/25 12:45	1
tert-Butyl alcohol	ND		100	30	ug/L			07/29/25 12:45	1
Isopropyl ether	ND		10	2.8	ug/L			07/29/25 12:45	1
Ethyl tert-butyl ether	ND		10	2.5	ug/L			07/29/25 12:45	1
3,3-Dimethyl-1-butanol	ND		100	34	ug/L			07/29/25 12:45	1
Ethanol	ND		100	47	ug/L			07/29/25 12:45	1
tert-Amyl alcohol	ND		100	34	ug/L			07/29/25 12:45	1
tert-Butyl Formate	ND		100	33	ug/L			07/29/25 12:45	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	102		77 - 121					07/29/25 12:45	1
Toluene-d8 (Surr)	98		78.6 - 119					07/29/25 12:45	1
4-Bromofluorobenzene	99		70 - 126					07/29/25 12:45	1

Client Sample ID: MW3

Lab Sample ID: 785-977-2

Date Collected: 07/23/25 14:18

Matrix: Water

Date Received: 07/24/25 14:00

Method: SW846 8260D/UST - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.20	ug/L			07/29/25 13:08	1
Toluene	ND		1.0	0.20	ug/L			07/29/25 13:08	1
Ethylbenzene	ND		1.0	0.28	ug/L			07/29/25 13:08	1
Xylenes, Total	ND		1.0	0.27	ug/L			07/29/25 13:08	1
Naphthalene	ND		5.0	1.6	ug/L			07/29/25 13:08	1
Methyl tert-butyl ether	ND		1.0	0.18	ug/L			07/29/25 13:08	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			07/29/25 13:08	1
Tert-amyl methyl ether	ND		10	3.1	ug/L			07/29/25 13:08	1
tert-Butyl alcohol	ND		100	30	ug/L			07/29/25 13:08	1
Isopropyl ether	ND		10	2.8	ug/L			07/29/25 13:08	1
Ethyl tert-butyl ether	ND		10	2.5	ug/L			07/29/25 13:08	1
3,3-Dimethyl-1-butanol	ND		100	34	ug/L			07/29/25 13:08	1
Ethanol	ND		100	47	ug/L			07/29/25 13:08	1
tert-Amyl alcohol	ND		100	34	ug/L			07/29/25 13:08	1
tert-Butyl Formate	ND		100	33	ug/L			07/29/25 13:08	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	101		77 - 121					07/29/25 13:08	1
Toluene-d8 (Surr)	97		78.6 - 119					07/29/25 13:08	1
4-Bromofluorobenzene	98		70 - 126					07/29/25 13:08	1

Eurofins Columbia

Client Sample Results

Client: F&ME Consultants
Project/Site: HHI PSD UST

Job ID: 785-977-1

Client Sample ID: MW4

Lab Sample ID: 785-977-3

Date Collected: 07/23/25 15:03

Matrix: Water

Date Received: 07/24/25 14:00

Method: SW846 8260D/UST - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.20	ug/L			07/29/25 13:32	1
Toluene	0.28	J	1.0	0.20	ug/L			07/29/25 13:32	1
Ethylbenzene	ND		1.0	0.28	ug/L			07/29/25 13:32	1
Xylenes, Total	ND		1.0	0.27	ug/L			07/29/25 13:32	1
Naphthalene	ND		5.0	1.6	ug/L			07/29/25 13:32	1
Methyl tert-butyl ether	ND		1.0	0.18	ug/L			07/29/25 13:32	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			07/29/25 13:32	1
Tert-amyl methyl ether	ND		10	3.1	ug/L			07/29/25 13:32	1
tert-Butyl alcohol	ND		100	30	ug/L			07/29/25 13:32	1
Isopropyl ether	ND		10	2.8	ug/L			07/29/25 13:32	1
Ethyl tert-butyl ether	ND		10	2.5	ug/L			07/29/25 13:32	1
3,3-Dimethyl-1-butanol	ND		100	34	ug/L			07/29/25 13:32	1
Ethanol	ND		100	47	ug/L			07/29/25 13:32	1
tert-Amyl alcohol	ND		100	34	ug/L			07/29/25 13:32	1
tert-Butyl Formate	ND		100	33	ug/L			07/29/25 13:32	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	103		77 - 121		07/29/25 13:32	1
Toluene-d8 (Surr)	99		78.6 - 119		07/29/25 13:32	1
4-Bromofluorobenzene	99		70 - 126		07/29/25 13:32	1

Client Sample ID: MW5

Lab Sample ID: 785-977-4

Date Collected: 07/23/25 15:10

Matrix: Water

Date Received: 07/24/25 14:00

Method: SW846 8260D/UST - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.20	ug/L			07/29/25 13:56	1
Toluene	0.32	J	1.0	0.20	ug/L			07/29/25 13:56	1
Ethylbenzene	ND		1.0	0.28	ug/L			07/29/25 13:56	1
Xylenes, Total	ND		1.0	0.27	ug/L			07/29/25 13:56	1
Naphthalene	ND		5.0	1.6	ug/L			07/29/25 13:56	1
Methyl tert-butyl ether	ND		1.0	0.18	ug/L			07/29/25 13:56	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			07/29/25 13:56	1
Tert-amyl methyl ether	ND		10	3.1	ug/L			07/29/25 13:56	1
tert-Butyl alcohol	ND		100	30	ug/L			07/29/25 13:56	1
Isopropyl ether	ND		10	2.8	ug/L			07/29/25 13:56	1
Ethyl tert-butyl ether	ND		10	2.5	ug/L			07/29/25 13:56	1
3,3-Dimethyl-1-butanol	ND		100	34	ug/L			07/29/25 13:56	1
Ethanol	ND		100	47	ug/L			07/29/25 13:56	1
tert-Amyl alcohol	ND		100	34	ug/L			07/29/25 13:56	1
tert-Butyl Formate	ND		100	33	ug/L			07/29/25 13:56	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	102		77 - 121		07/29/25 13:56	1
Toluene-d8 (Surr)	98		78.6 - 119		07/29/25 13:56	1
4-Bromofluorobenzene	98		70 - 126		07/29/25 13:56	1

Eurofins Columbia

Client Sample Results

Client: F&ME Consultants
Project/Site: HHI PSD UST

Job ID: 785-977-1

Client Sample ID: MW6

Lab Sample ID: 785-977-5

Date Collected: 07/23/25 13:42

Matrix: Water

Date Received: 07/24/25 14:00

Method: SW846 8260D/UST - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.20	ug/L			07/29/25 14:19	1
Toluene	ND		1.0	0.20	ug/L			07/29/25 14:19	1
Ethylbenzene	ND		1.0	0.28	ug/L			07/29/25 14:19	1
Xylenes, Total	ND		1.0	0.27	ug/L			07/29/25 14:19	1
Naphthalene	ND		5.0	1.6	ug/L			07/29/25 14:19	1
Methyl tert-butyl ether	ND		1.0	0.18	ug/L			07/29/25 14:19	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			07/29/25 14:19	1
Tert-amyl methyl ether	ND		10	3.1	ug/L			07/29/25 14:19	1
tert-Butyl alcohol	ND		100	30	ug/L			07/29/25 14:19	1
Isopropyl ether	ND		10	2.8	ug/L			07/29/25 14:19	1
Ethyl tert-butyl ether	ND		10	2.5	ug/L			07/29/25 14:19	1
3,3-Dimethyl-1-butanol	ND		100	34	ug/L			07/29/25 14:19	1
Ethanol	ND		100	47	ug/L			07/29/25 14:19	1
tert-Amyl alcohol	ND		100	34	ug/L			07/29/25 14:19	1
tert-Butyl Formate	ND		100	33	ug/L			07/29/25 14:19	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	103		77 - 121		07/29/25 14:19	1
Toluene-d8 (Surr)	98		78.6 - 119		07/29/25 14:19	1
4-Bromofluorobenzene	99		70 - 126		07/29/25 14:19	1

Client Sample ID: MW7

Lab Sample ID: 785-977-6

Date Collected: 07/23/25 14:40

Matrix: Water

Date Received: 07/24/25 14:00

Method: SW846 8260D/UST - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.20	ug/L			07/30/25 06:35	1
Toluene	0.26	J	1.0	0.20	ug/L			07/30/25 06:35	1
Ethylbenzene	ND		1.0	0.28	ug/L			07/30/25 06:35	1
Xylenes, Total	ND		1.0	0.27	ug/L			07/30/25 06:35	1
Naphthalene	ND		5.0	1.6	ug/L			07/30/25 06:35	1
Methyl tert-butyl ether	ND		1.0	0.18	ug/L			07/30/25 06:35	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			07/30/25 06:35	1
Tert-amyl methyl ether	ND		10	3.1	ug/L			07/30/25 06:35	1
tert-Butyl alcohol	ND		100	30	ug/L			07/30/25 06:35	1
Isopropyl ether	ND		10	2.8	ug/L			07/30/25 06:35	1
Ethyl tert-butyl ether	ND		10	2.5	ug/L			07/30/25 06:35	1
3,3-Dimethyl-1-butanol	ND		100	34	ug/L			07/30/25 06:35	1
Ethanol	ND		100	47	ug/L			07/30/25 06:35	1
tert-Amyl alcohol	ND		100	34	ug/L			07/30/25 06:35	1
tert-Butyl Formate	ND		100	33	ug/L			07/30/25 06:35	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	105		77 - 121		07/30/25 06:35	1
Toluene-d8 (Surr)	99		78.6 - 119		07/30/25 06:35	1
4-Bromofluorobenzene	99		70 - 126		07/30/25 06:35	1

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Client Sample Results

Client: F&ME Consultants
Project/Site: HHI PSD UST

Job ID: 785-977-1

Client Sample ID: MW8

Lab Sample ID: 785-977-7

Date Collected: 07/23/25 13:52

Matrix: Water

Date Received: 07/24/25 14:00

Method: SW846 8260D/UST - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.20	ug/L			07/30/25 06:12	1
Toluene	ND		1.0	0.20	ug/L			07/30/25 06:12	1
Ethylbenzene	ND		1.0	0.28	ug/L			07/30/25 06:12	1
Xylenes, Total	ND		1.0	0.27	ug/L			07/30/25 06:12	1
Naphthalene	ND		5.0	1.6	ug/L			07/30/25 06:12	1
Methyl tert-butyl ether	ND		1.0	0.18	ug/L			07/30/25 06:12	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			07/30/25 06:12	1
Tert-amyl methyl ether	ND		10	3.1	ug/L			07/30/25 06:12	1
tert-Butyl alcohol	ND		100	30	ug/L			07/30/25 06:12	1
Isopropyl ether	ND		10	2.8	ug/L			07/30/25 06:12	1
Ethyl tert-butyl ether	ND		10	2.5	ug/L			07/30/25 06:12	1
3,3-Dimethyl-1-butanol	ND		100	34	ug/L			07/30/25 06:12	1
Ethanol	ND		100	47	ug/L			07/30/25 06:12	1
tert-Amyl alcohol	ND		100	34	ug/L			07/30/25 06:12	1
tert-Butyl Formate	ND		100	33	ug/L			07/30/25 06:12	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	104		77 - 121		07/30/25 06:12	1
Toluene-d8 (Surr)	98		78.6 - 119		07/30/25 06:12	1
4-Bromofluorobenzene	96		70 - 126		07/30/25 06:12	1

Client Sample ID: MW10

Lab Sample ID: 785-977-8

Date Collected: 07/23/25 14:30

Matrix: Water

Date Received: 07/24/25 14:00

Method: SW846 8260D/UST - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.20	ug/L			07/30/25 05:48	1
Toluene	ND		1.0	0.20	ug/L			07/30/25 05:48	1
Ethylbenzene	ND		1.0	0.28	ug/L			07/30/25 05:48	1
Xylenes, Total	ND		1.0	0.27	ug/L			07/30/25 05:48	1
Naphthalene	ND		5.0	1.6	ug/L			07/30/25 05:48	1
Methyl tert-butyl ether	ND		1.0	0.18	ug/L			07/30/25 05:48	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			07/30/25 05:48	1
Tert-amyl methyl ether	ND		10	3.1	ug/L			07/30/25 05:48	1
tert-Butyl alcohol	ND		100	30	ug/L			07/30/25 05:48	1
Isopropyl ether	ND		10	2.8	ug/L			07/30/25 05:48	1
Ethyl tert-butyl ether	ND		10	2.5	ug/L			07/30/25 05:48	1
3,3-Dimethyl-1-butanol	ND		100	34	ug/L			07/30/25 05:48	1
Ethanol	ND		100	47	ug/L			07/30/25 05:48	1
tert-Amyl alcohol	ND		100	34	ug/L			07/30/25 05:48	1
tert-Butyl Formate	ND		100	33	ug/L			07/30/25 05:48	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	103		77 - 121		07/30/25 05:48	1
Toluene-d8 (Surr)	99		78.6 - 119		07/30/25 05:48	1
4-Bromofluorobenzene	99		70 - 126		07/30/25 05:48	1

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Client Sample Results

Client: F&ME Consultants
Project/Site: HHI PSD UST

Job ID: 785-977-1

Client Sample ID: MW11

Lab Sample ID: 785-977-9

Date Collected: 07/23/25 14:50

Matrix: Water

Date Received: 07/24/25 14:00

Method: SW846 8260D/UST - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.20	ug/L			07/30/25 05:24	1
Toluene	0.25	J	1.0	0.20	ug/L			07/30/25 05:24	1
Ethylbenzene	ND		1.0	0.28	ug/L			07/30/25 05:24	1
Xylenes, Total	ND		1.0	0.27	ug/L			07/30/25 05:24	1
Naphthalene	ND		5.0	1.6	ug/L			07/30/25 05:24	1
Methyl tert-butyl ether	ND		1.0	0.18	ug/L			07/30/25 05:24	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			07/30/25 05:24	1
Tert-amyl methyl ether	ND		10	3.1	ug/L			07/30/25 05:24	1
tert-Butyl alcohol	ND		100	30	ug/L			07/30/25 05:24	1
Isopropyl ether	ND		10	2.8	ug/L			07/30/25 05:24	1
Ethyl tert-butyl ether	ND		10	2.5	ug/L			07/30/25 05:24	1
3,3-Dimethyl-1-butanol	ND		100	34	ug/L			07/30/25 05:24	1
Ethanol	ND		100	47	ug/L			07/30/25 05:24	1
tert-Amyl alcohol	ND		100	34	ug/L			07/30/25 05:24	1
tert-Butyl Formate	ND		100	33	ug/L			07/30/25 05:24	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	102		77 - 121		07/30/25 05:24	1
Toluene-d8 (Surr)	98		78.6 - 119		07/30/25 05:24	1
4-Bromofluorobenzene	98		70 - 126		07/30/25 05:24	1

Client Sample ID: DCW1

Lab Sample ID: 785-977-10

Date Collected: 07/23/25 13:23

Matrix: Water

Date Received: 07/24/25 14:00

Method: SW846 8260D/UST - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.20	ug/L			07/30/25 05:01	1
Toluene	ND		1.0	0.20	ug/L			07/30/25 05:01	1
Ethylbenzene	ND		1.0	0.28	ug/L			07/30/25 05:01	1
Xylenes, Total	ND		1.0	0.27	ug/L			07/30/25 05:01	1
Naphthalene	ND		5.0	1.6	ug/L			07/30/25 05:01	1
Methyl tert-butyl ether	ND		1.0	0.18	ug/L			07/30/25 05:01	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			07/30/25 05:01	1
Tert-amyl methyl ether	ND		10	3.1	ug/L			07/30/25 05:01	1
tert-Butyl alcohol	ND		100	30	ug/L			07/30/25 05:01	1
Isopropyl ether	ND		10	2.8	ug/L			07/30/25 05:01	1
Ethyl tert-butyl ether	ND		10	2.5	ug/L			07/30/25 05:01	1
3,3-Dimethyl-1-butanol	ND		100	34	ug/L			07/30/25 05:01	1
Ethanol	ND		100	47	ug/L			07/30/25 05:01	1
tert-Amyl alcohol	ND		100	34	ug/L			07/30/25 05:01	1
tert-Butyl Formate	ND		100	33	ug/L			07/30/25 05:01	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	103		77 - 121		07/30/25 05:01	1
Toluene-d8 (Surr)	98		78.6 - 119		07/30/25 05:01	1
4-Bromofluorobenzene	97		70 - 126		07/30/25 05:01	1

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Client Sample Results

Client: F&ME Consultants
Project/Site: HHI PSD UST

Job ID: 785-977-1

Client Sample ID: RW2

Lab Sample ID: 785-977-11

Date Collected: 07/23/25 15:20

Matrix: Water

Date Received: 07/24/25 14:00

Method: SW846 8260D/UST - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.20	ug/L			07/31/25 11:35	1
Toluene	0.29	J	1.0	0.20	ug/L			07/31/25 11:35	1
Ethylbenzene	2.9		1.0	0.28	ug/L			07/31/25 11:35	1
Xylenes, Total	ND		1.0	0.27	ug/L			07/31/25 11:35	1
Naphthalene	4.1	J	5.0	1.6	ug/L			07/31/25 11:35	1
Methyl tert-butyl ether	ND		1.0	0.18	ug/L			07/31/25 11:35	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			07/31/25 11:35	1
Tert-amyl methyl ether	ND		10	3.1	ug/L			07/31/25 11:35	1
tert-Butyl alcohol	ND		100	30	ug/L			07/31/25 11:35	1
Isopropyl ether	ND		10	2.8	ug/L			07/31/25 11:35	1
Ethyl tert-butyl ether	ND		10	2.5	ug/L			07/31/25 11:35	1
3,3-Dimethyl-1-butanol	ND		100	34	ug/L			07/31/25 11:35	1
Ethanol	ND		100	47	ug/L			07/31/25 11:35	1
tert-Amyl alcohol	ND		100	34	ug/L			07/31/25 11:35	1
tert-Butyl Formate	ND		100	33	ug/L			07/31/25 11:35	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	103		77 - 121		07/31/25 11:35	1
Toluene-d8 (Surr)	100		78.6 - 119		07/31/25 11:35	1
4-Bromofluorobenzene	101		70 - 126		07/31/25 11:35	1

Client Sample ID: Duplicate

Lab Sample ID: 785-977-17

Date Collected: 07/23/25 00:00

Matrix: Water

Date Received: 07/24/25 14:00

Method: SW846 8260D/UST - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.20	ug/L			07/31/25 11:58	1
Toluene	0.23	J	1.0	0.20	ug/L			07/31/25 11:58	1
Ethylbenzene	3.1		1.0	0.28	ug/L			07/31/25 11:58	1
Xylenes, Total	0.37	J	1.0	0.27	ug/L			07/31/25 11:58	1
Naphthalene	5.7		5.0	1.6	ug/L			07/31/25 11:58	1
Methyl tert-butyl ether	ND		1.0	0.18	ug/L			07/31/25 11:58	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			07/31/25 11:58	1
Tert-amyl methyl ether	ND		10	3.1	ug/L			07/31/25 11:58	1
tert-Butyl alcohol	ND		100	30	ug/L			07/31/25 11:58	1
Isopropyl ether	ND		10	2.8	ug/L			07/31/25 11:58	1
Ethyl tert-butyl ether	ND		10	2.5	ug/L			07/31/25 11:58	1
3,3-Dimethyl-1-butanol	ND		100	34	ug/L			07/31/25 11:58	1
Ethanol	ND		100	47	ug/L			07/31/25 11:58	1
tert-Amyl alcohol	ND		100	34	ug/L			07/31/25 11:58	1
tert-Butyl Formate	ND		100	33	ug/L			07/31/25 11:58	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	100		77 - 121		07/31/25 11:58	1
Toluene-d8 (Surr)	99		78.6 - 119		07/31/25 11:58	1
4-Bromofluorobenzene	101		70 - 126		07/31/25 11:58	1

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Client Sample Results

Client: F&ME Consultants
Project/Site: HHI PSD UST

Job ID: 785-977-1

Client Sample ID: Field Blank

Lab Sample ID: 785-977-19

Date Collected: 07/23/25 13:30

Matrix: Water

Date Received: 07/24/25 14:00

Method: SW846 8260D/UST - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.20	ug/L			07/29/25 19:34	1
Toluene	ND		1.0	0.20	ug/L			07/29/25 19:34	1
Ethylbenzene	ND		1.0	0.28	ug/L			07/29/25 19:34	1
Xylenes, Total	ND		1.0	0.27	ug/L			07/29/25 19:34	1
Naphthalene	ND		5.0	1.6	ug/L			07/29/25 19:34	1
Methyl tert-butyl ether	ND		1.0	0.18	ug/L			07/29/25 19:34	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			07/29/25 19:34	1
Tert-amyl methyl ether	ND		10	3.1	ug/L			07/29/25 19:34	1
tert-Butyl alcohol	ND		100	30	ug/L			07/29/25 19:34	1
Isopropyl ether	ND		10	2.8	ug/L			07/29/25 19:34	1
Ethyl tert-butyl ether	ND		10	2.5	ug/L			07/29/25 19:34	1
3,3-Dimethyl-1-butanol	ND		100	34	ug/L			07/29/25 19:34	1
Ethanol	ND		100	47	ug/L			07/29/25 19:34	1
tert-Amyl alcohol	ND		100	34	ug/L			07/29/25 19:34	1
tert-Butyl Formate	ND		100	33	ug/L			07/29/25 19:34	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	101		77 - 121		07/29/25 19:34	1
Toluene-d8 (Surr)	97		78.6 - 119		07/29/25 19:34	1
4-Bromofluorobenzene	100		70 - 126		07/29/25 19:34	1

Client Sample ID: Trip Blank

Lab Sample ID: 785-977-20

Date Collected: 07/23/25 00:00

Matrix: Water

Date Received: 07/24/25 14:00

Method: SW846 8260D/UST - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.20	ug/L			07/29/25 19:57	1
Toluene	ND		1.0	0.20	ug/L			07/29/25 19:57	1
Ethylbenzene	ND		1.0	0.28	ug/L			07/29/25 19:57	1
Xylenes, Total	ND		1.0	0.27	ug/L			07/29/25 19:57	1
Naphthalene	ND		5.0	1.6	ug/L			07/29/25 19:57	1
Methyl tert-butyl ether	ND		1.0	0.18	ug/L			07/29/25 19:57	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			07/29/25 19:57	1
Tert-amyl methyl ether	ND		10	3.1	ug/L			07/29/25 19:57	1
tert-Butyl alcohol	ND		100	30	ug/L			07/29/25 19:57	1
Isopropyl ether	ND		10	2.8	ug/L			07/29/25 19:57	1
Ethyl tert-butyl ether	ND		10	2.5	ug/L			07/29/25 19:57	1
3,3-Dimethyl-1-butanol	ND		100	34	ug/L			07/29/25 19:57	1
Ethanol	ND		100	47	ug/L			07/29/25 19:57	1
tert-Amyl alcohol	ND		100	34	ug/L			07/29/25 19:57	1
tert-Butyl Formate	ND		100	33	ug/L			07/29/25 19:57	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	101		77 - 121		07/29/25 19:57	1
Toluene-d8 (Surr)	98		78.6 - 119		07/29/25 19:57	1
4-Bromofluorobenzene	101		70 - 126		07/29/25 19:57	1

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Surrogate Summary

Client: F&ME Consultants
Project/Site: HHI PSD UST

Job ID: 785-977-1

Method: 8260D/UST - Volatile Organic Compounds by GC/MS

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)		
		DBFM (77-121)	TOL (78.6-119)	BFB (70-126)
705-37568-C-35 MS	Matrix Spike	100	99	100
705-37568-C-35 MSD	Matrix Spike Duplicate	101	100	99
705-37619-A-26 MS	Matrix Spike	100	99	101
705-37619-A-26 MSD	Matrix Spike Duplicate	102	100	102
705-37619-B-14 DU	Duplicate	102	99	97
705-37619-B-15 MS	Matrix Spike	103	98	98
785-977-1	MW2	102	98	99
785-977-2	MW3	101	97	98
785-977-3	MW4	103	99	99
785-977-4	MW5	102	98	98
785-977-5	MW6	103	98	99
785-977-6	MW7	105	99	99
785-977-7	MW8	104	98	96
785-977-8	MW10	103	99	99
785-977-9	MW11	102	98	98
785-977-10	DCW1	103	98	97
785-977-11	RW2	103	100	101
785-977-17	Duplicate	100	99	101
785-977-19	Field Blank	101	97	100
785-977-20	Trip Blank	101	98	101
LCS 705-70945/1002	Lab Control Sample	102	100	98
LCS 705-71083/1002	Lab Control Sample	102	99	100
LCS 705-71517/1016	Lab Control Sample	101	99	101
MB 705-70945/5	Method Blank	101	98	99
MB 705-71083/7	Method Blank	103	98	98
MB 705-71517/18	Method Blank	103	99	101

Surrogate Legend

DBFM = Dibromofluoromethane (Surr)

TOL = Toluene-d8 (Surr)

BFB = 4-Bromofluorobenzene

QC Sample Results

Client: F&ME Consultants
Project/Site: HHI PSD UST

Job ID: 785-977-1

Method: 8260D/UST - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 705-70945/5

Matrix: Water

Analysis Batch: 70945

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.20	ug/L			07/29/25 10:45	1
Toluene	ND		1.0	0.20	ug/L			07/29/25 10:45	1
Ethylbenzene	ND		1.0	0.28	ug/L			07/29/25 10:45	1
Xylenes, Total	ND		1.0	0.27	ug/L			07/29/25 10:45	1
Naphthalene	ND		5.0	1.6	ug/L			07/29/25 10:45	1
Methyl tert-butyl ether	ND		1.0	0.18	ug/L			07/29/25 10:45	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			07/29/25 10:45	1
Tert-amyl methyl ether	ND		10	3.1	ug/L			07/29/25 10:45	1
tert-Butyl alcohol	ND		100	30	ug/L			07/29/25 10:45	1
Isopropyl ether	ND		10	2.8	ug/L			07/29/25 10:45	1
Ethyl tert-butyl ether	ND		10	2.5	ug/L			07/29/25 10:45	1
3,3-Dimethyl-1-butanol	ND		100	34	ug/L			07/29/25 10:45	1
Ethanol	ND		100	47	ug/L			07/29/25 10:45	1
tert-Amyl alcohol	ND		100	34	ug/L			07/29/25 10:45	1
tert-Butyl Formate	ND		100	33	ug/L			07/29/25 10:45	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	101		77 - 121		07/29/25 10:45	1
Toluene-d8 (Surr)	98		78.6 - 119		07/29/25 10:45	1
4-Bromofluorobenzene	99		70 - 126		07/29/25 10:45	1

Lab Sample ID: LCS 705-70945/1002

Matrix: Water

Analysis Batch: 70945

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	50.0	53.4		ug/L		107	76.3 - 122
Toluene	50.0	53.7		ug/L		107	74.3 - 124
Ethylbenzene	50.0	54.1		ug/L		108	75 - 127
Xylenes, Total	150	166		ug/L		111	74.6 - 128
Naphthalene	50.0	47.3		ug/L		95	66.7 - 129
Methyl tert-butyl ether	50.0	50.9		ug/L		102	76.1 - 123
1,2-Dichloroethane	50.0	54.0		ug/L		108	72.4 - 127
Tert-amyl methyl ether	100	99.6		ug/L		100	76.9 - 124
tert-Butyl alcohol	500	434		ug/L		87	70.6 - 129
Isopropyl ether	100	103		ug/L		103	74.7 - 129
Ethyl tert-butyl ether	100	103		ug/L		103	80.3 - 123
3,3-Dimethyl-1-butanol	500	471		ug/L		94	64.3 - 125
Ethanol	500	516		ug/L		103	61.3 - 129
tert-Amyl alcohol	500	443		ug/L		89	67.4 - 132
tert-Butyl Formate	500	514		ug/L		103	64.3 - 129
m,p-Xylene	100	111		ug/L		111	75.5 - 128
o-Xylene	50.0	54.8		ug/L		110	77.7 - 124

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Dibromofluoromethane (Surr)	102		77 - 121
Toluene-d8 (Surr)	100		78.6 - 119
4-Bromofluorobenzene	98		70 - 126

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QC Sample Results

Client: F&ME Consultants
Project/Site: HHI PSD UST

Job ID: 785-977-1

Method: 8260D/UST - Volatile Organic Compounds by GC/MS

Lab Sample ID: 705-37568-C-35 MS

Matrix: Water

Analysis Batch: 70945

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	6100		2500	8300		ug/L		87	71.3 - 133
Toluene	150		2500	2640		ug/L		100	72 - 134
Ethylbenzene	1500		2500	3950		ug/L		97	74.6 - 131
Xylenes, Total	3200		7500	10700		ug/L		99	73.8 - 131
Naphthalene	350		2500	2530		ug/L		87	63 - 134
Methyl tert-butyl ether	67		2500	2410		ug/L		94	70.2 - 130
1,2-Dichloroethane	ND		2500	2420		ug/L		97	70.5 - 133
Tert-amyl methyl ether	ND		5000	4450		ug/L		89	73.4 - 128
tert-Butyl alcohol	ND		25000	20400		ug/L		82	65.6 - 138
Isopropyl ether	410 J		5000	4940		ug/L		91	70 - 133
Ethyl tert-butyl ether	ND		5000	4710		ug/L		94	76 - 129
3,3-Dimethyl-1-butanol	ND		25000	25200		ug/L		101	54.5 - 132
Ethanol	ND		25000	25100		ug/L		101	55.3 - 137
tert-Amyl alcohol	3500 J		25000	25400		ug/L		88	57.2 - 138
tert-Butyl Formate	ND		25000	22800		ug/L		91	52.2 - 126
m,p-Xylene	2700		5000	7610		ug/L		97	72.7 - 133
o-Xylene	530		2500	3040		ug/L		101	72.6 - 132
MS MS									
Surrogate	%Recovery	Qualifier	Limits						
Dibromofluoromethane (Surr)	100		77 - 121						
Toluene-d8 (Surr)	99		78.6 - 119						
4-Bromofluorobenzene	100		70 - 126						

Lab Sample ID: 705-37568-C-35 MSD

Matrix: Water

Analysis Batch: 70945

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Benzene	6100		2500	7950		ug/L		73	71.3 - 133	4	42.4
Toluene	150		2500	2520		ug/L		95	72 - 134	5	42.5
Ethylbenzene	1500		2500	3740		ug/L		89	74.6 - 131	5	27.7
Xylenes, Total	3200		7500	10100		ug/L		92	73.8 - 131	5	28.2
Naphthalene	350		2500	2430		ug/L		83	63 - 134	4	47.9
Methyl tert-butyl ether	67		2500	2370		ug/L		92	70.2 - 130	2	29.9
1,2-Dichloroethane	ND		2500	2370		ug/L		95	70.5 - 133	2	41.4
Tert-amyl methyl ether	ND		5000	4300		ug/L		86	73.4 - 128	3	35.5
tert-Butyl alcohol	ND		25000	20100		ug/L		80	65.6 - 138	2	68.1
Isopropyl ether	410 J		5000	4800		ug/L		88	70 - 133	3	34.2
Ethyl tert-butyl ether	ND		5000	4580		ug/L		92	76 - 129	3	30
3,3-Dimethyl-1-butanol	ND		25000	24700		ug/L		99	54.5 - 132	2	30
Ethanol	ND		25000	24500		ug/L		98	55.3 - 137	3	48
tert-Amyl alcohol	3500 J		25000	24700		ug/L		85	57.2 - 138	3	45.7
tert-Butyl Formate	ND		25000	22200		ug/L		89	52.2 - 126	3	30
m,p-Xylene	2700		5000	7240		ug/L		90	72.7 - 133	5	28
o-Xylene	530		2500	2870		ug/L		94	72.6 - 132	6	27.9
MSD MSD											
Surrogate	%Recovery	Qualifier	Limits								
Dibromofluoromethane (Surr)	101		77 - 121								

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QC Sample Results

Client: F&ME Consultants
Project/Site: HHI PSD UST

Job ID: 785-977-1

Method: 8260D/UST - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: 705-37568-C-35 MSD

Matrix: Water

Analysis Batch: 70945

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

	MSD	MSD	
Surrogate	%Recovery	Qualifier	Limits
Toluene-d8 (Surr)	100		78.6 - 119
4-Bromofluorobenzene	99		70 - 126

Lab Sample ID: MB 705-71083/7

Matrix: Water

Analysis Batch: 71083

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Benzene	ND		1.0	0.20	ug/L			07/30/25 00:42	1
Toluene	ND		1.0	0.20	ug/L			07/30/25 00:42	1
Ethylbenzene	ND		1.0	0.28	ug/L			07/30/25 00:42	1
Xylenes, Total	ND		1.0	0.27	ug/L			07/30/25 00:42	1
Naphthalene	ND		5.0	1.6	ug/L			07/30/25 00:42	1
Methyl tert-butyl ether	ND		1.0	0.18	ug/L			07/30/25 00:42	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			07/30/25 00:42	1
Tert-amyl methyl ether	ND		10	3.1	ug/L			07/30/25 00:42	1
tert-Butyl alcohol	ND		100	30	ug/L			07/30/25 00:42	1
Isopropyl ether	ND		10	2.8	ug/L			07/30/25 00:42	1
Ethyl tert-butyl ether	ND		10	2.5	ug/L			07/30/25 00:42	1
3,3-Dimethyl-1-butanol	ND		100	34	ug/L			07/30/25 00:42	1
Ethanol	ND		100	47	ug/L			07/30/25 00:42	1
tert-Amyl alcohol	ND		100	34	ug/L			07/30/25 00:42	1
tert-Butyl Formate	ND		100	33	ug/L			07/30/25 00:42	1

	MB	MB		Prepared	Analyzed	Dil Fac
Surrogate	%Recovery	Qualifier	Limits			
Dibromofluoromethane (Surr)	103		77 - 121		07/30/25 00:42	1
Toluene-d8 (Surr)	98		78.6 - 119		07/30/25 00:42	1
4-Bromofluorobenzene	98		70 - 126		07/30/25 00:42	1

Lab Sample ID: LCS 705-71083/1002

Matrix: Water

Analysis Batch: 71083

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike	LCS	LCS	Unit	D	%Rec	%Rec
	Added	Result	Qualifier			Limits	
Benzene	40.0	40.4		ug/L		101	76.3 - 122
Toluene	40.0	40.9		ug/L		102	74.3 - 124
Ethylbenzene	40.0	40.7		ug/L		102	75 - 127
Xylenes, Total	120	124		ug/L		103	74.6 - 128
Naphthalene	40.0	33.4		ug/L		83	66.7 - 129
Methyl tert-butyl ether	40.0	36.9		ug/L		92	76.1 - 123
1,2-Dichloroethane	40.0	38.2		ug/L		96	72.4 - 127
Tert-amyl methyl ether	80.0	69.6		ug/L		87	76.9 - 124
tert-Butyl alcohol	400	342		ug/L		86	70.6 - 129
Isopropyl ether	80.0	72.7		ug/L		91	74.7 - 129
Ethyl tert-butyl ether	80.0	75.0		ug/L		94	80.3 - 123
3,3-Dimethyl-1-butanol	400	394		ug/L		99	64.3 - 125
Ethanol	400	370		ug/L		92	61.3 - 129
tert-Amyl alcohol	400	323		ug/L		81	67.4 - 132

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QC Sample Results

Client: F&ME Consultants
Project/Site: HHI PSD UST

Job ID: 785-977-1

Method: 8260D/UST - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 705-71083/1002

Matrix: Water

Analysis Batch: 71083

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
tert-Butyl Formate	400	268		ug/L		67	64.3 - 129
m,p-Xylene	80.0	82.6		ug/L		103	75.5 - 128
o-Xylene	40.0	41.2		ug/L		103	77.7 - 124

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Dibromofluoromethane (Surr)	102		77 - 121
Toluene-d8 (Surr)	99		78.6 - 119
4-Bromofluorobenzene	100		70 - 126

Lab Sample ID: 705-37619-B-15 MS

Matrix: Water

Analysis Batch: 71083

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	ND		40.0	49.1		ug/L		123	71.3 - 133
Toluene	ND		40.0	48.7		ug/L		122	72 - 134
Ethylbenzene	ND		40.0	50.1		ug/L		125	74.6 - 131
Xylenes, Total	ND		120	152		ug/L		126	73.8 - 131
Naphthalene	ND		40.0	40.4		ug/L		101	63 - 134
Methyl tert-butyl ether	35		40.0	80.4		ug/L		114	70.2 - 130
1,2-Dichloroethane	13		40.0	60.9		ug/L		120	70.5 - 133
Tert-amyl methyl ether	ND		80.0	81.4		ug/L		102	73.4 - 128
tert-Butyl alcohol	ND		400	476		ug/L		119	65.6 - 138
Isopropyl ether	ND		80.0	90.6		ug/L		113	70 - 133
Ethyl tert-butyl ether	ND		80.0	90.3		ug/L		113	76 - 129
3,3-Dimethyl-1-butanol	ND		400	401		ug/L		100	54.5 - 132
Ethanol	ND		400	419		ug/L		105	55.3 - 137
tert-Amyl alcohol	ND		400	319		ug/L		80	57.2 - 138
tert-Butyl Formate	ND	F1	400	ND	F1	ug/L		0	52.2 - 126
m,p-Xylene	ND		80.0	102		ug/L		128	72.7 - 133
o-Xylene	ND		40.0	49.6		ug/L		124	72.6 - 132

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	103		77 - 121
Toluene-d8 (Surr)	98		78.6 - 119
4-Bromofluorobenzene	98		70 - 126

Lab Sample ID: 705-37619-B-14 DU

Matrix: Water

Analysis Batch: 71083

Client Sample ID: Duplicate

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Benzene	ND		ND		ug/L		NC	42.4
Toluene	ND		ND		ug/L		NC	42.5
Ethylbenzene	ND		ND		ug/L		NC	27.7
Xylenes, Total	ND		ND		ug/L		NC	28.2
Naphthalene	ND		ND		ug/L		NC	47.9
Methyl tert-butyl ether	ND		ND		ug/L		NC	29.9

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QC Sample Results

Client: F&ME Consultants
Project/Site: HHI PSD UST

Job ID: 785-977-1

Method: 8260D/UST - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: 705-37619-B-14 DU

Matrix: Water

Analysis Batch: 71083

Client Sample ID: Duplicate

Prep Type: Total/NA

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	RPD	Limit
	Result	Qualifier	Result	Qualifier					
1,2-Dichloroethane	ND		ND		ug/L			NC	41.4
Tert-amyl methyl ether	ND		ND		ug/L			NC	35.5
tert-Butyl alcohol	ND		ND		ug/L			NC	68.1
Isopropyl ether	ND		ND		ug/L			NC	34.2
Ethyl tert-butyl ether	ND		ND		ug/L			NC	30
3,3-Dimethyl-1-butanol	ND		ND		ug/L			NC	30
Ethanol	ND		ND		ug/L			NC	48
tert-Amyl alcohol	ND		ND		ug/L			NC	45.7
tert-Butyl Formate	ND		ND		ug/L			NC	30

Surrogate	DU	DU	Limits
%Recovery	Result	Qualifier	
Dibromofluoromethane (Surr)	102		77 - 121
Toluene-d8 (Surr)	99		78.6 - 119
4-Bromofluorobenzene	97		70 - 126

Lab Sample ID: MB 705-71517/18

Matrix: Water

Analysis Batch: 71517

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Benzene	ND		1.0	0.20	ug/L			07/31/25 11:11	1
Toluene	ND		1.0	0.20	ug/L			07/31/25 11:11	1
Ethylbenzene	ND		1.0	0.28	ug/L			07/31/25 11:11	1
Xylenes, Total	ND		1.0	0.27	ug/L			07/31/25 11:11	1
Naphthalene	ND		5.0	1.6	ug/L			07/31/25 11:11	1
Methyl tert-butyl ether	ND		1.0	0.18	ug/L			07/31/25 11:11	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			07/31/25 11:11	1
Tert-amyl methyl ether	ND		10	3.1	ug/L			07/31/25 11:11	1
tert-Butyl alcohol	ND		100	30	ug/L			07/31/25 11:11	1
Isopropyl ether	ND		10	2.8	ug/L			07/31/25 11:11	1
Ethyl tert-butyl ether	ND		10	2.5	ug/L			07/31/25 11:11	1
3,3-Dimethyl-1-butanol	ND		100	34	ug/L			07/31/25 11:11	1
Ethanol	ND		100	47	ug/L			07/31/25 11:11	1
tert-Amyl alcohol	ND		100	34	ug/L			07/31/25 11:11	1
tert-Butyl Formate	ND		100	33	ug/L			07/31/25 11:11	1

Surrogate	MB	MB	Limits	Prepared	Analyzed	Dil Fac
%Recovery	Result	Qualifier				
Dibromofluoromethane (Surr)	103		77 - 121		07/31/25 11:11	1
Toluene-d8 (Surr)	99		78.6 - 119		07/31/25 11:11	1
4-Bromofluorobenzene	101		70 - 126		07/31/25 11:11	1

Lab Sample ID: LCS 705-71517/1016

Matrix: Water

Analysis Batch: 71517

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike	LCS	LCS	Unit	D	%Rec	%Rec	Limits
	Added	Result	Qualifier					
Benzene	50.0	48.3		ug/L		97		76.3 - 122
Toluene	50.0	48.5		ug/L		97		74.3 - 124

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QC Sample Results

Client: F&ME Consultants
Project/Site: HHI PSD UST

Job ID: 785-977-1

Method: 8260D/UST - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 705-71517/1016

Matrix: Water

Analysis Batch: 71517

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Ethylbenzene	50.0	50.6		ug/L		101	75 - 127
Xylenes, Total	150	154		ug/L		102	74.6 - 128
Naphthalene	50.0	50.6		ug/L		101	66.7 - 129
Methyl tert-butyl ether	50.0	50.7		ug/L		101	76.1 - 123
1,2-Dichloroethane	50.0	51.9		ug/L		104	72.4 - 127
Tert-amyl methyl ether	100	107		ug/L		107	76.9 - 124
tert-Butyl alcohol	500	503		ug/L		101	70.6 - 129
Isopropyl ether	100	108		ug/L		108	74.7 - 129
Ethyl tert-butyl ether	100	106		ug/L		106	80.3 - 123
3,3-Dimethyl-1-butanol	500	466		ug/L		93	64.3 - 125
Ethanol	500	497		ug/L		99	61.3 - 129
tert-Amyl alcohol	500	498		ug/L		100	67.4 - 132
tert-Butyl Formate	500	482		ug/L		96	64.3 - 129
m,p-Xylene	100	102		ug/L		102	75.5 - 128
o-Xylene	50.0	51.5		ug/L		103	77.7 - 124

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Dibromofluoromethane (Surr)	101		77 - 121
Toluene-d8 (Surr)	99		78.6 - 119
4-Bromofluorobenzene	101		70 - 126

Lab Sample ID: 705-37619-A-26 MS

Matrix: Water

Analysis Batch: 71517

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	2400		25000	29200		ug/L		107	71.3 - 133
Toluene	160	J F1	25000	27200		ug/L		108	72 - 134
Ethylbenzene	590		25000	28700		ug/L		112	74.6 - 131
Xylenes, Total	690		75000	84500		ug/L		112	73.8 - 131
Naphthalene	ND		25000	28600		ug/L		114	63 - 134
Methyl tert-butyl ether	730		25000	27800		ug/L		108	70.2 - 130
1,2-Dichloroethane	ND		25000	26200		ug/L		105	70.5 - 133
Tert-amyl methyl ether	ND		50000	54800		ug/L		110	73.4 - 128
tert-Butyl alcohol	ND		250000	246000		ug/L		98	65.6 - 138
Isopropyl ether	ND		50000	56000		ug/L		112	70 - 133
Ethyl tert-butyl ether	ND		50000	56100		ug/L		112	76 - 129
3,3-Dimethyl-1-butanol	ND		250000	267000		ug/L		107	54.5 - 132
Ethanol	ND		250000	243000		ug/L		97	55.3 - 137
tert-Amyl alcohol	ND		250000	262000		ug/L		105	57.2 - 138
tert-Butyl Formate	ND		250000	247000		ug/L		99	52.2 - 126
m,p-Xylene	690	J	50000	56800		ug/L		112	72.7 - 133
o-Xylene	ND		25000	27700		ug/L		111	72.6 - 132

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	100		77 - 121
Toluene-d8 (Surr)	99		78.6 - 119
4-Bromofluorobenzene	101		70 - 126

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QC Sample Results

Client: F&ME Consultants
Project/Site: HHI PSD UST

Job ID: 785-977-1

Method: 8260D/UST - Volatile Organic Compounds by GC/MS

Lab Sample ID: 705-37619-A-26 MSD

Matrix: Water

Analysis Batch: 71517

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec	RPD	RPD
	Result	Qualifier	Added	Result	Qualifier				Limits		Limit
Benzene	2400		25000	27600		ug/L		101	71.3 - 133	5	42.4
Toluene	160	J F1	25000	25800		ug/L		102	72 - 134	5	42.5
Ethylbenzene	590		25000	27200		ug/L		106	74.6 - 131	5	27.7
Xylenes, Total	690		75000	82000		ug/L		108	73.8 - 131	3	28.2
Naphthalene	ND		25000	27900		ug/L		112	63 - 134	2	47.9
Methyl tert-butyl ether	730		25000	27400		ug/L		107	70.2 - 130	1	29.9
1,2-Dichloroethane	ND		25000	25700		ug/L		103	70.5 - 133	2	41.4
Tert-amyl methyl ether	ND		50000	53800		ug/L		108	73.4 - 128	2	35.5
tert-Butyl alcohol	ND		250000	259000		ug/L		104	65.6 - 138	5	68.1
Isopropyl ether	ND		50000	54200		ug/L		108	70 - 133	3	34.2
Ethyl tert-butyl ether	ND		50000	54700		ug/L		109	76 - 129	2	30
3,3-Dimethyl-1-butanol	ND		250000	284000		ug/L		114	54.5 - 132	6	30
Ethanol	ND		250000	283000		ug/L		113	55.3 - 137	15	48
tert-Amyl alcohol	ND		250000	277000		ug/L		111	57.2 - 138	5	45.7
tert-Butyl Formate	ND		250000	246000		ug/L		98	52.2 - 126	1	30
m,p-Xylene	690	J	50000	54900		ug/L		109	72.7 - 133	3	28
o-Xylene	ND		25000	27100		ug/L		108	72.6 - 132	2	27.9
MSD MSD											
Surrogate	%Recovery	Qualifier	Limits								
Dibromofluoromethane (Surr)	102		77 - 121								
Toluene-d8 (Surr)	100		78.6 - 119								
4-Bromofluorobenzene	102		70 - 126								

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QC Association Summary

Client: F&ME Consultants
Project/Site: HHI PSD UST

Job ID: 785-977-1

GC/MS VOA

Analysis Batch: 70945

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
785-977-1	MW2	Total/NA	Water	8260D/UST	
785-977-2	MW3	Total/NA	Water	8260D/UST	
785-977-3	MW4	Total/NA	Water	8260D/UST	
785-977-4	MW5	Total/NA	Water	8260D/UST	
785-977-5	MW6	Total/NA	Water	8260D/UST	
785-977-19	Field Blank	Total/NA	Water	8260D/UST	
785-977-20	Trip Blank	Total/NA	Water	8260D/UST	
MB 705-70945/5	Method Blank	Total/NA	Water	8260D/UST	
LCS 705-70945/1002	Lab Control Sample	Total/NA	Water	8260D/UST	
705-37568-C-35 MS	Matrix Spike	Total/NA	Water	8260D/UST	
705-37568-C-35 MSD	Matrix Spike Duplicate	Total/NA	Water	8260D/UST	

Analysis Batch: 71083

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
785-977-6	MW7	Total/NA	Water	8260D/UST	
785-977-7	MW8	Total/NA	Water	8260D/UST	
785-977-8	MW10	Total/NA	Water	8260D/UST	
785-977-9	MW11	Total/NA	Water	8260D/UST	
785-977-10	DCW1	Total/NA	Water	8260D/UST	
MB 705-71083/7	Method Blank	Total/NA	Water	8260D/UST	
LCS 705-71083/1002	Lab Control Sample	Total/NA	Water	8260D/UST	
705-37619-B-15 MS	Matrix Spike	Total/NA	Water	8260D/UST	
705-37619-B-14 DU	Duplicate	Total/NA	Water	8260D/UST	

Analysis Batch: 71517

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
785-977-11	RW2	Total/NA	Water	8260D/UST	
785-977-17	Duplicate	Total/NA	Water	8260D/UST	
MB 705-71517/18	Method Blank	Total/NA	Water	8260D/UST	
LCS 705-71517/1016	Lab Control Sample	Total/NA	Water	8260D/UST	
705-37619-A-26 MS	Matrix Spike	Total/NA	Water	8260D/UST	
705-37619-A-26 MSD	Matrix Spike Duplicate	Total/NA	Water	8260D/UST	

Lab Chronicle

Client: F&ME Consultants
Project/Site: HHI PSD UST

Job ID: 785-977-1

Client Sample ID: MW2

Lab Sample ID: 785-977-1

Date Collected: 07/23/25 14:06

Matrix: Water

Date Received: 07/24/25 14:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D/UST		1	70945	ST	EET ATL	07/29/25 12:45

Client Sample ID: MW3

Lab Sample ID: 785-977-2

Date Collected: 07/23/25 14:18

Matrix: Water

Date Received: 07/24/25 14:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D/UST		1	70945	ST	EET ATL	07/29/25 13:08

Client Sample ID: MW4

Lab Sample ID: 785-977-3

Date Collected: 07/23/25 15:03

Matrix: Water

Date Received: 07/24/25 14:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D/UST		1	70945	ST	EET ATL	07/29/25 13:32

Client Sample ID: MW5

Lab Sample ID: 785-977-4

Date Collected: 07/23/25 15:10

Matrix: Water

Date Received: 07/24/25 14:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D/UST		1	70945	ST	EET ATL	07/29/25 13:56

Client Sample ID: MW6

Lab Sample ID: 785-977-5

Date Collected: 07/23/25 13:42

Matrix: Water

Date Received: 07/24/25 14:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D/UST		1	70945	ST	EET ATL	07/29/25 14:19

Client Sample ID: MW7

Lab Sample ID: 785-977-6

Date Collected: 07/23/25 14:40

Matrix: Water

Date Received: 07/24/25 14:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D/UST		1	71083	ST	EET ATL	07/30/25 06:35

Client Sample ID: MW8

Lab Sample ID: 785-977-7

Date Collected: 07/23/25 13:52

Matrix: Water

Date Received: 07/24/25 14:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D/UST		1	71083	ST	EET ATL	07/30/25 06:12

Eurofins Columbia

Lab Chronicle

Client: F&ME Consultants
Project/Site: HHI PSD UST

Job ID: 785-977-1

Client Sample ID: MW10

Date Collected: 07/23/25 14:30

Date Received: 07/24/25 14:00

Lab Sample ID: 785-977-8

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D/UST		1	71083	ST	EET ATL	07/30/25 05:48

Client Sample ID: MW11

Date Collected: 07/23/25 14:50

Date Received: 07/24/25 14:00

Lab Sample ID: 785-977-9

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D/UST		1	71083	ST	EET ATL	07/30/25 05:24

Client Sample ID: DCW1

Date Collected: 07/23/25 13:23

Date Received: 07/24/25 14:00

Lab Sample ID: 785-977-10

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D/UST		1	71083	ST	EET ATL	07/30/25 05:01

Client Sample ID: RW2

Date Collected: 07/23/25 15:20

Date Received: 07/24/25 14:00

Lab Sample ID: 785-977-11

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D/UST		1	71517	OM	EET ATL	07/31/25 11:35

Client Sample ID: Duplicate

Date Collected: 07/23/25 00:00

Date Received: 07/24/25 14:00

Lab Sample ID: 785-977-17

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D/UST		1	71517	OM	EET ATL	07/31/25 11:58

Client Sample ID: Field Blank

Date Collected: 07/23/25 13:30

Date Received: 07/24/25 14:00

Lab Sample ID: 785-977-19

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D/UST		1	70945	ST	EET ATL	07/29/25 19:34

Client Sample ID: Trip Blank

Date Collected: 07/23/25 00:00

Date Received: 07/24/25 14:00

Lab Sample ID: 785-977-20

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D/UST		1	70945	ST	EET ATL	07/29/25 19:57

Laboratory References:

EET ATL = Eurofins Atlanta, 3080 Presidential Dr, Atlanta, GA 30340, TEL (770)457-8177

Eurofins Columbia

Accreditation/Certification Summary

Client: F&ME Consultants
Project/Site: HHI PSD UST

Job ID: 785-977-1

Laboratory: Eurofins Atlanta

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
South Carolina	State	98016	06-30-26

Method Summary

Client: F&ME Consultants
Project/Site: HHI PSD UST

Job ID: 785-977-1

Method	Method Description	Protocol	Laboratory
8260D/UST	Volatile Organic Compounds by GC/MS	SW846	EET ATL
5030B	Purge and Trap	SW846	EET ATL

Protocol References:
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:
EET ATL = Eurofins Atlanta, 3080 Presidential Dr, Atlanta, GA 30340, TEL (770)457-8177

Sample Summary

Client: F&ME Consultants
Project/Site: HHI PSD UST

Job ID: 785-977-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
785-977-1	MW2	Water	07/23/25 14:06	07/24/25 14:00
785-977-2	MW3	Water	07/23/25 14:18	07/24/25 14:00
785-977-3	MW4	Water	07/23/25 15:03	07/24/25 14:00
785-977-4	MW5	Water	07/23/25 15:10	07/24/25 14:00
785-977-5	MW6	Water	07/23/25 13:42	07/24/25 14:00
785-977-6	MW7	Water	07/23/25 14:40	07/24/25 14:00
785-977-7	MW8	Water	07/23/25 13:52	07/24/25 14:00
785-977-8	MW10	Water	07/23/25 14:30	07/24/25 14:00
785-977-9	MW11	Water	07/23/25 14:50	07/24/25 14:00
785-977-10	DCW1	Water	07/23/25 13:23	07/24/25 14:00
785-977-11	RW2	Water	07/23/25 15:20	07/24/25 14:00
785-977-17	Duplicate	Water	07/23/25 00:00	07/24/25 14:00
785-977-19	Field Blank	Water	07/23/25 13:30	07/24/25 14:00
785-977-20	Trip Blank	Water	07/23/25 00:00	07/24/25 14:00

Eurofins Columbia

15 Thames Valley Rd
Irmo, SC 29063
Phone: 803-781-4243 Fax: 803-781-4243

Chain of Custody Record

977

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Client Information		Sampler: <i>Angela Martin</i>		Lab PM: Martin, Angela		Carrier Tracking No(s)		COC No: 785-313-64 1	
Client Contact: Christine Cafagna		Phone: <i>803-254-4540</i>		E-Mail: angela.martin@eurofinsus.com		State of Origin: SC		Page 1 of 2	
Company: F&ME Consultants				PWSID:		Analysis Requested			
Address: 211 Business Park Blvd		Due Date Requested: <i>Normal TAT</i>		8260D_UST - BTEX/M/DC/MOXY		211 Business Park Blvd		Preservation Codes A - HCL	
City: Columbia		TAT Requested (days): <i>Normal TAT</i>							
State Zip: SC, 29203		Compliance Project: ☐ Yes ☐ No							
Phone: 803-254-4540(Tel)		PO #: Purchase Order not required							
Email: ccafagna@fmeconsultants.com		WO #:							
Project Name: HHI PSD		Project #: 78500336		E6687.003					
Site: HHI PSD		SSOW#:							
Sample Identification		Sample Date		Sample Time		Sample Type (C=comp, G=grab)		Matrix (W=water, S=solid, O=wastefall, BT=Tissue, A=Air, DW=Drinking Water)	
								Special Instructions/Note:	
MW-2		7/23/25		1406		G		Water	
MW-3				1418				Water	
MW-4				1503				Water	
MW-5				1510				Water	
MW-6				1342				Water	
MW-7				1440				Water	
MW-8				1352				Water	
MW-10				1430				Water	
MW-11				1450				Water	
DCW-1				1323				Water	
RW-2				1520				Water	
Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological									
Sample Disposal (A fee may be assessed if samples are retained longer than 30 days) ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months									
Deliverable Requested I, II, III, IV, Other (specify) _____									
Special Instructions/QC Requirements									
Empty Kit Relinquished by: <i>Angela Martin</i>				Date: 7/24/25		Time: 11:00		Method of Shipment:	
Relinquished by: <i>Angela Martin</i>				Date/Time: 7/24/25 11:00		Company: F&ME		Received by: <i>Angela Martin</i>	
Relinquished by: <i>Angela Martin</i>				Date/Time: 7/24/25 13:07		Company: Eurofins		Received by: <i>Angela Martin</i>	
Relinquished by: <i>Angela Martin</i>				Date/Time: 7/24/25 14:00		Company: Eurofins		Received by: <i>Angela Martin</i>	
Custody Seals Intact: ☐ Yes ☐ No		Custody Seal No		Cooler Temperature(s) °C and Other Remarks: 7					



785-977 COC

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Environment Testing

7/31/2025

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Eurofins Columbia

15 Thames Valley Rd

Irmo, SC 29063

Phone: 803-781-4243 Fax: 803-781-4243

Chain of Custody Record



Environment Testing

Client Information (Sub Contract Lab)		Sampler: N/A		Lab PM: Martin, Angela		Carrier Tracking No(s): N/A		COC No: 785-87.1											
Client Contact: Shipping/Receiving		Phone: N/A		E-Mail: angela.martin@et.eurofinsus.com		State of Origin: South Carolina		Page: Page 1 of 2											
Company: Eurofins Environment Testing Southeast L				Accreditations Required (See note): State - South Carolina				Job #: 785-977-1											
Address: 3080 Presidential Dr,		Due Date Requested: 7/30/2025		Analysis Requested					Preservation Codes:										
City: Atlanta		TAT Requested (days): N/A		Field Filtered Sample (Yes or No) Perform MS/MSD (Yes or No) 8260D_UST/6030BSC UST w Oxy					Total Number of containers		Other: N/A								
State, Zip: GA, 30340																			
Phone: 770-457-8177(Tel)		PO #: N/A																	
Email: N/A		WO #: N/A																	
Project Name: HHI PSD UST		Project #: 78500336																	
Site: N/A		SSOW#: N/A																	
Sample Identification - Client ID (Lab ID)		Sample Date		Sample Time		Sample Type (C=comp, G=grab)		Matrix (W=water, S=solid, O=waste/oil, BT=tissue, A=air)		Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		8260D_UST/6030BSC UST w Oxy		Total Number of containers		Special Instructions/Note:	
MW2 (785-977-1)		7/23/25		14:06 Eastern		G		Water				X				3			
MW3 (785-977-2)		7/23/25		14:18 Eastern		G		Water				X				3			
MW4 (785-977-3)		7/23/25		15:03 Eastern		G		Water				X				3			
MW5 (785-977-4)		7/23/25		15:10 Eastern		G		Water				X				3			
MW6 (785-977-5)		7/23/25		13:42 Eastern		G		Water				X				3			
MW7 (785-977-6)		7/23/25		14:40 Eastern		G		Water				X				3			
MW8 (785-977-7)		7/23/25		13:52 Eastern		G		Water				X				3			
MW10 (785-977-8)		7/23/25		14:30 Eastern		G		Water				X				3			
MW11 (785-977-9)		7/23/25		14:50 Eastern		G		Water				X				3			
Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing Southeast, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing Southeast, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing Southeast, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing Southeast, LLC.																			
Possible Hazard Identification										Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)									
Unconfirmed										☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months									
Deliverable Requested: I, II, III, IV, Other (specify)										Special Instructions/QC Requirements:									
Empty Kit Relinquished by:										Method of Shipment:									
Relinquished by: <i>Christine Cole</i>										Date/Time: 7/25/25 15:34									
Relinquished by: <i>[Signature]</i>										Date/Time: 7/25/25 19:10									
Relinquished by: <i>[Signature]</i>										Date/Time: 7/25/25 19:10									
Custody Seals Intact: ☐ Yes ☐ No										Cooler Temperature(s) °C and Other Remarks: 3.1, 1.9 # 1927									

15 Thames Valley Rd
Irmo, SC 29063
Phone: 803-781-4243 Fax: 803-781-4243

 eurofins Environment Testing

Ver: 10/10/2024
7/31/2025

Login Sample Receipt Checklist

Client: F&ME Consultants

Job Number: 785-977-1

Login Number: 977

List Source: Eurofins Columbia

List Number: 1

Creator: Martin, Angela

Question	Answer	Comment
The cooler's custody seal, if present, is intact.	N/A	
The cooler does not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Sample custody seals, if present, are intact.	N/A	
Sample collection date/times are provided.	True	
The samples do not appear to have been compromised or tampered with.	True	
Containers are not broken or leaking.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Appropriate sample containers were rec'd and sufficient volume for all analyses.	True	
Samples are received within Holding Time (excluding tests with immediate HTs).	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Is there sufficient air space in bottle for bacteriological analysis.	N/A	

Login Sample Receipt Checklist

Client: F&ME Consultants

Job Number: 785-977-1

Login Number: 977

List Source: Eurofins Atlanta

List Number: 2

List Creation: 07/28/25 10:06 AM

Creator: Ceclu, Rodica

Question	Answer	Comment
The cooler's custody seal, if present, is intact.	True	
The cooler does not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Sample custody seals, if present, are intact.	True	
Sample collection date/times are provided.	True	
The samples do not appear to have been compromised or tampered with.	True	
Containers are not broken or leaking.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Appropriate sample containers were rec'd and sufficient volume for all analyses.	True	
Samples are received within Holding Time (excluding tests with immediate HTs).	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Is there sufficient air space in bottle for bacteriological analysis.	True	

Appendix C

Field Sampling Data Sheets for Groundwater Sampling



Field Data Information Sheet for Groundwater Sampling Low Flow Purging & Sampling

Date(mm/dd/yy)	<u>7/23/2025</u>		
Field Personnel	<u>J. Leary & J. Croom</u>		
General Weather Conditions	<u>P. Cloudy</u>		
Ambient Air Temperature F.	<u>82</u>		
Facility Name	<u>Hilton Head Island PSD</u>	Site ID#	<u>11399</u>
Quality Assurance			
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)			
Serial No.	<u>08J101242</u>		
pH=4.0	<u>4.01</u>	Standard	<u>1409</u> <u>1409</u>
pH=7.0	<u>7.07</u>	D.O.	<u>100%</u> <u>100.5%</u>
pH=10.0	<u>9.98</u>		
Temp. C.	<u>21.33</u>		<u>21.16</u>
Turbidity - Micro TPW SN# 201507278			
NTU - <u>0.02, 10.0, 1000</u> (NTU) <u>0.01, 9.92, 993.8</u>			

Well #	<u>MW-1</u>		
Well Diameter(d)	<u>2</u> inch or	<u>0.1667</u> feet	
conversion factor (c): $[3.142 \times (d/2)^2] \times 7.48$			
	for a 2 inch well c =	<u>0.163</u>	gal's/ft
	for a 4 inch well c =	<u>0.653</u>	gal's/ft
Total Well Depth(twd)	<u>12.0</u> feet	Screen 2-12	
Depth to GW (dwg)	<u>*4.62</u> feet	*Corrected Water Level	
Length of Water Column(lwc=twd-dgw)		_____ feet	
1 Csg Volume(lwc x c)=		_____ gallons	
3 Csg Volumes =		_____ gallons (Std. Purge Volume)	
Volume of Water Purged Before Sampling		_____ liters	

Didn't sample due to 0.64' of free-phase product (FPP). FPP @ 4.55', water @ 5.19'

Volume Purged (liters)
Time (military)
pH (s.u.)
Specific Cond. (umhos/cm)
Water Temp. (C)
Turbidity (NTU)
Dissolved Oxygen (mg/L)
Water Level (ft.)

nr = not recorded n/a = not applicable



**Field Data Information Sheet for Groundwater Sampling
Low Flow Purging & Sampling**

Date(mm/dd/yy) <u>7/23/2025</u>	
Field Personnel <u>J. Leary & J. Croom</u>	
General Weather Conditions <u>P. Cloudy</u>	
Ambient Air Temperature F. <u>83</u>	
Facility Name <u>Hilton Head Island PSD</u>	Site ID# <u>11399</u>
Quality Assurance	
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)	
Serial No. <u>08J101242</u>	
pH=4.0 <u>4.01</u>	Standard 1409 <u>1409</u>
pH=7.0 <u>7.07</u>	D.O. 100% <u>100.5%</u>
pH=10.0 <u>9.98</u>	
Temp. C. <u>21.33</u> <u>21.16</u>	
Turbidity - Micro TPW SN# 201507278	
NTU - 0.02, 10.0, 1000 (NTU) 0.01, 9.92, 993.8	

Well # <u>MW-2</u>	
Well Diameter(d) <u>2</u> inch or <u>0.1667</u> feet	
conversion factor (c): $[3.142 \times (d/2)^2] \times 7.48$	
for a 2 inch well c = <u>0.163</u> gal's/ft	
for a 4 inch well c = <u>0.653</u> gal's/ft	
Total Well Depth(twd) <u>13.0</u> feet	Screen <u>3-13</u>
Depth to GW (dwg) <u>5.65</u> feet	
Length of Water Column(lwc=twd-dgw) _____ feet	
1 Csg Volume(lwc x c)= _____ gallons	
3 Csg Volumes = _____ gallons (Std. Purge Volume)	
Volume of Water Purged Before Sampling <u>0.00</u> liters	

No Purging Required

	Sample				
Volume Purged (liters)	0.00				
Time (military)	1406				
pH (s.u.)	6.27				
Specific Cond. (umhos/cm)	492				
Water Temp. (C)	23.97				
Turbidity (NTU)	9.89				
Dissolved Oxygen (mg/L)	8.62				
Water Level (ft.)	n/a				

nr = not recorded n/a = not applicable



**Field Data Information Sheet for Groundwater Sampling
Low Flow Purging & Sampling**

Date(mm/dd/yy) <u>7/23/2025</u>	
Field Personnel <u>J. Leary & J. Croom</u>	
General Weather Conditions <u>P. Cloudy</u>	
Ambient Air Temperature F. <u>83</u>	
Facility Name <u>Hilton Head Island PSD</u>	Site ID# <u>11399</u>
Quality Assurance	
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)	
Serial No. <u>08J101242</u>	
pH=4.0 <u>4.01</u>	Standard 1409 <u>1409</u>
pH=7.0 <u>7.07</u>	D.O. 100% <u>100.5%</u>
pH=10.0 <u>9.98</u>	
Temp. C. <u>21.33</u> <u>21.16</u>	
Turbidity - Micro TPW SN# 201507278	
NTU - 0.02, 10.0, 1000 (NTU) 0.01, 9.92, 993.8	

Well # <u>MW-3</u>	
Well Diameter(d) <u>2</u> inch or <u>0.1667</u> feet	
conversion factor (c): $[3.142 \times (d/2)^2] \times 7.48$	
for a 2 inch well c = <u>0.163</u> gal's/ft	
for a 4 inch well c = <u>0.653</u> gal's/ft	
Total Well Depth(twd) <u>13.0</u> feet	Screen 3-13
Depth to GW (dwg) <u>5.36</u> feet	
Length of Water Column(lwc=twd-dgw) _____ feet	
1 Csg Volume(lwc x c)= _____ gallons	
3 Csg Volumes = _____ gallons (Std. Purge Volume)	
Volume of Water Purged Before Sampling <u>0.00</u> liters	

No Purging Required

	Sample				
Volume Purged (liters)	0.00				
Time (military)	1418				
pH (s.u.)	5.64				
Specific Cond. (umhos/cm)	652				
Water Temp. (C)	24.25				
Turbidity (NTU)	2.50				
Dissolved Oxygen (mg/L)	2.53				
Water Level (ft.)	n/a				

nr = not recorded n/a = not applicable



**Field Data Information Sheet for Groundwater Sampling
Low Flow Purging & Sampling**

Date(mm/dd/yy) <u>7/23/2025</u>	
Field Personnel <u>J. Leary & J. Croom</u>	
General Weather Conditions <u>P. Cloudy</u>	
Ambient Air Temperature F. <u>83</u>	
Facility Name <u>Hilton Head Island PSD</u>	Site ID# <u>11399</u>
Quality Assurance	
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)	
Serial No. <u>08J101242</u>	
pH=4.0 <u>4.01</u>	Standard 1409 <u>1409</u>
pH=7.0 <u>7.07</u>	D.O. 100% <u>100.5%</u>
pH=10.0 <u>9.98</u>	
Temp. C. <u>21.33</u> <u>21.16</u>	
Turbidity - Micro TPW SN# 201507278	
NTU - 0.02, 10.0, 1000 (NTU) 0.01, 9.92, 993.8	

Well # <u>MW-4</u>	
Well Diameter(d) <u>2</u> inch or <u>0.1667</u> feet	
conversion factor (c): $[3.142 \times (d/2)^2] \times 7.48$	
for a 2 inch well c = <u>0.163</u> gal's/ft	
for a 4 inch well c = <u>0.653</u> gal's/ft	
Total Well Depth(twd) <u>13.0</u> feet	Screen <u>3-13</u>
Depth to GW (dwg) <u>5.14</u> feet	
Length of Water Column(lwc=twd-dgw) _____ feet	
1 Csg Volume(lwc x c)= _____ gallons	
3 Csg Volumes = _____ gallons (Std. Purge Volume)	
Volume of Water Purged Before Sampling <u>0.00</u> liters	

No Purging Required

	Sample				
Volume Purged (liters)	0.00				
Time (military)	1503				
pH (s.u.)	6.54				
Specific Cond. (umhos/cm)	364				
Water Temp. (C)	25.62				
Turbidity (NTU)	26.64				
Dissolved Oxygen (mg/L)	4.34				
Water Level (ft.)	n/a				

nr = not recorded n/a = not applicable



**Field Data Information Sheet for Groundwater Sampling
Low Flow Purging & Sampling**

Date(mm/dd/yy) <u>7/23/2025</u>	
Field Personnel <u>J. Leary & J. Croom</u>	
General Weather Conditions <u>P. Cloudy</u>	
Ambient Air Temperature F. <u>83</u>	
Facility Name <u>Hilton Head Island PSD</u>	Site ID# <u>11399</u>
Quality Assurance	
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)	
Serial No. <u>08J101242</u>	
pH=4.0 <u>4.01</u>	Standard 1409 <u>1409</u>
pH=7.0 <u>7.07</u>	D.O. 100% <u>100.5%</u>
pH=10.0 <u>9.98</u>	
Temp. C. <u>21.33</u> <u>21.16</u>	
Turbidity - Micro TPW SN# 201507278	
NTU - 0.02, 10.0, 1000 (NTU) 0.01, 9.92, 993.8	

Well # <u>MW-5</u>	
Well Diameter(d) <u>2</u> inch or <u>0.1667</u> feet	
conversion factor (c): $[3.142 \times (d/2)^2] \times 7.48$	
for a 2 inch well c = <u>0.163</u> gal's/ft	
for a 4 inch well c = <u>0.653</u> gal's/ft	
Total Well Depth(twd) <u>14.0</u> feet	Screen 4-14
Depth to GW (dwg) <u>5.00</u> feet	
Length of Water Column(lwc=twd-dgw) _____ feet	
1 Csg Volume(lwc x c)= _____ gallons	
3 Csg Volumes = _____ gallons (Std. Purge Volume)	
Volume of Water Purged Before Sampling <u>0.00</u> liters	

No purging required

	Sample				
Volume Purged (liters)	0.00				
Time (military)	1510				
pH (s.u.)	6.64				
Specific Cond. (umhos/cm)	154				
Water Temp. (C)	25.99				
Turbidity (NTU)	27.85				
Dissolved Oxygen (mg/L)	4.96				
Water Level (ft.)	n/a				

nr = not recorded n/a = not applicable



**Field Data Information Sheet for Groundwater Sampling
Low Flow Purging & Sampling**

Date(mm/dd/yy)	<u>7/23/2025</u>		
Field Personnel	<u>J. Leary & J. Croom</u>		
General Weather Conditions	<u>P. Cloudy</u>		
Ambient Air Temperature F.	<u>82</u>		
Facility Name	<u>Hilton Head Island PSD</u>	Site ID#	<u>11399</u>
Quality Assurance			
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)			
Serial No.	<u>08J101242</u>		
pH=4.0	<u>4.01</u>	Standard	<u>1409</u> <u>1409</u>
pH=7.0	<u>7.07</u>	D.O.	<u>100%</u> <u>100.5%</u>
pH=10.0	<u>9.98</u>		
Temp. C.	<u>21.33</u>	<u>21.16</u>	
Turbidity - Micro TPW SN# 201507278			
NTU - <u>0.02, 10.0, 1000</u> (NTU) <u>0.01, 9.92, 993.8</u>			

Well #	<u>MW-6</u>		
Well Diameter(d)	<u>2</u> inch or <u>0.1667</u> feet		
conversion factor (c): $[3.142 \times (d/2)^2] \times 7.48$			
for a 2 inch well c =	<u>0.163</u> gal's/ft		
for a 4 inch well c =	<u>0.653</u> gal's/ft		
Total Well Depth(twd)	<u>14.0</u> feet	Screen 4-14	
Depth to GW (dwg)	<u>5.58</u> feet		
Length of Water Column(lwc=twd-dgw)		<u> </u> feet	
1 Csg Volume(lwc x c)=		<u> </u> gallons	
3 Csg Volumes =		<u> </u> gallons (Std. Purge Volume)	
Volume of Water Purged Before Sampling	<u>0.00</u>	liters	

No Purging Required

	Sample				
Volume Purged (liters)	0.00				
Time (military)	1342				
pH (s.u.)	6.75				
Specific Cond. (umhos/cm)	497				
Water Temp. (C)	26.02				
Turbidity (NTU)	7.22				
Dissolved Oxygen (mg/L)	2.96				
Water Level (ft.)	n/a				

nr = not recorded n/a = not applicable



**Field Data Information Sheet for Groundwater Sampling
Low Flow Purging & Sampling**

Date(mm/dd/yy) <u>7/23/2025</u>	
Field Personnel <u>J. Leary & J. Croom</u>	
General Weather Conditions <u>P. Cloudy</u>	
Ambient Air Temperature F. <u>83</u>	
Facility Name <u>Hilton Head Island PSD</u>	Site ID# <u>11399</u>
Quality Assurance	
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)	
Serial No. <u>08J101242</u>	
pH=4.0 <u>4.01</u>	Standard 1409 <u>1409</u>
pH=7.0 <u>7.07</u>	D.O. 100% <u>100.5%</u>
pH=10.0 <u>9.98</u>	
Temp. C. <u>21.33</u> <u>21.16</u>	
Turbidity - Micro TPW SN# 201507278	
NTU - 0.02, 10.0, 1000 (NTU) 0.01, 9.92, 993.8	

Well # <u>MW-7</u>	
Well Diameter(d) <u>2</u> inch or <u>0.1667</u> feet	
conversion factor (c): $[3.142 \times (d/2)^2] \times 7.48$	
for a 2 inch well c = <u>0.163</u> gal's/ft	
for a 4 inch well c = <u>0.653</u> gal's/ft	
Total Well Depth(twd) <u>13.0</u> feet	Screen <u>3-13</u>
Depth to GW (dwg) <u>4.41</u> feet	
Length of Water Column(lwc=twd-dgw) _____ feet	
1 Csg Volume(lwc x c)= _____ gallons	
3 Csg Volumes = _____ gallons (Std. Purge Volume)	
Volume of Water Purged Before Sampling <u>0.00</u> liters	

No Purging Required

	Sample				
Volume Purged (liters)	0.00				
Time (military)	1440				
pH (s.u.)	5.72				
Specific Cond. (umhos/cm)	322				
Water Temp. (C)	30.48				
Turbidity (NTU)	7.27				
Dissolved Oxygen (mg/L)	1.62				
Water Level (ft.)	n/a				

nr = not recorded n/a = not applicable



**Field Data Information Sheet for Groundwater Sampling
Low Flow Purging & Sampling**

Date(mm/dd/yy) <u>7/23/2025</u>	
Field Personnel <u>J. Leary & J. Croom</u>	
General Weather Conditions <u>P. Cloudy</u>	
Ambient Air Temperature F. <u>83</u>	
Facility Name <u>Hilton Head Island PSD</u>	Site ID# <u>11399</u>
Quality Assurance	
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)	
Serial No. <u>08J101242</u>	
pH=4.0 <u>4.01</u>	Standard 1409 <u>1409</u>
pH=7.0 <u>7.07</u>	D.O. 100% <u>100.5%</u>
pH=10.0 <u>9.98</u>	
Temp. C. <u>21.33</u> <u>21.16</u>	
Turbidity - Micro TPW SN# 201507278	
NTU - <u>0.02</u> , <u>10.0</u> , <u>1000</u> (NTU) <u>0.01</u> , <u>9.92</u> , <u>993.8</u>	

Well # <u>MW-8</u>	
Well Diameter(d) <u>2</u> inch or <u>0.1667</u> feet	
conversion factor (c): $[3.142 \times (d/2)^2] \times 7.48$	
for a 2 inch well c = <u>0.163</u> gal's/ft	
for a 4 inch well c = <u>0.653</u> gal's/ft	
Total Well Depth(twd) <u>14.0</u> feet	Screen <u>4-14</u>
Depth to GW (dwg) <u>5.05</u> feet	
Length of Water Column(lwc=twd-dgw) _____ feet	
1 Csg Volume(lwc x c)= _____ gallons	
3 Csg Volumes = _____ gallons (Std. Purge Volume)	
Volume of Water Purged Before Sampling <u>0.00</u> liters	

**No Purging Required
Sample**

Volume Purged (liters)	0.00				
Time (military)	1352				
pH (s.u.)	6.51				
Specific Cond. (umhos/cm)	540				
Water Temp. (C)	27.02				
Turbidity (NTU)	11.35				
Dissolved Oxygen (mg/L)	1.09				
Water Level (ft.)	n/a				

nr = not recorded n/a = not applicable



**Field Data Information Sheet for Groundwater Sampling
Low Flow Purging & Sampling**

Date(mm/dd/yy) <u>7/23/2025</u>	
Field Personnel <u>J. Leary & J. Croom</u>	
General Weather Conditions <u>P. Cloudy</u>	
Ambient Air Temperature F. <u>82</u>	
Facility Name <u>Hilton Head Island PSD</u>	Site ID# <u>11399</u>
Quality Assurance	
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)	
Serial No. <u>08J101242</u>	
pH=4.0 <u>4.01</u>	Standard 1409 <u>1409</u>
pH=7.0 <u>7.07</u>	D.O. 100% <u>100.5%</u>
pH=10.0 <u>9.98</u>	
Temp. C. <u>21.33</u> <u>21.16</u>	
Turbidity - Micro TPW SN# 201507278	
NTU - 0.02, 10.0, 1000 (NTU) 0.01, 9.92, 993.8	

Well # <u>MW-9</u>	
Well Diameter(d) <u>2</u> inch or <u>0.1667</u> feet	
conversion factor (c): $[3.142 \times (d/2)^2] \times 7.48$	
for a 2 inch well c = <u>0.163</u> gal's/ft	
for a 4 inch well c = <u>0.653</u> gal's/ft	
Total Well Depth(twd) <u>13.5</u> feet	Screen 3.5-13.5
Depth to GW (dwg) <u>*4.81</u> feet	*Corrected Water Level
Length of Water Column(lwc=twd-dgw) _____ feet	
1 Csg Volume(lwc x c)= _____ gallons	
3 Csg Volumes = _____ gallons (Std. Purge Volume)	
Volume of Water Purged Before Sampling _____ liters	

Didn't sample due to 0.55' of free-phase product (FPP). FPP @ 4.75', water @ 5.30'

Volume Purged (liters)
Time (military)
pH (s.u.)
Specific Cond. (umhos/cm)
Water Temp. (C)
Turbidity (NTU)
Dissolved Oxygen (mg/L)
Water Level (ft.)

nr = not recorded n/a = not applicable



**Field Data Information Sheet for Groundwater Sampling
Low Flow Purging & Sampling**

Date(mm/dd/yy) <u>7/23/2025</u>	
Field Personnel <u>J. Leary & J. Croom</u>	
General Weather Conditions <u>P. Cloudy</u>	
Ambient Air Temperature F. <u>83</u>	
Facility Name <u>Hilton Head Island PSD</u>	Site ID# <u>11399</u>
Quality Assurance	
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)	
Serial No. <u>08J101242</u>	
pH=4.0 <u>4.01</u>	Standard 1409 <u>1409</u>
pH=7.0 <u>7.07</u>	D.O. 100% <u>100.5%</u>
pH=10.0 <u>9.98</u>	
Temp. C. <u>21.33</u> <u>21.16</u>	
Turbidity - Micro TPW SN# 201507278	
NTU - <u>0.02</u> , <u>10.0</u> , <u>1000</u> (NTU) <u>0.01</u> , <u>9.92</u> , <u>993.8</u>	

Well # <u>MW-10</u>	
Well Diameter(d) <u>2</u> inch or <u>0.1667</u> feet	
conversion factor (c): $[3.142 \times (d/2)^2] \times 7.48$	
for a 2 inch well c = <u>0.163</u> gal's/ft	
for a 4 inch well c = <u>0.653</u> gal's/ft	
Total Well Depth(twd) <u>13.5</u> feet	Screen 3.5-13.5
Depth to GW (dwg) <u>4.54</u> feet	
Length of Water Column(lwc=twd-dgw) _____ feet	
1 Csg Volume(lwc x c)= _____ gallons	
3 Csg Volumes = _____ gallons (Std. Purge Volume)	
Volume of Water Purged Before Sampling <u>0.00</u> liters	

**No Purging Required
Sample**

Volume Purged (liters)	0.00				
Time (military)	1430				
pH (s.u.)	5.68				
Specific Cond. (umhos/cm)	395				
Water Temp. (C)	27.16				
Turbidity (NTU)	5.45				
Dissolved Oxygen (mg/L)	1.16				
Water Level (ft.)	n/a				

nr = not recorded



Field Data Information Sheet for Groundwater Sampling Low Flow Purging & Sampling

Date(mm/dd/yy)	<u>7/23/2025</u>		
Field Personnel	<u>J. Leary & J. Croom</u>		
General Weather Conditions	<u>P. Cloudy</u>		
Ambient Air Temperature F.	<u>83</u>		
Facility Name	<u>Hilton Head Island PSD</u>	Site ID#	<u>11399</u>
Quality Assurance			
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)			
Serial No.	<u>08J101242</u>		
pH=4.0	<u>4.01</u>	Standard	<u>1409</u> <u>1409</u>
pH=7.0	<u>7.07</u>	D.O.	<u>100%</u> <u>100.5%</u>
pH=10.0	<u>9.98</u>		
Temp. C.	<u>21.33</u>	<u>21.16</u>	
Turbidity - Micro TPW SN# 201507278			
NTU - <u>0.02, 10.0, 1000</u> (NTU) <u>0.01, 9.92, 993.8</u>			

Well #	<u>MW-11</u>		
Well Diameter(d)	<u>2</u> inch or <u>0.1667</u> feet		
conversion factor (c): $[3.142 \times (d/2)^2] \times 7.48$			
for a 2 inch well c =	<u>0.163</u> gal's/ft		
for a 4 inch well c =	<u>0.653</u> gal's/ft		
Total Well Depth(twd)	<u>13.0</u> feet	Screen	<u>3-13</u>
Depth to GW (dwg)	<u>4.47</u> feet		
Length of Water Column(lwc=twd-dgw)	<u> </u> feet		
1 Csg Volume(lwc x c)=	<u> </u> gallons		
3 Csg Volumes =	<u> </u> gallons	(Std. Purge Volume)	
Volume of Water Purged Before Sampling	<u>0.00</u> liters		

No Purging Required

	Sample				
Volume Purged (liters)	0.00				
Time (military)	1450				
pH (s.u.)	6.39				
Specific Cond. (umhos/cm)	616				
Water Temp. (C)	27.55				
Turbidity (NTU)	6.19				
Dissolved Oxygen (mg/L)	1.79				
Water Level (ft.)	n/a				

nr = not recorded n/a = not applicable



**Field Data Information Sheet for Groundwater Sampling
Low Flow Purging & Sampling**

Date(mm/dd/yy) <u>7/23/2025</u>	
Field Personnel <u>J. Leary & J. Croom</u>	
General Weather Conditions <u>P. Cloudy</u>	
Ambient Air Temperature F. <u>82</u>	
Facility Name <u>Hilton Head Island PSD</u>	Site ID# <u>11399</u>
Quality Assurance	
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)	
Serial No. <u>08J101242</u>	
pH=4.0 <u>4.01</u>	Standard 1409 <u>1409</u>
pH=7.0 <u>7.07</u>	D.O. 100% <u>100.5%</u>
pH=10.0 <u>9.98</u>	
Temp. C. <u>21.33</u> <u>21.16</u>	
Turbidity - Micro TPW SN# 201507278	
NTU - 0.02, 10.0, 1000 (NTU) 0.01, 9.92, 993.8	

Well # <u>MW-12</u>	
Well Diameter(d) <u>2</u> inch or <u>0.1667</u> feet	
conversion factor (c): $[3.142 \times (d/2)^2] \times 7.48$	
for a 2 inch well c = <u>0.163</u> gal's/ft	
for a 4 inch well c = <u>0.653</u> gal's/ft	
Total Well Depth(twd) <u>13.0</u> feet	Screen <u>3-13</u>
Depth to GW (dwg) <u>*4.64</u> feet	*Corrected Water Level
Length of Water Column(lwc=twd-dgw) _____ feet	
1 Csg Volume(lwc x c)= _____ gallons	
3 Csg Volumes = _____ gallons (Std. Purge Volume)	
Volume of Water Purged Before Sampling _____ liters	

Didn't sample due to 1.33' of free-phase product (FPP). FPP @ 4.49', water @ 5.82'

Sample						
Volume Purged (liters)						
Time (military)						
pH (s.u.)						
Specific Cond. (umhos/cm)						
Water Temp. (C)						
Turbidity (NTU)						
Dissolved Oxygen (mg/L)						
Water Level (ft.)						

nr = not recorded n/a = not applicable



**Field Data Information Sheet for Groundwater Sampling
Low Flow Purging & Sampling**

Date(mm/dd/yy) <u>7/23/2025</u>	
Field Personnel <u>J. Leary & J. Croom</u>	
General Weather Conditions <u>P. Cloudy</u>	
Ambient Air Temperature F. <u>82</u>	
Facility Name <u>Hilton Head Island PSD</u>	Site ID# <u>11399</u>
Quality Assurance	
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)	
Serial No. <u>08J101242</u>	
pH=4.0 <u>4.01</u>	Standard 1409 <u>1409</u>
pH=7.0 <u>7.07</u>	D.O. 100% <u>100.5%</u>
pH=10.0 <u>9.98</u>	
Temp. C. <u>21.33</u> <u>21.16</u>	
Turbidity - Micro TPW SN# 201507278	
NTU - <u>0.02, 10.0, 1000</u> (NTU) <u>0.01, 9.92, 993.8</u>	

Well # <u>MW-13</u>	
Well Diameter(d) <u>2</u> inch or <u>0.1667</u> feet	
conversion factor (c): $[3.142 \times (d/2)^2] \times 7.48$	
for a 2 inch well c = <u>0.163</u> gal's/ft	
for a 4 inch well c = <u>0.653</u> gal's/ft	
Total Well Depth(twd) <u>13.0</u> feet	Screen <u>3-13</u>
Depth to GW (dwg) <u>*4.82</u> feet	*Corrected Water Level
Length of Water Column(lwc=twd-dwg) _____ feet	
1 Csg Volume(lwc x c)= _____ gallons	
3 Csg Volumes = _____ gallons (Std. Purge Volume)	
Volume of Water Purged Before Sampling _____ liters	

Didn't sample due to 0.96' of free-phase product (FPP). FPP @ 4.71', water @ 5.67'

Volume Purged (liters)
Time (military)
pH (s.u.)
Specific Cond. (umhos/cm)
Water Temp. (C)
Turbidity (NTU)
Dissolved Oxygen (mg/L)
Water Level (ft.)

nr = not recorded n/a = not applicable



**Field Data Information Sheet for Groundwater Sampling
Low Flow Purging & Sampling**

Date(mm/dd/yy) <u>7/23/2025</u>	
Field Personnel <u>J. Leary & J. Croom</u>	
General Weather Conditions <u>P. Sunny</u>	
Ambient Air Temperature F. <u>81</u>	
Facility Name <u>Hilton Head Island PSD</u>	Site ID# <u>11399</u>
Quality Assurance	
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)	
Serial No. <u>08J101242</u>	
pH=4.0 <u>4.01</u>	Standard 1409 <u>1409</u>
pH=7.0 <u>7.07</u>	D.O. 100% <u>100.5%</u>
pH=10.0 <u>9.98</u>	
Temp. C. <u>21.33</u> <u>21.16</u>	
Turbidity - Micro TPW SN# 201507278	
NTU - 0.02, 10.0, 1000 (NTU) 0.01, 9.92, 993.8	

Well # <u>DCW-1</u>	
Well Diameter(d) <u>2</u> inch or <u>0.1667</u> feet	
conversion factor (c): $[3.142 \times (d/2)^2] \times 7.48$	
for a 2 inch well c = <u>0.163</u> gal's/ft	
for a 4 inch well c = <u>0.653</u> gal's/ft	
Total Well Depth(twd) <u>34.0</u> feet	Screen 29-34
Depth to GW (dwg) <u>4.91</u> feet	
Length of Water Column(lwc=twd-dgw) _____ feet	
1 Csg Volume(lwc x c)= _____ gallons	
3 Csg Volumes = _____ gallons (Std. Purge Volume)	
Volume of Water Purged Before Sampling <u>4.00</u> liters	

Purged and sampled with peristaltic pump. Purged water onto ground.

	Sample					
Volume Purged (liters)	0.50	1.75	3.00	4.50		
Time (military)	1308	1313	1318	1323		
pH (s.u.)	6.16	5.70	5.79	5.92		
Specific Cond. (umhos/cm)	286	289	290	290		
Water Temp. (C)	22.81	23.01	22.87	22.79		
Turbidity (NTU)	56.52	16.06	9.40	5.16		
Dissolved Oxygen (mg/L)	9.26	7.71	6.49	5.86		
Water Level (ft.)	5.13	5.05	5.06	5.06		

nr = not recorded n/a = not applicable



**Field Data Information Sheet for Groundwater Sampling
Low Flow Purging & Sampling**

Date(mm/dd/yy) <u>7/23/2025</u>	
Field Personnel <u>J. Leary & J. Croom</u>	
General Weather Conditions <u>P. Cloudy</u>	
Ambient Air Temperature F. <u>82</u>	
Facility Name <u>Hilton Head Island PSD</u>	Site ID# <u>11399</u>
Quality Assurance	
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)	
Serial No. <u>08J101242</u>	
pH=4.0 <u>4.01</u>	Standard 1409 <u>1409</u>
pH=7.0 <u>7.07</u>	D.O. 100% <u>100.5%</u>
pH=10.0 <u>9.98</u>	
Temp. C. <u>21.33</u> <u>21.16</u>	
Turbidity - Micro TPW SN# 201507278	
NTU - <u>0.02, 10.0, 1000</u> (NTU) <u>0.01, 9.92, 993.8</u>	

Well # <u>RW-1</u>	
Well Diameter(d) <u>4</u> inch or <u>0.3333</u> feet	
conversion factor (c): $[3.142 \times (d/2)^2] \times 7.48$	
for a 2 inch well c = <u>0.163</u> gal's/ft	
for a 4 inch well c = <u>0.653</u> gal's/ft	
Total Well Depth(twd) <u>12.0</u> feet	Screen <u>2-12</u>
Depth to GW (dwg) <u>*4.42</u> feet	*Corrected Water Level
Length of Water Column(lwc=twd-dgw) _____ feet	
1 Csg Volume(lwc x c)= _____ gallons	
3 Csg Volumes = _____ gallons (Std. Purge Volume)	
Volume of Water Purged Before Sampling _____ liters	

Didn't sample due to 1.31' of free-phase product (FPP). FPP @ 4.27', water @ 5.58'

Volume Purged (liters)
Time (military)
pH (s.u.)
Specific Cond. (umhos/cm)
Water Temp. (C)
Turbidity (NTU)
Dissolved Oxygen (mg/L)
Water Level (ft.)

nr = not recorded n/a = not applicable



**Field Data Information Sheet for Groundwater Sampling
Low Flow Purging & Sampling**

Date(mm/dd/yy) <u>7/23/2025</u>	
Field Personnel <u>J. Leary & J. Croom</u>	
General Weather Conditions <u>P. Cloudy</u>	
Ambient Air Temperature F. <u>83</u>	
Facility Name <u>Hilton Head Island PSD</u>	Site ID# <u>11399</u>
Quality Assurance	
Multi Meter - YSI 556 (pH, Cond., D.O., Temp.)	
Serial No. <u>08J101242</u>	
pH=4.0 <u>4.01</u>	Standard 1409 <u>1409</u>
pH=7.0 <u>7.07</u>	D.O. 100% <u>100.5%</u>
pH=10.0 <u>9.98</u>	
Temp. C. <u>21.33</u> <u>21.16</u>	
Turbidity - Micro TPW SN# 201507278	
NTU - 0.02, 10.0, 1000 (NTU) 0.01, 9.92, 993.8	

Well # <u>RW-2</u>	
Well Diameter(d) <u>4</u> inch or <u>0.3333</u> feet	
conversion factor (c): $[3.142 \times (d/2)^2] \times 7.48$	
for a 2 inch well c = <u>0.163</u> gal's/ft	
for a 4 inch well c = <u>0.653</u> gal's/ft	
Total Well Depth(twd) <u>12.0</u> feet	Screen 2-12
Depth to GW (dwg) <u>4.61</u> feet	
Length of Water Column(lwc=twd-dgw) _____ feet	
1 Csg Volume(lwc x c)= _____ gallons	
3 Csg Volumes = _____ gallons (Std. Purge Volume)	
Volume of Water Purged Before Sampling <u>0.00</u> liters	

Fuel Odor in water sample. No Purging Required

	Sample	Duplicate			
Volume Purged (liters)	0.00	n/a			
Time (military)	1520	n/a			
pH (s.u.)	6.32	6.29			
Specific Cond. (umhos/cm)	627	610			
Water Temp. (C)	26.16	26.23			
Turbidity (NTU)	17.06	22.2			
Dissolved Oxygen (mg/L)	1.50	4.45			
Water Level (ft.)	n/a	n/a			

nr = not recorded n/a = not applicable

Appendix D

Contractor Checklist

Contractor Checklist

For each report submitted to the UST Management Division, the contractor will be required to verify that all data elements for the required scope of work have been provided. For items not required for the scope of work, the N/A box should be checked. For items required and not completed or provided, the No box should be checked, and a thorough description of the reason must be provided.

Hilton Head Public Service District

UST Permit #11399

Item #	Item	Yes	No	N/A
1	Is Facility Name, Permit #, and address provided?	X		
2	Is UST Owner/Operator name, address, & phone number provided?	X		
3	Is name, address, & phone number of current property owner provided?	X		
4	Is the DHEC Certified UST Site Rehabilitation Contractor's Name, Address, telephone number, and certification number provided?	X		
5	Is the name, address, telephone number, and certification number of the well driller that installed borings/monitoring wells provided?			X
6	Is the name, address, telephone number, and certification number of the certified laboratory(ies) performing analytical analyses provided?	X		
7	Has the facility history been summarized?	X		
8	Has the regional geology and hydrogeology been described?	X		
9	Are the receptor survey results provided as required?			X
10	Has current use of the site and adjacent land been described?			X
11	Has the site-specific geology and hydrogeology been described?			X
12	Has the primary soil type been described?			X
13	Have field screening results been described?			X
14	Has a description of the soil sample collection and preservation been detailed?			X
15	Has the field screening methodology and procedure been detailed?			X
16	Has the monitoring well installation and development dates been provided?	X		
17	Has the method of well development been detailed?	X		
18	Has justification been provided for the locations of the monitoring wells?			X
19	Have the monitoring wells been labeled in accordance with the UST QAPP guidelines?			X
20	Has the groundwater sampling methodology been detailed?	X		
21	Have the groundwater sampling dates and groundwater measurements been provided?	X		
22	Has the purging methodology been detailed?	X		
23	Has the volume of water purged from each well been provided along with measurements to verify that purging is complete?	X		
24	If free-product is present, has the thickness been provided?	X		
25	Does the report include a brief discussion of the assessment done and the results?	X		
26	Does the report include a brief discussion of the aquifer evaluation and results?			X
27	Does the report include a brief discussion of the fate & transport models used?			X

Item #	Item	Yes	No	N/A
28	Are the site-conceptual model tables included? (Tier 1 Risk Evaluation)			X
29	Have the exposure pathways been analyzed? (Tier 2 Risk Evaluation)			X
30	Have the SSTLs for each compound and pathway been calculated? (Tier 2 Risk Evaluation)			X
31	Have recommendations for further action been provided and explained?	X		
32	Has the soil analytical data for the site been provided in tabular format?			X
33	Has the potentiometric data for the site been provided in tabular format? (Table 1)	X		
34	Has the current and historical laboratory data been provided in tabular format?	X		
35	Have the aquifer characteristics been provided and summarized on the appropriate form?			X
36	Have the Site conceptual model tables been included? (Tier 1 Risk Evaluation)			X
37	Has the topographic map been provided with all required elements? (Figure 2)	X		
38	Has the site base map been provided with all required elements? (Figure 3)	X		
39	Have the CoC site maps been provided? (Figure 5)	X		
40	Has the site potentiometric map been provided? (Figure 4)	X		
41	Have the geologic cross-sections been provided?			X
42	Have maps showing the predicted migration of the CoCs through time been provided? (Tier 2 Risk Evaluation)			X
43	Has the site survey been provided and include all necessary elements?			X
44	Have the sampling logs, chain of custody forms, and the analytical data package been included with all required elements? (Appendix F)	X		
45	Is the laboratory performing the analyses properly certified?	X		
46	Has the tax map been included with all necessary elements?			X
47	Have the soil boring/field screening logs been provided?			X
48	Have the well completion logs and SCDHEC Form 1903 been provided?			X
49	Have the aquifer evaluation forms, data, graphs, equations, etc. been provided?			X
50	Have the disposal manifests been provided?			X
51	Has a copy of the local zoning regulations been provided?			X
52	Has all fate and transport modeling been provided?			X
53	Have copies of all access agreements obtained by the contractor been provided?			X
54	Has a copy of this form been attached to the final report and are explanations for any missing or incomplete data been provided?	X		

Underground Storage Tank Management Division
Explanation for missing and incomplete information?

This image shows a full page of blank, lined paper. It features approximately 20 evenly spaced horizontal black lines across its entire width, typical of notebook or legal stationery. The background is a solid off-white color, and there are no margins, text, or other markings present.

Christine A. Caffery

(print name) Christine A. Cafagna

Date August 22, 2025

Appendix E

SCDES Groundwater Sampling Notice to Proceed Letter



SC DEPARTMENT of
**ENVIRONMENTAL
SERVICES**

Erin Jezek
Corrective Action & Field Support Section
Underground Storage Tank Management Division
2600 Bull Street
Columbia, SC 29201

HILTON HEAD PUBLIC SERVICE DISTRICT
PO BOX 21264
HILTON HEAD ISLAND SC 29925

JUN 27 2025

Re: **SSWP Approval and GWS Notice to Proceed**
Hilton Head Public Service District, 21 Oak Park Dr, Hilton Head Island, SC
UST Permit #11399 CA# 70143
Release reported July 27, 2017
Site Specific Work Plan received June 17, 2025
Beaufort County

To Whom It May Concern:

The Underground Storage Tank Management Division (UST Division) of the S.C. Department of Environmental Services has reviewed and approved the referenced Site Specific Work Plan (SSWP) submitted by your contractor. The groundwater sampling event should begin immediately upon receipt of this letter. All work should be conducted in compliance with the current revision of the UST Quality Assurance Program Plan (QAPP), your contractor's Annual Contractor Quality Assurance Plan, and all applicable regulations. The QAPP is available at des.sc.gov/programs/bureau-land-waste-management/underground-storage-tanks/ust-quality-assurance-program-plan-qapp.

Pursuant to S.C. Code Ann. Section 44-2-40(D), "The SUPERB Account and the SUPERB Financial Responsibility Fund shall provide combined coverage for site rehabilitation and third-party claims, respectively, not to exceed one million dollars per occurrence". **According to UST Division records, approximately \$43,576.83 has been expended from the SUPERB Account to date.** This scope of work, as recommended by your contractor, is anticipated to cost approximately \$4,001.33.

The contractor must provide notification to the UST Project Manager via email 4 days prior to initiation of any site rehabilitation activities. If there are any changes to the schedule, the UST Project Manager must be contacted within 24 hours of those changes.

In accordance with Section IV.A.4.c of the SUPERB Site Rehabilitation & Fund Access Regulation (R.61-98), the contractor shall be required to indemnify the property owner, underground storage tank owner/operator and the State of South Carolina from and against all claims, damages, losses and expenses arising out of or resulting from activity conducted by the contractor, its agents, employees or subcontractors.

Your contractor can submit an invoice for direct payment from the State Underground Petroleum Environmental Response Bank (SUPERB) Account for pre-approved costs. **The Monitoring Report, contractor checklist (QAPP Appendix K), and invoice should be submitted to the UST Division within sixty (60) days of the date of this correspondence.** If the invoice is not submitted within 120 days from the date of this letter, monies allocated to pay this invoice will be uncommitted. This means that the invoice will not be processed for payment until all other committed funds are paid or monies become available.

If the report cannot be submitted by the required due date, an extension may be requested by submitting a written request, either via postal mail or email, to my attention prior to the due date. The Department will issue a Notice of Alleged Violation if the report is not submitted by the required due date.

Please note that sections 44-2-110(4) and 44-2-130 of the SUPERB Statute state that the SUPERB Account cannot compensate any costs that are not pre-approved. If for any reason additional tasks will be completed, these additional tasks, and the associated cost, must be pre-approved by the UST Division for the cost to be paid. The UST Division reserves the authority to pay only for work properly performed and/or technically justified and will only pay rates in accordance with established criteria. Further, the UST Division reserves the right to question and/or reject costs if deemed unreasonable and the right to audit project records at any time during the project or after completion of work. **Per Section III.3.b of the SUPERB Site Rehabilitation and Fund Access Regulations (R.61-98), reimbursement for site rehabilitation activities shall in no event exceed the actual costs incurred.**

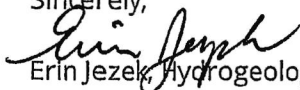
Please note that applicable South Carolina certification requirements regarding laboratory services, well installation, and report preparation must be satisfied. Any site rehabilitation activity associated with the UST release must be performed by a SCDES-certified site rehabilitation contractor as required by the SUPERB Site Rehabilitation and Fund Access Regulation, R.61-98.

The UST Division grants pre-approval for transportation of virgin petroleum impacted soil and groundwater from the referenced site to a permitted treatment facility. There can be no spillage or leakage in transport. All investigation-derived waste (IDW) must be properly contained and labeled prior to disposal. IDW should not be stored on-site longer than ninety (90) days. A copy of the disposal manifest and/or acceptance letter from the receiving facility that clearly designates the quantity received must be included as an appendix to the report. If the Chemical of Concern (CoC) concentrations based on laboratory analysis is below Risk-Based Screening Levels (RBSLs), please contact the project manager for approval to dispose of soil and/or groundwater on-site. The SUPERB Account will not reimburse for transportation or treatment of soil and/or groundwater with concentrations below RBSLs.

The contractor will be responsible for keeping and preserving suitable records of hydrological and other site assessments, site plans, contracts, accounts, invoices, or other transactions related to the cleanup and rehabilitation and the records must be accessible to the department during regular business hours. In addition, this includes all subcontractor agreements, invoices, correspondence, plans, reports, records, including electronic and paper formats. All records must be maintained for 10 years after project completion.

On all correspondence regarding this site, please reference the UST Permit number above. Should you have any questions, please contact me by phone at (803) 898-0608, by fax at (803) 898-0673, or by email at erin.jezek@des.sc.gov.

Sincerely,


Erin Jezek, Hydrogeologist

enc: Approved Cost Agreement

cc: F & ME Consultants Columbia, 211 Business Park Blvd, Columbia SC 29203 (w/ enc)
Technical file (w/ enc)

SUPERB COST AGREEMENT CHECKLIST

III Update payment code, task screen, punch list, status, etc. In tracking system III

UST Permit Name: Hilton Head Public Service District UST Permit #: 11399
Date Release Reported: 7/27/2017 Release #: 2 Project Manager: Erin Jezek
Priority Class (Circle): Emergency / 1 2A 2B 3A 3B 4A 4B 5
Category: ☐ Assessment ☐ ACA ☒ MNA ☐ FP Recovery
Description of Work: GWS
Cost Agreement #: 70143 Amount Approved: \$4,001.33

Cost Agreement Type

Committed/Currently Funded (WS)

SUPERB Paid to Date: \$43,576.83

Non-committed Contracts (WC)

To SUPERB \$25,000 Deductible (W25)

Committed (CA>\$25K)

Prior total toward \$25K: _____

To complete \$25K: _____

Over \$25K: _____

Non-committed (CA<\$25K): _____

Cost Agreement Duration

☒ 4 Months (120 Days)

☐ 2 Months (60 Days)

☐ Other _____

Payee & Address:

F & ME Consultants Columbia

211 Business Park Blvd

Columbia SC 29203

Contractor Certification #:

UCC# 0140

Rate Schedule:

State Lead

IGWA

Tier I

Tier II

Analytical

Sampling

GAC

PO#

O/O Lead

☒ SUPERB Allowable

Analytical

GAC

Other _____

Project Manager:

Erin Jezek

Date:

6/20/2025

Accountant:

Date:

Financial Supervisor:

Date:

Technical Supervisor:

Date:



**SC DEPARTMENT of
ENVIRONMENTAL
SERVICES**

ASSESSMENT COMPONENT COST AGREEMENT
South Carolina Department of Environmental Services
Underground Storage Tank Management Division
State Underground Petroleum Environmental Response Bank Account
August 9, 2023

Facility Name: Hilton Head Public Service District

UST Permit #: 11399

Cost Agreement #: 70143

ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL
A. Plan Preparation				
1.2 Site-specific Work Plan	1	each	\$183.22	\$183.22
2.2 Tax Map		each	\$85.50	\$0.00
3.2 QAPP Contractor Addendum (App B)		each	\$250.00	\$0.00
B. Survey				
1.1 Receptor Survey		each	\$673.06	\$0.00
C. Survey				
1.2 Comprehensive Survey		each	\$1,270.36	\$0.00
5.1 Ground Penetrating Radar Survey (100 x 100)		each	\$1,111.57	\$0.00
D. Mob/Demob				
1.2 Equipment		each	\$1,245.93	\$0.00
2.2 Personnel	1	each	\$516.69	\$516.69
3.2 Adverse Terrain Vehicle		each	\$610.75	\$0.00
E. Soil Borings				
1.1 Soil Borings (hand auger)		foot	\$21.80	\$0.00
F. Soil Borings (requiring equipment, push technology, etc) or Field Screening (including sampling and analyst)				
1.2 Standard		per foot	\$33.50	\$0.00
2.2 Fractured Rock		per foot	\$41.40	\$0.00
G.				
H. Well Abandonment				
1.2 2" diameter or less		per foot	\$3.79	\$0.00
2.2 Greater than 2" to 6" diameter		per foot	\$5.50	\$0.00
3.2 Dug/Bored well (up to 6 feet diameter)		per foot	\$18.32	\$0.00
I. Well Installation (In accordance with R.61-71)				
1.2 Water Table (hand augered)		per foot	\$31.40	\$0.00
2.B Water Table (drill rig) 2" Diameter		per foot	\$54.90	\$0.00
2.2 Single-cased 2" Diameter Monitoring Well >50ft		per foot	\$59.80	\$0.00
3.2 Telescoping		per foot	\$84.70	\$0.00
4.2 Rock Drilling		per foot	\$81.80	\$0.00
5.2 2" Rock Coring		per foot	\$88.50	\$0.00
6.2 Multi-sampling ports/screens		per foot	\$59.40	\$0.00
7.2 Recovery Well (4" diameter)		per foot	\$69.60	\$0.00
9.2 Rotosonic (2" diameter)		per foot	\$119.00	\$0.00
10.2 Re-develop Existing Well		per foot	\$13.44	\$0.00
J. Groundwater Sample Collection / Gauging Depth to Water/Product				
1.2 Groundwater Purge		per well	\$73.29	\$0.00
2.2 Air or Vapors		sample	\$14.66	\$0.00
3.2 Water Supply Sample		sample	\$26.87	\$0.00
4.1A HydraSleeve		sample	\$34.20	\$0.00
4.2B No-purge Groundwater Sample/Surface wa	10	sample	\$57.24	\$572.40
5.2 Gauge Well only	5	sample	\$8.55	\$42.75
6.2 Sample Below Product		sample	\$14.66	\$0.00
7.2 Passive Diffusion Bag		sample	\$31.75	\$0.00
8.2 Field Duplicates (MWs & WSWs) and Field B	2	sample	\$30.06	\$60.12
9.2 Groundwater (low flow purge)	1	sample	\$111.16	\$111.16
10.2 Equipment Blank		sample	\$30.06	\$0.00
11.1 Sample Product		per well	\$52.66	\$0.00
K. Laboratory Analyses-Groundwater				
1.2 BTEXNM+Oxyg's+1,2 DCA+Eth(8260D)	14	per sample	\$149.02	\$2,086.28
2.2 Lead, Filtered		per sample	\$16.85	\$0.00
3.2 Rush EPA Method 8260B		per sample	\$187.62	\$0.00

4.2 Trimethyl, Butyl, and Isopropyl Benzenes	per sample	\$34.20	\$0.00
5.2 PAH's	per sample	\$74.02	\$0.00
6.2 Lead	per sample	\$19.54	\$0.00
7.2 EDB by EPA 8011	per sample	\$55.21	\$0.00
8.2 EDB by EPA Method 8011 Rush	per sample	\$83.31	\$0.00
9.2 8 RCRA Metals	per sample	\$77.45	\$0.00
10.2 TPH (9070)	per sample	\$50.09	\$0.00
11.2 PH	per sample	\$6.35	\$0.00
12.2 BOD	per sample	\$24.42	\$0.00
13.2 Ethanol	per sample	\$18.08	\$0.00
K. Analyses-Drinking Water			
14.2 BTEXNM+1,2 DCA (524.2)	per sample	\$151.52	\$0.00
15.2 7-OXYGENATES & ETHANOL (8260D)	per sample	\$112.07	\$0.00
16.2 EDB (504.1)	per sample	\$97.11	\$0.00
17.2 RCRA METALS (200.8)	per sample	\$122.15	\$0.00
K. Analyses-Soil			
18.2 BTEX + Naphth.	per sample	\$78.18	\$0.00
19.2 PAH's	per sample	\$78.22	\$0.00
20.2 8 RCRA Metals	per sample	\$68.89	\$0.00
21.2 TPH-DRO (3550C/8015C)	per sample	\$48.86	\$0.00
22.2 TPH-GRO (5035B/8015C)	per sample	\$43.92	\$0.00
23.2 Grain size/hydrometer	per sample	\$127.04	\$0.00
24.2 Total Organic Carbon	per sample	\$37.38	\$0.00
K. Analyses-Air			
25.2 BTEX + Naphthalene	per sample	\$263.84	\$0.00
K. Hydrocarbon Fuel Identification			
27.1 C3-C44 Whole Oil (ASTM D3328)	per sample	\$465.93	\$0.00
28.1 Fuel Oxygenates (1624 Mod)	per sample	\$398.39	\$0.00
29.1 ALKYL Leads, EDB MMT (8080)	per sample	\$398.39	\$0.00
30.1 C8-C40 Full Scan (ASTM 5739)	per sample	\$629.64	\$0.00
31.1 Simulated Distillation (ASTM 2887)	per sample	\$398.39	\$0.00
32.1 Parent & Alk. PAH Com. (8270 SIM)	per sample	\$723.63	\$0.00
33.1 C3-C10 Plano (8260 MOD)	per sample	\$599.88	\$0.00
34.1 C10+Alkane Fingerprints	per sample	\$599.88	\$0.00
35.1 Expert Data Interpretation & Report	each	\$595.30	\$0.00
L. Aquifer Characterization			
1.2 Pumping Test	per hour	\$28.09	\$0.00
2.2 Slug Test	per test	\$233.31	\$0.00
3.2 Fractured Rock	per test	\$122.15	\$0.00
M. Free Product			
1.1 Free Product Recovery Rate Test	each	\$46.42	\$0.00
N.			
O. Risk Evaluation			
1.2 Tier I Risk Evaluation	each	\$366.45	\$0.00
2.2 Tier II Risk Evaluation	each	\$122.15	\$0.00
P. Survey			
1.1 Subsequent Survey	each	\$297.65	\$0.00
Q. Disposal (gallons or tons)			
1.2 Wastewater	gallon	\$1.19	\$0.00
2.2 Free Product	gallon	\$1.63	\$0.00
3.2 Soil Treatment/Disposal	ton	\$156.25	\$0.00
4.2 Drilling fluids	gallon	\$1.25	\$0.00
R. Miscellaneous (attach receipts)			
	each	\$0.00	\$0.00
	each	\$0.00	\$0.00
	each	\$0.00	\$0.00
T. Tier I Assessment (Use DHEC 3665 form)			
1.2 Southeast Region	standard	\$12,622.56	\$0.00
2.2 All Other Counties	standard	\$13,844.06	\$0.00
U. IGWA (Use DHEC 3666 form)			
1.2 Southeast Region	standard	\$4,353.67	\$0.00

2.2 All Other Counties		standard	\$4,720.01		\$0.00
22. Active Correction Action		PFP	Bid Cost		\$0.00
W. Aggressive Fluid & Vapor Recovery (AFVR)					
1.2 8-hour Event		per event	\$1,787.40		\$0.00
2.1 24-hour Event		per event	\$4,407.78		\$0.00
3.1 48-hour Event		per event	\$7,242.29		\$0.00
4.1 96-hour Event		per event	\$14,482.28		\$0.00
5.1 Off-gas Treatment 8 hour		per event	\$141.17		\$0.00
6.2 Off-gas Treatment 24 hour		per event	\$294.30		\$0.00
7.2 Off-gas Treatment 48 hour		per event	\$386.10		\$0.00
8.1 Off-gas Treatment 96 hour		per event	\$898.84		\$0.00
9.1 Off-gas Treatment 8 hour (w/chlorinated compounds)		per event	\$464.40		\$0.00
10.1 Off-gas Treatment 24 hour (w/chlorinated compounds)		per event	\$540.00		\$0.00
11.1 Off-gas Treatment 48 hour (w/chlorinated compounds)		per event	\$1,080.00		\$0.00
12.1 Off-gas Treatment 96 hour (w/chlorinated compounds)		per event	\$2,160.00		\$0.00
13.2 AFVR Effluent Disposal(w/chlorinated compounds)		gallon	\$0.64		\$0.00
14.2 AFVR Site Reconnaissance		each	\$302.40		\$0.00
15.1 Additional Hook-ups		each	\$29.68		\$0.00
16.2 AFVR Effluent Disposal		gallon	\$0.53		\$0.00
17.2 AFVR Mobilization/Demobilization		each	\$777.60		\$0.00
18.1 Mobilization for absorbents/skimers		each	\$516.69		\$0.00
19.1 Well sock 2" ID well		each	\$36.94		\$0.00
20.1 Well sock 4" ID well		each	\$49.03		\$0.00
21.1 pad (per pad)		each	\$49.95		\$0.00
22.1 3" diameter x 10' length boom		each	\$108.00		\$0.00
23.1 5" diameter x 10' length boom		each	\$132.84		\$0.00
24.1 New FPP recovery skimmer (2" wells)		each	\$791.10		\$0.00
25.1 New FPP recovery skimmer (4" wells)		each	\$1,247.40		\$0.00
26.1 Refurbished FPP recovery skimmer (2" or 4" wells)		each	\$760.32		\$0.00
27.1 Disposal of Absorbents		pound	\$4.10		\$0.00
28.1 Disposal of product from skimmers		gallon	\$0.50		\$0.00
X. Granulated Activated Carbon (GAC) filter system installation & service					
1.2 New GAC System Installation		each	\$2,320.86		\$0.00
2.2 Refurbished GAC Sys. Install		each	\$1,099.35		\$0.00
3.2 Filter replacement/removal		each	\$427.53		\$0.00
4.2 GAC System removal, cleaning, & refurbishment		each	\$335.92		\$0.00
5.2 GAC System housing		each	\$305.38		\$0.00
6.2 In-line particulate filter		each	\$183.22		\$0.00
7.2 Additional piping & fittings		foot	\$1.84		\$0.00
Y. Well Repair					
1.2 Additional Copies of the Report Delivered		each	\$61.07		\$0.00
2.2 Repair 2x2 MW pad		each	\$61.07		\$0.00
3.2 Repair 4x4 MW pad		each	\$107.49		\$0.00
4.2 Replace well vault		each	\$144.14		\$0.00
5.2 Replace well cover bolts		each	\$3.18		\$0.00
6.2 Replace locking well cap & lock		each	\$18.32		\$0.00
7.2 Replace/Repair stick-up		each	\$163.68		\$0.00
8.2 Convert Flush-mount to Stick-up		each	\$183.22		\$0.00
9.2 Convert Stick-up to Flush-mount		each	\$158.79		\$0.00
10.2 Replace missing/illegible well ID plate		each	\$14.66		\$0.00
11.1 Down-hole Camera		per foot	\$29.25		\$0.00
Z. High Resolution Site Characterization					
1.1 HRSC Screening Equipment Mobilization		each	\$1,468.80		\$0.00
2.1 HRSC Drilling Category 1		per foot	\$31.32		\$0.00
3.1 HRSC Drilling Category 2		per foot	\$36.18		\$0.00
4.1 HRSC Drilling Category 3		per foot	\$29.16		\$0.00
5.1 HRSC 3-D Model		each	\$4,363.20		\$0.00
S. Report Prep & Project Management	12%	percent	\$3,572.62		\$428.71
TOTAL					\$4,001.33

TABLES

- 1 - Summary of Groundwater Elevations**
- 2 - Summary of Groundwater COC Analytical Results**
- 3 - Summary of Groundwater Oxygenate Analytical Results**

Table 1
Summary of Groundwater Table Elevations
HHI PSD Release #2
Hilton Head Island, SC
SCDHEC Permit #11399

Well No.	Date Installed	Date Measured	Screened Interval (feet bgs)	TOC Elevation (feet MSL)	TOC to Product Level (feet MSL)	TOC to Water Level (feet MSL)	Free Product Petroleum (FPP) Thickness (feet)	Water Table Elevation (feet MSL)
MW-1	6/15/2018	06/18/2018	2-12	12.80	5.21	5.48	0.27	7.40
		04/20/2021			5.18	7.93	-	FP
		08/25/2022			3.16	3.29	1.17	9.51
		07/26/2023			5.50	5.55	0.42	7.25
		06/05/2024			4.88	5.07	1.62	7.73
		07/23/2025			4.55	4.62	0.64	8.18
MW-2	6/15/2018	06/18/2018	3-13	14.29	-	6.09	-	8.20
		04/20/2021			-	6.56	-	7.73
		08/25/2022			-	4.35	-	9.94
		07/26/2023			-	6.43	-	7.86
		06/05/2024			-	6.07	-	8.22
		07/23/2025			-	5.65	-	8.64
MW-3	6/15/2018	06/18/2018	3-13	14.13	-	6.09	-	8.04
		04/20/2021			-	6.50	-	7.63
		08/25/2022			-	4.25	-	9.88
		07/26/2023			-	6.41	-	7.72
		06/05/2024			-	5.96	-	8.17
		07/23/2025			-	5.36	-	8.77
MW-4	4/19/2021	04/20/2021	3-13	13.17	-	6.14	-	7.03
		08/25/2022			-	3.83	-	9.34
		07/26/2023			-	6.07	-	7.10
		06/05/2024			-	5.63	-	7.54
		07/23/2025			-	5.14	-	8.03
MW-5	4/19/2021	04/20/2021	4-14	12.95	-	5.88	-	7.07
		08/25/2022			-	3.63	-	9.32
		07/26/2023			-	5.83	-	7.12
		06/05/2024			-	5.42	-	7.53
		07/23/2025			-	5.00	-	7.95
MW-6	4/20/2021	04/20/2021	4-14	13.30	-	6.20	-	7.10
		08/25/2022			-	3.88	-	9.42
		07/26/2023			-	6.01	-	7.29
		06/05/2024			-	5.78	-	7.52
		07/23/2025			-	5.58	-	7.72
MW-7	4/20/2021	04/20/2021	3-13	12.61	-	5.65	-	6.96
		08/25/2022			-	3.24	-	9.37
		07/26/2023			-	5.65	-	6.96
		06/05/2024			-	5.10	-	7.51
		07/23/2025			-	4.41	-	8.20
MW-8	4/20/2021	04/20/2021	4-14	13.00	-	5.86	-	7.14
		08/25/2022			-	3.61	-	9.39
		07/26/2023			-	5.72	-	7.28
		06/05/2024			-	5.41	-	7.59
		07/23/2025			-	5.05	-	7.95
MW-9	4/20/2021	04/20/2021	3.5-13.5	12.91	-	5.87	-	7.04
		08/25/2022			3.52	3.60	0.70	9.31
		07/26/2023			5.74	5.81	0.61	7.10
		06/05/2024			5.12	5.32	1.77	7.59
		07/23/2025			4.75	4.81	0.55	8.10
MW-10	4/20/2021	04/20/2021	3.5-13.5	12.71	-	5.78	-	6.93
		08/25/2022			-	3.46	-	9.25
		07/26/2023			-	5.72	-	6.99
		06/05/2024			-	5.23	-	7.48
		07/23/2025			-	4.54	-	8.17
MW-11	8/23/2022	08/25/2022	3-13	12.46	-	2.75	-	9.71
		07/26/2023			-	5.30	-	7.16
		06/05/2024			-	4.85	-	7.61
		07/23/2025			-	4.47	-	7.99
MW-12	8/23/2022	08/25/2022	3-13	12.62	-	3.22	-	9.40
		07/26/2023			5.39	5.47	0.74	7.15
		06/05/2024			4.83	5.02	1.69	7.60
		07/23/2025			4.49	4.64	1.33	7.98
MW-13	8/22/2022	08/25/2022	3-13	12.88	3.52	3.58	0.52	9.30
		07/26/2023			5.65	5.75	0.83	7.13
		06/05/2024			5.17	5.31	1.25	7.57
		07/23/2025			4.71	4.82	0.96	8.06
DCW-1	4/19/2021	04/20/2021	29-34	12.92	-	5.85	-	7.07
		08/25/2022			-	3.56	-	9.36
		07/26/2023			-	5.76	-	7.16
		06/05/2024			-	5.36	-	7.56
		07/23/2025			-	4.91	-	8.01
RW-01	8/23/2022	08/25/2022	2-12	12.47	-	3.17	-	9.30
		07/26/2023			5.25	5.34	0.75	7.13
		06/05/2024			4.78	4.91	1.14	7.56
		07/23/2025			4.27	4.42	1.31	8.05
RW-02	8/24/2022	08/25/2022	2-12	12.55	3.22	3.23	0.07	9.32
		07/26/2023			5.42	5.43	0.08	7.12
		06/05/2024			-	5.01	-	7.54
		07/23/2025			-	4.61	-	7.94

Notes: Groundwater data from sampling events on 6/18/18 and 4/20/21 were taken from the AECOM Tier 1 and Tier II reports.
Corrected TOC Water Level and Water Table Elevation due to the presence of free product (Diesel).
Screened Interval measurement is represented in feet below ground surface.
TOC = Top of Casing
(bgs) = below ground surface
FP=Free Product. The corrected TOC Water Table Elevation was not calculated. Taken from the AECOM Tier I report.



Table 2
Summary of Groundwater COC Analytical Results (µg/L)
HHI PSD Release #2
Hilton Head Island, SC
SCDHEC Permit #11399

VOCs									
Sample ID	Sample Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylene (Total) (µg/L)	Naphthalene (µg/L)	MTBE (µg/L)	1,2-DCA (µg/L)	EDB (µg/L)
SCDHEC RBSLs		5	1,000	700	10,000	25	NS	5	0.05
MW-1	6/18/2018	Free Product/Not Sampled (0.07-foot thickness)							
	4/21/2021	Free Product/Not Sampled (Not reported)							
	8/25/2022	Free Product/Not Sampled (1.17-foot thickness)							
	7/26/2023	Free Product/Not Sampled (0.42-foot thickness)							
	6/5/2024	Free Product/Not Sampled (1.62-foot thickness)							
	7/23/2025	Free Product/Not Sampled (0.64-foot thickness)							
MW-2	6/18/2018	<1	<1	<1	<1	<1	<1	<1	NA
	4/21/2021	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	NA
	8/25/2022	<0.23	<0.55	<0.24	<0.78	<1.1	<0.24	<0.32	NA
	7/26/2023	<0.26	<0.33	<0.24	<0.76	<1.8	<0.23	<0.29	<0.016
	6/5/2024	<0.20	0.40J	<0.28	<0.64	<1.6	<0.18	<0.21	<0.004
	7/23/2025	<0.20	<0.20	<0.28	<0.27	<1.6	<0.18	<0.21	NA
MW-3	6/18/2018	<1	<1	<1	<1	<1	<1	<1	NA
	4/22/2021	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	NA
	8/25/2022	<0.23	<0.55	<0.24	<0.78	<1.1	<0.24	<0.32	NA
	7/26/2023	<0.26	<0.33	<0.24	<0.76	<1.8	<0.23	<0.29	<0.015
	6/5/2024	<0.20	0.36J	<0.28	<0.64	<1.6	<0.18	<0.21	<0.004
	7/23/2025	<0.20	<0.20	<0.28	<0.27	<1.6	<0.18	<0.21	NA
MW-4	4/22/2021	7.4	<0.40	7.7	21	0.78	<0.40	<0.40	NA
	8/25/2022	<0.23	<0.55	<0.24	<0.78	<1.1	<0.24	<0.32	NA
	7/26/2023	<0.26	<0.33	<0.24	<0.76	<1.8	<0.23	<0.29	<0.015
	6/5/2024	<0.20	0.34J	<0.28	<0.64	<1.6	<0.18	<0.21	<0.005
	7/23/2025	<0.20	0.28J	<0.28	<0.27	<1.6	<0.18	<0.21	NA
	4/22/2021	9.5	<0.40	26	7.9	9.6	<0.40	<0.40	NA
MW-5	8/25/2022	<0.23	<0.55	<0.24	<0.78	<1.1	<0.24	<0.32	NA
	7/26/2023	0.53J	<0.33	13	<0.76	32	<0.23	<0.29	<0.015
	6/5/2024	<0.20	0.24J	<0.28	<0.64	4.9J	<0.18	<0.21	<0.004
	7/23/2025	<0.20	0.32J	<0.28	<0.27	<1.6	<0.18	<0.21	NA
	4/22/2021	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	NA
	8/25/2022	<0.23	<0.55	<0.24	<0.78	<1.1	<0.24	<0.32	NA
MW-6	7/26/2023	<0.26	<0.33	<0.24	<0.76	<1.8	<0.23	<0.29	<0.016
	6/5/2024	<0.20	0.31J	<0.28	<0.64	<1.6	<0.18	<0.21	<0.004
	7/23/2025	<0.20	<0.20	<0.28	<0.27	<1.6	<0.18	<0.21	NA
	4/22/2021	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	NA
	8/25/2022	<0.23	<0.55	<0.24	<0.78	<1.1	<0.24	<0.32	NA
	7/26/2023	<0.26	<0.33	<0.24	<0.76	<1.8	<0.23	<0.29	<0.015
MW-7	6/5/2024	<0.20	<0.20	<0.28	<0.64	<1.6	<0.18	<0.21	<0.004
	7/23/2025	<0.20	0.26J	<0.28	<0.27	<1.6	<0.18	<0.21	NA
	4/22/2021	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	NA
	8/25/2022	<0.23	<0.55	<0.24	<0.78	<1.1	<0.24	<0.32	NA
	7/26/2023	<0.26	<0.33	<0.24	<0.76	<1.8	<0.23	<0.29	<0.016
	6/5/2024	<0.20	0.39J	<0.28	<0.64	<1.6	<0.18	<0.21	<0.005
MW-8	7/23/2025	<0.20	<0.20	<0.28	<0.27	<1.6	<0.18	<0.21	NA
	4/22/2021	45	37	60	170	14	1.9	<0.40	NA
	4/22/21 (Dup)	44	34	55	160	14	2.4	<0.40	NA
	8/25/2022	Free Product/Not Sampled (0.07-foot thickness)							
	7/26/2023	Free Product/Not Sampled (0.61-foot thickness)							
	6/5/2024	Free Product/Not Sampled (1.77-foot thickness)							
MW-9	7/23/2025	Free Product/Not Sampled (0.55-foot thickness)							

Table 2
Summary of Groundwater COC Analytical Results (µg/L)
HHI PSD Release #2
Hilton Head Island, SC
SCDHEC Permit #11399

VOCs									
Sample ID	Sample Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylene (Total) (µg/L)	Naphthalene (µg/L)	MTBE (µg/L)	1,2-DCA (µg/L)	EDB (µg/L)
SCDHEC RBSLs		5	1,000	700	10,000	25	NS	5	0.05
MW-10	4/22/2021	<0.40	<0.40	0.65	3.2	<0.40	<0.40	<0.40	NA
	8/25/2022	<0.23	<0.55	<0.24	<0.78	<1.1	<0.24	<0.32	NA
	7/26/2023	<0.26	<0.33	<0.24	<0.76	<1.8	<0.23	<0.29	<0.015
	6/5/2024	<0.20	0.33J	<0.28	<0.64	<1.6	<0.18	<0.21	<0.005
	7/23/2025	<0.20	<0.20	<0.28	<0.27	<1.6	<0.18	<0.21	NA
MW-11	8/25/2022	<0.23	<0.55	<0.24	<0.78	<1.1	<0.24	<0.32	NA
	7/26/2023	<0.26	<0.33	<0.24	<0.76	<1.8	<0.23	<0.29	<0.015
	7/26/23 (Dup)	<0.26	<0.33	<0.24	<0.76	<1.8	<0.23	<0.29	<0.015
	6/5/2024	<0.20	0.42J	<0.28	<0.64	<1.6	<0.18	<0.21	<0.004
	7/23/2025	<0.20	0.25J	<0.28	<0.27	<1.6	<0.18	<0.21	NA
MW-12	8/25/2022	7.4	<0.55	57	24.36J	53	<0.24	<0.32	NA
	7/26/2023	Free Product/Not Sampled (0.74-foot thickness)							
	6/5/2024	Free Product/Not Sampled (1.69-foot thickness)							
	7/23/2025	Free Product/Not Sampled (1.33-foot thickness)							
MW-13	8/25/2022	Free Product/Not Sampled (0.52-foot thickness)							
	7/26/2023	Free Product/Not Sampled (0.83-foot thickness)							
	6/5/2024	Free Product/Not Sampled (1.25-foot thickness)							
	7/23/2025	Free Product/Not Sampled (0.96-foot thickness)							
DCW-1	4/22/2021	<0.40	0.49	1.6	1.2	1.1	<0.40	<0.40	NA
	8/25/2022	<0.23	<0.55	<0.24	<0.78	<1.1	<0.24	<0.32	NA
	7/26/2023	<0.26	1.9	0.26J	1.22J	<1.8	<0.23	<0.29	<0.015
	6/5/2024	<0.20	3	<0.28	0.69J	<1.6	<0.18	<0.21	<0.004
	7/23/2025	<0.20	<0.20	<0.28	<0.27	<1.6	<0.18	<0.21	NA
RW-01	8/25/2022	3.3	<0.55	50	14	35	<0.24	<0.32	NA
	7/26/2023	Free Product/Not Sampled (0.75-foot thickness)							
	6/5/2024	Free Product/Not Sampled (1.14-foot thickness)							
	7/23/2025	Free Product/Not Sampled (1.31-foot thickness)							
RW-02	8/25/2022	Free Product/Not Sampled (0.07-foot thickness)							
	7/26/2023	Free Product/Not Sampled (0.08-foot thickness)							
	6/5/2024	0.23J	1.8	12	<0.64	17	<0.18	<0.21	<0.005
	6/5/2024 (Dup)	0.26J	0.64J	12	<0.64	16	<0.18	<0.21	<0.004
	7/23/2025	<0.20	0.29J	2.9	<0.27	4.1J	<0.18	<0.21	NA
	7/23/2025 (Dup)	<0.20	0.23J	3.1	0.37J	5.7	<0.18	<0.21	NA

Notes:

At or above SCDHEC RBSLs as listed in SCDHEC's UST QAPP Revision 4.0.

Bold = CoC detected above MDL.

SCDHEC RBSLs are for a sandy soil and are taken from Table D1 in Appendix D of the SCDHEC's Quality Assurance Program Plan (QAPP) Revision 4.0

NA = Not Analyzed

(NS) - No Standard Exists

Concentrations are reported in micrograms per liter (µg/L).

J = Estimated value detected below Reporting Limit

Dup= duplicate sample

Table 3
Summary of Groundwater Oxygenate Analytical Results (µg/L)
HHI PSD Release #2
Hilton Head Island, SC
SCDHEC Permit #11399

Well No.	Date Sampled	tert-Amyl Alcohol (µg/L)	tert-Amylmethyl ether (µg/L)	tert-Butyl Formate (µg/L)	Di-Isopropyl Ether (µg/L)	3,3-Dimethyl-1-Butanol (µg/L)	Ethanol (µg/L)	Ethyl-tert-Butyl Ether (µg/L)	tert-Butyl Alcohol (µg/L)
Action Levels for Groundwater (Oxygenates)	–	240	128	None	150	None	10,000	47	1,400
MW-1	6/18/2018	Free Product/Not Sampled (0.07-foot thickness)							
	4/21/2021	Free Product/Not Sampled (Not reported)							
	8/25/2022	Free Product/Not Sampled (1.17-foot thickness)							
	7/26/2023	Free Product/Not Sampled (0.42-foot thickness)							
	6/5/2024	Free Product/Not Sampled (1.62-foot thickness)							
	7/23/2025	Free Product/Not Sampled (0.64-foot thickness)							
MW-2	6/18/2018	<100	<10	<50	<1	<100	297	<10	<100
	4/21/2021	<8.0	<0.42	<2.0	<0.40	<8.0	<52	<0.40	<0.40
	8/25/2022	<31	<4.2	<33	<3.0	<40	<53	<3.8	<35
	7/26/2023	<31	<4.2	<33	<2.4	<40	<53	<3.8	<35
	6/5/2024	<34	<3.0	<33	<2.8	<34	<47	<2.5	<30
	7/23/2025	<34	<3.1	<33	<2.8	<34	<47	<2.5	<30
MW-3	6/18/2018	<100	<10	<50	<1	<100	209	<10	<100
	4/21/2021	<8.0	<0.42	<2.0	<0.40	<8.0	<52	<0.40	<0.40
	8/25/2022	<31	<4.2	<33	<3.0	<40	<53	<3.8	<35
	7/26/2023	<31	<4.2	<33	<2.4	<40	<53	<3.8	<35
	6/5/2024	<34	<3.0	<33	<2.8	<34	<47	<2.5	<30
	7/23/2025	<34	<3.1	<33	<2.8	<34	<47	<2.5	<30
MW-4	4/21/2021	<8.0	<0.42	<2.0	<0.40	<8.0	<52	<0.40	<0.40
	8/25/2022	<31	<4.2	<33	<3.0	<40	<53	<3.8	<35
	7/26/2023	<31	<4.2	<33	<2.4	<40	<53	<3.8	<35
	6/5/2024	<34	<3.0	<33	<2.8	<34	<47	<2.5	<30
	7/23/2025	<34	<3.1	<33	<2.8	<34	<47	<2.5	<30
MW-5	4/21/2021	<8.0	<0.42	<2.0	<0.40	<8.0	<52	<0.40	<0.40
	8/25/2022	<31	<4.2	<33	<3.0	<40	<53	<3.8	<35
	7/26/2023	<31	<4.2	<33	<2.4	<40	<53	<3.8	<35
	6/5/2024	<34	<3.0	<33	<2.8	<34	<47	<2.5	<30
	7/23/2025	<34	<3.1	<33	<2.8	<34	<47	<2.5	<30
MW-6	4/21/2021	<8.0	<0.42	<2.0	<0.40	<8.0	<52	<0.40	<0.40
	8/25/2022	<31	<4.2	<33	<3.0	<40	<53	<3.8	<35
	7/26/2023	<31	<4.2	<33	<2.4	<40	<53	<3.8	<35
	6/5/2024	<34	<3.0	<33	<2.8	<34	<47	<2.5	<30
	7/23/2025	<34	<3.1	<33	<2.8	<34	<47	<2.5	<30
MW-7	4/21/2021	<8.0	<0.42	<2.0	<0.40	<8.0	<52	<0.40	<0.40
	8/25/2022	<31	<4.2	<33	<3.0	<40	<53	<3.8	<35
	7/26/2023	<31	<4.2	<33	<2.4	<40	<53	<3.8	<35
	6/5/2024	<34	<3.0	<33	<2.8	<34	<47	<2.5	<30
	7/23/2025	<34	<3.1	<33	<2.8	<34	<47	<2.5	<30
MW-8	4/21/2021	<8.0	<0.42	<2.0	<0.40	<8.0	<52	<0.40	<0.40
	8/25/2022	<31	<4.2	<33	<3.0	<40	<53	<3.8	<35
	7/26/2023	<31	<4.2	<33	<2.4	<40	<53	<3.8	<35
	6/5/2024	<34	<3.0	<33	<2.8	<34	<47	<2.5	<30
	7/23/2025	<34	<3.1	<33	<2.8	<34	<47	<2.5	<30
MW-9	4/21/2021	<8.0	<0.42	<2.0	<0.40	<8.0	<52	2.4	1.4
	4/22/21 (Dup)	<8.0	<0.42	<2.0	<0.40	<8.0	<52	2.8	1.4
	8/25/2022	Free Product/Not Sampled (0.07-foot thickness)							
	7/26/2023	Free Product/Not Sampled (0.61-foot thickness)							
	6/5/2024	Free Product/Not Sampled (1.77-foot thickness)							
	7/23/2025	Free Product/Not Sampled (0.55-foot thickness)							

Table 3
Summary of Groundwater Oxygenate Analytical Results (µg/L)
HHI PSD Release #2
Hilton Head Island, SC
SCDHEC Permit #11399

Well No.	Date Sampled	tert-Amyl Alcohol (µg/L)	tert-Amylmethyl ether (µg/L)	tert-Butyl Formate (µg/L)	Di-Isopropyl Ether (µg/L)	3,3-Dimethyl-1-Butanol (µg/L)	Ethanol (µg/L)	Ethyl-tert-Butyl Ether (µg/L)	tert-Butyl Alcohol (µg/L)
MW-10	4/22/2021	<8.0	<0.42	<2.0	<0.40	<8.0	<52	<0.40	<0.40
	8/25/2022	<31	<4.2	<33	<3.0	<40	<53	<3.8	<35
	7/26/2023	<31	<4.2	<33	<2.4	<40	<53	<3.8	<35
	6/5/2024	<34	<3.0	<33	<2.8	<34	<47	<2.5	<30
	7/23/2025	<34	<3.1	<33	<2.8	<34	<47	<2.5	<30
MW-11	8/25/2022	<31	<4.2	<33	<3.0	<40	<53	<3.8	<35
	7/26/2023	<31	<4.2	<33	<2.4	<40	<53	<3.8	<35
	7/26/2023 (Dup)	<31	<4.2	<33	<2.4	<40	<53	<3.8	<35
	6/5/2024	<34	<3.0	<33	<2.8	<34	<47	<2.5	<30
	7/23/2025	<34	<3.1	<33	<2.8	<34	<47	<2.5	<30
MW-12	8/25/2022	<31	<4.2	<33	<3.0	<40	<53	<3.8	<35
	7/26/2023	Free Product/Not Sampled (0.74-foot thickness)							
	6/5/2024	Free Product/Not Sampled (1.69-foot thickness)							
	7/23/2025	Free Product/Not Sampled (1.33-foot thickness)							
MW-13	8/25/2022	Free Product/Not Sampled (0.52-foot thickness)							
	7/26/2023	Free Product/Not Sampled (0.83-foot thickness)							
	6/5/2024	Free Product/Not Sampled (1.25-foot thickness)							
	7/23/2025	Free Product/Not Sampled (0.96-foot thickness)							
DCW-1	4/22/2021	<8.0	<0.42	<2.0	<0.40	<8.0	<52	<0.40	<0.40
	8/25/2022	<31	<4.2	<33	<3.0	<40	<53	<3.8	<35
	8/25/2022 (Dup)	<31	<4.2	<33	<3.0	<40	<53	<3.8	<35
	7/26/2023	<31	<4.2	<33	<2.4	<40	<53	<3.8	<35
	6/5/2024	<34	<3.0	<33	<2.8	<34	<47	<2.5	<30
	7/23/2025	<34	<3.1	<33	<2.8	<34	<47	<2.5	<30
RW-1	8/25/2022	<31	<4.2	<33	<3.0	<40	310	<3.8	<35
	7/26/2023	Free Product/Not Sampled (0.75-foot thickness)							
	6/5/2024	Free Product/Not Sampled (1.14-foot thickness)							
	7/23/2025	Free Product/Not Sampled (1.31-foot thickness)							
RW-2	8/25/2022	Free Product/Not Sampled (0.07-foot thickness)							
	7/26/2023	Free Product/Not Sampled (0.08-foot thickness)							
	6/5/2024	<34	<3.0	<33	<2.8	<34	<47	<2.5	<30
	6/5/2024 (Dup)	<34	<3.0	<33	<2.8	<34	<47	<2.5	<30
	7/23/2025	<34	<3.1	<33	<2.8	<34	<47	<2.5	<30
	7/23/2025 (Dup)	<34	<3.1	<33	<2.8	<34	<47	<2.5	<30

Notes: At or above SCDHEC RBSLs as listed in SCDHEC's UST QAPP Revision 4.0.
Bold = CoC detected above MDL.
Concentrations are represented in micrograms per liter (µg/L)
NA = Not Analyzed
J = Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
Action Levels for Groundwater Oxygenates taken from SCDHEC QAPP Revision 4.0
Dup= duplicate sample



SC DEPARTMENT of
**ENVIRONMENTAL
SERVICES**

Erin Jezek
Corrective Action & Field Support Section
Underground Storage Tank Management Division
2600 Bull Street
Columbia, SC, 29201

HILTON HEAD PUBLIC SERVICE DISTRICT
PO BOX 21264
HILTON HEAD ISLAND SC 29925

OCT 02 2025

Re: **Notification of Site-Specific Target Levels & Strategy to Closure**
Hilton Head Public Service District, 21 Oak Park Dr, Hilton Head, SC
UST Permit #11399
Release reported July 27, 2017
Monitoring Report received August 26, 2025
Beaufort County



To Whom It May Concern :

The Underground Storage Tank (UST) Management Division of the South Carolina Department of Environmental Services (SCDES) has established Site-Specific Target Levels (SSTLs) for the referenced release. The SSTLs are being provided to you and your contractor to help plan the investigative and remedial activities that are required.

Pursuant to S.C. Code Ann. Section 44-2-40(D), "The SUPERB Account and the SUPERB Financial Responsibility Fund shall provide combined coverage for site rehabilitation and third-party claims, respectively, not to exceed one million dollars per occurrence". **According to UST Division records, approximately \$47,578.16 has been expended from the SUPERB Account to date.**

Due to the type of release on this site, diesel, the wells that are clear of free petroleum product have little to no contamination of any Chemicals of Concern (CoCs) and thus, the UST department does not currently have SSTLs for your site. Once the free product is removed, we will assess the contamination of dissolved constituents in the wells and determine the SSTLs for your site. Your consultant should use previous assessment data to evaluate site rehabilitation options as indicated in the Quality Assurance Program Plan for the UST Management Division (QAPP § A6.XIV, and B1.IV.). A Strategy to Closure document has been enclosed with points of consideration and discussion to be utilized in the development of the corrective action and closure strategy for this release. To assist in the selection of potential remedial technologies, please review the check lists at this link. <https://des.sc.gov/programs/bureau-land-waste-management/underground-storage-tanks/ust-owneroperator-information>

A meeting has been set for November 4th, 2025 at 10:30 AM to discuss the proposed path to closure for this release. Please contact me **within 15 days** of the date of this letter to confirm the meeting date and time. In addition, please review and complete the Strategy to Closure document and remedial checklists

and **return them within 30 days** from the date of this letter. The Strategy to Closure document and remedial checklists should be utilized in the development of the closure strategy for this release.

On all correspondence concerning this site, please reference UST Permit number above. Should you have any questions, please contact me by phone at (803) 898-0608, by fax at (803) 898-0673, or by email at erin.jezek@des.sc.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Erin Jezek", written in a cursive style.

Erin Jezek, Hydrogeologist
Corrective Action & Quality Assurance Section
Underground Storage Tank Management Division
Bureau of Land and Waste Management

enc: Strategy to Closure Form
Targeted Scope Cost Agreement
Table of Free Product SSTLs

cc: F & ME Consultants Columbia, 211 Business Park Blvd, Columbia SC 292038/26/25 (w/ enc)
Quincy Hoffer (w/o enc)
Technical file (w/ enc)

Hilton Head Public Service District, UST #11399
Beaufort County

Free Product Thickness (FP) SSTLs

	Current FPP Thickness	Free Product SSTL
MW-1	0.64	0.01
MW-9	0.55	0.01
MW-12	1.33	0.01
MW-13	0.96	0.01
RW-1	1.31	0.01

*Free Product Thicknesses are in feet



SC DEPARTMENT of
**ENVIRONMENTAL
SERVICES**

**STRATEGY TO CLOSURE PROPOSAL: HILTON HEAD PUBLIC SERVICE DISTRICT , PERMIT #11399, Release
Reported: July 27, 2017**

The UST Site Rehabilitation Contractor, on behalf of the owner/operator for the above reference release, proposes the work specified below to achieve Site-Specific Target Levels for the release and to achieve a Conditional No Further Action Determination.

I certify that this company:

- ☐ Has reviewed the technical file for the release and understands the nature of the release(s) and the geologic conditions at the site as documented in the technical file. Any quantities listed below are estimates and changes to those quantities or to the listed method(s) will be further detailed in a Corrective Action Plan submitted to SCDES.
- ☐ Has conducted a site visit and understands the physical layout of the property, the location(s) of any identified receptors, and any limitations that may exist on or off property as it may relate to the possible implementation of any proposed corrective action strategy.

UST Site Rehabilitation Contractor (Print)

UST Site Rehabilitation Contractor Certification #

Registered Professional Name (Print)

Registered Professional Signature (required)

P.G. ☐ P.E. ☐ (Check appropriate box)

Professional Certification # _____

I (the UST tank owner) certify that I:

- Have discussed the proposed strategy with the UST Site Rehabilitation Contractor and agree with the proposal as put forth.
- Understand that costs up to \$1 million SUPERB combined coverage may be utilized, and the UST Management Division reserves the right to set aside funds for the purpose of verifying achievement of remedial goals and understands that costs in excess of the \$1 million combined SUPERB coverage are my responsibility as the UST owner.

In addition, I (the UST tank owner) understand that a meeting (in person or virtual) will be scheduled between the UST Management Division, my selected contractor, and myself to discuss the proposed Strategy to Closure. (Please check one of the options below)

- ☐ I will be present during the meeting to participate in the discussion.
- ☐ I will not be present during the meeting to participate in the discussion. I consent to allowing my selected contractor to make any decisions necessary regarding the remedial design, including associated costs, on my behalf.

UST Owner (Print)

UST Owner Signature

State of _____ County of _____

Signed before me on _____ by _____
(date) Name of Person

My Commission Expires On _____

Notary Seal/Stamp Above

CLOSURE STRATEGY CONSIDERATIONS

1. Please provide appropriate information regarding the proposed treatment techniques that are proposed to be implemented at the site. Include the approximate number of injection points, the approximate number of extraction points, approximate volume of excavated material, approximate volume of injected material, etc., if known at this time. **Only** method(s) and/or technology(ies) that will be implemented on site should be included.
2. Complete remedial checklists that support the applicability of the technology for the constituents and geology present at the site. (<https://des.sc.gov/programs/bureau-land-waste-management/underground-storage-tanks/ust-owneroperator-information>)
3. Describe how implementation of the proposed treatment techniques will achieve the Site-Specific Target Levels for dissolved and/or free-phase products.
4. Approximate the amount of time in months for each phase of treatment to be implemented.
5. Approximate the amount of time, in months, it is anticipated that SSTLs will be achieved.
6. Would limited source treatment/removal achieve concentrations below SSTLs or does the extent of off-site contamination require a full-scale corrective action system? Is the proposed corrective action strategy limited to source removal/reduction or will treatment outside the source area be required? Please explain.
7. Please provide information on the length of time after attainment of SSTLs that additional monitoring would be needed to meet the conditions for a CNFA determination. Additionally, how will the monitoring results be used to determine that conditional closure requirements are met. (See Section III.B.3.e of the SUPERB Site Rehabilitation and Fund Access Regulations R.61-98 and the Quality Assurance Program Plan for the UST Management Division for details regarding the conditions required a conditional closure)
8. Please provide an estimated total cost to implement this corrective action strategy to achieve a CNFA determination and site closure. The estimate should include a breakdown of each aspect of the corrective action strategy (e.g. source treatment, dissolved plume treatment, MNA monitoring, etc.)
9. Please provide a contingent remedial strategy if the proposed remedial methods fail to achieve the SSTLs within the required time frame. This information can be generalized.
10. Please provide any other relevant information that may be utilized for the purposes of supporting the closure strategy.

Please note, per R.61-98, reimbursement for site rehabilitation activities shall in no event exceed the actual costs incurred.

In determination of costs, the SUPERB Allowable Rates should be utilized where applicable.

In accordance with Section 44-2-130, the owner or operator responsible for conducting the site rehabilitation or his agents shall keep and preserve suitable records of hydrological and other site assessments, site plans, accounts. Invoices, or other transactions related to the cleanup and rehabilitation and the records must be accessible to the

department during regular business hours. In addition, all subcontractor agreements, invoices, correspondence, plans, reports, and records, including all electronic and paper formats must be maintained.



**SC DEPARTMENT of
ENVIRONMENTAL
SERVICES**

TARGETED COMPONENT COST AGREEMENT
South Carolina
Department Environmental Services
Underground Storage Tank Management Division
State Underground Petroleum Environmental Response Bank Account
July 1, 2024

Facility Name: _____

UST Permit #: _____ Cost Agreement #: _____

ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL
C. Survey				
1.2 Comprehensive Survey		each	\$1,270.36	\$0.00
5.1 Ground Penetrating Radar Survey (100 x 100)		each	\$1,111.57	\$0.00
D. Mob/Demob				
1.2 Equipment		each	\$1,245.93	\$0.00
2.2 Personnel		each	\$516.69	\$0.00
3.2 Adverse Terrain Vehicle		each	\$610.75	\$0.00
E. Soil Borings*				
1.1 Soil Borings (hand auger)		foot	\$21.80	\$0.00
F. Soil Borings (requiring equipment, push technology, etc) or Field Screening (including sampling and analyst)*				
1.2 Standard		per foot	\$33.50	\$0.00
2.2 Fractured Rock		per foot	\$41.40	\$0.00
H. Well Abandonment (does not include Field Screening)*				
1.2 2" diameter or less		per foot	\$3.79	\$0.00
2.2 Greater than 2" to 6" diameter		per foot	\$5.50	\$0.00
3.2 Dug/Bored well (up to 6 feet diameter)		per foot	\$18.32	\$0.00
I. Well Installation (In accordance with R.61-71)*				
1.2 Water Table (hand augered)		per foot	\$31.40	\$0.00
2.B Water Table (drill rig) 2" Diameter		per foot	\$54.90	\$0.00
2.2 Single-cased 2" Diameter Monitoring Well >50ft		per foot	\$59.80	\$0.00
3.2 Telescoping		per foot	\$84.70	\$0.00
4.2 Rock Drilling		per foot	\$81.80	\$0.00
5.2 2" Rock Coring		per foot	\$88.50	\$0.00
6.2 Multi-sampling ports/screens		per foot	\$59.40	\$0.00
7.2 Recovery Well (4" diameter)		per foot	\$69.60	\$0.00
9.2 Rotosonic (2" diameter)		per foot	\$119.00	\$0.00
10.2 Re-develop Existing Well		per foot	\$13.44	\$0.00
J. Groundwater Sample Collection / Gauging Depth to Water/Product*				
1.2 Groundwater Purge		per well	\$73.29	\$0.00
2.2 Air or Vapors		sample	\$14.66	\$0.00
3.2 Water Supply Sample		sample	\$26.87	\$0.00
4.1A HydraSleeve		sample	\$34.20	\$0.00
4.2B No-purge Groundwater Sample/Surface water		sample	\$57.24	\$0.00
5.2 Gauge Well only		sample	\$8.55	\$0.00
6.2 Sample Below Product		sample	\$14.66	\$0.00
7.2 Passive Diffusion Bag		sample	\$31.75	\$0.00
8.2 Field Duplicates (MWs & WSWs) and Field Blanks		sample	\$30.06	\$0.00
9.2 Groundwater (low flow purge)		sample	\$111.16	\$0.00
10.2 Equipment Blank		sample	\$30.06	\$0.00
11.1 Sample Product		per well	\$52.66	\$0.00
K. Laboratory Analyses-Groundwater				
1.2 BTEXNM+Oxyg's+1,2 DCA+Eth(8260D)		per sample	\$149.02	\$0.00
2.2 Lead, Filtered		per sample	\$16.85	\$0.00
3.2 Rush EPA Method 8260B		per sample	\$187.62	\$0.00
4.2 Trimethal, Butyl, and Isopropyl Benzenes		per sample	\$34.20	\$0.00
5.2 PAH's		per sample	\$74.02	\$0.00
6.2 Lead		per sample	\$19.54	\$0.00
7.2 EDB by EPA 8011		per sample	\$55.21	\$0.00
8.2 EDB by EPA Method 8011 Rush		per sample	\$83.31	\$0.00
9.2 8 RCRA Metals		per sample	\$77.45	\$0.00
10.2 TPH (9070)		per sample	\$50.09	\$0.00
11.2 PH		per sample	\$6.35	\$0.00
12.2 BOD		per sample	\$24.42	\$0.00
13.2 Ethanol		per sample	\$18.08	\$0.00

Addendum

Previously Approved: \$0.00

Increase: \$0.00

New Approved Total: \$0.00

Project Manager: _____

Section Manager: _____

Finance: _____

Date: 9/29/2025

of pages

From:

UST/SCDHEC

Email: _____

Fax # () _____

Phone # () _____

The SCDES reserves the authority to pay only for work properly performed and/or technically justified and will only pay rates in accordance with established criteria.

K. Analyses-Drinking Water					
14.2 BTEXNM+1,2 DCA (524.2)		per sample	\$151.52		\$0.00
15.2 7-OXYGENATES & ETHANOL (8260D)		per sample	\$112.07		\$0.00
16.2 EDB (504.1)		per sample	\$97.11		\$0.00
17.2 RCRA METALS (200.8)		per sample	\$122.15		\$0.00
K. Analyses-Soil					
18.2 BTEX + Naphth.		per sample	\$78.18		\$0.00
19.2 PAH's		per sample	\$78.22		\$0.00
20.2 8 RCRA Metals		per sample	\$68.89		\$0.00
21.2 TPH-DRO (3550C/8015C)		per sample	\$48.86		\$0.00
22.2 TPH-GRO (5035B/8015C)		per sample	\$43.92		\$0.00
23.2 Grain size/hydrometer		per sample	\$127.04		\$0.00
24.2 Total Organic Carbon		per sample	\$37.38		\$0.00
P. Survey*					
1.1 Subsequent Survey		each	\$297.65		\$0.00
Q. Disposal (gallons or tons)*					
1.2 Wastewater		gallon	\$1.19		\$0.00
2.2 Free Product		gallon	\$1.63		\$0.00
3.2 Soil Treatment/Disposal		ton	\$156.25		\$0.00
4.2 Drilling fluids		gallon	\$1.25		\$0.00
R. Miscellaneous (attach receipts)					
1. Targeted Corrective Action (see Attached Table)	1	each	\$0.00		\$0.00
W. Aggressive Fluid & Vapor Recovery (AFVR)					
1.2 8-hour Event		per event	\$1,787.40		\$0.00
2.1 24-hour Event		per event	\$4,407.78		\$0.00
3.1 48-hour Event		per event	\$7,242.29		\$0.00
4.1 96-hour Event		per event	\$14,482.28		\$0.00
5.1 Off-gas Treatment 8 hour		per event	\$141.17		\$0.00
6.2 Off-gas Treatment 24 hour		per event	\$294.30		\$0.00
7.2 Off-gas Treatment 48 hour		per event	\$386.10		\$0.00
8.1 Off-gas Treatment 96 hour		per event	\$898.84		\$0.00
9.1 Off-gas Treatment 8 hour (w/chlorinated compounds)		per event	\$464.40		\$0.00
10.1 Off-gas Treatment 24 hour (w/chlorinated compounds)		per event	\$540.00		\$0.00
11.1 Off-gas Treatment 48 hour (w/chlorinated compounds)		per event	\$1,080.00		\$0.00
12.1 Off-gas Treatment 96 hour (w/chlorinated compounds)		per event	\$2,160.00		\$0.00
13.2 AFVR Effluent Disposal(w/chlorinated compounds)		gallon	\$0.64		\$0.00
14.2 AFVR Site Reconnaissance		each	\$302.40		\$0.00
15.1 Additional Hook-ups		each	\$29.68		\$0.00
16.2 AFVR Effluent Disposal		gallon	\$0.53		\$0.00
17.2 AFVR Mobilization/Demobilization		each	\$777.60		\$0.00
Z. High Resolution Site Characterization					
1.1 HRSC Screening Equipment Mobilization		each	\$1,468.80		\$0.00
2.1 HRSC Drilling Category 1		per foot	\$31.32		\$0.00
3.1 HRSC Drilling Category 2		per foot	\$36.18		\$0.00
4.1 HRSC Drilling Category 3		per foot	\$29.16		\$0.00
5.1 HRSC 3-D Model		each	\$4,363.20		\$0.00
S. Report Prep & Project Management		12%	percent	\$0.00	\$0.00
TOTAL					\$0.00

DHEC D-4294 (06/2022) *The appropriate mobilization cost can be added to complete these tasks, as necessary

ITEM					
R. Miscellaneous (attach receipts)	QUANTITY	UNIT	UNIT PRICE		TOTAL
Corrective Action Plan		each			\$0.00
I. Injection					
Injectate		per event			\$0.00
Injection Services		per event			\$0.00
Secondary Parameter Analysis		each			\$0.00
II. Enhanced AFVR					\$0.00
Injectate		per event			\$0.00
Injection Services		per event			\$0.00
Secondary Parameter Analysis		each			\$0.00
		each			\$0.00
III. Excavation					\$0.00
Excavation Services*		each			\$0.00
Backfill Material		ton			\$0.00
Backfill Additive		ton			\$0.00
Proctor/Compaction Testing		per event			\$0.00
Sheet Piling		per event			\$0.00
Dewatering Equipment		per event			\$0.00
Excavation Security/Fencing		per event			\$0.00
TOTAL					\$0.00

October 30, 2025

Ms. Erin Jezek
UST Management Division
SCDES, BLWM
2600 Bull Street
Columbia, SC 29201



Re: HHI PSD Release #2 – Strategy to Closure Summary
21 Oak Park Drive
Hilton Head Island, South Carolina 29926
Beaufort County
SCDES UST Permit #11399
Release Reported: Release #2 (July 27, 2017)

RECEIVED

NOV 04 2025

UST DIVISION

Dear Erin,

FME Consultants Inc. (FME) is proposing to use an Enhanced Aggressive Fluid Vapor Recover (E-AFVR) as a first step to get the Hilton Head Island Public Service Department (HHI PSD) site in Beaufort County to closure. A groundwater corrective action has been requested by South Carolina Department of Environmental Services (SCDES) in correspondence dated October 2, 2025. At this time, free product petroleum (FPP) (diesel), remains within five (5) monitoring and recovery wells at the HHI PSD site, as of our last sampling event in July 2025. In SCDES's October 2, 2025 correspondence, SCDES established interim Site-Specific Target Levels (SSTL) for FPP of <0.01 feet. Based on a brief meeting with SCDES and information provided, it is SCDES intention to get this site to closure within two (2) years.

Proposed Treatment – Enhanced Aggressive Fluid Vapor Recover (E-AFVR)

Based on collaboration with the Ivey Sol scientists, we are proposing to install "Ivey Sol 106" surfactant in the source area, specifically in existing recovery wells RW-1 and RW-2 as well as a new recovery well RW-3, to facilitate the desorption and extraction of FPP. Refer to Attachment #1 (Figures) for site and well locations. Proposed RW-3 will be a 4-inch diameter well to be installed between MW-9 and MW-13. A series of up to three (3) injection of Ivey Sol, followed by AFVR extractions, would be used to meet the interim SSTL. Ivey Sol is surfactant technology that is comprised of patented/proprietary formulations that makes FPP miscible in aqueous phase for enhanced mass removal. Please refer to Attachment #2, Ivey Sol information.

For each injection/extraction event, 30-gallons of the petroleum surfactant (i.e., 10-gallons at each RW well), at a 4% mix ratio (i.e., 265 gallons of surfactant-water mix injected at each RW well). Ivey Sol, will be injected 24-hours prior to the AFVR event to aid the FPP mobilization during the proposed AFVR event. A 24-hour AFVR will be conducted following injection, during which up to 10,000 gallons of petroleum impacted groundwater will be removed and disposed. Approximately



30 days following the AFVR event, F&ME personnel will gauge onsite monitoring and recovery wells for groundwater elevations, as well as for the presence of FPP (if any). If measurable FPP remains (i.e., greater than 0.01-foot of FPP), the injection/extraction will be repeated for up to a total of three (3) events. A copy of SCDES's AFVR checklist is included in Attachment #3 (SCDES Checklist and Correspondence).

It is understood that to facilitate the proposed treatment method, FME will need to prepare an abbreviated Underground Injection Control (UIC) Permit application for SCDES personnel to obtain approval for the groundwater treatment injections proposed here. This would be prepared after the preparation of, submittal, and approval by SCDES of a Corrective Action Plan (CAP).

Post-Injection/Extraction Monitoring:

As noted above, approximately 30-days following an injection/extraction event, onsite wells be gauged for groundwater elevations, as well as for the presence of FPP (if any). If measurable FPP remains (i.e., greater than 0.01-foot of FPP), the injection/extraction will be repeated up to a total of three (3) events. If no FPP remains after 30-days from an event, a second gauging event will occur after 30-additional days (i.e., 60-days after extraction) to determine if another injection/extraction event would be warranted. If after two (2) gauging events with no FPP measured, FME will perform a comprehensive sampling event to sample each well onsite and submit samples for laboratory analysis in accordance with the QAPP.

During the comprehensive sampling event, each well will be purged prior to sampling. Low flow purging and sampling methods will be used for each well. As required by the Revision 4.0 QAPP, an equipment blank will be collected and submitted for lab analysis for the submersible pump used for purging and sampling.

FME will prepare and submit evaluation reports to the SCDHEC Project Manager via email after each injection/extraction event, and following gauging activities. A comprehensive technical report to include each injection/extraction event information and the comprehensive groundwater sampling event will be provided after the groundwater sampling report is completed.

Schedule

FME has prepared an estimated schedule of the work described in this letter. However, the schedule is at this point approximated. Additionally, scheduling will be highly dependent upon subcontractor availability. However, we have provided an estimated schedule of work below for planning purposes only (see Inset #1).

INSET #1
Estimated Interim SSTL Work Schedule
HHI PSD Site
Hilton Head, Beaufort County, SC

Site Closeout Activity	Estimated Start Date	Estimated End Date	Approximate Duration (days)
CAP and UIC Preparation/Submittal to SCDES	5-Jan-26	14-Feb-26	40
UIC Approval/CAP Approval	14-Feb-26	7-Mar-26	21
PUPS/811/Install RW-3	7-Mar-26	6-Apr-26	30
Pre Planning Preparation, Scheduling Injection/AFVR, Ordering Materials Event 1	6-Apr-26	27-Apr-26	21
Event 1 Injection/Extraction	27-Apr-26	2-May-26	5
One month of Stasis/Followed by GW Gauging (Event 1)	2-May-26	6-Jun-26	35
Pre Planning Preparation, Scheduling Injection/AFVR, Ordering Materials Event 2*	6-Jun-26	20-Jun-26	14
Event 2 Injection/Extraction*	20-Jun-26	25-Jun-26	5
One month of Stasis/Followed by GW Gauging (Event 2)	25-Jun-26	30-Jul-26	35
Pre Planning Preparation, Scheduling Injection/AFVR, Ordering Materials Event 3*	30-Jul-26	13-Aug-26	14
Event 3 Injection/Extraction*	13-Aug-26	18-Aug-26	5
One month of Stasis/Followed by GW Gauging (Event 3)	18-Aug-26	22-Sep-26	35
Onsite GW Sampling**	22-Sep-26	29-Sep-26	7
Laboratory Analysis Time	29-Sep-26	13-Oct-26	14
Report Preparation and Submission to SCDES	13-Oct-26	27-Nov-26	45

* If needed. If gauging indicates less than 0.01-feet of FPP, another 30-days will elapse before a repeat gauging event.

** If less than 0.01-feet of FPP detected in two (2) back-to-back monthly gauging events, then comprehensive GW sampling/analysis will occur.

Alternative to E-AFVR

Please note that if E-AFVR does not appear to be effective, i.e., if subsequent gauging events do not indicate a significant decrease in FPP thickness and after discussion with SCDES personnel, an alternative route to site closure will be implemented. FME recommends that FPP belt skimmers be installed and used at RW-1, RW-2, and RW-3 (proposed) as an alternative treatment method. FPP skimmers are easy to install, easy to monitor effectiveness, and have been successful in past installations. Refer to <https://www.abanaki.com/product/petroextractor-well-oil-skimmer/> (or similar) for general information on FPP well skimmers.

Payment for Services

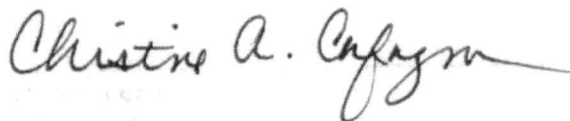
Please note that FME intends to request interim or milestone payment from the SUPERB account for services rendered after each E-AFVR and gauging event is complete. FME will provide a summary of work completed following injection task, AFVR event, and groundwater gauging. This will allow FME to be paid for product ordered/injected and AFVR subcontractor(s) to be paid in timely manner. Final payment will be requested after the groundwater sampling/analysis report.

As a means to estimate the cost of this remedial approach and strategy to site closure, we have prepared an **estimated** cost agreement, included here as Attachment #4. Please note that this is only provided as an estimate, and an updated cost agreement will be provided in the formal CAP.

If you have any questions concerning our proposal, or if we can provide any additional information, please feel free to contact us at (803) 719-6489 or ccafagna@fmeconsultants.com. We sincerely appreciate this opportunity.

Sincerely,

F&ME CONSULTANTS



Christine A. Cafagna
Senior Environmental Manager

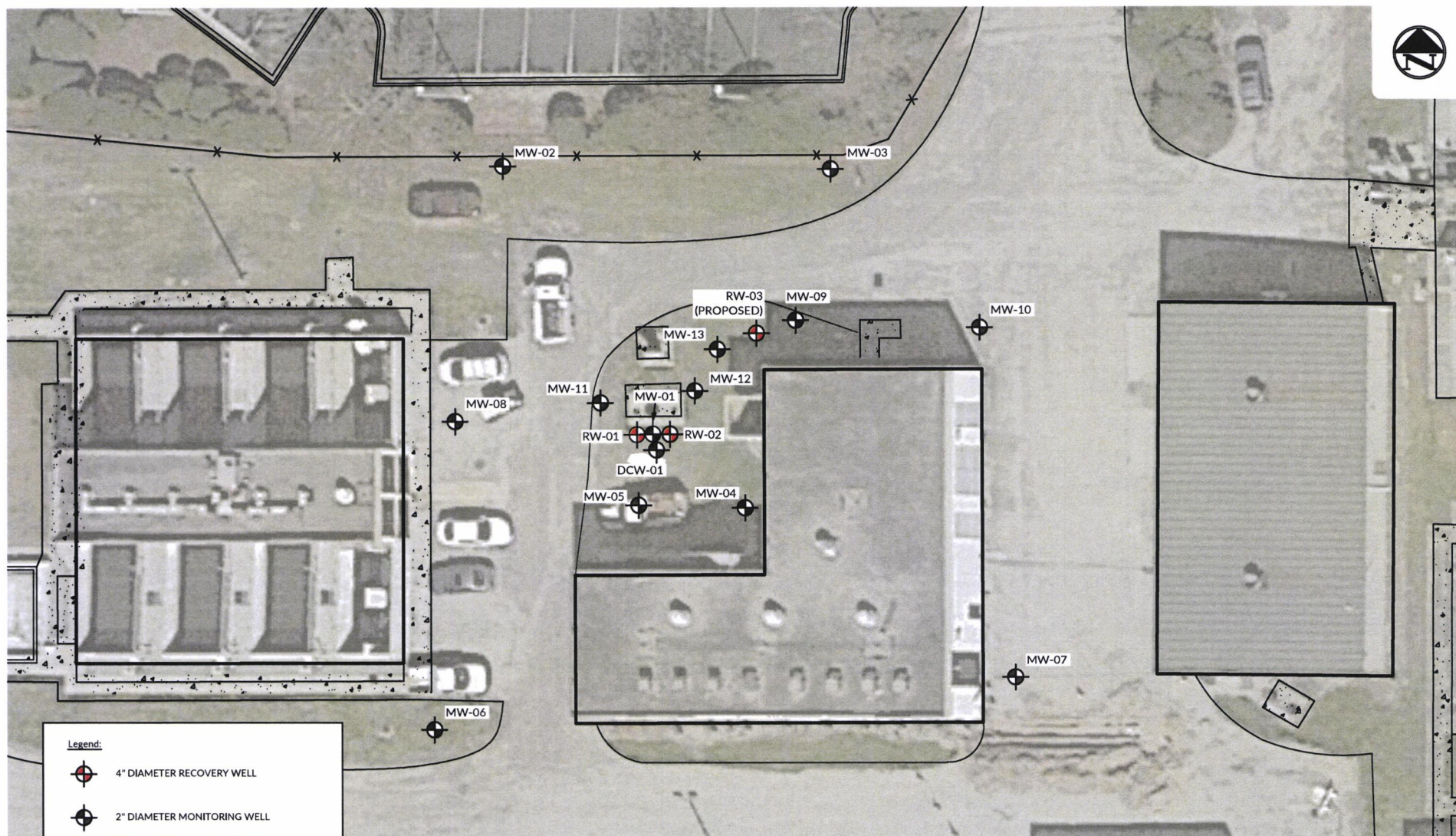
cc: Bill Davis, HHI PSD

Attachments:

- #1 – Figures
- #2 – Ivey Sol Information
- #3 – SCDES Checklist and Correspondence
- #4 – Cost Estimate (preliminary, to be updated based on CAP)

Attachment #1

Figures



Legend:



4" DIAMETER RECOVERY WELL



2" DIAMETER MONITORING WELL

GRAPHIC SCALE



DRAWN BY:	CTC	ORIGINAL:	
APPROVED BY:	CAC	DATE:	October 29, 2025
NOTES:		REVISIONS:	
		1.	
		2.	
		3.	
		SCALE:	1"=20'



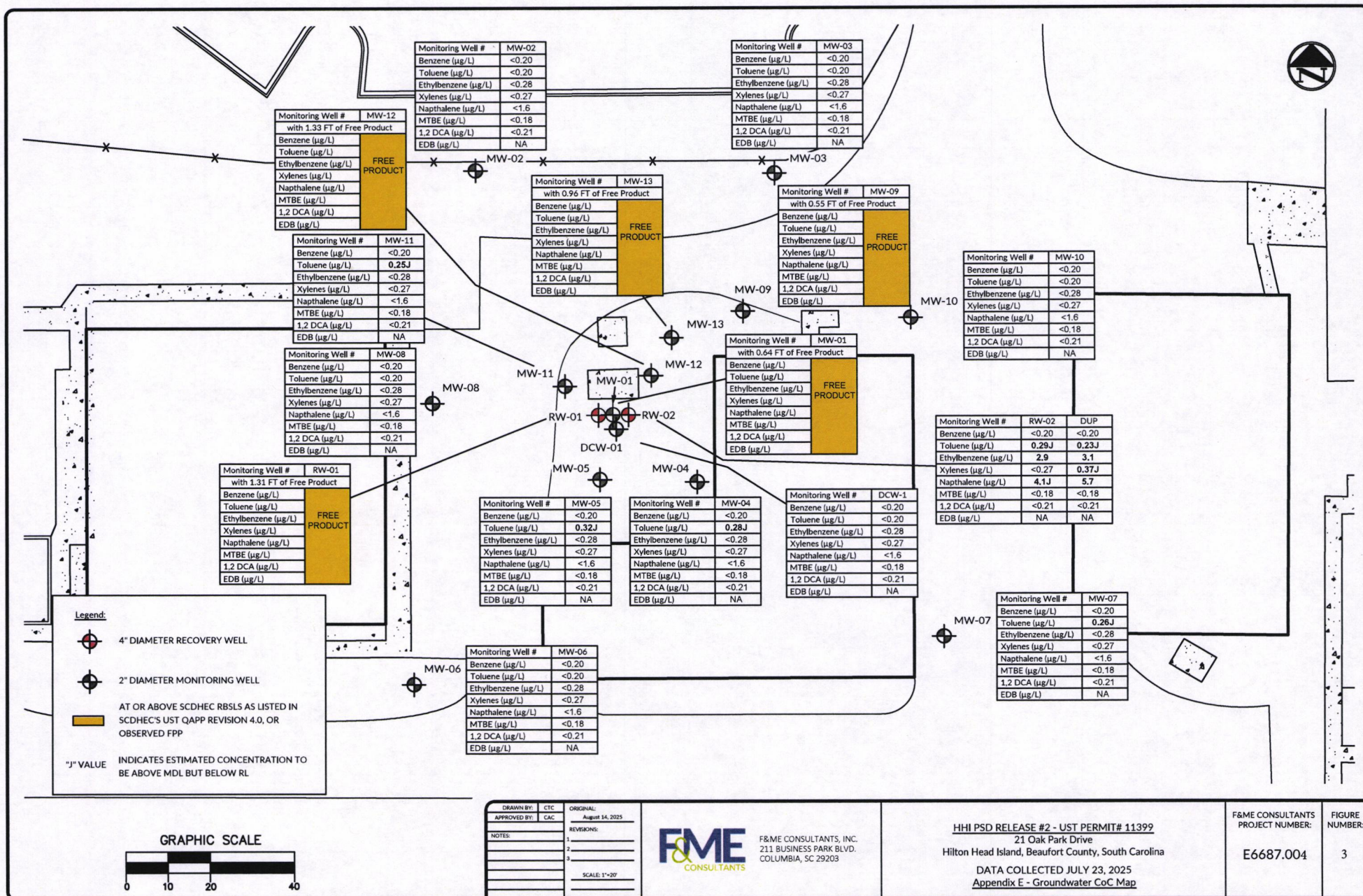
F&M CONSULTANTS, INC.
211 BUSINESS PARK BLVD.
COLUMBIA, SC 29203

HHI PSD RELEASE #2 - UST PERMIT# 11399
21 Oak Park Drive
Hilton Head Island, Beaufort County, South Carolina

WELL LOCATION PLAN

F&M CONSULTANTS
PROJECT NUMBER:
E6687.004

FIGURE
NUMBER:
2



DRAWN BY:	CTC	ORIGINAL:	August 14, 2025
APPROVED BY:	CAC	REVISIONS:	
NOTES:		1	
		2	
		3	
		SCALE: 1"=50'	



F&M CONSULTANTS, INC.
211 BUSINESS PARK BLVD.
COLUMBIA, SC 29203

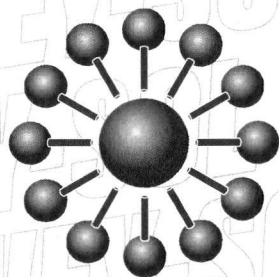
HHI PSD RELEASE #2 - UST PERMIT# 11399
21 Oak Park Drive
Hilton Head Island, Beaufort County, South Carolina
DATA COLLECTED JULY 23, 2025
Appendix E - Groundwater CoC Map

F&M CONSULTANTS
PROJECT NUMBER:
E6687.004

FIGURE
NUMBER:
3

Attachment #2

Ivey Sol Information



IVEY-SOL[®]
Surfactant Technology

**Ivey-sol[®] Surfactant Remediation
Technology for treatment of petroleum
hydrocarbon, chlorinated solvent,
PFAS, and Organometallic impacted
soil and groundwater**

**Free of Unwanted By-Products Including:
PFOA, PFAS, 1,4 Dioxane, Dioxins, Furans and Tested
and Free of USEPA Regulated Contaminates.**

Powering Site Remediation for Over 25 Years



**2020 Top 10 Environmental Technology
Solution Providers - Award Enterprise
Technology Review**



**2019 CV Best Environmental
& Remediation Solutions Award**



**2018 EBJ Technology
Merit Remediation Award**



**2018 CV Best Environmental
Tech Development Company Award**



**2011 MISTIC Environmental
Excellence Award**



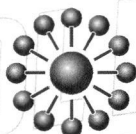
**2011 Roy F. Weston Award
Significant Contributions to Field
of Industrial Waste Management**



**2006 North American
Frost & Sullivan Award for
Technology Innovation**



**2006 Globe Award for
Environmental Innovation
and Application**

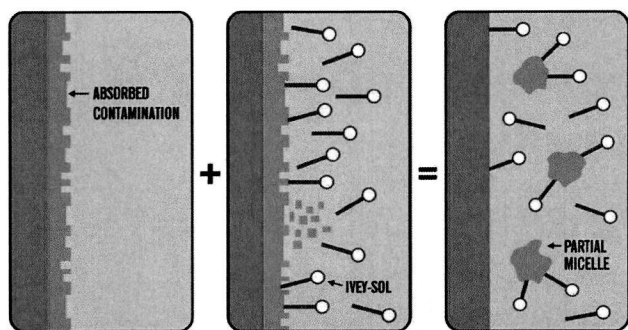


Ivey International Inc.
Today's environmental solutions for a better tomorrow[™]

ivey-sol.com

IVEY-SOL SURFACTANT REMEDIATION TECHNOLOGY

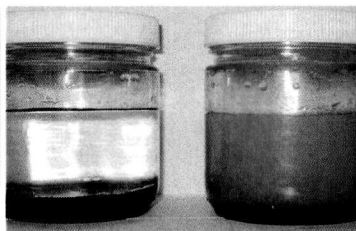
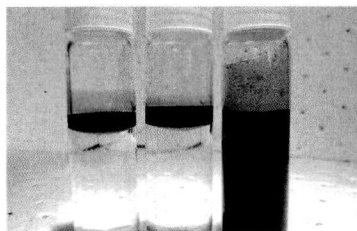
Ivey-sol® Surfactant Technology is comprised of several patented and/or proprietary non-ionic surfactant formulations (biodegradable) that have the unique ability to selectively desorb sorbed (i.e., absorbed and/or adsorbed) contaminants and make free-product (NAPL) miscible in the aqueous phase for enhanced mass removal (See Mechanism). This includes the broad range of Light Non Aqueous Phase Liquids (LNAPL) like petroleum hydrocarbons (API >10), and the Dense Non Aqueous Phase Liquids (DNAPL) including chlorinated solvents (API <10). Ivey-sol® has also been used for the remediation of recalcitrant compounds within fine to coarse soil textures, marine sediments and fractured bedrock, and within the groundwater table and associated smear-zones and capillary zones, with favorable results.



Ivey-sol® desorbing contamination off the soil surfaces, or from NAPL (i.e. LNAPL and/or DNAPL) layers making them more 'Available' for in-situ or ex-situ remediation. The three (3) main Ivey-sol® application processes that were developed over two (2) decades for enhancing in-situ and ex-situ remediation of: Vapors/VOC, Soil/Bedrock (sorbed), and Groundwater (Dissolved, LNAPL, and Smear-Zone) COC site remediation, are outlined as follows:

SER® SURFACTANT ENHANCED REMEDIATION

In-situ and ex-situ application processes to liberate sorbed and/or LNAPL COC making them more miscible (soluble) and more 'Physically-Available' for mass removal via 'Push-Pull™' or 'Pump & Treatment' type remediation methods.



SEB® SURFACTANT ENHANCED BIOREMEDIATION

In-situ and ex-situ application processes to liberate contaminants making them more 'Biologically Available' for microbial (bacteria) and associated enzymatic degradation. SEB® improves both in-situ and/or ex-situ bioremediation treatment methods.

SEC® SURFACTANT ENHANCED CHEMICALIZATION

In-situ and ex-situ application processes to liberate contaminants making them more 'Chemically-Available' for chemical REDOX (i.e. Reduction or Oxidation or combined) by chemical agents.

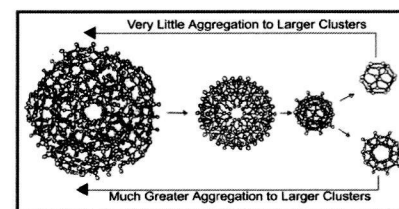


IVEY-SOL® WATER CLUSTER SIZE REDUCTION

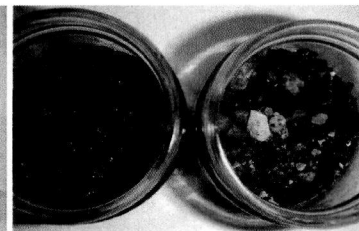
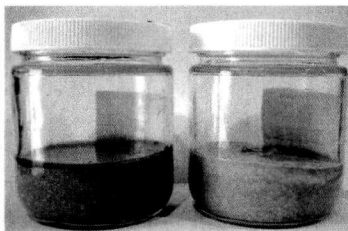
Ivey-sol® surfactants, when introduced into contaminated soil and groundwater regimes, can reduce the surface tension of water from 73 dynes to <30 dynes. This capacity improves the wetting ability, and movement, of the aqueous phase in the soil and groundwater (unsaturated and saturated) zones, and the relative 'Hydraulic Conductivity' (K), while Ivey-sol® is present. Once Ivey-sol® applications are completed the original site conditions return to normal.

The Ivey-sol® surfactants accomplished this by reducing the size and formation of large water-clusters to smaller water-clusters (See below). In doing so, the Ivey-sol® allows the water clusters to become smaller, and to penetrate into less permeable soils such as: clays, silty-clay, silty-sand, sands with silty and clay content to weathered and fractured bedrock, improving NAPL, sorbed and dissolved phase petroleum hydrocarbon and chlorinated solvent remediation.

Ivey-sol® reducing water cluster size for improved transport within fine grain soils.



A variety of Ivey-sol® application images are provided along the footer of this page showing the capacity and efficiency of this technology to enhance vapor, soil and groundwater remediation.





Ivey-sol 106 surfactant is mixed with water, with the addition of a conservative tracer for monitoring purposes, prior to injection.

SURFACTANT TECHNOLOGY ENHANCES REMEDIATION AT CONTAMINATED GRAIN ELEVATOR SITE

By Eric Dulle and George 'Bud' Ivey

Grain elevators are an enduring symbol of agricultural tradition. Unfortunately, they present environmental problems, due to a legacy of the agricultural industry's use of synthetic chemicals to help grow, store, and transport food. Since the 1970s, for example, grain producers have used fumigants containing chemicals such as carbon tetrachloride (CT) to protect stored grains from fungus and rot.

Fumigants were typically stored in above-ground storage tanks at grain elevator sites, ready for use as needed. As professionals in the remediation industry well know, where there are storage tanks, there are leaks, and where there

are leaks, there is the potential for soil and groundwater contamination. Such contamination is the reality at most, if not all, grain elevator sites.

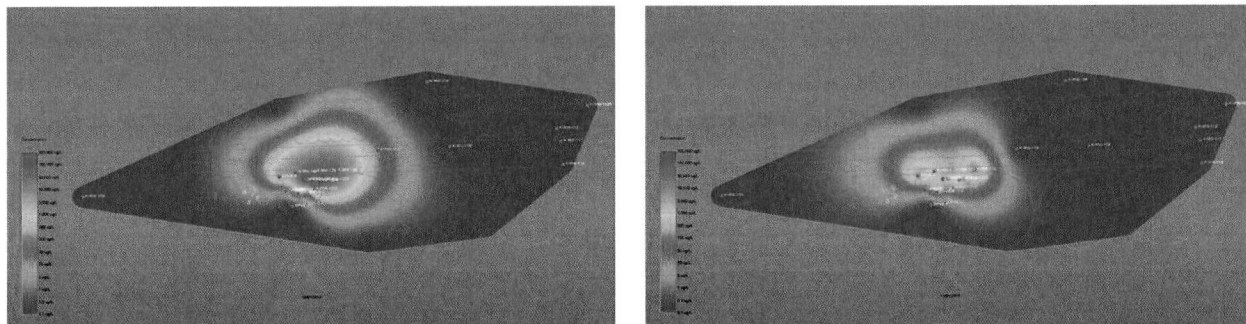
During the 1970s and 1980s, the owner/operator of a still-active grain elevator facility had regularly applied 80/20 grain fumigant (i.e., 80% CT and 20% carbon disulfide), as was common during that era. The fumigant compound was stored in an above-ground storage tank on the property before its removal in the 1990s.

The site entered into a voluntary cleanup and property redevelopment program in 2000, following soil and groundwater detection of fumigant constituents

of concern (COCs). These were primarily CT, but also carbon disulfide, chloroform, and methylene chloride. Groundwater impacts extended about 122 m down gradient from the site (the "source area").

To remediate the site, Burns & McDonnell Engineering Company, the consulting engineer for the project, recommended the installation of a dual-phase extraction (DPE) system. It has been operating since 2007.

Remediation options at the site were significantly limited due to access constraints associated with ongoing facility operations, a steep grade change from the access point to the source area, active mainline railroad tracks, and



Constituents of concern (COC) concentrations in groundwater plume before and after Ivey-sol application.

other utilities and structures throughout the impacted area. Nonetheless, the remediation team was able to successfully and safely install the DPE system, including eight extraction wells, within the source area.

Over the period from 2007 to 2014, the system achieved significant contaminant mass reduction, removing over 4,130 kg of COCs in the vapour and dissolved phases. About 28.5 million litres of groundwater were recovered and treated during this time period.

Evaluations of DPE performance in 2014 found that, while the system had succeeded in removing a very large amount of mass and significantly reducing the lateral extent of the source area, a subset of source-area extraction wells continued to exhibit elevated (i.e., source-level) COC concentrations in groundwater. The system had dramatically reduced source mass and prevented migration of the plume as intended, but a remnant, highly concentrated source still required remediation.

As a result, an additional investigation was conducted using high-resolution site characterization techniques to assess the nature and extent of residual COC mass in the source area. The investigation results indicated significant sorbed-phase COC mass, generally

limited to the shallow, sandy interval of an area bound by the DPE wells exhibiting elevated COC concentrations. Historical light non-aqueous phase liquid (LNAPL), heavily impacted with the site COCs, was also identified.

Burns & McDonnell used the data generated by the investigation to evaluate alternatives for expediting the source-area remediation and maximizing the effectiveness of the DPE system. During the course of evaluating alternatives, a presentation at a remediation industry conference, describing a project with similar site conditions, led Burns & McDonnell to believe that surfactant-enhanced extraction (SEE) would be a viable option. The company also had a previous relationship with surfactant technology developer Ivey International Inc. (Ivey) in a separate petroleum remediation project.

Based on these factors, Burns & McDonnell decided to conduct a SEE pilot study in 2015 using the Ivey-sol® 106 (CI) surfactant formulation, which was specially designed to treat chlorinated solvents at the site. If the pilot study yielded positive results, a full-scale project would follow.

Ivey-sol® SEE surfactant products consist of several patented and/or proprietary non-ionic formulations that

can selectively desorb sorbed COCs and render NAPLs miscible in the aqueous phase. Surfactants have a structure with a hydrophilic head and a hydrophobic tail; the hydrophobic tail attracts and attaches to the organic portion of CT and similar molecules, while the hydrophilic head attracts to groundwater, thereby making the CT molecules miscible.

Ivey-sol can do this without emulsifying the COCs, thereby increasing their availability for remediation, while not impacting the performance of wastewater treatment systems.

Ivey's products accomplish three goals. Firstly, surfactants overcome the "limitation" challenges associated with contaminant sorption and solubility. Secondly, they lower the relative surface tension of water, thereby improving its wetting and associated hydraulic conductivity properties. Thirdly, through their selective dissolving of COCs below the critical micelle concentration, the surfactants broaden the range of contaminants that can be treated and enhance physical, biological, and chemical remediation, in situ and ex situ.

According to Ivey, their surfactant products are non-toxic and biodegradable, so they do not persist in the environment after application, which can be

continued overleaf...

Ivey-sol can make carbon tetrachloride molecules miscible without emulsifying the constituents of concern, thereby increasing their availability for remediation, while not impacting the performance of wastewater treatment systems.

verified with Ivey-sol field test kits and by three USEPA laboratory test methods. Indeed, because they are non-toxic to bacteria, they can also give a boost to natural attenuation.

They have some disadvantages that careful application can overcome. For example, their effectiveness may be diminished if the mixtures freeze during storage, and their deployment may suppress volatile organic compounds, making them less detectable by standard, handheld vapour meters.

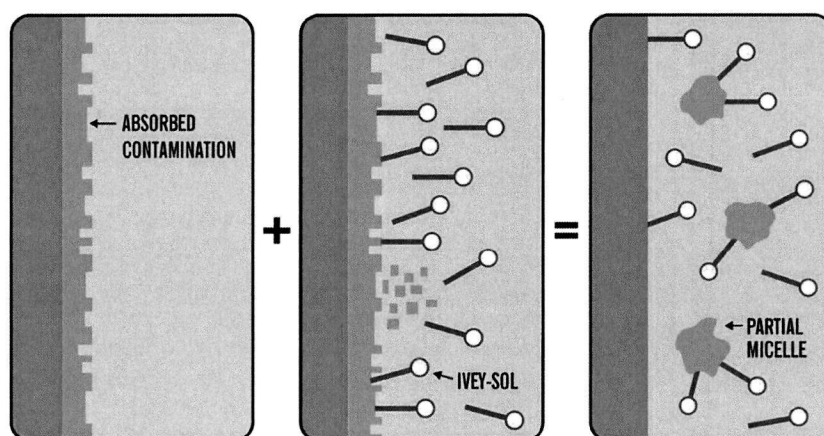
For the pilot study at the grain elevator site, which was conducted in April and May of 2015, Ivey-sol surfactant technology was deployed in single-well “push-pull” tests and multi-well “point-to-point” tests at two DPE system locations and two groundwater monitoring wells. Burns & McDonnell was able to use the existing DPE and well infrastructure to implement the surfactant injection and product recovery, thus minimizing intrusive activities and cost.

Groundwater was encountered at approximately 2.1 m – 2.4 m below ground surface. The lithology within the targeted source zone generally consisted of well-sorted, loose, silty sand to depths ranging from 4 m – 5.2 m below ground surface, underlain by a silty clay. Ivey have found that their surfactant products are effective in site conditions with more varied and complex structure, including coarse-grained, fine-grained, and higher silt and clay-content soils.

For this pilot, Ivey-sol surfactant was mixed with water in a 1% – 2% solution, which was gravity-fed into two monitoring wells and two DPE wells to achieve a targeted injection diffusion radius and then allowed to remain in the formation for a prescribed residence time.

Overall, concentrations of groundwater and soil vapour recovered by the DPE system, immediately following surfactant flushing, demonstrated increases of up to four times (>400%) more than the average concentrations observed under normal DPE operational conditions.

Based on these positive results, Burns & McDonnell elected to conduct a full-scale Ivey-sol SEE test from August through November of 2016 to address remaining COC mass within the source zone. For the full-scale test, 1,045 litres



Ivey-sol desorption mechanism operating on soil surfaces or LNAPL layers, making contamination more available for remediation.

of Ivey-sol 106 surfactant were mixed with potable water and a conservative tracer for observation of the solution's distribution.

Three additional monitoring wells were installed to facilitate surfactant delivery to the northern portion of the source area. Five Ivey-sol SEE phases were conducted to target the portion of the area with the highest COC concentrations, applying point-to-point surfactant delivery to the core source area within the shallow saturated zone, followed by groundwater extraction from the wells that were initially used for surfactant injection. Burns & McDonnell monitored recovery progress via real-time tracer testing and field surfactant test procedures developed by Ivey.

A key result of the full-scale activities was a dramatic increase in COC mass recovery rates. During the short SEE implementation and 12 month monitoring period, the surfactant-enhanced DPE system recovered more than 25% of the total mass that the DPE system had recovered over the previous 10 years. In addition, recovered groundwater concentrations up to 30,000 micrograms per liter (µg/L), more than five times (>500%) the highest concentrations ever observed during DPE operation, were observed during the SEE monitoring period.

Overall, the full-scale SEE test achieved 98% CT reduction in the source area's shallow monitoring wells and 92% reduction in source area DPE wells. More-

over, although not the primary objective of remediation activities, significant reductions in LNAPL thicknesses were observed. The DPE remediation system, enhanced with Ivey-sol 106 (CI) formulation, successfully recovered the LNAPL product as a serendipitous benefit.

The remediation team estimates that the full-scale SEE system saved about a decade in active remediation time. With the cost of operating and maintaining the DPE system totaling up to \$100,000 annually, the potential cost and time savings involved in deploying surfactant technology to complement DPE technology and recover more highly concentrated COC mass are readily apparent. ■

Eric Dulle is with Burns & McDonnell.

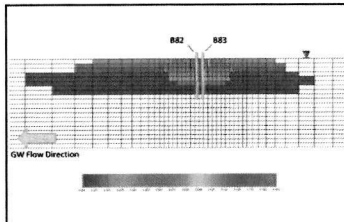
Email: edulle@burnsmcd.com

George “Bud” Ivey is with Ivey International.

Email: budivey@iveyinternational.com



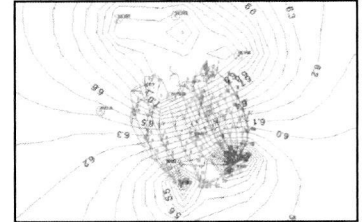
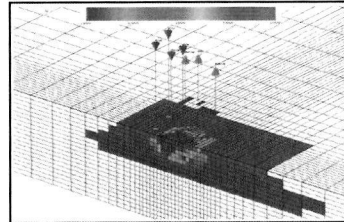
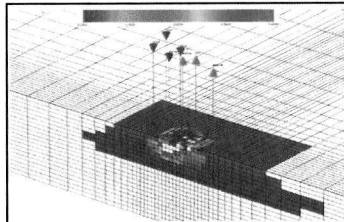
SETUP AND CALIBRATION OF A THREE-DIMENSIONAL NUMERICAL MULTIPHASE MODEL FOR DESIGN OF IN-SITU REMEDIATION OF JET FUEL WITH SURFACTANT



BACKGROUND

Storage and pumping of jet-fuel have caused a severe contamination of soil and groundwater at a military facility in Denmark. The contamination was detected in 2001. The Danish Defence has conducted a series of investigations and set up a skimmer system, that has recovered approximately 25 m³ of jet-fuel. In 2005, the recovery stopped, and the remaining jet-fuel is trapped as a residual light non-aqueous phase liquid (LNAPL) comprising approximately 45 m³ jet-fuel in a 1000 m² source area. In the ground water downstream of the source area, there is an extensive diving plume of contaminants.

In part of the source area, the Danish Defence and NIRAS have launched a pilot Scale Surfactant Enhanced Aquifer Remediation (SEAR) in order to demonstrate mobilization of LNAPL from the sediment. The pilot remediation was carried out using non-ionic surfactants (Ivey-sol®) from Ivey International Inc. for injection in a line of injections wells. The mobilized oil and injected surfactants were recovered from a downstream line of extraction wells. The recovered oil/ground water was treated on site, and the treated water was re-injected up-gradient in a line of hydraulic control wells. The effect of the pilot SEAR was monitored by sampling and analyzing the ground water from the extraction wells and by estimation of trapped jet-fuel in an oil-water separator as part of the on-site treatment, supplemented by post soil sampling/analyses from boreholes. The 3 different methods gave different results for the mass balance, and the estimated effect of the pilot remediation ranged from 25 kg to 150 kg of hydrocarbons.



Søren Rygaard Lenschow,
Anders G. Christensen
NIRAS A/S, Allerød,
Denmark

Mette Marie Mygind
Danish Defence, FBE,
Hjørring, Denmark

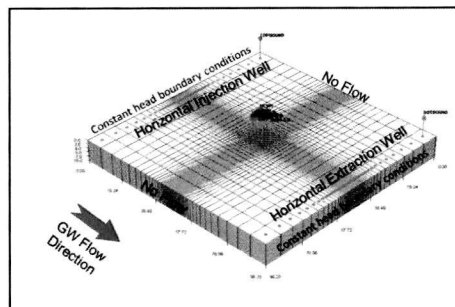
Ahmad Seyedabbasi,
Phillip C de Blanc
GSI Environmental Inc.,
Houston, TX, USA

George Ivey
Ivey International Inc.
Surrey, BC, Canada

WATER BALANCE

- Extraction – 12 m³/day (0.5 m³/h)
- Reinfiltration – 8 m³/day (0.33 m³/h)
- Injection 0.15 – 1 m³/day
- Discharge – 4 m³/day (0.17 m³/h)
- Hydraulic control – 2 weeks
- 7 injections of Ivey-sol® (0.15 – 1.0 m³ – 1.3 – 3.0 % surfactants)
- Hydraulic control for 7 weeks post injection

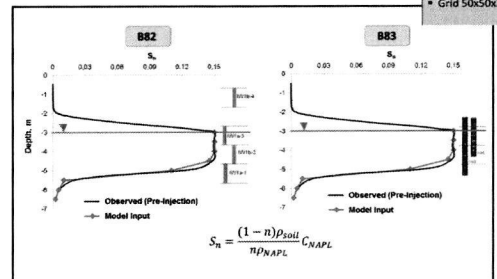
To validate the effect of the Pilot Remediation, GSI Environmental Inc. has set up a three-dimensional numerical multiphase model by using the University of Texas' Chemical Compositional Simulator UTCHEM.



SETUP UTCHEM

- Input – vertical oil saturation based on soil samples

- $dx = dy =$ variable
- Min = 0.5 m (center)
- Max = 7.7 m (boundaries)
- $dz = 0.5$ m
- 100 m x 100 m x 10 m
- Grid 50x50x200



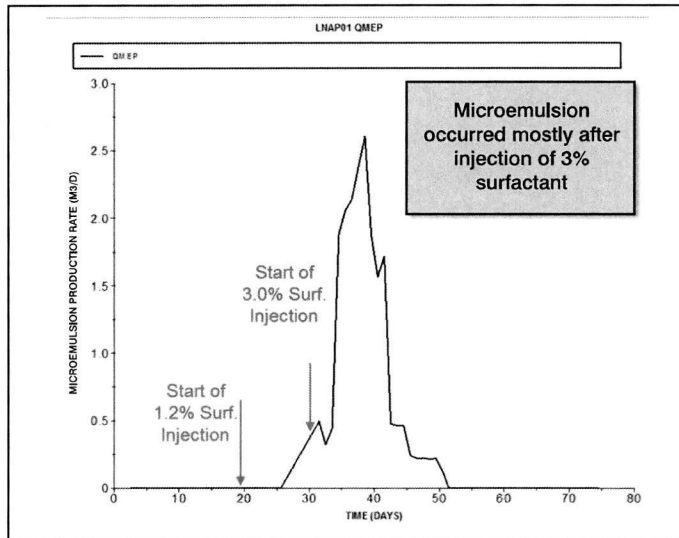
SIMULATIONS UTCHEM

- 70 days – Injections of Ivey-sol® surfactants from day 20 to day 27
- 7 injections of surfactants – 1.3 – 3.0% Ivey-sol®
- Oil saturation as function of time
- Accumulated oil from extraction wells
- Capture of surfactants in extraction wells
- Comparison of simulations with no injection of surfactant

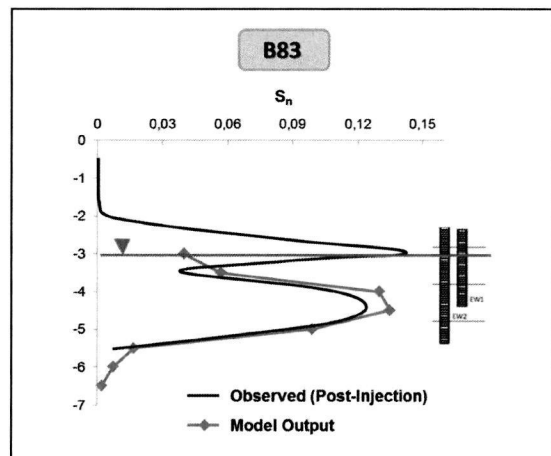
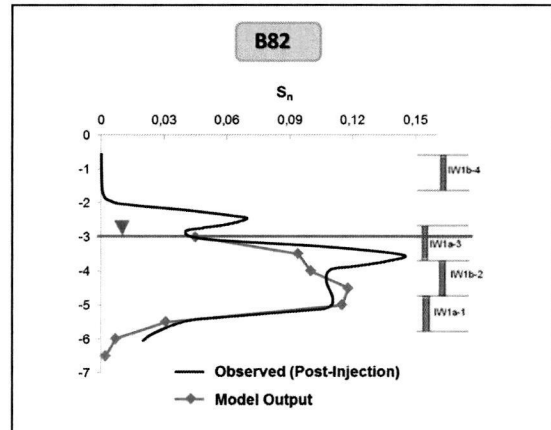


RESULTS

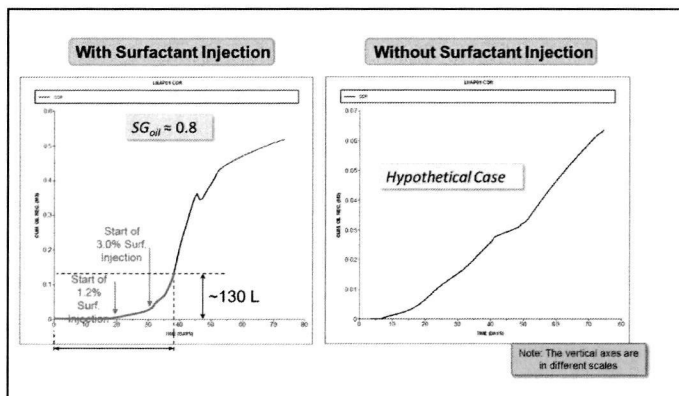
- Formation of micro-emulsion during Pilot SEAR



- Post Oil Saturation in soil



- Accumulated Oil during Pilot SEAR



The simulations indicate a removal of 130 kg oil on day 50 and approximately 400 kg after day 70. Simulations without surfactants show a removal of less than 1/10 of the removal achieved when using Ivey-sol® surfactants.

CONCLUSIONS

The UTCHEM model was able to simulate the Pilot SEAR, and injected fluids were contained within the pilot area. Further, the simulations estimated an approximate 10-fold (1000 %) increase of the oil concentration in the extracted ground water relative to a water injection without the use of Ivey-sol® Surfactants. The model also showed that the main process for mass removal during SEAR was production of a micro-emulsion.

The total removal during the Pilot SEAR was by UTCHEM estimated to be 100-400 kg oil compared to 25-50 kg by analysis and measurements of the effluents from the extraction wells, and 50-150 kg based on the change of oil saturation in the soil by analysis of soil samples.

The simulated post-SEAR oil saturation was similar to measured concentrations from post-study soil sampling. The simulations also indicate that most of the Ivey-sol® surfactants was removed during the pilot SEAR and the post pump & treat period.

The setup of the UTCHEM gave an insight into the processes and hydraulics during the pilot SEAR in comparison to a "Black Box" situation, where the remediation technology performance is only evaluated by process and monitoring data, after the remediation is conducted.

The performance of the pilot study provided important lessons of great value for both the design and the documentation of issues in the design and planning of future full-scale remediation.

Surfactant Enhanced HVDPE Remediation of Petroleum Contaminated Soil, Bedrock and Groundwater

Site Conditions

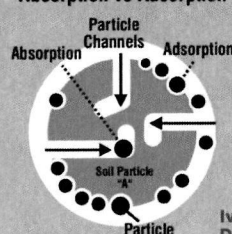


Remediation Challenge

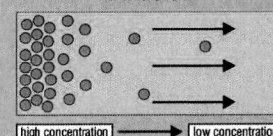
The number one limiting factor for all forms of in-situ remediation is contaminant sorption

Sorption >>>> Desorption or Diffusion

Absorption vs Adsorption



Diffusion



● solute
Solute transport is from the left to the right; movement of the solutes is due to concentration gradient (dC/dx).

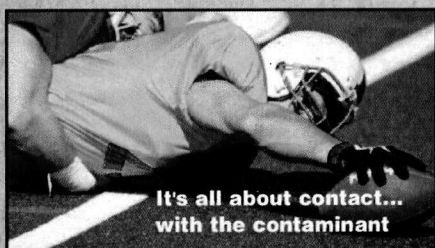
Ivey-sol® Overcomes Sorption Improving Desorption & Diffusion of Contaminants Increasing Their 'Availability' for Remediation

- ★ Recalcitrant petroleum product residuals sorbed in fine grain soils and fractured bedrock
- ★ Persistent concentrations in groundwater after 12 years of remediation – including pumping, HVDPE
- ★ Obtained regulatory approval for Ivey-sol® surfactant application in spring 2009

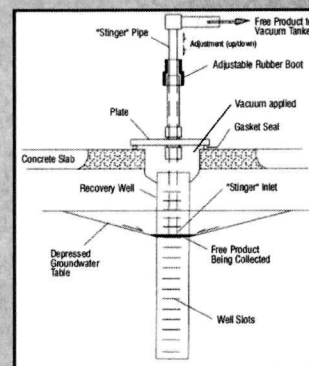
Pilot Test Approach

Focused Short-Term Surfactant Injection/Extraction to Maximize Recovery

- Ivey-sol® 106 pilot scale injection undertaken over 5 days in July 2009
- Four injection events, one injection well (MW15) and four extraction HVDEP wells (MW2, 7, 8 and 11)
- Five surrounding monitoring wells sampled during pilot
- Mobile HVDPE system capable of 28 inch Hg vacuum and 800 SCFM
- Groundwater HVDEP average recovery rate of 0.24 ppm

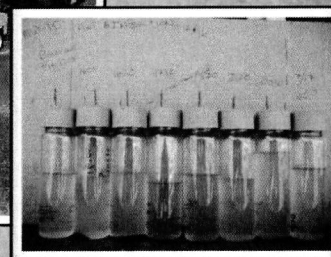
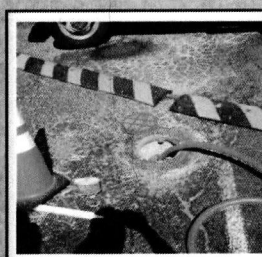


- Recalcitrant petroleum product residuals in fractured bedrock
- Persistent concentrations in groundwater after 12 years of remediation – including pumping, HVDPE



HVDPE Extraction Well

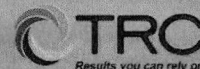
Diagram shows radius of influence and potential LNAPL collection



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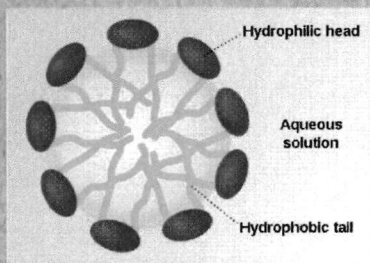
Results you can rely on

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Christopher d'Sa – E: CdSa@trcsolutions.com | Galen Kenoyer – E: Gkenoyer@trcsolutions.com

Surfactant Chemistry

Surfactant Structure



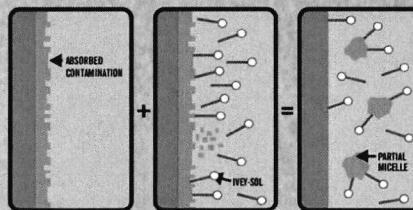
Hydrophilic (water loving) and Hydrophobic (water hating oil-like) Groupings allow for Mobilization of many Organic Contaminants

Classes of Surfactants

- **Anionic:** Have one or more negatively (-) charged groupings; commonly used in laundry detergent
- **Cationic:** Have one or more positively (+) charged groupings, typically poor detergents but well suited for use as germicides, fabric softeners and emulsifiers.
- **Amphoteric:** Contains both anionic and cationic groupings; prefer neutral pH and found in products such as hair shampoo, skin cleaners and carpet shampoo.
 - *Ionic Surfactants make up >95% of the surfactant used around the world.*
- **Non-ionic:** Have no ionic constituents or groupings; largest single group of SAA (Surface Active Agent) and have a correspondingly wide range of chemical characteristics. Ivey-sol® surfactant mixtures are non-ionic and have the unique ability to selectively desorb contamination (LNAPL, DNAPL's, PAH, PCB, DCE, TCE, PCE), etc.

Why Ivey-sol® Surfactants?

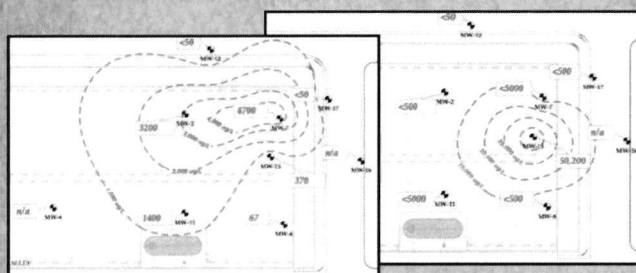
- Improves desorption of target contaminants in soil and groundwater
- Lowers the surface tension of water improving both its wetting and associated permeability (K) properties
- Effective as a stand alone technology for soil and groundwater remediation
- Effective to improve other remediation techniques (i.e., P&T, Soil Washing, Bioremediation, Chemical Oxidation/Reduction)



Ivey-sol® desorbing NAPL mass for increased 'availability' for remediation

Results

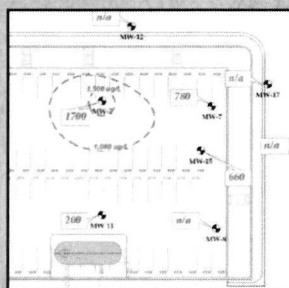
Before and During Test



TPH-d Isocon Map before Pilot Test

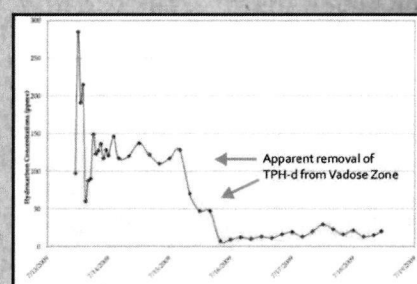
TPH-d Isocon Map 2 hrs after Pilot Test

Post Pilot Test Results



TPH-d Isocon Map 7 months after Pilot Test

HVDPE Vapor Concentrations



MW-2

$$[9.169 \times 10^3 \text{ mg/day} - 1.555 \times 10^3 \text{ mg/day}] \times 100\% = 590\%$$

MW-7

$$[2.1754 \times 10^3 \text{ mg/day} - 3.1918 \times 10^3 \text{ mg/day}] \times 100\% = 682\%$$

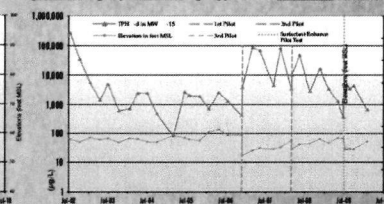
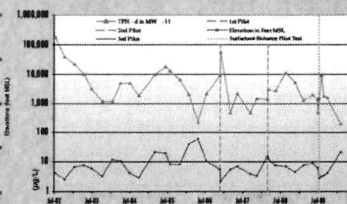
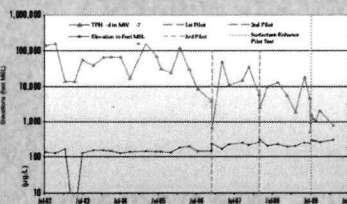
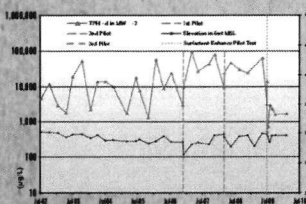
MW-11

$$[1.678 \times 10^3 \text{ mg/day} - 1.7579 \times 10^3 \text{ mg/day}] \times 100\% = 955\%$$

MW-15

$$[4.4107 \times 10^3 \text{ mg/day} - 2.7603 \times 10^3 \text{ mg/day}] \times 100\% = 1,598\% \text{ Standard Pilot}$$

$$[3.875 \times 10^3 \text{ mg/day} - 2.014 \times 10^3 \text{ mg/day}] \times 100\% = 1,924\% \text{ Push-Pull}$$



Conclusions: We increased the TPH_d Mass Recovery Rate by 10X !!!

★ Removed TPH-d from vadose zone

★ Lowered groundwater concentrations

★ Regulatory Agency agree to risk-based

closure if concentrations continue to decrease

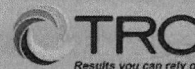
★ Pilot Application was a Success!



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Surfactant Enhanced Recovery of Separate-Phase Petroleum Hydrocarbons

Super Fund Site – Sunnyside Yard, Queens, New York City, USA

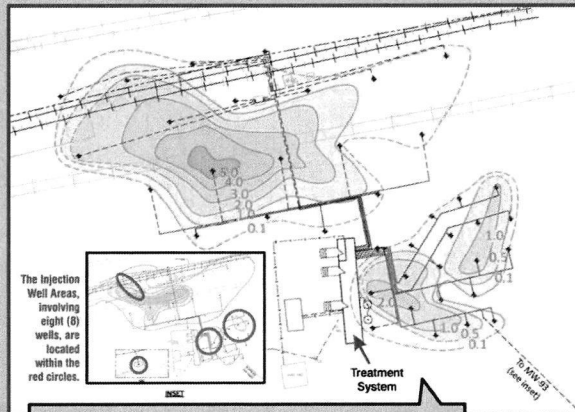
Paper ID: 22600 / Topic: ThS 4c / Author: George Ivey, Ivey International Inc.

SITE HISTORY



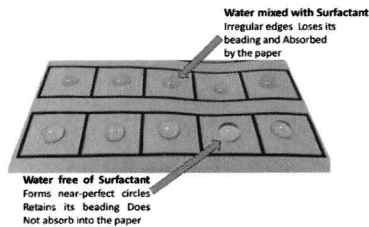
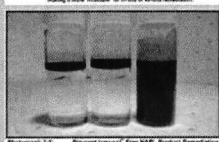
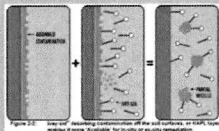
The site is located in Sunnyside Yard, Queens, New York City. It covers an area of 130 acres (52.6 Hectares). Has been in service for over 100 years. Site operations resulted in spills impacting the soil and groundwater with petroleum and PCB impacts, with observed phase separated petroleum hydrocarbons (LNAPL) on site. The site is a State Super Fund with six operational areas of remediation. This presentation focuses on the application of Ivey-sol surfactants to eliminate observed LNAPL to Regulatory Standards (<0.1 ft) within one area of the site, where the existing Dual Phase Vacuum Extraction (DPVE) System was proving to be effective.

DUAL PHASE VACUUM EXTRACTION (DPVE) SYSTEM LAYOUT



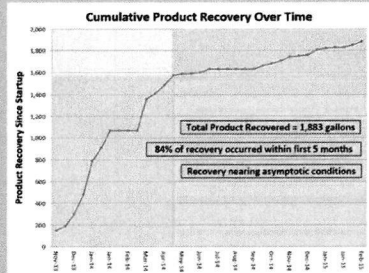
Operation of the in-situ DPVE system from 2013 and 2015 recovered 1883 Gallons (7,118 L) of product, with 84% of that mass recovery realized within the first five (5) months of system operation. Ongoing DPVE product recovery became asymptotic with diminishing rates of product recovery. Consultant wanted to enhance the product recovery. Bench scale testing of the Ivey-sol surfactant technology showed promise, resulting in regulatory approved pilot scale application presented herein.

Ivey-sol® Surfactant Technology



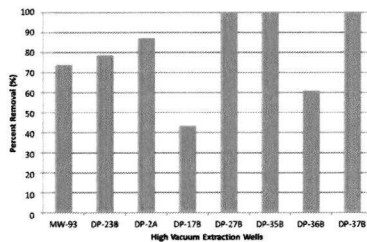
Ivey-sol surfactants technology is composed of several proprietary non-ionic surfactant formulations with the unique ability to selectively desorb petroleum hydrocarbons, and/or make phase separated hydrocarbons (LNAPL), more miscible in groundwater, below the critical micelle concentration (CMC) not requiring emulsification as shown in the supporting images. In doing so, this makes the phase separated hydrocarbons (LNAPL) more Physically-Available for enhanced DPVE mass recovery.

DPVE System Performance



RESULTS AND CONCLUSIONS

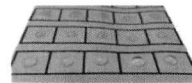
SPH (LNAPL) % Mass Removal



Conclusions

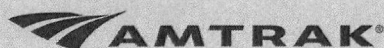
- SPH (LNAPL) mass recovery was significantly enhanced by the increase of SPH solubility by Ivey-sol;
- Free product was not observed in the extracted groundwater, and the performance of the groundwater treatment system (OW + GAC) was not hindered;
- Reduction of SPH (LNAPL) thickness was usually observed within 24 hours of Ivey-sol surfactant injections, and persisted for several weeks or longer (due to opening of obstructed pathways);
- Low concentration ratios of surfactant (1:20 to 1:50) are effective, and higher concentrations do not increase effectiveness as Ivey-sol mechanism works below the CMC (Yielding Cost Savings);
- Low injection volumes or injection rates were generally needed in the injection areas due to the low permeability soil conditions and high groundwater table;
- All treated wells experience significant product mass removal following the three (3) pilot-scale applications. Three (3) of the eight (8) wells experienced 100% product (LNAPL) removal, with the average product thickness reduction of 81% (no rebound observed);
- Based on the success of the pilot scale application, the project was given regulatory approval to go full scale application. Ivey-sol was also used in other impacted areas on this Super Fund Site aiding the physical, biological and/or chemical strategies being employed.

Pilot Study Methods



A total of three (3) in-situ Ivey-sol surfactant enhanced remediation (SER) applications were completed during the pilot study. This involved the gravity-fed injections of 265 Gal. (1000 L) of 2% Ivey-sol at each of the eight (8) injection well locations (IW). A post injection residence time of 24 hours was allowed before groundwater was extracted at these wells, to recover liberated product mass. Phase Separated Hydrocarbon measurements were completed prior to, during and after the Ivey-sol applications to evaluate the performance. The use of Ivey-sol surfactant field test kits (image provided) allowed the client to observe the location and relative concentration of Ivey-sol surfactant in-situ, and to determine the end-points of extraction associated with each event.

Project Update 2019 – The area treated in this presentation was successfully remediated, exceeding the state's regulatory standards, permitting the desired redevelopment of the area for a modern high speed train facility that has gone into operation.



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Site of July 2019 oil spill in northern Alberta.

SURFACTANT-BASED EXTRACTION PRODUCT HELPS MINIMIZE IMPACTS FROM LARGE SPILL IN ALBERTA

By **George (Bud) Ivey** and **Adam Dunn**

In July 2019, a failure of pump equipment led to the spill of about 320,000 litres of a mixture of crude oil and produced water at an oil storage and processing facility located in remote northern Alberta. As the facility operator reported, approximately 99% of the spilled fluids were recovered, having been contained in an on-site bermed area, which already held about 300 m³ of pooled surface water. Some of the product, however, breached the containment area and was released into the local environment.

Calgary-based Earthmaster Environmental Strategies Inc. was retained to assess cleanup options and implement the remedy for cleaning up the spill. They reported that the liquid product that breached the

containment area had flowed down a relatively steep slope (20% – 30% grade) about 180 m to the south-southwest. It was affecting herbaceous vegetation and associated trees and shrubs along its pathway.

An environmental receptor of concern was a small creek flowing near the base of the slope. Released fluids did not enter the creek, but there was some fluid infiltration into the shallow soil horizon and some oil sorption into vegetation and surface debris.

Released fluid consisted of 66 m³ of oil and 254 m³ of salt/produced water. No salt impacts were detected along the spill path, but the contaminants of concern (COC) included hydrocarbon fractions F1 (C6-C10), F2 (C10-C16) to F3 (C16-

C34), benzene, toluene, ethylbenzene and xylenes (BTEX).

The steep slope and the presence of merchantable timber, vegetation, leaf litter and organic debris, along with irregular surface contours, presented logistical and safety challenges for efforts to recover the fluid and clean up the area. Further challenges arose as a result of a number of precipitation events, some being significant.

In fact, a storm was predicted to dump about 150 mm of rain two days after the spill. This prompted Earthmaster to delay the selection and implementation of a final cleanup remedy while it prepared for the storm. The firm installed several lined bell-shaped holes to catch runoff

from the rain.

The application of LIDAR (light detection and ranging) remote sensing following the storm, confirmed that the bell holes were properly placed to prevent liquids from reaching the stream. As it turned out, they were also used for the final remedy chosen, which was flushing, or washing, as opposed to excavation and off-site disposal of the affected soil.

Excavation and removal is a common solution for many spills into the environment, but it presented several prohibitive challenges at this site, because of potential environmental damage. Deforestation of the hillside would have brought about erosion problems and a sedimentation threat to the nearby creek. There were cost issues as well, including a requirement to pay upwards of \$50,000 or more for the lost timber to the holder of the forest management agreement that covered the hillside.

Bioremediation and chemical oxidation were also deemed to be impractical for this particular spill. Bioremediation would not have addressed spill migration, which threatened the waterway, and ongoing monitoring and laboratory services would have been extended for several years and been very costly. Stoichiometrically chemical oxidation is also very costly when used to address free-product spills. It has the potential to kill vegetation, and requires special PPE handling as a hazardous material.

Fortunately, sampling at the site showed that the oil/water mixture that escaped from the containment area had coursed down the hill rather than penetrated into the soil to any significant depth. So, the

Ivey-sol has the unique ability to selectively desorb contamination at low application concentrations from surfaces, including free-product layers.

consultant decided that it could “do a flush” rather than a “scrape”, which, more precisely, was passive and active surface flushing, rather than excavation and off-site disposal.

A surfactant-based remedy was thus deemed optimal, and due to the remediation contractor’s familiarity with the Ivey-sol® surfactant product developed and marketed by Ivey International Inc. (IVEY), that product was chosen for the cleanup job. It is biodegradable, pH neutral, non-caustic, non-corrosive, and free of undesirable impurities.

The Ivey-sol surfactant-enhanced extraction (SEE) products consist of a series of non-ionic formulations that can selectively desorb sorbed contaminants and render non-aqueous-phase liquids miscible in the aqueous phase.

SEE products achieve three goals. Surfactants overcome the “limitation” chal-

lenges associated with contaminant sorption and solubility. Then, they lower the relative surface tension of water, thereby improving its wetting and associated hydraulic conductivity properties. Finally, through their selective dissolving of COCs below the critical micelle concentration (CMC), the surfactants broaden the range of contaminants that can be treated. Thus, they enhance in situ and ex situ physical, biological and chemical remediation.

These surfactant products are non-toxic and readily biodegradable, so they do not persist in the environment after application. This can be verified with field surfactant test kits developed by IVEY, and by using any of three U.S. Environmental Protection Agency laboratory test methods.

The products have some disadvantages that careful application can overcome. For example, their effectiveness may be diminished if the surfactant/water mixtures freeze during storage, and their deployment may suppress volatile organic compounds, making them less detectable by standard, handheld vapour meters.

Based on the understanding that sorption and free-product formation greatly limit the “availability” of contaminants for remediation, Ivey-sol has the unique ability to selectively desorb contamination at low application concentrations from surfaces, including free-product layers. This means they are more available for physical treatment, as evidenced by this challenging yet positive site application.

The Alberta Energy Regulator approved the use of the Ivey-sol technology at the
continued overleaf...



Views of area near Bell Hole 3 before and after flushing with the surfactant.

spill site. The client preferred it to environmentally destructive excavation alternatives.

At the spill site, the surfactant was deployed in varying concentrations, using various delivery methods in a roughly checkerboard configuration. The first trial was completed using backpack sprayers (with a surfactant-to-water ratio of 1:30), followed by pressure-washing.

There was not enough volume in this trial, however, to move the oil to the recovery bell holes for removal. In order to increase pressure and volume, the surfactant and water were mixed in the tank of a small hydrovac truck at a 1:40 ratio for the second trial and applied using the pressure wand. The oil could be recovered with this application with the right technique, but would splatter if too much pressure was used.

In the third trial, another surfactant-to-water ratio of 1:40 was mixed in the hydrovac truck tank, and the tank hose was used for application rather than the pressure wand. The surfactant effectively washed the oil off the vegetation using this application.

However, there was not enough pressure to move the fluid to the recovery bell holes, and suds were being produced. In order to optimize oil recovery and surfactant usage, ratios of 1:60 and 1:80 were applied and small local trenches were dug to collect and recover fluids.

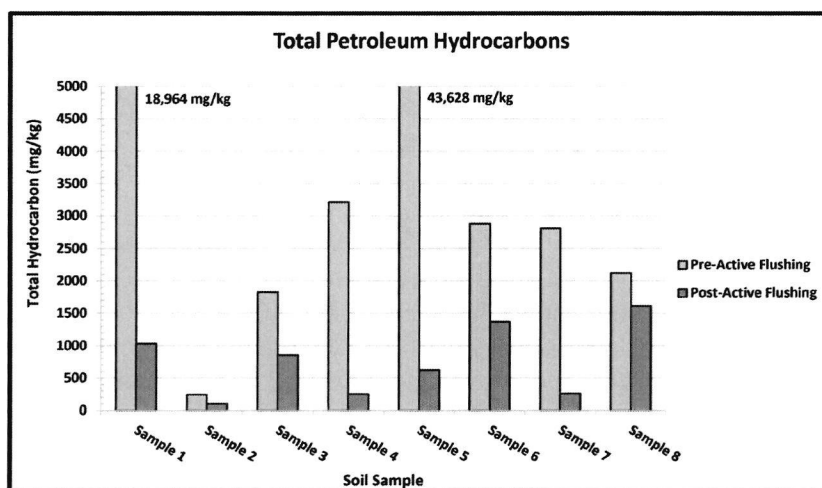
The surfactant was applied over the course of four days, and the majority of the oil on the hillside was effectively liberated and flushed into the trenches and bell holes for removal. Visual observations indicated that the cleanup operation was generally effective, and soil sampling confirmed these findings.

Earthmaster decided that some heavily impacted areas where the leaf litter and vegetation was saturated with oil did not warrant the amount of surfactant and time required for complete removal. As a result, the contractor completed the remediation via surface soil/vegetation removal in these areas.

The flushing operation did not necessarily save much time compared with the typical spill response operation. But, it did realize significant cost savings in terms of avoiding the removal of merchantable timber on the hillside and the option of



Cleanup crews flush forested impact site with Ivey-sol® surfactant.



Total PHC Bar Graph.

excavating and landfilling impacted soil and vegetation.

According to Earthmaster, there were numerous factors affecting project costs, and it was difficult to precisely quantify the cost savings attributable to choosing the flushing operation. The contractor estimates, however, that those cost savings could have been upwards of several hundred thousands of dollars. In light of this consideration, plus the avoidance of environmental damage, the Ivey-sol surfactant-based solution was deemed a sustainable success.

"In July 2019 we were faced with a 320,000 litre crude oil and produced water spill at a facility in northern Alberta," said Adam Dunn, vice president of operations at Earthmaster Environmental. "With our

rapid spill response strategy, utilizing the Ivey-sol surfactant remediation technology, we achieved significant time, cost, and environmentally sustainable cleanup benefits, resolving more than 99% of the spill on the hillside." ■

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Adam Dunn is with **Earthmaster Environmental Strategies Inc.** Email: adam.dunn@earthmaster.ab.ca

*Recently, Ivey International Inc. won a Top 10 Environmental Technology Solution Providers 2020 Award from Enterprise Technology Review, a U.S. media company, in recognition of their technological innovations.



Ivey International Inc.

"Today's Environmental Solutions For A Better Tomorrow"

REACH Bulletin

EU Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) Regulation Compliance



ENGLISH

The **IVEY-SOL**® surfactant formulation, and its specific components, are non-ionic polymers and are therefore exempt from REACH registration under Article 2(9). **Ivey International Inc.** is committed to ensuring that end users have the most effective and safe product for environmental remediation and reclamation. We are committed to working with all regulatory agencies to ensure compliance with current standards.

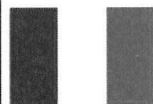
Conformité aux normes d'enregistrement à l'échelle de l'UE, évaluation, autorisation des substances chimiques et des restrictions applicables à ces substances (REACH)



FRANÇAIS

La formule tensioactive **IVEY-SOL**®, ainsi que ses composants spécifiques, constituent des polymères non ioniques et sont par conséquent exemptés d'enregistrement REACH, conformément à l'article 2(9). **Ivey International** s'engage à fournir aux utilisateurs finaux le produit le plus efficace et le plus sûr qu'il soit pour l'assainissement et la récupération environnementale. Nous sommes résolus à travailler avec tous les organismes de réglementation afin de veiller au respect des normes en vigueur.

Conformità al regolamento europeo REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals)



ITALIANO

La formulazione tensioattivi **IVEY-SOL**® e i suoi elementi specifici consistono in polimeri non ionici esenti da registrazione REACH ai sensi dell'articolo 2(9). **Ivey International** s'impegna ad assicurare all'utente finale un prodotto per le bonifiche ambientali efficace e sicuro, e a lavorare con le agenzie di regolazione preposte per assicurare la conformità agli standard in vigore.

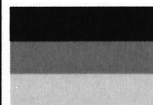
Cumplimiento de la Regulación de Registro, Evaluación y Restricción de Químicos (REACH, por sigla en inglés) de la UE



ESPAÑNOL

La formulación de tensoactivos de **IVEY-SOL**® y sus componentes específicos son polímeros no iónicos y por ello están exentos de registro REACH bajo el Artículo 2(9). **Ivey International** está comprometido a garantizar que los usuarios finales obtengan el producto más efectivo y seguro para la remediación y reclamación ambiental. Estamos comprometidos a trabajar con todas las agencias regulatorias para garantizar el cumplimiento de los estándares actuales.

Einhaltung der REACH-Verordnung (Registration, Evaluation, Authorisation and Restriction of Chemicals) der EU



DEUTCH

Die **IVEY-SOL**®-Tensid-Rezeptur und deren spezifische Komponenten sind nichtionische Polymere und daher gemäß Artikel 2 Absatz 9 von der REACH-Registrierungspflicht ausgenommen. **Ivey International** möchte sicherstellen, dass Endnutzer die effektivsten und sichersten Produkte für Umweltsanierung und Rekultivierung zur Verfügung stehen. Wir arbeiten mit allen Regulierungsbehörden zusammen, um die Einhaltung aktueller Standards zu gewährleisten.

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CLIENT TESTIMONIALS

"We completed an in-situ pilot-scale application of the Ivey-sol® surfactant technology at an industrial site with VC, DCE and TCE chlorinated contamination. We commenced site remediation with MPE with very good results, but eventually the rate of vapor, dissolved, and DNAPL phase mass recovery reduced over time. The introduction of Ivey-sol® significantly increased mass recovery of all phases, leading to our decision to go to full scale, pairing the MPE and Ivey-sol® technologies as an effective remediation strategy for the site"

DENNIS TU, Executive Director Environment

AECOM

"We increased the TPH Mass Recovery Rate by 10x, removed TPH-d from vadose zone and lowered groundwater concentrations. Regulatory Agency agreed to a risk based closure if contamination levels continue to decrease" [Site has since achieved regulatory closure]

GALEN KENOYER, Senior Hydrogeologist

CHRIS D'SA, Senior Project Manager

TRC
Results you can rely on

"We accomplished more with \$50,000 of Ivey-sol® than we did with the first \$500,000 we spent on the site over the previous 4 years. Ivey-sol® Increased our average rate of contaminant recovery by >409%"

DANIEL SMITH, Hydrogeologist

HCR
HARDY CONSULTING
& REMEDIATION, LLC

"At an EU military site the UTCHEM model was able to simulate the Pilot SEAR and that injected fluids were contained within the pilot application area. Further, the simulations estimated an approximate 1000 % increase in jet-fuel oil mass recovery with the application of the Ivey-sol® surfactant technology, compared to water injections without Ivey-sol®. The model also showed that the main process for mass removal during SEAR was production of a micro-emulsion."

SOREN RYGAARD LENSCHOW, Project Manager

NIRAS

"Given the complex nature of in-situ remediation projects, the most appropriate technologies need to be versatile and able to be adapted to various soil types and site-specific hydrogeological conditions. We have found the suite of Ivey-sol® surfactant products, and processes, to be very adaptable, affordable, and effective for the desorption and recovery of significant contaminant mass at our sites"

J. PETER MISENER, Chairman

GROUND FORCE
ENVIRONMENTAL INC.
Solutions for Earth

"We have been operating a dual-phase vacuum extraction (DPVE) system at an active grain elevator for approximately 9 years to address a groundwater source area consisting of carbon tetrachloride, carbon disulfide, and chloroform. In 2015, Burns & McDonnell conducted a pilotscale application of Ivey-sol® surfactant in an effort to enhance DPVE efficiency and recover the remaining source area contamination at the site. The pilot study indicated significant increases in contaminant mass removal. As a result, Burns & McDonnell conducted a full-scale surfactant application, consisting of up to 275 gallons of surfactant mixed to approximately 1 to 2 percent by volume, to the source area in late 2016. The introduction of the Ivey-sol surfactant significantly increased dissolved-phase mass removal and the effects of this increase on DPVE efficiency were observed up to 6 months after the application. During both the pilot and fullscale phases, existing DPVE infrastructure was utilized to complete the surfactant delivery and recovery, thus significantly reducing the cost of remediation. Burns & McDonnell was very pleased in the performance of the Ivey-sol® surfactant and continued support by Ivey-sol® staff"

ERIC DULLE, PE, Project Manager

BURNS & MCDONNELL

"Ivey-sol® has been proven highly effective at remediating both oil-based contamination and chlorinated solvents in a variety of different soil types, ranging from sands to clays. Given the current need for innovative and cost-effective cleanup technologies, usage of Ivey-sol® will significantly increase in the upcoming years"

BRUCE TUNNICLIFFE, President



VERTEX
Environmental Inc.

"Ecologia applied the Ivey-sol 108 surfactant product using an in-situ multi-well sweep application to enhance the rate of LNAPL recovery at an active factory site. The Ivey-sol applications permitted a significant reduction in the LNAPL saturation, leading to a reduction in LNAPL mobility by approximately 3 orders of magnitude. We are, and have been, very pleased with the efficacy, ease of use and reliability of the Ivey-sol remediation technology at our project sites"

DAVID HOLMES BSc (Hons), MSc, PhD, MCIWEM, C.WEM, CSci
Technical Manager - Ecologia Environmental Solutions Limite

Ecologia
experts on the ground

"The in-situ application of the Ivey-sol® surfactant technology significantly increased the DNAPL and BTEX mass recovery from the impacted soil and groundwater on-site. We were very pleased by these results leading to our recommending a full scale site application as a rapid and cost effective method to achieve site clean-up"

MARTIN BEAUDOIN, Project Engineer

SANEXEN
SERVICES ENVIRONNEMENTAUX INC.

"We used a combination of Ivey-sol® technology and soil excavation. It certainly saved us the headache of having to do more by way of foundation excavation. The result was the important thing. Ivey-sol® was a good add-on to the original excavation and we got the results we wanted"

MIKE ROY, Senior Claims Adjuster

Plant Hope
ADJUSTERS LTD.
EXPERTS EN SINISTRES

"In July 2019 we were faced with a 320,000 liter crude oil and produced water spill at a facility in northern Alberta. With our rapid spill response strategy, utilizing the innovative Ivey-sol® surfactant remediation technology, we achieved significant time, cost, and environmentally sustainable cleanup benefits, resolving more than 99% of the spill on the hillside. We and our client were very pleased with the outcome of this project"

EARTHMASTER
ENVIRONMENTAL STRATEGIES INC.

"After excavation and bio-piling of the soil, the surfactant enhanced bioremediation (SEB®) treatment was applied and the bio-pile was covered. Daily aeration was done during the treatment period. After only 12 weeks, samples were taken from the bio-pile showing that the remediation of the fuel-oil and PAH contamination was completed to the BC Environmental Standards and safe for reuse on-site"

TONY ROBSON, Director Mining & Equipment

QUINSAM
COAL

Ivey-sol Surfactant Remediation Technology
Is Still Winning Innovation Awards, because
Ivey International realized...



...it was that simple.

Ivey International Inc. overcame the fundamental challenges to rapid cost effective site remediation of petroleum hydrocarbons, chlorinated solvents, and PFAS, by not only stepping out of the box, we redesigned it.

The dedicated support and the innovative minds of our employees, research partners and clients have allowed us to reach our corporate goal of being recognized as; 'Today's Environmental Solutions for a Better Tomorrow'.[™]

For more information about Ivey International's Innovative Remediation Technologies, visit www.ivey-sol.com, call +1 604-538-1168, or email us at info@iveyinternational.com



info@iveyinternational.com
+1 604-538-1168



SAFETY DATA SHEET

SDS # 231005-08

Ivey-sol[®] Surfactant Remediation Technology

Ivey-sol[®] Formulations: 103, 106, 106 CI, and 108

1. Identification

Product identifier: Ivey-sol[®] 103, 106, 106 CI, 108
Other means of identification: Not applicable
Recommended use: Remediation surfactant
Restriction on use: Not applicable
Manufacturer/Supplier Address: Ivey International Inc.
Unit 7, 19122-27 Avenue, Surrey, BC Canada V3Z 5T1
Emergency telephone number: Tel: +1 (604) 538-1168 (Not available 24 hours)
Toll Free: +1 800 246-2744

2. Hazard Identification

WHMIS 2015/OSHA Hazcom 2012/GHS Classification:

- Serious Eye Damage/Irritation Category 2
- Skin Corrosion/Irritation Category 3

Label elements:

Signal word: Warning Pictograms: Hazard statements:

H316 – May causes mild skin irritation.

H319 – May causes eye irritation.



Precautionary Statements:

P264 - Wash contacted areas thoroughly after handling.

P280 - Wear eye protection.

P305/P351/P338 - If In Eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do so. Continue rinsing.

P332/P313 - If skin irritation occurs: Get medical advice/attention.

P337/P313 - If eye irritation persists: Get medical advice/attention

3. Composition / Information on Ingredients

Chemical Name	CAS No.	Concentration (v/v)	Other Identifiers
Biodegradable Non-ionic Surfactant 1	Proprietary	1-10%	Not applicable
Biodegradable Non-ionic Surfactant 2	Proprietary	1-10%	Not applicable
Biodegradable Non-ionic Surfactant 3	Proprietary	1-10%	Not applicable
Biodegradable Non-ionic Surfactant 4	Proprietary	1-10%	Not applicable
Biodegradable Non-ionic Surfactant 5	Proprietary	1-10%	Not applicable
Biodegradable Non-ionic Surfactant 6	Proprietary	1-10%	Not applicable



Preservative – DOWICIL 75	4080-31-3	<1%	Food Grade (Optional)
Scent – Pink Grapefruit 100% Natural	8016	<1%	Optional
Water	7732-18-5	<90%	Not applicable

Regulatory Note: Chemical names, CAS numbers and actual concentrations have been withheld as part of a confidential business information claim with HMIRA Registry #11724 filed on 2017-07-17

4. First-aid Measures

- Inhalation:** No adverse effects anticipated by this route when handled according to section 7 of document. However, if necessary, move person to fresh air.
- Skin contact:** Generally will not irritate skin. Wash contact areas with soap and water. If irritation persist, seek medical attention.
- Eye contact:** May cause eye irritation. Flush eyes with plenty of water for at least 15 minutes, remove contact lenses if present and easy to do so. If irritation persists, seek medical attention.
- Ingestion:** Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. If necessary, seek medical attention.

Most Important Symptoms and Effects, Acute and Delayed

Acute Symptoms:

Eye Contact: May be irritating to the eyes. Occasional contact through splashing is not expected to affect the eyes. If irritation occurs, effect will be transient.

Chronic Symptoms: Not Applicable

Immediate Medical Attention and Special Treatment: Not Applicable

5. Fire-Fighting Measures

Suitable extinguishing media: Not flammable. Use extinguishing media for surrounding fire.

Unsuitable extinguishing media: Not applicable

Specific hazards arising from the hazardous product: Not available

Special protective equipment for fire-fighters: Not available

6. Accidental release measures

Personal Precautions, Protective Equipment:

Observe good industrial hygiene practices. Use personal protective equipment as recommended in Section 8. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Emergency Procedures: Eliminate and/or contain source with inert material (sand, earth, absorbent pads, etc.). Wear basic eye and skin protection. Floor may be slightly slippery; so use care to avoid falling. Avoid discharge to natural waters, and/or dilute with water. Transfer liquids to suitable containers for recovery, re-use or disposal. Contact Ivey for technical assistance if required.

7. Handling and Storage

Precautions for Safe Handling:

Practice good housekeeping. Avoid breathing excessive vapours. Ensure adequate ventilation. Avoid contact with skin and eyes. Wear protective gloves. Wash thoroughly after handling.

Conditions for Safe Storage: Keep closed or sealed when not in use. Do not allow to freeze, keep >0°C.



8. Exposure Controls / Personal Protection

Control parameters: Not available
Appropriate Engineering Controls: General mechanical room ventilation is expected to be satisfactory.
Individual Protections Measures: Eye/face protection: Mono goggles or similar.
Skin protection: Latex gloves, or similar, would be sufficient. Normal work clothes.
Respiratory Protection: None expected to be needed. However, if an engineered / industrial application where vapours and/or misting may occur, wear MSHA/NIOSH approved half mask air purifying respirator

9. Physical and Chemical Properties

Appearance: Liquid, cloudy
Odour: Mild
Odour threshold: Not available
pH: 7 (+/- 0.5) (1% solution)
Melting Point: ~0°C
Freezing point: ~0°C
Boiling Point: Not available
Flash Point: Not applicable
Evaporation Rate: <0.01
Flammability: Not applicable
Lower flammable/ explosive limit: Not applicable
Upper flammable/Explosive Limit: Not applicable
Vapour Pressure: <0.01 mm Hg
Vapour Density: >1
Relative Density: 0.99-1.04
Solubility: 100% (Completely miscible in water)
Partition Coefficient: Not available (n-octanol / water)
Auto-Ignition Temperature: Not applicable
Decomposition Temperature: Not available
Viscosity: Not available

10. Stability and Reactivity

Reactivity: Not reactive.
Chemical Stability: Stable.
Possibility of Hazardous Reactions: Not applicable
Conditions to Avoid: Prolonged excessive heat may cause product decomposition. Freezing should also be avoided as it may cause product decomposition. In some cases freezing may cause irreversible changes.
Incompatible Materials: Normally un-reactive; however avoid strong bases at high temperatures, strong acids, strong oxidizing agents, and materials with reactive hydroxyl compounds. These compounds would damage the mixture and reduce its effectiveness during application.
Hazardous Decomposition products: Not applicable

11. Toxicological Information

Likely Routes of Exposure
Inhalation: No
Skin contact: No
Eye contact: Yes



Ingestion: No
Acute Toxicity:
LD50 - Oral (Rat): = >43.000mg/kg (rat) mg/kg
LD50 - Dermal (Rabbit): >58.000mg/kg (rabbit) mg/kg
Inhalation: Not available
Skin corrosion/irritation: Mild irritation
Serious eye damage/irritation: Eye irritation
Respiratory or skin sensitization: No
Germ cell mutagenicity: No
Carcinogenicity: None known or expected
Reproductive toxicity: No

12. Ecological Information

Toxicity: Low potential to affect aquatic organisms when used in accordance with Ivey International Inc. In-situ and Ex-situ Remediation Application Guidelines.

Acute toxicity	Time	Species	Method	Evaluation	Remarks
LC/50 = 0.07695%	96h	Rainbow trout	OECD 203	Not applicable	Not applicable
LC/50 = 0.11%	48h	Daphnia magna	OECD 202	Not applicable	Not applicable
EC/50 = Not applicable	72h	Algae	OECD 201	Not applicable	Not applicable

Persistence and degradability: >90% biodegradable in < 28 days.*
Bio-accumulative potential: Not available
Mobility in soil: Completely miscible with water.
Other adverse effects: Not available

Based on actual testing or on data for similar material(s). Degradation Biodegradation reached in Modified OECD Screening Test (OECD Test No.301 E) after 28 days: 90 %. Biodegradation reached in CO2 Evolution Test (Modified Sturm Test, (OECD Test No. 301 B) after 28 days: 70 %.

13. Disposal Considerations

Product/Packaging:

For aqueous mixture solutions; aerobic biological wastewater treatment systems are effective in treating said mixtures. Ivey-sol does not have any known negative affect on coagulant or flocculent water treatment processes.

14. Transport Information

UN Number: Not applicable
Proper Shipping Name: Not applicable
Technical Name: Not applicable
Transport Hazard Class: Not applicable
Packing Group: Not applicable
Environmental Hazards: Not applicable
Notes: Not Regulated for Transport. HS Code: 3402.42.00.00



15. Regulatory Information

UN GHS Classification: Classified in accordance with GHS 5th revised edition.

WHMIS Classification: Classified in accordance with HPR August 29, 2016 revised edition.

CPR Compliance: This product has been classified in accordance with the hazard criteria of the CPR, and the SDS contains all the information required by the CPR.

CEPA Compliance: All ingredients of this product are listed on the DSL.

16. Other Information

Creation Date: July 5, 2017

Revision Date: Updated October 2, 2017, October 18, 2018, November 4, 2022, October 6, 2023

Disclaimer: This Safety Data Sheet (SDS) was prepared by iHazmat Regulatory Ltd., (www.iHazmat.com) using information provided by Ivey International Inc. The information in this SDS is offered for your consideration and guidance when working with this product. As per usual practice, accuracy of the information included is based on what was provided by the manufacturer and sole liability for the accuracy of these documents falls to Ivey International Inc.

This Safety Data Sheet may not be changed, or altered in any way without the expressed knowledge and permission of Ivey International Inc.

SDS Created By: iHazmat Regulatory Ltd.
www.iHazmat.com

Attachment #3

SCDES Checklist and Correspondence

Aggressive Fluid Vapor Recovery

UST Permit #: 11399

Release #: 2

Do not proceed unless the full extent of the contamination for the release has been delineated.

I. Applicability Determination (Initial Screening)	Effective	Somewhat Effective	Ineffective
1. Provide a general description of the intrinsic permeability (k)* of soils in the area of remediation measured in cm². ☐ Based on soil type ☒ Calculated ☐ Field/lab test <i>Stratified soils may require special consideration in design to ensure less-permeable stratum are addressed. This should be documented</i>	☒ $k \geq 1 \times 10^{-8}$	☐ $1 \times 10^{-8} \geq k \geq 1 \times 10^{-11}$	☐ $k < 1 \times 10^{-11}$
2. What is the general boiling point range in °C for chemicals subject to remediation at this site? <i>For complex mixtures, select the boiling point range that is most representative of the chemicals of concern to be remediated by using this remedy.</i>	☐ < 250	☒ $\geq 250 - \leq 300$	☐ ≥ 300
3. What is the depth to groundwater in feet based on the shallowest well in area where remediation is being performed? <i>If water-table elevation fluctuate significantly, special design provisions should be made to accommodate them.</i>	☐ > 10	☒ $\geq 3 - \leq 10$	☐ < 3
4. What is the vapor pressure range in mm of the chemicals being remediated? <i>For complex mixtures, select the vapor pressure range that is most representative of the chemicals of concern to be remediated by using this remedy.</i>	☐ ≥ 1	☒ $> 0.5 - < 1.0$	☐ < 0.5
5. What is the Henry's law constant** (atm) for the chemicals being remediated? mixture <i>For complex mixtures, select the Henry's law constant range that is most representative of the chemicals of concern to be remediated by using this remedy.</i>	☐ > 150	☐ $\geq 100 - < 150$	☐ < 100
II. Aggressive Fluid Vapor Recovery System Design			
1. What is the radius of influence (ROI) in feet for the proposed extraction wells? <i>The wells must be identified by showing the ROI on a site diagram.</i>	☐ > 20	☒ $> 5 - \leq 20$	☐ < 5
2. Has the radius of influence (ROI) been calculated for each soil type at the site? One additional RW proposed <i>For more complex sites with multiple treatment depth intervals and/or the need for multiple extraction wells, subsurface airflow modeling must be conducted to determine well placement.</i>	☐ YES	☐ NO	☒ NO
3. Is the proposed well density appropriate, given the total area to be cleaned up and the radius of each well?	☒ YES		☐ NO

* Intrinsic permeability is a measure of the ability of soils to transmit fluids and is the single most important factor in determining the effectiveness of AFVR.

** Here is a link to an EPA website with common Henry's Law Constant for various chemicals. Choose H_{px} (partial pressure/mole fraction)

<https://www3.epa.gov/ceampubl/learn2model/part-two/onsite/esthenry.html>

Aggressive Fluid Vapor Recovery

II. Aggressive Fluid Vapor Recovery System Design (continued)

4. Describe the system.

☐ Single pump system

☒ Dual pump system

Existing RW-1 and RW-2, along with proposed RW-3

Identify and number the wells (on the site map) to be utilized for the AFVR.

5. What is the proposed extraction time period for each well?

24-hour event following Ivey Sol Injection

6. How many extractions are planned? Up to 3 events

7. What is the planned frequency of extractions?

☐ Once

☐ Weekly

☐ Monthly

☐ Quarterly for _____ quarters

☒ Other (specify): Injection, wait 48-hours, extract for 24-hours, wait one month to gauge (see strategy attached)

What is the estimate of time to achieve cleanup of the site with the anticipated extraction flow rates?

_____ days

Interim SSTL to be met within approximately thirteen months followed by new chemical specific SSTL, if needed (< 2 year)

III. Evaluation of Operation and Maintenance

For information pertaining to monitoring and operation, please refer to the current revision of the UST Quality Assurance Programmatic Plan. Information should be provided in the Corrective Action System Evaluation Reports. Additional information may be provided regarding system monitoring and operation as deemed necessary to demonstrate effectiveness.

List the monitoring and analytical parameters that are proposed for any verification sampling. Use CAP Analytical Parameters Attachment

Example	
Well Name	Substances
MW-1	BTEX, MTBE
MW-3	BTEX, MTBE

IV. Site Map

Site map(s) drawn to scale illustrating the following:

- Location of all present and former tanks, piping and dispensers in area of release;
- Footprint of surface and/or subsurface soil contamination;
- Footprint of other structures (buildings, canopies, roads, utilities, etc.);
- Location of treatment system;
- Location of extraction wells;
- Location of monitoring wells that will be used for sampling;
- Groundwater flow direction;
- North arrow, bar scale, and map legend

CAP Analytical Parameters Attachment

[illegible]

Comments	



SC DEPARTMENT of
**ENVIRONMENTAL
SERVICES**

Erin Jezek
Corrective Action & Field Support Section
Underground Storage Tank Management Division
2600 Bull Street
Columbia, SC, 29201

HILTON HEAD PUBLIC SERVICE DISTRICT
PO BOX 21264
HILTON HEAD ISLAND SC 29925

OCT 02 2025

Re: **Notification of Site-Specific Target Levels & Strategy to Closure**
Hilton Head Public Service District, 21 Oak Park Dr, Hilton Head, SC
UST Permit #11399
Release reported July 27, 2017
Monitoring Report received August 26, 2025
Beaufort County

To Whom It May Concern :

The Underground Storage Tank (UST) Management Division of the South Carolina Department of Environmental Services (SCDES) has established Site-Specific Target Levels (SSTLs) for the referenced release. The SSTLs are being provided to you and your contractor to help plan the investigative and remedial activities that are required.

Pursuant to S.C. Code Ann. Section 44-2-40(D), "The SUPERB Account and the SUPERB Financial Responsibility Fund shall provide combined coverage for site rehabilitation and third-party claims, respectively, not to exceed one million dollars per occurrence". **According to UST Division records, approximately \$47,578.16 has been expended from the SUPERB Account to date.**

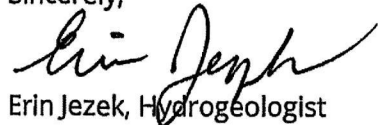
Due to the type of release on this site, diesel, the wells that are clear of free petroleum product have little to no contamination of any Chemicals of Concern (CoCs) and thus, the UST department does not currently have SSTLs for your site. Once the free product is removed, we will assess the contamination of dissolved constituents in the wells and determine the SSTLs for your site. Your consultant should use previous assessment data to evaluate site rehabilitation options as indicated in the Quality Assurance Program Plan for the UST Management Division (QAPP § A6.XIV, and B1.IV.). A Strategy to Closure document has been enclosed with points of consideration and discussion to be utilized in the development of the corrective action and closure strategy for this release. To assist in the selection of potential remedial technologies, please review the check lists at this link. <https://des.sc.gov/programs/bureau-land-waste-management/underground-storage-tanks/ust-owneroperator-information>

A meeting has been set for November 4th, 2025 at 10:30 AM to discuss the proposed path to closure for this release. Please contact me **within 15 days** of the date of this letter to confirm the meeting date and time. In addition, please review and complete the Strategy to Closure document and remedial checklists

and **return them within 30 days** from the date of this letter. The Strategy to Closure document and remedial checklists should be utilized in the development of the closure strategy for this release.

On all correspondence concerning this site, please reference UST Permit number above. Should you have any questions, please contact me by phone at (803) 898-0608, by fax at (803) 898-0673, or by email at erin.jezek@des.sc.gov.

Sincerely,



Erin Jezek, Hydrogeologist
Corrective Action & Quality Assurance Section
Underground Storage Tank Management Division
Bureau of Land and Waste Management

enc: Strategy to Closure Form
Targeted Scope Cost Agreement
Table of Free Product SSTLs

cc: F & ME Consultants Columbia, 211 Business Park Blvd, Columbia SC 292038/26/25 (w/ enc)
Quincy Hoffer (w/o enc)
Technical file (w/ enc)



SC DEPARTMENT of
**ENVIRONMENTAL
SERVICES**

STRATEGY TO CLOSURE PROPOSAL: HILTON HEAD PUBLIC SERVICE DISTRICT , PERMIT #11399, Release
Reported: July 27, 2017

The UST Site Rehabilitation Contractor, on behalf of the owner/operator for the above reference release, proposes the work specified below to achieve Site-Specific Target Levels for the release and to achieve a Conditional No Further Action Determination.

I certify that this company:

- ☒ Has reviewed the technical file for the release and understands the nature of the release(s) and the geologic conditions at the site as documented in the technical file. Any quantities listed below are estimates and changes to those quantities or to the listed method(s) will be further detailed in a Corrective Action Plan submitted to SCDES.
- ☒ Has conducted a site visit and understands the physical layout of the property, the location(s) of any identified receptors, and any limitations that may exist on or off property as it may relate to the possible implementation of any proposed corrective action strategy.

F+ME Consultants, Inc.
UST Site Rehabilitation Contractor (Print)

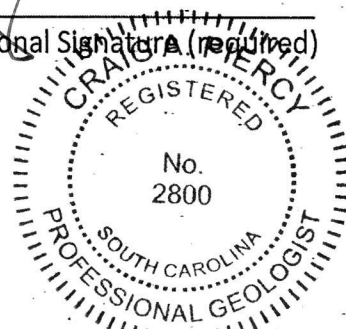
UCC-0140
UST Site Rehabilitation Contractor Certification #

Craig Piercy
Registered Professional Name (Print)

[Signature]
Registered Professional Signature (required)

P.G. ☒ P.E. ☐ (Check appropriate box)

Professional Certification # 2800



I (the UST tank owner) certify that I:

- Have discussed the proposed strategy with the UST Site Rehabilitation Contractor and agree with the proposal as put forth.
- Understand that costs up to \$1 million SUPERB combined coverage may be utilized, and the UST Management Division reserves the right to set aside funds for the purpose of verifying achievement of remedial goals and understands that costs in excess of the \$1 million combined SUPERB coverage are my responsibility as the UST owner.

Hilton Head Public Service District, UST #11399
Beaufort County

Free Product Thickness (FP) SSTLs

	Current FPP Thickness	Free Product SSTL
MW-1	0.64	0.01
MW-9	0.55	0.01
MW-12	1.33	0.01
MW-13	0.96	0.01
RW-1	1.31	0.01

*Free Product Thicknesses are in feet



In addition, I (the UST tank owner) understand that a meeting (in person or virtual) will be scheduled between the UST Management Division, my selected contractor, and myself to discuss the proposed Strategy to Closure. (Please check one of the options below)

- ☒ I will be present during the meeting to participate in the discussion.
- ☐ I will not be present during the meeting to participate in the discussion. I consent to allowing my selected contractor to make any decisions necessary regarding the remedial design, including associated costs, on my behalf.

Bill Davis
UST Owner (Print)

Bill Davis
UST Owner Signature

State of S.C. County of Beaufort

Signed before me on 10/15/2025 by Bill Davis
(date) Name of Person

My Commission Expires On 04-06-2031

Notary Seal/Stamp Above



Connie Whitehead
Notary Public
State of S.C.

CLOSURE STRATEGY CONSIDERATIONS

1. Please provide appropriate information regarding the proposed treatment techniques that are proposed to be implemented at the site. Include the approximate number of injection points, the approximate number of extraction points, approximate volume of excavated material, approximate volume of injected material, etc., if known at this time. Only method(s) and/or technology(ies) that will be implemented on site should be included.
2. Complete remedial checklists that support the applicability of the technology for the constituents and geology present at the site. (<https://des.sc.gov/programs/bureau-land-waste-management/underground-storage-tanks/ust-owneroperator-information>)
3. Describe how implementation of the proposed treatment techniques will achieve the Site-Specific Target Levels for dissolved and/or free-phase products.
4. Approximate the amount of time in months for each phase of treatment to be implemented.
5. Approximate the amount of time, in months, it is anticipated that SSTLs will be achieved.
6. Would limited source treatment/removal achieve concentrations below SSTLs or does the extent of off-site contamination require a full-scale corrective action system? Is the proposed corrective action strategy limited to source removal/reduction or will treatment outside the source area be required? Please explain.
7. Please provide information on the length of time after attainment of SSTLs that additional monitoring would be needed to meet the conditions for a CNFA determination. Additionally, how will the monitoring results be used to determine that conditional closure requirements are met. (See Section III.B.3.e of the SUPERB Site Rehabilitation and Fund Access Regulations R.61-98 and the Quality Assurance Program Plan for the UST Management Division for details regarding the conditions required for a conditional closure)
8. Please provide an estimated total cost to implement this corrective action strategy to achieve a CNFA determination and site closure. The estimate should include a breakdown of each aspect of the corrective action strategy (e.g. source treatment, dissolved plume treatment, MNA monitoring, etc.)
9. Please provide a contingent remedial strategy if the proposed remedial methods fail to achieve the SSTLs within the required time frame. This information can be generalized.
10. Please provide any other relevant information that may be utilized for the purposes of supporting the closure strategy.

Please note, per R.61-98, reimbursement for site rehabilitation activities shall in no event exceed the actual costs incurred.

In determination of costs, the SUPERB Allowable Rates should be utilized where applicable.

In accordance with Section 44-2-130, the owner or operator responsible for conducting the site rehabilitation or his agents shall keep and preserve suitable records of hydrological and other site assessments, site plans, accounts, invoices, or other transactions related to the cleanup and rehabilitation and the records must be accessible to the

department during regular business hours. In addition, all subcontractor agreements, invoices, correspondence, plans, reports, and records, including all electronic and paper formats must be maintained.



SC DEPARTMENT of
**ENVIRONMENTAL
SERVICES**

EXAMPLE

TARGETED COMPONENT COST AGREEMENT
South Carolina
Department Environmental Services
Underground Storage Tank Management Division
State Underground Petroleum Environmental Response Bank Account
July 1, 2024

Facility Name: _____

UST Permit #: _____

Cost Agreement #: _____

ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL
C. Survey				
1.2 Comprehensive Survey		each	\$1,270.36	\$0.00
5.1 Ground Penetrating Radar Survey (100 x 100)		each	\$1,111.57	\$0.00
D. Mob/Demob				
1.2 Equipment		each	\$1,245.93	\$0.00
2.2 Personnel		each	\$516.69	\$0.00
3.2 Adverse Terrain Vehicle		each	\$610.75	\$0.00
E. Soil Borings*				
1.1 Soil Borings (hand auger)		foot	\$21.80	\$0.00
F. Soil Borings (requiring equipment, push technology, etc) or Field Screening (including sampling and analyst)*				
1.2 Standard		per foot	\$33.50	\$0.00
2.2 Fractured Rock		per foot	\$41.40	\$0.00
H. Well Abandonment (does not include Field Screening)*				
1.2 2" diameter or less		per foot	\$3.79	\$0.00
2.2 Greater than 2" to 6" diameter		per foot	\$5.50	\$0.00
3.2 Dug/Bored well (up to 6 feet diameter)		per foot	\$18.32	\$0.00
I. Well Installation (in accordance with R.61-71)*				
1.2 Water Table (hand augered)		per foot	\$31.40	\$0.00
2.B Water Table (drill rig) 2" Diameter		per foot	\$54.90	\$0.00
2.2 Single-cased 2" Diameter Monitoring Well >50ft		per foot	\$59.80	\$0.00
3.2 Telescoping		per foot	\$84.70	\$0.00
4.2 Rock Drilling		per foot	\$81.80	\$0.00
5.2 2" Rock Coring		per foot	\$88.50	\$0.00
6.2 Multi-sampling ports/screens		per foot	\$59.40	\$0.00
7.2 Recovery Well (4" diameter)		per foot	\$69.60	\$0.00
9.2 Rotosonic (2" diameter)		per foot	\$119.00	\$0.00
10.2 Re-develop Existing Well		per foot	\$13.44	\$0.00
J. Groundwater Sample Collection / Gauging Depth to Water/Product*				
1.2 Groundwater Purge		per well	\$73.29	\$0.00
2.2 Air or Vapors		sample	\$14.66	\$0.00
3.2 Water Supply Sample		sample	\$26.87	\$0.00
4.1A HydraSleeve		sample	\$34.20	\$0.00
4.2B No-purge Groundwater Sample/Surface water		sample	\$57.24	\$0.00
5.2 Gauge Well only		sample	\$8.55	\$0.00
6.2 Sample Below Product		sample	\$14.66	\$0.00
7.2 Passive Diffusion Bag		sample	\$31.75	\$0.00
8.2 Field Duplicates (MWs & WSWs) and Field Blanks		sample	\$30.06	\$0.00
9.2 Groundwater (low flow purge)		sample	\$111.16	\$0.00
10.2 Equipment Blank		sample	\$30.06	\$0.00
11.1 Sample Product		per well	\$52.66	\$0.00
K. Laboratory Analyses-Groundwater				
1.2 BTEXNM+Oxyg's+1,2 DCA+Eth(8260D)		per sample	\$149.02	\$0.00
2.2 Lead, Filtered		per sample	\$16.85	\$0.00
3.2 Rush EPA Method 8260B		per sample	\$187.62	\$0.00
4.2 Trimethyl, Butyl, and Isopropyl Benzenes		per sample	\$34.20	\$0.00
5.2 PAHs		per sample	\$74.02	\$0.00
6.2 Lead		per sample	\$19.54	\$0.00
7.2 EDB by EPA 8011		per sample	\$55.21	\$0.00
8.2 EDB by EPA Method 8011 Rush		per sample	\$83.31	\$0.00
9.2 8 RCRA Metals		per sample	\$77.45	\$0.00
10.2 TPH (9070)		per sample	\$50.09	\$0.00
11.2 PH		per sample	\$6.35	\$0.00
12.2 BOD		per sample	\$24.42	\$0.00
13.2 Ethanol		per sample	\$18.08	\$0.00

Addendum

Previously Approved: \$0.00

Increase: \$0.00

New Approved Total: \$0.00

Project Manager: _____

Section Manager: _____

Finance: _____

Date: 9/29/2025

of pages _____

From: _____

UST/SCDHEC

Email: _____

Fax # (____) _____

Phone # (____) _____

The SCDES reserves the authority to pay only for work properly performed and/or technically justified and will only pay rates in accordance with established criteria.

K. Analyses-Drinking Water					
14.2 BTEXNM+1,2 DCA (524.2)		per sample	\$151.52		\$0.00
15.2 7-OXYGENATES & ETHANOL (8260D)		per sample	\$112.07		\$0.00
16.2 EDB (504.1)		per sample	\$97.11		\$0.00
17.2 RCRA METALS (200.8)		per sample	\$122.15		\$0.00
K. Analyses-Soil					
18.2 BTEX + Naphth.		per sample	\$78.18		\$0.00
19.2 PAH's		per sample	\$78.22		\$0.00
20.2 8 RCRA Metals		per sample	\$68.89		\$0.00
21.2 TPH-DRO (3550C/8015C)		per sample	\$48.86		\$0.00
22.2 TPH-GRO (5035B/8015C)		per sample	\$43.92		\$0.00
23.2 Grain size/hydrometer		per sample	\$127.04		\$0.00
24.2 Total Organic Carbon		per sample	\$37.38		\$0.00
P. Survey*					
1.1 Subsequent Survey		each	\$297.65		\$0.00
Q. Disposal (gallons or tons)*					
1.2 Wastewater		gallon	\$1.19		\$0.00
2.2 Free Product		gallon	\$1.63		\$0.00
3.2 Soil Treatment/Disposal		ton	\$156.25		\$0.00
4.2 Drilling fluids		gallon	\$1.25		\$0.00
R. Miscellaneous (attach receipts)					
1. Targeted Corrective Action (see Attached Table)	1	each	\$0.00		\$0.00
W. Aggressive Fluid & Vapor Recovery (AFVR)					
1.2 8-hour Event		per event	\$1,787.40		\$0.00
2.1 24-hour Event		per event	\$4,407.78		\$0.00
3.1 48-hour Event		per event	\$7,242.29		\$0.00
4.1 96-hour Event		per event	\$14,482.28		\$0.00
5.1 Off-gas Treatment 8 hour		per event	\$141.17		\$0.00
6.2 Off-gas Treatment 24 hour		per event	\$294.30		\$0.00
7.2 Off-gas Treatment 48 hour		per event	\$386.10		\$0.00
8.1 Off-gas Treatment 96 hour		per event	\$898.84		\$0.00
9.1 Off-gas Treatment 8 hour (w/chlorinated compounds)		per event	\$464.40		\$0.00
10.1 Off-gas Treatment 24 hour (w/chlorinated compounds)		per event	\$540.00		\$0.00
11.1 Off-gas Treatment 48 hour (w/chlorinated compounds)		per event	\$1,080.00		\$0.00
12.1 Off-gas Treatment 96 hour (w/chlorinated compounds)		per event	\$2,160.00		\$0.00
13.2 AFVR Effluent Disposal(w/chlorinated compounds)		gallon	\$0.64		\$0.00
14.2 AFVR Site Reconnaissance		each	\$302.40		\$0.00
15.1 Additional Hook-ups		each	\$29.68		\$0.00
16.2 AFVR Effluent Disposal		gallon	\$0.53		\$0.00
17.2 AFVR Mobilization/Demobilization		each	\$777.60		\$0.00
Z. High Resolution Site Characterization					
1.1 HRSC Screening Equipment Mobilization		each	\$1,468.80		\$0.00
2.1 HRSC Drilling Category 1		per foot	\$31.32		\$0.00
3.1 HRSC Drilling Category 2		per foot	\$36.18		\$0.00
4.1 HRSC Drilling Category 3		per foot	\$29.16		\$0.00
5.1 HRSC 3-D Model		each	\$4,363.20		\$0.00
S. Report Prep & Project Management					
	12%	percent	\$0.00		\$0.00
TOTAL					\$0.00

OHEC D-4294 (08/2022) *The appropriate mobilization cost can be added to complete these tasks, as necessary

ITEM					
R. Miscellaneous (attach receipts)	QUANTITY	UNIT	UNIT PRICE		TOTAL
Corrective Action Plan		each			\$0.00
I. Injection					
Injectate		per event			\$0.00
Injection Services		per event			\$0.00
Secondary Parameter Analysis		each			\$0.00
II. Enhanced AFVR					\$0.00
Injectate		per event			\$0.00
Injection Services		per event			\$0.00
Secondary Parameter Analysis		each			\$0.00
		each			\$0.00
III. Excavation					\$0.00
Excavation Services*		each			\$0.00
Backfill Material		ton			\$0.00
Backfill Additive		ton			\$0.00
Proctor/Compaction Testing		per event			\$0.00
Sheet Piling		per event			\$0.00
Dewatering Equipment		per event			\$0.00
Excavation Security/Fencing		per event			\$0.00
TOTAL					\$0.00

Attachment #4

Cost Estimate



ASSESSMENT COMPONENT COST AGREEMENT
 South Carolina Department of Health and Environmental Control
 Underground Storage Tank Management Division
 State Underground Petroleum Environmental Response Bank Account
 August 9, 2023

Facility Name: HHI PSD

UST Permit #: 11399 Cost Agreement #: TBD - Strategy to Closure

ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL
A. Plan Preparation				
1.2 Site-specific Work Plan		each	\$183.22	\$0.00
2.2 Tax Map		each	\$85.50	\$0.00
3.2 QAPP Contractor Addendum (App B)		each	\$250.00	\$0.00
B. Survey				
1.1 Receptor Survey		each	\$673.06	\$0.00
C. Survey				
1.2 Comprehensive Survey		each	\$1,270.36	\$0.00
5.1 Ground Penetrating Radar Survey (100 x 100)		each	\$1,111.57	\$0.00
D. Mob/Demob				
1.2 Equipment (1 well install, 3 inject, 3 extract)	7	each	\$1,245.93	\$8,721.51
2.2 Personnel (1.2 above, 3 guaging, 1 sampling)	11	each	\$516.69	\$5,683.59
3.2 Adverse Terrain Vehicle		each	\$610.75	\$0.00
E. Soil Borings				
1.1 Soil Borings (hand auger)		foot	\$21.80	\$0.00
F. Soil Borings (requiring equipment, push technology, etc) or Field Screening (including sampling and analyst)				
1.2 Standard		per foot	\$33.50	\$0.00
2.2 Fractured Rock		per foot	\$41.40	\$0.00
G.				
H. Well Abandonment				
1.2 2" diameter or less		per foot	\$3.79	\$0.00
2.2 Greater than 2" to 6" diameter		per foot	\$5.50	\$0.00
3.2 Dug/Bored well (up to 6 feet diameter)		per foot	\$18.32	\$0.00
I. Well Installation (In accordance with R.61-71)				
1.2 Water Table (hand augered)		per foot	\$31.40	\$0.00
2.B Water Table (drill rig) 2" Diameter		per foot	\$54.90	\$0.00
2.2 Single-cased 2" Diameter Monitoring Well >50ft		per foot	\$59.80	\$0.00
3.2 Telescoping		per foot	\$84.70	\$0.00
4.2 Rock Drilling		per foot	\$81.80	\$0.00
5.2 2" Rock Coring		per foot	\$88.50	\$0.00
6.2 Multi-sampling ports/screens		per foot	\$59.40	\$0.00
7.2 Recovery Well (4" diameter)	15	per foot	\$69.60	\$1,044.00
9.2 Rotasonic (2" diameter)		per foot	\$119.00	\$0.00
10.2 Re-develop Existing Well		per foot	\$13.44	\$0.00
J. Groundwater Sample Collection / Gauging Depth to Water/Product				
1.2 Groundwater Purge		per well	\$73.29	\$0.00
2.2 Air or Vapors		sample	\$14.66	\$0.00
3.2 Water Supply Sample		sample	\$26.87	\$0.00
4.1A HydraSleeve		sample	\$34.20	\$0.00

4.2B No-purge Groundwater Sample/Surface water	10	sample	\$57.24	\$572.40
5.2 Gauge Well only 3 events	48	sample	\$8.55	\$410.40
6.2 Sample Below Product		sample	\$14.66	\$0.00
7.2 Passive Diffusion Bag		sample	\$31.75	\$0.00
8.2 Field Duplicates (MWs & WSWs) and Field Bla	2	sample	\$30.06	\$60.12
9.2 Groundwater (low flow purge)	5	sample	\$111.16	\$555.80
10.2 Equipment Blank		sample	\$30.06	\$0.00
11.1 Sample Product		per well	\$52.66	\$0.00
K. Laboratory Analyses-Groundwater				
1.2 BTEXNM+Oxyg's+1,2 DCA+Eth(8260D)	20	per sample	\$149.02	\$2,980.40
2.2 Lead, Filtered		per sample	\$16.85	\$0.00
3.2 Rush EPA Method 8260B		per sample	\$187.62	\$0.00
4.2 Trimethal, Butyl, and Isopropyl Benzenes		per sample	\$34.20	\$0.00
5.2 PAH's		per sample	\$74.02	\$0.00
6.2 Lead		per sample	\$19.54	\$0.00
7.2 EDB by EPA 8011		per sample	\$55.21	\$0.00
8.2 EDB by EPA Method 8011 Rush		per sample	\$83.31	\$0.00
9.2 8 RCRA Metals		per sample	\$77.45	\$0.00
10.2 TPH (9070)		per sample	\$50.09	\$0.00
11.2 PH		per sample	\$6.35	\$0.00
12.2 BOD		per sample	\$24.42	\$0.00
13.2 Ethanol		per sample	\$18.08	\$0.00
K. Analyses-Drinking Water				
14.2 BTEXNM+1,2 DCA (524.2)		per sample	\$151.52	\$0.00
15.2 7-OXYGENATES & ETHANOL (8260D)		per sample	\$112.07	\$0.00
16.2 EDB (504.1)		per sample	\$97.11	\$0.00
17.2 RCRA METALS (200.8)		per sample	\$122.15	\$0.00
K. Analyses-Soil				
18.2 BTEX + Naphth.		per sample	\$78.18	\$0.00
19.2 PAH's		per sample	\$78.22	\$0.00
20.2 8 RCRA Metals		per sample	\$68.89	\$0.00
21.2 TPH-DRO (3550C/8015C)		per sample	\$48.86	\$0.00
22.2 TPH-GRO (5035B/8015C)		per sample	\$43.92	\$0.00
23.2 Grain size/hydrometer		per sample	\$127.04	\$0.00
24.2 Total Organic Carbon		per sample	\$37.38	\$0.00
K. Analyses-Air				
25.2 BTEX + Naphthalene		per sample	\$263.84	\$0.00
K. Hydrocarbon Fuel Identification				
27.1 C3-C44 Whole Oil (ASTM D3328)		per sample	\$465.93	\$0.00
28.1 Fuel Oxygenates (1624 Mod)		per sample	\$398.39	\$0.00
29.1 ALKYL Leads, EDB MMT (8080)		per sample	\$398.39	\$0.00
30.1 C8-C40 Full Scan (ASTM 5739)		per sample	\$629.64	\$0.00
31.1 Simulated Distillation (ASTM 2887)		per sample	\$398.39	\$0.00
32.1 Parent & Alk. PAH Com. (8270 SIM)		per sample	\$723.63	\$0.00
33.1 C3-C10 Piano (8260 MOD)		per sample	\$599.88	\$0.00
34.1 C10+Alkane Fingerprints		per sample	\$599.88	\$0.00
35.1 Expert Data Interpretation & Report		each	\$595.30	\$0.00
L. Aquifer Characterization				
1.2 Pumping Test		per hour	\$28.09	\$0.00

2.2 Slug Test		per test	\$233.31		\$0.00
3.2 Fractured Rock		per test	\$122.15		\$0.00
M. Free Product					
1.1 Free Product Recovery Rate Test		each	\$46.42		\$0.00
N.					
O. Risk Evaluation					
1.2 Tier I Risk Evaluation		each	\$366.45		\$0.00
2.2 Tier II Risk Evaluation		each	\$122.15		\$0.00
P. Survey					
1.1 Subsequent Survey		each	\$297.65		\$0.00
Q. Disposal (gallons or tons)					
1.2 Wastewater		gallon	\$1.19		\$0.00
2.2 Free Product		gallon	\$1.63		\$0.00
3.2 Soil Treatment/Disposal		ton	\$156.25		\$0.00
4.2 Drilling fluids		gallon	\$1.25		\$0.00
R. Miscellaneous (attach receipts)					
Injection Materials (Ivey Sol, including shipping, per event)	3	each	\$3,409.60		\$10,228.80
Equipment for Injection (per injection event, one day, incl mob)	3	each	\$2,800.00		\$8,400.00
Per Diem (between injection/extraction, per event)	3	each	\$300.00		\$900.00
Additional/Excess AFVR wastewater storage (per event)	3	each	\$1,800.00		\$5,400.00
Corrective Action Plan	1	each	\$1,800.00		\$1,800.00
		each	\$0.00		\$0.00
T. Tier I Assessment (Use DHEC 3665 form)					
1.2 Southeast Region		standard	\$12,622.56		\$0.00
2.2 All Other Counties		standard	\$13,844.06		\$0.00
U. IGWA (Use DHEC 3666 form)					
1.2 Southeast Region		standard	\$4,353.67		\$0.00
2.2 All Other Counties		standard	\$4,720.01		\$0.00
22. Active Correction Action					
		PFP	Bid Cost		\$0.00
W. Aggressive Fluid & Vapor Recovery (AFVR)					
1.2 8-hour Event		per event	\$1,787.40		\$0.00
2.1 24-hour Event	3	per event	\$4,407.78		\$13,223.34
3.1 48-hour Event		per event	\$7,242.29		\$0.00
4.1 96-hour Event		per event	\$14,482.28		\$0.00
5.1 Off-gas Treatment 8 hour		per event	\$141.17		\$0.00
6.2 Off-gas Treatment 24 hour	3	per event	\$294.30		\$882.90
7.2 Off-gas Treatment 48 hour		per event	\$386.10		\$0.00
8.1 Off-gas Treatment 96 hour		per event	\$898.84		\$0.00
9.1 Off-gas Treatment 8 hour (w/chlorinated compounds)		per event	\$464.40		\$0.00
10.1 Off-gas Treatment 24 hour (w/chlorinated compounds)		per event	\$540.00		\$0.00
11.1 Off-gas Treatment 48 hour (w/chlorinated compounds)		per event	\$1,080.00		\$0.00
12.1 Off-gas Treatment 96 hour (w/chlorinated compounds)		per event	\$2,160.00		\$0.00
13.2 AFVR Effluent Disposal(w/chlorinated compounds)		gallon	\$0.64		\$0.00
14.2 AFVR Site Reconnaissance		each	\$302.40		\$0.00
15.1 Additional Hook-ups		each	\$29.68		\$0.00
16.2 AFVR Effluent Disposal (3 events)	30000	gallon	\$0.53		\$15,900.00

17.2 AFVR Mobilization/Demobilization		each	\$777.60	\$0.00
18.1 Mobilization for absorbents/skimers		each	\$516.69	\$0.00
19.1 Well sock 2" ID well		each	\$36.94	\$0.00
20.1 Well sock 4" ID well		each	\$49.03	\$0.00
21.1 pad (per pad)		each	\$49.95	\$0.00
22.1 3" diameter x 10' length boom		each	\$108.00	\$0.00
23.1 5" diameter x 10' length boom		each	\$132.84	\$0.00
24.1 New FPP recovery skimmer (2" wells)		each	\$791.10	\$0.00
25.1 New FPP recovery skimmer (4" wells)		each	\$1,247.40	\$0.00
26.1 Refurbished FPP recovery skimmer (2" or 4" wells)		each	\$760.32	\$0.00
27.1 Disposal of Absorbents		pound	\$4.10	\$0.00
28.1 Disposal of product from skimmers		gallon	\$0.50	\$0.00
X. Granulated Activated Carbon (GAC) filter system installation & service:				
1.2 New GAC System Installation		each	\$2,320.86	\$0.00
2.2 Refurbished GAC Sys. Install		each	\$1,099.35	\$0.00
3.2 Filter replacement/removal		each	\$427.53	\$0.00
4.2 GAC System removal, cleaning, & refurbishment		each	\$335.92	\$0.00
5.2 GAC System housing		each	\$305.38	\$0.00
6.2 In-line particulate filter		each	\$183.22	\$0.00
7.2 Additional piping & fittings		foot	\$1.84	\$0.00
Y. Well Repair				
1.2 Additional Copies of the Report Delivered	1	each	\$61.07	\$61.07
2.2 Repair 2x2 MW pad		each	\$61.07	\$0.00
3.2 Repair 4x4 MW pad		each	\$107.49	\$0.00
4.2 Replace well vault		each	\$144.14	\$0.00
5.2 Replace well cover bolts		each	\$3.18	\$0.00
6.2 Replace locking well cap & lock		each	\$18.32	\$0.00
7.2 Replace/Repair stick-up		each	\$163.68	\$0.00
8.2 Convert Flush-mount to Stick-up		each	\$183.22	\$0.00
9.2 Convert Stick-up to Flush-mount		each	\$158.79	\$0.00
10.2 Replace missing/illegible well ID plate		each	\$14.66	\$0.00
11.1 Down-hole Camera		per foot	\$29.25	\$0.00
Z. High Resolution Site Characterization				
1.1 HRSC Screening Equipment Mobilization		each	\$1,468.80	\$0.00
2.1 HRSC Drilling Category 1		per foot	\$31.32	\$0.00
3.1 HRSC Drilling Category 2		per foot	\$36.18	\$0.00
4.1 HRSC Drilling Category 3		per foot	\$29.16	\$0.00
5.1 HRSC 3-D Model		each	\$4,363.20	\$0.00
S. Report Prep & Project Management	12%	percent	\$76,824.33	\$9,218.92
TOTAL				\$86,043.25

December 10, 2025

Ms. Erin Jezek
UST Management Division
SCDES, BLWM
2600 Bull Street
Columbia, SC 29201

RECEIVED

DEC 15 2025

UST DIVISION

Re: **HHI PSD Release #2 – Strategy to Closure Summary (Rev. 1)**
21 Oak Park Drive
Hilton Head Island, South Carolina 29926
Beaufort County
SCDES UST Permit #11399
Release Reported: Release #2 (July 27, 2017)



Dear Erin,

FME Consultants Inc. (FME) is providing this revised Strategy to Closure Summary to you based on our recent communications. FME is proposing to use an Enhanced Aggressive Fluid Vapor Recover (E-AFVR) as a first step to get the Hilton Head Island Public Service Department (HHI PSD) site in Beaufort County to closure. A groundwater corrective action has been requested by South Carolina Department of Environmental Services (SCDES) in correspondence dated October 2, 2025. At this time, free product petroleum (FPP) (diesel), remains within five (5) monitoring and recovery wells at the HHI PSD site, as of our last sampling event in July 2025. In SCDES's October 2, 2025 correspondence, SCDES established interim Site-Specific Target Levels (SSTL) for FPP of <0.01 feet. Based on a brief meeting with SCDES and information provided, it is SCDES intention to get this site to closure within two (2) years.

Proposed Treatment – Enhanced Aggressive Fluid Vapor Recover (E-AFVR)

Based on collaboration with the Ivey Sol scientists, we are proposing to install "Ivey Sol 106" surfactant in the source area, specifically in existing recovery wells RW-1 and RW-2 as well as three (3) new recovery wells (i.e., proposed RW-3, RW-4, and RW-5) to facilitate the desorption and extraction of FPP. Refer to Attachment #1 (Figures) for site and well locations. Proposed new recovery wells will be 4-inch diameter wells to be installed between MW-9 and MW-13 (RW-3), northeast of MW-9 (RW-4), and adjacent to the former tank basin (RW-5). It is anticipated that each recovery well will be installed up to 15-feet in depth, similar to existing recovery wells. A series of up to five (5) injection of Ivey Sol, followed by AFVR extractions, would be used to meet the interim SSTL. Ivey Sol is surfactant technology that is comprised of patented/proprietary formulations that makes FPP miscible in aqueous phase for enhanced mass removal. Please refer to Attachment #2, Ivey Sol information.



For each injection/extraction event, 50-gallons of the petroleum surfactant (i.e., 10-gallons at each RW well), at a 4% mix ratio (i.e., 265 gallons of surfactant-water mix injected at each RW well). Ivey Sol, will be injected 24-hours prior to the AFVR event to aid the FPP mobilization during the proposed AFVR event. A 24-hour AFVR will be conducted following injection, during which up to 10,000 gallons of petroleum impacted groundwater will be removed and disposed. Approximately 30 days following the AFVR event, F&ME personnel will gauge onsite monitoring and recovery wells for groundwater elevations, as well as for the presence of FPP (if any). If measurable FPP remains (i.e., greater than 0.01-foot of FPP), the injection/extraction will be repeated for up to a total of five (5) events. A copy of SCDES's AFVR checklist is included in Attachment #3 (SCDES Checklist and Correspondence).

It is understood that to facilitate the proposed treatment method, FME will need to prepare an abbreviated Underground Injection Control (UIC) Permit application for SCDES personnel to obtain approval for the groundwater treatment injections proposed here. This would be prepared after the preparation of, submittal, and approval by SCDES of a Corrective Action Plan (CAP).

Post-Injection/Extraction Monitoring:

Concurrent with the installation of the three (3) new proposed recovery wells (RW-3, RW-4, RW-5) discussed above, two (2) additional monitoring wells (i.e., MW-14 and MW-15) will be installed northeast of MW-9 to verify that we are capturing FPP extents. Refer to Figure 2 for the location of these proposed monitoring wells. These two (2) proposed monitoring wells will be used to monitor E-AFVR effectiveness and to ascertain the limits of the FPP observed onsite. We anticipate that the monitoring wells will be installed up to 15-feet in depth, similar to MW-3 and MW-9 in this area.

As noted above, approximately 30-days following an injection/extraction event, onsite wells be gauged for groundwater elevations, as well as for the presence of FPP (if any). If measurable FPP remains (i.e., greater than 0.01-foot of FPP), the injection/extraction will be repeated up to a total of five (5) events. If no FPP remains after 30-days from an event, a second gauging event will occur after 30-additional days (i.e., 60-days after extraction) to determine if another injection/extraction event would be warranted. If after two (2) gauging events with no FPP measured, FME will perform a comprehensive groundwater sampling event to sample each well onsite and submit samples for laboratory analysis in accordance with the QAPP.

During the comprehensive sampling event, each well will be purged prior to sampling. Low flow purging and sampling methods will be used for each well. As required by the Revision 4.0 QAPP, an equipment blank will be collected and submitted for lab analysis for the submersible pump used for purging and sampling.

FME will prepare and submit evaluation reports to the SCDHEC Project Manager via email after each injection/extraction event, and following gauging activities. A comprehensive technical report to include each injection/extraction event information and the comprehensive groundwater sampling event will be provided after the groundwater sampling report is completed.

Schedule

FME has prepared an estimated schedule of the work described in this letter. However, the schedule is at this point approximated. Additionally, scheduling will be highly dependent upon subcontractor availability. However, we have provided an estimated schedule of work below for planning purposes only (see Inset #1).

INSET #1
Estimated Interim SSTL Work Schedule (Rev. 1)
HHI PSD Site
Hilton Head, Beaufort County, SC

Site Closeout Activity	Estimated Start Date	Estimated End Date	Approximate Duration (days)
Submittal of Strategy to Closure Proposal to SCDES	11-Dec-25	31-Dec-25	20
CAP and UIC Preparation/Submittal to SCDES	31-Dec-25	4-Feb-26	35
UIC Approval/CAP Approval	4-Feb-26	25-Feb-26	21
PUPS/811/Install (3) RW and (2) MW	25-Feb-26	1-Apr-26	35
Pre Planning Preparation, Scheduling Injection/AFVR, Ordering Materials Event 1	1-Apr-26	22-Apr-26	21
Event 1 Injection/Extraction	22-Apr-26	27-Apr-26	5
One month of Stasis/Followed by GW Gauging (Event 1)	27-Apr-26	1-Jun-26	35
Pre Planning Preparation, Scheduling Injection/AFVR, Ordering Materials Event 2*	1-Jun-26	22-Jun-26	21
Event 2 Injection/Extraction*	22-Jun-26	27-Jun-26	5

Site Closeout Activity	Estimated Start Date	Estimated End Date	Approximate Duration (days)
One month of Stasis/Followed by GW Gauging (Event 2)	27-Jun-26	1-Aug-26	35
Pre Planning Preparation, Scheduling Injection/AFVR, Ordering Materials Event 3*	1-Aug-26	22-Aug-26	21
Event 3 Injection/Extraction*	22-Aug-26	27-Aug-26	5
One month of Stasis/Followed by GW Gauging (Event 3)	27-Aug-26	1-Oct-26	35
Pre Planning Preparation, Scheduling Injection/AFVR, Ordering Materials Event 4*	1-Oct-26	22-Oct-26	21
Event 4 Injection/Extraction*	22-Oct-26	27-Oct-26	5
One month of Stasis/Followed by GW Gauging (Event 4)	27-Oct-26	1-Dec-26	35
Pre Planning Preparation, Scheduling Injection/AFVR, Ordering Materials Event 5*	1-Dec-26	22-Dec-26	21
Event 5 Injection/Extraction*	22-Dec-26	27-Dec-26	5
One month of Stasis/Followed by GW Gauging (Event 5)	27-Dec-26	31-Jan-27	35
Onsite GW Sampling**	31-Jan-27	7-Mar-27	35
Laboratory Analysis Time	7-Mar-27	21-Mar-27	14
Report Preparation and Submission to SCDES	21-Mar-27	5-May-27	45

** If needed. If gauging indicates less than 0.01-feet of FPP, another 30-days will elapse before a repeat gauging event.*

*** If less than 0.01-feet of FPP detected in two (2) back-to-back gauging events, then comprehensive GW sampling/analysis will occur.*

Alternative to E-AFVR

Please note that if E-AFVR does not appear to be effective, i.e., if subsequent gauging events do not indicate a significant decrease in FPP thickness and after discussion with SCDES personnel, an alternative route to site closure will be implemented. FME recommends that FPP belt skimmers be installed and used at RW-1, RW-3 (proposed), and RW-4 (proposed) as an alternative treatment method. FPP skimmers are easy to install, easy to monitor effectiveness, and have been successful in past installations. Refer to <https://www.abanaki.com/product/petroextractor-well-oil-skimmer/> (or similar) for general information on FPP well skimmers.

Payment for Services

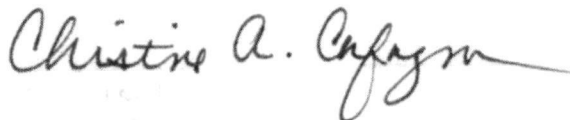
Please note that FME intends to request interim or milestone payment from the SUPERB account for services rendered after each E-AFVR and gauging event is complete. FME will provide a summary of work completed following injection task, AFVR event, and groundwater gauging. This will allow FME to be paid for product ordered/injected and AFVR subcontractor(s) to be paid in timely manner. Final payment will be requested after the groundwater sampling/analysis report.

As a means to estimate the cost of this remedial approach and strategy to site closure, we have prepared an **estimated** cost agreement, included here as Attachment #4. Please note that this is only provided as an estimate, and an updated cost agreement will be provided in the formal CAP.

If you have any questions concerning our proposal, or if we can provide any additional information, please feel free to contact us at (803) 719-6489 or ccafagna@fmeconsultants.com. We sincerely appreciate this opportunity.

Sincerely,

F&ME CONSULTANTS



Christine A. Cafagna
Senior Environmental Manager

cc: Bill Davis, HHI PSD

Attachments:

- #1 – Figures (Rev. 1)
- #2 – Ivey Sol Information
- #3 – SCDES Checklist and Correspondence
- #4 – Cost Estimate (preliminary, to be updated based on CAP)

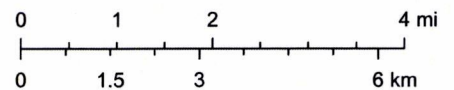
Attachment #1

Figures



BEAUFORT COUNTY

1:144,000



DRAWN BY:	CTC
APPROVED BY:	CAC
NOTES:	

ORIGINAL:
October 29, 2025

REVISIONS:

1 _____

2 _____

3 _____

SCALE: As Noted

F&M
CONSULTANTS

211 BUSINESS PARK BLVD.
COLUMBIA, SC 29203

HHI PSD RELEASE #2 - UST PERMIT# 11399
21 Oak Park Drive
Hilton Head Island, Beaufort County, South Carolina

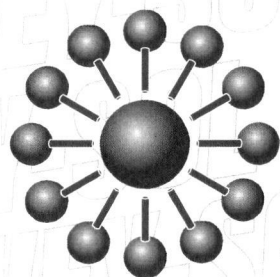
SITE VICINITY MAP

F&M CONSULTANTS
PROJECT NUMBER:
E6687.004

FIGURE
NUMBER:
1

Attachment #2

Ivey Sol Information



IVEY-SOL[®]
Surfactant Technology

**Ivey-sol[®] Surfactant Remediation
Technology for treatment of petroleum
hydrocarbon, chlorinated solvent,
PFAS, and Organometallic impacted
soil and groundwater**

**Free of Unwanted By-Products Including:
PFOA, PFAS, 1,4 Dioxane, Dioxins, Furans and Tested
and Free of USEPA Regulated Contaminates.**

Powering Site Remediation for Over 25 Years



**2020 Top 10 Environmental Technology
Solution Providers - Award Enterprise
Technology Review**



**2019 CV Best Environmental
& Remediation Solutions Award**



**2018 EBJ Technology
Merit Remediation Award**



**2018 CV Best Environmental
Tech Development Company Award**



**2011 MISTIC Environmental
Excellence Award**



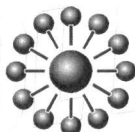
**2011 Roy F. Weston Award
Significant Contributions to Field
of Industrial Waste Management**



**2006 North American
Frost & Sullivan Award for
Technology Innovation**



**2006 Globe Award for
Environmental Innovation
and Application**

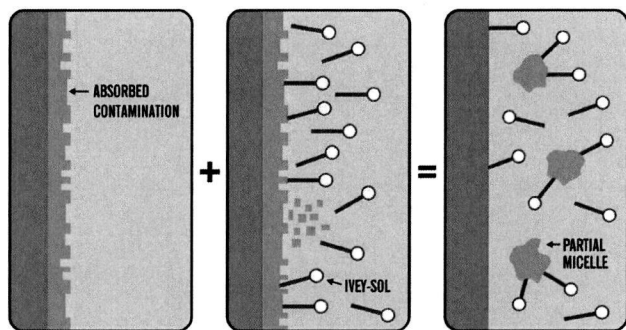


Ivey International Inc.
Today's environmental solutions for a better tomorrow[™]

ivey-sol.com

IVEY-SOL SURFACTANT REMEDIATION TECHNOLOGY

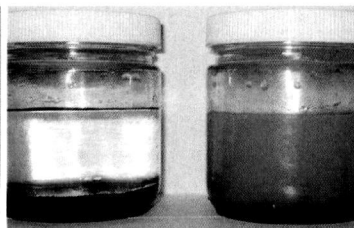
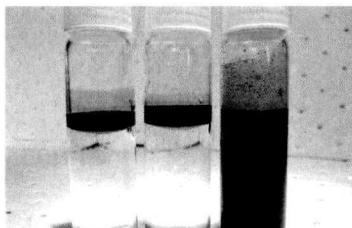
Ivey-sol® Surfactant Technology is comprised of several patented and/or proprietary non-ionic surfactant formulations (biodegradable) that have the unique ability to selectively desorb sorbed (i.e., absorbed and/or adsorbed) contaminants and make free-product (NAPL) miscible in the aqueous phase for enhanced mass removal (See Mechanism). This includes the broad range of Light Non Aqueous Phase Liquids (LNAPL) like petroleum hydrocarbons (API >10), and the Dense Non Aqueous Phase Liquids (DNAPL) including chlorinated solvents (API <10). Ivey-sol® has also been used for the remediation of recalcitrant compounds within fine to coarse soil textures, marine sediments and fractured bedrock, and within the groundwater table and associated smear-zones and capillary zones, with favorable results.



Ivey-sol® desorbing contamination off the soil surfaces, or from NAPL (i.e. LNAPL and/or DNAPL) layers making them more 'Available' for in-situ or ex-situ remediation. The three (3) main Ivey-sol® application processes that were developed over two (2) decades for enhancing in-situ and ex-situ remediation of: Vapors/VOC, Soil/Bedrock (sorbed), and Groundwater (Dissolved, LNAPL, and Smear-Zone) COC site remediation, are outlined as follows:

SER® SURFACTANT ENHANCED REMEDIATION

In-situ and ex-situ application processes to liberate sorbed and/or LNAPL COC making them more miscible (soluble) and more 'Physically-Available' for mass removal via 'Push-Pull™' or 'Pump & Treatment' type remediation methods.



SEB® SURFACTANT ENHANCED BIOREMEDIATION

In-situ and ex-situ application processes to liberate contaminants making them more 'Biologically Available' for microbial (bacteria) and associated enzymatic degradation. SEB® improves both in-situ and/or ex-situ bioremediation treatment methods.

SEC® SURFACTANT ENHANCED CHEMICALIZATION

In-situ and ex-situ application processes to liberate contaminants making them more 'Chemically-Available' for chemical REDOX (i.e. Reduction or Oxidation or combined) by chemical agents.

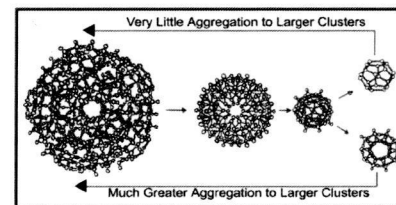


IVEY-SOL® WATER CLUSTER SIZE REDUCTION

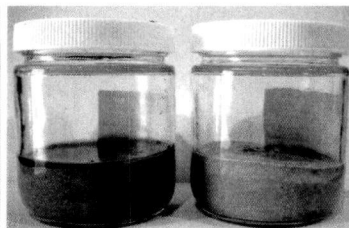
Ivey-sol® surfactants, when introduced into contaminated soil and groundwater regimes, can reduce the surface tension of water from 73 dynes to <30 dynes. This capacity improves the wetting ability, and movement, of the aqueous phase in the soil and groundwater (unsaturated and saturated) zones, and the relative 'Hydraulic Conductivity' (K), while Ivey-sol® is present. Once Ivey-sol® applications are completed the original site conditions return to normal.

The Ivey-sol® surfactants accomplished this by reducing the size and formation of large water-clusters to smaller water-clusters (See below). In doing so, the Ivey-sol® allows the water clusters to become smaller, and to penetrate into less permeable soils such as: clays, silty-clay, silty-sand, sands with silty and clay content to weathered and fractured bedrock, improving NAPL, sorbed and dissolved phase petroleum hydrocarbon and chlorinated solvent remediation.

Ivey-sol® reducing water cluster size for improved transport within fine grain soils.



A variety of Ivey-sol® application images are provided along the footer of this page showing the capacity and efficiency of this technology to enhance vapor, soil and groundwater remediation.





Ivey-sol 106 surfactant is mixed with water, with the addition of a conservative tracer for monitoring purposes, prior to injection.

SURFACTANT TECHNOLOGY ENHANCES REMEDIATION AT CONTAMINATED GRAIN ELEVATOR SITE

By Eric Dulle and George 'Bud' Ivey

Grain elevators are an enduring symbol of agricultural tradition. Unfortunately, they present environmental problems, due to a legacy of the agricultural industry's use of synthetic chemicals to help grow, store, and transport food. Since the 1970s, for example, grain producers have used fumigants containing chemicals such as carbon tetrachloride (CT) to protect stored grains from fungus and rot.

Fumigants were typically stored in above-ground storage tanks at grain elevator sites, ready for use as needed. As professionals in the remediation industry well know, where there are storage tanks, there are leaks, and where there

are leaks, there is the potential for soil and groundwater contamination. Such contamination is the reality at most, if not all, grain elevator sites.

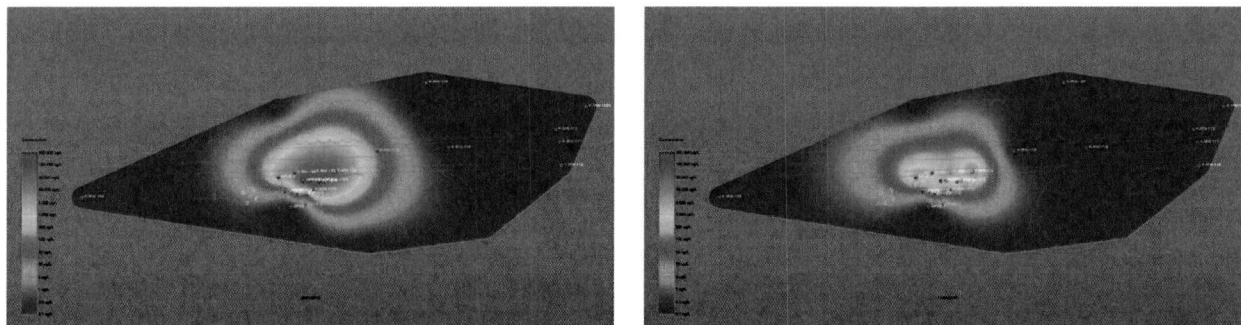
During the 1970s and 1980s, the owner/operator of a still-active grain elevator facility had regularly applied 80/20 grain fumigant (i.e., 80% CT and 20% carbon disulfide), as was common during that era. The fumigant compound was stored in an above-ground storage tank on the property before its removal in the 1990s.

The site entered into a voluntary cleanup and property redevelopment program in 2000, following soil and groundwater detection of fumigant constituents

of concern (COCs). These were primarily CT, but also carbon disulfide, chloroform, and methylene chloride. Groundwater impacts extended about 122 m down gradient from the site (the "source area").

To remediate the site, Burns & McDonnell Engineering Company, the consulting engineer for the project, recommended the installation of a dual-phase extraction (DPE) system. It has been operating since 2007.

Remediation options at the site were significantly limited due to access constraints associated with ongoing facility operations, a steep grade change from the access point to the source area, active mainline railroad tracks, and



Constituents of concern (COC) concentrations in groundwater plume before and after Ivey-sol application.

other utilities and structures throughout the impacted area. Nonetheless, the remediation team was able to successfully and safely install the DPE system, including eight extraction wells, within the source area.

Over the period from 2007 to 2014, the system achieved significant contaminant mass reduction, removing over 4,130 kg of COCs in the vapour and dissolved phases. About 28.5 million litres of groundwater were recovered and treated during this time period.

Evaluations of DPE performance in 2014 found that, while the system had succeeded in removing a very large amount of mass and significantly reducing the lateral extent of the source area, a subset of source-area extraction wells continued to exhibit elevated (i.e., source-level) COC concentrations in groundwater. The system had dramatically reduced source mass and prevented migration of the plume as intended, but a remnant, highly concentrated source still required remediation.

As a result, an additional investigation was conducted using high-resolution site characterization techniques to assess the nature and extent of residual COC mass in the source area. The investigation results indicated significant sorbed-phase COC mass, generally

limited to the shallow, sandy interval of an area bound by the DPE wells exhibiting elevated COC concentrations. Historical light non-aqueous phase liquid (LNAPL), heavily impacted with the site COCs, was also identified.

Burns & McDonnell used the data generated by the investigation to evaluate alternatives for expediting the source-area remediation and maximizing the effectiveness of the DPE system. During the course of evaluating alternatives, a presentation at a remediation industry conference, describing a project with similar site conditions, led Burns & McDonnell to believe that surfactant-enhanced extraction (SEE) would be a viable option. The company also had a previous relationship with surfactant technology developer Ivey International Inc. (Ivey) in a separate petroleum remediation project.

Based on these factors, Burns & McDonnell decided to conduct a SEE pilot study in 2015 using the Ivey-sol® 106 (Cl) surfactant formulation, which was specially designed to treat chlorinated solvents at the site. If the pilot study yielded positive results, a full-scale project would follow.

Ivey-sol® SEE surfactant products consist of several patented and/or proprietary non-ionic formulations that

can selectively desorb sorbed COCs and render NAPLs miscible in the aqueous phase. Surfactants have a structure with a hydrophilic head and a hydrophobic tail; the hydrophobic tail attracts and attaches to the organic portion of CT and similar molecules, while the hydrophilic head attracts to groundwater, thereby making the CT molecules miscible.

Ivey-sol can do this without emulsifying the COCs, thereby increasing their availability for remediation, while not impacting the performance of wastewater treatment systems.

Ivey's products accomplish three goals. Firstly, surfactants overcome the "limitation" challenges associated with contaminant sorption and solubility. Secondly, they lower the relative surface tension of water, thereby improving its wetting and associated hydraulic conductivity properties. Thirdly, through their selective dissolving of COCs below the critical micelle concentration, the surfactants broaden the range of contaminants that can be treated and enhance physical, biological, and chemical remediation, in situ and ex situ.

According to Ivey, their surfactant products are non-toxic and biodegradable, so they do not persist in the environment after application, which can be

continued overleaf...

Ivey-sol can make carbon tetrachloride molecules miscible without emulsifying the constituents of concern, thereby increasing their availability for remediation, while not impacting the performance of wastewater treatment systems.

verified with Ivey-sol field test kits and by three USEPA laboratory test methods. Indeed, because they are non-toxic to bacteria, they can also give a boost to natural attenuation.

They have some disadvantages that careful application can overcome. For example, their effectiveness may be diminished if the mixtures freeze during storage, and their deployment may suppress volatile organic compounds, making them less detectable by standard, handheld vapour meters.

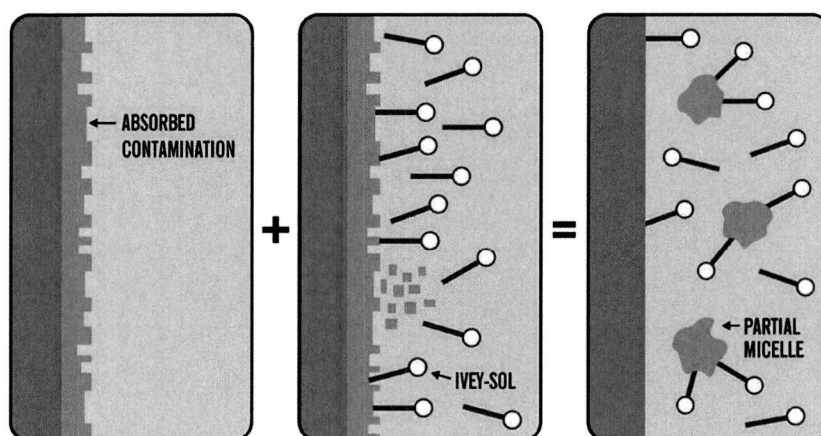
For the pilot study at the grain elevator site, which was conducted in April and May of 2015, Ivey-sol surfactant technology was deployed in single-well “push-pull” tests and multi-well “point-to-point” tests at two DPE system locations and two groundwater monitoring wells. Burns & McDonnell was able to use the existing DPE and well infrastructure to implement the surfactant injection and product recovery, thus minimizing intrusive activities and cost.

Groundwater was encountered at approximately 2.1 m – 2.4 m below ground surface. The lithology within the targeted source zone generally consisted of well-sorted, loose, silty sand to depths ranging from 4 m – 5.2 m below ground surface, underlain by a silty clay. Ivey have found that their surfactant products are effective in site conditions with more varied and complex structure, including coarse-grained, fine-grained, and higher silt and clay-content soils.

For this pilot, Ivey-sol surfactant was mixed with water in a 1% – 2% solution, which was gravity-fed into two monitoring wells and two DPE wells to achieve a targeted injection diffusion radius and then allowed to remain in the formation for a prescribed residence time.

Overall, concentrations of groundwater and soil vapour recovered by the DPE system, immediately following surfactant flushing, demonstrated increases of up to four times (>400%) more than the average concentrations observed under normal DPE operational conditions.

Based on these positive results, Burns & McDonnell elected to conduct a full-scale Ivey-sol SEE test from August through November of 2016 to address remaining COC mass within the source zone. For the full-scale test, 1,045 litres



Ivey-sol desorption mechanism operating on soil surfaces or LNAPL layers, making contamination more available for remediation.

of Ivey-sol 106 surfactant were mixed with potable water and a conservative tracer for observation of the solution's distribution.

Three additional monitoring wells were installed to facilitate surfactant delivery to the northern portion of the source area. Five Ivey-sol SEE phases were conducted to target the portion of the area with the highest COC concentrations, applying point-to-point surfactant delivery to the core source area within the shallow saturated zone, followed by groundwater extraction from the wells that were initially used for surfactant injection. Burns & McDonnell monitored recovery progress via real-time tracer testing and field surfactant test procedures developed by Ivey.

A key result of the full-scale activities was a dramatic increase in COC mass recovery rates. During the short SEE implementation and 12 month monitoring period, the surfactant-enhanced DPE system recovered more than 25% of the total mass that the DPE system had recovered over the previous 10 years. In addition, recovered groundwater concentrations up to 30,000 micrograms per liter (µg/L), more than five times (>500%) the highest concentrations ever observed during DPE operation, were observed during the SEE monitoring period.

Overall, the full-scale SEE test achieved 98% CT reduction in the source area's shallow monitoring wells and 92% reduction in source area DPE wells. More-

over, although not the primary objective of remediation activities, significant reductions in LNAPL thicknesses were observed. The DPE remediation system, enhanced with Ivey-sol 106 (CI) formulation, successfully recovered the LNAPL product as a serendipitous benefit.

The remediation team estimates that the full-scale SEE system saved about a decade in active remediation time. With the cost of operating and maintaining the DPE system totaling up to \$100,000 annually, the potential cost and time savings involved in deploying surfactant technology to complement DPE technology and recover more highly concentrated COC mass are readily apparent. ■

Eric Dulle is with Burns & McDonnell.

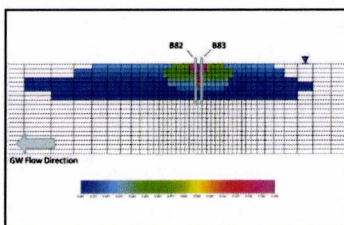
Email: edulle@burnsmcd.com

George “Bud” Ivey is with Ivey International.

Email: budivey@iveyinternational.com



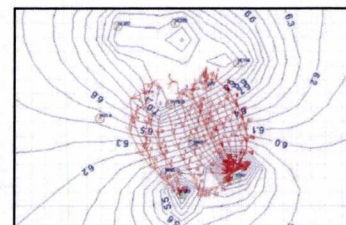
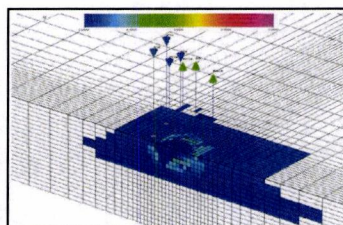
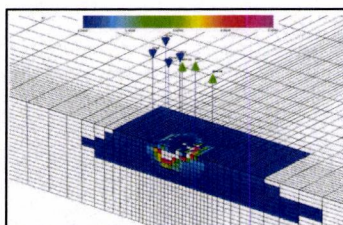
SETUP AND CALIBRATION OF A THREE-DIMENSIONAL NUMERICAL MULTIPHASE MODEL FOR DESIGN OF IN-SITU REMEDIATION OF JET FUEL WITH SURFACTANT



BACKGROUND

Storage and pumping of jet-fuel have caused a severe contamination of soil and groundwater at a military facility in Denmark. The contamination was detected in 2001. The Danish Defence has conducted a series of investigations and set up a skimmer system, that has recovered approximately 25 m³ of jet-fuel. In 2005, the recovery stopped, and the remaining jet-fuel is trapped as a residual light non-aqueous phase liquid (LNAPL) comprising approximately 45 m³ jet-fuel in a 1000 m² source area. In the ground water downstream of the source area, there is an extensive diving plume of contaminants.

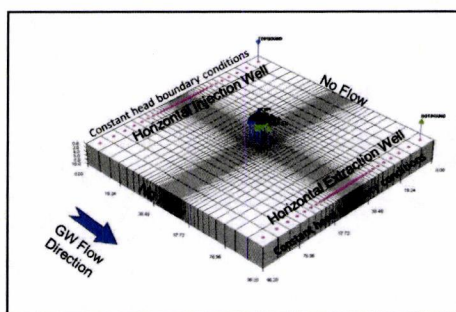
In part of the source area, the Danish Defence and NIRAS have launched a pilot Scale Surfactant Enhanced Aquifer Remediation (SEAR) in order to demonstrate mobilization of LNAPL from the sediment. The pilot remediation was carried out using non-ionic surfactants (Ivey-sol[®]) from Ivey International Inc. for injection in a line of injections wells. The mobilized oil and injected surfactants were recovered from a downstream line of extraction wells. The recovered oil/ground water was treated on site, and the treated water was re-injected up-gradient in a line of hydraulic control wells. The effect of the pilot SEAR was monitored by sampling and analyzing the ground water from the extraction wells and by estimation of trapped jet-fuel in an oil-water separator as part of the on-site treatment, supplemented by post soil sampling/analyses from boreholes. The 3 different methods gave different results for the mass balance, and the estimated effect of the pilot remediation ranged from 25 kg to 150 kg of hydrocarbons.



WATER BALANCE

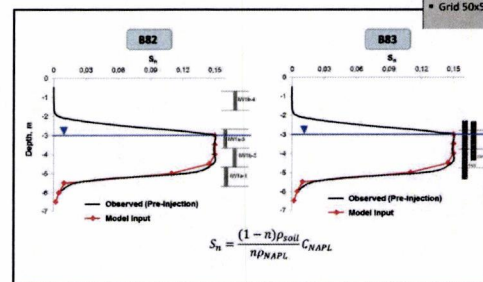
- Extraction – 12 m³/day (0.5 m³/h)
- Reinfiltration – 8 m³/day (0.33 m³/h)
- Injection 0.15 – 1 m³/day
- Discharge – 4 m³/day (0.17 m³/h)
- Hydraulic control – 2 weeks
- 7 injections of Ivey-sol[®] (0.15 – 1.0 m³ – 1.3 – 3.0 % surfactants)
- Hydraulic control for 7 weeks post injection

To validate the effect of the Pilot Remediation, GSI Environmental Inc. has set up a three-dimensional numerical multiphase model by using the University of Texas' Chemical Compositional Simulator UTCHEM.



SETUP UTCHEM

- Input – vertical oil saturation based on soil samples



• $dx = dy =$ variable
 • Min = 0.5 m (center)
 • Max = 7.7 m (boundaries)
 • $dz = 0.5$ m
 • 100 m x 100 m x 10 m
 • Grid 50x50x200

SIMULATIONS UTCHEM

- 70 days – Injections of Ivey-sol[®] surfactants from day 20 to day 27
- 7 injections of surfactants – 1.3 – 3.0% Ivey-sol[®]
- Oil saturation as function of time
- Accumulated oil from extraction wells
- Capture of surfactants in extraction wells
- Comparison of simulations with no injection of surfactant

Søren Rygaard Lenschow,
 Anders G. Christensen
 NIRAS A/S, Allerød,
 Denmark

Mette Marie Mygind
 Danish Defence, FBE,
 Hjørring, Denmark

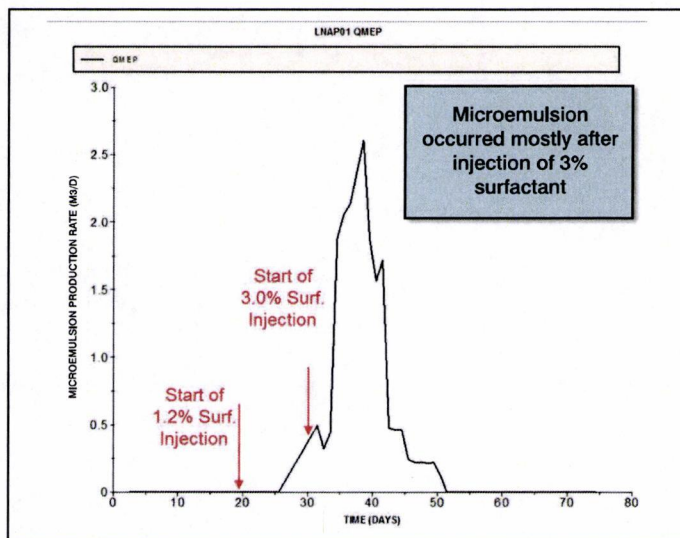
Ahmad Seyedabbasi,
 Phillip C de Blanc
 GSI Environmental Inc.,
 Houston, TX, USA

George Ivey
 Ivey International Inc.
 Surrey, BC, Canada

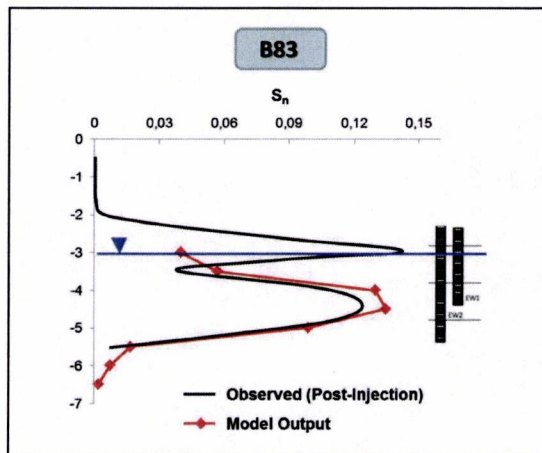
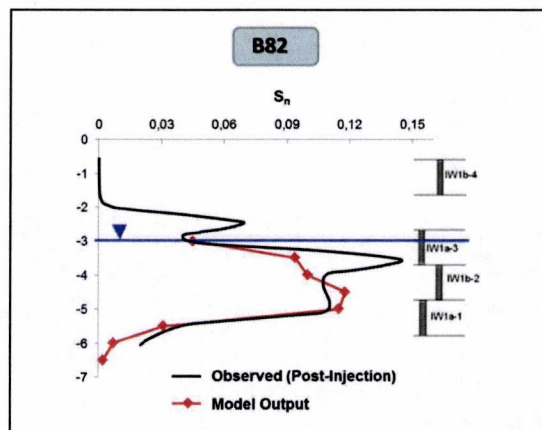


RESULTS

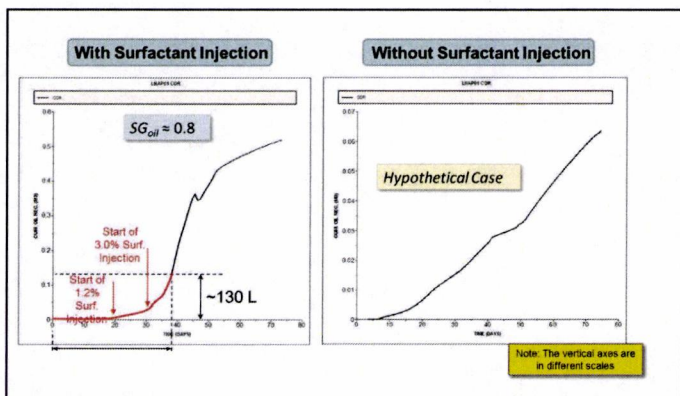
- Formation of micro-emulsion during Pilot SEAR



- Post Oil Saturation in soil



- Accumulated Oil during Pilot SEAR



The simulations indicate a removal of 130 kg oil on day 50 and approximately 400 kg after day 70. Simulations without surfactants show a removal of less than 1/10 of the removal achieved when using Ivey-sol® surfactants.

CONCLUSIONS

The UTCHEM model was able to simulate the Pilot SEAR, and injected fluids were contained within the pilot area. Further, the simulations estimated an approximate 10-fold (1000 %) increase of the oil concentration in the extracted ground water relative to a water injection without the use of Ivey-sol® Surfactants. The model also showed that the main process for mass removal during SEAR was production of a micro-emulsion.

The total removal during the Pilot SEAR was by UTCHEM estimated to be 100-400 kg oil compared to 25-50 kg by analysis and measurements of the effluents from the extraction wells, and 50-150 kg based on the change of oil saturation in the soil by analysis of soil samples.

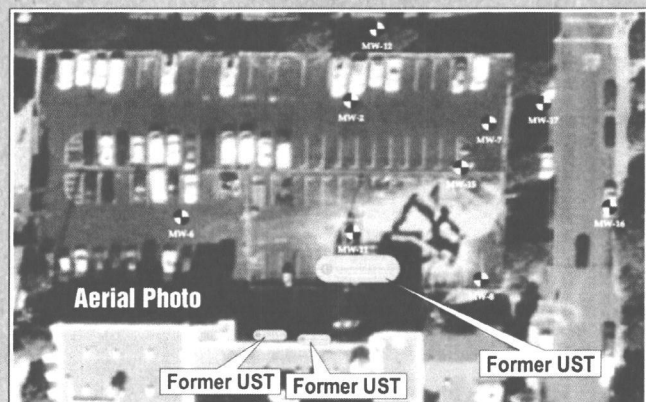
The simulated post-SEAR oil saturation was similar to measured concentrations from post-study soil sampling. The simulations also indicate that most of the Ivey-sol® surfactants was removed during the pilot SEAR and the post pump & treat period.

The setup of the UTCHEM gave an insight into the processes and hydraulics during the pilot SEAR in comparison to a "Black Box" situation, where the remediation technology performance is only evaluated by process and monitoring data, after the remediation is conducted.

The performance of the pilot study provided important lessons of great value for both the design and the documentation of issues in the design and planning of future full-scale remediation.

Surfactant Enhanced HVDPE Remediation of Petroleum Contaminated Soil, Bedrock and Groundwater

Site Conditions

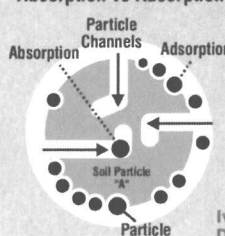


Remediation Challenge

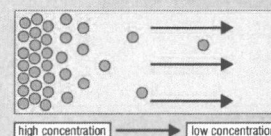
The number one limiting factor for all forms of in-situ remediation is contaminant sorption

Sorption >>>> Desorption or Diffusion

Absorption vs Adsorption



Diffusion



● solute
Solute transport is from the left to the right; movement of the solutes is due to concentration gradient (dC/dx).

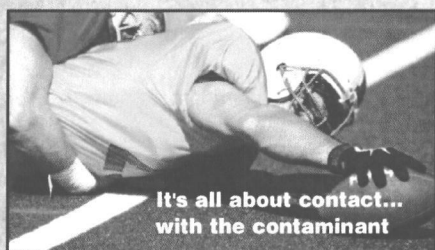
Ivey-sol® Overcomes Sorption Improving Desorption & Diffusion of Contaminants Increasing Their 'Availability' for Remediation

- ★ Recalcitrant petroleum product residuals sorbed in fine grain soils and fractured bedrock
- ★ Persistent concentrations in groundwater after 12 years of remediation – including pumping, HVDPE
- ★ Obtained regulatory approval for Ivey-sol® surfactant application in spring 2009

Pilot Test Approach

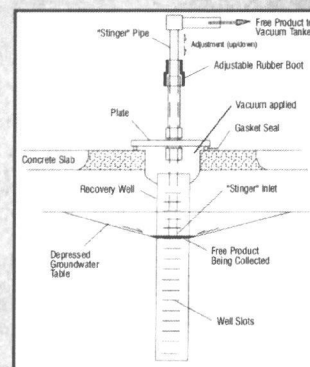
Focused Short-Term Surfactant Injection/Extraction to Maximize Recovery

- Ivey-sol® 106 pilot scale injection undertaken over 5 days in July 2009
- Four injection events, one injection well (MW15) and four extraction HVDPE wells (MW2, 7, 8 and 11)
- Five surrounding monitoring wells sampled during pilot
- Mobile HVDPE system capable of 28 inch Hg vacuum and 800 SCFM
- Groundwater HVDPE average recovery rate of 0.24 ppm

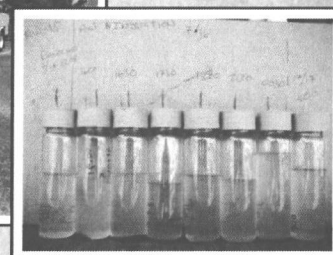
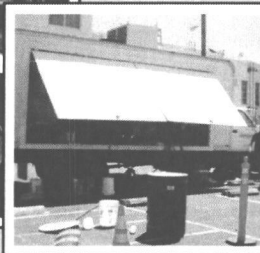
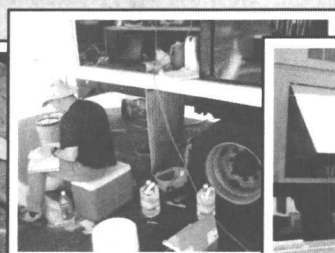


It's all about contact...
with the contaminant

- Recalcitrant petroleum product residuals in fractured bedrock
- Persistent concentrations in groundwater after 12 years of remediation – including pumping, HVDPE



HVDPE Extraction Well
Diagram shows radius of influence and potential LNAPL collection



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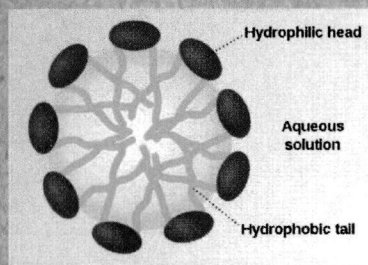
Results you can rely on

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Christopher d'Sa – E: CdSa@trcsolutions.com | Galen Kenoyer – E: Gkenoyer@trcsolutions.com

Surfactant Chemistry

Surfactant Structure



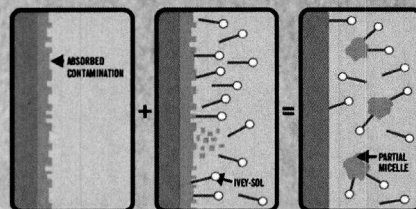
Hydrophilic (water loving) and Hydrophobic (water hating oil-liking) Groupings allow for Mobilization of many Organic Contaminants

Classes of Surfactants

- **Anionic:** Have one or more negatively (-) charged groupings; commonly used in laundry detergent
- **Cationic:** Have one or more positively (+) charged groupings, typically poor detergents but well suited for use as germicides, fabric softeners and emulsifiers.
- **Amphoteric:** Contains both anionic and cationic groupings; prefer neutral pH and found in products such as hair shampoo, skin cleaners and carpet shampoo.
 - *Ionic Surfactants make up >95% of the surfactant used around the world.*
- **Non-ionic:** Have no ionic constituents or groupings; largest single group of SAA (Surface Active Agent) and have a correspondingly wide range of chemical characteristics. Ivey-sol® surfactant mixtures are non-ionic and have the unique ability to selectively desorb contamination (LNAPL, DNAPL's, PAH, PCB, DCE, TCE, PCE), etc.

Why Ivey-sol® Surfactants?

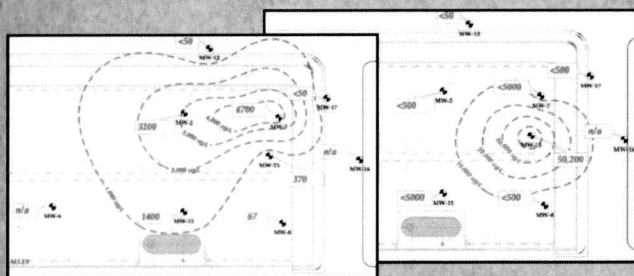
- Improves desorption of target contaminants in soil and groundwater
- Lowers the surface tension of water improving both its wetting and associated permeability (K) properties
- Effective as a stand alone technology for soil and groundwater remediation
- Effective to improve other remediation techniques (i.e., P&T, Soil Washing, Bioremediation, Chemical Oxidation/Reduction)



Ivey-sol® desorbing NAPL mass for increased 'availability' for remediation

Results

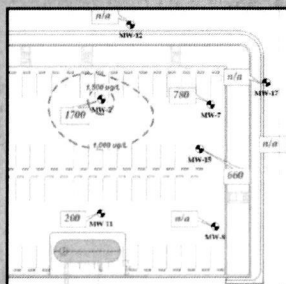
Before and During Test



TPH-d Isocon Map
before Pilot Test

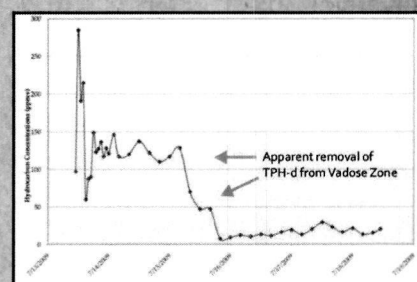
TPH-d Isocon Map
2 hrs after Pilot Test

Post Pilot Test Results



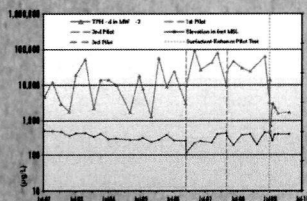
TPH-d Isocon Map
7 months after Pilot Test

HVDPE Vapor Concentrations



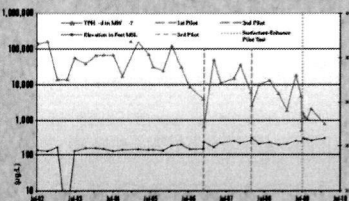
MW-2

$[9.169 \times 10^3 \text{ mg/day} + 1.5551 \times 10^3 \text{ mg/day}] \times 100\% = 590\%$



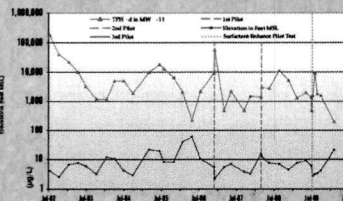
MW-7

$[2.1754 \times 10^3 \text{ mg/day} + 3.1918 \times 10^3 \text{ mg/day}] \times 100\% = 682\%$



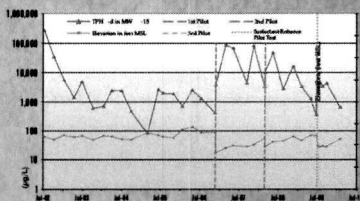
MW-11

$[1.678 \times 10^3 \text{ mg/day} + 1.7579 \times 10^3 \text{ mg/day}] \times 100\% = 955\%$



MW-15

$[4.4107 \times 10^3 \text{ mg/day} + 2.7803 \times 10^3 \text{ mg/day}] \times 100\% = 1,598\%$ Standard Pilot
 $[3.875 \times 10^3 \text{ mg/day} - 2.014 \times 10^3 \text{ mg/day}] \times 100\% = 1,924\%$ Push-Pull



Conclusions: We increased the TPH₀ Mass Recovery Rate by 10X !!!

★ Removed TPH-d from vadose zone

★ Lowered groundwater concentrations

★ Regulatory Agency agree to risk-based

closure if concentrations continue to decrease

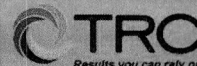
★ Pilot Application was a Success!



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Results you can rely on

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Christopher d'Sa - E: CdSa@trcsolutions.com | Galen Kenoyer - E: Gkenoyer@trcsolutions.com

Surfactant Enhanced Recovery of Separate-Phase Petroleum Hydrocarbons

Super Fund Site – Sunnyside Yard, Queens, New York City, USA

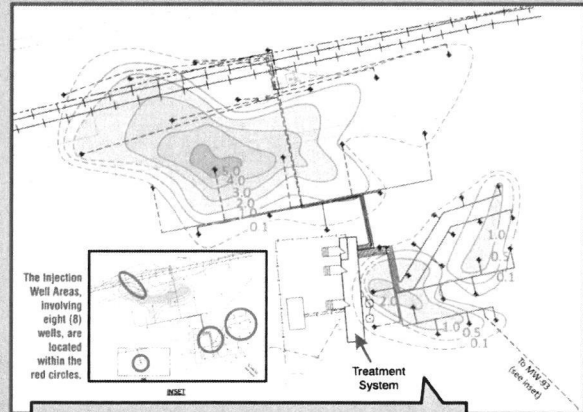
Paper ID: 22600 / Topic: ThS 4c / Author: George Ivey, Ivey International Inc.

SITE HISTORY



The site is located in Sunnyside Yard, Queens, New York City. It covers an area of 130 acres (52.6 Hectares). Has been in service for over 100 years. Site operations resulted in spills impacting the soil and groundwater with petroleum and PCB impacts, with observed phase separated petroleum hydrocarbons (LNAPL) on site. The site is a State Super Fund with six operational areas of remediation. This presentation focuses on the application of Ivey-sol surfactants to eliminate observed LNAPL to Regulatory Standards (<0.1 ft) within one area of the site, where the existing Dual Phase Vacuum Extraction (DPVE) System was proving to be effective.

DUAL PHASE VACUUM EXTRACTION (DPVE) SYSTEM LAYOUT



Operation of the in-situ DPVE system from 2013 and 2015 recovered 1883 Gallons (7,118 L) of product, with 84% of that mass recovery realized within the first five (5) months of system operation. Ongoing DPVE product recovery became asymptotic with diminishing rates of product recovery. Consultant wanted to enhance the product recovery. Bench scale testing of the Ivey-sol surfactant technology showed promise, resulting in regulatory approved pilot scale application presented herein.

Ivey-sol® Surfactant Technology

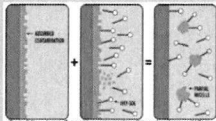
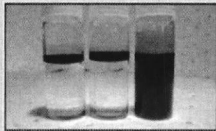
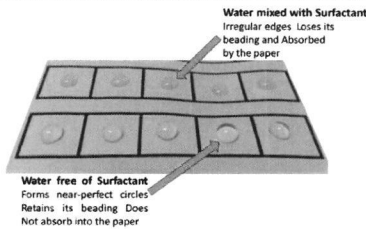


Figure 2-1: Ivey-sol surfactant technology breaks LNAPL into smaller droplets, making it more 'available' for recovery by the DPVE system.



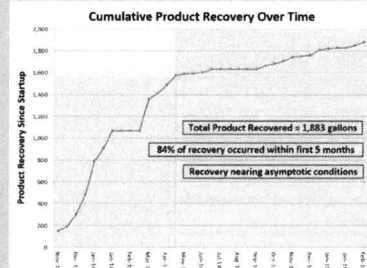
Photograph 2-2: Ivey-sol surfactant breaks LNAPL into smaller droplets, making it more 'available' for recovery by the DPVE system.



Water free of Surfactant
Forms near-perfect circles
Retains its beading Does
Not absorb into the paper

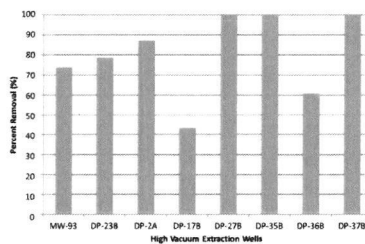
Ivey-sol surfactants technology is composed of several proprietary non-ionic surfactant formulations with the unique ability to selectively desorb petroleum hydrocarbons, and/or make phase separated hydrocarbons (LNAPL), more miscible in groundwater, below the critical micelle concentration (CMC) not requiring emulsification as shown in the supporting images. In doing so, this makes the phase separated hydrocarbons (LNAPL) more Physically-Available for enhanced DPVE mass recovery.

DPVE System Performance



RESULTS AND CONCLUSIONS

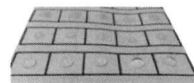
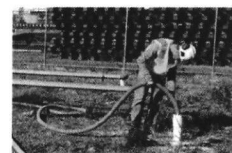
SPH (LNAPL) % Mass Removal



Conclusions

- SPH (LNAPL) mass recovery was significantly enhanced by the increase of SPH solubility by Ivey-sol;
- Free product was not observed in the extracted groundwater, and the performance of the groundwater treatment system (DW + GAC) was not hindered;
- Reduction of SPH (LNAPL) thickness was usually observed within 24 hours of Ivey-sol surfactant injections, and persisted for several weeks or longer (due to opening of obstructed pathways);
- Low concentration ratios of surfactant (1:20 to 1:50) are effective, and higher concentrations do not increase effectiveness as Ivey-sol mechanism works below the CMC (Yielding Cost Savings);
- Low injection volumes or injection rates were generally needed in the injection areas due to the low permeability soil conditions and high groundwater table;
- All treated wells experience significant product mass removal following the three (3) pilot-scale applications. Three (3) of the eight (8) wells experienced 100% product (LNAPL) removal, with the average product thickness reduction of 81% (no rebound observed);
- Based on the success of the pilot scale application, the project was given regulatory approval to go full scale application. Ivey-sol was also used in other impacted areas on this Super Fund Site aiding the physical, biological and/or chemical strategies being employed.

Pilot Study Methods



A total of three (3) in-situ Ivey-sol surfactant enhanced remediation (SER) applications were completed during the pilot study. This involved the gravity-feed injections of 265 Gal. (1000 L) of 2% Ivey-sol at each of the eight (8) injection well locations (IW). A post injection residence time of 24 hours was allowed before groundwater was extracted at these wells, to recover liberated product mass. Phase Separated Hydrocarbon measurements were completed prior to, during and after the Ivey-sol applications to evaluate the performance. The use of Ivey-sol surfactant field test kits (image provided) allowed the client to observe the location and relative concentration of Ivey-sol surfactant in-situ, and to determine the end-points of extraction associated with each event.

Project Update 2019 – The area treated in this presentation was successfully remediated, exceeding the state's regulatory standards, permitting the desired redevelopment of the area for a modern high speed train facility that has gone into operation.



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Site of July 2019 oil spill in northern Alberta.

SURFACTANT-BASED EXTRACTION PRODUCT HELPS MINIMIZE IMPACTS FROM LARGE SPILL IN ALBERTA

By **George (Bud) Ivey** and **Adam Dunn**

In July 2019, a failure of pump equipment led to the spill of about 320,000 litres of a mixture of crude oil and produced water at an oil storage and processing facility located in remote northern Alberta. As the facility operator reported, approximately 99% of the spilled fluids were recovered, having been contained in an on-site bermed area, which already held about 300 m³ of pooled surface water. Some of the product, however, breached the containment area and was released into the local environment.

Calgary-based Earthmaster Environmental Strategies Inc. was retained to assess cleanup options and implement the remedy for cleaning up the spill. They reported that the liquid product that breached the

containment area had flowed down a relatively steep slope (20% – 30% grade) about 180 m to the south-southwest. It was affecting herbaceous vegetation and associated trees and shrubs along its pathway.

An environmental receptor of concern was a small creek flowing near the base of the slope. Released fluids did not enter the creek, but there was some fluid infiltration into the shallow soil horizon and some oil sorption into vegetation and surface debris.

Released fluid consisted of 66 m³ of oil and 254 m³ of salt/produced water. No salt impacts were detected along the spill path, but the contaminants of concern (COC) included hydrocarbon fractions F1 (C6-C10), F2 (C10-C16) to F3 (C16-

C34), benzene, toluene, ethylbenzene and xylenes (BTEX).

The steep slope and the presence of merchantable timber, vegetation, leaf litter and organic debris, along with irregular surface contours, presented logistical and safety challenges for efforts to recover the fluid and clean up the area. Further challenges arose as a result of a number of precipitation events, some being significant.

In fact, a storm was predicted to dump about 150 mm of rain two days after the spill. This prompted Earthmaster to delay the selection and implementation of a final cleanup remedy while it prepared for the storm. The firm installed several lined bell-shaped holes to catch runoff

from the rain.

The application of LIDAR (light detection and ranging) remote sensing following the storm, confirmed that the bell holes were properly placed to prevent liquids from reaching the stream. As it turned out, they were also used for the final remedy chosen, which was flushing, or washing, as opposed to excavation and off-site disposal of the affected soil.

Excavation and removal is a common solution for many spills into the environment, but it presented several prohibitive challenges at this site, because of potential environmental damage. Deforestation of the hillside would have brought about erosion problems and a sedimentation threat to the nearby creek. There were cost issues as well, including a requirement to pay upwards of \$50,000 or more for the lost timber to the holder of the forest management agreement that covered the hillside.

Bioremediation and chemical oxidation were also deemed to be impractical for this particular spill. Bioremediation would not have addressed spill migration, which threatened the waterway, and ongoing monitoring and laboratory services would have been extended for several years and been very costly. Stoichiometrically chemical oxidation is also very costly when used to address free-product spills. It has the potential to kill vegetation, and requires special PPE handling as a hazardous material.

Fortunately, sampling at the site showed that the oil/water mixture that escaped from the containment area had coursed down the hill rather than penetrated into the soil to any significant depth. So, the

Ivey-sol has the unique ability to selectively desorb contamination at low application concentrations from surfaces, including free-product layers.

consultant decided that it could “do a flush” rather than a “scrape”, which, more precisely, was passive and active surface flushing, rather than excavation and off-site disposal.

A surfactant-based remedy was thus deemed optimal, and due to the remediation contractor’s familiarity with the Ivey-sol® surfactant product developed and marketed by Ivey International Inc. (IVEY), that product was chosen for the cleanup job. It is biodegradable, pH neutral, non-caustic, non-corrosive, and free of undesirable impurities.

The Ivey-sol surfactant-enhanced extraction (SEE) products consist of a series of non-ionic formulations that can selectively desorb sorbed contaminants and render non-aqueous-phase liquids miscible in the aqueous phase.

SEE products achieve three goals. Surfactants overcome the “limitation” chal-

lenges associated with contaminant sorption and solubility. Then, they lower the relative surface tension of water, thereby improving its wetting and associated hydraulic conductivity properties. Finally, through their selective dissolving of COCs below the critical micelle concentration (CMC), the surfactants broaden the range of contaminants that can be treated. Thus, they enhance in situ and ex situ physical, biological and chemical remediation.

These surfactant products are non-toxic and readily biodegradable, so they do not persist in the environment after application. This can be verified with field surfactant test kits developed by IVEY, and by using any of three U.S. Environmental Protection Agency laboratory test methods.

The products have some disadvantages that careful application can overcome. For example, their effectiveness may be diminished if the surfactant/water mixtures freeze during storage, and their deployment may suppress volatile organic compounds, making them less detectable by standard, handheld vapour meters.

Based on the understanding that sorption and free-product formation greatly limit the “availability” of contaminants for remediation, Ivey-sol has the unique ability to selectively desorb contamination at low application concentrations from surfaces, including free-product layers. This means they are more available for physical treatment, as evidenced by this challenging yet positive site application.

The Alberta Energy Regulator approved the use of the Ivey-sol technology at the
continued overleaf...



Views of area near Bell Hole 3 before and after flushing with the surfactant.

spill site. The client preferred it to environmentally destructive excavation alternatives.

At the spill site, the surfactant was deployed in varying concentrations, using various delivery methods in a roughly checkerboard configuration. The first trial was completed using backpack sprayers (with a surfactant-to-water ratio of 1:30), followed by pressure-washing.

There was not enough volume in this trial, however, to move the oil to the recovery bell holes for removal. In order to increase pressure and volume, the surfactant and water were mixed in the tank of a small hydrovac truck at a 1:40 ratio for the second trial and applied using the pressure wand. The oil could be recovered with this application with the right technique, but would splatter if too much pressure was used.

In the third trial, another surfactant-to-water ratio of 1:40 was mixed in the hydrovac truck tank, and the tank hose was used for application rather than the pressure wand. The surfactant effectively washed the oil off the vegetation using this application.

However, there was not enough pressure to move the fluid to the recovery bell holes, and suds were being produced. In order to optimize oil recovery and surfactant usage, ratios of 1:60 and 1:80 were applied and small local trenches were dug to collect and recover fluids.

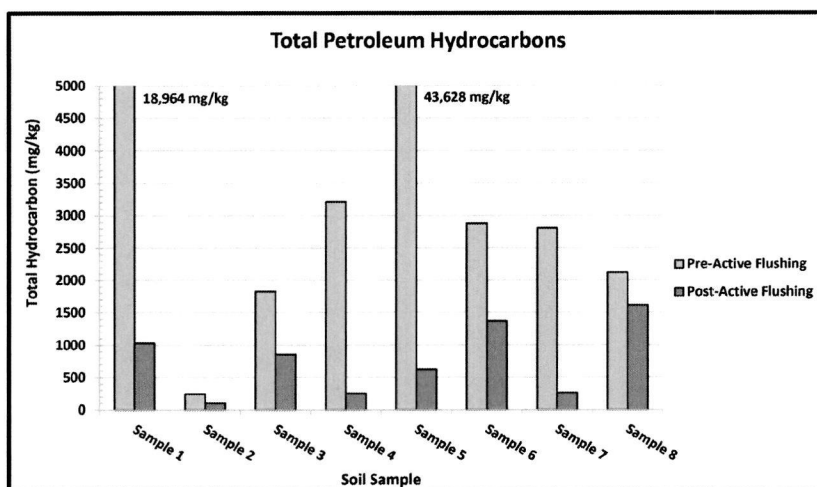
The surfactant was applied over the course of four days, and the majority of the oil on the hillside was effectively liberated and flushed into the trenches and bell holes for removal. Visual observations indicated that the cleanup operation was generally effective, and soil sampling confirmed these findings.

Earthmaster decided that some heavily impacted areas where the leaf litter and vegetation was saturated with oil did not warrant the amount of surfactant and time required for complete removal. As a result, the contractor completed the remediation via surface soil/vegetation removal in these areas.

The flushing operation did not necessarily save much time compared with the typical spill response operation. But, it did realize significant cost savings in terms of avoiding the removal of merchantable timber on the hillside and the option of



Cleanup crews flush forested impact site with Ivey-sol® surfactant.



Total PHC Bar Graph.

excavating and landfilling impacted soil and vegetation.

According to Earthmaster, there were numerous factors affecting project costs, and it was difficult to precisely quantify the cost savings attributable to choosing the flushing operation. The contractor estimates, however, that those cost savings could have been upwards of several hundred thousands of dollars. In light of this consideration, plus the avoidance of environmental damage, the Ivey-sol surfactant-based solution was deemed a sustainable success.

"In July 2019 we were faced with a 320,000 litre crude oil and produced water spill at a facility in northern Alberta," said Adam Dunn, vice president of operations at Earthmaster Environmental. "With our

rapid spill response strategy, utilizing the Ivey-sol surfactant remediation technology, we achieved significant time, cost, and environmentally sustainable cleanup benefits, resolving more than 99% of the spill on the hillside." ■

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Adam Dunn is with Earthmaster Environmental Strategies Inc. Email: adam.dunn@earthmaster.ab.ca

**Recently, Ivey International Inc. won a Top 10 Environmental Technology Solution Providers 2020 Award from Enterprise Technology Review, a U.S. media company, in recognition of their technological innovations.*



Ivey International Inc.

"Today's Environmental Solutions For A Better Tomorrow"

REACH Bulletin

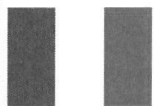
EU Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) Regulation Compliance



ENGLISH

The **IVEY-SOL®** surfactant formulation, and its specific components, are non-ionic polymers and are therefore exempt from REACH registration under Article 2(9). **Ivey International Inc.** is committed to ensuring that end users have the most effective and safe product for environmental remediation and reclamation. We are committed to working with all regulatory agencies to ensure compliance with current standards.

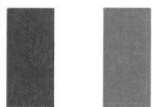
Conformité aux normes d'enregistrement à l'échelle de l'UE, évaluation, autorisation des substances chimiques et des restrictions applicables à ces substances (REACH)



FRANÇAIS

La formule tensioactive **IVEY-SOL®**, ainsi que ses composants spécifiques, constituent des polymères non ioniques et sont par conséquent exemptés d'enregistrement REACH, conformément à l'article 2(9). **Ivey International** s'engage à fournir aux utilisateurs finaux le produit le plus efficace et le plus sûr qu'il soit pour l'assainissement et la récupération environnementale. Nous sommes résolus à travailler avec tous les organismes de réglementation afin de veiller au respect des normes en vigueur.

Conformità al regolamento europeo REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals)



ITALIANO

La formulazione tensioattivi **IVEY-SOL®** e i suoi elementi specifici consistono in polimeri non ionici esenti da registrazione REACH ai sensi dell'articolo 2(9). **Ivey International** s'impegna ad assicurare all'utente finale un prodotto per le bonifiche ambientali efficace e sicuro, e a lavorare con le agenzie di regolazione preposte per assicurare la conformità agli standard in vigore.

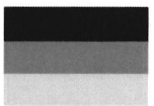
Cumplimiento de la Regulación de Registro, Evaluación y Restricción de Químicos (REACH, por sigla en inglés) de la UE



ESPAÑOL

La formulación de tensoactivos de **IVEY-SOL®** y sus componentes específicos son polímeros no iónicos y por ello están exentos de registro REACH bajo el Artículo 2(9). **Ivey International** está comprometido a garantizar que los usuarios finales obtengan el producto más efectivo y seguro para la remediación y reclamación ambiental. Estamos comprometidos a trabajar con todas las agencias regulatorias para garantizar el cumplimiento de los estándares actuales.

Einhaltung der REACH-Verordnung (Registration, Evaluation, Authorisation and Restriction of Chemicals) der EU



DEUTCH

Die **IVEY-SOL®**-Tensid-Rezeptur und deren spezifische Komponenten sind nichtionische Polymere und daher gemäß Artikel 2 Absatz 9 von der REACH-Registrierungspflicht ausgenommen. **Ivey International** möchte sicherstellen, dass Endnutzer die effektivsten und sichersten Produkte für Umweltsanierung und Rekultivierung zur Verfügung stehen. Wir arbeiten mit allen Regulierungsbehörden zusammen, um die Einhaltung aktueller Standards zu gewährleisten.

Ivey International Inc.

Unit 7, 19122-27 Ave, Surrey, BC, Canada, V3S 5T1

H.Q. Direct Phone: + 1 604 538-1168 / Fax: + 1 888 640 3622

info@iveyinternational.com / www.iveyinternational.com

CLIENT TESTIMONIALS

"We completed an in-situ pilot-scale application of the Ivey-sol® surfactant technology at an industrial site with VC, DCE and TCE chlorinated contamination. We commenced site remediation with MPE with very good results, but eventually the rate of vapor, dissolved, and DNAPL phase mass recovery reduced over time. The introduction of Ivey-sol® significantly increased mass recovery of all phases, leading to our decision to go to full scale, pairing the MPE and Ivey-sol® technologies as an effective remediation strategy for the site"

DENNIS TU, Executive Director Environment

AECOM

"We increased the TPH Mass Recovery Rate by 10x, removed TPH-d from vadose zone and lowered groundwater concentrations. Regulatory Agency agreed to a risk based closure if contamination levels continue to decrease" [Site has since achieved regulatory closure]

GALEN KENOYER, Senior Hydrogeologist

CHRIS D'SA, Senior Project Manager

TRC
Results you can rely on

"We accomplished more with \$50,000 of Ivey-sol® than we did with the first \$500,000 we spent on the site over the previous 4 years. Ivey-sol® Increased our average rate of contaminant recovery by >409%"

DANIEL SMITH, Hydrogeologist

HCR
HARDER CONSULTING & REMEDIATION, LLC

"At an EU military site the UTCHEM model was able to simulate the Pilot SEAR and that injected fluids were contained within the pilot application area. Further, the simulations estimated an approximate 1000 % increase in jet-fuel oil mass recovery with the application of the Ivey-sol® surfactant technology, compared to water injections without Ivey-sol®. The model also showed that the main process for mass removal during SEAR was production of a micro-emulsion."

SOREN RYGAARD LENSCHOW, Project Manager

NIRAS

"Given the complex nature of in-situ remediation projects, the most appropriate technologies need to be versatile and able to be adapted to various soil types and site-specific hydrogeological conditions. We have found the suite of Ivey-sol® surfactant products, and processes, to be very adaptable, affordable, and effective for the desorption and recovery of significant contaminant mass at our sites"

J. PETER MISENER, Chairman

GROUND FORCE
ENVIRONMENTAL INC
Solutions for Earth

"We have been operating a dual-phase vacuum extraction (DPVE) system at an active grain elevator for approximately 9 years to address a groundwater source area consisting of carbon tetrachloride, carbon disulfide, and chloroform. In 2015, Burns & McDonnell conducted a pilotscale application of Ivey-sol® surfactant in an effort to enhance DPVE efficiency and recover the remaining source area contamination at the site. The pilot study indicated significant increases in contaminant mass removal. As a result, Burns & McDonnell conducted a full-scale surfactant application, consisting of up to 275 gallons of surfactant mixed to approximately 1 to 2 percent by volume, to the source area in late 2016. The introduction of the Ivey-sol surfactant significantly increased dissolved-phase mass removal and the effects of this increase on DPVE efficiency were observed up to 6 months after the application. During both the pilot and fullscale phases, existing DPVE infrastructure was utilized to complete the surfactant delivery and recovery, thus significantly reducing the cost of remediation. Burns & McDonnell was very pleased in the performance of the Ivey-sol® surfactant and continued support by Ivey-sol® staff"

ERIC DULLE, PE, Project Manager

BURNS & MCDONNELL

"Ivey-sol® has been proven highly effective at remediating both oil-based contamination and chlorinated solvents in a variety of different soil types, ranging from sands to clays. Given the current need for innovative and cost-effective cleanup technologies, usage of Ivey-sol® will significantly increase in the upcoming years"

BRUCE TUNNICLIFFE, President



VERTEX
Environmental Inc.

"Ecologia applied the Ivey-sol 108 surfactant product using an in-situ multi-well sweep application to enhance the rate of LNAPL recovery at an active factory site. The Ivey-sol applications permitted a significant reduction in the LNAPL saturation, leading to a reduction in LNAPL mobility by approximately 3 orders of magnitude. We are, and have been, very pleased with the efficacy, ease of use and reliability of the Ivey-sol remediation technology at our project sites"

DAVID HOLMES BSc (Hons), MSc, PhD, MCIWEM, C.WEM, CSci
Technical Manager - Ecologia Environmental Solutions Limite

Ecologia
experts on the ground

"The in-situ application of the Ivey-sol® surfactant technology significantly increased the DNAPL and BTEX mass recovery from the impacted soil and groundwater on-site. We were very pleased by these results leading to our recommending a full scale site application as a rapid and cost effective method to achieve site clean-up"

MARTIN BEAUDOIN, Project Engineer

SANEXEN
SERVICES ENVIRONNEMENTAUX INC.

"We used a combination of Ivey-sol® technology and soil excavation. It certainly saved us the headache of having to do more by way of foundation excavation. The result was the important thing. Ivey-sol® was a good add-on to the original excavation and we got the results we wanted"

MIKE ROY, Senior Claims Adjuster

Plant Hope
ADJUSTERS LTD.
EXPERTS EN SINISTRES

"In July 2019 we were faced with a 320,000 liter crude oil and produced water spill at a facility in northern Alberta. With our rapid spill response strategy, utilizing the innovative Ivey-sol® surfactant remediation technology, we achieved significant time, cost, and environmentally sustainable cleanup benefits, resolving more than 99% of the spill on the hillside. We and our client were very pleased with the outcome of this project"

EARTHMASTER
ENVIRONMENTAL STRATEGIES INC

"After excavation and bio-piling of the soil, the surfactant enhanced bioremediation (SEB®) treatment was applied and the bio-pile was covered. Daily aeration was done during the treatment period. After only 12 weeks, samples were taken from the bio-pile showing that the remediation of the fuel-oil and PAH contamination was completed to the BC Environmental Standards and safe for reuse on-site"

TONY ROBSON, Director Mining & Equipment

QUINSAM
COAL

Ivey-sol Surfactant Remediation Technology
Is Still Winning Innovation Awards, because
Ivey International realized...



...it was that simple.

Ivey International Inc. overcame the fundamental challenges to rapid cost effective site remediation of petroleum hydrocarbons, chlorinated solvents, and PFAS, by not only stepping out of the box, we redesigned it.

The dedicated support and the innovative minds of our employees, research partners and clients have allowed us to reach our corporate goal of being recognized as; 'Today's Environmental Solutions for a Better Tomorrow'.™

For more information about Ivey International's Innovative Remediation Technologies, visit www.ivey-sol.com, call +1 604-538-1168, or email us at info@iveyinternational.com



info@iveyinternational.com
+1 604-538-1168



SAFETY DATA SHEET

SDS # 231005-08

Ivey-sol[®] Surfactant Remediation Technology

Ivey-sol[®] Formulations: 103, 106, 106 CI, and 108

1. Identification

Product identifier: Ivey-sol[®] 103, 106, 106 CI, 108
Other means of identification: Not applicable
Recommended use: Remediation surfactant
Restriction on use: Not applicable
Manufacturer/Supplier Address: Ivey International Inc.
Unit 7, 19122-27 Avenue, Surrey, BC Canada V3Z 5T1
Emergency telephone number: Tel: +1 (604) 538-1168 (Not available 24 hours)
Toll Free: +1 800 246-2744

2. Hazard Identification

WHMIS 2015/OSHA Hazcom 2012/GHS Classification:

- Serious Eye Damage/Irritation Category 2
- Skin Corrosion/Irritation Category 3

Label elements:

Signal word: Warning Pictograms: Hazard statements:

H316 – May causes mild skin irritation.

H319 – May causes eye irritation.



Precautionary Statements:

P264 - Wash contacted areas thoroughly after handling.

P280 - Wear eye protection.

P305/P351/P338 - If In Eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do so. Continue rinsing.

P332/P313 - If skin irritation occurs: Get medical advice/attention.

P337/P313 - If eye irritation persists: Get medical advice/attention

3. Composition / Information on Ingredients

Chemical Name	CAS No.	Concentration (v/v)	Other Identifiers
Biodegradable Non-ionic Surfactant 1	Proprietary	1-10%	Not applicable
Biodegradable Non-ionic Surfactant 2	Proprietary	1-10%	Not applicable
Biodegradable Non-ionic Surfactant 3	Proprietary	1-10%	Not applicable
Biodegradable Non-ionic Surfactant 4	Proprietary	1-10%	Not applicable
Biodegradable Non-ionic Surfactant 5	Proprietary	1-10%	Not applicable
Biodegradable Non-ionic Surfactant 6	Proprietary	1-10%	Not applicable



Preservative – DOWICIL 75	4080-31-3	<1%	Food Grade (Optional)
Scent – Pink Grapefruit 100% Natural	8016	<1%	Optional
Water	7732-18-5	<90%	Not applicable

Regulatory Note: Chemical names, CAS numbers and actual concentrations have been withheld as part of a confidential business information claim with HMIRA Registry #11724 filed on 2017-07-17

4. First-aid Measures

- Inhalation: No adverse effects anticipated by this route when handled according to section 7 of document. However, if necessary, move person to fresh air.
- Skin contact: Generally will not irritate skin. Wash contact areas with soap and water. If irritation persist, seek medical attention.
- Eye contact: May cause eye irritation. Flush eyes with plenty of water for at least 15 minutes, remove contact lenses if present and easy to do so. If irritation persists, seek medical attention.
- Ingestion: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. If necessary, seek medical attention.

Most Important Symptoms and Effects, Acute and Delayed

Acute Symptoms:

Eye Contact: May be irritating to the eyes. Occasional contact through splashing is not expected to affect the eyes. If irritation occurs, effect will be transient.

Chronic Symptoms: Not Applicable

Immediate Medical Attention and Special Treatment: Not Applicable

5. Fire-Fighting Measures

Suitable extinguishing media: Not flammable. Use extinguishing media for surrounding fire.

Unsuitable extinguishing media: Not applicable

Specific hazards arising from the hazardous product: Not available

Special protective equipment for fire-fighters: Not available

6. Accidental release measures

Personal Precautions, Protective Equipment:

Observe good industrial hygiene practices. Use personal protective equipment as recommended in Section 8. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Emergency Procedures: Eliminate and/or contain source with inert material (sand, earth, absorbent pads, etc.). Wear basic eye and skin protection. Floor may be slightly slippery; so use care to avoid falling. Avoid discharge to natural waters, and/or dilute with water. Transfer liquids to suitable containers for recovery, re-use or disposal. Contact Ivey for technical assistance if required.

7. Handling and Storage

Precautions for Safe Handling:

Practice good housekeeping. Avoid breathing excessive vapours. Ensure adequate ventilation. Avoid contact with skin and eyes. Wear protective gloves. Wash thoroughly after handling. Conditions for Safe Storage: Keep closed or sealed when not in use. Do not allow to freeze, keep >0°C.



8. Exposure Controls / Personal Protection

Control parameters: Not available
Appropriate Engineering Controls: General mechanical room ventilation is expected to be satisfactory.
Individual Protections Measures: Eye/face protection: Mono goggles or similar.
Skin protection: Latex gloves, or similar, would be sufficient. Normal work clothes.
Respiratory Protection: None expected to be needed. However, if an engineered / industrial application where vapours and/or misting may occur, wear MSHA/NIOSH approved half mask air purifying respirator

9. Physical and Chemical Properties

Appearance: Liquid, cloudy
Odour: Mild
Odour threshold: Not available
pH: 7 (+/- 0.5) (1% solution)
Melting Point: ~0°C
Freezing point: ~0°C
Boiling Point: Not available
Flash Point: Not applicable
Evaporation Rate: <0.01
Flammability: Not applicable
Lower flammable/ explosive limit: Not applicable
Upper flammable/Explosive Limit: Not applicable
Vapour Pressure: <0.01 mm Hg
Vapour Density: >1
Relative Density: 0.99-1.04
Solubility: 100% (Completely miscible in water)
Partition Coefficient: Not available (n-octanol / water)
Auto-Ignition Temperature: Not applicable
Decomposition Temperature: Not available
Viscosity: Not available

10. Stability and Reactivity

Reactivity: Not reactive.
Chemical Stability: Stable.
Possibility of Hazardous Reactions: Not applicable
Conditions to Avoid: Prolonged excessive heat may cause product decomposition. Freezing should also be avoided as it may cause product decomposition. In some cases freezing may cause irreversible changes.
Incompatible Materials: Normally un-reactive; however avoid strong bases at high temperatures, strong acids, strong oxidizing agents, and materials with reactive hydroxyl compounds. These compounds would damage the mixture and reduce its effectiveness during application.
Hazardous Decomposition products: Not applicable

11. Toxicological Information

Likely Routes of Exposure
Inhalation: No
Skin contact: No
Eye contact: Yes



Ingestion: No
Acute Toxicity:
LD50 - Oral (Rat): = >43.000mg/kg (rat) mg/kg
LD50 - Dermal (Rabbit): >58.000mg/kg (rabbit) mg/kg
Inhalation: Not available
Skin corrosion/irritation: Mild irritation
Serious eye damage/irritation: Eye irritation
Respiratory or skin sensitization: No
Germ cell mutagenicity: No
Carcinogenicity: None known or expected
Reproductive toxicity: No

12. Ecological Information

Toxicity: Low potential to affect aquatic organisms when used in accordance with Ivey International Inc. In-situ and Ex-situ Remediation Application Guidelines.

Acute toxicity	Time	Species	Method	Evaluation	Remarks
LC/50 = 0.07695%	96h	Rainbow trout	OECD 203	Not applicable	Not applicable
LC/50 = 0.11%	48h	Daphnia magna	OECD 202	Not applicable	Not applicable
EC/50 = Not applicable	72h	Algae	OECD 201	Not applicable	Not applicable

Persistence and degradability: >90% biodegradable in < 28 days.*
Bio-accumulative potential: Not available
Mobility in soil: Completely miscible with water.
Other adverse effects: Not available

Based on actual testing or on data for similar material(s). Degradation Biodegradation reached in Modified OECD Screening Test (OECD Test No.301 E) after 28 days: 90 %. Biodegradation reached in CO2 Evolution Test (Modified Sturm Test, (OECD Test No. 301 B) after 28 days: 70 %.

13. Disposal Considerations

Product/Packaging:

For aqueous mixture solutions; aerobic biological wastewater treatment systems are effective in treating said mixtures. Ivey-sol does not have any known negative affect on coagulant or flocculent water treatment processes.

14. Transport Information

UN Number: Not applicable
Proper Shipping Name: Not applicable
Technical Name: Not applicable
Transport Hazard Class: Not applicable
Packing Group: Not applicable
Environmental Hazards: Not applicable
Notes: Not Regulated for Transport. HS Code: 3402.42.00.00



15. Regulatory Information

UN GHS Classification: Classified in accordance with GHS 5th revised edition.

WHMIS Classification: Classified in accordance with HPR August 29, 2016 revised edition.

CPR Compliance: This product has been classified in accordance with the hazard criteria of the CPR, and the SDS contains all the information required by the CPR.

CEPA Compliance: All ingredients of this product are listed on the DSL.

16. Other Information

Creation Date: July 5, 2017

Revision Date: Updated October 2, 2017, October 18, 2018, November 4, 2022, October 6, 2023

Disclaimer: This Safety Data Sheet (SDS) was prepared by iHazmat Regulatory Ltd., (www.iHazmat.com) using information provided by Ivey International Inc. The information in this SDS is offered for your consideration and guidance when working with this product. As per usual practice, accuracy of the information included is based on what was provided by the manufacturer and sole liability for the accuracy of these documents falls to Ivey International Inc.

This Safety Data Sheet may not be changed, or altered in any way without the expressed knowledge and permission of Ivey International Inc.

SDS Created By: iHazmat Regulatory Ltd.
www.iHazmat.com

Attachment #3

SCDES Checklist and Correspondence

Aggressive Fluid Vapor Recovery

UST Permit #: 11399

Release #: 2

Do not proceed unless the full extent of the contamination for the release has been delineated.

I. Applicability Determination (Initial Screening)	Effective	Somewhat Effective	Ineffective
1. Provide a general description of the intrinsic permeability (k)* of soils in the area of remediation measured in cm². ☐ Based on soil type ☒ Calculated ☐ Field/lab test <i>Stratified soils may require special consideration in design to ensure less-permeable stratum are addressed. This should be documented</i>	☒ $k \geq 1 \times 10^{-8}$	☐ $1 \times 10^{-8} \geq k \geq 1 \times 10^{-11}$	☐ $k < 1 \times 10^{-11}$
2. What is the general boiling point range in °C for chemicals subject to remediation at this site? <i>For complex mixtures, select the boiling point range that is most representative of the chemicals of concern to be remediated by using this remedy.</i>	☐ < 250	☒ $\geq 250 - \leq 300$	☐ ≥ 300
3. What is the depth to groundwater in feet based on the shallowest well in area where remediation is being performed? <i>If water-table elevation fluctuate significantly, special design provisions should be made to accommodate them.</i>	☐ > 10	☒ $\geq 3 - \leq 10$	☐ < 3
4. What is the vapor pressure range in mm of the chemicals being remediated? <i>For complex mixtures, select the vapor pressure range that is most representative of the chemicals of concern to be remediated by using this remedy.</i>	☐ ≥ 1	☒ $> 0.5 - < 1.0$	☐ < 0.5
5. What is the Henry's law constant** (atm) for the chemicals being remediated? mixture <i>For complex mixtures, select the Henry's law constant range that is most representative of the chemicals of concern to be remediated by using this remedy.</i>	☐ > 150	☐ $\geq 100 - < 150$	☐ < 100
II. Aggressive Fluid Vapor Recovery System Design			
1. What is the radius of influence (ROI) in feet for the proposed extraction wells? <i>The wells must be identified by showing the ROI on a site diagram.</i>	☐ > 20	☒ $> 5 - \leq 20$	☐ < 5
2. Has the radius of influence (ROI) been calculated for each soil type at the site? One additional RW proposed <i>For more complex sites with multiple treatment depth intervals and/or the need for multiple extraction wells, subsurface airflow modeling must be conducted to determine well placement.</i>	☐ YES	☐ NO	☒ NO
3. Is the proposed well density appropriate, given the total area to be cleaned up and the radius of each well?	☒ YES		☐ NO

* Intrinsic permeability is a measure of the ability of soils to transmit fluids and is the single most important factor in determining the effectiveness of AFVR.

** Here is a link to an EPA website with common Henry's Law Constant for various chemicals. Choose Hpx (partial pressure/mole fraction)

<https://www3.epa.gov/ceampubl/learn2model/part-two/onsite/esthenry.html>

Aggressive Fluid Vapor Recovery

II. Aggressive Fluid Vapor Recovery System Design (continued)

4. Describe the system.

☐ Single pump system

☒ Dual pump system

Existing RW-1 and RW-2, along with proposed RW-3, RW-4, RW-5

Identify and number the wells (on the site map) to be utilized for the AFVR.

5. What is the proposed extraction time period for each well?

24-hour event following Ivey Sol Injection

6. How many extractions are planned? Up to 5 events

7. What is the planned frequency of extractions?

☐ Once

☐ Weekly

☐ Monthly

☐ Quarterly for _____ quarters

☒ Other (specify): Injection, wait 48-hours, extract for 24-hours, wait one month to gauge (see strategy attached)

What is the estimate of time to achieve cleanup of the site with the anticipated extraction flow rates?

_____ days

Interim SSTL to be met within approximately thirteen months followed by new chemical specific SSTL, if needed (< 2 year)

III. Evaluation of Operation and Maintenance

For information pertaining to monitoring and operation, please refer to the current revision of the UST Quality Assurance Programmatic Plan. Information should be provided in the Corrective Action System Evaluation Reports. Additional information may be provided regarding system monitoring and operation as deemed necessary to demonstrate effectiveness.

List the monitoring and analytical parameters that are proposed for any verification sampling. Use CAP Analytical Parameters Attachment

Example	
Well Name	Substances
MW-1	BTEX, MTBE
MW-3	BTEX, MTBE

IV. Site Map

Site map(s) drawn to scale illustrating the following:

- Location of all present and former tanks, piping and dispensers in area of release;
- Footprint of surface and/or subsurface soil contamination;
- Footprint of other structures (buildings, canopies, roads, utilities, etc.);
- Location of treatment system;
- Location of extraction wells;
- Location of monitoring wells that will be used for sampling;
- Groundwater flow direction;
- North arrow, bar scale, and map legend

[illegible]

Comments	



SC DEPARTMENT of
**ENVIRONMENTAL
SERVICES**

**STRATEGY TO CLOSURE PROPOSAL: HILTON HEAD PUBLIC SERVICE DISTRICT , PERMIT #11399, Release
Reported: July 27, 2017**

The UST Site Rehabilitation Contractor, on behalf of the owner/operator for the above reference release, proposes the work specified below to achieve Site-Specific Target Levels for the release and to achieve a Conditional No Further Action Determination.

I certify that this company:

- ☒ Has reviewed the technical file for the release and understands the nature of the release(s) and the geologic conditions at the site as documented in the technical file. Any quantities listed below are estimates and changes to those quantities or to the listed method(s) will be further detailed in a Corrective Action Plan submitted to SCDES.
- ☒ Has conducted a site visit and understands the physical layout of the property, the location(s) of any identified receptors, and any limitations that may exist on or off property as it may relate to the possible implementation of any proposed corrective action strategy.

F+ME Consultants, Inc.
UST Site Rehabilitation Contractor (Print)

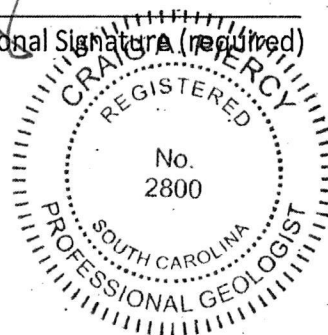
UCC-0140
UST Site Rehabilitation Contractor Certification #

Craig Piercy
Registered Professional Name (Print)

[Signature]
Registered Professional Signature (required)

P.G. ☒ P.E. ☐ (Check appropriate box)

Professional Certification # 2800



I (the UST tank owner) certify that I:

- Have discussed the proposed strategy with the UST Site Rehabilitation Contractor and agree with the proposal as put forth.
- Understand that costs up to \$1 million SUPERB combined coverage may be utilized, and the UST Management Division reserves the right to set aside funds for the purpose of verifying achievement of remedial goals and understands that costs in excess of the \$1 million combined SUPERB coverage are my responsibility as the UST owner.

In addition, I (the UST tank owner) understand that a meeting (in person or virtual) will be scheduled between the UST Management Division, my selected contractor, and myself to discuss the proposed Strategy to Closure. (Please check one of the options below)

- ☒ I will be present during the meeting to participate in the discussion.
- ☐ I will not be present during the meeting to participate in the discussion. I consent to allowing my selected contractor to make any decisions necessary regarding the remedial design, including associated costs, on my behalf.

Bill Davis
UST Owner (Print)

Bill Davis
UST Owner Signature

State of S.C. County of Beaufort

Signed before me on 10/15/2025 by Bill Davis
(date) Name of Person

My Commission Expires On 04-06-2031

Notary Seal/Stamp Above



Connie Whitehead
Notary Public
State of S.C.



SC DEPARTMENT of
**ENVIRONMENTAL
SERVICES**

Erin Jezek
Corrective Action & Field Support Section
Underground Storage Tank Management Division
2600 Bull Street
Columbia, SC, 29201

HILTON HEAD PUBLIC SERVICE DISTRICT
PO BOX 21264
HILTON HEAD ISLAND SC 29925

OCT 02 2025

Re: **Notification of Site-Specific Target Levels & Strategy to Closure**
Hilton Head Public Service District, 21 Oak Park Dr, Hilton Head, SC
UST Permit #11399
Release reported July 27, 2017
Monitoring Report received August 26, 2025
Beaufort County

To Whom It May Concern :

The Underground Storage Tank (UST) Management Division of the South Carolina Department of Environmental Services (SCDES) has established Site-Specific Target Levels (SSTLs) for the referenced release. The SSTLs are being provided to you and your contractor to help plan the investigative and remedial activities that are required.

Pursuant to S.C. Code Ann. Section 44-2-40(D), "The SUPERB Account and the SUPERB Financial Responsibility Fund shall provide combined coverage for site rehabilitation and third-party claims, respectively, not to exceed one million dollars per occurrence". **According to UST Division records, approximately \$47,578.16 has been expended from the SUPERB Account to date.**

Due to the type of release on this site, diesel, the wells that are clear of free petroleum product have little to no contamination of any Chemicals of Concern (CoCs) and thus, the UST department does not currently have SSTLs for your site. Once the free product is removed, we will assess the contamination of dissolved constituents in the wells and determine the SSTLs for your site. Your consultant should use previous assessment data to evaluate site rehabilitation options as indicated in the Quality Assurance Program Plan for the UST Management Division (QAPP § A6.XIV, and B1.IV.). A Strategy to Closure document has been enclosed with points of consideration and discussion to be utilized in the development of the corrective action and closure strategy for this release. To assist in the selection of potential remedial technologies, please review the check lists at this link. <https://des.sc.gov/programs/bureau-land-waste-management/underground-storage-tanks/ust-owneroperator-information>

A meeting has been set for November 4th, 2025 at 10:30 AM to discuss the proposed path to closure for this release. Please contact me **within 15 days** of the date of this letter to confirm the meeting date and time. In addition, please review and complete the Strategy to Closure document and remedial checklists

and **return them within 30 days** from the date of this letter. The Strategy to Closure document and remedial checklists should be utilized in the development of the closure strategy for this release.

On all correspondence concerning this site, please reference UST Permit number above. Should you have any questions, please contact me by phone at (803) 898-0608, by fax at (803) 898-0673, or by email at erin.jezek@des.sc.gov.

Sincerely,



Erin Jezek, Hydrogeologist
Corrective Action & Quality Assurance Section
Underground Storage Tank Management Division
Bureau of Land and Waste Management

enc: Strategy to Closure Form
Targeted Scope Cost Agreement
Table of Free Product SSTLs

cc: F & ME Consultants Columbia, 211 Business Park Blvd, Columbia SC 292038/26/25 (w/ enc)
Quincy Hoffer (w/o enc)
Technical file (w/ enc)

Hilton Head Public Service District, UST #11399
Beaufort County

Free Product Thickness (FP) SSTLs

	Current FPP Thickness	Free Product SSTL
MW-1	0.64	0.01
MW-9	0.55	0.01
MW-12	1.33	0.01
MW-13	0.96	0.01
RW-1	1.31	0.01

*Free Product Thicknesses are in feet

Attachment #4

Cost Estimate



ASSESSMENT COMPONENT COST AGREEMENT
 South Carolina Department of Health and Environmental Control
 Underground Storage Tank Management Division
 State Underground Petroleum Environmental Response Bank Account
 August 9, 2023

Facility Name: HHI PSD

UST Permit #: 11399

Cost Agreement #: TBD/Estimate - Strategy to Closure (Rev. 1)

ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL
A. Plan Preparation				
1.2 Site-specific Work Plan		each	\$183.22	\$0.00
2.2 Tax Map		each	\$85.50	\$0.00
3.2 QAPP Contractor Addendum (App B)		each	\$250.00	\$0.00
B. Survey				
1.1 Receptor Survey		each	\$673.06	\$0.00
C. Survey				
1.2 Comprehensive Survey		each	\$1,270.36	\$0.00
5.1 Ground Penetrating Radar Survey (100 x 100)		each	\$1,111.57	\$0.00
D. Mob/Demob				
1.2 Equipment (1 well install, 5 inject, 5 extract)	11	each	\$1,245.93	\$13,705.23
2.2 Personnel (1.2 above, 5 gauging, 1 sampling)	17	each	\$516.69	\$8,783.73
3.2 Adverse Terrain Vehicle		each	\$610.75	\$0.00
E. Soil Borings				
1.1 Soil Borings (hand auger)		foot	\$21.80	\$0.00
F. Soil Borings (requiring equipment, push technology, etc) or Field Screening (including sampling and analyst)				
1.2 Standard		per foot	\$33.50	\$0.00
2.2 Fractured Rock		per foot	\$41.40	\$0.00
G.				
H. Well Abandonment				
1.2 2" diameter or less		per foot	\$3.79	\$0.00
2.2 Greater than 2" to 6" diameter		per foot	\$5.50	\$0.00
3.2 Dug/Bored well (up to 6 feet diameter)		per foot	\$18.32	\$0.00
I. Well Installation (In accordance with R.61-71)				
1.2 Water Table (hand augered)		per foot	\$31.40	\$0.00
2.B Water Table (drill rig) 2" Diameter	30	per foot	\$54.90	\$1,647.00
2.2 Single-cased 2" Diameter Monitoring Well >50ft		per foot	\$59.80	\$0.00
3.2 Telescoping		per foot	\$84.70	\$0.00
4.2 Rock Drilling		per foot	\$81.80	\$0.00
5.2 2" Rock Coring		per foot	\$88.50	\$0.00
6.2 Multi-sampling ports/screens		per foot	\$59.40	\$0.00
7.2 Recovery Well (4" diameter)	45	per foot	\$69.60	\$3,132.00
9.2 Rotosonic (2" diameter)		per foot	\$119.00	\$0.00
10.2 Re-develop Existing Well		per foot	\$13.44	\$0.00
J. Groundwater Sample Collection / Gauging Depth to Water/Product				
1.2 Groundwater Purge		per well	\$73.29	\$0.00
2.2 Air or Vapors		sample	\$14.66	\$0.00
3.2 Water Supply Sample		sample	\$26.87	\$0.00
4.1A HydraSleeve		sample	\$34.20	\$0.00
4.2B No-purge Groundwater Sample/Surface water	10	sample	\$57.24	\$572.40

5.2 Gauge Well only	5 events	100	sample	\$8.55	\$855.00
6.2 Sample Below Product			sample	\$14.66	\$0.00
7.2 Passive Diffusion Bag			sample	\$31.75	\$0.00
8.2 Field Duplicates (MWs & WSWs) and Field Bla	2		sample	\$30.06	\$60.12
9.2 Groundwater (low flow purge)	7		sample	\$111.16	\$778.12
10.2 Equipment Blank			sample	\$30.06	\$0.00
11.1 Sample Product			per well	\$52.66	\$0.00
K. Laboratory Analyses-Groundwater					
1.2 BTEXNM+Oxyg's+1,2 DCA+Eth(8260D)	24		per sample	\$149.02	\$3,576.48
2.2 Lead, Filtered			per sample	\$16.85	\$0.00
3.2 Rush EPA Method 8260B			per sample	\$187.62	\$0.00
4.2 Trimethal, Butyl, and Isopropyl Benzenes			per sample	\$34.20	\$0.00
5.2 PAH's			per sample	\$74.02	\$0.00
6.2 Lead			per sample	\$19.54	\$0.00
7.2 EDB by EPA 8011			per sample	\$55.21	\$0.00
8.2 EDB by EPA Method 8011 Rush			per sample	\$83.31	\$0.00
9.2 8 RCRA Metals			per sample	\$77.45	\$0.00
10.2 TPH (9070)			per sample	\$50.09	\$0.00
11.2 PH			per sample	\$6.35	\$0.00
12.2 BOD			per sample	\$24.42	\$0.00
13.2 Ethanol			per sample	\$18.08	\$0.00
K. Analyses-Drinking Water					
14.2 BTEXNM+1,2 DCA (524.2)			per sample	\$151.52	\$0.00
15.2 7-OXYGENATES & ETHANOL (8260D)			per sample	\$112.07	\$0.00
16.2 EDB (504.1)			per sample	\$97.11	\$0.00
17.2 RCRA METALS (200.8)			per sample	\$122.15	\$0.00
K. Analyses-Soil					
18.2 BTEX + Naphth.			per sample	\$78.18	\$0.00
19.2 PAH's			per sample	\$78.22	\$0.00
20.2 8 RCRA Metals			per sample	\$68.89	\$0.00
21.2 TPH-DRO (3550C/8015C)			per sample	\$48.86	\$0.00
22.2 TPH-GRO (5035B/8015C)			per sample	\$43.92	\$0.00
23.2 Grain size/hydrometer			per sample	\$127.04	\$0.00
24.2 Total Organic Carbon			per sample	\$37.38	\$0.00
K. Analyses-Air					
25.2 BTEX + Naphthalene			per sample	\$263.84	\$0.00
K. Hydrocarbon Fuel Identification					
27.1 C3-C44 Whole Oil (ASTM D3328)			per sample	\$465.93	\$0.00
28.1 Fuel Oxygenates (1624 Mod)			per sample	\$398.39	\$0.00
29.1 ALKYL Leads, EDB MMT (8080)			per sample	\$398.39	\$0.00
30.1 C8-C40 Full Scan (ASTM 5739)			per sample	\$629.64	\$0.00
31.1 Simulated Distillation (ASTM 2887)			per sample	\$398.39	\$0.00
32.1 Parent & Alk. PAH Com. (8270 SIM)			per sample	\$723.63	\$0.00
33.1 C3-C10 Piano (8260 MOD)			per sample	\$599.88	\$0.00
34.1 C10+Alkane Fingerprints			per sample	\$599.88	\$0.00
35.1 Expert Data Interpretation & Report			each	\$595.30	\$0.00
L. Aquifer Characterization					
1.2 Pumping Test			per hour	\$28.09	\$0.00
2.2 Slug Test			per test	\$233.31	\$0.00
3.2 Fractured Rock			per test	\$122.15	\$0.00

M. Free Product					
1.1 Free Product Recovery Rate Test		each	\$46.42		\$0.00
N.					
O. Risk Evaluation					
1.2 Tier I Risk Evaluation		each	\$366.45		\$0.00
2.2 Tier II Risk Evaluation		each	\$122.15		\$0.00
P. Survey					
1.1 Subsequent Survey		each	\$297.65		\$0.00
Q. Disposal (gallons or tons)					
1.2 Wastewater		gallon	\$1.19		\$0.00
2.2 Free Product		gallon	\$1.63		\$0.00
3.2 Soil Treatment/Disposal		ton	\$156.25		\$0.00
4.2 Drilling fluids		gallon	\$1.25		\$0.00
R. Miscellaneous (attach receipts)					
Injection Materials (Ivey Sol, including shipping, per event)	5	each	\$3,409.60		\$17,048.00
Equipment for Injection (per injection event, one day, incl mob)	5	each	\$2,800.00		\$14,000.00
Per Diem (between injection/extraction, per event)	5	each	\$300.00		\$1,500.00
Additional/Excess AFVR wastewater storage (per event)	5	each	\$1,800.00		\$9,000.00
Corrective Action Plan	1	each	\$1,800.00		\$1,800.00
		each	\$0.00		\$0.00
T. Tier I Assessment (Use DHEC 3665 form)					
1.2 Southeast Region		standard	\$12,622.56		\$0.00
2.2 All Other Counties		standard	\$13,844.06		\$0.00
U. IGWA (Use DHEC 3666 form)					
1.2 Southeast Region		standard	\$4,353.67		\$0.00
2.2 All Other Counties		standard	\$4,720.01		\$0.00
22. Active Correction Action					
		PFP	Bid Cost		\$0.00
W. Aggressive Fluid & Vapor Recovery (AFVR)					
1.2 8-hour Event		per event	\$1,787.40		\$0.00
2.1 24-hour Event	5	per event	\$4,407.78		\$22,038.90
3.1 48-hour Event		per event	\$7,242.29		\$0.00
4.1 96-hour Event		per event	\$14,482.28		\$0.00
5.1 Off-gas Treatment 8 hour		per event	\$141.17		\$0.00
6.2 Off-gas Treatment 24 hour	5	per event	\$294.30		\$1,471.50
7.2 Off-gas Treatment 48 hour		per event	\$386.10		\$0.00
8.1 Off-gas Treatment 96 hour		per event	\$898.84		\$0.00
9.1 Off-gas Treatment 8 hour (w/chlorinated compounds)		per event	\$464.40		\$0.00
10.1 Off-gas Treatment 24 hour (w/chlorinated compounds)		per event	\$540.00		\$0.00
11.1 Off-gas Treatment 48 hour (w/chlorinated compounds)		per event	\$1,080.00		\$0.00
12.1 Off-gas Treatment 96 hour (w/chlorinated compounds)		per event	\$2,160.00		\$0.00
13.2 AFVR Effluent Disposal(w/chlorinated compounds)		gallon	\$0.64		\$0.00
14.2 AFVR Site Reconnaissance		each	\$302.40		\$0.00
15.1 Additional Hook-ups		each	\$29.68		\$0.00
16.2 AFVR Effluent Disposal (3 events)	50000	gallon	\$0.53		\$26,500.00
17.2 AFVR Mobilization/Demobilization		each	\$777.60		\$0.00
18.1 Mobilization for absorbents/skimers		each	\$516.69		\$0.00
19.1 Well sock 2" ID well		each	\$36.94		\$0.00

20.1 Well sock 4" ID well		each	\$49.03	\$0.00
21.1 pad (per pad)		each	\$49.95	\$0.00
22.1 3" diameter x 10' length boom		each	\$108.00	\$0.00
23.1 5" diameter x 10' length boom		each	\$132.84	\$0.00
24.1 New FPP recovery skimmer (2" wells)		each	\$791.10	\$0.00
25.1 New FPP recovery skimmer (4" wells)		each	\$1,247.40	\$0.00
26.1 Refurbished FPP recovery skimmer (2" or 4" wells)		each	\$760.32	\$0.00
27.1 Disposal of Absorbents		pound	\$4.10	\$0.00
28.1 Disposal of product from skimmers		gallon	\$0.50	\$0.00
X. Granulated Activated Carbon (GAC) filter system installation & service:				
1.2 New GAC System Installation		each	\$2,320.86	\$0.00
2.2 Refurbished GAC Sys. Install		each	\$1,099.35	\$0.00
3.2 Filter replacement/removal		each	\$427.53	\$0.00
4.2 GAC System removal, cleaning, & refurbishment		each	\$335.92	\$0.00
5.2 GAC System housing		each	\$305.38	\$0.00
6.2 In-line particulate filter		each	\$183.22	\$0.00
7.2 Additional piping & fittings		foot	\$1.84	\$0.00
Y. Well Repair				
1.2 Additional Copies of the Report Delivered	1	each	\$61.07	\$61.07
2.2 Repair 2x2 MW pad		each	\$61.07	\$0.00
3.2 Repair 4x4 MW pad		each	\$107.49	\$0.00
4.2 Replace well vault		each	\$144.14	\$0.00
5.2 Replace well cover bolts		each	\$3.18	\$0.00
6.2 Replace locking well cap & lock		each	\$18.32	\$0.00
7.2 Replace/Repair stick-up		each	\$163.68	\$0.00
8.2 Convert Flush-mount to Stick-up		each	\$183.22	\$0.00
9.2 Convert Stick-up to Flush-mount		each	\$158.79	\$0.00
10.2 Replace missing/illegible well ID plate		each	\$14.66	\$0.00
11.1 Down-hole Camera		per foot	\$29.25	\$0.00
Z. High Resolution Site Characterization				
1.1 HRSC Screening Equipment Mobilization		each	\$1,468.80	\$0.00
2.1 HRSC Drilling Category 1		per foot	\$31.32	\$0.00
3.1 HRSC Drilling Category 2		per foot	\$36.18	\$0.00
4.1 HRSC Drilling Category 3		per foot	\$29.16	\$0.00
5.1 HRSC 3-D Model		each	\$4,363.20	\$0.00
S. Report Prep & Project Management	12%	percent	\$126,529.55	\$15,183.55
TOTAL				\$141,713.10

RE: Meeting to Discuss moving forward with UST# 11399

From Christine A. Cafagna <ccafagna@fmeconsultants.com>

Date Mon 12/22/2025 10:51 AM

To Erin E. Jezek <erin.jezek@des.sc.gov>

Yes, no problem. Please send meeting invite.

Christine A. Cafagna
Senior Environmental Manager



FME Consultants, Inc.
211 Business Park Blvd. | Columbia, SC 29203
D 803.995.8856 | O 803.254.4540 | M 803.719.6489
ccafagna@fmeconsultants.com | www.fmeconsultants.com



From: Erin E. Jezek <erin.jezek@des.sc.gov>
Sent: Monday, December 22, 2025 10:47 AM
To: Christine A. Cafagna <ccafagna@fmeconsultants.com>
Subject: Re: Meeting to Discuss moving forward with UST# 11399

Christine

Can you do today at 2:00?

Erin Jezek
Geologist/Hydrologist I
UST Management Division
Bureau of Land and Waste Management
O: 803-898-0608
Erin.Jezek@des.sc.gov
DES.SC.gov



SC DEPARTMENT of
**ENVIRONMENTAL
SERVICES**

From: Christine A. Cafagna <ccafagna@fmeconsultants.com>
Sent: Monday, December 22, 2025 9:32 AM
To: Erin E. Jezek <erin.jezek@des.sc.gov>
Cc: Audrey C. Hayes <Audrey.Hayes@des.sc.gov>
Subject: RE: Meeting to Discuss moving forward with UST# 11399

Hey Erin,

Sorry for delayed response. I am in today and tomorrow. But then out Xmas and next week.

Could you squeeze in a call today/tomorrow?

Thanks.

Christine A. Cafagna
Senior Environmental Manager



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ccafagna@fmeconsultants.com | www.fmeconsultants.com

From: Erin E. Jezek <erin.jezek@des.sc.gov>
Sent: Thursday, December 18, 2025 4:39 PM
To: Christine A. Cafagna <ccafagna@fmeconsultants.com>
Cc: Audrey C. Hayes <Audrey.Hayes@des.sc.gov>
Subject: Meeting to Discuss moving forward with UST# 11399

Christine,

We received your revised Strategy to Close for the Hilton Head Public Service District site. Audry and I would like to set up a time to discuss what you have proposed and some things we have noticed about the site. With the holidays coming up we were wanting to see what your availability is and if we could find a time that works for us all. Could you let us know a couple dates and times that you have available to see when we can make this happen?

Thank you,

Erin Jezek
Geologist/Hydrologist I
UST Management Division
Bureau of Land and Waste Management
O: 803-898-0608
Erin.Jezek@des.sc.gov
DES.SC.gov



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Re: 11399 Discussion/Locations

From Audrey C. Hayes <Audrey.Hayes@des.sc.gov>

Date Mon 12/22/2025 3:04 PM

To ccafagna@fmeconsultants.com <ccafagna@fmeconsultants.com>; Erin E. Jezek <erin.jezek@des.sc.gov>

Good afternoon,

Thank you for the call this afternoon, here's a recap of what we discussed/decided:

- Based on site conditions and the CAP submitted by FME Consultants, we decided to conduct additional assessment activities before entering a targeted scope.
- The proposed location of MW-15 has been adjusted to better define the plume around MW-9 and MW-13. SCDES requested that MW-15 be placed in the open space between MW-2 and wells with free product.
- FME proposed an additional monitoring well (MW-16) to be located southeast of MW-15 (proposed) to further define the plume in this area.
- FME proposed the installation of an additional recovery well (RW-6) to aid in the clean-up of free product.
- FME Consultants will send a Site-Specific Work Plan to SCDES for additional assessment with the newly proposed monitoring well locations and a groundwater sampling event.

Let me know if you have any questions or concerns. Thank you!

Audrey Hayes
Hydrogeologist I
Corrective Action & Field Support Section
Underground Storage Tank Management Division
Bureau of Land Waste Management
Office: (803) 898-1386
Fax: (803) 898-0673
audrey.hayes@des.sc.gov



SC DEPARTMENT of
**ENVIRONMENTAL
SERVICES**

From: Christine A. Cafagna <ccafagna@fmeconsultants.com>

Sent: Monday, December 22, 2025 2:34 PM

To: Erin E. Jezek <erin.jezek@des.sc.gov>; Audrey C. Hayes <Audrey.Hayes@des.sc.gov>

Subject: RE: 11399 Discussion/Locations

Hey Audrey/Erin,

See attached hand mark-up. Forgive its "crudeness", but let me know if you agree with locations (or feel free to nudge).

Will get you a SSWP shortly after new year, if it can wait until then.

Christine

Christine A. Cafagna
Senior Environmental Manager



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ccafagna@fmeconsultants.com | www.fmeconsultants.com

-----Original Appointment-----

From: Erin E. Jezek <erin.jezek@des.sc.gov>

Sent: Monday, December 22, 2025 10:53 AM

To: Erin E. Jezek; Audrey C. Hayes; Christine A. Cafagna

Subject: 11399 Meeting

When: Monday, December 22, 2025 2:00 PM-2:30 PM (UTC-05:00) Eastern Time (US & Canada).

Where: Microsoft Teams Meeting

Microsoft Teams [Need help?](#)

Join the meeting now

Meeting ID: 226 229 116 121 89

Passcode: si6c7MM7

Dial in by phone

+1 803-829-0782,,759990500# United States, Bowman

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Phone conference ID: 759 990 500#

For organizers: [Meeting options](#) | [Reset dial-in PIN](#)

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RECEIVED

JAN 27 2016

UST DIVISION



Site-Specific Work Plan for Approved ACQAP Underground Storage Tank Management Division

To: Audrey Hayes, Hydrogeologist (SCDHEC Project Manager)
 From: Christine A. Cafagna (Contractor Project Manager)
 Contractor: F&ME Consultants, Inc. UST Contractor Certification Number: UCC-0140

Facility Name: Hilton Head Public Service District UST Permit #: 11399

Facility Address: 21 Oak Park Dr., Beaufort, SC 29926

Responsible Party: William C. Davis, Operations Manager Phone: 843-681-5525

RP Address: PO Box 21264, Beaufort, SC 29925

Property Owner (if different):

Property Owner Address:

Current Use of Property: Water Treatment Facility



Scope of Work (Please check all that apply)

☐ IGWA ☐ Tier II ☒ Groundwater Sampling ☐ GAC
☐ Tier I ☒ Monitoring Well Installation ☐ Other _____

Analyses (Please check all that apply)

Groundwater/Surface Water:

☒ BTEXNMDCA (8260D) ☐ Lead ☐ BOD ☐ Methane
☒ Oxygenates (8260D) ☐ 8 RCRA Metals ☐ Nitrate ☐ Ethanol
☐ EDB (8011) ☐ TPH ☐ Sulfate ☐ Dissolved Iron
☐ PAH (8270E) ☐ pH ☐ Other _____

Drinking Water Supply Wells:

☐ BTEXNMDCA (524.2) ☐ Mercury (200.8 245.1 or 245.2) ☐ EDB (504.1)
☐ Oxygenates & Ethanol (8260D) ☐ RCRA Metals (200.8)

Soil:

☐ BTEXNM ☐ Lead ☐ RCRA Metals ☐ TPH-DRO (3550B/8015B) ☐ Grain Size
☐ PAH ☐ Oil & Grease (9071) ☐ TPH-GRO (5030B/8015B) ☐ TOC

Air:

☐ BTEXN

Sample Collection (Estimate the number of samples of each matrix that are expected to be collected.)

_____ Soil _____ Water Supply Wells _____ Equipment 1 Field Blank
23 Monitoring Wells _____ Surface Water 2 Duplicate 1 Trip Blank

Field Screening Methodology

Estimate number and total completed depth for each point, and include their proposed locations on the attached map.

of shallow points proposed: _____ Estimated Footage: _____ feet per point

of deep points proposed: _____ Estimated Footage: _____ feet per point

Field Screening Methodology: _____

Permanent Monitoring Wells

Estimate number and total completed depth for each well, and include their proposed locations on the attached map.

of shallow wells: 3 Estimated Footage: 13 feet per point

of deep wells: _____ Estimated Footage: _____ feet per point

of recovery wells: 4 Estimated Footage: 12 feet per point

Comments, if warranted:

UST Permit #: 11399 Facility Name: Hilton Head Public Service District

Implementation Schedule (Number of calendar days from approval)

Field Work Start-Up: 7 days Field Work Completion: 30 days
Report Submittal: 60 days # of Copies Provided to Property Owners: 1

Aquifer Characterization

Pump Test: ☐ Slug Test: ☐ (Check one and provide explanation below for choice)

Investigation Derived Waste Disposal

Soil: 3 Tons Purge Water: 250 Gallons
Drilling Fluids: _____ Gallons Free-Phase Product: _____ Gallons

Additional Details For This Scope of Work

For example, list wells to be sampled, wells to be abandoned/repared, well pads/bolts/caps to replace, details of AFVR event, etc.

See Attached narrative.

Compliance With Annual Contractor Quality Assurance Plan (ACQAP)

Yes Laboratory as indicated in ACQAP? (Yes/No) If no, indicate laboratory information below.

Name of Laboratory: _____

SCDHEC Certification Number: _____

Name of Laboratory Director: _____

Yes Well Driller as indicated in ACQAP? (Yes/No) If no, indicate driller information below.

Name of Well Driller: _____

SCLLR Certification Number: _____

____ Other variations from ACQAP. Please describe below.

Attachments

1. Attach a copy of the relevant portion of the USGS topographic map showing the site location.
2. Prepare a site base map. This map must be accurately scaled, but does not need to be surveyed. The map must include the following:

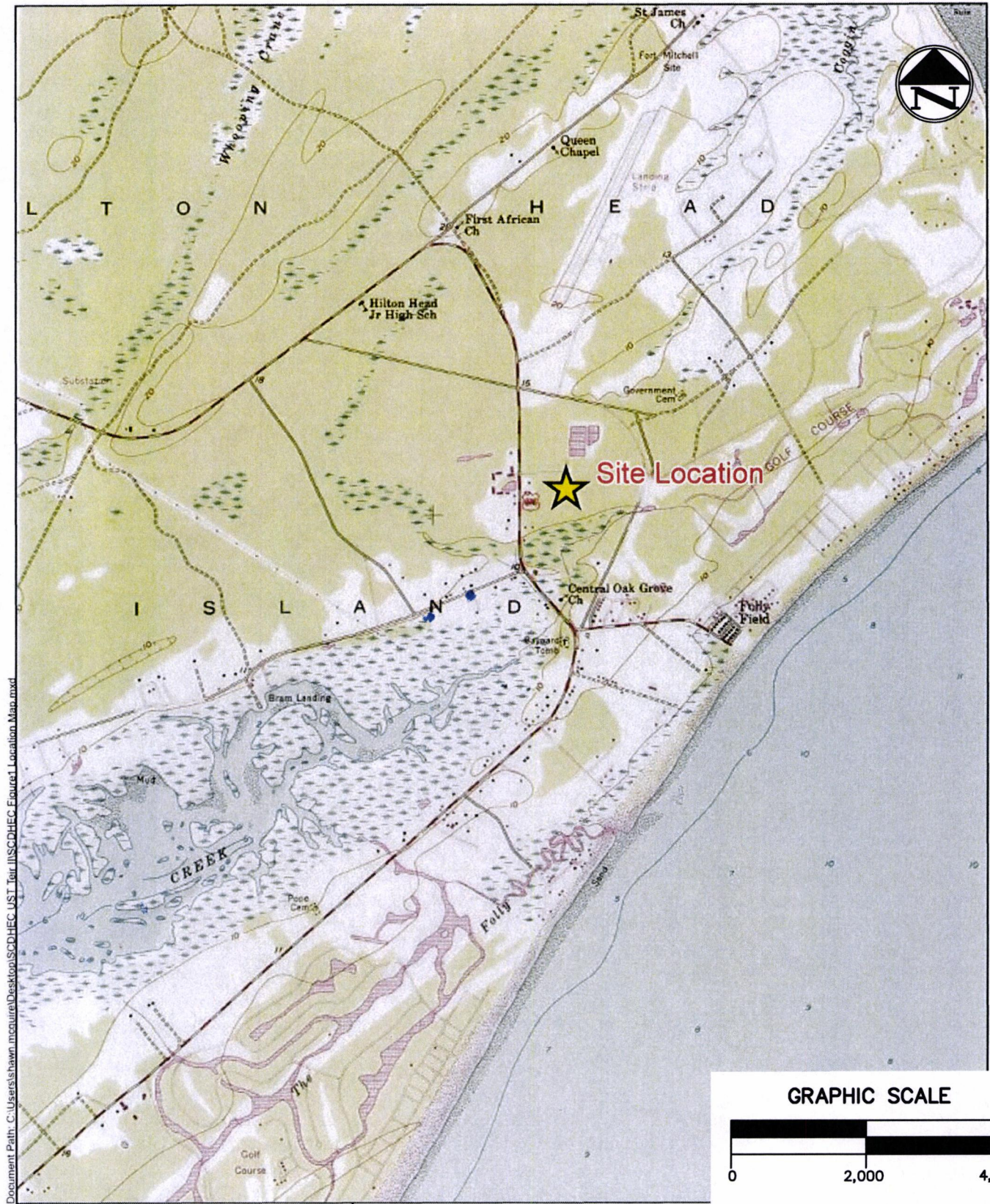
North Arrow	Proposed monitoring well locations
Location of property lines	Legend with facility name and address, UST permit number, and bar scale
Location of buildings	Streets or highways (indicate names and numbers)
Previous soil sampling locations	Location of all present and former ASTs and USTs
Previous monitoring well locations	Location of all potential receptors
Proposed soil boring locations	
3. Assessment Component Cost Agreement, SCDHEC Form D-3664

HHI PSD
UST ID 11399
SSWP – January 2025

Install three (3) shallow monitoring wells and install four (4) recovery wells in the locations requested by SCDES and as shown on the attached site map (if underground utilities allow). Approximately two (2) weeks after the new wells are installed. FME personnel will return to the site to purge and sample the seven (7) newly installed wells along with the existing wells.

Of the existing wells, there are a total of sixteen (16) monitoring wells on site: (13) shallow wells, 1 deep well, and 2 recovery wells). If any of the newly installed wells or existing wells contain free-phase product (FPP), the well(s) will only be gauged. We are assuming that the previous five (5) wells that had FPP during the last sampling event will still have FPP and only be gauged. On the existing wells, only wells with screens that do not bracket the water table will be purged prior to sampling. It is anticipated that the deep well, DCW-1, will be the only existing well requiring purging before sampling along with the seven (7) newly installed wells.

Low-flow purging methods will be implemented using a peristaltic pump. The purge water from DCW-1 will be disposed of on the ground by the well since the well meets the SCDES QAPP requirements for on-site disposal. The purge water from the newly installed wells will be containerized in a 55-gallon drum for transport to an appropriate facility for disposal. The wells not requiring purging before sampling will be sampled with a new disposable bailer between each well. To our knowledge, there are no water supply wells or surface waters within a 1000-foot radius of the site that will require sampling. The consultant overseeing the well installations is different from the well drilling company, so an additional personnel mobilization fee has been included. An additional personnel mobilization has been included for the survey of the newly installed wells. A mobilization fee has been included for the soil and water waste disposal. A personnel mobilization has been included for sampling the wells.



DRAWN BY:	CTC
APPROVED BY:	CAC
NOTES:	

ORIGINAL:	July 2, 2024
REVISIONS:	
1.	
2.	
3.	
SCALE:	As Noted

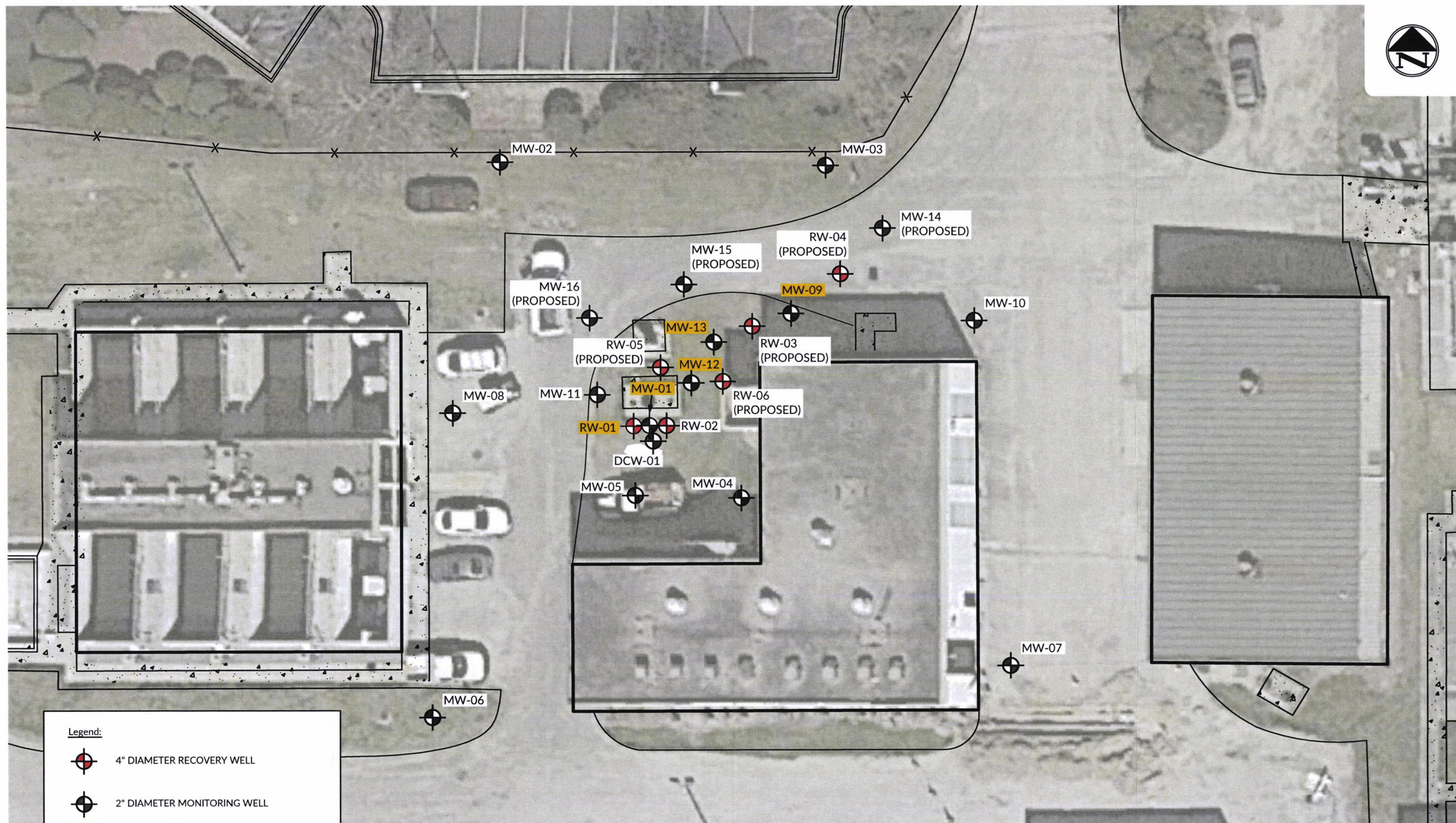
F&ME
CONSULTANTS
211 BUSINESS PARK BLVD.
COLUMBIA, SC 29203

HHI PSD RELEASE #2 - UST PERMIT# 11399
21 Oak Park Drive
Hilton Head Island, Beaufort County, South Carolina

Appendix B - Site Topo Map

F&ME CONSULTANTS
PROJECT NUMBER:
E6687.002

FIGURE
NUMBER:
2



 4" DIAMETER RECOVERY WELL

 2" DIAMETER MONITORING WELL

 WELL CONTAINED FPP 7/2025

A number line is shown with tick marks at 0, 10, 20, and 40. A shaded region is indicated between the tick marks for 10 and 20.

FME
CONSULTANTS

2



ASSESSMENT COMPONENT INVOICE

South Carolina Department of Health and Environmental Control
Underground Storage Tank Management Division
State Underground Petroleum Environmental Response Bank Account
August 9, 2023

Facility Name: Hilton Head Public Service District

UST Permit #: 11399

Cost Agreement #: N/A

ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL
A. Plan Preparation				
1.2 Site-specific Work Plan	1	each	\$183.22	\$183.22
2.2 Tax Map		each	\$85.50	\$0.00
3.2 QAPP Contractor Addendum (App B)		each	\$250.00	\$0.00
B. Survey				
1.1 Receptor Survey		each	\$673.06	\$0.00
C. Survey				
1.2 Comprehensive Survey		each	\$1,270.36	\$0.00
5.1 Ground Penetrating Radar Survey (100 x 100)		each	\$1,111.57	\$0.00
D. Mob/Demob				
1.2 Equipment	1	each	\$1,245.93	\$1,245.93
2.2 Personnel	4	each	\$516.69	\$2,066.76
3.2 Adverse Terrain Vehicle		each	\$610.75	\$0.00
E. Soil Borings				
1.1 Soil Borings (hand auger)		foot	\$21.80	\$0.00
F. Soil Borings (requiring equipment, push technology, etc) or Field Screening (including sampling and analyst)				
1.2 Standard		per foot	\$33.50	\$0.00
2.2 Fractured Rock		per foot	\$41.40	\$0.00
G.				
H. Well Abandonment				
1.2 2" diameter or less		per foot	\$3.79	\$0.00
2.2 Greater than 2" to 6" diameter		per foot	\$5.50	\$0.00
3.2 Dug/Bored well (up to 6 feet diameter)		per foot	\$18.32	\$0.00
I. Well Installation (In accordance with R.61-71)				
1.2 Water Table (hand augered)		per foot	\$31.40	\$0.00
2.B Water Table (drill rig) 2" Diameter	39	per foot	\$54.90	\$2,141.10
2.2 Single-cased 2" Diameter Monitoring Well >50ft		per foot	\$59.80	\$0.00
3.2 Telescoping		per foot	\$84.70	\$0.00
4.2 Rock Drilling		per foot	\$81.80	\$0.00
5.2 2" Rock Coring		per foot	\$88.50	\$0.00
6.2 Multi-sampling ports/screens		per foot	\$59.40	\$0.00
7.2 Recovery Well (4" diameter)	48	per foot	\$69.60	\$3,340.80
9.2 Rotosonic (2" diameter)		per foot	\$119.00	\$0.00
10.2 Re-develop Existing Well		per foot	\$13.44	\$0.00
J. Groundwater Sample Collection / Gauging Depth to Water/Product				
1.2 Groundwater Purge		per well	\$73.29	\$0.00
2.2 Air or Vapors		sample	\$14.66	\$0.00
3.2 Water Supply Sample		sample	\$26.87	\$0.00
4.1A HydraSleeve		sample	\$34.20	\$0.00
4.2B No-purge Groundwater Sample/Surface water	10	sample	\$57.24	\$572.40
5.2 Gauge Well only	5	sample	\$8.55	\$42.75
6.2 Sample Below Product		sample	\$14.66	\$0.00
7.2 Passive Diffusion Bag		sample	\$31.75	\$0.00
8.2 Field Duplicates (MWs & WSWs) and Field Blank	3	sample	\$30.06	\$90.18
9.2 Groundwater (low flow purge)	8	sample	\$111.16	\$889.28
10.2 Equipment Blank		sample	\$30.06	\$0.00
11.1 Sample Product		per well	\$52.66	\$0.00

K. Laboratory Analyses-Groundwater					
1.2 BTEXNM+Oxyg's+1,2 DCA+Eth(8260D)	27	per sample	\$149.02		\$4,023.54
2.2 Lead, Filtered		per sample	\$16.85		\$0.00
3.2 Rush EPA Method 8260B		per sample	\$187.62		\$0.00
4.2 Trimethal, Butyl, and Isopropyl Benzenes		per sample	\$34.20		\$0.00
5.2 PAH's		per sample	\$74.02		\$0.00
6.2 Lead		per sample	\$19.54		\$0.00
7.2 EDB by EPA 8011		per sample	\$55.21		\$0.00
8.2 EDB by EPA Method 8011 Rush		per sample	\$83.31		\$0.00
9.2 8 RCRA Metals		per sample	\$77.45		\$0.00
10.2 TPH (9070)		per sample	\$50.09		\$0.00
11.2 PH		per sample	\$6.35		\$0.00
12.2 BOD		per sample	\$24.42		\$0.00
13.2 Ethanol		per sample	\$18.08		\$0.00
K. Analyses-Drinking Water					
14.2 BTEXNM+1,2 DCA (524.2)		per sample	\$151.52		\$0.00
15.2 7-OXYGENATES & ETHANOL (8260D)		per sample	\$112.07		\$0.00
16.2 EDB (504.1)		per sample	\$97.11		\$0.00
17.2 RCRA METALS (200.8)		per sample	\$122.15		\$0.00
K. Analyses-Soil					
18.2 BTEX + Naphth.		per sample	\$78.18		\$0.00
19.2 PAH's		per sample	\$78.22		\$0.00
20.2 8 RCRA Metals		per sample	\$68.89		\$0.00
21.2 TPH-DRO (3550C/8015C)		per sample	\$48.86		\$0.00
22.2 TPH-GRO (5035B/8015C)		per sample	\$43.92		\$0.00
23.2 Grain size/hydrometer		per sample	\$127.04		\$0.00
24.2 Total Organic Carbon		per sample	\$37.38		\$0.00
K. Analyses-Air					
25.2 BTEX + Naphthalene		per sample	\$263.84		\$0.00
K. Hydrocarbon Fuel Identification					
27.1 C3-C44 Whole Oil (ASTM D3328)		per sample	\$465.93		\$0.00
28.1 Fuel Oxygenates (1624 Mod)		per sample	\$398.39		\$0.00
29.1 ALKYL Leads, EDB MMT (8080)		per sample	\$398.39		\$0.00
30.1 C8-C40 Full Scan (ASTM 5739)		per sample	\$629.64		\$0.00
31.1 Simulated Distillation (ASTM 2887)		per sample	\$398.39		\$0.00
32.1 Parent & Alk. PAH Com. (8270 SIM)		per sample	\$723.63		\$0.00
33.1 C3-C10 Piano (8260 MOD)		per sample	\$599.88		\$0.00
34.1 C10+Alkane Fingerprints		per sample	\$599.88		\$0.00
35.1 Expert Data Interpretation & Report		each	\$595.30		\$0.00
L. Aquifer Characterization					
1.2 Pumping Test		per hour	\$28.09		\$0.00
2.2 Slug Test		per test	\$233.31		\$0.00
3.2 Fractured Rock		per test	\$122.15		\$0.00
M. Free Product					
1.1 Free Product Recovery Rate Test		each	\$46.42		\$0.00
N.					
O. Risk Evaluation					
1.2 Tier I Risk Evaluation		each	\$366.45		\$0.00
2.2 Tier II Risk Evaluation		each	\$122.15		\$0.00
P. Survey					
1.1 Subsequent Survey	1	each	\$297.65		\$297.65
Q. Disposal (gallons or tons)					
1.2 Wastewater	200	gallon	\$1.19		\$238.00
2.2 Free Product		gallon	\$1.63		\$0.00
3.2 Soil Treatment/Disposal	3	ton	\$156.25		\$468.75
4.2 Drilling fluids		gallon	\$1.25		\$0.00

R. Miscellaneous (attach receipts)					
		each	\$0.00		\$0.00
		each	\$0.00		\$0.00
		each	\$0.00		\$0.00
T. Tier I Assessment (Use DHEC 3665 form)					
1.2 Southeast Region		standard	\$12,622.56		\$0.00
2.2 All Other Counties		standard	\$13,844.06		\$0.00
U. IGWA (Use DHEC 3666 form)					
1.2 Southeast Region		standard	\$4,353.67		\$0.00
2.2 All Other Counties		standard	\$4,720.01		\$0.00
22. Active Correction Action		PF	Bid Cost		\$0.00
W. Aggressive Fluid & Vapor Recovery (AFVR)					
1.2 8-hour Event		per event	\$1,787.40		\$0.00
2.1 24-hour Event		per event	\$4,407.78		\$0.00
3.1 48-hour Event		per event	\$7,242.29		\$0.00
4.1 96-hour Event		per event	\$14,482.28		\$0.00
5.1 Off-gas Treatment 8 hour		per event	\$141.17		\$0.00
6.2 Off-gas Treatment 24 hour		per event	\$294.30		\$0.00
7.2 Off-gas Treatment 48 hour		per event	\$386.10		\$0.00
8.1 Off-gas Treatment 96 hour		per event	\$898.84		\$0.00
9.1 Off-gas Treatment 8 hour (w/chlorinated compounds)		per event	\$464.40		\$0.00
10.1 Off-gas Treatment 24 hour (w/chlorinated compounds)		per event	\$540.00		\$0.00
11.1 Off-gas Treatment 48 hour (w/chlorinated compounds)		per event	\$1,080.00		\$0.00
12.1 Off-gas Treatment 96 hour (w/chlorinated compounds)		per event	\$2,160.00		\$0.00
13.2 AFVR Effluent Disposal(w/chlorinated compounds)		gallon	\$0.64		\$0.00
14.2 AFVR Site Reconnaissance		each	\$302.40		\$0.00
15.1 Additional Hook-ups		each	\$29.68		\$0.00
16.2 AFVR Effluent Disposal		gallon	\$0.53		\$0.00
17.2 AFVR Mobilization/Demobilization		each	\$777.60		\$0.00
18.1 Mobilization for absorbents/skimers		each	\$516.69		\$0.00
19.1 Well sock 2" ID well		each	\$36.94		\$0.00
20.1 Well sock 4" ID well		each	\$49.03		\$0.00
21.1 pad (per pad)		each	\$49.95		\$0.00
22.1 3" diameter x 10' length boom		each	\$108.00		\$0.00
23.1 5" diameter x 10' length boom		each	\$132.84		\$0.00
24.1 New FPP recovery skimmer (2" wells)		each	\$791.10		\$0.00
25.1 New FPP recovery skimmer (4" wells)		each	\$1,247.40		\$0.00
26.1 Refurbished FPP recovery skimmer (2" or 4" wells)		each	\$760.32		\$0.00
27.1 Disposal of Absorbents		pound	\$4.10		\$0.00
28.1 Disposal of product from skimmers		gallon	\$0.50		\$0.00
X. Granulated Activated Carbon (GAC) filter system installation & service:					
1.2 New GAC System Installation		each	\$2,320.86		\$0.00
2.2 Refurbished GAC Sys. Install		each	\$1,099.35		\$0.00
3.2 Filter replacement/removal		each	\$427.53		\$0.00
4.2 GAC System removal, cleaning, & refurbishment		each	\$335.92		\$0.00
5.2 GAC System housing		each	\$305.38		\$0.00
6.2 In-line particulate filter		each	\$183.22		\$0.00
7.2 Additional piping & fittings		foot	\$1.84		\$0.00
Y. Well Repair					
1.2 Additional Copies of the Report Delivered		each	\$61.07		\$0.00
2.2 Repair 2x2 MW pad		each	\$61.07		\$0.00
3.2 Repair 4x4 MW pad		each	\$107.49		\$0.00
4.2 Replace well vault		each	\$144.14		\$0.00

5.2 Replace well cover bolts		each	\$3.18	\$0.00
6.2 Replace locking well cap & lock		each	\$18.32	\$0.00
7.2 Replace/Repair stick-up		each	\$163.68	\$0.00
8.2 Convert Flush-mount to Stick-up		each	\$183.22	\$0.00
9.2 Convert Stick-up to Flush-mount		each	\$158.79	\$0.00
10.2 Replace missing/illegible well ID plate		each	\$14.66	\$0.00
11.1 Down-hole Camera		per foot	\$29.25	\$0.00
Z. High Resolution Site Characterization				
1.1 HRSC Screening Equipment Mobilization		each	\$1,468.80	\$0.00
2.1 HRSC Drilling Category 1		per foot	\$31.32	\$0.00
3.1 HRSC Drilling Category 2		per foot	\$36.18	\$0.00
4.1 HRSC Drilling Category 3		per foot	\$29.16	\$0.00
5.1 HRSC 3-D Model		each	\$4,363.20	\$0.00
S. Report Prep & Project Management	12%	percent	\$15,600.36	\$1,872.04
TOTAL				\$17,472.40

DHEC D-4407 (07/2023)



SC DEPARTMENT of
**ENVIRONMENTAL
SERVICES**

Audrey Hayes
Corrective Action & Field Support Section
Underground Storage Tank Management Division
2600 Bull Street
Columbia, SC 29201

HILTON HEAD PUBLIC SERVICE DISTRICT
PO BOX 21264
HILTON HEAD ISLAND SC 29925

FEB 23 2026

Re: **Additional Assessment Notice to Proceed**
Hilton Head Public Service District, 21 Oak Park Dr, Hilton Head, SC
UST Permit #11399; CA #70941; UMW-30383
Release #2 reported July 27, 2017
Site Specific Work Plan received January 27, 2026
Beaufort County



To Whom It May Concern,

The Underground Storage Tank Management Division (UST Division) of the S.C. Department of Environmental Services (SCDES) has reviewed and approved the referenced Site-Specific Work Plan (SSWP) submitted by your contractor. The assessment should begin immediately upon receipt of this letter. A monitoring well approval has been enclosed for the monitoring well installation. All work should be conducted in compliance with the current revision of the UST Quality Assurance Program Plan (QAPP), your contractor's Annual Contractor Quality Assurance Plan (ACQAP), and all applicable regulations. The QAPP is available at des.sc.gov/programs/bureau-land-waste-management/underground-storage-tanks/ust-quality-assurance-program-plan-qapp.

Pursuant to S.C. Code Ann. Section 44-2-40(D), "The SUPERB Account and the SUPERB Financial Responsibility Fund shall provide combined coverage for site rehabilitation and third party claims, respectively, not to exceed one million dollars per occurrence". **According to UST Division records, approximately \$47,578.18 has been expended from the SUPERB Account to date.** This scope of work, as recommended by your contractor, is anticipated to cost approximately \$17,472.40.

The contractor is responsible for ensuring that the subsurface is free of any obstructions (e.g. utilities, supply lines, etc.) prior to the installation of any boring or well.

The Contractor must provide the UST Project Manager with a Project Status Report on a weekly basis via e-mail or notify the UST Project Manager via email 4 days prior to initiation of any site rehabilitation activities. If there are any changes or conflicts with the date(s) of site activities, the UST Project Manager must be contacted within 24 hours of those changes.

The Assessment Report, contractor checklist (QAPP Appendix K), and invoice should be submitted to the UST Division within ninety (90) days of the date of this correspondence. The report submitted at the completion of these activities should include the required information outlined in the QAPP.

If the report cannot be submitted by the required due date, an extension may be requested by submitting a written request, either via postal mail or email, to my attention prior to the due date. The Department will issue a Notice of Alleged Violation if the report is not submitted by the required due date.

In accordance with Section IV.A.4.c of the SUPERB Site Rehabilitation & Fund Access Regulation (R.61-98), the contractor shall be required to indemnify the property owner, underground storage tank owner/operator and the State of South Carolina from and against all claims, damages, losses and expenses arising out of or resulting from activity conducted by the contractor, its agents, employees or subcontractors.

Your contractor can submit an invoice for direct payment from the State Underground Petroleum Environmental Response Bank (SUPERB) Account for pre-approved costs. By law, the SUPERB Account cannot compensate any costs that are not pre-approved. If the invoice is not submitted within 120 days from the date of this letter, monies allocated to pay this invoice will be uncommitted. This means that the invoice will not be processed for payment until all other committed funds are paid or monies become available.

Please note that Sections 44-2-110(4) and 44-2-130 of the SUPERB Statute state that no costs will be allowed unless prior approval from the UST Division is obtained. If for any reason additional tasks will be completed, these additional tasks and the associated cost must be pre-approved by the UST Division for the cost to be paid. The UST Division reserves the authority to pay only for work properly performed and/or technically justified and will only pay rates in accordance with established criteria. Further, the UST Division reserves the right to question and/or reject costs if deemed unreasonable and the right to audit project records at any time during the project or after completion of work. **Per Section III.3.b of the SUPERB Site Rehabilitation and Fund Access Regulations (R.61-98), reimbursement for site rehabilitation activities shall in no event exceed the actual costs incurred.**

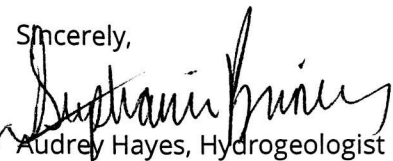
Please note that applicable South Carolina certification requirements regarding laboratory services, well installation, and report preparation must be satisfied. Any site rehabilitation activity associated with the UST release must be performed by a SCDES-certified site rehabilitation contractor as required by R.61-98.

The UST Division grants pre-approval for transportation of virgin petroleum impacted soil and groundwater from the referenced site to a permitted treatment facility. There can be no spillage or leakage in transport. All investigation-derived waste (IDW) must be properly contained and labeled prior to disposal. IDW should not be stored on-site longer than ninety (90) days. A copy of the disposal manifest and/or acceptance letter from the receiving facility that clearly designates the quantity received must be included as an appendix to the report. If the Chemical of Concern (CoC) concentrations based on laboratory analysis are below Risk-Based Screening Levels (RBSLs), please contact the project manager for approval to dispose of soil and/or groundwater on-site. The SUPERB Account will not reimburse for transportation or treatment of soil and/or groundwater with concentrations below RBSLs.

The contractor will be responsible for keeping and preserving suitable records of hydrological and other site assessments, site plans, contracts, accounts, invoices, or other transactions related to the cleanup and rehabilitation and the records must be accessible to the department during regular business hours. In addition, this includes all subcontractor agreements, invoices, correspondence, plans, reports, records, including electronic and paper formats. All records must be maintained for 10 years after project completion.

On all correspondence regarding this site, please reference the UST Permit number above. Should you have any questions, please contact me by phone at (803) 898-1386, by fax at (803) 898-0673, or by email at Audrey.Hayes@des.sc.gov.

Sincerely,

for 
Audrey Hayes, Hydrogeologist

enc: Approved Cost Agreement
Monitoring Well Approval Form

cc: F&ME Consultants Inc., 211 Business Park Blvd, Columbia, SC 29203 (w/ enc)
Technical file (w/ enc)



Monitoring Well Approval

Approval is granted to: F&ME Consultants Inc.

On behalf of: Hilton Head Public Service District

Facility: Hilton Head Public Service District, 21 Oak Park Dr, Hilton Head, SC

UST Permit: #11399

County: Beaufort

This approval is for the installation of three shallow monitoring wells. The monitoring wells are to be installed in the approved locations. Monitoring wells are to be installed following the S.C. Well Standards, R.61-71, and the applicable guidance documents.

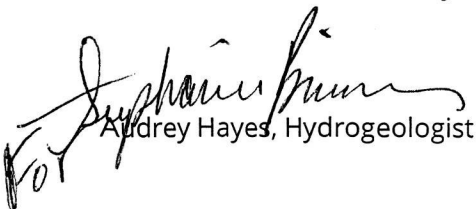
Please note that R.61-71 requires the following:

1. All wells shall be drilled, constructed, and abandoned by a S.C. certified well driller per R.61-71.D.1.
2. All monitoring wells shall be labeled as required by R.61-71.H.2.c.
3. A Water Well Record Form or other form provided or approved by the UST Division shall be completed and submitted to the UST Division within 30 days after well completion or abandonment unless another schedule has been approved by the UST Division. The form should contain the "as-built" construction details and all other information required by R.61-71.H.1.f
4. All analytical data and water levels obtained from each monitoring well shall be submitted to the UST Division within 30 days of receipt of laboratory results unless another schedule has been approved by the UST Division as required by R.61-71.H.1.d.
5. If any of the information provided to the UST Division changes, notification to Audrey Hayes, the project manager (phone: (803) 898-1386 or email: Audrey.Hayes@des.sc.gov.) shall be provided a minimum of twenty-four (24) hours prior to well construction as required by R.61-71.H.1.a.
6. All temporary monitoring wells shall be abandoned within 5 days of borehole completion using appropriate methods as required by R.61-71.H.4.c. All other wells shall be properly developed per R.61-71.H.2.d.
7. UST Division approval is required prior to abandonment of all monitoring wells as required by R.61-71.H.1.a.

This approval is pursuant to the provisions of Section 44-55-40 of the 1976 S.C. Code of Laws and R.61-71 of the S.C. Well Standards and Regulations, dated May 27, 2016. A copy of this approval should be on the site during well installation.

Date of Issuance: February 10, 2026

Approval #: UMW-30383


Audrey Hayes, Hydrogeologist

Approved Cost Agreement CA-70941

Facility Name: 11399 - HILTON HEAD PUBLIC SERVICE DISTRICT

Facility Number: 11399

PO Number	Description	Comments	Qty / Pct	Unit Price	Amount
70941	A / PLAN PREPARATION / 1.2 / SITE SPECIFIC WORK PLAN		1	\$183.22	\$183.22
70941	D / MOB/DEMOB / 1.2 / EQUIPMENT		1	\$1245.93	\$1245.93
70941	D / MOB/DEMOB / 2.2 / PERSONNEL		4	\$516.69	\$2066.76
70941	I / WELL INSTALLATION / 2.B / WATER TABLE DRILL RIG 2" DIA		39	\$54.9	\$2141.1
70941	I / WELL INSTALLATION / 7.2 / RECOVERY WELL (4" DIAMETER)		48	\$69.6	\$3340.8
70941	J / SAMPLE COLLECTION / 4.2B / NO-PURGE GROUNDWATER		10	\$57.24	\$572.4
70941	J / SAMPLE COLLECTION / 5.2 / GAUGE WELL ONLY		5	\$8.55	\$42.75
70941	J / SAMPLE COLLECTION / 8.2 / FIELD DUPL. (MWS & WWS) & FB		3	\$30.06	\$90.18
70941	J / SAMPLE COLLECTION / 9.2 / GROUNDWATER (LOW FLOW PURGE)		8	\$111.16	\$889.28
70941	K / ANALYSES / 1.2 / BTEXNM+OXYGS+1,2 DCA+ETH 8260D		27	\$149.02	\$4023.54
70941	P / SUBSEQUENT SURVEY / 1.1 / SUBSEQUENT SURVEY		1	\$297.65	\$297.65
70941	Q / DISPOSAL / 1.2 / WASTEWATER		200	\$1.19	\$238
70941	Q / DISPOSAL / 3.2 / SOIL TREATMENT DISPOSAL		3	\$156.25	\$468.75
70941	S / REPORT PROJECT MANAGEMENT / S / REPORT PREP & PROJ. MANAGEMENT		0.12	\$0.12	\$1872.04

Total : \$17472.4