



C. Earl Hunter, Commissioner

*Promoting and protecting the health of the public and the environment.*

**SEP 24 2008**

MS CYNDI SUTTLES  
R L JORDAN OIL CO OF NC  
PO BOX 2527  
SPARTANBURG SC 29304

Re: Groundwater Sampling Directive  
Hot Spot #3005, SC Hwy. 221, Chesnee, SC  
UST Permit # 12719; CA #33581  
Release #2 reported August 4, 2003  
Monitoring Report received October 31, 2005  
Spartanburg County

Dear Ms. Suttles:

The Underground Storage Tank (UST) Program of the South Carolina Department of Health and Environmental Control (SCDHEC) recognizes your commitment to continue work at this site utilizing Terry Environmental Services (Terry). The Program has reviewed the referenced report and determined the next necessary scope of work to be a comprehensive groundwater sampling event.

Cost Agreement #33581 has been approved in the amount shown on the enclosed cost agreement for a comprehensive sampling event. The Program requests that all existing monitoring wells associated with the release be sampled for BTEX, Naphthalene, MTBE and 1,2-DCA using EPA method 8260B, as well as EDB using EPA method 8011. Please note that wells in which the screen brackets the water table may be sampled without purging.

Please have Terry submit groundwater sampling results to the Program in a monitoring report containing the following items:

- A narrative portion documenting current site conditions and noting the names of field personnel, date, time, ambient air temperature, and general weather conditions during the sampling event. The report shall also contain well purging data, pH, specific conductivity, water temperature, PID readings (where applicable) and turbidity comments.
- Groundwater elevations, depth to groundwater, measurable free product thickness (where applicable), total well depth and screened interval for all monitoring wells associated with the site, unless otherwise directed by the Program, shall be presented in tabular form. Groundwater laboratory analytical data for all monitoring wells shall be presented in tabular format.
- Should any monitoring wells or water supply wells not be sampled, note the reason for which the sampling was not conducted on such wells.
- A groundwater elevation contour map of the site based on current groundwater potentiometric data.
- A CoC map based on current groundwater laboratory analytical data. The groundwater data should be adjacent to the relevant monitoring well.
- Manifests for any contaminated soil and/or groundwater removed from the site for treatment and/or disposal.
- Signature and seal by a professional geologist or engineer registered in the State of South Carolina.

**UST DOCKET**

Terry can submit an invoice for direct billing from the State Underground Petroleum Environmental Response Bank (SUPERB) Account. Please note that all applicable South Carolina certification

**SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL**

2600 Bull Street • Columbia, SC 29201 • Phone: (803) 898-3432 • www.scdhec.gov

requirements apply to the laboratory services, well installation, and report preparation. All site rehabilitation activities must be performed and submitted by a South Carolina Certified Underground Storage Tank Site Rehabilitation Contractor.

**A Report of Findings and the invoice is due within 60 days from the date of this letter and within 45 days from the sampling date. Interim invoices may not be submitted for this scope of work. 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 Department is obtained. If for any reason additional tasks will be completed, these additional tasks and the associated cost must be pre-approved by the Department for the cost to be paid. The SCDHEC 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, SCDHEC reserves the right to question and/or reject costs if deemed unreasonable and to audit project records at any time during the project or after completion of work.

The Department 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 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.

On all correspondence or inquiries regarding this project, please reference UST Permit #12719. If you have any questions, please feel free to contact me by phone at (803) 896-4078, by fax at (803) 896-6245, or email at [jaspermj@dhec.sc.gov](mailto:jaspermj@dhec.sc.gov).

Sincerely,



Mike Jaspers, Hydrogeologist  
Northeastern South Carolina Corrective Action Section  
Assessment and Corrective Action Division  
Underground Storage Tank Program  
Bureau of Land and Waste Management

enc: Approved Cost Agreement  
cc: Terry Environmental Services, PO Box 25, Summerville, SC 29484 (w/enc)  
Technical file (w/o enc)

MJJ/9.10.08

# Approved Cost Agreement 33581

Facility: 12719 HOT SPOT 3005

JASPERMJ

PO Number:

<u>Task / Description</u>	<u>Categories</u>	<u>Item Description</u>	<u>Qty / Pct</u>	<u>Unit Price</u>	<u>Amount</u>
04 MOB/DEMOB		B PERSONNEL	2.0000	290.00	580.00
10 SAMPLE COLLECTION		A GROUND WATER	1.0000	55.00	55.00
		D GROUNDWATER NO-PURGE	14.0000	35.00	490.00
11 ANALYSES					
	GW GROUNDWATER	A BTEX+NAPTH+MTBE	15.0000	100.00	1,500.00
		BB 1,2-DCA	15.0000	10.75	161.25
		F EDB	15.0000	55.00	825.00
17 DISPOSAL					
		A1 WASTEWATER - PURGING/SAMPLING	1.0000	90.00	90.00
19 RPT/PROJECT MNGT & COORDINATIO					
		PCT PERCENT	0.1500	3,701.25	555.19
<b>Total Amount</b>					<b>4,256.44</b>

**GROUNDWATER MONITORING REPORT  
HOT SPOT # 3005  
CHESNEE, SOUTH CAROLINA  
SCDHEC UST PERMIT # 12719  
CA # 33581**

Prepared For:

**SCDHEC UNDERGROUND STORAGE TANK PROGRAM  
2600 BULL ST.  
COLUMBIA, SC 29201**

Submitted By:



**TERRY Environmental Services**

*CLIENTS FIRST ALWAYS*

P.O. BOX 25  
SUMMERVILLE, SOUTH CAROLINA 29484  
(843) 873-8200  
Fax (843) 873-8765  
[www.terryenvironmental.com](http://www.terryenvironmental.com)

UST CONTRACTOR # 223  
PROJECT # 2230.8B

Handwritten signature of Kelly Cone in blue ink.

**KELLY CONE  
PROJECT MANAGER**

Handwritten signature of Jason A. Terry in blue ink.

**JASON A. TERRY, PG  
PRESIDENT**

NOVEMBER 2008



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## **1.0 INTRODUCTION**

TERRY Environmental Services, Inc. (TERRY) has been contracted by R. L. Jordan Oil Company to serve as their environmental contractor for the Hot Spot # 3005 site, South Carolina Department of Health and Environmental Control (SCDHEC) Site # 12719. The Groundwater Monitoring Event presented herein has been performed to monitor the contaminant levels at the Hot Spot # 3005 site. The site is located at the intersection of SC Highway 221 (Hampton Street) and North Alabama Avenue in Chesnee, South Carolina (Appendix 1, Figure 1). The site is bordered to the north by a school, to the east by a vacant field, and to the south and west by residential properties. A site map is provided as Appendix 1, Figure 2.

## **2.0 SITE SPECIFIC ASSESSMENT INFORMATION**

### **2.1 Piezometric Data**

On October 2, 2008 the monitoring wells were gauged with an oil/water interface probe by TERRY personnel. Depths to water measurements were taken with reference to the top of well casing elevations (TOC) and then converted to elevations by subtracting them from the TOC elevations. The piezometric data is included in Table 1, Appendix 2 and on the Groundwater Sampling Logs provided in Appendix 3. Piezometric contour lines were created utilizing the piezometric data and linear interpolation between known groundwater elevations. The resulting Groundwater Contour Map is included in Appendix 1 as Figure 3. Groundwater flow is to the west which is consistent with the previous assessment.

### **2.2 Groundwater Sampling**

TERRY personnel conducted a comprehensive sampling event on October 2, 2008. MW-1 and MW-5 both had six inches or less of water when gauged; therefore no sample could be collected. MW-8 and MW-11R could not be located to sample. The groundwater samples from the remaining wells were submitted to Access Analytical, Inc. (SCDHEC Lab Certification # 73006). The groundwater analytical data are provided in Table 2, Appendix 2. The analytical data were used to generate a contaminant concentration map for COC's detected by laboratory analyses (Appendix 1, Figure 4). The laboratory analytical report and chain of custody are included in Appendix 4. The purge water was disposed of via processing through a granular-activated-carbon (GAC) unit in accordance with the NPDES General Permit No. SCG830000. A Certificate of On-Site Treatment is provided in Appendix 5.

### 3.0 CONCLUSIONS AND RECOMMENDATIONS

Based upon the groundwater sampling and analyses, the following conclusions are offered:

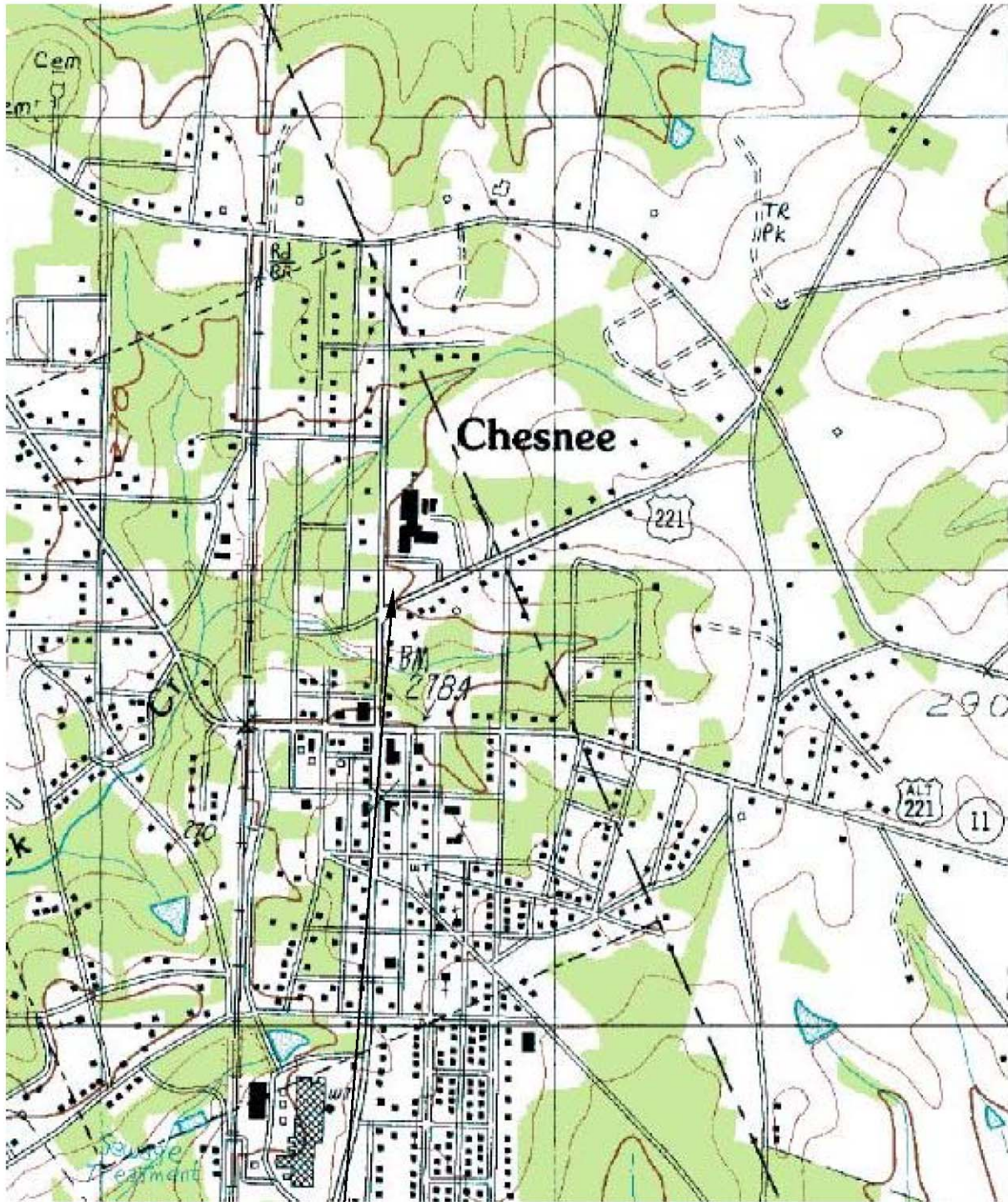
- MW-1 and MW-5 both had six inches or less of water when gauged; therefore no sample could be collected.
- MW-8 and MW-11R could not be located to sample.
- Groundwater flow is to the west, consistent with previous assessments.
- The groundwater is contaminated above RBSL's in monitoring wells MW-3R and MW-6.
- The majority of contaminant concentrations have increased in MW-3R and MW-6 while all the contaminant concentrations have decreased below the RBSL's in MW-2, since the August 2005 sampling event.

TERRY recommends replacement of MW-1 and MW-5 and continued sampling of the site to monitor the groundwater contamination and to determine the trend in contaminant mass. An assessment plan proposal for these recommendations is provided in Appendix 6. It should also be noted that MW-13 and MW-14 had a 1.73 and 2.09ft water column, respectively. It may be necessary to replace these wells in the future, but their replacement has not been included in the cost proposal.



## **APPENDIX 1**

### **Figures**



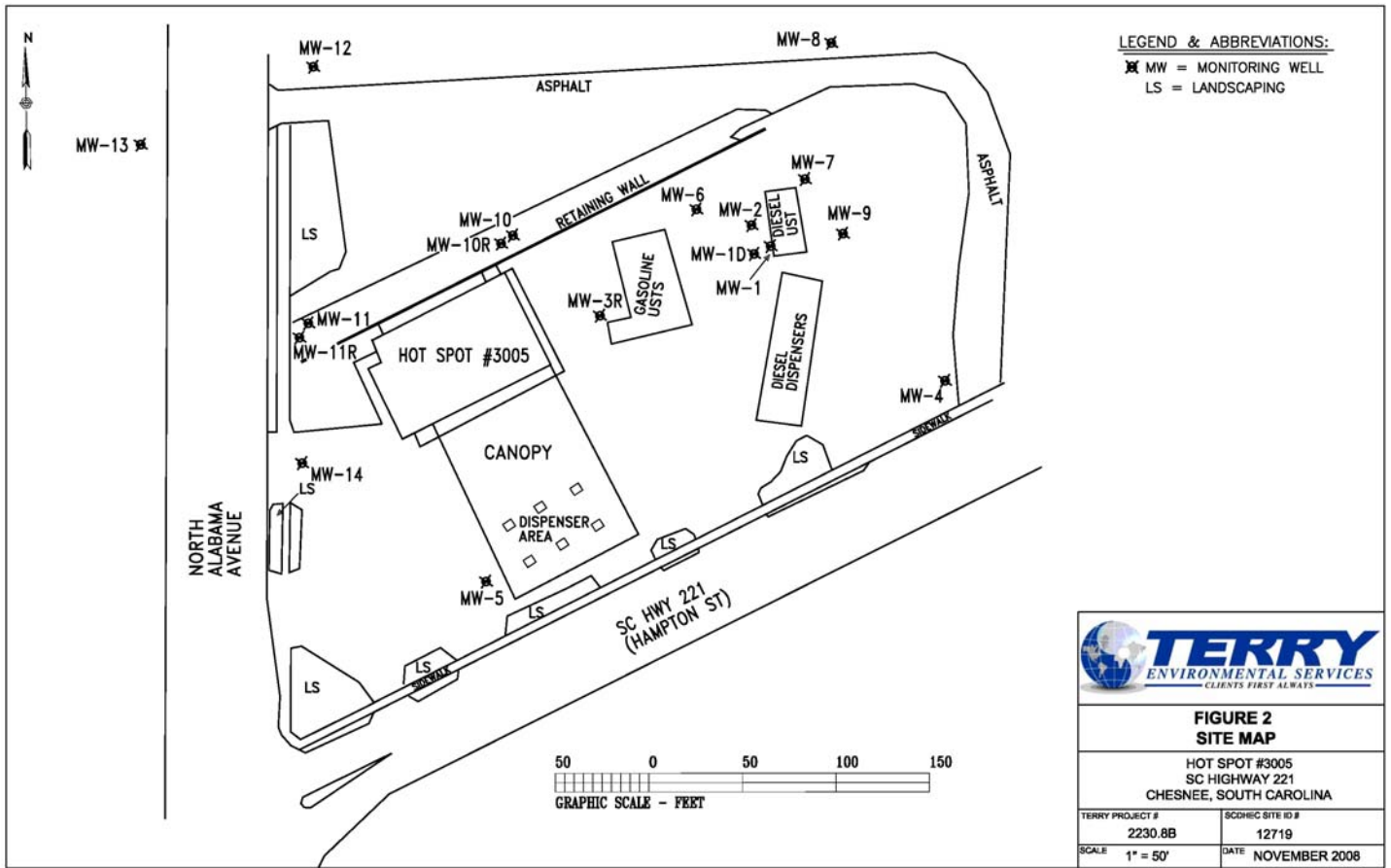

Hot Spot #3005  
SCDHEC UST Permit #12719

## FIGURE 1 SITE LOCATION - USGS

Hot Spot #3005  
SC Highway 221  
Chesnee, South Carolina  
SCDHEC Site # 12719



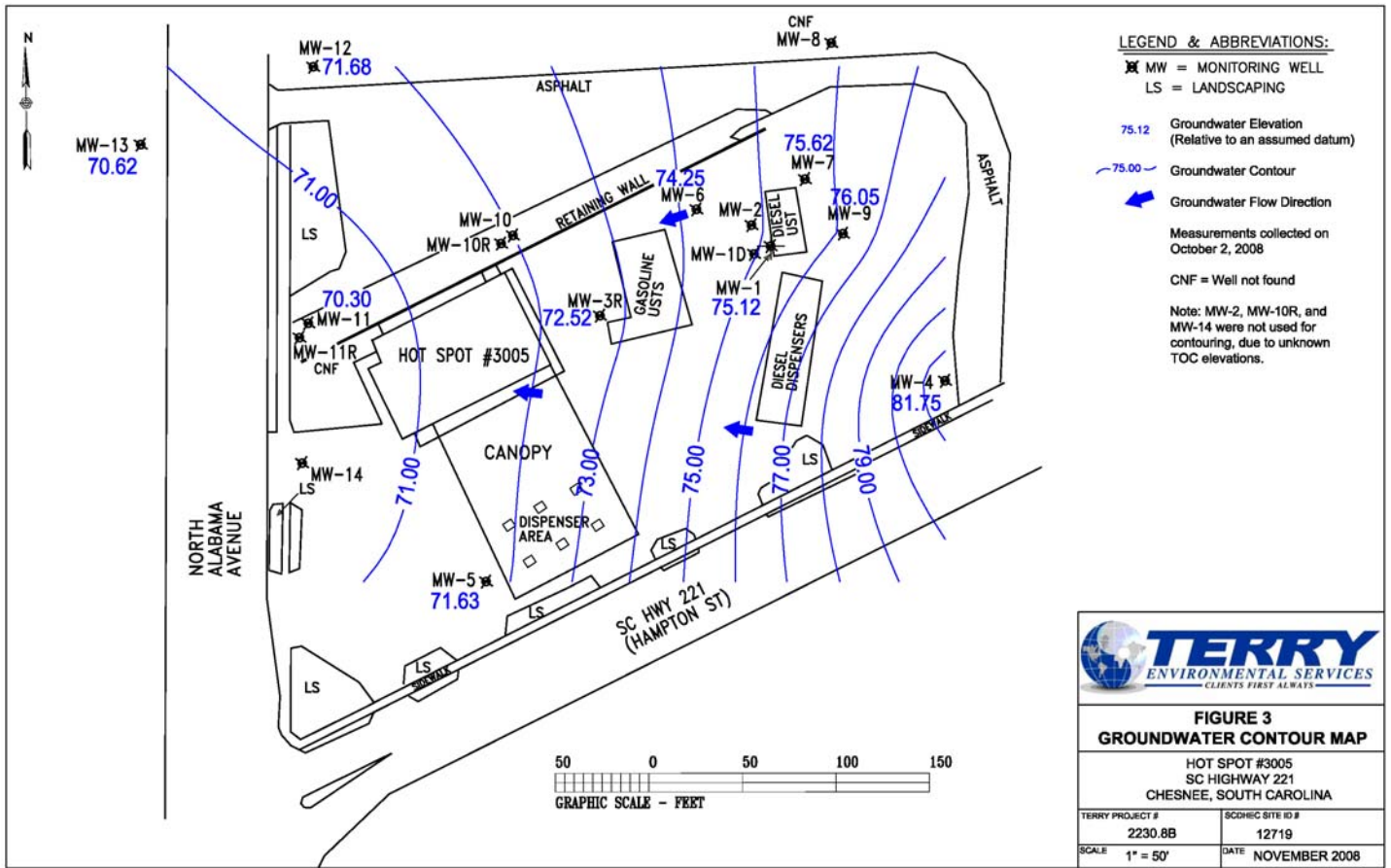
SIZE	TERRY Project No.	DWG NO.	REV
B	2230.8B	Figure 1 Site Location.dwg	
SCALE: NOT TO SCALE			DATE: November 2008

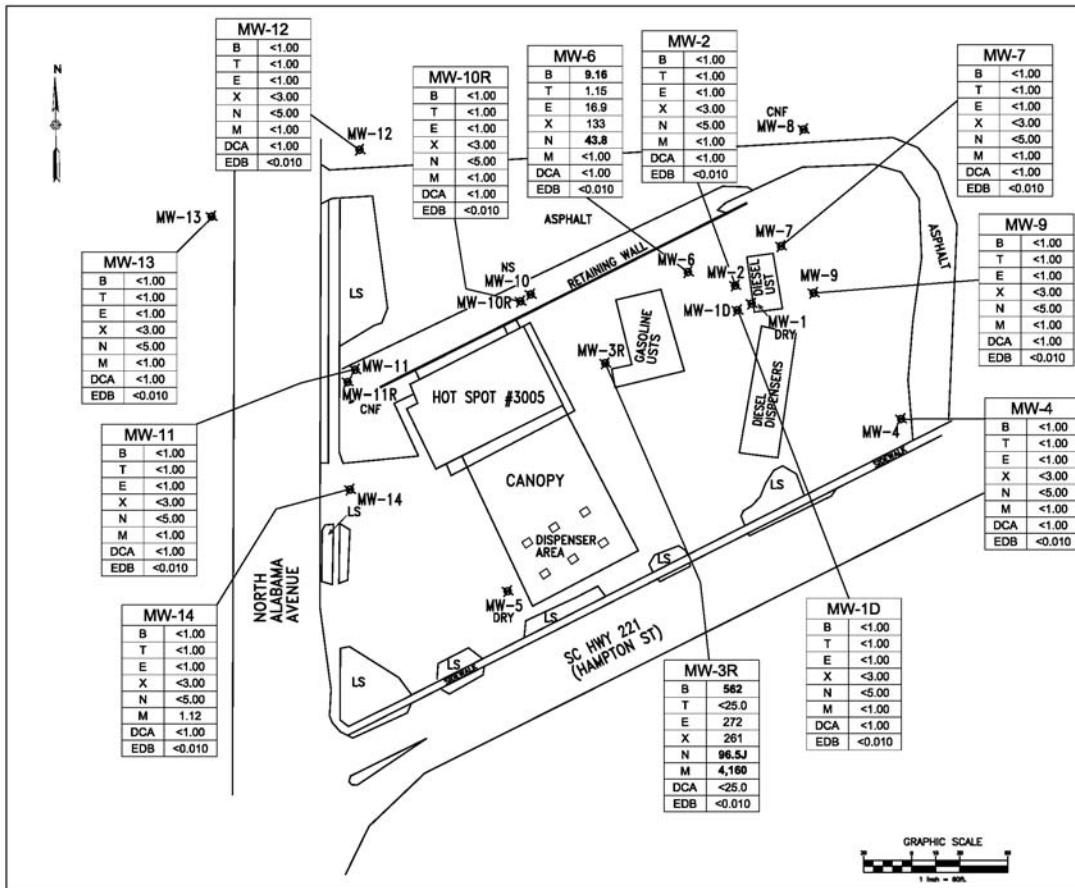



**FIGURE 2  
SITE MAP**

HOT SPOT #3005  
 SC HIGHWAY 221  
 CHESNEE, SOUTH CAROLINA

TERRY PROJECT # 2230.8B	SCDHEC SITE ID # 12719
SCALE 1" = 50'	DATE NOVEMBER 2008





**LEGEND & ABBREVIATIONS:**

✕ MW = MONITORING WELL  
 LS = LANDSCAPING

B = Benzene  
 T = Toluene  
 E = Ethylbenzene  
 X = Xylene (Total)  
 N = Naphthalene  
 M = Tert-Butyl Methyl Ether  
 DCA = 1,2-Dichloroethane  
 EDB = 1,2-Dibromoethane

**Bold text indicates values exceed SCDHEC RBSL's**

All concentrations are in ug/L  
 Data was collected on October 2, 2008

CNF = Well not found  
 NS = Well not sampled  
 DRY = Not enough water to sample

MW-12	
B	<1.00
T	<1.00
E	<1.00
X	<3.00
N	<5.00
M	<1.00
DCA	<1.00
EDB	<0.010

MW-10R	
B	<1.00
T	<1.00
E	<1.00
X	<3.00
N	<5.00
M	<1.00
DCA	<1.00
EDB	<0.010

MW-6	
B	<b>9.16</b>
T	1.15
E	16.9
X	133
N	<b>43.8</b>
M	<1.00
DCA	<1.00
EDB	<0.010

MW-2	
B	<1.00
T	<1.00
E	<1.00
X	<3.00
N	<5.00
M	<1.00
DCA	<1.00
EDB	<0.010

MW-7	
B	<1.00
T	<1.00
E	<1.00
X	<3.00
N	<5.00
M	<1.00
DCA	<1.00
EDB	<0.010

MW-9	
B	<1.00
T	<1.00
E	<1.00
X	<3.00
N	<5.00
M	<1.00
DCA	<1.00
EDB	<0.010

MW-13	
B	<1.00
T	<1.00
E	<1.00
X	<3.00
N	<5.00
M	<1.00
DCA	<1.00
EDB	<0.010

MW-11	
B	<1.00
T	<1.00
E	<1.00
X	<3.00
N	<5.00
M	<1.00
DCA	<1.00
EDB	<0.010

MW-14	
B	<1.00
T	<1.00
E	<1.00
X	<3.00
N	<5.00
M	1.12
DCA	<1.00
EDB	<0.010

MW-3R	
B	562
T	<25.0
E	272
X	261
N	<b>96.53</b>
M	<b>4,160</b>
DCA	<25.0
EDB	<0.010

MW-1D	
B	<1.00
T	<1.00
E	<1.00
X	<3.00
N	<5.00
M	<1.00
DCA	<1.00
EDB	<0.010



**FIGURE 4  
 GROUNDWATER ANALYTICAL MAP**

HOT SPOT #3005  
 SC HIGHWAY 221  
 CHESNEE, SOUTH CAROLINA

TERRY PROJECT #	SCDHEC SITE ID #
2230.8B	12719
SCALE	DATE
1" = 60'	NOVEMBER 2008

## **APPENDIX 2**

### **Tables**

**TABLE 1**  
**MONITORING WELL AND GROUNDWATER DATA**  
**HOT SPOT # 3005**  
**CHESNEE, SOUTH CAROLINA**  
**SCDHEC UST PERMIT #12719**

Well #	DATE	TOC Elevation	Screened Interval	Depth to Product** (ft)	Depth to Water** (ft)	Product Thickness (ft)	Water Table Elevation (ft)
MW-1	8/18/2005	104.89	20'-30'	--	23.69	--	81.20
	10/2/2008	104.89	20'-30'	--	29.77	--	75.12
MW-2	8/18/2005	Unknown	26'-36'	--	23.69	--	--
	10/2/2008	Unknown	26'-36'	--	29.61	--	--
MW-3R	8/18/2005	104.92	26'-36'	--	27.15	--	77.77
	10/2/2008	104.92	26'-36'	--	32.40	--	72.52
MW-4	8/18/2005	111.32	36'-46'	--	23.25	--	88.07
	10/2/2008	111.32	36'-46'	--	29.57	--	81.75
MW-5	8/18/2005	103.57	22'-32'	--	29.03	--	74.54
	10/2/2008	103.57	22'-32'	--	31.94	--	71.63
MW-6	8/18/2005	104.14	26'-36'	--	24.22	--	79.92
	10/2/2008	104.14	26'-36'	--	29.89	--	74.25
MW-7	8/18/2005	104.52	26'-36'	--	22.74	--	81.78
	10/2/2008	104.52	26'-36'	--	28.90	--	75.62
MW-8	8/18/2005	101.79	Unknown	--	18.05	--	83.74
	10/2/2008	101.79	Unknown	CNF			
MW-9	8/18/2005	105.43	Unknown	--	22.95	--	82.48
	10/2/2008	105.43	Unknown	--	29.38	--	76.05
MW-10	8/18/2005	96.57	17'-27'	--	--	--	--
MW-10R	8/18/2005	Unknown	22'-32'	--	19.67	--	--
	10/2/2008	Unknown	22'-32'	--	24.50	--	--
MW-11	8/18/2005	95.15	18'-28'	--	--	--	--
	10/2/2008	95.15	18'-28'	--	24.85	--	70.30
MW-11R	8/18/2005	Unknown	22'-32'	--	20.68	--	--
	10/2/2008	Unknown	22'-32'	CNF			
MW-12	8/18/2005	97.03	20'-30'	--	19.57	--	77.46
	10/2/2008	97.03	20'-30'	--	25.35	--	71.68
MW-13	8/18/2005	95.89	17'-27'	--	20.62	--	75.27
	10/2/2008	95.89	17'-27'	--	25.27	--	70.62
MW-14	8/18/2005	Unknown	21'-31'	--	24.84	--	--
	10/2/2008	Unknown	21'-31'	--	28.46	--	--
MW-1D	8/18/2005	104.61	55'-60'	--	24.60	--	80.01
	10/2/2008	104.61	55'-60'	--	30.46	--	74.15

\*\* = Relative to top of casing

-- = Not applicable

CNF = Could not find

**TABLE 2**  
**GROUNDWATER ANALYTICAL DATA**  
**HOT SPOT #3005**  
**CHESNEE, SC**  
**SCDHEC UST PERMIT #12719**

Well	Date	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	MTBE	1,2 DCA	EDB
	Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
	RBSL	5	1,000	700	10,000	40	25	n/a	0.05
MW-1	8/18/2005	85	110	42	170	41	<5.0	n/a	n/a
	10/2/2008	Dry - Not enough water to sample							
MW-2	8/18/2005	90	100	78	350	94	8.9	n/a	n/a
	10/2/2008	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<0.010
MW-3R	8/18/2005	270	41	170	880	430	330	n/a	n/a
	10/2/2008	562	<25.0	272	261	96.5J	4,160	<25.0	<0.010
MW-4	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	n/a	n/a
	10/2/2008	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<0.010
MW-5	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	n/a	n/a
	10/2/2008	Dry - Not enough water to sample							
MW-6	8/18/2005	7.8	6.3	5.5	52	22	6.8	n/a	n/a
	10/2/2008	9.16	1.15	16.9	133	43.8	<1.00	<1.00	<0.010
MW-7	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	n/a	n/a
	10/2/2008	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<0.010
MW-8	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	n/a	n/a
	10/2/2008	Well could not be located							
MW-9	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	n/a	n/a
	10/2/2008	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<0.010
MW-10	8/18/2005	Not sampled							
	10/2/2008	Not sampled							
MW-10R	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	n/a	n/a
	10/2/2008	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<0.010
MW-11	8/18/2005	Not sampled							
	10/2/2008	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<0.010
MW-11R	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	n/a	n/a
	10/2/2008	Well could not be located							
MW-12	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	n/a	n/a
	10/2/2008	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<0.010
MW-13	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	n/a	n/a
	10/2/2008	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<0.010
MW-14	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	n/a	n/a
	10/2/2008	<1.00	<1.00	<1.00	<3.00	<5.00	1.12	<1.00	<0.010
MW-1D	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	n/a	n/a
	10/2/2008	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<0.010

Notes:

RBSL - Risk Based Screening Levels

ug/L = Micrograms Per Liter

J = Indicates an estimated value

Values in **Bold** Exceed the RBSL

n/a = Not Applicable



## **APPENDIX 3**

### **Groundwater Sampling Logs**

**Groundwater Sampling Log**

<b>TERRY Environmental Services</b> <small>CLIENTS FIRST ALWAYS</small>				P.O. Box 25 Summerville, SC 29484 1-800-325-0605					
				<p align="center"><b>Site Specific Information</b></p>				<p align="center"><b>Monitoring Well Information</b></p>	
Terry Project ID		2230.803		Well ID		MW-1		TAG BOTTOM OF WELL TO VERIFY WELL DEPTH AND WRITE BELOW!	
SCDHEC Permit No.		#12719		Well Diameter		2	in		
Project Name		Hot Spot #3005		Screened Interval		20-30	ft		
Date		10/2/08		Total Well Depth		30.30	ft		
Field Personnel		G. Munn		Depth to Groundwater		29.77	ft		
General Weather		Sunny		Length of Water Column			ft		
Ambient Air Temperature		75F		1 Casing Volume (0.163)			gals		
<p align="center"><b>Quality Assurance</b></p>				3 Casing Volumes (0.489)			gals	30.30	
				Total Volume Purged			gals		
pH Meter		Oakton		Conductivity Meter		Oakton		Additional Comments 0.53 ft. of water DRY	
Serial Number		73168		Serial Number		73168			
Calibration Constant		4.01		Calibration Constant		447 µS			
Calibration Constant		7.00		Calibration Constant		1413 µS			
Calibration Constant		10.00		Calibration Constant					
Calibration Constant				Calibration Constant					
Volume (gal)									
Time									
pH (su)									
Spec Conductivity									
Water Temperature									
Turbidity (subjective)									
Dissolved Oxygen (mg/L)									
Additional Comments:									
-overall well condition acceptable?		Yes							
-well cap acceptable?		↓							
-manhole and cover acceptable?		No bolts							
-well pad acceptable?		Yes							
-area safe?		↓							
-other comments									

**Groundwater Sampling Log**



**TERRY Environmental Services**  
CLIENTS FIRST ALWAYS

P.O. Box 25  
 Summerville, SC 29484  
 1-800-325-0605

Site Specific Information				Monitoring Well Information			
Terry Project ID		2230.808		Well ID		MW-2	
SCDHEC Permit No.		#12719		Well Diameter		2	in
Project Name		Hot Spot #3005		Screened Interval		26-36	ft
Date		10/2/08		Total Well Depth		33.78	ft
Field Personnel		G. Munn		Depth to Groundwater		29.61	ft
General Weather		Sunny		Length of Water Column			ft
Ambient Air Temperature		75F		1 Casing Volume (0.163)			gals
Quality Assurance				3 Casing Volumes (0.489)			gals
				Total Volume Purged			gals
pH Meter		Oakton		Conductivity Meter		Oakton	
Serial Number		73168		Serial Number		73168	
Calibration Constant		4.01		Calibration Constant		447 µS	
Calibration Constant		7.00		Calibration Constant		1413 µS	
Calibration Constant		10.00		Calibration Constant			
Additional Comments							
Volume (gal)							
Time		14:30					
pH (su)		9.02					
Spec Conductivity		244					
Water Temperature		20.0					
Turbidity (subjective)		1					
Dissolved Oxygen (mg/L)		1.2					
Additional Comments:							
-overall well condition acceptable?		No					
-well cap acceptable?		No holes Yes					
-manhole and cover acceptable?		No holes					
-well pad acceptable?		Yes					
-area safe?		Yes					
-other comments		Casing is broken					

**Groundwater Sampling Log**



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Site Specific Information				Monitoring Well Information			
Terry Project ID		2230.80B		Well ID		MW-3R	
SCDHEC Permit No.		#12719		Well Diameter		2	in
Project Name		Hot Spot #3005		Screened Interval		26-36	ft
Date		10/2/08		Total Well Depth		<del>36.27</del>	ft
Field Personnel		G. Munn		Depth to Groundwater		32.40	ft
General Weather		Sunny		Length of Water Column			ft
Ambient Air Temperature		75 F		1 Casing Volume (0.163)			gals
<b>Quality Assurance</b>				3 Casing Volumes (0.489)			gals
				Total Volume Purged			gals
pH Meter	Oakton	Conductivity Meter	Oakton	Additional Comments <i>Sitting past time!!</i>			
Serial Number	73168	Serial Number	73168				
Calibration Constant	4.01	Calibration Constant	447 µS				
Calibration Constant	7.00	Calibration Constant	1413 µS				
Calibration Constant	10.00	Calibration Constant					
Volume (gal)							
Time	15:00						
pH (su)	9.14						
Spec Conductivity	320						
Water Temperature	19.8						
Turbidity (subjective)	1						
Dissolved Oxygen (mg/L)	1.3						
Additional Comments:							
-overall well condition acceptable?		Yes					
-well cap acceptable?		↓					
-manhole and cover acceptable?		↓					
-well pad acceptable?		↓					
-area safe?		↓					
-other comments							

**Groundwater Sampling Log**



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Site Specific Information				Monitoring Well Information			
Terry Project ID		2230.8▲B		Well ID		MW-4	
SCDHEC Permit No.		#12719		Well Diameter		2	in
Project Name		Hot Spot #3005		Screened Interval		36-46	ft
Date		10/2/08		Total Well Depth		45.62	ft
Field Personnel		G. Munn		Depth to Groundwater		29.57	ft
General Weather		Sunny		Length of Water Column		16.05	ft
Ambient Air Temperature		75F		1 Casing Volume (0.163)		2.66	gals
Quality Assurance				3 Casing Volumes (0.489)		8	gals
				Total Volume Purged		8	gals
pH Meter	Oakton	Conductivity Meter	Oakton	Additional Comments			
Serial Number	73168	Serial Number	73168				
Calibration Constant	4.01	Calibration Constant	447 µS				
Calibration Constant	7.00	Calibration Constant	1413 µS				
Calibration Constant	10.00	Calibration Constant					
Volume (gal)	2.66	5.33	8				
Time	12:50	12:55	13:05				
pH (su)	9.50	9.44	9.52				
Spec Conductivity	239	215	210				
Water Temperature	19.6	18.7	19.0				
Turbidity (subjective)	2	1	1				
Dissolved Oxygen (mg/L)	4.2	3.0	1.8				
Additional Comments:							
-overall well condition acceptable? Yes							
-well cap acceptable? Metal part of cap has broken off							
-manhole and cover acceptable?							
-well pad acceptable?							
-area safe?							
-other comments							

**Groundwater Sampling Log**



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Site Specific Information				Monitoring Well Information			
Terry Project ID		2230.8AB		Well ID		MW-5	
SCDHEC Permit No.		#12719		Well Diameter		2	in
Project Name		Hot Spot #3005		Screened Interval		22-32	ft
Date		10/2/08		Total Well Depth		32.28	ft
Field Personnel		G. Munn		Depth to Groundwater		31.94	ft
General Weather		Junny		Length of Water Column			ft
Ambient Air Temperature		75F		1 Casing Volume (0.163)			gals
<b>Quality Assurance</b>				3 Casing Volumes (0.489)			gals
				Total Volume Purged			gals
pH Meter	Oakton	Conductivity Meter	Oakton	<b>Additional Comments</b> DRY			
Serial Number	73168	Serial Number	73168				
Calibration Constant	4.01	Calibration Constant	447 µS				
Calibration Constant	7.00	Calibration Constant	1413 µS				
Calibration Constant	10.00	Calibration Constant					
Volume (gal)							
Time							
pH (su)							
Spec Conductivity							
Water Temperature							
Turbidity (subjective)							
Dissolved Oxygen (mg/L)							
<b>Additional Comments:</b>							
-overall well condition acceptable?							
-well cap acceptable?							
-manhole and cover acceptable?							
-well pad acceptable?							
-area safe?							
-other comments							

**Groundwater Sampling Log**



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Site Specific Information				Monitoring Well Information			
Terry Project ID		2230.808		Well ID		MW-6	
SCDHEC Permit No.		#12719		Well Diameter		2	in
Project Name		Hot Spot #3005		Screened Interval		26-36	ft
Date		10/2/08		Total Well Depth		36.20	ft
Field Personnel		G. Munn		Depth to Groundwater		29.89	ft
General Weather		Sunny		Length of Water Column			ft
Ambient Air Temperature		75F		1 Casing Volume (0.163)			gals
<b>Quality Assurance</b>				3 Casing Volumes (0.489)			gals
				Total Volume Purged			gals
pH Meter	Oakton	Conductivity Meter	Oakton	<b>Additional Comments</b> Slight pesto smell			
Serial Number	73168	Serial Number	73168				
Calibration Constant	4.01	Calibration Constant	447 µS				
Calibration Constant	7.00	Calibration Constant	1413 µS				
Calibration Constant	10.00	Calibration Constant					
Volume (gal)							
Time	14:10						
pH (su)	9.02						
Spec Conductivity	445						
Water Temperature	20.0						
Turbidity (subjective)	1						
Dissolved Oxygen (mg/L)	2.4						
<b>Additional Comments:</b>							
-overall well condition acceptable?							
-well cap acceptable?							
-manhole and cover acceptable? No holes							
-well pad acceptable?							
-area safe?							
-other comments							

**Groundwater Sampling Log**



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Site Specific Information				Monitoring Well Information			
Terry Project ID		2230.808		Well ID		MW-7	
SCDHEC Permit No.		#12719		Well Diameter		2	in
Project Name		Hot Spot #3005		Screened Interval		26-36	ft
Date		10/2/08		Total Well Depth		36.23	ft
Field Personnel		G. Munn		Depth to Groundwater		28.90	ft
General Weather		Sunny		Length of Water Column			ft
Ambient Air Temperature		75F		1 Casing Volume (0.163)			gals
<b>Quality Assurance</b>				3 Casing Volumes (0.489)			gals
				Total Volume Purged			gals
pH Meter		Oakton		Conductivity Meter		Oakton	
Serial Number		73168		Serial Number		73168	
Calibration Constant		4.01		Calibration Constant		447 µS	
Calibration Constant		7.00		Calibration Constant		1413 µS	
Calibration Constant		10.00		Calibration Constant			
<b>Additional Comments</b>							
Volume (gal)							
Time		13:30					
pH (su)		9.14					
Spec Conductivity		101.2					
Water Temperature		19.5					
Turbidity (subjective)		1					
Dissolved Oxygen (mg/L)		3.9					
Additional Comments:							
-overall well condition acceptable?		Yes					
-well cap acceptable?		Metal part of cap has broken off					
-manhole and cover acceptable?		Yes					
-well pad acceptable?		J					
-area safe?		J					
-other comments							



**Groundwater Sampling Log**



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Site Specific Information				Monitoring Well Information			
Terry Project ID	2230.808	Well ID	MW-8	Well Diameter	2	in	TAG BOTTOM OF WELL TO VERIFY WELL DEPTH AND WRITE BELOW!
SCDHEC Permit No.	#12719	Screened Interval				ft	
Project Name	Hot Spot #3005	Total Well Depth				ft	
Date	10/2/08	Depth to Groundwater				ft	
Field Personnel	G. Munn	Length of Water Column				ft	
General Weather	Sunny	1 Casing Volume (0.163)				gals	
Ambient Air Temperature	75F	3 Casing Volumes (0.489)				gals	
<b>Quality Assurance</b>				<b>Total Volume Purged</b>			
pH Meter	Oakton	Conductivity Meter	Oakton	<b>Additional Comments</b> CNF			
Serial Number	73168	Serial Number	73168				
Calibration Constant	4.01	Calibration Constant	447 µS				
Calibration Constant	7.00	Calibration Constant	1413 µS				
Calibration Constant	10.00	Calibration Constant					
Volume (gal)							
Time							
pH (su)							
Spec Conductivity							
Water Temperature							
Turbidity (subjective)							
Dissolved Oxygen (mg/L)							
<b>Additional Comments:</b>							
-overall well condition acceptable?							
-well cap acceptable?							
-manhole and cover acceptable?							
-well pad acceptable?							
-area safe?							
-other comments							

**Groundwater Sampling Log**



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Site Specific Information				Monitoring Well Information			
Terry Project ID		2230.84B		Well ID		MW-9	
SCDHEC Permit No.		#12719		Well Diameter		2 in	
Project Name		Hot Spot #3005		Screened Interval			
Date		10/2/08		Total Well Depth		35.22 ft	
Field Personnel		G. Munn		Depth to Groundwater		29.38 ft	
General Weather		Sunny		Length of Water Column		ft	
Ambient Air Temperature		75F		1 Casing Volume (0.163)		gals	
<b>Quality Assurance</b>				3 Casing Volumes (0.489)		gals	
				Total Volume Purged		gals	
pH Meter		Oakton		Conductivity Meter		Oakton	
Serial Number		73168		Serial Number		73168	
Calibration Constant		4.01		Calibration Constant		447 µS	
Calibration Constant		7.00		Calibration Constant		1413 µS	
Calibration Constant		10.00		Calibration Constant			
<b>Additional Comments</b>							
Slight petro smell							
Volume (gal)							
Time		13:45					
pH (su)		9.23					
Spec Conductivity		32.0					
Water Temperature		19.2					
Turbidity (subjective)		1					
Dissolved Oxygen (mg/L)		3.6					
<b>Additional Comments:</b>							
-overall well condition acceptable?							
-well cap acceptable?							
-manhole and cover acceptable? No bolts							
-well pad acceptable?							
-area safe?							
-other comments							

**Groundwater Sampling Log**



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Site Specific Information				Monitoring Well Information			
Terry Project ID	2230.8AB	Well ID	MW-10R				
SCDHEC Permit No.	#12719	Well Diameter	2	in			TAG BOTTOM OF WELL TO VERIFY WELL DEPTH AND WRITE BELOW!
Project Name	Hot Spot #3005	Screened Interval	22-32	ft			
Date	10/2/08	Total Well Depth	32.07	ft			
Field Personnel	G. Munn	Depth to Groundwater	24.50	ft			
General Weather	Sunny	Length of Water Column		ft			
Ambient Air Temperature	75F	1 Casing Volume (0.163)		gals			
<b>Quality Assurance</b>				3 Casing Volumes (0.489)	gals	32.07	
pH Meter	Oakton	Conductivity Meter	Oakton	<b>Additional Comments</b>			
Serial Number	73168	Serial Number	73168				
Calibration Constant	4.01	Calibration Constant	447 µS				
Calibration Constant	7.00	Calibration Constant	1413 µS				
Calibration Constant	10.00	Calibration Constant					
Volume (gal)							
Time	16:10						
pH (su)	9.46						
Spec Conductivity	92.6						
Water Temperature	18.3						
Turbidity (subjective)	1						
Dissolved Oxygen (mg/L)	3.6						
<b>Additional Comments:</b>							
-overall well condition acceptable?	Yes						
-well cap acceptable?	↓						
-manhole and cover acceptable?	↓						
-well pad acceptable?	↓						
-area safe?	↓						
-other comments							

**Groundwater Sampling Log**




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Site Specific Information				Monitoring Well Information			
Terry Project ID		2230.838		Well ID		MW-117	
SCDHEC Permit No.		#12719		Well Diameter		2 in	
Project Name		Hot Spot #3005		Screened Interval		<del>25.00-30.00</del> ft 18-28	
Date		10/2/08		Total Well Depth		28.20 ft	
Field Personnel		G. Munn		Depth to Groundwater		24.85 ft	
General Weather		Sunny		Length of Water Column		ft	
Ambient Air Temperature		75F		1 Casing Volume (0.163)		gals	
<b>Quality Assurance</b>				3 Casing Volumes (0.489)		gals	
				Total Volume Purged		gals	
pH Meter		Oakton		Conductivity Meter		Oakton	
Serial Number		73168		Serial Number		73168	
Calibration Constant		4.01		Calibration Constant		447 µS	
Calibration Constant		7.00		Calibration Constant		1413 µS	
Calibration Constant		10.00		Calibration Constant			
<b>Additional Comments</b>							
Volume (gal)							
Time		16:40					
pH (su)		9.41					
Spec Conductivity		52.9					
Water Temperature		18.1					
Turbidity (subjective)		1					
Dissolved Oxygen (mg/L)		4.3					
Additional Comments:							
-overall well condition acceptable?		Yes					
-well cap acceptable?		J					
-manhole and cover acceptable?		J					
-well pad acceptable?		J					
-area safe?		J					
-other comments							

*LM*

**Groundwater Sampling Log**

 <b>TERRY Environmental Services</b> <small>CLIENTS FIRST ALWAYS</small>				P.O. Box 25 Summerville, SC 29484 1-800-325-0605									
				<p align="center"><b>Site Specific Information</b></p>				<p align="center"><b>Monitoring Well Information</b></p>					
Terry Project ID		2230.808		Well ID		MW-12		TAG BOTTOM OF WELL TO VERIFY WELL DEPTH AND WRITE BELOW!					
SCDHEC Permit No.		#12719		Well Diameter		2	in						
Project Name		Hot Spot #3005		Screened Interval		20-30	ft						
Date		10/2/08		Total Well Depth		30.37	ft						
Field Personnel		G. Munn		Depth to Groundwater		25.35	ft						
General Weather		Sunny		Length of Water Column			ft						
Ambient Air Temperature		75F		1 Casing Volume (0.163)			gals						
<p align="center"><b>Quality Assurance</b></p>				3 Casing Volumes (0.489)			gals	30.37					
				Total Volume Purged			gals	<p align="center"><b>Additional Comments</b></p>					
pH Meter		Oakton	Conductivity Meter		Oakton	<p align="center"><b>Additional Comments</b></p>							
Serial Number		73168	Serial Number		73168								
Calibration Constant		4.01	Calibration Constant		447 µS								
Calibration Constant		7.00	Calibration Constant		1413 µS								
Calibration Constant		10.00	Calibration Constant										
Volume (gal)													
Time		17:00											
pH (su)		9.43											
Spec Conductivity		82.2											
Water Temperature		17.6											
Turbidity (subjective)		2											
Dissolved Oxygen (mg/L)		0.3											
<p><b>Additional Comments:</b></p>													
-overall well condition acceptable?		Yes											
-well cap acceptable?		↓											
-manhole and cover acceptable?		↓											
-well pad acceptable?		↓											
-area safe?		↓											
-other comments													

**Groundwater Sampling Log**



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Site Specific Information				Monitoring Well Information			
Terry Project ID	2230.808			Well ID	MW-13		
SCDHEC Permit No.	#12719			Well Diameter	2	in	TAG BOTTOM OF WELL TO VERIFY WELL DEPTH AND WRITE BELOW!
Project Name	Hot Spot #3005			Screened Interval	17-27	ft	
Date	10/2/08			Total Well Depth	27.0	ft	
Field Personnel	G. Munn			Depth to Groundwater	25.27	ft	
General Weather	Sunny			Length of Water Column		ft	
Ambient Air Temperature	75F			1 Casing Volume (0.163)		gals	
<b>Quality Assurance</b>				3 Casing Volumes (0.489)		gals	27.0
pH Meter	Oakton	Conductivity Meter	Oakton	Total Volume Purged		gals	
Serial Number	73168	Serial Number	73168	Additional Comments			
Calibration Constant	4.01	Calibration Constant	447 µS				
Calibration Constant	7.00	Calibration Constant	1413 µS				
Calibration Constant	10.00	Calibration Constant					
Volume (gal)							
Time	17:15						
pH (su)	9.31						
Spec Conductivity	105.9						
Water Temperature	18.5						
Turbidity (subjective)	2						
Dissolved Oxygen (mg/L)	5.4						
Additional Comments:							
-overall well condition acceptable?	yes						
-well cap acceptable?	↓						
-manhole and cover acceptable?	⊕ Missing one bolt						
-well pad acceptable?	↓						
-area safe?	↓						
-other comments							

**Groundwater Sampling Log**



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Site Specific Information				Monitoring Well Information			
Terry Project ID		2230.808		Well ID		MW-14	
SCDHEC Permit No.		#12719		Well Diameter		2	in
Project Name		Hot Spot #3005		Screened Interval		21-31	ft
Date		10/2/08		Total Well Depth		30.55	ft
Field Personnel		G. Munn		Depth to Groundwater		28.46	ft
General Weather		Sunny		Length of Water Column			ft
Ambient Air Temperature		75F		1 Casing Volume (0.163)			gals
Quality Assurance				3 Casing Volumes (0.489)			gals
				Total Volume Purged			gals
pH Meter		Oakton		Conductivity Meter		Oakton	
Serial Number		73168		Serial Number		73168	
Calibration Constant		4.01		Calibration Constant		447 µS	
Calibration Constant		7.00		Calibration Constant		1413 µS	
Calibration Constant		10.00		Calibration Constant			
Additional Comments							
Volume (gal)							
Time		12:20					
pH (su)		9.84					
Spec Conductivity		113.6					
Water Temperature		19.9					
Turbidity (subjective)		2					
Dissolved Oxygen (mg/L)		8.0					
Additional Comments:							
-overall well condition acceptable?		Yes					
-well cap acceptable?		↓					
-manhole and cover acceptable?		↓					
-well pad acceptable?		↓					
-area safe?		↓					
-other comments							

**Groundwater Sampling Log**



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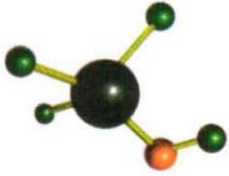
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Site Specific Information				Monitoring Well Information			
Terry Project ID	2230.8AB			Well ID	MW-1D		
SCDHEC Permit No.	#12719			Well Diameter	2	in	TAG BOTTOM OF WELL TO VERIFY WELL DEPTH AND WRITE BELOW!
Project Name	Hot Spot #3005			Screened Interval	55-60	ft	
Date	10/2/08			Total Well Depth	58.54	ft	
Field Personnel	G. Munn			Depth to Groundwater	30.46	ft	
General Weather	Sunny			Length of Water Column	28.08	ft	
Ambient Air Temperature	75F			1 Casing Volume (0.163)	4.6	gals	
Quality Assurance				3 Casing Volumes (0.489)	13.8	gals	
pH Meter	Oakton	Conductivity Meter	Oakton	Total Volume Purged		gals	
Serial Number	73168	Serial Number	73168	Additional Comments			
Calibration Constant	4.01	Calibration Constant	447 µS	Slight petro smell			
Calibration Constant	7.00	Calibration Constant	1413 µS				
Calibration Constant	10.00	Calibration Constant					
Volume (gal)	4.6	9.2	13.8				
Time	15:25	15:30	15:35				
pH (su)	9.39	9.35	9.47				
Spec Conductivity	156.7	99.8	92.1				
Water Temperature	18.7	18.7	18.5				
Turbidity (subjective)	1	1	1				
Dissolved Oxygen (mg/L)	4.9	5.6	5.4				
Additional Comments:							
-overall well condition acceptable?	Yes						
-well cap acceptable?	Yes						
-manhole and cover acceptable?	One bolt missing						
-well pad acceptable?	Yes						
-area safe?	Yes						
-other comments							



**APPENDIX 4**

**Groundwater Analytical Report**



ACCESS  
ANALYTICAL, INC.

## ANALYTICAL REPORT

### CLIENT

Terry Environmental  
P.O. Box 25  
Summerville, SC 29484

### ATTENTION

Kelly Cone

### PROJECT ID

HOT SPOT #3005 / 2230.8B

### LABORATORY REPORT NUMBER

208100432

### DATE

10/23/2008

Primary Data Review By

Secondary Data Review By

---

Curtis Ekker  
Data Validation Manager, GCAL

*Ashley B. Amick*  
Project Manager, Access Analytical, Inc.  
[aamick@accessanalyticalinc.com](mailto:aamick@accessanalyticalinc.com)

### PLEASE NOTE:

- Unless otherwise noted, all analysis on this report performed at Gulf Coast Analytical Labs (GCAL), 7979 GSRI Rd. Baton Rouge, LA 70820.
- GCAL is SCDHEC certified laboratory # 73006, NCDENR certified lab # 618, GA certified lab # LA-01955, NELAP certified laboratory # 01955
- Local support services for this project are provided by Access Analytical, Inc.. Access Analytical is a representative of GCAL serving clients in the SC/NC/GA areas. 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.

# ANALYTICAL RESULTS

PERFORMED BY

GULF COAST ANALYTICAL LABORATORIES, INC.

**Report Date** 10/23/2008

**GCAL Report** 208100432



**Deliver To** Terry Environmental  
P.O. Box 25  
Summerville, SC 29484

**Attn** Kelly Cone

**Project** HOT SPOT #3005 / 2230.8B

## CASE NARRATIVE

**Client:** Terry Environmental Services      **Report:** 208100432

Gulf Coast Analytical Laboratories received and analyzed the sample(s) listed on the sample cross-reference page of this report. Receipt of the sample(s) is documented by the attached chain of custody. This applies only to the sample(s) listed in this report. No sample integrity or quality control exceptions were identified unless noted below.

This report was resubmitted on 10/24/08. The reporting format was revised to report "<RDL" with estimated concentrations instead of "MDLU" for non-detected analytes.

### **VOLATILES MASS SPECTROMETRY**

In the SW-846 8260B analysis for analytical batch 398272, no MS/MSD was performed due to insufficient sample volume. The LCS/LCSD is included for review.

In the SW-846 8260B analysis, sample 20810043203 (MW-3R) had to be diluted to bracket the concentration of target compounds within the calibration range of the instrument.

In the SW-846 8260B analysis for analytical batches 398230 and 398241, the MS/MSD exhibited recovery failures.

# Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with GCAL's Standard Operating Procedures.

## Common Abbreviations Utilized in this Report

<b>ND</b>	Indicates the result was Not Detected at the specified RDL
<b>DO</b>	Indicates the result was Diluted Out
<b>MI</b>	Indicates the result was subject to Matrix Interference
<b>TNTC</b>	Indicates the result was Too Numerous To Count
<b>SUBC</b>	Indicates the analysis was Sub-Contracted
<b>FLD</b>	Indicates the analysis was performed in the Field
<b>PQL</b>	Practical Quantitation Limit
<b>MDL</b>	Method Detection Limit
<b>RDL</b>	Reporting Detection Limit
<b>00:00</b>	Reported as a time equivalent to 12:00 AM

## Reporting Flags Utilized in this Report

<b>J</b>	Indicates an estimated value
<b>U</b>	Indicates the compound was analyzed for but not detected
<b>B</b>	(ORGANICS) Indicates the analyte was detected in the associated Method Blank
<b>B</b>	(INORGANICS) Indicates the result is between the RDL and MDL

Sample receipt at GCAL is documented through the attached chain of custody. In accordance with [ISO Guide 25](#) and [NELAC](#), this report shall be reproduced only in full and with the written permission of GCAL. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with the terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

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CURTIS EKKER  
DATA VALIDATION MANAGER  
GCAL REPORT 208100432

THIS REPORT CONTAINS \_\_\_\_\_ PAGES.

# Report Sample Summary

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
20810043201	MW-1D	Water	10/02/2008 15:35	10/04/2008 09:00
20810043202	MW-2	Water	10/02/2008 14:30	10/04/2008 09:00
20810043203	MW-3R	Water	10/02/2008 15:00	10/04/2008 09:00
20810043204	MW-4	Water	10/02/2008 13:05	10/04/2008 09:00
20810043205	MW-6	Water	10/02/2008 14:10	10/04/2008 09:00
20810043206	MW-7	Water	10/02/2008 13:30	10/04/2008 09:00
20810043207	MW-9	Water	10/02/2008 13:45	10/04/2008 09:00
20810043208	MW-10R	Water	10/02/2008 16:10	10/04/2008 09:00
20810043209	MW-11	Water	10/02/2008 16:40	10/04/2008 09:00
20810043210	MW-12	Water	10/02/2008 17:00	10/04/2008 09:00
20810043211	MW-13	Water	10/02/2008 17:15	10/04/2008 09:00
20810043212	MW-14	Water	10/02/2008 12:20	10/04/2008 09:00

# Summary of Compounds Detected

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
20810043203	MW-3R	Water	10/02/2008 15:00	10/04/2008 09:00

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	562	25.0	1.62	ug/L
100-41-4	Ethylbenzene	272	25.0	1.63	ug/L
1330-20-7	Xylene (total)	261	75.0	4.58	ug/L
91-20-3	Naphthalene	96.5J	125	2.95	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	4160	25.0	1.92	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
20810043205	MW-6	Water	10/02/2008 14:10	10/04/2008 09:00

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	9.16	1.00	0.065	ug/L
108-88-3	Toluene	1.15	1.00	0.076	ug/L
100-41-4	Ethylbenzene	16.9	1.00	0.065	ug/L
1330-20-7	Xylene (total)	133	3.00	0.183	ug/L
91-20-3	Naphthalene	43.8	5.00	0.118	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
20810043212	MW-14	Water	10/02/2008 12:20	10/04/2008 09:00

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
1634-04-4	tert-Butyl methyl ether (MTBE)	1.12	1.00	0.077	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
20810043201	MW-1D	Water	10/02/2008 15:35	10/04/2008 09:00

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	10/06/2008 19:15	ADI	398230

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	<1.00	1.00	0.065	ug/L
108-88-3	Toluene	<1.00	1.00	0.076	ug/L
100-41-4	Ethylbenzene	<1.00	1.00	0.065	ug/L
1330-20-7	Xylene (total)	<3.00	3.00	0.183	ug/L
91-20-3	Naphthalene	<5.00	5.00	0.118	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	<1.00	1.00	0.077	ug/L
107-06-2	1,2-Dichloroethane	<1.00	1.00	0.090	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	49.1	ug/L	98	78 - 130
1868-53-7	Dibromofluoromethane	50	51.5	ug/L	103	77 - 127
2037-26-5	Toluene d8	50	50.7	ug/L	101	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	50	ug/L	100	71 - 127

SW-846 8011

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
10/06/2008 14:00	398166	SW-846 8011	1	10/07/2008 19:14	TLS	398425

CAS#	Parameter	Result	RDL	MDL	Units
106-93-4	1,2-Dibromoethane	<0.010	0.010	0.00350	ug/L



GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
20810043202	MW-2	Water	10/02/2008 14:30	10/04/2008 09:00

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	10/07/2008 03:31	AGC	398272

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	<1.00	1.00	0.065	ug/L
108-88-3	Toluene	<1.00	1.00	0.076	ug/L
100-41-4	Ethylbenzene	<1.00	1.00	0.065	ug/L
1330-20-7	Xylene (total)	<3.00	3.00	0.183	ug/L
91-20-3	Naphthalene	<5.00	5.00	0.118	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	<1.00	1.00	0.077	ug/L
107-06-2	1,2-Dichloroethane	<1.00	1.00	0.090	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	44.5	ug/L	89	78 - 130
1868-53-7	Dibromofluoromethane	50	51.6	ug/L	103	77 - 127
2037-26-5	Toluene d8	50	58.6	ug/L	117	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	45.1	ug/L	90	71 - 127

SW-846 8011

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
10/06/2008 14:00	398166	SW-846 8011	1	10/07/2008 19:36	TLS	398425

CAS#	Parameter	Result	RDL	MDL	Units
106-93-4	1,2-Dibromoethane	<0.010	0.010	0.00350	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
20810043203	MW-3R	Water	10/02/2008 15:00	10/04/2008 09:00

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			25	10/06/2008 13:35	WAS	398241

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	562	25.0	1.62	ug/L
108-88-3	Toluene	<25.0	25.0	1.89	ug/L
100-41-4	Ethylbenzene	272	25.0	1.63	ug/L
1330-20-7	Xylene (total)	261	75.0	4.58	ug/L
91-20-3	Naphthalene	96.5J	125	2.95	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	4160	25.0	1.92	ug/L
107-06-2	1,2-Dichloroethane	<25.0	25.0	2.25	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	1250	1210	ug/L	97	78 - 130
1868-53-7	Dibromofluoromethane	1250	1110	ug/L	89	77 - 127
2037-26-5	Toluene d8	1250	1270	ug/L	102	76 - 134
17060-07-0	1,2-Dichloroethane-d4	1250	1120	ug/L	90	71 - 127

SW-846 8011

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
10/06/2008 14:00	398166	SW-846 8011	1	10/07/2008 19:58	TLS	398425

CAS#	Parameter	Result	RDL	MDL	Units
106-93-4	1,2-Dibromoethane	<0.010	0.010	0.00350	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
20810043204	MW-4	Water	10/02/2008 13:05	10/04/2008 09:00

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	10/06/2008 12:25	WAS	398241

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	<1.00	1.00	0.065	ug/L
108-88-3	Toluene	<1.00	1.00	0.076	ug/L
100-41-4	Ethylbenzene	<1.00	1.00	0.065	ug/L
1330-20-7	Xylene (total)	<3.00	3.00	0.183	ug/L
91-20-3	Naphthalene	<5.00	5.00	0.118	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	<1.00	1.00	0.077	ug/L
107-06-2	1,2-Dichloroethane	<1.00	1.00	0.090	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	48	ug/L	96	78 - 130
1868-53-7	Dibromofluoromethane	50	45.7	ug/L	91	77 - 127
2037-26-5	Toluene d8	50	50.6	ug/L	101	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	44.4	ug/L	89	71 - 127

SW-846 8011

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
10/06/2008 14:00	398166	SW-846 8011	1	10/07/2008 20:19	TLS	398425

CAS#	Parameter	Result	RDL	MDL	Units
106-93-4	1,2-Dibromoethane	<0.010	0.010	0.00350	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
20810043205	MW-6	Water	10/02/2008 14:10	10/04/2008 09:00

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	10/06/2008 12:47	WAS	398241

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	9.16	1.00	0.065	ug/L
108-88-3	Toluene	1.15	1.00	0.076	ug/L
100-41-4	Ethylbenzene	16.9	1.00	0.065	ug/L
1330-20-7	Xylene (total)	133	3.00	0.183	ug/L
91-20-3	Naphthalene	43.8	5.00	0.118	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	<1.00	1.00	0.077	ug/L
107-06-2	1,2-Dichloroethane	<1.00	1.00	0.090	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	49.4	ug/L	99	78 - 130
1868-53-7	Dibromofluoromethane	50	45.6	ug/L	91	77 - 127
2037-26-5	Toluene d8	50	50.7	ug/L	101	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	45.4	ug/L	91	71 - 127

SW-846 8011

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
10/06/2008 14:00	398166	SW-846 8011	1	10/07/2008 20:41	TLS	398425

CAS#	Parameter	Result	RDL	MDL	Units
106-93-4	1,2-Dibromoethane	<0.010	0.010	0.00350	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
20810043206	MW-7	Water	10/02/2008 13:30	10/04/2008 09:00

### SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	10/06/2008 13:12	WAS	398241

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	<1.00	1.00	0.065	ug/L
108-88-3	Toluene	<1.00	1.00	0.076	ug/L
100-41-4	Ethylbenzene	<1.00	1.00	0.065	ug/L
1330-20-7	Xylene (total)	<3.00	3.00	0.183	ug/L
91-20-3	Naphthalene	<5.00	5.00	0.118	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	<1.00	1.00	0.077	ug/L
107-06-2	1,2-Dichloroethane	<1.00	1.00	0.090	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	47.6	ug/L	95	78 - 130
1868-53-7	Dibromofluoromethane	50	45.9	ug/L	92	77 - 127
2037-26-5	Toluene d8	50	50.7	ug/L	101	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	44.7	ug/L	89	71 - 127

### SW-846 8011

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
10/06/2008 14:00	398166	SW-846 8011	1	10/07/2008 21:03	TLS	398425

CAS#	Parameter	Result	RDL	MDL	Units
106-93-4	1,2-Dibromoethane	<0.010	0.010	0.00350	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
20810043207	MW-9	Water	10/02/2008 13:45	10/04/2008 09:00

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	10/06/2008 15:54	RJU	398241

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	<1.00	1.00	0.065	ug/L
108-88-3	Toluene	<1.00	1.00	0.076	ug/L
100-41-4	Ethylbenzene	<1.00	1.00	0.065	ug/L
1330-20-7	Xylene (total)	<3.00	3.00	0.183	ug/L
91-20-3	Naphthalene	<5.00	5.00	0.118	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	<1.00	1.00	0.077	ug/L
107-06-2	1,2-Dichloroethane	<1.00	1.00	0.090	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	49.7	ug/L	99	78 - 130
1868-53-7	Dibromofluoromethane	50	46.3	ug/L	93	77 - 127
2037-26-5	Toluene d8	50	47.9	ug/L	96	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	46.2	ug/L	92	71 - 127

SW-846 8011

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
10/06/2008 14:00	398166	SW-846 8011	1	10/07/2008 21:25	TLS	398425

CAS#	Parameter	Result	RDL	MDL	Units
106-93-4	1,2-Dibromoethane	<0.010	0.010	0.00350	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
20810043208	MW-10R	Water	10/02/2008 16:10	10/04/2008 09:00

### SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	10/06/2008 16:16	RJU	398241

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	<1.00	1.00	0.065	ug/L
108-88-3	Toluene	<1.00	1.00	0.076	ug/L
100-41-4	Ethylbenzene	<1.00	1.00	0.065	ug/L
1330-20-7	Xylene (total)	<3.00	3.00	0.183	ug/L
91-20-3	Naphthalene	<5.00	5.00	0.118	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	<1.00	1.00	0.077	ug/L
107-06-2	1,2-Dichloroethane	<1.00	1.00	0.090	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	48	ug/L	96	78 - 130
1868-53-7	Dibromofluoromethane	50	46.9	ug/L	94	77 - 127
2037-26-5	Toluene d8	50	51.6	ug/L	103	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	45.1	ug/L	90	71 - 127

### SW-846 8011

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
10/06/2008 14:00	398166	SW-846 8011	1	10/07/2008 21:46	TLS	398425

CAS#	Parameter	Result	RDL	MDL	Units
106-93-4	1,2-Dibromoethane	<0.010	0.010	0.00350	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
20810043209	MW-11	Water	10/02/2008 16:40	10/04/2008 09:00

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	10/06/2008 17:01	RJU	398241

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	<1.00	1.00	0.065	ug/L
108-88-3	Toluene	<1.00	1.00	0.076	ug/L
100-41-4	Ethylbenzene	<1.00	1.00	0.065	ug/L
1330-20-7	Xylene (total)	<3.00	3.00	0.183	ug/L
91-20-3	Naphthalene	<5.00	5.00	0.118	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	<1.00	1.00	0.077	ug/L
107-06-2	1,2-Dichloroethane	<1.00	1.00	0.090	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	46.9	ug/L	94	78 - 130
1868-53-7	Dibromofluoromethane	50	46.9	ug/L	94	77 - 127
2037-26-5	Toluene d8	50	50.8	ug/L	102	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	46	ug/L	92	71 - 127

SW-846 8011

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
10/06/2008 14:00	398166	SW-846 8011	1	10/07/2008 22:08	TLS	398425

CAS#	Parameter	Result	RDL	MDL	Units
106-93-4	1,2-Dibromoethane	<0.010	0.010	0.00350	ug/L



GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
20810043210	MW-12	Water	10/02/2008 17:00	10/04/2008 09:00

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	10/06/2008 17:24	RJU	398241

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	<1.00	1.00	0.065	ug/L
108-88-3	Toluene	<1.00	1.00	0.076	ug/L
100-41-4	Ethylbenzene	<1.00	1.00	0.065	ug/L
1330-20-7	Xylene (total)	<3.00	3.00	0.183	ug/L
91-20-3	Naphthalene	<5.00	5.00	0.118	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	<1.00	1.00	0.077	ug/L
107-06-2	1,2-Dichloroethane	<1.00	1.00	0.090	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	48.1	ug/L	96	78 - 130
1868-53-7	Dibromofluoromethane	50	46.9	ug/L	94	77 - 127
2037-26-5	Toluene d8	50	50.5	ug/L	101	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	45.7	ug/L	91	71 - 127

SW-846 8011

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
10/06/2008 14:00	398166	SW-846 8011	1	10/07/2008 22:51	TLS	398425

CAS#	Parameter	Result	RDL	MDL	Units
106-93-4	1,2-Dibromoethane	<0.010	0.010	0.00350	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
20810043211	MW-13	Water	10/02/2008 17:15	10/04/2008 09:00

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	10/06/2008 17:46	RJU	398241

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	<1.00	1.00	0.065	ug/L
108-88-3	Toluene	<1.00	1.00	0.076	ug/L
100-41-4	Ethylbenzene	<1.00	1.00	0.065	ug/L
1330-20-7	Xylene (total)	<3.00	3.00	0.183	ug/L
91-20-3	Naphthalene	<5.00	5.00	0.118	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	<1.00	1.00	0.077	ug/L
107-06-2	1,2-Dichloroethane	<1.00	1.00	0.090	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	47.6	ug/L	95	78 - 130
1868-53-7	Dibromofluoromethane	50	47.1	ug/L	94	77 - 127
2037-26-5	Toluene d8	50	50.7	ug/L	101	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	45.8	ug/L	92	71 - 127

SW-846 8011

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
10/06/2008 14:00	398166	SW-846 8011	1	10/07/2008 23:12	TLS	398425

CAS#	Parameter	Result	RDL	MDL	Units
106-93-4	1,2-Dibromoethane	<0.010	0.010	0.00350	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
20810043212	MW-14	Water	10/02/2008 12:20	10/04/2008 09:00

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	10/06/2008 18:09	RJU	398241

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	<1.00	1.00	0.065	ug/L
108-88-3	Toluene	<1.00	1.00	0.076	ug/L
100-41-4	Ethylbenzene	<1.00	1.00	0.065	ug/L
1330-20-7	Xylene (total)	<3.00	3.00	0.183	ug/L
91-20-3	Naphthalene	<5.00	5.00	0.118	ug/L
<b>1634-04-4</b>	<b>tert-Butyl methyl ether (MTBE)</b>	<b>1.12</b>	<b>1.00</b>	<b>0.077</b>	<b>ug/L</b>
107-06-2	1,2-Dichloroethane	<1.00	1.00	0.090	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	48.1	ug/L	96	78 - 130
1868-53-7	Dibromofluoromethane	50	48.2	ug/L	96	77 - 127
2037-26-5	Toluene d8	50	52.2	ug/L	104	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	46.9	ug/L	94	71 - 127

SW-846 8011

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
10/06/2008 14:00	398166	SW-846 8011	1	10/07/2008 23:34	TLS	398425

CAS#	Parameter	Result	RDL	MDL	Units
106-93-4	1,2-Dibromoethane	<0.010	0.010	0.00350	ug/L

## GC/MS Volatiles Quality Control Summary

Analytical Batch 398230 Prep Batch N/A		Client ID MB398230 GCAL ID 653334 Sample Type Method Blank Analytical Date 10/06/2008 09:50 Matrix Water		LCS398230 653335 LCS 10/06/2008 08:36 Water			LCSD398230 653336 LCSD 10/06/2008 09:01 Water						
SW-846 8260B				Units Result	ug/L RDL	Spike Added	Result	% R	Control Limits % R	Result	% R	RPD	RPD Limit
107-06-2	1,2-Dichloroethane	<1.00	1.00	50.0	53.6	107	75 - 122	51.8	104	3	30		
100-41-4	Ethylbenzene	<1.00	1.00	50.0	48.7	97	80 - 125	46.8	94	4	30		
1634-04-4	tert-Butyl methyl ether (MTBE)	<1.00	1.00	50.0	52.3	105	72 - 127	50.0	100	4	30		
1330-20-7	Xylene (total)	<3.00	3.00	100	96.9	97	80 - 129	93.3	93	4	30		
91-20-3	Naphthalene	<5.00	5.00	50.0	47.9	96	67 - 149	50.2	100	5	35		
71-43-2	Benzene	<1.00	1.00	50.0	44.6	89	80 - 120	42.7	85	4	20		
108-88-3	Toluene	<1.00	1.00	50.0	54.0	108	80 - 124	50.8	102	6	20		
<b>Surrogate</b>													
460-00-4	4-Bromofluorobenzene	49.2	98	50	50.9	102	78 - 130	50.8	102				
1868-53-7	Dibromofluoromethane	52.9	106	50	50.3	101	77 - 127	50.1	100				
2037-26-5	Toluene d8	50.8	102	50	50.3	101	76 - 134	49.6	99				
17060-07-0	1,2-Dichloroethane-d4	49.2	98	50	50	100	71 - 127	50.3	101				

Analytical Batch 398230 Prep Batch N/A		Client ID MW-6 GCAL ID 20810042616 Sample Type SAMPLE Analytical Date 10/06/2008 10:14 Matrix Water		652953MS 653365 MS 10/06/2008 11:51 Water			652953MSD 653366 MSD 10/06/2008 12:16 Water						
SW-846 8260B				Units Result	ug/L RDL	Spike Added	Result	% R	Control Limits % R	Result	% R	RPD	RPD Limit
107-06-2	1,2-Dichloroethane	0.00	50.0	2500	2650	106	75 - 122	2590	104	2	30		
100-41-4	Ethylbenzene	1890	50.0	2500	4060	87	80 - 125	3870	79*	5	30		
1634-04-4	tert-Butyl methyl ether (MTBE)	0.00	50.0	2500	2580	103	72 - 127	2600	104	0.8	30		
1330-20-7	Xylene (total)	1680	150	5000	6280	92	80 - 129	5940	85	6	30		
91-20-3	Naphthalene	925	250	2500	5320	176*	67 - 149	5430	180*	2	30		
71-43-2	Benzene	3350	50.0	2500	5460	84	80 - 120	5090	70*	7	30		
108-88-3	Toluene	459	50.0	2500	3110	106	80 - 124	2920	98	6	30		
<b>Surrogate</b>													
460-00-4	4-Bromofluorobenzene			2500	2590	104	78 - 130	2590	104				
1868-53-7	Dibromofluoromethane			2500	2480	99	77 - 127	2460	98				
2037-26-5	Toluene d8			2500	2490	100	76 - 134	2480	99				
17060-07-0	1,2-Dichloroethane-d4			2500	2540	102	71 - 127	2490	100				

## GC/MS Volatiles Quality Control Summary

Analytical Batch 398241 Prep Batch N/A		Client ID GCAL ID Sample Type Analytical Date Matrix		MB398241 653358 Method Blank 10/06/2008 09:18 Water			LCS398241 653359 LCS 10/06/2008 07:54 Water			LCSD398241 653360 LCSD 10/06/2008 08:33 Water			
SW-846 8260B				Units	ug/L	Spike	Result	% R	Control	Result	% R	RPD	RPD
				Result	RDL	Added			Limits % R			Limit	
107-06-2	1,2-Dichloroethane	<1.00	1.00	50.0	47.7	95	75 - 122	49.0	98	3	30		
100-41-4	Ethylbenzene	<1.00	1.00	50.0	53.9	108	80 - 125	56.2	112	4	30		
75-69-4	Trichlorofluoromethane	<1.00	1.00	50.0	47.2	94	62 - 140	48.9	98	4	30		
96-12-8	1,2-Dibromo-3-chloropropane	<1.00	1.00	50.0	49.5	99	63 - 138	51.6	103	4	30		
1634-04-4	tert-Butyl methyl ether (MTBE)	<1.00	1.00	50.0	47.4	95	72 - 127	50.1	100	6	30		
1330-20-7	Xylene (total)	<3.00	3.00	150	152	101	80 - 129	159	106	5	30		
76-13-1	Trichlorotrifluoroethane	<1.00	1.00	50.0	49.2	98	72 - 130	51.4	103	4	30		
91-20-3	Naphthalene	<5.00	5.00	50.0	56.7	113	67 - 149	60.3	121	6	35		
71-43-2	Benzene	<1.00	1.00	50.0	51.7	103	80 - 120	53.3	107	3	20		
108-88-3	Toluene	<1.00	1.00	50.0	51.0	102	80 - 124	53.5	107	5	20		
<b>Surrogate</b>													
460-00-4	4-Bromofluorobenzene	46.2	92	50	50.5	101	78 - 130	51.4	103				
1868-53-7	Dibromofluoromethane	48.5	97	50	49.9	100	77 - 127	50.6	101				
2037-26-5	Toluene d8	51.1	102	50	49.7	99	76 - 134	50.5	101				
17060-07-0	1,2-Dichloroethane-d4	48.5	97	50	48.1	96	71 - 127	49.2	98				

Analytical Batch 398241 Prep Batch N/A		Client ID GCAL ID Sample Type Analytical Date Matrix		MW-3R 20810043203 SAMPLE 10/06/2008 13:35 Water			653026MS 653457 MS 10/06/2008 14:19 Water			653026MSD 653458 MSD 10/06/2008 14:42 Water			
SW-846 8260B				Units	ug/L	Spike	Result	% R	Control	Result	% R	RPD	RPD
				Result	RDL	Added			Limits % R			Limit	
107-06-2	1,2-Dichloroethane	0.00	25.0	1250	1060	85	75 - 122	1030	82	3	30		
100-41-4	Ethylbenzene	272	25.0	1250	1590	105	80 - 125	1490	97	6	30		
75-69-4	Trichlorofluoromethane	0.00	25.0	1250	932	75	62 - 140	880	70	6	30		
96-12-8	1,2-Dibromo-3-chloropropane	0.00	25.0	1250	1290	103	63 - 138	1280	102	0.8	30		
1634-04-4	tert-Butyl methyl ether (MTBE)	4160	25.0	1250	4910	60*	72 - 127	4870	57*	0.8	30		
1330-20-7	Xylene (total)	261	75.0	3750	3960	99	80 - 129	3770	94	5	30		
76-13-1	Trichlorotrifluoroethane	0.00	25.0	1250	1070	86	72 - 130	996	80	7	30		
91-20-3	Naphthalene	96.5	125	1250	1520	114	67 - 149	1510	113	0.7	30		
71-43-2	Benzene	562	25.0	1250	1760	96	80 - 120	1680	89	5	30		

## GC/MS Volatiles Quality Control Summary

Analytical Batch 398241 Prep Batch N/A		Client ID GCAL ID 20810043203 Sample Type SAMPLE Analytical Date 10/06/2008 13:35 Matrix Water		653026MS 653457 MS 10/06/2008 14:19 Water			653026MSD 653458 MSD 10/06/2008 14:42 Water						
SW-846 8260B				Units Result	ug/L RDL	Spike Added	Result	% R	Control Limits % R	Result	% R	RPD	RPD Limit
108-88-3	Toluene	0.00	25.0	1250	1290	103	80 - 124	1220	98	6	30		
<b>Surrogate</b>													
460-00-4	4-Bromofluorobenzene	1210	97	1250	1250	100	78 - 130	1230	98				
1868-53-7	Dibromofluoromethane	1110	89	1250	1180	94	77 - 127	1170	94				
2037-26-5	Toluene d8	1270	102	1250	1280	102	76 - 134	1270	102				
17060-07-0	1,2-Dichloroethane-d4	1120	90	1250	1140	91	71 - 127	1140	91				

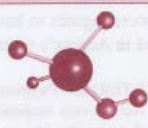
Analytical Batch 398272 Prep Batch N/A		Client ID GCAL ID MB398272 Sample Type Method Blank Analytical Date 10/06/2008 21:22 Matrix Water		LCS398272 653593 LCS 10/06/2008 20:15 Water			LCSD398272 653594 LCSD 10/06/2008 20:37 Water						
SW-846 8260B				Units Result	ug/L RDL	Spike Added	Result	% R	Control Limits % R	Result	% R	RPD	RPD Limit
107-06-2	1,2-Dichloroethane	<1.00	1.00	50.0	48.2	96	75 - 122	42.4	85	13	30		
100-41-4	Ethylbenzene	<1.00	1.00	50.0	47.3	95	80 - 125	41.7	83	13	30		
1634-04-4	tert-Butyl methyl ether (MTBE)	<1.00	1.00	50.0	57.0	114	72 - 127	53.1	106	7	30		
1330-20-7	Xylene (total)	<3.00	3.00	100	94.2	94	80 - 129	82.2	82	14	30		
91-20-3	Naphthalene	<5.00	5.00	50.0	58.3	117	67 - 149	50.6	101	14	35		
71-43-2	Benzene	<1.00	1.00	50.0	51.6	103	80 - 120	44.7	89	14	20		
108-88-3	Toluene	<1.00	1.00	50.0	56.5	113	80 - 124	48.7	97	15	20		
<b>Surrogate</b>													
460-00-4	4-Bromofluorobenzene	44.4	89	50	50.2	100	78 - 130	50.5	101				
1868-53-7	Dibromofluoromethane	50.9	102	50	49	98	77 - 127	49.1	98				
2037-26-5	Toluene d8	58.6	117	50	52.3	105	76 - 134	52.3	105				
17060-07-0	1,2-Dichloroethane-d4	45.1	90	50	47.5	95	71 - 127	46.8	94				

## General Chromatography Quality Control Summary

<b>Analytical Batch</b> 398425 <b>Prep Batch</b> 398166 <b>Prep Method</b> SW-846 8011		<b>Client ID</b> MB398166 <b>GCAL ID</b> 653100 <b>Sample Type</b> Method Blank <b>Prep Date</b> 10/06/2008 14:00 <b>Analytical Date</b> 10/07/2008 14:54 <b>Matrix</b> Water		<b>LCS398166</b> 653101 LCS 10/06/2008 14:00 10/07/2008 15:18 Water			<b>LCSD398166</b> 653102 LCSD 10/06/2008 14:00 10/07/2008 15:46 Water				
<b>SW-846 8011</b>		<b>Units</b>	ug/L	<b>Spike</b>	<b>Result</b>		<b>Control</b>	<b>Result</b>			<b>RPD</b>
		<b>Result</b>	<b>RDL</b>	<b>Added</b>		<b>% R</b>	<b>Limits % R</b>		<b>% R</b>	<b>RPD</b>	<b>Limit</b>
106-93-4	1,2-Dibromoethane	<0.010	0.010	1.04	0.771	74	62 - 140	0.734	70	5	40

ACCESS/ 4565/ 208100432/ 10-10-8

### Access Analytical - Chain of Custody Record

<b>Project Submission #</b> _____		<b>PO #</b> _____		<b>Laboratory ID:</b> _____									
Company Name: <u>Terry Environmental</u>			Preservative: (*see codes below)		<p>* Preservative Codes (place corresponding # in block above analysis field): 0=None, 1=HCL, 2=HNO<sub>3</sub>, 3=H<sub>2</sub>SO<sub>4</sub>, 4=NaOH, 5=Na<sub>2</sub>SiO<sub>3</sub>, 6=NaHSO<sub>4</sub>, Other=Specify</p>  <p style="text-align: center;"><b>ACCESS ANALYTICAL, INC.</b></p> <p style="text-align: center;">Phone: (803) 781-4243 7478 Carlisle Street Fax: 781-4303 Irmo, SC 29063 Toll Free (888) 315-4243 www.accessanalyticalinc.com</p> <p style="text-align: center;">NOTES / COMMENTS</p>								
Report To: <u>Kelly Cone</u>			↓ REQUESTED LAB ANALYSIS: ↓ BTEX, NAPH, MTBE, 1,2-DCA EDB										
Address: <u>P.O. Box 25</u>													
City: <u>Summerville</u> State: <u>SC</u> Zip: <u>29484</u>													
Phone: <u>843-873-8200</u> Fax: <u>843-873-8765</u>													
Email: <u>kcone@terryenvironmental.com</u>													
Project Name: <u>Hot Spot # 3005/2230.8 B</u>			Sampled By (print): <u>Gabrielle Munn</u>										
Sample Label	Date Collected	Time Collected	Matrix	# of Cont									
MW-1D	10/2/08	15:35	H <sub>2</sub> O	4	X	X	-1						
MW-2	↓	14:30	↓	↓	↓	↓	-2						
MW-3R	↓	15:00	↓	↓	↓	↓	-3						
MW-4	↓	13:05	↓	↓	↓	↓	-4						
MW-6	↓	14:10	↓	↓	↓	↓	-5						
MW-7	↓	13:30	↓	↓	↓	↓	-6						
MW-9	↓	13:45	↓	↓	↓	↓	-7						
MW-10R	↓	16:10	↓	↓	↓	↓	-8						
MW-11	↓	16:40	↓	↓	↓	↓	-9						
MW-12	↓	17:00	↓	↓	↓	↓	-10						
<b>Turnaround Time:</b> <input checked="" type="checkbox"/> Std. (5-7 Bus. days) <input type="checkbox"/> RUSH* *Date Required: (For rush work, results faxed by end of business day on date required)		Samples Recd. on Ice? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <u>5.20</u>		Project Location: <input checked="" type="checkbox"/> SC <input type="checkbox"/> NC Other _____ (specify)		Relinquished By: <u>Gabrielle M. Munn</u> <u>Christy Russ</u> <u>FEDEX</u>		Date: <u>10/2/08</u> <u>10/2/08</u> <u>10-4-8</u>		Time: <u>19:45</u> <u>1700</u> <u>0900</u>		Received By: <u>Christy Russ</u> <u>FedEx</u> <u>A. Manton</u>	




**Access Analytical - Chain of Custody Record**

ACCESS/ 45651 208100432 / 10-10-08

Project Submission # \_\_\_\_\_

PO # \_\_\_\_\_

Laboratory ID: \_\_\_\_\_

Company Name: <u>Terry Environmental</u>				Preservative: (*see codes below)						* Preservative Codes (place corresponding # in block above analysis field): 0=None, 1=HCL, 2=HNO <sub>3</sub> , 3=H <sub>2</sub> SO <sub>4</sub> , 4=NaOH, 5=Na <sub>2</sub> S <sub>2</sub> O <sub>8</sub> , 6=NaHSO <sub>4</sub> , Other=Specify					
Report To: <u>Kelly Cone</u>				REQUESTED LAB ANALYSIS: ↓		BTEX, NAPH, MTBE, 1,2 DCA									
Address: <u>P.O. Box 25</u>															
City: <u>Sumnerville</u> State: <u>SC</u> Zip: <u>29484</u>															
Phone: <u>843-873-8200</u> Fax: <u>843-873-8765</u>															
Email: <u>kcone@terryenvironmental.com</u>															
Project Name: <u>Hot Spot # 3005/2230.8B</u>										ACCESS ANALYTICAL, INC.  Phone: (803) 781-4243 7478 Carlisle Street Fax: 781-4303 Irmo, SC 29063 Toll Free (888) 315-4243 www.accessanalyticalinc.com					
Sampled By (print): <u>Gabrielle Munn</u>										NOTES / COMMENTS					
Sample Label	Date Collected	Time Collected	Matrix	# of Cont											
<u>MV-13</u>	<u>10/2/08</u>	<u>17:15</u>	<u>H<sub>2</sub>O</u>	<u>4</u>	<u>X</u>	<u>X</u>					<u>-11</u>				
<u>MW-14</u>	<u>↓</u>	<u>12:20</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>					<u>-12</u>				
Turnaround Time: <input checked="" type="checkbox"/> Std. (5-7 Bus. days) <input type="checkbox"/> RUSH* *Date Required: _____ (For rush work, results faxed by end of business day on date required)				Samples Recd. on Ice? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <u>5.20</u>		Project Location: <input checked="" type="checkbox"/> SC <input type="checkbox"/> NC Other _____ (specify)		Relinquished By: <u>Gabrielle Munn</u> <u>Christy Ross</u> <u>FEDEx</u>		Date: <u>10/2/08</u> <u>10/2/08</u> <u>10-4-8</u>		Time: <u>19:45</u> <u>nw</u> <u>0900</u>		Received By: <u>Christy Ross</u> <u>FedEx</u> <u>A. Manta</u>	

**APPENDIX 5**

**Certificate of On-Site Treatment**

# TERRY Environmental Services, Inc. Certificate of On-Site Treatment

*In accordance with NPDES General Permit No. SCG830000, one (1) 55-gallon drum of petroleum contaminated groundwater was processed on-site via a portable granular activated carbon (GAC) unit and released to the surface within the area of the known petroleum contamination plume.*

*Hot Spot #3005*

*Chesnee, South Carolina*

*SCDHEC UST Permit No.: 12719*



**TERRY Environmental Services**  
CLIENTS FIRST ALWAYS

## **APPENDIX 6**

### **Proposal**

**ASSESSMENT PLAN**

**SOUTH CAROLINA**  
**Department of Health and Environmental Control**  
**Bureau of Underground Storage Tank Management**

Site ID  12719 Facility Name HOT SPOT #3005

**Site Maps**

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                              | Legend with facility name and address, Site ID number, date, and a bar scale |
| Location of property lines         | Streets or highways (indicate names and numbers)                             |
| Location of buildings              | Identification of located buildings  |
| Paved areas on or adjacent to site | Locations of all present and former ASTs and USTs                            |
| Previous soil sampling locations   | Underground and above ground utilities on or adjacent to site                |
| Previous monitoring well locations | Locations of any other potential receptor                                    |

**Aquifer Characterization (Check one and provide explanation for choice)**

Pump Test \_\_\_\_\_ Slug Tests \_\_\_\_\_

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**Small Volume Disposal Type and Method**

Soil \_\_\_\_\_  
Soil cuttings will be containerized within 55 gallon drums and disposed of properly.

Purge Water \_\_\_\_\_  
Purge water will be containerized within 55 gallon drums and disposed of properly.

**Additional Comments** \_\_\_\_\_

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**ASSESSMENT PLAN**

**SOUTH CAROLINA**

**Department of Health and Environmental Control  
Bureau of Underground Storage Tank Management**

Site ID  12719 County Spartanburg Facility Name Hot Spot #3005  
Facility Address SC Highway 221, Chesnee, SC  
Responsible party R.L. Jordan Oil Company Address PO Box 2527, Spartanburg, SC  
No. USTs Unknown removed? N/A replaced? N/A  
(date) (date)  
Current use of facility/property Gasoline retail and convenience store  
Current property owner name R.L. Jordan Oil Company  
Current property owner address same as above

Field Screening Methodology  
Specify the field screening methodology to be used. The use of field screening methods to optimize the number and location of permanent wells is required.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Permanent Monitoring wells (Estimate number and total completed depth)  
 of shall wells 2 total depth 75 (35  40 )  
 of deep wells \_\_\_\_\_ total depth \_\_\_\_\_ (if necessary)  
Comments, if warranted Based on fluctuations in groundwater table elevation, 15  screens may be warranted on the replacement wells.

Analyses BTEX, Naphthalene, MTBE  
List the analytical parameters (e.g., BTEX MTBE) and estimated number.  
Groundwater:  
15  BTEX, Naphthalene, MTBE, 1,2-DCA  
15  Lead  
15  EDB  
15  8 Oxygenates  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Implementation Schedule  
Start up date Upon Approval Completion date 90 Days from Approval  
Report submittal date 90 Days from Approval

ASSESSMENT COMPONENT INVOICE  
SOUTH CAROLINA  
Department of Health and Environmental Control  
Bureau of Underground Storage Tank Management  
State Underground Petroleum Environmental Response Bank Account

Facility Name Hot Spot  3005

UST Permit  12719

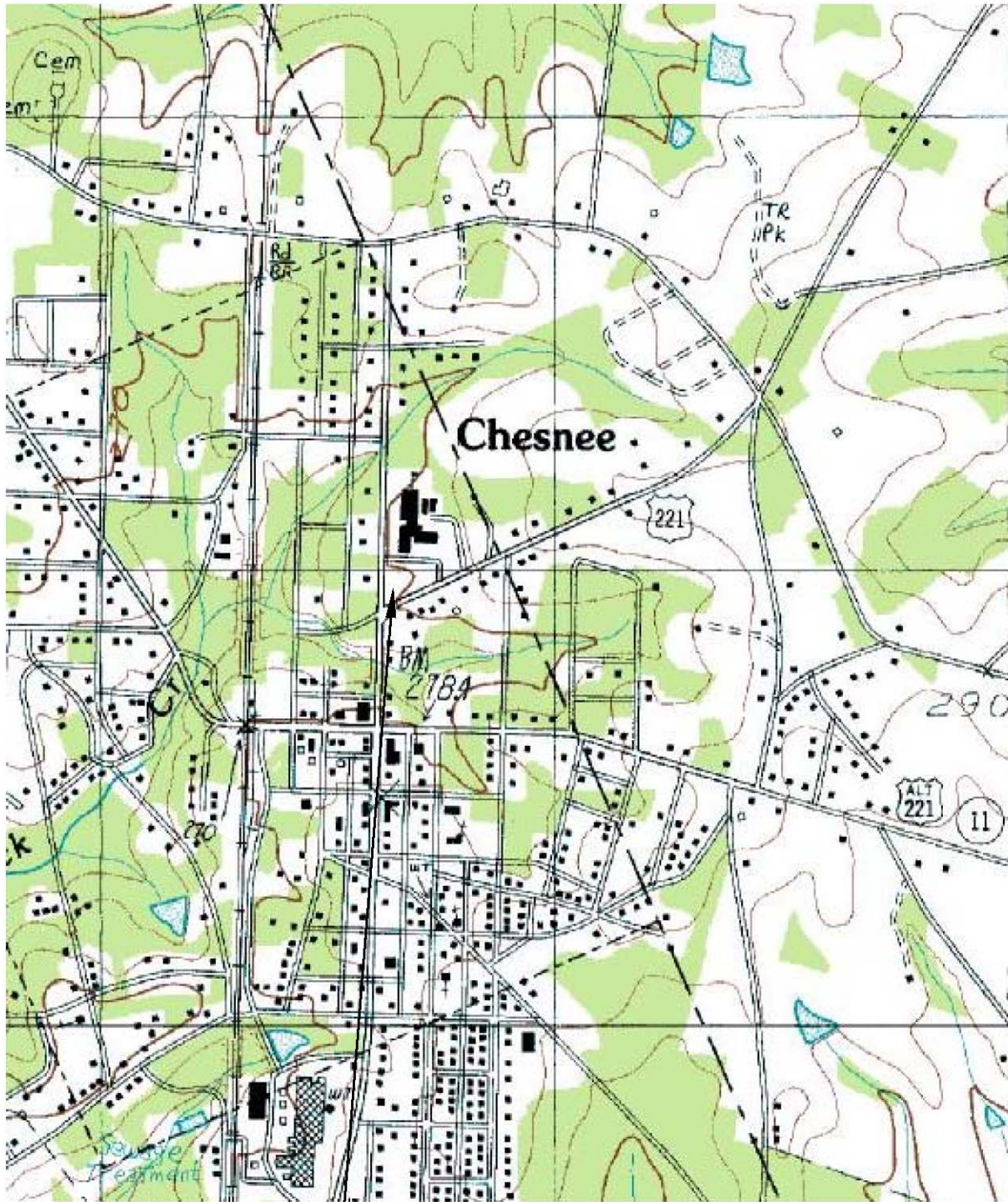
Cost Agreement

	ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	Plan <input type="checkbox"/>				
	A. Plan Preparation		X	<input type="checkbox"/> 100.00	
	B. Tax Maps		X	<input type="checkbox"/> 50.00	
2	Receptor Survey <input type="checkbox"/>		X	<input type="checkbox"/> 500.00	
3	Comprehensive Survey		X	<input type="checkbox"/> 1,000.00	
4	Mob/Demob				
	A. Equipment - 9	1	X	<input type="checkbox"/> 575.00	<input type="checkbox"/> 575.00
	B. Personnel - (9, 10, 16, 17)	4	each	<input type="checkbox"/> 290.00	<input type="checkbox"/> 1,160.00
	C. Adverse Terrain Vehicle		X	<input type="checkbox"/> 575.00	
5	Soil Borings (hand auger) <input type="checkbox"/>		feet X	<input type="checkbox"/> 14.00	
6	Soil Borings(drilled) <input type="checkbox"/> Field Screening		feet X	<input type="checkbox"/> 17.00	
7	Soil Leachability Model		each X	<input type="checkbox"/> 200.00	
8	Abandonment <input type="checkbox"/>		feet X	<input type="checkbox"/> 5.00	
9	Well Installation <input type="checkbox"/>				
	A. Water Table (hand auger)		feet X	<input type="checkbox"/> 20.00	
	B. Water Table (drilled)	75	feet X	<input type="checkbox"/> 38.00	<input type="checkbox"/> 2,850.00
	C. Telescoping		feet X	<input type="checkbox"/> 58.00	
	D. Rock Drilling		feet X	<input type="checkbox"/> 58.00	
10	Groundwater Sample collection <input type="checkbox"/>				
	A. Groundwater	3	samples X	<input type="checkbox"/> 55.00	<input type="checkbox"/> 165.00
	B. Air Vapor		samples X	<input type="checkbox"/> 90.00	
	C. Water Supply		samples X	<input type="checkbox"/> 25.00	
	D. Groundwater No Purge	12	samples X	<input type="checkbox"/> 35.00	<input type="checkbox"/> 420.00
	E. Gauge Well Only		per well X	<input type="checkbox"/> 20.00	
11	Analyses-Groundwater	(See Analytical Methodology for analyses)			
	A. BTEX <input type="checkbox"/> Naph. <input type="checkbox"/> MTBE	15	samples X	<input type="checkbox"/> 100.00	<input type="checkbox"/> 1,500.00
	BB. 1,2-DCA	15	samples X	<input type="checkbox"/> 10.75	<input type="checkbox"/> 161.25
	C. BTEX <input type="checkbox"/> naph. <input type="checkbox"/> MTBE Trimethylbenzene		samples X	<input type="checkbox"/> 135.00	
	D. PAH's		samples X	<input type="checkbox"/> 120.00	
	E. Lead	15	samples X	<input type="checkbox"/> 20.00	<input type="checkbox"/> 300.00
	F. EDB	15	samples X	<input type="checkbox"/> 55.00	<input type="checkbox"/> 825.00
	G. 8 RCRA Metals		samples X	<input type="checkbox"/> 140.00	
	H. TPH (9070)		samples X	<input type="checkbox"/> 55.00	
	I. pH		samples X	<input type="checkbox"/> 10.00	
	J. BOD		samples X	<input type="checkbox"/> 40.00	
	K. Nitrate		samples X	<input type="checkbox"/> 20.00	
	L. Sulfate		samples X	<input type="checkbox"/> 20.00	
	M. Ferrous Iron		samples X	<input type="checkbox"/> 20.00	
	N. Methane		samples X	<input type="checkbox"/> 110.00	
	O. Organic Lead		samples X	<input type="checkbox"/> 100.00	
	P. 8 Oxygenates	15	samples X	<input type="checkbox"/> 85.00	<input type="checkbox"/> 1,275.00
11	Analyses-Soils				
	Q. BTEX <input type="checkbox"/> Naph.		samples X	<input type="checkbox"/> 100.00	
	R. PAH's		samples X	<input type="checkbox"/> 120.00	

	S. 8 RCRA Metals		samples X	☐150.00	
	T. TPH (9071)		samples X	☐60.00	
	U. TPH (3550B/8015B)		samples X	☐65.00	
	V. TPH (5030B/8015B)		samples X	☐65.00	
	W. Grain size ☐hydrometer		samples X	☐75.00	
	X. Total Organic Carbon		samples X	☐35.00	
11	Analyses-Air				
	Y. BTEX ☐ Naph.		samples X	☐100.00	
	Z. Hydrocarbon Fuel Identification		samples X	☐593.00	
12	Aquifer Characterization☐				
	A. Pumping Test		hours X	☐120.00	
	B. Slug Test		tests X	☐150.00	
13	Free Product Recovery Rate Test☐		tests X	☐120.00	
14	Fate☐Transport Modeling				
	A. Mathematical Model		each	☐300.00	
	B. Computer Model		each	☐500.00	
15	Risk Evaluation				
	A. Tier I Risk Evaluation		X	☐300.00	
	B. Tier II Risk Evaluation		X	☐500.00	
16	Subsequent Survey☐	1	X	☐260.00	☐260.00
17	Disposal☐				
	A. Wastewater				
	1. Purging Sampling	1	drums X	☐90.00	☐90.00
	2. Pumping Test/EFR		gallons X	☐0.60	
	B. Free Product		drums X	☐110.00	
	C. Soil (Treatment/Disposal)	4	tons X	☐50.00	☐200.00
18	Miscellaneous (attach receipts)		X		
20	Tier I Assessment (Use DHEC 3665 form)				
21	IGWA (Use DHEC 3666 form)				
22	Corrective Action (Use DHEC 3687 form)				
23	EFR A. 8-hour Event☐		each	☐3,000.00	
	B. Additional Hour		per hour X	☐204.00	
	C. Off-gas treatment		per hour X	☐35.00	
24	Granulated Activated Carbon (GAC) filter system installation ☐ service:				
	A. New GAC System Installation☐		each X	☐2,500.00	
	B. Refurbished GAC Sys. Install☐		each X	☐850.00	
	C. Filter replacement/removal☐		each X	☐450.00	
	D. GAC System removal, cleaning, ☐ refurbishment☐		each X	☐450.00	
	E. GAC System housing		each X	☐450.00	
	F. In-line particulate filter		each X	☐140.00	
	G. Additional piping ☐ fittings		feet X	☐4.00	
19	Report/Project Management ☐ Coordination	☐9,781.25	X		15☐ ☐1,467.19
25	Total				☐11,248.44

☐The appropriate mobilization cost can be added to complete these tasks, as necessary.





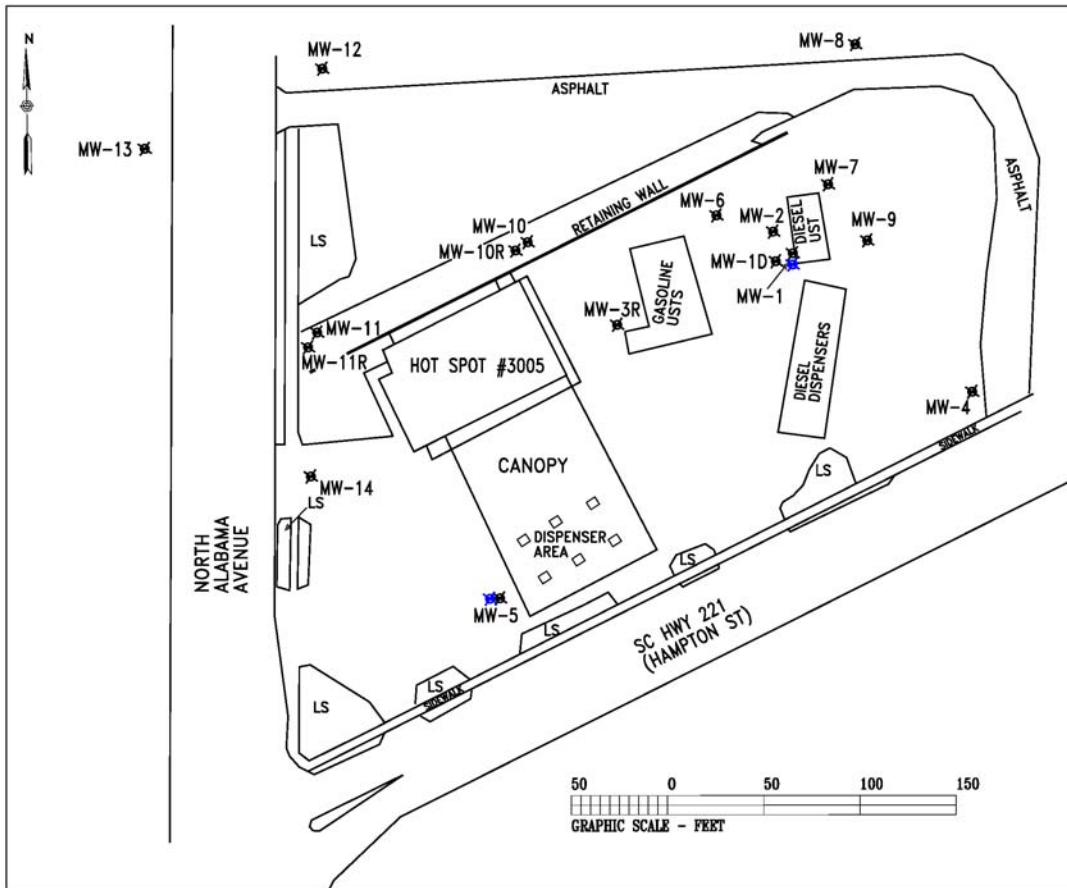
Hot Spot #3005  
SCDHEC UST Permit #12719

## FIGURE 1 SITE LOCATION - USGS

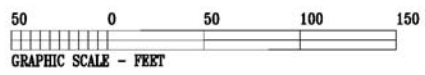
Hot Spot #3005  
SC Highway 221  
Chesnee, South Carolina  
SCDHEC Site # 12719



SIZE	TERRY Project No.	DWG NO.	REV
B	2230.8B	Figure 1 Site Location.dwg	
SCALE: NOT TO SCALE			DATE: November 2008



**LEGEND & ABBREVIATIONS:**  
 x MW = MONITORING WELL  
 LS = LANDSCAPING  
 x (blue) PROPOSED REPLACEMENT MONITORING WELL



**PROPOSAL MAP**

HOT SPOT #3005  
 SC HIGHWAY 221  
 CHESNEE, SOUTH CAROLINA

TERRY PROJECT #	SCDHEC SITE ID #
2230.8B	12719
SCALE	DATE
1" = 50'	NOVEMBER 2008



**TERRY Environmental Services**  
CLIENTS FIRST ALWAYS

June 16, 2010



Ms. Cyndi Suttles  
R L Jordan Oil Company of North Carolina, Inc.  
PO Box 2527  
Spartanburg, SC 29304

Re: Hot Spot #3005  
107 Hampton Street  
Chesnee, South Carolina  
Site ID# 12719

Dear Ms. Suttles,

This letter is to inform you that on June 3, 2010 Terry Environmental Services, Inc. (TERRY) personnel arrived at Hot Spot #3005 (Figure 1, Attachment 1) and collected one soil sample (SB-1) adjacent to the spill bucket associated with the kerosene tank. The sample was collected at approximately eighteen inches below ground surface. This work was conducted in response to the SCDHEC UST Program Compliance letter dated May 20, 2010. The sample was submitted to Access Analytical (SCDHEC Certified Laboratory #73006) for analyses.

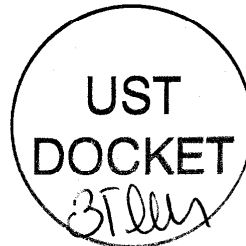
The results from the analysis are provided in Attachment 2 and on Figure 2 in Attachment 1.

Thank you for the opportunity to be of service. If you should have any questions, please contact us at your earliest convenience. At your direction, we are prepared to submit this report to the SCDHEC UST Program on your behalf.

Sincerely,

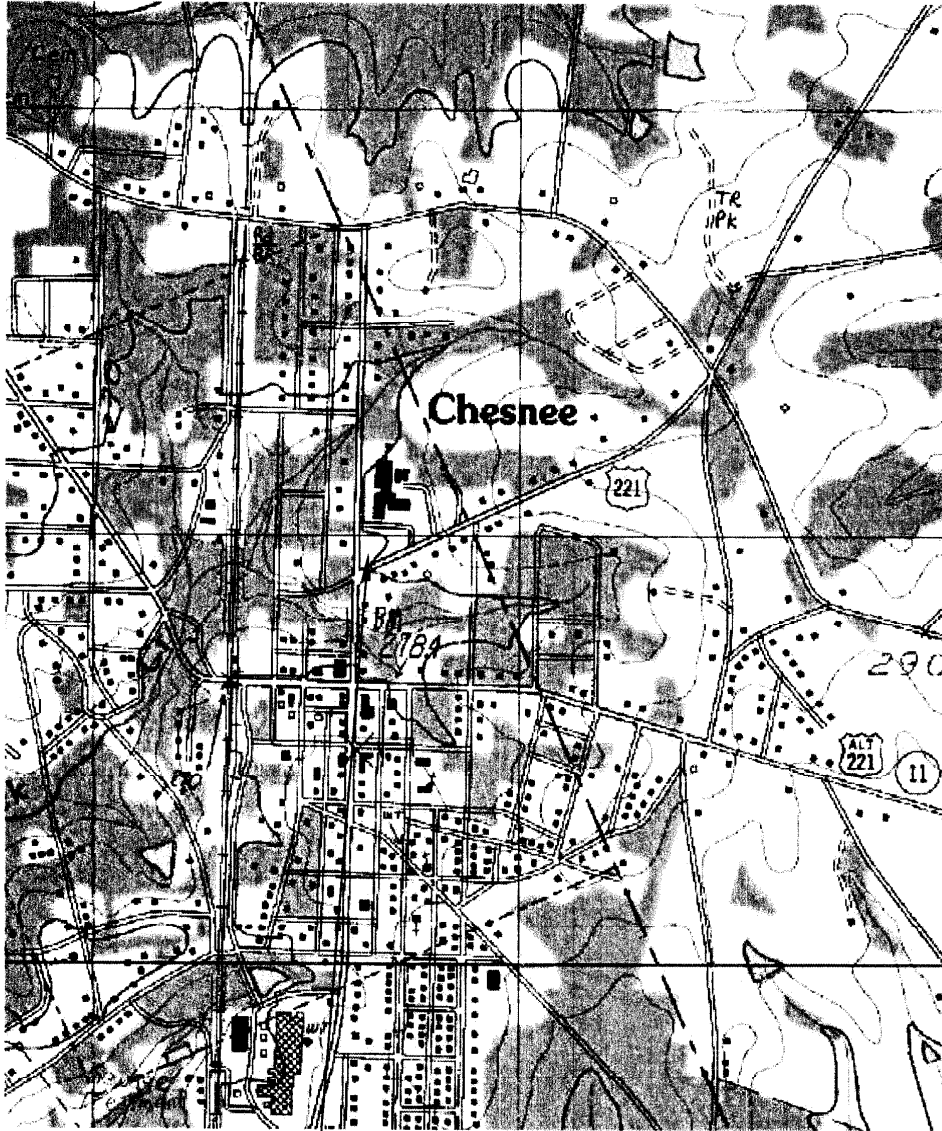
Kelly K. Cone  
Project Manager

Jason A. Terry, PG  
President



**ATTACHMENT 1**

**Figures**



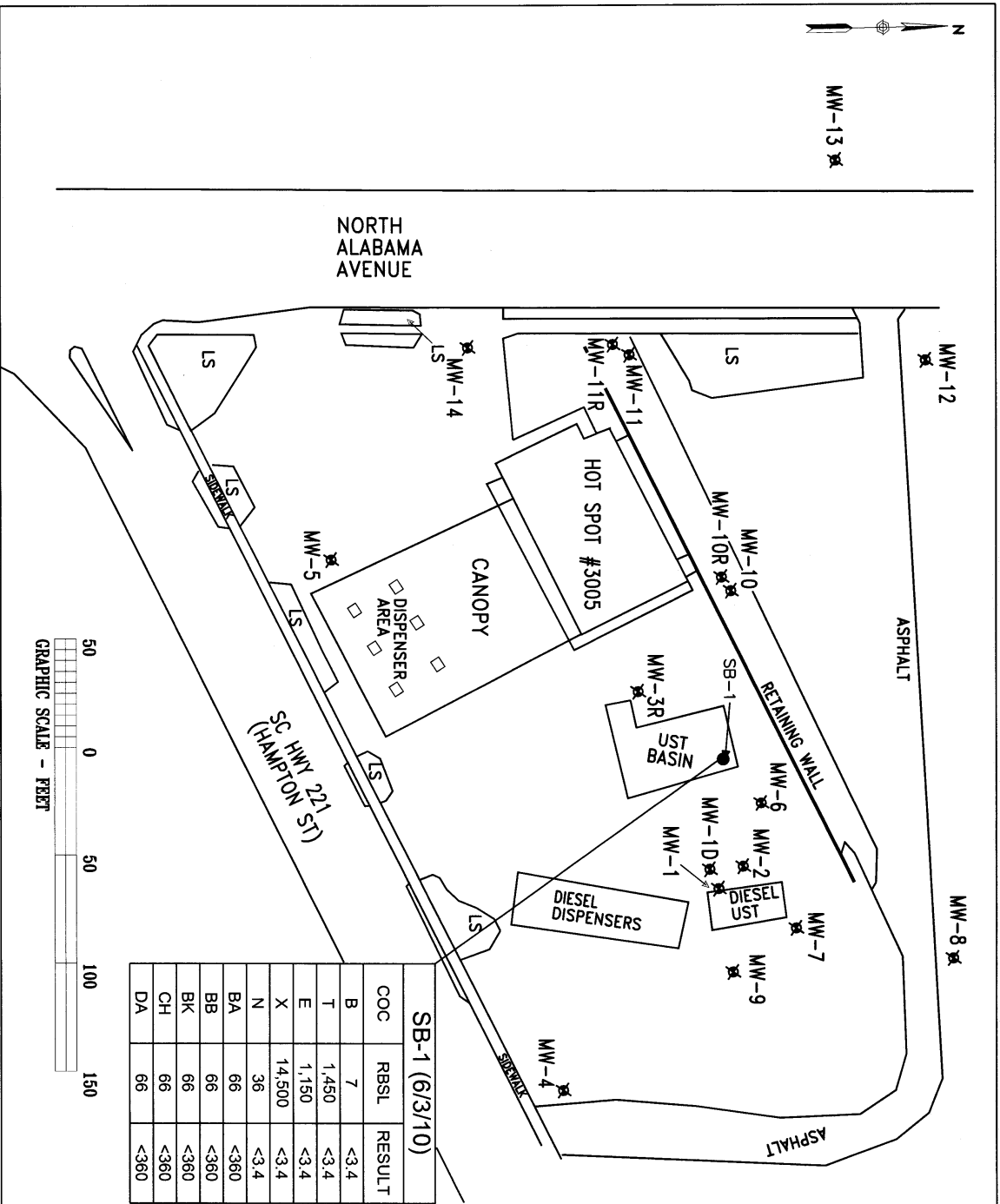
Hot Spot #3005  
 SCDHEC UST Permit #12719

**FIGURE 1  
 SITE LOCATION - USGS**

Hot Spot #3005  
 107 Hampton Street  
 Chesnee, South Carolina  
 SCDHEC Site # 12719



SIZE	TERRY Project No.	DWG NO.	REV
B	2230.8C	Figure 1 Site Location.dwg	
SCALE: NOT TO SCALE		DATE: June 2010	



SB-1 (6/3/10)		
COC	RBSL	RESULT
B	7	<3.4
T	1,450	<3.4
E	1,150	<3.4
X	14,500	<3.4
N	36	<3.4
BA	66	<360
BB	66	<360
BK	66	<360
CH	66	<360
DA	66	<360

**LEGEND & ABBREVIATIONS:**

- ☒ MW = MONITORING WELL
- SB = SOIL BORING LOCATION
- LS = LANDSCAPING

- B = BENZENE (units ug/kg)
- T = TOLUENE (units ug/kg)
- E = ETHYLBENZENE (units ug/kg)
- X = XYLENES (units ug/kg)
- N = NAPHTHALENE (units ug/kg)
- PAHs = POLYNUCLEAR AROMATIC HYDROCARBONS (ug/kg):
- BA = BENZO(A) ANTHRACENE
- BB = BENZO(B) FLUORANTHENE
- BK = BENZO(K) FLUORANTHENE
- CH = CHRYSENE
- DA = DIBENZO(A,H) ANTHRACENE

SOIL SAMPLE COLLECTED ON JUNE 3, 2010 AT A DEPTH OF 18 IN. BELOW GROUND SURFACE

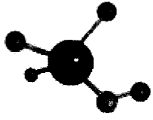


**FIGURE 2  
SITE MAP**

HOT SPOT #3005	
107 HAMPTON STREET	
CHESNEE, SOUTH CAROLINA	
TERRY PROJECT #	SCDHEC SITE ID #
2230.8C	12719
SCALE 1" = 50'	DATE JUNE 2010

**ATTACHMENT 2**

**Soil Analytical Data**



ACCESS  
ANALYTICAL, INC.

**ANALYTICAL REPORT**

**CLIENT**

Terry Environmental  
PO Box 25  
Summerville SC 29484

**ATTENTION**  
Kelly Cone

**PROJECT ID**  
Hot Spot #3005

**LABORATORY REPORT NUMBER**  
1006349

**DATE**  
June 14, 2010

Primary Data Review By

---

Brian Rohr  
Project Manager, AES

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 Analytical Environmental Services Inc. (AES Inc), 3785 Presidential Parkway, Atlanta, GA 30340.
- AES is SCDHEC certified laboratory # 98016, NCDENR certified lab # 562, GA certified lab # FL-E87582, NELAP certified laboratory # E87582
- Local support services for this project are provided by Access Analytical, Inc. Access Analytical is a representative of AES serving client in the SC/NC/GA areas. 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 Analytical - Chain of Custody Record

LAB USE ONLY 1006349

Project Work Order # \_\_\_\_\_ PO # \_\_\_\_\_ Access Quote # \_\_\_\_\_

Company Name: **TEARY ENVIRONMENTAL**  
 Report To: **K. CONE**  
 Address: **PO BOX 25**  
 City: **Summerville** State: **SC** Zip: **29484**  
 Phone: **843 873 8200** Fax: **843 873 8765**  
 Email: **kcone@tearyenvironmental.com**  
 Project Name: **HOT SPOT #3005**  
 Sampled By: **C. MARCHION**

Preservative: \_\_\_\_\_  
 (See Lab Manual)

Requested Lab Analysis: **GTEX, AMPH, PAH**

ANALYTICAL, INC.  
 Phone: (803) 781-4243  
 Fax: 781-4303  
 Toll Free (888) 315-4243  
 www.aas-inc.com  
 7478 Carlisle Street  
 Irmo, SC 29063

Preservative Codes (Place over analysis in black above analysis field): 0=None, 1=HCl, 2=HNO<sub>3</sub>, 3=H<sub>2</sub>O<sub>2</sub>, 4=H<sub>2</sub>O, 5=NaHSO<sub>4</sub>, 6=NaHSO<sub>3</sub>, Other-Specify \_\_\_\_\_  
 Matrix Codes (Place over analysis code in simple matrix column): GW=ground water, VW=waste water, DW=drinking water, S=soil, SL=sediment, A=air, IW=industrial waste, WO=waste oil, OT=other (Specify in comments section)

Sample Location/Description: **SB-1**  
 Date Collected: **6/2/10** Time Collected: **1300**  
 Type (see manual): **G** Matrix: **S** Cont: **H**

NOTES / COMMENTS  
 (If blank is acceptable, please use space below to describe time, date, etc.)  
**SOIL SAMPLE FROM**  
**VECO SPILL BUCKET**  
  
**\* Preservative - 5035 Soil**  
**Set w/ NaHSO<sub>4</sub> + CH<sub>3</sub>OH**  
  
**Program area - SHW**

Relinquished By:	Date:	Time:	Received By:
<i>[Signature]</i>	6/3/10	15:11	M Rebuton
<i>[Signature]</i>	6/3/10	17:00	Fede
	6/4/10	10:40	RLS

Turnaround Time:  
 Standard  **RUSH\***  
 \*Date Required: **6/1/10**  
 (For rush work, results emailed/faxed by end of business day on date required)

Project Location: **SC**  
 SC  NC  
 Other: \_\_\_\_\_ (specify)

LAB USE ONLY  
 Samples Recd. at Lab:  Yes  No  
 Receipt Temp: \_\_\_\_\_

See Reverse for Terms and Conditions  
 Access Temp **16.12**

Original Copy - Returned w/Report  
 Yellow Copy - Access File Copy  
 Pink Copy - Client Copy

**Analytical Environmental Services, Inc**

**Date:** 14-Jun-10

<b>Client:</b> Terry Environmental	<b>Client Sample ID:</b> SB-1
<b>Project:</b> Hot Spot #3005	<b>Collection Date:</b> 6/3/2010 1:00:00 PM
<b>Lab ID:</b> 1006349-001	<b>Matrix:</b> Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
<b>Volatile Organic Compounds by GC/MS SW8260B</b>					<b>(SW5035)</b>			
Benzene	BRL	3.4		ug/Kg-dry	130634	1	06/11/2010 06:54	JE
Toluene	BRL	3.4		ug/Kg-dry	130634	1	06/11/2010 06:54	JE
Ethylbenzene	BRL	3.4		ug/Kg-dry	130634	1	06/11/2010 06:54	JE
m,p-Xylene	BRL	3.4		ug/Kg-dry	130634	1	06/11/2010 06:54	JE
o-Xylene	BRL	3.4		ug/Kg-dry	130634	1	06/11/2010 06:54	JE
Naphthalene	BRL	3.4		ug/Kg-dry	130634	1	06/11/2010 06:54	JE
Surr: 4-Bromofluorobenzene	73.8	58.2-140		%REC	130634	1	06/11/2010 06:54	JE
Surr: Dibromofluoromethane	133	71.1-132	S	%REC	130634	1	06/11/2010 06:54	JE
Surr: Toluene-d8	99.9	77.6-119		%REC	130634	1	06/11/2010 06:54	JE
<b>POLYAROMATIC HYDROCARBONS SW8270D</b>					<b>(SW3550C)</b>			
Naphthalene	BRL	360		ug/Kg-dry	130565	1	06/09/2010 17:28	NE
Acenaphthylene	BRL	360		ug/Kg-dry	130565	1	06/09/2010 17:28	NE
1-Methylnaphthalene	BRL	360		ug/Kg-dry	130565	1	06/09/2010 17:28	NE
2-Methylnaphthalene	BRL	360		ug/Kg-dry	130565	1	06/09/2010 17:28	NE
Acenaphthene	BRL	360		ug/Kg-dry	130565	1	06/09/2010 17:28	NE
Fluorene	BRL	360		ug/Kg-dry	130565	1	06/09/2010 17:28	NE
Phenanthrene	BRL	360		ug/Kg-dry	130565	1	06/09/2010 17:28	NE
Anthracene	BRL	360		ug/Kg-dry	130565	1	06/09/2010 17:28	NE
Fluoranthene	BRL	360		ug/Kg-dry	130565	1	06/09/2010 17:28	NE
Pyrene	BRL	360		ug/Kg-dry	130565	1	06/09/2010 17:28	NE
Benz(a)anthracene	BRL	360		ug/Kg-dry	130565	1	06/09/2010 17:28	NE
Chrysene	BRL	360		ug/Kg-dry	130565	1	06/09/2010 17:28	NE
Benzo(b)fluoranthene	BRL	360		ug/Kg-dry	130565	1	06/09/2010 17:28	NE
Benzo(k)fluoranthene	BRL	360		ug/Kg-dry	130565	1	06/09/2010 17:28	NE
Benzo(a)pyrene	BRL	360		ug/Kg-dry	130565	1	06/09/2010 17:28	NE
Dibenz(a,h)anthracene	BRL	360		ug/Kg-dry	130565	1	06/09/2010 17:28	NE
Benzo(g,h,i)perylene	BRL	360		ug/Kg-dry	130565	1	06/09/2010 17:28	NE
Indeno(1,2,3-cd)pyrene	BRL	360		ug/Kg-dry	130565	1	06/09/2010 17:28	NE
Surr: 2-Fluorobiphenyl	85.7	52.6-120		%REC	130565	1	06/09/2010 17:28	NE
Surr: 4-Terphenyl-d14	87.6	65-120		%REC	130565	1	06/09/2010 17:28	NE
Surr: Nitrobenzene-d5	70.7	35.2-120		%REC	130565	1	06/09/2010 17:28	NE
<b>PERCENT MOISTURE D2216</b>								
Percent Moisture	9.02	0		wr%	R173641	1	06/09/2010 19:00	AS

**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
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value

Analytical Environmental Services, Inc.

Sample/Cooler Receipt Checklist

Client Access Work Order Number 1006349

Checklist completed by maf Date 6/4/10  
Signature Date

Carrier name: FedEx  UPS  Courier  Client  US Mail  Other

Shipping container/cooler in good condition? Yes  No  Not Present

Custody seals intact on shipping container/cooler? Yes  No  Not Present

Custody seals intact on sample bottles? Yes  No  Not Present

Container/Temp Blank temperature in compliance? (4°C±2)\* Yes  No

Cooler #1 3.6 Cooler #2 2.8 Cooler #3 \_\_\_\_\_ Cooler #4 \_\_\_\_\_ Cooler#5 \_\_\_\_\_ Cooler #6 \_\_\_\_\_

Chain of custody present? Yes  No

Chain of custody signed when relinquished and received? Yes  No

Chain of custody agrees with sample labels? Yes  No

Samples in proper container/bottle? Yes  No

Sample containers intact? Yes  No

Sufficient sample volume for indicated test? Yes  No

All samples received within holding time? Yes  No

Was TAT marked on the COC? Yes  No

Proceed with Standard TAT as per project history? Yes  No  Not Applicable

Water - VOA vials have zero headspace? No VOA vials submitted  Yes  No

Water - pH acceptable upon receipt? Yes  No  Not Applicable

Adjusted? \_\_\_\_\_ Checked by \_\_\_\_\_

Sample Condition: Good  Other(Explain) \_\_\_\_\_

(For diffusive samples or AIHA lead) Is a known blank included? Yes  No

See Case Narrative for resolution of the Non-Conformance.

\* Samples do not have to comply with the given range for certain parameters.

Analytical Environmental Services, Inc

Date: 14-Jun-10

Client: Terry Environmental  
 Project Name: Hot Spot #3005  
 Workorder: 1006349

ANALYTICAL QC SUMMARY REPORT

BatchID: 130565

Sample ID: MB-130565	Client ID:	Units: ug/Kg	Prep Date:	Run No: 173542					
Sample Type: MBLK	Test Code: POLYAROMATIC HYDROCARBONS	BatchID: 130565	Analysis Date: 06/09/2010	Seq No: 3608668					
SW8270D	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1-Methylnaphthalene	BRL	330	0	0	0	0	0	0	0
2-Methylnaphthalene	BRL	330	0	0	0	0	0	0	0
Acenaphthene	BRL	330	0	0	0	0	0	0	0
Acenaphthylene	BRL	330	0	0	0	0	0	0	0
Anthracene	BRL	330	0	0	0	0	0	0	0
Benzo(a)anthracene	BRL	330	0	0	0	0	0	0	0
Benzo(a)pyrene	BRL	330	0	0	0	0	0	0	0
Benzo(b)fluoranthene	BRL	330	0	0	0	0	0	0	0
Benzo(g,h,i)perylene	BRL	330	0	0	0	0	0	0	0
Benzo(k)fluoranthene	BRL	330	0	0	0	0	0	0	0
Chrysene	BRL	330	0	0	0	0	0	0	0
Dibenz(a,h)anthracene	BRL	330	0	0	0	0	0	0	0
Fluoranthene	BRL	330	0	0	0	0	0	0	0
Fluorene	BRL	330	0	0	0	0	0	0	0
Indeno(1,2,3-cd)pyrene	BRL	330	0	0	0	0	0	0	0
Naphthalene	BRL	330	0	0	0	0	0	0	0
Phenanthrene	BRL	330	0	0	0	0	0	0	0
Pyrene	BRL	330	0	0	0	0	0	0	0
Surr: 2-Fluorobiphenyl	1310	0	1667	0	78.6	52.6	120	0	0
Surr: 4-Terphenyl-d14	1439	0	1667	0	86.4	65	120	0	0
Surr: Nitrobenzene-d5	1122	0	1667	0	67.3	35.2	120	0	0

Sample ID: LCS-130565	Client ID:	Units: ug/Kg	Prep Date:	Run No: 173542					
Sample Type: LCS	Test Code: POLYAROMATIC HYDROCARBONS	BatchID: 130565	Analysis Date: 06/09/2010	Seq No: 3608668					
SW8270D	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Acenaphthene	1216	330	1667	0	72.9	56.2	120	0	0

Qualifiers: > Greater than Result value  
 BRL Below reporting limit  
 E Estimated value detected below Reporting Limit  
 N Analyte not NELAC certified  
 S Spike Recovery outside limits due to matrix  
 5 of 10  
 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

**Analytical Environmental Services, Inc**

Date: 14-Jun-10

Client: Terry Environmental  
 Project Name: Hot Spot #3005  
 Workorder: 1006349

**ANALYTICAL QC SUMMARY REPORT**

BatchID: 130565

Sample ID: LCS-130565	Client ID:	Units:	ug/Kg	Run No: 173542				
Sample Type: LCS	Test Code: POLYAROMATIC HYDROCARBONS SW8270D	BatchID: 130565	Prep Date: 06/08/2010	Seq No: 3608668				
Analyte	Result	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Acenaphthylene	1225	73.5	56	120	0	0	0	0
Anthracene	1220	73.2	58.8	120	0	0	0	0
Benz(a)anthracene	1277	76.6	64.8	120	0	0	0	0
Benzo(a)pyrene	1174	70.5	59.3	120	0	0	0	0
Benzo(b)fluoranthene	1423	85.4	63	120	0	0	0	0
Benzo(g,h,i)perylene	1303	78.2	62.6	120	0	0	0	0
Benzo(k)fluoranthene	1276	76.6	63.3	120	0	0	0	0
Chrysene	1303	78.2	66.7	120	0	0	0	0
Dibenz(a,h)anthracene	1394	83.7	60.7	120	0	0	0	0
Fluoranthene	1477	88.6	63.4	120	0	0	0	0
Fluorene	1322	79.3	59.6	120	0	0	0	0
Indeno(1,2,3-cd)pyrene	1451	87	61.9	120	0	0	0	0
Naphthalene	1189	71.4	50.1	120	0	0	0	0
Phenanthrene	1435	86.1	60.6	120	0	0	0	0
Pyrene	1250	75	63.1	120	0	0	0	0
Surr: 2-Fluorobiphenyl	1284	77	52.6	120	0	0	0	0
Surr: 4-Terphenyl-d14	1373	82.4	65	120	0	0	0	0
Surr: Nitrobenzene-d5	1105	66.3	35.2	120	0	0	0	0

Sample ID: 1006349-001BMS	Client ID: SB-1	Units:	ug/Kg-dry	Run No: 173542				
Sample Type: MS	Test Code: POLYAROMATIC HYDROCARBONS SW8270D	BatchID: 130565	Prep Date: 06/08/2010	Seq No: 3609284				
Analyte	Result	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Acenaphthene	1270	69.4	48.7	120	0	0	0	0
Acenaphthylene	1305	71.3	50.2	120	0	0	0	0
Anthracene	1303	71.2	51.8	120	0	0	0	0
Benz(a)anthracene	1336	73	59.1	120	0	0	0	0
Benzo(a)pyrene	1240	67.8	54.8	120	0	0	0	0

Qualifiers: > Greater than Result value  
 BRL Below reporting limit  
 E Estimated value detected below Reporting Limit  
 N Analyte not NELAC certified  
 S Spike Recovery outside limits due to matrix  
 < 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

Analytical Environmental Services, Inc

Date: 14-Jun-10

Client: Terry Environmental  
 Project Name: Hot Spot #3005  
 Workorder: 1006349

ANALYTICAL QC SUMMARY REPORT

BatchID: 130565

Sample ID: 1006349-001BMS	Client ID: SB-1	Units: ug/Kg-dry	Prep Date: 06/08/2010	Run No: 173542							
Sample Type: MS	TestCode: POLYAROMATIC HYDROCARBONS	BatchID: 130565	Analysis Date: 06/09/2010	Seq No: 3609284							
Analyte	Result	RPT Limit	SPK value	SPK RefVal	%REC	Low Limit	High Limit	RPD RefVal	%RPD	RPD Limit	Qual
Benzo(b)fluoranthene	1506	360	1829	0	82.3	56.6	120	0	0	0	0
Benzo(g,h,i)perylene	1337	360	1829	0	73.1	53.1	120	0	0	0	0
Benzo(k)fluoranthene	1218	360	1829	0	66.6	56.2	120	0	0	0	0
Chrysene	1399	360	1829	0	76.5	61.3	120	0	0	0	0
Dibenz(a,h)anthracene	1454	360	1829	0	79.5	54.2	120	0	0	0	0
Fluoranthene	1506	360	1829	0	82.3	55.1	120	0	0	0	0
Fluorene	1344	360	1829	0	73.4	53.9	120	0	0	0	0
Indeno(1,2,3-cd)pyrene	1524	360	1829	0	83.3	52.9	120	0	0	0	0
Naphthalene	1251	360	1829	0	68.4	41.8	120	0	0	0	0
Phenanthrene	1500	360	1829	0	82	54.2	120	0	0	0	0
Pyrene	1271	360	1829	0	69.5	54.8	120	0	0	0	0
Surr: 2-Fluorobiphenyl	1388	0	1829	0	75.9	52.6	120	0	0	0	0
Surr: 4-Terphenyl-d14	1443	0	1829	0	78.9	65	120	0	0	0	0
Surr: Nitrobenzene-d5	1131	0	1829	0	61.8	35.2	120	0	0	0	0

Sample ID: 1006349-001BMSD	Client ID: SB-1	Units: ug/Kg-dry	Prep Date: 06/08/2010	Run No: 173542							
Sample Type: MSD	TestCode: POLYAROMATIC HYDROCARBONS	BatchID: 130565	Analysis Date: 06/09/2010	Seq No: 3609300							
Analyte	Result	RPT Limit	SPK value	SPK RefVal	%REC	Low Limit	High Limit	RPD RefVal	%RPD	RPD Limit	Qual
Acenaphthene	1313	360	1831	0	71.7	48.7	120	1270	3.35	20.9	
Acenaphthylene	1350	360	1831	0	73.7	50.2	120	1305	3.38	20	
Anthracene	1377	360	1831	0	75.2	51.8	120	1303	5.56	17.1	
Benzo(a)anthracene	1381	360	1831	0	75.4	59.1	120	1336	3.27	15.8	
Benzo(a)pyrene	1302	360	1831	0	71.1	54.8	120	1240	4.85	19.1	
Benzo(b)fluoranthene	1507	360	1831	0	82.3	56.6	120	1506	0.042	19	
Benzo(g,h,i)perylene	1373	360	1831	0	75	53.1	120	1337	2.69	17	
Benzo(k)fluoranthene	1316	360	1831	0	71.9	56.2	120	1218	7.78	15.5	
Chrysene	1410	360	1831	0	77	61.3	120	1399	0.796	16	

Qualifiers: > Greater than Result value  
 BRL Below reporting limit  
 7 of 10 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

Analytical Environmental Services, Inc

Date: 14-Jun-10

Client: Terry Environmental  
 Project Name: Hot Spot #3005  
 Workorder: 1006349

ANALYTICAL QC SUMMARY REPORT

BatchID: 130565

Sample ID: 1006349-001BMSD Client ID: SB-1 Run No: 173542  
 TestCode: POLYAROMATIC HYDROCARBONS SW8270D Analysis Date: 06/09/2010 Seq No: 3609300  
 Units: ug/Kg-dry Prep Date: 06/08/2010  
 BatchID: 130565

Analyte	Result	RPT Limit	SPK value	SPK RefVal	%REC	Low Limit	High Limit	RPD RefVal	%RPD	RPD Limit	Qual
Dibenz(a,h)anthracene	1474	360	1831	0	80.5	54.2	120	1454	1.34	19.7	
Fluoranthene	1605	360	1831	0	87.7	55.1	120	1506	6.37	17.2	
Fluorene	1391	360	1831	0	76	53.9	120	1344	3.49	15.3	
Indeno(1,2,3-cd)pyrene	1532	360	1831	0	83.7	52.9	120	1524	0.57	16.2	
Naphthalene	1223	360	1831	0	66.8	41.8	120	1251	2.21	23.1	
Phenanthrene	1573	360	1831	0	85.9	54.2	120	1500	4.76	15.2	
Pyrene	1311	360	1831	0	71.6	54.8	120	1271	3.13	16.6	
Surr: 2-Fluorobiphenyl	1436	0	1831	0	78.4	52.6	120	1388	0	0	
Surr: 4-Terphenyl-d14	1456	0	1831	0	79.5	65	120	1443	0	0	
Surr: Nitrobenzene-d5	1058	0	1831	0	57.8	35.2	120	1131	0	0	

Qualifiers: > Greater than Result value  
 BRL Below reporting limit  
 8 of 10 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

Analytical Environmental Services, Inc

Date: 14-Jun-10

Client: Terry Environmental  
 Project Name: Hot Spot #3005  
 Workorder: 1006349

ANALYTICAL QC SUMMARY REPORT

BatchID: 130634

Sample ID: MB-130634	Client ID:	Units: ug/Kg	Prep Date: 06/08/2010	Run No: 173576
Sample Type: MBLK	TestCode: Volatile Organic Compounds by GC/MS SW8260B	BatchID: 130634	Analysis Date: 06/08/2010	Seq No: 3608864

Analyte	Result	RPT Limit	SPK value	SPK RefVal	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Benzene	BRL	5.0	0	0	0	0	0	0	0	0	0
Ethylbenzene	BRL	5.0	0	0	0	0	0	0	0	0	0
m,p-Xylene	BRL	10	0	0	0	0	0	0	0	0	0
Naphthalene	BRL	5.0	0	0	0	0	0	0	0	0	0
o-Xylene	BRL	5.0	0	0	0	0	0	0	0	0	0
Toluene	BRL	5.0	0	0	0	0	0	0	0	0	0
Surr: 4-Bromofluorobenzene	44.45	0	50	0	88.9	58.2	140	0	0	0	0
Surr: Dibromofluoromethane	49.66	0	50	0	99.3	71.1	132	0	0	0	0
Surr: Toluene-d8	49.12	0	50	0	98.2	77.6	119	0	0	0	0

Sample ID: LCS-130634	Client ID:	Units: ug/Kg	Prep Date: 06/08/2010	Run No: 173576
Sample Type: LCS	TestCode: Volatile Organic Compounds by GC/MS SW8260B	BatchID: 130634	Analysis Date: 06/08/2010	Seq No: 3608865

Analyte	Result	RPT Limit	SPK value	SPK RefVal	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Benzene	59.74	5.0	50	0	119	68.7	139	0	0	0	0
Toluene	56.23	5.0	50	0	112	68.5	139	0	0	0	0
Surr: 4-Bromofluorobenzene	55.92	0	50	0	112	58.2	140	0	0	0	0
Surr: Dibromofluoromethane	49.47	0	50	0	98.9	71.1	132	0	0	0	0
Surr: Toluene-d8	48.45	0	50	0	96.9	77.6	119	0	0	0	0

Sample ID: 1006311-001AMS	Client ID:	Units: ug/Kg-dry	Prep Date: 06/08/2010	Run No: 173576
Sample Type: MS	TestCode: Volatile Organic Compounds by GC/MS SW8260B	BatchID: 130634	Analysis Date: 06/08/2010	Seq No: 3608866

Analyte	Result	RPT Limit	SPK value	SPK RefVal	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Benzene	69.95	5.3	52.86	0	132	64	142	0	0	0	0
Toluene	64.52	5.3	52.86	0	122	61.6	143	0	0	0	0
Surr: 4-Bromofluorobenzene	55.38	0	52.86	0	105	58.2	140	0	0	0	0
Surr: Dibromofluoromethane	35.09	0	52.86	0	66.4	71.1	132	0	0	0	S

Qualifiers: > Greater than Result value  
 BRL Below reporting limit  
 9 of 10 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



**Analytical Environmental Services, Inc**

Date: 14-Jun-10

Client: Terry Environmental  
 Project Name: Hot Spot #3005  
 Workorder: 1006349

**ANALYTICAL QC SUMMARY REPORT**

BatchID: 130634

Sample ID: 1006311-001AMS	Client ID:	Volatile Organic Compounds by GC/MS	SW8260B	Units: ug/Kg-dry	Prep Date: 06/08/2010	Run No: 173576				
Sample Type: MS	TestCode:	SPK value	SPK RefVal	BatchID: 130634	Analysis Date: 06/08/2010	Seq No: 3608866				
Analyte	Result	RPT Limit	SPK RefVal	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

Surr: Toluene-d8	50.44	0	52.86	0	95.4	77.6	119	0	0	0
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Sample ID: 1006311-001AMSD	Client ID:	Volatile Organic Compounds by GC/MS	SW8260B	Units: ug/Kg-dry	Prep Date: 06/08/2010	Run No: 173576				
Sample Type: MSD	TestCode:	SPK value	SPK RefVal	BatchID: 130634	Analysis Date: 06/08/2010	Seq No: 3608867				
Analyte	Result	RPT Limit	SPK RefVal	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

Benzene	68.27	5.3	52.86	0	129	64	142	69.95	2.43	22.5
Toluene	64.28	5.3	52.86	0	122	61.6	143	64.52	0.378	25.8
Surr: 4-Bromofluorobenzene	55.77	0	52.86	0	106	58.2	140	55.38	0	0
Surr: Dibromofluoromethane	50.59	0	52.86	0	95.7	71.1	132	35.09	0	0
Surr: Toluene-d8	49.62	0	52.86	0	93.9	77.6	119	50.44	0	0

Qualifiers: > Greater than Result value  
 BRL Below reporting limit  
 Estimated value detected below Reporting Limit  
 Rpt Lim Reporting Limit  
 10 of 10  
 < 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

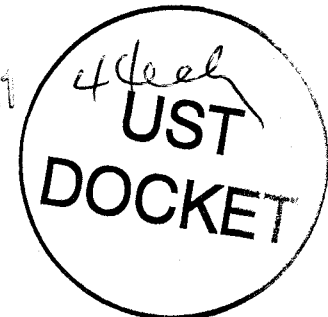


C. Earl Hunter, Commissioner

*Promoting and protecting the health of the public and the environment.*

MS CYNDI SUTTLES  
R L JORDAN OIL COMPANY OOF NORTH CAROLINA  
PO BOX 2527  
SPARTANBURG SC 29304-2527

AUG 05 2011



Re: **QAPP Contractor Addendum Directive**  
Hot Spot #3005, 107 Hampton Street, Chesnee, SC  
**UST Permit #12719**  
Release reported August 4, 2003  
Groundwater Monitoring Report received November 10, 2008  
Spartanburg County

Dear Ms. Suttles:

The Underground Storage Tank Management Division (UST Division) of the South Carolina Department of Health and Environmental Control (SCDHEC) has reviewed the referenced report. The report indicates the presence of chemicals of concern in the groundwater.


To determine what risk the referenced release may pose to the environment and public health, and in accordance with Section 280.65 of the South Carolina Underground Storage Tank Control Regulations, implementation of a groundwater sampling event as outlined in the UST Quality Assurance Program Plan (QAPP) is necessary. Monitoring wells MW-1, MW-2, MW-3R, MW-5, MW-6, MW-10R, and MW-1D should be sampled for BTEX, Naphthalene, 1,2-DCA, and the 8 Oxygenates. Due to the length of time since the last sampling event, each of these wells should be purged prior to sample collection. The sampling should be conducted in accordance with the UST QAPP and in compliance with all applicable regulations. A copy of the SCDHEC QAPP for the UST Division is available at:

<http://www.dhec.sc.gov/environment/lwm/html/ust.htm>

**Please have your contractor complete and submit the QAPP Contractor Addendum and Cost Agreement to the UST Division within thirty (30) days of 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 technical and financial pre-approval from the SCDHEC must be issued before work begins.**

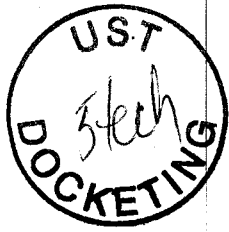
On all correspondence regarding this site, please reference UST Permit #12719. If you have questions or need additional information, feel free to contact me by telephone at (803) 896-4078, by fax at (803) 896-6245, or by e-mail to [RIVERSMS@dhec.sc.gov](mailto:RIVERSMS@dhec.sc.gov).

Sincerely,

  
Michael (Mike) Rivers, Hydrogeologist  
Corrective Action Section  
Underground Storage Tank Management Division  
Bureau of Land and Waste Management

cc: Ms. Kelly Cone, PG, Terry Environmental Services, PO Box 25, Summerville, SC 29484  
Technical File

MR/QAPPREQ08.02.11



Quality Assurance Project Plan  
Addendum to the SC DHEC UST Programmatic QAPP, Revision 1.0



For

Hot Spot #3005, UST Permit #12719  
107 Hampton Street, Chesnee, South Carolina

Prepared by: Kelly K. Cone, P.G.

e-mail: kcone@terrvenvironmental.com

Date: August 29, 2011

Terry Environmental Services, Inc.

Approvals

Michael Rivers \_\_\_\_\_

Date \_\_\_\_\_

SC DHEC Project Manager Signature

Annette Balsitis Annette Balsitis


Date 8/29/11

Contractor QA Manager Signature

Kelly K. Cone KK Cone

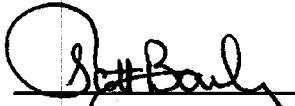
Date 8/29/11

Site Rehabilitation Contractor Signature

Ashley B. Amick   
Ashley B. Amick  
Fri Aug 26 2011 16:41:39

Date 8-26-11

Access Analytical Laboratory Director Signature

Scott Bailey 

Date 08/26/11

GCAL Laboratory Director Signature

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**A3 Distribution List**

**Table 1A Addendum Distribution List**

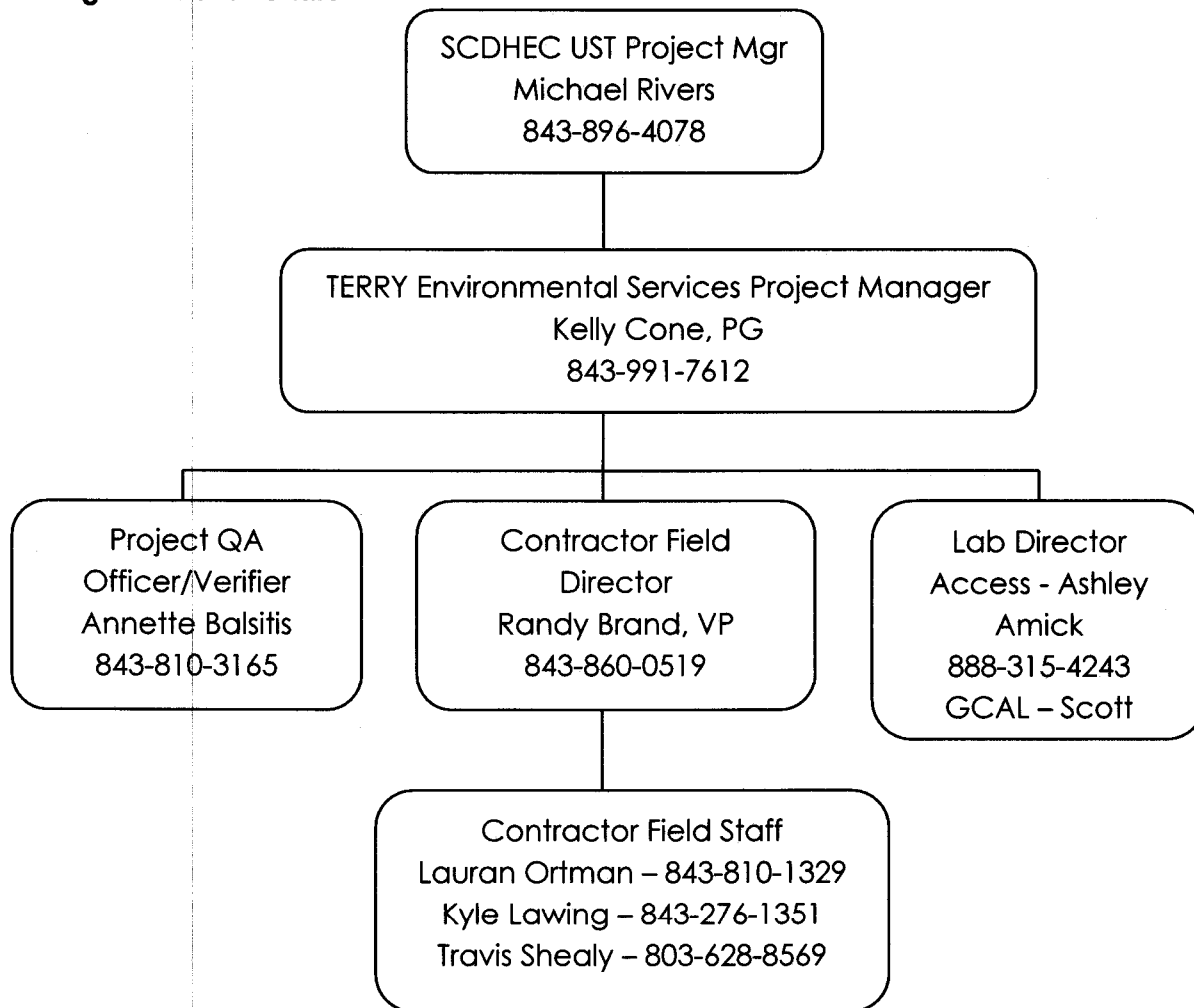
Name	Title	Organization/Address	Phone	Fax	Email
Michael Rivers	SC DHEC Technical Project Manager	SCDHEC, UST Management Division, 2600 Bull St., Columbia, SC, 29201	803-896-4078	803-896-6245	<a href="mailto:riversms@dh.ec.sc.gov">riversms@dh.ec.sc.gov</a>
Kelly Cone	Site Rehabilitation Contractor	TERRY Environmental Services, PO Box 25, Summerville, SC 29484	843-873-8200	843-873-8765	<a href="mailto:kccone@terryenvironmental.com">kccone@terryenvironmental.com</a>
Randy Brand	Field Manager	TERRY Environmental Services, PO Box 25, Summerville, SC 29484	843-873-8200	843-873-8765	<a href="mailto:rbrand@terryenvironmental.com">rbrand@terryenvironmental.com</a>
Ashley Amick	Laboratory Director	Access Analytical, Inc., 7478 Carlisle St., Irmo, SC 29063	803-781-4243	803-781-4303	<a href="mailto:aamick@axs-inc.com">aamick@axs-inc.com</a>
Scott Bailey	Laboratory Director	Gulf Coast Analytical Laboratories, Inc., 7979 GSRI Avenue, Baton Rouge, LA 70820	225-769-4900	225-767-5717	<a href="mailto:scott.bailey@gcal.com">scott.bailey@gcal.com</a>

**A4 Project Organization**

**Table 2A Addendum Role Identification and Contact Information**

Project Role	Name	Organization/Address	Phone	Fax	Email
Project Manager	Michael Rivers	SCDHEC, UST Management Division, 2600 Bull St., Columbia, SC, 29201	803-896-4078	803-896-6245	<a href="mailto:riversms@dhec.sc.gov">riversms@dhec.sc.gov</a>
Site Rehabilitation Contractor	Kelly Cone	TERRY Environmental Services, PO Box 25, Summerville, SC 29484	843-873-8200	843-873-8765	<a href="mailto:kccone@terryenvironmental.com">kccone@terryenvironmental.com</a>
Field Manager	Randy Brand	TERRY Environmental Services, PO Box 25, Summerville, SC 29484	843-873-8200	843-873-8765	<a href="mailto:rbrand@terryenvironmental.com">rbrand@terryenvironmental.com</a>
Analytical Laboratory Director	Ashley Amick	Access Analytical, Inc., 7478 Carlisle St., Irmo, SC 29063	803-781-4243	803-781-4303	<a href="mailto:aamick@axs-inc.com">aamick@axs-inc.com</a>
Analytical Laboratory Director	Scott Bailey	Gulf Coast Analytical Laboratories, Inc., 7979 GSRI Avenue, Baton Rouge, LA 70820	225-769-4900	225-767-5717	<a href="mailto:scott.bailey@gcal.com">scott.bailey@gcal.com</a>
Project Verifier	Annette Balsitis	TERRY Environmental Services, PO Box 25, Summerville, SC 29484	843-873-8200	843-873-8765	<a href="mailto:amb@terryenvironmental.com">amb@terryenvironmental.com</a>

**Figure 1A Organizational Chart**



**A5 Problem Definition/Background**

*Three gasoline USTs, two diesel USTs, and one kerosene UST are in service at the subject site. Assessment work conducted by the previous contractor includes the installation of sixteen shallow monitoring wells (MW-1, -2, -3R, -4, -5, -6, -7, -8, -9, -10, -10R, -11, -11R, -12, -13, and -14) and one deep monitoring well (MW-1D).*

*Subsequent Groundwater Sampling Reports were submitted by TERRY in June 2005, October 2005, and November 2008. Based on the November 2008 results, TERRY recommended replacement of MW-1 and MW-5 followed by a comprehensive groundwater sampling event to monitor the contaminant plume.*

*A May 2010 Compliance inspection at the site indicated damage to the kerosene spill bucket. A site check was conducted with a soil sample collected adjacent to the kerosene spill bucket. The analytical results indicated that no contaminants of concern were detected above the risk based screening levels.*

**Please answer the following: Does this project fall under UST or Brownfields area? UST**

**A6 Project/Task Description**

1. Per SCDHEC request, TERRY plans to conduct a comprehensive groundwater sampling.
2. The work will begin within 7 days after cost approval and sampling should be complete by 30 days.
3. Are there are time or resource constraints? None are anticipated.

**A7 Data Quality Objectives (DQOs) and Data Quality Indicators (DQIs)**

The site is located at the intersection of SC Highway 221 (Hampton Street) and North Alabama Avenue in Chesnee, South Carolina. The site is bordered to the north by a school, to the east by a vacant field, and to the south and west by residential properties. The general site location is shown on a USGS map as Figure 1, Attachment 1. A site map is provided as Figure 2, Attachment 1.

**A8 Training and Certificates**

**Table 3A Required Training and Licenses**

Title/Job	Name	Training Required	Date training received	Type of License	License Number
Project Manager	Kelly Cone	BS Geology SC PG OSHA Refresher	5/13/2001 6/1/2011 5/17/2011	Professional Geologist	2509
Field Director/Driller	Randy Brand	Licensed Driller OSHA Refresher	4/29/2011 8/11/2011	Well Driller	B1485
Field Staff/Driller	Kyle Lawing	BS Geology or similar Licensed Driller OSHA Refresher	12/2009 7/12/2011 3/17/2011	Well Driller	D2047
Field Staff/Driller	Travis Shealy	BS Geology or similar Licensed Driller OSHA Refresher	5/2004 7/12/2011 4/7/2011	Well Driller	D2048
Field Staff	Lauran Ortman	BS Geology or similar OSHA Refresher	5/2008 5/12/2011		
Laboratory Director	Ashley Amick	BS in Biology	5/1991		
Laboratory Directory	Scott Bailey	BS in Environmental Health	12/1991		

All TERRY employees receive on the job training by their supervisor in the proper procedures for sample collection, logging of soil cuttings, drilling oversight, etc. These procedures follow those established by SCDHEC, OSHA, US EPA, Unified Soil Classification System (USCS), and other industry standards as applicable. Jason A. Terry, President of TERRY Environmental Services, Inc. is responsible to ensuring that personnel participating in this project receive the proper training. All training records will be stored at: TERRY Environmental Corporate Office; 1753 North Main Street; Summerville, SC 29483.

**It is understood that training records will be produced if requested by SC DHEC.**

The Following Laboratory(ies) will be used for this Project:

**Commercial Lab(s)**

Full Name of the Laboratory: Access Analytical, Inc.  
 Name of Lab Director: Ashley Amick  
 SC DHEC Certification Number: 3257500  
 Parameters this Lab will analyze for this project: n/a

Full Name of the Laboratory: Gulf Coast Analytical Laboratories, Inc.  
 Name of Lab Director: Scott Bailey  
 SC DHEC Certification Number: 73006001  
 Parameters this Lab will analyze for this project: BTEX, Naphthalene, 1,2 DCA, and Oxygenates by EPA 8260B

Access Analytical (Access) works in a unique, cooperative relationship with Gulf Coast Analytical Labs (GCAL) in Baton Rouge, LA. Access serves as an authorized local representative providing project management and local services to its clients. The relationship between the two companies works in the following manner: Client sample kits are prepped at the Access office using pre-cleaned and batch certified environmental sample containers provided by Access Analytical (containers are purchased from Daniels Scientific).

Prepared kits are then delivered to clients for collection of samples in the field. Once field work is completed samples are returned to Access Analytical. Samples are then shipped according to the established SOP from the Access office in Irmo, SC to GCAL. Samples are shipped on a daily basis via express overnight delivery. Samples are then processed at the laboratory and the subsequently generated data is validated by the QA staff. Once data is validated and approved it is transmitted electronically back to Access Analytical for a second tier review and final invoicing. Second tier review helps to insure accuracy and precision of sample data as well as compliance with local SC rules and regulations. After second tier review of the data is final completed reports are released to clients via email and/or postal mail. Final reports indicate that samples were analyzed at GCAL, are signed off on by GCAL and Access management and list the DHEC certification number of the lab.

**A9 Documents and Records**

***Personnel will receive the most current version of the QAPP Addendum via:***

xxxxx US Mail  Courier  Hand delivered

Other (please specify): \_\_\_\_\_

**Table 4A Record Identification, Storage, and Disposal**

Record	Produced By	Hardcopy/ Electronic	Storage Location For how long?	Archival
Correspondence	TERRY	Electronic	Corporate Office – 5 yrs	5 years after project completion
Analytical Data	Access/GCAL	Hardcopy/ Electronic	Corporate Office/ Secured Storage Facility – 10 yrs	10 years
Field Logs	TERRY	Electronic	Corporate Office – 5 yrs	5 years after project completion



Well Logs	TERRY	Electronic	Corporate Office – 5 yrs	5 years after project completion
Invoicing	TERRY	Electronic	Corporate Office – 5 yrs	5 years after project completion
Manifest	TERRY	Electronic	Corporate Office – 5 yrs	5 years after project completion
Sampling Logs	TERRY	Electronic	Corporate Office – 5 yrs	5 years after project completion
Figures	TERRY	Electronic	Corporate Office – 5 yrs	5 years after project completion
Surveys	TERRY	Electronic	Corporate Office – 5 yrs	5 years after project completion
Survey (RLS)	Construction Support Services, Inc.	Electronic	Corporate Office – 5 yrs	5 years after project completion
Disposal Manifest	US Water Recovery, LLC	Hardcopy	Corporate Office – 5 yrs	5 years after project completion
Disposal Manifest	JBR Environmental Services	Hardcopy	Corporate Office – 5 yrs	5 years after project completion

## **Section B Measurement/Data Acquisition**

### **B1 Sampling Process/Experimental Design**

**Table 5A Sampling Activities**

Item	Start Date	End Date	Comments
Sampling Wells	9/19/11	9/19/11	
Receive/ Review Lab Data	9/29/2011	9/30/2011	
Waste Disposal	10/3/2011	10/3/2011	
Preparation of Report	10/4/2011	10/7/2011	
Report Review and Revision	10/10/2011	10/11/2011	
Submit Report to DHEC	10/12/2011	10/12/2011	
Note: All dates subject to receipt of approved SCDHEC Directive			

### **B2 Sampling Methods**

Please note: The contractor must follow sampling protocols as given in the SC DHEC UST QAPP, Revision 1.0.

**Estimate the number of samples of each matrix that are expected to be collected:**

Soil	<u>n/a</u>
Ground Water from monitoring wells	<u>seven (7)</u>
From Drinking/Irrigation water wells	<u>n/a</u>
From surface water features	<u>n/a</u>
Total number of Water samples	<u>seven (7) plus 1 trip blank, 1 field blank, and 1 field duplicate</u>

**The samples will be (check as many as apply):** \_\_\_ Homogenized \_\_\_ Split X Grab

**If any of the above are circled please indicate how will it be done and the equipment needed. A grab groundwater sample will be collected from each monitoring well with a new, disposable bailer or clean purge pump with new, disposable tubing. Field parameters will be collected and recorded for each well utilizing the appropriate field equipment (i.e. interface probe, DO meter, etc.). See Table 11A for a list of field equipment. Sample collection and purging, if necessary, will be conducted in accordance with Section B2 of the SC DHEC UST QAPP, Revision 1.0.**

**Will Sampling Equipment have to be cleaned and decontaminated or is everything disposable? Yes, the field measurement equipment will need to be cleaned and decontaminated between each well.**

**If sampling equipment must be cleaned please give a detailed description of how this is done and the disposal of by-products from the cleaning and decontamination. The field measurement equipment will be cleaned and decontaminated in accordance with "Appendix H: Standard Field Cleaning Procedures" of the SC DHEC UST QAPP, Revision 1.0. By-products will be disposed of via processing through a granular-activated-carbon (GAC) unit in accordance with the NPDES General Permit No. SCG830000.**

**Identify any equipment and support facilities needed. This may include such things as Fed-ex to ship the samples, a Geoprobe, field analysis done by another contractor (who must be certified), and electricity to run sampling equipment. FEDEX, Geoprobe, general sampling equipment and meters.**

**Address the actions to be taken when problems occur in the field, and the person responsible for taking corrective action and how the corrective action will be documented.**

**Table 6A Field Corrective Action**

Failure	Response	Documentation	Individual Responsible
Meter failure	Troubleshoot, repair, or replace meter	In field logbook	Field staff on site
Water level meter failure	Troubleshoot, repair, or replace meter	In field logbook	Field staff on site
Interface probe failure	Troubleshoot, repair, or replace meter	In field logbook	Field staff on site

Note: See Table 11A for a list of specific meters and sampling equipment to be used.

**B3 Sample Handling and Custody**

**1. How will the samples get from the Site to the Lab to ensure holding requirements are met? Samples will be packed in coolers of ice and proper temperatures maintained until they can be delivered to Access Analytical at the completion of field activities or held at the TERRY office until they are picked up by a lab courier. Arrangements will be made prior to sample collection for a site pick up via courier if any analytical methods have a limited hold time.**

**2. How will the contractors cool the samples and keep the samples cool? Immediately following collection the samples will be placed in a cooler and surrounded by ice to bring the samples to the proper temperature. The temperature will be checked for compliance by TERRY personnel every four hours during sampling and at the completion of the event using a NIST traceable thermometer and recorded in the field notes. Additional ice will be added as needed to maintain the proper temperature. The samples will be packed so that they begin to cool immediately and remain between 0-6 degrees C while in transit to the lab.**

**3. How will the lab determine the temperature of the samples upon receipt? Once samples are received from Terry by Access they are temperature checked for compliance using a NIST traceable thermometer and the temperature is recorded on the COC. Samples are then kept on ice until they are shipped out (normally samples are shipped on the same day they are received by Access). Samples are shipped according to the established SOP that Access has for environmental sample shipment. This SOP addresses temperature**

control issues and specifies how samples are to be packed so that they remain between 0-6 degrees C while in transit to the lab.

**4. Where will the samples be stored in the Lab once they are received? Sample Holding**

**5. Describe the chain of custody procedure and attach a copy of each chain of custody that will be used. All persons taking custody of samples will be required to sign the Chain-of-Custody forms with the exception of couriers such as FEDEX, UPS, etc. In these instances, the shipping label and shipping documentation will serve as addendum to the chain-of-custody.**

Access Analytical Chain of Custody records are used (Attachment 2). These documents have been reviewed and approved by the DHEC office of laboratory certification for SC work. GCAL receives all Access samples on these COC forms and is accustomed to using them for login of samples.

**B4 Analytical Methods**

**1. Identify the SOPs which will be used to analyze the samples, the method which the SOP references and the equipment or instrumentation that is needed:**

**Table 7A Analytical SOPs and Referenced Methods**

Parameter	SOP ID*	Method Referenced	Equipment	Comments
VOC's (BTEX/Naph/MTBE/DCA)	Method 8260B GCMSV-003 r22	8260B	GC/MS	
Oxygenates	Oxygenates GCMSV-004 r1	8260B	GC/MS	

- This can be a full name of a SOP, an abbreviation, or a number. In the latter two cases, the abbreviation or number must be associated with the full name of the SOP. See also Table 8A SOP Abbreviation Key.

**Table 8A SOP Abbreviation Key**

Abbreviation	Lab Identification of this SOP	Full Name of the SOP
GCMSV-003	Method 8260B GCMSV-003 r22	STANDARD OPERATING PROCEDURE FOR THE ANALYSIS OF VOLATILE MASS SPEC SAMPLES METHOD 8260B
GCMSV-004	Oxygenates GCMSV-004 r1	STANDARD OPERATING PROCEDURE FOR THE ANALYSIS OF OXYGENATES BY METHOD 8260B

**2. Identify procedures to follow when failures occur, identify the individual responsible for corrective action and appropriate documentation:**

*The laboratory standard operating procedure for the handling of non-conformance issues requiring corrective action is provided in Attachment 3. The SOP is identified as "Non Conformance Corrective Action GEN-18".*

**3. Identify sample disposal procedures.**

*Sample disposal procedures and policies are outlined in Section 10.1 of the laboratory QAP which is provided in Attachment 4.*

**4. Provide SOPs for the Kerr Method or the Ferrous Iron Method if these are parameters for this study. This can be attached or written here. If attached please note that it is an attachment and where it is located (if applicable).**

**B5 Quality Control Requirements:**

All QC will follow the requirements laid out in Section B5 of the SC DHEC UST QAPP, Revision 1.0.

**B6 Field Instrument and Equipment Testing, Inspection and Maintenance**

1. Identify all field and laboratory equipment needing periodic maintenance, the schedule for this, and the person responsible. Not the availability and location of spare parts.  
See Table 11A for information regarding the field equipment. See Attachment 5 for information regarding the laboratory equipment. Section 6 "Facility Description and Equipment" of the laboratory QAP is attached.

**Table 11A Instrument and Equipment Maintenance**

Instrument	Serial Number	Type of Maintenance	Frequency	Parts Needed/Location	Person Responsible
YSI DO 550A <i>Dissolved Oxygen</i>	6L1476A	Routine, cleaning, charging	Following every use	Ben Meadows	Randy Brand
Oakton <i>PH/ Conductivity/ Temperature Meter</i>	364862	Routine, cleaning, charging	Following every use	Ben Meadows	Randy Brand
Horiba U-52 <i>pH/DO/Conductivity/ Turbidity/ Temp.</i>	Pending – on order	Routine, cleaning, charging	Following every use	Enviro-Equipment	Randy Brand
Interface Probe <i>Depth to Water/ Free Product/Total Depth</i>	2671	Routine, cleaning, charging	Following every use	Enviro-Equipment	Randy Brand
Tornado Purge Pump	P-10330	Routine, cleaning	Following every use	n/a	Randy Brand
Fisher Scientific Digital Thermometer	Pending – on order	Routine, cleaning	Following every use	n/a	Randy Brand

2. Identify the testing criteria for each lab or field instrument that is used to ensure the equipment is performing properly. Indicate how deficiencies, if found, will be resolved, re-inspections performed, and effectiveness of corrective action determined and documented. Give the person responsible for this.  
See Table 12A for information regarding the field equipment. See Attachment 5 for information regarding the laboratory equipment. Section 6 "Facility Description and Equipment" of the laboratory Quality Assurance Plan is attached.

**Table 12A Instrument and Equipment Inspection**

<b>Instrument/Equipment</b>	<b>Serial Number</b>	<b>Type of Inspection</b>	<b>Requirement</b>	<b>Individual Responsible</b>	<b>Resolution of Deficiencies</b>
YSI DO 550A <i>Dissolved Oxygen</i>	6L1476A	Routine	Prior to use	FTL	Repair/Replace
Oakton <i>PH/ Conductivity/ Temperature Meter</i>	364862	Routine	Prior to use	FTL	Repair/Replace
Horiba U-52 <i>pH/DO/Conductivity/ Turbidity/ Temp.</i>	Pending – on order	Routine	Prior to use	FTL	Repair/Replace
Interface Probe <i>Depth to Water/ Free Product/Total Depth</i>	2671	Routine	Prior to use	FTL	Repair/Replace
Tornado Purge Pump	P-10330	Routine	Prior to use	FTL	Repair/Replace
Fisher Scientific Digital Thermometer	Pending – on order	Routine	Prior to use	FTL	Repair/Replace

**B7 Instrument Calibration and Frequency**

1. Identify equipment, tools, and instruments for field or lab work that should be calibrated and the frequency.
2. Describe how the calibrations should be performed and documented, indicating test criteria and standards or certified equipment.
3. Identify how deficiencies should be resolved and documented. Identify the person responsible for corrective action.

See Table 13A for information regarding the field equipment. See Attachment 5 for information regarding the laboratory equipment. Section 6 "Facility Description and Equipment" of the laboratory Quality Assurance Plan is attached.

**Table 13A Instrument Calibration Criteria and Corrective Action**

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA	SOP Reference*
YSI DO 550A <i>Dissolved Oxygen</i>	Self diagnostic routine	Prior to sampling event; after 4 hours of use; at completion of each event	Calibrates as per manufacturer's guidelines	Recalibrate, repair, replace	Randy Brand	Manufacturer's SOP
Oakton <i>PH/ Conductivity/ Temperature Meter</i>	Following manufacturer's instructions	Prior to sampling event; after 4 hours of use; at completion of each event	Calibrates as per SCDHEC guidelines; Section B7 of the UST QAPP, Rev 1.0	Recalibrate, repair, replace	Randy Brand	Manufacturer's SOP
Horiba U-52 <i>pH/DO/ Conductivity/ Turbidity/ Temp.</i>	Following manufacturer's instructions	Prior to sampling event; after 4 hours of use; at completion of each event	Calibrates as per SCDHEC guidelines; Section B7 of the UST QAPP, Rev 1.0	Recalibrate, repair, replace	Randy Brand	Manufacturer's SOP
Interface Probe <i>Depth to Water/ Free Product/Total Depth</i>	Measured by Invar steel surveyor's chain or equivalent	Annually	Calibrates as per SCDHEC guidelines; Section B2 of the UST QAPP, Rev 1.0	Recalibrate, repair, replace	Randy Brand	Manufacturer's SOP
Fisher Scientific <i>Digital Thermometer</i>	Tested by NIST Certified Thermometer	Annually	Calibrates as per manufacturer's guidelines	Recalibrate, repair, replace	Randy Brand	Manufacturer's SOP

\*This can be a full name of a SOP, an abbreviation, or a number. In the latter two cases, the abbreviation or number must be associated with the full name of the SOP. See also Table 8A SOP Abbreviation Key.

**B8 Inspection/Acceptance Requirements for Supplies and Consumables**

1. Identify critical supplies and consumables for field and laboratory, noting supply source, acceptance criteria, and procedures for tracking, storing and retrieving these materials.  
See Table 14A for information regarding the field. See Attachment 5 for information regarding the laboratory. Section 6 "Facility Description and Equipment" of the laboratory Quality Assurance Plan is attached.
2. Identify the individual(s) responsible for this.

**Table 14A List of Consumables and Acceptance Criteria**

Item	Vendor	Acceptance criteria	Handling/Storage Conditions	Person responsible for inspection and tracking.
Disposable Bailers	Aquabailers, Inc. and Groundwater Essentials	Box sealed and bailers undamaged.	Climate controlled storage	Randy Brand
Disposable Gloves	Aquabailers, Inc. and Groundwater Essentials	Box sealed and gloves undamaged.	Climate controlled storage	Randy Brand
Liquinox	Ben Meadows	Box sealed and container undamaged.	Climate controlled storage	Randy Brand
Calibration Standards for pH, DO, and Conductivity	Ben Meadows and Enviro-Equipment	Must be within expiration date and acceptable for the allowable method.	Climate controlled storage	Randy Brand
Nylon Rope for Bailers	Ben Meadows	Box sealed and rope undamaged.	Climate controlled storage	Randy Brand
Polyethylene Tubing	Enviro-Equipment	Box sealed and tubing undamaged.	Climate controlled storage	Randy Brand
Plastic Sheeting	Lowes or Home Depot	Box sealed and not damaged	Climate controlled storage	Randy Brand
Insulated Containers	Access Analytical, Inc.	In good condition, no damage that would compromise samples.	Climate controlled storage	Randy Brand
Sample Containers*	Access Analytical, Inc.	Containers sealed and undamaged with custody seal intact.	Climate controlled storage	Randy Brand

\*The sample containers supplied to TERRY for sample collection are purchased from Daniels Scientific in Greenville, SC. The containers are all "level III" lot certified bottles specifically for use in environmental lab applications. The containers are all labeled with lot # identifications which are traceable back to the batch QC analysis that was performed.

**B9 Data Acquisition Requirements (Non-Direct Measurements)**

1. Identify data sources, for example, computer databases or literature files, or models that should be accessed or used.
2. Describe the intended use of this information and the rationale for their selection, i.e., its relevance to project.
3. Indicate the acceptance criteria for these data sources and/or models.

**Table 15A Non-Direct Measurements**

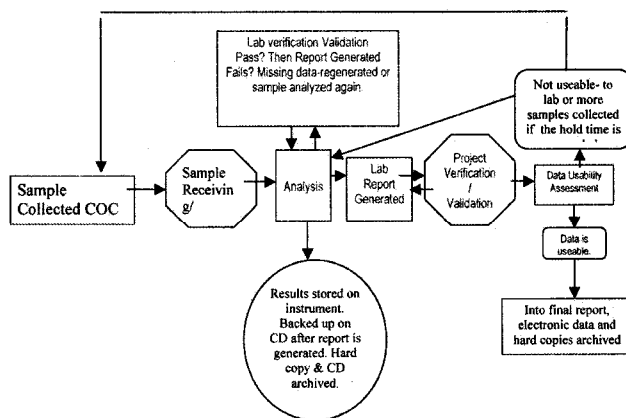
Data Source	Used for	Justification for use in this project	Comments
SCDHEC Freedom of Information Office	Historical Data	To obtain site and release history.	
TERRY Groundwater Monitoring Reports (June 2005, October 2005, & November 2008)	Historical Data	To obtain site and release history.	
TERRY Site Check Letter June 2010	Historical Data	To obtain site and release history.	

4. Identify key resources/support facilities needed. – n/a

**B10 Data Management**

1. Describe the data management scheme from field to final use and storage.

**Figure 2 Data Management Scheme**



2. How does the lab and field staff ensure that no unauthorized changes are made to the chain of custody, sampling notebooks, laboratory notebooks and computer records?

*All data is recorded in bound books and/or by instrument printout. If data is recorded by hand, it must be done in ink. It is inappropriate to have pencils, erasers, or correction fluid at the bench. Data is kept either as a hardcopy, electronically, or both. All data must be protected by the use of audit trails, passwords, and controlled logbooks. If changes or corrections are necessary, it must be performed in a way that maintains the integrity of the data. Changes must be initialed and dated and corrections made using a single line strikeout. If the record does not allow space to clearly show the change, write it in the comments or at the bottom of the page. If electronic files must be changed, the file must be renamed so original information is not lost. If an entire batch of data must be reprocessed all files must be renamed. Reasons for doing so must be written in the comments and/or fully documented using a correction form. At no time shall data be obliterated for any reasons.*

3. How does the lab ensure that there are no errors in samples records including times when sample information is compiled, data calculated and/or transmitted.

*All data reported includes three levels of data review including calculations used to generate the reported analytical results. This review is performed by the analyst performing the test, the supervisor, and report generation manager or designee. Data reduction includes all activities that convert instrument/computer responses into reportable results. Manually entered information is reviewed for accuracy in the LIMS and in the signed copy of the client report.*

4. How will the data be archived once the report is produced? How can it be retrieved? (This applies to both electronic and hard copies).

*The laboratory will retain all records related to sample analysis including raw test data, calculations, derived data, calibrations and copies of test reports including chain of custodies. These records are archived in accordance with regulatory requirements for a minimum of ten (10) years or as required by specific client contracts. Software/hardware permitting the access of electronic data must be maintained. The copy of client reports is stored in a room requiring key-card access. All reports must be signed out using the archived reports logbook. Client reports and chain of custodies are also scanned for electronic storage. Written and printed data records (bench sheets, logbooks, electronic printouts, etc.) are scanned before*



being boxed and placed in storage. Electronic data is stored on a dedicated server, which is backed-up daily. The safety officer keeps safety and disposal information. Archived data is stored on-site until capacity is met. The oldest archived data is then moved to a secure storage facility. The storage and on-site facility are monitored and protected from fire and theft. Electronic data storage is free from magnetic sources. It is the goal of the lab to have redundant copies (hard and electronic) to prevent loss of records due to being misplaced or environmental deterioration or catastrophe.

## **Section C Assessment and Oversight**

### **C1 Assessment and Response Actions**

1. The Contractor is supposed to observe field personnel daily during sampling activities to ensure samples are collected and handled properly and report problems to DHEC within 24 hours. Please state who is responsible for doing this and what observations will be made. Will this person have the authority to stop work if severe problems are seen?

*Field Team Leader. Yes they will have stop-work authority.*

2. The SCDHEC UST QAPP, Revision 1.0 states that the Lab will receive an Offsite Technical System Audit. For this project, what assessments will be done on the Commercial Lab(s) that are being used—other than their certification audit? When or how often are these done? Who will the results be given to and who has the ability to stop work if problems are severe?

*The laboratory reports will include full QA/QC data and these data will be reviewed for quality issues for each set of samples submitted. Quality issues will be brought to the attention of the Laboratory Director for explanation and resolution. The TERRY Project Manager will have full authority to stop work and chose an alternate laboratory if needed. Any change in laboratory choice will be communicated with the SCDHEC Project Manager prior to the change.*

### **C2 Reports to Management**

See the SC DHEC UST QAPP, Revision 1.0.

## **Section D Data Validation and Usability**

See the SC DHEC UST QAPP, Revision 1.0.

**ATTACHMENT 1**

**Figures**



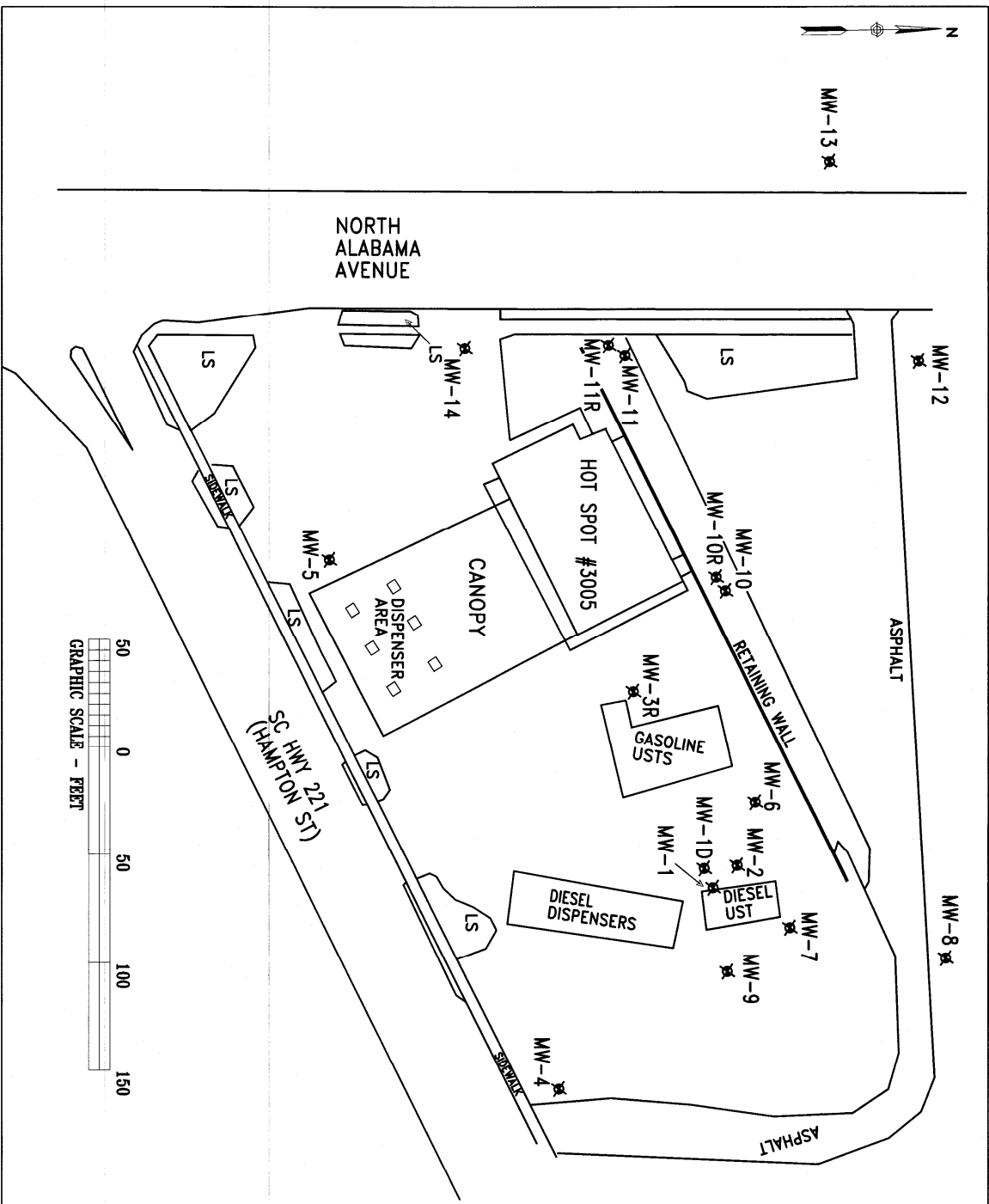
Hot Spot #3005  
 SCDHEC UST Permit #12719

### FIGURE 1 SITE LOCATION - USGS

Hot Spot #3005  
 SC Highway 221  
 Chesnee, South Carolina  
 SCDHEC Site # 12719



SIZE	TERRY Project No.	DWG NO.	REV
B	2230.8D	Figure 1 Site Location.dwg	
SCALE: NOT TO SCALE		DATE: AUGUST 2011	



**LEGEND & ABBREVIATIONS:**  
 ✕ MW = MONITORING WELL  
 LS = LANDSCAPING



**FIGURE 2  
 SITE MAP**

HOT SPOT #3005 SC HIGHWAY 221 CHESNEE, SOUTH CAROLINA	
TERRY PROJECT # 2230.8D	SCDHEC SITE ID # 12719
SCALE 1" = 50'	DATE AUGUST 2011

**ATTACHMENT 2**

**Chain of Custody**

LAB USE ONLY

### Access Analytical - Chain of Custody Record

LAB USE ONLY

Project Work Order # \_\_\_\_\_ PO # \_\_\_\_\_ Access Quote # \_\_\_\_\_ Laboratory ID: \_\_\_\_\_

Company Name: \_\_\_\_\_ Preservative: (\*see codes) \_\_\_\_\_

Report To: \_\_\_\_\_ Container Type: (\*see codes) \_\_\_\_\_

Address: \_\_\_\_\_

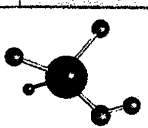
City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Email: \_\_\_\_\_

Project ID: \_\_\_\_\_

Sampled By: \_\_\_\_\_



**ACCESS ANALYTICAL, INC.**

7478 Carlisle Street Phone: (803) 781-4243  
Irmo, SC 29063 Fax: 781-4303

www.axs-inc.com

\*Preservative Codes (place corresponding # in block above analysis field):  
0 = None, 1 = HCL, 2 = HNO3, 3 = H2SO4, 4 = NaOH, 5 = Na2S2O8,  
6 = Method 5025 set w/ NaHSO3 & CH3OH, 7 = NaOH/ZnOAC, 8 = H3PO4.

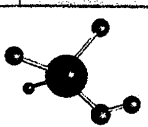
\*Matrix Codes (place corresponding code in matrix column):  
GW = ground water, WW = waste water, DW = drinking water, S = soil,  
SL = sludge, A = air, IW = industrial waste, WFO = waste oil, OT = other  
(specify in comments section)

\*Program Area Codes: CWA = Clean Water Act (for wastewaters), SDWA = Safe Drinking Water Act (for drinking waters), SHW = Solid and Hazardous Wastes (for soils, ground waters and waste samples)

\*Container Type: G = Glass, P = Plastic

Sample ID/Description	Date Collected	Time Collected	Type: (grab or composite)	Matrix: (see codes)	Program Area: (see codes)	TOTAL # of containers	REQUESTED LAB ANALYSIS: ↓		
							# of containers	per	analyte

Turnaround Time: ___ Standard ___ RUSH* *Date Required: _____ (For rush work, results emailed/faxed by end of business day on date required)	Project Location: ___ SC ___ NC ___ Other (specify) _____	Relinquished By:	Received By:	Date (mm-dd-yy)	Time (24HR)	Sample Temp. Upon Receipt (°C):		



7478 Carlisle Street Irmo, SC 29063 Phone: (803) 781-4243 Fax: 781-4303 www.axs-inc.com

\*Preservative Codes (place corresponding # in block above analysis field): 0 = None, 1 = HCL, 2 = HNO3, 3 = H2SO4, 4 = NaOH, 5 = Na2S2O8, 6 = Method 5025 set w/ NaHSO3 & CH3OH, 7 = NaOH/ZnOAC, 8 = H3PO4. \*Matrix Codes (place corresponding code in matrix column): GW = ground water, WW = waste water, DW = drinking water, S = soil, SL = sludge, A = air, IW = industrial waste, WFO = waste oil, OT = other (specify in comments section) \*Program Area Codes: CWA = Clean Water Act (for wastewaters), SDWA = Safe Drinking Water Act (for drinking waters), SHW = Solid and Hazardous Wastes (for soils, ground waters and waste samples) \*Container Type: G = Glass, P = Plastic

#### NOTES / COMMENTS

(if sample is a composite please use space below to note start/finish times & dates)

See Reverse for Terms and Conditions

Original Copy - Returned w/Report  
Yellow Copy - Access File Copy

**ATTACHMENT 3**

**Laboratory Standard Operating Procedure  
for Non-Conformance/Corrective Action**

GULF COAST ANALYTICAL LABS  
GENERAL  
STANDARD OPERATING PROCEDURES

PROCEDURE: GEN-018  
PAGE: 1 OF 3  
EFFECTIVE DATE: 05/14/10  
APPROVED BY: *Qu*  
QA/QC APPROVED: *JDT*

SUBJECT

SCOPE AND APPLICATION

A non-conformance is any indication or judgment that a product or service has not met the requirements of the relevant specification, contract, or regulation. It is the state of failing to meet the requirements. Correction action is the action taken to eliminate the causes of an existing non-conformance to prevent reoccurrence. Non-conformance identification and corrective action are an integral part of GCAL's plan for quality assurance in sample analysis. Every attempt is made by the laboratory staff to comply with any requirements set forth in methods, standard operating procedures, GCAL's Quality Assurance Program Plan, and any client or program specific requirements. When non-conformances occur and are not correctable on-the-spot, the occurrence is documented in the case narrative of the final report and the client is notified of the non-conformance. When errors, deficiencies, or out-of-control situations develop, corrective action is initiated.

DEFINITIONS

See SOP GEN-016

LOGIN CORRECTIVE ACTIONS

1. Login Discrepancy forms are maintained in the sample receiving department. Each form is specific to a particular workorder. The Discrepancy form will be labeled by the customer and workorder number.
2. If a Login or sample handling problem arises, a Login Discrepancy form is filled out and forwarded to the Project Manager. The Project Manager will contact the client and explain the discrepancy or problem. The client will provide information to clarify the issue and make the decision on whether to proceed with sample analysis. The client response is recorded on the Discrepancy form. Discrepancies in sample preservation will be noted on the preservation checklist. Login will notify the Project Manager of the lack of preservation by documenting on the preservation form. The Project Manager will notify the client of the non-conformance and obtain information as to how to proceed.



ANALYTICAL CORRECTIVE ACTIONS

1. Analytical problems encountered in sample preparation or analyses are documented in the logbook, on the bench sheet or on the re-extraction form. In these cases, the staff member will immediately correct the problem. The analyst is responsible for the initial review of all quality control associated with a sample batch. If any measurements are outside the acceptable control limits, the corrective actions required in the specific SOP will be followed. Narratives will be included with the final report if necessary.

GENERAL CORRECTIVE ACTIONS

A Non-conformance/Corrective Action Form (NCCAF) must be generated whenever a non-routine action is required to correct an issue. The NCCAF's will be maintained by the QA/QC department. Each form will have a specific number printed in the upper right-hand corner of the form. The initiator of the NCCAF will be responsible for logging the event into the Non-conformance/Corrective Action logbook. This book will be used to track the completion of corrective actions initiated in the laboratory.

Once the Corrective Action is completed the form will be forwarded to the QA/QC department for archival. The QA/QC department will be responsible for ensuring that all corrective actions are completed in a timely manner. The QA/QC department will also be responsible for monitoring the effectiveness of the corrective actions.

1. Any staff member who detects a recurring or unresolved quality assurance problem (non-conformance to previously established criteria or procedures) shall immediately notify the department supervisor. A NCCAF will be initiated. The QA/QC Director will be involved in the complete corrective action process for these types of situations.
2. A Client Inquiry form is initiated by the Project Manager if a client requests verification of data or has a question pertaining to a report or faxed data. All findings are documented on the Client Inquiry Form. A NCCAF may also be initiated as a result of the client inquiry.
3. Non-conformances will also be identified and initiated based on findings or deficiencies identified during data audits, internal audits, external audits, and performance evaluation studies. These will be initiated by the QA/QC

Department and assigned to the appropriate department for corrective action. Responses to deficiencies on performance evaluation studies will be filed with the study report. All other Corrective Action forms will be signed and maintained by the QA/QC Department.

4. When the corrective action process is completed, the form will be forwarded to the QA/QC Director for review to verify the issue has been resolved. The QA/QC Director will close the corrective action or plan for follow-up action if necessary. All NCCAF's will be maintained by the QA/QC Department. A review of the corrective actions will be included in reports to management.

#### EFFECTIVENESS OF CORRECTIVE ACTION

1. The QA/QC department is responsible for monitoring the effectiveness of corrective actions.
2. Following corrective action, additional training should be provided to the personnel involved. Training will be documented and signed by the personnel.
3. When necessary, periodic follow-up audits will be performed to review that procedures are being followed.
4. When corrective action involves a change to a test, statistical analysis of QC data should be monitored to show that the system is in control.
5. If a corrective action is shown to not be effective, further corrective action is necessary and should be initiated immediately.

**ATTACHMENT 4**

**Laboratory Sample Disposal  
Procedures and Policies**

### **10.1 Waste Collection and Storage**

Samples are stored in the appropriate cooler for 60 days after receipt. After 60 days, samples are moved to a waste area. The samples are scanned out for disposal on the LIMS. The samples are then stored in the waste staging area until disposal into appropriate drums. Hazardous samples are returned to the client whenever possible to be disposed of with larger quantities of the sample material. Laboratory waste is segregated by laboratory personnel into waste streams, which have been established by the Regulatory Compliance Officer. The waste streams are determined by analysis of the waste and through process knowledge. All laboratory wastes are disposed of in the proper container. No waste is placed in regular trash containers or poured down the drain. Waste is stored in drums in satellite accumulation areas and then in the central accumulation facility. Waste disposal service is provided by approved vendors who will incinerate, landfill, treat, or reclaim the waste based on the characteristics.

### **10.2 Pollution Prevention**

Environmental concerns, risks to employees and the public, and high disposal costs have increased the need and effort of the laboratory to minimize or prevent waste generation. The quantity of chemicals and standards purchased is based on expected usage during its shelf life and the disposal cost of the unused material. The volume of standards and reagents prepared in the laboratory reflect stability and anticipated usage. If possible, methods requiring the use of hazardous chemicals or that produce hazardous waste are replaced with an alternative method. Sample containers are selected based on the minimum volume that is necessary to perform a test, therefore reducing sample waste. Sample sizes are reduced in some cases, therefore reducing the quantities of extraction solvents and reagents.

**ATTACHMENT 5**

**Laboratory Facility  
Description and Equipment**

## **6 Facility Description and Equipment**

### **6.1 Laboratory Facilities**

GCAL is a full service environmental laboratory. The laboratory was established in 1979 with a staff of two and has grown to its present size of over 50 employees operating in a modern laboratory space of 20,000 square feet.

The laboratory's working areas are subdivided into areas for instrumental analysis, wet chemistry and sample preparation. These areas are designed to allow for a safe and comfortable working environment with special attention having been given to ventilation, airflow patterns and environmental controls. Administrative and Marketing areas are located for optimization of supervision and to allow for efficient handling of paperwork and results. The laboratory is protected by an electronic security and fire monitoring system. A floor plan of the facility is included in Appendix D.

### **6.2 Procurement and Inventory Control**

Chemical reagents, solvents, gases, glassware and general chromatographic supplies are ordered as needed to maintain sufficient quantities on hand for use. Purchase orders are maintained as an inventory control of materials ordered by the laboratory. All orders are processed through central receiving and routed to the appropriate departments. Routine supplies are maintained on site in an inventory control stock room.

The purchase of analytical instrumentation is based on anticipated sample volume and the need to maintain superior quality data. Specifications are carefully examined to be sure new instrumentation meets current and anticipated needs. Warranty and service contract information is gathered at the time bids are reviewed and this information is considered in making the final selection. An extensive performance check-out before the instrument is accepted is mandatory. New equipment must undergo a rigorous method validation before being put into production. Operators of new instruments are sent to training courses if necessary.

Inventory records are maintained for all major capital equipment. Major suppliers of consumable items are:

Allometrics	Templet & Templet	Dionex
Fisher Scientific Company	Supelco	CPI
Environmental Express	Perkin-Elmer	Shimadzu

### **6.3 Capital Equipment**

Laboratory equipment and instrumentation are maintained in compliance with instrumentation manuals. All equipment is kept in working condition to allow for conformity to each approved method. The key instrumentation such as Gas Chromatography, Gas Chromatographs/Mass Spectrometers, ICP and Atomic Absorption Spectrometers has maintenance contracts with their

respective suppliers. A list of instrumentation and equipment is maintained by the QA/QC Department and is included in Appendix C.

#### **6.4 Equipment Operation and Calibration**

Equipment is defined as any non-disposable mechanical and/or electronic device used in the generation or measurement of data.

- 6.4.1 The calibration of instruments and support equipment is required to ensure that the analytical system is operating correctly and functioning within acceptable precision, accuracy and sensitivity limits. Calibration is defined as the systematic determination of the relationship of the response of the measurement system to a known standard. The calibrations or calibration checks are performed with reference standards traceable to primary standards (e.g. NIST or other certified standards). If traceable chemical standards are not available, standards are prepared according to the laboratory quality control procedures or the project's requirements. The calibration requirements for each type of equipment or instrument are defined in the standard operating procedures. Additionally, specific requirements are defined in a project plan. Table 6-1 summarizes the calibration requirements of the lab.
- 6.4.2 It is the responsibility of the analyst to verify that the instrument configuration and operating conditions used satisfy the analytical requirements and to maintain quality control data confirming instrument performance and analytical results. The inability to achieve calibration is an indication that the equipment needs maintenance. It is not acceptable for an analyst to repeat analysis of calibration or QC standards beyond what is allowed by the SOP until "acceptable" results are achieved.
- 6.4.3 If equipment outside the permanent control of the laboratory is used, it must meet the same criteria. The laboratory shall ensure that the function and calibration status of the equipment is checked and shown to be satisfactory before it is put into service. The equipment must meet all requirements of LADEQ regulations/NELAC standards.

#### **6.5 Equipment Maintenance**

Maintenance is defined as cleaning and/or replacing equipment components to assure that the equipment has been properly and periodically serviced and is in satisfactory condition. The equipment manual is a good guideline to determine preventive and routine maintenance schedules. These manuals also assist in identification of commonly needed replacement parts so that an inventory of these parts can be properly maintained.

- 6.5.1 A maintenance log is issued for each piece of equipment. It shall be maintained by the analyst to describe problems, the maintenance performed on the instrument and outcome. This includes routine service checks by laboratory personnel (unless described in the SOP) as well as factory service calls. This log also provides a written source for future use in preventive maintenance. The logs are periodically reviewed by QA.

6.5.2 In order to prevent system down time, minimize corrective maintenance cost and to help insure data validity, GCAL uses a system of preventive maintenance. All routine maintenance is performed as recommended by the manufacturer. Maintenance contracts are purchased for most instruments. This insures periodic preventive maintenance visits by factory authorized service representatives and immediate service for corrective actions if required.

6.5.3 When a piece of equipment is deemed defective, it is taken out of service and identified with an "OUT OF SERVICE" label. For support equipment such as balances, ovens, coolers, and pipettes, the QA/QC Department is notified so that proper servicing and repair can be scheduled. The analysts perform routine and preventive maintenance for major instrumentation. If outside service is necessary, the Department Supervisor schedules it, with approval from the Laboratory Manager. Satisfactory instrument performance must be verified prior to returning to service any repaired equipment.

6.5.4 Table 6-1 is a list of support equipment calibration frequencies. In addition to the stated frequencies, calibrations are performed prior to first use and upon evidence of deterioration. Class "A" glassware is only verified upon evidence of deterioration. Calibration acceptance is based on 10 replicate measurements. See SOP GEN-010 for more details.

**Table 6-1 Equipment Calibration**

<b>Equipment</b>	<b>Calibration*</b>	<b>Frequency</b>
Analytical Instrument	Traceable standard	Each day of use or as required by instrument manual
Oven and Refrigerator	Calibrated thermometer	Each day of use
Thermometers	NIST Thermometer	Annually (Mercury), Quarterly (Digital)
NIST Thermometer	Certified off-site	As required by certificate
Balance	Certified weights	Each day of use, certified semi-annually
Weights	Certified off-site	As required by certificate
Adjustable pipettes	Weight	Each day of use
Non standard lab ware	Weight	By lot
Non-class A volumetric	Weight	Quarterly
Agitators (TCLP, SPLP)	Stop watch	Monthly

\* Acceptance criteria are included in logbook used to document check, or in certificate.

## 6.6 Reagents

6.6.1 All solvents used for preparation of standards must be of acceptable purity to not interfere or invalidate the test. Purity of reagents must meet the reference method requirements and must not invalidate the test as shown by the acceptability of method blanks.

6.6.2 Reagents must be stored as specified by the manufacturer, and must be disposed of after the expiration date. If no expiration date is supplied, label acids and bases for five years from receipt, and other reagents as one year from receipt.



- 6.6.3 Neat chemicals must be stored as specified by the manufacturer, and must be disposed of after the expiration date. If no expiration date is supplied, label the neat chemicals for 10 years from receipt.
- 6.6.4 All reagents must be in labeled bottles with the date of receipt and date opened marked in permanent marker.
- 6.6.5 Reagent water is available throughout the lab. GCAL uses de-ionized water supplied by US Filter. The water conductivity is monitored daily and is serviced when necessary.

#### 6.7 Standards

Preparation of standards for calibration or QC must be made from materials of known purity, (98% or better preferred) or from purchased concentrates certified by NIST, EPA, or other acceptable agencies.

- 6.7.1 Stock standards can be kept up to one year if the manufacturer indicates no expiration date. Upon preparation of the standard, the following items must be recorded on the bottle containing the standard: laboratory assigned ID, standard name, concentration, initials of the analyst preparing the standard, date prepared, and expiration date. All other information regarding the standard including solvent used, lot number(s) of solvent used, the analyte source, purity and lot number, expiration date, concentration, dilution procedure, analyst's initials, and date prepared must be entered in the log book.
- 6.7.2 Preparation of intermediate standard solutions is necessary for many tests. These working standards include calibration standards, spiking solutions, surrogate solutions, internal standard solutions, etc., and must be stored as suggested by the manufacturer when not in use. Working standards for the analysis of volatile organic constituents must be prepared at least once in two weeks or more often if required by the method or if performance is compromised. Working standards for the analysis of semi-volatile organic constituents and pesticides are prepared as needed or every six months. Working standards for trace metal analysis is prepared at least once a month for concentrations of 1 mg/L and less. Calibration standards for mercury are digested as needed and calibration standards for graphite furnace are prepared daily. Working standards expiration cannot be longer than the expiration of the parent standard or reagents used. Standard expiration is extended by approval of the QA Director. Acceptable performance must be demonstrated and documentation kept on file. Prepared working standards are verified by comparison to response from the previous calibration as described in SOP GEN-006.
- 6.7.3 The identification of each standard prepared must be unique and all documents related to sample analysis in which the standard was used must contain this unique identification. The documentation shall be such that all of the standard information could be traced from the raw data for the sample.
- 6.7.4 Freezers and refrigerators are designated for storage of standards. Samples are not stored with standards. Refrigerators or freezers used for storage of standards or samples are

monitored for temperature compliance seven days a week. Refrigerators are maintained at  $<6^{\circ}\text{C}$  and  $>0^{\circ}\text{C}$ . Freezers are maintained between  $-10^{\circ}\text{C}$  and  $-20^{\circ}\text{C}$ .

## **Appendix C**

## GCAL Equipment List

ORGANICS	Location	Date Received	Date in Service	Condition	MAKE/MODEL	SERIAL NUMBER
GCMSV 4	MSSV Lab	September-05	September-08	new	AGILENT 5975	US52430653
	MSSV Lab	September-05	September-08	new	AGILENT 6890N	CN10532052
GCMSV 5	MSSV Lab	November-05	November-05	new	AGILENT 5975	US53931245
	MSSV Lab	November-05	November-05	new	AGILENT 6890N	CN10539069
GCMSV 6	MSSV Lab	July-07	July-07	new	Agilent 7890	CN10717068
	MSSV Lab	July-07	July-07	new	Agilent 5975C	US71235850
GCMSV 0	MSV lab	September-01	September-01	new	HP 5890 SERIES II	3336A58851
	MSV lab	September-01	September-01	new	HP 5972	3501A02325
	MSV lab	September-01	September-01	new	Teledyne/Tekmar-XPT	US05279001
	MSV lab	September-01	September-01	new	T/D Solatek 72	USO2294002 (GCAL# 0337)
GCMSV 5	MSV lab	October-03	October-03	new	HP 5890 SERIES II	3310A48460
	MSV lab	October-03	October-03	new	HP 5971	3307A00395
	MSV lab	October-03	October-03	new	Tekmar LCS 2000	90211015/93154002/9115009
GCMSV 8	MSV Lab	October-01	October-01	new	AGILENT 5973	US10441235
	MSV Lab	October-01	October-01	new	AGILENT 6890N	US10134037
	MSV Lab	October-01	October-01	new	Teledyne/Tekmar-XPT	US03240004
	MSV Lab	October-01	October-01	new	T/D Solatek 72	US05283001
GCMSV 9	MSV lab	April-07	April-07	new	AGILENT 5979B	US63234781
	MSV lab	April-07	April-07	new	AGILENT 6890N	CN10647134
	MSV lab	April-07	April-07	new	Teledyne/Tekmar-XPT	US06296004
	MSV lab	April-07	April-07	new	T/D Solatek 72	US07022004
GCMSV 11	MSV Lab	April-04	April-08	new	AGILENT 5973	US33220204
	MSV Lab	April-04	April-08	new	AGILENT 6890N	CN10407013
	MSV Lab	July-07	July-07	new	Teledyne/Tekmar-XPT	US03140007
	MSV Lab	July-07	July-07	new	T/D Solatek 72	USO2098018
GCMSV 12	MSV Lab	June-10	June-10	new	AGILENT 5973	US10441235
	MSV Lab	June-10	June-10	new	AGILENT 7890A	CN10211053
	MSV Lab	June-10	June-10	new	Teledyne/Tekmar-XPT	US10160001
	MSV Lab	June-10	June-10	new	T/D Solatek 72	US05283001
FUME HOOD	MSV Lab	January-97	January-97	new	LABCONCO (#20) GCMSV	N/A
FUME HOOD	MSSV Lab	January-97	January-97	new	LABCONCO (#19)	N/A
COOLER	MSV lab	January-97	January-97	new	TRUE (#22)	1330620
COOLER	MSV lab	January-97	January-97	new	TRUE/GDM-45 (#30)	1-3681854
REFRIG/FREEZER	MSV lab	January-97	January-97	new	KENMORE/2538684012	0983108619
REFRIG/FREEZER	MSV lab	January-97	January-97	new	SEARS (V0A 2)	983108619
FREEZER#12	MSV lab	January-97	January-97	new	FRIGIDAIRE, MODEL #MFU17F3GW6 (#12)	WB02927861
REFRIGERATOR (#41)	MSV lab	February-11	February-11	new	FRIDGIDAIRE (#41)	BU1210823890132
BALANCE	MSV lab	January-97	January-97	new	METTLER AE200	L65273
GCSV 12	GCSV Lab	November-03	November-03	new	AGILENT TECH 6980N	US10338067
GCSV 14	GCSV Lab	January-04	January-04	new	AGILENT TECH 6980N	US10342128
GCSV 15	GCSV Lab	April-04	April-04	new	AGILENT TECH 6980N	CN10413018
GCSV 16	GCSV Lab	August-05	August-05	new	AGILENT TECH 6980N	CN10525006
GCSV 17	GCSV Lab	September-05	September-05	new	AGILENT TECH 6980N	CN10529074

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GCSV 18	GCSV Lab	September-05	September-05	new	AGILENT TECH 6980N	CN10528084
GCSV 19	GCSV Lab	September-05	September-05	new	AGILENT TECH 6980N	CN10534099
GCSV 20	GCSV Lab	October-05	October-05	new	AGILENT TECH 6980N	CN10534109
GCSV 21	GCSV Lab	December-05	December-05	new	AGILENT TECH 6980N	CN10538039
FUME HOOD	GCSV Lab	January-97	January-97	new	LABCONCO(#33)	301116
GCV 5	GCV Lab	February-08	February-08	new	AGILENT 6890 SERIES	US00026701
GCV 6	GCV Lab	November-05	November-05	new	AGILENT 6890N SERIES	CN10538061
GCV 7	GCV Lab	April-07	April-07	new	AGILENT 6890N SERIES	CN10545063
GCV 8	GCV Lab	April-08	April-08	new	AGILENT 6890N SERIES	CN10636089
GCV9	GCV Lab	March-05	June-10	new	AGILENT 6890N	CN10452003
PURGE/TRAP INSTRUMENT 5	GCV Lab	February-08	February-08	new	TELEDYNE TEKMAR / 14-8900-00T	US05257002
PURGE/TRAP INSTRUMENT 6	GCV Lab	November-05	November-05	new	TEKMAR	BETA 005
PURGE/TRAP INSTRUMENT 7	GCV Lab	April-07	April-07	new	TELEDYNE TEKMAR XPT / 14-8900O0T	US0527002
PURGE/TRAP INSTRUMENT 9	GCV Lab	March-05	June-10	new	TELEDYNE TEKMAR XPT	US0507010
AUTOSAMPLER INSTRUMENT 5	GCV Lab	February-08	February-08	new	TELEDYNE TEKMAR SOLATEK 72	US02277005
AUTOSAMPLER INSTRUMENT 6	GCV Lab	November-05	November-05	new	TELEDYNE TEKMAR AQUATEk 70	US05355004
AUTOSAMPLER INSTRUMENT 7	GCV Lab	April-07	April-07	new	TELEDYNE TEKMAR AQUATEk 70	US05347003
AUTOSAMPLER INSTRUMENT 9	GCV Lab	March-05	June-10	new	TELEDYNE TEKMAR SOLATEK 72	US0324004
Digital Vortex Meter	GCV Lab	November-08	November-08	new	N/A	080801081
BALANCE	GCSV Lab	January-97	January-97	new	SARTORIUS AC211P	50305162
REFRIGERATOR (#43)	GCV Lab	March-11	March-11	new	Frigidaire (#43)	KA03300793
REFRIGERATOR	GCSV Lab	January-97	January-97	new	MASTERBILT (#18)	254034
FREEZER	GCSV Lab	January-97	January-97	new	Frigidaire (#34)	WB44328710
REFRIG/FREEZER	GCSV Lab	January-97	January-97	new	SEARS (#11)	BA01000875
REFRIG/FREEZER	GCSV Lab	January-97	January-97	new	KENMORE (#14)	BA04391055
REFRIG/FREEZER	GCSV Lab	January-97	January-97	new	KENMORE (#15)	BA04391057
REFRIG/FREEZER	GCSV Lab	January-97	January-97	new	KENMORE (#17)	BA03100524
FREEZER	GCSV Lab	January-97	January-97	new	Whirlpool (#37)	EWV3489616
FREEZER	GCSV Lab	January-97	January-97	new	Frigidaire (#26)	WB83724994
<b>HPLC</b>	<b>Location</b>	<b>Date Received</b>	<b>Date in Service</b>	<b>Condition</b>	<b>MAKE/MODEL</b>	<b>SERIAL NUMBER</b>
COLUMN HEATER	MSSV Lab	December-06	December-06	new	EPPENDORF TC-45	N/A
HPLC - 2	MSSV Lab	December-06	December-06	new	AGILENT 1200 SERIES - MWD	DE60555127
	MSSV Lab	December-06	December-06	new	AGILENT 1200 SERIES - FLD	DE60555722
	MSSV Lab	December-06	December-06	new	AGILENT 1200 SERIES - TCC	DE63060177
	MSSV Lab	December-06	December-06	new	AGILENT 1200 SERIES - QUANT PUMP	DE60556714
	MSSV Lab	December-06	December-06	new	AGILENT 1200 SERIES - ALS	DE60557762
	MSSV Lab	December-06	December-06	new	AGILENT 1200 SERIES - DEGASSER	JP62354304
<b>METALS</b>	<b>Location</b>	<b>Date Received</b>	<b>Date in Service</b>	<b>Condition</b>	<b>MAKE/MODEL</b>	<b>SERIAL NUMBER</b>
ICP/MS	Metals Lab	September-10		new	Agilent 7700/7500 Series	JP10280491
ICP/MS Autosampler	Metals Lab	September-10		new	Agilent ASX-500	US071080A520
ICP	Metals Lab	September-05	September-05	new	PERKIN-ELMER OPTIMA 4300DV	077N0050202
AUTOSAMPLER	Metals Lab	September-05	September-05	new	PERKIN-ELMER AS93 Plus	N/A
ICP	Metals Lab	May-00	May-00	new	PERKIN-ELMER 5300DV	077N5090602
GFAA 2	Metals Lab	January-09	January-09	used	PERKIN-ELMER 800	8411

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GFAA Autosampler	Metals Lab	January-09	January-09	used	PERKIN-ELMER AS800	1852
GFAA Chiller	Metals Lab	January-09	January-09	used	N/A	N/A
HG ANALYZER	Metals Lab	January-97	January-97	new	PERKIN ELMER/FIMS 400	4515
CHILLER	Metals Lab	January-97	January-97	new	Polyscience	G51284
FUME HOOD--FLOW SCIENCES	Metals Lab	January-97	January-97	new	FS3100BKFVA	11-j-07-04
FUME HOOD	Metals Lab	January-97	January-97	new	FS3100BKFVA	11-j-07-15
<b>METALS PREP</b>	<b>Location</b>	<b>Date Received</b>	<b>Date in Service</b>	<b>Condition</b>	<b>MAKE/MODEL</b>	<b>SERIAL NUMBER</b>
MICROWAVE	Metals Prep Lab	January-97	January-97	new	CEM MARSS	DS-6208
DIGESTION BLOCKS (4)	Metals Prep Lab	January-97	January-97	new	CPI MOD BLOCK	N/A
FUME HOOD -FLOW SCIENCES (2)	Metals Prep Lab	January-97	January-97	new	FS3100BKDVA / FS3100BKGVA	05-N-03-02 / 08-M-13-02
BALANCE	Metals Prep Lab	July-07	July-07	new	Mettler Toledo XS 104	1128260845
<b>EXTRACTIONS</b>	<b>Location</b>	<b>Date Received</b>	<b>Date in Service</b>	<b>Condition</b>	<b>MAKE/MODEL</b>	<b>SERIAL NUMBER</b>
FUME HOODS (18)	EXT Area	January-97	January-97	new	N/A	N/A
GLASS WASHER	EXT Area	January-97	January-97	new	AMSCO 400	36911195001
SHAKER (4)	EXT Area	January-97	January-97	new	GLAS-COL 099A	N/A
MILLIPORE(2)	EXT Area	January-97	January-97	new	N/A	N/A
VACUUM PUMP	EXT Area	May-08	May-08	new	Edwards	76434563
GPC (1)	EXT Area	January-97	January-97	new	ABC AP-100	9161SI/AS007-9114-9114
CENTRIFUGE	EXT Area	January-97	January-97	new	IEC HN-SII	N/A
OVEN	EXT Area	January-97	January-97	new	FISHER ISOTEMP 655G	11000184
TCLP/ZHE ROTATOR	EXT Area	January-97	January-97	new	ASSOCIATED DESIGN	NA 05101808
ZHE EXTRACTORS	EXT Area	January-97	January-97	new	ENVIRONMENTAL EXPRESS	NA 05081684
SONICATOR (6)	EXT Area	January-97	January-97	new	FISHER SCIENTIFIC	BELW0521408FBW1510134408FBW25101849FBW15101850
INCUBATOR SHAKER	EXT Area	January-97	January-97	new	NEW BRUNSWICK SCIENTIFIC/CLASSIC SE	100524881
BALANCE	EXT Area	January-97	January-97	new	METTLER PM 3000	M33557
BALANCE	EXT Area	January-97	January-97	new	METTLER PG 3001 S	1117331005
BALANCE	EXT Area	January-97	January-97	new	AND FX-300	5015502
BALANCE	EXT Area	January-97	January-97	new	OHAUS SCOUT PRO SP2001	7124330243
BALANCE	EXT Area	January-97	January-97	new	OHAUS SCOUT PRO SP402	7124280031
BALANCE	EXT Area	January-97	January-97	new	OHAUS SCOUT PRO SPE4001	7123450167
BALANCE	EXT Area	January-97	January-97	new	OHAUS SCOUT PRO SP2001	7124371673
PH METER	EXT Area	January-97	January-97	new	ORION SA520	QT20A
PH METER	EXT Area	January-97	January-97	new	THERMO ORION 720A	074216
PH METER	EXT Area	January-97	January-97	new	ORION 720A+	085153
PH METER	EXT Area	January-97	January-97	new	ORION 720A+	089622
PH PROBE 01/ATC PROBE	EXT Area	January-97	January-97	new	ORION SURE-FLOW ROSS 8172BNWP	LY1-16730
PH PROBE 03/ATC PROBE	EXT Area	January-97	January-97	new	ORION SURE-FLOW ROSS 8172BNWP	MX3-10451
PH ELECTRODE (03)	EXT Area	January-97	January-97	new	ORION SURE FLOW	MP3-10011
COOLER	EXT Area	January-97	January-97	new	TRUE (#5)	1334961
REFRIG/FREEZER	EXT Area	January-97	January-97	new	WHITE WESTINGHOUSE (#8)	LA10903763
REFRIG/FREEZER	EXT Area	January-97	January-97	new	WHITE WESTINGHOUSE (#9)	BA04391056
REFRIG/FREEZER	EXT Area	January-97	January-97	new	Frigadaire (R#34)	BA61019273
FREEZER	EXT Area	January-97	January-97	new	WHITE WESTINGHOUSE (#23)	WB40802629
ULTRASONIC CLEANER	EXT Area	January-97	January-97	new	FISHER SCIENTIFIC/FS30	RTB040265340



GCAL Equipment List

WET CHEMISTRY	Location	Date Received	Date in Service	Condition	MAKE/MODEL	SERIAL NUMBER
MUFFLE FURNACE	EXT Area	January-97	January-97	new	FISHER SCIENTIFIC/ISOTEMP 550 SERIES M	410N0074
STANDARD TEST SIEVE	EXT Area	January-97	January-97	new	WS TYLER/MODEL #RX-812	24372
PYROMETER	EXT Area	January-09	January-09	new	PM20700	SN 8502832
SAMPLE CONCENTRATOR	EXT Area	January-05	January-05	new	OA-SYS	SN 20018
SAMPLE CONCENTRATOR	EXT Area	January-05	January-05	new	OA-SYS	SN 20019
TOX	Wet Chemistry	January-97	January-97	new	MITSUBISHI TOX-10E	N/A
TOC (1)	Wet Chemistry	June-08	June-08	new	Shimadzu TOC-V CSH	H51104535288CS
	Wet Chemistry	January-97	January-97	new	Shimadzu Solid Module	H52504500370
	Wet Chemistry	January-97	January-97	new	Shimadzu Autosampler	H52104502483
AUTOANALYZER	Wet Chemistry	June-08	June-08	new	LACHET QUICK CHEM AE	200-474
IC	Wet Chemistry	October-00	October-00	new	DIONEX LC20/ED40/AD20/AS40	900915
COD REACTOR #4	Wet Chemistry	January-97	January-97	new	HACH COD REACTOR	910404575/920800007697
COD REACTOR #5	Wet Chemistry	January-11	January-11	new	Lovibond CSB/Reactor ET125	0310/4260
TURBIDIMETER	Wet Chemistry	January-97	January-97	new	HACH 2100P	960700011424
SPECTROPHOTOMETER	Wet Chemistry	January-97	January-97	new	HACH #3 DR 2800	1209697
SPECTROPHOTOMETER	Wet Chemistry	January-97	January-97	new	HACH #4 DR 2800	11996-79
TITRATOR	Wet Chemistry	January-97	January-97	new	METTLER TOLEDO DL53	S119484414
VISCOMETER	Wet Chemistry	January-97	January-97	new	BROOKFIELD DVII	32587
WATER BATH	Wet Chemistry	January-97	January-97	new	BROOKFIELD TC-200	GCAL# 0311
CLOSED CUP FLASH PT	Wet Chemistry	January-97	January-97	new	PRECISION SCIENTIFIC	10BR-12
FLASHPOINT (FP3)	Wet Chemistry	December-08	December-08	new	Herzog HFP 339	083390442
AMMONIA PROBE	Wet Chemistry	January-97	January-97	new	ORION 95-12	N/A
OXYGEN BOMB CAL	Wet Chemistry	January-97	January-97	new	PARR	6616
CONDUCTIVITY METER 2	Wet Chemistry	January-11	14/11	new	OAKTON pH/CON 510 SERIES	528330
COLIFORM BATH 1	Wet Chemistry	January-92	January-92	new	PRECISION SCIENTIFIC INCUBATOR	10AZ-1
COLIFORM BATH 2	Wet Chemistry	May-08	May-08	new	THERMOSCIENTIFIC INCUBATOR	204785
COLIFORM BATH 3	Wet Chemistry	May-09	May-09	new	THERMOSCIENTIFIC INCUBATOR	207063
PH METER	Wet Chemistry	January-97	January-97	new	ORION 720A+	092891
PH PROBE 04/ATC PROBE	Wet Chemistry	January-97	January-97	new	ORION SURE-FLOW ROSS 8102BNUWP	LUJ-18038
PH METER	Wet Chemistry	January-97	January-97	new	ORION 420A	7881
PH PROBE	Wet Chemistry	January-97	January-97	new	ORION TRIODE	N/A
PH PROBE/ATC PROBE	Wet Chemistry	January-97	January-97	new	ORION COMB 915600/917006	N/A
PH METER (PH-05)	Wet Chemistry	October-08	October-08	new	ORION 2STAR	B11765
PH PROBE	Wet Chemistry	January-97	January-97	new	ORION 9107APMD	RMR21
PH Meter (PH-07)	Wet Chemistry	September-10	September-10	new	Thermo Scientific/Dual Star	E03025
AUTOCLAVE	Wet Chemistry	September-10	September-10	new	Tuttnauer	10003285
DO METER	Wet Chemistry	January-97	January-97	new	YSI MODEL 59/5905 PROBE	93A01946
DO METER	Wet Chemistry	March-10	March-10	new	YSI MODEL 5100	10A 101264
OVENS (2)	Wet Chemistry	January-97	January-97	new	BLUE M SW17TA-1	SW-5478/SW-5408
OVEN	Wet Chemistry	January-97	January-97	new	FISHER SCIENTIFIC 3510-ISF	1879070606147
OVEN	Wet Chemistry	January-97	January-97	new	GRIEVE PL-326	444341
OVEN	Wet Chemistry	January-97	January-97	new	FISHER SCIENTIFIC ISOTEMP/MODEL 516G	506NO196
OVEN	Wet Chemistry	January-97	January-97	new	FISHER SCIENTIFIC ISOTEMP/MODEL 650G	508NO138

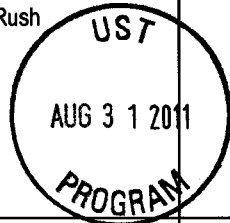
GCAL Equipment List

OVEN	Wet Chemistry	January-97	January-97	new	FISHER SCIENTIFIC ISOTEMP/MODEL 650G	508N0137
FURNACE	EXT area	January-97	January-97	new	THERMOLYNE 1500	N/A
DESSICATORS (7)	Wet Chemistry	January-97	January-97	new	DRY KEEPER	N/A
INCUBATOR	Wet Chemistry	January-97	January-97	new	FISHER SCIENTIFIC(#3)	WB93928030
BALANCE	Wet Chemistry	January-97	January-97	new	METTLER AE160	C05693
BALANCE	Wet Chemistry	January-97	January-97	new	METTLER AX504	1122043050
BALANCE	Wet Chemistry	January-97	January-97	new	SARTORIUS / PT6-000V2	60802675
BALANCE	Wet Chemistry	January-97	January-97	new	FISHER SCIENTIFIC / ACCU-224	F224075004
FUME HOODS (5)	Wet Chemistry	January-97	January-97	new	N/A	N/A
INCUBATOR (BOD#6)	Wet Chemistry	January-97	January-97	new	REVCO	T28C-142152-TC
INCUBATOR (BOD#2)	Wet Chemistry	January-97	January-97	new	PRECISION SCIENTIFIC	10AZ-12
INCUBATOR (BOD#7)	Wet Chemistry	January-97	January-97	new	FISHER SCIENTIFIC	407N0211
INCUBATOR (BOD#5)	Wet Chemistry	January-97	January-97	new	FISHER SCIENTIFIC	WB93928030
INCUBATOR (BOD#8)	Wet Chemistry	January-97	January-97	new	FISHER SCIENTIFIC	WB53337398
INCUBATOR (BOD#9)	Wet Chemistry	January-97	January-97	new	FISHER SCIENTIFIC	2018080398339
INCUBATOR (BOD#10)	Wet Chemistry	January-97	January-97	new	FISHER SCIENTIFIC	2018080607337
REFRIG/FREEZER	Wet Chemistry	January-97	January-97	new	SEARS (#19)	LA91905856
REFRIG/FREEZER	Wet Chemistry	January-97	January-97	new	WHITE WESTINGHOUSE (#1)	WB10507478
VACUUM PUMP	EXT Area	May-08	May-08	new	Edwards	7643558
GRINDING MILL	Wet Chemistry	January-97	January-97	new	THE STRAUB CO/MODEL 4E	N/A
<b>LOG-IN</b>	<b>Location</b>	<b>Date Received</b>	<b>Date in Service</b>	<b>Condition</b>	<b>MAKE/MODEL</b>	<b>SERIAL NUMBER</b>
FUME HOOD (1)	LOGIN Area	January-97	January-97	new	FUME HOOD #9	N/A
COOLER	LOGIN Area	January-97	January-97	new	TRUE (#2)	708391
COOLER	LOGIN Area	January-97	January-97	new	TRUE (#3)/GDM-72	1-3792963
WALK-IN COOLER (2)	LOGIN Area	January-97	January-97	new	N/A	N/A
REFRIG/FREEZER	LOGIN Area	January-97	January-97	new	KENMORE (#4)	BA01902878
IR THERMOMETER	LOGIN Area	May-08	May-08	new	FISHER SCIENTIFIC	72704761
REFRIG/FREEZER	LOGIN Area	January-97	January-97	new	FRIGIDAIRE (#33)	BA454622395
FREEZER	LOGIN Area	January-97	January-97	new	FRIGIDAIRE(#27) MFU17F3GW6	WB03102969
SCANNER	LOGIN Area	January-97	January-97	new	HEWLETT PACKARD SCANJET 5470C/C9850	CN1B41HOTZ
FREEZER	LOGIN Area	January-97	January-97	new	FRIGIDAIRE (#28) FFU20FC4CWO	WB34937210
FREEZER	LOGIN Area	January-97	January-97	new	FRIGIDAIRE (#29) FFC15C4CWO	WB40427812



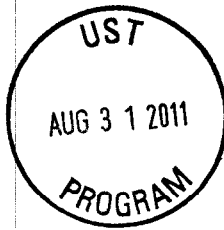
 		<b>ASSESSMENT COMPONENT COST AGREEMENT SOUTH CAROLINA</b> Department of Health and Environmental Control Underground Storage Tank Management Division State Underground Petroleum Environmental Response Bank Account			
<b>Facility Name:</b>	<b>Hot Spot #3005</b>				
<b>UST Permit #:</b>	12719	<b>Cost Agreement #:</b>	Proposal		
ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL	
<b>1. Plan*</b>					
B. Tax Map		x	\$50.00		\$0.00
C. Tier II or Comp. Plan /QAPP Appendix B	1	x	\$525.00		\$525.00
<b>2. Receptor Survey *</b>		x	\$500.00		\$0.00
<b>3. Survey (500 x 500 feet)</b>					
A. Comprehensive Survey		x	\$1,000.00		\$0.00
B. Subsurface Geophysical Survey					
1. < 10 meters below grade		x	\$2,750.00		\$0.00
2. > 10 meters below grade		x	\$3,250.00		\$0.00
C. Geophysical UST or Drum Survey		x	\$1,125.00		\$0.00
<b>4. Mob/Demob (Each)</b>					
A. Equipment		x	\$575.00		\$0.00
B. Personnel	2	x	\$290.00		\$580.00
C. Adverse Terrain Vehicle to install wells		x	\$575.00		\$0.00
<b>5. Soil Borings (hand auger)* (Feet)</b>		feet x	\$14.00		\$0.00
<b>6. Soil Borings (drilled) &amp; Field Screening *</b>					
Rate includes collection of water sample or soil sample, and lab or other analyses					
A. Standard		feet x	\$17.00		\$0.00
C. Fractured Rock		feet x	\$27.50		\$0.00
<b>7. Soil Leachability Model (Each)</b>		each x	\$200.00		\$0.00
<b>8. Abandonment* (per foot)</b>					
A. 2" diameter or less		feet x	\$5.00		\$0.00
B. Greater than 2" to 6" diameter		feet x	\$5.50		\$0.00
C. Dug/Bored well (up to 6 foot diameter)		feet x	\$18.00		\$0.00
<b>9. Well Installation* (per foot)</b>					
A. Water Table (hand augered)		feet x	\$20.00		\$0.00
B. Water Table (drill rig)		feet x	\$38.00		\$0.00
C. Telescoping/ Pit Cased		feet x	\$58.00		\$0.00
D. Rock Drilling		feet x	\$58.00		\$0.00
E. 2" Rock Coring		feet x	\$45.00		\$0.00
G. Rock Multi-sampling ports/screens		feet x	\$47.20		\$0.00
H. Recovery Well (4 inch diameter)		each x	\$45.00		\$0.00
I. Pushed Pre-packed screen (1.25 diameter)		each x	\$18.50		\$0.00
J. Rotasonic (2 inch diameter)		each x	\$45.00		\$0.00
<b>10. Groundwater Sample Collection / Gauge Depth to Water or Product (Each)</b>					
A. Groundwater Purge	7	wells x	\$55.00		\$385.00
B. Air or Vapors		samples x	\$90.00		\$0.00
C. Water Supply		samples x	\$30.00		\$0.00
D. Groundwater No Purge or Duplicate (1)	1	samples x	\$35.00		\$35.00
E. Gauge Well only		per well x	\$20.00		\$0.00
F. Sample Below Product		wells x	\$50.00		\$0.00
G. Passive Diffusion Bag		each x	\$40.00		\$0.00
H. Field Blank	1	each x	\$5.00		\$5.00

<b>11. Laboratory Analyses-Groundwater (Each Sample)</b>					
A1. BTEXNM+ Oxyg's+ 1,2 DCA + Ethanol	10	samples x	\$100.00		\$1,000.00
AA. Lead, Filtered		samples x	\$46.00		\$0.00
B1. Rush EPA Method 8260B (All of item A.)		samples x	\$143.00		\$0.00
C1. Trimethyl, Butyl, and Isopropyl Benzenes		samples x	\$40.00		\$0.00
D. PAH's		samples x	\$120.00		\$0.00
E. Lead, Unfiltered		samples x	\$20.00		\$0.00
F. EDB by EPA 8011		samples x	\$55.00		\$0.00
FF. EDB by EPA Method 8011 Rush		samples x	\$75.00		\$0.00
G. 8 RCRA Metals		samples x	\$140.00		\$0.00
H. TPH (9070)		samples x	\$55.00		\$0.00
I. pH		samples x	\$10.00		\$0.00
J. BOD		samples x	\$40.00		\$0.00
P1. Ethanol		samples x	\$21.50		\$0.00
<b>11. Analyses-Soil (Each Sample)</b>					
Q. BTEX + Naphth.		samples x	\$100.00		\$0.00
R. PAH's		samples x	\$120.00		\$0.00
S. 8 RCRA Metals		samples x	\$150.00		\$0.00
T. Oil & Grease (9071)		samples x	\$60.00		\$0.00
U. TPH-DRO (3550B/8015B)		samples x	\$65.00		\$0.00
V. TPH- GRO (5030B/8015B)		samples x	\$65.00		\$0.00
W. Grain size/hydrometer		samples x	\$99.00		\$0.00
X. Total Organic Carbon		samples x	\$35.00		\$0.00
<b>11. Analyses-Air (Each Sample)</b>					
Y. BTEX + Naphthalene		samples x	\$247.50		\$0.00
<b>11. Analyses-Free Phase Product (Each Sample)</b>					
Z. Hydrocarbon Fuel Identification		samples x	\$620.00		\$0.00
<b>12. Aquifer Characterization*</b>					
A. Pumping Test		hours x	\$120.00		\$0.00
B. Slug Test*		tests x	\$150.00		\$0.00
C. Fractured Rock		tests x	\$500.00		\$0.00
<b>13. Free Product Recovery Rate Test* (Each)</b>					
		tests x	\$120.00		\$0.00
<b>14. Fate/Transport Modeling</b>					
A. Mathematical Model		each x	\$300.00		\$0.00
B. Computer Model		each x	\$500.00		\$0.00
<b>15. Risk Evaluation</b>					
A. Tier I Risk Evaluation		x	\$300.00		\$0.00
B. Tier II Risk Evaluation		x	\$500.00		\$0.00
<b>16. Subsequent Survey*</b>					
		x	\$300.00		\$0.00
<b>17. Disposal* (gallons or tons)</b>					
A. Wastewater	55	gallons x	\$0.80		\$44.00
B1. Free Product		gallons x	\$0.85		\$0.00
C. Soil Treatment/Disposal		tons x	\$72.50		\$0.00
D. Drilling fluids		gallons x	\$0.80		\$0.00
<b>18. Miscellaneous (attach receipts)</b>					
		x			\$0.00
		x			\$0.00
		x			\$0.00
<b>20. Tier I Assessment (Use DHEC 3665 form)</b>					
		x			\$0.00
<b>21. IGWA (Use DHEC 3666 form)</b>					
		x			\$0.00
<b>22. Corrective Action (Use DHEC 3667 form)</b>					
		x			\$0.00



<b>23. Aggressive Fluid &amp; Vapor Recovery (AFVR)</b>					
A. 8-hour Event*		each	x	\$3,000.00	\$0.00
B. AFVR per-hour Continuance		per hour	x	\$204.00	\$0.00
C. Off-gas treatment per-hour Continuance		per hour	x	\$35.00	\$0.00
<b>24. Granulated Activated Carbon (GAC) filter system installation &amp; service:</b>					
A. New GAC System Installation*		each	x	\$2,500.00	\$0.00
B1. Refurbished GAC Sys. Install*		each	x	\$1,180.00	\$0.00
C. Filter replacement/removal*		each	x	\$450.00	\$0.00
D1. GAC System removal, cleaning, & refurbishment*		each	x	\$720.00	\$0.00
E. GAC System housing		each	x	\$450.00	\$0.00
F. In-line particulate filter		each	x	\$150.00	\$0.00
G. Additional piping & fittings		feet	x	\$4.00	\$0.00
<b>25. Well Repair</b>					
A. Additional Copies of the Report Delivered		each	x	\$32.50	\$0.00
B. Repair 2x2 MW pad		each	x	\$100.00	\$0.00
C. Repair 4x4 MW pad		each	x	\$150.00	\$0.00
D. Repair well vault		each	x	\$225.00	\$0.00
F. Replace well cover bolts		each	x	\$10.00	\$0.00
G. Replace locking well cap & lock		each	x	\$15.00	\$0.00
H. Replace/Repair stick-up		each	x	\$137.50	\$0.00
I. Convert Flush-mount to Stick-up		each	x	\$175.00	\$0.00
J. Convert Stick-up to Flush-mount		each	x	\$125.00	\$0.00
K. Replace missing/illegible well ID plate		each	x	\$22.50	\$0.00
<b>Report Prep &amp; Project Management</b>	15%		x	\$2,574.00	\$386.10
<b>TOTAL</b>					<b>\$2,960.10</b>

\*The appropriate mobilization cost can be added to complete these tasks, as necessary

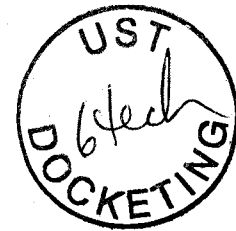




C. Earl Hunter, Commissioner

*Promoting and protecting the health of the public and the environment.*

OCT 18 2011



MS CYNDI SUTTLES  
R L JORDAN OIL COMPANY OF NORTH CAROLINA  
PO BOX 2527  
SPARTANBURG SC 29304-2527

Re: **Groundwater Sampling Directive**  
Hot Spot #3005, 107 Hampton Street (U.S. Highway 221), Chesnee, SC  
UST Permit #12719; Cost Agreement #39315  
Release No. 2 reported August 4, 2003  
Groundwater Monitoring Report received November 10, 2008  
Site Specific QAPP Contractor Addendum & Cost Agreement received August 31, 2011  
Spartanburg County

Dear Ms. Suttles:

The Underground Storage Tank Management Division (UST Division) of the South Carolina Department of Health and Environmental Control (SCDHEC) has reviewed the referenced addendum submitted on your behalf by Terry Environmental Services, Inc. The previous assessment work for this release indicates that petroleum Chemicals of Concern (CoC) are present in the groundwater at concentrations that exceed risk-based screening levels (RBSLs). In order to obtain current groundwater quality data, a limited groundwater sampling event is necessary. All work should be conducted in accordance with the UST Quality Assurance Protection Plan and must be conducted in compliance with all applicable regulations. A copy of SCDHEC Quality Assurance Program Plan (QAPP) for the UST Management Division is available at <http://www.scdhec.gov/environment/lwm/html/ust.htm>.

Groundwater sampling activities at the site should begin immediately upon receipt of this letter. Cost Agreement #39315 has been approved for the amount shown on the enclosed cost agreement form for the sampling of monitoring wells MW-1, MW-2, MW-3R, MW-5, MW-6, MW-10R, and MW-1D associated with the release. Groundwater samples should be collected and analyzed for BTEX, Naphthalene, MtBE, 1,2-DCA, the 8 Oxygenates, and Ethanol. Analyses should be in accordance with Appendix E of the QAPP and shall include a duplicate sample, field blank, and trip blank.

**The monitoring report, contractor checklist from Appendix K of the QAPP, and invoice are due within 60 days from the date of this letter.** The report submitted at the completion of these activities should include the required information outlined in the QAPP. Please note that all applicable South Carolina certification requirements apply to the services and report preparation. All site rehabilitation activities must be performed and submitted by a South Carolina Certified Underground Storage Tank Site Rehabilitation Contractor.

Terry Environmental Services, Inc. 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. Please note that applicable South Carolina certification requirements regarding laboratory services and report preparation must be satisfied. 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.

Ms. Cyndi Suttles  
Hot Spot #3005; UST Permit #12719  
Page 2

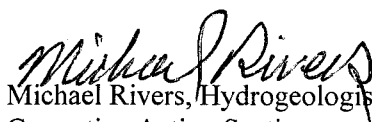
Please note that Sections 44-2-110(4) and 44-2-130 of the SUPERB Statute state that no costs will be allowed unless prior approval from the UST Division is obtained. If for any reason additional tasks will be completed, these additional tasks and the associated cost must be pre-approved by the UST Division for the cost to be paid. The SCDHEC 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 SCDHEC 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.

Please note, if unnecessary dilutions are completed resulting in reporting limits of individual CoC in excess of RBSL, the data cannot be used. In those cases, the UST Division may deny payment for any non-detect analysis where the reporting limit exceeds the RBSL. The UST Division encourages the use of 'J' values as necessary so the appropriate action can be determined for a release.

The SCDHEC grants pre-approval for transportation of virgin petroleum impacted soil and groundwater from the referenced site to a permitted treatment facility. The transport and disposal must be conducted in accordance with the QAPP. If the CoC concentrations based on laboratory analysis are below 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 **UST Permit #12719 and Cost Agreement #39315**. If you have any questions regarding this correspondence, please contact me by telephone at (803) 896-6633, by fax at (803) 896-6245, or by e-mail to [RIVERSMS@DHEC.sc.gov](mailto:RIVERSMS@DHEC.sc.gov).

Sincerely,

  
Michael Rivers, Hydrogeologist  
Corrective Action Section  
Underground Storage Tank Management Division  
Bureau of Land and Waste Management

enc: Approved Cost Agreement  
Signed Site Specific QAPP Contractor Addendum

cc: Ms. Kelly K. Cone, P.G., Terry Environmental Services, Inc., P.O. Box 25, Summerville, SC  
29484 (w/ enc.)  
Technical File (w/ enc.)

MR/GWSDIR10.13.11

SCANNED



Quality Assurance Project Plan  
Addendum to the SC DHEC UST Programmatic QAPP, Revision 1.0

For

Hot Spot #3005, UST Permit #12719

107 Hampton Street, Chesnee, South Carolina

Prepared by: Kelly K. Cone, P.G.

e-mail: kcone@terryenvironmental.com

Date: August 29, 2011

Terry Environmental Services, Inc.

Approvals

Michael Rivers Michael Rivers

Date 10/13/11

SC DHEC Project Manager Signature

Annette Balsitis Annette Balsitis

Date 8/29/11

Contractor QA Manager Signature

Kelly K. Cone KK Cone

Date 8/29/11

Site Rehabilitation Contractor Signature

Ashley Amick Ashley Amick  
Ashley B. Amick  
Fri Aug 26 2011 16:41:39

Date 8-26-11

Access Analytical Laboratory Director Signature

Scott Bailey Scott Bailey

Date 08/26/11

GCAL Laboratory Director Signature

# Approved Cost Agreement 39315

Facility: 12719 HOT SPOT 3005

RIVERSMS

PO Number:

<u>Task / Description</u>	<u>Categories</u>	<u>Item Description</u>	<u>Qty / Pct</u>	<u>Unit Price</u>	<u>Amount</u>
01 PLAN		C TIER II/COMP. PLAN/QAPP APP B	1.0000	525.00	525.00
04 MOB/DEMOB		B PERSONNEL	2.0000	290.00	580.00
10 SAMPLE COLLECTION		A GROUND WATER	7.0000	55.00	385.00
		D GROUNDWATER NO-PURGE	1.0000	35.00	35.00
		H FIELD BLANK	1.0000	5.00	5.00
11 ANALYSES	GW GROUNDWATER	A1 BTEXNM+OXYGS+1,2-DCA+ETH-8260B	10.0000	100.00	1,000.00
17 DISPOSAL		A WASTEWATER	55.0000	0.80	44.00
19 RPT/PROJECT MNGT & COORDINATIO		PCT PERCENT	0.1500	2,574.00	386.10
<b>Total Amount</b>					2,960.10

**GROUNDWATER MONITORING REPORT  
HOT SPOT 3005  
107 HAMPTON STREET  
CHESNEE, SOUTH CAROLINA  
SCDHEC UST PERMIT #12719  
CA #39315**

Prepared For:

**SCDHEC UNDERGROUND STORAGE TANK PROGRAM  
2600 BULL ST.  
COLUMBIA, SC 29201**

Submitted By:



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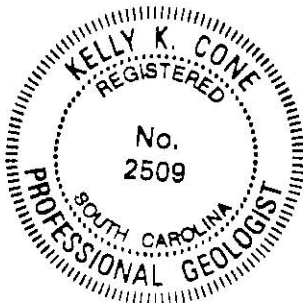
UST CONTRACTOR #UCC-0223  
TERRY PROJECT #2230.8D

A handwritten signature in blue ink that reads "KK Cone". The signature is written in a cursive style and is positioned above a horizontal line.

**Kelly K. Cone, PG  
Vice President, Assessment Services**

A handwritten signature in blue ink that reads "Jason A. Terry". The signature is written in a cursive style and is positioned above a horizontal line.

**Jason A. Terry, PG  
President**



**DECEMBER 2011**



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**A. INTRODUCTION****1. UST Facility and Owner/Operator Information**

Facility Name (Permit #) : Hot Spot #3005 (12719)  
Facility Address: 107 Hampton Street, Chesnee, South Carolina 29323  
Facility Telephone: 864-461-4147  
  
Owner/ Operator Name: RL Jordan Oil Co. of NC (Contact: Ms. Cyndi Suttles)  
Owner/ Operator Address: PO Box 2527, Spartanburg, SC 29304  
Owner/ Operator Telephone: 864-585-2784

**2. Property Owner Information**

Name: EJ Enterprises Inc.  
Address: PO Box 2527, Spartanburg, SC 29304  
Telephone: 864-585-2784

**3. Contractor Information**

Name: Terry Environmental Services, Inc.  
Address: P.O. Box 25, Summerville, South Carolina 29484  
Telephone: 843-873-8200  
Certification: UCC-0223

**4. Well Driller Information**

Not Applicable

**5. Laboratory Information**

Name: Gulf Coast Analytical Laboratories, Inc.  
Address: 7979 GSRI Avenue, Baton Rouge, LA 70820  
Telephone: 225-769-4900  
Certification: 73006001

Name: Access Analytical, Inc.  
Address: 7478 Carlisle St., Irmo, SC 29063  
Telephone: 803-781-4243  
Certification: 3257500

**6. Site History**

Date Release Reported to SCDHEC: August 4, 2003  
Estimated Quantity of Product Released: Unknown  
Cause of Release: Unknown  
Current use of Facility: Gas Station and Convenience Store (Hot Spot)

UST #	Product	Date Installed	Currently In Use (Yes or No)	If not in use, Date Removed
1 (12,000 gal)	Unleaded Gasoline	8/6/1990	Yes	-
2 (8,000 gal)	Plus Gasoline	8/6/1990	Yes	-
3 (8,000 gal)	Premium Gasoline	8/6/1990	Yes	-
4 (8,000 gal)	Diesel	8/6/1990	Yes	-
5 (8,000 gal)	Kerosene	8/6/1990	Yes	-
6(12,000 gal)	Diesel	10/3/1991	Yes	-

Other Releases at this site?      Yes XXXX      No \_\_\_\_\_  
 If yes, Date Release Reported to SCDHEC      November 3, 1993  
**Status of Release:**      Feb. 2002 Brook & Medlock selected as CA contractor.  
 No Further Action Date:      N/A

### 7. Regional Geology and Hydrogeology

The Hot Spot #3005 site is located in Chesnee which lies in the Western Piedmont Province of South Carolina. The western piedmont is comprised of the Inner Piedmont block, the Smith River allochthon, and the Sauratwon Mountain window. The Inner Piedmont block encompasses the Inner Piedmont belt and the Chauga belt, and consists of a composite stack of thrust sheets containing a variety of gneisses, schists, amphibolites, sparse ultramafic bodies, and intrusive granitoids. (The Geology of the Carolinas, Horton & Zullo, 1991)

The Hot Spot #3005 site is located in the Inner Piedmont Belt which is characterized by granitic, biotitic, and hornblendic rocks. Generally, wells drilled in the Inner Piedmont Belt of Spartanburg County yield 1 to 250 gallons per minute (gpm). The highest average yields (35 gpm) were obtained from wells drilled in biotite gneiss and migmatite with the lowest average yields from wells drilled in quartz monzonite. The average yield of all wells inventoried was 20 gpm. The ground waters in Spartanburg County are of good to excellent quality for most domestic, municipal, and industrial uses. (USGS/SCWRC Report 3: Water Resources of Spartanburg County, South Carolina, 1970)

## **B. RECEPTOR SURVEY & SITE DATA**

### **1. Receptor Survey Results**

A receptor survey was not conducted during this scope of work.

### **2. Current Site and Adjacent Land Use**

Description of current site use (commercial, residential, rural, etc.):

Commercial; the site is operating as Hot Spot #3005, a gas station and convenience store.

Description of adjacent land use (commercial, residential, rural, etc):

Commercial and residential.

UST sites within a 1,000-foot radius:

10122 Free Time Convenience Store

The site is located at 107 Hampton Street, Chesnee, South Carolina. The site is bordered to the north by a school, to the east by a vacant field, and to the south and west by commercial and residential properties. The general site location is shown on the Topographic Map provided in Section J as Figure 1. A Site Base Map based on the previous contractor's site survey is provided in Section J as Figure 2.

### **3. Site-Specific Geology and Hydrogeology**

Site-specific stratigraphy was not documented during this scope of work. The Site Potentiometric Map (Figure 5, Section J) from the limited groundwater sampling event indicates that shallow groundwater flow is generally to the west.

**C. SOIL ASSESSMENT/FIELD SCREENING INFORMATION & METHODOLOGY**

Not Applicable. No soil or groundwater borings were installed during this scope of work.

**D. MONITORING WELL INFORMATION**

Not Applicable. No monitoring wells were installed during this scope of work.

## **E. GROUNDWATER DATA**

### **1. Groundwater Sampling Methodology**

TERRY conducted a limited sampling event at the site on October 31, 2011. As directed by SCDHEC, monitoring wells MW-1, MW-2, MW-3R, MW-5, MW-6, MW-10R, and MW-1D were sampled. Just prior to the sampling event, these monitoring wells were gauged with an oil/water interface probe to determine depth to groundwater measurements and the presence or absence of free-phase petroleum. Water level was recorded to the nearest 0.01 foot and total well depth was recorded to the nearest 0.1 foot. Monitoring well MW-5 had an insufficient volume to collect groundwater measurements and the sample was collected prior to purging. Monitoring well MW-2 has a crack in the top of the well casing and is missing bolts in the vault cover. Documentation of the condition of the monitoring well is noted on the Groundwater Sampling Log provided in Appendix B.

Sampling was conducted from the least contaminated wells to the most contaminated wells based on the previous assessment data. The wells at the site had not been sampled within the past twelve months; therefore, the wells were purged prior to sampling. A clean purge pump with new disposable tubing was utilized for purging monitoring wells with an adequate casing volume. Groundwater samples were collected from each monitoring well with a new disposable bailer. Bailers with new colorless nylon rope were slowly lowered into the top of the water column, allowed to fill, and slowly removed to minimize turbidity and disturbance of the volatile organic compounds (VOCs).

Trip blanks, field blanks, and field duplicates were prepared or collected in accordance with the SCDHEC UST QAPP, Revision 1.0. One trip blank was included in the cooler and analyzed for VOCs. One field blank was collected for this sampling event and analyzed for VOCs. One field duplicate was collected and analyzed for VOCs as less than twenty samples were collected during this event.

Samples were immediately packed in a cooler of ice and proper temperatures were maintained in accordance with the SCDHEC UST QAPP, Revision 1.0 and the site-specific Addendum. At the completion of the sampling event, the samples were submitted to a SCDHEC certified laboratory for analyses. The samples were analyzed for Benzene, Toluene, Ethylbenzene, Xylenes, Naphthalene, Tert-Butyl Methyl Ether, 1,2-Dichloroethane, Oxygenates, and Ethanol.

Field conditions were documented throughout the sampling event. All field measurement equipment was properly cleaned and decontaminated before use, between each well, and prior to site departure in accordance with "Appendix H: Standard Field Cleaning Procedures" of the SCDHEC UST QAPP, Revision 1.0. By-products were disposed of via processing through a granular-activated-carbon (GAC) unit in accordance with the NPDES General Permit No. SCG830000. The field measurement equipment was properly calibrated prior to the sampling event and verified

after four (4) hours of use and at the completion of the event. The calibration and verification data for the sampling event is provided in Appendix B.

Depth to groundwater measurements were taken with reference to the top of well casing (TOC) and converted to elevations by subtracting the depth to groundwater measurements from the TOC elevations. Potentiometric data are provided in Section I as Table 2 and on the Groundwater Sampling Logs provided in Appendix B.

## **2. Purging Methodology**

Purging was conducted from the least contaminated wells to the most contaminated wells based on the previous assessment data. Prior to purging, new plastic sheeting was placed on the ground surface around the well to prevent contamination of pumps, hoses, meters, etc. For monitoring wells with smaller casing volumes and/or slow recharge rates, a new disposable bailer was utilized for purging. When utilized, bailers with new colorless nylon rope were slowly lowered into the top of the water column, allowed to fill, and slowly removed to minimize turbidity and disturbance of the VOCs. When utilized, the purge pump was lowered approximately 3-5 feet into the standing water column and adjusted only if the pumping rate exceeded the recovery rate as drawdown occurred. In accordance with the SCDHEC UST QAPP, Revision 1.0, an adequate purge was achieved when pH, specific conductance, and temperature of the groundwater stabilized, and turbidity either stabilized or was below 10 nephelometric turbidity units (NTUs). The purge water generated was disposed of via processing through a granular-activated-carbon (GAC) unit in accordance with the NPDES General Permit No. SCG830000. The Certificate of On-Site Treatment for the contaminated purge water and the by-products from cleaning and decontamination is provided in Appendix G.

If a well was pumped or purged dry, even with reduced purge rates, the well was considered adequately purged per the SCDHEC UST QAPP, Revision 1.0. The sample was collected immediately following sufficient recovery to fill all sampling containers. The groundwater measurements collected during the sampling event for the purged wells are provided as follows:



**SCDHEC UST PERMIT #12719**

SECTION E -2					
GROUNDWATER MEASUREMENTS (PURGE SAMPLING)					
HOT SPOT #3005					
CHESNEE, SOUTH CAROLINA					
SCDHEC UST PERMIT #12719					
<b>12719-MW1</b>	<b>10/31/2011</b>				
Volume (gal)	Intitial	1.5	3.0	4.5/Sample	
Time (military)	1300	1306	1311	1320	
pH (su)	5.17	5.19	5.29	5.38	
Spec Conductivity (mS/cm)	0.099	0.090	0.090	0.093	
Water Temperature (°C)	19.0	19.7	19.7	19.7	
Turbidity (NTU)	16.1	101	150	123	
Dissolved Oxygen (mg/L)	5.92	5.66	7.28	6.64	
<b>12719-MW2</b>	<b>10/31/2011</b>				
Volume (gal)	Intitial	1.0	2.0	3.0/Sample	
Time (military)	1335	1340	1354	1409	
pH (su)	6.63	6.79	6.86	6.87	
Spec Conductivity (mS/cm)	0.207	0.216	0.230	0.233	
Water Temperature (°C)	19.4	19.8	19.8	19.8	
Turbidity (NTU)	70.9	88.7	142	447	
Dissolved Oxygen (mg/L)	7.15	3.27	2.74	2.81	
<b>12719-MW3R</b>	<b>10/31/2011</b>				
Volume (gal)	Intitial	1.0	2.0	3.0/Sample	Duplicate (DUP)
Time (military)	1510	1515	1525	1540	1545
pH (su)	5.66	5.80	5.72	5.74	
Spec Conductivity (mS/cm)	0.258	0.299	0.290	0.292	
Water Temperature (°C)	19.05	19.4	19.4	19.4	
Turbidity (NTU)	8.7	20.1	66.9	80.0	
Dissolved Oxygen (mg/L)	7.67	6.37	6.28	6.21	
<b>12719-MW5</b>	<b>10/31/2011</b>				
Volume (gal)	Ins./Sample				
Time (military)	1108				
pH (su)					
Spec Conductivity (mS/cm)					
Water Temperature (°C)					
Turbidity (NTU)					
Dissolved Oxygen (mg/L)					
<b>12719-MW6</b>	<b>10/31/2011</b>				
Volume (gal)	Intitial	1.0	2.0	3.0/Sample	
Time (military)	1425	1435	1439	1445	
pH (su)	4.66	4.74	4.74	4.76	
Spec Conductivity (mS/cm)	0.632	0.498	0.479	0.483	
Water Temperature (°C)	19.1	19.8	19.8	19.8	
Turbidity (NTU)	5.4	13.3	17.3	17.2	
Dissolved Oxygen (mg/L)	8.52	3.01	2.46	2.70	

12719-MW10R	10/31/2011				
Volume (gal)	Intitial	1.5	3.0	4.50	6.0/Sample
Time (military)	1022	1026	1031	1034	1039
pH (su)	4.04	4.52	4.72	4.71	4.79
Spec Conductivity (mS/cm)	0.220	0.095	0.082	0.080	0.081
Water Temperature (°C)	17.1	17.9	18.4	18.4	18.4
Turbidity (NTU)	50.2	511	399	341	460
Dissolved Oxygen (mg/L)	9.85	5.14	5.29	5.31	5.36
12719-MW1D	10/31/2011				
Volume (gal)	Intitial	2.5	5.0	7.50	10.0
Time (military)	1155	1159	1204	1206	1208
pH (su)	6.11	5.99	5.98	5.94	5.98
Spec Conductivity (mS/cm)	0.092	0.100	0.093	0.085	0.085
Water Temperature (°C)	16.7	17.7	18.0	18.1	18.1
Turbidity (NTU)	39.4	11.9	15.6	9.0	6.8
Dissolved Oxygen (mg/L)	5.51	9.33	7.93	6.39	6.29
Volume (gal)	12.5	15.0	17.5	20.0/Sample	
Time (military)	1211	1220	1225	1230	
pH (su)	5.90	5.81	5.83	5.86	
Spec Conductivity (mS/cm)	0.078	0.075	0.077	0.082	
Water Temperature (°C)	18.1	18.1	18.1	18.1	
Turbidity (NTU)	7.1	6.8	7.0	3.3	
Dissolved Oxygen (mg/L)	7.51	7.31	7.40	7.32	

**NOTES/KEY:**

gal = gallons  
 su = standard unit  
 mS/cm = milliSiemens per centimeter  
 NTU = nephelometric turbidity units  
 mg/L = milligrams per liter  
 Ins = insufficient volume

**3. Free Product Measurements**

No free-phase petroleum was measured in the monitoring wells gauged.

**F. AFVR INFORMATION**

Not Applicable. No Aggressive Fluid Vapor Recovery (AFVR) Events were performed during this scope of work.

**G. GRANULATED ACTIVATED CARBON INSTALLATION**

Not Applicable. No granulated activated carbon units were installed during this scope of work.

## **H. RESULTS & DISCUSSION**

### **1. Assessment Results**

During this scope of work, TERRY conducted a limited sampling event in accordance with the SC DHEC UST QAPP, Revision 1.0 and the associated site-specific Addendum dated August 29, 2011 and fully executed on October 13, 2011. The wells at the site had not been sampled within the past twelve months; therefore, all wells were purged prior to sampling. Monitoring well MW-5 had an insufficient volume to collect groundwater measurements and the sample was collected prior to purging.

The groundwater analytical data are summarized in Section I as Table 3, and are included in Appendix B. The analytical data were used to generate contaminant concentration maps for CoC's detected by the laboratory and are provided in Section J as Figures 4A and 4B. Based on the analytical data from the limited sampling event, shallow groundwater contamination is observed onsite in the vicinity of the diesel UST basin (MW-1), the gasoline UST basin (MW-3R and MW-6), and the dispenser area (MW-5).

### **2. Aquifer Evaluation Results**

Not Applicable

### **3. Fate & Transport Results**

Not Applicable

### **4. Tier 1 Risk Evaluation**

Not Applicable

### **5. Tier 2 Risk Evaluation**

Not Applicable

**I. TABLES**

**1. Soil Analytical Data**

Table 1 Soil Analytical Data - Not Applicable

**2. Potentiometric Data**

Table 2 Potentiometric Data - Attached

**3. Laboratory Data**

Table 3 Groundwater Laboratory Data - Attached

**4. Aquifer Characteristics**

Table 4 Aquifer Characteristics - Not Applicable

**5. Site Conceptual Model**

Table 5 Site Conceptual Model - Not Applicable

**TABLE 2  
GROUNDWATER POTENTIOMETRIC DATA  
HOT SPOT # 3005  
CHESNEE, SOUTH CAROLINA  
SCDHEC UST PERMIT #12719**

Well #	DATE	TOC Elevation	Screened Interval	Depth to Product** (ft)	Depth to Water** (ft)	Product Thickness (ft)	Water Table Elevation (ft)
12719-MW1	8/18/2005	104.89	20'-30'	--	23.69	--	81.20
	10/2/2008	104.89	20'-30'	--	29.77	--	75.12
	10/31/2011	104.89	20'-30'	--	29.20	--	75.69
12719-MW2	8/18/2005	Unknown	26'-36'	--	23.69	--	--
	10/2/2008	Unknown	26'-36'	--	29.61	--	--
	10/31/2011	Unknown	26'-36'	--	29.03	--	--
12719-MW3R	8/18/2005	104.92	26'-36'	--	27.15	--	77.77
	10/2/2008	104.92	26'-36'	--	32.40	--	72.52
	10/31/2011	104.92	26'-36'	--	32.12	--	72.80
12719-MW4	8/18/2005	111.32	36'-46'	--	23.25	--	88.07
	10/2/2008	111.32	36'-46'	--	29.57	--	81.75
	10/31/2011	111.32	36'-46'	Not sampled			
12719-MW5	8/18/2005	103.57	22'-32'	--	29.03	--	74.54
	10/2/2008	103.57	22'-32'	--	31.94	--	71.63
	10/31/2011	103.57	22'-32'	--	31.80	--	71.77
12719-MW6	8/18/2005	104.14	26'-36'	--	24.22	--	79.92
	10/2/2008	104.14	26'-36'	--	29.89	--	74.25
	10/31/2011	104.14	26'-36'	--	30.57	--	73.57
12719-MW7	8/18/2005	104.52	26'-36'	--	22.74	--	81.78
	10/2/2008	104.52	26'-36'	--	28.90	--	75.62
	10/31/2011	104.52	26'-36'	Not sampled			
12719-MW8	8/18/2005	101.79	Unknown	--	18.05	--	83.74
	10/2/2008	101.79	Unknown	Well could not be located			
	10/31/2011	101.79	Unknown	Not sampled			
12719-MW9	8/18/2005	105.43	Unknown	--	22.95	--	82.48
	10/2/2008	105.43	Unknown	--	29.38	--	76.05
	10/31/2011	105.43	Unknown	Not sampled			
12719-MW10	8/18/2005	96.57	17'-27'	--	--	--	--
	10/31/2011	96.57	17'-27'	Not sampled			
12719-MW10R	8/18/2005	Unknown	22'-32'	--	19.67	--	--
	10/2/2008	Unknown	22'-32'	--	24.50	--	--
	10/31/2011	Unknown	22'-32'	--	24.39	--	--
12719-MW11	8/18/2005	95.15	18'-28'	--	--	--	--
	10/2/2008	95.15	18'-28'	--	24.85	--	70.30
	10/31/2011	95.15	18'-28'	Not sampled			
12719-MW11R	8/18/2005	Unknown	22'-32'	--	20.68	--	--
	10/2/2008	Unknown	22'-32'	Well could not be located			
	10/31/2011	Unknown	22'-32'	Not sampled			
12719-MW12	8/18/2005	97.03	20'-30'	--	19.57	--	77.46
	10/2/2008	97.03	20'-30'	--	25.35	--	71.68
	10/31/2011	97.03	20'-30'	Not sampled			
12719-MW13	8/18/2005	95.89	17'-27'	--	20.62	--	75.27
	10/2/2008	95.89	17'-27'	--	25.27	--	70.62
	10/31/2011	95.89	17'-27'	Not sampled			

**TABLE 2**  
**GROUNDWATER POTENTIOMETRIC DATA**  
**HOT SPOT # 3005**  
**CHESNEE, SOUTH CAROLINA**  
**SCDHEC UST PERMIT #12719**

Well #	DATE	TOC Elevation	Screened Interval	Depth to Product** (ft)	Depth to Water** (ft)	Product Thickness (ft)	Water Table Elevation (ft)
12719-MW14	8/18/2005	Unknown	21'-31'	--	24.84	--	--
	10/2/2008	Unknown	21'-31'	--	28.46	--	--
	10/31/2011	Unknown	21'-31'	Not sampled			
12719-MW1D	8/18/2005	104.61	55'-60'	--	24.60	--	80.01
	10/2/2008	104.61	55'-60'	--	30.46	--	74.15
	10/31/2011	104.61	55'-60'	--	30.03	--	74.58

\*\* = Relative to top of casing

-- = Not applicable

TABLE 3  
GROUNDWATER LABORATORY DATA  
HOT SPOT #3005  
CHESNEE, SC  
SCDHEC UST PERMIT #12719

Well	Date	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	MTBE	1,2 DCA	EDB	TAME	TBA	DIPE	ETBE	ETBA	Ethanol	TAA	TBF	
	Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	
		RBSL	5	1,000	700	10,000	40	25	5	0.05	128	1,400	150	47	n/a	10,000	240	n/a
12719-MW1	8/18/2005	85	110	42	170	41	<5.0	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	10/2/2008	Dry - Not enough water to sample																
12719-MW2	10/31/2011	57.6	1.93	36.8	176	91.4	8.03	<1.00	NT	<5.00	<10.0	<5.00	<5.00	<100	<1,000	7.42J	<5.00	
	8/18/2005	90	100	78	350	94	8.9	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	10/2/2008	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<0.010	NT	NT	NT	NT	NT	NT	NT	NT	NT
12719-MW3R	10/31/2011	<1.00	<1.00	<1.00	<3.00	2.23J	11.1	<1.00	NT	<5.00	<10.0	<5.00	<5.00	<100	<1,000	46.3	<5.00	
	8/18/2005	270	41	170	880	430	330	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	10/2/2008	562	<25.0	272	261	96.5J	4,160	<25.0	<0.010	NT	NT	NT	NT	NT	NT	NT	NT	
12719-MW3R(DUP)	10/31/2011	196	<20.0	39.1	31.3J	143	2,060	<20.0	NT	163	255	53.3J	<100	<2,000	<20,000	282J	<100	
	10/31/2011	194	<20.0	35.5	29.0J	151	2,070	<20.0	NT	163	246	53.4J	<100	<2,000	<20,000	284J	<100	
12719-MW4	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	10/2/2008	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<0.010	NT	NT	NT	NT	NT	NT	NT	NT	
12719-MW5	10/31/2011	Not sampled																
	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	10/2/2008	Dry - Not enough water to sample																
12719-MW6	10/31/2011	110	11.5	<1.00	9.27	<5.00	4.31	<1.00	NT	<5.00	7.11J	<5.00	<5.00	<100	<1,000	32.0	<5.00	
	8/18/2005	7.8	6.3	5.5	52	22	6.8	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	10/2/2008	9.16	1.15	16.9	133	43.8	<1.00	<1.00	<0.010	NT	NT	NT	NT	NT	NT	NT	NT	
12719-MW7	10/31/2011	10.4	<1.00	3.17	91.5	65.4	<1.00	<1.00	NT	<5.00	<10.0	<5.00	<5.00	<100	<1,000	8.52J	<5.00	
	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	10/2/2008	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<0.010	NT	NT	NT	NT	NT	NT	NT	NT	
12719-MW8	10/31/2011	Not sampled																
	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	10/2/2008	Well could not be located																
12719-MW9	10/31/2011	Not sampled																
	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	10/2/2008	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<0.010	NT	NT	NT	NT	NT	NT	NT	NT	
12719-MW10	10/31/2011	Not sampled																
	8/18/2005	Not sampled																
	10/2/2008	Not sampled																
12719-MW10R	10/31/2011	Not sampled																
	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	10/2/2008	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<0.010	NT	NT	NT	NT	NT	NT	NT	NT	
12719-MW11	10/31/2011	<1.00	<1.00	<1.00	<3.00	1.88J	<1.00	<1.00	NT	<5.00	<10.0	<5.00	<5.00	<100	<1,000	<20.0	<5.00	
	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	10/2/2008	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<0.010	NT	NT	NT	NT	NT	NT	NT	NT	
12719-MW11R	10/31/2011	Not sampled																
	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	10/2/2008	Well could not be located																
12719-MW12	10/31/2011	Not sampled																
	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	10/2/2008	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<0.010	NT	NT	NT	NT	NT	NT	NT	NT	
12719-MW13	10/31/2011	Not sampled																
	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	10/2/2008	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<0.010	NT	NT	NT	NT	NT	NT	NT	NT	



**TABLE 3  
GROUNDWATER LABORATORY DATA  
HOT SPOT #3005  
CHESNEE, SC  
SCDHEC UST PERMIT #12719**

Well	Date	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	MTBE	1,2-DCA	EDB	TAME	TBA	DIPE	ETBE	ETBA	Ethanol	TAA	TBF
	Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
	<b>RBSL</b>	<b>5</b>	<b>1,000</b>	<b>700</b>	<b>10,000</b>	<b>40</b>	<b>25</b>	<b>5</b>	<b>0.05</b>	<b>128</b>	<b>1,400</b>	<b>150</b>	<b>47</b>	<b>n/a</b>	<b>10,000</b>	<b>240</b>	<b>n/a</b>
12719-MW14	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	10/2/2008	<1.00	<1.00	<1.00	<3.00	<5.00	1.12	<1.00	<0.010	NT	NT	NT	NT	NT	NT	NT	NT
	10/31/2011	Not sampled															
12719-MW1D	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	10/2/2008	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<0.010	NT	NT	NT	NT	NT	NT	NT	NT
	10/31/2011	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	NT	<5.00	<10.0	<5.00	<5.00	<100	<1,000	<20.0	<5.00
12719-FB	10/31/2011	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	NT	<5.00	<10.0	<5.00	<5.00	<100	<1,000	<20.0	<5.00
12719-TB	10/31/2011	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	NT	<5.00	<10.0	<5.00	<5.00	<100	236J	<20.0	<5.00

NOTES:

RBSL = Risk-Based Screening Level  
**Bold** lettering indicates parameter exceeds SCDHEC RBSL's except 1,2-DCA which is based on EPA limit  
 ug/L = micrograms per liter  
 NT = Parameter was not tested during this event  
 MTBE = tert-Butyl methyl ether  
 1,2-DCA = 1,2-Dichloroethane  
 EDB = 1,2-Dibromoethane

TAME = tert-Amyl methyl ether  
 TBA = tert-Butyl Alcohol or t-Butanol  
 DIPE = Isopropyl ether or diisopropyl ether  
 ETBE = Ethyl tet-butyl ether  
 ETBA = 3,3-Dimethyl-1-butanol or ethyl tert-butanol  
 TAA = tert-amyl alcohol  
 TBF = tert-butyl formate

J - Indicates an estimated value  
 (DUP) = Field duplicate sample  
 FB = Field Blank sample  
 TB = Trip Blank sample

## **J. FIGURES**

### **1. Topographic Map**

Figure 1 Topographic Map - Attached

### **2. Site Base Map**

Figure 2 Site Base Map - Attached

### **3. CoC Site Maps**

Figure 3 Soil CoC Map - Not Applicable

Figure 4A Groundwater CoC Map - Attached

Figure 4B Groundwater CoC Map (Oxygenates) - Attached

### **4. Site Potentiometric Maps**

Figure 5 Site Potentiometric Map - Attached

### **5. Geologic Cross Sections**

Figure 6 Geologic Cross Sections - Not Applicable

### **6. Predicted Migration and Attenuation of CoCs**

Figure 7 Predicted Migration and Attenuation of CoCs - Not Applicable

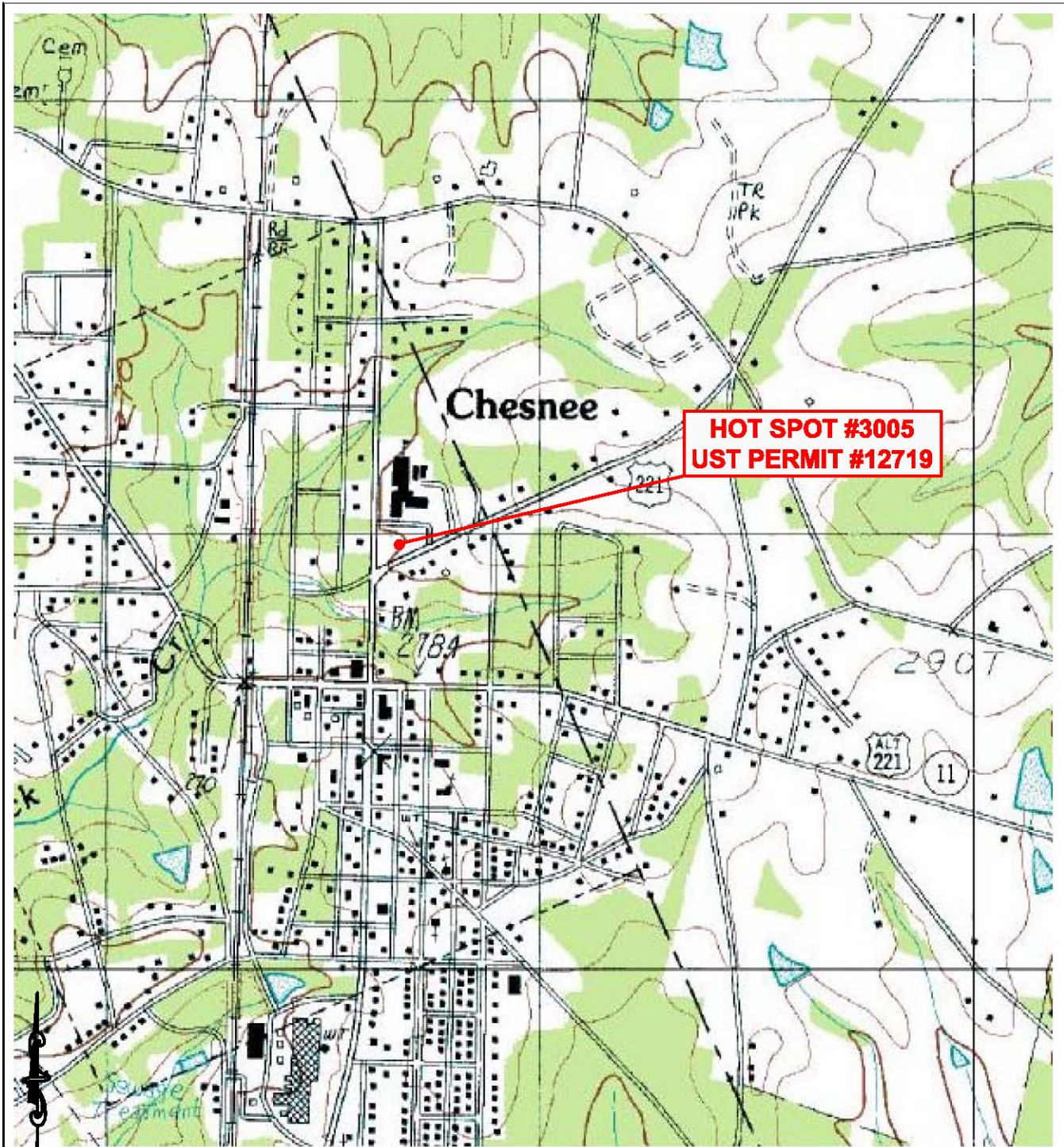


Image courtesy of the U.S. Geological Survey



## FIGURE 1 TOPOGRAPHIC MAP

HOT SPOT #3005  
SC HIGHWAY 221  
CHESNEE, SOUTH CAROLINA

*... providing our clients with the best services available,  
actually understanding our clients objectives,  
and making their objectives our own!*

SIZE  
B

TERRY Project No.  
2230.8D

DWG NO.

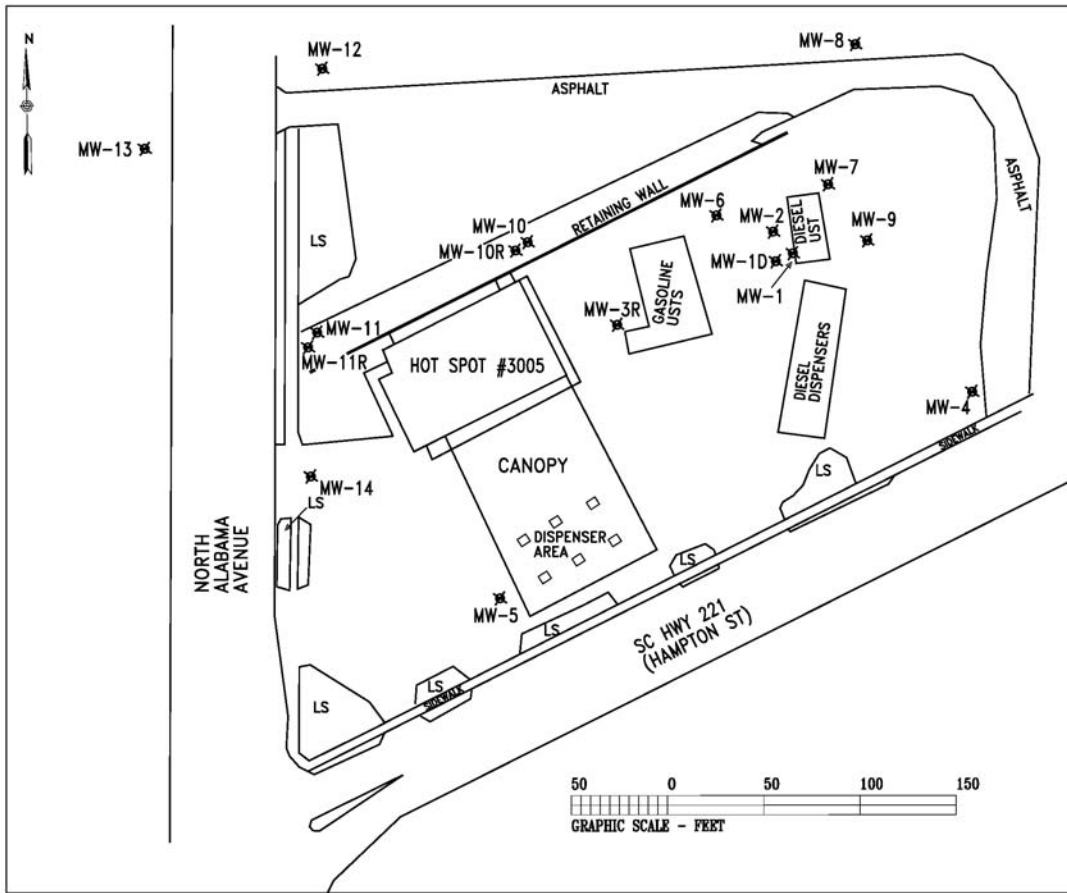
Figure 1 Topographic Map

REV

PO Box 25  
Summerville, South Carolina 29484  
(800) 325-0605 (843)-873-8200 fax: (843)-873-8765


SCALE: As Shown

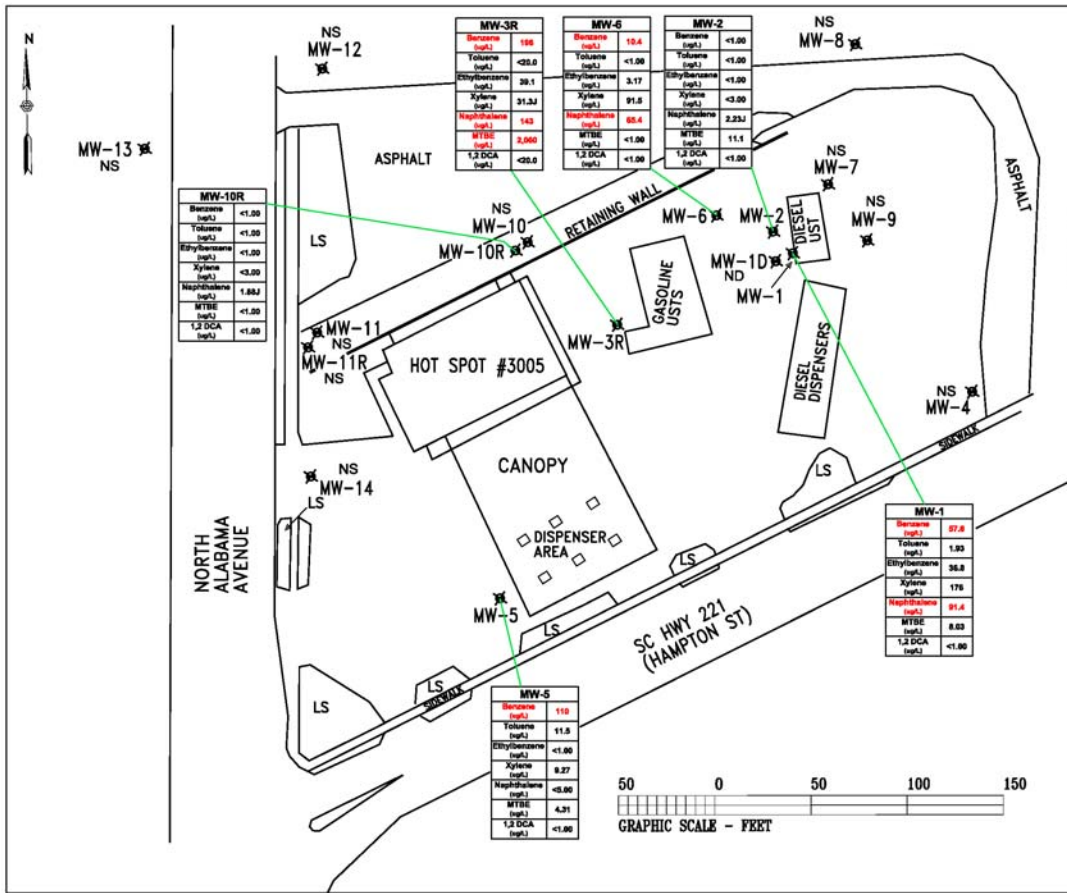
DATE: DECEMBER 2011



**LEGEND & ABBREVIATIONS:**  
 ✕ MW = MONITORING WELL  
 LS = LANDSCAPING  
 ALL MW AND SAMPLE IDENTIFICATIONS ARE PRECEDED BY UST PERMIT #12719 (i.e. 12719-MW1)



 <b>TERRY</b> ENVIRONMENTAL SERVICES <small>CLIENTS FIRST ALWAYS</small>	
<b>FIGURE 2</b> <b>SITE BASE MAP</b>	
HOT SPOT #3005 SC HIGHWAY 221 CHESNEE, SOUTH CAROLINA	
TERRY PROJECT #	SCDHEC SITE ID #
2230.8D	12719
SCALE	DATE
1" = 50'	DECEMBER 2011



**LEGEND & ABBREVIATIONS:**

- MW = MONITORING WELL
- LS = LANDSCAPING
- NS = NOT SAMPLED
- MTBE = tert-BUTYL METHYL ETHER
- 1,2 DCA = 1,2-DICHLOROETHANE
- J = ESTIMATED VALUE
- ND = LABORATORY ANALYSIS INDICATES ALL CoC AT OR BELOW DETECTION LIMITS

RED INDICATES CONTAMINANTS EXCEED RBLS

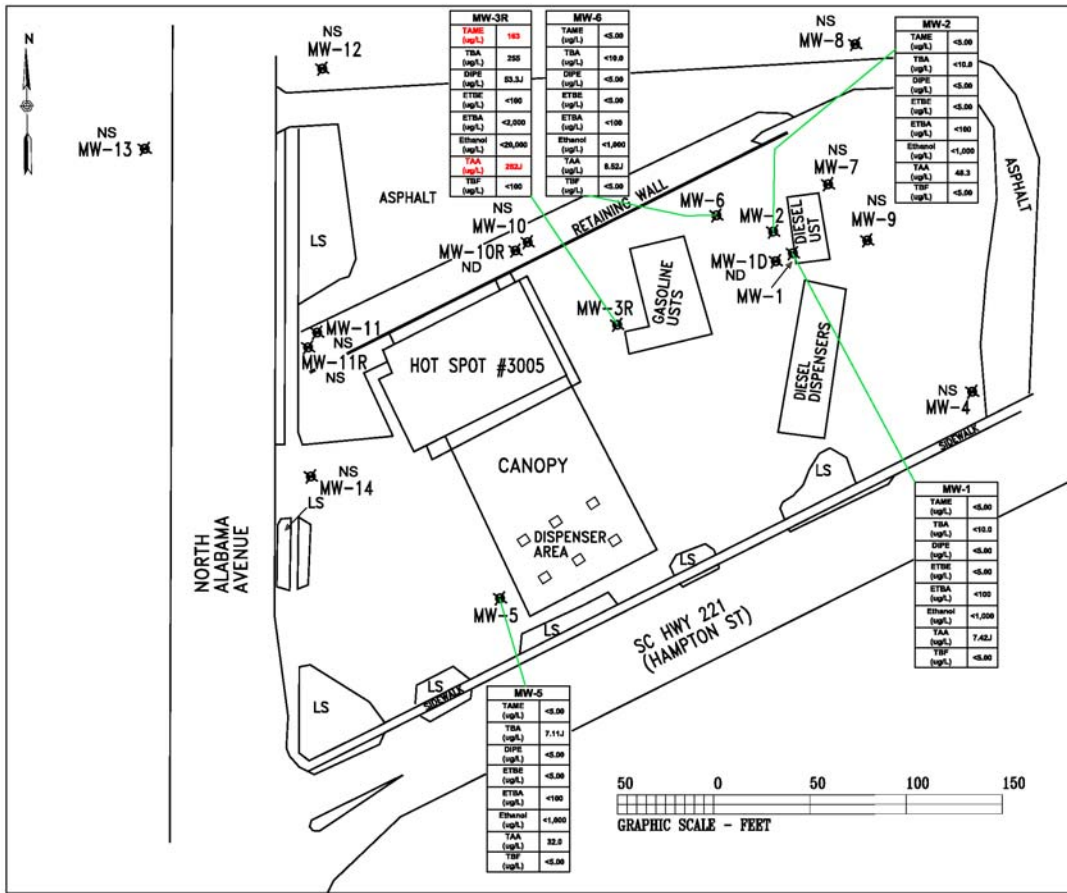
SAMPLES COLLECTED OCTOBER 31, 2011.

ALL MW AND SAMPLE IDENTIFICATIONS ARE PRECEDED BY UST PERMIT #12719 (ie. 12719-MW1)

**FIGURE 4A  
GROUNDWATER COC MAP**

HOT SPOT #3005  
SC HIGHWAY 221  
CHESNEE, SOUTH CAROLINA

TERRY PROJECT #	SCDHEC SITE ID #
2230.8D	12719
SCALE 1" = 50'	DATE DECEMBER 2011




**LEGEND & ABBREVIATIONS:**

- ☒ MW = MONITORING WELL
- LS = LANDSCAPING

TAME = TERT-AMYL METHYL ETHER  
TBA = TERT-BUTYL ALCOHOL or T-BUTANOL  
DIPE = ISOPROPYL ETHER or DISOPROPYL ETHER  
ETBE = ETHYL TERT-BUTYL ETHER  
ETBA = 3,3-DIMETHYL-1-BUTANOL  
TAA = TERT-AMYL ALCOHOL  
TBF = TERT-BUTYL FORMATE  
J = ESTIMATED VALUE  
ND = LABORATORY ANALYSIS INDICATES ALL CoC AT OR BELOW DETECTION LIMITS

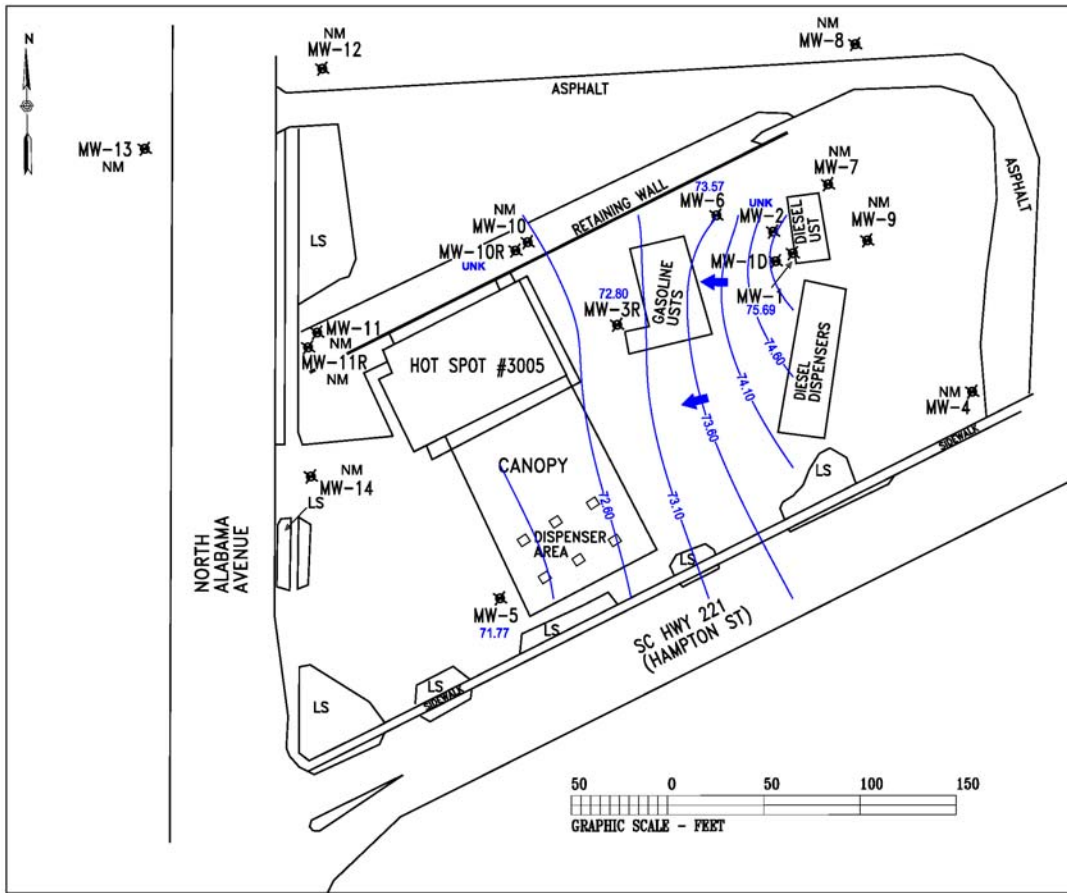
RED INDICATES CONTAMINANTS EXCEED RBLS  
SAMPLES COLLECTED OCTOBER 31, 2011.  
ALL MW AND SAMPLE IDENTIFICATIONS ARE PRECEDED BY UST PERMIT #12719 (ie. 12719-MW1)



**FIGURE 4B**  
**GROUNDWATER COC MAP**  
**(OXYGENATES)**

HOT SPOT #3005  
SC HIGHWAY 221  
CHESNEE, SOUTH CAROLINA


TERRY PROJECT # 2230.8D	SCDHEC SITE ID # 12719
SCALE 1" = 50'	DATE DECEMBER 2011



**LEGEND & ABBREVIATIONS:**

- ☒ MW = MONITORING WELL
- LS = LANDSCAPING
- NM = NOT MEASURED
- UNK = UNKNOWN WATER TABLE SURFACE ELEVATION
- 75.69 GROUNDWATER ELEVATION (RELATIVE TO AN ASSUMED DATUM)
- 74.10 GROUNDWATER CONTOUR
- ➡ GROUNDWATER FLOW DIRECTION

SAMPLES COLLECTED OCTOBER 31, 2011.  
 ALL MW AND SAMPLE IDENTIFICATIONS ARE PRECEDED BY UST PERMIT #12719 (ie. 12719-MW1)



**TERRY**  
 ENVIRONMENTAL SERVICES  
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**FIGURE 5**  
**GROUNDWATER POTENTIOMETRIC MAP**

HOT SPOT #3005  
 SC HIGHWAY 221  
 CHESNEE, SOUTH CAROLINA

TERRY PROJECT #	SCDHEC SITE ID #
2230.8D	12719
SCALE	DATE
1" = 50'	DECEMBER 2011

**K. APPENDICES**

**1. Appendix A: Site Survey**

Not Applicable

**2. Appendix B: Sampling Logs and Laboratory Data**

**3. Appendix C: Tax Map**

Not Applicable

**4. Appendix D: Soil Boring/Field Screening Logs**

Not Applicable

**5. Appendix E: Well Completion Logs/SCDHEC 1903 Forms**

Not Applicable

**6. Appendix F: Aquifer Evaluation Forms**

Not Applicable

**7. Appendix G: Disposal Manifest**

**8. Appendix H: Local Zoning Regulations**

Not Applicable

**9. Appendix I: Fate and Transport Modeling Data**

Not Applicable

**10. Appendix J: Access Agreements**

Not Applicable

**11. Appendix K: Data Verification Checklist**



**APPENDIX A**

**Site Survey  
(Not Applicable)**

## **APPENDIX B**

### **Sampling Logs and Laboratory Data**



# TERRY Environmental Services

CLIENTS FIRST ALWAYS

P.O. Box 25  
Summerville, SC 29484  
1-800-325-0605

Site Specific Information					Monitoring Well Information				
Terry Project ID		2230.8D			Well ID		12719 - MW1		
SCDHEC Permit No.		12719			Testing Parameters		BTEX, Naph, MTBE, 1,2-DCA, Oxygenates, & Ethanol		
Project Name		Hot Spot #3005							
Date		10/31/11							
Field Personnel		TS			Well Diameter		2	in	TAG BOTTOM OF WELL TO VERIFY WELL DEPTH. WRITE BELOW TO NEAREST 0.1'
General Weather		CLEAR			Screened Interval		20-30	ft	
Ambient Air Temperature		500			Total Well Depth (nearest 0.1')		35.9	ft	
Quality Assurance					Depth to Groundwater (nearest 0.01')		29.20	ft	
pH Meter		Horiba U-52-2			Conductivity Meter		Horiba U-52-2		
Serial Number		VWKAUMKJ			Serial Number		VWKAUMKJ		
Calibration Constant		4.00			Calibration Constant		4.49 mS/cm		
Calibration Constant		6.86			Calibration Constant		53.0 mS/cm		
Calibration Constant		9.18			Calibration Constant		58.7 mS/cm		
Last Calibration (time)		10/1			Last Verification (time)				
Length of Water Column		6.70			1 Casing Volume (0.163)		1.09		
3 Casing Volumes (0.489)		3.27			Total Volume Purged		4.50		
Purge Technique Utilized (bailer, pump)		BAILER			Well Yield		Low	<input checked="" type="checkbox"/> Medium	<input checked="" type="checkbox"/> High
Volume (gal)		1.50	3.00	4.50	35.9				
Time (military)		1300	1306	1311					
pH (su)		5.17	5.19	5.29					
Spec Conductivity (mS/cm)		0.099	0.090	0.090					
Water Temperature (°C)		19.0	19.7	19.7					
Turbidity (NTU)		16.1	101	150					
Dissolved Oxygen (mg/L)		5.92	5.66	7.28					
Well Condition Information					Additional Comments				
-overall condition acceptable?		Yes			φ PETRO ODO				
-well cap acceptable?					# SILEN PRESENT				
-manhole and cover acceptable?									
-well pad acceptable?									
-area safe?									
-other comments		Missing 1 Bolt							



# TERRY Environmental Services

CLIENTS FIRST ALWAYS

P.O. Box 25  
Summerville, SC 29484  
1-800-325-0605

Site Specific Information				Monitoring Well Information			
Terry Project ID	2230.8D			Well ID	12719 - MW2		
SCDHEC Permit No.	12719			Testing Parameters	BTEX, Naph, MTBE, 1,2-DCA, Oxygenates, & Ethanol		
Project Name	Hot Spot #3005						
Date	10/31/11						
Field Personnel	TS			Well Diameter	2	in	TAG BOTTOM OF WELL TO VERIFY WELL DEPTH. WRITE BELOW TO NEAREST 0.1'
General Weather	CLEAR			Screened Interval	26-36	ft	
Ambient Air Temperature	50°			Total Well Depth (nearest 0.1')	32.9	ft	
Quality Assurance				Depth to Groundwater (nearest 0.01')	29.03	ft	
pH Meter	Horiba U-52-2	Conductivity Meter	Horiba U-52-2	Length of Water Column	3.87	ft	
Serial Number	VWKAUMKJ	Serial Number	VWKAUMKJ	1 Casing Volume (0.163)	0.63	ft	
Calibration Constant	4.00	Calibration Constant	4.49 mS/cm	3 Casing Volumes (0.489)	1.89	gals	
Calibration Constant	6.86	Calibration Constant	53.0 mS/cm	Total Volume Purged	3.00	gals	
Calibration Constant	9.18	Calibration Constant	58.7 mS/cm	Purge Technique Utilized (bailer, pump)	BAILER		
Last Calibration (time)	10/11	Last Verification (time)		Well Yield	Low <input checked="" type="checkbox"/>	Medium <input type="checkbox"/>	High <input type="checkbox"/>
Volume (gal)	INITIAL	1.0	2.0	3.0			32.9
Time (military)	1335	1340	1354	1409			
pH (su)	6.63	6.79	6.86	6.87			
Spec Conductivity (mS/cm)	0.207	0.216	0.230	0.233			
Water Temperature (°C)	19.4	19.8	19.8	19.8			
Turbidity (NTU)	70.9	88.7	142	447			
Dissolved Oxygen (mg/L)	7.15	3.27	2.74	2.81			
Well Condition Information				Additional Comments			
-overall condition acceptable?	TOC IS CRACKED (Took Pic)			✓ SHEET PRESENT			
-well cap acceptable?	HARD TO SEAL ON BROKE CASING			✓ DEBRIS PARTICLES IN H2O COLUMN			
-manhole and cover acceptable?	YES						
-well pad acceptable?	YES						
-area safe?	YES						
-other comments	MISSING 3 BOLTS						



# TERRY Environmental Services

CLIENTS FIRST ALWAYS

P.O. Box 25  
Summerville, SC 29484  
1-800-325-0605

Site Specific Information				Monitoring Well Information																											
Terry Project ID		2230.8D		Well ID		12719 - MW3R																									
SCDHEC Permit No.		12719		Testing Parameters		BTEX, Naph, MTBE, 1,2-DCA, Oxygenates, & Ethanol																									
Project Name		Hot Spot #3005																													
Date		10/31/11																													
Field Personnel		TS		Well Diameter		2	in																								
General Weather		Cloudy		Screened Interval		26-36	ft																								
Ambient Air Temperature		55.0		Total Well Depth (nearest 0.1')		36.3	ft																								
<b>Quality Assurance</b> <table border="1"> <tr> <td>pH Meter</td> <td>Horiba U-52-2</td> <td>Conductivity Meter</td> <td>Horiba U-52-2</td> </tr> <tr> <td>Serial Number</td> <td>VWKAUMKJ</td> <td>Serial Number</td> <td>VWKAUMKJ</td> </tr> <tr> <td>Calibration Constant</td> <td>4.00</td> <td>Calibration Constant</td> <td>4.49 mS/cm</td> </tr> <tr> <td>Calibration Constant</td> <td>6.86</td> <td>Calibration Constant</td> <td>53.0 mS/cm</td> </tr> <tr> <td>Calibration Constant</td> <td>9.18</td> <td>Calibration Constant</td> <td>58.7 mS/cm</td> </tr> <tr> <td>Last Calibration (time)</td> <td></td> <td>Last Verification (time)</td> <td>1419</td> </tr> </table>				pH Meter	Horiba U-52-2	Conductivity Meter	Horiba U-52-2	Serial Number	VWKAUMKJ	Serial Number	VWKAUMKJ	Calibration Constant	4.00	Calibration Constant	4.49 mS/cm	Calibration Constant	6.86	Calibration Constant	53.0 mS/cm	Calibration Constant	9.18	Calibration Constant	58.7 mS/cm	Last Calibration (time)		Last Verification (time)	1419	Depth to Groundwater (nearest 0.01')		32.12	ft
				pH Meter	Horiba U-52-2	Conductivity Meter	Horiba U-52-2																								
Serial Number	VWKAUMKJ	Serial Number	VWKAUMKJ																												
Calibration Constant	4.00	Calibration Constant	4.49 mS/cm																												
Calibration Constant	6.86	Calibration Constant	53.0 mS/cm																												
Calibration Constant	9.18	Calibration Constant	58.7 mS/cm																												
Last Calibration (time)		Last Verification (time)	1419																												
				Length of Water Column		4.18	ft																								
				1 Casing Volume (0.163)		0.68	ft																								
				3 Casing Volumes (0.489)		2.04	gals																								
				Total Volume Purged		3.00	gals																								
				Purge Technique Utilized (bailer, pump)		BAILER																									
				Well Yield		Low <input checked="" type="checkbox"/>	Medium <input type="checkbox"/>																								
						High <input type="checkbox"/>	36.3																								
Volume (gal)	1.0	2.0	3.0	Duplicate																											
Time (military)	1510	1515	1525	1545																											
pH (su)	5.66	5.80	5.72	5.74																											
Spec Conductivity (mS/cm)	0.258	0.299	0.290	0.292																											
Water Temperature (°C)	19.05	19.4	19.4	19.4																											
Turbidity (NTU)	8.7	20.1	66.9	80.0																											
Dissolved Oxygen (mg/L)	7.67	6.37	6.28	6.21																											
<b>Well Condition Information</b>				<b>Additional Comments</b>																											
-overall condition acceptable?				✓ TS																											
-well cap acceptable?				✓ STEADY PETRO ODR																											
-manhole and cover acceptable?				✓ DUPLICATES TAKEN																											
-well pad acceptable?																															
-area safe?																															
-other comments																															



# TERRY Environmental Services

CLIENTS FIRST ALWAYS

P.O. Box 25  
Summerville, SC 29484  
1-800-325-0605

Site Specific Information				Monitoring Well Information			
Terry Project ID		2230.8D		Well ID		12719 - MW5	
SCDHEC Permit No.		12719		Testing Parameters		BTEX, Naph, MTBE, 1,2-DCA, Oxygenates, & Ethanol	
Project Name		Hot Spot #3005					
Date		10/31/11					
Field Personnel		TS		Well Diameter		2	in
General Weather		CLEAR		Screened Interval		22-32	ft
Ambient Air Temperature		45°		Total Well Depth (nearest 0.1')		32.3	ft
Quality Assurance				Depth to Groundwater (nearest 0.01')		31.80	ft
pH Meter	Horiba U-52-2	Conductivity Meter	Horiba U-52-2	Length of Water Column		0.50	ft
Serial Number	VWKAUMKJ	Serial Number	VWKAUMKJ	1 Casing Volume (0.163)		.08	ft
Calibration Constant	4.00	Calibration Constant	4.49 mS/cm	3 Casing Volumes (0.489)		.24	gals
Calibration Constant	6.86	Calibration Constant	53.0 mS/cm	Total Volume Purged		-	gals
Calibration Constant	9.18	Calibration Constant	58.7 mS/cm	Purge Technique Utilized (bailer, pump)		BAILER	
Last Calibration (time)	1011	Last Verification (time)		Well Yield		Low <input checked="" type="checkbox"/>	Medium <input type="checkbox"/>
Volume (gal)	INITIAL					32.3	
Time (military)	1108						
pH (su)	/						
Spec Conductivity (mS/cm)	/						
Water Temperature (°C)	/						
Turbidity (NTU)	/						
Dissolved Oxygen (mg/L)	/						
Well Condition Information				Additional Comments			
-overall condition acceptable?		YES		# MINIMAL H2O IN WELL, NO PARAMETERS TAKEN, ONLY ENOUGH H2O TO FILL 4 VIALS # CHEMICAL ODOR			
-well cap acceptable?							
-manhole and cover acceptable?							
-well pad acceptable?							
-area safe?							
-other comments							



# TERRY Environmental Services

CLIENTS FIRST ALWAYS

P.O. Box 25  
Summerville, SC 29484  
1-800-325-0605

Site Specific Information					Monitoring Well Information							
Terry Project ID		2230.8D			Well ID		12719 - MW6					
SCDHEC Permit No.		12719			Testing Parameters		BTEX, Naph, MTBE, 1,2-DCA, Oxygenates, & Ethanol					
Project Name		Hot Spot #3005										
Date		10/31/11										
Field Personnel		TS			Well Diameter		2	in	TAG BOTTOM OF WELL TO VERIFY WELL DEPTH. WRITE BELOW TO NEAREST 0.1'			
General Weather		CLOUDY			Screened Interval		26-36	ft				
Ambient Air Temperature		55°			Total Well Depth (nearest 0.1')		36.3	ft				
Quality Assurance					Depth to Groundwater (nearest 0.01')		36.57	ft				
pH Meter		Horiba U-52-2		Conductivity Meter		Horiba U-52-2		Length of Water Column		5.73	ft	
Serial Number		VWKAUMKJ		Serial Number		VWKAUMKJ		1 Casing Volume (0.163)		0.93	ft	
Calibration Constant		4.00		Calibration Constant		4.49 mS/cm		3 Casing Volumes (0.489)		2.79	gals	
Calibration Constant		6.86		Calibration Constant		53.0 mS/cm		Total Volume Purged		3.00	gals	
Calibration Constant		9.18		Calibration Constant		58.7 mS/cm		Purge Technique Utilized (bailer, pump)		BAILER		
Last Calibration (time)				Last Verification (time)		1419		Well Yield		Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Volume (gal)	INITIAL	1.00	2.00	3.00								
Time (military)	1425	1435	1439	1445								
pH (su)	4.66	4.74	4.74	4.76								
Spec Conductivity (mS/cm)	0.632	0.498	0.479	0.483								
Water Temperature (°C)	19.1	19.8	19.8	19.8								
Turbidity (NTU)	5.4	13.3	17.3	17.2								
Dissolved Oxygen (mg/L)	8.52	3.01	2.46	2.70								
Well Condition Information					Additional Comments							
-overall condition acceptable?		YES			* SLIGHT PETRO ODDOR							
-well cap acceptable?												
-manhole and cover acceptable?												
-well pad acceptable?												
-area safe?												
-other comments												



# TERRY Environmental Services

CLIENTS FIRST ALWAYS

P.O. Box 25  
Summerville, SC 29484  
1-800-325-0605

Site Specific Information					Monitoring Well Information								
Terry Project ID		2230.8D			Well ID		12719 - MW10R						
SCDHEC Permit No.		12719			Testing Parameters		BTEX, Naph, MTBE, 1,2-DCA, Oxygenates, & Ethanol						
Project Name		Hot Spot #3005											
Date		10/31/11											
Field Personnel		TS			Well Diameter		2	in	TAG BOTTOM OF WELL TO VERIFY WELL DEPTH. WRITE BELOW TO NEAREST 0.1'				
General Weather		P. Cloudy			Screened Interval		22-32	ft					
Ambient Air Temperature		40°			Total Well Depth (nearest 0.1')		32.1	ft					
Quality Assurance					Depth to Groundwater (nearest 0.01')		24.39	ft					
pH Meter		Horiba U-52-2		Conductivity Meter		Horiba U-52-2		Length of Water Column		7.7	ft		
Serial Number		VWKAUMKJ		Serial Number		VWKAUMKJ		1 Casing Volume (0.163)		1.26	ft		
Calibration Constant		4.00		Calibration Constant		4.49 mS/cm		3 Casing Volumes (0.489)		3.78	gals		
Calibration Constant		6.86		Calibration Constant		53.0 mS/cm		Total Volume Purged		6.00	gals		
Calibration Constant		9.18		Calibration Constant		58.7 mS/cm		Purge Technique Utilized (bailer, pump)		Bailer			
Last Calibration (time)		10/11		Last Verification (time)				Well Yield		Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	32.1
Volume (gal)		1.50	3.0	4.5	6.0								
Time (military)		1022	1026	1031	1034	1039							
pH (su)		4.04	4.52	4.72	4.71	4.79							
Spec Conductivity (mS/cm)		0.220	0.095	0.082	0.080	0.081							
Water Temperature (°C)		17.1	17.9	18.4	18.4	18.4							
Turbidity (NTU)		50.2	51	399	341	460							
Dissolved Oxygen (mg/L)		9.85	5.14	5.29	5.31	5.36							
Well Condition Information					Additional Comments								
-overall condition acceptable?					✓								
-well cap acceptable?					✓								
-manhole and cover acceptable?					COVER HAS SURFACE CRACK								
-well pad acceptable?					✓								
-area safe?					✓								
-other comments					MISSING 1 BOLT								





# TERRY Environmental Services

CLIENTS FIRST ALWAYS

P.O. Box 25  
Summerville, SC 29484  
1-800-325-0605

Site Specific Information					Monitoring Well Information				
Terry Project ID	2230.8D				Well ID	12719 - MW1D			
SCDHEC Permit No.	12719				Testing Parameters	BTEX, Naph, MTBE, 1,2-DCA, Oxygenates, & Ethanol			
Project Name	Hot Spot #3005								
Date	10/31/11								
Field Personnel	TS				Well Diameter	2	in		TAG BOTTOM OF WELL TO VERIFY WELL DEPTH, WRITE BELOW TO NEAREST 0.1'
General Weather	CLEAR				Screened Interval	55-60	ft		
Ambient Air Temperature	45°				Total Well Depth (nearest 0.1')	58.6	ft		
Quality Assurance					Depth to Groundwater (nearest 0.01')	30.03	ft		
pH Meter	Horiba U-52-2	Conductivity Meter		Horiba U-52-2	Length of Water Column	28.30	ft		
Serial Number	VWKAUMKJ	Serial Number		VWKAUMKJ	1 Casing Volume (0.163)	4.61	ft		
Calibration Constant	4.00	Calibration Constant		4.49 mS/cm	3 Casing Volumes (0.489)	13.83	gals		
Calibration Constant	6.86	Calibration Constant		53.0 mS/cm	Total Volume Purged	20.00	gals		
Calibration Constant	9.18	Calibration Constant		58.7 mS/cm	Purge Technique Utilized (bailer, pump)	Pump			
Last Calibration (time)	1011	Last Verification (time)			Well Yield	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	58.6
Volume (gal)	INITIAL	2.50	5.00	7.50	10.00	12.50	15.00	17.50	20.00
Time (military)	1155	1159	1204	1206	1208	1211	1220	1225	1230
pH (su)	6.11	5.99	5.98	5.94	5.90	5.90	5.81	5.83	5.86
Spec Conductivity (mS/cm)	0.092	0.100	0.093	0.085	0.085	0.078	0.075	0.077	0.082
Water Temperature (°C)	16.7	17.7	18.0	18.1	18.1	18.1	18.1	18.1	18.1
Turbidity (NTU)	39.4	11.9	15.6	9.0	6.8	7.1	6.8	7.0	3.3
Dissolved Oxygen (mg/L)	5.51	9.33	7.93	6.39	6.29	7.51	7.31	7.40	7.32
Well Condition Information					Additional Comments				
-overall condition acceptable?	Yes								
-well cap acceptable?									
-manhole and cover acceptable?									
-well pad acceptable?									
-area safe?									
-other comments	Missing 1 Bolt								



**HORIBA U-52-2 DAILY CALIBRATION DATA SHEET**

Serial Number: VWKAUMKJ Date/Time: 10-31-11 / 1011 Inspector: TS

Solution Manufacturer: Aurical Lot Number: 8928 Expiration Date: 5-6-12

<u>Solution Value</u>	<u>Instrument Reading</u>	<u>Accuracy</u>
pH: 4.00	<u>4.01</u>	± <u>0.01</u>
Conductivity: 4.49 mS/cm	<u>4.50</u> mS/cm	± <u>0.01</u> mS/cm
Turbidity: 0.0 NTU	<u>0.0</u> NTU	± <u>0.0</u> NTU

<u>Standard Reading</u>	<u>Instrument Reading</u>	<u>Accuracy</u>
NIST-Traceable Thermometer: <u>11.6</u> °C	<u>12.4</u> °C	± <u>0.8</u> °C

**QAPP Acceptance Criteria**

<u>Field Parameter</u>	<u>Accuracy</u>
Temperature	±1°C against an NIST-traceable thermometer
Specific Conductance	10% of each standard used
pH	±0.2 pH units of stated buffer value
Turbidity	10% of each standard used

**Inspector's Maintenance Notes**

- HOT SPOT #3005 / 2030.8D

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**HORIBA U-52-2 VERIFICATION CHECK DATA SHEET**

Serial Number: VWKAUMKJ      Date/Time: 10-31-11/1419      Inspector: TS

Solution Manufacturer: <u>Aurical</u>	Lot Number: <u>8928</u>	Expiration Date: <u>5-6-12</u>
<u>Solution Value</u>	<u>Instrument Reading</u>	<u>Accuracy</u>
pH: 4.00	<u>3.99</u>	± <u>0.01</u>
Conductivity: 4.49 mS/cm	<u>4.49</u> mS/cm	± <u>0.0</u> mS/cm
Turbidity: 0.0 NTU	<u>0.0</u> NTU	± <u>0.0</u> NTU

<u>Standard Reading</u>	<u>Instrument Reading</u>	<u>Accuracy</u>
NIST-Traceable Thermometer: <u>17.8</u> °C	<u>17.5</u> °C	± <u>0.3</u> °C

**QAPP Acceptance Criteria**

<u>Field Parameter</u>	<u>Accuracy</u>
Temperature	±1°C against an NIST-traceable thermometer
Specific Conductance	10% of each standard used
pH	±0.2 pH units of stated buffer value
Turbidity	10% of each standard used

**Inspector's Maintenance Notes**

\* HOT SPOT # 3005 / 2230.80

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**HORIBA U-52-2 VERIFICATION CHECK DATA SHEET**

Serial Number: VWKAUMKJ    Date/Time: 10/31/11/1555    Inspector: TS

Solution Manufacturer: Aurical    Lot Number: 8928    Expiration Date: 5-6-12

<u>Solution Value</u>	<u>Instrument Reading</u>	<u>Accuracy</u>
pH: 4.00	<u>3.99</u>	± 0.01
Conductivity: 4.49 mS/cm	<u>4.48</u> mS/cm	± 0.01 mS/cm
Turbidity: 0.0 NTU	<u>0.0</u> NTU	± 0.0 NTU

<u>Standard Reading</u>	<u>Instrument Reading</u>	<u>Accuracy</u>
NIST-Traceable Thermometer: <u>17.4</u> °C	<u>17.0</u> °C	± 0.4 °C

**QAPP Acceptance Criteria**

<u>Field Parameter</u>	<u>Accuracy</u>
Temperature	±1°C against an NIST-traceable thermometer
Specific Conductance	10% of each standard used
pH	±0.2 pH units of stated buffer value
Turbidity	10% of each standard used

**Inspector's Maintenance Notes**

- HOT SPOT #3005/2230.80

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ACCESS  
ANALYTICAL, INC.

## ANALYTICAL REPORT

### CLIENT

Terry Environmental  
P.O. Box 25  
Summerville, SC 29484

### ATTENTION

Kelly Cone

### PROJECT ID

Hot Spot #3005 / 2230.8B

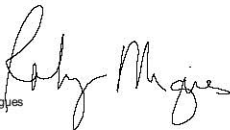
### LABORATORY REPORT NUMBER

211110225

### DATE

11/07/2011

Primary Data Review By



Robyn Migjes

Curtis Ekker  
Data Validation Manager, GCAL

Secondary Data Review By

Ashley B. Amick  
Project Manager, Access Analytical, Inc.  
[aamick@accessanalyticalinc.com](mailto:aamick@accessanalyticalinc.com)

### PLEASE NOTE:

- Unless otherwise noted, all analysis on this report performed at Gulf Coast Analytical Labs (GCAL), 7979 GSRI Avenue, Baton Rouge, LA 70820.
- GCAL is SCDHEC certified laboratory # 73006, NCDENR certified lab # 618, GA certified lab # LA-01955, NELAP certified laboratory # 01955
- Local support services for this project are provided by Access Analytical, Inc.. Access Analytical is a representative of GCAL serving clients in the SC/NC/GA areas. 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.

# ANALYTICAL RESULTS

PERFORMED BY

GULF COAST ANALYTICAL LABORATORIES, INC.

7979 GSRI Avenue  
Baton Rouge, LA 70820

Report Date 11/07/2011

GCAL Report 211110225



**Deliver To** Terry Environmental  
P.O. Box 25  
Summerville, SC 29484

**Attn** Kelly Cone

**Project** Hot Spot #3005 / 2230.8B

## CASE NARRATIVE

**Client:** Access Analytical      **Report:** 211110225

Gulf Coast Analytical Laboratories received and analyzed the sample(s) listed on the sample cross-reference page of this report. Receipt of the sample(s) is documented by the attached chain of custody. This applies only to the sample(s) listed in this report. No sample integrity or quality control exceptions were identified unless noted below.

### **VOLATILES MASS SPECTROMETRY**

In the SW-846 8260B analysis, samples 21111022503 (12719-MW3R) and 21111022508 (12719-MW3R(DUP)) had to be diluted to bracket the concentration of target compounds within the calibration range of the instrument. The dilutions are reflected in elevated detection limits.

In the SW-846 8260B - Gas Additives analysis, samples 21111022503 (12719-MW3R) and 21111022508 (12719-MW3R(DUP)) had to be diluted due to the presence of non-target background. This dilution is reflected in elevated reporting limits.

# Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with GCAL's Standard Operating Procedures.

## Common Abbreviations Utilized in this Report

<b>ND</b>	Indicates the result was Not Detected at the specified RDL
<b>DO</b>	Indicates the result was Diluted Out
<b>MI</b>	Indicates the result was subject to Matrix Interference
<b>TNTC</b>	Indicates the result was Too Numerous To Count
<b>SUBC</b>	Indicates the analysis was Sub-Contracted
<b>FLD</b>	Indicates the analysis was performed in the Field
<b>PQL</b>	Practical Quantitation Limit
<b>MDL</b>	Method Detection Limit
<b>RDL</b>	Reporting Detection Limit
<b>00:00</b>	Reported as a time equivalent to 12:00 AM

## Reporting Flags Utilized in this Report

<b>J</b>	Indicates an estimated value
<b>U</b>	Indicates the compound was analyzed for but not detected
<b>B</b>	(ORGANICS) Indicates the analyte was detected in the associated Method Blank
<b>B</b>	(INORGANICS) Indicates the result is between the RDL and MDL

Sample receipt at GCAL is documented through the attached chain of custody. In accordance with [NELAC](#), this report shall be reproduced only in full and with the written permission of GCAL. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with the NELAC standard and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.

Robyn Miguez



Robyn Miguez  
Technical Director

GCAL REPORT 211110225

THIS REPORT CONTAINS 22 PAGES.



# Report Sample Summary

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21111022501	12719-MW1	Water	10/31/2011 13:20	11/02/2011 09:00
21111022502	12719-MW2	Water	10/31/2011 14:09	11/02/2011 09:00
21111022503	12719-MW3R	Water	10/31/2011 15:40	11/02/2011 09:00
21111022504	12719-MW5	Water	10/31/2011 11:08	11/02/2011 09:00
21111022505	12719-MW6	Water	10/31/2011 14:45	11/02/2011 09:00
21111022506	12719-MW10R	Water	10/31/2011 10:39	11/02/2011 09:00
21111022507	12719-MW1D	Water	10/31/2011 12:30	11/02/2011 09:00
21111022508	12719-MW3R(DUP)	Water	10/31/2011 15:45	11/02/2011 09:00
21111022509	FB	Water	10/31/2011 09:57	11/02/2011 09:00
21111022510	TB	Water	10/31/2011 00:00	11/02/2011 09:00

# Summary of Compounds Detected

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21111022501	12719-MW1	Water	10/31/2011 13:20	11/02/2011 09:00

## SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
75-85-4	tert-amyl alcohol (TAA)	7.42J	20.0	1.39	ug/L

## SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	57.6	1.00	0.049	ug/L
108-88-3	Toluene	1.93	1.00	0.078	ug/L
100-41-4	Ethylbenzene	36.8	1.00	0.180	ug/L
1330-20-7	Xylene (total)	176	3.00	0.123	ug/L
91-20-3	Naphthalene	91.4	5.00	0.175	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	8.03	1.00	0.084	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21111022502	12719-MW2	Water	10/31/2011 14:09	11/02/2011 09:00

## SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
91-20-3	Naphthalene	2.23J	5.00	0.175	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	11.1	1.00	0.084	ug/L

## SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
75-85-4	tert-amyl alcohol (TAA)	46.3	20.0	1.39	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21111022503	12719-MW3R	Water	10/31/2011 15:40	11/02/2011 09:00

## SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
994-05-8	t-amyl methyl ether (TAME)	163	100	21.0	ug/L
75-65-0	t-Butanol (TBA)	255	200	5.80	ug/L
108-20-3	diisopropyl Ether (DIPE)	53.3J	100	2.10	ug/L
75-85-4	tert-amyl alcohol (TAA)	282J	400	27.8	ug/L

## SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	196	20.0	0.980	ug/L
100-41-4	Ethylbenzene	39.1	20.0	3.60	ug/L
1330-20-7	Xylene (total)	31.3J	60.0	2.46	ug/L
91-20-3	Naphthalene	143	100	3.50	ug/L

# Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21111022503	12719-MW3R	Water	10/31/2011 15:40	11/02/2011 09:00

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
1634-04-4	tert-Butyl methyl ether (MTBE)	2060	20.0	1.68	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21111022504	12719-MW5	Water	10/31/2011 11:08	11/02/2011 09:00

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
75-65-0	t-Butanol (TBA)	7.11J	10.0	0.290	ug/L
75-85-4	tert-amyl alcohol (TAA)	32.0	20.0	1.39	ug/L

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	110	1.00	0.049	ug/L
108-88-3	Toluene	11.5	1.00	0.078	ug/L
1330-20-7	Xylene (total)	9.27	3.00	0.123	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	4.31	1.00	0.084	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21111022505	12719-MW6	Water	10/31/2011 14:45	11/02/2011 09:00

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
75-85-4	tert-amyl alcohol (TAA)	8.52J	20.0	1.39	ug/L

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	10.4	1.00	0.049	ug/L
100-41-4	Ethylbenzene	3.17	1.00	0.180	ug/L
1330-20-7	Xylene (total)	91.5	3.00	0.123	ug/L
91-20-3	Naphthalene	65.4	5.00	0.175	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21111022506	12719-MW10R	Water	10/31/2011 10:39	11/02/2011 09:00

SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
91-20-3	Naphthalene	1.88J	5.00	0.175	ug/L

## Summary of Compounds Detected (con't)

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21111022508	12719-MW3R(DUP)	Water	10/31/2011 15:45	11/02/2011 09:00

### SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
994-05-8	t-amyl methyl ether (TAME)	163	100	21.0	ug/L
75-65-0	t-Butanol (TBA)	246	200	5.80	ug/L
108-20-3	diisopropyl Ether (DIPE)	53.4J	100	2.10	ug/L
75-85-4	tert-amyl alcohol (TAA)	284J	400	27.8	ug/L

### SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	194	20.0	0.980	ug/L
100-41-4	Ethylbenzene	35.5	20.0	3.60	ug/L
1330-20-7	Xylene (total)	29.0J	60.0	2.46	ug/L
91-20-3	Naphthalene	151	100	3.50	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	2070	20.0	1.68	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21111022510	TB	Water	10/31/2011 00:00	11/02/2011 09:00

### SW-846 8260B

CAS#	Parameter	Result	RDL	MDL	Units
64-17-5	Ethanol	236J	1000	81.8	ug/L

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21111022501	12719-MW1	Water	10/31/2011 13:20	11/02/2011 09:00

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	11/05/2011 15:26	EDS	468644

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	57.6	1.00	0.049	ug/L
108-88-3	Toluene	1.93	1.00	0.078	ug/L
100-41-4	Ethylbenzene	36.8	1.00	0.180	ug/L
1330-20-7	Xylene (total)	176	3.00	0.123	ug/L
91-20-3	Naphthalene	91.4	5.00	0.175	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	8.03	1.00	0.084	ug/L
107-06-2	1,2-Dichloroethane	<1.00	1.00	0.121	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	49.6	ug/L	99	78 - 130
1868-53-7	Dibromofluoromethane	50	49.9	ug/L	100	77 - 127
2037-26-5	Toluene d8	50	49.5	ug/L	99	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	48.7	ug/L	97	71 - 127

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	11/05/2011 15:26	EDS	468645

CAS#	Parameter	Result	RDL	MDL	Units
994-05-8	t-amyl methyl ether (TAME)	<5.00	5.00	1.05	ug/L
75-65-0	t-Butanol (TBA)	<10.0	10.0	0.290	ug/L
108-20-3	diisopropyl Ether (DIPE)	<5.00	5.00	0.105	ug/L
637-92-3	Ethyl tert-butyl ether (ETBE)	<5.00	5.00	1.11	ug/L
624-95-3	ethyl tert-butanol (ETBA)	<100	100	37.6	ug/L
64-17-5	Ethanol	<1000	1000	81.8	ug/L
75-85-4	tert-amyl alcohol (TAA)	7.42J	20.0	1.39	ug/L
762-75-4	tert-butyl formate (TBF)	<5.00	5.00	2.16	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	49.6	ug/L	99	78 - 130
1868-53-7	Dibromofluoromethane	50	49.9	ug/L	100	77 - 127
2037-26-5	Toluene d8	50	49.5	ug/L	99	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	48.7	ug/L	97	71 - 127

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21111022502	12719-MW2	Water	10/31/2011 14:09	11/02/2011 09:00

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	11/05/2011 15:47	EDS	468644

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	<1.00	1.00	0.049	ug/L
108-88-3	Toluene	<1.00	1.00	0.078	ug/L
100-41-4	Ethylbenzene	<1.00	1.00	0.180	ug/L
1330-20-7	Xylene (total)	<3.00	3.00	0.123	ug/L
<b>91-20-3</b>	<b>Naphthalene</b>	<b>2.23J</b>	<b>5.00</b>	<b>0.175</b>	<b>ug/L</b>
<b>1634-04-4</b>	<b>tert-Butyl methyl ether (MTBE)</b>	<b>11.1</b>	<b>1.00</b>	<b>0.084</b>	<b>ug/L</b>
107-06-2	1,2-Dichloroethane	<1.00	1.00	0.121	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	52.2	ug/L	104	78 - 130
1868-53-7	Dibromofluoromethane	50	51.7	ug/L	103	77 - 127
2037-26-5	Toluene d8	50	50	ug/L	100	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	48.5	ug/L	97	71 - 127

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	11/05/2011 15:47	EDS	468645

CAS#	Parameter	Result	RDL	MDL	Units
994-05-8	t-amyl methyl ether (TAME)	<5.00	5.00	1.05	ug/L
75-65-0	t-Butanol (TBA)	<10.0	10.0	0.290	ug/L
108-20-3	diisopropyl Ether (DIPE)	<5.00	5.00	0.105	ug/L
637-92-3	Ethyl tert-butyl ether (ETBE)	<5.00	5.00	1.11	ug/L
624-95-3	ethyl tert-butanol (ETBA)	<100	100	37.6	ug/L
64-17-5	Ethanol	<1000	1000	81.8	ug/L
<b>75-85-4</b>	<b>tert-amyl alcohol (TAA)</b>	<b>46.3</b>	<b>20.0</b>	<b>1.39</b>	<b>ug/L</b>
762-75-4	tert-butyl formate (TBF)	<5.00	5.00	2.16	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	52.2	ug/L	104	78 - 130
1868-53-7	Dibromofluoromethane	50	51.7	ug/L	103	77 - 127
2037-26-5	Toluene d8	50	50	ug/L	100	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	48.5	ug/L	97	71 - 127

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21111022503	12719-MW3R	Water	10/31/2011 15:40	11/02/2011 09:00

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			20	11/05/2011 18:14	EDS	468644

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	196	20.0	0.980	ug/L
108-88-3	Toluene	<20.0	20.0	1.55	ug/L
100-41-4	Ethylbenzene	39.1	20.0	3.60	ug/L
1330-20-7	Xylene (total)	31.3J	60.0	2.46	ug/L
91-20-3	Naphthalene	143	100	3.50	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	2060	20.0	1.68	ug/L
107-06-2	1,2-Dichloroethane	<20.0	20.0	2.42	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	1000	1040	ug/L	104	78 - 130
1868-53-7	Dibromofluoromethane	1000	976	ug/L	98	77 - 127
2037-26-5	Toluene d8	1000	995	ug/L	100	76 - 134
17060-07-0	1,2-Dichloroethane-d4	1000	952	ug/L	95	71 - 127

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			20	11/05/2011 18:14	EDS	468645

CAS#	Parameter	Result	RDL	MDL	Units
994-05-8	t-amyl methyl ether (TAME)	163	100	21.0	ug/L
75-65-0	t-Butanol (TBA)	255	200	5.80	ug/L
108-20-3	diisopropyl Ether (DIPE)	53.3J	100	2.10	ug/L
637-92-3	Ethyl tert-butyl ether (ETBE)	<100	100	22.2	ug/L
624-95-3	ethyl tert-butanol (ETBA)	<2000	2000	752	ug/L
64-17-5	Ethanol	<20000	20000	1640	ug/L
75-85-4	tert-amyl alcohol (TAA)	282J	400	27.8	ug/L
762-75-4	tert-butyl formate (TBF)	<100	100	43.2	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	1000	1040	ug/L	104	78 - 130
1868-53-7	Dibromofluoromethane	1000	976	ug/L	98	77 - 127
2037-26-5	Toluene d8	1000	995	ug/L	100	76 - 134
17060-07-0	1,2-Dichloroethane-d4	1000	952	ug/L	95	71 - 127

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21111022504	12719-MW5	Water	10/31/2011 11:08	11/02/2011 09:00

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	11/05/2011 16:08	EDS	468644

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	110	1.00	0.049	ug/L
108-88-3	Toluene	11.5	1.00	0.078	ug/L
100-41-4	Ethylbenzene	<1.00	1.00	0.180	ug/L
1330-20-7	Xylene (total)	9.27	3.00	0.123	ug/L
91-20-3	Naphthalene	<5.00	5.00	0.175	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	4.31	1.00	0.084	ug/L
107-06-2	1,2-Dichloroethane	<1.00	1.00	0.121	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	50.3	ug/L	101	78 - 130
1868-53-7	Dibromofluoromethane	50	48.8	ug/L	98	77 - 127
2037-26-5	Toluene d8	50	49.6	ug/L	99	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	48.9	ug/L	98	71 - 127

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	11/05/2011 16:08	EDS	468645

CAS#	Parameter	Result	RDL	MDL	Units
994-05-8	t-amyl methyl ether (TAME)	<5.00	5.00	1.05	ug/L
75-65-0	t-Butanol (TBA)	7.11J	10.0	0.290	ug/L
108-20-3	diisopropyl Ether (DIPE)	<5.00	5.00	0.105	ug/L
637-92-3	Ethyl tert-butyl ether (ETBE)	<5.00	5.00	1.11	ug/L
624-95-3	ethyl tert-butanol (ETBA)	<100	100	37.6	ug/L
64-17-5	Ethanol	<1000	1000	81.8	ug/L
75-85-4	tert-amyl alcohol (TAA)	32.0	20.0	1.39	ug/L
762-75-4	tert-butyl formate (TBF)	<5.00	5.00	2.16	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	50.3	ug/L	101	78 - 130
1868-53-7	Dibromofluoromethane	50	48.8	ug/L	98	77 - 127
2037-26-5	Toluene d8	50	49.6	ug/L	99	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	48.9	ug/L	98	71 - 127



GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21111022505	12719-MW6	Water	10/31/2011 14:45	11/02/2011 09:00

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	11/05/2011 16:29	EDS	468644

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	10.4	1.00	0.049	ug/L
108-88-3	Toluene	<1.00	1.00	0.078	ug/L
100-41-4	Ethylbenzene	3.17	1.00	0.180	ug/L
1330-20-7	Xylene (total)	91.5	3.00	0.123	ug/L
91-20-3	Naphthalene	65.4	5.00	0.175	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	<1.00	1.00	0.084	ug/L
107-06-2	1,2-Dichloroethane	<1.00	1.00	0.121	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	51.1	ug/L	102	78 - 130
1868-53-7	Dibromofluoromethane	50	52.3	ug/L	105	77 - 127
2037-26-5	Toluene d8	50	49.7	ug/L	99	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	49.3	ug/L	99	71 - 127

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	11/05/2011 16:29	EDS	468645

CAS#	Parameter	Result	RDL	MDL	Units
994-05-8	t-amyl methyl ether (TAME)	<5.00	5.00	1.05	ug/L
75-65-0	t-Butanol (TBA)	<10.0	10.0	0.290	ug/L
108-20-3	diisopropyl Ether (DIPE)	<5.00	5.00	0.105	ug/L
637-92-3	Ethyl tert-butyl ether (ETBE)	<5.00	5.00	1.11	ug/L
624-95-3	ethyl tert-butanol (ETBA)	<100	100	37.6	ug/L
64-17-5	Ethanol	<1000	1000	81.8	ug/L
75-85-4	tert-amyl alcohol (TAA)	8.52J	20.0	1.39	ug/L
762-75-4	tert-butyl formate (TBF)	<5.00	5.00	2.16	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	51.1	ug/L	102	78 - 130
1868-53-7	Dibromofluoromethane	50	52.3	ug/L	105	77 - 127
2037-26-5	Toluene d8	50	49.7	ug/L	99	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	49.3	ug/L	99	71 - 127

<b>GCAL ID</b> 21111022506	<b>Client ID</b> 12719-MW10R	<b>Matrix</b> Water	<b>Collect Date/Time</b> 10/31/2011 10:39	<b>Receive Date/Time</b> 11/02/2011 09:00
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SW-846 8260B

<b>Prep Date</b>	<b>Prep Batch</b>	<b>Prep Method</b>	<b>Dilution</b> 1	<b>Analyzed</b> 11/05/2011 16:50	<b>By</b> EDS	<b>Analytical Batch</b> 468644
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CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	<1.00	1.00	0.049	ug/L
108-88-3	Toluene	<1.00	1.00	0.078	ug/L
100-41-4	Ethylbenzene	<1.00	1.00	0.180	ug/L
1330-20-7	Xylene (total)	<3.00	3.00	0.123	ug/L
<b>91-20-3</b>	<b>Naphthalene</b>	<b>1.88J</b>	<b>5.00</b>	<b>0.175</b>	<b>ug/L</b>
1634-04-4	tert-Butyl methyl ether (MTBE)	<1.00	1.00	0.084	ug/L
107-06-2	1,2-Dichloroethane	<1.00	1.00	0.121	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	51.4	ug/L	103	78 - 130
1868-53-7	Dibromofluoromethane	50	51.9	ug/L	104	77 - 127
2037-26-5	Toluene d8	50	50.3	ug/L	101	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	49.1	ug/L	98	71 - 127

SW-846 8260B

<b>Prep Date</b>	<b>Prep Batch</b>	<b>Prep Method</b>	<b>Dilution</b> 1	<b>Analyzed</b> 11/05/2011 16:50	<b>By</b> EDS	<b>Analytical Batch</b> 468645
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CAS#	Parameter	Result	RDL	MDL	Units
994-05-8	t-amyl methyl ether (TAME)	<5.00	5.00	1.05	ug/L
75-65-0	t-Butanol (TBA)	<10.0	10.0	0.290	ug/L
108-20-3	diisopropyl Ether (DIPE)	<5.00	5.00	0.105	ug/L
637-92-3	Ethyl tert-butyl ether (ETBE)	<5.00	5.00	1.11	ug/L
624-95-3	ethyl tert-butanol (ETBA)	<100	100	37.6	ug/L
64-17-5	Ethanol	<1000	1000	81.8	ug/L
75-85-4	tert-amyl alcohol (TAA)	<20.0	20.0	1.39	ug/L
762-75-4	tert-butyl formate (TBF)	<5.00	5.00	2.16	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	51.4	ug/L	103	78 - 130
1868-53-7	Dibromofluoromethane	50	51.9	ug/L	104	77 - 127
2037-26-5	Toluene d8	50	50.3	ug/L	101	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	49.1	ug/L	98	71 - 127

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21111022507	12719-MW1D	Water	10/31/2011 12:30	11/02/2011 09:00

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	11/05/2011 17:11	EDS	468644

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	<1.00	1.00	0.049	ug/L
108-88-3	Toluene	<1.00	1.00	0.078	ug/L
100-41-4	Ethylbenzene	<1.00	1.00	0.180	ug/L
1330-20-7	Xylene (total)	<3.00	3.00	0.123	ug/L
91-20-3	Naphthalene	<5.00	5.00	0.175	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	<1.00	1.00	0.084	ug/L
107-06-2	1,2-Dichloroethane	<1.00	1.00	0.121	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	49.1	ug/L	98	78 - 130
1868-53-7	Dibromofluoromethane	50	51.2	ug/L	102	77 - 127
2037-26-5	Toluene d8	50	50	ug/L	100	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	48.8	ug/L	98	71 - 127

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	11/05/2011 17:11	EDS	468645

CAS#	Parameter	Result	RDL	MDL	Units
994-05-8	t-amyl methyl ether (TAME)	<5.00	5.00	1.05	ug/L
75-65-0	t-Butanol (TBA)	<10.0	10.0	0.290	ug/L
108-20-3	diisopropyl Ether (DIPE)	<5.00	5.00	0.105	ug/L
637-92-3	Ethyl tert-butyl ether (ETBE)	<5.00	5.00	1.11	ug/L
624-95-3	ethyl tert-butanol (ETBA)	<100	100	37.6	ug/L
64-17-5	Ethanol	<1000	1000	81.8	ug/L
75-85-4	tert-amyl alcohol (TAA)	<20.0	20.0	1.39	ug/L
762-75-4	tert-butyl formate (TBF)	<5.00	5.00	2.16	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	49.1	ug/L	98	78 - 130
1868-53-7	Dibromofluoromethane	50	51.2	ug/L	102	77 - 127
2037-26-5	Toluene d8	50	50	ug/L	100	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	48.8	ug/L	98	71 - 127

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21111022508	12719-MW3R(DUP)	Water	10/31/2011 15:45	11/02/2011 09:00

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			20	11/05/2011 18:35	EDS	468644

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	194	20.0	0.980	ug/L
108-88-3	Toluene	<20.0	20.0	1.55	ug/L
100-41-4	Ethylbenzene	35.5	20.0	3.60	ug/L
1330-20-7	Xylene (total)	29.0J	60.0	2.46	ug/L
91-20-3	Naphthalene	151	100	3.50	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	2070	20.0	1.68	ug/L
107-06-2	1,2-Dichloroethane	<20.0	20.0	2.42	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	1000	987	ug/L	99	78 - 130
1868-53-7	Dibromofluoromethane	1000	997	ug/L	100	77 - 127
2037-26-5	Toluene d8	1000	1000	ug/L	100	76 - 134
17060-07-0	1,2-Dichloroethane-d4	1000	968	ug/L	97	71 - 127

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			20	11/05/2011 18:35	EDS	468645

CAS#	Parameter	Result	RDL	MDL	Units
994-05-8	t-amyl methyl ether (TAME)	163	100	21.0	ug/L
75-65-0	t-Butanol (TBA)	246	200	5.80	ug/L
108-20-3	diisopropyl Ether (DIPE)	53.4J	100	2.10	ug/L
637-92-3	Ethyl tert-butyl ether (ETBE)	<100	100	22.2	ug/L
624-95-3	ethyl tert-butanol (ETBA)	<2000	2000	752	ug/L
64-17-5	Ethanol	<20000	20000	1640	ug/L
75-85-4	tert-amyl alcohol (TAA)	284J	400	27.8	ug/L
762-75-4	tert-butyl formate (TBF)	<100	100	43.2	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	1000	987	ug/L	99	78 - 130
1868-53-7	Dibromofluoromethane	1000	997	ug/L	100	77 - 127
2037-26-5	Toluene d8	1000	1000	ug/L	100	76 - 134
17060-07-0	1,2-Dichloroethane-d4	1000	968	ug/L	97	71 - 127

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21111022509	FB	Water	10/31/2011 09:57	11/02/2011 09:00

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	11/05/2011 17:32	EDS	468644

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	<1.00	1.00	0.049	ug/L
108-88-3	Toluene	<1.00	1.00	0.078	ug/L
100-41-4	Ethylbenzene	<1.00	1.00	0.180	ug/L
1330-20-7	Xylene (total)	<3.00	3.00	0.123	ug/L
91-20-3	Naphthalene	<5.00	5.00	0.175	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	<1.00	1.00	0.084	ug/L
107-06-2	1,2-Dichloroethane	<1.00	1.00	0.121	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	50.2	ug/L	100	78 - 130
1868-53-7	Dibromofluoromethane	50	50.7	ug/L	101	77 - 127
2037-26-5	Toluene d8	50	49.7	ug/L	99	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	48.2	ug/L	96	71 - 127

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	11/05/2011 17:32	EDS	468645

CAS#	Parameter	Result	RDL	MDL	Units
994-05-8	t-amyl methyl ether (TAME)	<5.00	5.00	1.05	ug/L
75-65-0	t-Butanol (TBA)	<10.0	10.0	0.290	ug/L
108-20-3	diisopropyl Ether (DIPE)	<5.00	5.00	0.105	ug/L
637-92-3	Ethyl tert-butyl ether (ETBE)	<5.00	5.00	1.11	ug/L
624-95-3	ethyl tert-butanol (ETBA)	<100	100	37.6	ug/L
64-17-5	Ethanol	<1000	1000	81.8	ug/L
75-85-4	tert-amyl alcohol (TAA)	<20.0	20.0	1.39	ug/L
762-75-4	tert-butyl formate (TBF)	<5.00	5.00	2.16	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	50.2	ug/L	100	78 - 130
1868-53-7	Dibromofluoromethane	50	50.7	ug/L	101	77 - 127
2037-26-5	Toluene d8	50	49.7	ug/L	99	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	48.2	ug/L	96	71 - 127

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21111022510	TB	Water	10/31/2011 00:00	11/02/2011 09:00

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	11/05/2011 17:53	EDS	468644

CAS#	Parameter	Result	RDL	MDL	Units
71-43-2	Benzene	<1.00	1.00	0.049	ug/L
108-88-3	Toluene	<1.00	1.00	0.078	ug/L
100-41-4	Ethylbenzene	<1.00	1.00	0.180	ug/L
1330-20-7	Xylene (total)	<3.00	3.00	0.123	ug/L
91-20-3	Naphthalene	<5.00	5.00	0.175	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	<1.00	1.00	0.084	ug/L
107-06-2	1,2-Dichloroethane	<1.00	1.00	0.121	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	50.2	ug/L	100	78 - 130
1868-53-7	Dibromofluoromethane	50	50.7	ug/L	101	77 - 127
2037-26-5	Toluene d8	50	49.7	ug/L	99	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	48.3	ug/L	97	71 - 127

SW-846 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
			1	11/05/2011 17:53	EDS	468645

CAS#	Parameter	Result	RDL	MDL	Units
994-05-8	t-amyl methyl ether (TAME)	<5.00	5.00	1.05	ug/L
75-65-0	t-Butanol (TBA)	<10.0	10.0	0.290	ug/L
108-20-3	diisopropyl Ether (DIPE)	<5.00	5.00	0.105	ug/L
637-92-3	Ethyl tert-butyl ether (ETBE)	<5.00	5.00	1.11	ug/L
624-95-3	ethyl tert-butanol (ETBA)	<100	100	37.6	ug/L
<b>64-17-5</b>	<b>Ethanol</b>	<b>236J</b>	<b>1000</b>	<b>81.8</b>	<b>ug/L</b>
75-85-4	tert-amyl alcohol (TAA)	<20.0	20.0	1.39	ug/L
762-75-4	tert-butyl formate (TBF)	<5.00	5.00	2.16	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	50.2	ug/L	100	78 - 130
1868-53-7	Dibromofluoromethane	50	50.7	ug/L	101	77 - 127
2037-26-5	Toluene d8	50	49.7	ug/L	99	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	48.3	ug/L	97	71 - 127

## GC/MS Volatiles Quality Control Summary

Analytical Batch 468644 Prep Batch N/A		Client ID GCAL ID Sample Type Analytical Date Matrix		MB468644 1003752 Method Blank 11/05/2011 10:39 Water			LCS468644 1003753 LCS 11/05/2011 09:19 Water			LCSD468644 1003754 LCSD 11/05/2011 09:57 Water			
<b>SW-846 8260B</b>				Units Result	ug/L RDL	Spike Added	Result	% R	Control Limits % R	Result	% R	RPD	RPD Limit
107-06-2	1,2-Dichloroethane	<1.00	1.00	50.0	46.5	93	71 - 129	47.8	96	3	30		
100-41-4	Ethylbenzene	<1.00	1.00	50.0	50.2	100	74 - 126	49.9	100	0.6	30		
1634-04-4	tert-Butyl methyl ether (MTBE)	<1.00	1.00	50.0	46.1	92	71 - 125	46.6	93	1	30		
1330-20-7	Xylene (total)	<3.00	3.00	150	151	101	74 - 127	152	101	0.7	30		
91-20-3	Naphthalene	<5.00	5.00	50.0	46.3	93	57 - 138	48.2	96	4	35		
71-43-2	Benzene	<1.00	1.00	50.0	48.3	97	70 - 129	49.3	99	2	20		
108-88-3	Toluene	<1.00	1.00	50.0	49.2	98	72 - 120	48.8	98	0.8	20		
<b>Surrogate</b>													
460-00-4	4-Bromofluorobenzene	49.9	100	50	49.7	99	78 - 130	48.9	98				
1868-53-7	Dibromofluoromethane	50.3	101	50	50.4	101	77 - 127	50.6	101				
2037-26-5	Toluene d8	50	100	50	49.9	100	76 - 134	49.2	98				
17060-07-0	1,2-Dichloroethane-d4	48.8	98	50	50.1	100	71 - 127	49.5	99				

## GC/MS Volatiles Quality Control Summary

Analytical Batch 468645 Prep Batch N/A		Client ID MB468645 GCAL ID 1003755 Sample Type Method Blank Analytical Date 11/05/2011 10:39 Matrix Water		LCS468645 1003756 LCS 11/05/2011 09:19 Water			LCSD468645 1003757 LCSD 11/05/2011 09:57 Water				
<b>SW-846 8260B</b>		Units Result	ug/L RDL	Spike Added	Result	% R	Control Limits % R	Result	% R	RPD	RPD Limit
994-05-8	t-amyl methyl ether (TAME)	<5.00	5.00	50.0	48.3	97	50 - 150	48.9	98	1	50
75-65-0	t-Butanol (TBA)	<10.0	10.0	50.0	41.7	83	50 - 150	45.7	91	9	50
108-20-3	diisopropyl Ether (DIPE)	<5.00	5.00	50.0	49.4	99	50 - 150	49.2	98	0.4	50
637-92-3	Ethyl tert-butyl ether (ETBE)	<5.00	5.00	50.0	50.1	100	50 - 150	50.0	100	0.2	50
624-95-3	ethyl tert-butanol (ETBA)	<100	100	2550	2220	87	50 - 150	2360	93	6	50
64-17-5	Ethanol	<1000	1000	25200	26500	105	50 - 150	27100	108	2	50
75-85-4	tert-amyl alcohol (TAA)	<20.0	20.0	200	163	82	50 - 150	182	91	11	50
762-75-4	tert-butyl formate (TBF)	<5.00	5.00	50.0	58.5	117	50 - 150	56.0	112	4	50
<b>Surrogate</b>											
460-00-4	4-Bromofluorobenzene	49.9	100	50	49.7	99	78 - 130	48.9	98		
1868-53-7	Dibromofluoromethane	50.3	101	50	50.4	101	77 - 127	50.6	101		
2037-26-5	Toluene d8	50	100	50	49.9	100	76 - 134	49.2	98		
17060-07-0	1,2-Dichloroethane-d4	48.8	98	50	50.1	100	71 - 127	49.5	99		



Access 4565/11110225/11-9-11

## Access Analytical - Chain of Custody Record

**Sales Order #** \_\_\_\_\_ **PO #** \_\_\_\_\_ **Access Quote #** \_\_\_\_\_  
**Company Name:** TERRY ENVIRONMENTAL  
**Report To:** KELLY COLE  
**Address:** PO Box 25  
**City:** SUMMERVILLE **State:** SC **Zip:** 29484  
**Phone:** (843) 873-8100 **Fax:** \_\_\_\_\_  
**Email:** KCOLE@TERRYENVIRONMENTAL.COM  
**Project ID:** HOT SPOT # 3005 / 2230.8B  
**Sampled By:** TS

**Project Work Order #** \_\_\_\_\_  
**Laboratory ID:** GCAL



**ACCESS ANALYTICAL, INC.**

7478 Carlisle Street Phone: (803) 781-4243  
 Irmo, SC 29063 Fax: 781-4303  
 www.axs-inc.com

\*Preservative Codes (place corresponding # in block above analysis field)  
 0 = None, 1 = HCL, 2 = HNO<sub>3</sub>, 3 = H<sub>2</sub>SO<sub>4</sub>, 4 = NaOH, 5 = Na<sub>2</sub>SO<sub>4</sub>,  
 6 = Method 5035 set w/ NaHSO<sub>3</sub> & CH<sub>3</sub>OH, 7 = NaOH/ZnOAC, 8 = H<sub>3</sub>PO<sub>4</sub>.  
 \*Matrix Codes (place corresponding code in matrix column)  
 GW = ground water, WW = waste water, DW = drinking water, S = soil,  
 SL = sludge, A = air, IW = industrial waste, WO = waste oil, OT = other  
 (Specify in comments section)  
 \*Program Area Codes: CWA = Clean Water Act (for wastewaters), SDWA =  
 Safe Drinking Water Act (for drinking waters), SHW = Solid and Hazardous  
 Wastes (for soils, ground waters and waste samples)  
 \*Container Type: G = Glass, P = Plastic

Sample ID/Description	Date Collected	Time Collected	Type (grab or composite)	Matrix (see codes)	Program (see code)	TOTAL # of containers	REQUESTED LAB ANALYSIS: 1	2	3	4	5	6	7	8	9	10	NOTES / COMMENTS <small>(if sample is a composite please use space below to note start/finish times &amp; dates)</small>	
12719-MW1	10-31-11	1320	G	GW	WST MGT DIV	4	BTEX, NAPH, MTBE, 1,2-TRA	Z	Z								PETRO ODOR/SHEEN PRESENT	1
12719-MW2		1409				4											SHEEN PRESENT	2
12719-MW3R		1540				4											STRONG PETRO ODOR	3
12719-MW5		1108				4											CHEMICAL ODOR	4
12719-MW6		1445				4											SLIGHT PETRO ODOR	5
12719-MW10R		1039				4												6
12719-MW1D		1230				4												7
12719-MW3R (Dup)		1545				4											DUPLICATE (STRONG PETRO ODOR)	8
FB		0957				4											FIELD BLANK	9
TB		-				1											TAP BLANK	10

<b>Turnaround Time:</b> <input checked="" type="checkbox"/> Standard <input type="checkbox"/> RUSH* *Date Required: 11/10/11 For rush work, results emailed/faxed by end of business day on date required	<b>Project Location:</b> <input checked="" type="checkbox"/> SC <input type="checkbox"/> NC <input type="checkbox"/> Other (specify) _____	<b>Relinquished By:</b> M. Robertson (Access) FedEx	<b>Received By:</b> (Access) Chaucier	<b>Date (mm/dd/yyyy):</b> 11/1/11 10/31/11 11/1/11 11/2/11	<b>Time (24HR):</b> 0815 1700 900	<b>Sample Temp. Upon Receipt (°C):</b> 1.2 (°C) (N/A) (°C) (N/A) 4.6 (°C) (N/A) 4.9 (°C) (N/A)
	5035 7502 2466					
	See Reverse for Terms and Conditions					
	Original Copy - Returned w/Report Yellow Copy - Access File Copy Pink Copy - Client Copy					



### SAMPLE RECEIVING CHECKLIST

Workorder: 211110225

Client: 4565 - Access Analytical

Profile: 78455 - Terry Env

Line Item: 2 - Water BTEX/N/MTBE/1,2 DCA

Received by: Saucier, Charlotte

Received Date/Time: 11/2/2011 9:00:00 AM

Samples Received via: FEDEX

Number of Coolers Received: 1

Cooler tracking numbers(s): 5035 7502 2466

Cooler temperature(s): 4.9

- Were all coolers received at a temperature of 0 - 6° C?  Yes  No  N/A
- Were all custody seals intact?  Yes  No  N/A
- Were all samples received in proper containers?  Yes  No  N/A
- Were all samples properly preserved?  Yes  No  N/A
- Was preservative added to any container at the lab?  Yes  No  N/A
- Were all containers received in good condition?  Yes  No  N/A
- Were all VOA vials received with no head space?  Yes  No  N/A
- Do all sample labels match the Chain of Custody?  Yes  No  N/A
- Was the client notified about any discrepancies?  Yes  No  N/A

Notes/Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**APPENDIX C**

**Tax Map  
(Not Applicable)**

**APPENDIX D**

**Soil Boring/Field Screening Logs  
(Not Applicable)**

**APPENDIX E**

**Well Completion Logs/SCDHEC 1903 Forms  
(Not Applicable)**

**APPENDIX F**

**Aquifer Evaluation Forms  
(Not Applicable)**

**APPENDIX G**

**Disposal Manifest**

# TERRY Environmental Services, Inc. Certificate of On-Site Treatment

*In accordance with NPDES General Permit No. SCG830000, 12 gallons of petroleum contaminated purge water and/or by-products from cleaning and decontamination were processed on-site via a portable granular activated carbon (GAC) unit and released to the surface within the area of the known petroleum contamination plume on October 31, 2011.*

*Hot Spot #3005*

*Chesnee, South Carolina*

*SCDHEC UST Permit No.: 12719*





**APPENDIX H**

**Local Zoning Regulations  
(Not Applicable)**

**APPENDIX I**

**Fate and Transport Modeling Data  
(Not Applicable)**

**APPENDIX J**

**Access Agreements  
(Not Applicable)**

## **APPENDIX K**

### **Data Verification Checklist**

## Contractor Checklist – Hot Spot #3005

**UST Permit #12719 - TERRY Project #2230.8D**

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
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? (Table 1)			X
33	Has the potentiometric data for the site been provided in tabular format? (Table 2)	X		
34	Has the current and historical laboratory data been provided in tabular format?	X		

Item #	Item	Yes	No	N/A
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 1)	X		
38	Has the site base map been provided with all required elements? (Figure 2)	X		
39	Have the CoC site maps been provided? (Figure 3 & Figure 4)	X Fig 4		X Fig 3
40	Has the site potentiometric map been provided? (Figure 5)	X		
41	Have the geologic cross-sections been provided? (Figure 6)			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? (Appendix A)			X
44	Have the sampling logs, chain of custody forms, and the analytical data package been included with all required elements? (Appendix B)	X		
45	Is the laboratory performing the analyses properly certified?	X		
46	Has the tax map been included with all necessary elements? (Appendix C)			X
47	Have the soil boring/field screening logs been provided? (Appendix D)			X
48	Have the well completion logs and SCDHEC Form 1903 been provided? (Appendix E)			X
49	Have the aquifer evaluation forms, data, graphs, equations, etc. been provided? (Appendix F)			X
50	Have the disposal manifests been provided? (Appendix G)	X		
51	Has a copy of the local zoning regulations been provided? (Appendix H)			X
52	Has all fate and transport modeling been provided? (Appendix I)			X
53	Have copies of all access agreements obtained by the contractor been provided? (Appendix J)			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		

Explanation for missing and incomplete information?

Not Applicable for the current directive.



C. Earl Hunter, Commissioner

*Promoting and protecting the health of the public and the environment.*



JAN 18 2012

**MS CYNDI SUTTLES  
R L JORDAN OIL COMPANY OF NORTH CAROLINA  
PO BOX 2527  
SPARTANBURG SC 29304-2527**

**Re: AFVR Directive**  
Hot Spot #30005, 107 Hampton Street, Chesnee, SC  
UST Permit #12719, Cost Agreement #42948  
Release No. 2 reported August 4, 2003  
Groundwater Monitoring Report received December 14, 2011  
Spartanburg County

Dear Ms. Suttles:

The Underground Storage Tank Management Division (UST Division) of the South Carolina of health and Environmental Control (SCDHEC) has reviewed the referenced report and noted the findings.

In accordance with Section 280.64 of the South Carolina Underground Storage Tank Control Regulations, the implementation of an Aggressive Fluid Vapor Recovery (AFVR) event as outlined in the UST Quality Assurance Program Plan (QAPP), Revision 1.0 is necessary. The AFVR event should be performed on monitoring well MW-3R. A copy of the SCDHEC QAPP for the UST Division is available online at:  
<http://www.dhec.sc.gov/environment/lwm/html/ust.htm>.

Cost Agreement #42948 has been approved in the amount shown on the enclosed cost agreement form for the aforementioned scope of work. The work may proceed immediately upon your receipt of this letter.

The AFVR Report should be submitted within sixty (60) days from the date of this letter. Please note that all applicable South Carolina certification requirements apply to the services and report preparation. All site rehabilitation activities must be performed and submitted by a South Carolina Certified Underground Storage Tank Site Rehabilitation Contractor.

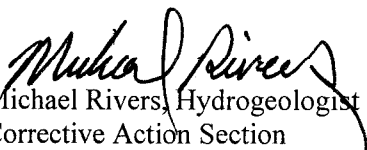
Terry Environmental Services can submit an invoice for direct billing from the State Underground Petroleum Environmental Response Bank (SUPERB) Account. Interim invoices may be submitted for this scope of work. If the invoice is not submitted within one hundred twenty (120) days from the date of this 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.

Ms. Cyndi Suttles  
Hot Spot #3005; UST Permit #12719  
Page 2

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 SCDHEC 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 SCDHEC 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.

On all correspondence concerning this site and directive, please reference **UST Permit #12719 and Cost Agreement #42948**. If you have any questions concerning this project, please contact me by telephone at (803) 896-4078 or by e-mail to [RIVERSMS@dhec.sc.gov](mailto:RIVERSMS@dhec.sc.gov).

Sincerely,

  
Michael Rivers, Hydrogeologist  
Corrective Action Section  
Underground Storage Tank Management Division  
Bureau of Land and Waste Management

enc: Approved Cost Agreement

cc: Terry Environmental Services, P.O. Box 25, Summerville, SC 29484 (w/ enc.)  
Technical File (w/ enc.)

MR/AFVRDIR01.12.12



# Approved Cost Agreement 42948

Facility: 12719 HOT SPOT 3005

RIVERSMS

PO Number:

<u>Task / Description</u>	<u>Categories</u>	<u>Item Description</u>	<u>Qty / Pct</u>	<u>Unit Price</u>	<u>Amount</u>
04 MOB/DEMOB		A EQUIPMENT	1.0000	575.00	575.00
17 DISPOSAL		A WASTEWATER	1,000.0000	0.80	800.00
19 RPT/PROJECT MNGT & COORDINATIO		PCT PERCENT	0.1500	4,655.00	698.25
23 EFR		A 8 HOUR EVENT	1.0000	3,000.00	3,000.00
		C OFF GAS TREATMENT	8.0000	35.00	280.00
<b>Total Amount</b>					<b>5,353.25</b>

**AGGRESSIVE FLUID VAPOR RECOVERY (AFVR) EVENT REPORT  
HOT SPOT 3005  
107 HAMPTON STREET  
CHESNEE, SOUTH CAROLINA  
SCDHEC UST PERMIT #12719  
CA #42948**

Prepared For:

**SCDHEC UNDERGROUND STORAGE TANK PROGRAM  
2600 BULL ST.  
COLUMBIA, SC 29201**

Submitted By:



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UST CONTRACTOR #UCC-0223  
TERRY PROJECT #2230.8E

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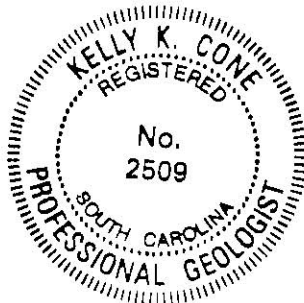
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**KELLY K. CONE, PG**  
Vice President, Assessment Services

Handwritten signature of Jason A. Terry in blue ink.

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**JASON A. TERRY, PG**  
President



FEBRUARY 2012

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**A. INTRODUCTION**
**1. UST Facility and Owner/Operator Information**

Facility Name (Permit #): Hot Spot #3005 (12719)  
 Facility Address: 107 Hampton Street, Chesnee, South Carolina 29323  
 Facility Telephone: 864-461-4147  
  
 Owner/ Operator Name: RL Jordan Oil Co. of NC (Contact: Ms. Cyndi Suttles)  
 Owner/ Operator Address: PO Box 2527, Spartanburg, SC 29304  
 Owner/ Operator Telephone: 864-585-2784

**2. Property Owner Information**

Name: EJ Enterprises Inc.  
 Address: PO Box 2527, Spartanburg, SC 29304  
 Telephone: 864-585-2784

**3. Contractor Information**

Name: Terry Environmental Services, Inc.  
 Address: P.O. Box 25, Summerville, South Carolina 29484  
 Telephone: 843-873-8200  
 Certification: UCC-0223

**4. Well Driller Information**

Not Applicable

**5. Laboratory Information**

Not Applicable

**6. Site History**

Date Release Reported to SCDHEC: August 4, 2003  
 Estimated Quantity of Product Released: Unknown  
 Cause of Release: Unknown  
 Current use of Facility: Gas Station and Convenience Store (Hot Spot)

UST #	Product	Date Installed	Currently In Use (Yes or No)	If not in use, Date Removed
1 (12,000 gal)	Unleaded Gasoline	8/6/1990	Yes	-
2 (8,000 gal)	Plus Gasoline	8/6/1990	Yes	-
3 (8,000 gal)	Premium Gasoline	8/6/1990	Yes	-
4 (8,000 gal)	Diesel	8/6/1990	Yes	-
5 (8,000 gal)	Kerosene	8/6/1990	Yes	-
6(12,000 gal)	Diesel	10/3/1991	Yes	-

Other Releases at this site? Yes XXXX No \_\_\_\_\_  
 If yes, Date Release Reported to SCDHEC November 3, 1993  
**Status of Release:** Feb. 2002 Brook & Medlock selected as CA contractor.  
 No Further Action Date: N/A

## **7. Regional Geology and Hydrogeology**

The Hot Spot #3005 site is located in Chesnee which lies in the Western Piedmont Province of South Carolina. The western piedmont is comprised of the Inner Piedmont block, the Smith River allochthon, and the Sauratwon Mountain window. The Inner Piedmont block encompasses the Inner Piedmont belt and the Chauga belt, and consists of a composite stack of thrust sheets containing a variety of gneisses, schists, amphibolites, sparse ultramafic bodies, and intrusive granitoids. (The Geology of the Carolinas, Horton & Zullo, 1991)

The Hot Spot #3005 site is located in the Inner Piedmont Belt which is characterized by granitic, biotitic, and hornblendic rocks. Generally, wells drilled in the Inner Piedmont Belt of Spartanburg County yield 1 to 250 gallons per minute (gpm). The highest average yields (35 gpm) were obtained from wells drilled in biotite gneiss and migmatite with the lowest average yields from wells drilled in quartz monzonite. The average yield of all wells inventoried was 20 gpm. The ground waters in Spartanburg County are of good to excellent quality for most domestic, municipal, and industrial uses. (USGS/SCWRC Report 3: Water Resources of Spartanburg County, South Carolina, 1970)

## **B. RECEPTOR SURVEY & SITE DATA**

### **1. Receptor Survey Results**

A receptor survey was not conducted during this scope of work.

### **2. Current Site and Adjacent Land Use**

Description of current site use (commercial, residential, rural, etc.):

Commercial; the site is operating as Hot Spot #3005, a gas station and convenience store.

Description of adjacent land use (commercial, residential, rural, etc):

Commercial and residential.

UST sites within a 1,000-foot radius:

10122 Free Time Convenience Store

The site is located at 107 Hampton Street, Chesnee, South Carolina. The site is bordered to the north by a school, to the east by a vacant field, and to the south and west by commercial and residential properties. The general site location is shown on the Topographic Map provided in Section J as Figure 1. A Site Base Map based on the previous contractor's site survey is provided in Section J as Figure 2.

### **3. Site-Specific Geology and Hydrogeology**

Site-specific stratigraphy was not documented during this scope of work. Depth to groundwater was measured between 27 and 32 feet below top of casing in the recovery and influence wells gauged.

**C. SOIL ASSESSMENT/FIELD SCREENING INFORMATION & METHODOLOGY**

Not Applicable. No soil or groundwater borings were installed during this scope of work.

**D. MONITORING WELL INFORMATION**

Not Applicable. No monitoring wells were installed during this scope of work.

**E. GROUNDWATER DATA**

Not Applicable. No groundwater samples were collected during this scope of work.



## **F. AFVR INFORMATION**

### **1. Scope of Work**

As directed by SCDHEC, one AFVR event was performed on monitoring well MW-3R. On January 30, 2012 TERRY Exploration Services, LLC performed the 8-hour Aggressive Fluid Vapor Recovery (AFVR) event under the supervision of TERRY Environmental Services, Inc.

### **2. AFVR Emissions Table**

AFVR Emissions Table – Attached

### **3. Vacuum Data Table**

Vacuum Data Table – Attached

### **4. Volume of Water Recovered**

350 gallons of fluid were recovered during the 8-hour event conducted on January 30, 2012.

### **5. Volume of Product Recovered**

At the completion of the event no product was detected in the recovery tank. However, the AFVR process routinely emulsifies product which can take several hours to separate.

### **6. Mass of Petroleum Recovered as Vapor**

1.93 pounds of volatile organic vapors (approximate equivalent of 0.31 gallons of gasoline) were recovered during the course of the 8-hour event conducted on January 30, 2012.

### **7. Free Product Thickness Table**

Free Product Thickness Table – Attached

### **8. AFVR Event Map**

Figure F-8 AFVR Map - Attached

### **9. Recovery Water Disposal**

The disposal manifest for the recovery water generated during the January 30, 2012 AFVR Event is included in Appendix G.

**SECTION F-2  
AFVR EMISSIONS TABLE  
HOT SPOT #3005  
CHESNEE, SOUTH CAROLINA  
SCDHEC UST PERMIT #12719**

Date:	January 30, 2012		Average Depth to Groundwater:	22-32 ft.													
Site Name:	Hot Spot #3005		Describe Soil in Saturated Zone:	Saprolite													
SCDHEC Site ID #:	12719		Vacuum Contractor:	Terry Exploration Services, LLC													
Well ID #:	MW-3R	Blower Specification of the Vacuum Truck (CFM @ Hg):		282 CFM @ 25" Hg													
<b>DRY STANDARD CUBIC FEET PER MINUTE (DSCFM) CALCULATIONS (Qstd)</b>																	
<b>EMISSION CALCULATION</b>																	
Date	Time	Vacuum (in. Hg)	Velocity (ft/min)	Pipe Id (in)	Temp. (F)	Rel.Humid (%)	PPM <sub>measured</sub> (ppm)	Elapsed time (min)	Flow (DSCFM)	PPM <sub>d</sub>	PPM <sub>e</sub>	K	C <sub>em</sub> (mg/dsm <sup>3</sup> )	C <sub>e</sub> (lb/dscf)	PMR <sub>c</sub> (lb/hr)	PMR <sub>d</sub> (lb/hr)	PMR <sub>g</sub> (gal/hr)
1/30/2012	10:45	21.0	1,374	3.0	75.5	29.0	482	0	60.64	528.34	2113.35	4	1054.48	6.583E-05	0.24	0.28	0.04
1/30/2012	11:15	21.0	1,395	3.0	109.6	19.9	572	30	57.88	626.99	2507.95	4	1251.37	7.812E-05	0.27	0.31	0.05
1/30/2012	11:45	22.0	1,406	3.0	130.0	19.6	526	60	56.32	576.57	2306.26	4	1150.74	7.184E-05	0.24	0.28	0.04
1/30/2012	12:15	22.0	1,417	3.0	141.8	17.3	510	90	55.65	559.03	2236.11	4	1115.73	6.966E-05	0.23	0.27	0.04
1/30/2012	12:45	22.0	1,427	3.0	143.9	17.4	531	120	55.84	582.05	2328.19	4	1161.68	7.252E-05	0.24	0.28	0.04
1/30/2012	13:15	22.0	1,421	3.0	146.2	17.3	507	150	55.40	555.74	2222.96	4	1109.17	6.925E-05	0.23	0.27	0.04
1/30/2012	13:45	22.0	1,439	3.0	147.2	17.8	486	180	56.01	532.72	2130.88	4	1063.23	6.638E-05	0.22	0.26	0.04
1/30/2012	14:15	22.0	1,434	3.0	148.8	17.7	472	210	55.67	517.38	2069.50	4	1032.60	6.447E-05	0.22	0.25	0.04
1/30/2012	14:45	22.0	1,446	3.0	150.1	17.3	450	240	56.01	493.26	1973.04	4	984.47	6.146E-05	0.21	0.24	0.04
1/30/2012	15:15	22.0	1,441	3.0	149.0	18.3	404	270	55.92	442.84	1771.35	4	883.84	5.518E-05	0.19	0.21	0.03
1/30/2012	15:45	22.0	1,431	3.0	150.6	16.8	410	300	55.39	449.41	1797.66	4	896.96	5.600E-05	0.19	0.22	0.03
1/30/2012	16:15	22.0	1,449	3.0	152.0	15.0	403	330	55.95	441.74	1766.97	4	881.65	5.504E-05	0.18	0.21	0.03
1/30/2012	16:45	22.0	1,438	3.0	149.6	15.4	392	360	55.75	429.68	1718.74	4	857.58	5.354E-05	0.18	0.21	0.03
1/30/2012	17:15	22.0	1,430	3.0	151.4	16.1	399	390	55.28	437.36	1749.43	4	872.90	5.449E-05	0.18	0.21	0.03
1/30/2012	17:45	22.0	1,417	3.0	153.8	15.7	400	420	54.56	438.45	1753.81	4	875.09	5.463E-05	0.18	0.21	0.03
1/30/2012	18:15	22.0	1,410	3.0	151.4	16.5	394	450	54.50	431.88	1727.51	4	861.96	5.381E-05	0.18	0.20	0.03
1/30/2012	18:45	22.0	1,414	3.0	151.9	16.3	388	480	54.61	425.30	1701.20	4	848.83	5.299E-05	0.17	0.20	0.03
Average		21.9	1423	3.0	141.3	17.8	454		55.92	498.16	1992.64	4	994.25	6.207E-05	0.21	0.24	0.04
Bws =	0.088	BwsW:	0.06														

Total Pounds of Carbon Recovered as Emissions: 1.67

Total Pounds of Gasoline Vapor Recovered as Emissions: 1.93

Total Gallons of Gasoline Recovered as Emissions: 0.31

(This Number Represents the Gallons Recovered via Vapors, Not Total Liquids)

## AFVR Definitions and Equations

$Qstd = (60 \text{ sec/min}) (1 - Bws) (\text{velocity}) (\text{Pipe ID sq.ft.}) [(528 \text{ oR} / (\text{Temp.} + 460))] (\text{Listed As Flow Above})$

$Bws = (B_{wsw} / 18 \text{ lb-mole H}_2\text{O}) / [(1/28.84 \text{ lb-mole dry air}) + B_{wsw} / 18 \text{ lb-mole H}_2\text{O}]$

$PPMd = (PPM_w) / (1 - Bws)$                        $PPMc = (PPM) (K)$

$Cc = Ccm (62.43 \text{ E}^{-9} \text{ lb-m}^3/\text{mg-ft}^3)$                        $PMRg = (PMRc) (\text{Mg/Mcg})$

Bgs = below top of casing

$Bws = (B_{wsw} / 18 \text{ lb-mole H}_2\text{O}) / [(1/28.84 \text{ lb-mole dry air}) + B_{wsw} / 18 \text{ lb-mole H}_2\text{O}]$

$Qstd = (60 \text{ sec/min})(1 - Bws)(V)(A)(\text{Temp deg Rankin})$

Bgs = below top of casing

Bws - water vapor % by volume

PPMmeasured = obtained directly from Photo Ionization Detector (PID)

Bwsw - pounds of water per pound of dry air, derived from the psychometric chart (temp Vs relative hum)

PPMw = PPM measured (wet Conc.)

K = # of carbons in calibration gas (isobutylene)

PPMc = PPMv, volumetric concentration of VOC emissions as carbon, dry basis, at STP

Ccm = mg/dsm<sup>3</sup>, mass concentration of VOC emissions as carbon

Mc = 12.01 mg/mg-mole, molecular wt. of carbon

K<sub>3</sub> = 24.07 dsm<sup>3</sup>/10<sup>6</sup> mg-mole, mass to volume conversion factor at stp

Cc = lb/dscf, mass concentration of VOC emissions as carbon, dry basis, at STP

PMRc = lb/hr, pollutant mass removal rate of VOC's as carbon

PMRg = lb/hr, pollutant mass removal rate of VOC's as gasoline

Mcg = 89 mg/mg-mole, weight of carbon in gasoline molecule

PPMd = "dry" concentration

Mg = 103 mg/mg-mole, molecular wt. of gasoline

Qstd - Flow at DSCFM

Ccm = PPMc (Mc/K<sub>3</sub>)

PMRc = Cc (Qstd) (60 min/hr)

### Reference:

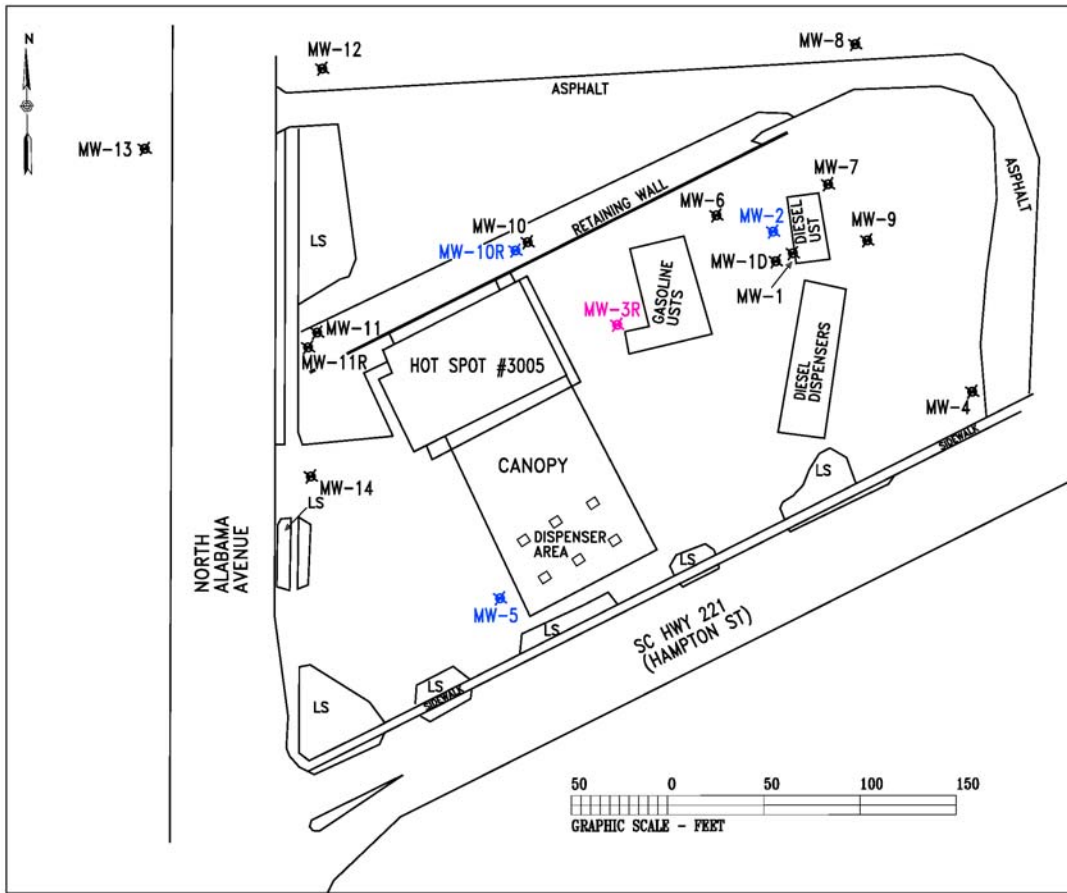
North Carolina Department of Natural Resources, Division of Waste Management, Underground Storage Tank Section, Appendix B, Report Formats, April 2001.

**SECTION F-3  
VACUUM DATA TABLE  
HOT SPOT #3005  
CHESNEE, SOUTH CAROLINA  
SCDHEC UST PERMIT #12719  
JANUARY 30, 2012**

<b>Well #</b>	<b>MW-2</b>	<b>Well #</b>	<b>MW-5</b>	<b>Well #</b>	<b>MW-10R</b>
<b>Elapsed Time</b>	<b>Vacuum (in H2O)</b>	<b>Elapsed Time</b>	<b>Vacuum (in H2O)</b>	<b>Elapsed Time</b>	<b>Vacuum (in H2O)</b>
0	0.0	0	0.0	0	0.0
0.5	0.0	0.5	0.0	0.5	0.0
1	0.0	1	0.0	1	0.0
1.5	0.0	1.5	0.0	1.5	0.0
2	0.0	2	0.0	2	0.0
2.5	0.0	2.5	0.0	2.5	0.0
3	0.0	3	0.0	3	0.0
3.5	0.0	3.5	0.0	3.5	0.0
4	0.0	4	0.0	4	0.0
4.5	0.0	4.5	0.0	4.5	0.0
5	0.0	5	0.0	5	0.0
5.5	0.0	5.5	0.0	5.5	0.0
6	0.0	6	0.0	6	0.0
6.5	0.0	6.5	0.0	6.5	0.0
7	0.0	7	0.0	7	0.0
7.5	0.0	7.5	0.0	7.5	0.0
8	0.0	8	0.0	8	0.0

**SECTION F-7  
 FREE PRODUCT THICKNESS TABLE  
 HOT SPOT #3005  
 CHESNEE, SOUTH CAROLINA  
 SCDHEC UST PERMIT #12719  
 JANUARY 30, 2012**

<b>Well #</b>	<b>--</b>	<b>Depth to Product</b>	<b>Depth to Water</b>	<b>Product Thickness</b>
MW-2	Initial	n/a	27.89	n/a
	Final	n/a	27.96	n/a
MW-3R	Initial	n/a	31.00	n/a
	Final	n/a	30.87	n/a
MW-5	Initial	n/a	32.18	n/a
	Final	n/a	32.18	n/a
MW-10R	Initial	n/a	22.98	n/a
	Final	n/a	22.98	n/a



**LEGEND & ABBREVIATIONS:**

- ☒ MW = MONITORING WELL
- LS = LANDSCAPING
- ☒ RECOVERY WELL
- ☒ INFLUENCE WELL

ALL MW AND SAMPLE IDENTIFICATIONS ARE PRECEDED BY UST PERMIT #12719 (i.e. 12719-MW1)

**FIGURE F-8  
AFVR MAP**

HOT SPOT #3005  
107 HAMPTON STREET  
CHESNEE, SOUTH CAROLINA

TERRY PROJECT # 2230.8E	SCDHEC SITE ID # 12719
SCALE 1" = 50'	DATE FEBRUARY 2012

**G. GRANULATED ACTIVATED CARBON INSTALLATION**

Not Applicable. No granulated activated carbon units were installed during this scope of work.

## **H. RESULTS & DISCUSSION**

### **1. Assessment Results**

During this scope of work, one AFVR event was performed on monitoring well MW-3R. Prior to and at the completion of the event, no free-phase product was measured in the recovery well. 1.93 pounds of gasoline vapors (approximate equivalent of 0.31 gallons of gasoline) were recovered as emissions during the event.

The AFVR event appears successful at recovering contaminant mass. As such, it is recommended to conduct two (2) additional AFVR Events 15 days apart on monitoring well MW-3R (Event 1) and monitoring wells MW-1 and MW-6, concurrently (Event 2).

### **2. Aquifer Evaluation Results**

Not Applicable

### **3. Fate & Transport Results**

Not Applicable

### **4. Tier 1 Risk Evaluation**

Not Applicable

### **5. Tier 2 Risk Evaluation**

Not Applicable



**I. TABLES**

**1. Soil Analytical Data**

Table 1 Soil Analytical Data - Not Applicable

**2. Potentiometric Data**

Table 2 Potentiometric Data - Not Applicable

**3. Laboratory Data**

Table 3 Groundwater Laboratory Data - Not Applicable

**4. Aquifer Characteristics**

Table 4 Aquifer Characteristics - Not Applicable

**5. Site Conceptual Model**

Table 5 Site Conceptual Model - Not Applicable

**J. FIGURES**

**1. Topographic Map**

Figure 1 Topographic Map - Attached

**2. Site Base Map**

Figure 2 Site Base Map - Attached

**3. CoC Site Maps**

Figure 3 Soil CoC Map - Not Applicable

Figure 4 Groundwater CoC Map - Not Applicable

**4. Site Potentiometric Maps**

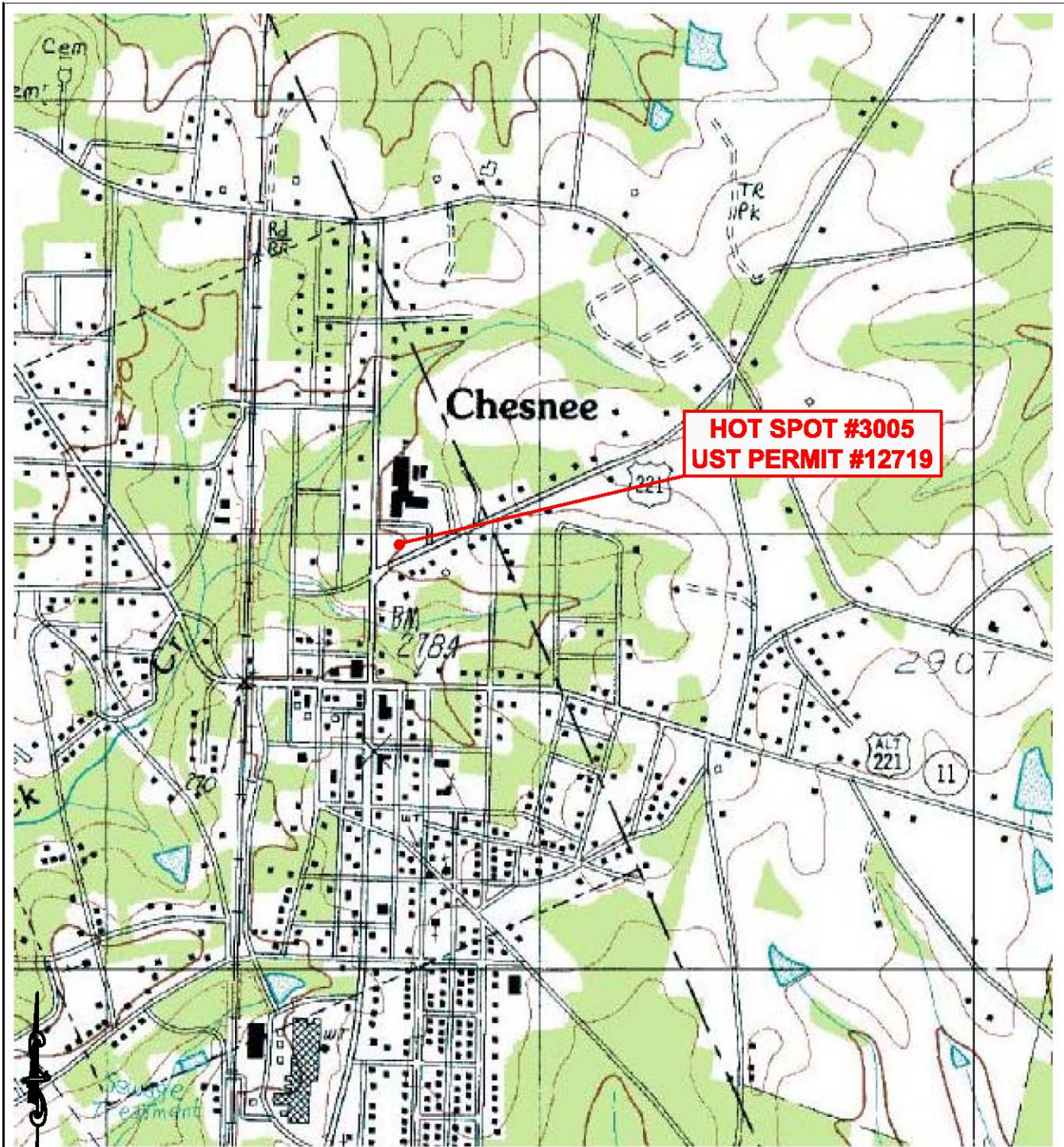
Figure 5 Site Potentiometric Map – Not Applicable

**5. Geologic Cross Sections**

Figure 6 Geologic Cross Sections - Not Applicable

**6. Predicted Migration and Attenuation of CoCs**

Figure 7 Predicted Migration and Attenuation of CoCs - Not Applicable



**HOT SPOT #3005  
UST PERMIT #12719**

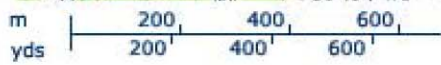


Image courtesy of the U.S. Geological Survey



**FIGURE 1  
TOPOGRAPHIC MAP**

**HOT SPOT #3005  
107 HAMPTON STREET  
CHESNEE, SOUTH CAROLINA**

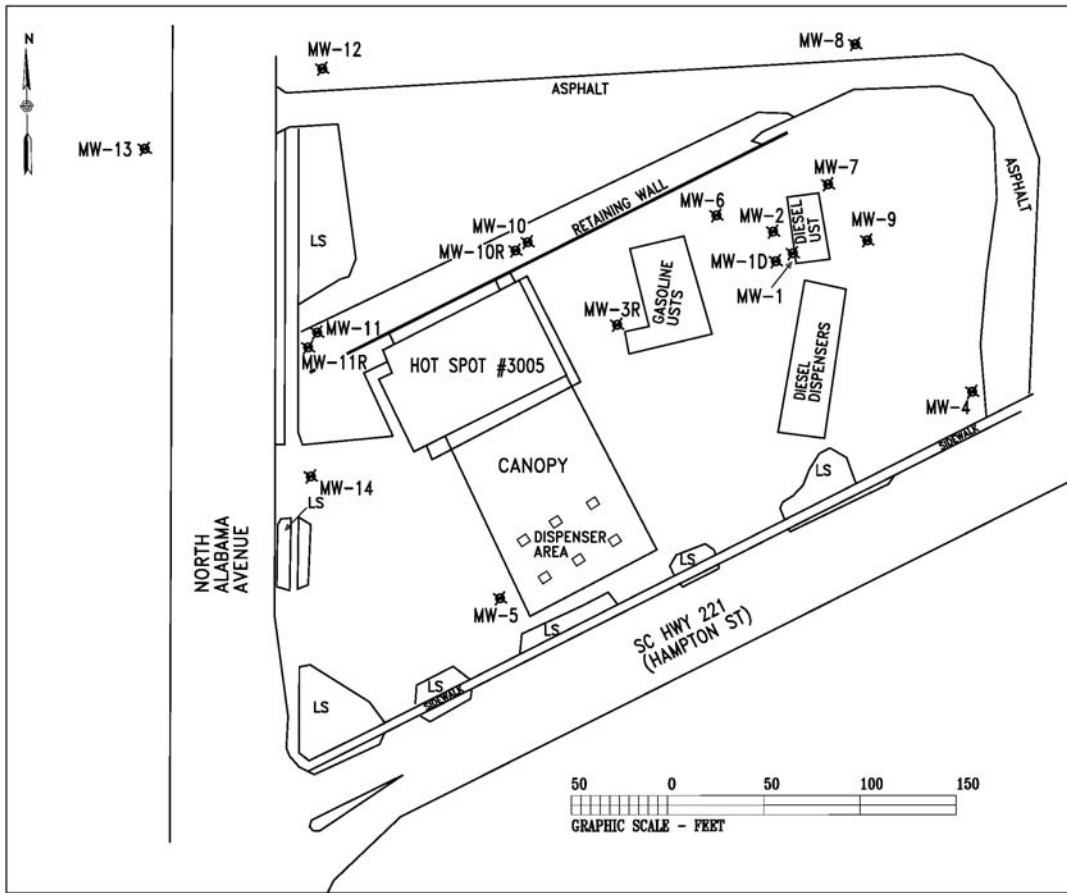
*... providing our clients with the best services available,  
actually understanding our clients objectives,  
and making their objectives our own!*

SIZE B	TERRY Project No. 2230.8E	DWG NO. Figure 1 Topographic Map	REV
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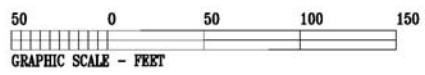
PO Box 25  
Summerville, South Carolina 29484  
(800) 325-0605 (843)-873-8200 fax: (843)-873-8765

SCALE: As Shown

DATE: FEBRUARY 2012



**LEGEND & ABBREVIATIONS:**  
 ✕ MW = MONITORING WELL  
 LS = LANDSCAPING  
 ALL MW AND SAMPLE IDENTIFICATIONS ARE PRECEDED BY UST PERMIT #12719 (i.e. 12719-MW1)



**FIGURE 2  
 SITE BASE MAP**

HOT SPOT #3005  
 107 HAMPTON STREET  
 CHESNEE, SOUTH CAROLINA

TERRY PROJECT # 2230.8E	SCDHEC SITE ID # 12719
SCALE 1" = 50'	DATE FEBRUARY 2012

**K. APPENDICES**

**1. Appendix A: Site Survey**

Not Applicable

**2. Appendix B: Sampling Logs and Laboratory Data**

Not Applicable

**3. Appendix C: Tax Map**

Not Applicable

**4. Appendix D: Soil Boring/Field Screening Logs**

Not Applicable

**5. Appendix E: Well Completion Logs/SCDHEC 1903 Forms**

Not Applicable

**6. Appendix F: Aquifer Evaluation Forms**

Not Applicable

**7. Appendix G: Disposal Manifest**

**8. Appendix H: Local Zoning Regulations**

Not Applicable

**9. Appendix I: Fate and Transport Modeling Data**

Not Applicable

**10. Appendix J: Access Agreements**

Not Applicable

**11. Appendix K: Data Verification Checklist**

**APPENDIX A**

**Site Survey  
(Not Applicable)**

## **APPENDIX B**

### **Sampling Logs and Laboratory Data (Not Applicable)**

**APPENDIX C**

**Tax Map  
(Not Applicable)**



**APPENDIX D**

**Soil Boring/Field Screening Logs  
(Not Applicable)**

**APPENDIX E**

**Well Completion Logs/SCDHEC 1903 Forms  
(Not Applicable)**

**APPENDIX F**

**Aquifer Evaluation Forms  
(Not Applicable)**

**APPENDIX G**

**Disposal Manifest**

# US Water Recovery

<b>Non-Hazardous Wastewater Manifest</b>		<b>Number:</b>		
1. Generator's EPA ID# (if applicable):		Waste ID Number:		
2. Generator's Name and Mailing Address: <i>HOT SPOT # 3005 CAESAR, SC</i>		Phone (843) 873-8200 P O #: 2230.8E		
3. Agent of Generator and Mailing Address: <i>SAME</i> ↑		Phone ( ) ↑ P O #: ↑		
4. Transporter Company Name: <i>TEERY ENVIRONMENTAL PO BOX 25 SUMMERVILLE, SC</i>		Phone (843) 873-8200		
Truck & Trailer License Number:				
5. Transporter U.S. EPA ID#:				
6. Facility Name and Site Address: U S Water Recovery 435 Old Mt. Holly Rd. Mt. Holly, SC 29445		Mailing Address: U S Water Recovery 210 S. Cedar Street Summerville, SC 29483		
Phone: (843) 797-8674 Fax: (843) 797-2126		Phone: (843) 797-3111 Fax: (843) 797-1884		
7. Facility U.S. EPA ID#:				
Start Level:	End Level:	Total Gallons:	Tank Number:	
<i>0</i>	<i>350</i>	<i>350</i>		
8. U.S. DOT Description	Container		Unit	Quantity
	No.	Type		
<i>a. Non-Hazardous, non-regulated waste water</i>	<i>1</i>	<i>JAC</i>	<i>GAL</i>	
9. Generator's Certification: I hereby declare that the contents of this consignment are not hazardous by definition or listing and are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and the laws of the State of South Carolina. I further certify that the contents of this consignment are as represented by the description contained on the Waste Profile Form previously submitted to and approved by the Designated Facility.				
Printed/Typed Name: <i>TRAVIS SIKELY</i>		Signature: <i>[Signature]</i>		Date: <i>1-31-12</i>
10. Transporter Acknowledgement of Receipt of Materials		Signature: <i>[Signature]</i>		Date: <i>1-31-12</i>
Printed/Typed Name: <i>TRAVIS SIKELY</i>		Signature: <i>[Signature]</i>		Date: <i>1-31-12</i>
11. Discrepancy indication space:				
12. Facility Owner or Operator: Certification of Receipt of Materials				
Printed/Typed Name: <i>[Signature]</i>		Signature: <i>[Signature]</i>		Date: <i>1-31-12</i>

White - Facility    Yellow - Office    Pink - Transporter    Blue - Generator

**APPENDIX H**

**Local Zoning Regulations  
(Not Applicable)**

**APPENDIX I**

**Fate and Transport Modeling Data  
(Not Applicable)**

**APPENDIX J**

**Access Agreements  
(Not Applicable)**



## **APPENDIX K**

### **Data Verification Checklist**

## Contractor Checklist – Hot Spot #3005

**UST Permit #12719 - TERRY Project #2230.8E**

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
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? (Table 1)			X
33	Has the potentiometric data for the site been provided in tabular format? (Table 2)			X
34	Has the current and historical laboratory data been provided in tabular format?			X

Item #	Item	Yes	No	N/A
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 1)	X		
38	Has the site base map been provided with all required elements? (Figure 2)	X		
39	Have the CoC site maps been provided? (Figure 3 & Figure 4)			X
40	Has the site potentiometric map been provided? (Figure 5)			X
41	Have the geologic cross-sections been provided? (Figure 6)			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? (Appendix A)			X
44	Have the sampling logs, chain of custody forms, and the analytical data package been included with all required elements? (Appendix B)			X
45	Is the laboratory performing the analyses properly certified?			X
46	Has the tax map been included with all necessary elements? (Appendix C)			X
47	Have the soil boring/field screening logs been provided? (Appendix D)			X
48	Have the well completion logs and SCDHEC Form 1903 been provided? (Appendix E)			X
49	Have the aquifer evaluation forms, data, graphs, equations, etc. been provided? (Appendix F)			X
50	Have the disposal manifests been provided? (Appendix G)	X		
51	Has a copy of the local zoning regulations been provided? (Appendix H)			X
52	Has all fate and transport modeling been provided? (Appendix I)			X
53	Have copies of all access agreements obtained by the contractor been provided? (Appendix J)			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		

Explanation for missing and incomplete information?

Not Applicable for the current directive.

12719

Mike

UNDERGROUND STORAGE TANK (UST) OWNER/OPERATOR LEAD INFORMATION SHEET



1. CONTRACTOR OF CHOICE  
As the UST Owner/Operator of Site #'s:

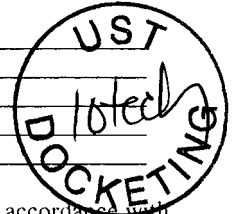
00583	<del>08325</del>	12845	15841	04562	10866	14269	18187
<del>01354</del>	08326	12941	<del>16558</del>	05401	<del>11341</del>	14275	<del>18192</del>
03489	08327	12978	17256	06990	12041	14737	18193
04550	08328	<del>13014</del>	17259	<del>07265</del>	12157	<del>15167</del>	<del>18757</del>
04554	09370	13797	17515	07266	12474	15454	18861
04561	10106	<del>14176</del>	<del>18028</del>	08324	12719	15584	<del>19169</del>

I would like to use the contractor or person(s)\* listed below and request that they represent me for: (check one)

- XXXX Initial Groundwater Assessment
- XXXX all future assessment scopes.\*\*
- XXXX all Corrective Actions
- XXXX all releases

✓ = No releases

Name of Contractor/Person(s) TERRY Environmental Services, Inc.  
 Contractor # 223  
 Address P.O. Box 25  
Summerville, South Carolina 29484  
 Telephone Number (843) 873-8200



Note: Site rehabilitation activities must be performed by a SCDHEC Certified Site Rehabilitation Contractor in accordance with R.61-98.

\*indicate if person listed is your employee

\*\* if you would like the contractor to perform all future assessment activities at this and/or other UST sites that have confirmed releases, please provide a list of all sites on your letterhead and provide the information requested in items 2 and 3 below within the context of the letter.

2. FINANCIAL OR FAMILIAL RELATIONSHIP

Does a financial or familial relationship, as defined below, exist between you and the contractor/person that you listed above?  
Yes xxxxx No (please initial) CS

Financial relationship: A connection or association through a material interest of sources of income which exceed five percent of annual gross income from a business entity.

Familial Relationship: A connection or association by family or relatives, in which a family member or relative has a material interest. Family or relatives include: father, mother, son, daughter, brother, sister, uncle, aunt, first cousin, nephew, niece, husband, wife, father-in-law, mother-in-law, daughter-in-law, step father, stepmother, stepson, stepdaughter, stepbrother, stepsister, half brother, half sister, grandparent, grandchild, great grandchild, step grandparent, step great grandparent, step grandchild, step great grandchild, or fiancée.

3. PAYMENT

You can pay the contractor and, upon submittal of the canceled check (or a notarized statement from the contractor), be compensated from the SUPERB Account, or have payment issued directly from us to the contractor.

I request that payment be made to me after I have paid the contractor. Yes No (please initial)  
I request that payment be made directly to the contractor. xxx Yes No (please initial)

Note: All costs must receive prior financial approval from the Department regardless of payment option.

Underground Storage Tank Owner/Operator Signature Cyndi Suttles, Agave, RWAC

Print Cyndi Suttles, Compliance Manager

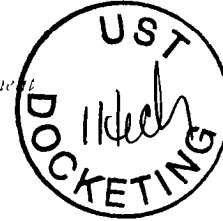
Date 11-14-13



Catherine B. Templeton, Director

*Promoting and protecting the health of the public and the environment*

NOV 06 2014



MS CYNDI SUTTLES  
R L JORDAN OIL COMPANY OF NORTH CAROLINA  
PO BOX 2527  
SPARTANBURG SC 29304-2527

Re: **Site-Specific Work Plan Directive**  
Hot Spot #3005, 107 Hampton Street (U.S. Highway 221), Chesnee, SC  
UST Permit #12719  
Release No. 2 reported August 4, 2003  
Groundwater Monitoring Report received December 14, 2011  
Aggressive Fluid Vapor Recovery (AFVR) Report received February 6, 2012  
Spartanburg County

Dear Ms. Suttles:

The Underground Storage Tank Management Division (UST Division) of the South Carolina Department of Health and Environmental Control (Agency) has reviewed the referenced reports. The reports indicate the presence of chemicals of concern in groundwater during the October 31, 2011 groundwater sampling event and the removal of gasoline vapors during the January 30, 2012 AFVR event.

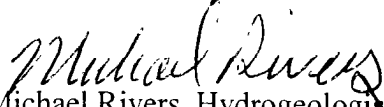
To determine what risk the referenced release currently pose to the environment and public health and in accordance with Section 280.65 of the South Carolina Underground Storage Tank Control Regulations, implementation of a groundwater sampling event as outlined in the UST Quality Assurance Program Plan (QAPP) Revision 2.0 is necessary. This scope of work must be conducted in accordance with the UST QAPP and in compliance with all applicable regulations. Monitoring wells MW-1, MW-2, MW-3R, MW-4 through MW-9, MW-10R, MW-11R, MW-12 through MW-14, and MW-1D associated with the release should be sampled. Prior to sampling, all wells must be purged. Laboratory analyses should be performed for BTEX, naphthalene, MtBE, 1,2-DCA, and the oxygenates. A copy of the QAPP Revision 2.0 for the UST Division is available at: [http://www.scdhec.gov/environment/docs/QAPP\\_Rev-2\\_April2013.pdf](http://www.scdhec.gov/environment/docs/QAPP_Rev-2_April2013.pdf).

**Your contractor must complete and submit the Site-Specific Work Plan and Cost Agreement for the aforementioned scope of work to the UST Division within thirty (30) days of the date of this letter. The Site-Specific Work Plan form may be found at <http://www.scdhec.gov/library/D-0653.pdf>.** 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 new SUPERB rates became effective May 15, 2014 and that technical and financial pre-approval from the Agency must be issued before work begins.

Ms. Cyndi Suttles  
Hot Spot #3005; UST Permit #12719  
Page 2

On all correspondence regarding this site, please reference **UST Permit #12719**. If you have questions or need additional information, feel free to contact me by telephone at (803) 898-0671 or by e-mail to [RiversMS@dhec.sc.gov](mailto:RiversMS@dhec.sc.gov).

Sincerely,

  
Michael Rivers, Hydrogeologist  
Corrective Action Section  
Underground Storage Tank Management Division  
Bureau of Land and Waste Management

cc: Ms. Kelly Cone, P.G., TERRY Environmental Services, Inc., P.O. Box 25, Summerville,  
SC 29484  
Technical File

MR/SSWP11 06 14

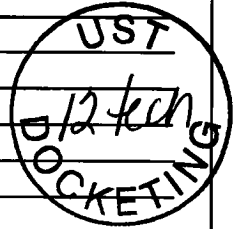


Site-Specific Work Plan for Approved ACQAP
Underground Storage Tank Management Division



To: Michael Rivers (SCDHEC Project Manager)
From: Kelly Cone (Contractor Project Manager)
Contractor: TERRY Environmental UST Contractor Certification Number: UCC-0223

Facility Name: Hot Spot #3005 UST Permit #: 12719
Facility Address: 107 Hampton Street, Chesnee, South Carolina 29323
Responsible Party: RL Jordan Oil Co. of NC (Contact: Ms. Cyndi Suttles) Phone: 864-585-2784
RP Address: PO Box 2527, Spartanburg, SC 29304
Property Owner (if different): EJ Enterprises Inc.
Property Owner Address: PO Box 2527, Spartanburg, SC 29304
Current Use of Property: Commercial



Scope of Work (Please check all that apply)

- IGWA, Tier I, Tier II, Monitoring Well Installation, Groundwater Sampling, Other, GAC

Analyses (Please check all that apply)

Groundwater/Surface Water:

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

Soil:

- BTEXN, PAH, 8 RCRA Metals, Oil & Grease (9071), TPH-DRO (3550B/8015B), TPH-GRO (5030B/8015B), Grain Size, TOC

Air:

- BTEXN

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

Soil, Water Supply Wells, Air, Field Blank, Monitoring Wells, Surface Water, Duplicate, 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
Monitoring Well development method (consistent with SOP):
Comments, if warranted:

UST Permit #: 12719 Facility Name: Hot Spot #3005

**Implementation Schedule** (Number of calendar days from approval)

Field Work Start-Up: 14-30 days Field Work Completion: 30-45 days  
Report Submittal: 60 days # of Copies Provided to Property Owners: RP

**Aquifer Characterization**

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

**Investigation Derived Waste Disposal**

Soil: -- Tons Purge Water: 55 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.

Conduct a limited sampling event; monitoring wells MW-1, MW-2, MW-3R, MW-4 through MW-9, MW-10R, MW-11R, MW-12 through MW-14, and MW-1D will be sampled. The wells were last sampled in October 2011 and will require purging.

**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 ACQAO? (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





**ASSESSMENT COMPONENT COST AGREEMENT  
SOUTH CAROLINA**  
Department of Health and Environmental Control  
Underground Storage Tank Management Division  
State Underground Petroleum Environmental Response Bank Account  
May 15, 2014

<b>Facility Name:</b> <u>Hot Spot #3005</u>				
<b>UST Permit #:</b> <u>12719</u>	<b>Cost Agreement #:</b> <u>Proposal</u>			
ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL
<b>1. Plan Preparation</b>				
A1. Site-specific Work Plan	1	each	\$150.00	\$150.00
B1. Tax Map		each	\$70.00	\$0.00
C1. Tier II or Comp. Plan /QAPP Appendix B		each	\$250.00	\$0.00
<b>2. A1. Receptor Survey *</b>				
		each	\$551.00	\$0.00
<b>3. Survey (500 ft x 500 ft)</b>				
A1. Comprehensive Survey		each	\$1,040.00	\$0.00
<b>B. Subsurface Geophysical Survey</b>				
1B. < 10 meters below grade		each	\$1,300.00	\$0.00
2B. > 10 meters below grade		each	\$2,310.00	\$0.00
C1. Geophysical UST or Drum Survey		each	\$910.00	\$0.00
<b>4. Mob/Demob</b>				
A1. Equipment		each	\$1,020.00	\$0.00
B1. Personnel	1	each	\$423.00	\$423.00
C1. Adverse Terrain Vehicle		each	\$500.00	\$0.00
<b>5. A1. Soil Borings (hand auger)*</b>				
		foot	\$5.00	\$0.00
<b>6. Soil Borings (requiring equipment, push technology, etc)* or Field Screening (including water sample, soil sample, soil gas sample, etc.)*</b>				
A1. Standard		per foot	\$15.00	\$0.00
C1. Fractured Rock		per foot	\$20.20	\$0.00
<b>7. A1. Soil Leachability Model</b>				
		each	\$60.00	\$0.00
<b>8. Abandonment (per foot)*</b>				
A1. 2" diameter or less		per foot	\$3.10	\$0.00
B1. Greater than 2" to 6" diameter		per foot	\$4.50	\$0.00
C1. Dug/Bored well (up to 6 feet diameter)		per foot	\$15.00	\$0.00
<b>9. Well Installation (per foot)*</b>				
A1. Water Table (hand augered)		per foot	\$10.60	\$0.00
B1. Water Table (drill rig)		per foot	\$38.00	\$0.00
C1. Telescoping		per foot	\$50.00	\$0.00
D1. Rock Drilling		per foot	\$58.00	\$0.00
E1. 2" Rock Coring		per foot	\$30.90	\$0.00
G1. Rock Multi-sampling ports/screens		per foot	\$33.40	\$0.00
H1. Recovery Well (4" diameter)		per foot	\$45.00	\$0.00
II. Pushed Pre-packed screen (1.25" dia)		per foot	\$15.00	\$0.00
J1. Rotasonic (2" diameter)		per foot	\$44.00	\$0.00
K. Re-develop Existing Well		per foot	\$11.00	\$0.00
<b>10. Groundwater Sample Collection / Gauge Depth to Water or Product *</b>				
A1. Groundwater Purge	15	per well/recepto	\$60.00	\$900.00
B1. Air or Vapors		per receptor	\$12.00	\$0.00
C1. Water Supply		per well/recepto	\$22.00	\$0.00
D1. Groundwater NP or Duplicate (1)	1	per well/recepto	\$28.00	\$28.00
E1. Gauge Well only		per well	\$7.00	\$0.00
F1. Sample Below Product		per well	\$12.00	\$0.00
G1. Passive Diffusion Bag		each	\$26.00	\$0.00
H1. Field Blank	1	each	\$24.60	\$24.60

<b>11. Laboratory Analyses-Groundwater</b>					
A2. BTEXNM+Oxyg's+1,2 DCA+Eth(8260B)	18	per sample	\$122.00		\$2,196.00
AA1. Lead, Filtered		per sample	\$13.80		\$0.00
B2. Rush EPA Method 8260B (All of item A.)		per sample	\$153.60		\$0.00
C2. Trimethal, Butyl, and Isopropyl Benzenes		per sample	\$36.40		\$0.00
D1. PAH's		per sample	\$60.60		\$0.00
E1. Lead		per sample	\$16.00		\$0.00
F1. EDB by EPA 8011		per sample	\$45.20		\$0.00
FF1. EDB by EPA Method 8011 Rush		per sample	\$68.20		\$0.00
G1. 8 RCRA Metals		per sample	\$63.40		\$0.00
H1. TPH (9070)		per sample	\$41.00		\$0.00
II. pH		per sample	\$5.20		\$0.00
J1. BOD		per sample	\$20.00		\$0.00
PP. Ethanol		per sample	\$14.80		\$0.00
<b>11. Analyses-Soil</b>					
Q1. BTEX + Naphth.		per sample	\$64.00		\$0.00
R1. PAH's		per sample	\$64.04		\$0.00
S1. 8 RCRA Metals		per sample	\$56.40		\$0.00
U1. TPH-DRO (3550C/8015C)		per sample	\$40.00		\$0.00
V1. TPH- GRO (5030B/8015C)		per sample	\$35.96		\$0.00
W1. Grain size/hydrometer		per sample	\$104.00		\$0.00
X1. Total Organic Carbon		per sample	\$30.60		\$0.00
<b>11. Analyses-Air</b>					
Y1. BTEX + Naphthalene		per sample	\$216.00		\$0.00
<b>11. Analyses-Free Phase Product</b>					
Z1. Hydrocarbon Fuel Identification		per sample	\$357.00		\$0.00
<b>12. Aquifer Characterization</b>					
A1. Pumping Test*		per hour	\$23.00		\$0.00
B1. Slug Test*		per test	\$191.00		\$0.00
C1. Fractured Rock		per test	\$100.00		\$0.00
<b>13. A1. Free Product Recovery Rate Test*</b>					
		each	\$38.00		\$0.00
<b>14. Fate/Transport Modeling</b>					
A1. Mathematical Model		each	\$100.00		\$0.00
B1. Computer Model		each	\$100.00		\$0.00
<b>15. Risk Evaluation</b>					
A. Tier I Risk Evaluation		each	\$300.00		\$0.00
B1. Tier II Risk Evaluation		each	\$100.00		\$0.00
<b>16. A1. Subsequent Survey*</b>					
		each	\$260.00		\$0.00
<b>17. Disposal (gallons or tons)*</b>					
AA. Wastewater	55	gallon	\$0.56		\$30.80
BB. Free Product		gallon	\$0.50		\$0.00
C1. Soil Treatment/Disposal		ton	\$60.00		\$0.00
D1. Drilling fluids		gallon	\$0.42		\$0.00
<b>18. Miscellaneous (attach receipts)</b>					
		each	\$0.00		\$0.00
		each	\$0.00		\$0.00
		each	\$0.00		\$0.00
<b>20. Tier I Assessment (Use DHEC 3665 form)</b>					
		standard			\$0.00
<b>21. IGWA (Use DHEC 3666 form)</b>					
		standard			\$0.00
<b>22. Corrective Action (Use DHEC 3667 form)</b>					
		PFP Bid			\$0.00

<b>23. Aggressive Fluid &amp; Vapor Recovery (AFVR)</b>					
A1. 8-hour Event*		each	\$1,375.00		\$0.00
A2. 24-hour Event*		each	\$3,825.00		\$0.00
A3. 48-hour Event*		each	\$6,265.00		\$0.00
A4. 96-hour Event*		each	\$12,567.50		\$0.00
C1. Off-gas Treatment 8 hour		per event	\$122.50		\$0.00
C2. Off-gas Treatment 24 hour		per event	\$241.50		\$0.00
C3. Off-gas Treatment 48 hour		per event	\$327.00		\$0.00
C4. Off-gas Treatment 96 hour		per event	\$780.00		\$0.00
D. Site Reconnaissance		each	\$203.25		\$0.00
E1. Additional Hook-ups		each	\$25.75		\$0.00
F. Effluent Disposal		gallon	\$0.44		\$0.00
G. AFVR Mobilization/Demobilization		each	\$391.50		\$0.00
<b>24. Granulated Activated Carbon (GAC) filter system installation &amp; service:</b>					
A1. New GAC System Installation*		each	\$1,900.00		\$0.00
BB. Refurbished GAC Sys. Install*		each	\$900.00		\$0.00
C1. Filter replacement/removal*		each	\$350.00		\$0.00
DD. GAC System removal, cleaning, & refurbishment*		each	\$275.00		\$0.00
E1. GAC System housing*		each	\$250.00		\$0.00
F. In-line particulate filter		each	\$150.00		\$0.00
G1. Additional piping & fittings		foot	\$1.50		\$0.00
<b>25. Well Repair</b>					
A1. Additional Copies of the Report Delivered		each	\$50.00		\$0.00
B1. Repair 2x2 MW pad*		each	\$50.00		\$0.00
C1. Repair 4x4 MW pad*		each	\$88.00		\$0.00
D1. Repair well vault*		each	\$118.00		\$0.00
F1. Replace well cover bolts		each	\$2.60		\$0.00
G. Replace locking well cap & lock		each	\$15.00		\$0.00
H1. Replace/Repair stick-up*		each	\$134.00		\$0.00
II. Convert Flush-mount to Stick-up*		each	\$150.00		\$0.00
J1. Convert Stick-up to Flush-mount*		each	\$130.00		\$0.00
K1. Replace missing/illegible well ID plate		each	\$12.00		\$0.00
<b>Report Prep &amp; Project Management</b>	12%	percent	\$3,752.40		\$450.29
<b>TOTAL</b>					<b>\$4,202.69</b>

\*The appropriate mobilization cost can be added to complete these tasks, as necessary



Image courtesy of the U.S. Geological Survey



**FIGURE 1  
TOPOGRAPHIC MAP**

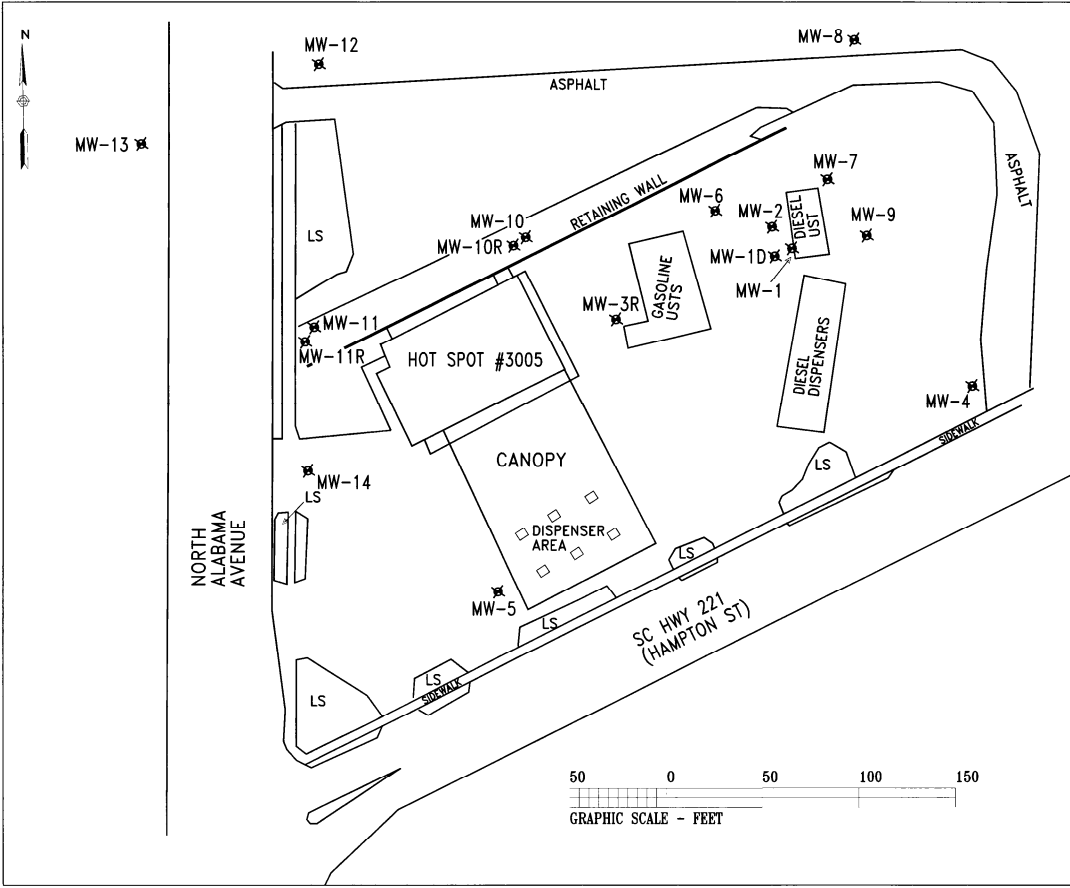
HOT SPOT #3005  
107 HAMPTON STREET  
CHESNEE, SOUTH CAROLINA

*... providing our clients with the best services available,  
actually understanding our clients objectives,  
and making their objectives our own!*

PO Box 25  
Summerville, South Carolina 29484  
(800) 325-0605 (943) 873-8200 fax: (943) 873-8765

SIZE B	TERRY Project No. 2230.8F	DWG NO. Figure 1 Topographic Map	REV
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SCALE: As Shown      DATE: November 2014



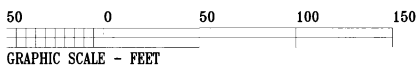
**LEGEND & ABBREVIATIONS:**  
 ☒ MW = MONITORING WELL  
 LS = LANDSCAPING  
 ALL MW AND SAMPLE IDENTIFICATIONS ARE PRECEDED BY UST PERMIT #12719 (ie. 12719-MW1)



**FIGURE 2  
 SITE BASE MAP**

HOT SPOT #3005  
 107 HAMPTON STREET  
 CHESNEE, SOUTH CAROLINA

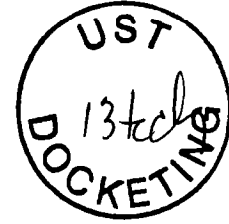
TERRY PROJECT # 2230.8F	SCDHEC SITE ID # 12719
SCALE 1" = 50'	DATE November 2014





Catherine B. Templeton, Director

*Promoting and protecting the health of the public and the environment*



MS CYNDI SUTTLES  
R L JORDAN OIL COMPANY OF NORTH CAROLINA  
PO BOX 2527  
SPARTANBURG SC 29304-2527

DEC 12 2014

Re: **Groundwater Sampling Directive**  
Hot Spot #3005, 107 Hampton Street (U.S. Highway 221), Chesnee, SC  
UST Permit #12719; Cost Agreement #49232  
Release No. 2 reported August 4, 2003  
Site-Specific Work Plan and Cost Agreement received November 14, 2014  
Spartanburg County

Dear Ms. Suttles:

The Underground Storage Tank Management Division (UST Division) of the South Carolina Department of Health and Environmental Control (Agency) has reviewed and approved the referenced work plan submitted on your behalf by TERRY Environmental Services, Inc. The previous assessment work for this release indicates that petroleum Chemicals of Concern (CoC) are present in the groundwater at concentrations that exceed risk-based screening levels (RBSL). In order to obtain current groundwater quality data, a comprehensive sampling event is necessary. All work must be conducted in accordance with the UST Quality Assurance Protection Plan (QAPP) Revision 2.0 and in compliance with all applicable regulations. A copy of the Agency QAPP for the UST Division is available at:  
[http://www.scdhec.gov/environment/docs/QAPP\\_Rev-2\\_April2013.pdf](http://www.scdhec.gov/environment/docs/QAPP_Rev-2_April2013.pdf).

Groundwater sampling activities at the site should begin immediately upon receipt of this letter. Cost Agreement #49232 has been approved for the amount shown on the enclosed cost agreement form for the sampling of all monitoring wells associated with the release. Groundwater samples should be analyzed for BTEX, naphthalene, MtBE, 1,2-DCA, and the oxygenates. Analyses should be in accordance with Appendix E of the QAPP to include a duplicate sample, field blank, and trip blank.

In accordance with the QAPP, a weekly status report of the project should be provided by e-mail. If any quality assurance problems arise, you must contact me within 24 hours via telephone or e-mail. In addition, a discussion of the problem(s) encountered, including quality assurance problems, the actions taken, and the results must be included in the final report submitted to the Agency.

**The monitoring report, contractor checklist from Appendix K of the QAPP, and invoice are due within sixty (60) days from the date of this letter.** Interim invoices may not be

Ms. Cyndi Suttles  
Hot Spot #3005; UST Permit #12719  
Page 2

submitted for this scope of work. The report submitted at the completion of these activities should include the required information outlined in the QAPP. Please note that all applicable South Carolina certification requirements apply to the services and report preparation. All site rehabilitation activities must be performed and submitted by a South Carolina Certified Underground Storage Tank Site Rehabilitation Contractor.

TERRY Environmental Services, Inc. may 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. Please note that applicable South Carolina certification requirements regarding laboratory services and report preparation must be satisfied. 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.

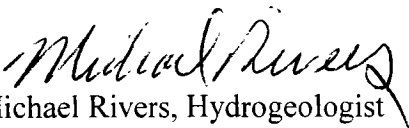
Please note that Sections 44-2-110(4) and 44-2-130 of the SUPERB Statute state that no costs will be allowed unless prior approval from the UST Division is obtained. If for any reason additional tasks will be completed, these additional tasks and the associated cost must be pre-approved by the UST Division for the cost to be paid. The Agency 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 Agency 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.

If unnecessary dilutions are completed resulting in reporting limits of individual CoC in excess of RBSL, the data cannot be used. In those cases, the UST Division may deny payment for any non-detect analysis where the reporting limit exceeds the RBSL. The UST Division encourages the use of 'J' values as necessary so the appropriate action can be determined for a release.

The Agency grants pre-approval for transportation of virgin petroleum impacted soil and groundwater from the referenced site to a permitted treatment facility. The transport and disposal must be conducted in accordance with the QAPP. If the CoC concentrations based on laboratory analysis are below RBSL, 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 RBSL.

On all correspondence regarding this directive, please reference **UST Permit #12719 and Cost Agreement #49232**. If you have any questions regarding this correspondence, please contact me by telephone at (803) 898-0671 or by e-mail to [RiversMS@dhec.sc.gov](mailto:RiversMS@dhec.sc.gov).

Sincerely,

  
Michael Rivers, Hydrogeologist  
Corrective Action Section  
Underground Storage Tank Management Division  
Bureau of Land and Waste Management

Ms. Cyndi Suttles  
Hot Spot #3005; UST Permit #12719  
Page 3

enc: Approved Cost Agreement

cc: TERRY Environmental Services, Inc., P.O. Box 25, Summerville, SC 29484 (w/ enc.)  
Technical File (w/ enc.)

MR/GWSDIR12 01 14



# Approved Cost Agreement 49232

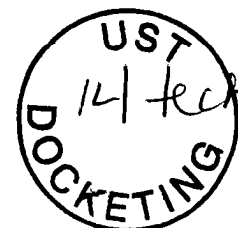
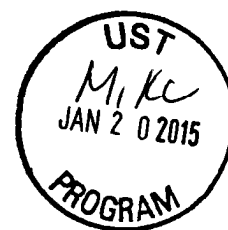
Facility: 12719 HOT SPOT 3005

RIVERSMS

PO Number:

<u>Task / Description</u>	<u>Categories</u>	<u>Item Description</u>	<u>Qty / Pct</u>	<u>Unit Price</u>	<u>Amount</u>
01 PLAN		A1 SITE SPECIFIC WORK PLAN	1.0000	150.00	150.00
04 MOB/DEMOB		B1 PERSONNEL	1.0000	423.00	423.00
10 SAMPLE COLLECTION		A1 GROUNDWATER (PURGE)	15 0000	60.00	900.00
		D1 GROUNDWATER NO PURGE/DUPLICATE	1.0000	28.00	28.00
		H1 FIELD BLANK	1.0000	24.60	24.60
11 ANALYSES	GW GROUNDWATER	A2 BTEXNM+OXYGS+1,2-DCA+ETH-8260B	18 0000	122.00	2,196.00
17 DISPOSAL		AA WASTEWATER	55.0000	0.56	30.80
19 RPT/PROJECT MNGT & COORDINATIO		PRT REPORT PREPARATION	0 1200	3,752.40	450.29
				<b>Total Amount</b>	<b>4,202.69</b>

**GROUNDWATER MONITORING REPORT  
HOT SPOT #3005  
107 HAMPTON STREET  
CHESNEE, SOUTH CAROLINA  
SCDHEC UST PERMIT #12719  
CA #49232**



Prepared For:

**SCDHEC UNDERGROUND STORAGE TANK PROGRAM  
2600 BULL ST.  
COLUMBIA, SC 29201**

Submitted By:



***TERRY Environmental Services***  
*CLIENTS FIRST ALWAYS*

P.O. BOX 25  
SUMMERVILLE, SOUTH CAROLINA 29484  
(843) 873-8200  
Fax (843) 873-8765  
[www.terryenvironmental.com](http://www.terryenvironmental.com)

UST CONTRACTOR #UCC-0223  
TERRY PROJECT #2230.8F

**JANUARY 2015**

**GROUNDWATER MONITORING REPORT  
HOT SPOT #3005  
107 HAMPTON STREET  
CHESNEE, SOUTH CAROLINA  
SCDHEC UST PERMIT #12719  
CA #49232**

Prepared For:

**SCDHEC UNDERGROUND STORAGE TANK PROGRAM  
2600 BULL ST.  
COLUMBIA, SC 29201**

Submitted By:



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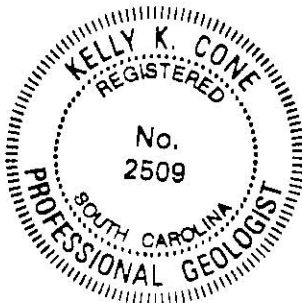
UST CONTRACTOR #UCC-0223  
TERRY PROJECT #2230.8F



**Kelly K. Cone, PG  
Vice President, Assessment Services**



**Jason A. Terry, PG  
President**



**JANUARY 2015**

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**A. INTRODUCTION**

**1. UST Facility and Owner/Operator Information**

Facility Name (Permit #) : Hot Spot #3005 (12719)  
Facility Address: 107 Hampton Street, Chesnee, South Carolina 29323  
Facility Telephone: 864-461-4147  
  
Owner/ Operator Name: RL Jordan Oil Co. of NC (Contact: Ms. Cyndi Suttles)  
Owner/ Operator Address: PO Box 2527, Spartanburg, SC 29304  
Owner/ Operator Telephone: 864-585-2784

**2. Property Owner Information**

Name: EJ Enterprises Inc.  
Address: PO Box 2527, Spartanburg, SC 29304  
Telephone: 864-585-2784

**3. Contractor Information**

Name: Terry Environmental Services, Inc.  
Address: P.O. Box 25, Summerville, South Carolina 29484  
Telephone: 843-873-8200  
Certification: UCC-0223

**4. Well Driller Information**

Not Applicable

**5. Laboratory Information**

Name: Shealy Environmental Services, Inc. (Shealy)  
Address: 106 Vantage Point Drive, West Columbia, South Carolina 29172  
Telephone: 803-791-9700  
Certification: 32010

**6. Site History**

Date Release Reported to SCDHEC: August 4, 2003  
Estimated Quantity of Product Released: Unknown  
Cause of Release: Unknown  
Current use of Facility: Gas Station and Convenience Store (Hot Spot)

UST #	Product	Date Installed	Currently In Use (Yes or No)	If not in use, Date Removed
1 (12,000 gal)	Unleaded Gasoline	8/6/1990	Yes	-
2 (8,000 gal)	Plus Gasoline	8/6/1990	Yes	-
3 (8,000 gal)	Premium Gasoline	8/6/1990	Yes	-
4 (8,000 gal)	Diesel	8/6/1990	Yes	-
5 (8,000 gal)	Kerosene	8/6/1990	Yes	-
6(12,000 gal)	Diesel	10/3/1991	Yes	-

Other Releases at this site?      Yes XXXX      No \_\_\_\_\_  
 If yes, Date Release Reported to SCDHEC      November 3, 1993  
**Status of Release:**      Feb. 2002 Brook & Medlock selected as CA contractor.  
 No Further Action Date:      N/A

### 7. Regional Geology and Hydrogeology

The Hot Spot #3005 site is located in Chesnee which lies in the Western Piedmont Province of South Carolina. The western piedmont is comprised of the Inner Piedmont block, the Smith River allochthon, and the Sauratwon Mountain window. The Inner Piedmont block encompasses the Inner Piedmont belt and the Chauga belt, and consists of a composite stack of thrust sheets containing a variety of gneisses, schists, amphibolites, sparse ultramafic bodies, and intrusive granitoids. (The Geology of the Carolinas, Horton & Zullo, 1991)

The Hot Spot #3005 site is located in the Inner Piedmont Belt which is characterized by granitic, biotitic, and hornblendic rocks. Generally, wells drilled in the Inner Piedmont Belt of Spartanburg County yield 1 to 250 gallons per minute (gpm). The highest average yields (35 gpm) were obtained from wells drilled in biotite gneiss and migmatite with the lowest average yields from wells drilled in quartz monzonite. The average yield of all wells inventoried was 20 gpm. The ground waters in Spartanburg County are of good to excellent quality for most domestic, municipal, and industrial uses. (USGS/SCWRC Report 3: Water Resources of Spartanburg County, South Carolina, 1970)

## **B. RECEPTOR SURVEY & SITE DATA**

### **1. Receptor Survey Results**

A receptor survey was not conducted during this scope of work.

### **2. Current Site and Adjacent Land Use**

Description of current site use (commercial, residential, rural, etc.):

Commercial; the site is operating as Hot Spot #3005, a gas station and convenience store.

Description of adjacent land use (commercial, residential, rural, etc):

Commercial and residential.

UST sites within a 1,000-foot radius:

10122 Free Time Convenience Store

The site is located at 107 Hampton Street, Chesnee, South Carolina. The site is bordered to the north by a school, to the east by a vacant field, and to the south and west by commercial and residential properties. The general site location is shown on the Topographic Map provided in Section J as Figure 1. A Site Base Map based on the previous contractor's site survey is provided in Section J as Figure 2.

### **3. Site-Specific Geology and Hydrogeology**

Site-specific stratigraphy was not documented during this scope of work. The Site Potentiometric Map (Figure 5, Section J) from the comprehensive groundwater sampling event indicates that shallow groundwater flow is generally to the west.



**C. SOIL ASSESSMENT/FIELD SCREENING INFORMATION & METHODOLOGY**

Not Applicable. No soil or groundwater borings were installed during this scope of work.

**D. MONITORING WELL INFORMATION**

Not Applicable. No monitoring wells were installed during this scope of work.

## **E. GROUNDWATER DATA**

### **1. Groundwater Sampling Methodology**

TERRY conducted a sampling event on December 30, 2014. As directed by SCDHEC, monitoring wells MW-1, MW-2, MW-3R, MW-4 through MW-9, MW-10R, MW-11R, MW-12 through MW-14, and MW-1D were sampled. Just prior to the sampling event, these monitoring wells were gauged with an oil/water interface probe to determine depth to groundwater measurements and the presence or absence of free-phase petroleum. Water level was recorded to the nearest 0.01 foot and total well depth was recorded to the nearest 0.1 foot.

Sampling was conducted from the least contaminated wells to the most contaminated wells based on the previous assessment data. The wells at the site had not been sampled within the past twelve months; therefore, the wells were purged prior to sampling. A clean purge pump with new disposable tubing was utilized for purging monitoring wells with an adequate casing volume. Groundwater samples were collected from each monitoring well with a new disposable bailer. Bailers with new colorless nylon rope were slowly lowered into the top of the water column, allowed to fill, and slowly removed to minimize turbidity and disturbance of the volatile organic compounds (VOCs).

Trip blanks, field blanks, and field duplicates were prepared or collected in accordance with the SCDHEC UST QAPP, Revision 2.0. One trip blank was shipped with each cooler and analyzed for VOCs. One field blank was collected for this sampling event and analyzed for VOCs. One field duplicate was collected and analyzed for VOCs as less than twenty samples were collected during this event.

Samples were immediately packed in a cooler of ice and proper temperatures were maintained in accordance with the SCDHEC UST QAPP, Revision 2.0 and the site-specific Addendum. At the completion of the sampling event, the samples were submitted to a SCDHEC certified laboratory for analyses. The samples were analyzed for Benzene, Toluene, Ethylbenzene, Xylenes, Naphthalene, Methyl tertiary butyl ether, 1,2-Dichloroethane, Oxygenates, and Ethanol.

Field conditions were documented throughout the sampling event. All field measurement equipment was properly cleaned and decontaminated before use, between each well, and prior to site departure in accordance with "Appendix H: Standard Field Cleaning Procedures" of the SCDHEC UST QAPP, Revision 2.0. By-products were disposed of via processing through a granular-activated-carbon (GAC) unit in accordance with the NPDES General Permit No. SCG830000. The field measurement equipment was properly calibrated prior to the sampling event and verified after four (4) hours of use and at the completion of the event. The calibration and verification data for the sampling event is provided in Appendix B.

Depth to groundwater measurements were taken with reference to the top of well casing (TOC) and converted to elevations by subtracting the depth to groundwater measurements from the TOC elevations. Potentiometric data are provided in Section I as Table 2 and on the Groundwater Sampling Logs provided in Appendix B.

## **2. Purging Methodology**

Purging was conducted from the least contaminated wells to the most contaminated wells based on the previous assessment data. Prior to purging, new plastic sheeting was placed on the ground surface around the well to prevent contamination of pumps, hoses, meters, etc. For monitoring wells with smaller casing volumes and/or slow recharge rates, a new disposable bailer was utilized for purging. When utilized, bailers with new colorless nylon rope were slowly lowered into the top of the water column, allowed to fill, and slowly removed to minimize turbidity and disturbance of the VOCs. When utilized, the purge pump was lowered approximately 3-5 feet into the standing water column and adjusted only if the pumping rate exceeded the recovery rate as drawdown occurred. In accordance with the SCDHEC UST QAPP, Revision 2.0, an adequate purge was achieved when pH, specific conductance, and temperature of the groundwater stabilized, and turbidity either stabilized or was below 10 nephelometric turbidity units (NTUs). The purge water generated was disposed of via processing through a granular-activated-carbon (GAC) unit in accordance with the NPDES General Permit No. SCG830000. The Certificate of On-Site Treatment for the contaminated purge water and the by-products from cleaning and decontamination is provided in Appendix G.

If a well was pumped or purged dry, even with reduced purge rates, the well was considered adequately purged per the SCDHEC UST QAPP, Revision 2.0. The sample was collected immediately following sufficient recovery to fill all sampling containers. The groundwater measurements collected during the sampling event for the purged wells are provided as follows:

SECTION E -2 GROUNDWATER MEASUREMENTS (PURGE SAMPLING) HOT SPOT #3005 CHESNEE, SOUTH CAROLINA SCDHEC UST PERMIT #12719					
<b>12719-MW1</b>	<b>12/30/2014</b>				
	Free Product (0.13 ft)				
<b>12719-MW2</b>	<b>12/30/2014</b>				
Volume (gal)	Intitial	2.00	4.00	6.00/Sample	
Time (military)	1450	1454	1500	1504	
pH (su)	5.19	5.25	5.23	5.22	
Spec Conductivity (mS/cm)	0.122	0.122	0.121	0.120	
Water Temperature (°C)	18.9	19.8	19.8	19.8	
Turbidity (NTU)	56.4	99.8	99.6	99.3	
Dissolved Oxygen (mg/L)	5.55	5.86	5.78	5.72	
<b>12719-MW3R</b>	<b>12/30/2014</b>				
Volume (gal)	Intitial	1.25	2.50	3.75/Sample	
Time (military)	1542	1545	1548	1551	
pH (su)	6.00	6.23	6.27	6.27	
Spec Conductivity (mS/cm)	0.402	0.412	0.414	0.416	
Water Temperature (°C)	18.4	18.6	18.6	18.6	
Turbidity (NTU)	212	271	263	256	
Dissolved Oxygen (mg/L)	5.51	7.92	7.88	7.82	
<b>12719-MW4</b>	<b>12/30/2014</b>				
Volume (gal)	Intitial	3.75	7.50	11.25/Sample	Duplicate (DUP)
Time (military)	1229	1235	1241	1247	1249
pH (su)	5.82	6.51	6.50	6.52	
Spec Conductivity (mS/cm)	0.163	0.217	0.215	0.219	
Water Temperature (°C)	17.9	18.8	18.8	18.8	
Turbidity (NTU)	154	115	112	107	
Dissolved Oxygen (mg/L)	5.88	6.14	6.25	6.39	
<b>12719-MW5</b>	<b>12/30/2014</b>				
Volume (gal)	Initial	0.50	1.00	1.50/Sample	
Time (military)	1630	1633	1636	1639	
pH (su)	5.05	5.03	5.04	5.02	
Spec Conductivity (mS/cm)	0.049	0.046	0.047	0.045	
Water Temperature (°C)	18.5	19.8	19.8	19.8	
Turbidity (NTU)	131	88.1	87.9	87.3	
Dissolved Oxygen (mg/L)	3.72	5.79	5.71	5.58	
<b>12719-MW6</b>	<b>12/30/2014</b>				
Volume (gal)	Intitial	1.75	3.50	5.25/Sample	
Time (military)	1432	1436	1440	1444	
pH (su)	4.55	4.82	4.84	4.85	
Spec Conductivity (mS/cm)	0.234	0.263	0.279	0.284	
Water Temperature (°C)	18.5	19.9	19.9	19.9	
Turbidity (NTU)	57.3	134	124	119	
Dissolved Oxygen (mg/L)	8.01	1.98	1.92	1.70	

<b>12719-MW7</b>		<b>12/30/2014</b>			
Volume (gal)	Intitial	2.25	4.50	6.75/Sample	
Time (military)	1340	1343	1346	1349	
pH (su)	5.24	4.79	4.76	4.74	
Spec Conductivity (mS/cm)	0.059	0.066	0.065	0.066	
Water Temperature (°C)	18.8	19.2	19.2	19.2	
Turbidity (NTU)	91.2	81.1	80.8	80.4	
Dissolved Oxygen (mg/L)	5.64	6.21	6.13	6.08	
<b>12719-MW8</b>		<b>12/30/2014</b>			
Volume (gal)	Intitial	2.00	4.00	6.00/Sample	
Time (military)	1209	1213	1217	1221	
pH (su)	4.27	4.23	4.21	4.20	
Spec Conductivity (mS/cm)	0.008	0.006	0.007	0.007	
Water Temperature (°C)	18.0	18.9	18.9	18.9	
Turbidity (NTU)	103	179	174	172	
Dissolved Oxygen (mg/L)	7.16	7.08	7.01	6.98	
<b>12719-MW9</b>		<b>12/30/2014</b>			
Volume (gal)	Intitial	2.00	4.00	6.00/Sample	
Time (military)	1320	1323	1326	1329	
pH (su)	5.26	4.78	4.73	4.67	
Spec Conductivity (mS/cm)	0.047	0.045	0.045	0.044	
Water Temperature (°C)	17.8	19.3	19.3	19.3	
Turbidity (NTU)	104	116	112	107	
Dissolved Oxygen (mg/L)	4.39	1.14	1.08	1.01	
<b>12719-MW10R</b>		<b>12/30/2014</b>			
Volume (gal)	Intitial	2.00	4.00	6.00/Sample	
Time (military)	1128	1131	1134	1137	
pH (su)	4.07	3.99	3.99	3.98	
Spec Conductivity (mS/cm)	0.053	0.058	0.058	0.059	
Water Temperature (°C)	19.0	19.6	19.6	19.6	
Turbidity (NTU)	86.4	159	155	151	
Dissolved Oxygen (mg/L)	5.74	6.32	6.24	6.01	
<b>12719-MW11R</b>		<b>12/30/2014</b>			
Volume (gal)	Intitial	1.25	2.50	3.75/Sample	
Time (military)	1107	1111	1115	1119	
pH (su)	4.12	4.07	4.04	4.01	
Spec Conductivity (mS/cm)	0.023	0.036	0.035	0.038	
Water Temperature (°C)	18.7	19.2	19.2	19.2	
Turbidity (NTU)	55.6	173	171	164	
Dissolved Oxygen (mg/L)	5.79	7.11	6.86	6.21	
<b>12719-MW12</b>		<b>12/30/2014</b>			
Volume (gal)	Intitial	1.75	3.50	5.25/Sample	
Time (military)	1050	1053	1056	1059	
pH (su)	4.12	4.60	4.59	4.63	
Spec Conductivity (mS/cm)	0.236	0.121	0.121	0.120	
Water Temperature (°C)	17.8	17.9	17.9	17.9	
Turbidity (NTU)	31.4	181	177	173	
Dissolved Oxygen (mg/L)	6.27	5.12	3.56	3.37	

12719-MW13		12/30/2014			
Volume (gal)	Intitial	1.00	2.00	3.00/Sample	
Time (military)	1255	1258	1301	1304	
pH (su)	5.10	5.85	5.85	5.87	
Spec Conductivity (mS/cm)	0.106	0.122	0.121	0.123	
Water Temperature (°C)	18.8	19.2	19.2	19.2	
Turbidity (NTU)	212	124	121	117	
Dissolved Oxygen (mg/L)	4.62	4.48	4.23	4.12	
12719-MW14		12/30/2014			
Volume (gal)	Intitial	1.00	2.00	3.00/Sample	
Time (military)	1606	1609	1612	1615	
pH (su)	5.02	5.42	5.43	5.46	
Spec Conductivity (mS/cm)	0.101	0.078	0.078	0.077	
Water Temperature (°C)	18.0	18.4	18.4	18.4	
Turbidity (NTU)	143	220	217	212	
Dissolved Oxygen (mg/L)	5.29	3.46	3.33	3.21	
12719-MW1D		12/30/2014			
Volume (gal)	Intitial	5.25	10.50	15.75/Sample	
Time (military)	1512	1520	1528	1536	
pH (su)	6.08	6.10	6.10	6.11	
Spec Conductivity (mS/cm)	0.036	0.081	0.082	0.084	
Water Temperature (°C)	19.2	19.2	19.2	19.2	
Turbidity (NTU)	73.1	83.0	82.6	82.3	
Dissolved Oxygen (mg/L)	6.42	2.61	2.56	2.49	

**NOTES/KEY:**

gal = gallons  
 su = standard unit  
 mS/cm = milliSiemens per centimeter  
 NTU = nephelometric turbidity units  
 mg/L = milligrams per liter  
 Ins = insufficient volume

**3. Free Product Measurements**

Free-phase petroleum was measured in MW-1 (0.13 feet) on December 30, 2014. Therefore MW-1 was not sampled.

**F. AFVR INFORMATION**

Not Applicable. No Aggressive Fluid Vapor Recovery (AFVR) Events were performed during this scope of work.

**G. GRANULATED ACTIVATED CARBON INSTALLATION**

Not Applicable. No granulated activated carbon units were installed during this scope of work.

## **H. RESULTS & DISCUSSION**

### **1. Assessment Results**

During this scope of work, TERRY conducted a sampling event in accordance with the SCDHEC UST QAPP, Revision 2.0 and the associated site-specific work plan submitted in November 2014. The wells at the site had not been sampled within the past twelve months; therefore, all wells were purged prior to sampling.

The groundwater analytical data are summarized in Section I as Table 3, and are included in Appendix B. The analytical data were used to generate contaminant concentration maps for CoC's detected by the laboratory and are provided in Section J as Figures 4A and 4B. Based on the analytical data from the comprehensive sampling event, shallow groundwater contamination is observed onsite in the vicinity of the diesel UST basin (MW-1 & MW-2), the gasoline UST basin (MW-3R), and the dispenser area (MW-5).

### **2. Aquifer Evaluation Results**

Not Applicable

### **3. Fate & Transport Results**

Not Applicable

### **4. Tier 1 Risk Evaluation**

Not Applicable

### **5. Tier 2 Risk Evaluation**

Not Applicable



**I. TABLES**

**1. Soil Analytical Data**

Table 1 Soil Analytical Data - Not Applicable

**2. Potentiometric Data**

Table 2 Potentiometric Data - Attached

**3. Laboratory Data**

Table 3 Groundwater Laboratory Data - Attached

**4. Aquifer Characteristics**

Table 4 Aquifer Characteristics - Not Applicable

**5. Site Conceptual Model**

Table 5 Site Conceptual Model - Not Applicable

**TABLE 2**  
**GROUNDWATER POTENTIOMETRIC DATA**  
**HOT SPOT # 3005**  
**CHESNEE, SOUTH CAROLINA**  
**SCDHEC UST PERMIT #12719**

Well #	DATE	TOC Elevation	Screened Interval	Depth to Product** (ft)	Depth to Water** (ft)	Product Thickness (ft)	Water Table Elevation (ft)
12719-MW1	8/18/2005	104.89	20'-30'	--	23.69	--	81.20
	10/2/2008	104.89	20'-30'	--	29.77	--	75.12
	10/31/2011	104.89	20'-30'	--	29.20	--	75.69
	12/30/2014	104.89	20'-30'	25.87	26.00	0.13	78.89
12719-MW2	8/18/2005	Unknown	26'-36'	--	23.69	--	--
	10/2/2008	Unknown	26'-36'	--	29.61	--	--
	10/31/2011	Unknown	26'-36'	--	29.03	--	--
	12/30/2104	Unknown	26'-36'	--	25.41	--	--
12719-MW3R	8/18/2005	104.92	26'-36'	--	27.15	--	77.77
	10/2/2008	104.92	26'-36'	--	32.40	--	72.52
	10/31/2011	104.92	26'-36'	--	32.12	--	72.80
	12/30/2014	104.92	26'-36'	--	28.56	--	76.36
12719-MW4	8/18/2005	111.32	36'-46'	--	23.25	--	88.07
	10/2/2008	111.32	36'-46'	--	29.57	--	81.75
	10/31/2011	111.32	36'-46'	Not sampled			
	12/30/2014	111.32	36'-46'	--	23.95	--	87.37
12719-MW5	8/18/2005	103.57	22'-32'	--	29.03	--	74.54
	10/2/2008	103.57	22'-32'	--	31.94	--	71.63
	10/31/2011	103.57	22'-32'	--	31.80	--	71.77
	12/30/2014	103.57	22'-32'	--	30.02	--	73.55
12719-MW6	8/18/2005	104.14	26'-36'	--	24.22	--	79.92
	10/2/2008	104.14	26'-36'	--	29.89	--	74.25
	10/31/2011	104.14	26'-36'	--	30.57	--	73.57
	12/30/2014	104.14	26'-36'	--	25.92	--	78.22
12719-MW7	8/18/2005	104.52	26'-36'	--	22.74	--	81.78
	10/2/2008	104.52	26'-36'	--	28.90	--	75.62
	10/31/2011	104.52	26'-36'	Not sampled			
	12/30/2014	104.52	26'-36'	--	23.89	--	80.63
12719-MW8	8/18/2005	101.79	Unknown	--	18.05	--	83.74
	10/2/2008	101.79	Unknown	Well could not be located			
	10/31/2011	101.79	Unknown	Not sampled			
	12/30/2014	101.79	Unknown	--	21.53	--	80.26
12719-MW9	8/18/2005	105.43	Unknown	--	22.95	--	82.48
	10/2/2008	105.43	Unknown	--	29.38	--	76.05
	10/31/2011	105.43	Unknown	Not sampled			
	12/30/2014	105.43	Unknown	--	24.02	--	81.41
12719-MW10	8/18/2005	96.57	17'-27'	--	--	--	--
	10/31/2011	96.57	17'-27'	Not sampled			
	12/30/2014	96.57	17'-27'	Not sampled			
12719-MW10R	8/18/2005	Unknown	22'-32'	--	19.67	--	--
	10/2/2008	Unknown	22'-32'	--	24.50	--	--
	10/31/2011	Unknown	22'-32'	--	24.39	--	--
	12/30/2014	Unknown	22'-32'	--	21.13	--	--

**TABLE 2  
GROUNDWATER POTENTIOMETRIC DATA  
HOT SPOT # 3005  
CHESNEE, SOUTH CAROLINA  
SCDHEC UST PERMIT #12719**

Well #	DATE	TOC Elevation	Screened Interval	Depth to Product** (ft)	Depth to Water** (ft)	Product Thickness (ft)	Water Table Elevation (ft)
12719-MW11	8/18/2005	95.15	18'-28'	--	--	--	--
	10/2/2008	95.15	18'-28'	--	24.85	--	70.30
	10/31/2011	95.15	18'-28'	Not sampled			
	12/30/2014	95.15	18'-28'	Not sampled			
12719-MW11R	8/18/2005	Unknown	22'-32'	--	20.68	--	--
	10/2/2008	Unknown	22'-32'	Well could not be located			
	10/31/2011	Unknown	22'-32'	Not sampled			
	12/30/2014	Unknown	22'-32'	--	21.91	--	--
12719-MW12	8/18/2005	97.03	20'-30'	--	19.57	--	77.46
	10/2/2008	97.03	20'-30'	--	25.35	--	71.68
	10/31/2011	97.03	20'-30'	Not sampled			
	12/30/2014	97.03	20'-30'	--	21.37	--	75.66
12719-MW13	8/18/2005	95.89	17'-27'	--	20.62	--	75.27
	10/2/2008	95.89	17'-27'	--	25.27	--	70.62
	10/31/2011	95.89	17'-27'	Not sampled			
	12/30/2014	95.89	17'-27'	--	22.08	--	73.81
12719-MW14	8/18/2005	Unknown	21'-31'	--	24.84	--	--
	10/2/2008	Unknown	21'-31'	--	28.46	--	--
	10/31/2011	Unknown	21'-31'	Not sampled			
	12/30/2014	Unknown	21'-31'	--	30.60	--	--
12719-MW1D	8/18/2005	104.61	55'-60'	--	24.60	--	80.01
	10/2/2008	104.61	55'-60'	--	30.46	--	74.15
	10/31/2011	104.61	55'-60'	--	30.03	--	74.58
	12/30/2014	104.61	55'-60'	--	26.82	--	77.79

\*\* = Relative to top of casing

-- = Not applicable

**TABLE 3  
GROUNDWATER LABORATORY DATA  
HOT SPOT #3005  
CHESNEE, SC  
SCDHEC UST PERMIT #12719**

Well	Date	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	MTBE	1,2 DCA	EDB	TAME	TBA	DIPE	ETBE	ETBA	Ethanol	TAA	TBF	
	Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	
12719-MW1	8/18/2005	5	1,000	700	10,000	40	25	5	0.05	128	1,400	150	47	n/a	10,000	240	n/a	
	10/2/2008	85	110	42	170	41	<5.0	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	10/31/2011	57.6	1.93	36.8	176	91.4	8.03	<1.00	NT	<5.00	<10.0	<5.00	<5.00	<100	<1,000	7.42J	<5.00	
	12/30/2014	Free Product (0.13B)																
12719-MW2	8/18/2005	90	100	78	350	94	8.9	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	10/2/2008	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<0.010	NT	NT	NT	NT	NT	NT	NT	NT	
	10/31/2011	<1.00	<1.00	<1.00	<3.00	2.23J	11.1	<1.00	NT	<5.00	<10.0	<5.00	<5.00	<100	<1,000	46.3	<5.00	
	12/30/2014	100	4.6	98	380	120	<1.0	<1.0	NT	0.25J	<20	<1.0	<1.0	<20	<100	<20	<5.0	
12719-MW3R	8/18/2005	270	41	170	880	430	330	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	10/2/2008	562	<25.0	272	261	96.5J	4,160	<25.0	<0.010	NT	NT	NT	NT	NT	NT	NT	NT	
	10/31/2011	196	<20.0	39.1	31.3J	143	2,060	<20.0	NT	163	255	53.3J	<100	<2,000	<20,000	282J	<100	
	12/30/2014	1,300	38	77	530	14J	85	<20	NT	5.3J	250J	30	<20	<400	<2,000	2,500	<100	
12719-MW4	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	<1.00	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	10/2/2008	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<0.010	NT	NT	NT	NT	NT	NT	NT	NT	
	10/31/2011	Not sampled																
	12/30/2014	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NT	<10	<20	<1.0	<1.0	<20	<100	<20	<5.0	
12719-MW4(DUP)	12/30/2014	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NT	<10	<20	<1.0	<1.0	<20	<100	<20	<5.0	
12719-MW5	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	10/2/2008	Dry - Not enough water to sample																
	10/31/2011	110	11.5	<1.00	9.27	<5.00	4.31	<1.00	NT	<5.00	7.11J	<5.00	<5.00	<100	<1,000	32.0	<5.00	
	12/30/2014	680	910	72	360	<20	<20	<20	NT	<200	<400	<20	<20	<400	<2,000	130J	<100	
12719-MW6	8/18/2005	7.8	6.3	5.5	52	22	6.8	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	10/2/2008	9.16	1.15	16.9	133	43.8	<1.00	<1.00	<0.010	NT	NT	NT	NT	NT	NT	NT	NT	
	10/31/2011	10.4	<1.00	3.17	91.5	65.4	<1.00	<1.00	NT	<5.00	<10.0	<5.00	<5.00	<100	<1,000	8.52J	<5.00	
	12/30/2014	2.2	<1.0	<1.0	13	9.2	<1.0	<1.0	NT	0.34J	12J	1.1	<1.0	<20	<100	<20	<5.0	
12719-MW7	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	10/2/2008	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<0.010	NT	NT	NT	NT	NT	NT	NT	NT	
	10/31/2011	Not sampled																
	12/30/2014	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NT	<10	<20	<1.0	<1.0	<20	<100	<20	<5.0	
12719-MW8	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	10/2/2008	Well could not be located																
	10/31/2011	Not sampled																
	12/30/2014	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NT	<10	<20	<1.0	<1.0	<20	<100	<20	<5.0	
12719-MW9	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	10/2/2008	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<0.010	NT	NT	NT	NT	NT	NT	NT	NT	
	10/31/2011	Not sampled																
	12/30/2014	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NT	<10	<20	<1.0	<1.0	<20	<100	<20	<5.0	
12719-MW10	8/18/2005	Not sampled																
	10/2/2008	Not sampled																
	10/31/2011	Not sampled																
	12/30/2014	Not sampled																
12719-MW10R	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	10/2/2008	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<0.010	NT	NT	NT	NT	NT	NT	NT	NT	
	10/31/2011	<1.00	<1.00	<1.00	<3.00	1.88J	<1.00	<1.00	NT	<5.00	<10.0	<5.00	<5.00	<100	<1,000	<20.0	<5.00	
	12/30/2014	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NT	<10	<20	<1.0	<1.0	<20	<100	<20	<5.0	

**TABLE 3  
GROUNDWATER LABORATORY DATA  
HOT SPOT #3005  
CHESNEE, SC  
SCDHEC UST PERMIT #12719**

Well	Date	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	MTBE	1,2-DCA	EDB	TAME	TBA	DIPE	ETBE	ETBA	Ethanol	TAA	TBF
	Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
	RBSL	5	1,000	700	10,000	40	25	5	0.05	128	1,400	150	47	n/a	10,000	240	n/a
12719-MW11	8/18/2005	Not sampled															
	10/2/2008	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<0.010	NT	NT	NT	NT	NT	NT	NT	NT
	10/31/2011	Not sampled															
	12/30/2014	Not sampled															
12719-MW11R	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	10/2/2008	Well could not be located															
	10/31/2011	Not sampled															
	12/30/2014	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NT	<10	<20	<1.0	<1.0	<20	<100	<20
12719-MW12	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	10/2/2008	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<0.010	NT	NT	NT	NT	NT	NT	NT	NT
	10/31/2011	Not sampled															
	12/30/2014	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NT	<10	<20	<1.0	<1.0	<20	<100	<20	<5.0
12719-MW13	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	10/2/2008	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<0.010	NT	NT	NT	NT	NT	NT	NT	NT
	10/31/2011	Not sampled															
	12/30/2014	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NT	<10	<20	<1.0	<1.0	<20	<100	<20	<5.0
12719-MW14	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	10/2/2008	<1.00	<1.00		<3.00	<5.00	1.12	<1.00	<0.010	NT	NT	NT	NT	NT	NT	NT	NT
	10/31/2011	Not sampled															
	12/30/2014	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NT	<10	<20	<1.0	<1.0	<20	<100	<20	<5.0
12719-MW1D	8/18/2005	<1.0	<5.0	<5.0	<10	<5.0	<5.0	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	10/2/2008	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<0.010	NT	NT	NT	NT	NT	NT	NT	NT
	10/31/2011	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	NT	<5.00	<10.0	<5.00	<5.00	<100	<1,000	<20.0	<5.00
	12/30/2014	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NT	<10	<20	<1.0	<1.0	<20	<100	<20	<5.0
<b>12719-FB1</b>	12/30/2014	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NT	<10	<20	<1.0	<1.0	<20	<100	<20	<5.0
<b>12719-TB</b>	12/30/2014	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NT	<10	<20	<1.0	<1.0	<20	<100	<20	<5.0

NOTES:

RBSL = Risk-Based Screening Level  
**Bold** lettering indicates parameter exceeds SCDHEC RBSL's except 1,2-DCA which is based on EPA limit  
 ug/L= micrograms per liter  
 NT = Parameter was not tested during this event  
 MTBE = tert-Butyl methyl ether  
 1,2-DCA = 1,2-Dichloroethane  
 EDB = 1,2-Dibromoethane

TAME = tert-Amyl methyl ether  
 TBA = tert-Butyl Alcohol or t-Butanol  
 DIPE = Isopropyl ether or diisopropyl ether  
 ETBE = Ethyl tert-butyl ether  
 ETBA = 3,3-Dimethyl-1-butanol or ethyl tert-butanol  
 TAA = tert-amyl alcohol  
 TBF = tert-butyl formate

J - Indicates an estimated value  
 (DUP) = Field duplicate sample  
 FB = Field Blank sample  
 TB = Trip Blank sample

## **J. FIGURES**

### **1. Topographic Map**

Figure 1 Topographic Map - Attached

### **2. Site Base Map**

Figure 2 Site Base Map - Attached

### **3. CoC Site Maps**

Figure 3 Soil CoC Map - Not Applicable

Figure 4A Groundwater CoC Map - Attached

Figure 4B Groundwater CoC Map (Oxygenates) - Attached

### **4. Site Potentiometric Maps**

Figure 5 Site Potentiometric Map - Attached

### **5. Geologic Cross Sections**

Figure 6 Geologic Cross Sections - Not Applicable

### **6. Predicted Migration and Attenuation of CoCs**

Figure 7 Predicted Migration and Attenuation of CoCs - Not Applicable

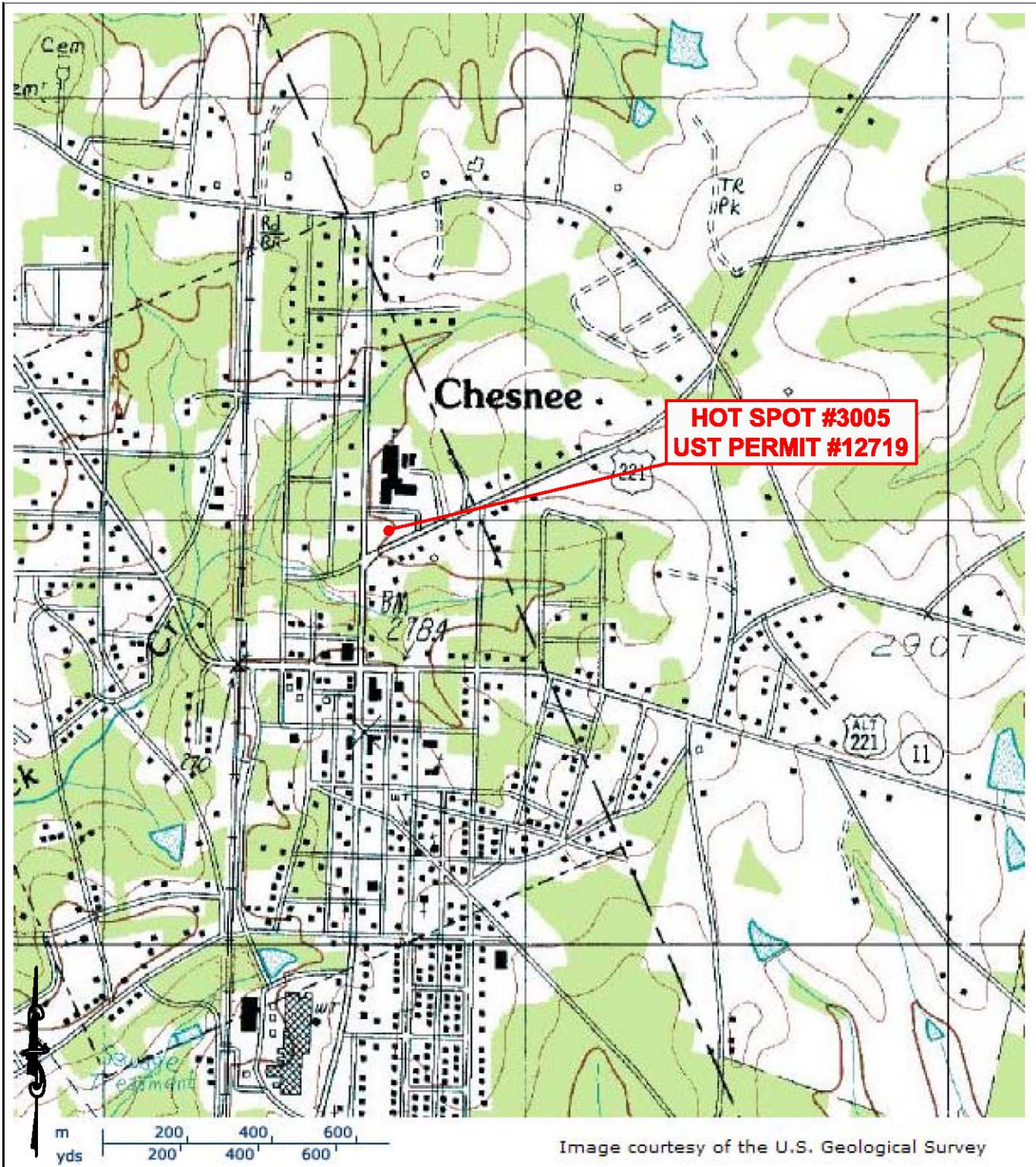


Image courtesy of the U.S. Geological Survey



**FIGURE 1  
TOPOGRAPHIC MAP**

**HOT SPOT #3005  
107 HAMPTON STREET  
CHESNEE, SOUTH CAROLINA**

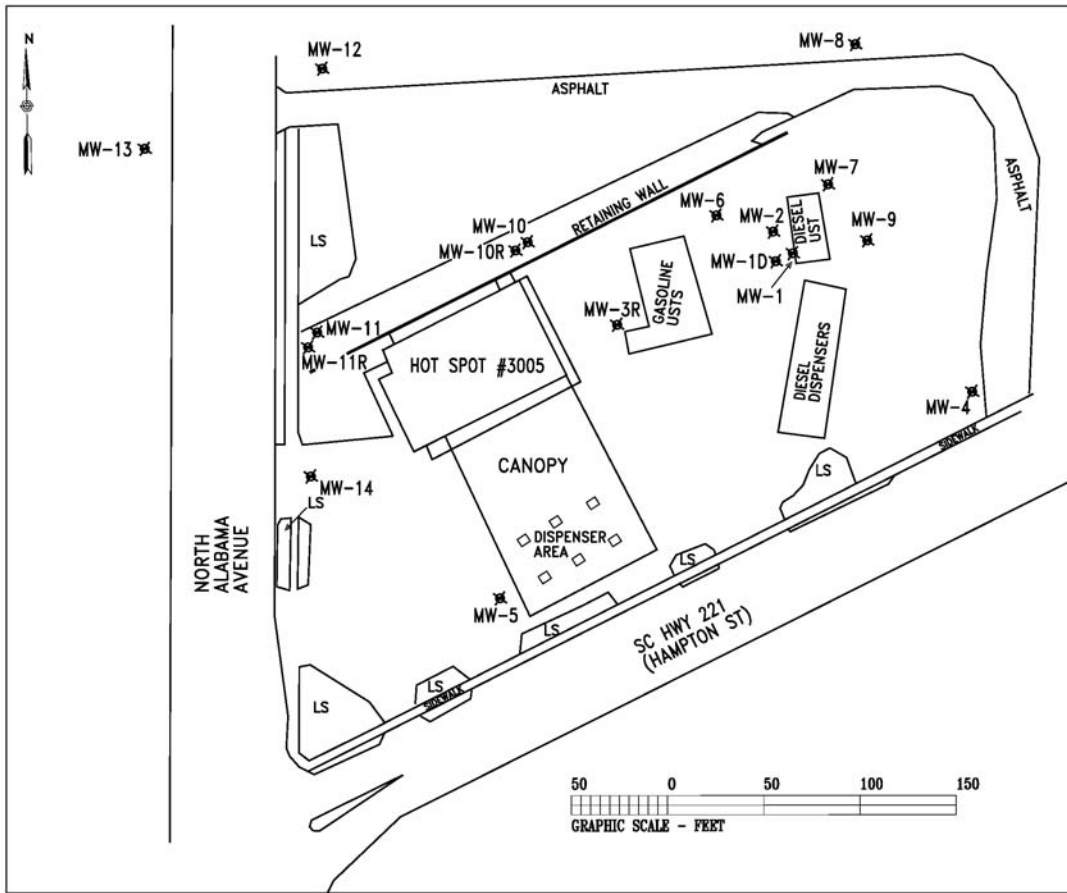
*... providing our clients with the best services available,  
actually understanding our clients objectives,  
and making their objectives our own!*

SIZE B	TERRY Project No. 2230.8F	DWG NO. Figure 1 Topographic Map	REV
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PO Box 25  
Summerville, South Carolina 29484  
(800) 325-0605 (843)-873-8200 fax: (843)-873-8765

SCALE: As Shown

DATE: January 2015



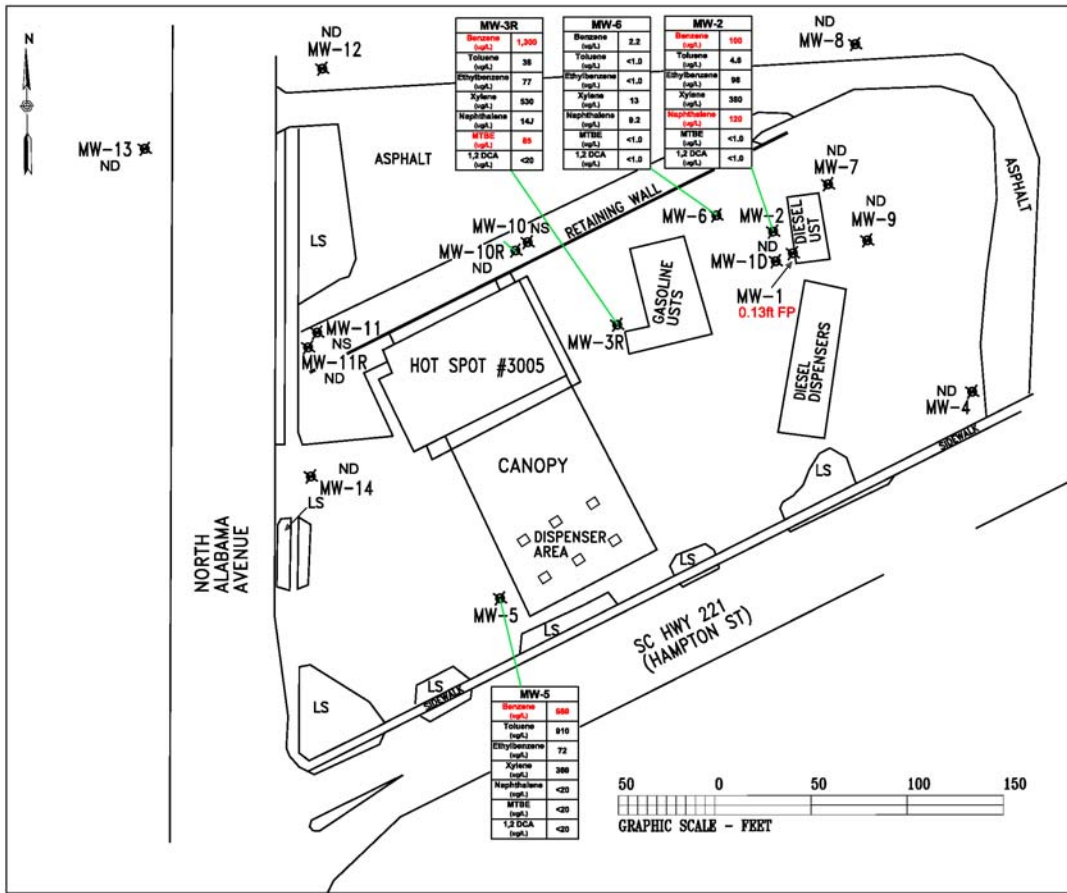
**LEGEND & ABBREVIATIONS:**  
 ✕ MW = MONITORING WELL  
 LS = LANDSCAPING  
 ALL MW AND SAMPLE IDENTIFICATIONS ARE PRECEDED BY UST PERMIT #12719 (i.e. 12719-MW1)

**FIGURE 2  
 SITE BASE MAP**

HOT SPOT #3005  
 107 HAMPTON STREET  
 CHESNEE, SOUTH CAROLINA

TERRY PROJECT # 2230.8F	SCDHEC SITE ID # 12719
SCALE 1" = 50'	DATE January 2015





**LEGEND & ABBREVIATIONS:**

- ☒ MW = MONITORING WELL
- LS = LANDSCAPING
- ND = NON DETECT
- NS = NOT SAMPLED
- MTBE = METHYL TERTIARY BUTYL ETHER
- 1,2 DCA = 1,2-DICHLOROETHANE
- J = ESTIMATED VALUE
- ND = LABORATORY ANALYSIS INDICATES ALL CoC AT OR BELOW DETECTION LIMITS

RED INDICATES CONTAMINANTS EXCEED RBLS

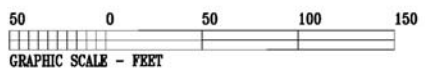
SAMPLES COLLECTED DECEMBER 30, 2014.

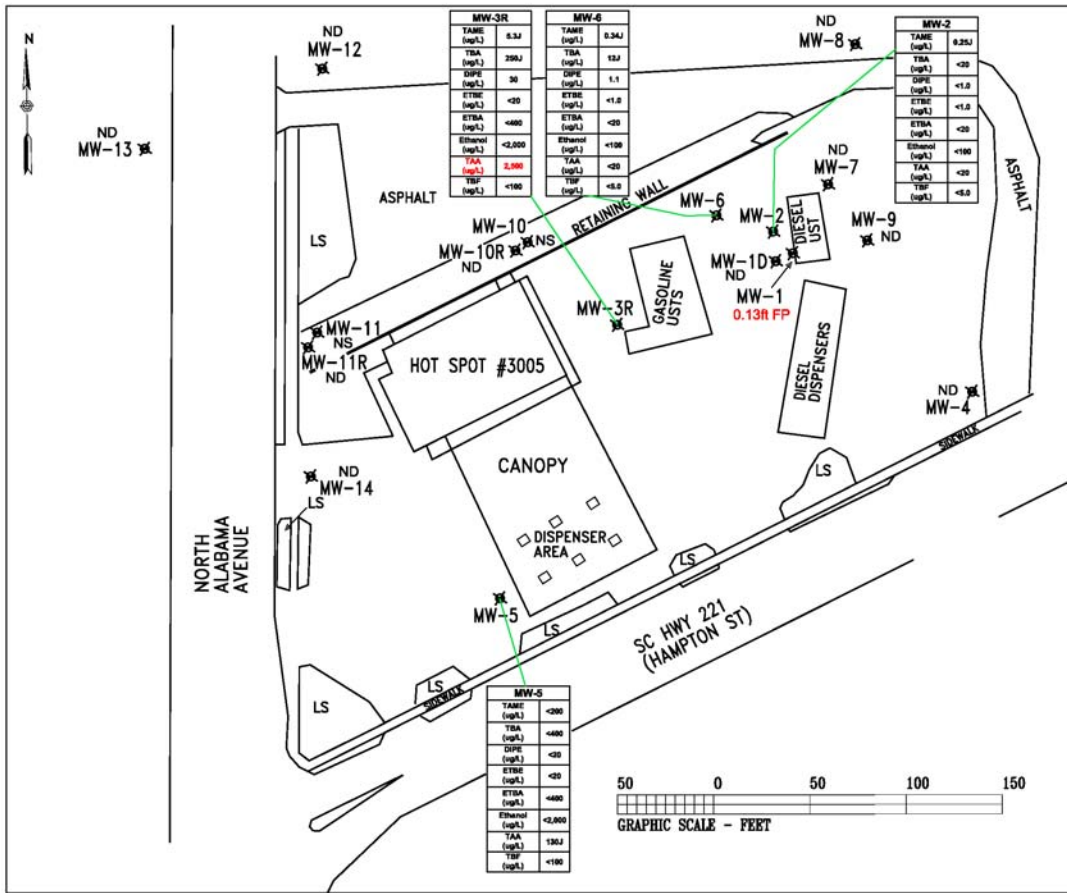
ALL MW AND SAMPLE IDENTIFICATIONS ARE PRECEDED BY UST PERMIT #12719 (i.e. 12719-MW1)

**FIGURE 4A  
GROUNDWATER COC MAP**

HOT SPOT #3005  
SC HIGHWAY 221  
CHESNEE, SOUTH CAROLINA

TERRY PROJECT #	SCDHEC SITE ID #
2230.8F	12719
SCALE 1" = 50'	DATE January 2015





**LEGEND & ABBREVIATIONS:**

- ✕ MW = MONITORING WELL
- NS = NOT SAMPLED
- LS = LANDSCAPING
- TAME = TERT-AMYL METHYL ETHER
- TBA = TERT-BUTYL ALCOHOL or T-BUTANOL
- DIPE = ISOPROPYL ETHER or DIISOPROPYL ETHER
- ETBE = ETHYL TERT-BUTYL ETHER
- ETBA = 3,3-DIMETHYL-1-BUTANOL
- TAA = TERT-AMYL ALCOHOL
- TBF = TERT-BUTYL FORMATE
- J = ESTIMATED VALUE
- ND = LABORATORY ANALYSIS INDICATES ALL CoC AT OR BELOW DETECTION LIMITS

RED INDICATES CONTAMINANTS EXCEED RBSLs

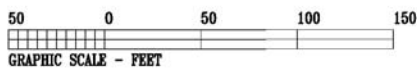
SAMPLES COLLECTED DECEMBER 30, 2014.

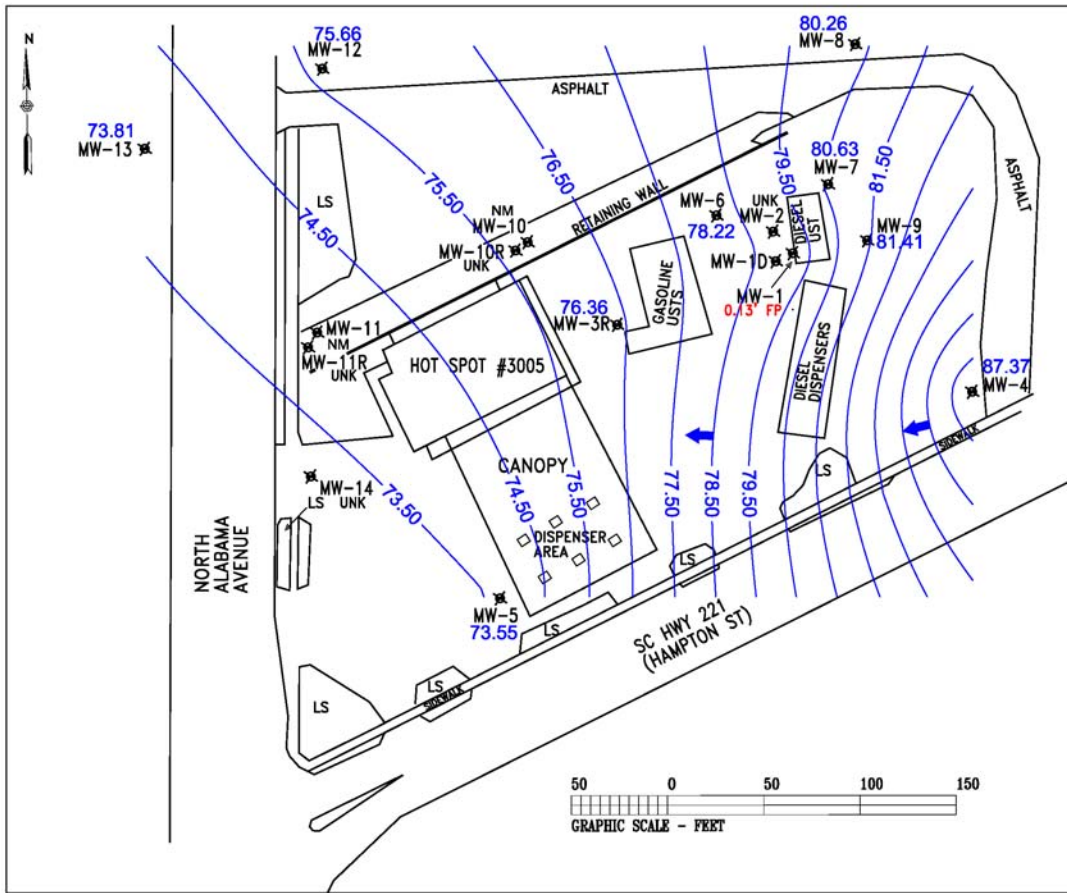
ALL MW AND SAMPLE IDENTIFICATIONS ARE PRECEDED BY UST PERMIT #12719 (ie. 12719-MW1)

**FIGURE 4B**  
**GROUNDWATER COC MAP**  
**(OXYGENATES)**

HOT SPOT #3005  
 SC HIGHWAY 221  
 CHESNEE, SOUTH CAROLINA

TERRY PROJECT #	SCDHEC SITE ID #
2230.8F	12719
SCALE 1" = 50'	DATE January 2015






**LEGEND & ABBREVIATIONS:**

- ✕ MW = MONITORING WELL
- LS = LANDSCAPING
- NM = NOT MEASURED
- UNK = UNKNOWN WATER TABLE SURFACE ELEVATION
- FP = FREE PRODUCT
- 80.63 GROUNDWATER ELEVATION (RELATIVE TO AN ASSUMED DATUM)
- 81.50- GROUNDWATER CONTOUR
- ← GROUNDWATER FLOW DIRECTION

SAMPLES COLLECTED DECEMBER 30, 2014.  
 ALL MW AND SAMPLE IDENTIFICATIONS ARE PRECEDED BY UST PERMIT #12719 (i.e. 12719-MW1)



**FIGURE 5**  
**GROUNDWATER POTENTIOMETRIC MAP**

HOT SPOT #3005  
 SC HIGHWAY 221  
 CHESNEE, SOUTH CAROLINA

TERRY PROJECT #	SCDHEC SITE ID #
2230.8F	12719
SCALE	DATE
1" = 50'	January 2015

**K. APPENDICES**

**1. Appendix A: Site Survey**

Not Applicable

**2. Appendix B: Sampling Logs and Laboratory Data**

**3. Appendix C: Tax Map**

Not Applicable

**4. Appendix D: Soil Boring/Field Screening Logs**

Not Applicable

**5. Appendix E: Well Completion Logs/SCDHEC 1903 Forms**

Not Applicable

**6. Appendix F: Aquifer Evaluation Forms**

Not Applicable

**7. Appendix G: Disposal Manifest**

**8. Appendix H: Local Zoning Regulations**

Not Applicable

**9. Appendix I: Fate and Transport Modeling Data**

Not Applicable

**10. Appendix J: Access Agreements**

Not Applicable

**11. Appendix K: Data Verification Checklist**

**APPENDIX A**

**Site Survey  
(Not Applicable)**

## **APPENDIX B**

### **Sampling Logs and Laboratory Data**

**Groundwater Sampling Log**



**TERRY Environmental Services**  
CLIENTS FIRST ALWAYS

P.O. Box 25  
 Summerville, SC 29484  
 1-800-325-0605


Site Specific Information				Monitoring Well Information											
Terry Project ID	2230.8F			Well ID	12719 - MW-1										
SCDHEC Permit No.	12719			Testing Parameters	BTEX, Naph, MTBE, 1,2-DCA, Oxygenates, & Ethanol										
Project Name	Hot Spot #3005														
Date	12/30/2014														
Field Personnel	BS, AK			Well Diameter	2	in	TAG BOTTOM OF WELL TO VERIFY WELL DEPTH, WRITE BELOW TO NEAREST 0.1'								
General Weather	Cloudy			Screened Interval		ft									
Ambient Air Temperature	45°			Total Well Depth (nearest 0.1')	—	ft									
Quality Assurance				Depth to Groundwater (nearest 0.01')	26.0	ft									
pH Meter	Horiba U-52-2	Conductivity Meter	Horiba U-52-2	Length of Water Column		ft									
Serial Number	VWKAUMKJ	Serial Number	VWKAUMKJ	1 Casing Volume (0.163)		ft									
Calibration Constant	4.00	Calibration Constant	4.49 mS/cm	3 Casing Volumes (0.489)		gals									
Calibration Constant	6.86	Calibration Constant	53.0 mS/cm	Total Volume Purged		gals									
Calibration Constant	9.18	Calibration Constant	58.7 mS/cm	Purge Technique Utilized (bailer, pump)											
Last Calibration (time)	1045	Last Verification (time)	1445	Well Yield	Low	<input type="checkbox"/>	Medium	<input type="checkbox"/>	High	<input type="checkbox"/>					
Volume (gal)															
Time (military)															
pH (su)															
Spec Conductivity (mS/cm)															
Water Temperature (°C)															
Turbidity (NTU)															
Dissolved Oxygen (mg/L)															
Well Condition Information				Additional Comments											
-overall condition acceptable?	Yes			Free Product, no sample; Photo taken											
-well cap acceptable?	↓														
-manhole and cover acceptable?	↓														
-well pad acceptable?	↓														
-area safe?	↓														
-other comments				<table border="1"> <tr> <td>DTP</td> <td>DTW</td> <td>Diff</td> <td>Color</td> </tr> <tr> <td>25.87</td> <td>26.00</td> <td>0.13</td> <td>Medium-Dark Amber</td> </tr> </table>				DTP	DTW	Diff	Color	25.87	26.00	0.13	Medium-Dark Amber
DTP	DTW	Diff	Color												
25.87	26.00	0.13	Medium-Dark Amber												

**Groundwater Sampling Log**


<b>TERRY Environmental Services</b> <small>CLIENTS FIRST ALWAYS</small>					P.O. Box 25 Summerville, SC 29484 1-800-325-0605								
					<b>Site Specific Information</b>					<b>Monitoring Well Information</b>			
Terry Project ID		2230.8F			Well ID		12719 - <i>MW-2</i>			TAG BOTTOM OF WELL TO VERIFY WELL DEPTH. WRITE BELOW TO NEAREST 0.1'			
SCDHEC Permit No.		12719			Testing Parameters		BTEX, Naph, MTBE, 1,2-DCA, Oxygenates, & Ethanol						
Project Name		Hot Spot #3005											
Date		12/30/2014											
Field Personnel		<i>BS, AK</i>			Well Diameter		<i>2</i>		in				
General Weather		<i>Cloudy</i>			Screened Interval		<i>26-36</i>				ft		
Ambient Air Temperature		<i>45°</i>			Total Well Depth (nearest 0.1')		<i>36.2</i>		ft				
<b>Quality Assurance</b>					Depth to Groundwater (nearest 0.01')		<i>25.41</i>		ft				
pH Meter		Horiba U-52-2		Conductivity Meter		Horiba U-52-2		Length of Water Column		<i>10.79</i>		ft	
Serial Number		VWKAUMKJ		Serial Number		VWKAUMKJ		1 Casing Volume (0.163)		<i>1.76</i>		ft	
Calibration Constant		4.00		Calibration Constant		4.49 mS/cm		3 Casing Volumes (0.489)		<i>5.28</i>		gals	
Calibration Constant		6.86		Calibration Constant		53.0 mS/cm		Total Volume Purged		<i>6.00</i>		gals	
Calibration Constant		9.18		Calibration Constant		58.7 mS/cm		Purge Technique Utilized ( <i>bailer</i> pump)					
Last Calibration (time)		<i>1045</i>		Last Verification (time)		<i>1445</i>		Well Yield		Low <input type="checkbox"/>		Medium <input type="checkbox"/>	
								High <input checked="" type="checkbox"/>				<i>36.2</i>	
Volume (gal)		<i>Initial</i>		<i>2.00</i>		<i>4.00</i>		<i>6.00</i>		<i>sample</i>			
Time (military)		<i>1450</i>		<i>1454</i>		<i>1500</i>		<i>1504</i>					
pH (su)		<i>5.19</i>		<i>5.25</i>		<i>5.23</i>		<i>5.22</i>					
Spec Conductivity (mS/cm)		<i>0.122</i>		<i>0.122</i>		<i>0.121</i>		<i>0.120</i>					
Water Temperature (°C)		<i>18.9</i>		<i>19.8</i>		<i>19.8</i>		<i>19.3</i>					
Turbidity (NTU)		<i>56.4</i>		<i>99.8</i>		<i>99.6</i>		<i>99.3</i>					
Dissolved Oxygen (mg/L)		<i>5.55</i>		<i>5.36</i>		<i>5.78</i>		<i>5.72</i>					
<b>Well Condition Information</b>					<b>Additional Comments</b>								
-overall condition acceptable?					<i>Yes</i>								
-well cap acceptable?					<i>↓</i>								
-manhole and cover acceptable?					<i>↓</i>								
-well pad acceptable?					<i>↓</i>								
-area safe?					<i>↓</i>								
-other comments													



**Groundwater Sampling Log**

 <b>TERRY Environmental Services</b> <small>CLIENTS FIRST ALWAYS</small>		P.O. Box 25 Summerville, SC 29484 1-800-325-0605						
<b>Site Specific Information</b>				<b>Monitoring Well Information</b>				
Terry Project ID		2230.8F		Well ID		12719 - <i>MW-3R</i>		
SCDHEC Permit No.		12719		Testing Parameters		BTEX, Naph, MTBE, 1,2-DCA, Oxygenates, & Ethanol		
Project Name		Hot Spot #3005						
Date		12/30/2014						
Field Personnel		<i>BS, AK</i>		Well Diameter		<i>2</i>	in	
General Weather		<i>Cloudy</i>		Screened Interval		<i>26-36</i>	ft	
Ambient Air Temperature		<i>45°</i>		Total Well Depth (nearest 0.1')		<i>35.8</i>	ft	
<b>Quality Assurance</b>				Depth to Groundwater (nearest 0.01')		<i>28.56</i>	ft	
pH Meter	Horiba U-52-2	Conductivity Meter	Horiba U-52-2	Length of Water Column		<i>7.24</i>	ft	
	Serial Number		Serial Number	VWKAUMKJ	1 Casing Volume (0.163)		<i>1.18</i>	ft
Calibration Constant	4.00	Calibration Constant	4.49 mS/cm	3 Casing Volumes (0.489)		<i>3.54</i>	gals	
Calibration Constant	6.86	Calibration Constant	53.0 mS/cm	Total Volume Purged		<i>3.75</i>	gals	
Calibration Constant	9.18	Calibration Constant	58.7 mS/cm	Purge Technique Utilized ( <i>bailer, pump</i> )				
Last Calibration (time)	<i>1045</i>	Last Verification (time)	<i>1445</i>	Well Yield		Low <input type="checkbox"/>	Medium <input checked="" type="checkbox"/>	High <input type="checkbox"/>
Volume (gal)		<i>Initial</i>	<i>01.25</i>	<i>2.50</i>	<i>3.75</i>	<i>sample</i>		
Time (military)		<i>1542</i>	<i>1545</i>	<i>1548</i>	<i>1551</i>			
pH (su)		<i>6.00</i>	<i>6.23</i>	<i>6.27</i>	<i>6.27</i>			
Spec Conductivity (mS/cm)		<i>0.402</i>	<i>0.412</i>	<i>0.414</i>	<i>0.416</i>			
Water Temperature (°C)		<i>18.4</i>	<i>18.6</i>	<i>18.6</i>	<i>18.6</i>			
Turbidity (NTU)		<i>212</i>	<i>271</i>	<i>263</i>	<i>256</i>			
Dissolved Oxygen (mg/L)		<i>5.51</i>	<i>7.92</i>	<i>7.38</i>	<i>7.32</i>			
<b>Well Condition Information</b>				<b>Additional Comments</b>				
-overall condition acceptable?				<i>Yes</i>				
-well cap acceptable?								
-manhole and cover acceptable?								
-well pad acceptable?								
-area safe?								
-other comments								

**Groundwater Sampling Log**

 <b>TERRY Environmental Services</b> <small>CLIENTS FIRST ALWAYS</small>				P.O. Box 25 Summerville, SC 29484 1-800-325-0605						
				<b>Site Specific Information</b>				<b>Monitoring Well Information</b>		
Terry Project ID		2230.8F		Well ID		12719 - <i>MW-4</i>		TAG BOTTOM OF WELL TO VERIFY WELL DEPTH, WRITE BELOW TO NEAREST 0.1'		
SCDHEC Permit No.		12719		Testing Parameters		BTEX, Naph, MTBE, 1,2-DCA, Oxygenates, & Ethanol				
Project Name		Hot Spot #3005								
Date		12/30/2014								
Field Personnel		<i>BS, AK</i>		Well Diameter		<i>2</i>	in			
General Weather		<i>Cloudy</i>		Screened Interval		<i>36-46</i>	ft			
Ambient Air Temperature		<i>45</i>		Total Well Depth (nearest 0.1')		<i>45.7</i>	ft			
<b>Quality Assurance</b>				Depth to Groundwater (nearest 0.01')				<i>23.95</i>	ft	
pH Meter Serial Number	Horiba U-52-2		Conductivity Meter Serial Number	Horiba U-52-2		Length of Water Column		<i>21.75</i>	ft	
	VWKAUMKJ			VWKAUMKJ		1 Casing Volume (0.163)		<i>3.55</i>	ft	
Calibration Constant		4.00		Calibration Constant		3 Casing Volumes (0.489)		<i>10.65</i>	gals	
Calibration Constant		6.86		Calibration Constant		Total Volume Purged		<i>11.25</i>	gals	
Calibration Constant		9.18		Calibration Constant		Purge Technique Utilized (batter, pump)				
Last Calibration (time)		<i>1045</i>		Last Verification (time)		Well Yield		Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Volume (gal)	<i>Initial</i>	<i>3.75</i>	<i>7.50</i>	<i>11.25</i>	<i>Sample</i>					
Time (military)	<i>1229</i>	<i>1235</i>	<i>1241</i>	<i>1247</i>						
pH (su)	<i>5.32</i>	<i>6.51</i>	<i>6.50</i>	<i>6.52</i>						
Spec Conductivity (mS/cm)	<i>0.163</i>	<i>0.217</i>	<i>0.215</i>	<i>0.219</i>						
Water Temperature (°C)	<i>17.9</i>	<i>18.8</i>	<i>18.8</i>	<i>18.8</i>						
Turbidity (NTU)	<i>154</i>	<i>115</i>	<i>112</i>	<i>107</i>						
Dissolved Oxygen (mg/L)	<i>5.38</i>	<i>6.14</i>	<i>6.25</i>	<i>6.39</i>						
<b>Well Condition Information</b>						<b>Additional Comments</b>				
-overall condition acceptable?						<i>MW-4 DUP taken @ 1249</i>				
-well cap acceptable?										
-manhole and cover acceptable?										
-well pad acceptable?										
-area safe?										
-other comments										

**Groundwater Sampling Log**



**TERRY Environmental Services**  
CLIENTS FIRST ALWAYS

P.O. Box 25  
Summerville, SC 29484  
1-800-325-0605

Site Specific Information				Monitoring Well Information			
Terry Project ID	2230.8F			Well ID	12719 - MW-5		
SCDHEC Permit No.	12719			Testing Parameters	BTEX, Naph, MTBE, 1,2-DCA, Oxygenates, & Ethanol		
Project Name	Hot Spot #3005						
Date	12/30/2014						
Field Personnel	BS, AK			Well Diameter	2	in	TAG BOTTOM OF WELL TO VERIFY WELL DEPTH, WRITE BELOW TO NEAREST 0.1'
General Weather	cloudy			Screened Interval	22-32	ft	
Ambient Air Temperature	45°			Total Well Depth (nearest 0.1')	32.3	ft	
Quality Assurance				Depth to Groundwater (nearest 0.01')	30.02	ft	
pH Meter	Horiba U-52-2	Conductivity Meter	Horiba U-52-2	Length of Water Column	2.28	ft	
Serial Number	VWKAUMKJ	Serial Number	VWKAUMKJ	1 Casing Volume (0.163)	0.37	ft	
Calibration Constant	4.00	Calibration Constant	4.49 mS/cm	3 Casing Volumes (0.489)	1.11	gals	
Calibration Constant	6.86	Calibration Constant	53.0 mS/cm	Total Volume Purged	1.50	gals	
Calibration Constant	9.18	Calibration Constant	58.7 mS/cm	Purge Technique Utilized (bailer, pump)			
Last Calibration (time)	1045	Last Verification (time)	1445	Well Yield	Low <input checked="" type="checkbox"/>	Medium <input type="checkbox"/>	High <input type="checkbox"/>
Volume (gal)	Initial	0.50	1.00	1.50	sample		32.3
Time (military)	1630	1633	1636	1639			
pH (su)	5.05	5.03	5.04	5.02			
Spec Conductivity (mS/cm)	0.049	0.046	0.047	0.045			
Water Temperature (°C)	18.5	19.8	19.8	19.8			
Turbidity (NTU)	131	88.1	87.9	87.3			
Dissolved Oxygen (mg/L)	3.72	5.79	5.71	5.58			
Well Condition Information				Additional Comments			
-overall condition acceptable?	Yes						
-well cap acceptable?	↓						
-manhole and cover acceptable?	↓						
-well pad acceptable?	↓						
-area safe?	↓						
-other comments							

**Groundwater Sampling Log**



**TERRY Environmental Services**  
CLIENTS FIRST ALWAYS

P.O. Box 25  
Summerville, SC 29484  
1-800-325-0605

Site Specific Information					Monitoring Well Information					
Terry Project ID	2230.8F				Well ID	12719 - MW-6				
SCDHEC Permit No.	12719				Testing Parameters	BTEX, Naph, MTBE, 1,2-DCA, Oxygenates, & Ethanol				
Project Name	Hot Spot #3005									
Date	12/30/2014									
Field Personnel	BS, AK				Well Diameter	2	in	TAG BOTTOM OF WELL TO VERIFY WELL DEPTH, WRITE BELOW TO NEAREST 0.1'		
General Weather	Cloudy				Screened Interval	26-36	ft			
Ambient Air Temperature	45°				Total Well Depth (nearest 0.1')	36.2	ft			
Quality Assurance					Depth to Groundwater (nearest 0.01')	25.92	ft			
pH Meter	Horiba U-52-2	Conductivity Meter	Horiba U-52-2	Length of Water Column	10.28	ft				
Serial Number	VWKAUMKJ	Serial Number	VWKAUMKJ	1 Casing Volume (0.163)	1.68	ft				
Calibration Constant	4.00	Calibration Constant	4.49 mS/cm	3 Casing Volumes (0.489)	5.04	gals				
Calibration Constant	6.86	Calibration Constant	53.0 mS/cm	Total Volume Purged	5.25	gals				
Calibration Constant	9.18	Calibration Constant	58.7 mS/cm	Purge Technique Utilized	(bailey pump)					
Last Calibration (time)	1045	Last Verification (time)	—	Well Yield	Low	<input type="checkbox"/>	Medium	<input type="checkbox"/>	High	<input checked="" type="checkbox"/> 36.2
Volume (gal)	Initial	1.75	3.50	5.25	sample					
Time (military)	1432	1436	1440	1444						
pH (su)	4.55	4.82	4.84	4.85						
Spec Conductivity (mS/cm)	0.234	0.263	0.279	0.284						
Water Temperature (°C)	18.5	19.9	19.9	19.9						
Turbidity (NTU)	57.3	134	124	119						
Dissolved Oxygen (mg/L)	8.01	1.92	1.92	1.70						
Well Condition Information					Additional Comments					
-overall condition acceptable?	Yes									
-well cap acceptable?	↓									
-manhole and cover acceptable?	↓									
-well pad acceptable?	↓									
-area safe?	↓									
-other comments										

**Groundwater Sampling Log**




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Site Specific Information					Monitoring Well Information				
Terry Project ID	2230.8F				Well ID	12719 - MW-7			
SCDHEC Permit No.	12719				Testing Parameters	BTEX, Naph, MTBE, 1,2-DCA, Oxygenates, & Ethanol			
Project Name	Hot Spot #3005								
Date	12/30/2014								
Field Personnel	BS, AK				Well Diameter	2	in	TAG BOTTOM OF WELL TO VERIFY WELL DEPTH, WRITE BELOW TO NEAREST 0.1'	
General Weather	Cloudy				Screened Interval	26-36	ft		
Ambient Air Temperature	45				Total Well Depth (nearest 0.1')	36.3	ft		
Quality Assurance					Depth to Groundwater (nearest 0.01')	23.89	ft		
pH Meter	Horiba U-52-2	Conductivity Meter	Horiba U-52-2		Length of Water Column	12.41	ft		
Serial Number	VWKAUMKJ	Serial Number	VWKAUMKJ		1 Casing Volume (0.163)	2.02	ft		
Calibration Constant	4.00	Calibration Constant	4.49 mS/cm		3 Casing Volumes (0.489)	6.06	gals		
Calibration Constant	6.86	Calibration Constant	53.0 mS/cm		Total Volume Purged	6.75	gals		
Calibration Constant	9.18	Calibration Constant	58.7 mS/cm		Purge Technique Utilized (bailer, pump)				
Last Calibration (time)	1045	Last Verification (time)	---		Well Yield	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Volume (gal)	Initial	2.25	4.50	6.75	sample			36.3	
Time (military)	1340	1343	1346	1349					
pH (su)	5.24	4.79	4.76	4.74					
Spec Conductivity (mS/cm)	0.059	0.066	0.065	0.066					
Water Temperature (°C)	18.8	17.2	17.2	17.2					
Turbidity (NTU)	91.2	81.1	80.3	80.4					
Dissolved Oxygen (mg/L)	5.64	6.21	6.13	6.08					
Well Condition Information					Additional Comments				
-overall condition acceptable?	Yes								
-well cap acceptable?	↓								
-manhole and cover acceptable?	↓								
-well pad acceptable?	↓								
-area safe?	↓								
-other comments									

**Groundwater Sampling Log**

 <b>TERRY Environmental Services</b> <small>CLIENTS FIRST ALWAYS</small>				P.O. Box 25 Summerville, SC 29484 1-800-325-0605					
				<b>Site Specific Information</b>				<b>Monitoring Well Information</b>	
Terry Project ID		2230.8F		Well ID		12719 - <i>MW-8</i>			
SCDHEC Permit No.		12719		Testing Parameters		BTEX, Naph, MTBE, 1,2-DCA, Oxygenates, & Ethanol			
Project Name		Hot Spot #3005							
Date		12/30/2014							
Field Personnel		<i>BS, AK</i>		Well Diameter		<i>2</i>	in	TAG BOTTOM OF WELL TO VERIFY WELL DEPTH, WRITE BELOW TO NEAREST 0.1'	
General Weather		<i>Cloudy</i>		Screened Interval		<i>Unknown</i>	ft		
Ambient Air Temperature		<i>45°</i>		Total Well Depth (nearest 0.1')		<i>33.3</i>	ft		
<b>Quality Assurance</b>				Depth to Groundwater (nearest 0.01')		<i>21.53</i>	ft		
pH Meter		Horiba U-52-2		Conductivity Meter		Horiba U-52-2			
Serial Number		VWKAUMKJ		Serial Number		VWKAUMKJ		1 Casing Volume (0.163)	
Calibration Constant		4.00		Calibration Constant		4.49 mS/cm		3 Casing Volumes (0.489)	
Calibration Constant		6.86		Calibration Constant		53.0 mS/cm		Total Volume Purged	
Calibration Constant		9.18		Calibration Constant		58.7 mS/cm		Purge Technique Utilized (batter, pump)	
Last Calibration (time)		<i>1045</i>		Last Verification (time)		—		Well Yield    Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input checked="" type="checkbox"/>	
Volume (gal)		<i>Initial</i>	<i>2.00</i>	<i>4.00</i>	<i>6.00</i>	<i>Sample</i>			<i>33.3</i>
Time (military)		<i>1209</i>	<i>1213</i>	<i>1217</i>	<i>1221</i>				
pH (su)		<i>4.27</i>	<i>4.23</i>	<i>4.21</i>	<i>4.20</i>				
Spec Conductivity (mS/cm)		<i>0.008</i>	<i>0.006</i>	<i>0.007</i>	<i>0.007</i>				
Water Temperature (°C)		<i>18.0</i>	<i>18.9</i>	<i>18.9</i>	<i>18.9</i>				
Turbidity (NTU)		<i>103</i>	<i>179</i>	<i>174</i>	<i>172</i>				
Dissolved Oxygen (mg/L)		<i>7.16</i>	<i>7.08</i>	<i>7.01</i>	<i>6.92</i>				
<b>Well Condition Information</b>						<b>Additional Comments</b>			
-overall condition acceptable?									
-well cap acceptable?									
-manhole and cover acceptable?									
-well pad acceptable?									
-area safe?									
-other comments									

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<b>TERRY Environmental Services</b> <small>CLIENTS FIRST ALWAYS</small>				P.O. Box 25 Summerville, SC 29484 1-800-325-0605							
				<b>Site Specific Information</b>				<b>Monitoring Well Information</b>			
Terry Project ID		2230.8F		Well ID		12719 - <i>NW-9</i>		TAG BOTTOM OF WELL TO VERIFY WELL DEPTH, WRITE BELOW TO NEAREST 0.1'			
SCDHEC Permit No.		12719		Testing Parameters		BTEX, Naph, MTBE, 1,2-DCA, Oxygenates, & Ethanol					
Project Name		Hot Spot #3005									
Date		12/30/2014									
Field Personnel		<i>BS, AK</i>		Well Diameter		<i>2</i> in					
General Weather		<i>Cloudy</i>		Screened Interval		<i>Unknown</i> ft					
Ambient Air Temperature		<i>45°</i>		Total Well Depth (nearest 0.1')		<i>35.2</i> ft					
<b>Quality Assurance</b>				Depth to Groundwater (nearest 0.01')		<i>24.02</i> ft		TAG BOTTOM OF WELL TO VERIFY WELL DEPTH, WRITE BELOW TO NEAREST 0.1'			
pH Meter		Horiba U-52-2		Conductivity Meter		Horiba U-52-2				Length of Water Column	
Serial Number		VWKAUMKJ		Serial Number		VWKAUMKJ				1 Casing Volume (0.163)	
Calibration Constant		4.00		Calibration Constant		4.49 mS/cm				3 Casing Volumes (0.489)	
Calibration Constant		6.86		Calibration Constant		53.0 mS/cm				Total Volume Purged	
Calibration Constant		9.18		Calibration Constant		58.7 mS/cm				Purge Technique Utilized ( <i>Bailer</i> , pump)	
Last Calibration (time)		<i>1045</i>		Last Verification (time)						Well Yield	
										Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input checked="" type="checkbox"/>	
Volume (gal)		<i>Initial</i>		<i>2.00</i>		<i>4.00</i>				<i>6.00</i>	
Time (military)		<i>1320</i>		<i>1323</i>		<i>1326</i>				<i>1329</i>	
pH (su)		<i>5.26</i>		<i>4.78</i>		<i>4.73</i>		<i>4.67</i>			
Spec Conductivity (mS/cm)		<i>0.047</i>		<i>0.045</i>		<i>0.045</i>		<i>0.044</i>			
Water Temperature (°C)		<i>17.8</i>		<i>19.3</i>		<i>19.3</i>		<i>19.3</i>			
Turbidity (NTU)		<i>104</i>		<i>116</i>		<i>112</i>		<i>107</i>			
Dissolved Oxygen (mg/L)		<i>4.39</i>		<i>1.14</i>		<i>1.08</i>		<i>1.01</i>			
<b>Well Condition Information</b>				<b>Additional Comments</b>							
-overall condition acceptable?				<i>Yes</i>							
-well cap acceptable?											
-manhole and cover acceptable?											
-well pad acceptable?											
-area safe?											
-other comments											

**Groundwater Sampling Log**



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Site Specific Information				Monitoring Well Information			
Terry Project ID	2230.8F			Well ID	12719 - MW-10R		
SCDHEC Permit No.	12719			Testing Parameters	BTEX, Naph, MTBE, 1,2-DCA, Oxygenates, & Ethanol		
Project Name	Hot Spot #3005						
Date	12/30/2014						
Field Personnel	BS, AK			Well Diameter	2	in	TAG BOTTOM OF WELL TO VERIFY WELL DEPTH, WRITE BELOW TO NEAREST 0.1'
General Weather	Cloudy			Screened Interval	22-32	ft	
Ambient Air Temperature	45°			Total Well Depth (nearest 0.1')	32.1	ft	
Quality Assurance				Depth to Groundwater (nearest 0.01')	21.13	ft	
pH Meter	Horiba U-52-2	Conductivity Meter	Horiba U-52-2	Length of Water Column	10.97	ft	
Serial Number	VWKAUMKJ	Serial Number	VWKAUMKJ	1 Casing Volume (0.163)	1.79	ft	
Calibration Constant	4.00	Calibration Constant	4.49 mS/cm	3 Casing Volumes (0.489)	5.37	gals	
Calibration Constant	6.86	Calibration Constant	53.0 mS/cm	Total Volume Purged	6.00	gals	
Calibration Constant	9.18	Calibration Constant	58.7 mS/cm	Purge Technique Utilized (bailer, pump)			
Last Calibration (time)	1045	Last Verification (time)	—	Well Yield	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/> 32.1
Volume (gal)	Initial	2.00	4.00	6.00	sample		
Time (military)	1128	1131	1134	1137			
pH (su)	4.07	3.99	3.99	3.98			
Spec Conductivity (mS/cm)	0.053	0.058	0.058	0.059			
Water Temperature (°C)	19.0	19.6	19.6	19.6			
Turbidity (NTU)	36.4	159	155	151			
Dissolved Oxygen (mg/L)	5.74	6.32	6.24	6.01			
Well Condition Information				Additional Comments			
-overall condition acceptable?	Yes						
-well cap acceptable?	↓						
-manhole and cover acceptable?	↓						
-well pad acceptable?	↓						
-area safe?	↓						
-other comments							



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Site Specific Information				Monitoring Well Information			
Terry Project ID	2230.8F			Well ID	12719 - MW-11R		
SCDHEC Permit No.	12719			Testing Parameters	BTEX, Naph, MTBE, 1,2-DCA, Oxygenates, & Ethanol		
Project Name	Hot Spot #3005						
Date	12/30/2014						
Field Personnel	BS, AK			Well Diameter	2	in	TAG BOTTOM OF WELL TO VERIFY WELL DEPTH. WRITE BELOW TO NEAREST 0.1'
General Weather	Cloudy			Screened Interval	22-32	ft	
Ambient Air Temperature	45°			Total Well Depth (nearest 0.1')	28.2	ft	
Quality Assurance				Depth to Groundwater (nearest 0.01')	21.91	ft	
pH Meter	Horiba U-52-2	Conductivity Meter	Horiba U-52-2	Length of Water Column	6.29	ft	
Serial Number	VWKAUMKJ	Serial Number	VWKAUMKJ	1 Casing Volume (0.163)	1.03	ft	
Calibration Constant	4.00	Calibration Constant	4.49 mS/cm	3 Casing Volumes (0.489)	3.09	gals	
Calibration Constant	6.86	Calibration Constant	53.0 mS/cm	Total Volume Purged	3.75	gals	
Calibration Constant	9.18	Calibration Constant	58.7 mS/cm	Purge Technique Utilized (bailer, pump)			
Last Calibration (time)	1045	Last Verification (time)		Well Yield	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Volume (gal)	Initial	1.25	2.50	3.75	Sample		
Time (military)	1107	1111	1115	1119			
pH (su)	4.12	4.07	4.04	4.01			
Spec Conductivity (mS/cm)	0.023	0.036	0.035	0.038			
Water Temperature (°C)	18.7	19.2	19.2	19.2			
Turbidity (NTU)	55.6	173	171	184			
Dissolved Oxygen (mg/L)	5.79	7.11	6.86	6.21			
Well Condition Information				Additional Comments			
-overall condition acceptable?	Yes						
-well cap acceptable?	↓						
-manhole and cover acceptable?	↓						
-well pad acceptable?	↓						
-area safe?	↓						
-other comments							

**Groundwater Sampling Log**



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Site Specific Information					Monitoring Well Information				
Terry Project ID	2230.8F				Well ID	12719 - MW-12			
SCDHEC Permit No.	12719				Testing Parameters	BTEX, Naph, MTBE, 1,2-DCA, Oxygenates, & Ethanol			
Project Name	Hot Spot #3005								
Date	12/30/2014								
Field Personnel	BS, AK				Well Diameter	2	in	TAG BOTTOM OF WELL TO VERIFY WELL DEPTH, WRITE BELOW TO NEAREST 0.1'	
General Weather	Cloudy				Screened Interval	20-30	ft		
Ambient Air Temperature	50°				Total Well Depth (nearest 0.1')	31.4	ft		
Quality Assurance					Depth to Groundwater (nearest 0.01')	21.37	ft		
pH Meter	Horiba U-52-2	Conductivity Meter	Horiba U-52-2	Length of Water Column	10.03	ft			
Serial Number	VWKAUMKJ	Serial Number	VWKAUMKJ	1 Casing Volume (0.163)	1.63	ft			
Calibration Constant	4.00	Calibration Constant	4.49 mS/cm	3 Casing Volumes (0.489)	4.89	gals			
Calibration Constant	6.86	Calibration Constant	53.0 mS/cm	Total Volume Purged	5.25	gals			
Calibration Constant	9.18	Calibration Constant	58.7 mS/cm	Purge Technique Utilized (bailer, pump)					
Last Calibration (time)	1045	Last Verification (time)		Well Yield	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>		
Volume (gal)	Initial	1.75	3.50	5.25	Sample			31.4	
Time (military)	1050	1053	1056	1059					
pH (su)	4.12	4.60	4.59	4.63					
Spec Conductivity (mS/cm)	0.236	0.121	0.121	0.120					
Water Temperature (°C)	17.8	17.9	17.9	17.9					
Turbidity (NTU)	31.4	181	177	173					
Dissolved Oxygen (mg/L)	6.27	5.12	3.56	3.37					
Well Condition Information					Additional Comments				
-overall condition acceptable?	Yes								
-well cap acceptable?	↓								
-manhole and cover acceptable?	↓								
-well pad acceptable?	↓								
-area safe?	↓								
-other comments									

**Groundwater Sampling Log**




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Site Specific Information				Monitoring Well Information			
Terry Project ID	2230.8F			Well ID	12719 - MW-13		
SCDHEC Permit No.	12719			Testing Parameters	BTEX, Naph, MTBE, 1,2-DCA, Oxygenates, & Ethanol		
Project Name	Hot Spot #3005						
Date	12/30/2014						
Field Personnel	BS, AK			Well Diameter	2	in	TAG BOTTOM OF WELL TO VERIFY WELL DEPTH, WRITE BELOW TO NEAREST 0.1'
General Weather	Cloudy			Screened Interval	17-27	ft	
Ambient Air Temperature	43°			Total Well Depth (nearest 0.1')	27.0	ft	
Quality Assurance				Depth to Groundwater (nearest 0.01')	22.08	ft	
pH Meter	Horiba U-52-2	Conductivity Meter	Horiba U-52-2	Length of Water Column	4.92	ft	
Serial Number	VWKAUMKJ	Serial Number	VWKAUMKJ	1 Casing Volume (0.163)	0.80	ft	
Calibration Constant	4.00	Calibration Constant	4.49 mS/cm	3 Casing Volumes (0.489)	2.40	gals	
Calibration Constant	6.86	Calibration Constant	53.0 mS/cm	Total Volume Purged	3.00	gals	
Calibration Constant	9.18	Calibration Constant	58.7 mS/cm	Purge Technique Utilized (bailer, pump)			
Last Calibration (time)	1045	Last Verification (time)		Well Yield	Low <input type="checkbox"/>	Medium <input checked="" type="checkbox"/>	High <input type="checkbox"/>
Volume (gal)	Initial	1.00	2.00	3.00	sample		27.0
Time (military)	1255	1258	1301	1304			
pH (su)	5.10	5.85	5.85	5.87			
Spec Conductivity (mS/cm)	0.106	0.122	0.121	0.123			
Water Temperature (°C)	18.8	19.2	19.2	19.2			
Turbidity (NTU)	212	124	121	117			
Dissolved Oxygen (mg/L)	4.62	4.48	4.23	4.12			
Well Condition Information				Additional Comments			
-overall condition acceptable?	Yes						
-well cap acceptable?	↓						
-manhole and cover acceptable?	↓						
-well pad acceptable?	↓						
-area safe?	↓						
-other comments							

**Groundwater Sampling Log**

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				<b>Site Specific Information</b>				<b>Monitoring Well Information</b>	
Terry Project ID		2230.8F		Well ID		12719 - <i>MW-14</i>			
SCDHEC Permit No.		12719		Testing Parameters		BTEX, Naph, MTBE, 1,2-DCA, Oxygenates, & Ethanol			
Project Name		Hot Spot #3005							
Date		12/30/2014							
Field Personnel		<i>BS, AK</i>		Well Diameter		<i>2</i>		in	
General Weather		<i>Cloudy</i>		Screened Interval		<i>21-31</i>		ft	
Ambient Air Temperature		<i>45°</i>		Total Well Depth (nearest 0.1')		<i>25.79</i>		ft	
<b>Quality Assurance</b>				Depth to Groundwater (nearest 0.01')		<i>30.60</i>		ft	
pH Meter Serial Number	Horiba U-52-2	Conductivity Meter Serial Number	Horiba U-52-2	Length of Water Column		<i>4.81</i>		ft	
	VWKAUMKJ		VWKAUMKJ	1 Casing Volume (0.163)		<i>0.78</i>		ft	
Calibration Constant	4.00	Calibration Constant	4.49 mS/cm	3 Casing Volumes (0.489)		<i>2.34</i>		gals	
Calibration Constant	6.86	Calibration Constant	53.0 mS/cm	Total Volume Purged		<i>3.00</i>		gals	
Calibration Constant	9.18	Calibration Constant	58.7 mS/cm	Purge Technique Utilized ( <i>baller, pump</i> )					
Last Calibration (time)	<i>1045</i>	Last Verification (time)	<i>1445</i>	Well Yield		Low	<input type="checkbox"/>	Medium	<input type="checkbox"/>
						High	<input checked="" type="checkbox"/>	<i>30.6</i>	
Volume (gal)	<i>Initial</i>	<i>1.00</i>	<i>2.00</i>	<i>3.00</i>	<i>sample</i>				
Time (military)	<i>1606</i>	<i>1609</i>	<i>1612</i>	<i>1615</i>					
pH (su)	<i>5.02</i>	<i>5.42</i>	<i>5.43</i>	<i>5.46</i>					
Spec Conductivity (mS/cm)	<i>0.101</i>	<i>0.078</i>	<i>0.078</i>	<i>0.077</i>					
Water Temperature (°C)	<i>18.0</i>	<i>18.4</i>	<i>18.4</i>	<i>18.4</i>					
Turbidity (NTU)	<i>143</i>	<i>220</i>	<i>217</i>	<i>212</i>					
Dissolved Oxygen (mg/L)	<i>5.29</i>	<i>3.46</i>	<i>3.33</i>	<i>3.21</i>					
<b>Well Condition Information</b>				<b>Additional Comments</b>					
-overall condition acceptable?				<i>yes</i>					
-well cap acceptable?				↓					
-manhole and cover acceptable?									
-well pad acceptable?									
-area safe?									
-other comments									

**Groundwater Sampling Log**

<b>TERRY Environmental Services</b> <small>CLIENTS FIRST ALWAYS</small>				P.O. Box 25 Summerville, SC 29484 1-800-325-0605					
				<b>Site Specific Information</b>				<b>Monitoring Well Information</b>	
Terry Project ID		2230.8F		Well ID		12719 - <i>MW-1D</i>		TAG BOTTOM OF WELL TO VERIFY WELL DEPTH, WRITE BELOW TO NEAREST 0.1'	
SCDHEC Permit No.		12719		Testing Parameters		BTEX, Naph, MTBE, 1,2-DCA, Oxygenates, & Ethanol			
Project Name		Hot Spot #3005							
Date		12/30/2014							
Field Personnel		<i>BS, AK</i>		Well Diameter		<i>2</i>	in		
General Weather		<i>Clear</i>		Screened Interval		<i>55-60'</i>	ft		
Ambient Air Temperature		<i>45°</i>		Total Well Depth (nearest 0.1')		<i>58.6</i>	ft		
<b>Quality Assurance</b>				Depth to Groundwater (nearest 0.01')		<i>26.82</i>	ft		
pH Meter	Horiba U-52-2	Conductivity Meter	Horiba U-52-2	Length of Water Column		<i>31.78</i>	ft		
Serial Number	VWKAUMKJ	Serial Number	VWKAUMKJ	1 Casing Volume (0.163)		<i>5.18</i>	ft		
Calibration Constant	4.00	Calibration Constant	4.49 mS/cm	3 Casing Volumes (0.489)		<i>15.54</i>	gals		
Calibration Constant	6.86	Calibration Constant	53.0 mS/cm	Total Volume Purged		<i>15.75</i>	gals		
Calibration Constant	9.18	Calibration Constant	58.7 mS/cm	Purge Technique Utilized ( <i>bailer, pump</i> )					
Last Calibration (time)	<i>1045</i>	Last Verification (time)	<i>1445</i>	Well Yield		Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Volume (gal)	<i>Initial</i>	<i>5.25</i>	<i>10.50</i>	<i>16.75</i>	<i>Sample</i>			<i>58.6</i>	
Time (military)	<i>1512</i>	<i>1520</i>	<i>1528</i>	<i>1536</i>					
pH (su)	<i>6.08</i>	<i>6.10</i>	<i>6.10</i>	<i>6.11</i>					
Spec Conductivity (mS/cm)	<i>0.036</i>	<i>0.081</i>	<i>0.082</i>	<i>0.084</i>					
Water Temperature (°C)	<i>19.2</i>	<i>19.2</i>	<i>19.2</i>	<i>19.2</i>					
Turbidity (NTU)	<i>73.1</i>	<i>83.0</i>	<i>82.6</i>	<i>82.3</i>					
Dissolved Oxygen (mg/L)	<i>6.42</i>	<i>2.61</i>	<i>2.56</i>	<i>2.49</i>					
<b>Well Condition Information</b>				<b>Additional Comments</b>					
-overall condition acceptable?				<i>Yes</i>					
-well cap acceptable?				↓					
-manhole and cover acceptable?				↓					
-well pad acceptable?				↓					
-area safe?				↓					
-other comments									



**HORIBA U-52-2 DAILY CALIBRATION DATA SHEET**

Serial Number: VWKAUMKJ    Date/Time: 12/30/14 1045    Inspector: BS

Solution Manufacturer: <u>Aurical</u>	Lot Number: <u>4AH949</u>	Expiration Date: <u>08/2015</u>
<u>Solution Value</u>	<u>Instrument Reading</u>	<u>Accuracy</u>
pH: 4.00	<u>3.98</u>	± <u>0.02</u>
Conductivity: 4.49 mS/cm	<u>4.48</u> mS/cm	± <u>0.01</u> mS/cm
Turbidity: 0.0 NTU	<u>0.0</u> NTU	± <u>0.0</u> NTU

	<u>Standard Reading</u>	<u>Instrument Reading</u>	<u>Accuracy</u>
NIST-Traceable Thermometer:	<u>14.4</u> °C	<u>14.6</u> °C	± <u>0.2</u> °C

**QAPP Acceptance Criteria**

<u>Field Parameter</u>	<u>Accuracy</u>
Temperature	±1°C against an NIST-traceable thermometer
Specific Conductance	10% of each standard used
pH	±0.2 pH units of stated buffer value
Turbidity	10% of each standard used

**Inspector's Maintenance Notes**

HS #3005    2230.8F

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**HORIBA U-52-2 DAILY VERIFICATION DATA SHEET**

Serial Number: VWKAUMKJ Date/Time: 12/30/14 1445 Inspector: BS

Solution Manufacturer: Aurical Lot Number: 444949 Expiration Date: 08/2015

<u>Solution Value</u>	<u>Instrument Reading</u>	<u>Accuracy</u>
pH: 4.00	<u>3.99</u>	± 0.01
Conductivity: 4.49 mS/cm	<u>4.47</u> mS/cm	± 0.02 mS/cm
Turbidity: 0.0 NTU	<u>0.1</u> NTU	± 0.1 NTU

	<u>Standard Reading</u>	<u>Instrument Reading</u>	<u>Accuracy</u>
NIST-Traceable Thermometer:	<u>15.2</u> °C	<u>15.3</u> °C	± 0.1 °C

**QAPP Acceptance Criteria**

<u>Field Parameter</u>	<u>Accuracy</u>
Temperature	±1°C against an NIST-traceable thermometer
Specific Conductance	10% of each standard used
pH	±0.2 pH units of stated buffer value
Turbidity	10% of each standard used

**Inspector's Maintenance Notes**

HS #3005 2230.8F

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**HORIBA U-52-2 DAILY VERIFICATION DATA SHEET**

Serial Number: VWKAUMKJ Date/Time: 12/30/14 1730 Inspector: BS

Solution Manufacturer: Aurical Lot Number: 4AH949 Expiration Date: 08/2015

<u>Solution Value</u>	<u>Instrument Reading</u>	<u>Accuracy</u>
pH: 4.00	<u>3.99</u>	± <u>0.01</u>
Conductivity: 4.49 mS/cm	<u>4.48</u> mS/cm	± <u>0.01</u> mS/cm
Turbidity: 0.0 NTU	<u>0.0</u> NTU	± <u>0.0</u> NTU

	<u>Standard Reading</u>	<u>Instrument Reading</u>	<u>Accuracy</u>
NIST-Traceable Thermometer:	<u>15.0</u> °C	<u>15.1</u> °C	± <u>0.1</u> °C

**QAPP Acceptance Criteria**

<u>Field Parameter</u>	<u>Accuracy</u>
Temperature	±1°C against an NIST-traceable thermometer
Specific Conductance	10% of each standard used
pH	±0.2 pH units of stated buffer value
Turbidity	10% of each standard used

**Inspector's Maintenance Notes**

HS #3005 2230.8F

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**Report of Analysis**

**Terry Environmental Services, Inc.**

1753 North Main Street  
Summerville, SC 29483  
Attention: Kelly Cone

Project Name: **Hot Spot #3005**

Project Number: **2230.8F**

Lot Number: **QA03003**

Date Completed: **01/08/2015**



**Kelly M. Nance**  
Project Manager



This report shall not be reproduced, except in its entirety, without the written approval of Shealy Environmental Services, Inc.

The following non-paginated documents are considered part of this report: Chain of Custody Record and Sample Receipt Checklist.

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# SHEALY ENVIRONMENTAL SERVICES, INC.

SC DHEC No: 32010

NELAC No: E87653

NC DENR No: 329

NC Field Parameters No: 5639

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## Case Narrative

### Terry Environmental Services, Inc.

#### Lot Number: QA03003

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This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved NELAC standards, the Shealy Environmental Services, Inc. ("Shealy") Quality Assurance Management Plan (QAMP), standard operating procedures (SOPs), and Shealy policies. Any exceptions to the NELAC standards, the QAMP, SOPs or policies are qualified on the results page or discussed below.

If you have any questions regarding this report please contact the Shealy Project Manager listed on the cover page.

#### GC/MS Volatiles

The MS/MSD associated with sample -004 had tert-butyl formate and ethanol recovered outside of the acceptance limits. The LCS was recovered within the required acceptance limits; therefore, this demonstrates a matrix effect and data quality is not impacted.

# SHEALY ENVIRONMENTAL SERVICES, INC.

## Sample Summary Terry Environmental Services, Inc. Lot Number: QA03003

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	12719-MW-2	Aqueous	12/30/2014 1504	01/03/2015
002	12719-MW-3R	Aqueous	12/30/2014 1551	01/03/2015
003	12719-MW-4	Aqueous	12/30/2014 1247	01/03/2015
004	12719-MW-5	Aqueous	12/30/2014 1639	01/03/2015
005	12719-MW-6	Aqueous	12/30/2014 1444	01/03/2015
006	12719-MW-7	Aqueous	12/30/2014 1349	01/03/2015
007	12719-MW-8	Aqueous	12/30/2014 1221	01/03/2015
008	12719-MW-9	Aqueous	12/30/2014 1329	01/03/2015
009	12719-MW-10R	Aqueous	12/30/2014 1137	01/03/2015
010	12719-MW-11R	Aqueous	12/30/2014 1119	01/03/2015
011	12719-MW-12	Aqueous	12/30/2014 1059	01/03/2015
012	12719-MW-13	Aqueous	12/30/2014 1304	01/03/2015
013	12719-MW-14	Aqueous	12/30/2014 1615	01/03/2015
014	12719-MW-1D	Aqueous	12/30/2014 1536	01/03/2015
015	12719-FB-1	Aqueous	12/30/2014 1035	01/03/2015
016	12719-MW-4 DUP	Aqueous	12/30/2014 1249	01/03/2015
017	12719-TB	Aqueous	12/30/2014	01/03/2015

(17 samples)

# SHEALY ENVIRONMENTAL SERVICES, INC.

## Executive Summary Terry Environmental Services, Inc. Lot Number: QA03003

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	12719-MW-2	Aqueous	tert-Amyl methyl ether (TAME)	8260B	0.25	J	ug/L	5
001	12719-MW-2	Aqueous	Benzene	8260B	100		ug/L	5
001	12719-MW-2	Aqueous	Ethylbenzene	8260B	98		ug/L	5
001	12719-MW-2	Aqueous	Naphthalene	8260B	120		ug/L	5
001	12719-MW-2	Aqueous	Toluene	8260B	4.6		ug/L	5
001	12719-MW-2	Aqueous	Xylenes (total)	8260B	380		ug/L	5
002	12719-MW-3R	Aqueous	tert-Amyl alcohol (TAA)	8260B	2500		ug/L	6
002	12719-MW-3R	Aqueous	tert-Amyl methyl ether (TAME)	8260B	5.3	J	ug/L	6
002	12719-MW-3R	Aqueous	Benzene	8260B	1300		ug/L	6
002	12719-MW-3R	Aqueous	Diisopropyl ether (IPE)	8260B	30		ug/L	6
002	12719-MW-3R	Aqueous	Ethylbenzene	8260B	77		ug/L	6
002	12719-MW-3R	Aqueous	Methyl tertiary butyl ether (MTBE)	8260B	85		ug/L	6
002	12719-MW-3R	Aqueous	Naphthalene	8260B	14	J	ug/L	6
002	12719-MW-3R	Aqueous	tert-butyl alcohol (TBA)	8260B	250	J	ug/L	6
002	12719-MW-3R	Aqueous	Toluene	8260B	38		ug/L	6
002	12719-MW-3R	Aqueous	Xylenes (total)	8260B	530		ug/L	6
004	12719-MW-5	Aqueous	tert-Amyl alcohol (TAA)	8260B	130	J	ug/L	8
004	12719-MW-5	Aqueous	Benzene	8260B	680		ug/L	8
004	12719-MW-5	Aqueous	Ethylbenzene	8260B	72		ug/L	8
004	12719-MW-5	Aqueous	Toluene	8260B	910		ug/L	8
004	12719-MW-5	Aqueous	Xylenes (total)	8260B	360		ug/L	8
005	12719-MW-6	Aqueous	tert-Amyl methyl ether (TAME)	8260B	0.34	J	ug/L	9
005	12719-MW-6	Aqueous	Benzene	8260B	2.2		ug/L	9
005	12719-MW-6	Aqueous	Diisopropyl ether (IPE)	8260B	1.1		ug/L	9
005	12719-MW-6	Aqueous	Naphthalene	8260B	9.2		ug/L	9
005	12719-MW-6	Aqueous	tert-butyl alcohol (TBA)	8260B	12	J	ug/L	9
005	12719-MW-6	Aqueous	Xylenes (total)	8260B	13		ug/L	9

(27 detections)

Description: 12719-MW-2

Matrix: Aqueous

Date Sampled: 12/30/2014 1504

Date Received: 01/03/2015

## Volatile Organic Compounds by GC/MS

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch		
1	5030B	8260B	1	01/06/2015 1700	EH1		64673		
Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run	
tert-Amyl alcohol (TAA)	75-85-4	8260B	ND		20	6.7	ug/L	1	
tert-Amyl methyl ether (TAME)	994-05-8	8260B	0.25	J	10	0.20	ug/L	1	
Benzene	71-43-2	8260B	100		1.0	0.13	ug/L	1	
tert-Butyl formate (TBF)	762-75-4	8260B	ND		5.0	1.0	ug/L	1	
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1	
Diisopropyl ether (IPE)	108-20-3	8260B	ND		1.0	0.40	ug/L	1	
3,3-Dimethyl-1-butanol	624-95-3	8260B	ND		20	1.0	ug/L	1	
Ethanol	64-17-5	8260B	ND		100	33	ug/L	1	
Ethylbenzene	100-41-4	8260B	98		1.0	0.33	ug/L	1	
Ethyl-tert-butyl ether (ETBE)	637-92-3	8260B	ND		1.0	0.20	ug/L	1	
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1	
Naphthalene	91-20-3	8260B	120		1.0	0.40	ug/L	1	
tert-butyl alcohol (TBA)	75-65-0	8260B	ND		20	6.7	ug/L	1	
Toluene	108-88-3	8260B	4.6		1.0	0.33	ug/L	1	
Xylenes (total)	1330-20-7	8260B	380		1.0	0.33	ug/L	1	
Surrogate	Q	Run 1 % Recovery	Acceptance Limits						
1,2-Dichloroethane-d4		80	70-130						
Bromofluorobenzene		96	70-130						
Toluene-d8		84	70-130						

PQL = Practical quantitation limit

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

ND = Not detected at or above the MDL

J = Estimated result &lt; PQL and ≥ MDL

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Description: 12719-MW-3R

Matrix: Aqueous

Date Sampled: 12/30/2014 1551

Date Received: 01/03/2015

## Volatile Organic Compounds by GC/MS

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch		
1	5030B	8260B	20	01/06/2015 1615	EH1		64673		
Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run	
tert-Amyl alcohol (TAA)	75-85-4	8260B	2500		400	130	ug/L	1	
tert-Amyl methyl ether (TAME)	994-05-8	8260B	5.3	J	200	4.0	ug/L	1	
Benzene	71-43-2	8260B	1300		20	2.6	ug/L	1	
tert-Butyl formate (TBF)	762-75-4	8260B	ND		100	20	ug/L	1	
1,2-Dichloroethane	107-06-2	8260B	ND		20	2.9	ug/L	1	
Diisopropyl ether (IPE)	108-20-3	8260B	30		20	8.0	ug/L	1	
3,3-Dimethyl-1-butanol	624-95-3	8260B	ND		400	20	ug/L	1	
Ethanol	64-17-5	8260B	ND		2000	660	ug/L	1	
Ethylbenzene	100-41-4	8260B	77		20	6.6	ug/L	1	
Ethyl-tert-butyl ether (ETBE)	637-92-3	8260B	ND		20	4.0	ug/L	1	
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	85		20	8.0	ug/L	1	
Naphthalene	91-20-3	8260B	14	J	20	8.0	ug/L	1	
tert-butyl alcohol (TBA)	75-65-0	8260B	250	J	400	130	ug/L	1	
Toluene	108-88-3	8260B	38		20	6.6	ug/L	1	
Xylenes (total)	1330-20-7	8260B	530		20	6.6	ug/L	1	
Surrogate	Q	Run 1 % Recovery	Acceptance Limits						
1,2-Dichloroethane-d4		77	70-130						
Bromofluorobenzene		99	70-130						
Toluene-d8		85	70-130						

PQL = Practical quantitation limit

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

ND = Not detected at or above the MDL

J = Estimated result &lt; PQL and ≥ MDL

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Description: 12719-MW-4

Matrix: Aqueous

Date Sampled: 12/30/2014 1247

Date Received: 01/03/2015

## Volatile Organic Compounds by GC/MS

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch				
1	5030B	8260B	1	01/06/2015 1530	EH1		64673				
Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run			
tert-Amyl alcohol (TAA)	75-85-4	8260B	ND		20	6.7	ug/L	1			
tert-Amyl methyl ether (TAME)	994-05-8	8260B	ND		10	0.20	ug/L	1			
Benzene	71-43-2	8260B	ND		1.0	0.13	ug/L	1			
tert-Butyl formate (TBF)	762-75-4	8260B	ND		5.0	1.0	ug/L	1			
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1			
Diisopropyl ether (IPE)	108-20-3	8260B	ND		1.0	0.40	ug/L	1			
3,3-Dimethyl-1-butanol	624-95-3	8260B	ND		20	1.0	ug/L	1			
Ethanol	64-17-5	8260B	ND		100	33	ug/L	1			
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1			
Ethyl-tert-butyl ether (ETBE)	637-92-3	8260B	ND		1.0	0.20	ug/L	1			
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1			
Naphthalene	91-20-3	8260B	ND		1.0	0.40	ug/L	1			
tert-butyl alcohol (TBA)	75-65-0	8260B	ND		20	6.7	ug/L	1			
Toluene	108-88-3	8260B	ND		1.0	0.33	ug/L	1			
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.33	ug/L	1			
Surrogate	Q	Run 1 % Recovery	Acceptance Limits								
1,2-Dichloroethane-d4		77	70-130								
Bromofluorobenzene		99	70-130								
Toluene-d8		85	70-130								

PQL = Practical quantitation limit

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

ND = Not detected at or above the MDL

J = Estimated result &lt; PQL and ≥ MDL

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Description: 12719-MW-5

Matrix: Aqueous

Date Sampled: 12/30/2014 1639

Date Received: 01/03/2015

## Volatile Organic Compounds by GC/MS

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch			
1	5030B	8260B	20	01/06/2015 1637	EH1		64673			
Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run		
tert-Amyl alcohol (TAA)	75-85-4	8260B	130	J	400	130	ug/L	1		
tert-Amyl methyl ether (TAME)	994-05-8	8260B	ND		200	4.0	ug/L	1		
<b>Benzene</b>	<b>71-43-2</b>	<b>8260B</b>	<b>680</b>		<b>20</b>	<b>2.6</b>	<b>ug/L</b>	<b>1</b>		
tert-Butyl formate (TBF)	762-75-4	8260B	ND		100	20	ug/L	1		
1,2-Dichloroethane	107-06-2	8260B	ND		20	2.9	ug/L	1		
Diisopropyl ether (IPE)	108-20-3	8260B	ND		20	8.0	ug/L	1		
3,3-Dimethyl-1-butanol	624-95-3	8260B	ND		400	20	ug/L	1		
Ethanol	64-17-5	8260B	ND		2000	660	ug/L	1		
<b>Ethylbenzene</b>	<b>100-41-4</b>	<b>8260B</b>	<b>72</b>		<b>20</b>	<b>6.6</b>	<b>ug/L</b>	<b>1</b>		
Ethyl-tert-butyl ether (ETBE)	637-92-3	8260B	ND		20	4.0	ug/L	1		
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		20	8.0	ug/L	1		
Naphthalene	91-20-3	8260B	ND		20	8.0	ug/L	1		
tert-butyl alcohol (TBA)	75-65-0	8260B	ND		400	130	ug/L	1		
<b>Toluene</b>	<b>108-88-3</b>	<b>8260B</b>	<b>910</b>		<b>20</b>	<b>6.6</b>	<b>ug/L</b>	<b>1</b>		
<b>Xylenes (total)</b>	<b>1330-20-7</b>	<b>8260B</b>	<b>360</b>		<b>20</b>	<b>6.6</b>	<b>ug/L</b>	<b>1</b>		
Surrogate	Q	Run 1 % Recovery	Acceptance Limits							
1,2-Dichloroethane-d4		77	70-130							
Bromofluorobenzene		98	70-130							
Toluene-d8		85	70-130							

PQL = Practical quantitation limit

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

ND = Not detected at or above the MDL

J = Estimated result &lt; PQL and ≥ MDL

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"



Description: 12719-MW-6

Matrix: Aqueous

Date Sampled: 12/30/2014 1444

Date Received: 01/03/2015

## Volatile Organic Compounds by GC/MS

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch		
1	5030B	8260B	1	01/06/2015 1400	EH1		64673		
Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run	
tert-Amyl alcohol (TAA)	75-85-4	8260B	ND		20	6.7	ug/L	1	
tert-Amyl methyl ether (TAME)	994-05-8	8260B	0.34	J	10	0.20	ug/L	1	
Benzene	71-43-2	8260B	2.2		1.0	0.13	ug/L	1	
tert-Butyl formate (TBF)	762-75-4	8260B	ND		5.0	1.0	ug/L	1	
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1	
Diisopropyl ether (IPE)	108-20-3	8260B	1.1		1.0	0.40	ug/L	1	
3,3-Dimethyl-1-butanol	624-95-3	8260B	ND		20	1.0	ug/L	1	
Ethanol	64-17-5	8260B	ND		100	33	ug/L	1	
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1	
Ethyl-tert-butyl ether (ETBE)	637-92-3	8260B	ND		1.0	0.20	ug/L	1	
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1	
Naphthalene	91-20-3	8260B	9.2		1.0	0.40	ug/L	1	
tert-butyl alcohol (TBA)	75-65-0	8260B	12	J	20	6.7	ug/L	1	
Toluene	108-88-3	8260B	ND		1.0	0.33	ug/L	1	
Xylenes (total)	1330-20-7	8260B	13		1.0	0.33	ug/L	1	
Surrogate	Q	Run 1 % Recovery	Acceptance Limits						
1,2-Dichloroethane-d4		78	70-130						
Bromofluorobenzene		98	70-130						
Toluene-d8		85	70-130						

PQL = Practical quantitation limit

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

ND = Not detected at or above the MDL

J = Estimated result &lt; PQL and ≥ MDL

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Description: 12719-MW-7

Matrix: Aqueous

Date Sampled: 12/30/2014 1349

Date Received: 01/03/2015

## Volatile Organic Compounds by GC/MS

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch				
1	5030B	8260B	1	01/06/2015 1422	EH1		64673				
Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run			
tert-Amyl alcohol (TAA)	75-85-4	8260B	ND		20	6.7	ug/L	1			
tert-Amyl methyl ether (TAME)	994-05-8	8260B	ND		10	0.20	ug/L	1			
Benzene	71-43-2	8260B	ND		1.0	0.13	ug/L	1			
tert-Butyl formate (TBF)	762-75-4	8260B	ND		5.0	1.0	ug/L	1			
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1			
Diisopropyl ether (IPE)	108-20-3	8260B	ND		1.0	0.40	ug/L	1			
3,3-Dimethyl-1-butanol	624-95-3	8260B	ND		20	1.0	ug/L	1			
Ethanol	64-17-5	8260B	ND		100	33	ug/L	1			
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1			
Ethyl-tert-butyl ether (ETBE)	637-92-3	8260B	ND		1.0	0.20	ug/L	1			
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1			
Naphthalene	91-20-3	8260B	ND		1.0	0.40	ug/L	1			
tert-butyl alcohol (TBA)	75-65-0	8260B	ND		20	6.7	ug/L	1			
Toluene	108-88-3	8260B	ND		1.0	0.33	ug/L	1			
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.33	ug/L	1			
Surrogate	Q	Run 1 % Recovery	Acceptance Limits								
1,2-Dichloroethane-d4		76	70-130								
Bromofluorobenzene		98	70-130								
Toluene-d8		85	70-130								

PQL = Practical quantitation limit

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

ND = Not detected at or above the MDL

J = Estimated result &lt; PQL and ≥ MDL

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Description: 12719-MW-8

Matrix: Aqueous

Date Sampled: 12/30/2014 1221

Date Received: 01/03/2015

## Volatile Organic Compounds by GC/MS

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch				
1	5030B	8260B	1	01/06/2015 1445	EH1		64673				
Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run			
tert-Amyl alcohol (TAA)	75-85-4	8260B	ND		20	6.7	ug/L	1			
tert-Amyl methyl ether (TAME)	994-05-8	8260B	ND		10	0.20	ug/L	1			
Benzene	71-43-2	8260B	ND		1.0	0.13	ug/L	1			
tert-Butyl formate (TBF)	762-75-4	8260B	ND		5.0	1.0	ug/L	1			
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1			
Diisopropyl ether (IPE)	108-20-3	8260B	ND		1.0	0.40	ug/L	1			
3,3-Dimethyl-1-butanol	624-95-3	8260B	ND		20	1.0	ug/L	1			
Ethanol	64-17-5	8260B	ND		100	33	ug/L	1			
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1			
Ethyl-tert-butyl ether (ETBE)	637-92-3	8260B	ND		1.0	0.20	ug/L	1			
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1			
Naphthalene	91-20-3	8260B	ND		1.0	0.40	ug/L	1			
tert-butyl alcohol (TBA)	75-65-0	8260B	ND		20	6.7	ug/L	1			
Toluene	108-88-3	8260B	ND		1.0	0.33	ug/L	1			
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.33	ug/L	1			
Surrogate	Q	Run 1 % Recovery	Acceptance Limits								
1,2-Dichloroethane-d4		76	70-130								
Bromofluorobenzene		99	70-130								
Toluene-d8		86	70-130								

PQL = Practical quantitation limit

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

ND = Not detected at or above the MDL

J = Estimated result &lt; PQL and ≥ MDL

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Description: 12719-MW-9

Matrix: Aqueous

Date Sampled: 12/30/2014 1329

Date Received: 01/03/2015

## Volatile Organic Compounds by GC/MS

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch				
1	5030B	8260B	1	01/06/2015 1507	EH1		64673				
Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run			
tert-Amyl alcohol (TAA)	75-85-4	8260B	ND		20	6.7	ug/L	1			
tert-Amyl methyl ether (TAME)	994-05-8	8260B	ND		10	0.20	ug/L	1			
Benzene	71-43-2	8260B	ND		1.0	0.13	ug/L	1			
tert-Butyl formate (TBF)	762-75-4	8260B	ND		5.0	1.0	ug/L	1			
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1			
Diisopropyl ether (IPE)	108-20-3	8260B	ND		1.0	0.40	ug/L	1			
3,3-Dimethyl-1-butanol	624-95-3	8260B	ND		20	1.0	ug/L	1			
Ethanol	64-17-5	8260B	ND		100	33	ug/L	1			
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1			
Ethyl-tert-butyl ether (ETBE)	637-92-3	8260B	ND		1.0	0.20	ug/L	1			
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1			
Naphthalene	91-20-3	8260B	ND		1.0	0.40	ug/L	1			
tert-butyl alcohol (TBA)	75-65-0	8260B	ND		20	6.7	ug/L	1			
Toluene	108-88-3	8260B	ND		1.0	0.33	ug/L	1			
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.33	ug/L	1			
Surrogate	Q	Run 1 % Recovery	Acceptance Limits								
1,2-Dichloroethane-d4		77	70-130								
Bromofluorobenzene		98	70-130								
Toluene-d8		85	70-130								

PQL = Practical quantitation limit

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

ND = Not detected at or above the MDL

J = Estimated result &lt; PQL and ≥ MDL

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Description: 12719-MW-10R

Matrix: Aqueous

Date Sampled: 12/30/2014 1137

Date Received: 01/03/2015

## Volatile Organic Compounds by GC/MS

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch				
1	5030B	8260B	1	01/06/2015 1224	EH1		64668				
Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run			
tert-Amyl alcohol (TAA)	75-85-4	8260B	ND		20	6.7	ug/L	1			
tert-Amyl methyl ether (TAME)	994-05-8	8260B	ND		10	0.20	ug/L	1			
Benzene	71-43-2	8260B	ND		1.0	0.13	ug/L	1			
tert-Butyl formate (TBF)	762-75-4	8260B	ND		5.0	1.0	ug/L	1			
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1			
Diisopropyl ether (IPE)	108-20-3	8260B	ND		1.0	0.40	ug/L	1			
3,3-Dimethyl-1-butanol	624-95-3	8260B	ND		20	1.0	ug/L	1			
Ethanol	64-17-5	8260B	ND		100	33	ug/L	1			
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1			
Ethyl-tert-butyl ether (ETBE)	637-92-3	8260B	ND		1.0	0.20	ug/L	1			
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1			
Naphthalene	91-20-3	8260B	ND		1.0	0.40	ug/L	1			
tert-butyl alcohol (TBA)	75-65-0	8260B	ND		20	6.7	ug/L	1			
Toluene	108-88-3	8260B	ND		1.0	0.33	ug/L	1			
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.33	ug/L	1			
Surrogate	Q	Run 1 % Recovery	Acceptance Limits								
1,2-Dichloroethane-d4		93	70-130								
Bromofluorobenzene		95	70-130								
Toluene-d8		99	70-130								

PQL = Practical quantitation limit

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

ND = Not detected at or above the MDL

J = Estimated result &lt; PQL and ≥ MDL

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Description: 12719-MW-11R

Matrix: Aqueous

Date Sampled: 12/30/2014 1119

Date Received: 01/03/2015

## Volatile Organic Compounds by GC/MS

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch				
1	5030B	8260B	1	01/06/2015 1246	EH1		64668				
Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run			
tert-Amyl alcohol (TAA)	75-85-4	8260B	ND		20	6.7	ug/L	1			
tert-Amyl methyl ether (TAME)	994-05-8	8260B	ND		10	0.20	ug/L	1			
Benzene	71-43-2	8260B	ND		1.0	0.13	ug/L	1			
tert-Butyl formate (TBF)	762-75-4	8260B	ND		5.0	1.0	ug/L	1			
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1			
Diisopropyl ether (IPE)	108-20-3	8260B	ND		1.0	0.40	ug/L	1			
3,3-Dimethyl-1-butanol	624-95-3	8260B	ND		20	1.0	ug/L	1			
Ethanol	64-17-5	8260B	ND		100	33	ug/L	1			
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1			
Ethyl-tert-butyl ether (ETBE)	637-92-3	8260B	ND		1.0	0.20	ug/L	1			
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1			
Naphthalene	91-20-3	8260B	ND		1.0	0.40	ug/L	1			
tert-butyl alcohol (TBA)	75-65-0	8260B	ND		20	6.7	ug/L	1			
Toluene	108-88-3	8260B	ND		1.0	0.33	ug/L	1			
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.33	ug/L	1			
Surrogate	Q	Run 1 % Recovery	Acceptance Limits								
1,2-Dichloroethane-d4		92	70-130								
Bromofluorobenzene		96	70-130								
Toluene-d8		99	70-130								

PQL = Practical quantitation limit

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

ND = Not detected at or above the MDL

J = Estimated result &lt; PQL and ≥ MDL

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Description: 12719-MW-12

Matrix: Aqueous

Date Sampled: 12/30/2014 1059

Date Received: 01/03/2015

## Volatile Organic Compounds by GC/MS

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch				
1	5030B	8260B	1	01/06/2015 1307	EH1		64668				
Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run			
tert-Amyl alcohol (TAA)	75-85-4	8260B	ND		20	6.7	ug/L	1			
tert-Amyl methyl ether (TAME)	994-05-8	8260B	ND		10	0.20	ug/L	1			
Benzene	71-43-2	8260B	ND		1.0	0.13	ug/L	1			
tert-Butyl formate (TBF)	762-75-4	8260B	ND		5.0	1.0	ug/L	1			
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1			
Diisopropyl ether (IPE)	108-20-3	8260B	ND		1.0	0.40	ug/L	1			
3,3-Dimethyl-1-butanol	624-95-3	8260B	ND		20	1.0	ug/L	1			
Ethanol	64-17-5	8260B	ND		100	33	ug/L	1			
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1			
Ethyl-tert-butyl ether (ETBE)	637-92-3	8260B	ND		1.0	0.20	ug/L	1			
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1			
Naphthalene	91-20-3	8260B	ND		1.0	0.40	ug/L	1			
tert-butyl alcohol (TBA)	75-65-0	8260B	ND		20	6.7	ug/L	1			
Toluene	108-88-3	8260B	ND		1.0	0.33	ug/L	1			
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.33	ug/L	1			
Surrogate	Q	Run 1 % Recovery	Acceptance Limits								
1,2-Dichloroethane-d4		92	70-130								
Bromofluorobenzene		96	70-130								
Toluene-d8		99	70-130								

PQL = Practical quantitation limit

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

ND = Not detected at or above the MDL

J = Estimated result &lt; PQL and ≥ MDL

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Description: 12719-MW-13

Matrix: Aqueous

Date Sampled: 12/30/2014 1304

Date Received: 01/03/2015

## Volatile Organic Compounds by GC/MS

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch				
1	5030B	8260B	1	01/06/2015 1329	EH1		64668				
Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run			
tert-Amyl alcohol (TAA)	75-85-4	8260B	ND		20	6.7	ug/L	1			
tert-Amyl methyl ether (TAME)	994-05-8	8260B	ND		10	0.20	ug/L	1			
Benzene	71-43-2	8260B	ND		1.0	0.13	ug/L	1			
tert-Butyl formate (TBF)	762-75-4	8260B	ND		5.0	1.0	ug/L	1			
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1			
Diisopropyl ether (IPE)	108-20-3	8260B	ND		1.0	0.40	ug/L	1			
3,3-Dimethyl-1-butanol	624-95-3	8260B	ND		20	1.0	ug/L	1			
Ethanol	64-17-5	8260B	ND		100	33	ug/L	1			
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1			
Ethyl-tert-butyl ether (ETBE)	637-92-3	8260B	ND		1.0	0.20	ug/L	1			
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1			
Naphthalene	91-20-3	8260B	ND		1.0	0.40	ug/L	1			
tert-butyl alcohol (TBA)	75-65-0	8260B	ND		20	6.7	ug/L	1			
Toluene	108-88-3	8260B	ND		1.0	0.33	ug/L	1			
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.33	ug/L	1			
Surrogate	Q	Run 1 % Recovery	Acceptance Limits								
1,2-Dichloroethane-d4		92	70-130								
Bromofluorobenzene		95	70-130								
Toluene-d8		98	70-130								

PQL = Practical quantitation limit

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

ND = Not detected at or above the MDL

J = Estimated result &lt; PQL and ≥ MDL

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"



Description: 12719-MW-14

Matrix: Aqueous

Date Sampled: 12/30/2014 1615

Date Received: 01/03/2015

## Volatile Organic Compounds by GC/MS

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch				
1	5030B	8260B	1	01/06/2015 1351	EH1		64668				
Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run			
tert-Amyl alcohol (TAA)	75-85-4	8260B	ND		20	6.7	ug/L	1			
tert-Amyl methyl ether (TAME)	994-05-8	8260B	ND		10	0.20	ug/L	1			
Benzene	71-43-2	8260B	ND		1.0	0.13	ug/L	1			
tert-Butyl formate (TBF)	762-75-4	8260B	ND		5.0	1.0	ug/L	1			
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1			
Diisopropyl ether (IPE)	108-20-3	8260B	ND		1.0	0.40	ug/L	1			
3,3-Dimethyl-1-butanol	624-95-3	8260B	ND		20	1.0	ug/L	1			
Ethanol	64-17-5	8260B	ND		100	33	ug/L	1			
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1			
Ethyl-tert-butyl ether (ETBE)	637-92-3	8260B	ND		1.0	0.20	ug/L	1			
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1			
Naphthalene	91-20-3	8260B	ND		1.0	0.40	ug/L	1			
tert-butyl alcohol (TBA)	75-65-0	8260B	ND		20	6.7	ug/L	1			
Toluene	108-88-3	8260B	ND		1.0	0.33	ug/L	1			
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.33	ug/L	1			
Surrogate	Q	Run 1 % Recovery	Acceptance Limits								
1,2-Dichloroethane-d4		91	70-130								
Bromofluorobenzene		95	70-130								
Toluene-d8		97	70-130								

PQL = Practical quantitation limit

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

ND = Not detected at or above the MDL

J = Estimated result &lt; PQL and ≥ MDL

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Description: 12719-MW-1D

Matrix: Aqueous

Date Sampled: 12/30/2014 1536

Date Received: 01/03/2015

## Volatile Organic Compounds by GC/MS

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch				
1	5030B	8260B	1	01/06/2015 1413	EH1		64668				
Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run			
tert-Amyl alcohol (TAA)	75-85-4	8260B	ND		20	6.7	ug/L	1			
tert-Amyl methyl ether (TAME)	994-05-8	8260B	ND		10	0.20	ug/L	1			
Benzene	71-43-2	8260B	ND		1.0	0.13	ug/L	1			
tert-Butyl formate (TBF)	762-75-4	8260B	ND		5.0	1.0	ug/L	1			
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1			
Diisopropyl ether (IPE)	108-20-3	8260B	ND		1.0	0.40	ug/L	1			
3,3-Dimethyl-1-butanol	624-95-3	8260B	ND		20	1.0	ug/L	1			
Ethanol	64-17-5	8260B	ND		100	33	ug/L	1			
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1			
Ethyl-tert-butyl ether (ETBE)	637-92-3	8260B	ND		1.0	0.20	ug/L	1			
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1			
Naphthalene	91-20-3	8260B	ND		1.0	0.40	ug/L	1			
tert-butyl alcohol (TBA)	75-65-0	8260B	ND		20	6.7	ug/L	1			
Toluene	108-88-3	8260B	ND		1.0	0.33	ug/L	1			
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.33	ug/L	1			
Surrogate	Q	Run 1 % Recovery	Acceptance Limits								
1,2-Dichloroethane-d4		93	70-130								
Bromofluorobenzene		94	70-130								
Toluene-d8		98	70-130								

PQL = Practical quantitation limit

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

ND = Not detected at or above the MDL

J = Estimated result &lt; PQL and ≥ MDL

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Description: 12719-FB-1

Matrix: Aqueous

Date Sampled: 12/30/2014 1035

Date Received: 01/03/2015

## Volatile Organic Compounds by GC/MS

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch				
1	5030B	8260B	1	01/06/2015 0952	EH1		64673				
Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run			
tert-Amyl alcohol (TAA)	75-85-4	8260B	ND		20	6.7	ug/L	1			
tert-Amyl methyl ether (TAME)	994-05-8	8260B	ND		10	0.20	ug/L	1			
Benzene	71-43-2	8260B	ND		1.0	0.13	ug/L	1			
tert-Butyl formate (TBF)	762-75-4	8260B	ND		5.0	1.0	ug/L	1			
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1			
Diisopropyl ether (IPE)	108-20-3	8260B	ND		1.0	0.40	ug/L	1			
3,3-Dimethyl-1-butanol	624-95-3	8260B	ND		20	1.0	ug/L	1			
Ethanol	64-17-5	8260B	ND		100	33	ug/L	1			
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1			
Ethyl-tert-butyl ether (ETBE)	637-92-3	8260B	ND		1.0	0.20	ug/L	1			
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1			
Naphthalene	91-20-3	8260B	ND		1.0	0.40	ug/L	1			
tert-butyl alcohol (TBA)	75-65-0	8260B	ND		20	6.7	ug/L	1			
Toluene	108-88-3	8260B	ND		1.0	0.33	ug/L	1			
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.33	ug/L	1			
Surrogate	Q	Run 1 % Recovery	Acceptance Limits								
1,2-Dichloroethane-d4		73	70-130								
Bromofluorobenzene		98	70-130								
Toluene-d8		87	70-130								

PQL = Practical quantitation limit

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

ND = Not detected at or above the MDL

J = Estimated result &lt; PQL and ≥ MDL

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Description: 12719-MW-4 DUP

Matrix: Aqueous

Date Sampled: 12/30/2014 1249

Date Received: 01/03/2015

## Volatile Organic Compounds by GC/MS

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch				
1	5030B	8260B	1	01/06/2015 1552	EH1		64673				
Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run			
tert-Amyl alcohol (TAA)	75-85-4	8260B	ND		20	6.7	ug/L	1			
tert-Amyl methyl ether (TAME)	994-05-8	8260B	ND		10	0.20	ug/L	1			
Benzene	71-43-2	8260B	ND		1.0	0.13	ug/L	1			
tert-Butyl formate (TBF)	762-75-4	8260B	ND		5.0	1.0	ug/L	1			
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1			
Diisopropyl ether (IPE)	108-20-3	8260B	ND		1.0	0.40	ug/L	1			
3,3-Dimethyl-1-butanol	624-95-3	8260B	ND		20	1.0	ug/L	1			
Ethanol	64-17-5	8260B	ND		100	33	ug/L	1			
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1			
Ethyl-tert-butyl ether (ETBE)	637-92-3	8260B	ND		1.0	0.20	ug/L	1			
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1			
Naphthalene	91-20-3	8260B	ND		1.0	0.40	ug/L	1			
tert-butyl alcohol (TBA)	75-65-0	8260B	ND		20	6.7	ug/L	1			
Toluene	108-88-3	8260B	ND		1.0	0.33	ug/L	1			
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.33	ug/L	1			
Surrogate	Q	Run 1 % Recovery	Acceptance Limits								
1,2-Dichloroethane-d4		79	70-130								
Bromofluorobenzene		99	70-130								
Toluene-d8		85	70-130								

PQL = Practical quantitation limit

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

ND = Not detected at or above the MDL

J = Estimated result &lt; PQL and ≥ MDL

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Description: 12719-TB

Matrix: Aqueous

Date Sampled: 12/30/2014

Date Received: 01/03/2015

## Volatile Organic Compounds by GC/MS

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch				
1	5030B	8260B	1	01/06/2015 1015	EH1		64673				
Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run			
tert-Amyl alcohol (TAA)	75-85-4	8260B	ND		20	6.7	ug/L	1			
tert-Amyl methyl ether (TAME)	994-05-8	8260B	ND		10	0.20	ug/L	1			
Benzene	71-43-2	8260B	ND		1.0	0.13	ug/L	1			
tert-Butyl formate (TBF)	762-75-4	8260B	ND		5.0	1.0	ug/L	1			
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.15	ug/L	1			
Diisopropyl ether (IPE)	108-20-3	8260B	ND		1.0	0.40	ug/L	1			
3,3-Dimethyl-1-butanol	624-95-3	8260B	ND		20	1.0	ug/L	1			
Ethanol	64-17-5	8260B	ND		100	33	ug/L	1			
Ethylbenzene	100-41-4	8260B	ND		1.0	0.33	ug/L	1			
Ethyl-tert-butyl ether (ETBE)	637-92-3	8260B	ND		1.0	0.20	ug/L	1			
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		1.0	0.40	ug/L	1			
Naphthalene	91-20-3	8260B	ND		1.0	0.40	ug/L	1			
tert-butyl alcohol (TBA)	75-65-0	8260B	ND		20	6.7	ug/L	1			
Toluene	108-88-3	8260B	ND		1.0	0.33	ug/L	1			
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.33	ug/L	1			
Surrogate	Q	Run 1 % Recovery	Acceptance Limits								
1,2-Dichloroethane-d4		73	70-130								
Bromofluorobenzene		96	70-130								
Toluene-d8		86	70-130								

PQL = Practical quantitation limit

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

H = Out of holding time

ND = Not detected at or above the MDL

J = Estimated result &lt; PQL and ≥ MDL

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

## QC Summary

## Volatile Organic Compounds by GC/MS - MB

Sample ID: QQ64668-001

Matrix: Aqueous

Batch: 64668

Prep Method: 5030B

Analytical Method: 8260B

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
tert-Amyl alcohol (TAA)	ND		1	20	6.7	ug/L	01/06/2015 1035
tert-Amyl methyl ether (TAME)	ND		1	10	0.20	ug/L	01/06/2015 1035
Benzene	ND		1	1.0	0.13	ug/L	01/06/2015 1035
tert-Butyl formate (TBF)	ND		1	5.0	1.0	ug/L	01/06/2015 1035
1,2-Dichloroethane	ND		1	1.0	0.15	ug/L	01/06/2015 1035
Diisopropyl ether (IPE)	ND		1	1.0	0.40	ug/L	01/06/2015 1035
3,3-Dimethyl-1-butanol	ND		1	20	1.0	ug/L	01/06/2015 1035
Ethanol	ND		1	100	33	ug/L	01/06/2015 1035
Ethylbenzene	ND		1	1.0	0.33	ug/L	01/06/2015 1035
Ethyl-tert-butyl ether (ETBE)	ND		1	1.0	0.20	ug/L	01/06/2015 1035
Methyl tertiary butyl ether (MTBE)	ND		1	1.0	0.40	ug/L	01/06/2015 1035
Naphthalene	ND		1	1.0	0.40	ug/L	01/06/2015 1035
tert-butyl alcohol (TBA)	ND		1	20	6.7	ug/L	01/06/2015 1035
Toluene	ND		1	1.0	0.33	ug/L	01/06/2015 1035
Xylenes (total)	ND		1	1.0	0.33	ug/L	01/06/2015 1035
Surrogate	Q	% Rec	Acceptance Limit				
Bromofluorobenzene		97	70-130				
1,2-Dichloroethane-d4		93	70-130				
Toluene-d8		99	70-130				

## Volatile Organic Compounds by GC/MS - LCS

Sample ID: QQ64668-002

Matrix: Aqueous

Batch: 64668

Prep Method: 5030B

Analytical Method: 8260B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
tert-Amyl alcohol (TAA)	1000	900		1	90	70-130	01/06/2015 0952
tert-Amyl methyl ether (TAME)	50	48		1	95	70-130	01/06/2015 0952
Benzene	50	49		1	98	70-130	01/06/2015 0952
tert-Butyl formate (TBF)	250	230		1	92	70-130	01/06/2015 0952
1,2-Dichloroethane	50	49		1	99	70-130	01/06/2015 0952
Diisopropyl ether (IPE)	50	50		1	100	70-130	01/06/2015 0952
3,3-Dimethyl-1-butanol	1000	940		1	94	70-130	01/06/2015 0952
Ethanol	5000	4700		1	95	60-140	01/06/2015 0952
Ethylbenzene	50	50		1	100	70-130	01/06/2015 0952
Ethyl-tert-butyl ether (ETBE)	50	49		1	97	70-130	01/06/2015 0952
Methyl tertiary butyl ether (MTBE)	50	49		1	97	70-130	01/06/2015 0952

PQL = Practical quantitation limit

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

ND = Not detected at or above the MDL

J = Estimated result < PQL and ≥ MDL

+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

## Volatile Organic Compounds by GC/MS - LCS

Sample ID: QQ64668-002

Matrix: Aqueous

Batch: 64668

Prep Method: 5030B

Analytical Method: 8260B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Naphthalene	50	47		1	94	70-130	01/06/2015 0952
tert-butyl alcohol (TBA)	1000	990		1	99	70-130	01/06/2015 0952
Toluene	50	49		1	99	70-130	01/06/2015 0952
Xylenes (total)	100	100		1	100	70-130	01/06/2015 0952
Surrogate	Q	% Rec	Acceptance Limit				
Bromofluorobenzene		97	70-130				
1,2-Dichloroethane-d4		92	70-130				
Toluene-d8		98	70-130				

## Volatile Organic Compounds by GC/MS - MB

Sample ID: QQ64673-001

Matrix: Aqueous

Batch: 64673

Prep Method: 5030B

Analytical Method: 8260B

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
tert-Amyl alcohol (TAA)	ND		1	20	6.7	ug/L	01/06/2015 0930
tert-Amyl methyl ether (TAME)	ND		1	10	0.20	ug/L	01/06/2015 0930
Benzene	ND		1	1.0	0.13	ug/L	01/06/2015 0930
tert-Butyl formate (TBF)	ND		1	5.0	1.0	ug/L	01/06/2015 0930
1,2-Dichloroethane	ND		1	1.0	0.15	ug/L	01/06/2015 0930
Diisopropyl ether (IPE)	ND		1	1.0	0.40	ug/L	01/06/2015 0930
3,3-Dimethyl-1-butanol	ND		1	20	1.0	ug/L	01/06/2015 0930
Ethanol	ND		1	100	33	ug/L	01/06/2015 0930
Ethylbenzene	ND		1	1.0	0.33	ug/L	01/06/2015 0930
Ethyl-tert-butyl ether (ETBE)	ND		1	1.0	0.20	ug/L	01/06/2015 0930
Methyl tertiary butyl ether (MTBE)	ND		1	1.0	0.40	ug/L	01/06/2015 0930
Naphthalene	ND		1	1.0	0.40	ug/L	01/06/2015 0930
tert-butyl alcohol (TBA)	ND		1	20	6.7	ug/L	01/06/2015 0930
Toluene	ND		1	1.0	0.33	ug/L	01/06/2015 0930
Xylenes (total)	ND		1	1.0	0.33	ug/L	01/06/2015 0930
Surrogate	Q	% Rec	Acceptance Limit				
Bromofluorobenzene		99	70-130				
1,2-Dichloroethane-d4		73	70-130				
Toluene-d8		87	70-130				

PQL = Practical quantitation limit

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

ND = Not detected at or above the MDL

J = Estimated result < PQL and ≥ MDL

+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**



## Volatile Organic Compounds by GC/MS - LCS

Sample ID: QQ64673-002

Matrix: Aqueous

Batch: 64673

Prep Method: 5030B

Analytical Method: 8260B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
tert-Amyl alcohol (TAA)	1000	840		1	84	70-130	01/06/2015 0845
tert-Amyl methyl ether (TAME)	50	43		1	86	70-130	01/06/2015 0845
Benzene	50	45		1	90	70-130	01/06/2015 0845
tert-Butyl formate (TBF)	250	200		1	82	70-130	01/06/2015 0845
1,2-Dichloroethane	50	44		1	87	70-130	01/06/2015 0845
Diisopropyl ether (IPE)	50	45		1	90	70-130	01/06/2015 0845
3,3-Dimethyl-1-butanol	1000	870		1	87	70-130	01/06/2015 0845
Ethanol	5000	4300		1	87	60-140	01/06/2015 0845
Ethylbenzene	50	49		1	99	70-130	01/06/2015 0845
Ethyl-tert-butyl ether (ETBE)	50	44		1	87	70-130	01/06/2015 0845
Methyl tertiary butyl ether (MTBE)	50	42		1	85	70-130	01/06/2015 0845
Naphthalene	50	46		1	93	70-130	01/06/2015 0845
tert-butyl alcohol (TBA)	1000	850		1	85	70-130	01/06/2015 0845
Toluene	50	48		1	95	70-130	01/06/2015 0845
Xylenes (total)	100	97		1	97	70-130	01/06/2015 0845
Surrogate	Q	% Rec	Acceptance Limit				
Bromofluorobenzene		97	70-130				
1,2-Dichloroethane-d4		72	70-130				
Toluene-d8		87	70-130				

## Volatile Organic Compounds by GC/MS - MS

Sample ID: QA03003-004MS

Matrix: Aqueous

Batch: 64673

Prep Method: 5030B

Analytical Method: 8260B

Parameter	Sample Amount (ug/L)	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
tert-Amyl alcohol (TAA)	130	20000	14000		20	71	70-130	01/06/2015 1722
tert-Amyl methyl ether (TAME)	ND	1000	820		20	82	70-130	01/06/2015 1722
Benzene	680	1000	1600		20	89	72-127	01/06/2015 1722
tert-Butyl formate (TBF)	ND	5000	2900	N	20	57	70-130	01/06/2015 1722
1,2-Dichloroethane	ND	1000	890		20	89	59-143	01/06/2015 1722
Diisopropyl ether (IPE)	ND	1000	850		20	85	70-130	01/06/2015 1722
3,3-Dimethyl-1-butanol	ND	20000	15000		20	75	70-130	01/06/2015 1722
Ethanol	ND	100000	53000	N	20	53	70-130	01/06/2015 1722
Ethylbenzene	72	1000	1000		20	93	79-132	01/06/2015 1722
Ethyl-tert-butyl ether (ETBE)	ND	1000	850		20	85	70-130	01/06/2015 1722
Methyl tertiary butyl ether (MTBE)	ND	1000	840		20	84	60-140	01/06/2015 1722

PQL = Practical quantitation limit

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

ND = Not detected at or above the MDL

J = Estimated result < PQL and ≥ MDL

+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

## Volatile Organic Compounds by GC/MS - MS

Sample ID: QA03003-004MS

Matrix: Aqueous

Batch: 64673

Prep Method: 5030B

Analytical Method: 8260B

Parameter	Sample Amount (ug/L)	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date	
Naphthalene	ND	1000	950		20	95	62-136	01/06/2015 1722	
tert-butyl alcohol (TBA)	ND	20000	15000		20	74	70-130	01/06/2015 1722	
Toluene	910	1000	1800		20	88	75-125	01/06/2015 1722	
Xylenes (total)	360	2000	2200		20	93	70-130	01/06/2015 1722	
Surrogate	Q	% Rec	Acceptance Limit						
1,2-Dichloroethane-d4		71	70-130						
Bromofluorobenzene		98	70-130						
Toluene-d8		84	70-130						

## Volatile Organic Compounds by GC/MS - MSD

Sample ID: QA03003-004MD

Matrix: Aqueous

Batch: 64673

Prep Method: 5030B

Analytical Method: 8260B

Parameter	Sample Amount (ug/L)	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
tert-Amyl alcohol (TAA)	130	20000	16000		20	78	8.8	70-130	20	01/06/2015 1745
tert-Amyl methyl ether (TAME)	ND	1000	890		20	89	7.8	70-130	20	01/06/2015 1745
Benzene	680	1000	1600		20	96	4.5	72-127	20	01/06/2015 1745
tert-Butyl formate (TBF)	ND	5000	3000	N	20	60	4.3	70-130	20	01/06/2015 1745
1,2-Dichloroethane	ND	1000	920		20	92	3.5	59-143	20	01/06/2015 1745
Diisopropyl ether (IPE)	ND	1000	920		20	92	8.5	70-130	20	01/06/2015 1745
3,3-Dimethyl-1-butanol	ND	20000	16000		20	82	8.4	70-130	20	01/06/2015 1745
Ethanol	ND	100000	68000	N,+	20	68	24	70-130	20	01/06/2015 1745
Ethylbenzene	72	1000	1100		20	101	7.6	79-132	20	01/06/2015 1745
Ethyl-tert-butyl ether (ETBE)	ND	1000	910		20	91	6.5	70-130	20	01/06/2015 1745
Methyl tertiary butyl ether (MTBE)	ND	1000	910		20	91	7.4	60-140	20	01/06/2015 1745
Naphthalene	ND	1000	1000		20	100	5.1	62-136	20	01/06/2015 1745
tert-butyl alcohol (TBA)	ND	20000	17000		20	83	12	70-130	20	01/06/2015 1745
Toluene	910	1000	1900		20	98	5.3	75-125	20	01/06/2015 1745
Xylenes (total)	360	2000	2400		20	100	6.2	70-130	20	01/06/2015 1745
Surrogate	Q	% Rec	Acceptance Limit							
1,2-Dichloroethane-d4		72	70-130							
Bromofluorobenzene		98	70-130							
Toluene-d8		85	70-130							

PQL = Practical quantitation limit

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

ND = Not detected at or above the MDL

J = Estimated result < PQL and ≥ MDL

+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**



**Chain of Custody Record**

**SHEALY ENVIRONMENTAL SERVICES, INC.**  
106 Vantage Point Drive • West Columbia, SC 29172  
Telephone No. 803-791-9700 Fax No. 803-791-9111  
www.shealylab.com

**Number 43841**

Client <b>Terry Environmental</b>		Report to Contact <b>Kelly Cone</b>		Telephone No. / E-mail <b>843-273-8200/kcone@terryenvironmental.com</b>		Quote No.				
Address <b>70 Box 25</b>		Sampler's Signature		Analysis (Attach list if more space is needed)		Page <b>1 of 2</b>				
City <b>Summerville</b>	State <b>SC</b>	Zip Code <b>29484</b>	Printed Name <b>Brian Spillane</b>		<b>QA03003</b>					
Project Name <b>Hot Spot #3005</b>										
Project No. <b>22.30.8F</b>	P.O. No.	Matrix		No of Containers by Preservative Type						
Sample ID / Description <small>(Containers for each sample may be combined on one line.)</small>	Date	Time	Matrix	Formaldehyde	ARSDP	ANDES	NOB	MEP	MSK	Remarks / Cooler I.D.
<b>12719 MW-2</b>	<b>12/30/14</b>	<b>1504</b>	<b>GX</b>				<b>3</b>			
<b>12719 MW-3R</b>		<b>1551</b>								
<b>12719 MW-4</b>		<b>1247</b>								
<b>12719 MW-5</b>		<b>1639</b>								
<b>12719 MW-6</b>		<b>1444</b>								
<b>12719 MW-7</b>		<b>1349</b>								
<b>12719 MW-8</b>		<b>1221</b>								
<b>12719 MW-9</b>		<b>1329</b>								
<b>12719 MW-10R</b>		<b>1137</b>								
<b>12719 MW-11R</b>		<b>1119</b>								
Turn Around Time Required (Prior lab approval required for expedited TAT.) <input checked="" type="checkbox"/> Standard <input type="checkbox"/> Rush (Specify)		Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab		Possible Hazard Identification <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison <input type="checkbox"/> Unknown				QC Requirements (Specify)		
1. Relinquished by		Date <b>12/31/14</b>	Time <b>1200</b>	1. Received by				Date	Time	
2. Relinquished by		Date	Time	2. Received by				Date	Time	
3. Relinquished by		Date	Time	3. Received by				Date	Time	
4. Relinquished by <b>FedEx</b>		Date <b>1/3/15</b>	Time <b>0900</b>	4. Laboratory received by				Date <b>1/3/15</b>	Time <b>0900</b>	
Note: All samples are retained for four weeks from receipt unless other arrangements are made.				LAB USE ONLY Received on ice (Circle) <input checked="" type="checkbox"/> No Ice Pack				Receipt Temp. <b>2.1</b> °C		

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK Field/Client Copy

Document Number: F-AD-133 Effective Date: 08-01-2014



**Chain of Custody Record**

**SHEALY ENVIRONMENTAL SERVICES, INC.**  
106 Vantage Point Drive • West Columbia, SC 29172  
Telephone No. 803-791-9700 Fax No. 803-791-9111  
www.shealylab.com

Number **43840**

Client <b>Terry Environmental</b>		Report to Contact <b>Kelly Cone</b>		Telephone No. / E-mail <b>845 273 8000 / kcone@terryenvironmental.com</b>		Quote No. <b>TC/Env/2014/04</b>	
Address <b>PO Box 26</b>		Sampler's Signature 		Analysis (Attach list if more space is needed)		Page <b>2</b> of <b>2</b>	
City <b>Summerville</b>	State <b>SC</b>	Zip Code <b>29484</b>	Printed Name <b>Brian Spillane</b>		<b>QA03003</b>		
Project Name <b>Hot Spot 3005</b>							
Project No. <b>2230-8F</b>	P.O. No.	Matrix		No. of Containers by Preservative Type		Remarks / Cooler I.D.	
Sample ID / Description <small>(Containers for each sample may be combined on one line.)</small>		Date	Time	Matrix	None	PHOS	NO3
<b>12719 MW-12</b>	<b>12/30/14</b>	<b>1059</b>	<b>6X</b>			<b>3</b>	<b>3</b>
<b>12719 MW-13</b>	↓	<b>1304</b>	↓			↓	↓
<b>12719 MW-14</b>	↓	<b>1615</b>	↓			↓	↓
<b>12719 MW-1D</b>	↓	<b>1536</b>	↓			↓	↓
<b>12719 FB-1</b>	↓	<b>1035</b>	↓			↓	↓
<b>12719 MW-4 DUP</b>	↓	<b>1249</b>	↓			<b>2</b>	<b>2</b>
<b>12719 TB</b>	↓	—	↓				
Turn Around Time Required (Prior lab approval required for expedited TAT.)		Sample Disposal		Possible Hazard Identification		QC Requirements (Specify)	
<input checked="" type="checkbox"/> Standard <input type="checkbox"/> Rush (Specify)		<input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Dispose by Lab		<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison <input type="checkbox"/> Unknown			
1. Relinquished by		Date	Time	1. Received by		Date	Time
		<b>12/5/14</b>	<b>1200</b>				
2. Relinquished by		Date	Time	2. Received by		Date	Time
3. Relinquished by		Date	Time	3. Received by		Date	Time
		<b>12/15</b>				<b>12/15</b>	
4. Relinquished by <b>FedEx</b>		Date	Time	4. Laboratory received by		Date	Time
		<b>12/14</b>	<b>0900</b>			<b>12/14</b>	<b>0900</b>
Note: All samples are retained for four weeks from receipt unless other arrangements are made.				LAB USE ONLY		Receipt Temp. <b>2.1</b> °C	
				Received on Ice (Circle) <input checked="" type="checkbox"/> No Ice Pack			

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: F-AD-133 Effective Date: 08-01-2014

# SHEALY ENVIRONMENTAL SERVICES, INC.

Shealy Environmental Services, Inc.  
 Document Number: F-AD-016  
 Revision Number: 16

Page 1 of 1  
 Replaces Date: 07/15/14  
 Effective Date: 11/07/14

## Sample Receipt Checklist (SRC)

Client: Terry Env. Cooler Inspected by/date: mem/010315 Lot #: Q1A03003

Means of receipt: <input type="checkbox"/> SESI <input type="checkbox"/> Client <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Airborne Exp <input type="checkbox"/> Other		
Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		1. Were custody seals present on the cooler?
Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input checked="" type="checkbox"/>		2. If custody seals were present, were they intact and unbroken?
Cooler ID/Original temperature upon receipt/Derived (corrected) temperature upon receipt: <u>1447/2.2/2.1</u> °C / / °C / / °C / / °C		
Method: <input checked="" type="checkbox"/> Temperature Blank <input type="checkbox"/> Against Bottles IR Gun ID: #4 IR Gun Correction Factor: <u>0.1</u> °C		
Method of coolant: <input checked="" type="checkbox"/> Wet Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> Dry Ice <input type="checkbox"/> None		
Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input checked="" type="checkbox"/>		3. If temperature of any cooler exceeded 6.0°C, was Project Manager notified? PM notified by SRC, phone, note (circle one), other: _____ (For coolers received via commercial courier, PMs are to be notified immediately.)
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>		4. Is the commercial courier's packing slip attached to this form?
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		5. Were proper custody procedures (relinquished/received) followed?
Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA <input type="checkbox"/>		5a Were samples relinquished by client to commercial courier?
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		6. Were sample IDs listed on the COC?
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		7. Were sample IDs listed on all sample containers?
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		8. Was collection date & time listed on the COC?
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		9. Was collection date & time listed on all sample containers?
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		10. Did all container label information (ID, date, time) agree with the COC?
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		11. Were tests to be performed listed on the COC?
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		12. Did all samples arrive in the proper containers for each test?
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		13. Did all containers arrive in good condition (unbroken, lids on, etc.)?
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		14. Was adequate sample volume available?
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		15. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		16. Were any samples containers missing?
Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		17. Were there any excess samples not listed on COC?
Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA <input type="checkbox"/>		18. Were bubbles present >"pca-size" (¼" or 6mm in diameter) in any VOA vials?
Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input checked="" type="checkbox"/>		19. Were all metals/O&G/HEM/nutrient samples received at a pH of <2?
Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input checked="" type="checkbox"/>		20. Were all cyanide and/or sulfide samples received at a pH >12?
Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input checked="" type="checkbox"/>		21. Were all applicable NH3/TKN/cyanide/phenol (<0.2mg/L) samples free of residual chlorine?
Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input checked="" type="checkbox"/>		22. Were collection temperatures documented on the COC for NC samples?
Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input checked="" type="checkbox"/>		23. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc...) correctly transcribed from the COC into the comment section in LIMS?
Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		24. Was the quote number used taken from the container label?
<b>Sample Preservation</b> (Must be completed for any sample(s) incorrectly preserved or with headspace.)		
Sample(s) _____ were received incorrectly preserved and were adjusted accordingly in sample receiving with _____ (H <sub>2</sub> SO <sub>4</sub> , HNO <sub>3</sub> , HCl, NaOH) using SR # _____		
Sample(s) _____ were received with bubbles >6 mm in diameter.		
Sample(s) _____ were received with TRC >0.2 mg/L (If #21 is No)		
SC Drinking Water Project Sample(s) pH verified to be > 2 by _____ Date: _____		
Sample(s) _____ were not received at a pH of <2 and were adjusted accordingly using SR# _____		
Sample labels applied by: <u>mem</u> Verified by: _____ Date: <u>1/3/15</u>		

Comments:

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**APPENDIX C**

**Tax Map  
(Not Applicable)**

**APPENDIX D**

**Soil Boring/Field Screening Logs  
(Not Applicable)**

**APPENDIX E**

**Well Completion Logs/SCDHEC 1903 Forms  
(Not Applicable)**



**APPENDIX F**

**Aquifer Evaluation Forms  
(Not Applicable)**

**APPENDIX G**

**Disposal Manifest**

# TERRY Environmental Services, Inc. Certificate of On-Site Treatment

*In accordance with NPDES General Permit No. SCG830000, 13.25 gallons of petroleum contaminated purge water and/or by-products from cleaning and decontamination were processed on-site via a portable granular activated carbon (GAC) unit and released to the surface within the area of the known petroleum contamination plume on December 30, 2014.*

*Hot Spot #3005*

*Chesnee, South Carolina*

*SCDHEC UST Permit No.: 12719*



**APPENDIX H**

**Local Zoning Regulations  
(Not Applicable)**

**APPENDIX I**

**Fate and Transport Modeling Data  
(Not Applicable)**

**APPENDIX J**

**Access Agreements  
(Not Applicable)**

## **APPENDIX K**

### **Data Verification Checklist**

## Contractor Checklist – Hot Spot #3005

### UST Permit #12719 - TERRY Project #2230.8F

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
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? (Table 1)			X
33	Has the potentiometric data for the site been provided in tabular format? (Table 2)	X		
34	Has the current and historical laboratory data been provided in tabular format?	X		



Item #	Item	Yes	No	N/A
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 1)	X		
38	Has the site base map been provided with all required elements? (Figure 2)	X		
39	Have the CoC site maps been provided? (Figure 3 & Figure 4)	X Fig 4		X Fig 3
40	Has the site potentiometric map been provided? (Figure 5)	X		
41	Have the geologic cross-sections been provided? (Figure 6)			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? (Appendix A)			X
44	Have the sampling logs, chain of custody forms, and the analytical data package been included with all required elements? (Appendix B)	X		
45	Is the laboratory performing the analyses properly certified?	X		
46	Has the tax map been included with all necessary elements? (Appendix C)			X
47	Have the soil boring/field screening logs been provided? (Appendix D)			X
48	Have the well completion logs and SCDHEC Form 1903 been provided? (Appendix E)			X
49	Have the aquifer evaluation forms, data, graphs, equations, etc. been provided? (Appendix F)			X
50	Have the disposal manifests been provided? (Appendix G)	X		
51	Has a copy of the local zoning regulations been provided? (Appendix H)			X
52	Has all fate and transport modeling been provided? (Appendix I)			X
53	Have copies of all access agreements obtained by the contractor been provided? (Appendix J)			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		

Explanation for missing and incomplete information?

Not Applicable for the current directive.



W. Marshall Taylor Jr., Acting Director

*Promoting and protecting the health of the public and the environment*



APR 01 2015

**MS CYNDI SUTTLES  
R L JORDAN OIL COMPANY OF NORTH CAROLINA  
PO BOX 2527  
SPARTANBURG SC 29304-2527**

**Re: Aggressive Fluid Vapor Recovery & Gauging Events Directive  
Hot Spot #3005, 107 Hampton Street (U.S. Highway 221), Chesnee, SC  
UST Permit #12719, Cost Agreement #49730  
Release No. 2 reported August 4, 2003  
Groundwater Monitoring Report received January 20, 2015  
Spartanburg County**

Dear Ms. Suttles:

The Underground Storage Tank Management Division (UST Division) of the South Carolina of Health and Environmental Control (Agency) recognizes your commitment to continue work at this site using TERRY Environmental Services, Inc. as your contractor. Based on the results of the referenced report, the UST Division has determined the next necessary scope of work is to conduct an Aggressive Fluid Vapor Recovery (AFVR) event to remove free-phase petroleum (FFP) from groundwater and decrease concentrations of chemicals of concern.

In accordance with Section 280.64 of the South Carolina Underground Storage Tank Control Regulations, a 48-hour AFVR event as outlined in the UST Quality Assurance Program Plan (QAPP) Revision 2.0 should be implemented. **Please note that AFVR procedures have been updated.** The AFVR event should be performed on monitoring well MW-1. The stinger shall be lowered at six-inch intervals starting at the water table interface to a target depth of 30 feet below top of casing. Please strive to reach the target depth within the first eight (8) hours of the event and then periodically readjust the stinger to the interval with the highest vapor readings while maintaining dewatering of the petroleum smear zone. The goal is to achieve the highest possible vapor recovery while simultaneously dewatering the petroleum smear zone. Off-gas treatment will be necessary. Approximately 30 days after the AFVR event, well MW-1 should be gauged. A copy of the Agency QAPP Revision 2.0 for the UST Division is available online at: [http://www.scdhec.gov/environment/docs/QAPP\\_Rev-2\\_April2013.pdf](http://www.scdhec.gov/environment/docs/QAPP_Rev-2_April2013.pdf).

**Please notify Mike Rivers at [RiversMS@dhec.sc.gov](mailto:RiversMS@dhec.sc.gov) as soon as the AFVR event start date has been scheduled.**

Cost Agreement #49730 has been approved in the amount shown on the enclosed cost agreement form for the aforementioned scope of work. AFVR activities may proceed immediately upon your receipt of this letter.

Ms. Cyndi Suttles  
Hot Spot #3005; UST Permit #12719  
Page 2

Costs for a site reconnaissance have been approved. Objectives of the site reconnaissance are to verify the location of the facility, locate and identify the monitoring well targeted for AFVR, and to verify the presence of measurable (0.01') FFP in the target well. Results of the site reconnaissance shall be provided to the UST Project Manager via e-mail. The results should include gauging data for the AFVR target well, a proposed starting date for the AFVR event, and any pertinent site information.

**The AFVR/Gauging Report should be submitted within sixty (60) days from the date of this letter.** Please note that all applicable South Carolina certification requirements apply to the services and report preparation. All site rehabilitation activities must be performed and submitted by a South Carolina Certified Underground Storage Tank Site Rehabilitation Contractor.

TERRY Environmental Services, Inc. may submit an invoice for direct billing from the State Underground Petroleum Environmental Response Bank (SUPERB) Account. Interim invoices may not be submitted for this scope of work. By law, the SUPERB Account cannot compensate any costs that are not pre-approved. If the invoice is not submitted within one hundred twenty (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 Agency 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 Agency 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.

The UST Division grants pre-approval for transportation of free-phase product and petroleum-contaminated groundwater from the referenced facility to a permitted treatment facility for disposal. The transport and disposal must be conducted in accordance with the QAPP.

On all correspondence concerning this directive, please reference **UST Permit #12719 and Cost Agreement #49730**. If you have any questions concerning this site, please contact me by telephone at (803) 898-0671 or by e-mail to [RiversMS@dhec.sc.gov](mailto:RiversMS@dhec.sc.gov).

Sincerely,



Michael Rivers, Hydrogeologist  
Corrective Action Section  
Underground Storage Tank Management Division  
Bureau of Land and Waste Management

**Ms. Cyndi Suttles**  
**Hot Spot #3005; UST Permit #12719**  
**Page 3**

**enc: Approved Cost Agreement**

**cc: Ms. Kelly K. Cone, P.G., TERRY Environmental Services, Inc., P.O. Box 25,**  
**Summerville, SC 29484 (w/ enc.)**  
**Technical File (w/ enc.)**

**MR/AFVR03.26.15**

**Approved Cost Agreement 49730**

Facility: 12719 HOT SPOT 3005

RIVERSMS

PO Number:

<u>Task / Description</u>	<u>Categories</u>	<u>Item Description</u>	<u>Qty / Pct</u>	<u>Unit Price</u>	<u>Amount</u>
04 MOB/DEMOB		B1 PERSONNEL	1.0000	423.00	423.00
10 SAMPLE COLLECTION		E1 GAUGE WELL ONLY	1.0000	7.00	7.00
19 RPT/PROJECT MNGT & COORDINATIO		PRT REPORT PREPARATION	0.1200	12,016.75	1,442.01
23 EFR		A3 48 HOUR EVENT	1.0000	6,265.00	6,265.00
		C3 OFF GAS TREATMENT 48 HOUR	1.0000	327.00	327.00
		D SITE RECONNAISSANCE	1.0000	203.25	203.25
		F1 EFFLUENT DISPOSAL	10,000.0000	0.44	4,400.00
		G AFVR EQUIPMENT MOB	1.0000	391.50	391.50
<b>Total Amount</b>					<b>13,458.76</b>

# Document Receipt Information

Hard Copy

CD

Email

Date Received 5-28-15

Permit Number 12719

Project Manager Mike Kureis

Name of Contractor TES

UST Certification Number \_\_\_\_\_

Docket Number 16tech

Scanned \_\_\_\_\_

AFVR/Gauging Events

**AGGRESSIVE FLUID VAPOR RECOVERY (AFVR)  
AND GAUGING EVENTS REPORT  
HOT SPOT #3005  
107 HAMPTON STREET  
CHESNEE, SOUTH CAROLINA  
SCDHEC UST PERMIT #12719  
CA #49730**

Prepared For:

**SCDHEC UNDERGROUND STORAGE TANK PROGRAM  
2600 BULL ST.  
COLUMBIA, SC 29201**

Submitted By:



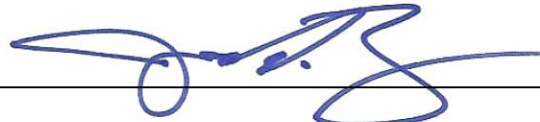
P.O. BOX 25  
SUMMERVILLE, SOUTH CAROLINA 29484  
(843) 873-8200  
Fax (843) 873-8765  
[www.terryenvironmental.com](http://www.terryenvironmental.com)

UST CONTRACTOR #UCC-0223  
TERRY PROJECT #2230.8G



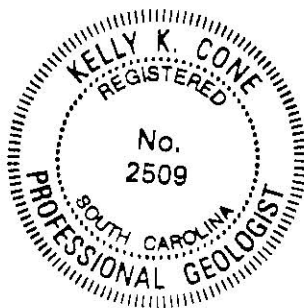
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**KELLY K. CONE, PG**  
Vice President, Assessment Services



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**JASON A. TERRY, PG**  
President



MAY 2015

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**SCDHEC UST PERMIT #12719**
**A. INTRODUCTION**
**1. UST Facility and Owner/Operator Information**

Facility Name (Permit #): Hot Spot #3005 (12719)  
 Facility Address: 107 Hampton Street, Chesnee, South Carolina 29323  
 Facility Telephone: 864-461-4147  
 Owner/ Operator Name: RL Jordan Oil Co. of NC (Contact: Ms. Cyndi Suttles)  
 Owner/ Operator Address: PO Box 2527, Spartanburg, SC 29304  
 Owner/ Operator Telephone: 864-585-2784

**2. Property Owner Information**

Name: EJ Enterprises Inc.  
 Address: PO Box 2527, Spartanburg, SC 29304  
 Telephone: 864-585-2784

**3. Contractor Information**

Name: Terry Environmental Services, Inc.  
 Address: P.O. Box 25, Summerville, South Carolina 29484  
 Telephone: 843-873-8200  
 Certification: UCC-0223

**4. Well Driller Information**

Not Applicable

**5. Laboratory Information**

Not Applicable

**6. Site History**

Date Release Reported to SCDHEC: August 4, 2003  
 Estimated Quantity of Product Released: Unknown  
 Cause of Release: Unknown  
 Current use of Facility: Gas Station and Convenience Store (Hot Spot)

UST #	Product	Date Installed	Currently In Use (Yes or No)	If not in use, Date Removed
1 (12,000 gal)	Unleaded Gasoline	8/6/1990	Yes	-
2 (8,000 gal)	Plus Gasoline	8/6/1990	Yes	-
3 (8,000 gal)	Premium Gasoline	8/6/1990	Yes	-
4 (8,000 gal)	Diesel	8/6/1990	Yes	-
5 (8,000 gal)	Kerosene	8/6/1990	Yes	-
6(12,000 gal)	Diesel	10/3/1991	Yes	-

Other Releases at this site? Yes XXXX No \_\_\_\_\_  
 If yes, Date Release Reported to SCDHEC November 3, 1993  
**Status of Release:** Feb. 2002 Brook & Medlock selected as CA contractor.  
 No Further Action Date: N/A

## **7. Regional Geology and Hydrogeology**

The Hot Spot #3005 site is located in Chesnee which lies in the Western Piedmont Province of South Carolina. The western piedmont is comprised of the Inner Piedmont block, the Smith River allochthon, and the Sauratwon Mountain window. The Inner Piedmont block encompasses the Inner Piedmont belt and the Chauga belt, and consists of a composite stack of thrust sheets containing a variety of gneisses, schists, amphibolites, sparse ultramafic bodies, and intrusive granitoids. (The Geology of the Carolinas, Horton & Zullo, 1991)

The Hot Spot #3005 site is located in the Inner Piedmont Belt which is characterized by granitic, biotitic, and hornblendic rocks. Generally, wells drilled in the Inner Piedmont Belt of Spartanburg County yield 1 to 250 gallons per minute (gpm). The highest average yields (35 gpm) were obtained from wells drilled in biotite gneiss and migmatite with the lowest average yields from wells drilled in quartz monzonite. The average yield of all wells inventoried was 20 gpm. The ground waters in Spartanburg County are of good to excellent quality for most domestic, municipal, and industrial uses. (USGS/SCWRC Report 3: Water Resources of Spartanburg County, South Carolina, 1970)

## **B. RECEPTOR SURVEY & SITE DATA**

### **1. Receptor Survey Results**

A receptor survey was not conducted during this scope of work.

### **2. Current Site and Adjacent Land Use**

Description of current site use (commercial, residential, rural, etc.):

Commercial; the site is operating as Hot Spot #3005, a gas station and convenience store.

Description of adjacent land use (commercial, residential, rural, etc.):

Commercial and residential.

UST sites within a 1,000-foot radius:

10122 Free Time Convenience Store

The site is located at 107 Hampton Street, Chesnee, South Carolina. The site is bordered to the north by a school, to the east by a vacant field, and to the south and west by commercial and residential properties. The general site location is shown on the Topographic Map provided in Section J as Figure 1. A Site Base Map based on the previous contractor's site survey is provided in Section J as Figure 2.

### **3. Site-Specific Geology and Hydrogeology**

Site-specific stratigraphy was not documented during this scope of work. During this scope of work, depth to groundwater was measured between 20 and 28 feet below top of casing in the recovery and influence wells gauged prior to the start of each event.

**C. SOIL ASSESSMENT/FIELD SCREENING INFORMATION & METHODOLOGY**

Not Applicable. No soil or groundwater borings were installed during this scope of work.

**D. MONITORING WELL INFORMATION**

Not Applicable. No monitoring wells were installed during this scope of work.

**E. GROUNDWATER DATA**

Not Applicable. No groundwater samples were collected during this scope of work.

## **F. AFVR INFORMATION**

### **1. Scope of Work**

As directed by SCDHEC, a 48-hour continuous AFVR Event was performed on monitoring/recovery well MW-1. Between April 22, 2015 and April 24, 2015 TERRY Exploration Services, LLC performed the AFVR event under the supervision of TERRY Environmental Services, Inc.

### **2. AFVR Emissions Table**

AFVR Emissions Table (Event 1) – Attached

Extraction Well Stinger Depth Table (Event 1) – Attached

### **3. Vacuum Data Table**

Vacuum Data Table (Event 1) – Attached

### **4. Volume of Water Recovered**

A total of 4,400 gallons of fluid were recovered during the 48-hour event conducted April 22, 2015 through April 24, 2015.

### **5. Volume of Product Recovered**

At the completion of the event no product was detected in the recovery tank. However, the AFVR process routinely emulsifies product which can take several hours to separate.

### **6. Mass of Petroleum Recovered as Vapor**

A total of 20.35 pounds of volatile organic vapors (approximate equivalent of 3.26 gallons of gasoline) were recovered during the course of the 48-hour event conducted April 22, 2015 through April 24, 2015. Off-gas treatment was provided during the event as directed by the SCDHEC Project Manager.

### **7. Free Product Thickness Table**

Free Product Thickness Table (Event 1) – Attached

Free Product Thickness Table (Gauging) – Attached

### **8. AFVR Event Map**

Figure F-8 AFVR Map (Event 1) – Attached

**SECTION F-2A  
AFVR EMISSIONS TABLE  
HOT SPOT #3005  
CHESNEE, SOUTH CAROLINA  
SCDHEC UST PERMIT #12719**

Date:	April 22-24, 2015											Average Depth to Groundwater:			20-28 ft.					
Site Name:	Hot Spot #3005											Describe Soil in Saturated Zone:			Sandy Silt					
SCDHEC Site ID #:	12719											Vacuum Contractor:			TERRY Exploration Services, LLC					
Well ID #:	NW-1											Blower Specification of the Vacuum Truck (CFM @ Hg):						282 CFM @ 25" Hg		
DRY STANDARD CUBIC FEET PER MINUTE (DSCFM) CALCULATIONS (Qstd)												EMISSION CALCULATION								
Date	Time	Vacuum (in. Hg)	Velocity (ft/min)	Pipe Id (in)	Temp (F)	Rel.Humid (%)	PPM <sub>mp</sub> (ppm)	PPM <sub>ocst</sub> (ppm)	Reduction (%)	Elapsed time (min)	Flow (DSCFM)	PPM <sub>t</sub>	PPM <sub>e</sub>	K	C <sub>m</sub> (mg/dsm <sup>3</sup> )	C <sub>e</sub> (lb/dscf)	PMR <sub>v</sub> (lb/hr)	PMR <sub>l</sub> (lb/hr)	PMR <sub>g</sub> (gal/hr)	
4/22/2015	13:00	21.0	693	3	132.6	22.7	2,962	411	86	0	27.84	3248.75	12986.99	4	6480.01	4.045E-04	0.67	0.78	0.12	
4/22/2015	13:30	21.0	706	3	134.8	22.6	3,217	486	85	30	28.05	3526.26	14105.05	4	7037.87	4.394E-04	0.74	0.86	0.14	
4/22/2015	14:00	21.0	789	3	146.2	21.9	3,067	524	83	60	30.76	3361.84	13447.37	4	6709.72	4.189E-04	0.77	0.89	0.14	
4/22/2015	14:30	21.0	726	3	149.4	21.7	2,143	421	80	90	28.16	2349.01	9396.06	4	4688.27	2.927E-04	0.49	0.57	0.09	
4/22/2015	15:00	21.0	754	3	151.6	20.0	1,864	351	81	120	29.14	2043.19	8172.77	4	4077.90	2.546E-04	0.45	0.51	0.08	
4/22/2015	15:30	21.0	699	3	152.9	19.0	2,682	304	89	150	26.95	2939.83	11759.32	4	5867.45	3.663E-04	0.59	0.69	0.11	
4/22/2015	16:00	21.0	717	3	153.3	20.1	2,541	426	83	180	27.63	2785.28	11141.10	4	5558.98	3.470E-04	0.58	0.67	0.11	
4/22/2015	16:30	21.0	806	3	153.9	20.0	2,162	413	81	210	31.03	2369.84	9479.36	4	4729.84	2.953E-04	0.55	0.64	0.10	
4/22/2015	17:00	21.0	815	3	152.7	19.7	2,295	445	81	240	31.44	2515.63	10062.51	4	5020.80	3.134E-04	0.59	0.68	0.11	
4/22/2015	17:30	21.0	792	3	153.6	19.6	2,092	408	80	270	30.50	2293.11	9172.45	4	4576.70	2.857E-04	0.52	0.61	0.10	
4/22/2015	18:00	21.0	777	3	153.9	20.3	1,867	354	81	300	29.91	2046.48	8185.93	4	4084.46	2.550E-04	0.46	0.53	0.08	
4/22/2015	18:30	21.0	819	3	153.3	20.4	1,710	321	81	330	31.56	1874.39	7497.55	4	3740.99	2.335E-04	0.44	0.51	0.08	
4/22/2015	19:00	21.0	826	3	153.5	21.3	2,007	387	81	360	31.82	2199.94	8799.76	4	4390.74	2.741E-04	0.52	0.61	0.10	
4/22/2015	19:30	21.0	832	3	152.8	22.7	2,193	365	83	390	32.09	2403.82	9615.28	4	4797.65	2.995E-04	0.58	0.67	0.11	
4/22/2015	20:00	21.0	811	3	152.7	23.0	2,050	343	83	420	31.28	2247.07	8988.29	4	4484.81	2.800E-04	0.53	0.61	0.10	
4/22/2015	20:30	21.0	806	3	152.6	24.3	2,134	374	82	450	31.09	2339.15	9356.60	4	4668.58	2.915E-04	0.54	0.63	0.10	
4/22/2015	21:00	21.0	835	3	151.8	24.7	2,207	398	82	480	32.26	2419.17	9676.67	4	4828.28	3.014E-04	0.58	0.67	0.11	
4/22/2015	22:00	21.0	710	3	150.9	26.1	1,809	354	80	540	27.47	1982.91	7931.62	4	3957.57	2.471E-04	0.41	0.47	0.08	
4/22/2015	23:00	21.0	961	3	151.3	26.3	1,451	288	80	600	37.15	1590.49	6361.96	4	3174.37	1.982E-04	0.44	0.51	0.08	
4/23/2015	0:00	21.0	850	3	150.7	26.4	1,078	210	81	660	32.89	1181.63	4726.53	4	2358.35	1.472E-04	0.29	0.34	0.05	
4/23/2015	8:00	21.0	966	3	148.8	27.6	968	198	80	1140	37.50	1061.08	4244.23	4	2117.71	1.322E-04	0.30	0.34	0.06	
4/23/2015	9:00	21.0	910	3	150.6	25.9	878	177	80	1200	35.22	962.41	3849.62	4	1920.81	1.199E-04	0.25	0.29	0.05	
4/23/2015	10:00	21.0	873	3	151.3	24.3	857	154	82	1260	33.75	939.39	3757.55	4	1874.87	1.170E-04	0.24	0.27	0.04	
4/23/2015	11:00	21.0	865	3	152.0	23.6	838	162	81	1320	33.40	918.56	3674.24	4	1833.30	1.145E-04	0.23	0.27	0.04	
4/23/2015	12:00	21.0	888	3	152.7	21.2	807	148	82	1380	34.25	894.58	3538.32	4	1765.48	1.102E-04	0.23	0.26	0.04	
4/23/2015	13:00	21.0	791	3	153.9	20.7	742	150	80	1440	30.45	813.33	3253.32	4	1623.28	1.013E-04	0.19	0.21	0.03	
4/23/2015	15:00	21.0	830	3	151.6	20.6	688	128	81	1560	32.07	754.14	3016.56	4	1505.15	9.397E-05	0.18	0.21	0.03	
4/23/2015	17:00	21.0	814	3	153.1	19.6	511	98	81	1680	31.38	560.12	2240.50	4	1117.92	6.979E-05	0.13	0.15	0.02	
4/23/2015	19:00	21.0	820	3	151.9	19.4	420	85	80	1800	31.67	460.38	1841.50	4	918.84	5.736E-05	0.11	0.13	0.02	
4/23/2015	21:00	21.0	816	3	153.6	20.1	331	63	81	1920	31.43	362.82	1451.28	4	724.13	4.521E-05	0.09	0.10	0.02	
4/23/2015	23:00	21.0	832	3	153.9	21.6	124	21	83	2040	32.03	135.92	543.68	4	271.28	1.694E-05	0.03	0.04	0.01	
4/24/2015	0:00	21.0	796	3	152.6	21.9	116	19	84	2100	30.71	127.15	508.61	4	253.77	1.584E-05	0.03	0.03	0.01	
4/24/2015	8:00	21.0	915	3	151.0	21.3	98	16	84	2580	35.39	107.86	431.44	4	215.27	1.344E-05	0.03	0.03	0.01	
4/24/2015	10:00	21.0	846	3	151.6	21.6	90	12	87	2700	32.69	98.98	395.92	4	197.55	1.233E-05	0.02	0.03	0.00	
4/24/2015	12:00	21.0	792	3	153.2	20.2	81	14	83	2820	30.52	88.35	353.39	4	176.33	1.101E-05	0.02	0.02	0.00	
4/24/2015	13:00	21.0	816	3	153.9	19.7	65	13	80	2880	31.41	71.36	285.43	4	142.42	8.891E-06	0.02	0.02	0.00	
Average		21.0	814	3.0	151.1	22.0	1421	251	82		31.47	1557.28	6229.13	4	3108.10	1.940E-04	0.37	0.42	0.07	
Bws =	0.088	Bsw =	0.06																	

Total Pounds of Carbon Recovered as Emissions: 17.59  
 Total Pounds of Gasoline Vapor Recovered as Emissions: 20.35  
 Total Gallons of Gasoline Recovered as Emissions: 3.26  
 (This Number Represents the Gallons Recovered via Vapors, Not Total Liquids)

## AFVR Definitions and Equations

$Qstd = (60 \text{ sec/min}) (1 - Bws) (\text{velocity}) (\text{Pipe ID sq.ft.}) [(528 \text{ oR} / (\text{Temp.} + 460))] (\text{Listed As Flow Above})$

$Bws = (B_{wsw} / 18 \text{ lb-mole H}_2\text{O}) / [(1/28.84 \text{ lb-mole dry air}) + B_{wsw} / 18 \text{ lb-mole H}_2\text{O}]$

$PPMd = (PPM_w) / (1 - Bws)$        $PPMc = (PPM) (K)$

$Cc = Ccm (62.43 \text{ E } -9 \text{ lb-m}^3/\text{mg-ft}^3)$        $PMRg = (PMRc) (\text{Mg/Mcg})$

Bgs = below top of casing

$Bws = (B_{wsw} / 18 \text{ lb-mole H}_2\text{O}) / [(1/28.84 \text{ lb-mole dry air}) + B_{wsw} / 18 \text{ lb-mole H}_2\text{O}]$

$Qstd = (60 \text{ sec/min})(1 - Bws)(V)(A)(\text{Temp deg Rankin})$

Bgs = below top of casing

Bws - water vapor % by volume

PPMpre = measured directly from Photo Ionization Detector (PID) pre-treatment

PPMpost = measured directly from PID post-treatment

Bwsw - pounds of water per pound of dry air, derived from the psychometric chart (temp Vs relative hum)

PPMw = PPM measured (wet Conc.)

K = # of carbons in calibration gas (isobutylene)

PPMc = PPMv, volumetric concentration of VOC emissions as carbon, dry basis, at STP

Ccm = mg/dsm<sup>3</sup>, mass concentration of VOC emissions as carbon

Mc = 12.01 mg/mg-mole, molecular wt. of carbon

K<sub>3</sub> = 24.07 dsm<sup>3</sup>/10<sup>6</sup> mg-mole, mass to volume conversion factor at stp

Cc = lb/dscf, mass concentration of VOC emissions as carbon, dry basis, at STP

PMRc = lb/hr, pollutant mass removal rate of VOC's as carbon

PMRg = lb/hr, pollutant mass removal rate of VOC's as gasoline

Mcg = 89 mg/mg-mole, weight of carbon in gasoline molecule

PPMd = "dry" concentration

Mg = 103 mg/mg-mole, molecular wt. of gasoline

Qstd - Flow at DSCFM

Ccm = PPMc (Mc/K<sub>3</sub>)

PMRc = Cc (Qstd) (60 min/hr)

Reference:

North Carolina Department of Natural Resources, Division of Waste Management, Underground Storage Tank Section, Appendix B, Report Formats, April 2001.



**SECTION F-2B  
EXTRACTION WELL STINGER DEPTH TABLE  
HOT SPOT #3005  
CHESNEE, SOUTH CAROLINA  
SCDHEC UST PERMIT #12719  
APRIL 22-24, 2015**

Well #	MW-1
Elapsed Time	Stinger Depth (ft)*
0	24.0
0.5	24.5
1	25.0
1.5	25.5
2	26.0
2.5	26.5
3	27.0
3.5	27.5
4	28.0
4.5	28.5
5	29.0
5.5	29.5
6	30.0
6.5	30.0
7	30.0
7.5	30.0
8	30.0
9	30.0
10	30.0
11	30.0
19	30.0
20	30.0
21	30.0
22	29.0
23	28.5
24	28.0
26	27.0
28	28.0
30	27.0
32	26.5
34	27.0
35	27.0
43	27.0
45	26.5
47	28.0
48	29.0

\*Measured relative to the top of the well casing.

**SECTION F-3  
VACUUM DATA TABLE  
HOT SPOT #3005  
CHESNEE, SOUTH CAROLINA  
SCDHEC UST PERMIT #12719  
APRIL 22-24, 2015**

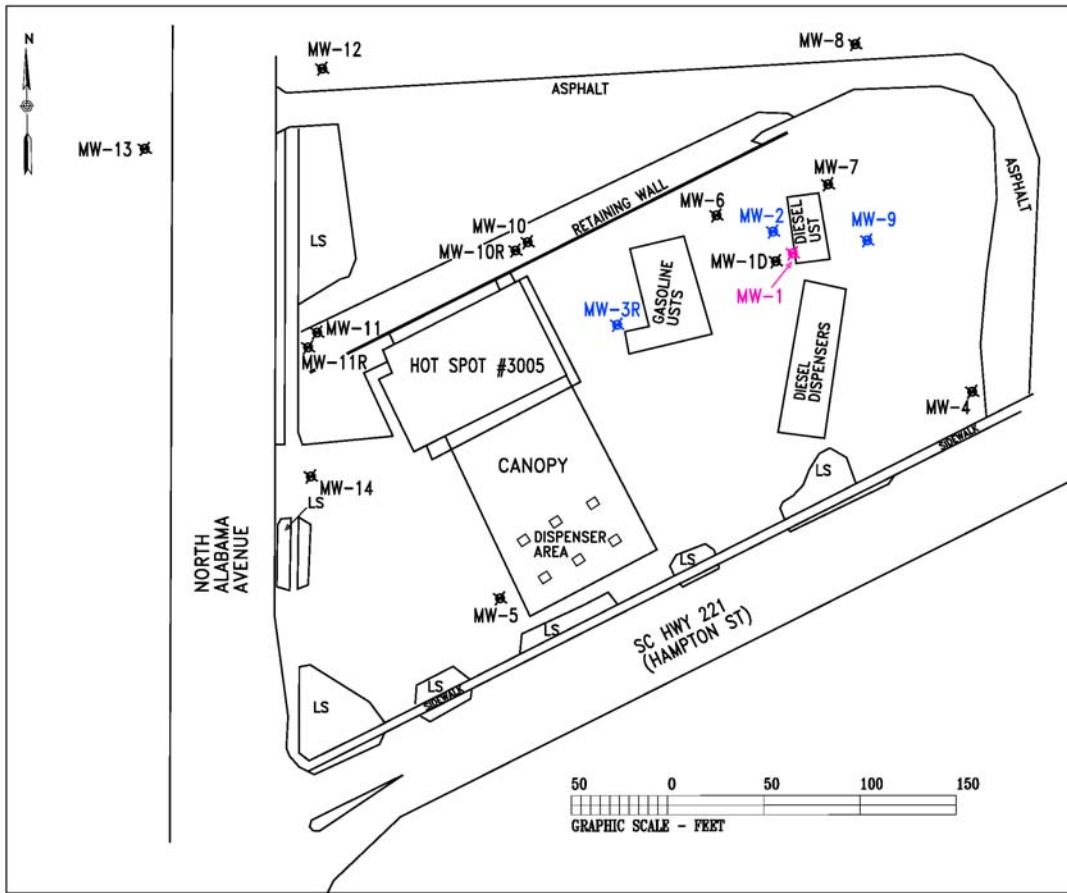
<b>Well #</b>	<b>MW-2</b>	<b>Well #</b>	<b>MW-3R</b>	<b>Well #</b>	<b>MW-9</b>
<b>Elapsed Time</b>	<b>Vacuum (in H2O)</b>	<b>Elapsed Time</b>	<b>Vacuum (in H2O)</b>	<b>Elapsed Time</b>	<b>Vacuum (in H2O)</b>
0	0.0	0	0.0	0	0.0
0.5	0.0	0.5	0.0	0.5	0.0
1	0.3	1	0.0	1	0.1
1.5	0.4	1.5	0.0	1.5	0.1
2	0.4	2	0.0	2	0.1
2.5	0.5	2.5	0.1	2.5	0.1
3	0.8	3	0.1	3	0.1
3.5	0.9	3.5	0.1	3.5	0.1
4	1.0	4	0.2	4	0.2
4.5	1.2	4.5	0.2	4.5	0.2
5	1.3	5	0.2	5	0.3
5.5	1.3	5.5	0.2	5.5	0.3
6	1.4	6	0.2	6	0.3
6.5	1.4	6.5	0.4	6.5	0.4
7	1.5	7	0.4	7	0.4
7.5	1.6	7.5	0.4	7.5	0.4
8	1.6	8	0.5	8	0.4
9	2.0	9	0.5	9	0.4
10	2.1	10	0.5	10	0.4
11	2.2	11	0.5	11	0.4
19	2.3	19	0.5	19	0.4
20	2.6	20	0.5	20	0.4
21	2.6	21	0.5	21	0.4
22	2.6	22	0.5	22	0.4
23	2.6	23	0.5	23	0.4
24	2.6	24	0.5	24	0.4
26	2.6	26	0.5	26	0.4
28	2.6	28	0.5	28	0.4
30	2.6	30	0.5	30	0.4
32	2.6	32	0.5	32	0.4
34	2.6	34	0.5	34	0.4
35	2.6	35	0.5	35	0.4
43	2.6	43	0.5	43	0.4
45	2.6	45	0.5	45	0.4
47	2.6	47	0.5	47	0.4
48	2.6	48	0.5	48	0.4

**SECTION F-7**  
**FREE PRODUCT THICKNESS TABLE**  
**HOT SPOT #3005**  
**CHESNEE, SOUTH CAROLINA**  
**SCDHEC UST PERMIT #12719**  
**APRIL 22-24, 2015**

<b>Well #</b>	<b>--</b>	<b>Depth to Product</b>	<b>Depth to Water</b>	<b>Product Thickness</b>
MW-1	Initial	n/a	24.87	n/a
	Final	n/a	28.97	n/a
MW-2	Initial	n/a	20.93	n/a
	Final	n/a	24.30	n/a
MW-3R	Initial	n/a	27.68	n/a
	Final	n/a	27.62	n/a
MW-9	Initial	n/a	23.96	n/a
	Final	n/a	24.43	n/a

**SECTION F-7**  
**FREE PRODUCT THICKNESS TABLE (GAUGING)**  
**HOT SPOT #3005**  
**CHESNEE, SOUTH CAROLINA**  
**SCDHEC UST PERMIT #12719**  
**MAY 22, 2015**

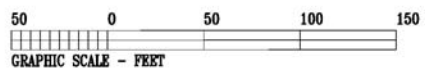
<b>Well #</b>	<b>Depth to Product</b>	<b>Depth to Water</b>	<b>Product Thickness</b>
MW-1	n/a	24.59	n/a



**LEGEND & ABBREVIATIONS:**

- ☒ MW = MONITORING WELL
- LS = LANDSCAPING
- ☒ RECOVERY WELL
- ☒ INFLUENCE WELL

ALL MW AND SAMPLE IDENTIFICATIONS ARE PRECEDED BY UST PERMIT #12719 (i.e. 12719-MW1)



**FIGURE F-8  
AFVR MAP**

HOT SPOT #3005  
107 HAMPTON STREET  
CHESNEE, SOUTH CAROLINA

TERRY PROJECT #	SCDHEC SITE ID #
2230.8G	12719
SCALE 1" = 50'	DATE May 2015

## **9. Recovery Water Disposal**

The disposal manifest for the recovery water generated during the April 22-24, 2015 AFVR Event is included in Appendix G.

**G. GRANULATED ACTIVATED CARBON INSTALLATION**

Not Applicable. No granulated activated carbon units were installed during this scope of work.

## **H. RESULTS & DISCUSSION**

### **1. Assessment Results**

During this scope of work, one 48-hour AFVR event was performed consecutively at the subject site. Prior to and completion of the April 2015 event, no free-phase product was measured in the recovery or influence wells. A total of 20.35 pounds of gasoline vapors (approximate equivalent of 3.26 gallons of gasoline) were recovered as emissions during the event.

On May 22, 2015 approximately thirty (30) days after the AFVR Event, a gauging event was performed on MW-1 to obtain current data. No free-phase product was measured. Depth to groundwater was measured at 24.59 feet below the top of casing. The Gauging Log is provided in Appendix B.

The AFVR event was successful at recovering contaminant mass and exposing the smear zone to vacuum. As such, it is recommended to conduct two consecutive 48-hour AFVR events on monitoring/recovery wells MW-1 and MW-2 (Event 1), concurrently and monitoring/recovery well MW-3R (Event 2) in the source area.

### **2. Aquifer Evaluation Results**

Not Applicable

### **3. Fate & Transport Results**

Not Applicable

### **4. Tier 1 Risk Evaluation**

Not Applicable

### **5. Tier 2 Risk Evaluation**

Not Applicable



**I. TABLES**

**1. Soil Analytical Data**

Table 1 Soil Analytical Data - Not Applicable

**2. Potentiometric Data**

Table 2 Potentiometric Data - Not Applicable

**3. Laboratory Data**

Table 3 Groundwater Laboratory Data - Not Applicable

**4. Aquifer Characteristics**

Table 4 Aquifer Characteristics - Not Applicable

**5. Site Conceptual Model**

Table 5 Site Conceptual Model - Not Applicable

**J. FIGURES**

**1. Topographic Map**

Figure 1 Topographic Map - Attached

**2. Site Base Map**

Figure 2 Site Base Map - Attached

**3. CoC Site Maps**

Figure 3 Soil CoC Map - Not Applicable

Figure 4 Groundwater CoC Map - Not Applicable

**4. Site Potentiometric Maps**

Figure 5 Site Potentiometric Map – Not Applicable

**5. Geologic Cross Sections**

Figure 6 Geologic Cross Sections - Not Applicable

**6. Predicted Migration and Attenuation of CoCs**

Figure 7 Predicted Migration and Attenuation of CoCs - Not Applicable

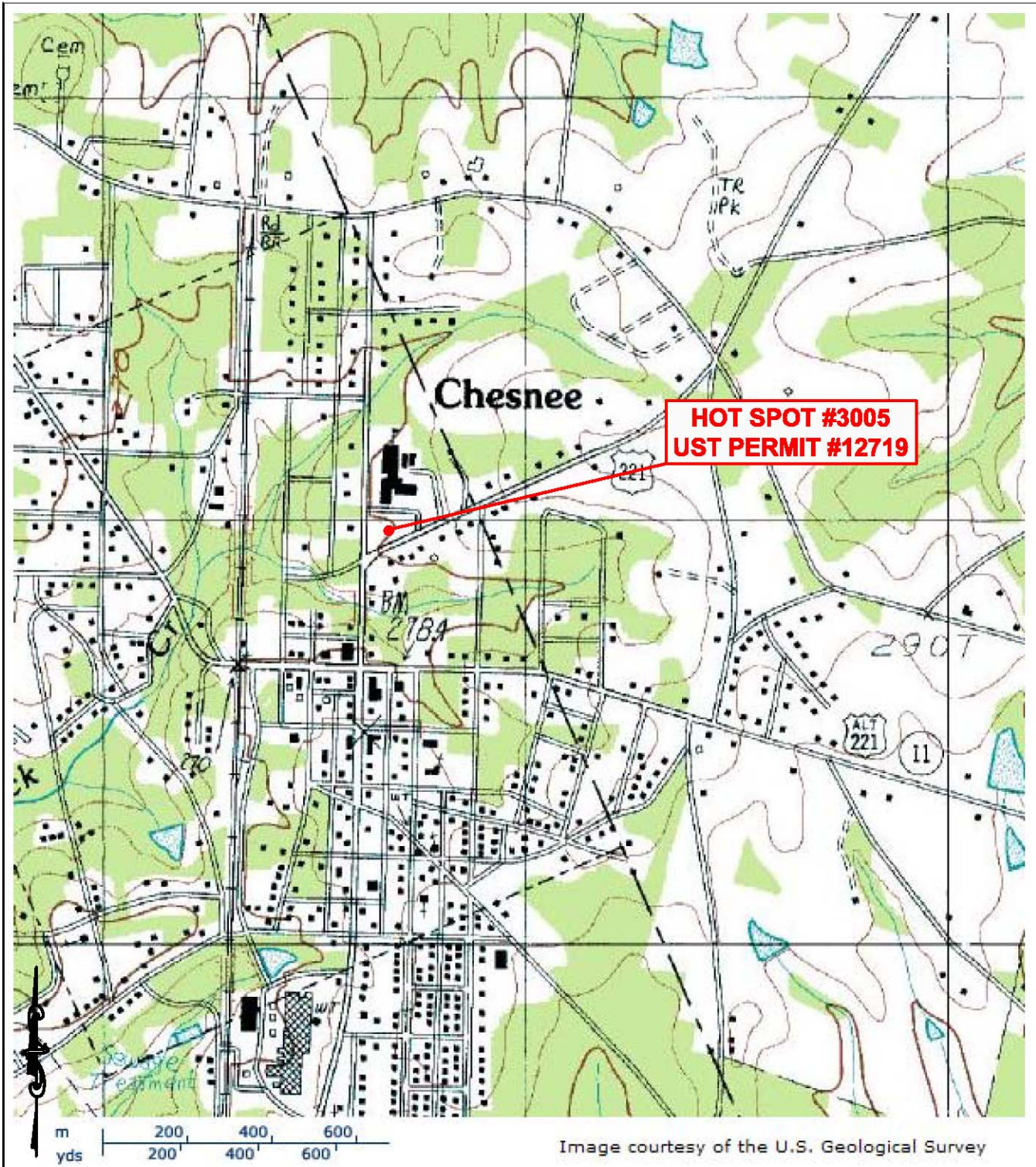


Image courtesy of the U.S. Geological Survey



**FIGURE 1  
TOPOGRAPHIC MAP**

**HOT SPOT #3005  
107 HAMPTON STREET  
CHESNEE, SOUTH CAROLINA**

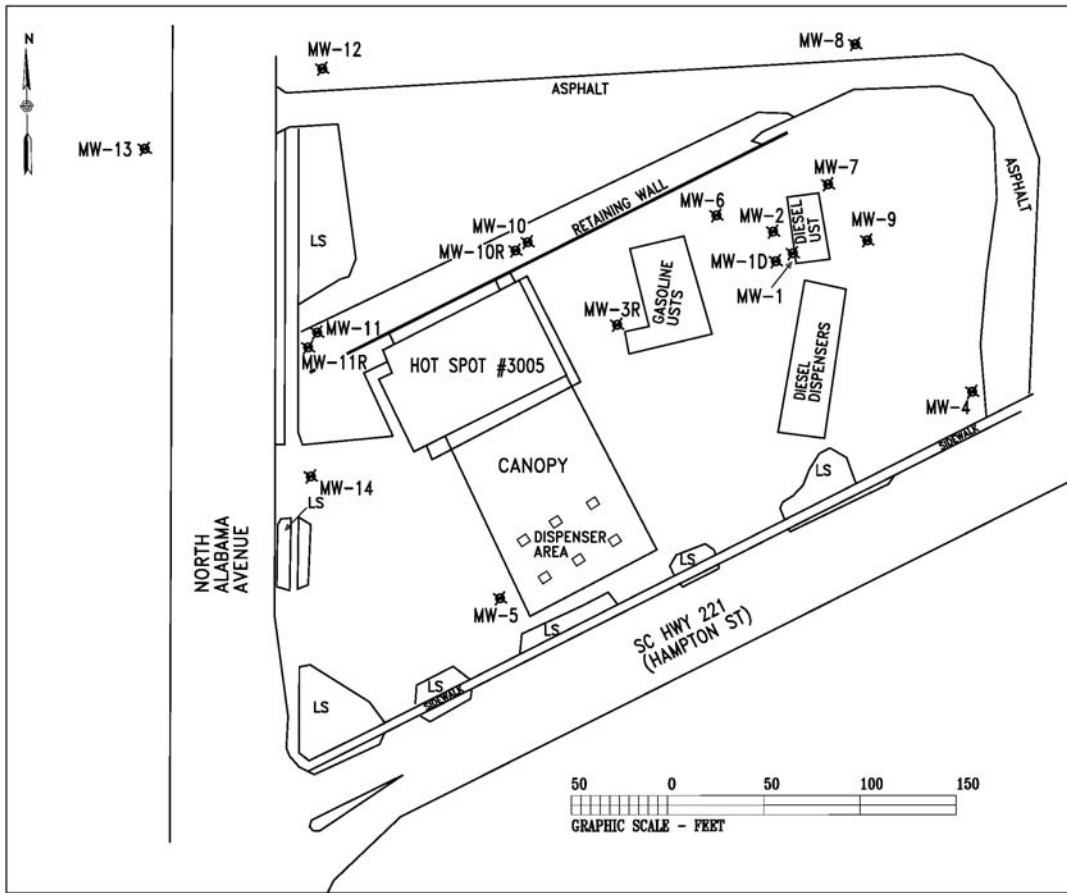
*... providing our clients with the best services available,  
actually understanding our clients objectives,  
and making their objectives our own!*

PO Box 25  
Summerville, South Carolina 29484  
(800) 325-0605 (843)-873-8200 fax: (843)-873-8765

SIZE B	TERRY Project No. 2230.8G	DWG NO. Figure 1 Topographic Map	REV
-----------	------------------------------	-------------------------------------	-----

SCALE: As Shown

DATE: May 2015



**LEGEND & ABBREVIATIONS:**  
 ✕ MW = MONITORING WELL  
 LS = LANDSCAPING  
 ALL MW AND SAMPLE IDENTIFICATIONS ARE PRECEDED BY UST PERMIT #12719 (i.e. 12719-MW1)

**FIGURE 2  
 SITE BASE MAP**

HOT SPOT #3005  
 107 HAMPTON STREET  
 CHESNEE, SOUTH CAROLINA

TERRY PROJECT #	SCDHEC SITE ID #
2230.8G	12719
SCALE 1" = 50'	DATE May 2015

**K. APPENDICES**

**1. Appendix A: Site Survey**

Not Applicable

**2. Appendix B: Sampling Logs and Laboratory Data**

**3. Appendix C: Tax Map**

Not Applicable

**4. Appendix D: Soil Boring/Field Screening Logs**

Not Applicable

**5. Appendix E: Well Completion Logs/SCDHEC 1903 Forms**

Not Applicable

**6. Appendix F: Aquifer Evaluation Forms**

Not Applicable

**7. Appendix G: Disposal Manifest**

**8. Appendix H: Local Zoning Regulations**

Not Applicable

**9. Appendix I: Fate and Transport Modeling Data**

Not Applicable

**10. Appendix J: Access Agreements**

Not Applicable

**11. Appendix K: Data Verification Checklist**

**APPENDIX A**

**Site Survey  
(Not Applicable)**

## **APPENDIX B**

### **Sampling Logs and Laboratory Data**

**Groundwater Sampling Log**



**TERRY Environmental Services**  
CLIENTS FIRST ALWAYS

P.O. Box 25  
 Summerville, SC 29484  
 1-800-325-0605

Site Specific Information				Monitoring Well Information				
Terry Project ID		2230.8G		Well ID		12719 - MW1		
SCDHEC Permit No.		12719		Testing Parameters		Gauge Well Only		
Project Name		Hot Spot #3005						
Date		5/22/2015						
Field Personnel		AK		Well Diameter		2	in	
General Weather		Sunny		Screened Interval			ft	
Ambient Air Temperature		75		Total Well Depth (nearest 0.1')		30.4	ft	
Quality Assurance				Depth to Groundwater (nearest 0.01')		24.59	ft	
pH Meter Serial Number	Horiba U-52-2	Conductivity Meter Serial Number	Horiba U-52-2	Length of Water Column			ft	
	VWKAUMKJ		VWKAUMKJ	1 Casing Volume (0.163)			ft	
	Calibration Constant		4.00	Calibration Constant	4.49 mS/cm	3 Casing Volumes (0.489)		
	Calibration Constant		6.86	Calibration Constant	53.0 mS/cm	Total Volume Purged		
	Calibration Constant		9.18	Calibration Constant	58.7 mS/cm	Purge Technique Utilized (bailer, pump)		
Last Calibration (time)		Last Verification (time)		Well Yield		Low	Medium	High
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Volume (gal)								
Time (military)								
pH (su)								
Spec Conductivity (mS/cm)								
Water Temperature (°C)								
Turbidity (NTU)								
Dissolved Oxygen (mg/L)								
Well Condition Information				Additional Comments				
-overall condition acceptable?								
-well cap acceptable?								
-manhole and cover acceptable?								
-well pad acceptable?								
-area safe?								
-other comments								

TAG  
 BOTTOM OF  
 WELL TO  
 VERIFY  
 WELL  
 DEPTH.  
 WRITE  
 BELOW TO  
 NEAREST  
 0.1'

36.4



**APPENDIX C**

**Tax Map  
(Not Applicable)**

**APPENDIX D**

**Soil Boring/Field Screening Logs  
(Not Applicable)**

**APPENDIX E**

**Well Completion Logs/SCDHEC 1903 Forms  
(Not Applicable)**

**APPENDIX F**

**Aquifer Evaluation Forms  
(Not Applicable)**

**APPENDIX G**

**Disposal Manifest**

# US Water Recovery

<b>Non-Hazardous Manifest: Waste Water or Drums</b>		<b>Number:</b>		
1. Generator's EPA ID# (if applicable):		Waste ID Number:		
2. Generator's Name and Mailing Address: Terry Environmental Services Inc. P.O. Box 25 Summerville, SC 29484 Store # 3005 Hot Spot Cherokee SC		Phone (813) 873-8200 P O #: 2230-86		
3. Agent of Generator and Mailing Address:		Phone ( ) P O #:		
4. Transporter Company Name: Goodsell Transport 5110 Old Mt Holly Rd		Phone ( )		
Truck & Trailer License Number: Goose Creek SC 29445				
5. Transporter U.S. EPA ID#:				
6. Facility Name and Site Address: US Water Recovery 511 Old Mt. Holly Rd. Goose Creek, SC 29445		Phone: (843) 797-8674 Fax: (843) 797-2126	Mailing Address: US Water Recovery 511 Old Mt. Holly Rd. Goose Creek, SC 29445 Phone: (843) 797-3111 Fax: (843) 797-1884	
7. Facility U.S. EPA ID#:				
Start Level:	End Level:	Total Gallons: 4400	Tank Number	
8. U.S. DOT Description	Container		Unit	Quantity
	No.	Type		
a. Non-Hazardous, non-regulated waste water	103	VT	Gal	4400
9. Generator's Certification: I hereby declare that the contents of this consignment are not hazardous by definition or listing and are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and the laws of the State of South Carolina. I further certify that the contents of this consignment are as represented by the description contained on the Waste Profile Form previously submitted to and approved by the Designated Facility.				
Printed/Typed Name: Tyler Waterhouse		Signature: <i>[Signature]</i>		Date: 4/24/15
10. Transporter Acknowledgement of Receipt of Materials				
Printed/Typed Name: David Kinross		Signature: <i>[Signature]</i>		Date: 4/24/15
11. Discrepancy Indication space:				
12. Facility Owner or Operator: Certification of Receipt of Materials				
Printed/Typed Name: David Kinross		Signature: <i>[Signature]</i>		Date: 4-24-15

White - Facility      Yellow - Office      Pink - Transporter      Blue - Generator

2 23086

**APPENDIX H**

**Local Zoning Regulations  
(Not Applicable)**

## **APPENDIX I**

### **Fate and Transport Modeling Data (Not Applicable)**



**APPENDIX J**

**Access Agreements  
(Not Applicable)**

## **APPENDIX K**

### **Data Verification Checklist**

## Contractor Checklist – Hot Spot #3005

**UST Permit #12719 - TERRY Project #2230.8G**

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
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? (Table 1)			X
33	Has the potentiometric data for the site been provided in tabular format? (Table 2)			X
34	Has the current and historical laboratory data been provided in tabular format?			X

Item #	Item	Yes	No	N/A
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 1)	X		
38	Has the site base map been provided with all required elements? (Figure 2)	X		
39	Have the CoC site maps been provided? (Figure 3 & Figure 4)			X
40	Has the site potentiometric map been provided? (Figure 5)			X
41	Have the geologic cross-sections been provided? (Figure 6)			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? (Appendix A)			X
44	Have the sampling logs, chain of custody forms, and the analytical data package been included with all required elements? (Appendix B) - Gauging Log Only	X		
45	Is the laboratory performing the analyses properly certified?			X
46	Has the tax map been included with all necessary elements? (Appendix C)			X
47	Have the soil boring/field screening logs been provided? (Appendix D)			X
48	Have the well completion logs and SCDHEC Form 1903 been provided? (Appendix E)			X
49	Have the aquifer evaluation forms, data, graphs, equations, etc. been provided? (Appendix F)			X
50	Have the disposal manifests been provided? (Appendix G)	X		
51	Has a copy of the local zoning regulations been provided? (Appendix H)			X
52	Has all fate and transport modeling been provided? (Appendix I)			X
53	Have copies of all access agreements obtained by the contractor been provided? (Appendix J)			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		

Explanation for missing and incomplete information?

Not Applicable for the current directive.



Department of Health and Environmental Control  
2600 Bull Street, Columbia, SC 29201

Commissioner: Douglas E. Bryant

Board: John H. Burriss, Chairman  
William M. Hull, Jr., MD, Vice Chairman  
Roger Leaks, Jr., Secretary

Richard E. Jabbour, DDS  
Cyndi C. Mosteller  
Brian K. Smith  
Rodney L. Grandy

Promoting Health, Protecting the Environment

November 21, 1995

R. L. Jordan Oil Company  
Attn: ~~Tony Hamlett~~ *Judith A. Laughter*  
Post Office Box 2527  
Spartanburg, SC 29304

*Mailed 11/29/95*

Re: Hot Spot #36  
Site ID# 12719  
Environmental Insurance Statement  
Spartanburg County

Dear Mr. Hamlett:

The Underground Storage Tank Program (USTP) of the South Carolina Department of Health and Environmental Control (SCDHEC) has reviewed the departmental file for the referenced facility and determined that a release of petroleum hydrocarbons has occurred. To proceed with the qualification process for the State Underground Petroleum Environmental Response Bank (SUPERB) Act, the following information is required:

- Written confirmation of the existence or non-existence of an environmental insurance policy or financial responsibility mechanism for this site. This information must be signed by the responsible party and a notary public. For your convenience, an insurance statement form has been enclosed. If an environmental insurance policy existed at the time of the release, a copy of the policy with all endorsements must be submitted with the insurance statement.

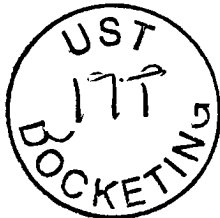
The requested information must be submitted to my attention on or before **December 15, 1995** with a copy of this letter. Qualification for SUPERB funds cannot occur until this information is submitted.

On all correspondence relating to this site, please reference the **Site ID number**. If you have any questions, please call me at (803) 734-4663.

Sincerely,

*Leigh Ann Britton*

Leigh Ann Britton, Hydrogeologist  
Technical Section  
Underground Storage Tank Program



enc: Insurance Statement

Commissioner: Douglas E. Bryant

Board: John H. Burriss, Chairman  
William M. Hull, Jr., MD, Vice Chairman  
Roger Leaks, Jr., Secretary

Richard E. Jabbour, DDS  
Cyndi C. Mosteller  
Brian K. Smith  
Rodney L. Grandy

Promoting Health, Protecting the Environment

November 21, 1995

R. L. Jordan Oil Company  
Attn: Tommy Hamlett  
Post Office Box 2527  
Spartanburg, SC 29304

Re: Hot Spot #36  
Site ID# 12719  
Environmental Insurance Statement  
Spartanburg County

Dear Mr. Hamlett:

The Underground Storage Tank Program (USTP) of the South Carolina Department of Health and Environmental Control (SCDHEC) has reviewed the departmental file for the referenced facility and determined that a release of petroleum hydrocarbons has occurred. To proceed with the qualification process for the State Underground Petroleum Environmental Response Bank (SUPERB) Act, the following information is required:

- Written confirmation of the existence or non-existence of an environmental insurance policy or financial responsibility mechanism for this site. This information must be signed by the responsible party and a notary public. For your convenience, an insurance statement form has been enclosed. If an environmental insurance policy existed at the time of the release, a copy of the policy with all endorsements must be submitted with the insurance statement.

The requested information must be submitted to my attention on or before **December 15, 1995** with a copy of this letter. Qualification for SUPERB funds cannot occur until this information is submitted.

On all correspondence relating to this site, please reference the **Site ID number**. If you have any questions, please call me at (803) 734-4663.

Sincerely,



Leigh Ann Britton, Hydrogeologist  
Technical Section  
Underground Storage Tank Program

enc: Insurance Statement

## INSURANCE STATEMENT FORM

Site ID # 12719 is potentially eligible to receive state monies to assist you in site rehabilitation, if required. Before eligibility for State Underground Petroleum Environmental Response Bank (SUPERB) funds can be determined, written confirmation of the existence or non-existence of an environmental insurance policy for this site is required. Please complete the following information.

I do not have any insurance that would cover releases from underground storage tanks.

I have an insurance policy that covers releases from underground storage tanks.

My provider is: \_\_\_\_\_  
The policy deductible is: \_\_\_\_\_  
The policy limit is: \_\_\_\_\_

If you have this type of insurance, please include a copy of the policy with this report.

Signature: Judith A. Luattio

Date: Nov. 29, 1995

### To be Completed by Notary Public:

Sworn before me this 29<sup>th</sup> day of Nov, 1995.

Carolyn B. Grooms  
(Name)

Notary Public for the state of South Carolina.

My commission expires 07-24-05.

DEC 01 1995  
Commission Expires  
2005

Please affix State Seal if you are commissioned outside South Carolina.

12/18  
jhr

DEC 17 1995

R. L. Jordan Oil Company  
Attn: Judith Laughter  
Post Office Box 2527  
Spartanburg, SC 29304

Re: Hot Spot #36  
Site ID: #12719  
Assessment Report received March 28, 1994  
Spartanburg County

Dear Ms. Laughter:

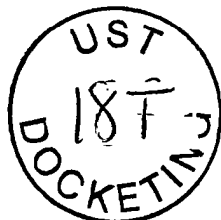
The Underground Storage Tank Program of the South Carolina Department of Health and Environmental Control (SCDHEC) has reviewed the assessment report dated March 28, 1995. The report documents that a release has occurred at the site and that additional actions will be necessary.

According to our records, the release was reported to the SCDHEC on November 3, 1993, subsequent to the early detection incentive program. Therefore, in accordance with Section 44-2-40(B) of the Act, you are responsible for the first \$25,000 for site rehabilitation. To insure that any expenditures you make apply to the first \$25,000, as this site is qualified to receive SUPERB funds, it is prudent for this agency to pre-approve such costs along with your technical plan of action. By law, the SUPERB account cannot compensate any costs that are not pre-approved.

The referenced report indicates concentration of chemicals of concern in the soil. To determine what risk the release may pose to the environment and public health, and in accordance with Section 280.65 of the South Carolina Underground Storage Tank Control Regulations, implementation of the scope of work as outlined in the enclosed Initial Ground-Water Assessment document is necessary. Since the above scope of work is detailed in the Initial Ground-Water Assessment document, a separate plan is not required.

Please note that the maximum approvable amount for the Initial Ground-Water Assessment is \$851.00. Upon receipt of the signed Initial Ground-Water Assessment invoice form, Initial Ground-Water Assessment Report, and a copy of your cancelled check (front and back) for this scope of work, up to \$851.00 will be applied toward your deductible.

Implementation of the Initial Assessment Plan may proceed upon receipt of this correspondence. The required monitoring well





Ms. Laughter

Page 2

approval is enclosed. **The report should be submitted on or before 90 days from the date of this letter.** A list of contractors that have provided services to customers is also enclosed for your convenience.

On all correspondence regarding this site, please reference site ID #12719 and cost agreement #01425. Per Section 44-2-40 of the SUPERB Statute, the completed Initial Ground-Water Assessment Invoice form must be submitted on or before **120 days from the date of this letter.** If you have any questions concerning this correspondence, please contact Leigh Ann Britton at (803) 734-4663.

Sincerely,  
Technical Section  
Underground Storage Tank Program

*Leigh Ann Britton*  
Leigh Ann Britton, Hydrogeologist

*DG Baize*  
David G. Baize, Manager

enc: Initial Ground-Water Assessment Document  
Monitoring Well Approval  
Tank Consultants and Contractors List  
Initial Ground-Water Assessment Invoice Form

cc: Aubrey Stewart, Appalachia III District EQC  
Administrative Section

- - - Z 761 897 354



# Receipt for Certified Mail

No Insurance Coverage Provided  
Do not use for International Mail  
(See Reverse) #127M

Sent to Attn: Judith Weynt + Gr K.L Jordan Oil Company	
Street and No. P.O. Box 2527	
P.O., State and ZIP Code Spartanburg, SC 29304	
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	\$
Postmark or Date 3/27/96	

PS Form 3800, March 1993

**STICK POSTAGE STAMPS TO ARTICLE TO COVER FIRST CLASS POSTAGE,  
CERTIFIED MAIL FEE, AND CHARGES FOR ANY SELECTED OPTIONAL SERVICES (see front).**

1. If you want this receipt postmarked, stick the gummed stub to the right of the return address leaving the receipt attached and present the article at a post office service window or hand it to your rural carrier (no extra charge).
2. If you do not want this receipt postmarked, stick the gummed stub to the right of the return address of the article, date, detach and retain the receipt, and mail the article.
3. If you want a return receipt, write the certified mail number and your name and address on a return receipt card, Form 3811, and attach it to the front of the article by means of the gummed ends if space permits. Otherwise, affix to back of article. Endorse front of article **RETURN RECEIPT REQUESTED** adjacent to the number.
4. If you want delivery restricted to the addressee, or to an authorized agent of the addressee, endorse **RESTRICTED DELIVERY** on the front of the article.
5. Enter fees for the services requested in the appropriate spaces on the front of this receipt. If return receipt is requested, check the applicable blocks in item 1 of Form 3811.
6. Save this receipt and present it if you make inquiry.

102595-93-Z-0478

PS Form 3800, March 1993 (Reverse)

South Carolina  
**DHEC**

Department of Health and Environmental Control  
2600 Bull Street, Columbia, SC 29201

Commissioner: Douglas E. Bryant

Board: John H. Burriss, Chairman  
William M. Hull, Jr., MD, Vice Chairman  
Roger Leaks, Jr., Secretary

Richard E. Jabbour, DDS  
Cyndi C. Mosteller  
Brian K. Smith  
Rodney L. Grandy

Promoting Health, Protecting the Environment

FL  
3/27/96  
su

**Certified Mail**

R. L. Jordan Oil Company  
Attn: Judith Laughter  
Post Office Box 2527  
Spartanburg, SC 29304

MAR 27 1996

Re: Hot Spot #36  
Late Initial Ground-Water Assessment Report  
Site ID 12719  
Spartanburg County

Dear Ms. Laughter:

In a letter dated December 17, 1995, the Bureau of Underground Storage Tank Management directed implementation of an Initial Ground-Water Assessment. The report for this scope of work was due on March 15, 1996. To date, however, the report has not been received. Please submit the Initial Ground-Water Assessment Report by **April 29, 1996**. Please let me know if you cannot submit this report on or before the due date.

On all correspondence concerning this site, please reference the Site ID Number listed above. If you have any questions regarding this correspondence, please call Leigh Ann Britton at (803) 734-4663.

Sincerely,

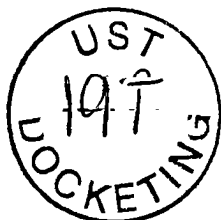
Technical Section  
Bureau of Underground Storage Tank Management



Leigh Ann Britton, Hydrogeologist



David G. Baize, Manager



GR D WATER PROTECT

(AUTO)

THE FOLLOWING FILE(S) ERASED

FILE	FILE TYPE	OPTION	TEL NO.	PAGE	RESULT
021	TRANSMISSION		918642718124	08	OK

Post-it® Fax Note 7671		Date	4-12-69	# of pages	8
To	Jim Buscher		From	Leigh Ann Britton	
Co./Dept.			Co.	SCDHEC	
Phone #	a		Phone #	(803) 734-4163	
Fax #	(804) 271-8124		Fax #	(803) 734-3604	

ERRORS

- 1) HANG UP OR LINE FAIL
- 2) BUSY
- 3) NO ANSWER
- 4) NO FACSIMILE CONNECTION

Faxed IOWA Doc  
 J  
 12-17 letter





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"OVER ONE HUNDRED YEARS OF SERVICE"



1310 Lowndes Hill Road  
Greenville, SC 29607  
(803) 271-2840 Fax (803) 271-8124

April 29, 1996

SCDHEC  
Technical Section  
Bureau of Underground Storage Tank Management  
2600 Bull Street  
Columbia, South Carolina 29201

Attn: Ms. Leigh Ann Britton

Re: Hot Spot # 36  
Initial Ground-Water Assessment Report  
Site ID 12719  
Chesnee, South Carolina

**RECEIVED**

MAY 15 1996

Bureau of Underground  
Storage Tank Management

Dear Ms. Britton:

Froehling & Robertson, Inc. (F&R) is pleased to present the attached Initial Ground-Water Assessment (IGWA) Report for the above referenced site. The facility owner is R.L. Jordan Oil Company (R.L. Jordan) of Spartanburg, South Carolina.

Prior to beginning site work, F&R reviewed the March 24, 1994 **Report of Findings: Soil Assessment** prepared by The Fletcher Group, Inc. Based on this report, monitoring well MW-1 was located near SB-2 because boring SB-2 had contained soils with the highest concentration of BTEX and TPH compounds encountered during the soil assessment activities.

On April 23, 1996, F&R commenced installation of one ground-water monitoring well at the facility for the purpose of performing an Initial Ground-Water Assessment. Soil samples were collected at five foot intervals and screened with a photo-ionization detector (PID). PID measurements ranged from 1.2 parts per million (ppm) at a depth of 8.5 feet to 41 ppm at a depth of 23.5 feet. Ground-water was encountered during drilling at approximately 35 feet below land surface (BLS) and was observed at approximately 27.5 feet BLS an hour and a half later. Because of this rapid change in water level the augers were left in the ground to maintain the borehole over night. The next day, April 24, 1996, water level



Hot Spot # 36  
R.L. Jordan Oil Company

IGWA Site 12719  
Page 2

measurements indicated a static level of 22.5 feet BLS. It was decided to set the bottom of the well at 30 feet BLS with fifteen feet of screen in order to be certain that the screen "split" the water table and to allow for seasonal ground-water fluctuations. The well was developed by hand-bailing until relatively clear water was obtained. Ground-water samples were collected and sent to F&R's South Carolina Certified laboratory for analysis of benzene, toluene, ethylbenzene, xylenes (BTEX) and naphthalene as well as poly-aromatic hydrocarbons (PAH).

The receptor survey indicated underground utilities within 500 feet of the UST. These utilities are telephone approximately 100 feet north of the UST and telephone/sewer approximately 200 feet south of the UST. Additionally, since the subject facility is an operating gasoline station and convenience store, underground utilities associated with petroleum USTs are also present. F&R observed no evidence of public or private supply wells within 1000 feet of the subject site. Two unnamed tributaries to Little Buck Creek are located approximately 750 feet south and 900 feet northwest of the project site. An elementary school is located immediately north of the site.

Results of laboratory analysis are presented in the attached IGWA report and indicate that ground-water has been impacted at the subject site.

Due to time constraints, we are including two maps provided to us by R.L. Jordan to present the base site map information. The first is a general site map showing the facility's layout. The second, UST Area Map, is a more detailed map showing the location of the soil borings performed by The Fletcher Group in 1994 and the location of MW-1. A complete, scaled base map will be prepared in the future should additional work be required at the facility.

If you have any questions, please contact us (864) 271-2840.

Sincerely,  
**FROEHLING & ROBERTSON, INC.**



Craig A. Lee  
Staff Geologist

attachments

cc: Judy Laughter - R.L. Jordan

## INITIAL GROUND-WATER ASSESSMENT REPORT

Facility Name: Hot Spot # 36

Site ID Number: 12719

Owner's Name: R.L. Jordan Oil Company

Address: P.O. Box 2527; Spartanburg, SC 29304

Phone Number: (864) 585-2784

Contractor: Froehling & Robertson, Inc.

Address: P.O. Box 17186

Phone Number: (864) 271-2840

### Receptor and Site Data

Please place a check in the appropriate answer block for each question:

Receptor Survey Questions	No	Yes *
Is there a drinking water supply well(public or private, please indicate) or surface water supply intake within 1000 feet of the UST?	X	
Are irrigation or other non-drinking water wells located within 1000 feet of the UST?	X	
Are there other potential receptors (i.e., utilities, surface waters, wetlands) less than 500 feet from the UST?		X

\* If "yes" provide additional information:

Underground utilities include telephone (located approx. 100-200 feet north of UST) and telephone & sewer (located approx. 200 feet south of UST)

Is the current use of the site and surrounding properties commercial, residential, agricultural or industrial?

The property is commercial. Surrounding properties are commercial and residential. An elementary school is located adjacent to the north of the site.



## Initial Ground-Water Assessment Report

Site ID # 12719

## Soil and Monitoring Well Data

Primary Soil Type: Sandy SILTWell Installation Method and Date: Drill Rig / Hollow Stem Augers (6.25" I.D.)Development Method: Bailer (4/24/1996)

## Ground-Water Data

Depth to Ground Water: 22.50 feet below ground-surfaceWell Purging/Sampling Method: Bailer (4/24/1996)Date Sampled: 4/24/1996Free Product Thickness: No Free Product Observed**GROUND-WATER ANALYTICAL DATA**

Benzene (ug/l)	Toluene (ug/l)	Ethylbenzene (ug/l)	Xylenes (ug/l)	Naphthalene (ug/l)
27.4	88.3	46.0	170.1	55.7

Benzo(a)- anthracene (ug/l)	Benzo(b)- fluoranthene (ug/l)	Benzo(k)- fluoranthene (ug/l)	Chrysene (ug/l)	Dibenz(a,h)- anthracene (ug/l)
BDL	BDL	BDL	BDL	BDL

## Appendices

The appendices required for this report are as follows:

Appendix A. Well Construction Log

Appendix B. Laboratory Data

Appendix C. Site Base Map

Appendix D. Invoice Form

Report Completed By: 

(signature)

Date: April 29, 1996



Report No.: X-65-014

DATE: April 29, 1996

Client: R. L. Jordan Oil Company							
Project: Chesnee Hot Spot #36 Chesnee, South Carolina							
Boring No.: MW-1 (1 of 1)		Total Depth: 35.0'	Elev:		Location: See UST Area Map		
Type of Boring: 6-1/4" HSA			Started: 4/23/96	Completed: 4/24/96	Driller: C. Lanford		
Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	Sample Depth (Feet)	H-Nu Reading (ppm)	Water Level (Feet)	Well Log	REMARKS
	0.8	10" Concrete					Flush Manhole w/concrete
	1.0	2" gravel					
		Fill - Red sandy CLAY	3.5				Schedule 40 PVC pipe with bentonite-cement slurry
			5.0	2			
		Fill - Gray SAND	8.5				Bentonite Seal
			10.0	1			
			13.5				Additional sand backfill
	14.5		15.0	3			
		Residual - Red to brown sandy SILT	18.5				Slotted pipe with sand backfill
			20.0	32			
			23.5				PVC Endcap
			25.0	37			
		Residual - Brown sandy silty CLAY	28.5				Remainder of boring backfilled with sand
	30.0			30.0	41		
			33.5				Boring terminated at approximately 35.0 ft below existing surface.
	35.0		35.0	26			

\*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.



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CERTIFICATE OF ANALYSIS

April 29, 1996

Page 1 of 2

LAB #: 9604181  
 CLIENT: F&R Greenville  
 Attn: Craig Lee

PROJECT: Chesnee Hot Spot

SAMPLES COLLECTED BY: C. Lee  
 LAB RECEIPT: 04/25/96, 0936

<u>PARAMETER</u>	<u>ANALYSIS DATE/TIME</u>	<u>METHOD</u>	<u>ANALYST</u>
BTEX/Naphthalene	04/26/96, 1241	SW846/8260	EVY
PAH-Extraction	04/25/96, 0940	SW846/8270	TS
PAH	04/26/96, 1134	SW846/8270	EVY

**RESULTS:**

F&R #: 9604181-01  
 SAMPLE ID: MW-1  
 DATE/TIME: 04/24/96, 1530  
 TYPE: Water/Grab

**Det'n Limit:**

BTEX/Naphthalene (µg/L)		Det'n Limit:
Benzene	27.4	5
Ethylbenzene	46.0	5
Toluene	88.3	5
m,p-Xylene	70.2	5
o-Xylene	99.9	5
Naphthalene	55.7	5

µg/L = microgram per Liter

**Audrey N. Brubeck**  
 Laboratory Supervisor

AB/psg

HEADQUARTERS: 3015 DUMBARTON ROAD • BOX 27524 • RICHMOND, VA 23261-7524  
 TELEPHONE (804) 264-2701 • FAX (804) 264-1202

BRANCHES: ASHEVILLE, NC • BALTIMORE, MD • CHARLOTTE, NC • CHESAPEAKE, VA  
 CROZET, VA • FAYETTEVILLE, NC • FREDERICKSBURG, VA  
 GREENVILLE, SC • RALEIGH, NC • ROANOKE, VA • STERLING, VA



**RESULTS:**

**F&R #:** 9604181-01  
**SAMPLE ID:** MW-1  
**DATE/TIME:** 04/24/96, 1530  
**TYPE:** Water/Grab

**Det'n Limit:**

<b>PAH (µg/L)</b>		
Acenaphthene	BDL	10
Acenaphthylene	BDL	10
Anthracene	BDL	10
Benzo[a]anthracene	BDL	10
Benzo[a]pyrene	BDL	10
Benzo[b]fluoranthene	BDL	10
Benzo[g,h,i]perylene	BDL	10
Benzo[k]fluoranthene	BDL	10
Chrysene	BDL	10
Dibenz[a,h]anthracene	BDL	10
Fluoranthene	BDL	10
Fluorene	BDL	10
Indeno[1,2,3-cd]pyrene	BDL	10
Naphthalene	41.9	10
Phenanthrene	BDL	10
Pyrene	BDL	10

µg/L = microgram per Liter      BDL = Below Detection Limit



# CHAIN OF CUSTODY RECORD

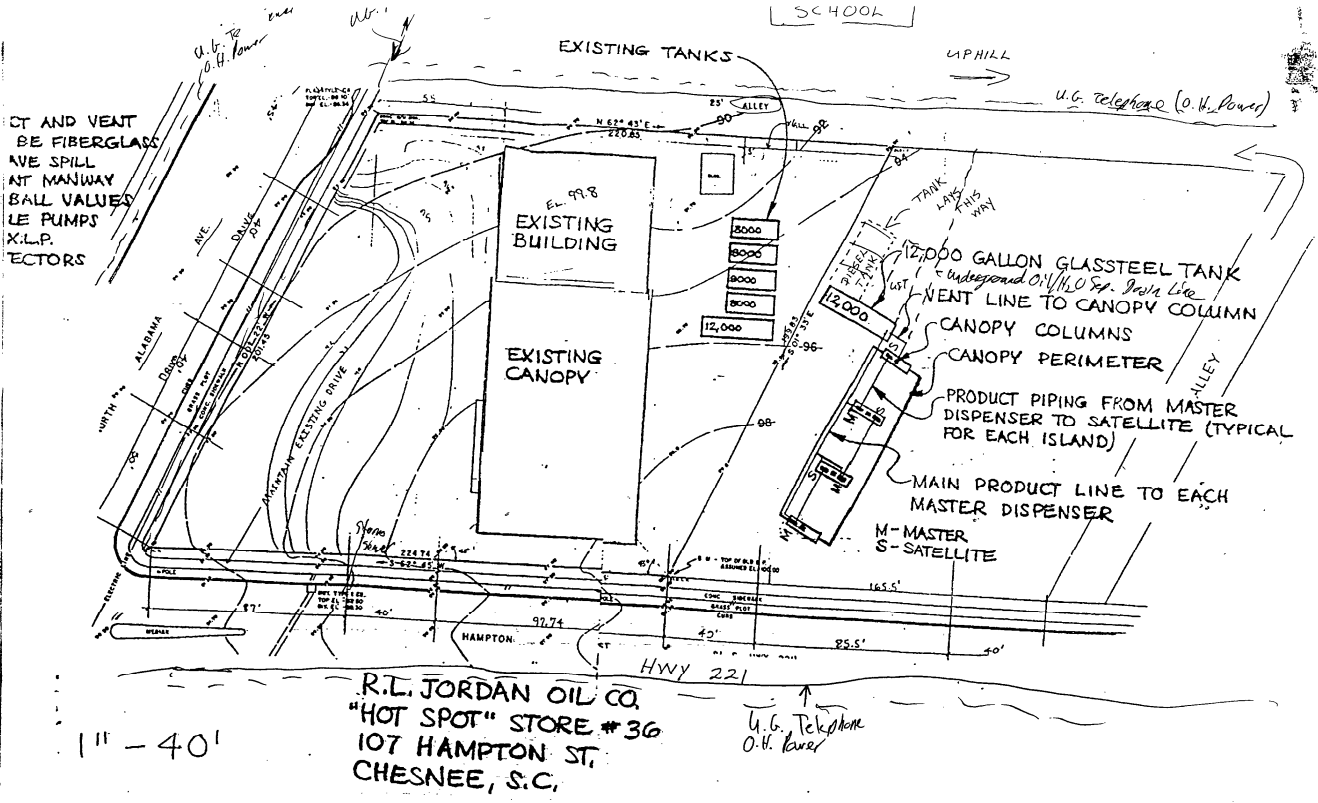
Please Print CLIENT ADDRESS: F&R - Greenville  
 ATTN: Craig Lee / Jim Buschur  
 PHONE/FAX: \_\_\_\_\_

**FROEHLING & ROBERTSON, INC.**  
 P.O. BOX 27524  
 RICHMOND, VIRGINIA 23261  
 TEL: (804) 264-2701  
 FAX: (804) 264-1202

LAB PROJECT #		PROJECT NAME/NUMBER - Please Print				CONTAINERS # OF	SAMPLE (MATRIX)	REQUESTED TEST PARAMETERS - Please Print															
SAMPLED BY - Please Print								DATE	TIME	GRAB	COMP	SAMPLE IDENTIFICATION - Please Print	BTEX + Naphthalene	PAH-8270									
9604181		Chesnee Hot Spot				4	4-26-96								Water	X		MW-1	✓	✓			
Carl Landford / Craig Lee																							
LAB I.D.	DATE	TIME	GRAB	COMP	SAMPLE IDENTIFICATION - Please Print	DATE	TIME	GRAB	COMP	SAMPLE IDENTIFICATION - Please Print	BTEX + Naphthalene	PAH-8270											
01	4-24-96	15:30	X		MW-1	4-26-96	12:41																

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY	DATE	TIME	FIELD COMMENTS: Please Print	
<i>Craig Lee</i>	4-24-96	16:45	<i>J. Rose</i>	4-25-96	09:30		24 hr. Turnaround - As per SC DHEC UST guidelines
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY	DATE	TIME		
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED FOR LAB BY	DATE	TIME		
SHIPPED VIA Fed-Ex Airbill # 4580547904 DATE 4-24-96							

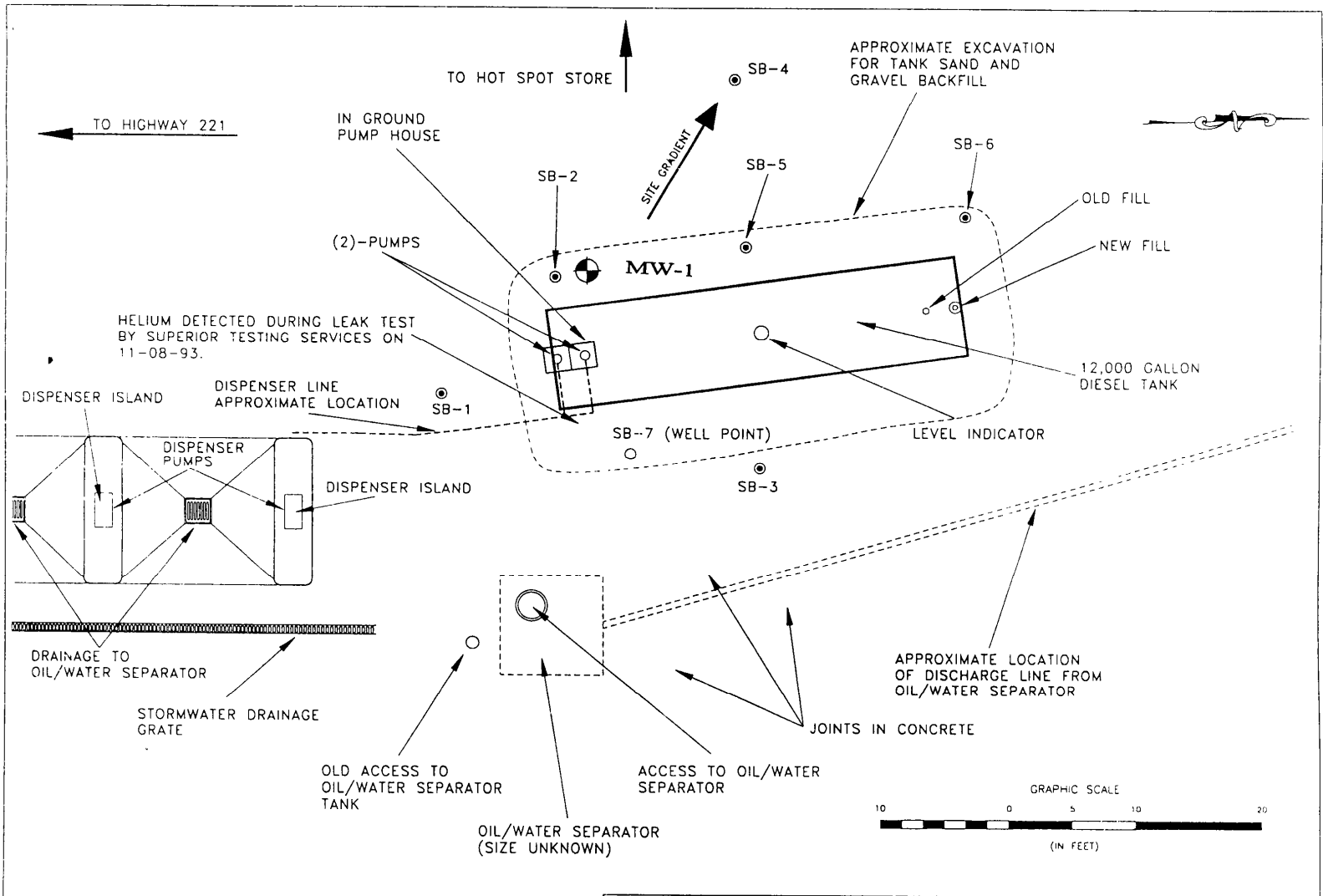
pH \_\_\_\_\_ TEMP. On ice



1" = 40'

R.L. JORDAN OIL CO.  
 "HOT SPOT" STORE #36  
 107 HAMPTON ST.  
 CHESNEE, S.C.

U.S. Telephone  
 O.V. Power



<b>GREENVILLE BRANCH</b>		<small>FRÖHLING &amp; ROBERTSON, INC.</small> <small>100% FULL SERVICE LABORATORIES - ENGINEERING / ENVIRONMENTAL</small> <small>"OVER ONE HUNDRED YEARS OF SERVICE"</small>	
SCALE: NOT TO SCALE	DATE: 04/29/96	F&R FILE NUMBER: X-65-014	DRAWN BY: C.A.L.
R.L. JORDAN OIL COMPANY: HOT SPOT #36 - SCHEC ID # 12719			REVISIONS:
UST AREA MAP			DRAWING NUMBER: 2



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1310 Lowndes Hill Road  
 Greenville, SC 29607  
 (803) 271-2840 Fax (803) 271-8124

Post-It™ brand fax transmittal memo 7671 # of pages > 10

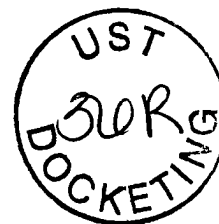
To	Leigh Ann Britton	From	Craig Lee
Co.	SCDHEC	Co.	F&R
Dept.	UST - Technical	Phone #	864-271-2840
Fax #	803-734-3604	Fax #	

April 29, 1996

SCDHEC  
 Technical Section  
 Bureau of Underground Storage Tank Management  
 2600 Bull Street  
 Columbia, South Carolina 29201

Attn: Ms. Leigh Ann Britton

Re: Hot Spot # 36  
 Initial Ground-Water Assessment Report  
 Site ID 12719  
 Chesnee, South Carolina



Dear Ms. Britton:

Froehling & Robertson, Inc. (F&R) is pleased to present the attached Initial Ground-Water Assessment (IGWA) Report for the above referenced site. The facility owner is R.L. Jordan Oil Company (R.L. Jordan) of Spartanburg, South Carolina.

Prior to beginning site work, F&R reviewed the March 24, 1994 Report of Findings: Soil Assessment prepared by The Fletcher Group, Inc. Based on this report, monitoring well MW-1 was located near SB-2 because boring SB-2 had contained soils with the highest concentration of BTEX and TPH compounds encountered during the soil assessment activities.

On April 23, 1996, F&R commenced installation of one ground-water monitoring well at the facility for the purpose of performing an Initial Ground-Water Assessment. Soil samples were collected at five foot intervals and screened with a photo-ionization detector (PID). PID measurements ranged from 1.2 parts per million (ppm) at a depth of 8.5 feet to 41 ppm at a depth of 23.5 feet. Ground-water was encountered during drilling at approximately 35 feet below land surface (BLS) and was observed at approximately 27.5 feet BLS an hour and a half later. Because of this rapid change in water level the augers were left in the ground to maintain the borehole over night. The next day, April 24, 1996, water level

RECEIVED

APR 29 1996

HEADQUARTERS: 3015 DUMBARTON ROAD • BOX 27524 • RICHMOND, VA 23261-7524  
 TELEPHONE (804) 264-2701 • FAX (804) 264-1202

BRANCHES: ASHEVILLE, NC • BALTIMORE, MD • CHARLOTTE, NC • CHESAPEAKE, VA  
 CROZET, VA • FAYETTEVILLE, NC • FREDERICKSBURG, VA  
 GREENVILLE, SC • RALEIGH, NC • ROANOKE, VA • STERLING, VA

Bureau of Underground  
 Storage Tank Management





Hot Spot # 36  
R.L. Jordan Oil Company

IGWA Site 12719  
Page 2

measurements indicated a static level of 22.5 feet BLS. It was decided to set the bottom of the well at 30 feet BLS with fifteen feet of screen in order to be certain that the screen "split" the water table and to allow for seasonal ground-water fluctuations. The well was developed by hand-bailing until relatively clear water was obtained. Ground-water samples were collected and sent to F&R's South Carolina Certified laboratory for analysis of benzene, toluene, ethylbenzene, xylenes (BTEX) and naphthalene as well as poly-aromatic hydrocarbons (PAH).

The receptor survey indicated underground utilities within 500 feet of the UST. These utilities are telephone approximately 100 feet north of the UST and telephone/sewer approximately 200 feet south of the UST. Additionally, since the subject facility is an operating gasoline station and convenience store, underground utilities associated with petroleum USTs are also present. F&R observed no evidence of public or private supply wells within 1000 feet of the subject site. Two unnamed tributaries to Little Buck Creek are located approximately 750 feet south and 900 feet northwest of the project site. An elementary school is located immediately north of the site.

Results of laboratory analysis are presented in the attached IGWA report and indicate that ground-water has been impacted at the subject site.

Due to time constraints, we are including two maps provided to us by R.L. Jordan to present the base site map information. The first is a general site map showing the facility's layout. The second, UST Area Map, is a more detailed map showing the location of the soil borings performed by The Fletcher Group in 1994 and the location of MW-1. A complete, scaled base map will be prepared in the future should additional work be required at the facility.

If you have any questions, please contact us (864) 271-2840.

Sincerely,  
**FROEHLING & ROBERTSON, INC.**



Craig A. Lee  
Staff Geologist

attachments

cc: Judy Laughter - R.L. Jordan

APR 12 '96 10:28AM GROUND WATER PROTECT

P.5

## INITIAL GROUND-WATER ASSESSMENT REPORT

Facility Name: Hot Spot # 36

Site ID Number: 12719

Owner's Name: R.L. Jordan Oil Company

Address: P.O. Box 2527; Spartanburg, SC 29304

Phone Number: (864) 585-2784

Contractor: Froehling & Robertson, Inc.

Address: P.O. Box 17186

Phone Number: (864) 271-2840

### Receptor and Site Data

Please place a check in the appropriate answer block for each question:

Receptor Survey Questions	No	Yes *
Is there a drinking water supply well(public or private, please indicate) or surface water supply intake within 1000 feet of the UST?	X	
Are irrigation or other non-drinking water wells located within 1000 feet of the UST?	X	
Are there other potential receptors (i.e., utilities, surface waters, wetlands) less than 500 feet from the UST?		X

\* If "yes" provide additional information:

Underground utilities include telephone (located approx. 100-200 feet north of UST) and telephone & sewer (located approx. 200 feet south of UST)

Is the current use of the site and surrounding properties commercial, residential, agricultural or industrial?

The property is commercial. Surrounding properties are commercial and residential. An elementary school is located adjacent to the north of the site.

APR 12 '96 10:28AM GROUND WATER PROTECT

**Initial Ground-Water Assessment Report**

Site ID # 12719

**Soil and Monitoring Well Data**

Primary Soil Type: Sandy SILT

Well Installation Method and Date: Drill Rig / Hollow Stem Augers (6.25" I.D.)

Development Method: Bailer (4/24/1996)

**Ground-Water Data**

Depth to Ground Water: 22.50 feet below ground-surface

Well Purging/Sampling Method: Bailer (4/24/1996)

Date Sampled: 4/24/1996

Free Product Thickness: No Free Product Observed

**GROUND-WATER ANALYTICAL DATA**

Benzene (ug/l)	Toluene (ug/l)	Ethylbenzene (ug/l)	Xylenes (ug/l)	Naphthalene (ug/l)
27.4	88.3	46.0	170.1	55.7

Benzo(a)-anthracene (ug/l)	Benzo(b)-fluoranthene (ug/l)	Benzo(k)-fluoranthene (ug/l)	Chrysene (ug/l)	Dibenz(a,h)-anthracene (ug/l)
BDL	BDL	BDL	BDL	BDL

**Appendices**

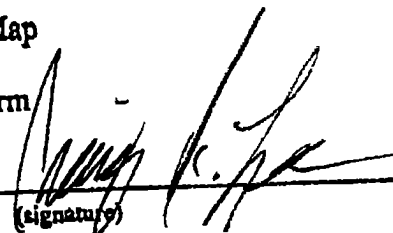
The appendices required for this report are as follows:

Appendix A. Well Construction Log

Appendix B. Laboratory Data

Appendix C. Site Base Map

Appendix D. Invoice Form

Report Completed By:   
(signature)

Date: April 29, 1996



FULL SERVICE LABO DRIES ENGINEERS & CHEMISTS  
"OVER ONE HUNDRED YEARS OF SERVICE"

DATE: April 29, 1996

Report No.: X-65-014

Client: R. L. Jordan Oil Company

Project: Chesnee Hot Spot #36 Chesnee, South Carolina

Boring No.: MW-1 (1 of 1) Total Depth 35.0' Elev.

Location: See UST Area Map

Type of Boring: 6-1/4" HSA

Started: 4/23/96

Completed: 4/24/96

Driller: C. Lanford

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	Sample Depth (Feet)	H-Nu Reading (ppm)	Water Level (Feet)	Well Log	REMARKS	
0.8	1.0	10" Concrete					Flush Manhole w/concrete	
		2" gravel						
	3.5	Fill - Red sandy CLAY	3.5	2			Schedule 40 PVC pipe with bentonite-cement slurry	
			5.0					
		Fill - Gray SAND	8.5	1				
			10.0				Bentonite Seal	
			13.5	3				
	14.5		15.0				Additional sand backfill	
			18.5	32				
		Residual - Red to brown sandy SILT	20.0				Slotted pipe with sand backfill	
			23.5	37				
			25.0					
			28.5	41			PVC Endcap	
	30.0		30.0					
		Residual - Brown sandy silty CLAY	33.5	26			Remainder of boring backfilled with sand	
			35.0					
	35.0	Boring terminated at approximately 35.0 ft below existing surface.						

\*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

SINCE



1881

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CERTIFICATE OF ANALYSIS

Page 1 of 2

April 29, 1996

LAB #: 9604181  
 CLIENT: F&R Greenville  
 Attn: Craig Lee

PROJECT: Chesnee Hot Spot

SAMPLES COLLECTED BY: C. Lee  
 LAB RECEIPT: 04/25/96, 0936

<u>PARAMETER</u>	<u>ANALYSIS DATE/TIME</u>	<u>METHOD</u>	<u>ANALYST</u>
BTEX/Naphthalene	04/26/96, 1241	SW846/8260	EVY
PAH-Extraction	04/25/96, 0940	SW846/8270	TS
PAH	04/26/96, 1134	SW846/8270	EVY

**RESULTS:**

F&R #: 9604181-01  
 SAMPLE ID: MW-1  
 DATE/TIME: 04/24/96, 1530  
 TYPE: Water/Grab

**Det'n Limit:**

BTEX/Naphthalene ( $\mu\text{g/L}$ )		
Benzene	27.4	5
Ethylbenzene	46.0	5
Toluene	88.3	5
m,p-Xylene	70.2	5
o-Xylene	99.9	5
Naphthalene	55.7	5

 $\mu\text{g/L}$  = microgram per Liter

*Audrey N. Brubeck*  
 Audrey N. Brubeck  
 Laboratory Supervisor

AB/psg



**RESULTS:**

**F&R #:** 9604181-01  
**SAMPLE ID:** MW-1  
**DATE/TIME:** 04/24/96, 1530  
**TYPE:** Water/Grab

**Det'n Limit:**

PAH (µg/L)		Det'n Limit:
Acenaphthene	BDL	10
Acenaphthylene	BDL	10
Anthracene	BDL	10
Benzo[a]anthracene	BDL	10
Benzo[a]pyrene	BDL	10
Benzo[b]fluoranthene	BDL	10
Benzo[g,h,i]perylene	BDL	10
Benzo[k]fluoranthene	BDL	10
Chrysene	BDL	10
Dibenz[a,h]anthracene	BDL	10
Fluoranthene	BDL	10
Fluorene	BDL	10
Indeno[1,2,3-cd]pyrene	BDL	10
Naphthalene	41.9	10
Phenanthrene	BDL	10
Pyrene	BDL	10

µg/L = microgram per Liter      BDL = Below Detection Limit



# CHAIN OF CUSTODY RECORD

Please Print CLIENT ADDRESS F&R - Greenville  
 ATTN Craig Lee / Jim Gaschar  
 PHONE/FAX \_\_\_\_\_

**FROEHLING & ROBERTSON, INC**  
 P.O. BOX 27524  
 RICHMOND, VIRGINIA 23261  
 TEL: (804) 264-2701  
 FAX: (804) 264-1202

LAB PROJECT #		PROJECT-NAME/NUMBER - Please Print				CONTAINERS # OF	SAMPLE (MATRIX)	REQUESTED TEST PARAMETERS - Please Print											
SAMPLED BY - Please Print								BTEX Negatives	PAH-8270										
LAB I.D.	DATE	TIME	GRAB	COMP	SAMPLE IDENTIFICATION - Please Print														
	4-24-96	15:30	X		MW-1	4	Water	✓	✓										

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY	DATE	TIME	FIELD COMMENTS: Please Print	
<i>Craig Lee</i>	4-24-96	16:45					24 hr. Turnaround - As per SC DHEC UST guidelines
SHIPPED VIA Fed-Ex Airbill # 4580547904 DATE 4-24-96						pH _____ TEMP. _____	

APR-29-96 MON 15:32 F&R INC P.08

APR 29-96 MON 10:33 PER INC P. 03

SCHOOL

UPHILL

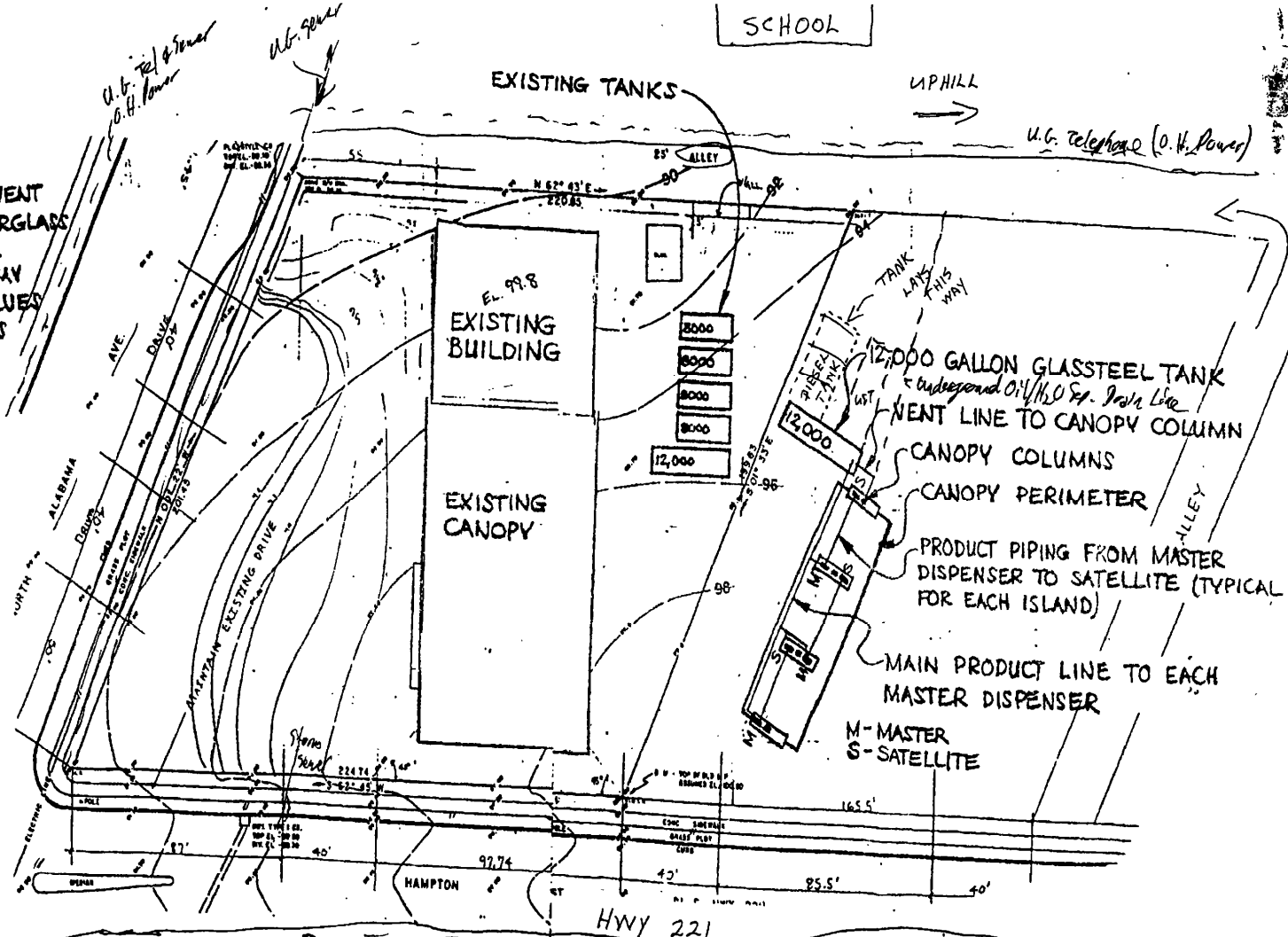
U.G. telephone (O.H. Power)

T AND VENT  
BE FIBERGLASS  
VE SPILL  
IT MANWAY  
ALL VALVES  
E PUMPS  
L.P.  
ECTORS

EXISTING TANKS

EXISTING BUILDING  
EXISTING CANOPY

12,000 GALLON GLASSTEEL TANK  
underground O.V./H<sub>2</sub>O Sp. Drain Line  
VENT LINE TO CANOPY COLUMN  
CANOPY COLUMNS  
CANOPY PERIMETER  
PRODUCT PIPING FROM MASTER  
DISPENSER TO SATELLITE (TYPICAL  
FOR EACH ISLAND)  
MAIN PRODUCT LINE TO EACH  
MASTER DISPENSER  
M-MASTER  
S-SATELLITE

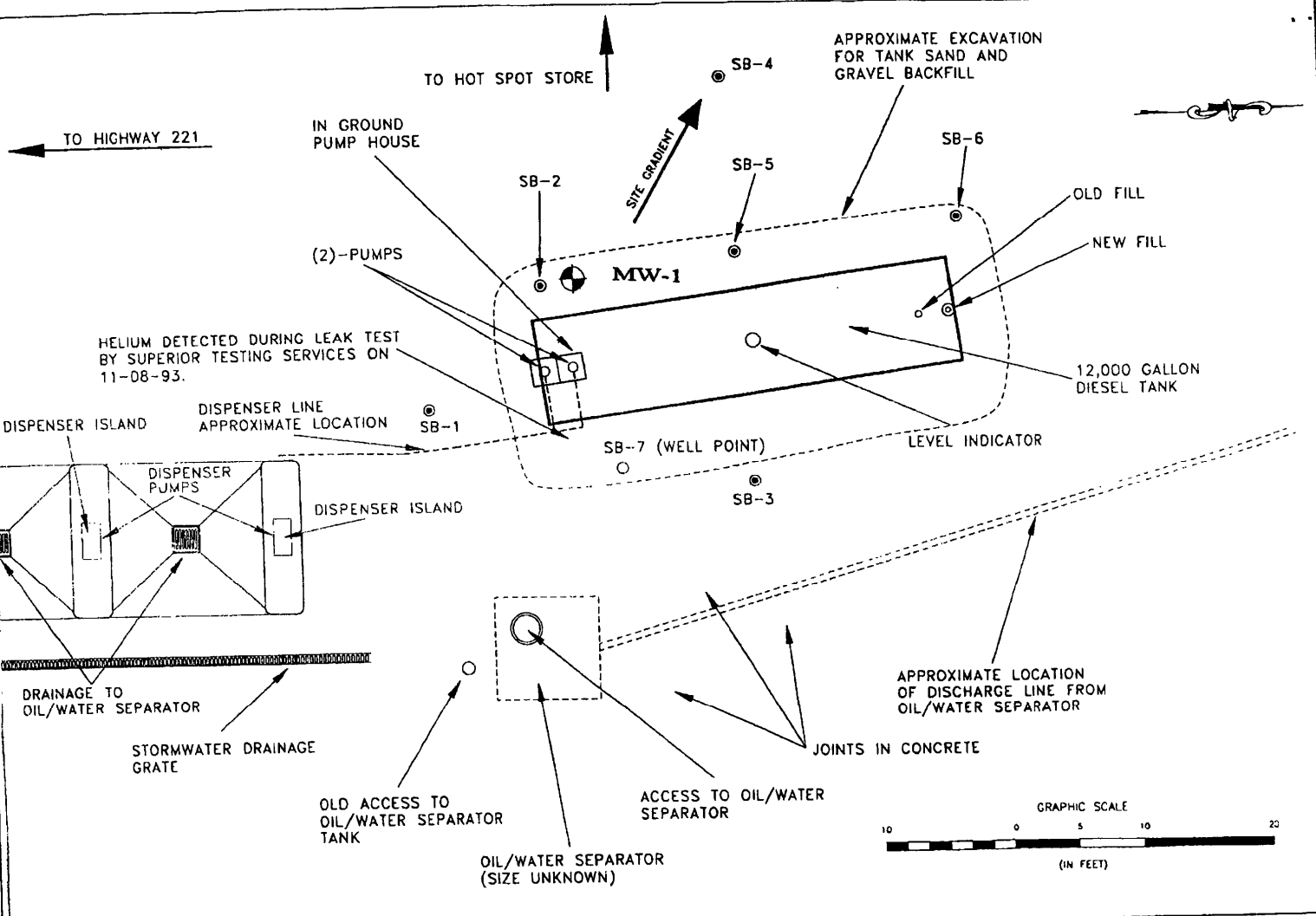


R.L. JORDAN OIL CO  
"HOT SPOT" STORE #36  
107 HAMPTON ST.  
CHESNEE, S.C.

U.G. Telephone  
O.H. Power

11" - 40'





<b>GREENVILLE BRANCH</b>		<b>F&amp;R</b>		<b>FROEHLING &amp; ROBERTSON, INC.</b>	
SCALE: NOT TO SCALE		F&R FILE NUMBER: <b>X-65-014</b>		DRAWN BY: <b>C.A.L.</b>	
DATE: <b>04/29/96</b>				REVISIONS:	
<b>R.L. JORDAN OIL COMPANY: HOT SPOT #36 - SCHEC ID # 12719</b>					
<b>UST AREA MAP</b>				SHEET NUMBER <b>2</b>	

# TPS

TECHNOLOGIES INC.

*Dave*

415 Blackberry Valley Road  Greenville, South Carolina 29611-6706  
Telephone (864) 246-6304  Fax (864) 246-6330

(866) 492-4452

August 30, 1996

Ms. Reba Fant  
Bureau of Underground Storage Tank Management  
S. Carolina Dept. of Health and Environmental Control  
Ground Water Protection Division, Regulatory Section  
2600 Bull Street, Third Floor  
Columbia, SC 29201-1708

### For Your Approval

Generator/Contact:	R. L. Jordan Oil Company/Mr. Jim Busher
Site Address:	Chesee Hot Spot, 107 Hampton Street, Chesee, SC 29323
Generator's Address:	P.O. Box 2527, Spartanburg, SC 29304
Generator's Telephone:	(864) 585-2784
Environmental Consultant/Contact:	Froehling and Robertson, Inc./Mr. Jim Busher
Consultant's Address:	P.O. Box 17186, Greenville, SC 29606
Consultant's Telephone:	(864) 271-2840
Estimated Tons:	3 drums
TPST Project Number:	05-00928
TPST Remediation Site:	Greenville
Type of Contamination:	Virgin Diesel
<b>GWPID#</b>	12719

Dear Ms. Fant:

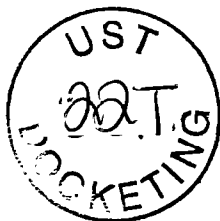
TPS Technologies hereby requests your permission to transport and remediate the above referenced soils. The contamination is the result of a UST release. Enclosed please find copies of the Soil Data and Certification Sheet and the necessary analytical data.

If you have any questions, please do not hesitate to telephone me at (866) 492-4451.

Sincerely,



Mr. Brad Smith  
Client Service Manager



RECEIVED

SEP 04 1996

Bureau of Underground  
Storage Tank Management

South Carolina  
Soil Recycling Facility

# TPS Technologies Inc.

Soil Data and Certification Sheet

415 Blackberry Valley Road  
Greenville, SC 29611-6706  
(864) 246-6304/ (864) 246-6330 Fax

Generator R E Jordoan Oil Company  
 Mailing Address P. O. Box 2527  
Spartanburg, SC 29304  
 Contact Judy Laughter  
 Phone ( 864 ) 585-2784  
 Fax ( 864 ) 582-6018  
 Site Name Chesnee Hot Spot  
 Street Address 107 Hampton Street  
Chesnee, SC 29323  
 Contact \_\_\_\_\_  
 Phone ( 864 ) 461-4147  
 Fax ( 864 ) 461-5129

Consultant Froehling & Robertson, Inc.  
 Mailing Address P. O. 373 17186  
Greenville, SC 29606  
 Contact Jim Buscher  
 Phone ( 864 ) 271-2840  
 Fax ( 864 ) 271-8124  
 Transporter R. L. Jordan Oil Company  
 Mailing Address P. O. Box 2527  
Spartanburg, SC 29304  
 Contact Judy Laughter  
 Phone ( 864 ) 585-2784  
 Fax ( 864 ) 582-6018

### Site History

Type of Petroleum (Gas, diesel, waste oil, etc.) Diesel Estimated quantity in tons (3 Drums)

How did soil contamination occur? Loose fitting on dispenser line near UST.

Name of testing lab Froehling & Robertson, Inc. Contact Jim Buscher Phone ( 864 ) 271-2840

How and where at site were samples taken? One composite sample was collected from the three drums.

Check appropriate box below and attach all required analytical reports including test methodologies used. Unless otherwise noted composite sample should be collected with the following frequency: One sample for the first 300 tons; one sample for each additional 200 tons, with a maximum of 10 samples.

UST/GWPID# 12719

<input checked="" type="checkbox"/> Superb	<input type="checkbox"/> Non-Superb	<input checked="" type="checkbox"/> Virgin	<input type="checkbox"/> Non-Virgin
<input type="checkbox"/> AST	<input type="checkbox"/> Spill	<input checked="" type="checkbox"/> Other	<input type="checkbox"/> Emergency Response

I/We certify that the soil referenced herein is contaminated solely by virgin petroleum products from leaking underground storage tank(s) or an emergency response. Attach analysis for the following:

- Total petroleum hydrocarbons (TPH) California method using GC-FID analysis.
- Benzene/ toluene/ ethylbenzene/ xylene (BTEX) method 8020.

I/We certify that some or all of the contaminants in the soil referenced herein is waste oil or some other non-virgin petroleum product or virgin petroleum from a leaking above-ground storage tank or spill.

Attach analysis for the following:

- Total petroleum hydrocarbons (TPH) California method using GC-FID analysis.
- Benzene/toluene/ethylbenzene/xylene (BTEX) method 8020.
- Total organic halogens (TOX) EPA method 9020.\*
- Total metals concentration for a) through i):\*\* a) arsenic, b) barium, c) cadmium, d) chromium, e) lead, f) mercury, g) nickel, h) selenium, i) silver

\* If elevated TOX levels are detected, additional analyses for PCB's may be required.  
 \*\* If elevated total metal concentrations are detected, additional analyses for TCLP metals may be required.

No soils referenced herein may be delivered until this certificate is received and approved by TPST, and TPST issues manifest(s) and assigns a delivery date. If any soils delivered to TPST are found to be "hazardous waste" pursuant to federal or state regulations, Client shall be solely responsible for their removal. If Client fails to remove such soils, TPST, acting as Client's agent, may arrange for such removal at Client's expense.

This is a complete and accurate description of the soil referenced herein; no deliberate or willful omissions have been made and all known or suspected hazards have been disclosed herein. I/We further hereby Certify that the soil is not "hazardous" as defined by U.S. Department of Transportation (DOT), U.S. Environmental Protection Agency (EPA), State of origin, South Carolina or local regulations, and that no other knowledge concerning other TCLP constituents have been withheld. All required analysis reports are attached.

Generator/Owner

*[Handwritten signatures and initials]*



**FROEHLING & ROBERTSON, INC.**  
 GEOTECHNICAL • ENVIRONMENTAL • MATERIALS  
 ENGINEERS • LABORATORIES  
 "OVER ONE HUNDRED YEARS OF SERVICE"

CERTIFICATE OF ANALYSIS

June 28, 1996

Page 1 of 1

LAB #: 9606146  
 CLIENT: F&R Greenville  
 Attn: Craig Lee

PROJECT: RL Jordan-Drums (Chesnee)

SAMPLES COLLECTED BY: C. Lee  
 LAB RECEIPT: 06/20/96, 1055

<u>PARAMETER</u>	<u>ANALYSIS DATE/TIME</u>	<u>METHOD</u>	<u>ANALYST</u>
BTEX	06/26/96, 0908	SW846/5030/8020	KR
TPH-GC High BP	06/26/96, 0900	SW846/Cal/8015m	KR
TPH-GC Low BP	06/26/96, 0908	SW846/5030/8015	KR

**RESULTS:**

F&R #: 9606146-01  
 SAMPLE ID: CD-1  
 DATE/TIME: 06/19/96, 1115  
 TYPE: Soil/Composite

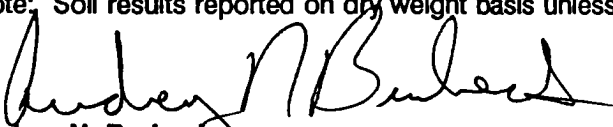
**Det'n Limit:**

TPH-GC High BP	1,055	8
TPH-GC Low BP	478	5
<b>BTEX:</b>		
Benzene	BDL	0.1
Toluene	BDL	0.1
Ethylbenzene	BDL	0.1
Total Xylenes	BDL	0.3

All units are mg/kg.

mg/kg = milligram per kilogram      BDL = Below Detection Limit

Note: Soil results reported on dry weight basis unless otherwise noted.

  
 Audrey N. Brubeck  
 Laboratory Supervisor

AB/psg



# CHAIN OF CUSTODY RECORD

Please Print CLIENT ADDRESS F&R - Greenville  
 ATTN Craig Lee  
 PHONE/FAX \_\_\_\_\_

**FROEHLING & ROBERTSON, INC.**  
 P.O. BOX 27524  
 RICHMOND, VIRGINIA 23261  
 TEL: (804) 264-2701  
 FAX: (804) 264-1202

LAB PROJECT #		PROJECT NAME/NUMBER - Please Print				CONTAINERS # OF	SAMPLE (MATRIX)	REQUESTED TEST PARAMETERS - Please Print													
9606146		R.L. Jarden - Drums (chestee)					1														
SAMPLED BY - Please Print																					
Craig A. Lee																					
LAB I.D.	DATE	TIME	GRAB	COMP	SAMPLE IDENTIFICATION - Please Print																
01	6-19-96	11:15		✓	CD-1																

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY	DATE	TIME	FIELD COMMENTS: Please Print
<i>Craig A. Lee</i>	6-19-96	11:00	<i>[Signature]</i>	6-20-96	10:55	
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY	DATE	TIME	
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED FOR LAB BY	DATE	TIME	
SHIPPED VIA <u>UPS - Next Day</u>			DATE <u>6-19-96</u>	pH _____	TEMP. _____	

**Commissioner:** Douglas E. Bryant

**Board:** John H. Burriss, Chairman  
William M. Hull, Jr., MD, Vice Chairman  
Roger Leaks, Jr., Secretary

Richard E. Jabbour, DDS  
Cyndi C. Mosteller  
Brian K. Smith  
Rodney L. Grandy

*Promoting Health, Protecting the Environment*

SEP 16 1996

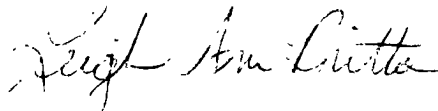
R. L. Jordan Oil Company  
Attn: Ms. Judy Laughter  
Post Office Box 2527  
Spartanburg, SC 29304

**Re:** Soil Disposal Request  
Chesnee Hot Spot  
Site ID# 12719  
Spartanburg County

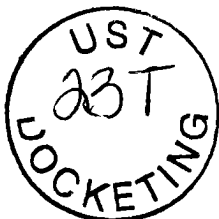
Dear Ms. Laughter:

Please find enclosed the approval form for soil disposal at the referenced facility. Note carefully the conditions on the approval form. If you have any questions regarding this correspondence, please call me at (803) 734-4663.

Sincerely,



Leigh Ann Britton, Hydrogeologist  
Assessment and Corrective Action Division  
Bureau of Underground Storage Tank Management



**Commissioner:** Douglas E. Bryant

**Board:** John H. Burriss, Chairman  
William M. Hull, Jr., MD, Vice Chairman  
Roger Leaks, Jr., Secretary

Richard E. Jabbour, DDS  
Cyndi C. Mosteller  
Brian K. Smith  
Rodney L. Grandy

*Promoting Health, Protecting the Environment*

**September 12, 1996**  
**Expiration Date: December 12, 1996**

R. L. Jordan Oil Company  
Attn: Ms. Judy Laughter  
Post Office Box 2527  
Spartanburg, SC 29304

Re: Chesnee Hot Spot  
Site ID#12719  
Spartanburg County

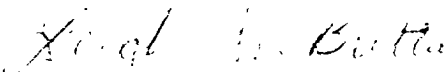
Dear Ms. Laughter:

This office hereby grants approval to R. L. Jordan Oil Company for treatment of three (3) drums of virgin petroleum contaminated soil from the referenced underground storage tank facility at the TPS Technologies, Inc. facility in Greenville, South Carolina.

The following restrictions apply to all thermally treated soils.

1. Prior approval must be obtained from the appropriate treatment facility officials.
2. The waste must be compatible with the treatment facility and not adversely affect the safe and efficient operation of the unit.
3. There can be no spillage or leakage during transport.
4. The DHEC Appalachia III District EQC office ((864) 596-3800) must be notified of your soil disposal location 72 hours in advance.
5. All State and Federal Air Quality Regulations must be strictly complied with.
6. This approval will be for one time only and is invalid after December 12, 1996.
7. As this work is being conducted without prior approval of cost, compensation from the State Underground Petroleum Response Bank (SUPERB) Account cannot be authorized (Section 44-2-130 of the SUPERB Statute).

Sincerely,



Leigh Ann Britton, Hydrogeologist  
Assessment and Corrective Action Division  
Bureau of Underground Storage Tank Management

cc: Aubrey Stewart, Appalachia III District EQC  
Larry Bunn, Air Quality Control  
Harold Seabrook, Bureau of Solid & Hazardous Waste Management

**Fax Message**

Date: 11-7-96

Number of Pages Including Cover Sheet: 3

*faxed treatment request -  
he never got it.*

*Please Deliver This Fax Message*

TO: Brad Smith  
Name

TPS  
Organization/Department

(800) 492-4452  
Fax Number

(804) 246-6304  
Office Phone

FROM: Leigh Ann Britton  
Name

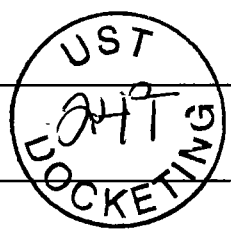
Bureau of UST Management  
Bureau/Division/Section

(803) 734-3604  
Fax Number

(803) 734-4603  
Office Phone

SUBJECT/COMMENTS: If you need anything else  
give me a call!

*Thanks  
LAB*



**Confidentiality Notice**

This transmission is intended only for the use of the individual or entity to which it is addressed and may contain information which is privileged and confidential. If the reader of this message is not the intended recipient, you are hereby notified that any disclosure, distribution, or copying of this information is strictly prohibited. If you received this transmission in error, please notify the sender immediately by calling the above telephone number.



GR . ) WATER PROTECT

(AUTO)

THE FOLLOWING FILE(S) ERASED

FILE	FILE TYPE	OPTION	TEL NO.	PAGE	RESULT
010	TRANSMISSION		918004924452	03	OK

ERRORS

- 1) HANG UP OR LINE FAIL      2) BUSY      3) NO ANSWER      4) NO FACSIMILE CONNECTION



2600 Bull Street  
Columbia, SC 29201-1708

NOV 03 1998

Attention: Ms. Judith A. Laughter  
P.O. Box 2527  
Spartanburg, SC 29304

Re: Hot Spot #3005  
Facility ID #12719, Cost Proposal # 06295  
Initial Ground-Water Assessment received April 29, 1996  
Spartanburg County



Dear Ms. Laughter:

The Division of Underground Storage Tank (UST) Management of the South Carolina Department of Health and Environmental Control (SCDHEC) has reviewed the referenced assessment. The referenced report indicates concentration of chemicals of concern in the soil and groundwater. To determine what risk the release may pose to the environment and public health, and in accordance with Section 280.65 of the South Carolina Underground Storage Tank Control Regulations, implementation of the scope of work as outlined in the enclosed Standard Limited Assessment (SLA) document is necessary. Since the above scope of work is detailed in the SLA document, a separate plan is not required.


According to our records, the release was reported to the SCDHEC subsequent to the early detection incentive program. Therefore, in accordance with Section 44-2-40(B) of the Act, you are responsible for the first \$25,000 for site rehabilitation. To insure that any expenditures you make apply to this \$25,000 deductible, it is prudent for this agency to pre-approve such costs along with your technical plan of action. By law, the SUPERB account cannot compensate any costs that are not pre-approved. Eligible costs exceeding the \$25,000 deductible can be compensated from the SUPERB Account.

Please note that the maximum approvable amount for the SLA is **\$10,800.00**. Upon receipt of the signed SLA Invoice, SLA Report, and a copy of your canceled check (front and back) or a notarized statement from the contractor verifying payment for this scope of work, up to \$10,800.00 may be applied toward your deductible. **Please complete and return the enclosed Owner/Operator Information Sheet within 14 days from the date of this letter (note that all rehabilitation activities associated with a UST release must be performed by an SCDHEC certified site rehabilitation contractor as required by R.61-98).** The contractor must possess Class 1 certification. Cost proposal #06295 has been established to track the allowable costs associated with this SLA. Please include the cost proposal number when submitting your invoice.

Implementation of the SLA should proceed upon receipt of this correspondence. The required monitoring well approval is enclosed. **The report should be submitted within 90 days from the date of this letter.** All investigative derived waste must be properly stored in labeled containers or covered with plastic as appropriate. The Division grants preapproval for the transportation of the investigative derived waste (virgin petroleum contaminated soil and groundwater) from the referenced site to a permitted treatment facility. All contaminated investigative derived waste must be accepted by the approved treatment facility. There can be no spillage or leakage in transport. A copy of the disposal manifest and approval letter from the receiving facility must be included as an appendix to the final report. If the levels of petroleum contamination based on laboratory analysis are below treatment levels, please contact the project manager for approval to dispose of the investigative derived waste on site. The SUPERB Account will not compensate for transportation or treatment of clean soil and/or ground water. The SCDHEC reserves the authority to only apply costs to your deductible for work properly performed and/or technically justified in accordance with established criteria. The SCDHEC reserves the authority to only apply costs to your deductible for work properly performed and/or technically justified in accordance with established criteria.

On all correspondence regarding this site and scope of work, please reference Facility #12719 and cost proposal #06295. If you have any questions concerning this correspondence, please contact Konstantine Akhvlediani at (803) 734-5334 or 1-800-826-5435 (within SC).

Sincerely,  
State Lead and Field Services Section  
Assessment and Corrective Action Branch  
Division of Underground Storage Tank Management

  
Konstantine Akhvlediani, Hydrogeologist

  
Christopher S. Doll, P.G., Manager

enc.: Monitoring Well Approval  
Standard Limited Assessment Document  
Owner/Operator Information Sheet

cc: Technical File (w/copy of Monitoring Well Approval)  
Financial/Read Files (without enclosures)



2600 Bull Street  
Columbia, SC 29201-1708

### Monitoring Well Installation Approval Form

Date of Issue: 10/19/1998

Approval No.: 10399

Approval is hereby granted to: Ms. Judy A. Laughter

(On behalf of):

Facility ID: #12719


County: Spartanburg

This approval is for the construction of up to three(3) shallow monitoring wells in accordance with the South Carolina Well Standards and Regulations. The well(s) are to be constructed within the surficial aquifer for the intended purpose of monitoring ground-water quality and/or water level(s) at the referenced facility. Approval is provided with the following conditions:

1. The latitude and longitude, surveyed elevations, boring and/or geologist logs and actual (as built) construction details for each well will be submitted with the technical report.
2. Each well will be labeled with an identification plate constructed of a durable material affixed to the casing or surface pad where it is readily visible. The plate will provide monitoring well I.D.#, date of construction, static water level, and driller name and state certification #.
3. Well construction and sampling derived waste including, but not necessarily limited to, drill cuttings, drilling fluids, development and purge water should be managed properly and in compliance with applicable requirements. If containerized, each vessel should be clearly labeled with regard to contents, source, and date of activity.
4. A minimum of forty-eight (48) hours prior to initiation of drilling activities, please provide notice to Konstantine Akhvlediani at (803) 734-5334 or Akhvlekt@columb26.dhec.state.sc.us.
5. Please provide ground-water quality analytical data (chemical analysis and/or water level(s)) and associated measurements (i.e., in-situ field measurements) to me with the technical report.
6. Monitoring wells and temporary monitoring wells will be installed by or under the direct supervision of a licensed well driller certified by the State of South Carolina.
7. Monitoring wells and temporary monitoring wells will be abandoned by or under the direct supervision of a licensed well driller certified by the State of South Carolina. Temporary monitoring wells will not remain in place for longer than 30 days from the date of installation. Monitoring wells may be abandoned only upon concurrence by this Division.

This approval is pursuant to the provisions of Section 44-55-40 of the 1976 South Carolina Code of Laws and the Department of Health and Environmental Control Regulations R.61-71. Please remember to have a copy of this approval on the site during well installation.

Approved by:

  
Konstantine Akhvlediani, Hydrogeologist  
State Lead and Field Services Section  
Division of UST Management

cc: Appalachia III District EQC  
Technical File



DIVISION OF  
UNDERGROUND STORAGE TANK MANAGEMENT

Phone (803) 898-4339 Fax (803) 898-4330

2600 Bull Street  
Columbia, SC 29201-1708

JUN 07 1999

CERTIFIED MAIL

R.L. Jordan Oil Company  
Attention: Ms. Judith A. Laughter  
P.O. Box 2527  
Spartanburg, SC 29304

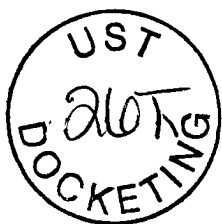
Re: Hot Spot #3005  
UST Permit #12719, Cost Proposal # 06295  
Notice of Violation  
Spartanburg County

Dear Ms. Laughter:

The Division of Underground Storage Tank (UST) Management of the South Carolina Department of Health and Environmental Control directed you to complete a Standard Limited Assessment in October 1998 with the assessment report due in January 1999. To date the required assessment report has not been received. In accordance with Section 280.65 of the South Carolina Underground Storage Tank Regulations the assessment must be conducted as documented chemicals of concern are above the risk-based-screening levels.

Implementation of this scope of work should proceed upon receipt of this correspondence. **The report must be submitted within 60 days from the date of this letter. If the report is not received in accordance with this schedule, enforcement procedures will be initiated.**

On all correspondence regarding this site, please reference UST Permit # 12719. If you have any questions concerning this correspondence, please call Konstantine Akhvlediani at (803) 898-4353 or 1-800-826-5435 (within South Carolina only).



Sincerely,  
State Lead and Field Services Section  
Assessment and Corrective Action Branch  
Division of Underground Storage Tank Management

*K. Akhvlediani*  
Konstantine Akhvlediani, Hydrogeologist

*Christopher S. Doll*  
Christopher S. Doll, P.G., Manager

cc: Technical/Read Files



**RECEIVED**

SEP 27 1999

DIVISION OF UNDERGROUND  
STORAGE TANK MGMT.

September 24, 1999

R.L. Jordan Oil Company  
P.O. Box 2527  
Spartanburg, SC 29304-2527

ATTENTION: Judy Laughter

Reference: **STANDARD LIMITED ASSESSMENT REPORT**  
Hot Spot #~~36~~ 3005  
Site ID #: 12719  
S.C. Highway 221  
Chesnee, South Carolina  
S&ME Project No. 1264-99-506

Dear Ms. Laughter:

Attached is the report on the Standard Limited Assessment performed at Hot Spot #36 on Highway 221 in Chesnee, South Carolina. Plans for off site disposal of purge water and soil have been made with GARCO, Inc. S&ME will forward the disposal manifest upon receipt.

Our invoice for the assessment and a corresponding SCDHEC invoice will follow. If you have any questions, please call us at (864) 574-2360.

Sincerely,

**S&ME, Inc.**

David E. Klemm, P.G.  
Project Geologist

Stanford Lummus, P.E.  
Senior Environmental Engineer



Contracting Company Name/Address→

R.L. Jordan Oil Company  
P.O. Box 2527  
Spartanburg, SC 29304-2527

**STANDARD LIMITED ASSESSMENT REPORT**

Site Name/Address→

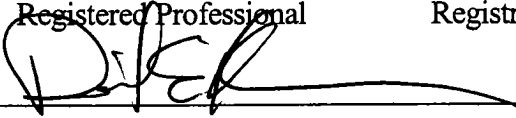
Hot Spot #~~36~~ 3005  
SC Highway 221  
Chesnee, Spartanburg County, South Carolina  
Site ID #12719

Submitted to:

Bureau of Underground Storage Tank Management  
South Carolina Department of Health and Environmental Control  
2600 Bull Street  
Columbia, South Carolina 29201

This report has been reviewed by:

Name David E. Klemm #1024 9/24/99  
Registered Professional Registration # Date

Signature  Date

REGISTERED PROFESSIONAL SEAL→



SCDHEC Certificate # \_\_\_\_\_

## STANDARD LIMITED ASSESSMENT REPORT OF FINDINGS

### I. INTRODUCTION

#### A. Owner/Operator Information

Name: R.L. Jordan Oil Company

Address: P.O. Box 2527, Spartanburg, SC 29304-2527

Telephone Number (include area code): (864) 585-2784

#### B. Property Owner Information

Name (if different from above):

Address:

Telephone Number (include area code):

#### C. Consultant Information

Name: S&ME, Inc.

Address: 155 Tradd Street, Spartanburg, South Carolina 29301

Telephone Number (include area code): (864) 574-2360

#### D. Site Information

Address: North corner of Hampton St. (SC 221) and Alabama Ave. Chesnee, SC

Description of Adjacent Land Use (Commercial, residential, rural, etc.) Include documentation (e.g. zoning regulations) as appropriate. Elementary school to North and East, Alabama Ave. and SC 221 to the west and south. In general, site is located within a transition between commercial small businesses and residential area.

Predicted Future Land Use (include site and adjacent area): Predicted future land use for site not expected to change.

#### E. Site History

Date Release Reported to SCDHEC: March 24, 1994

Estimated Quantity of Product Released: Unknown

Cause of Release: Leaking UST



UST #	Product	Date Installed	Currently in use (Yes or No)	If not in use, Date Removed
1	Diesel fuel	Unknown	No	1994
2	8000 gas	Unknown	Yes	
3	8000 gas	Unknown	Yes	
4	8000 gas	Unknown	Yes	
5	8000 gas	Unknown	Yes	
6	8000 gas	Unknown	Yes	
7	12000 gas	Unknown	Yes	

Other Releases at this site: Yes \_\_\_\_\_ No ✓  
 If yes, Date Release Reported to SCDHEC \_\_\_\_\_

Status of Release Unknown

No Further Action Date Unknown

**II. SITE CHARACTERISTICS**

**A. Site Geography**

Describe the topography of the site and surrounding area (slope, vegetation, bodies of water, major land features etc.) Developed portion of the site is overlain with concrete and asphalt paving and gently slopes downward to the south and west toward Alabama Avenue. No surface water identified on-site.

Mean Elevation of Site 886 feet MSL

Additional Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**B. Exposure Analysis**

Describe all potential and preferential pathways within a 1000-foot radius of the site.

Description of Receptor	Distance/Direction from Site
Small unnamed tributary to Little Buck Creek	approximately 600 feet south of site
Little Buck Creek	approximately 800 feet northwest of site

Provide any additional comments necessary to complete the exposure analysis.

---

**C. Utilities Survey**

List the utilities on site, and adjacent to the site within a 250-foot radius, that could serve as exposure points or as preferential pathways.

<b>Utility</b>	<b>On-Site or Distance/Direction from Site</b>	<b>Depth to Utility</b>
Water	On-Site	Unknown
Natural Gas	On-Site	Unknown
Electricity	On-Site	Unknown
Sewer (to septic tank)	On-Site	Unknown
Storm Water (trench drains)	On-Site	Unknown

Additional Comments: Estimated depths of utilities would be 1 to 3 feet below ground surface. Utilities would not appear to be likely contaminant pathways.

**D. Site Geology**

Provide a brief description of the regional geology and hydrogeology. The site lies within the Piedmont Geologic Province of South Carolina. The Piedmont consists primarily of schist and gneiss and intrusives such as granite. Generally, the rocks are strongly foliated and fractured. The percolation of water downward through the fractures has resulted in the formation of a layer of residual weathered material (saprolite) and soil at the land surface.

Provide a brief description of the site specific geology and stratigraphy. Site underlain by residual soil consisting of sandy and clayey silts. Encountered auger refusal on apparent rock (prior to encountering groundwater) at a depth of 22 feet below grade at topographically high area of site. Encountered groundwater at an approximate depth of 24 feet below grade at a topographically low area of the site. Groundwater encountered within sandy silts at these locations.

**E. Soil Boring Data**

Drilling Dates. September 9-14, 1999

Provide a brief justification for the location of the soil borings

MW-3 monitoring well installed down gradient near existing USTs and where release occurred

MW-4 background boring and monitoring well

MW-5 monitoring well installed further down gradient near dispenser island

MW-2 Soil boring performed near abandoned UST

HA-1 hand auger boring located near dispenser island

HA-2 hand auger boring located near dispenser island

HA-3 hand auger boring located near dispenser island

HA-4 hand auger boring located near dispenser island

Complete the table below for each soil boring.

Monitoring Well – MW-3      Sampling Date – 9/13/99      Sample Depth – 25 feet

Split Spoon Interval (ft.)	Field Screening Results (ppm)	Lithology (soil type, color, rocks/minerals present)	Soil conditions (dry, moist, Etc.; petroleum odor)
3.5 / 5	160	Fill-Red/Brown sandy SILT	Dry - no odor
8.5 / 10	120	Fill-Red/Brown sandy SILT	Dry - no odor
13.5 / 15	56	Residuum-Red, orange, white sandy SILT w/ some rock fragments	Dry - no odor
18.5 / 20	76	Residuum-Red, orange, white sandy SILT w/ some rock fragments	Dry - no odor
23.5-25	110	Residuum- Red-orange, slightly micaceous sandy SILT	Dry - no odor
28.5-30	9	Residuum- Red-orange, slightly micaceous sandy SILT	Saturated - no odor

Monitoring Well – MW-4      Sampling Date – 9/14/98      Sample Depth – 10 feet

Split Spoon Interval (ft.)	Field Screening Results (ppm)	Lithology (soil type, color, rocks/minerals present)	Soil conditions (dry, moist, Etc.; petroleum odor)
3.5 / 5	0	Fill-Red-orange sandy CLAY	Dry - no odor
8.5 / 10	0	Residuum-red-orange sandy SILT	Dry - no odor
13.5 / 15	0	Residuum-tan-gray slightly micaceous silty SAND w/ rock fragments	Dry - no odor
18.5 / 20	0	Residuum-tan-gray slightly micaceous silty SAND w/ rock fragments	Dry - no odor
22 - 46.3	N/A	Rock- Biotite gneiss	

Monitoring Well – MW-5

Sampling Date – 9/14/99

Sample Depth – 25 feet

Split Spoon Interval (ft.)	Field Screening Results (ppm)	Lithology (soil type, color, rocks/minerals present)	Soil conditions (dry, moist, Etc.; petroleum odor)
3.5 / 5	0	Fill-Red-orange silty SAND	Dry – no odor
8.5 / 10	0	Residuum- Red-orange, tan slightly micaceous sandy SILT	Dry – no odor
13.5 / 15	0	Residuum- Red-orange, tan slightly micaceous sandy SILT	Dry – no odor
18.5 / 20	0	Residuum- Red-orange, tan slightly micaceous sandy SILT	Dry – no odor
23.5 / 25	0	Residuum- Red-orange, tan slightly micaceous sandy SILT	Dry – no odor
28.5 / 30	0	Residuum- Red-orange, tan slightly micaceous sandy SILT	Dry – no odor

Borehole –MW-2

Sampling Date – 9/13/99

Sample Depth – 5 feet

Split Spoon Interval (ft.)	Field Screening Results (ppm)	Lithology (soil type, color, rocks/minerals present)	Soil conditions (dry, moist, Etc.; petroleum odor)
3.5 / 5.0	64	Fill-Red-orange sandy CLAY	Dry – no odor
8.5 / 10	5	Residuum-Red-orange slightly micaceous sandy SILT w/ rock fragments	Dry – no odor
13.5 / 15	7.6	Residuum-Red-orange slightly micaceous sandy SILT w/ rock fragments	Dry – no odor
18.5 / 20	10	Residuum-Red-orange slightly micaceous sandy SILT w/ rock fragments	Dry – no odor
23.5 / 25	3.6	Residuum-Red-orange slightly micaceous sandy SILT w/ rock fragments	Dry – no odor
28.5 / 30	.4	Residuum-Red-orange slightly micaceous sandy SILT w/ rock fragments	Dry – no odor

Borehole –HA-1

Sampling Date – 9/9/99

Sample Depth – 3 feet

Split Spoon Interval (ft.)	Field Screening Results (ppm)	Lithology (soil type, color, rocks/minerals present)	Soil conditions (dry, moist, Etc.; petroleum odor)
0-1	0	concrete and gravel	Dry – no odor
1-2	0	Fill- Orange-brown clayey SILT	Dry – no odor
2-3	0	Pea gravel	Dry – no odor

Borehole –HA-2

Sampling Date – 9/9/99

Sample Depth – 3 feet

Split Spoon Interval (ft.)	Field Screening Results (ppm)	Lithology (soil type, color, rocks/minerals present)	Soil conditions (dry, moist, Etc.; petroleum odor)
0-1	0	concrete and gravel	Dry – no odor
1-3	0	Orange-brown clayey SILT	Dry – no odor

Borehole –HA-3

Sampling Date – 9/9/99

Sample Depth – .5 feet

Split Spoon Interval (ft.)	Field Screening Results (ppm)	Lithology (soil type, color, rocks/minerals present)	Soil conditions (dry, moist, Etc.; petroleum odor)
0-5	56.7	concrete	Dry – no odor
.5-2	1.7	Fill-Red orange clayey SILT	Dry – no odor
2-10	0-1	Fill-Red-brown silty sandy CLAY	Dry – no odor

Borehole –HA-4

Sampling Date – 9/9/99

Sampling Depth – 8 feet

Split Spoon Interval (ft.)	Field Screening Results (ppm)	Lithology (soil type, color, rocks/minerals present)	Soil conditions (dry, moist, Etc.; petroleum odor)
0-1	1932	concrete	
1-2	2000	Fill-Brown orange clayey SILT	Dry – strong petroleum odor
2-4	2000	Fill-Orange clayey sandy SILT	Dry – strong petroleum odor
4-6	17000	Fill-Orange clayey sandy SILT	Dry – strong petroleum odor
6-8	17000	Fill- Red-orange sandy SILT	Dry – strong petroleum odor
8-10	1500	Tan silty SAND	Dry – strong petroleum odor

Enter the soil analytical data for each soil boring for all COC in the table below and on the following page. Enter the appropriate RBSL for the soil type from Tables 4 through 8 in SCDHEC Risk-Based Corrective Action (RBCA) for Petroleum Releases Guidance Document.

COC	RBSL (ug/kg)	MW-3	MW-4	MW-5	MW-2	HA-1	HA-2	HA-3	HA-4
Benzene ug/kg	7	<7.2		<6.1	<5.9	<5.6	<5.7	6.9	<300
Toluene ug/kg	1,700	<7.2		<6.1	<5.9	<5.6	<5.7	<6.4	20000
Ethylbenzene ug/kg	1,500	<7.2		<6.1	<5.9	<5.6	<5.7	<6.4	22000
Xylenes ug/kg	44,000	<7.2		<6.1	<5.9	<5.6	<5.7	24	210000
Total BTEX ug/kg	N/A	<7.2		<6.1	<5.9	<5.6	<5.7	30.9	252000
Naphthalene ug/kg	200	<7.2		<6.1	<5.9	<5.6	<5.7	<6.4	67000

CoC	RBSL	MW-3	MW-4	MW-5	MW-2	HA-1	HA-2	HA-3	HA-4
Benzo (a)anthracene, ug/kg	700	<470		<400	<420	<390	<410	<430	<4000
Benzo(b)flouranthene, ug/kg	660	<470		<400	<420	<390	<410	<430	<4000
Benzo(k)flouranthene, ug/kg	4,600	<470		<400	<420	<390	<410	<430	<4000
Chrysene, ug/kg	660	<470		<400	<420	<390	<410	<430	<4000
Dibenz(a,h)anthracene, ug/kg	2,600	<470		<400	<420	<390	<410	<430	<4000
TPH (EPA 3550) , mg/kg	NA								1800
TOC , mg/kg	NA		<12						

Discuss the horizontal and vertical extent of COC in the soil. The RBSLs for all COC were exceeded only in one sample (HA-4 at 8 feet). OVA detected low concentrations in the near surface sample of that boring increasing in concentrations to 8 feet before decreasing below 8 feet.

Additional Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**F. Chemicals of Concern – Ground Water**

Provide well installation information in the table below.

MW#	Installation Date	Development Date	Sampling Date
MW-1	4/23/96	4/24/96	4/24/96
MW-3	9/13/99	9/15/99	9/15/99
MW-4	9/17/99	9/20/99	9/20/99
MW-5	9/14/99	9/15/99	9/15/99

Enter the soil analytical data for each monitoring well for all CoC in the table below.

CoC	MW-3	MW-4	MW-5
Depth of sample (feet)	25	10	25
Benzene (µg/kg)	<7.2	not analyzed	<6.1
Toluene (µg/kg)	<7.2	not analyzed	<6.1
Ethylbenzene (µg/kg)	<7.2	not analyzed	<6.1
Xylenes (µg/kg)	<7.2	not analyzed	<6.1
Total BTEX (µg/kg)	<7.2	not analyzed	<6.1
Naphthalene (µg/kg)	<7.2	not analyzed	<6.1
Benzo(a)anthracene (µg/kg)	<470	not analyzed	<400
Benzo(b)flouranthene (µg/kg)	<470	not analyzed	<400
Benzo(k)flouranthene (µg/kg)	<470	not analyzed	<400
Chrysene (µg/kg)	<470	not analyzed	<400
Dibenz(a,h)anthracene (µg/kg)	<470	not analyzed	<400
Lead (mg/kg)	not analyzed	not analyzed	not analyzed
EDB	not analyzed	not analyzed	not analyzed

Summarize the monitoring well and ground-water data in the table below.

MW#	TOC Elevation (ft)	Screened Interval (ft)	Depth to Water (ft)	Water Table Elevation (ft)
MW-1	104.11	15-30	26.81 (corrected)	77.30
MW-3	104.92	22.28-32.28	30.05	74.87
MW-4	111.32	35.4-45.4	26.65	84.67
MW-5	103.57	22.25-32.25	30.86	72.71



Complete the slug test form and include in Appendix D of the report. Include all data, graphs, and equations used to derive the aquifer and hydrologic parameters (hydraulic conductivity, seepage velocity, hydraulic gradient, etc.) in Appendix D.

### III. Tier I Evaluation

A. CURRENT LAND USE – Identify any potential receptors or human exposure pathways (e.g. basements, contaminated soils from UST closures, etc) within a 1000-foot radius for current land use. Complete the table below. Additional sheets may be attached if necessary.

Media (for exposure)	Exposure Route	Pathway Selected for Evaluation? (Yes or No)	Exposure point or Reason for Non-Selection	Data Requirements (If pathway selected)
Air	Inhalation	No	Site is concrete covered	
	Explosion Hazard	No		
Ground-Water	Ingestion	No	Groundwater in area not known to be used for potable or bathing water	
	Dermal Contact	No		
	Volatile Inhalation	No		
Surface Water	Ingestion	No	Surface water not potable water source	
	Dermal Contact	No	Surface water not suspected of being impacted	
	Volatile Inhalation	No		
Surficial Soil	Ingestion	No	Site is concrete covered	
	Dermal Contact	No	No disturbances of surficial soil planned	
	Volatile Inhalation	No		
	Leaching to Ground-Water	No	Further tier assessment required to evaluate this potential	
Subsurface Soil	Ingestion	No	Site is concrete covered	
	Dermal Contact	No	No disturbances of surficial soil planned	
	Volatile Inhalation	No		
	Leaching to Ground-Water	No	Further tier assessment required to evaluate this potential	



B. FUTURE LAND USE – Identify any potential receptors or human exposure pathways (e.g. basements, contaminated soils from UST closures, etc.) within a 1000-foot radius for projected future land use. Complete the table below. Additional sheets may be attached if necessary.

**Future land use not projected to differ from current land use.**

Media (for exposure)	Exposure Route	Pathway Selected for Evaluation? (Yes or No)		Exposure point or Reason for Non-Selection	Data Requirements (If pathway selected)
		Yes	No		
Air	Inhalation	Yes	No		
	Explosion Hazard	Yes	No		
Ground-Water	Ingestion	Yes	No		
	Dermal Contact	Yes	No		
	Volatile Inhalation	Yes	No		
Surface Water	Ingestion	Yes	No		
	Dermal Contact	Yes	No		
	Volatile Inhalation	Yes	No		
Surficial Soil	Ingestion	Yes	No		
	Dermal Contact	Yes	No		
	Volatile Inhalation	Yes	No		
	Leaching to Ground-Water	Yes	No		
Subsurface Soil	Ingestion	Yes	No		
	Dermal Contact	Yes	No		
	Volatile Inhalation	Yes	No		
	Leaching to Ground-Water	Yes	No		

Recommendations for further action: Rapid Assessment

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#### IV. MAPS AND FIGURES

A. Figures

All maps must include the following

- the facility name,
- address,
- site id number,
- date
- bar scale,
- north arrow.

1. Figure 1 – Topographic Map

Prepare a copy of the relevant portion of the appropriate United States Geological Survey 7.5 minute topographic map. Indicate the location of the site and location of any receptors (e.g., marsh, ground-water well, city water well, etc.)

2. Figure 2 – Scaled Site Location Map

Prepare a site location map identifying the site and any pertinent property boundaries (residential and commercial), streets, receptors, etc.) within a 500 foot radius.

3. **Figure 3 – Surveyed Site Map**  
 Prepare a site base map to scale and plot all the utilities. This map will include:
- Location of property lines.
  - Streets and highways (indicate names).
  - Location of buildings.
  - Paved areas on or adjacent to site.
  - Location of all present and former above ground and underground storage tanks and associated lines, pumps, and dispensers.
  - Underground utilities on or adjacent to site (sewer, water, telephone, gas, electric, etc.).
  - Location of any other potential receptors.
  - Eight soil boring locations.
  - Three monitoring well locations.
  - Survey datum location.

4. **Figure 4 – Soil COC Site Map**  
 Prepare a COC site map from a copy of Figure 3. Add all accompanying soil data. The soil analytical data will be plotted adjacent to each soil boring (SB) using the following format:

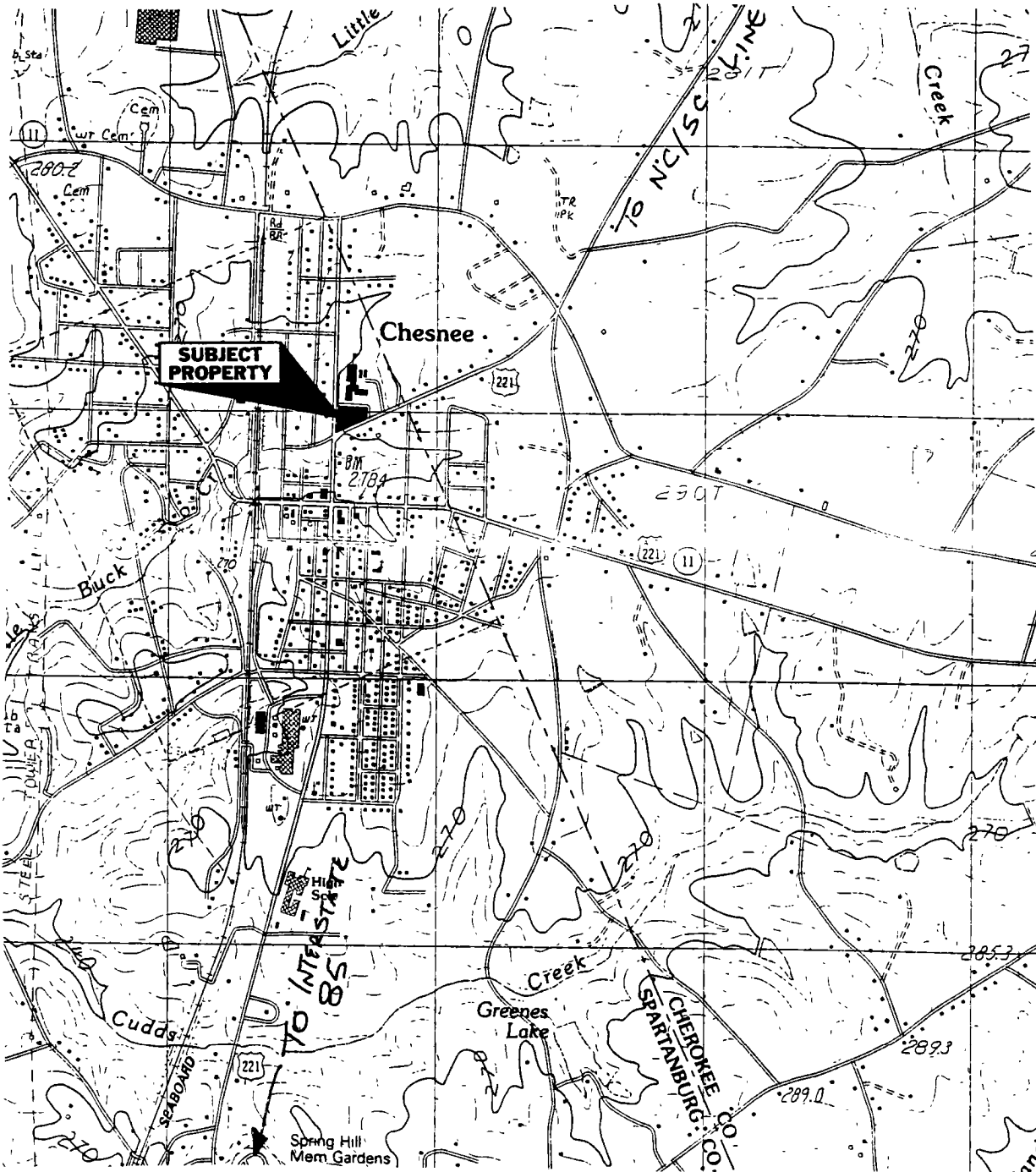
SB #	
Sample Depth (ft)	
Benzene (mg/kg)	
Toluene (mg/kg)	
Ethylbenzene (mg/kg)	
Xylenes (mg/kg)	
PAHs (mg/kg)	

5. **Figure 5 – Ground Water COC Site Map**  
 Prepare a COC site map from a copy of Figure 3. Add potentiometric surface (elevation) data, an arrow indicating ground water flow direction, and accompanying ground-water data. The ground-water data should be plotted adjacent to the monitoring wells (MW) using the following format.

MW #	
Ground Water Elevation	
Benzene (µg/kg)	
Toluene (µg/kg)	
Ethylbenzene (µg/kg)	
Xylenes (µg/kg)	
PAHs (µg/kg)	

## B. Appendices

- Appendix A – Soil Boring Logs**  
 The soil boring logs should indicate lithology, water level (if encountered), split-spoon sample intervals and field screening results. Also, the presence of hydrocarbon odors and qualitative indication of soil conditions (dry, moist, wet, saturated, etc) should be noted on the logs.
- Appendix B – Monitoring Well Construction Logs**  
 The monitoring well construction logs must include all information as outlined in the S.C. Well Standards and Regulations R.61-71.11E(2). Additionally, a copy of DHEC Form 1903 (Water Well Record) should be included for each monitoring well installed.
- Appendix C – Laboratory Data**  
 A copy of the completed chain of custody, certificates of analysis and field sampling logs should be attached. The sampling logs should note the location and type of each sample submitted for analysis. The laboratory certificates of analysis should include the analytical results, the reporting limit, the analytical method utilized, and the laboratory certification number.
- Appendix D – Aquifer Calculations**  
 The slug test summary forms, and all data, graphs, and equations that were used to derive the aquifer characteristics and hydrologic parameters should be included.
- Appendix E – Soil and water disposal manifests.**



**NORTH**

**SOURCE: USGS TOPOGRAPHIC MAP, 7.5 MINUTE SERIES  
CHESNEE, SOUTH CAROLINA QUADRANGLE**

**SCALE: 1" = 2000'**

CHECK BY

DRAWN BY O'Connell

DATE: 24-Sep-99



**TOPOGRAPHIC MAP**

**HOT SPOT #36**

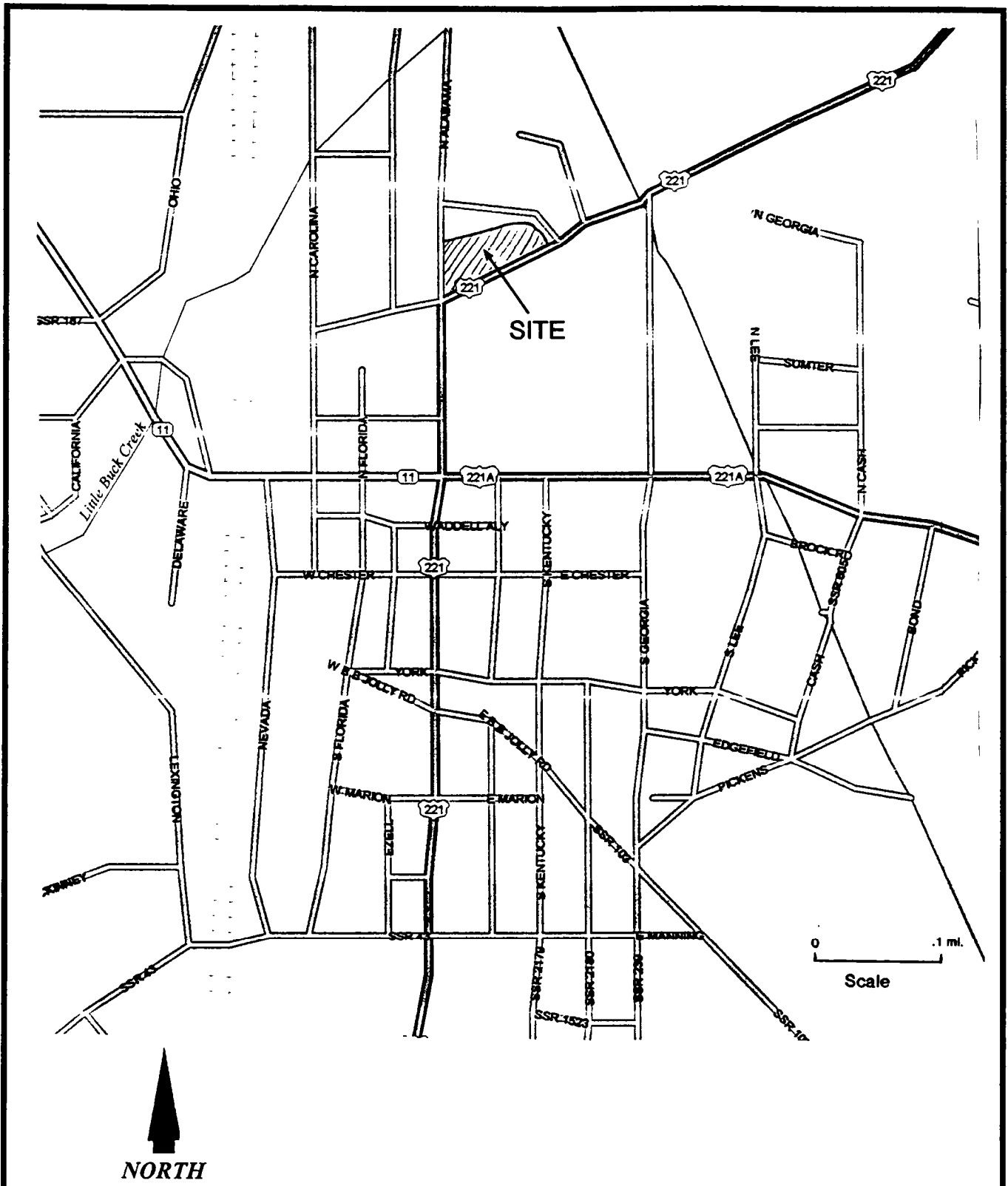
HIGHWAY 221

CHESNEE, SOUTH CAROLINA

1264-99-506

FIGURE NO:

**1**



CHECK BY:

DRAWN BY: O'Connell

DATE: 24-Sep-99



**SITE LOCATION MAP**

**HOT SPOT #36**

**HIGHWAY 221**

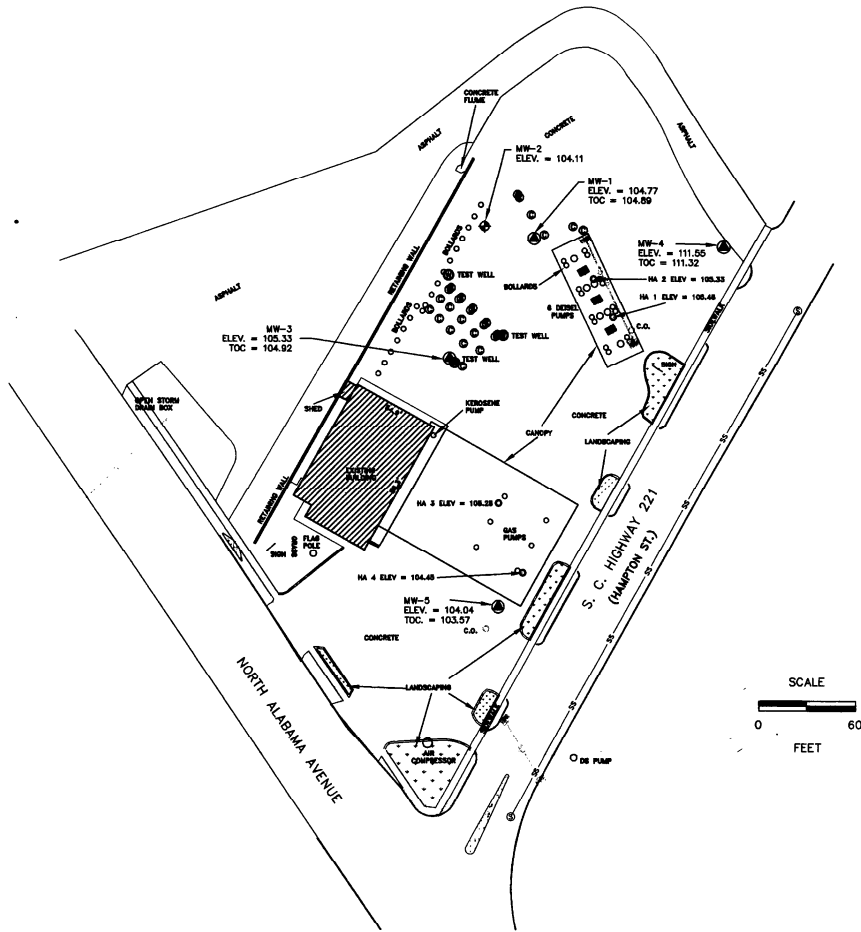
**CHESNEE, SOUTH CAROLINA**

**1264-99-506**

FIGURE NO:

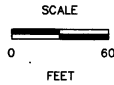
**2**


CAD FILE: K:\DWG\126\1999\0906\19990920.DWG

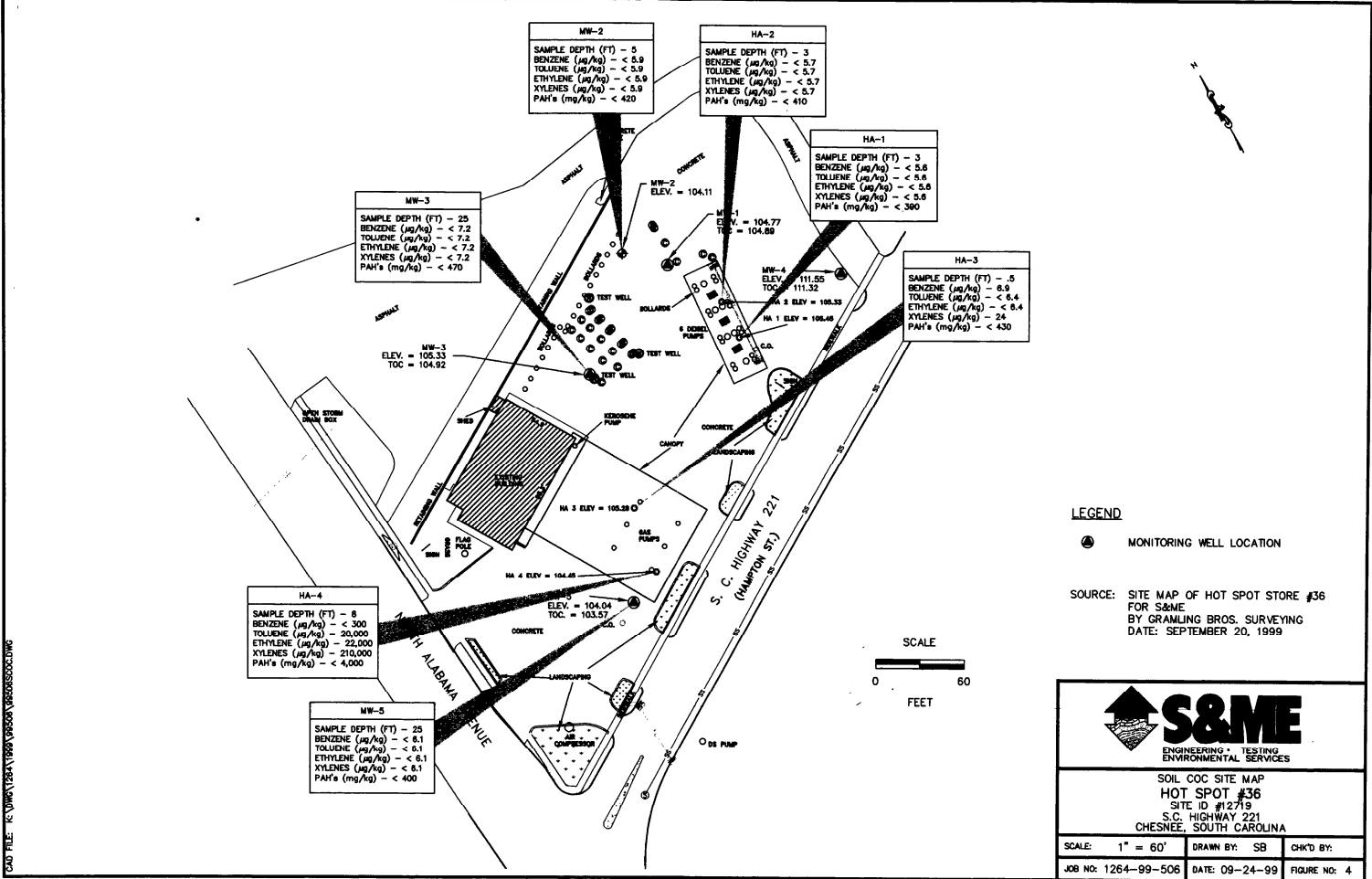


**LEGEND**  
 MONITORING WELL LOCATION

SOURCE: SITE MAP OF HOT SPOT STORE #36 FOR S&ME BY GRAMLING BROS. SURVEYING DATE: SEPTEMBER 20, 1999

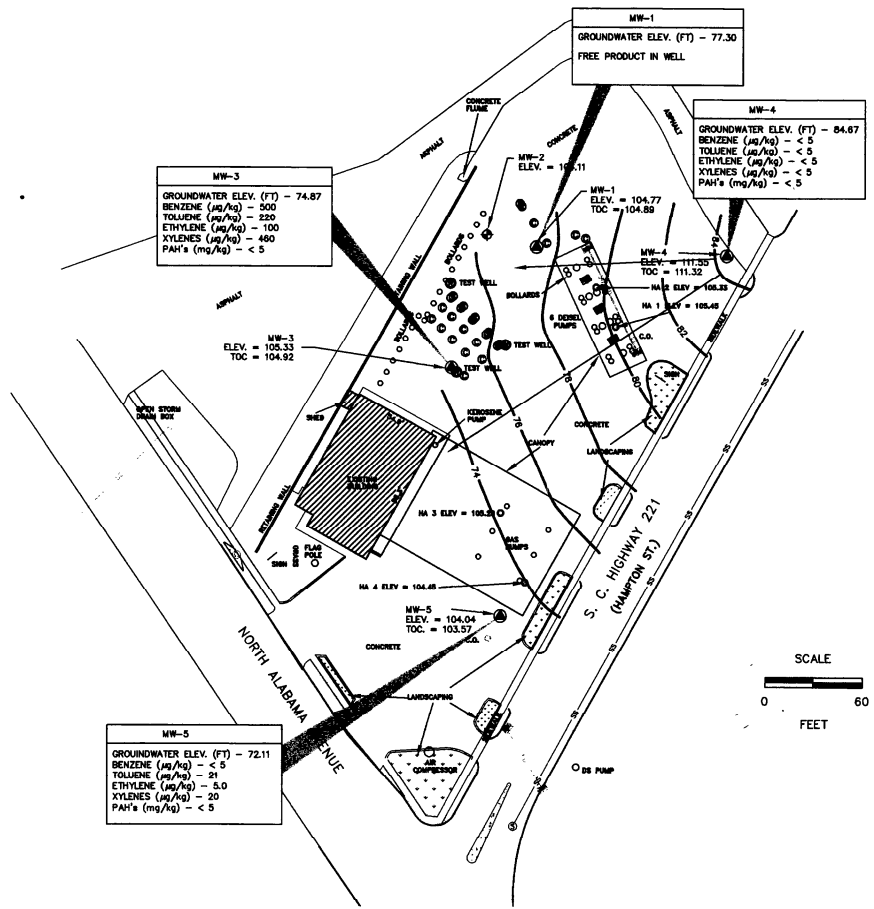


 <b>S&amp;ME</b> ENGINEERING - TESTING ENVIRONMENTAL SERVICES		
SURVEYED SITE MAP <b>HOT SPOT #36</b> SITE ID #12719 S.C. HIGHWAY 221 CHESNÉE, SOUTH CAROLINA		
SCALE: 1" = 60'	DRAWN BY: SB	CHK'D BY:
JOB NO: 1264-99-506	DATE: 09-24-99	FIGURE NO: 3



CAD FILE: R:\DMEV\1264\1999\0924\0924.DWG

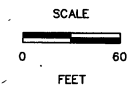
CAD FILE: K:\DWG\1264\1999\0909\09090500.DWG




**LEGEND**

- MONITORING WELL LOCATION
- GROUNDWATER FLOW LINE
- GROUNDWATER CONTOUR

SOURCE: SITE MAP OF HOT SPOT STORE #36 FOR S&ME BY GRAMLING BROS. SURVEYING DATE: SEPTEMBER 20, 1999





**ENGINEERING • TESTING  
ENVIRONMENTAL SERVICES**

GROUNDWATER COC SITE MAP  
HOT SPOT #36  
SITE ID #12719  
S.C. HIGHWAY 221  
CHESNÉE, SOUTH CAROLINA

SCALE: 1" = 60'	DRAWN BY: SB	CHK'D BY:
JOB NO: 1264-99-506	DATE: 09-24-99	FIGURE NO: 5

**APPENDIX A**  
**SOIL BORING LOGS**



# LOG OF BORING NO. HA-1

PROJECT: **Hot Spot #36**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **Not Encountered @ TOB**

DATE DRILLED: **9/9/99**  
 DRILLING CONTRACTOR: **S&ME, Inc.**  
 DRILLING METHOD: **Hand Auger**

GROUND SURFACE ELEVATION: **Not Measured**  
 LOGGED BY: **Jeff Lindsey**

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.								
1	1	0		0			8" CONCRETE	
2	1	0					2" GRAVEL	
3	1	0					Orange brown clayey SILT Pea GRAVEL	
HAND AUGER REFUSAL AT 3 FEET ON CONCRETE PIPE								

NOTES:

HAND AUGER LOG 6499506 GPF J S&ME GDT 9/24/99



155 Tradd Street  
 Spartanburg, SC 29301

**LOG OF BORING HA-1**

# LOG OF BORING NO. HA-2

PROJECT: **Hot Spot #36**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **Not Encountered @ TOB**

DATE DRILLED: **9/9/99**  
 DRILLING CONTRACTOR: **S&ME, Inc.**  
 DRILLING METHOD: **Hand Auger**

GROUND SURFACE ELEVATION: **Not Measured**  
 LOGGED BY: **Jeff Lindsey**

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.								
1	1	0		0			0-8" CONCRETE	
2	1	0					8-10" GRAVEL	
3	1	0					Orange brown clayey SILT	
REFUSAL AT 3 FEET ON CONCRETE PIPE								

NOTES:

HAND AUGER LOG 6489506.GPJ S&ME GDT 9/24/99



155 Tradd Street  
 Spartanburg, SC 29301

LOG OF BORING HA-2









# LOG OF BORING NO. HA-3

PROJECT: **Hot Spot #36**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **Not Encountered @ TOB**

DATE DRILLED: **9/9/99**  
 DRILLING CONTRACTOR: **S&ME, Inc.**  
 DRILLING METHOD: **Hand Auger**

GROUND SURFACE ELEVATION: **Not Measured**  
 LOGGED BY: **Jeff Lindsey**

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS GRAPHIC SYMBOL	This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	
						DESCRIPTION	REMARKS
				0		6" CONCRETE	
1	1	56.7				Red orange sandy clayey SILT	
2	1	1.7				Red-brown silty sandy CLAY	
3	2	1					
4	2	0		5			
5	2	1					
6	2	1					
				10		BORING TERMINATED AT 10 FEET	

NOTES:

HAND AUGER LOG 6499506 GP.J. S&ME GDT 9/24/99



155 Tradd Street  
 Spartanburg, SC 29301

**LOG OF BORING HA-3**



# LOG OF BORING NO. HA-4

PROJECT: **Hot Spot #36**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **Not Encountered @ TOB**

DATE DRILLED: **9/9/99**  
 DRILLING CONTRACTOR: **S&ME, Inc.**  
 DRILLING METHOD: **Hand Auger**

GROUND SURFACE ELEVATION: **Not Measured**  
 LOGGED BY: **Jeff Lindsey**

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS GRAPHIC SYMBOL	This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	
						DESCRIPTION	REMARKS
				0		<b>0-8" CONCRETE</b>	
1	1	1,932 PPM				Brown orange clayey SILT with strong petroluem odor	
2	1	2%				Orange clayey sandy SILT with strong petroleum odor and organic debris	
3	2	2%				Red orange sandy SILT with strong petroleum odor	
4	2	17%		5		Tan silty SAND with strong petroleum odor	
5	2	17%				<b>BORING TERMINATED AT 10 FEET</b>	
6	2	1.5%		10			

NOTES:

HAND AUGER LOG 6499506 GPJ S&ME GDT 9/24/99



155 Tradd Street  
 Spartanburg, SC 29301

**LOG OF BORING HA-4**

# LOG OF BORING NO. MW-2

PROJECT: **Hot Spot #36**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **Not Encountered @ TOB**

DATE COMPLETED: **9/13/99**  
 DRILLING CONTRACTOR: **S&ME, Inc.**  
 DRILLER: **Costello & Giles**  
 DRILLING METHOD: **4 1/4" H.S.A.**  
 SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: **104.11**  
 DATUM: **Site Benchmark**  
 WEATHER:  
 LOGGED BY: **Jeff Lindsey**

This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
						104.11	0			<b>8" CONCRETE</b>	
1	5		12		64			//		Fill - Stiff red sandy silty CLAY	
2	5		21		5	99.11	5				
3	5		15		7.6	94.11	10				
4	5		17		10	89.11	15			Residuum- very stiff red-orange slightly micaceous sandy SILT with rock fragments	
5	5		21		3.6	84.11	20				
6	5		21		0.4	79.11	25				
						74.11	30			<b>BORING TERMINATED AT 30 FEET</b>	

NOTES:

ENV BORING LOG 6495506 GPJ S&ME GDT 9/24/99



155 Tradd Street  
 Spartanburg, SC 29301

**LOG OF BORING MW-2**

# LOG OF BORING NO. MW-3

PROJECT: **Hot Spot #36**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **29.35 on 9/15/99**

DATE COMPLETED: **9/13/99**  
 DRILLING CONTRACTOR: **S&ME, Inc.**  
 DRILLER: **Costello & Giles**  
 DRILLING METHOD: **4 1/4" H.S.A.**  
 SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: **105.33**  
 DATUM: **Site Benchmark**  
 WEATHER:  
 LOGGED BY: **Jeff Lindsey**

This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
						105.33	0			<b>8" CONCRETE</b>	
1	5		19		160						
						100.33	5			Fill - Very stiff brown to red, sandy SILT with organic debris fine to medium	
2	5		22		120						
						95.33	10				
3	5		17		56						
						90.33	15			Residuum - Very stiff red-orange-white fine to medium sandy SILT with rock fragments	
4	5		23		76						
						85.33	20				
5	5		20		110						
						80.33	25			Very stiff red-orange slightly micaceous fine to medium sandy SILT	▼
6	5		20		9						
						75.33	30				
<b>BORING TERMINATED AT 32 FEET</b>											

NOTES:

ENV BORING LOG 6499506 GPJ S&ME GDT 9/24/99



155 Tradd Street  
 Spartanburg, SC 29301

**LOG OF BORING MW-3**

# LOG OF BORING NO. MW-4

PROJECT: **Hot Spot #36**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **26.65 on 9/23/99**

DATE COMPLETED: **9/14/99**  
 DRILLING CONTRACTOR: **S&ME, Inc.**  
 DRILLER: **Costello & Giles**  
 DRILLING METHOD: **4 1/4" H.S.A.**  
 SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: **111.55**  
 DATUM: **Site Benchmark**  
 WEATHER:  
 LOGGED BY: **Jeff Lindsey**

This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
						111.55	0			10" CONCRETE	
1	5		36		0	106.55	5		//	Fill - Hard red-orange medium to fine sandy CLAY	
2	5		11		0	101.55	10			Residuum - Stiff red-orange medium to fine sandy SILT	
3	5		76		0	96.55	15		. . .	Very dense tan-gray slightly micaceous fine to medium silty SAND with rocks	
4	5		15		0	91.55	20		. . .	Medium dense tan slightly micaceous fine to medium silty SAND	
						86.55	25		/ /		Rock coring from 22 to 45.4 feet
						81.55	30		/ /		▼
						76.55	35		/ /	ROCK - Biotite Gneiss	
						71.55	40		/ /		
						66.55	45		/ /		

NOTES:

ENV BORING LOG 6499506 GPJ S&ME GDT 9/24/99



155 Tradd Street  
 Spartanburg, SC 29301

LOG OF BORING MW-4

# LOG OF BORING NO. MW-5

PROJECT: **Hot Spot #36**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **30.86 on 9/16/99**

DATE COMPLETED: **9/14/99**  
 DRILLING CONTRACTOR: **S&ME, Inc.**  
 DRILLER: **Costello & Giles**  
 DRILLING METHOD: **4 1/4" H.S.A.**  
 SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: **104.04**  
 DATUM: **Site Benchmark**  
 WEATHER:  
 LOGGED BY: **Jeff Lindsey**

This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION		REMARKS
						104.04	0			10" CONCRETE		
1	5		34	0						Fill - Dense red-orange medium to fine silty SAND		
2	5		19	0		99.04	5					
3	5		21	0		94.04	10					
4	5		26	0		89.04	15					
5	5		23	0		84.04	20			Residuum - Very stiff red-orange to tan slightly micaceous medium to fine sandy SILT		
6	5		21	0		79.04	25					
						74.04	30					▼
										BORING TERMINATED AT 32 FEET		

NOTES:

ENV BORING LOG 6499506 GPJ S&ME GDT 9/24/99



155 Tradd Street  
 Spartanburg, SC 29301

**LOG OF BORING MW-5**



**APPENDIX B**

**MONITORING WELL CONSTRUCTION LOGS**

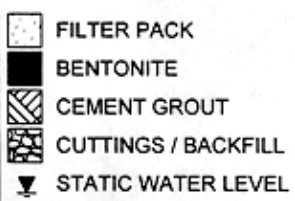
# COMPLETION REPORT OF WELL No. MW-3

PROJECT: **Hot Spot #36**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **29.35 on 9/15/99**

DRILLING CONTRACTOR: **S&ME, Inc.**  
 DRILLING METHOD: **4 1/4" H.S.A.**  
 DATE COMPLETED: **9/13/99**

LATITUDE: **N 35° 9.069 min.**  
 LONGITUDE: **W 81° 51.604 min.**  
 TOP OF CASING ELEVATION: **104.92**  
 DATUM: **Site Benchmark**  
 LOGGED BY: **Jeff Lindsey**

STRATA		WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)	WELL CONSTRUCTION DETAILS
DESCRIPTION	SYMBOL					
			0.00	GS	105.33	<b>PROTECTIVE CASING</b> Diameter: <b>8 inch</b> Type: <b>Man-Hole Cover</b> Interval: <b>0 to 8 inches</b>
<b>8" CONCRETE</b>			0.41	TOC	104.92	
Fill - Very stiff brown to red, sandy SILT with organic debris fine to medium			5			<b>RISER CASING</b> Diameter: <b>2 inch</b> Type: <b>Sch 40 PVC</b> Interval: <b>.41 to 22.28 feet</b>
			10			
Residuum - Very stiff red-orange-white fine to medium sandy SILT with rock fragments			15			<b>GROUT</b> Type: <b>Portland Cement</b> Interval: <b>0.75 to 18 feet</b>
			18.00	CG	87.33	
			20			<b>SEAL</b> Type: <b>Bentonite</b> Interval: <b>18 to 20 feet</b>
			20.00	BS	85.33	
Very stiff red-orange slightly micaceous fine to medium sandy SILT			22.28			<b>FILTERPACK</b> Type: <b>Clean, Medium Grain Filter Sand</b> Interval: <b>20 to 32.28 feet</b>
			22.28	TSC	83.05	
<b>BORING TERMINATED AT 32.28 FEET</b>			25			<b>SCREEN</b> Diameter: <b>2 inch</b> Type: <b>Sch 40 PVC, 0.01 Slot</b> Interval: <b>22.28 to 32.28 feet</b>
			30			
			32.28	BSC	73.05	<b>LEGEND</b> 

MONITORING WELL 6459506.GPJ S&ME.GDT 9/24/99



155 Tradd Street  
 Spartanburg, SC 29301

**COMPLETION REPORT OF WELL No. MW-3**


# COMPLETION REPORT OF WELL No. MW-4

PROJECT: **Hot Spot #36**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **26.65 on 9/23/99**

DRILLING CONTRACTOR: **S&ME, Inc.**  
 DRILLING METHOD: **4 1/4" H.S.A.**  
 DATE COMPLETED: **9/14/99**

LATITUDE: **N 35° 9.069 min.**  
 LONGITUDE: **W 81° 51.604 min.**  
 TOP OF CASING ELEVATION: **111.32**  
 DATUM: **Site Benchmark**  
 LOGGED BY: **Jeff Lindsey**

STRATA		WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)	WELL CONSTRUCTION DETAILS
DESCRIPTION	SYMBOL DEPTH (ft.)					
	0		0.00	GS	111.55	<b>PROTECTIVE CASING</b> Diameter: <b>8 inch</b> Type: <b>Man-Hole Cover</b> Interval: <b>0 to 8 inches</b>
<b>10" CONCRETE</b>	0		0.23	TOC	111.32	
Fill - Hard red-orange medium to fine sandy <b>CLAY</b>	5					<b>RISER CASING</b> Diameter: <b>2 inch</b> Type: <b>Sch 40 PVC</b> Interval: <b>0.23 to 35.4 feet</b>
Residuum - Stiff red-orange medium to fine sandy <b>SILT</b>	10					
Very dense tan-gray slightly micaceous fine to medium silty <b>SAND</b> with rocks	15					<b>GROUT</b> Type: <b>Portland Cement</b> Interval: <b>0.75 to 20 feet</b>
Medium dense tan slightly micaceous fine to medium silty <b>SAND</b>	20		20.00	CG	91.55	
	20		22.00	BS	89.55	<b>SEAL</b> Type: <b>Bentonite</b> Interval: <b>20 to 22 feet</b>
	25					<b>FILTERPACK</b> Type: <b>Clean, Medium Grain Filter</b> Interval: <b>22 to 45.4 feet</b>
	30					
<b>ROCK - Biotite Gneiss</b>	35		35.40	TSC	76.15	<b>SCREEN</b> Diameter: <b>2 inch</b> Type: <b>Sch 40 PVC, 0.01 Slot</b> Interval: <b>35.4 to 45.4</b>
	40					<b>LEGEND</b> 
	45		45.40	BSC	66.15	
<b>CORING TERMINATED AT 46 FEET</b>						TOC TOP OF CASING GS GROUND SURFACE BS BENTONITE SEAL BOC BASE OF OUTER CASING TSC TOP OF SCREEN BSC BOTTOM OF SCREEN TD TOTAL DEPTH CG CEMENT GROUT

MONITORING WELL 649506.GPJ S&ME.GDT 9/24/99



155 Tradd Street  
 Spartanburg, SC 29301

**COMPLETION REPORT OF  
 WELL No. MW-4**

# COMPLETION REPORT OF WELL No. MW-5

PROJECT: **Hot Spot #36**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **30.86 on 9/16/99**

DRILLING CONTRACTOR: **S&ME, Inc.**  
 DRILLING METHOD: **4 1/4" H.S.A.**  
 DATE COMPLETED: **9/14/99**

LATITUDE: **N 35° 9.069 min.**  
 LONGITUDE: **W 81° 51.604 min.**  
 TOP OF CASING ELEVATION: **103.57**  
 DATUM: **Site Benchmark**  
 LOGGED BY: **Jeff Lindsey**

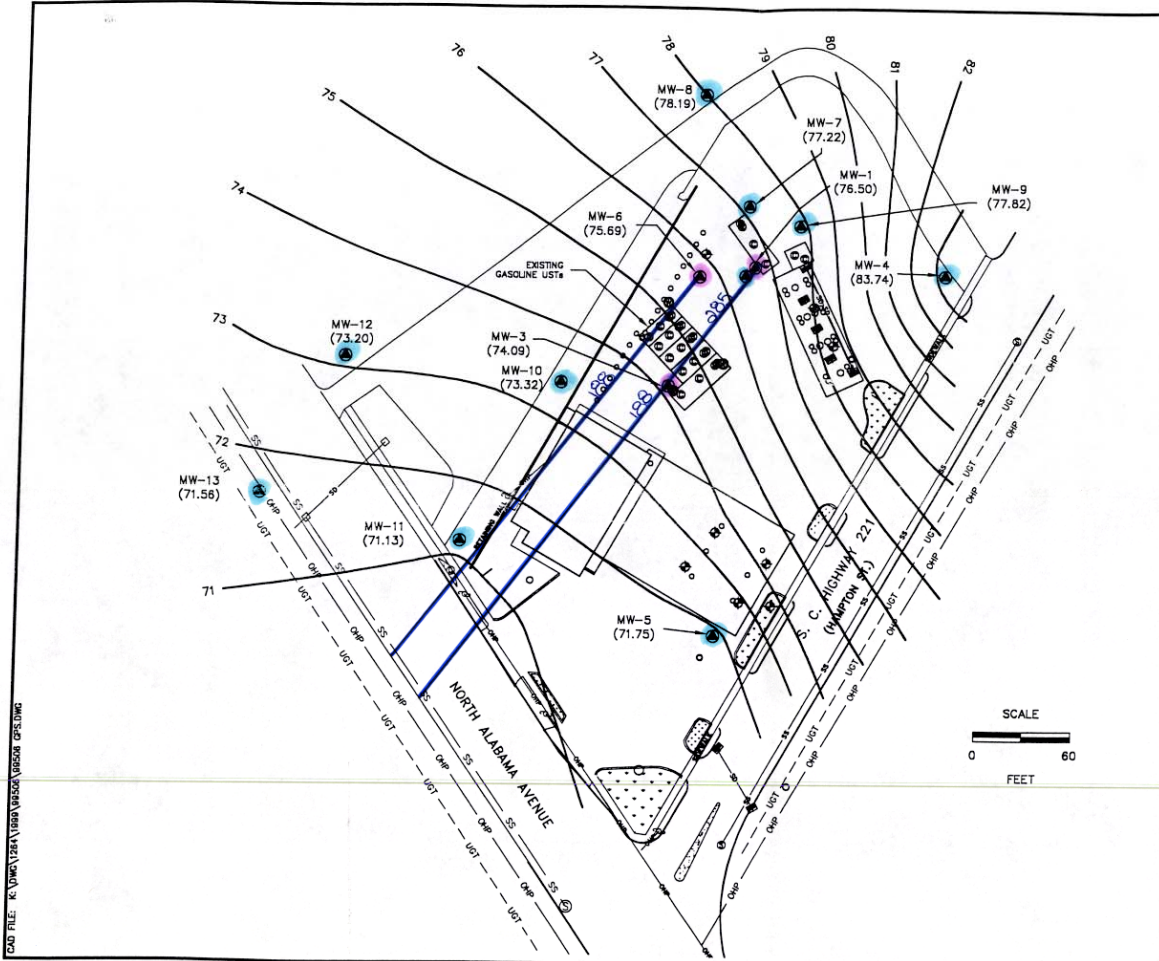
STRATA		WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)	WELL CONSTRUCTION DETAILS
DESCRIPTION	SYMBOL					
		0	0.00	GS	104.04	<b>PROTECTIVE CASING</b> Diameter: <b>8 inch</b> Type: <b>Man-Hole Cover</b> Interval: <b>0 to 8 inches</b>
10" CONCRETE	[Symbol]	0.47	0.47	TOC	103.57	
Fill - Dense red-orange medium to fine silty SAND	[Symbol]	5				<b>RISER CASING</b> Diameter: <b>2 inch</b> Type: <b>Sch 40 PVC</b> Interval: <b>0.47 to 22.25 feet</b>
		10				
		15				<b>GROUT</b> Type: <b>Portland Cement</b> Interval: <b>0.75 to 18 feet</b>
		18.00	18.00	CG	86.04	
		20	20.00	BS	84.04	<b>SEAL</b> Type: <b>Bentonite</b> Interval: <b>18 to 20 feet</b>
Residuum - Very stiff red-orange to tan slightly micaceous medium to fine sandy SILT	[Symbol]	20				
		22.25	22.25	TSC	81.79	<b>FILTERPACK</b> Type: <b>Clean, Medium Grain Filter</b> Interval: <b>20 to 32.25 feet</b>
		25				
		30				<b>SCREEN</b> Diameter: <b>2 inch</b> Type: <b>Sch 40 PVC, 0.01 Slot</b> Interval: <b>22.25 to 32.25 feet</b>
		32.25	32.25	BSC	71.79	
<b>BORING TERMINATED AT 32.25 FEET</b>						<b>LEGEND</b> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <ul style="list-style-type: none"> <li>[Symbol] FILTER PACK</li> <li>[Symbol] BENTONITE</li> <li>[Symbol] CEMENT GROUT</li> <li>[Symbol] CUTTINGS / BACKFILL</li> <li>[Symbol] STATIC WATER LEVEL</li> </ul> </div> <div style="width: 45%;"> <ul style="list-style-type: none"> <li>TOC TOP OF CASING</li> <li>GS GROUND SURFACE</li> <li>BS BENTONITE SEAL</li> <li>BOC BASE OF OUTER CASING</li> <li>TSC TOP OF SCREEN</li> <li>BSC BOTTOM OF SCREEN</li> <li>TD TOTAL DEPTH</li> <li>CG CEMENT GROUT</li> </ul> </div> </div>

MONITORING WELL 6499506.GPJ S&ME.GDT 9/24/99



155 Tradd Street  
 Spartanburg, SC 29301

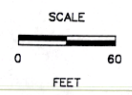
**COMPLETION REPORT OF WELL No. MW-5**



#12719 Modeling

- LEGEND**
- MONITORING WELL LOCATION
  - ⊕ SOIL BORING LOCATION
  - 75— GROUNDWATER CONTOUR
  - (73.20) GROUNDWATER ELEVATION

SOURCE: SITE MAP OF HOT SPOT STORE #36 FOR S&ME BY GRAMLING BROS. SURVEYING DATE: SEPTEMBER 20, 1999



GROUNDWATER POTENTIOMETRIC SURFACE  
HOT SPOT #3005  
SITE ID #12719  
S.C. HIGHWAY 221  
CHESNEE, SOUTH CAROLINA

SCALE: 1" = 60'	DRAWN BY: SB	CHECKED BY:
JOB NO: 1264-99-506	DATE: 11-20-00	FIGURE NO: 9

CAD FILE: K:\WORK\1264\1264-99-506\ORDR001.DWG

# Benzene SSTL

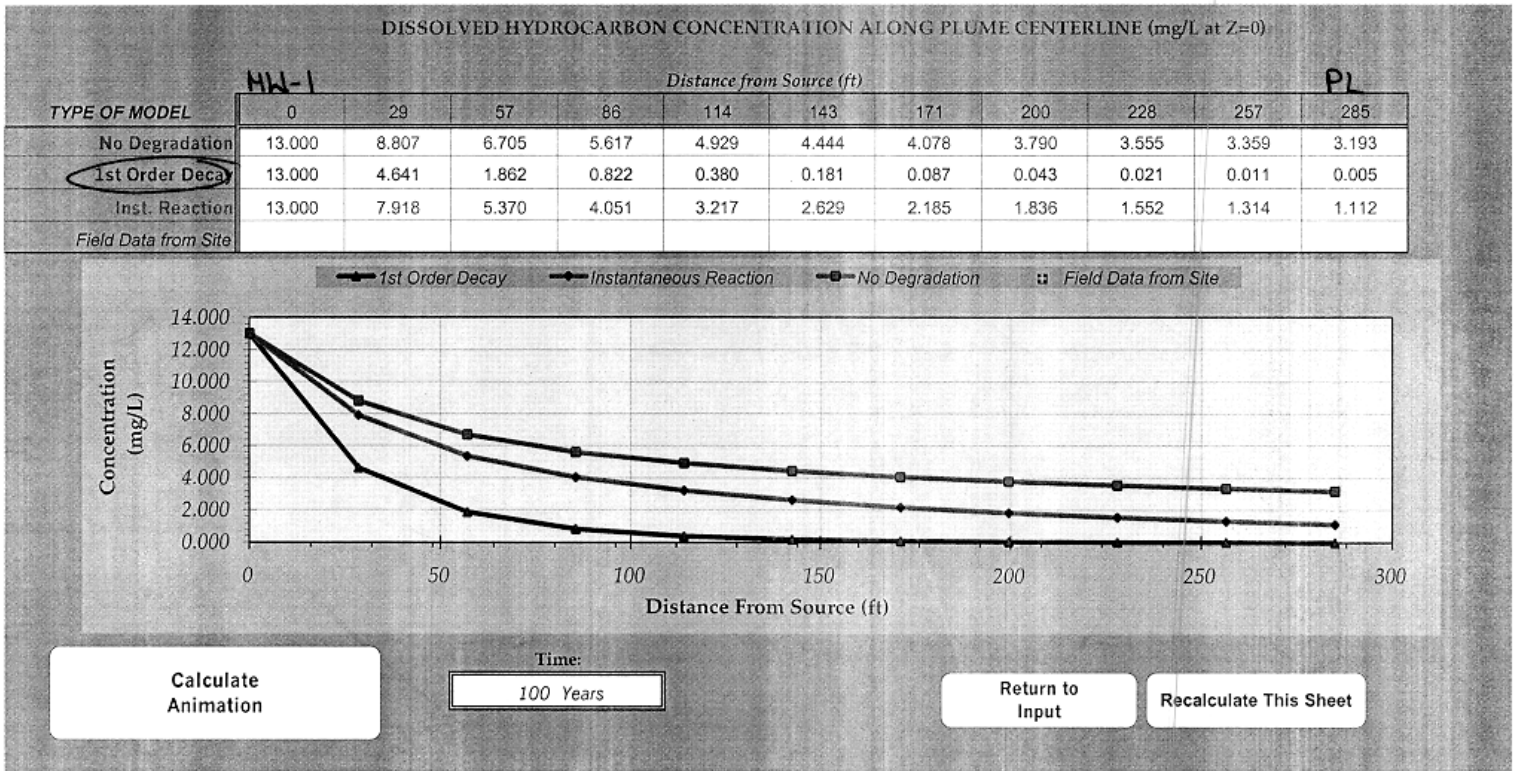


Figure 3. Centerline Output. UST Site 870, Hill AFB.

### BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence

Version 1.3

Hot Spot

UST #12719

#### Data Input Instructions:

115

0.02

Variable\*

20

1. Enter value directly... or
2. Calculate by filling in grey cells below. (To restore formulas, hit button below). Data used directly in model. Value calculated by model. (Don't enter any data).

#### 1. HYDROGEOLOGY

Seepage Velocity*	Vs	12.8	(ft/yr)
or			
Hydraulic Conductivity	K	1.1E-04	(cm/sec)
Hydraulic Gradient	I	3.50E-02	(ft/ft)
Porosity	n	0.3	(-)

#### 2. DISPERSION

Longitudinal Dispersivity*	alpha x	17.9	(ft)
Transverse Dispersivity*	alpha y	1.8	(ft)
Vertical Dispersivity*	alpha z	0.0	(ft)
or			
Estimated Plume Length	Lp	500	(ft)

#### 3. ADSORPTION

Retardation Factor*	R	1.2	(-)
or			
Soil Bulk Density	rho	1.7	(kg/l)
Partition Coefficient	Koc	81	(L/kg)
Fraction Organic Carbon	foc	3.50E-04	(-)

#### 4. BIODEGRADATION

1st Order Decay Coeff*	lambda	3.5E-1	(per yr)
or			
Solute Half-Life	t-half	2.00	(year)
or Instantaneous Reaction Model			
Delta Oxygen*	DO	3.4	(mg/L)
Delta Nitrate*	NO3	1.87	(mg/L)
Observed Ferrous Iron*	Fe2+	5	(mg/L)
Delta Sulfate*	SO4	5	(mg/L)
Observed Methane*	CH4	0	(mg/L)

#### 5. GENERAL

Modeled Area Length*	285	(ft)
Modeled Area Width*	50	(ft)
Simulation Time*	8	(yr)



#### 6. SOURCE DATA

Source Thickness in Sat Zone\* 15 (ft)

Source Zones:

Width* (ft)	Conc. (mg/L)*
5	0.01
10	1.5
20	27.4
10	1.5
5	0.01

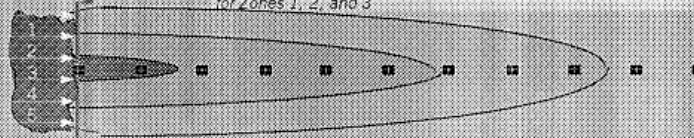
Source Decay (see Halo):

Source Half-life\* Infinite (yr)

Solute Mass ↑

In NAPL Soil infinite (kg)

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells # No Data Leave Blank or Enter "0"

#### 7. FIELD DATA FOR COMPARISON

Concentration (mg/L)	27.4				1.5								
Dist. from Source (ft)	0	29	57	86	114	143	171	200	228	257	285		

#### 8. CHOOSE TYPE OF OUTPUT TO SEE:

**RUN CENTERLINE**

View Output

**RUN ARRAY**

View Output

**Help**

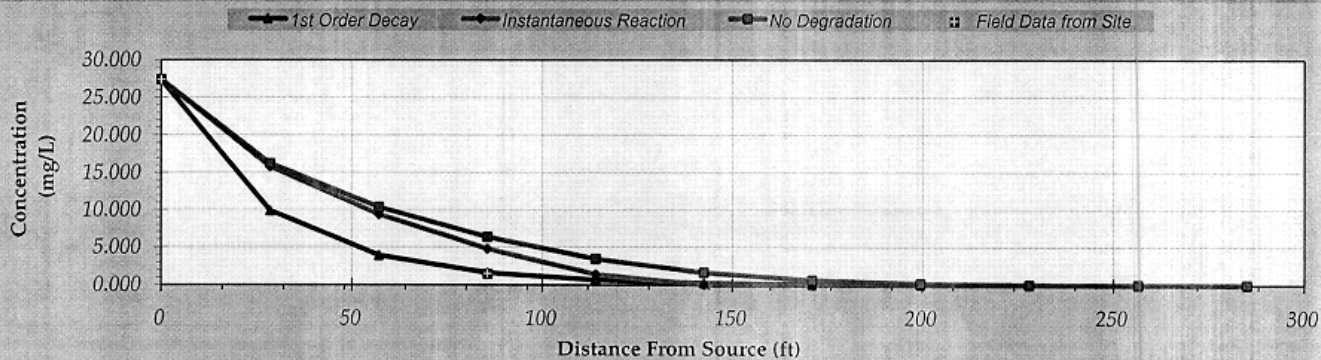
Recalculate This Sheet

Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft)										
	0	29	57	86	114	143	171	200	228	257	285
No Degradation	27.400	16.224	10.363	6.366	3.479	1.619	0.624	0.196	0.049	0.010	0.002
1st Order Decay	27.400	9.898	3.917	1.629	0.658	0.244	0.080	0.022	0.005	0.001	0.000
Inst. Reaction	27.400	15.793	9.404	4.816	1.415	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	27.400			1.500							



Calculate Animation

Time:

8 Years

Return to Input

Recalculate This Sheet

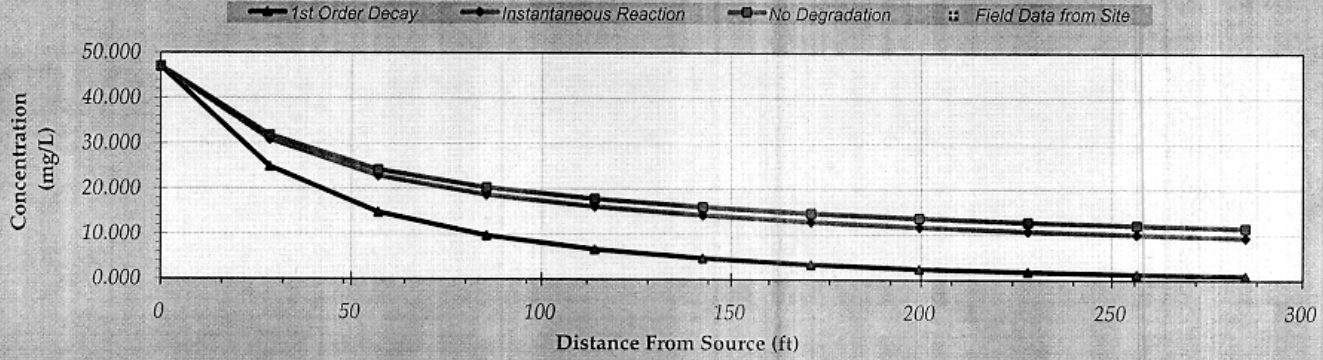
Figure 3. Centerline Output. UST Site 870, Hill AFB.



# Toluene SSTL

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft)										
	0	29	57	86	114	143	171	200	228	257	285
No Degradation	47.000	31.842	24.242	20.309	17.820	16.065	14.744	13.702	12.854	12.146	11.543
1st Order Decay	47.000	24.923	14.851	9.738	6.688	4.719	3.390	2.466	1.811	1.339	0.996
Inst. Reaction	47.000	30.952	22.907	18.743	16.108	14.250	12.851	11.748	10.850	10.101	9.463
Field Data from Site											



Calculate Animation

Time: 100 Years

Return to Input

Recalculate This Sheet

### BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence

Version 1.3

Hot Spot  
UST #12719  
Run Name

#### Data Input Instructions:

1. Enter value directly... or
  2. Calculate by filling in grey cells below. (To restore formulas, hit button below)
- Data used directly in model.  
Value calculated by model.  
(Don't enter any data)

#### 1. HYDROGEOLOGY

Seepage Velocity*	Vs	12.8	(ft/yr)
or			
Hydraulic Conductivity	K	1.1E-04	(cm/sec)
Hydraulic Gradient	i	3.50E-02	(ft/ft)
Porosity	n	0.3	(-)

#### 2. DISPERSION

Longitudinal Dispersivity*	alpha x	17.9	(ft)
Transverse Dispersivity*	alpha y	1.8	(ft)
Vertical Dispersivity*	alpha z	0.0	(ft)
or			
Estimated Plume Length	Lp	500	(ft)

#### 3. ADSORPTION

Retardation Factor*	R	1.3	(-)
or			
Soil Bulk Density	rho	1.7	(kg/l)
Partition Coefficient	Koc	176	(L/kg)
Fraction Organic Carbon	foc	3.50E-04	(-)

#### 4. BIODEGRADATION

1st Order Decay Coef*	lambda	6.3E-1	(per yr)
or			
Solute Half-Life	t-half	1.10	(year)
or Instantaneous Reaction Model			
Delta Oxygen*	DO	3.4	(mg/L)
Delta Nitrate*	NO3	1.87	(mg/L)
Observed Ferrous Iron*	Fe2+	5	(mg/L)
Delta Sulfate*	SO4	5	(mg/L)
Observed Methane*	CH4	0	(mg/L)

#### 5. GENERAL

Modeled Area Length*	285	(ft)
Modeled Area Width*	50	(ft)
Simulation Time*	8	(yr)

#### 6. SOURCE DATA

Source Thickness in Sat Zone\* 15 (ft)

Source Zones

Width* (ft)	Conc. (mg/L)*
5	0.01
10	0.13
20	88.3
10	0.13
5	0.01

Source Decay (see Help)

Source Lifetime\* Infinite (yr)

Soluble Mass

In NAPL, Soil infinite (Kg)

#### 7. FIELD DATA FOR COMPARISON

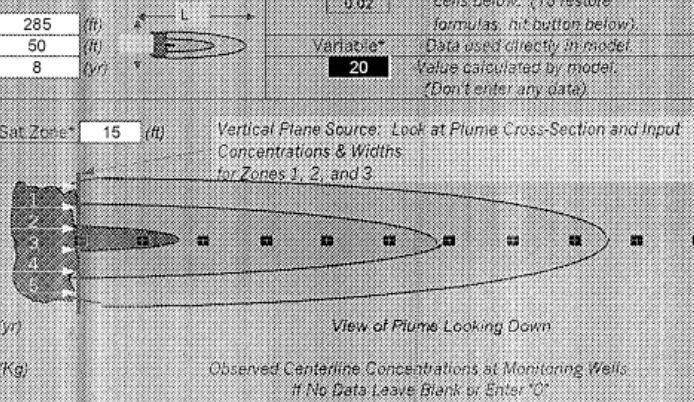
Concentration (mg/L)	88.3				1.3										
Dist. from Source (ft)	0	29	57	86	114	143	171	200	228	257	285				

#### 8. CHOOSE TYPE OF OUTPUT TO SEE:

**RUN CENTERLINE**  
View Output

**RUN ARRAY**  
View Output

**Help** Recalculate This Sheet  
Paste Example Dataset  
Restore Formulas for Vs, Dispersivities, R, lambda, other



Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3

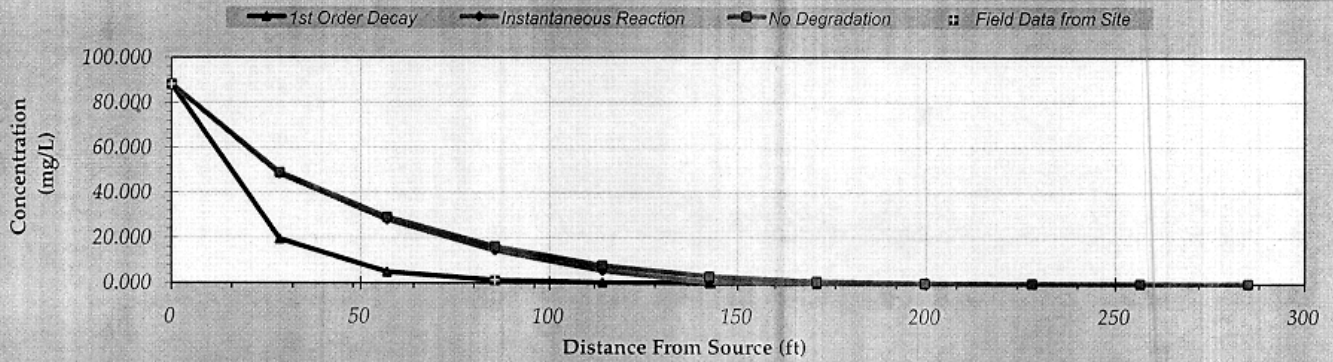
View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells  
If No Data Leave Blank or Enter "0"

**DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)**

*Distance from Source (ft)*

<b>TYPE OF MODEL</b>	0	29	57	86	114	143	171	200	228	257	285
No Degradation	88.300	48.920	29.162	16.226	7.728	3.007	0.929	0.224	0.041	0.006	0.001
1st Order Decay	88.300	19.577	4.851	1.300	0.349	0.088	0.020	0.004	0.001	0.000	0.000
Inst. Reaction	88.300	48.386	28.027	14.460	5.469	0.450	0.000	0.000	0.000	0.000	0.000
Field Data from Site	88.300			1.300							



Calculate Animation

Time:

8 Years

Return to Input

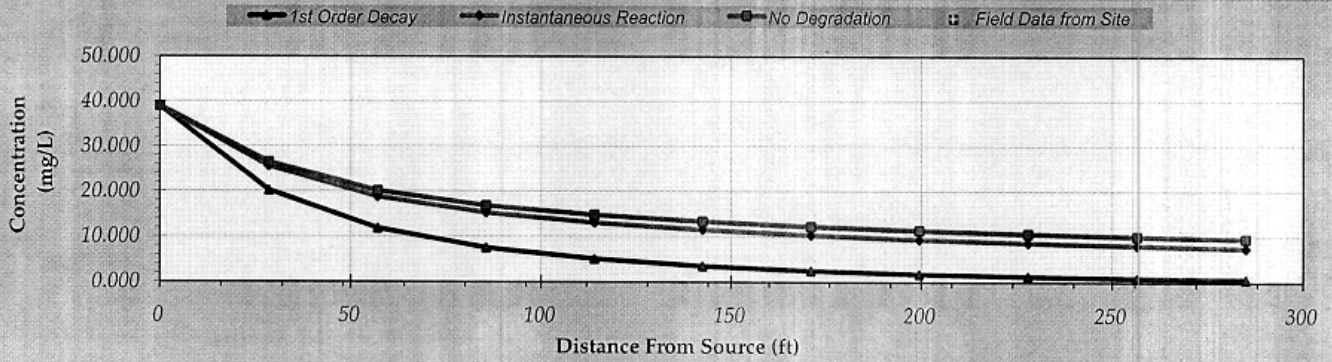
Recalculate This Sheet

Ethylbenzene SST

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

Distance from Source (ft)

TYPE OF MODEL	0	29	57	86	114	143	171	200	228	257	285
No Degradation	39.000	26.422	20.116	16.852	14.787	13.331	12.234	11.370	10.666	10.078	9.578
1st Order Decay	39.000	20.243	11.807	7.578	5.094	3.519	2.474	1.762	1.266	0.917	0.667
Inst. Reaction	39.000	25.532	18.780	15.286	13.075	11.516	10.342	9.416	8.663	8.033	7.498
Field Data from Site											



Calculate Animation

Time:

100 Years

Return to Input

Recalculate This Sheet

Ethylbenzene Calibration

**BIOSCREEN Natural Attenuation Decision Support System**

Air Force Center for Environmental Excellence

Version 1.3

Hot Spot  
UST #12719  
Run Name

**Data Input Instructions:**

- 1. Enter value directly... or
  - 2. Calculate by filling in grey cells below. (To restore formulas, hit button below)
- Data used directly in model.  
Value calculated by model.  
(Don't enter any data)

**1. HYDROGEOLOGY**

Seepage Velocity\*  $V_s$  12.8 (ft/yr)

or

Hydraulic Conductivity  $K$  1.1E-04 (cm/sec)

Hydraulic Gradient  $i$  3.50E-02 (ft/ft)

Porosity  $n$  0.3 (-)

**2. DISPERSION**

Longitudinal Dispersivity\*  $\alpha_x$  17.9 (ft)

Transverse Dispersivity\*  $\alpha_y$  1.8 (ft)

Vertical Dispersivity\*  $\alpha_z$  0.0 (ft)

or

Estimated Plume Length  $L_p$  500 (ft)

**3. ADSORPTION**

Retardation Factor\*  $R$  1.2 (-)

or

Soil Bulk Density  $\rho_{bc}$  1.7 (t/g)

Partition Coefficient  $K_{oc}$  176 (L/kg)

Fraction Organic Carbon  $f_{oc}$  3.50E-04 (-)

**4. BIODEGRADATION**

1st Order Decay Coeff\*  $\lambda$  2.3E-1 (per yr)

or

Solute Half-Life  $t_{-half}$  3.00 (year)

**or Instantaneous Reaction Model**

Delta Oxygen\*  $DO$  3.4 (mg/L)

Delta Nitrate\*  $NO_3$  1.87 (mg/L)

Observed Ferrous Iron\*  $Fe^{2+}$  5 (mg/L)

Delta Sulfate\*  $SO_4$  5 (mg/L)

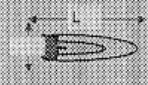
Observed Methane\*  $CH_4$  0 (mg/L)

**5. GENERAL**

Modeled Area Length\* 285 (ft)

Modeled Area Width\* 50 (ft)

Simulation Time\* 8 (yr)



**6. SOURCE DATA**

Source Thickness in Sat Zone\* 15 (ft)

Source Zones

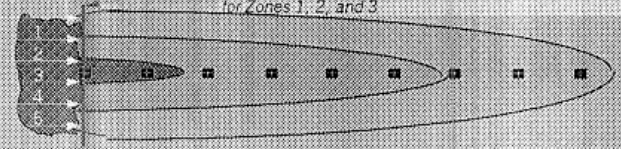
Width* (ft)	Conc. (mg/L)*
5	0.001
10	0.4
20	46
10	0.4
5	0.001

Source Decay (see Help)

Source Half-life\* Infinite (yr)

Soluble Mass

In NAPL Soil infinite (Kg)



Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3

View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells  
# No Data Leave Blank or Enter "0"

**7. FIELD DATA FOR COMPARISON**

Concentration (mg/L)	46.0			4.0										
Dist. from Source (ft)	0	29	57	86	114	143	171	200	228	257	285			

**8. CHOOSE TYPE OF OUTPUT TO SEE:**

**RUN CENTERLINE** **RUN ARRAY**

**View Output** **View Output**

**Help** **Recalculate This Sheet**

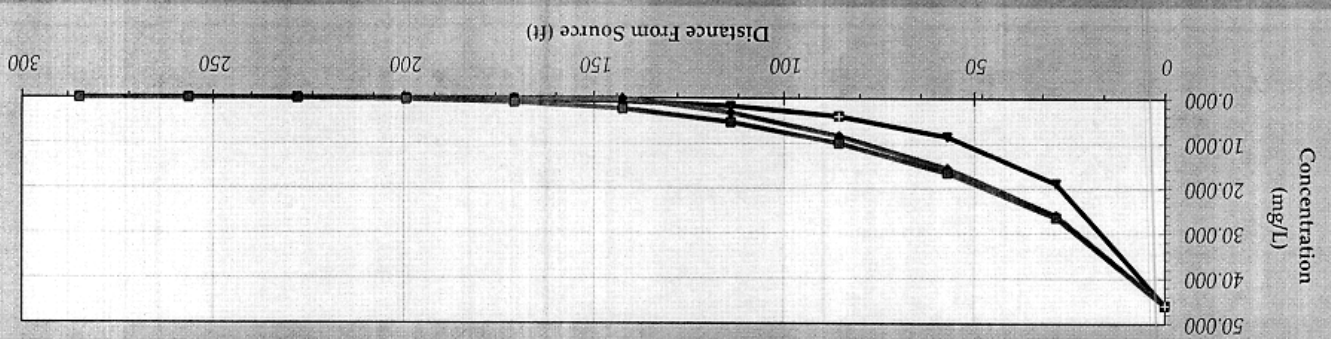
**Paste Example Dataset**

**Restore Formulas for  $V_s$ , Dispersivities,  $R$ ,  $\lambda$ , other**

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	0	29	57	86	114	143	171	200	228	257	285
No Degradation	46.000	26.490	16.558	9.932	5.265	2.358	0.868	0.258	0.051	0.011	0.002
1st Order Decay	46.000	18.917	8.495	3.925	1.709	0.662	0.219	0.060	0.013	0.002	0.000
Inst. Reaction	46.000	26.037	15.561	8.334	3.155	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	46.000			4.000							

Distance from Source (ft)



Legend: 1st Order Decay, Instantaneous Reaction, No Degradation, Field Data from Site

Calculate Animation

Time: 8 Years

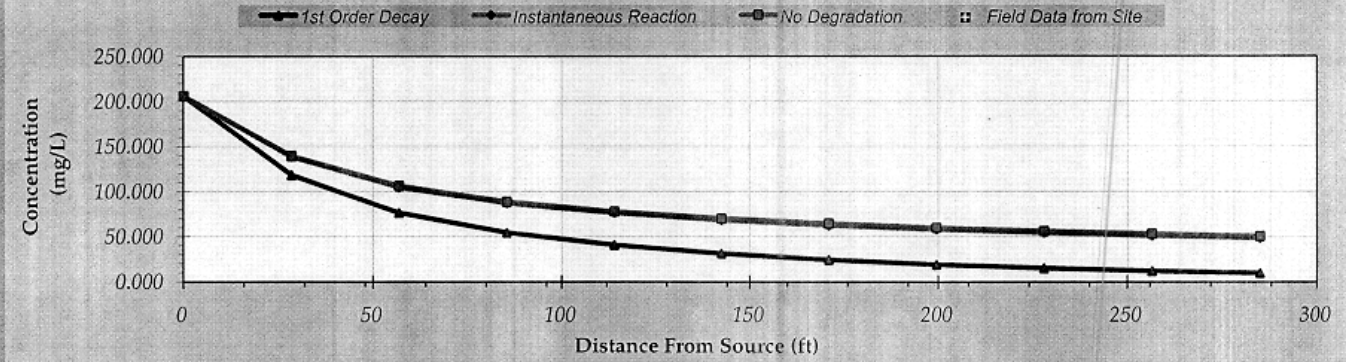
Return to Input

Recalculate This Sheet

Xylene SSTL

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft)										
	0	29	57	86	114	143	171	200	228	257	285
No Degradation	206.000	139.561	106.251	89.016	78.105	70.415	64.622	60.056	56.338	53.235	50.594
1st Order Decay	206.000	118.655	76.803	54.706	40.810	31.281	24.407	19.285	15.381	12.357	9.984
Inst. Reaction	206.000	138.672	104.916	87.450	76.393	68.600	62.729	58.102	54.335	51.190	48.513
Field Data from Site											



Calculate Animation

Time: 100 Years

Return to Input

Recalculate This Sheet

### BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence

Version 1.3

Hot Spot

UST #12719

#### Data Input Instructions:

115

0.02

Variable\*

20

1. Enter value directly... or
2. Calculate by filling in grey cells below. (To restore formulas, hit button below).  
Data used directly in model.  
Value calculated by model.  
(Don't enter any date)

#### 1. HYDROGEOLOGY

Seepage Velocity*	Vs	12.8	(ft/yr)
or			
Hydraulic Conductivity	K	1.1E-04	(cm/sec)
Hydraulic Gradient	i	3.50E-02	(ft/ft)
Porosity	n	0.3	(-)

#### 2. DISPERSION

Longitudinal Dispersivity*	alpha x	17.9	(ft)
Transverse Dispersivity*	alpha y	1.8	(ft)
Vertical Dispersivity*	alpha z	0.0	(ft)
or			
Estimated Plume Length	Lp	500	(ft)

#### 3. ADSORPTION

Retardation Factor*	R	2.3	(-)
or			
Soil Bulk Density	rho	1.7	(kg/l)
Partition Coefficient	Koc	639	(L/kg)
Fraction Organic Carbon	foc	3.50E-04	(-)

#### 4. BIODEGRADATION

1st Order Decay Coeff*	lambda	2.8E-1	(per yr)
or			
Solute Half-Life	t-half	2.50	(year)
or Instantaneous Reaction Model			
Delta Oxygen*	DO	3.4	(mg/L)
Delta Nitrate*	NO3	1.87	(mg/L)
Observed Ferrous Iron*	Fe2+	5	(mg/L)
Delta Sulfate*	SO4	5	(mg/L)
Observed Methane*	CH4	0	(mg/L)

#### 5. GENERAL

Modeled Area Length*	285	(ft)
Modeled Area Width*	50	(ft)
Simulation Time*	8	(yr)



#### 6. SOURCE DATA

Source Thickness in Sat Zone\* 15 (ft)

Source Zones:

Width* (ft)	Conc. (mg/L)*
5	0.001
10	3.1
20	170
10	3.1
5	0.001

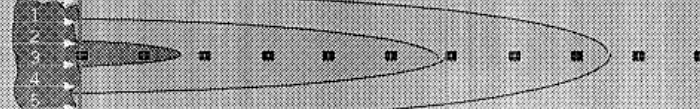
Source Decay (see Help):

Source Half-life\* Infinite (yr)

Soluble Mass\*

In NAPL Soil infinite (Kg)

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells  
# No Data Leave Blank or Enter "0"

#### 7. FIELD DATA FOR COMPARISON

Concentration (mg/L)	170.0					3.1							
Dist. from Source (ft)	0	29	57	86	114	143	171	200	228	257	285		

#### 8. CHOOSE TYPE OF OUTPUT TO SEE:

**RUN CENTERLINE**

**RUN ARRAY**

**Help**

Recalculate This Sheet

View Output

View Output

Paste Example Dataset

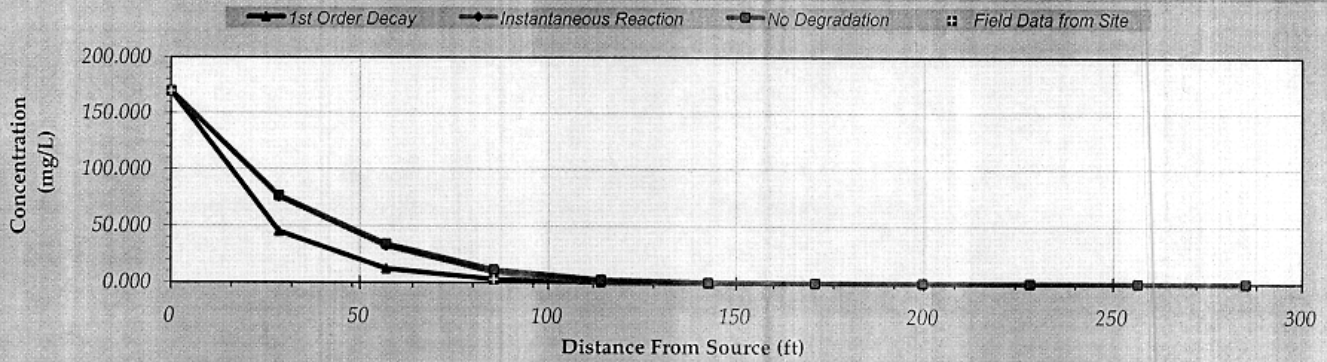
Restore Formulas for Vs, Dispersivities, R, lambda, other



DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

Distance from Source (ft)

TYPE OF MODEL	0	29	57	86	114	143	171	200	228	257	285
No Degradation	170.000	76.501	33.923	11.658	2.805	0.448	0.046	0.003	0.000	0.000	0.000
1st Order Decay	170.000	45.063	12.268	3.029	0.586	0.081	0.008	0.000	0.000	0.000	0.000
Inst. Reaction	170.000	75.538	32.136	9.266	0.140	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	170.000			3.100							



Calculate Animation

Time:

8 Years

Return to Input

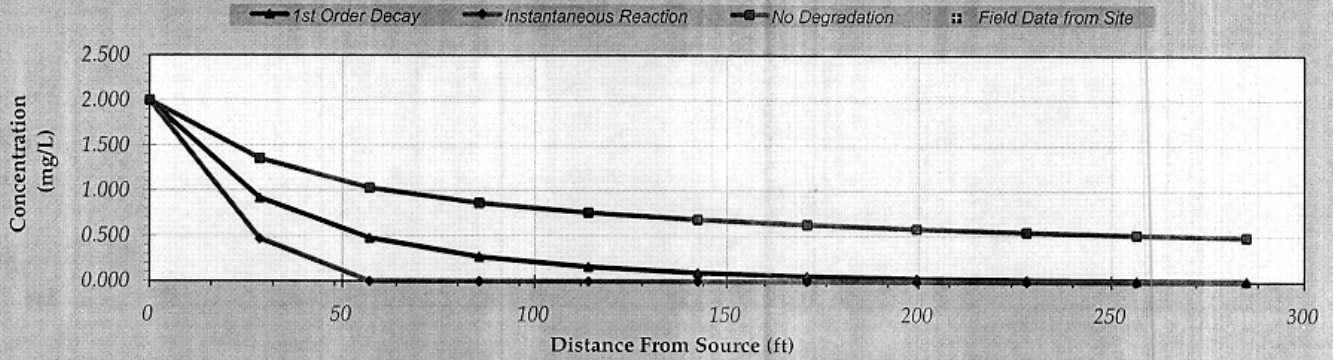
Recalculate This Sheet

## Naphthalene SSTL

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

*Distance from Source (ft)*

TYPE OF MODEL	0	29	57	86	114	143	171	200	228	257	285
No Degradation	2.000	1.355	1.032	0.864	0.758	0.684	0.627	0.583	0.547	0.517	0.491
1st Order Decay	2.000	0.920	0.475	0.270	0.161	0.098	0.061	0.039	0.025	0.016	0.010
Inst. Reaction	2.000	0.466	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site											



Calculate Animation

Time:

100 Years

Return to Input

Recalculate This Sheet

Naphthalene Calibration

**BIOSCREEN Natural Attenuation Decision Support System**

Air Force Center for Environmental Excellence

Version 1.3

**1. HYDROGEOLOGY**

Seepage Velocity*	$V_s$	12.8	(ft/yr)
or			
Hydraulic Conductivity	$K$	1.1E-04	(cm/sec)
Hydraulic Gradient	$J$	3.50E-02	(ft/ft)
Porosity	$n$	0.3	(-)

**2. DISPERSION**

Longitudinal Dispersivity*	$\alpha_{\text{long}}$	17.9	(ft)
Transverse Dispersivity*	$\alpha_{\text{tr}}$	1.8	(ft)
Vertical Dispersivity*	$\alpha_z$	0.0	(ft)
or			
Estimated Plume Length	$L_p$	500	(ft)

**3. ADSORPTION**

Retardation Factor*	$R$	3.1	(-)
or			
Soil Bulk Density	$\rho_b$	1.7	(g/cc)
Partition Coefficient	$K_{oc}$	1543	(L/kg)
Fraction Organic Carbon	$f_{oc}$	3.50E-04	(-)

**4. BIODEGRADATION**

1st Order Decay Coef*	$\lambda$	2.8E-1	(per yr)
or			
Solute Half-Life	$t_{\text{half}}$	2.50	(year)
or Instantaneous Reaction Model			
Delta Oxygen*	$\Delta O_2$	3.4	(mg/L)
Delta Nitrate*	$\Delta NO_3$	1.87	(mg/L)
Observed Ferrous Iron*	$Fe^{2+}$	5	(mg/L)
Delta Sulfate*	$\Delta SO_4$	5	(mg/L)
Observed Methane*	$CH_4$	0	(mg/L)

**5. GENERAL**

Modeled Area Length*	285	(ft)
Modeled Area Width*	50	(ft)
Simulation Time*	8	(yr)

Hot Spot  
UST #12719  
Run Name

**Data Input Instructions:**

1. Enter value directly ... or
  2. Calculate by filling in grey cells below. (To restore formulas, hit button below)
- Data used directly in model.  
Value calculated by model.  
(Don't enter any date)

**6. SOURCE DATA**

Source Thickness in Sat Zone\* 15 (ft)

Source Zones:

Width* (ft)	Conc. (mg/L)*
5	0.001
10	0.36
20	55.7
10	0.36
5	0.001

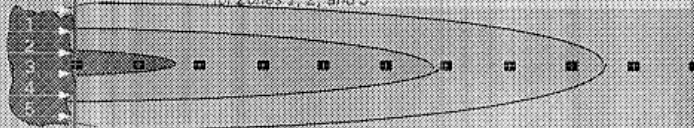
Source Decay (see Halo)

Source Half-life: Infinite (yr)

Soluble Mass

In NAPL Soil: infinite (kg)

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells if No Data Leave Blank or Enter "0"

**7. FIELD DATA FOR COMPARISON**

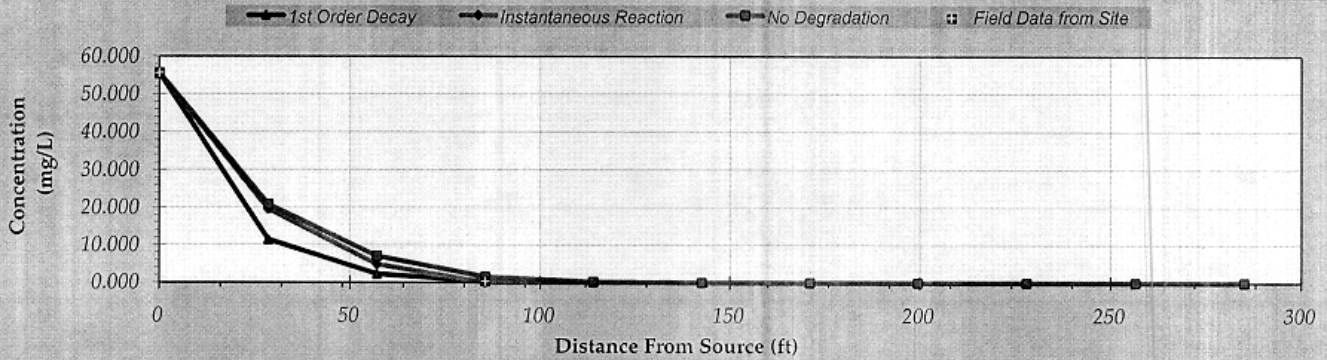
Concentration (mg/L)	55.7			.36									
Dist. from Source (ft)	0	29	57	86	114	143	171	200	228	257	285		

**8. CHOOSE TYPE OF OUTPUT TO SEE:**

**DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)**

*Distance from Source (ft)*

<b>TYPE OF MODEL</b>	0	29	57	86	114	143	171	200	228	257	285
No Degradation	55.700	20.850	6.968	1.521	0.194	0.014	0.001	0.000	0.000	0.000	0.000
1st Order Decay	55.700	11.440	2.262	0.356	0.037	0.002	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	55.700	19.592	4.823	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	55.700			0.360							



Calculate Animation

Time:

8 Years

Return to Input

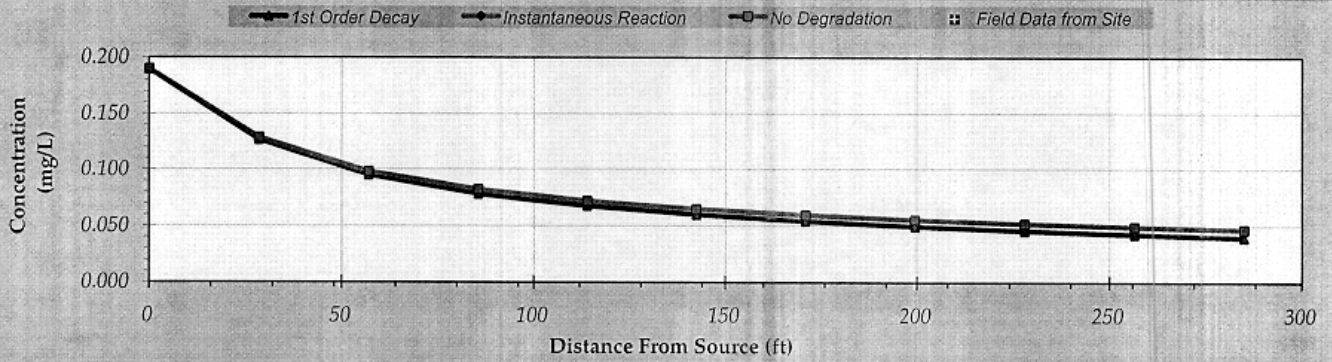
Recalculate This Sheet

# MTBE SSTL

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

Distance from Source (ft)

TYPE OF MODEL	0	29	57	86	114	143	171	200	228	257	285
No Degradation	0.190	0.129	0.098	0.082	0.072	0.065	0.060	0.055	0.052	0.049	0.047
1st Order Decay	0.190	0.127	0.095	0.078	0.068	0.060	0.054	0.050	0.046	0.043	0.040
Inst. Reaction	0.190	0.129	0.098	0.082	0.072	0.065	0.060	0.055	0.052	0.049	0.047
Field Data from Site											



Calculate Animation

Time:

100 Years

Return to Input

Recalculate This Sheet

**BIOSCREEN Natural Attenuation Decision Support System**

Air Force Center for Environmental Excellence

Version 1.3

Hot Spot

UST #12719

**Data Input Instructions:**

115

0.02

Variable\*

20

1. Enter value directly... or
2. Calculate by filling in grey cells below. (To restore formulas, hit button below). Data used directly in model. Value calculated by model. (Don't enter any data)

**1. HYDROGEOLOGY**

Seepage Velocity*	Vs	12.8	(ft/yr)
or			
Hydraulic Conductivity	K	1.1E-04	(cm/sec)
Hydraulic Gradient	i	3.50E-02	(ft/ft)
Porosity	n	0.3	(-)

**2. DISPERSION**

Longitudinal Dispersivity*	alpha x	17.9	(ft)
Transverse Dispersivity*	alpha y	1.8	(ft)
Vertical Dispersivity*	alpha z	0.0	(ft)
or			
Estimated Plume Length	Lp	500	(ft)

**3. ADSORPTION**

Retardation Factor*	R	1.0	(-)
or			
Soil Bulk Density	rho	1.7	(t/g)
Partition Coefficient	Koc	12	(L/g)
Fraction Organic Carbon	foc	3.50E-04	(-)

**4. BIODEGRADATION**

1st Order Decay Coeff*	lambda	6.9E-3	(per yr)
or			
Solute Half-Life	t-half	100.00	(year)
or <i>Instantaneous Reaction Model</i>			
Delta Oxygen*	DO	3.4	(mg/L)
Delta Nitrate*	NO3	1.87	(mg/L)
Observed Ferrous Iron*	Fe2+	5	(mg/L)
Delta Sulfate*	SO4	5	(mg/L)
Observed Methane*	CH4	0	(mg/L)

**5. GENERAL**

Modeled Area Length*	285	(ft)
Modeled Area Width*	50	(ft)
Simulation Time*	8	(yr)



**6. SOURCE DATA**

Source Thickness in Sat Zone\* 15 (ft)

Source Zones:

Width* (ft)	Conc. (mg/L)*
5	0.001
10	6.4
20	255
10	6.4
5	0.001

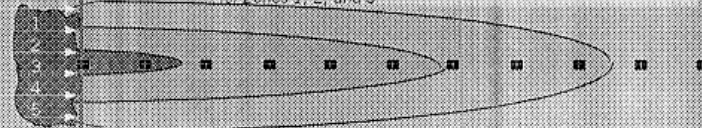
Source Decay (see Help)

Source Half-life\* Infinite (yr)

Soluble Mass

In NAPL Soil infinite (Kg)

Vertical Plume Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells  
If No Data Leave Blank or Enter "0"

**7. FIELD DATA FOR COMPARISON**

Concentration (mg/L)	255.0				64.0														
Dist. from Source (ft)	0	29	57	86	114	143	171	200	228	257	285								

**8. CHOOSE TYPE OF OUTPUT TO SEE:**

**RUN CENTERLINE**

**RUN ARRAY**

**Help**

Recalculate This Sheet

View Output

View Output

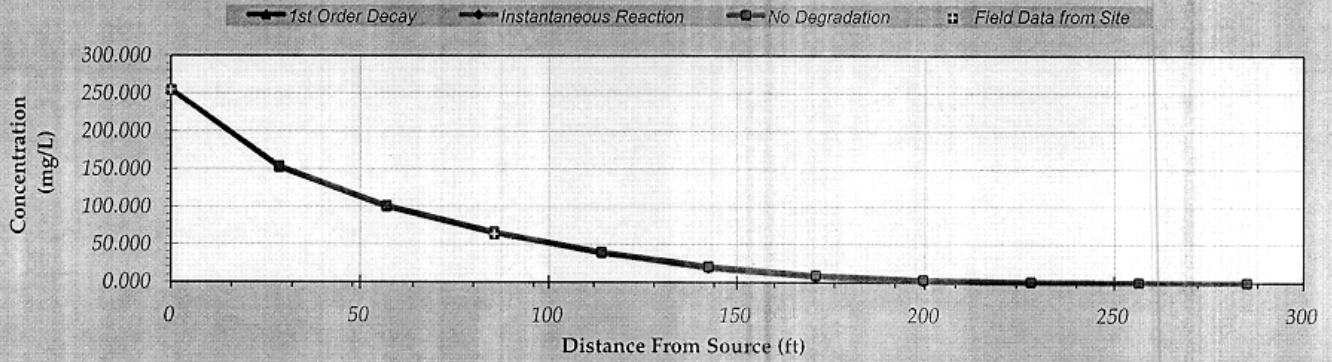
Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

Distance from Source (ft)

TYPE OF MODEL	0	29	57	86	114	143	171	200	228	257	285
No Degradation	255.000	154.106	101.828	66.601	39.944	21.061	9.502	3.602	1.132	0.293	0.062
1st Order Decay	255.000	152.795	99.983	64.898	38.699	20.316	9.136	3.454	1.084	0.280	0.059
Inst. Reaction	255.000	153.751	101.004	65.229	38.062	18.781	6.965	0.929	0.000	0.000	0.000
Field Data from Site	255.000			64.000							



Calculate Animation

Time:

8 Years

Return to Input

Recalculate This Sheet

## ANALYTICAL REPORT

SCDHEC 2200  
 UNDERGRD STOR TANK-DEBRA THOMA  
 2600 BULL STREET  
 COLUMBIA, SC 29201

Lab Number: 01-A138476  
 Sample ID: MW-3  
 Sample Type: Water  
 Site ID:

Project: 12719  
 Project Name: HOT SPOT 3005  
 Sampler: ALLISON ENGLE

Date Collected: 9/28/01  
 Time Collected: 12:09  
 Date Received: 9/29/01  
 Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
*VOLATILE ORGANICS*										
Benzene	2140	ug/l	50.0	2.0	50	10/ 5/01	1:53	M.Himelick	8260B	1281
Toluene	155.	ug/l	50.0	2.0	50	10/ 5/01	1:53	M.Himelick	8260B	1281
Ethylbenzene	295.	ug/l	50.0	2.0	50	10/ 5/01	1:53	M.Himelick	8260B	1281
Xylenes, Total	2260	ug/l	50.0	2.0	50	10/ 5/01	1:53	M.Himelick	8260B	1281
Methyl-t-butyl ether	7460	ug/l	50.0	2.0	50	10/ 5/01	1:53	M.Himelick	8260B	1281
Naphthalene	300.	ug/l	50.0	5.0	50	10/ 5/01	1:53	M.Himelick	8260B	1281

ND - Not detected at the report limit.

Surrogate	% Recovery	Target Range
VOA Surr 1,2-DCA-d4	101.	68. - 143.
VOA Surr Toluene-d8	86.	78. - 127.
VOA Surr, 4-BFB	97.	73. - 127.
VOA Surr, DBFM	117.	76. - 135.

# - Recovery outside Laboratory historical or method prescribed limits.

Sample report continued . . .



## ANALYTICAL REPORT

SCDHEC 2200  
 UNDERGRD STOR TANK-DEBRA THOMA  
 2600 BULL STREET  
 COLUMBIA, SC 29201

Lab Number: 01-A138477  
 Sample ID: MW-4  
 Sample Type: Water  
 Site ID:

Project: 12719  
 Project Name: HOT SPOT 3005  
 Sampler: ALLISON ENGLE

Date Collected: 9/28/01  
 Time Collected: 11:00  
 Date Received: 9/29/01  
 Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
*VOLATILE ORGANICS*										
Benzene	ND	ug/l	1.0	1.0	1	10/ 5/01	2:31	M.Himelick	8260B	1281
Toluene	ND	ug/l	1.0	1.0	1	10/ 5/01	2:31	M.Himelick	8260B	1281
Ethylbenzene	ND	ug/l	1.0	1.0	1	10/ 5/01	2:31	M.Himelick	8260B	1281
Xylenes, Total	ND	ug/l	1.0	1.0	1	10/ 5/01	2:31	M.Himelick	8260B	1281
Methyl-t-butyl ether	ND	ug/l	5.0	2.0	1	10/ 5/01	2:31	M.Himelick	8260B	1281
Naphthalene	ND	ug/l	5.0	5.0	1	10/ 5/01	2:31	M.Himelick	8260B	1281

ND - Not detected at the report limit.

Surrogate	% Recovery	Target Range
VOA Surr 1,2-DCA-d4	104.	68. - 143.
VOA Surr Toluene-d8	87.	78. - 127.
VOA Surr, 4-BFB	109.	73. - 127.
VOA Surr, DBFM	110.	76. - 135.

# - Recovery outside Laboratory historical or method prescribed limits.

Sample report continued . . .

## ANALYTICAL REPORT

SCDHEC 2200  
 UNDERGRD STOR TANK-DEBRA THOMA  
 2600 BULL STREET  
 COLUMBIA, SC 29201

Lab Number: 01-A138478  
 Sample ID: MW-6  
 Sample Type: Water  
 Site ID:

Project: 12719  
 Project Name: HOT SPOT 3005  
 Sampler: ALLISON ENGLE

Date Collected: 9/28/01  
 Time Collected: 11:52  
 Date Received: 9/29/01  
 Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
<b>*VOLATILE ORGANICS*</b>										
Benzene	6.5	ug/l	1.0	1.0	1	10/ 5/01	3:07	M.Himelick	8260B	1281
Toluene	1.9	ug/l	1.0	1.0	1	10/ 5/01	3:07	M.Himelick	8260B	1281
Ethylbenzene	23.9	ug/l	1.0	1.0	1	10/ 5/01	3:07	M.Himelick	8260B	1281
Xylenes, Total	97.0	ug/l	1.0	1.0	1	10/ 5/01	3:07	M.Himelick	8260B	1281
Methyl-t-butyl ether	ND	ug/l	5.0	2.0	1	10/ 5/01	3:07	M.Himelick	8260B	1281
Naphthalene	138.	ug/l	1.0	1.0	1	10/ 5/01	3:07	M.Himelick	8260B	1281

ND - Not detected at the report limit.

Surrogate	% Recovery	Target Range
VOA Surr 1,2-DCA-d4	101.	68. - 143.
VOA Surr Toluene-d8	91.	78. - 127.
VOA Surr, 4-BFB	110.	73. - 127.
VOA Surr, DBFM	110.	76. - 135.

# - Recovery outside Laboratory historical or method prescribed limits.

Sample report continued . . .

## ANALYTICAL REPORT

SCDHEC 2200  
 UNDERGRD STOR TANK-DEBRA THOMA  
 2600 BULL STREET  
 COLUMBIA, SC 29201

Lab Number: 01-A138479  
 Sample ID: MW-7  
 Sample Type: Water  
 Site ID:

Project: 12719  
 Project Name: HOT SPOT 3005  
 Sampler: ALLISON ENGLE

Date Collected: 9/28/01  
 Time Collected: 11:35  
 Date Received: 9/29/01  
 Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
*VOLATILE ORGANICS*										
Benzene	ND	ug/l	1.0	1.0	1	10/ 5/01	3:44	M.Himelick	8260B	1281
Toluene	ND	ug/l	1.0	1.0	1	10/ 5/01	3:44	M.Himelick	8260B	1281
Ethylbenzene	ND	ug/l	1.0	1.0	1	10/ 5/01	3:44	M.Himelick	8260B	1281
Xylenes, Total	ND	ug/l	1.0	1.0	1	10/ 5/01	3:44	M.Himelick	8260B	1281
Methyl-t-butyl ether	ND	ug/l	5.0	2.0	1	10/ 5/01	3:44	M.Himelick	8260B	1281
Naphthalene	ND	ug/l	5.0	5.0	1	10/ 5/01	3:44	M.Himelick	8260B	1281

ND - Not detected at the report limit.

Surrogate	% Recovery	Target Range
VOA Surr 1,2-DCA-d4	94.	68. - 143.
VOA Surr Toluene-d8	84.	78. - 127.
VOA Surr, 4-BFB	106.	73. - 127.
VOA Surr, DBFM	106.	76. - 135.

# - Recovery outside Laboratory historical or method prescribed limits.

Sample report continued . . .

## ANALYTICAL REPORT

SCDHEC 2200  
 UNDERGRD STOR TANK-DEBRA THOMA  
 2600 BULL STREET  
 COLUMBIA, SC 29201

Lab Number: 01-A138480  
 Sample ID: MW-8  
 Sample Type: Water  
 Site ID:

Project: 12719  
 Project Name: HOT SPOT 3005  
 Sampler: ALLISON ENGLE

Date Collected: 9/28/01  
 Time Collected: 9:56  
 Date Received: 9/29/01  
 Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
*VOLATILE ORGANICS*										
Benzene	ND	ug/l	1.0	1.0	1	10/ 5/01	4:22	M.Himelick	8260B	1281
Toluene	ND	ug/l	1.0	1.0	1	10/ 5/01	4:22	M.Himelick	8260B	1281
Ethylbenzene	ND	ug/l	1.0	1.0	1	10/ 5/01	4:22	M.Himelick	8260B	1281
Xylenes, Total	ND	ug/l	1.0	1.0	1	10/ 5/01	4:22	M.Himelick	8260B	1281
Methyl-t-butyl ether	ND	ug/l	5.0	2.0	1	10/ 5/01	4:22	M.Himelick	8260B	1281
Naphthalene	ND	ug/l	5.0	5.0	1	10/ 5/01	4:22	M.Himelick	8260B	1281

ND - Not detected at the report limit.

Surrogate	% Recovery	Target Range
VOA Surr 1,2-DCA-d4	109.	68. - 143.
VOA Surr Toluene-d8	99.	78. - 127.
VOA Surr, 4-BFB	105.	73. - 127.
VOA Surr, DBFM	119.	76. - 135.

# - Recovery outside Laboratory historical or method prescribed limits.

Sample report continued . . .

# Test America

INCORPORATED

## ANALYTICAL REPORT

SCDHEC 2200  
 UNDERGRD STOR TANK-DEBRA THOMA  
 2600 BULL STREET  
 COLUMBIA, SC 29201

Lab Number: 01-A138481  
 Sample ID: MW-9  
 Sample Type: Water  
 Site ID:

Project: 12719  
 Project Name: HOT SPOT 3005  
 Sampler: ALLISON ENGLE

Date Collected: 9/28/01  
 Time Collected: 11:17  
 Date Received: 9/29/01  
 Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
<b>*VOLATILE ORGANICS*</b>										
Benzene	ND	ug/l	1.0	1.0	1	10/ 5/01	9:59	M.Himelick	8260B	1281
Toluene	ND	ug/l	1.0	1.0	1	10/ 5/01	9:59	M.Himelick	8260B	1281
Ethylbenzene	ND	ug/l	1.0	1.0	1	10/ 5/01	9:59	M.Himelick	8260B	1281
Xylenes, Total	ND	ug/l	1.0	1.0	1	10/ 5/01	9:59	M.Himelick	8260B	1281
Methyl-t-butyl ether	ND	ug/l	5.0	2.0	1	10/ 5/01	9:59	M.Himelick	8260B	1281
Naphthalene	ND	ug/l	5.0	5.0	1	10/ 5/01	9:59	M.Himelick	8260B	1281

ND - Not detected at the report limit.

Surrogate	% Recovery	Target Range
VOA Surr 1,2-DCA-d4	106.	68. - 143.
VOA Surr Toluene-d8	112.	78. - 127.
VOA Surr, 4-BFB	98.	73. - 127.
VOA Surr, DBFM	113.	76. - 135.

# - Recovery outside Laboratory historical or method prescribed limits.

Sample report continued . . .

## ANALYTICAL REPORT

SCDHEC 2200  
 UNDERGRD STOR TANK-DEBRA THOMA  
 2600 BULL STREET  
 COLUMBIA, SC 29201

Lab Number: 01-A138482  
 Sample ID: MW-10  
 Sample Type: Water  
 Site ID:

Project: 12719  
 Project Name: HOT SPOT 3005  
 Sampler: ALLISON ENGLE

Date Collected: 9/28/01  
 Time Collected: 10:09  
 Date Received: 9/29/01  
 Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
*VOLATILE ORGANICS*										
Benzene	ND	ug/l	1.0	1.0	1	10/ 5/01	10:36	M.Himelick	8260B	1281
Toluene	ND	ug/l	1.0	1.0	1	10/ 5/01	10:36	M.Himelick	8260B	1281
Ethylbenzene	ND	ug/l	1.0	1.0	1	10/ 5/01	10:36	M.Himelick	8260B	1281
Xylenes, Total	ND	ug/l	1.0	1.0	1	10/ 5/01	10:36	M.Himelick	8260B	1281
Methyl-t-butyl ether	ND	ug/l	5.0	2.0	1	10/ 5/01	10:36	M.Himelick	8260B	1281
Naphthalene	ND	ug/l	5.0	5.0	1	10/ 5/01	10:36	M.Himelick	8260B	1281

ND - Not detected at the report limit.

Surrogate	% Recovery	Target Range
VOA Surr 1,2-DCA-d4	113.	68. - 143.
VOA Surr Toluene-d8	102.	78. - 127.
VOA Surr, 4-BFB	100.	73. - 127.
VOA Surr, DBFM	117.	76. - 135.

# - Recovery outside Laboratory historical or method prescribed limits.

Sample report continued . . .

## ANALYTICAL REPORT

SCDHEC 2200  
 UNDERGRD STOR TANK-DEBRA THOMA  
 2600 BULL STREET  
 COLUMBIA, SC 29201

Lab Number: 01-A138483  
 Sample ID: MW-11  
 Sample Type: Water  
 Site ID:

Project: 12719  
 Project Name: HOT SPOT 3005  
 Sampler: ALLISON ENGLE

Date Collected: 9/28/01  
 Time Collected: 10:21  
 Date Received: 9/29/01  
 Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
*VOLATILE ORGANICS*										
Benzene	ND	ug/l	1.0	1.0	1	10/ 5/01	11:13	M.Himelick	8260B	1281
Toluene	ND	ug/l	1.0	1.0	1	10/ 5/01	11:13	M.Himelick	8260B	1281
Ethylbenzene	ND	ug/l	1.0	1.0	1	10/ 5/01	11:13	M.Himelick	8260B	1281
Xylenes, Total	ND	ug/l	1.0	1.0	1	10/ 5/01	11:13	M.Himelick	8260B	1281
Methyl-t-butyl ether	ND	ug/l	5.0	2.0	1	10/ 5/01	11:13	M.Himelick	8260B	1281
Naphthalene	ND	ug/l	5.0	5.0	1	10/ 5/01	11:13	M.Himelick	8260B	1281

ND - Not detected at the report limit.

Surrogate	% Recovery	Target Range
VOA Surr 1,2-DCA-d4	114.	68. - 143.
VOA Surr Toluene-d8	104.	78. - 127.
VOA Surr, 4-BFB	102.	73. - 127.
VOA Surr, DBFM	122.	76. - 135.

# - Recovery outside Laboratory historical or method prescribed limits.

Sample report continued . . .

## ANALYTICAL REPORT

SCDHEC 2200  
 UNDERGRD STOR TANK-DEBRA THOMA  
 2600 BULL STREET  
 COLUMBIA, SC 29201

Lab Number: 01-A138484  
 Sample ID: MW-12  
 Sample Type: Water  
 Site ID:

Project: 12719  
 Project Name: HOT SPOT 3005  
 Sampler: ALLISON ENGLE

Date Collected: 9/28/01  
 Time Collected: 9:38  
 Date Received: 9/29/01  
 Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
<b>*VOLATILE ORGANICS*</b>										
Benzene	ND	ug/l	1.0	1.0	1	10/ 5/01	11:50	M.Himelick	8260B	1281
Toluene	ND	ug/l	1.0	1.0	1	10/ 5/01	11:50	M.Himelick	8260B	1281
Ethylbenzene	ND	ug/l	1.0	1.0	1	10/ 5/01	11:50	M.Himelick	8260B	1281
Xylenes, Total	ND	ug/l	1.0	1.0	1	10/ 5/01	11:50	M.Himelick	8260B	1281
Methyl-t-butyl ether	ND	ug/l	5.0	2.0	1	10/ 5/01	11:50	M.Himelick	8260B	1281
Naphthalene	ND	ug/l	5.0	5.0	1	10/ 5/01	11:50	M.Himelick	8260B	1281

ND - Not detected at the report limit.

Surrogate	% Recovery	Target Range
VOA Surr 1,2-DCA-d4	111.	68. - 143.
VOA Surr Toluene-d8	105.	78. - 127.
VOA Surr, 4-BFB	104.	73. - 127.
VOA Surr, DBFM	113.	76. - 135.

# - Recovery outside Laboratory historical or method prescribed limits.

Sample report continued . . .



## ANALYTICAL REPORT

SCDHEC 2200  
 UNDERGRD STOR TANK-DEBRA THOMA  
 2600 BULL STREET  
 COLUMBIA, SC 29201

Lab Number: 01-A138485  
 Sample ID: MW-13  
 Sample Type: Water  
 Site ID:

Project: 12719  
 Project Name: HOT SPOT 3005  
 Sampler: ALLISON ENGLE

Date Collected: 9/28/01  
 Time Collected: 10:33  
 Date Received: 9/29/01  
 Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
<b>*VOLATILE ORGANICS*</b>										
Benzene	ND	ug/l	1.0	1.0	1	10/ 5/01	12:27	M.Himelick	8260B	1281
Toluene	ND	ug/l	1.0	1.0	1	10/ 5/01	12:27	M.Himelick	8260B	1281
Ethylbenzene	ND	ug/l	1.0	1.0	1	10/ 5/01	12:27	M.Himelick	8260B	1281
Xylenes, Total	ND	ug/l	1.0	1.0	1	10/ 5/01	12:27	M.Himelick	8260B	1281
Methyl-t-butyl ether	ND	ug/l	5.0	2.0	1	10/ 5/01	12:27	M.Himelick	8260B	1281
Naphthalene	ND	ug/l	5.0	5.0	1	10/ 5/01	12:27	M.Himelick	8260B	1281

ND - Not detected at the report limit.

Surrogate	% Recovery	Target Range
VOA Surr 1,2-DCA-d4	108.	68. - 143.
VOA Surr Toluene-d8	105.	78. - 127.
VOA Surr, 4-BFB	105.	73. - 127.
VOA Surr, DBFM	114.	76. - 135.

# - Recovery outside Laboratory historical or method prescribed limits.

Sample report continued . . .

## ANALYTICAL REPORT

SCDHEC 2200  
 UNDERGRD STOR TANK-DEBRA THOMA  
 2600 BULL STREET  
 COLUMBIA, SC 29201

Lab Number: 01-A138486  
 Sample ID: MW-1D  
 Sample Type: Water  
 Site ID:

Project: 12719  
 Project Name: HOT SPOT 3005  
 Sampler: ALLISON ENGLE

Date Collected: 9/28/01  
 Time Collected: 12:58  
 Date Received: 9/29/01  
 Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
*VOLATILE ORGANICS*										
Benzene	ND	ug/l	1.0	1.0	1	10/ 5/01	13:04	M.Himelick	8260B	1281
Toluene	ND	ug/l	1.0	1.0	1	10/ 5/01	13:04	M.Himelick	8260B	1281
Ethylbenzene	ND	ug/l	1.0	1.0	1	10/ 5/01	13:04	M.Himelick	8260B	1281
Xylenes, Total	ND	ug/l	1.0	1.0	1	10/ 5/01	13:04	M.Himelick	8260B	1281
Methyl-t-butyl ether	ND	ug/l	5.0	2.0	1	10/ 5/01	13:04	M.Himelick	8260B	1281
Naphthalene	ND	ug/l	5.0	5.0	1	10/ 5/01	13:04	M.Himelick	8260B	1281

ND - Not detected at the report limit.

Surrogate	% Recovery	Target Range
VOA Surr 1,2-DCA-d4	108.	68. - 143.
VOA Surr Toluene-d8	95.	78. - 127.
VOA Surr, 4-BFB	104.	73. - 127.
VOA Surr, DBFM	108.	76. - 135.

# - Recovery outside Laboratory historical or method prescribed limits.

Sample report continued . . .



**UNDERGROUND STORAGE TANK PROGRAM  
BUREAU OF LAND AND WASTE MANAGEMENT**

2600 Bull Street  
Columbia, SC 29201  
Telephone (803) 898-4350

**M E M O R A N D U M**

DATE: November 6, 2001

TO: Henry Wigfall  
Bureau of Business Management

FROM: Laura Pace, CGFO, CPM, Manager *lp*  
Financial Section  
Underground Storage Tank Program

SUBJECT: Bid Request

Attached is a hard copy of the bid specifications for corrective action at UST Permit #04517, UST Permit #12719, and UST Permit #15793. This bid package should be sent out in SCBO. The information is also on the enclosed disk under file name Oct.doc. **This corrective action is funded by the SUPERB Fund.**

Purchase Requisition #18121 for UST Permit # 04517, Requisition #18122 for UST Permit #12719, and Requisition #18123 for UST Permit #15793 has been created on the AIMS System.

Please send a copy of the final bid package to Pat Holland so that it can be placed in the technical file in the Freedom of Information Office as outlined in the bid specifications. If you have any questions, contact Joel Padgett concerning UST Permit #04517 at 898-4339, Debra Thoma concerning UST Permit #12719 at 898-4362, or Read Miner concerning UST Permit #15793 at 898-4349.

cc: Chris Doll, P.G., Manager, State Lead & Field Services Section  
Read Miner, State Lead & Field Services Section  
Joel Padgett, State Lead & Field Services Section  
Debra Thoma, State Lead & Field Services Section  
Pat Holland, Financial Section  
Technical File (3)



2600 Bull Street  
Columbia, SC 29201-1708

OCT 13 1999

R.L. Jordan Oil Company, Inc.  
Attention: Ms. Judy Laughter  
P.O. Box 2527  
Spartanburg, SC 29304-2527

Re: Hot Spot #3005  
Facility ID#12719  
Standard Limited Assessment Report received September 27, 1999  
Spartanburg County

Dear Ms. Laughter:

The Division of Underground Storage Tank (UST) Management of the South Carolina Department of Health and Environmental Control (SCDHEC) has reviewed the referenced report. The referenced report indicates presence of 3.84 feet of a free product in the groundwater.

To determine what risk the release may pose to the environment and public health, and in accordance with Section 280.65 of the South Carolina Underground Storage Tank Control Regulations, implementation of the scope of work as outlined in the enclosed Rapid Assessment (RA) document is necessary.

**Please have your contractor complete and submit an Assessment Component Cost Proposal form and Rapid Assessment Plan forms within thirty days of the date of this letter.** Every component may not be necessary to complete the above scope of work. The SUPERB allowable cost for each component is included on the Assessment Component Cost Proposal Form.

According to our records, the release was reported to the SCDHEC subsequent to the early detection incentive program. Therefore, in accordance with Section 44-2-40(B) of the Act, you are responsible for the first \$25,000 for site rehabilitation. To insure that any expenditures you make apply to this \$25,000 deductible, it is prudent for this agency to pre-approve such costs along with your technical plan of action. By law, the SUPERB account cannot compensate any costs that are not pre-approved. Eligible costs exceeding the \$25,000 deductible can be compensated from the SUPERB Account.

On all correspondence regarding this site and scope of work, please reference UST Permit #12719. If you have any questions concerning this correspondence, please contact me at (803) 898-4353 or 1-800-826-5435 (within SC).

Sincerely,

Konstantine Akhvlediani, Hydrogeologist  
State Lead and Field Services Section  
Assessment and Corrective Action Branch  
Division of Underground Storage Tank Management



cc: Mr. Stanford Lummus, S&ME, Inc., 155 Tradd Street, Spartanburg, SC 29301  
Technical File

SCDHEC/UST/SLFSS/KTA/09/28/99



October 15, 1999

South Carolina Department of  
Health and Environmental Control  
2600 Bull Street  
Columbia, SC 29201-1708

ATTENTION: Konstantine Akhvlediani

Reference: **DISPOSAL MANIFEST**  
Hot Spot #36  
Site ID #: 12719  
S.C. Highway 221  
Chesnee, South Carolina  
S&ME Project No. 1264-99-506

Dear Mr. Akhvlediani:

Enclosed is the disposal manifest for the Standard Limited Assessment report recently submitted for Hot Spot #36 on Highway 221 in Chesnee, South Carolina.

If you have any questions, please call us at (864) 574-2360.

Sincerely,

**S&ME, Inc.**

David E. Klemm, P.G.  
Project Geologist

Stanford Lummus, P.E. *for*  
Senior Environmental Engineer



**RECEIVED**  
OCT 19 1999  
DIVISION OF UNDERGROUND  
STORAGE TANK MGMT.

# GARCO, Inc.

Environmental, Industrial & Recycling Services

## *Certificate of Disposal*

34  
**RECEIVED**  
OCT 19 1999  
DIVISION OF UNDERGROUND  
STORAGE TANK MGMT.

**GENERATOR:**

Jordan Oil - Hot Spot  
107 Hampton St.  
Chesnee, SC

**MATERIAL ACCEPTED:**

3 drums of non-hazardous petroleum contaminated soil

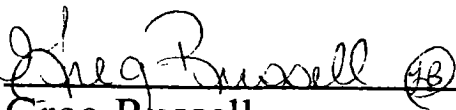
**DISPOSAL METHOD:**

Bio-Remediation

GARCO Inc. accepted the above listed materials on 10/05/99. The material has been assigned the following GARCO Identification number(s).

GARCO ID No.(s)      SP-1672 through SP - 1674

GARCO, Inc. has accepted custody of the above referenced non-hazardous material. This material has been determined to be non-hazardous by a material profile, generator knowledge and/or analytical data provided to GARCO, Inc.

 (48)

Greg Russell

President

# NO AZARDOUS WASTE MANI

# CLIENT

Please print or type (Form designed for use on elite (12 pitch) typewriter)

<b>NON-HAZARDOUS WASTE MANIFEST</b>	1. Generator's US EPA ID No. <p style="text-align: center;">NA</p>	Manifest Document No. <p style="text-align: center;">99001</p>	2. Page 1 of
3. Generator's Name and Mailing Address <p style="text-align: center;">Jordan Oil - Hot Spot 107 Hampton St. Chesnee, SC</p>		let Lindsey	
4. Generator's Phone ( <u>864 571-2360</u> )	6. US EPA ID Number <p style="text-align: center;">NA</p>	A. State Transporter's ID	
5. Transporter 1 Company Name <p style="text-align: center;">GARCO, Inc.</p>	8. US EPA ID Number	B. Transporter 1 Phone <p style="text-align: center;">336-683-0911</p>	
7. Transporter 2 Company Name	10. US EPA ID Number <p style="text-align: center;">NA</p>	C. State Transporter's ID	
9. Designated Facility Name and Site Address <p style="text-align: center;">GARCO, Inc. 2503 N. Fayetteville St. Asheboro, NC 27203</p>		D. Transporter 2 Phone	
		E. State Facility's ID	
		F. Facility's Phone <p style="text-align: center;">336-683-0911</p>	

11. WASTE DESCRIPTION	12. Containers		13. Total Quantity	14. Unit Wt./Vol.
	No.	Type		
a. <b>Non-hazardous Material</b>	3	DM	2,100	P
b. <b>Non-hazardous Material</b>	0	DM	—	P
c.				
d.				

G. Additional Descriptions for Materials Listed Above	H. Handling Codes for Wastes Listed Above
11a). Soil <u>SP 1672 - SP 1674</u>	None
11b). Water <del>SP 1672 - SP 1674</del>	

15. Special Handling Instructions and Additional Information

24 Hour ER# 800-814-1204

**16. GENERATOR'S CERTIFICATION:** I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.

	Date
Printed/Typed Name <u>Andy Ferguson Agent for Garco</u>	Month Day Year <u>10 05 99</u>

17. Transporter 1 Acknowledgement of Receipt of Materials	Date
Printed/Typed Name <u>James Owen</u>	Month Day Year <u>10 15 99</u>

18. Transporter 2 Acknowledgement of Receipt of Materials	Date
Printed/Typed Name	Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator; Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

	Date
Printed/Typed Name <u>Mr. Boyd</u>	Month Day Year <u>10 05 99</u>

NON-HAZARDOUS WASTE

GENERATOR

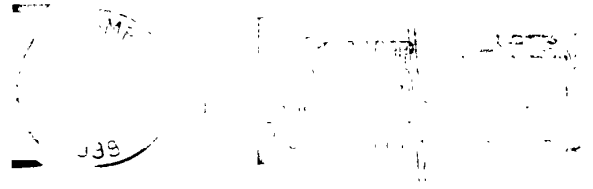
TRANSPORTER

FACILITY





S&ME, Inc.  
155 Tradd Street  
Spartanburg, South Carolina 29301



South Carolina Department of  
Health and Environmental Control  
2600 Bull Street  
Columbia, South Carolina 29201-1708

Attention: Konstantine Akhvlediani

29201-1708 01







**RECEIVED**

OCT 28 1999

DIVISION OF UNDERGROUND  
STORAGE TANK MGMT.

October 25, 1999

South Carolina Department of  
Health and Environmental Control  
2600 Bull Street  
Columbia, SC 29201-1708

ATTENTION: Konstantine Akhvlediani

Reference: **RAPID ASSESSMENT PLAN & COST PROPOSAL**  
Hot Spot #36  
Site ID #: 12719  
S.C. Highway 221  
Chesnee, South Carolina  
S&ME Project No. 1264-99-506

Dear Mr. Akhvlediani:

S&ME, Inc. has completed a Rapid Assessment Plan and associated Assessment Component Cost Proposal for the referenced site. The plan and cost proposal were prepared in accordance with the South Carolina Department of Health and Environmental Control document *Rapid Assessment Guidance* (SCDHEC, 1997).

S&ME proposes to perform 12 soil borings as shown on the site map. Three of the borings will be performed to 10 feet using a hand auger to delineate petroleum impact on the soils in the vicinity of the gasoline pumps. Four other borings are proposed to delineate the extent of free product and impact to soils around MW-1. These borings will be performed to a depth of 25 feet each. Three of these will be extended and completed as shallow monitoring wells to aid in delineation of free product floating on the groundwater. One of these will be completed as a deep well for vertical delineation of dissolved hydrocarbons in the groundwater. The other borings are proposed to delineate the horizontal extent of dissolved hydrocarbons and will be completed as permanent monitoring wells based on field screening results.

If you have any questions, please call us at (864) 574-2360.

Sincerely,

S&ME, Inc.

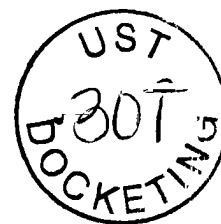
Michael P. O'Connell  
Staff Professional

S&ME, Inc.  
155 Tradd Street  
Spartanburg, South Carolina 29301

Stanford Lammus, P.E.  
Senior Environmental Engineer

(864) 574-2360  
(864) 576-8730 fax  
(864) 232-8987 Greenville

[www.smeinc.com](http://www.smeinc.com)



RAPID ASSESSMENT PLAN

**RECEIVED**

SOUTH CAROLINA

Department of Health and Environmental Control

OCT 28 1999

Division of Underground Storage Tank Management

DIVISION OF UNDERGROUND STORAGE TANK MGMT.

Site ID# 12719 County Spartanburg Facility Name Hot Spot #36  
 Facility Address 107 Hampton Street, Chesnee, SC  
 Responsible party R.L. Jordan Oil Company Address P.O. Box 2527, Spartanburg, SC 29304  
 No. USTs 1 removed? 1994 replaced? \_\_\_\_\_  
 (date) (date)  
 Current use of facility/property Hot Spot service station and mini-mart  
 Current property owner name R.L. Jordan Oil Company  
 Current property owner address P.O. Box 2527, Spartanburg, SC 29304

Field Screening Methodology

Specify the field screening methodology to be used. The use of field screening methods to optimize the number and location of permanent wells is required.

Soil samples will be collected in the vicinity of the source zone at five foot intervals.

Samples will be screened with an OVA for relative TPH levels. Screening data will be utilized for permanent well placement.

Permanent Monitoring Wells (Estimate number and total completed depth)

# of shallow wells	<u>8</u>	total depth	<u>320</u>	
# of deep wells	<u>1</u>	total depth	<u>60</u>	(If necessary)

Comments, if warranted \_\_\_\_\_

Analyses

List the analytical parameters (e.g., BTEX, MTBE) and estimated number.

BTEX+Naph by 8020 - 13 groundwater samples & 6 soil samples

PAHs by Method 8100 - 13 groundwater samples & 6 soil samples

Nitrates by 353.3 - 13 groundwater samples

Sulfates by 375.4 - 13 groundwater samples

Dissolved Iron by 200.7 - 13 groundwater samples

Lead by 200.7 - 13 groundwater samples

EDB by 504 - 13 groundwater samples

MTBE by 8020 - 13 groundwater samples

Methane - 13 groundwater samples

Implementation Schedule

Start up date Upon approval Completion date \_\_\_\_\_

Report submittal date \_\_\_\_\_

RAPID ASSESSMENT PLAN

RECEIVED

SOUTH CAROLINA

Department of Health and Environmental Control  
Bureau of Underground Storage Tank Management

JUL 23 1999

DIVISION OF UNDERGROUND  
STORAGE TANK MGMT.

Site ID# 12719 Facility Name Hot Spot # 36

Site Maps

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	Legend with facility name and address, Site ID number, date, and a bar scale
Location of property lines	Streets or highways (indicate names and numbers)
Location of buildings	Identification of located buildings
Paved areas on or adjacent to site	Location of all present and former ASTs and USTs
Previous soil sampling locations	Underground and above ground utilities on or adjacent to site
Previous monitoring well locations	Location of any other potential receptor

Aquifer Characterization (Check one and provide explanation for choice)

Pump Test \_\_\_\_\_ Slug Tests 3

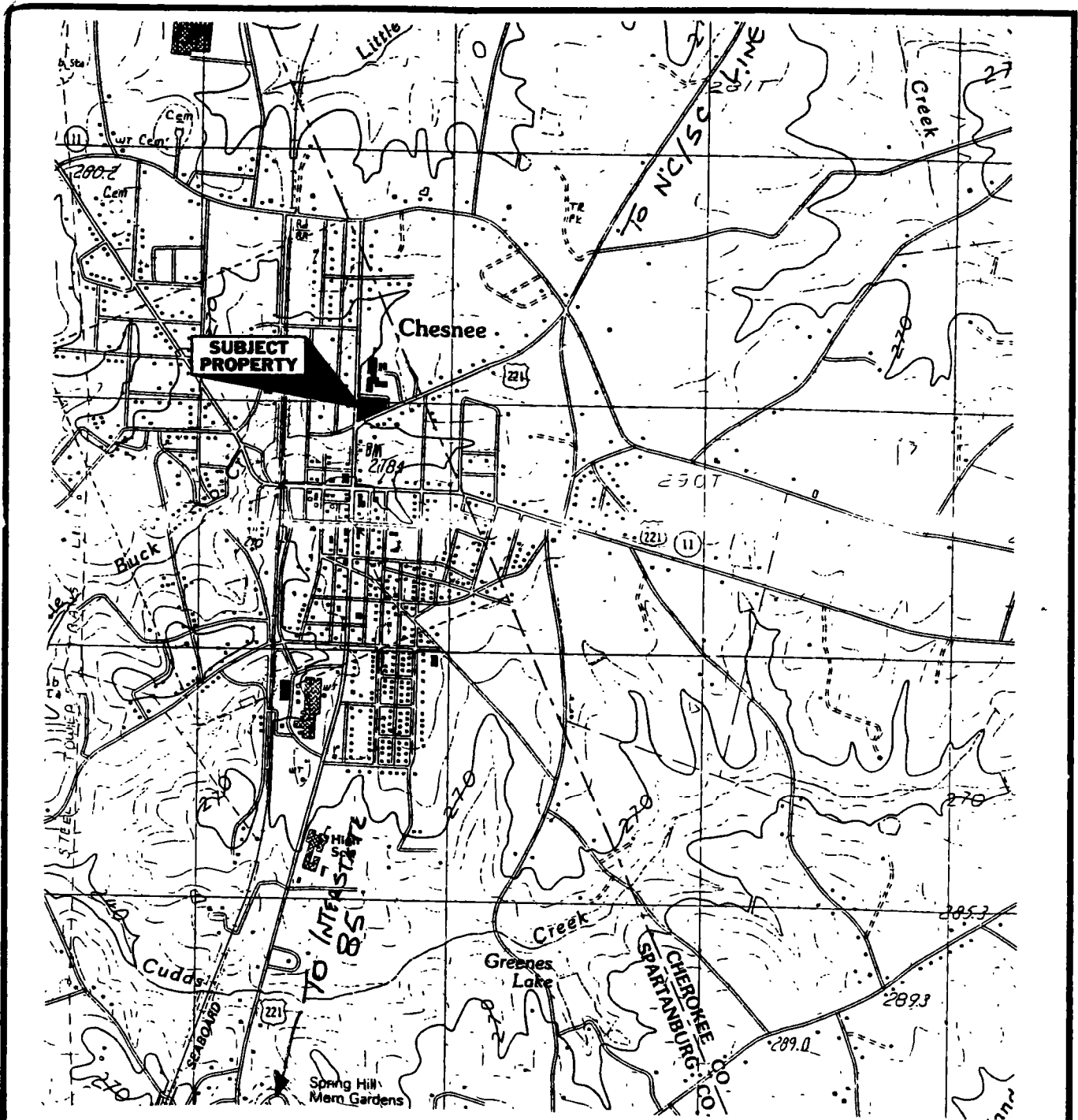
Slug tests can be performed with minimal waste generated. Two tests will be performed on new shallow wells and one on the new deep well.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Small Volume Disposal Type and Method

Soil Soil will be containerized in 55-gallon drums. Upon receipt of groundwater analytical data, the appropriate disposal method will be scheduled.  
\_\_\_\_\_

Purge Water Purge water will be containerized in 55-gallon drums. Upon receipt of groundwater analytical data, the appropriate disposal method will be scheduled.  
\_\_\_\_\_

Additional Comments \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



**SUBJECT PROPERTY**

**SOURCE: USGS TOPOGRAPHIC MAP, 7.5 MINUTE SERIES  
CHESNEE, SOUTH CAROLINA QUADRANGLE**

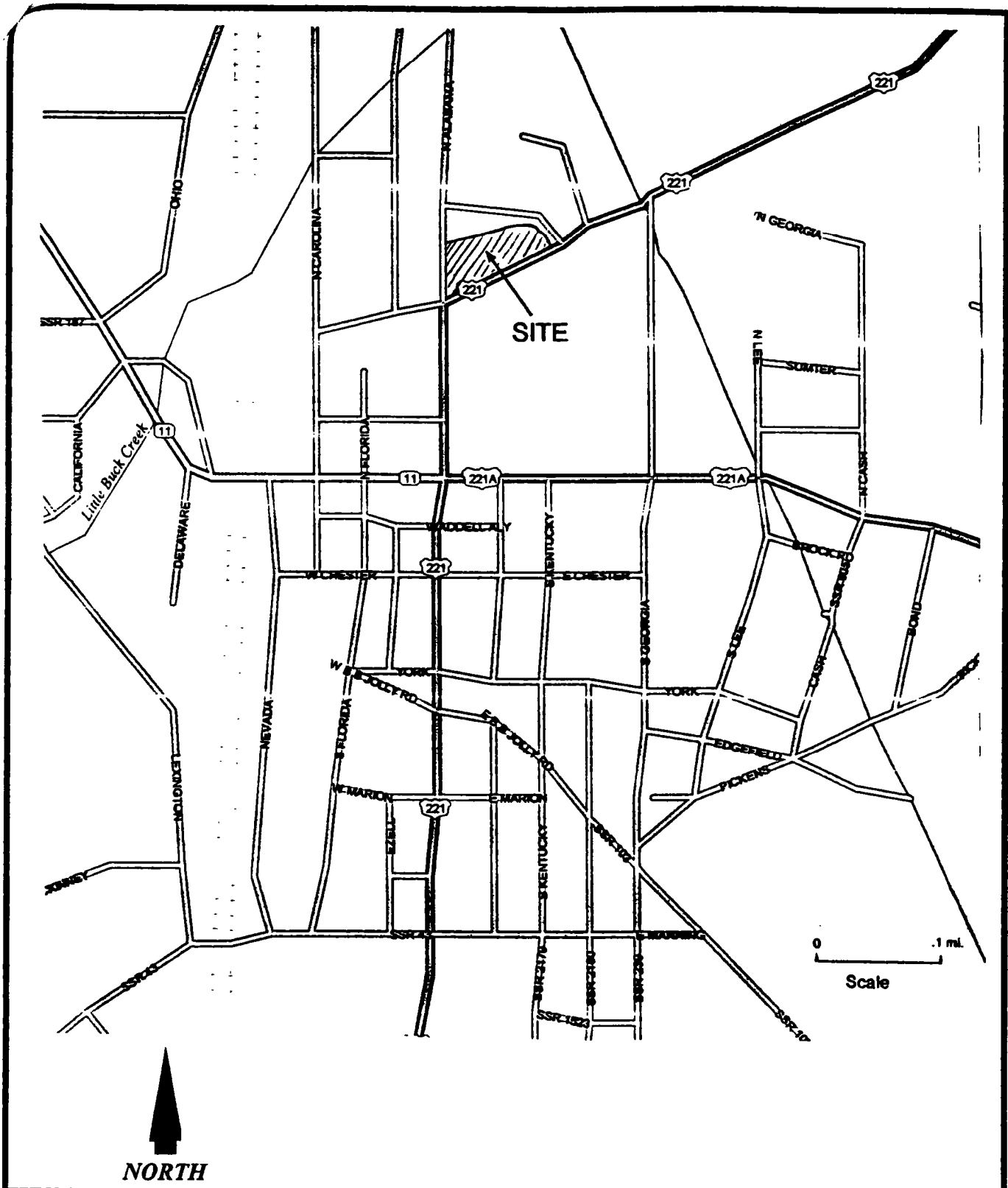


SCALE: 1" = 2000'  
 CHECK BY:  
 DRAWN BY: O'Connell  
 DATE: 24-Sep-99



**TOPOGRAPHIC MAP**  
**HOT SPOT #36**  
 HIGHWAY 221  
 CHESNEE, SOUTH CAROLINA  
 1264-99-506


FIGURE NO:  
**1**



CHECK BY:

DRAWN BY: O'Connell

DATE: 24-Sep-99

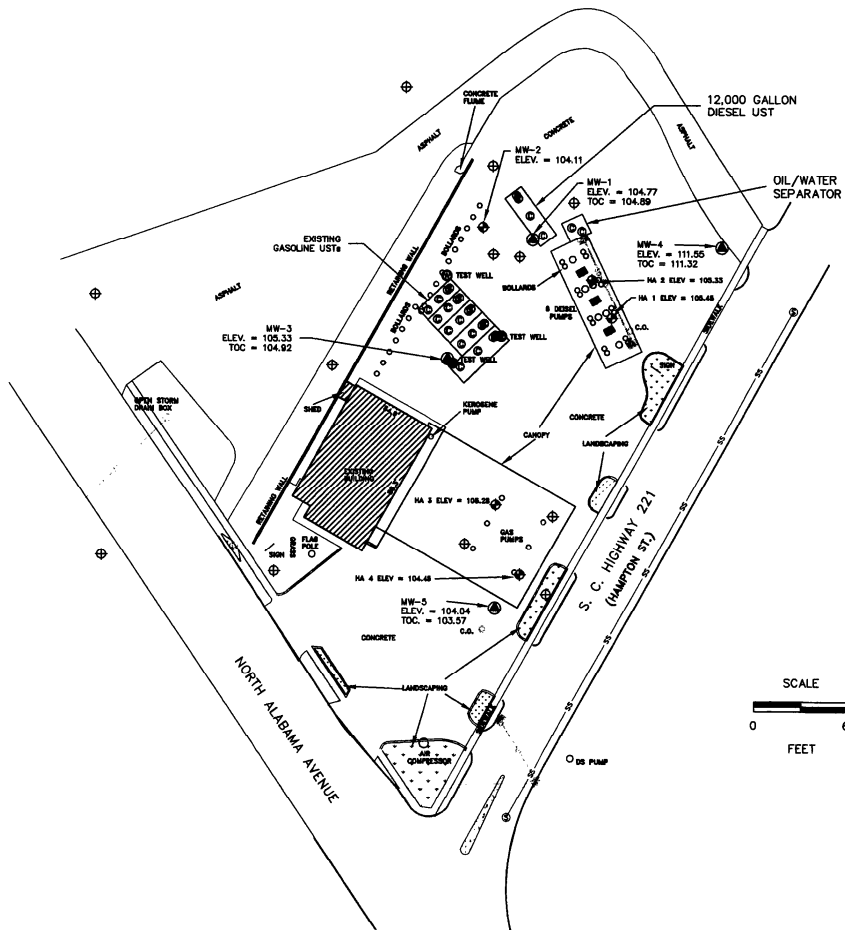


**S&ME**  
 ENGINEERING TESTING  
 ENVIRONMENTAL SERVICES

**SITE LOCATION MAP**  
 HOT SPOT #36  
 HIGHWAY 221  
 CHESNEE, SOUTH CAROLINA  
 1264-99-506

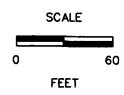
FIGURE NO:  
**2**


CAD FILE: R:\WORK\1999\199909\19990908\19990908.DWG



- LEGEND**
- MONITORING WELL LOCATION
  - ⊕ PREVIOUS SOIL BORING LOCATION
  - ⊕ PROPOSED SOIL BORING LOCATION

SOURCE: SITE MAP OF HOT SPOT STORE #36 FOR S&ME BY GRAMLING BROS. SURVEYING DATE: SEPTEMBER 20, 1999



 <b>S&amp;ME</b> ENGINEERING • TESTING ENVIRONMENTAL SERVICES		
SURVEYED SITE MAP <b>HOT SPOT #36</b> SITE ID #12719 S.C. HIGHWAY 221 CHESNEE, SOUTH CAROLINA		
SCALE: 1" = 60'	DRAWN BY: SB	CHK'D BY:
JOB NO: 1264-99-506	DATE: 10-19-99	FIGURE NO: 3



2600 Bull Street  
Columbia, SC 29201-1708

BUREAU OF  
UNDERGROUND STORAGE TANK MANAGEMENT

Phone (803) 898-4350 Fax (803) 898-4330

R.L. Jordan Oil Company, Inc.  
Attention: Ms. Judy Laughter  
P.O. Box 2527  
Spartanburg, SC 29304-2527



Tech file  
Copy

Re: Hot Spot #3005  
Facility ID#12719. CP #09759  
Tier I Assessment Plan received October 28, 1999  
Spartanburg County

Dear Ms. Laughter:

The Division of Underground Storage Tank (UST) Management of the South Carolina Department of Health and Environmental Control (SCDHEC) has reviewed the referenced Tier I Assessment Plan. The cost proposal has been approved up to the amount indicated on the enclosed cost agreement form and assigned #09759 to track the allowable cost associated with this Tier I Assessment. The Division made the following adjustments:

- Personnel mobilizations were reduced from nine to five;
- TPH, Grain size/hydrometer and TOC analyses for soil have been added.

According to our records, the release was reported to the SCDHEC subsequent to the early detection incentive program. Therefore, in accordance with Section 44-2-40(D) of the State Underground Petroleum Environmental Response Bank (SUPERB) Act, you are responsible for the first \$25,000 for site rehabilitation. To insure that any expenditures you make apply to this \$25,000 deductible, it is prudent for this agency to pre-approve such costs along with your technical plan of action. By law, the SUPERB Account cannot compensate any costs that are not pre-approved. Eligible costs exceeding the \$25,000 deductible can be compensated from the SUPERB Account.


Upon receipt of the signed RA invoice, RA report, and a copy of your canceled check (front and back) or a notarized statement from the contractor verifying payment for this scope of work, amount up to the amount of the enclosed cost agreement form may be applied toward your deductible and the amount in excess of the \$25,000.00 deductible will be paid by the SUPERB Account. Please include the cost proposal numbers when submitting your invoice.

Implementation of the RA should proceed upon receipt of this correspondence. The original required monitoring well approval was issued to your environmental contractor and a copy for your records is enclosed. The report should be submitted within 90 days from the date of this letter. All investigative derived waste must be properly stored in labeled containers or covered with plastic as appropriate. The Division grants preapproval for the transportation of the investigative derived waste (virgin petroleum contaminated soil and groundwater) from the referenced site to a permitted treatment facility. All contaminated investigative derived waste must be accepted by the approved treatment facility. There can be no spillage or leakage in transport. A copy of the disposal manifest and approval letter from the receiving facility must be included as an appendix to the final report. If the levels of petroleum contamination based on laboratory analysis are below treatment levels, please contact the project manager for approval to dispose of the investigative derived waste on site. The SUPERB Account will not compensate for transportation or treatment of clean soil and/or ground water. The SCDHEC reserves the authority to only apply costs to your deductible for work properly performed and/or technically justified in accordance with established criteria.

**Field screening results, along with proposed permanent monitoring well locations, are to be faxed to the Department project manager at (803) 898-4330 for approval prior to the installation of permanent well locations.**

On all correspondence regarding this site and scope of work, please reference UST permit #12719 and cost proposal #09759. If you have any questions concerning this correspondence, please contact me at (803) 898-4353 or 1-800-826-5435 (within SC).

Sincerely,



Konstantine Akhvediani, Hydrogeologist  
State Lead and Field Services Section  
Assessment and Corrective Action Division  
Bureau of Underground Storage Tank Management

- enc.: Approved Assessment Component Cost Proposal  
Monitoring Well Approval
- cc: Mr. Stanford Lummus, P.E., S&ME, Inc., 155 Tradd Street, Spartanburg, SC 29301 (w/original  
Monitoring Well Approval and Approved Assessment Component Cost Proposal)  
Financial File (w/Approved Assessment Component Cost Proposal)  
Technical File (w/Approved Assessment Component Cost Proposal)  
Read Files (without enclosures)





2600 Bull Street  
Columbia, SC 29201-1708

### Monitoring Well Installation Approval Form

Date of Issue: 11/3/1999

Approval No.: 12234


Approval is hereby granted to: S&ME, Inc.  
(On behalf of): Ms. Judy Laughter  
UST Permit #12719  
County: Spartanburg

This approval is for the construction of up to eight (8) shallow monitoring wells, one deep well and twenty temporary wells in accordance with the South Carolina Well Standards and Regulations. The well(s) are to be constructed within the surficial aquifer for the intended purpose of monitoring ground-water quality and/or water level(s) at the referenced facility. Approval is provided with the following conditions:

1. The latitude and longitude, surveyed elevations, boring and/or geologist logs and actual (as built) construction details for each well will be submitted with the technical report.
2. Each well will be labeled with an identification plate constructed of a durable material affixed to the casing or surface pad where it is readily visible. The plate will provide monitoring well I.D.#, date of construction, static water level, and driller name and state certification #.
3. Well construction and sampling derived waste including, but not necessarily limited to, drill cuttings, drilling fluids, development and purge water should be managed properly and in compliance with applicable requirements. If containerized, each vessel should be clearly labeled with regard to contents, source, and date of activity.
4. A minimum of forty-eight (48) hours prior to initiation of drilling activities, please provide notice to Konstantine Akhvlediani at (803) 898-4353 or Akhvlekt@columb26.dhec.state.sc.us.
5. Please provide ground-water quality analytical data (chemical analysis and/or water level(s)) and associated measurements (i.e., in-situ field measurements) to me with the technical report.
6. Monitoring wells and temporary monitoring wells will be installed by or under the direct supervision of a licensed well driller certified by the State of South Carolina.
7. Monitoring wells and temporary monitoring wells will be abandoned by or under the direct supervision of a licensed well driller certified by the State of South Carolina. Temporary monitoring wells will not remain in place for longer than 30 days from the date of installation. Monitoring wells may be abandoned only upon concurrence by this Division.

This approval is pursuant to the provisions of Section 44-55-40 of the 1976 South Carolina Code of Laws and the Department of Health and Environmental Control Regulations R.61-71. Please remember to have a copy of this approval on the site during well installation.

Approved by:

  
Konstantine Akhvlediani, Hydrogeologist  
State Lead and Field Services Section  
Assessment and Corrective Action Division  
Bureau of UST Management

cc: Appalachia III District EQC  
Technical File

Ms. Judy Laughter, P.O. Box 2527, Spartanburg, SC 29304-2527



PROMOTE PROTECT PROSPER  
2600 Bull Street  
Columbia, SC 29201-1708

BUREAU OF  
UNDERGROUND STORAGE TANK MANAGEMENT

Phone (803) 898-4350 Fax (803) 898-4330

**CERTIFIED MAIL**  
**Z 326 708 682**

Mr. Tommy Hamlet  
Jordan Oil Company  
PO Box 2527  
Spartanburg, SC 29304

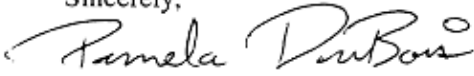
MAR 17 2000

Re: Hot Spot #3005  
UST Permit #12719, Cost Proposal #06295  
Standard Limited Assessment Invoice  
Spartanburg County

Dear Mr. Hamlet:

According to our records, an invoice with copies of your canceled check (front and back) or a notarized statement from the contractor verifying payment for the Standard Limited Assessment submitted in September 1999 has not been received. **If the enclosed Standard Limited Assessment Invoice and proof of payment is not received within thirty days from the date of this letter, the referenced cost proposal may be closed and any eligible costs will not be applied to your deductible.**

On all correspondence regarding this site, please reference **UST Permit #12719**. Please feel free to call me at (803) 898-4334 or 1-800-826-5435 (within South Carolina only) if you have questions or need additional information.

Sincerely,  
  
Pamela DuBois, Hydrogeologist  
Owner/Operator Assistance Section  
Assessment and Corrective Action Division  
Bureau of Underground Storage Tank Management

enc: Standard Limited Assessment Invoice Form

cc: **Technical File**  
Financial File  
S&ME, Inc., 155 Tradd Street, Spartanburg, SC 29301  
UST/PMD/031600



nd  
**SCANNED**

# D H E C



2600 Bull Street  
Columbia, SC 29201-1708

July 11, 2000

Mr. Steven Weathers  
Resident Maintenance Engineer  
South Carolina Department of Transportation (SCDOT) Spartanburg  
Maintenance Facility  
P.O. Box 5706  
Spartanburg, SC 29304

Re: Application for Encroachment Permit received July 11,  
2000  
Hot Spot #3005  
**UST Permit #12719**  
Spartanburg County

Dear Mr. Weathers:

The South Carolina Department of Health and Environmental Control (SCDHEC) has reviewed the referenced Application for Encroachment Permit submitted by S&ME, Inc. on behalf of R.L. Jordan Oil Company, Inc. The application requests permission to install two permanent monitoring wells in the right-of-way of North Alabama Avenue in Chesnee, SC.

The SCDHEC considers the proposed location of the monitoring wells within the right-of-way as necessary and appropriate to assess the severity and extent of ground-water contamination at the Hot Spot #3005 site. This assessment is in the public interest of protecting the ground-water supply of the State of South Carolina. The Department, therefore, respectfully requests that the SCDOT approve the application as submitted. Should you require additional information regarding this site, feel free to contact me at (803)898-4361 or S&ME, Inc. at (864)574-2360.

Sincerely,

Joel P. Padgett, P.G.  
SCDOT Liaison



JPP/jpp  
12719.OFF

DHEC/JPP/071100



November 22, 2000

R.L. Jordan Oil Company  
P.O. Box 2527  
Spartanburg, SC 29304-2527

ATTENTION: Ms. Judy Laughter

Reference: **TIER II ASSESSMENT REPORT**  
Hot Spot #3005  
SC Highway 221  
Chesnee, South Carolina  
UST Permit No. 12719  
S&ME, Inc. Project No. 1264-99-506

Dear Ms. Laughter:

S&ME, Inc. is pleased to submit this Tier II Assessment Report for the Hot Spot #3005 facility located in Chesnee, South Carolina. This report contains the results of a Tier II evaluation which included soil leachability modeling, free product recovery tests, and groundwater fate and transport modeling.

We appreciate the opportunity to provide our services to you on this important project. If you need additional information or have questions, please contact us at (864) 574-2360.

Sincerely,

S&ME, Inc.

David Klemm, P.G.  
Project Geologist

Stanford Lummus, P.E.  
Senior Environmental Engineer



Env00/6499506/RAreport

S&ME, Inc.  
155 Tradd Street  
Spartanburg, South Carolina 29301

(864) 574-2360  
(864) 576-8730 fax  
(864) 232-8987 Greenville

[www.smeinc.com](http://www.smeinc.com)

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## 1.0 INTRODUCTION

### 1.1 BACKGROUND INFORMATION

S&ME, Inc. (S&ME) has completed a Tier II Assessment at Hot Spot #3005 (UST Permit No. 12719) in accordance with criteria outlined in the South Carolina Department of Health and Environmental Control (SCDHEC) *Tier II Assessment* document dated March 15, 2000 and *Risk-Based Corrective Action (RBCA) For Petroleum Releases* guidance document dated January 1998. The site is located at the intersection of Hampton Street (S.C. 221) and North Alabama Avenue in Chesnee, Spartanburg County, South Carolina, at coordinates 35° 9.069' north latitude and 81° 51.604' west longitude (Figure 1).

Presently, the site contains a one-story convenience store building, a canopy-covered auto fueling area containing six gasoline fueling islands, and a canopy-covered truck fueling area containing four diesel fueling islands. The entire site is concrete covered with the exception of a few landscaped areas along the adjoining roads. The site generally slopes gradually downward from east to west, with a relatively level grade in the vicinity of the store. The approximate elevation of the site is 886 feet above sea level. The properties surrounding the site include the Chesnee Elementary School to the north, single family residential properties to the east and west, and commercial, residential, and government properties to the south. Table 1 lists the property owners for the surrounding adjacent properties. The corresponding map is attached as Figure 2.

<b>TABLE 1 SURROUNDING PROPERTY DATA</b>		
<b>LOT #</b>	<b>TYPE</b>	<b>OWNER NAME/ADDRESS</b>
207, 11	Commercial	Subject Property- R.L. Jordan Oil Company
206,10	Government	County of Spartanburg School Chesnee Elementary School 212 North Alabama Avenue Chesnee, SC 29323-1204
13	Government	Spartanburg County Health Dept. -- Chesnee Branch P.O. Box 5666 Spartanburg, SC 29304-5666
2	Residential	Rocky D. Blackwell 115 Eber Drive Cowpens, SC 29330-9415
1	Commercial	James P. and Barbara S. Thorne P.O. Box 35 Chesnee, SC 29323
301	Commercial	Kieth Comer P.O. Box 3125 Spartanburg, SC 29304
194	Residential	Larry Jenkins P.O. Box 186 Chesnee, SC 29323-0186
192	Common Area	
188	Residential	Michael Henderson 128 W. Cherokee Street Chesnee, SC 29323-1226
187	Residential	Hannah Lancaster P.O. Box 301 Chesnee, SC 29323-0301

In April 1996, Froehling & Robertson, Inc. performed an Initial Groundwater Assessment (IGWA) at the site. The assessment involved the installation of one monitoring well in the vicinity of the underground storage tanks (USTs). The groundwater sample taken in April 1996 yielded elevated levels of benzene, ethylbenzene, toluene, xylenes (BETX), and naphthalene.

In September 1999, S&ME, Inc. performed a Standard Limited Assessment (SLA) at the site. The SLA involved the performance of 8 soil borings and the installation of 3 additional monitoring wells. During the investigation, MW-1 was found to contain 3.84 feet of free product and two other wells, MW-3 and MW-5, contained CoC above the SCDHEC Risk Based Screening Levels



(RBSLs). Based on these findings, S&ME recommended a Tier II assessment for further delineation of the plume.

In November 1999, S&ME submitted a Tier II assessment plan for the performance of twelve soil borings and field screening to aid in the placement of nine additional monitoring wells. The results of the Tier II assessment are contained in this report.

## **1.2 REGIONAL GEOLOGY & HYDROGEOLOGY**

The site lies within the Piedmont Geologic Province of South Carolina. The Piedmont Geologic Province is primarily comprised of biotite quartzofeldspathic gneiss and biotite-muscovite schist. Crystalline rock is overlain by a variable thickness of a highly weathered soil/rock mixture called saprolite that retains the structure of the weathered bedrock. In areas, weathering has resulted in a structureless soil termed residuum. In general, there is a gradual downward lithologic and textural change from residuum to saprolite to bedrock.

In the Piedmont Geologic Province, the saprolitic and residual soils typically have high porosity but low hydraulic conductivity; thus, they do not readily transmit groundwater. The saprolite and residuum are considered leaky (semi-permeable) beds which may store and recharge groundwater to the underlying bedrock aquifer. Groundwater occurs within the saprolite and residuum between the clay, silt and sand grains. Groundwater also occurs within the bedrock along fractures, joints, and planes of weakness in the rock, and flows primarily through these zones in the rock.

The movement of groundwater through the crystalline rock aquifers and overlying saprolite is strongly influenced by topography which generally controls the location of recharge and discharge zones. Groundwater within the Piedmont generally moves from topographically high areas (recharge zones) to topographically low areas within and along stream valleys (discharge areas). The flow of groundwater is also influenced by fracture zones which may occur in the bedrock (and may be retained within the saprolite), and foliation trends in the saprolite and partially weathered bedrock. These zones usually have the greatest hydraulic conductivity.

---

### 1.3 RECEPTOR SURVEY

A receptor survey was completed in accordance with the requirements of the Tier II Assessment guidance document. The survey included a drive-by and visual inspection of all residences within 1000 feet of the site, checking buried utilities within 250 feet of the site, and checking the Spartanburg County zoning for the adjacent properties. The identified receptors, distance and direction from the site are shown on Table 2. The locations of the utilities adjacent to the site are shown on Figure 3.

**TABLE 2**  
**RECEPTOR SURVEY DATA**  
**HOT SPOT #3005**  
**CHESNEE, SOUTH CAROLINA**  
**UST PERMIT NO. 12719**

Receptor	Distance of Receptor From Site	Depth of Receptor (ft)
Unnamed tributary to Little Buck Creek	420 feet south/southwest	NA
Little Buck Creek	800 feet northwest	NA
12" Water main	North Alabama Avenue	Unknown
12" Water main	Hampton Street	Unknown
Sanitary Sewer	Hampton Street	Unknown
Storm Drain	North Alabama Avenue	Unknown
Storm Drain	Hampton Street	Unknown
Storm Drain	On-site	Unknown
Underground Telephone	North Alabama Avenue	Unknown
Underground Telephone	Hampton Street	Unknown

No water wells were found within 1000 feet of the site and public water is available to the site vicinity.

### 2.0 ASSESSMENT INFORMATION

Site assessment activities performed to date include performance of four hand auger borings, performance of twelve Geoprobe™ borings, performance of eight soil test borings, installation of thirteen groundwater monitoring wells, aquifer testing, and groundwater sampling. The locations

of the sampling points are shown on Figure 3. The specific information regarding assessment of this site is included in the following sections.

## **2.1 SITE SPECIFIC GEOLOGY**

The site specific geology is interpreted from the well installation logs completed during the IGWA and SLA phases, and from the soils data collected during the Tier II Assessment. The soil boring logs and monitoring well logs are attached in Appendix A.

Generally, the surficial 5 to 10 feet contains a fill material of red clayey silt. The residual material layer below the fill is fairly thin, if recognized, and generally consists of red and orange micaceous silt and fine sand. There is a rapid lithologic transformation from residual silts and sands to saprolite. Bedrock was encountered in MW-3, MW-4, MW-5, and MW-1D at 32, 22, 32, and 50 feet, respectively.

Two lithological cross sections were developed for the site using the available soils data. The cross sections are generalized due to the limited available data. The limits are shown on Figure 4. Lithological cross sections are attached as Figures 5 and 6.

During the assessment, a single grab soil sample was collected from the apparent worst case boring SB-4 (MW-1D) at a depth of 25 feet below land surface. The sample was analyzed with a sieve and hydrometer to determine the approximate sand, silt and clay fractions. The sample is classified as a red, brown sandy silt. The sample contained 60.4% sand or greater sized particles (>0.075mm), 34.6% silt particles (>0.004 - <0.075mm), and 5.0% clay particles (<0.004 mm).

## **2.2 SITE ASSESSMENT ACTIVITIES AND RESULTS**

### **2.2.1 Field Screening**

The twelve soil borings (SB-1 through SB-12) for this phase of the assessment were performed by Troxler Geologic with a Geoprobe™ rig. Head-space screening was performed on each soil

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sample collected using an organic vapor analyzer (OVA). The six soil samples resulting in the highest OVA readings were submitted for laboratory analysis. The results of the field screening are shown on Table 3. Note that nine of the borings (SB-1 through SB-9) were completed to 25 feet or the water table, while three of the borings (SB-10 through SB-12) were only completed to 10 feet in the vicinity of the pump islands.

**TABLE 3**  
**FIELD SCREENING RESULTS**  
**HOT SPOT #3005**  
**CHESNEE, SOUTH CAROLINA**  
**UST PERMIT NO. 12719**

Boring/Well	Date	OVA READING (ppm)														
		Sample Depth (feet)														
		1			5			10			15		20		25	
MW-1	4/23/96	2.0			1.0			3.0			32			37		
HA-1	9/9/99	0														
HA-2	9/9/99	0														
HA-3	9/9/99	56.7	1	0	1	1										
HA-4	9/9/99	2%	2%	17%	17%	1.5%										
MW-2	9/13/99	64			5			7.6			10			3.6		
MW-3	9/13/99	160			120			56			76			110		
MW-4	9/14/99	0			0			0			0					
MW-5	9/14/99	0			0			0			0			0		
SB-1/MW-8	9/6/00	0.5			0.3			0.4			0.75			0.9		
SB-2/MW-10	9/6/00	0.8			0.9			1.1			1.15			1.8		
SB-3/MW-9	9/6/00	12			171			438			354			515		
SB-4/MW-1D	9/6/00	0.95			0.92			7.8			23.5			456		
SB-5/MW-6	9/6/00	74			142			112			154			376		
SB-6/MW-7	9/7/00	0			16			12.2			9.02			12.89		
SB-7/MW-13	9/7/00	0.5						0.38			0.1			0.15		
SB-8/MW-12	9/7/00	1.8			1.8			1.5			1.2			1.0		
SB-9/MW-11	9/7/00	0.5			1.0			0.7			1.3			0.8		
SB-10	9/7/00	23.8			3.1											
SB-11	9/7/00	2.09			7.04											
SB-12	9/7/00	1.71			1.08											

The highest OVA readings were recorded near the dispenser islands from boring HA-4 performed during the Standard Limited Assessment in September 1999.

### 2.2.2 Soil Sampling and Analytical Results

Analytical testing was performed for the six soils samples resulting in the highest OVA readings. The selected soil samples were collected from borings SB-3 through SB-6, SB-10, and SB-11. The soil samples collected were analyzed for BTEX and naphthalene by EPA method #8260 and PAHs by EPA method 8270. Additionally, a sample from SB-3 was analyzed for total organic carbon by EPA method 9060 and a sample from SB-4 was analyzed for TPH by method #3550. The results of the soil sampling are shown on Table 4. The results of the recent and previous soil testing were placed on the Site Plan to depict the distribution of the soil contaminants at the site (Figure 7). The laboratory reports are attached in Appendix B.

<b>TABLE 4</b> <b>SOIL SAMPLING RESULTS</b> <b>HOT SPOT #3005</b> <b>CHESNEE, SOUTH CAROLINA</b> <b>UST PERMIT NO. 12719</b>						
Parameter	Results (µg/kg)					
	SB-3 21 ft	SB-4 25 ft	SB-5 25 ft	SB-6 9 ft	SB-10 5 ft	SB-11 10 ft
Benzene	<1.2	12	3.2	<1.2	<1.5	<1.2
Toluene	<1.2	67	<1.4	<1.2	<1.5	<1.2
Ethylbenzene	<1.2	100	<1.4	<1.2	<1.5	<1.2
Xylenes	4.0	480	<4.0	<3.7	<4.5	<3.6
Naphthalene	7.1	310	12	1.2	<1.5	<1.2
PAHs	<400	<420	<440	<410	<410	<400
TPH (DRO)	NA	300,000	NA	NA	NA	NA
Total Organic Carbon	180,000	NA	NA	NA	NA	NA

NA – Not Analyzed

The results identify BTEX and naphthalene as chemicals of concern (CoC) in soils. The RBSLs for benzene and naphthalene were exceeded in SB-4.

### 2.2.3 Monitoring Well Installation, Sampling and Testing

A total of thirteen monitoring wells have been installed at the site. Monitoring well MW-1 was installed in 1996 for the Initial Groundwater Assessment. Monitoring wells MW-3, MW-4, and MW-5 were installed during the 1999 SLA. Monitoring wells MW-1D and MW-6 through MW-13 were installed during this Tier II assessment. Each well, with the exception of MW-1D, is constructed within the surficial aquifer for the purpose of determining groundwater elevations and monitoring shallow groundwater quality. The locations and elevations of the monitoring wells are shown on Figure 3. Well construction details are shown on Table 5. Boring Logs for the monitoring wells are attached in Appendix A.

**TABLE 5**  
**MONITORING WELL CONSTRUCTION DETAILS**  
**HOT SPOT #3005**  
**CHESNEE, SOUTH CAROLINA**  
**UST PERMIT NO. 12719**

WELL ID	Installation Date	Boring Depth (ft)	Boring Diameter (in)	Casing Diameter (in)	Screen Interval (ft)	Screen Slot Size (in)	TOC elevation (ft)
MW-1	4/24/96	35	8	2	15-30	0.01	104.89
MW-3	9/13/99	32.28	6	2	22.28-32.28	0.01	104.92
MW-4	9/14/99	45.40	6	2	35.40-45.40	0.01	111.32
MW-5	9/14/99	32.25	6	2	22.25-32.25	0.01	103.57
MW-6	9/25/00	36.61	6	2	26.61-36.61	0.01	104.14
MW-7	9/25/00	36.37	6	2	26.37-36.37	0.01	104.52
MW-8	9/26/00	33.69	6	2	23.69-33.69	0.01	101.79
MW-9	9/27/00	35.40	6	2	25.40-35.40	0.01	105.43
MW-10	9/27/00	27.44	6	2	17.44-27.44	0.01	96.57
MW-11	9/27/00	28.28	6	2	18.28-28.28	0.01	95.15
MW-12	9/29/00	30.60	6	2	20.60-30.60	0.01	97.03
MW-13	9/29/00	27.11	6	2	17.11-27.11	0.01	95.89
MW-1D	9/28/00	58.64	6/3	2	53.64-58.64	0.01	104.61

Groundwater sampling events were performed following each monitoring well installation event. The most recent round of sampling was performed on October 13<sup>th</sup> and 16<sup>th</sup>, 2000. Monitoring well MW-1 was not sampled due to the presence of separate phase product and MW-5 could not be sampled because it was dry. The groundwater samples were collected with dedicated 1-liter polyethylene bailers following purging of the wells. The samples were placed immediately on ice in a laboratory-supplied cooler to await shipment to Environmental Science Corp. for analysis. Each sample was analyzed for BTEX, naphthalene, MTBE, and EDB by EPA Method 8260B, PAHs by Method 8270, total lead by EPA Method 6010B, ferrous iron by EPA method 3500, and nitrates and sulfates by EPA method 9056. The results of the organic groundwater testing are shown on Table 6. The inorganic results are shown on Table 7. The laboratory reports are attached in Appendix C.

**TABLE 6**  
**GROUNDWATER SAMPLING RESULTS (ORGANICS)**  
**HOT SPOT #3005**  
**CHESNEE, SOUTH CAROLINA**  
**UST PERMIT NO. 12719**

WELL ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	Naphthalene (µg/L)	MTBE (µg/L)	EDB (µg/L)
MW-1	10/13/00	FP	FP	FP	FP	FP	FP	FP
MW-3	10/16/00	1500	170	290	2000	3.6	2200	<1.0
MW-4	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
MW-5	10/13/00	DRY	DRY	DRY	DRY	DRY	DRY	DRY
MW-6	10/16/00	7.4	3.5	29	81	44	<1.0	<1.0
MW-7	10/16/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
MW-8	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
MW-9	10/16/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
MW-10	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
MW-11	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
MW-12	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
MW-13	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
MW-1D	10/16/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0

**TABLE 7**  
**GROUNDWATER SAMPLING RESULTS (INORGANICS)**  
**HOT SPOT #3005**  
**CHESNEE, SOUTH CAROLINA**  
**UST PERMIT NO. 12719**

WELL ID	Date	Lead (mg/L)	Ferrous Iron (mg/L)	Nitrate (mg/L)	Sulfate (mg/L)
MW-1	10/13/00	NS	NS	NS	NS
MW-3	10/16/00	56	5,000	730	<5,000
MW-4	10/13/00	<5.0	220	<100	12,000
MW-5	10/13/00	DRY	DRY	DRY	DRY
MW-6	10/16/00	<5.0	250	1,300	<5,000
MW-7	10/16/00	14	60	1,300	<5,000
MW-8	10/13/00	<5.0	290	1,100	<10,000
MW-9	10/16/00	5.4	1,700	1,800	<5,000
MW-10	10/13/00	67	1,000	2,600	<10,000
MW-11	10/13/00	<5.0	1,100	2,900	<10,000
MW-12	10/13/00	<5.0	80	1,300	32,000
MW-13	10/13/00	<5.0	7,700	1,500	25,000
MW-1D	10/16/00	14	8,000	2,800	<5,000

The current analytical results identify BETX/MTBE, naphthalene, and lead as the CoC in the groundwater. A groundwater plume map is attached as Figure 8.

#### 2.2.4 Aquifer Evaluation

On October 16, 2000, S&ME personnel gauged the depth to groundwater in the seven existing groundwater monitoring wells. Gramling Brothers Surveying performed a comprehensive site survey of the site on September 20, 1999. A subsequent survey performed in October 2000 established the location, top of casing (TOC) elevation, and ground surface elevation of each well relative to a site benchmark with an assumed elevation of 100 feet. The groundwater level information was subtracted from the TOC elevations to calculate the elevation of the saturated groundwater interface in each well. The groundwater elevation data was placed on a site plan to depict the approximate groundwater surface below the site. The resulting groundwater surface was used to estimate the groundwater flow direction and gradient. The groundwater elevation data is included on Table 8. A Groundwater Potentiometric Surface Map is attached as Figure 9.



Based on this data, it appears that groundwater flow within the surficial aquifer is toward the east under an approximate hydraulic gradient of 0.035 feet per foot.

**TABLE 8**  
**GROUNDWATER ELEVATION DATA**  
**HOT SPOT #3005**  
**CHESNEE, SOUTH CAROLINA**  
**UST PERMIT NO. 12719**

WELL ID	Date	Top of Casing Elevation (ft)	Depth to Water (ft)	Depth to Liquid (ft)	Product Thickness (ft)	Relative Groundwater Elevation
MW-1	10/16/00	104.77	29.76	27.90	1.86	76.50
MW-3	10/16/00	104.92	30.83	30.83	0.00	74.09
MW-4	10/16/00	111.32	27.58	27.58	0.00	83.74
MW-5	10/16/00	103.57	31.82	31.82	0.00	71.75
MW-6	10/16/00	104.14	28.45	28.45	0.00	75.69
MW-7	10/16/00	104.52	27.30	27.30	0.00	77.22
MW-8	10/16/00	101.79	23.60	23.60	0.00	78.19
MW-9	10/16/00	105.43	27.61	27.61	0.00	77.82
MW-10	10/16/00	96.57	23.25	23.25	0.00	73.32
MW-11	10/16/00	95.15	24.02	24.02	0.00	71.13
MW-12	10/16/00	97.03	23.83	23.83	0.00	73.20
MW-13	10/16/00	95.89	24.33	24.33	0.00	71.56
MW-1D	10/16/00	104.61	28.69	28.69	0.00	75.92

Three independent slug tests were performed to assist in determining the hydraulic characteristics of the surficial and bedrock aquifers. The slug tests were performed by bailing/pumping the water table down as far as possible and measuring the rate of recharge. The tests were performed in two shallow aquifer wells (MW-11 and MW-12) and one deep aquifer rock well (MW-1D). The slug test data was reduced using the formula derived by Bower and Rice. The hydraulic conductivity values for the shallow aquifer were  $9.51 \times 10^{-5}$  and  $3.20 \times 10^{-4}$  ft/min for MW-11 and MW-12, respectively. The hydraulic conductivity value for the deep aquifer rock well was  $9.6 \times 10^{-4}$  ft/min. The measured hydraulic conductivity values for monitoring wells MW-3 and MW-4, performed during the Standard Limited Assessment were  $5.4 \times 10^{-5}$  and  $9.3 \times 10^{-5}$  ft/min, respectively. The average hydraulic conductivity in the shallow aquifer using the four values is  $1.41 \times 10^{-4}$  ft/min. Based on an estimated effective hydraulic

gradient of 0.035 ft/ft, an average hydraulic conductivity of  $1.41 \times 10^{-4}$  ft/min, and an estimated effective porosity of 0.3, a linear flow (seepage) velocity of 8.6 ft/year was calculated for the surficial aquifer. The flow velocity for the deep aquifer was not estimated since only one deep well exists and the flow characteristics of the rock aquifer are not known. Groundwater flow within the surficial aquifer is generally to the west and southwest. The hydraulic conductivity calculations are attached with slug test data in Appendix D.

### **2.2.5 Free Product Recovery Test**

A free product recovery test was performed on monitoring well MW-1 in attempt to determine the true free product thickness in the aquifer. The test is performed by bailing out the product and water and measuring the rate of recovery. The point at which the product begins depressing the water table is called the inflection point. The difference in the depth to product and water at this point is considered to be the true free product thickness. Two tests were performed on MW-1 on November 10, 2000 and November 14, 2000. The results of both tests were inconclusive. The first test indicated a thinning free product thickness over the duration of the test. The second test initially indicated a thinning free product layer for the first 2.25 minutes of the test before the product began thickening. This test was terminated after 5 minutes because the free product level had returned close to the static level. The water level on the second test stabilized after approximately 3.5 minutes only 0.2 feet from the static level.

Of note is that the water level in the well was so low that adequate draw-down of the water/product in the well was restricted which apparently affected the recovery test. The data for the free product recovery tests is included in Appendix D.

## **2.3 FATE AND TRANSPORT MODELING**

BIOSCREEN Natural Attenuation software, based on the Domenico (1987) model, was utilized to estimate the predicted horizontal, down-gradient extent of the identified CoC at or above their respective SCDHEC-established RBSLs. The analytical model included the following assumptions: (1) the receptor(s) is located along the centerline (x-axis) and hydraulically down-

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gradient from the source, (2) the source width is estimated to be perpendicular to groundwater flow, with the approximate dimensions of the former UST 10'x 30', (3) one dimensional flow and three dimensional dispersion, (4) the medium is isotropic and homogeneous, (5) the source concentration is constant, and (6) decay of the contaminant in the dissolved and absorbed phases occurs at the same rate.

The source area was chosen as the diesel UST excavation. The source concentrations were selected from MW-1 and MW-3 because MW-1 contains separate phase diesel fuel and MW-3 has the highest benzene and MTBE concentrations. A naphthalene concentration of 2,000 µg/L was used based on recommendations by SCDHEC for water in contact with free phase naphthalene. The selected source concentrations are benzene (1500 µg/L), naphthalene (2000 µg/L) and MTBE (2200 µg/L). A tributary of Little Buck Creek approximately 420 feet down-gradient from the closest site border was selected as the receptor. An average linear flow velocity of 8.6 ft/year and a porosity of 0.3 were used in the modeling.

Based on the modeling results (see Appendix E) and current worst case source concentrations, it appears that benzene is the only CoC that exceeds the calculated SSTL. The measured benzene concentration was 1500 µg/L and the calculated SSTL for benzene was 1480 µg/L.

### 3.0 TIER 1 EVALUATION

A site conceptual model for both current and projected future land use was developed to identify all complete exposure pathways using available site-specific assessment information. Each identified exposure pathway(s) was evaluated for both current (see Table 9) and future land use (see Table 10). The exposure pathways selected for both the current and future land uses are surface water, and surficial and subsurface soils leaching to groundwater. It is not expected that the future use of the property will change from the current use.

**TABLE 9**  
**SITE CONCEPTUAL MODEL (Current Land Usage)**  
**HOT SPOT #3005**  
**CHESNEE, SOUTH CAROLINA**  
**UST PERMIT NO. 12719**

Media (for Exposure)	Exposure Route	Pathway Selected for Evaluation? (yes or no)		Exposure point/reason for non-selection	Data Requirements (if pathway selected)
Air	Inhalation	Yes	NO	Site Paved	
	Explosion Hazard	Yes	NO	No accumulation of VOCs	
Groundwater	Ingestion	Yes	NO	Groundwater not in use in vicinity of site	
	Dermal Contact	Yes	NO	Groundwater not in use in vicinity of site	
	Volatile Inhalation	Yes	NO	Groundwater not in use in vicinity of site	
Surface Water	Ingestion	YES	No		Bioscreen Model
	Dermal Contact	YES	No		Bioscreen Model
	Volatile Inhalation	YES	No		Bioscreen Model
Surficial Soil	Ingestion	Yes	NO	Under asphalt/concrete	
	Dermal Contact	Yes	NO	Under asphalt/concrete	
	Volatile Inhalation	Yes	NO	Under asphalt concrete	
	Leaching to Groundwater	YES	No		Soil Leachability Model
Subsurface Soil	Ingestion	Yes	NO	Under asphalt/concrete	
	Dermal Contact	Yes	NO	Under asphalt/concrete	
	Volatile Inhalation	Yes	NO	Under asphalt/concrete	
	Leaching to Groundwater	YES	No		Soil Leachability Model

**TABLE 10**  
**SITE CONCEPTUAL MODEL (Future Land Usage)**  
**HOT SPOT #3005**  
**CHESNEE, SOUTH CAROLINA**  
**UST PERMIT NO. 12719**

Media (for Exposure)	Exposure Route	Pathway Selected for Evaluation? (yes or no)		Exposure point/reason for non-selection	Data Requirements (if pathway selected)
Air	Inhalation	Yes	NO	Site Paved	
	Explosion Hazard	Yes	NO	No accumulation of VOCs	
Groundwater	Ingestion	Yes	NO	Groundwater not in use in vicinity of site	
	Dermal Contact	Yes	NO	Groundwater not in use in vicinity of site	
	Volatile Inhalation	Yes	NO	Groundwater not in use in vicinity of site	
Surface Water	Ingestion	YES	No		Bioscreen Model
	Dermal Contact	YES	No		Bioscreen Model
	Volatile Inhalation	YES	No		Bioscreen Model
Surficial Soil	Ingestion	Yes	NO	Under asphalt/concrete	
	Dermal Contact	Yes	NO	Under asphalt/concrete	
	Volatile Inhalation	Yes	NO	Under asphalt concrete	
	Leaching to Groundwater	YES	No		Soil Leachability Model
Subsurface Soil	Ingestion	Yes	NO	Under asphalt/concrete	
	Dermal Contact	Yes	NO	Under asphalt/concrete	
	Volatile Inhalation	Yes	NO	Under asphalt/concrete	
	Leaching to Groundwater	YES	No		Soil Leachability Model

## **4.0 TIER II EVALUATION**

Based on the results of the site conceptual model, a Tier II risk evaluation was completed. Exposure points were established, points of compliance were identified and site-specific target levels (SSTLs) were calculated for each identified exposure point.

### **4.1 ESTABLISHING EXPOSURE POINTS**

The exposure pathways identified in Section 3.0 include surface water, and surface and subsurface soils leaching of CoC from soil to groundwater. As stated, the groundwater pathways were not included since groundwater is apparently not used in the vicinity of the site. The surface water pathways were included since a tributary of Little Buck Creek is located approximately 420 feet down-gradient of the site. The subsurface soils leaching to groundwater were evaluated due to the hydrocarbon concentrations identified in the soils.

### **4.2 ESTABLISHING POINTS OF COMPLIANCE**

The established compliance point for the surface water pathway is the tributary to Little Buck Creek located approximately 420 feet south/southwest of the site. The target concentration for hydrocarbons potentially discharging to the stream are the RBSLs.

### **4.3 ESTABLISHING THE SITE SPECIFIC TARGET LEVELS (SSTLs)**

SSTLs have been calculated for each CoC detected above its respective RBSL in each particular exposure pathway identified in the site conceptual model. These include potential exposure due to plume migration to the tributary to Little Buck Creek and from hydrocarbons leaching from soil to groundwater.

### 4.3.1 Surface Water Pathways

The Bioscreen II model was utilized to calculate the SSTLs for plume discharge to the tributary of Little Buck Creek. The assumptions and limitations of this model are discussed in Section 2.3. The SSTL is the source point concentration that must be achieved and/or maintained to ensure that the identified exposure point will not be impacted by the identified CoC at or above the established RBSL. The CoCs identified for the surface water pathway include benzene, MTBE, and naphthalene.

The SSTL is calculated by completing multiple iterations of two variables; time and source zone concentration. The time parameter is calibrated to maximize the CoC concentration at the exposure point while identifying the smallest time input possible to achieve the maximum concentration. After the time input has been calibrated, the source zone concentration is input to calculate the CoC concentration at the exposure point. The calculated SSTL is the allowable source concentration for which the RBSL will not be exceeded at the compliance point. (Table 11).

<b>TABLE 11</b> <b>SSTL Calculation (Surface Water Pathway)</b> HOT SPOT #3005 CHESNEE, SOUTH CAROLINA UST PERMIT NO. 12719				
COC Selected	RBSL (µg/L)	Compliance Point Tributary of Little Buck Creek		
		Time (years)	SSTL (µg/L)	Source Concentration (µg/L)
Benzene	5.0	106	1480	1500
MTBE	40	143	10300	2200
Naphthalene	25	300	6500	2000

The modeling results indicate that benzene slightly exceeds its calculated SSTL. The modeling information is included in Appendix E.

### 4.3.2 Soil Leaching to Groundwater Pathway

Soil samples collected from SB-4 reported benzene and naphthalene exceeding their respective RBSLs during this assessment. However, the CoCs reported for HA-4 from the previous Standard Limited Assessment (9/24/99) were significantly higher and reported exceedances of the RBSLs for toluene, ethylbenzene, xylenes, and naphthalene. Benzene was reported below the detection limit of 300 µg/kg. Benzene was reported at 12 mg/kg in SB-4 during this assessment. Therefore, the sampling results from HA-4 collected during the Standard Limited Assessment were used in the soil leachability modeling. The SSTLs for each of the CoC were calculated based on the current highest reported CoC concentration (see Table 12). The reported detection limit of 300 µg/kg was used as the benzene soil concentration.

**TABLE 12**  
**SSTL CALCULATION (SOIL LEACHING PATHWAY)**  
HOT SPOT #3005  
CHESNEE, SOUTH CAROLINA  
UST PERMIT NO. 12719

Analyte Evaluated	Worst Case Concentration	RBSL for Sandy Soil	Soil SSTL
	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.300	0.007	1.63
Toluene	20	1.7	1.59
Ethylbenzene	22	1.5	1.50
Xylenes	210	44	31.98
Naphthalene	67	0.2	0.13

The soil leachability modeling indicates the reported concentration of toluene, ethylbenzene, xylenes, and naphthalene exceed the calculated SSTL. Soil leachability modeling information is included in Appendix F.

## 5.0 CONCLUSIONS AND RECOMMENDATIONS

A Rapid Assessment has been performed for the Hot Spot site located on Highway 221 in Chesnee, South Carolina. This assessment included a receptor survey, soil screening and sample collection, Geoprobe™ sampling, and an evaluation of the hydraulic characteristics of the



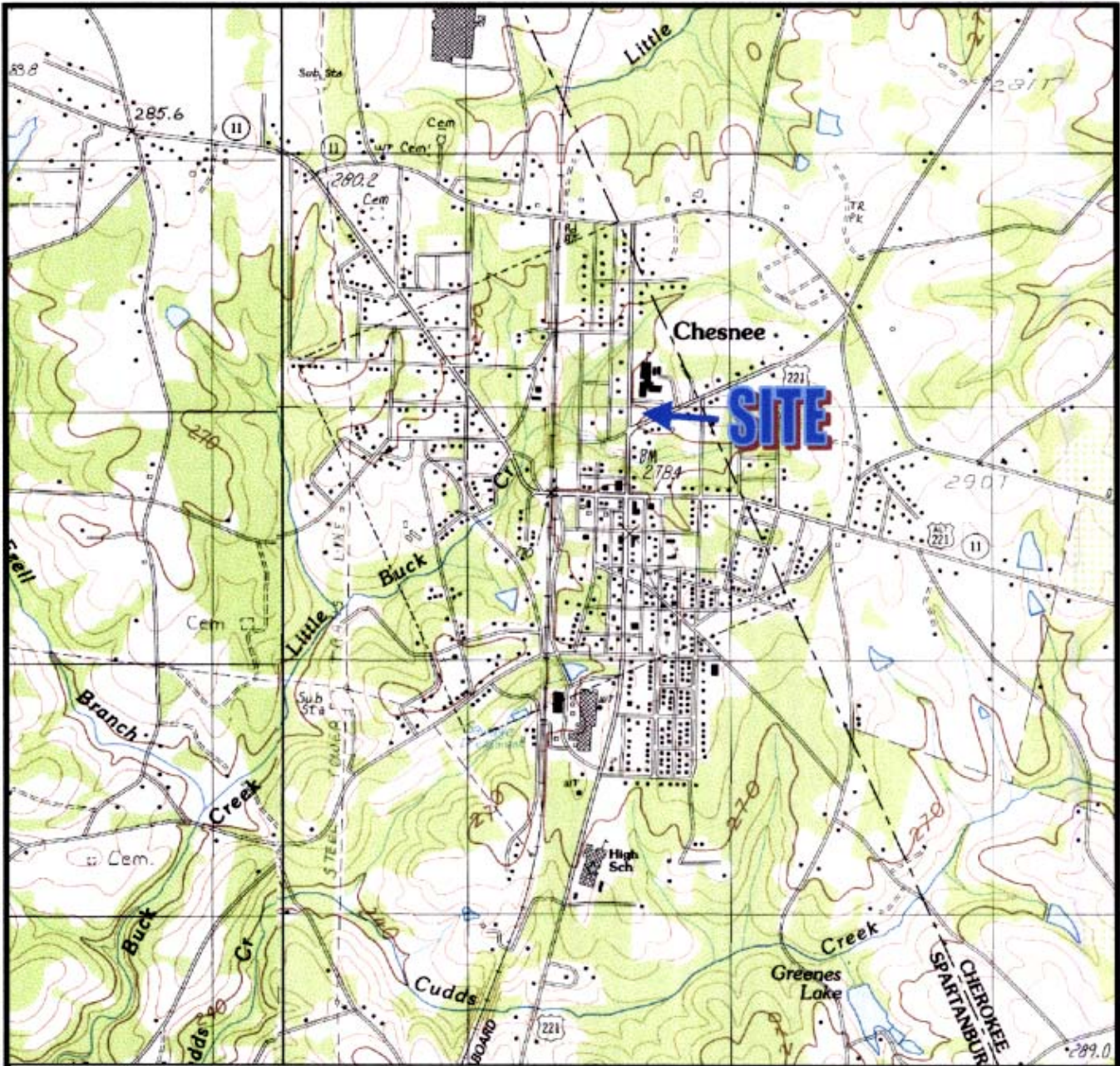
surficial aquifer. The assessment and hydrogeologic data obtained was used to identify CoC, model the fate and transport of the identified CoC, and complete Tier I and Tier II evaluations to include the establishment of SSTLs for identified exposure pathways.

Surface water and hydrocarbons leaching from soils to groundwater were identified as potential exposure pathways and were subsequently evaluated. It appears that the presence of specific organic CoC (ethylbenzene, toluene, xylenes, and naphthalene) in the subsurface soil may be a continued secondary source of dissolved CoC. The groundwater SSTL for benzene was exceeded. Free phase petroleum product was recorded in monitoring well MW-1 at a thickness of 1.86 feet.

The horizontal extent of the dissolved hydrocarbon plume appears to have been defined during this assessment. Additionally, the vertical delineation groundwater monitoring well MW-1D indicates the vertical delineation is complete as well.

Based on a review of the available historical assessment data, current fate and transport modeling results, and the calculated SSTLs for each identified exposure pathway, S&ME recommends the following:

- Initiate free product recovery in the vicinity of MW-1.
- Initiate soil and groundwater remediation in the vicinity of MW-1 and MW-3 to reduce the groundwater hydrocarbon concentrations to below the SSTLs.
- Evaluate hydrocarbon concentrations in the groundwater directly below boring HA-4.
- Initiate soil and/or groundwater remediation in the vicinity of boring HA-4 to lower the hydrocarbon concentrations in the soils to below the calculated soil SSTLs.



SOURCE: TOPOGRAPHIC MAP OF CHESNEE, SOUTH CAROLINA  
 QUADRANGLE, 7.5 MINUTE SERIES, 1983

SCALE 1"=2000'

CHECK BY:

DRAWN BY: Klemm

DATE: 17-Nov-00



ENGINEERING TESTING  
 ENVIRONMENTAL SERVICES

## SITE LOCATION MAP

HOT SPOT #3005

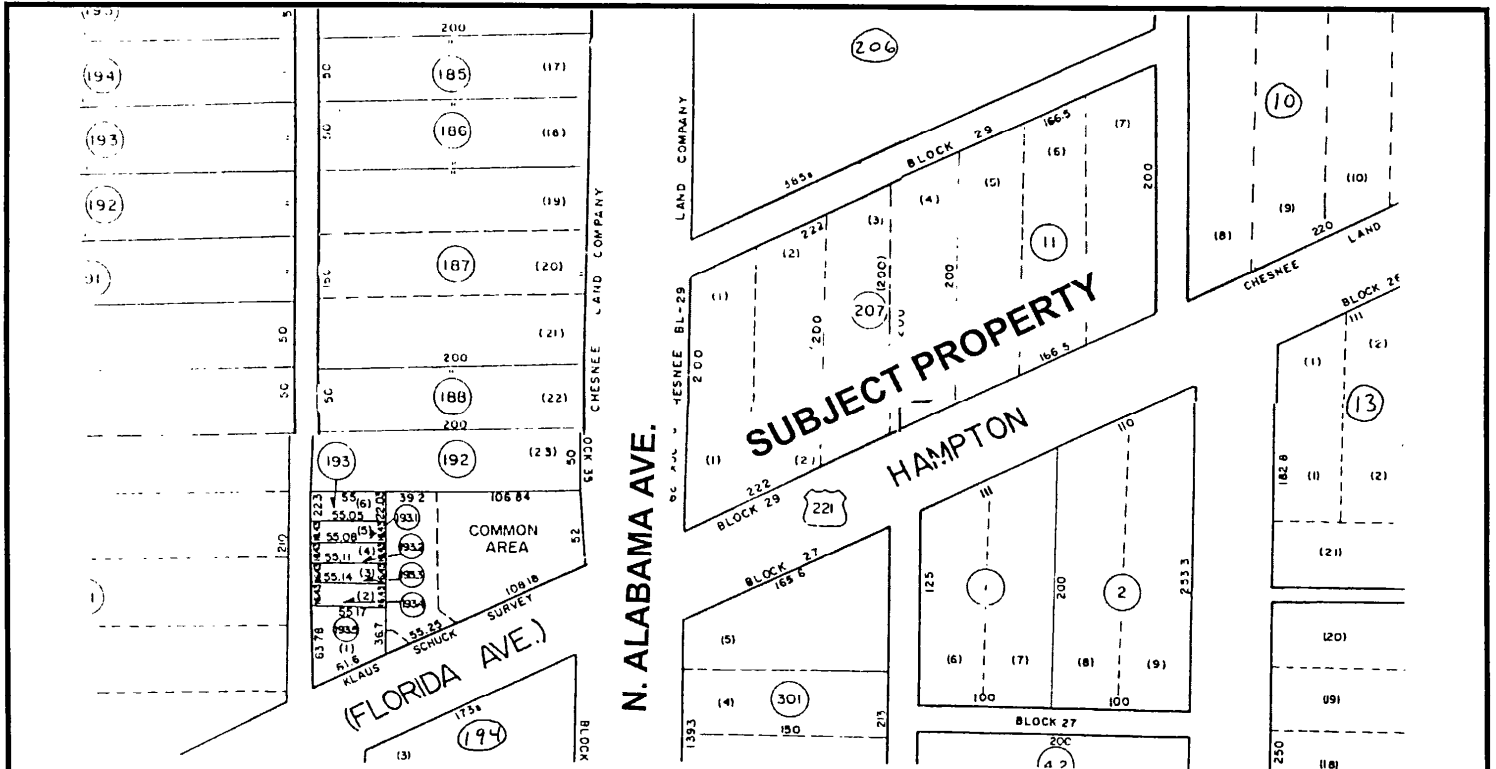
Site ID# 12719

SC HWY 221, CHESNEE, SOUTH CAROLINA

1264-99-506

FIGURE NO:

1



SOURCE: SPARTANBURG COUNTY PROPERTY MAP  
 Compiled from Sheets 2-14-5, 2-14-6, 2-14-10, 2-14-11

CHECK BY:  
 DRAWN BY:  
 DATE:



MAP OF SURROUNDING PROPERTIES

HOT SPOT #3005

SITE ID 12719

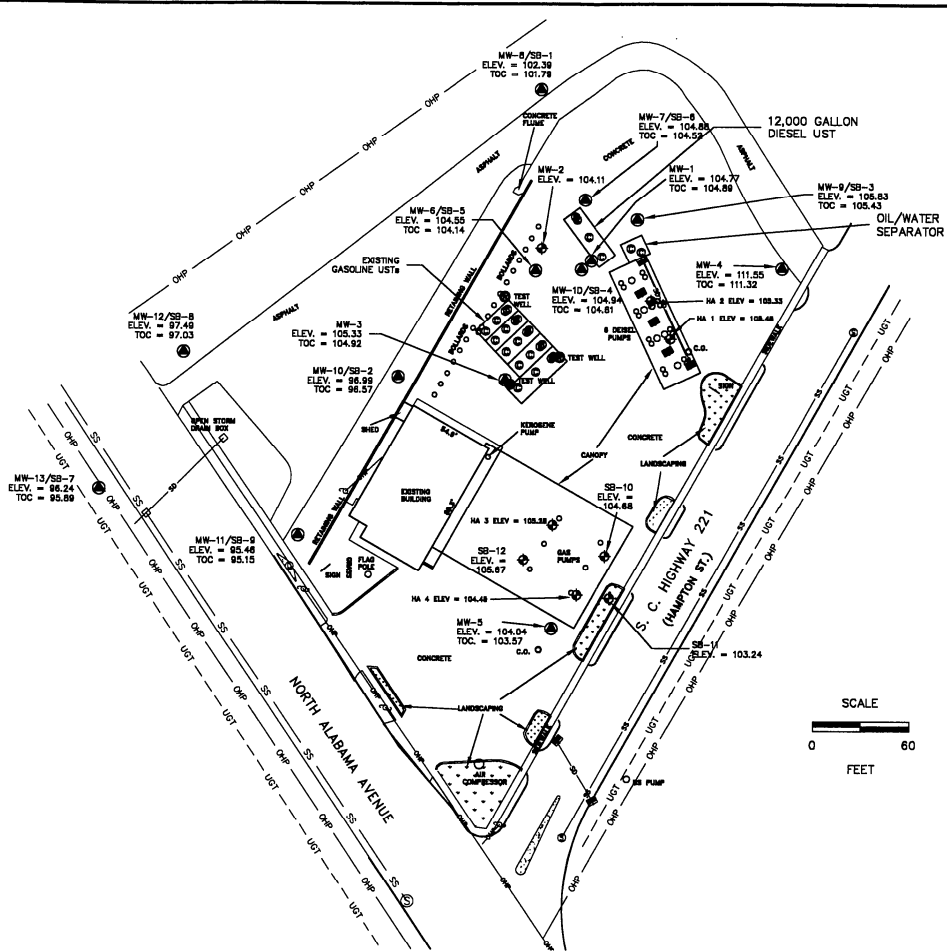
Highway 221, Chesnee, South Carolina

1264-99-506

FIGURE NO:

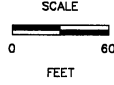
2


CAD FILE: K:\DATA\2004\2004\UNRESERVED\STPLONG



- LEGEND**
- MONITORING WELL LOCATION
  - ⊕ SOIL BORING LOCATION
  - OHP — OVERHEAD POWER LINE
  - SS — SANITARY SEWER LINE
  - - - UGT - - UNDERGROUND TELEPHONE LINE

SOURCE: SITE MAP OF HOT SPOT STORE #36 FOR S&ME BY GRAMLING BROS. SURVEYING DATE: SEPTEMBER 20, 1999



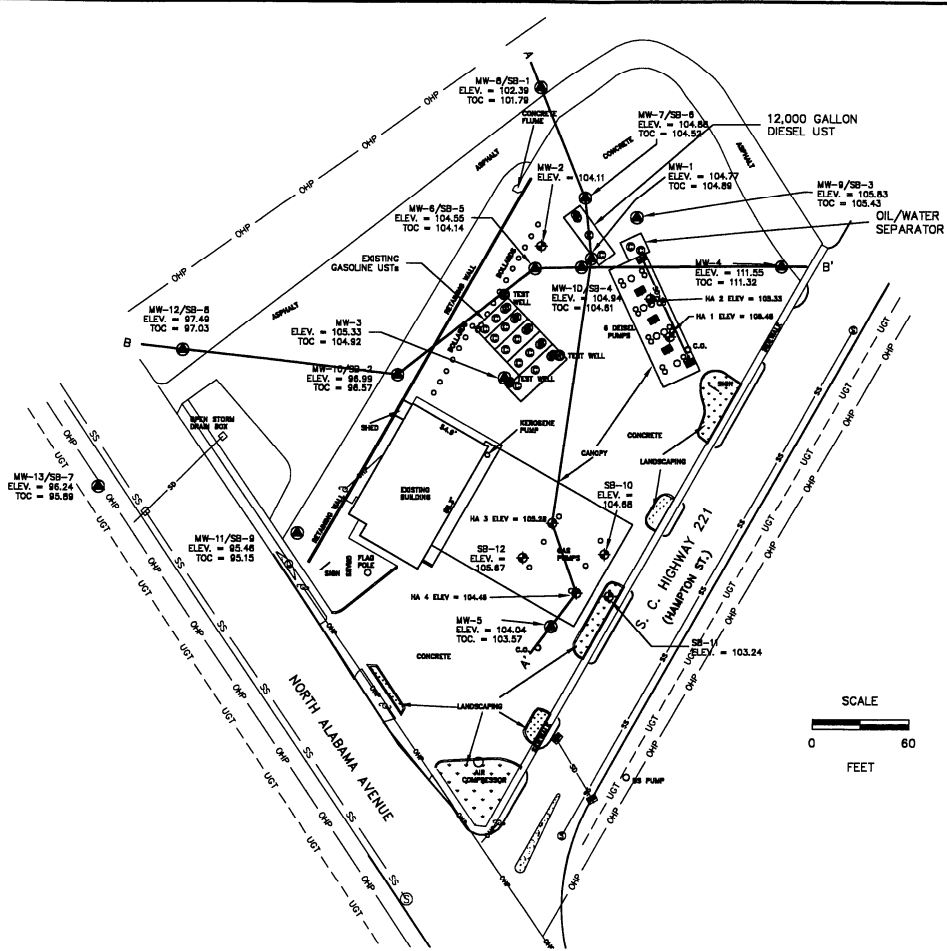


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SURVEYED SITE MAP  
HOT SPOT #3005  
SITE ID #12719  
S.C. HIGHWAY 221  
CHESNEE, SOUTH CAROLINA

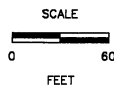
SCALE: 1" = 60'	DRAWN BY: SB	CHK'D BY:
JOB NO: 1264-99-506	DATE: 10-19-99	FIGURE NO: 3


CAD FILE: W:\DATA\TRA\TRA\3005\3005.DWG



- LEGEND**
- MONITORING WELL LOCATION
  - ⊕ SOIL BORING LOCATION
  - OHP— OVERHEAD POWER LINE
  - SS— SANITARY SEWER LINE
  - - - UGT - - - UNDERGROUND TELEPHONE LINE

SOURCE: SITE MAP OF HOT SPOT STORE #36 FOR S&ME BY GRAMLING BROS., SURVEYING DATE: SEPTEMBER 20, 1999

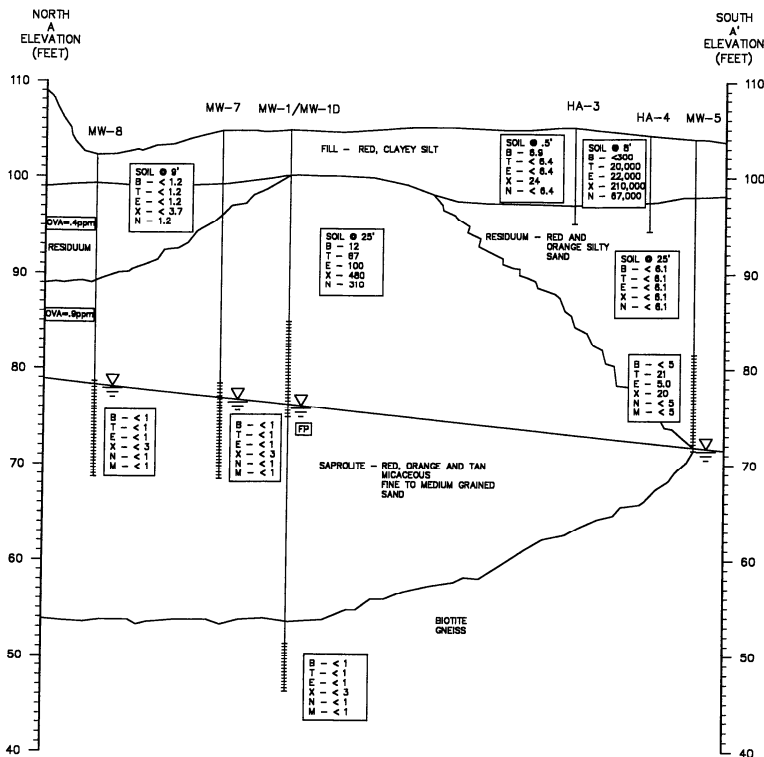




**S&ME**  
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ENVIRONMENTAL SERVICES

LIMITS OF LITHOLOGIC CROSS SECTION  
**HOT SPOT #3005**  
SITE ID #12719  
S.C. HIGHWAY 221  
CHESNEE, SOUTH CAROLINA

SCALE: 1" = 60'	DRAWN BY: SB	CHK'D BY:
JOB NO: 1264-99-506	DATE: 11-14-00	FIGURE NO: 4



**LEGEND**

- B BENZENE CONCENTRATION IN µg/L
- T TOLUENE CONCENTRATION IN µg/L
- E ETHYLBENZENE CONCENTRATION IN µg/L
- X XYLENE CONCENTRATION IN µg/L
- N NAPHTHALENE CONCENTRATION IN µg/L
- M MTBE CONCENTRATION IN µg/L
- FP FREE PRODUCT
- ▽ WATER LEVEL IN WELL ON 10-16-00

NOTE: COC CONCENTRATIONS IN MW-5 ARE FROM SAMPLE TAKEN IN SEPTEMBER, 1999

SCALE:  
HORIZONTAL: 1" = 60'  
VERTICAL: 1" = 10'

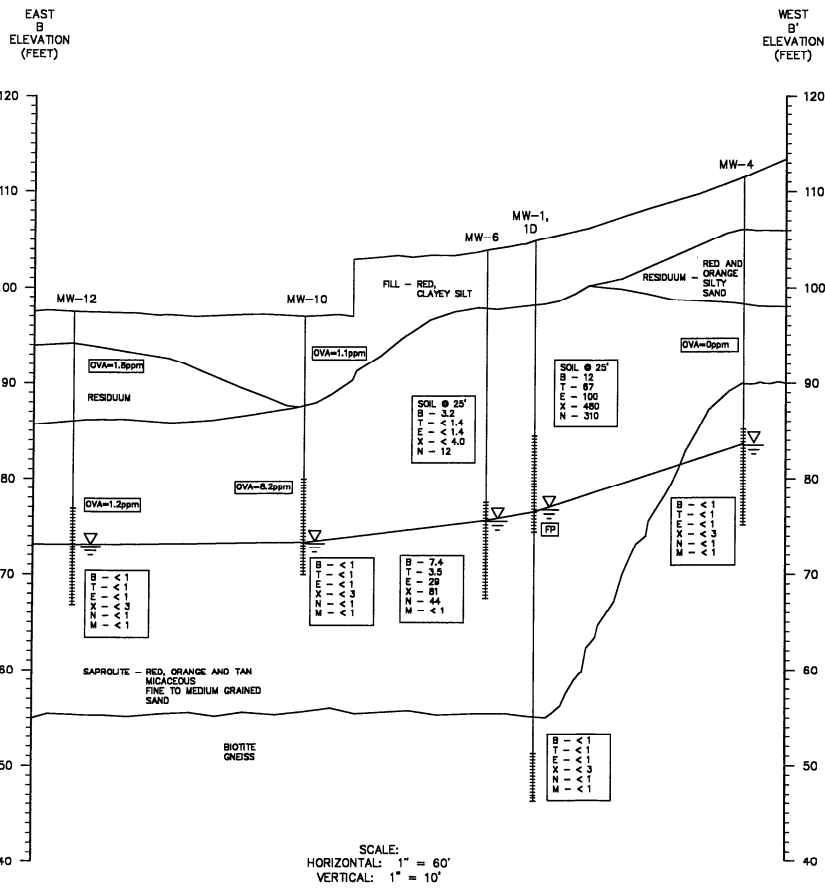


LITHOLOGIC CROSS SECTION A-A'  
HOT SPOT #3005  
SITE ID #12719  
S.C. HIGHWAY 221  
CHESNEE, SOUTH CAROLINA

SCALE: AS SHOWN	DRAWN BY: SB	CHK'D BY:
JOB NO: 1264-99-506	DATE: 11-14-00	FIGURE NO: 5

CAD FILE: K:\WORK\2264\1084\1084\1084\1084\CROSS SECTION A-A'.DWG

CAD FILE: K:\VIA\1264\1264-99\1264-99-006.DWG

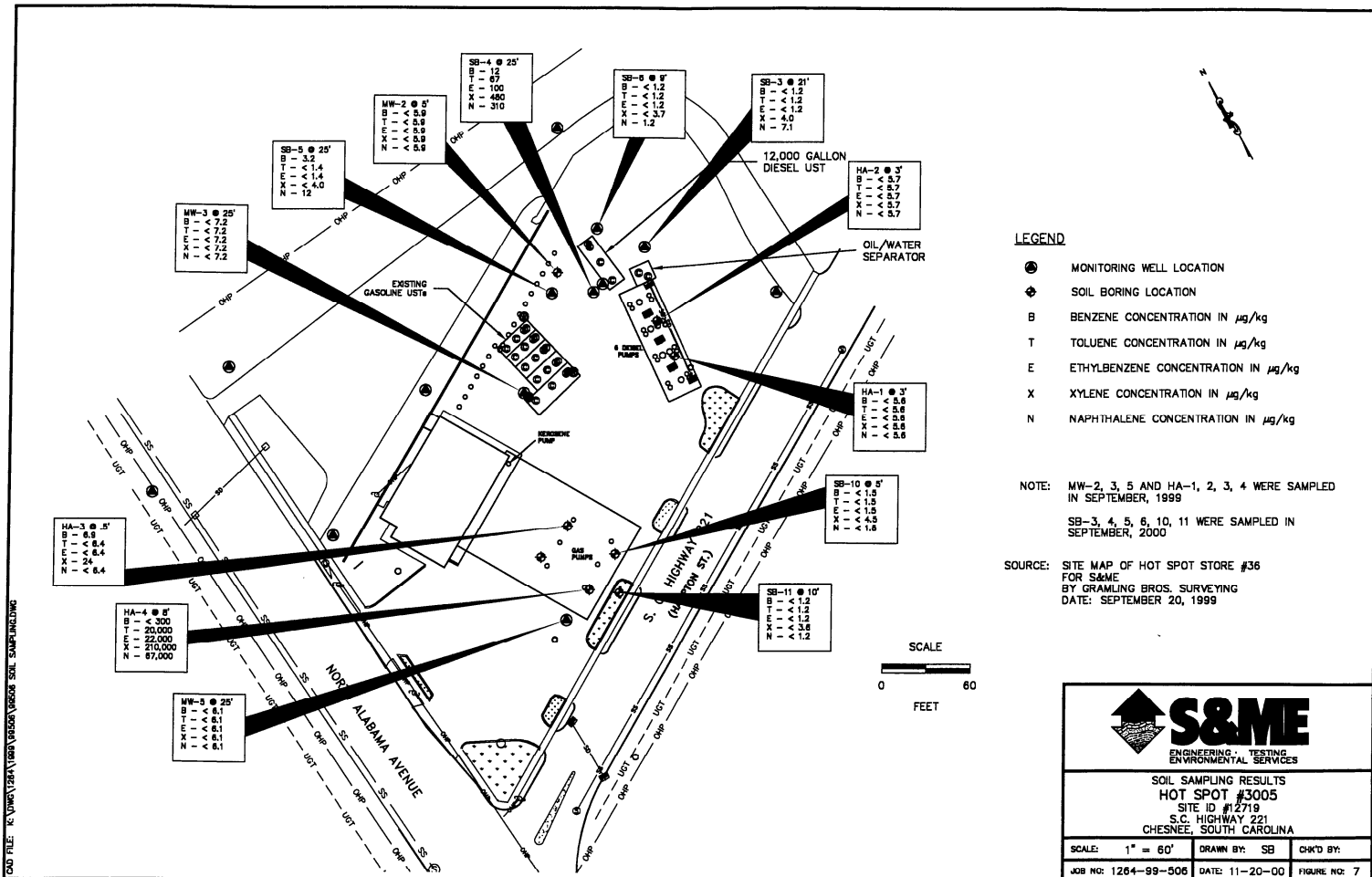


SCALE:  
 HORIZONTAL: 1" = 60'  
 VERTICAL: 1" = 10'

**LEGEND**

- B BENZENE CONCENTRATION IN  $\mu\text{g}/\text{L}$
- T TOLUENE CONCENTRATION IN  $\mu\text{g}/\text{L}$
- E ETHYLBENZENE CONCENTRATION IN  $\mu\text{g}/\text{L}$
- X XYLENE CONCENTRATION IN  $\mu\text{g}/\text{L}$
- N NAPHTHALENE CONCENTRATION IN  $\mu\text{g}/\text{L}$
- M MTBE CONCENTRATION IN  $\mu\text{g}/\text{L}$
- FP FREE PRODUCT
- WATER LEVEL IN WELL ON 10-16-00

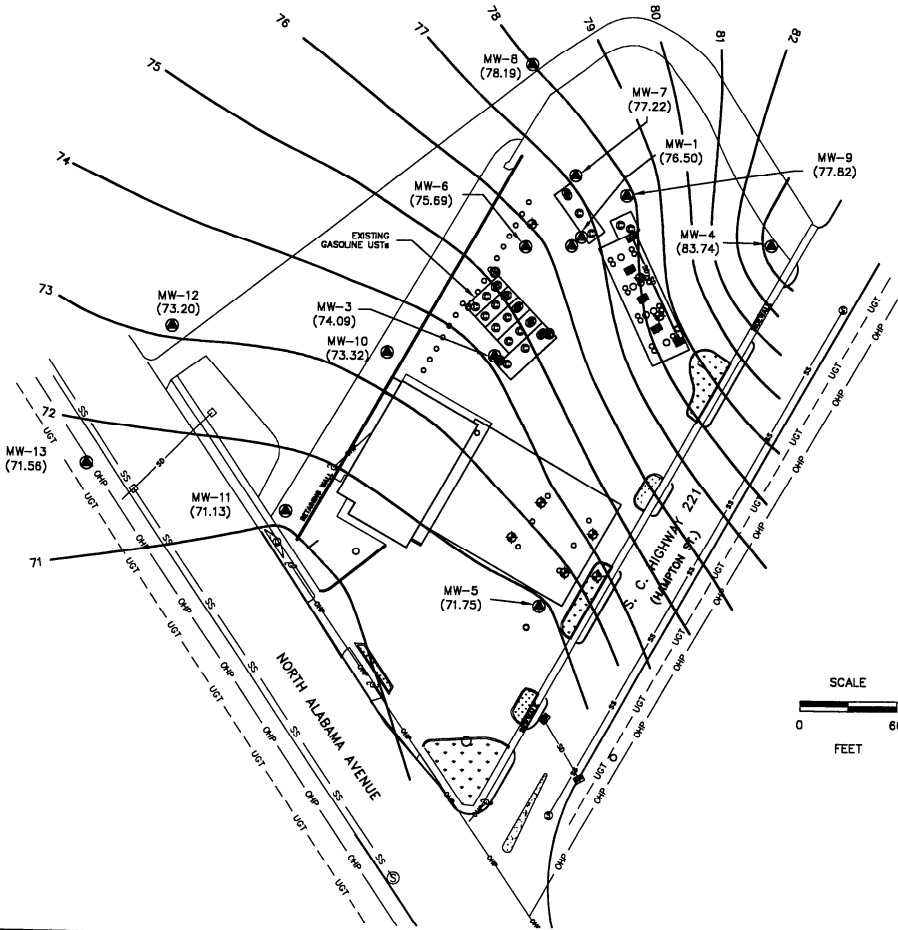
<b>S&amp;ME</b> ENGINEERING • TESTING ENVIRONMENTAL SERVICES		
LITHOLOGIC CROSS SECTION B-B' HOT SPOT #3005 SITE ID #12719 S.C. HIGHWAY 221 CHESNÉE, SOUTH CAROLINA		
SCALE: AS SHOWN	DRAWN BY: SB	CHK'D BY:
JOB NO: 1264-99-506	DATE: 11-14-00	FIGURE NO: 6



OLD FILE: K:\WORK\1999\1004\1004\SOIL SAMPLING.DWG

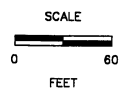







- LEGEND**
- MONITORING WELL LOCATION
  - ⊕ SOIL BORING LOCATION
  - 75— GROUNDWATER CONTOUR
  - (73.20) GROUNDWATER ELEVATION

SOURCE: SITE MAP OF HOT SPOT STORE #36 FOR S&ME BY GRAMLING BROS. SURVEYING DATE: SEPTEMBER 20, 1999





**ENGINEERING · TESTING  
ENVIRONMENTAL SERVICES**

GROUNDWATER POTENTIOMETRIC SURFACE  
HOT SPOT #3005  
SITE ID #12719  
S.C. HIGHWAY 221  
CHESNEE, SOUTH CAROLINA

SCALE: 1" = 60'	DRAWN BY: SB	CHK'D BY:
JOB NO: 1264-99-506	DATE: 11-20-00	FIGURE NO: 9

CAD FILE: R:\DWG\1999\1264-99-506.DWG

**APPENDIX A**

**SOIL BORING AND WELL LOGS**








# LOG OF BORING NO. SB-1 (MW-8)

PROJECT: **Hot Spot #3005**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **23.6 feet on 10/16/00**

DATE COMPLETED: **9/26/00**  
 DRILLING CONTRACTOR: **S&ME, Inc.**  
 DRILLER: **Costello**  
 DRILLING METHOD: **HSA**  
 SAMPLING METHOD: **Geoprobe**

GROUND SURFACE ELEVATION: **102.39**  
 DATUM: **Site Benchmark**  
 WEATHER: **Sunny, Warm**  
 LOGGED BY: **M. O'Connell**

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	
										DESCRIPTION	REMARKS
						102.39	0			Fill - red clayey SILT	
1	5				5	97.39	5			Residuum - red, slightly micaceous, silty to fine SAND	
2	4				.3	92.39	10			Residuum - red and orange mottled, slightly micaceous, silty, fine SAND	
3	4				.4	87.39	15			Residuum - red and orange mottled, slightly micaceous, silty, fine SAND	
4	4				75	82.39	20			Saprolite - brown, red and tan, micaceous, silty to fine SAND	
5	4				9	77.39	25			Saprolite - red and tan, very micaceous, fine to medium SAND	▼
6	3					72.39	30				

NOTES:

ENV BORING LOG 6499506 GPJ S&ME GDT 11/22/00



155 Tradd Street  
Spartanburg, SC 29301

**LOG OF BORING SB-1 (MW-8)**

# LOG OF BORING NO. SB-2 (MW-10)

PROJECT: **Hot Spot #3005**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **23.25 feet on 10/16/00**

DATE COMPLETED: **9/27/00**  
 DRILLING CONTRACTOR: **S&ME, Inc.**  
 DRILLER: **Costello**  
 DRILLING METHOD: **HSA**  
 SAMPLING METHOD: **Geoprobe**

GROUND SURFACE ELEVATION: **96.99**  
 DATUM: **Site Benchmark**  
 WEATHER: **Sunny, Warm**  
 LOGGED BY: **M. O'Connell**

This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
						96.99	0				
1	5				.8				[Cross-hatched symbol]	Fill - brown-red, clayey SILT	
						91.99	5				
2	4				.9						
						86.99	10				
3	4				1.1				[Dotted symbol]	Saprolite - tan and red micaceous, silty, fine to medium SAND	
						81.99	15				
4	3				1.15						
						76.99	20				
5	4				1.8				[Dotted symbol]	Saprolite - medium dense, brown and orange very micaceous, fine SAND	
						71.99	25				
6	3				8.2						

NOTES:

ENV BORING LOG 6499506 GPJ S&ME GDT 11/22/00



155 Tradd Street  
 Spartanburg, SC 29301

**LOG OF BORING SB-2 (MW-10)**








# LOG OF BORING NO. SB-3 (MW-9)

PROJECT: **Hot Spot #3005**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **27.61 feet on 10/16/00**

DATE COMPLETED: **9/27/00**  
 DRILLING CONTRACTOR: **S&ME, Inc.**  
 DRILLER: **Costello**  
 DRILLING METHOD: **HSA**  
 SAMPLING METHOD: **Geoprobe**

GROUND SURFACE ELEVATION: **105.83**  
 DATUM: **Site Benchmark**  
 WEATHER: **Sunny, Warm**  
 LOGGED BY: **M. O'Connell**

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	
										DESCRIPTION	REMARKS
1	5				12	105.83	0			Fill - red, clayey SILT	
2	4				171	100.83	5			Saprolite - tan, white micaceous, medium SAND	
3	4				438	95.83	10			Saprolite - brown, red, tan micaceous, fine to medium SAND	
4	4				354	90.83	15			Saprolite - medium dense tan and red very micaceous, fine SAND	
5	4				515	85.83	20			Saprolite - medium dense gray, brown and white micaceous, medium SAND	
6	4				480	80.83	25				▼
7	1.5		28			75.83	30				
8	1.5		26			70.83	35				

ENV BORING LOG 6499506 GPJ S&ME GDT 11/22/00

NOTES:



155 Tradd Street  
 Spartanburg, SC 29301

**LOG OF BORING SB-3 (MW-9)**

# LOG OF BORING NO. SB-4 (MW-1D)

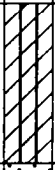
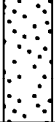






PROJECT: **Hot Spot #3005**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **28.69 feet on 10/16/00**

DATE COMPLETED: **9/28/00**  
 DRILLING CONTRACTOR: **S&ME, Inc.**  
 DRILLER: **Costello**  
 DRILLING METHOD: **HSA/Rock Coring**  
 SAMPLING METHOD: **Geoprobe**

GROUND SURFACE ELEVATION: **104.94**  
 DATUM: **Site Benchmark**  
 WEATHER: **Sunny, Warm**  
 LOGGED BY: **M. O'Connell**

This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION		REMARKS
						104.94	0			Fill - red, clayey SILT		
1	5				.95	99.94	5			Saprolite - white, orange, micaceous, fine to medium SAND		
2	4				92	94.94	10			Saprolite - tan and red micaceous, fine to medium SAND		
3	4				7.8	89.94	15			Saprolite - tan and red micaceous, fine to medium SAND		
4	5				23.5	84.94	20			Saprolite - tan and red micaceous, fine to medium SAND		
5	4				456	79.94	25			Saprolite - tan and red micaceous, fine to medium SAND		
6	3				615	74.94	30			Saprolite - medium dense tan and red very micaceous, fine SAND		▼
7	15		15			69.94	35			No Recovery		
8	15		20									

ENV BORING LOG 6499506 GPJ S&ME GDT 11/22/00

NOTES:



155 Tradd Street  
 Spartanburg, SC 29301

**LOG OF BORING SB-4 (MW-1D)**

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	
										DESCRIPTION	REMARKS
						69.94	35			No Recovery (continued)	
9	1.5		20			64.94	40			Saprolite - medium dense brown and tan very micaceous, fine SAND with occasional very coarse quartz veins	
10	1.5		15			59.94	45			Saprolite - medium dense, tan and orange very micaceous, fine to medium SAND	
11	1.5		45			54.94	50			8" Saprolite - dense brown and red very micaceous medium SAND 10" - Black, brown and gray PARTIALLY WEATHERED ROCK	
						49.94	55			Rock - biotite-gneiss	
										Boring terminated at 58.64 feet.	

NOTES:

ENV BORING LOG 6499506 GP J S&ME GDT 11/22/00



155 Tradd Street  
 Spartanburg, SC 29301

**LOG OF BORING SB-4 (MW-1D)**



# LOG OF BORING NO. SB-5 (MW-6)






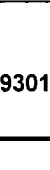

PROJECT: **Hot Spot #3005**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **28.45 feet on 10/16/00**

DATE COMPLETED: **9/25/00**  
 DRILLING CONTRACTOR: **S&ME, Inc.**  
 DRILLER: **Costello**  
 DRILLING METHOD: **HSA**  
 SAMPLING METHOD: **Geoprobe**

GROUND SURFACE ELEVATION: **104.55**  
 DATUM: **Site Benchmark**  
 WEATHER: **Sunny, hot**  
 LOGGED BY: **M. O'Connell**

This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
						104.55	0				
1	1.5				74	99.55	5			Fill - red clayey SILT with some medium grain sand	
2	1.5				142	94.55	10				
3	1.5				112	89.55	15			Saprolite - red and tan very micaceous, silty fine to medium SAND	
4	1.5				154	84.55	20				
5	1.5				376	79.55	25				
6	1.5		12			74.55	30			Saprolite - medium dense red and tan very micaceous, silty fine to medium SAND	▼
7	1.5		13			69.55	35				

NOTES:

ENV BORING LOG 6499506.GPJ S&ME GDT 11/22/00



155 Tradd Street  
 Spartanburg, SC 29301

**LOG OF BORING SB-5 (MW-6)**

# LOG OF BORING NO. SB-6 (MW-7)










PROJECT: **Hot Spot #3005**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **27.3 feet on 10/16/00**

DATE COMPLETED: **9/25/00**  
 DRILLING CONTRACTOR: **S&ME, Inc.**  
 DRILLER: **Costello**  
 DRILLING METHOD: **HSA**  
 SAMPLING METHOD: **Geoprobe**

GROUND SURFACE ELEVATION: **104.88**  
 DATUM: **Site Benchmark**  
 WEATHER: **Partly cloudy, hot**  
 LOGGED BY: **M. O'Connell**

This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
						104.88	0			Fill - red, clayey SILT	
1	5				0	99.88	5			Fill - red, clayey SILT	
2	4				16	94.88	10			Residuum - tan and red mottled micaceous, silty, fine SAND Saprolite - tan and orange, micaceous, silty, fine to medium SAND	
3	4				12.2	89.88	15			Saprolite - tan and orange, micaceous, silty, fine to medium SAND	
4	4				9.02	84.88	20			Saprolite - tan and brown and white micaceous, medium SAND	
5	4				12.89	79.88	25			Saprolite - tan and brown and white micaceous, medium SAND	
6	4				1.6	74.88	30			Saprolite - tan and brown and white micaceous, medium SAND	
7	1.5		12			69.88	35			Saprolite - brown, red, and tan micaceous, medium SAND with small quartz veins	▼
8	1.5		13							Saprolite - brown, red, and tan micaceous, medium SAND with small quartz veins	

ENV BORING LOG 6499506 GPJ, S&ME GDT 11/22/00

NOTES:



155 Tradd Street  
Spartanburg, SC 29301

LOG OF BORING SB-6 (MW-7)








# LOG OF BORING NO. SB-7 (MW-13)

PROJECT: **Hot Spot #3005**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **24.33 feet on 10/16/00**

DATE COMPLETED: **9/29/00**  
 DRILLING CONTRACTOR: **S&ME, Inc.**  
 DRILLER: **Costello**  
 DRILLING METHOD: **HSA**  
 SAMPLING METHOD: **Geoprobe**

GROUND SURFACE ELEVATION: **96.24**  
 DATUM: **Site Benchmark**  
 WEATHER: **Sunny, warm**  
 LOGGED BY: **M. O'Connell**

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.											
						96.24	0			Fill - red - brown clayey SILT	
1	10				.5	91.24	5				
						86.24	10			Residuum - orange-brown, clayey SILT	
4	5				.38	81.24	15				
						76.24	20			Saprolite - red, orange and tan, micaceous, silty, fine to medium SAND	
5	5				.1	71.24	25			Saprolite - red, orange and tan, micaceous, silty, fine to medium SAND	▼
6	4				.15					Saprolite - red, orange and tan, micaceous, silty, fine to medium SAND	

NOTES:

ENV BORING LOG 6489506 GPJ S&ME GDT 11/22/00



155 Tradd Street  
 Spartanburg, SC 29301

**LOG OF BORING SB-7 (MW-13)**








# LOG OF BORING NO. SB-8 (MW-12)

PROJECT: **Hot Spot #3005**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **23.83 feet on 10/16/00**

DATE COMPLETED: **9/29/00**  
 DRILLING CONTRACTOR: **S&ME, Inc.**  
 DRILLER: **Costello**  
 DRILLING METHOD: **HSA**  
 SAMPLING METHOD: **Geoprobe**

GROUND SURFACE ELEVATION: **97.49**  
 DATUM: **Site Benchmark**  
 WEATHER: **Sunny, warm**  
 LOGGED BY: **M. O'Connell**

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	
										DESCRIPTION	REMARKS
1	5				1.8	97.49	0			Fill - red - orange SILT	
2	5				1.8	92.49	5			Residuum - red and orange (mottled) micaceous, SILT	
3	5				1.5	87.49	10			Residuum - red and orange (mottled) micaceous SILT	
4	5				1.2	82.49	15			Saprolite - tan - orange micaceous, medium SAND	
5	5				1.0	77.49	20			Saprolite - tan - orange micaceous, medium SAND	
						72.49	25			Saprolite - tan - orange micaceous, medium SAND	▼
6	1.5		15			67.49	30			Saprolite - tan - orange micaceous, medium SAND	

NOTES:

**LOG OF BORING SB-8 (MW-12)**

ENV BORING LOG 6499506 GPJ S&ME GDT 11/22/00



155 Tradd Street  
 Spartanburg, SC 29301







# LOG OF BORING NO. SB-9 (MW-11)

PROJECT: **Hot Spot #3005**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **24.02 feet on 10/16/00**

DATE COMPLETED: **9/27/00**  
 DRILLING CONTRACTOR: **S&ME, Inc.**  
 DRILLER: **Costello**  
 DRILLING METHOD: **HSA**  
 SAMPLING METHOD: **Geoprobe**

GROUND SURFACE ELEVATION: **95.46**  
 DATUM: **Site Benchmark**  
 WEATHER: **Sunny, warm**  
 LOGGED BY: **M. O'Connell**

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	
										DESCRIPTION	REMARKS
1	5				5	95.46	0			Fill - red, clayey SILT	
2	5				1.0	90.46	5			Residuum - red and orange (mottled) micaceous, silty, fine SAND	
3	4				.7	85.46	10			Saprolite - tan and orange, micaceous, medium SAND	
4	5				1.3	80.46	15			Saprolite - tan and orange, micaceous, medium SAND	
5	4				8	75.46	20			Saprolite - tan and orange, micaceous, medium SAND	
6	5		25			70.46	25			Saprolite - medium-dense, brown, tan and white, very micaceous, fine to medium SAND with some coarse quartz veins	▼

ENV BORING LOG 6499506.GPJ, S&ME.GDT 11/22/00

NOTES:



155 Tradd Street  
 Spartanburg, SC 29301

## LOG OF BORING SB-9 (MW-11)



# LOG OF BORING NO. SB-10

PROJECT: **Hot Spot #3005**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **Not Encountered**

DATE COMPLETED: **9/7/00**  
 DRILLING CONTRACTOR: **Troxler Geologic**  
 DRILLER: **Costello**  
 DRILLING METHOD: **Geoprobe**  
 SAMPLING METHOD: **Geoprobe**

GROUND SURFACE ELEVATION: **104.68**  
 DATUM: **Site Benchmark**  
 WEATHER: **Sunny, cool**  
 LOGGED BY: **M. O'Connell**

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.											
1	5				23.8	104.68	0			Fill - red, clayey SILT	
2	5				3.1	99.68	5			Saprolite - tan and orange, very micaceous, fine to medium SAND	
						94.68	10			Boring terminated at 10 feet.	

NOTES:

ENV BORING LOG 6499506 GPJ S&ME GDT 11/22/00



155 Tradd Street  
 Spartanburg, SC 29301

**LOG OF BORING SB-10**



# LOG OF BORING NO. SB-11

PROJECT: **Hot Spot #3005**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **Not Encountered**

DATE COMPLETED: **9/7/00**  
 DRILLING CONTRACTOR: **Troxler Geologic**  
 DRILLER: **Costello**  
 DRILLING METHOD: **Geoprobe**  
 SAMPLING METHOD: **Geoprobe**

GROUND SURFACE ELEVATION: **103.24**  
 DATUM: **Site Benchmark**  
 WEATHER: **Sunny, cool**  
 LOGGED BY: **M. O'Connell**

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.											
						103.24	0			Fill - red, clayey SILT	
1	5				2.09	98.24	5			Saprolite - tan and orange very micaceous fine to medium SAND	
2	5				7.04	93.24	10			Boring terminated t 10 feet.	

NOTES:

ENV BORING LOG 649506 GPJ S&ME GDT 11/22/00



155 Tradd Street  
 Spartanburg, SC 29301

**LOG OF BORING SB-11**

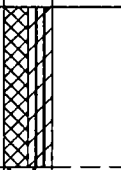
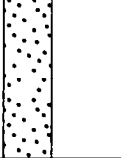
# LOG OF BORING NO. SB-12

PROJECT: **Hot Spot #3005**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **Not Encountered**

DATE COMPLETED: **9/7/00**  
 DRILLING CONTRACTOR: **Troxler Geologic**  
 DRILLER: **Costello**  
 DRILLING METHOD: **Geoprobe**  
 SAMPLING METHOD: **Geoprobe**

GROUND SURFACE ELEVATION: **105.67**  
 DATUM: **Site Benchmark**  
 WEATHER: **Sunny, cool**  
 LOGGED BY: **M. O'Connell**

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
						105.67	0			Fill - red, clayey SILT	
1	5				1.71	100.67	5			Saprolite - tan and orange, micaceous, medium SAND	
2	5				1.08	95.67	10			Boring terminated at 10 feet.	

This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

ENV BORING LOG 6499506.GPJ S&ME GDT 11/22/00

NOTES:



155 Tradd Street  
 Spartanburg, SC 29301

**LOG OF BORING SB-12**



# COMPLETION REPORT OF WELL No. SB-4 (MW-1D)

PROJECT: Hot Spot #3005  
 PROJECT NO: 1264-99-506  
 PROJECT LOCATION: Chesnee, South Carolina

WATER LEVEL: 28.69 feet on 10/16/00

DRILLING CONTRACTOR: S&ME, Inc.  
 DRILLING METHOD: HSA/Rock Coring  
 DATE COMPLETED: 9/28/00

LATITUDE: N 35° 9.069'  
 LONGITUDE: W 81° 51.604'  
 TOP OF CASING ELEVATION: 104.61  
 DATUM: Site Benchmark  
 LOGGED BY: M. O'Connell

STRATA			WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)	WELL CONSTRUCTION DETAILS																																
DESCRIPTION	SYMBOL	DEPTH (ft.)																																					
		0		0.00	GS	104.94	<p><b>PROTECTIVE CASING</b>                      Diameter: <b>6 inch</b>                      Type: <b>Schedule 40 PVC</b>                      Interval: <b>0 to 8 inches bgs</b></p> <p><b>RISER CASING</b>                      Diameter: <b>2 inch</b>                      Type: <b>Sch 40 PVC</b>                      Interval: <b>.33 to 53.64 feet bgs</b></p> <p><b>GROUT</b>                      Type: <b>Portland Cement</b>                      Interval: <b>0 to 49.64 feet bgs</b></p> <p><b>SEAL</b>                      Type: <b>Bentonite</b>                      Interval: <b>49.64 to 51.64 feet bgs</b></p> <p><b>FILTERPACK</b>                      Type: <b>Clean, Medium Grain Filter Sand</b>                      Interval: <b>51.64 to 58.64 feet bgs</b></p> <p><b>SCREEN</b>                      Diameter: <b>2 inch</b>                      Type: <b>Sch 40 PVC, 0.01 Slot</b>                      Interval: <b>53.64 to 58.64 feet bgs</b></p> <p><b>LEGEND</b></p> <table style="font-size: small;"> <tr> <td></td> <td>FILTER PACK</td> <td>TOC</td> <td>TOP OF CASING</td> </tr> <tr> <td></td> <td>BENTONITE</td> <td>GS</td> <td>GROUND SURFACE</td> </tr> <tr> <td></td> <td>CEMENT GROUT</td> <td>BS</td> <td>BENTONITE SEAL</td> </tr> <tr> <td></td> <td>CUTTINGS / BACKFILL</td> <td>BOC</td> <td>BASE OF OUTER CASING</td> </tr> <tr> <td></td> <td>STATIC WATER LEVEL</td> <td>TSC</td> <td>TOP OF SCREEN</td> </tr> <tr> <td></td> <td></td> <td>BSC</td> <td>BOTTOM OF SCREEN</td> </tr> <tr> <td></td> <td></td> <td>TD</td> <td>TOTAL DEPTH</td> </tr> <tr> <td></td> <td></td> <td>CG</td> <td>CEMENT GROUT</td> </tr> </table>		FILTER PACK	TOC	TOP OF CASING		BENTONITE	GS	GROUND SURFACE		CEMENT GROUT	BS	BENTONITE SEAL		CUTTINGS / BACKFILL	BOC	BASE OF OUTER CASING		STATIC WATER LEVEL	TSC	TOP OF SCREEN			BSC	BOTTOM OF SCREEN			TD	TOTAL DEPTH			CG	CEMENT GROUT
	FILTER PACK	TOC		TOP OF CASING																																			
	BENTONITE	GS		GROUND SURFACE																																			
	CEMENT GROUT	BS		BENTONITE SEAL																																			
	CUTTINGS / BACKFILL	BOC		BASE OF OUTER CASING																																			
	STATIC WATER LEVEL	TSC		TOP OF SCREEN																																			
		BSC		BOTTOM OF SCREEN																																			
		TD		TOTAL DEPTH																																			
		CG		CEMENT GROUT																																			
		0.33		TOC	104.61																																		
Fill - red, clayey SILT		5																																					
Saprolite - white, orange, micaceous, fine to medium SAND		10																																					
Saprolite - tan and red micaceous, fine to medium SAND		15																																					
Saprolite - tan and red micaceous, fine to medium SAND		20																																					
Saprolite - tan and red micaceous, fine to medium SAND		25																																					
Saprolite - medium dense tan and red very micaceous, fine SAND		30																																					
No Recovery																																							

MONITORING WELL: 6499506 GPJ S&ME GDT: 11/22/00








155 Tradd Street  
 Spartanburg, SC 29301

## COMPLETION REPORT OF WELL No. SB-4 (MW-1D)

STRATA			WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)	WELL CONSTRUCTION DETAILS
DESCRIPTION	SYMBOL	DEPTH (ft.)					
(See Page 1)							
No Recovery (continued)		35					
Saprolite - medium dense brown and tan very micaceous, fine SAND with occasional very coarse quartz veins		40					
Saprolite - medium dense, tan and orange very micaceous, fine to medium SAND		45					
8" Saprolite - dense brown and red very micaceous medium SAND		49.64		CG	55.30		
10" - Black, brown and gray PARTIALLY WEATHERED ROCK		50		BS	53.30		
Rock - biotite-gneiss		53.64		TSC	51.30		
		55					
Boring terminated at 58.64 feet.		58.64		BSC	46.30		

**LEGEND**

-  FILTER PACK
-  BENTONITE
-  CEMENT GROUT
-  CUTTINGS / BACKFILL
-  STATIC WATER LEVEL
- TOC TOP OF CASING
- GS GROUND SURFACE
- BS BENTONITE SEAL
- BOC BASE OF OUTER CASING
- TSC TOP OF SCREEN
- BSC BOTTOM OF SCREEN
- TD TOTAL DEPTH
- CG CEMENT GROUT

MONITORING WELL 6499506 GPJ S&ME.GDT 11/22/00



155 Tradd Street  
 Spartanburg, SC 29301

**COMPLETION REPORT OF  
 WELL No. SB-4 (MW-1D)**

# COMPLETION REPORT OF WELL No. SB-5 (MW-6)

PROJECT: **Hot Spot #3005**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **28.45 feet on 10/16/00**

DRILLING CONTRACTOR: **S&ME, Inc.**  
 DRILLING METHOD: **HSA**  
 DATE COMPLETED: **9/25/00**

LATITUDE: **N 35° 9.069'**  
 LONGITUDE: **W 81° 51.604'**  
 TOP OF CASING ELEVATION: **104.14**  
 DATUM: **Site Benchmark**  
 LOGGED BY: **M. O'Connell**

STRATA		WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)	WELL CONSTRUCTION DETAILS
DESCRIPTION	SYMBOL					
		0	0.00	GS	104.55	<b>PROTECTIVE CASING</b> Diameter: <b>8 inch</b> Type: <b>Flushmount</b> Interval: <b>0 to 8 inches bgs</b>
Fill - red clayey SILT with some medium grain sand	[Cross-hatch symbol]	0.41	TOC	104.14		
		5				<b>RISER CASING</b> Diameter: <b>2 inch</b> Type: <b>Sch 40 PVC</b> Interval: <b>.41 to 26.61 feet bgs</b>
		10				
		15				<b>GROUT</b> Type: <b>Portland Cement</b> Interval: <b>0 to 22.61 feet bgs</b>
Saprolite - red and tan very micaceous, silty fine to medium SAND	[Dotted symbol]	20				
		25	22.61	CG	81.94	<b>SEAL</b> Type: <b>Bentonite</b> Interval: <b>22.61 to 24.61 feet bgs</b>
		24.61	BS	79.94		
		26.61	TSC	77.94		<b>FILTERPACK</b> Type: <b>Clean, Medium Grain Filter Sand</b> Interval: <b>24.61 to 36.61 feet bgs</b>
		30				
		35	26.61	TSC	77.94	<b>SCREEN</b> Diameter: <b>2 inch</b> Type: <b>Sch 40 PVC, 0.01 Slot</b> Interval: <b>26.61 to 36.61 feet bgs</b>
Saprolite - medium dense red and tan very micaceous, silty fine to medium SAND	[Dotted symbol]	36.61	BSC	67.94		
						<b>LEGEND</b> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <ul style="list-style-type: none"> <li>[Dotted] FILTER PACK</li> <li>[Solid black] BENTONITE</li> <li>[Diagonal lines /] CEMENT GROUT</li> <li>[Cross-hatch] CUTTINGS / BACKFILL</li> <li>[Inverted triangle] STATIC WATER LEVEL</li> </ul> </div> <div style="width: 45%;"> <ul style="list-style-type: none"> <li>TOC TOP OF CASING</li> <li>GS GROUND SURFACE</li> <li>BS BENTONITE SEAL</li> <li>BOC BASE OF OUTER CASING</li> <li>TSC TOP OF SCREEN</li> <li>BSC BOTTOM OF SCREEN</li> <li>TD TOTAL DEPTH</li> <li>CG CEMENT GROUT</li> </ul> </div> </div>

MONITORING WELL 6495506 GPJ S&ME.GDT 11/22/00



155 Tradd Street  
Spartanburg, SC 29301

**COMPLETION REPORT OF  
WELL No. SB-5 (MW-6)**

# COMPLETION REPORT OF WELL No. SB-6 (MW-7)

PROJECT: **Hot Spot #3005**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **27.3 feet on 10/16/00**

DRILLING CONTRACTOR: **S&ME, Inc.**  
 DRILLING METHOD: **HSA**  
 DATE COMPLETED: **9/25/00**

LATITUDE: **N 35° 9.069'**  
 LONGITUDE: **W 81° 51.604'**  
 TOP OF CASING ELEVATION: **104.52**  
 DATUM: **Site Benchmark**  
 LOGGED BY: **M. O'Connell**

STRATA		WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)	WELL CONSTRUCTION DETAILS
DESCRIPTION	SYMBOL DEPTH (ft.)					
			0.00	GS	104.88	<b>PROTECTIVE CASING</b> Diameter: <b>8 inch</b> Type: <b>Flushmount</b> Interval: <b>0 to 8 inches bgs</b>
Fill - red, clayey SILT			0.36	TOC	104.52	
Fill - red, clayey SILT			5			<b>RISER CASING</b> Diameter: <b>2 inch</b> Type: <b>Sch 40 PVC</b> Interval: <b>.36 to 26.37 feet bgs</b>
Residuum - tan and red mottled micaceous, silty, fine SAND			10			
Saprolite - tan and orange, micaceous, silty, fine to medium SAND			15			<b>GROUT</b> Type: <b>Portland Cement</b> Interval: <b>0 to 22.37 feet bgs</b>
Saprolite - tan and orange, micaceous, silty, fine to medium SAND			20			
Saprolite - tan and brown and white micaceous, medium SAND			22.37	CG	82.51	<b>SEAL</b> Type: <b>Bentonite</b> Interval: <b>22.37 to 24.37 feet bgs</b>
Saprolite - tan and brown and white micaceous, medium SAND			24.37	BS	80.51	
Saprolite - tan and brown and white micaceous, medium SAND			26.37	TSC	78.51	<b>FILTERPACK</b> Type: <b>Clean, Medium Grain Filter Sand</b> Interval: <b>24.37 to 36.37 feet bgs</b>
Saprolite - brown, red, and tan micaceous, medium SAND with small quartz veins			30			
Saprolite - brown, red, and tan micaceous, medium SAND with small quartz veins			35			<b>SCREEN</b> Diameter: <b>2 inch</b> Type: <b>Sch 40 PVC, 0.01 Slot</b> Interval: <b>26.37 to 36.37 feet bgs</b>
			36.37	BSC	68.51	

### LEGEND

- |  |                     |     |                      |
|--|---------------------|-----|----------------------|
|  | FILTER PACK         | TOC | TOP OF CASING        |
|  | BENTONITE           | GS  | GROUND SURFACE       |
|  | CEMENT GROUT        | BS  | BENTONITE SEAL       |
|  | CUTTINGS / BACKFILL | BOC | BASE OF OUTER CASING |
|  | STATIC WATER LEVEL  | TSC | TOP OF SCREEN        |
|  |                     | BSC | BOTTOM OF SCREEN     |
|  |                     | TD  | TOTAL DEPTH          |
|  |                     | CG  | CEMENT GROUT         |

MONITORING WELL 6499506.GPJ S&ME.GDT 11/22/00



155 Tradd Street  
Spartanburg, SC 29301

**COMPLETION REPORT OF  
WELL No. SB-6 (MW-7)**

# COMPLETION REPORT OF WELL No. SB-1 (MW-8)

PROJECT: **Hot Spot #3005**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **23.6 feet on 10/16/00**

DRILLING CONTRACTOR: **S&ME, Inc.**  
 DRILLING METHOD: **HSA**  
 DATE COMPLETED: **9/26/00**

LATITUDE: **N 35° 9.069'**  
 LONGITUDE: **W 81° 51.604'**  
 TOP OF CASING ELEVATION: **101.79**  
 DATUM: **Site Benchmark**  
 LOGGED BY: **M. O'Connell**

STRATA			WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)	WELL CONSTRUCTION DETAILS
DESCRIPTION	SYMBOL	DEPTH (ft.)					
		0		0.00	GS	102.39	<b>PROTECTIVE CASING</b> Diameter: <b>8 inch</b> Type: <b>Flushmount</b> Interval: <b>0 to 8 inches bgs</b>
Fill - red clayey SILT		0.60		0.60	TOC	101.79	
		5					<b>RISER CASING</b> Diameter: <b>2 inch</b> Type: <b>Sch 40 PVC</b> Interval: <b>.6 to 23.69 feet bgs</b>
Residuum - red, slightly micaceous, silty to fine SAND		5					
Residuum - red and orange mottled, slightly micaceous, silty, fine SAND		10					<b>GROUT</b> Type: <b>Portland Cement</b> Interval: <b>0 to 19.69 feet bgs</b>
Residuum - red and orange mottled, slightly micaceous, silty, fine SAND		15					
Saprolite - brown, red and tan, micaceous, silty to fine SAND		20		19.69	CG	82.70	<b>SEAL</b> Type: <b>Bentonite</b> Interval: <b>19.69 to 21.69 feet bgs</b>
Saprolite - brown, red and tan, micaceous, silty to fine SAND		20		21.69	BS	80.70	
Saprolite - red and tan, very micaceous, fine to medium SAND		25		23.69	TSC	78.70	<b>FILTERPACK</b> Type: <b>Clean, Medium Grain Filter Sand</b> Interval: <b>21.69 to 23.69 feet bgs</b>
Saprolite - red and tan, very micaceous, fine to medium SAND		25		23.69	TSC	78.70	
		30		33.69	BSC	68.70	<b>SCREEN</b> Diameter: <b>2 inch</b> Type: <b>Sch 40 PVC, 0.01 Slot</b> Interval: <b>23.69 to 33.69 feet bgs</b>
		30		33.69	BSC	68.70	
		30					<b>LEGEND</b> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <ul style="list-style-type: none"> <li> FILTER PACK</li> <li> BENTONITE</li> <li> CEMENT GROUT</li> <li> CUTTINGS / BACKFILL</li> <li> STATIC WATER LEVEL</li> </ul> </div> <div style="width: 45%;"> <ul style="list-style-type: none"> <li>TOC TOP OF CASING</li> <li>GS GROUND SURFACE</li> <li>BS BENTONITE SEAL</li> <li>BOC BASE OF OUTER CASING</li> <li>TSC TOP OF SCREEN</li> <li>BSC BOTTOM OF SCREEN</li> <li>TD TOTAL DEPTH</li> <li>CG CEMENT GROUT</li> </ul> </div> </div>

MONITORING WELL 649506 GPJ S&ME GDT 11/22/00



155 Tradd Street  
 Spartanburg, SC 29301

**COMPLETION REPORT OF  
 WELL No. SB-1 (MW-8)**






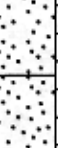
# COMPLETION REPORT OF WELL No. SB-3 (MW-9)

PROJECT: **Hot Spot #3005**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**






WATER LEVEL: **27.61 feet on 10/16/00**

DRILLING CONTRACTOR: **S&ME, Inc.**  
 DRILLING METHOD: **HSA**  
 DATE COMPLETED: **9/27/00**

LATITUDE: **N 35° 9.069'**  
 LONGITUDE: **W 81° 51.604'**  
 TOP OF CASING ELEVATION: **105.43**  
 DATUM: **Site Benchmark**  
 LOGGED BY: **M. O'Connell**

STRATA			WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)	WELL CONSTRUCTION DETAILS
DESCRIPTION	SYMBOL	DEPTH (ft.)					
		0		0.00	GS	105.83	<b>PROTECTIVE CASING</b> Diameter: <b>8 inch</b> Type: <b>Flushmount</b> Interval: <b>0 to 8 inches bgs</b>
Fill - red, clayey SILT		0.40		0.40	TOC	105.43	
		5					<b>RISER CASING</b> Diameter: <b>2 inch</b> Type: <b>Sch 40 PVC</b> Interval: <b>.4 to 25.4 feet bgs</b>
Saprolite - tan, white micaceous, medium SAND		10					
		15					<b>GROUT</b> Type: <b>Portland Cement</b> Interval: <b>0 to 21.4 feet bgs</b>
Saprolite - brown, red, tan micaceous, fine to medium SAND		20					
		21.40		21.40	CG	84.43	<b>SEAL</b> Type: <b>Bentonite</b> Interval: <b>21.4 to 23.4 feet bgs</b>
Saprolite - medium dense tan and red very micaceous, fine SAND		23.40		23.40	BS	82.43	
		25		25.40	TSC	80.43	<b>FILTERPACK</b> Type: <b>Clean, Medium Grain Filter Sand</b> Interval: <b>23.4 to 35.4 feet bgs</b>
Saprolite - medium dense gray, brown and white micaceous, medium SAND		30					
		35		35.40	BSC	70.43	<b>SCREEN</b> Diameter: <b>2 inch</b> Type: <b>Sch 40 PVC, 0.01 Slot</b> Interval: <b>25.4 to 35.4 feet bgs</b>
Saprolite - medium dense gray, brown and white micaceous, medium SAND		35					

**LEGEND**

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li> FILTER PACK</li> <li> BENTONITE</li> <li> CEMENT GROUT</li> <li> CUTTINGS / BACKFILL</li> <li> STATIC WATER LEVEL</li> </ul> | <ul style="list-style-type: none"> <li>TOC TOP OF CASING</li> <li>GS GROUND SURFACE</li> <li>BS BENTONITE SEAL</li> <li>BOC BASE OF OUTER CASING</li> <li>TSC TOP OF SCREEN</li> <li>BSC BOTTOM OF SCREEN</li> <li>TD TOTAL DEPTH</li> <li>CG CEMENT GROUT</li> </ul> |
|---|---|

MONITORING WELL 6499506.GPJ S&ME.GDT 11/22/00



155 Tradd Street  
 Spartanburg, SC 29301

**COMPLETION REPORT OF  
 WELL No. SB-3 (MW-9)**

# COMPLETION REPORT OF WELL No. SB-2 (MW-10)

PROJECT: **Hot Spot #3005**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **23.25 feet on 10/16/00**

LATITUDE: **N 35° 9.069'**

LONGITUDE: **W 81° 51.604'**

DRILLING CONTRACTOR: **S&ME, Inc.**









TOP OF CASING ELEVATION: **96.57**

DRILLING METHOD: **HSA**

DATUM: **Site Benchmark**

DATE COMPLETED: **9/27/00**

LOGGED BY: **M. O'Connell**

STRATA			WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)	WELL CONSTRUCTION DETAILS
DESCRIPTION	SYMBOL	DEPTH (ft.)					
		0		0.00	GS	96.99	<b>PROTECTIVE CASING</b> Diameter: <b>8 inch</b> Type: <b>Flushmount</b> Interval: <b>0 to 8 inches bgs</b>
		0.42		0.42	TOC	96.57	
Fill - brown-red, clayey SILT		5					<b>RISER CASING</b> Diameter: <b>2 inch</b> Type: <b>Sch 40 PVC</b> Interval: <b>.42 to 17.44 bgs</b>
		10					
		10					<b>GROUT</b> Type: <b>Portland Cement</b> Interval: <b>0 to 13.44 feet bgs</b>
		13.44		13.44	CG	83.55	
		15		15.44	BS	81.55	<b>SEAL</b> Type: <b>Bentonite</b> Interval: <b>13.44 to 15.44 feet bgs</b>
		15					
Saprolite - tan and red micaceous, silty, fine to medium SAND		20		17.44	TSC	79.55	<b>FILTERPACK</b> Type: <b>Clean, Medium Grain Filter Sand</b> Interval: <b>15.44 to 27.44 feet bgs</b>
		20					
Saprolite - medium dense, brown and orange very micaceous, fine SAND		25		27.44	BSC	69.55	<b>SCREEN</b> Diameter: <b>2 inch</b> Type: <b>Sch 40 PVC, 0.01 Slot</b> Interval: <b>17.44 to 27.44 feet bgs</b>
		25					
							<b>LEGEND</b>  FILTER PACK  BENTONITE  CEMENT GROUT  CUTTINGS / BACKFILL  STATIC WATER LEVEL TOC TOP OF CASING GS GROUND SURFACE BS BENTONITE SEAL BOC BASE OF OUTER CASING TSC TOP OF SCREEN BSC BOTTOM OF SCREEN TD TOTAL DEPTH CG CEMENT GROUT

MONITORING WELL 6499506.GPJ S&ME.GDT 11/22/00



155 Tradd Street  
 Spartanburg, SC 29301

**COMPLETION REPORT OF  
 WELL No. SB-2 (MW-10)**

# COMPLETION REPORT OF WELL No. SB-9 (MW-11)

Sheet 1 of 1

PROJECT: **Hot Spot #3005**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **24.02 feet on 10/16/00**

DRILLING CONTRACTOR: **S&ME, Inc.**  
 DRILLING METHOD: **HSA**  
 DATE COMPLETED: **9/27/00**

LATITUDE: **N 35° 9.069'**  
 LONGITUDE: **W 81° 51.604'**  
 TOP OF CASING ELEVATION: **95.15**  
 DATUM: **Site Benchmark**  
 LOGGED BY: **M. O'Connell**

STRATA			WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)	WELL CONSTRUCTION DETAILS
DESCRIPTION	SYMBOL	DEPTH (ft.)					
		0		0.00	GS	95.46	<b>PROTECTIVE CASING</b> Diameter: <b>8 inch</b> Type: <b>Flushmount</b> Interval: <b>0 to 8 inches bgs</b>
Fill - red, clayey SILT		0.31		TOC	95.15	<b>RISER CASING</b> Diameter: <b>2 inch</b> Type: <b>Sch 40 PVC</b> Interval: <b>.31 to 18.28 feet bgs</b>	
Residuum - red and orange (mottled) micaceous, silty, fine SAND		5		14.28	CG		81.18
Saprolite - tan and orange, micaceous, medium SAND		10					
Saprolite - tan and orange, micaceous, medium SAND		15		16.28	BS	79.18	<b>GROUT</b> Type: <b>Portland Cement</b> Interval: <b>0 to 14.28 feet bgs</b>
Saprolite - tan and orange, micaceous, medium SAND		18.28		TSC	77.18	<b>SEAL</b> Type: <b>Bentonite</b> Interval: <b>14.28 to 16.28 feet bgs</b>	
Saprolite - tan and orange, micaceous, medium SAND		20		18.28	TSC		77.18
Saprolite - medium-dense, brown, tan and white, very micaceous, fine to medium SAND with some coarse quartz veins		25					
		28.18	BSC	67.28	<b>FILTERPACK</b> Type: <b>Clean, Medium Grain Filter Sand</b> Interval: <b>16.28 to 28.28 feet bgs</b>		
		28.18	BSC	67.28		<b>SCREEN</b> Diameter: <b>2 inch</b> Type: <b>Sch 40 PVC, 0.01 Slot</b> Interval: <b>18.28 to 28.28 feet bgs</b>	
							<b>LEGEND</b> 
						TOC TOP OF CASING GS GROUND SURFACE BS BENTONITE SEAL BOC BASE OF OUTER CASING TSC TOP OF SCREEN BSC BOTTOM OF SCREEN TD TOTAL DEPTH CG CEMENT GROUT	

MONITORING WELL 6499506 GPJ S&ME GDT 11/22/00



155 Tradd Street  
 Spartanburg, SC 29301

**COMPLETION REPORT OF  
 WELL No. SB-9 (MW-11)**

Sheet 1 of 1











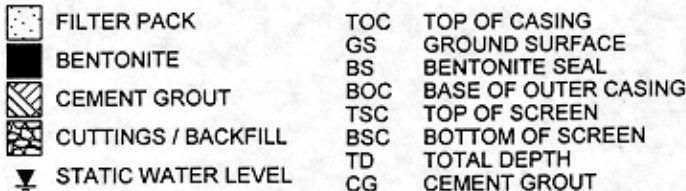
# COMPLETION REPORT OF WELL No. SB-8 (MW-12)

PROJECT: **Hot Spot #3005**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **23.83 feet on 10/16/00**

DRILLING CONTRACTOR: **S&ME, Inc.**  
 DRILLING METHOD: **HSA**  
 DATE COMPLETED: **9/29/00**

LATITUDE: **N 35° 9.069'**  
 LONGITUDE: **W 81° 51.604'**  
 TOP OF CASING ELEVATION: **97.03**  
 DATUM: **Site Benchmark**  
 LOGGED BY: **M. O'Connell**

STRATA		WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)	WELL CONSTRUCTION DETAILS
DESCRIPTION	SYMBOL					
			0.00	GS	97.49	<b>PROTECTIVE CASING</b> Diameter: <b>8 inch</b> Type: <b>Flushmount</b> Interval: <b>0 to 8 inches bgs</b>
Fill - red - orange <b>SILT</b>			0.46	TOC	97.03	
Residuum - red and orange (mottled) micaceous, <b>SILT</b>						<b>RISER CASING</b> Diameter: <b>2 inch</b> Type: <b>Sch 40 PVC</b> Interval: <b>.46 to 20.6 feet bgs</b>
Residuum - red and orange (mottled) micaceous <b>SILT</b> Saprolite - tan - orange micaceous, medium <b>SAND</b>						
Saprolite - tan - orange micaceous, medium <b>SAND</b>			16.60	CG	80.89	<b>GROUT</b> Type: <b>Portland Cement</b> Interval: <b>0 to 16.6 feet bgs</b>
Saprolite - tan - orange micaceous, medium <b>SAND</b>			18.60	BS	78.89	
Saprolite - tan - orange micaceous, medium <b>SAND</b>			20.60	TSC	76.89	<b>SEAL</b> Type: <b>Bentonite</b> Interval: <b>16.6 to 18.6 feet bgs</b>
Saprolite - tan - orange micaceous, medium <b>SAND</b>						
						<b>FILTERPACK</b> Type: <b>Clean, Medium Grain Filter Sand</b> Interval: <b>18.6 to 30.60 feet bgs</b>
						<b>SCREEN</b> Diameter: <b>2 inch</b> Type: <b>Sch 40 PVC, 0.01 Slot</b> Interval: <b>20.60 to 30.60 feet bgs</b>
			30.60	BSC	66.89	<b>LEGEND</b> 

MONITORING WELL 6499506.GPJ S&ME GDT 11/22/00



155 Tradd Street  
 Spartanburg, SC 29301

**COMPLETION REPORT OF  
 WELL No. SB-8 (MW-12)**










# COMPLETION REPORT OF WELL No. SB-7 (MW-13)

PROJECT: **Hot Spot #3005**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **24.33 feet on 10/16/00**

DRILLING CONTRACTOR: **S&ME, Inc.**  
 DRILLING METHOD: **HSA**  
 DATE COMPLETED: **9/29/00**

LATITUDE: **N 35° 9.069'**  
 LONGITUDE: **W 81° 51.604'**  
 TOP OF CASING ELEVATION: **95.89**  
 DATUM: **Site Benchmark**  
 LOGGED BY: **M. O'Connell**

STRATA			WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)	WELL CONSTRUCTION DETAILS
DESCRIPTION	SYMBOL	DEPTH (ft.)					
		0		0.00	GS	96.24	<b>PROTECTIVE CASING</b> Diameter: <b>8 inch</b> Type: <b>Flushmount</b> Interval: <b>0 to 8 inches bgs</b>
		0.35		0.35	TOC	95.89	
Fill - red - brown clayey SILT		5					<b>RISER CASING</b> Diameter: <b>2 inch</b> Type: <b>Sch 40 PVC</b> Interval: <b>.35 to 17.11 feet bgs</b>
		10					
Residuum - orange-brown, clayey SILT		15		13.11	CG	83.13	
		15.11		15.11	BS	81.13	<b>GROUT</b> Type: <b>Portland Cement</b> Interval: <b>0 to 13.11 feet bgs</b>
Saprolite - red, orange and tan, micaceous, silty, fine to medium SAND		20		17.11	TSC	79.13	<b>SEAL</b> Type: <b>Bentonite</b> Interval: <b>13.11 to 15.11 feet bgs</b>
		25					<b>FILTERPACK</b> Type: <b>Clean, Medium Grain Filter Sand</b> Interval: <b>15.11 to 27.11 feet bgs</b>
Saprolite - red, orange and tan, micaceous, silty, fine to medium SAND		27.11		27.11	BSC	69.13	
							<b>SCREEN</b> Diameter: <b>2 inch</b> Type: <b>Sch 40 PVC, 0.01 Slot</b> Interval: <b>17.11 to 27.11 feet bgs</b>
							<b>LEGEND</b> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <ul style="list-style-type: none"> <li> FILTER PACK</li> <li> BENTONITE</li> <li> CEMENT GROUT</li> <li> CUTTINGS / BACKFILL</li> <li> STATIC WATER LEVEL</li> </ul> </div> <div style="width: 45%;"> <ul style="list-style-type: none"> <li>TOC TOP OF CASING</li> <li>GS GROUND SURFACE</li> <li>BS BENTONITE SEAL</li> <li>BOC BASE OF OUTER CASING</li> <li>TSC TOP OF SCREEN</li> <li>BSC BOTTOM OF SCREEN</li> <li>TD TOTAL DEPTH</li> <li>CG CEMENT GROUT</li> </ul> </div> </div>

MONITORING WELL 649506.GPJ S&ME.GDT 11/22/00



155 Tradd Street  
 Spartanburg, SC 29301

## COMPLETION REPORT OF WELL No. SB-7 (MW-13)

**APPENDIX B**

**SOIL SAMPLING ANALYTICAL REPORTS**



**ENVIRONMENTAL  
SCIENCE CORP.**

SEP 23

12065 Lebanon Rd.  
Mt. Juliet, TN 37122  
(615) 758-5858  
1-800-767-5859  
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

**REPORT OF ANALYSIS**


September 15, 2000

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

Date Received : September 08, 2000  
Description : Soil - 126499506 Hot Spot #3005  
Sample ID : SB 3 21 FT  
Collected By :  
Collection Date : 09/06/00 14:14

ESC Sample # : L24404-01  
ESC Key : SMESPAR-126499506  
Site ID : HOTSPOT #3005  
Project # : 3005

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
TOC (Total Organic Carbon)	180		mg/kg	9060	09/09/00	1
Total Solids	82.		%	2540G	09/09/00	1
Benzene	BDL	0.0012	mg/kg	8260	09/11/00	1
Toluene	BDL	0.0012	mg/kg	8260	09/11/00	1
Ethylbenzene	BDL	0.0012	mg/kg	8260	09/11/00	1
Xylenes, Total	0.0040	0.0036	mg/kg	8260	09/11/00	1
Naphthalene	0.0071	0.0012	mg/kg	8260	09/11/00	1
Surrogate Recovery						
Toluene-d8	98.		% Rec.	8260	09/11/00	1
Dibromofluoromethane	90.		% Rec.	8260	09/11/00	1
4-Bromofluorobenzene	90.		% Rec.	8260	09/11/00	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.40	mg/kg	8270C	09/14/00	1
Acenaphthene	BDL	0.40	mg/kg	8270C	09/14/00	1
Acenaphthylene	BDL	0.40	mg/kg	8270C	09/14/00	1
Benzo(a)anthracene	BDL	0.40	mg/kg	8270C	09/14/00	1
Benzo(a)pyrene	BDL	0.40	mg/kg	8270C	09/14/00	1
Benzo(b)fluoranthene	BDL	0.40	mg/kg	8270C	09/14/00	1
Benzo(g,h,i)perylene	BDL	0.40	mg/kg	8270C	09/14/00	1
Benzo(k)fluoranthene	BDL	0.40	mg/kg	8270C	09/14/00	1
Chrysene	BDL	0.40	mg/kg	8270C	09/14/00	1
Dibenz(a,h)anthracene	BDL	0.40	mg/kg	8270C	09/14/00	1
Fluoranthene	BDL	0.40	mg/kg	8270C	09/14/00	1
Fluorene	BDL	0.40	mg/kg	8270C	09/14/00	1
Indeno(1,2,3-cd)pyrene	BDL	0.40	mg/kg	8270C	09/14/00	1
Naphthalene	BDL	0.40	mg/kg	8270C	09/14/00	1
Phenanthrene	BDL	0.40	mg/kg	8270C	09/14/00	1
Pyrene	BDL	0.40	mg/kg	8270C	09/14/00	1
Surrogate Recovery						
Nitrobenzene-d5	84.		% Rec.	8270C	09/14/00	1
2-Fluorobiphenyl	88.		% Rec.	8270C	09/14/00	1
p-Terphenyl-d14	79.		% Rec.	8270C	09/14/00	1

  
Allen Dunkerley, ESC Representative

Results listed are dry weight basis.  
BDL - Below Detection Limit  
Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:  
A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

Note:  
This report shall not be reproduced, except in full, without the written approval from ESC.  
The reported analytical results relate only to the sample submitted



# ENVIRONMENTAL SCIENCE CORP.

SEP 23

12065 Lebanon Rd.  
Mt. Juliet, TN 37122  
(615) 758-5858  
1-800-767-5859  
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

## REPORT OF ANALYSIS

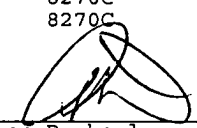
September 15, 2000

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

Date Received : September 08, 2000  
Description : Soil - 126499506 Hot Spot #3005  
Sample ID : SB 4 25 FT  
Collected By :  
Collection Date : 09/06/00 15:20

ESC Sample # : L24404-02  
ESC Key : SMESPAR-126499506  
Site ID : HOTSPOT #3005  
Project # : 3005

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	78.		%	2540G	09/09/00	1
Benzene	0.012	0.0013	mg/kg	8260	09/11/00	1
Toluene	0.067	0.0013	mg/kg	8260	09/11/00	1
Ethylbenzene	0.10	0.0013	mg/kg	8260	09/11/00	1
Xylenes, Total	0.48	0.0038	mg/kg	8260	09/11/00	1
Naphthalene	0.31	0.0013	mg/kg	8260	09/11/00	1
Surrogate Recovery						
Toluene-d8	110		% Rec.	8260	09/11/00	1
Dibromofluoromethane	99.		% Rec.	8260	09/11/00	1
4-Bromofluorobenzene	100		% Rec.	8260	09/11/00	1
TPH (GC/FID) High Fraction	300		mg/kg	3550/DRO	09/12/00	10
Surrogate Recovery (50-150) o-Terphenyl	54.		% Rec.	3550/DRO	09/12/00	10
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.42	mg/kg	8270C	09/14/00	1
Acenaphthene	BDL	0.42	mg/kg	8270C	09/14/00	1
Acenaphthylene	BDL	0.42	mg/kg	8270C	09/14/00	1
Benzo(a)anthracene	BDL	0.42	mg/kg	8270C	09/14/00	1
Benzo(a)pyrene	BDL	0.42	mg/kg	8270C	09/14/00	1
Benzo(b)fluoranthene	BDL	0.42	mg/kg	8270C	09/14/00	1
Benzo(g,h,i)perylene	BDL	0.42	mg/kg	8270C	09/14/00	1
Benzo(k)fluoranthene	BDL	0.42	mg/kg	8270C	09/14/00	1
Chrysene	BDL	0.42	mg/kg	8270C	09/14/00	1
Dibenz(a,h)anthracene	BDL	0.42	mg/kg	8270C	09/14/00	1
Fluoranthene	BDL	0.42	mg/kg	8270C	09/14/00	1
Fluorene	BDL	0.42	mg/kg	8270C	09/14/00	1
Indeno(1,2,3-cd)pyrene	BDL	0.42	mg/kg	8270C	09/14/00	1
Naphthalene	BDL	0.42	mg/kg	8270C	09/14/00	1
Phenanthrene	BDL	0.42	mg/kg	8270C	09/14/00	1
Pyrene	BDL	0.42	mg/kg	8270C	09/14/00	1
Surrogate Recovery						
Nitrobenzene-d5	88.		% Rec.	8270C	09/14/00	1
2-Fluorobiphenyl	84.		% Rec.	8270C	09/14/00	1
p-Terphenyl-d14	73.		% Rec.	8270C	09/14/00	1

  
Allen Dunkerley, ESC Representative

Results listed are dry weight basis.

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit(EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

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# ENVIRONMENTAL SCIENCE CORP.

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Mt. Juliet, TN 37122  
(615) 758-5858  
1-800-767-5859  
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

## REPORT OF ANALYSIS

September 15, 2000

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

Date Received : September 08, 2000  
Description : Soil - 126499506 Hot Spot #3005  
Sample ID : SB 5 25 FT  
Collected By :  
Collection Date : 09/06/00 16:25

ESC Sample # : L24404-03  
ESC Key : SMESPAR-126499506  
Site ID : HOTSPOT #3005  
Project # : 3005

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	74.		%	2540G	09/11/00	1
Benzene	0.0032	0.0014	mg/kg	8260	09/11/00	1
Toluene	BDL	0.0014	mg/kg	8260	09/11/00	1
Ethylbenzene	BDL	0.0014	mg/kg	8260	09/11/00	1
Xylenes, Total	BDL	0.0040	mg/kg	8260	09/11/00	1
Naphthalene	0.012	0.0014	mg/kg	8260	09/11/00	1
Surrogate Recovery						
Toluene-d8	96.		% Rec.	8260	09/11/00	1
Dibromofluoromethane	87.		% Rec.	8260	09/11/00	1
4-Bromofluorobenzene	92.		% Rec.	8260	09/11/00	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.44	mg/kg	8270C	09/14/00	1
Acenaphthene	BDL	0.44	mg/kg	8270C	09/14/00	1
Acenaphthylene	BDL	0.44	mg/kg	8270C	09/14/00	1
Benzo(a)anthracene	BDL	0.44	mg/kg	8270C	09/14/00	1
Benzo(a)pyrene	BDL	0.44	mg/kg	8270C	09/14/00	1
Benzo(b)fluoranthene	BDL	0.44	mg/kg	8270C	09/14/00	1
Benzo(g,h,i)perylene	BDL	0.44	mg/kg	8270C	09/14/00	1
Benzo(k)fluoranthene	BDL	0.44	mg/kg	8270C	09/14/00	1
Chrysene	BDL	0.44	mg/kg	8270C	09/14/00	1
Dibenz(a,h)anthracene	BDL	0.44	mg/kg	8270C	09/14/00	1
Fluoranthene	BDL	0.44	mg/kg	8270C	09/14/00	1
Fluorene	BDL	0.44	mg/kg	8270C	09/14/00	1
Indeno(1,2,3-cd)pyrene	BDL	0.44	mg/kg	8270C	09/14/00	1
Naphthalene	BDL	0.44	mg/kg	8270C	09/14/00	1
Phenanthrene	BDL	0.44	mg/kg	8270C	09/14/00	1
Pyrene	BDL	0.44	mg/kg	8270C	09/14/00	1
Surrogate Recovery						
Nitrobenzene-d5	85.		% Rec.	8270C	09/14/00	1
2-Fluorobiphenyl	87.		% Rec.	8270C	09/14/00	1
p-Terphenyl-d14	81.		% Rec.	8270C	09/14/00	1

Allen Dunkerley, ESC Representative

Results listed are dry weight basis.

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

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Tax I.D. 62-0814289  
  
Est. 1970

**REPORT OF ANALYSIS**

September 15, 2000

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

Date Received : September 08, 2000  
Description : Soil - 126499506 Hot Spot #3005  
Sample ID : SB 6 9 FT  
Collected By :  
Collection Date : 09/07/00 08:30

ESC Sample # : L24404-04  
ESC Key : SMESPAR-126499506  
Site ID : HOTSPOT #3005  
Project # : 3005

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	81.		%	2540G	09/12/00	1
Benzene	BDL	0.0012	mg/kg	8260	09/11/00	1
Toluene	BDL	0.0012	mg/kg	8260	09/11/00	1
Ethylbenzene	BDL	0.0012	mg/kg	8260	09/11/00	1
Xylenes, Total	BDL	0.0037	mg/kg	8260	09/11/00	1
Naphthalene	0.0012	0.0012	mg/kg	8260	09/11/00	1
Surrogate Recovery						
Toluene-d8	98.		% Rec.	8260	09/11/00	1
Dibromofluoromethane	82.		% Rec.	8260	09/11/00	1
4-Bromofluorobenzene	91.		% Rec.	8260	09/11/00	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.41	mg/kg	8270C	09/14/00	1
Acenaphthene	BDL	0.41	mg/kg	8270C	09/14/00	1
Acenaphthylene	BDL	0.41	mg/kg	8270C	09/14/00	1
Benzo(a)anthracene	BDL	0.41	mg/kg	8270C	09/14/00	1
Benzo(a)pyrene	BDL	0.41	mg/kg	8270C	09/14/00	1
Benzo(b)fluoranthene	BDL	0.41	mg/kg	8270C	09/14/00	1
Benzo(g,h,i)perylene	BDL	0.41	mg/kg	8270C	09/14/00	1
Benzo(k)fluoranthene	BDL	0.41	mg/kg	8270C	09/14/00	1
Chrysene	BDL	0.41	mg/kg	8270C	09/14/00	1
Dibenz(a,h)anthracene	BDL	0.41	mg/kg	8270C	09/14/00	1
Fluoranthene	BDL	0.41	mg/kg	8270C	09/14/00	1
Fluorene	BDL	0.41	mg/kg	8270C	09/14/00	1
Indeno(1,2,3-cd)pyrene	BDL	0.41	mg/kg	8270C	09/14/00	1
Naphthalene	BDL	0.41	mg/kg	8270C	09/14/00	1
Phenanthrene	BDL	0.41	mg/kg	8270C	09/14/00	1
Pyrene	BDL	0.41	mg/kg	8270C	09/14/00	1
Surrogate Recovery						
Nitrobenzene-d5	86.		% Rec.	8270C	09/14/00	1
2-Fluorobiphenyl	89.		% Rec.	8270C	09/14/00	1
p-Terphenyl-d14	82.		% Rec.	8270C	09/14/00	1

Allen Dunkerley, ESC Representative

Results listed are dry weight basis.  
BDL - Below Detection Limit  
Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:  
A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS


September 15, 2000

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

Date Received : September 08, 2000  
Description : Soil - 126499506 Hot Spot #3005  
Sample ID : SB 10 5 FT  
Collected By :  
Collection Date : 09/07/00 13:35

ESC Sample # : L24404-05  
ESC Key : SMESPAR-126499506  
Site ID : HOTSPOT #3005  
Project # : 3005

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	80.		%	2540G	09/12/00	1
Benzene	BDL	0.0015	mg/kg	8260	09/11/00	1.21
Toluene	BDL	0.0015	mg/kg	8260	09/11/00	1.21
Ethylbenzene	BDL	0.0015	mg/kg	8260	09/11/00	1.21
Xylenes, Total	BDL	0.0045	mg/kg	8260	09/11/00	1.21
Naphthalene	BDL	0.0015	mg/kg	8260	09/11/00	1.21
Surrogate Recovery						
Toluene-d8	98.		% Rec.	8260	09/11/00	1.21
Dibromofluoromethane	71.		% Rec.	8260	09/11/00	1.21
4-Bromofluorobenzene	95.		% Rec.	8260	09/11/00	1.21
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.41	mg/kg	8270C	09/14/00	1
Acenaphthene	BDL	0.41	mg/kg	8270C	09/14/00	1
Acenaphthylene	BDL	0.41	mg/kg	8270C	09/14/00	1
Benzo(a)anthracene	BDL	0.41	mg/kg	8270C	09/14/00	1
Benzo(a)pyrene	BDL	0.41	mg/kg	8270C	09/14/00	1
Benzo(b)fluoranthene	BDL	0.41	mg/kg	8270C	09/14/00	1
Benzo(g,h,i)perylene	BDL	0.41	mg/kg	8270C	09/14/00	1
Benzo(k)fluoranthene	BDL	0.41	mg/kg	8270C	09/14/00	1
Chrysene	BDL	0.41	mg/kg	8270C	09/14/00	1
Dibenz(a,h)anthracene	BDL	0.41	mg/kg	8270C	09/14/00	1
Fluoranthene	BDL	0.41	mg/kg	8270C	09/14/00	1
Fluorene	BDL	0.41	mg/kg	8270C	09/14/00	1
Indeno(1,2,3-cd)pyrene	BDL	0.41	mg/kg	8270C	09/14/00	1
Naphthalene	BDL	0.41	mg/kg	8270C	09/14/00	1
Phenanthrene	BDL	0.41	mg/kg	8270C	09/14/00	1
Pyrene	BDL	0.41	mg/kg	8270C	09/14/00	1
Surrogate Recovery						
Nitrobenzene-d5	79.		% Rec.	8270C	09/14/00	1
2-Fluorobiphenyl	83.		% Rec.	8270C	09/14/00	1
p-Terphenyl-d14	78.		% Rec.	8270C	09/14/00	1

  
Allen Dunkerley, ESC Representative

Results listed are dry weight basis.

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
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Est. 1970

## REPORT OF ANALYSIS


September 15, 2000

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

Date Received : September 08, 2000  
Description : Soil - 126499506 Hot Spot #3005  
Sample ID : SB 11 10 FT  
Collected By :  
Collection Date : 09/07/00 13:52

ESC Sample # : L24404-06  
ESC Key : SMESPAR-126499506  
Site ID : HOTSPOT #3005  
Project # : 3005

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	82.		%	2540G	09/12/00	1
Benzene	BDL	0.0012	mg/kg	8260	09/11/00	1
Toluene	BDL	0.0012	mg/kg	8260	09/11/00	1
Ethylbenzene	BDL	0.0012	mg/kg	8260	09/11/00	1
Xylenes, Total	BDL	0.0036	mg/kg	8260	09/11/00	1
Naphthalene	BDL	0.0012	mg/kg	8260	09/11/00	1
Surrogate Recovery						
Toluene-d8	97.		% Rec.	8260	09/11/00	1
Dibromofluoromethane	81.		% Rec.	8260	09/11/00	1
4-Bromofluorobenzene	89.		% Rec.	8260	09/11/00	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.40	mg/kg	8270C	09/15/00	1
Acenaphthene	BDL	0.40	mg/kg	8270C	09/15/00	1
Acenaphthylene	BDL	0.40	mg/kg	8270C	09/15/00	1
Benzo(a)anthracene	BDL	0.40	mg/kg	8270C	09/15/00	1
Benzo(a)pyrene	BDL	0.40	mg/kg	8270C	09/15/00	1
Benzo(b)fluoranthene	BDL	0.40	mg/kg	8270C	09/15/00	1
Benzo(g,h,i)perylene	BDL	0.40	mg/kg	8270C	09/15/00	1
Benzo(k)fluoranthene	BDL	0.40	mg/kg	8270C	09/15/00	1
Chrysene	BDL	0.40	mg/kg	8270C	09/15/00	1
Dibenz(a,h)anthracene	BDL	0.40	mg/kg	8270C	09/15/00	1
Fluoranthene	BDL	0.40	mg/kg	8270C	09/15/00	1
Fluorene	BDL	0.40	mg/kg	8270C	09/15/00	1
Indeno(1,2,3-cd)pyrene	BDL	0.40	mg/kg	8270C	09/15/00	1
Naphthalene	BDL	0.40	mg/kg	8270C	09/15/00	1
Phenanthrene	BDL	0.40	mg/kg	8270C	09/15/00	1
Pyrene	BDL	0.40	mg/kg	8270C	09/15/00	1
Surrogate Recovery						
Nitrobenzene-d5	64.		% Rec.	8270C	09/15/00	1
2-Fluorobiphenyl	71.		% Rec.	8270C	09/15/00	1
p-Terphenyl-d14	88.		% Rec.	8270C	09/15/00	1

  
Allen Bunkerley, ESC Representative

Results listed are dry weight basis.

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

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**S & M E**

155 Tradd Street  
Spartanburg, SC 29301

Alternate billing information

Analysis Containment Reserve

Chain of Custody  
Page \_\_\_ of \_\_\_

Prepared by:

**ENVIRONMENTAL  
SCIENCE CORP.**

12065 Lebanon Road  
Mt. Juliet, TN 37122  
Phone (800) 767-5859  
FAX (615) 758-5859

Report to: Mike O'Connell  
Mr. Jeff Lindsey

Description: Hot Spot #3005

Client Project #: 3005-1264-99-506 Lab Project # \_\_\_\_\_

Site/Facility ID#: HOTSPOT #3005 P O #: 2055

Collected by (signature): \_\_\_\_\_

Rush? (Lab MUST Be Notified)

<24 hr ..... 200%

24-48 hr ..... 100%

48-72 hr ..... 50%

Date Results Needed: \_\_\_\_\_

FAX? No Yes

No. of Cntrs: \_\_\_\_\_

CoCode: **SMESPAR** (lab use only)

Template/Prelogin **T7790 / P18495**

Cooler #: 9/5/00 JV

Shipped Via: **UPS Next Day Saver**

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	SV8270PAH 4ozClr-NoPres	TOC 2ozClr-NoPres	TPH-DRO 3550 4ozClr-NoPres	V8260BTEXND20ozClr-NoPres	V8260BTEXN 40mlAmb + Stir bar	Remarks/Contaminant	Sample # (lab only)
SB-3	Grab	SS	21'	9/4/00	14:14	4	X	X	X	X	X		L24404-C
SB-4		SS	25'		15:20	4	X	X	X	X	X		-02
SB-5		SS	25'		16:25	3	X	X	X	X	X		-03
SB-6		SS	9'	9/7/00	8:30	3	X	X	X	X	X		-04
SB-10		SS	5'	9/7/00	13:35	3	X	X	X	X	X		-05
SB-11		SS	10'	9/7/00	13:52	3	X	X	X	X	X		-06
~~~~~						2	X	X	X	X	X		

\*Matrix SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other \_\_\_\_\_

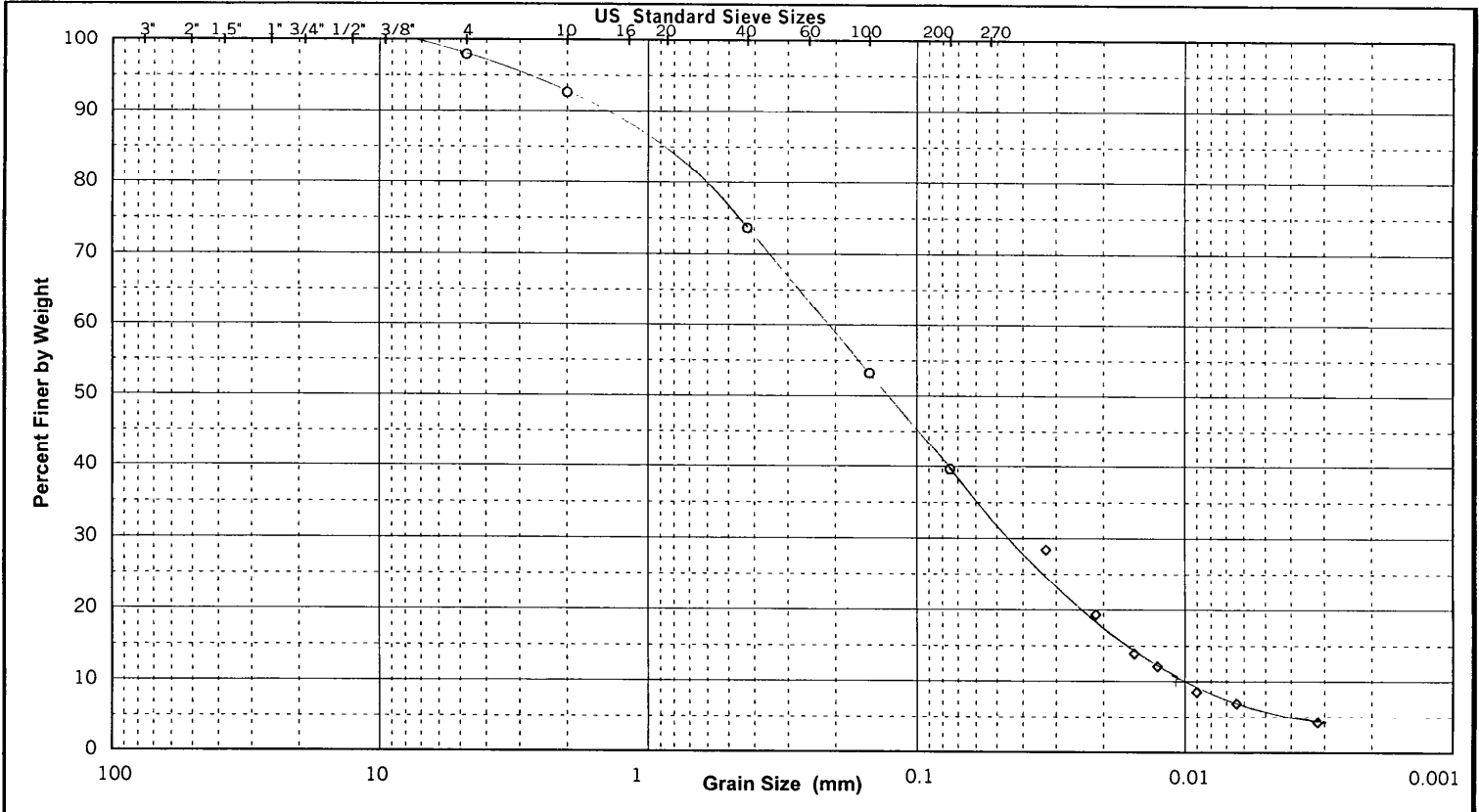
pH \_\_\_\_\_ Temp \_\_\_\_\_


Flow \_\_\_\_\_ Other \_\_\_\_\_

Relinquished by: (Signature) <u>[Signature]</u>	Date: <u>9/7/00</u>	Time: <u>16:30</u>	Received by: (Signature) _____	Samples returned via: <input checked="" type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> Courier <input type="checkbox"/> _____	Condition: (lab use only)
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Temp: <u>40</u>	Bottles Received: <u>20</u>
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature) <u>[Signature]</u>	Date: <u>9/15/00</u>	Time: <u>11:00</u>

pH Checked: Yes  No

NCF: Yes  No



<b>Job Name</b>	Hot Spot #3005	<b>Nat. Moist.</b>	na %	<b>GRAIN SIZE DISTRIBUTION</b> ASTM D-422   <b>S&amp;ME</b> ENVIRONMENTAL SERVICES ENGINEERING • TESTING
<b>Job Number</b>	1264-99-506	<b>LL</b>	na	
<b>Boring Number</b>	SB-4	<b>PL</b>	na	
<b>Depth</b>	25'	<b>PI</b>	na	
<b>Soil Description/Classification</b>		Red brown sandy SILT		

**APPENDIX C**

**GROUNDWATER ANALYTICAL REPORTS**



**ENVIRONMENTAL  
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Tax I.D. 62-0814289

Est. 1970

**REPORT OF ANALYSIS**

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

October 23, 2000

Date Received : October 17, 2000  
Description : Waters for Hot Spot 3005  
Sample ID : MW-1D  
Collected By : Mike O'Connell  
Collection Date : 10/16/00 11:10

ESC Sample # : L27326-05  
ESC Key : SMESPAR-1264-99-506  
Site ID : HOT SPOT #305  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Methane	BDL		ug/l	8015M	10/18/00	1
Ferrous Iron	8000	25.	ug/l	3500Fe	10/17/00	1
Nitrate	2800	100	ug/l	9056	10/17/00	1
Sulfate	BDL	5000	ug/l	9056	10/17/00	1
Lead	14.	5.0	ug/l	6010B	10/18/00	1
Benzene	BDL	1.0	ug/l	8260B	10/19/00	1
Toluene	BDL	1.0	ug/l	8260B	10/19/00	1
Ethylbenzene	BDL	1.0	ug/l	8260B	10/19/00	1
Total Xylenes	BDL	3.0	ug/l	8260B	10/19/00	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	10/19/00	1
Naphthalene	BDL	1.0	ug/l	8260B	10/19/00	1
1,2-Dibromoethane	BDL	1.0	ug/l	8260B	10/19/00	1
Surrogate Recovery						
Toluene-d8	110		% Rec.	8260B	10/19/00	1
Dibromofluoromethane	94.		% Rec.	8260B	10/19/00	1
4-Bromofluorobenzene	93.		% Rec.	8260B	10/19/00	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Acenaphthene	BDL	10.	ug/l	8270C	10/18/00	1
Acenaphthylene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(a)anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(a)pyrene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(b)fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(g,h,i)perylene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(k)fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Chrysene	BDL	10.	ug/l	8270C	10/18/00	1
Dibenz(a,h)anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Fluorene	BDL	10.	ug/l	8270C	10/18/00	1
Indeno(1,2,3-cd)pyrene	BDL	10.	ug/l	8270C	10/18/00	1
Naphthalene	BDL	10.	ug/l	8270C	10/18/00	1
Phenanthrene	BDL	10.	ug/l	8270C	10/18/00	1
Pyrene	BDL	10.	ug/l	8270C	10/18/00	1

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233



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Est. 1970

**REPORT OF ANALYSIS**

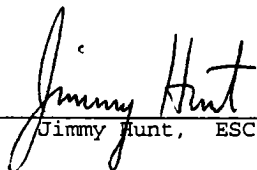
Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

October 23, 2000

Date Received : October 17, 2000  
Description : Waters for Hot Spot 3005  
Sample ID : MW-1D  
Collected By : Mike O'Connell  
Collection Date : 10/16/00 11:10

ESC Sample # : L27326-05  
ESC Key : SMESPAR-1264-99-506  
Site ID : HOT SPOT #305  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Surrogate Recovery						
Nitrobenzene-d5	80.		% Rec.	8270C	10/18/00	1
2-Fluorobiphenyl	79.		% Rec.	8270C	10/18/00	1
p-Terphenyl-d14	72.		% Rec.	8270C	10/18/00	1

  
Jimmy Hunt, ESC Representative

BDL - Below Detection Limit  
Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

Note:

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**REPORT OF ANALYSIS**

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

October 23, 2000

Date Received : October 17, 2000  
Description : Waters for Hot Spot 3005  
Sample ID : MW-3  
Collected By : Mike O'Connell  
Collection Date : 10/16/00 09:40

ESC Sample # : L27326-01  
ESC Key : SMESPAR-1264-99-506  
Site ID : HOT SPOT #305  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Methane	BDL		ug/l	8015M	10/18/00	1
Ferrous Iron	5000	25.	ug/l	3500Fe	10/17/00	1
Nitrate	730	100	ug/l	9056	10/17/00	1
Sulfate	BDL	5000	ug/l	9056	10/17/00	1
Lead	56.	5.0	ug/l	6010B	10/18/00	1
Benzene	1500	1.0	ug/l	8260B	10/19/00	1
Toluene	170	1.0	ug/l	8260B	10/19/00	1
Ethylbenzene	290	1.0	ug/l	8260B	10/19/00	1
Total Xylenes	2000	3.0	ug/l	8260B	10/19/00	1
Methyl tert-butyl ether	2200	1.0	ug/l	8260B	10/19/00	1
Naphthalene	3.6	1.0	ug/l	8260B	10/19/00	1
1,2-Dibromoethane	BDL	1.0	ug/l	8260B	10/19/00	1
Surrogate Recovery						
Toluene-d8	110		% Rec.	8260B	10/19/00	1
Dibromofluoromethane	100		% Rec.	8260B	10/19/00	1
4-Bromofluorobenzene	110		% Rec.	8260B	10/19/00	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Acenaphthene	BDL	10.	ug/l	8270C	10/18/00	1
Acenaphthylene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(a)anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(a)pyrene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(b)fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(g,h,i)perylene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(k)fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Chrysene	BDL	10.	ug/l	8270C	10/18/00	1
Dibenz(a,h)anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Fluorene	BDL	10.	ug/l	8270C	10/18/00	1
Indeno(1,2,3-cd)pyrene	BDL	10.	ug/l	8270C	10/18/00	1
Naphthalene	BDL	10.	ug/l	8270C	10/18/00	1
Phenanthrene	BDL	10.	ug/l	8270C	10/18/00	1
Pyrene	BDL	10.	ug/l	8270C	10/18/00	1

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233



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**REPORT OF ANALYSIS**

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

October 23, 2000

Date Received : October 17, 2000  
Description : Waters for Hot Spot 3005  
Sample ID : MW-3  
Collected By : Mike O'Connell  
Collection Date : 10/16/00 09:40

ESC Sample # : L27326-01  
ESC Key : SMESPAR-1264-99-506  
Site ID : HOT SPOT #305  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Surrogate Recovery						
Nitrobenzene-d5	59.		% Rec.	8270C	10/18/00	1
2-Fluorobiphenyl	69.		% Rec.	8270C	10/18/00	1
p-Terphenyl-d14	67.		% Rec.	8270C	10/18/00	1

  
Jimmy Hunt, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
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**REPORT OF ANALYSIS**

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

October 19, 2000

Date Received : October 14, 2000  
Description : Waters for Hot Spot 3005  
Sample ID : MW-4  
Collected By : Mike O'Connell  
Collection Date : 10/13/00 10:45

ESC Sample # : L27269-01  
ESC Key : SMESPAR-1264-99-506  
Site ID : HOT SPOT #305  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Methane	BDL		ug/l	8015M	10/18/00	1
Ferrous Iron	220	25.	ug/l	3500Fe	10/14/00	1
Nitrate	BDL	100	ug/l	9056	10/14/00	1
Sulfate	12000	10000	ug/l	9056	10/14/00	1
Lead	BDL	5.0	ug/l	6010B	10/15/00	1
Benzene	BDL	1.0	ug/l	8260B	10/18/00	1
Toluene	BDL	1.0	ug/l	8260B	10/18/00	1
Ethylbenzene	BDL	1.0	ug/l	8260B	10/18/00	1
Total Xylenes	BDL	3.0	ug/l	8260B	10/18/00	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	10/18/00	1
Naphthalene	BDL	1.0	ug/l	8260B	10/18/00	1
1,2-Dibromoethane	BDL	1.0	ug/l	8260B	10/18/00	1
Surrogate Recovery						
Toluene-d8	75.		% Rec.	8260B	10/18/00	1
Dibromofluoromethane	96.		% Rec.	8260B	10/18/00	1
4-Bromofluorobenzene	99.		% Rec.	8260B	10/18/00	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Acenaphthene	BDL	10.	ug/l	8270C	10/18/00	1
Acenaphthylene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(a)anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(a)pyrene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(b)fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(g,h,i)perylene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(k)fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Chrysene	BDL	10.	ug/l	8270C	10/18/00	1
Dibenz(a,h)anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Fluorene	BDL	10.	ug/l	8270C	10/18/00	1
Indeno(1,2,3-cd)pyrene	BDL	10.	ug/l	8270C	10/18/00	1
Naphthalene	BDL	10.	ug/l	8270C	10/18/00	1
Phenanthrene	BDL	10.	ug/l	8270C	10/18/00	1
Pyrene	BDL	10.	ug/l	8270C	10/18/00	1

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
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**REPORT OF ANALYSIS**

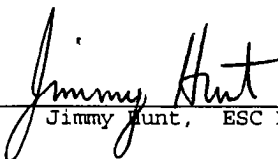
Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

October 19, 2000

Date Received : October 14, 2000  
Description : Waters for Hot Spot 3005  
Sample ID : MW-4  
Collected By : Mike O'Connell  
Collection Date : 10/13/00 10:45

ESC Sample # : L27269-01  
ESC Key : SMESPAR-1264-99-506  
Site ID : HOT SPOT #305  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Surrogate Recovery						
Nitrobenzene-d5	78.		% Rec.	8270C	10/18/00	1
2-Fluorobiphenyl	82.		% Rec.	8270C	10/18/00	1
p-Terphenyl-d14	87.		% Rec.	8270C	10/18/00	1

  
Jimmy Hunt, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

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## REPORT OF ANALYSIS

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

October 23, 2000

Date Received : October 17, 2000  
Description : Waters for Hot Spot 3005  
Sample ID : MW-6  
Collected By : Mike O'Connell  
Collection Date : 10/16/00 10:00

ESC Sample # : L27326-03  
ESC Key : SMESPAR-1264-99-506  
Site ID : HOT SPOT #305  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Methane	BDL		ug/l	8015M	10/18/00	1
Ferrous Iron	250	25.	ug/l	3500Fe	10/17/00	1
Nitrate	1300	100	ug/l	9056	10/17/00	1
Sulfate	BDL	5000	ug/l	9056	10/17/00	1
Lead	BDL	5.0	ug/l	6010B	10/18/00	1
Benzene	7.4	1.0	ug/l	8260B	10/19/00	1
Toluene	3.5	1.0	ug/l	8260B	10/19/00	1
Ethylbenzene	29.	1.0	ug/l	8260B	10/19/00	1
Total Xylenes	81.	3.0	ug/l	8260B	10/19/00	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	10/19/00	1
Naphthalene	44.	1.0	ug/l	8260B	10/19/00	1
1,2-Dibromoethane	BDL	1.0	ug/l	8260B	10/19/00	1
Surrogate Recovery						
Toluene-d8	110		% Rec.	8260B	10/19/00	1
Dibromofluoromethane	90.		% Rec.	8260B	10/19/00	1
4-Bromofluorobenzene	97.		% Rec.	8260B	10/19/00	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Acenaphthene	BDL	10.	ug/l	8270C	10/18/00	1
Acenaphthylene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(a)anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(a)pyrene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(b)fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(g,h,i)perylene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(k)fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Chrysene	BDL	10.	ug/l	8270C	10/18/00	1
Dibenz(a,h)anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Fluorene	BDL	10.	ug/l	8270C	10/18/00	1
Indeno(1,2,3-cd)pyrene	BDL	10.	ug/l	8270C	10/18/00	1
Naphthalene	40.	10.	ug/l	8270C	10/18/00	1
Phenanthrene	BDL	10.	ug/l	8270C	10/18/00	1
Pyrene	BDL	10.	ug/l	8270C	10/18/00	1

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
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**REPORT OF ANALYSIS**

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

October 23, 2000

Date Received : October 17, 2000  
Description : Waters for Hot Spot 3005  
Sample ID : MW-6  
Collected By : Mike O'Connell  
Collection Date : 10/16/00 10:00

ESC Sample # : L27326-03  
ESC Key : SMESPAR-1264-99-506  
Site ID : HOT SPOT #305  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Surrogate Recovery						
Nitrobenzene-d5	69.		% Rec.	8270C	10/18/00	1
2-Fluorobiphenyl	78.		% Rec.	8270C	10/18/00	1
p-Terphenyl-d14	73.		% Rec.	8270C	10/18/00	1

  
Jimmy Hunt, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
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**REPORT OF ANALYSIS**

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

October 23, 2000

Date Received : October 17, 2000  
Description : Waters for Hot Spot 3005  
Sample ID : MW-7  
Collected By : Mike O'Connell  
Collection Date : 10/16/00 10:30

ESC Sample # : L27326-04  
ESC Key : SMESPAR-1264-99-506  
Site ID : HOT SPOT #305  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Methane	BDL		ug/l	8015M	10/18/00	1
Ferrous Iron	60.	25.	ug/l	3500Fe	10/17/00	1
Nitrate	1300	100	ug/l	9056	10/17/00	1
Sulfate	BDL	5000	ug/l	9056	10/17/00	1
Lead	14.	5.0	ug/l	6010B	10/18/00	1
Benzene	BDL	1.0	ug/l	8260B	10/19/00	1
Toluene	BDL	1.0	ug/l	8260B	10/19/00	1
Ethylbenzene	BDL	1.0	ug/l	8260B	10/19/00	1
Total Xylenes	BDL	3.0	ug/l	8260B	10/19/00	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	10/19/00	1
Naphthalene	BDL	1.0	ug/l	8260B	10/19/00	1
1,2-Dibromoethane	BDL	1.0	ug/l	8260B	10/19/00	1
Surrogate Recovery						
Toluene-d8	120		% Rec.	8260B	10/19/00	1
Dibromofluoromethane	110		% Rec.	8260B	10/19/00	1
4-Bromofluorobenzene	82.		% Rec.	8260B	10/19/00	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Acenaphthene	BDL	10.	ug/l	8270C	10/18/00	1
Acenaphthylene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo (a) anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo (a) pyrene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo (b) fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo (g, h, i) perylene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo (k) fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Chrysene	BDL	10.	ug/l	8270C	10/18/00	1
Dibenz (a, h) anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Fluorene	BDL	10.	ug/l	8270C	10/18/00	1
Indeno (1, 2, 3-cd) pyrene	BDL	10.	ug/l	8270C	10/18/00	1
Naphthalene	BDL	10.	ug/l	8270C	10/18/00	1
Phenanthrene	BDL	10.	ug/l	8270C	10/18/00	1
Pyrene	BDL	10.	ug/l	8270C	10/18/00	1

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
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**REPORT OF ANALYSIS**

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

October 23, 2000

Date Received : October 17, 2000  
Description : Waters for Hot Spot 3005  
Sample ID : MW-7  
Collected By : Mike O'Connell  
Collection Date : 10/16/00 10:30

ESC Sample # : L27326-04  
ESC Key : SMESPAR-1264-99-506  
Site ID : HOT SPOT #305  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Surrogate Recovery						
Nitrobenzene-d5	70.		% Rec.	8270C	10/18/00	1
2-Fluorobiphenyl	70.		% Rec.	8270C	10/18/00	1
p-Terphenyl-d14	66.		% Rec.	8270C	10/18/00	1

  
Jimmy Hunt, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

Note:

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**ENVIRONMENTAL  
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Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

**REPORT OF ANALYSIS**

October 19, 2000

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

Date Received : October 14, 2000  
Description : Waters for Hot Spot 3005  
Sample ID : MW-8  
Collected By : Mike O'Connell  
Collection Date : 10/13/00 11:30

ESC Sample # : L27269-02  
ESC Key : SMESPAR-1264-99-506  
Site ID : HOT SPOT #3005  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Methane	BDL		ug/l	8015M	10/18/00	1
Ferrous Iron	290	25.	ug/l	3500Fe	10/14/00	1
Nitrate	1100	100	ug/l	9056	10/14/00	1
Sulfate	BDL	10000	ug/l	9056	10/14/00	1
Lead	BDL	5.0	ug/l	6010B	10/15/00	1
Benzene	BDL	1.0	ug/l	8260B	10/18/00	1
Toluene	BDL	1.0	ug/l	8260B	10/18/00	1
Ethylbenzene	BDL	1.0	ug/l	8260B	10/18/00	1
Total Xylenes	BDL	3.0	ug/l	8260B	10/18/00	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	10/18/00	1
Naphthalene	BDL	1.0	ug/l	8260B	10/18/00	1
1,2-Dibromoethane	BDL	1.0	ug/l	8260B	10/18/00	1
Surrogate Recovery						
Toluene-d8	76.		% Rec.	8260B	10/18/00	1
Dibromofluoromethane	100		% Rec.	8260B	10/18/00	1
4-Bromofluorobenzene	91.		% Rec.	8260B	10/18/00	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Acenaphthene	BDL	10.	ug/l	8270C	10/18/00	1
Acenaphthylene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(a)anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(a)pyrene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(b)fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(g,h,i)perylene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(k)fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Chrysene	BDL	10.	ug/l	8270C	10/18/00	1
Dibenz(a,h)anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Fluorene	BDL	10.	ug/l	8270C	10/18/00	1
Indeno(1,2,3-cd)pyrene	BDL	10.	ug/l	8270C	10/18/00	1
Naphthalene	BDL	10.	ug/l	8270C	10/18/00	1
Phenanthrene	BDL	10.	ug/l	8270C	10/18/00	1
Pyrene	BDL	10.	ug/l	8270C	10/18/00	1

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit(EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
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**REPORT OF ANALYSIS**

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

October 19, 2000

Date Received : October 14, 2000  
Description : Waters for Hot Spot 3005  
Sample ID : MW-8  
Collected By : Mike O'Connell  
Collection Date : 10/13/00 11:30

ESC Sample # : L27269-02  
ESC Key : SMESPAR-1264-99-506  
Site ID : HOT SPOT #3005  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Surrogate Recovery						
Nitrobenzene-d5	84.		% Rec.	8270C	10/18/00	1
2-Fluorobiphenyl	89.		% Rec.	8270C	10/18/00	1
p-Terphenyl-d14	95.		% Rec.	8270C	10/18/00	1

Jimmy Hunt, ESC Representative

BDL - Below Detection Limit  
Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:  
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**REPORT OF ANALYSIS**

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

October 23, 2000

Date Received : October 17, 2000  
Description : Waters for Hot Spot 3005  
Sample ID : MW-9  
Collected By : Mike O'Connell  
Collection Date : 10/16/00 13:45

ESC Sample # : L27326-02  
ESC Key : SMESPAR-1264-99-506  
Site ID : HOT SPOT #305  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Methane	BDL		ug/l	8015M	10/18/00	1
Ferrous Iron	1700	25.	ug/l	3500Fe	10/17/00	1
Nitrate	1800	100	ug/l	9056	10/17/00	1
Sulfate	BDL	5000	ug/l	9056	10/17/00	1
Lead	5.4	5.0	ug/l	6010B	10/18/00	1
Benzene	BDL	1.0	ug/l	8260B	10/19/00	1
Toluene	BDL	1.0	ug/l	8260B	10/19/00	1
Ethylbenzene	BDL	1.0	ug/l	8260B	10/19/00	1
Total Xylenes	BDL	3.0	ug/l	8260B	10/19/00	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	10/19/00	1
Naphthalene	BDL	1.0	ug/l	8260B	10/19/00	1
1,2-Dibromoethane	BDL	1.0	ug/l	8260B	10/19/00	1
Surrogate Recovery						
Toluene-d8	92.		% Rec.	8260B	10/19/00	1
Dibromofluoromethane	94.		% Rec.	8260B	10/19/00	1
4-Bromofluorobenzene	90.		% Rec.	8260B	10/19/00	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Acenaphthene	BDL	10.	ug/l	8270C	10/18/00	1
Acenaphthylene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(a)anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(a)pyrene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(b)fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(g,h,i)perylene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(k)fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Chrysene	BDL	10.	ug/l	8270C	10/18/00	1
Dibenz(a,h)anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Fluorene	BDL	10.	ug/l	8270C	10/18/00	1
Indeno(1,2,3-cd)pyrene	BDL	10.	ug/l	8270C	10/18/00	1
Naphthalene	BDL	10.	ug/l	8270C	10/18/00	1
Phenanthrene	BDL	10.	ug/l	8270C	10/18/00	1
Pyrene	BDL	10.	ug/l	8270C	10/18/00	1

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

**Laboratory Certification Numbers:**

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**REPORT OF ANALYSIS**

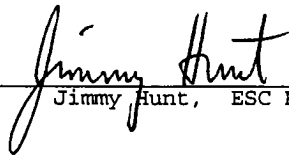
Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

October 23, 2000

Date Received : October 17, 2000  
Description : Waters for Hot Spot 3005  
Sample ID : MW-9  
Collected By : Mike O'Connell  
Collection Date : 10/16/00 13:45

ESC Sample # : L27326-02  
ESC Key : SMESPAR-1264-99-506  
Site ID : HOT SPOT #305  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Surrogate Recovery						
Nitrobenzene-d5	66.		% Rec.	8270C	10/18/00	1
2-Fluorobiphenyl	64.		% Rec.	8270C	10/18/00	1
p-Terphenyl-d14	62.		% Rec.	8270C	10/18/00	1

  
Jimmy Hunt, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

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**REPORT OF ANALYSIS**

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

October 19,2000

Date Received : October 14, 2000  
Description : Waters for Hot Spot 3005  
Sample ID : MW-10  
Collected By : Mike O'Connell  
Collection Date : 10/13/00 12:30

ESC Sample # : L27269-03  
ESC Key : SMESPAR-1264-99-506  
Site ID : HOT SPOT #3005  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Methane	BDL		ug/l	8015M	10/18/00	1
Ferrous Iron	1000	25.	ug/l	3500Fe	10/14/00	1
Nitrate	2600	100	ug/l	9056	10/14/00	1
Sulfate	BDL	10000	ug/l	9056	10/14/00	1
Lead	67.	5.0	ug/l	6010B	10/15/00	1
Benzene	BDL	1.0	ug/l	8260B	10/18/00	1
Toluene	BDL	1.0	ug/l	8260B	10/18/00	1
Ethylbenzene	BDL	1.0	ug/l	8260B	10/18/00	1
Total Xylenes	BDL	3.0	ug/l	8260B	10/18/00	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	10/18/00	1
Naphthalene	BDL	1.0	ug/l	8260B	10/18/00	1
1,2-Dibromoethane	BDL	1.0	ug/l	8260B	10/18/00	1
Surrogate Recovery						
Toluene-d8	80.		% Rec.	8260B	10/18/00	1
Dibromofluoromethane	100		% Rec.	8260B	10/18/00	1
4-Bromofluorobenzene	99.		% Rec.	8260B	10/18/00	1
<b>Polynuclear Aromatic Hydrocarbons</b>						
Anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Acenaphthene	BDL	10.	ug/l	8270C	10/18/00	1
Acenaphthylene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(a)anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(a)pyrene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(b)fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(g,h,i)perylene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(k)fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Chrysene	BDL	10.	ug/l	8270C	10/18/00	1
Dibenz(a,h)anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Fluorene	BDL	10.	ug/l	8270C	10/18/00	1
Indeno(1,2,3-cd)pyrene	BDL	10.	ug/l	8270C	10/18/00	1
Naphthalene	BDL	10.	ug/l	8270C	10/18/00	1
Phenanthrene	BDL	10.	ug/l	8270C	10/18/00	1
Pyrene	BDL	10.	ug/l	8270C	10/18/00	1

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

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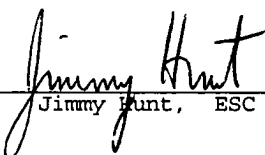
Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

October 19, 2000

Date Received : October 14, 2000  
Description : Waters for Hot Spot 3005  
Sample ID : MW-10  
Collected By : Mike O'Connell  
Collection Date : 10/13/00 12:30

ESC Sample # : L27269-03  
ESC Key : SMESPAR-1264-99-506  
Site ID : HOT SPOT #3005  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Surrogate Recovery						
Nitrobenzene-d5	69.		% Rec.	8270C	10/18/00	1
2-Fluorobiphenyl	69.		% Rec.	8270C	10/18/00	1
p-Terphenyl-d14	87.		% Rec.	8270C	10/18/00	1

  
Jimmy Hunt, ESC Representative

BDL - Below Detection Limit

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**REPORT OF ANALYSIS**

October 19,2000

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

Date Received : October 14, 2000  
Description : Waters for Hot Spot 3005  
Sample ID : MW-11  
Collected By : Mike O'Connell  
Collection Date : 10/13/00 14:00

ESC Sample # : L27269-04  
ESC Key : SMESPAR-1264-99-506  
Site ID : HOT SPOT #3005  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Methane	BDL		ug/l	8015M	10/18/00	1
Ferrous Iron	1100	25.	ug/l	3500Fe	10/14/00	1
Nitrate	2900	100	ug/l	9056	10/14/00	1
Sulfate	BDL	10000	ug/l	9056	10/14/00	1
Lead	BDL	5.0	ug/l	6010B	10/15/00	1
Benzene	BDL	1.0	ug/l	8260B	10/18/00	1
Toluene	BDL	1.0	ug/l	8260B	10/18/00	1
Ethylbenzene	BDL	1.0	ug/l	8260B	10/18/00	1
Total Xylenes	BDL	3.0	ug/l	8260B	10/18/00	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	10/18/00	1
Naphthalene	BDL	1.0	ug/l	8260B	10/18/00	1
1,2-Dibromoethane	BDL	1.0	ug/l	8260B	10/18/00	1
Surrogate Recovery						
Toluene-d8	77.		% Rec.	8260B	10/18/00	1
Dibromofluoromethane	100		% Rec.	8260B	10/18/00	1
4-Bromofluorobenzene	96.		% Rec.	8260B	10/18/00	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Acenaphthene	BDL	10.	ug/l	8270C	10/18/00	1
Acenaphthylene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo (a) anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo (a) pyrene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo (b) fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo (g, h, i) perylene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo (k) fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Chrysene	BDL	10.	ug/l	8270C	10/18/00	1
Dibenz (a, h) anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Fluorene	BDL	10.	ug/l	8270C	10/18/00	1
Indeno (1,2,3-cd) pyrene	BDL	10.	ug/l	8270C	10/18/00	1
Naphthalene	BDL	10.	ug/l	8270C	10/18/00	1
Phenanthrene	BDL	10.	ug/l	8270C	10/18/00	1
Pyrene	BDL	10.	ug/l	8270C	10/18/00	1

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

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**REPORT OF ANALYSIS**

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

October 19, 2000

Date Received : October 14, 2000  
Description : Waters for Hot Spot 3005  
Sample ID : MW-11  
Collected By : Mike O'Connell  
Collection Date : 10/13/00 14:00

ESC Sample # : L27269-04  
ESC Key : SMESPAR-1264-99-506  
Site ID : HOT SPOT #3005  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Surrogate Recovery						
Nitrobenzene-d5	53.		% Rec.	8270C	10/18/00	1
2-Fluorobiphenyl	50.		% Rec.	8270C	10/18/00	1
p-Terphenyl-d14	81.		% Rec.	8270C	10/18/00	1

Jimmy Hunt, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

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**REPORT OF ANALYSIS**

October 19, 2000

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

Date Received : October 14, 2000  
Description : Waters for Hot Spot 3005  
Sample ID : MW-12  
Collected By : Mike O'Connell  
Collection Date : 10/13/00 13:15

ESC Sample # : L27269-05  
ESC Key : SMESPAR-1264-99-506  
Site ID : HOT SPOT #3005  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Methane	BDL		ug/l	8015M	10/18/00	1
Ferrous Iron	80.	25.	ug/l	3500Fe	10/14/00	1
Nitrate	1300	100	ug/l	9056	10/14/00	1
Sulfate	32000	10000	ug/l	9056	10/14/00	1
Lead	BDL	5.0	ug/l	6010B	10/15/00	1
Benzene	BDL	1.0	ug/l	8260B	10/18/00	1
Toluene	BDL	1.0	ug/l	8260B	10/18/00	1
Ethylbenzene	BDL	1.0	ug/l	8260B	10/18/00	1
Total Xylenes	BDL	3.0	ug/l	8260B	10/18/00	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	10/18/00	1
Naphthalene	BDL	1.0	ug/l	8260B	10/18/00	1
1,2-Dibromoethane	BDL	1.0	ug/l	8260B	10/18/00	1
Surrogate Recovery						
Toluene-d8	76.		% Rec.	8260B	10/18/00	1
Dibromofluoromethane	120		% Rec.	8260B	10/18/00	1
4-Bromofluorobenzene	100		% Rec.	8260B	10/18/00	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Acenaphthene	BDL	10.	ug/l	8270C	10/18/00	1
Acenaphthylene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo (a) anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo (a) pyrene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo (b) fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo (g, h, i) perylene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo (k) fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Chrysene	BDL	10.	ug/l	8270C	10/18/00	1
Dibenz (a, h) anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Fluorene	BDL	10.	ug/l	8270C	10/18/00	1
Indeno (1, 2, 3-cd) pyrene	BDL	10.	ug/l	8270C	10/18/00	1
Naphthalene	BDL	10.	ug/l	8270C	10/18/00	1
Phenanthrene	BDL	10.	ug/l	8270C	10/18/00	1
Pyrene	BDL	10.	ug/l	8270C	10/18/00	1

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

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**ENVIRONMENTAL  
SCIENCE CORP.**

12065 Lebanon Rd.  
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1-800-767-5859  
Fax (615) 758-5859  
  
Tax I.D. 62-0814289  
  
Est. 1970

REPORT OF ANALYSIS

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

October 19, 2000

Date Received : October 14, 2000  
Description : Waters for Hot Spot 3005  
Sample ID : MW-12  
Collected By : Mike O'Connell  
Collection Date : 10/13/00 13:15

ESC Sample # : L27269-05  
ESC Key : SMESPAR-1264-99-506  
Site ID : HOT SPOT #3005  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Surrogate Recovery						
Nitrobenzene-d5	67.		% Rec.	8270C	10/18/00	1
2-Fluorobiphenyl	71.		% Rec.	8270C	10/18/00	1
p-Terphenyl-d14	84.		% Rec.	8270C	10/18/00	1

Jimmy Hunt, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

Note:

The reported analytical results relate only to the sample submitted.

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Est. 1970

**REPORT OF ANALYSIS**

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

October 19,2000

Date Received : October 14, 2000  
Description : Waters for Hot Spot 3005  
Sample ID : MW-13  
Collected By : Mike O'Connell  
Collection Date : 10/13/00 14:30

ESC Sample # : L27269-06  
ESC Key : SMESPAR-1264-99-506  
Site ID : HOT SPOT #3005  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Methane	BDL		ug/l	8015M	10/18/00	1
Ferrous Iron	7700	25.	ug/l	3500Fe	10/14/00	1
Nitrate	1500	100	ug/l	9056	10/14/00	1
Sulfate	25000	10000	ug/l	9056	10/14/00	1
Lead	BDL	5.0	ug/l	6010B	10/15/00	1
Benzene	BDL	1.0	ug/l	8260B	10/18/00	1
Toluene	BDL	1.0	ug/l	8260B	10/18/00	1
Ethylbenzene	BDL	1.0	ug/l	8260B	10/18/00	1
Total Xylenes	BDL	3.0	ug/l	8260B	10/18/00	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	10/18/00	1
Naphthalene	BDL	1.0	ug/l	8260B	10/18/00	1
1,2-Dibromoethane	BDL	1.0	ug/l	8260B	10/18/00	1
Surrogate Recovery						
Toluene-d8	79.		% Rec.	8260B	10/18/00	1
Dibromofluoromethane	120		% Rec.	8260B	10/18/00	1
4-Bromofluorobenzene	100		% Rec.	8260B	10/18/00	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Acenaphthene	BDL	10.	ug/l	8270C	10/18/00	1
Acenaphthylene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(a)anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(a)pyrene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(b)fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(g,h,i)perylene	BDL	10.	ug/l	8270C	10/18/00	1
Benzo(k)fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Chrysene	BDL	10.	ug/l	8270C	10/18/00	1
Dibenz(a,h)anthracene	BDL	10.	ug/l	8270C	10/18/00	1
Fluoranthene	BDL	10.	ug/l	8270C	10/18/00	1
Fluorene	BDL	10.	ug/l	8270C	10/18/00	1
Indeno(1,2,3-cd)pyrene	BDL	10.	ug/l	8270C	10/18/00	1
Naphthalene	BDL	10.	ug/l	8270C	10/18/00	1
Phenanthrene	BDL	10.	ug/l	8270C	10/18/00	1
Pyrene	BDL	10.	ug/l	8270C	10/18/00	1

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit(EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
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Est. 1970

**REPORT OF ANALYSIS**

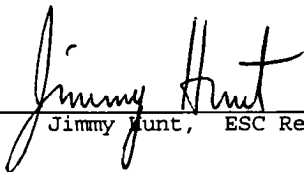
Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

October 19, 2000

Date Received : October 14, 2000  
Description : Waters for Hot Spot 3005  
Sample ID : MW-13  
Collected By : Mike O'Connell  
Collection Date : 10/13/00 14:30

ESC Sample # : L27269-06  
ESC Key : SMESPAR-1264-99-506  
Site ID : HOT SPOT #3005  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Surrogate Recovery						
Nitrobenzene-d5	33.		% Rec.	8270C	10/18/00	1
2-Fluorobiphenyl	26.		% Rec.	8270C	10/18/00	1
p-Terphenyl-d14	30.		% Rec.	8270C	10/18/00	1



Jimmy Hunt, ESC Representative

BDL - Below Detection Limit  
Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

Note:

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155 Tradd Street  
Spartanburg, SC 29301

Alternate billing information:

Analysis/Contaminant/Matrix/Preservative

Prepared by:

**ENVIRONMENTAL  
SCIENCE CORP.**

12065 Lebanon Road  
Mt. Juliet, TN 37122  
Phone (866) 767-5859  
FAX (615) 758-5859

V8260BTEXMNE 40mlAmb-HCI  
SV8270PAH 1L-Amb-NoPres  
SO4 250mlHDPE-NoPres  
PBICP 250mlHDPE-HNO3  
NO3 125mlHDPE-NoPres  
METHANE 40mlAmb-NoPres  
FERUSFE 250mlAmb-HCI

CoCode: **SMESPAR** (lab use only)  
Template/Prelogin **T8081 / P20174**  
Cooler #: **10/10/00 NY**  
Shipped Via: **UPS Next Day Saver**

Remarks: Contaminant

2. (lab use only)  
\* 2 coolers 09  
03  
01  
65  
06

Description: **Waters for Hot Spot 3005**

Client Project #: **SMESPAR-1264-99-506**

Site/Facility ID#: **Hot Spot # 3005** P.O.#: **2185**

Rush? (Lab MUST Be Notified) Date Results Needed

<24 hr .....200%  
24-48 hr .....100%  
48-72 hr .....50%

FAX? No Yes  
No. of Cntrs

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs
MW-4	Grab	GW		10/13	10:45	9
MW-8		GW		11:30		9
MW-10		GW		12:30		9
MW-11		GW		14:00		9
MW-12		GW		13:15		9
MW-13		GW		14:30		9

SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other

pH \_\_\_\_\_ Temp \_\_\_\_\_  
Flow \_\_\_\_\_ Other \_\_\_\_\_

Requested by (Signature)  
Furnished by (Signature)

Date: 10/13/00 16:00  
Time: 16:00

Received by (Signature)  
Received by (Signature)

Samples returned via:  UPS  
 FedEx  Courier  
Temp: 40  
Bottles Received: 54

Condition: (lab use only)

Requested by (Signature)

Date: \_\_\_\_\_  
Time: \_\_\_\_\_

Received by (Signature)

Date: 10/13/00  
Time: 1:25

pH Checked: Yes  
NCF: Yes

S & M E

155 Tradd Street  
Spartanburg, SC 29301

Alternate billing information:

Analysis/Container/Preservative:

Client of Choice  
Page 1 of 2

Prepared by:  
**ENVIRONMENTAL  
SCIENCE CORP.**

12065 Lebanon Road  
Mt. Juliet, TN 37122  
Phone (800) 767-5559  
FAX (615) 256-5559

Report to: **Mr. Mike O'Connell** Description: **Waters for Hot Spot 3005**

Phone: (864) 574-2360 Client Project #: **1264-99-506** Lab Project #: **SMESPAR-1264-99-506**  
 FAX: (864) 576-8730

Collected by (print): **Mike O'Connell** Site/Facility ID#: **Hot Spot # 3005** P.O.#: **2191**  
 Collected by (signature): *[Signature]*

Rush? (Lab MUST Be Notified)

Date Results Needed

<24 hr ..... 200%  
 24-48 hr ..... 100%  
 48-72 hr ..... 50%

FAX?  No  Yes

FERUSFE 250ml/Amb-HCI
METHANE 40ml/Amb-NoPres
NO3 125mlHDPE-NoPres
PBICP 250mlHDPE-HNO3
SO4 250mlHDPE-NoPres
SV8270PAH 1L-Amb-NoPres
V8260BTXMXNE 40ml/Amb-HCI

CoCode: **SMESPAR** (lab use only)  
 Template/Prelogin **T8081 / P2017**  
 Cooler #: **10/10/00 AV**  
 Shipped Via: **UPS Next Day Saver**

Sample ID	Comp/Grab	Matrx*	Depth	Date	Time	No of Cntrs	FERUSFE 250ml/Amb-HCI	METHANE 40ml/Amb-NoPres	NO3 125mlHDPE-NoPres	PBICP 250mlHDPE-HNO3	SO4 250mlHDPE-NoPres	SV8270PAH 1L-Amb-NoPres	V8260BTXMXNE 40ml/Amb-HCI	Remarks/Contaminant	Sample # (lab use only)
MW-3	Grab	GW		10/16	9:40	9	X	X	X	X	X	X	X		
MW-9	↓	GW			13:45	9	X	X	X	X	X	X	X		
MW-6	↓	GW			10:00	9	X	X	X	X	X	X	X	* 2 COOLERS	L2732651 02
MW-7	↓	GW			10:30	9	X	X	X	X	X	X	X		03
MW-ID	↓	GW			11:10	9	X	X	X	X	X	X	X		04
		GW				9	X	X	X	X	X	X	X		05
		GW				9	X	X	X	X	X	X	X		
		GW				9	X	X	X	X	X	X	X		
		GW				9	X	X	X	X	X	X	X		

Flow: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other

pH \_\_\_\_\_ Temp \_\_\_\_\_

Flow \_\_\_\_\_ Other \_\_\_\_\_

Received by: (Signature) <i>[Signature]</i>	Date: <b>10/16/00</b> Time: <b>4:30</b>	Received by: (Signature)	Samples returned via: <input checked="" type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> Courier	Condition: (lab use only)
Pushed by: (Signature)	Date: _____ Time: _____	Received by: (Signature)	Temp: <b>4c</b> Bottles Received: <b>45</b>	
Pushed by: (Signature)	Date: _____ Time: _____	Received for lab by: (Signature)	Date: <b>10/17/00</b> Time: <b>2:15</b>	pH Checked (Yes) <input checked="" type="checkbox"/> NCF: Yes

**APPENDIX D**

**SLUG TEST DATA/FREE PRODUCT RECOVERY  
TEST DATA**

## HYDRAULIC CONDUCTIVITY TEST DATA

PROJECT NAME: HOT SPOT #3005  
PROJECT NUMBER: 1264-99-506

WELL ID: MW-12  
TEST DATE: 11/14/00

### LEVELS MEASURED RELATIVE TO TOP OF CASING OR MEASURING POINT

DEPTH TO BASE OF AQUIFER -	50.00	FT
DEPTH TO WATER -	23.91	FT
DEPTH TO TOP OF SCREEN -	20.14	FT
DEPTH TO BASE OF SCREEN -	30.14	FT
CASING DIAMETER =	2.38	IN
BOREHOLE DIAMETER =	6.00	IN
SAND PACK POROSITY -	0.30	

### SLUG TEST DATA

TIME (MIN)	DTW (FT)	Y1 (FT)	LOG (Y1)
0.00	30.71	6.80	0.833
0.25	30.55	6.64	0.822
0.50	30.43	6.52	0.814
0.75	30.35	6.44	0.809
1.00	30.3	6.39	0.806
1.25	30.27	6.36	0.803
1.50	30.15	6.24	0.795
1.75	30.1	6.19	0.792
2.00	29	5.09	0.707
2.25	28.92	5.01	0.700
2.50	28.8	4.89	0.689
2.75	28.72	4.81	0.682
3.00	28.63	4.72	0.674
3.50	28.42	4.51	0.654
4.00	28.21	4.30	0.633
4.50	28.05	4.14	0.617
5.00	27.82	3.91	0.592
6.00	27.52	3.61	0.558
7.00	27.29	3.38	0.529
8.00	26.97	3.06	0.486
9.00	26.69	2.78	0.444
10.00	26.41	2.50	0.398
15.00	25.27	1.36	0.134
20.00	24.49	0.58	-0.237

### TIMES FOR LINEAR REGRESSION

INITIAL TIME = 0 MIN  
FINAL TIME = 20 MIN

### METHOD:

**BOUWER & RICE**

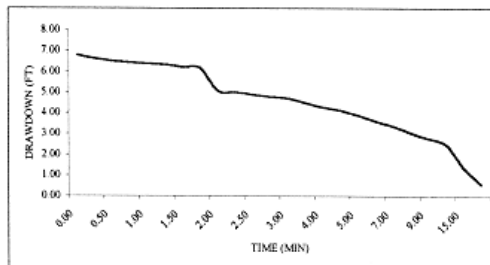
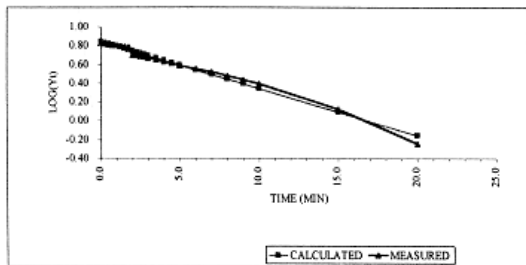
"A SLUG TEST FOR DETERMINING HYDRAULIC CONDUCTIVITY OF UNCONFINED AQUIFER WITH COMPLETELY OR PARTIALLY PENETRATING WELLS".  
1976 AND  
"BOWER AND RICE SLUG TEST - AN UPDATE", 1989

### HYDRAULIC CONDUCTIVITY

FT/MIN = 3.20E-04  
FT/DAY = 4.61E-01  
GPD/FT2 = 3.45E+00  
CM/SEC = 1.63E-04

### Regression Statistics

Multiple R	0.991404591		
R <sup>2</sup>	0.982883063	Intercept	7.01 0
Adjusted R <sup>2</sup>	0.982105021	X Variable 1	-0.049883348 0
Std. Error	0.032947867		
Observations	24		



## HYDRAULIC CONDUCTIVITY TEST DATA

PROJECT NAME: HOT SPOT #3005  
 PROJECT NUMBER: 1264-99-506

WELL ID: MW-12  
 TEST DATE: 11/14/00

Rw = 0.2500 FT      Le/Rw = 40  
 Lw = 6.23 FT      A = 2.798888  
 H = 26.09 FT      B = 0.437957  
 Le = 10.00 FT  
 Rc = 0.0992 FT  
  
 Rce = 0.1601 FT      ln(H-Lw/Rw) = 4.375002  
 Yo = 7.01 FT      ln(Re/Rw) = 2.174156  
 LOG(Yo) = 0.8456  
 t = 10 MIN  
 Yt = 2.22 FT  
 LOG(Yt) = 0.35

**SUMMARY OUTPUT**

Regression Statistics	
Multiple R	0.991404591
R Square	0.982883063
Adjusted R Square	0.982105021
Standard Error	0.032947867
Observations	24

**ANOVA**

	df	SS	MS	F	Significance F
Regression	1	1.371365113	1.371365113	1263.28	6.26493E-21
Residual	22	0.023882363	0.001085562		
Total	23	1.395247476			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.845646149	0.009367312	90.27628916	9.1E-30	0.826219513	0.8650728	0.826219513	0.865072786
X Variable 1	-0.049883348	0.00140348	-35.54260393	6.3E-21	-0.052793992	-0.046973	-0.052793992	-0.0469727

## HYDRAULIC CONDUCTIVITY TEST DATA

**PROJECT NAME:** HOT SPOT #3005  
**PROJECT NUMBER:** 1264-99-506

**WELL ID:** MW-11  
**TEST DATE:** 11/10/00

**LEVELS MEASURED RELATIVE TO TOP OF CASING OR MEASURING POINT**

DEPTH TO BASE OF AQUIFER = 50.00 FT  
 DEPTH TO WATER = 24.12 FT  
 DEPTH TO TOP OF SCREEN = 17.97 FT  
 DEPTH TO BASE OF SCREEN = 27.97 FT  
 CASING DIAMETER = 2.38 IN  
 BOREHOLE DIAMETER = 6.00 IN  
 SAND PACK POROSITY = 0.30

**HYDRAULIC CONDUCTIVITY**

**FT/MIN = 9.51E-05**  
**FT/DAY = 1.37E-01**  
**GPD/FT<sup>2</sup> = 1.02E+00**  
**CM/SEC = 4.83E-05**

**SLUG TEST DATA**

TIME (MIN)	DTW (FT)	Yt (FT)	LOG (Yt)
0.00	26.82	2.70	0.431
0.25	26.71	2.59	0.413
0.50	26.62	2.50	0.398
0.75	26.6	2.48	0.394
1.00	26.59	2.47	0.393
1.25	26.55	2.43	0.386
1.50	26.53	2.41	0.382
1.75	26.49	2.37	0.375
2.00	26.45	2.33	0.367
2.25	26.43	2.31	0.364
2.50	26.41	2.29	0.360
2.75	26.39	2.27	0.356
3.00	26.37	2.25	0.352
3.50	26.32	2.20	0.342
4.00	26.28	2.16	0.334
4.50	26.22	2.10	0.322
5.00	26.18	2.06	0.314
6.00	26.12	2.00	0.301
7.00	26.02	1.90	0.279
8.00	25.93	1.81	0.258
9.00	25.85	1.73	0.238
10.00	25.8	1.68	0.225
15.00	25.52	1.40	0.146
20.00	25.31	1.19	0.076
30.00	24.94	0.82	-0.086

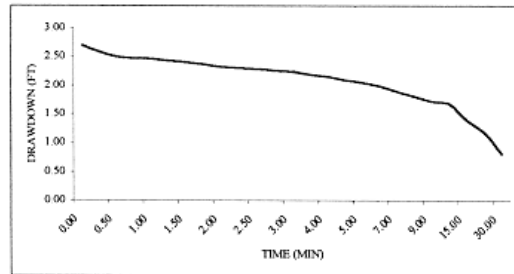
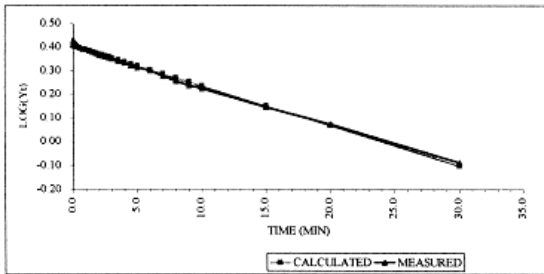
**TIMES FOR LINEAR REGRESSION**  
 INITIAL TIME = 0 MIN  
 FINAL TIME = 30 MIN

**METHOD:**  
**BOUWER & RICE**

"A SLUG TEST FOR DETERMINING HYDRAULIC CONDUCTIVITY OF UNCONFINED AQUIFER WITH COMPLETELY OR PARTIALLY PENETRATING WELLS", 1976 AND "BOWER AND RICE SLUG TEST - AN UPDATE", 1989

Regression Statistics

	Multiple R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Std. Error	Intercept	X Variable 1	Coefficients	Standard Error
Multiple R	0.997088426							
R <sup>2</sup>	0.994185328				2.53		0	
Adjusted R <sup>2</sup>	0.993932517					-0.016794984	0	
Std. Error	0.009153975							
Observations	25							





## HYDRAULIC CONDUCTIVITY TEST DATA

PROJECT NAME:      HOT SPOT #3005  
 PROJECT NUMBER:   1264-99-506

WELL ID:            MW-11  
 TEST DATE:         11/10/00

Rw = 0.2500 FT      Le/Rw = 40  
 Lw = 3.85 FT        A = 2.79889  
 H = 25.88 FT        B = 0.43796  
 Le = 10.00 FT  
 Rc = 0.0992 FT  
  
 Rce = 0.1601 FT     ln(H-Lw/Rw) = 4.4787  
 Yo = 2.53 FT        ln(Re/Rw) = 1.9183  
 LOG(Yo) = 0.4039  
 t = 10 MIN  
 Yt = 1.72 FT  
 LOG(Yo) = 0.24

### SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.997088426
R Square	0.994185328
Adjusted R Square	0.993932517
Standard Error	0.009153975
Observations	25

### ANOVA

	df	SS	MS	F	Significance F
Regression	1	0.329525779	0.329525779	3932.51	3.23267E-27
Residual	23	0.001927291	8.37953E-05		
Total	24	0.33145307			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.403875806	0.002376902	169.9169104	3.8E-37	0.398958817	0.408793	0.398958817	0.4087928
X Variable 1	-0.016794984	0.000267821	-62.70973912	3.2E-27	-0.017349013	-0.016241	-0.01734901	-0.01624095

## HYDRAULIC CONDUCTIVITY TEST DATA

PROJECT NAME: HOT SPOT #3005  
PROJECT NUMBER: 1264-99-506

WELL ID: MW-1D  
TEST DATE: 10/26/00

**LEVELS MEASURED RELATIVE TO TOP OF CASING OR MEASURING POINT**

DEPTH TO BASE OF AQUIFER = 75.00 FT  
DEPTH TO WATER = 28.88 FT  
DEPTH TO TOP OF SCREEN = 53.31 FT  
DEPTH TO BASE OF SCREEN = 58.31 FT  
CASING DIAMETER = 2.38 IN  
BOREHOLE DIAMETER = 6.00 IN  
SAND PACK POROSITY = 0.30

**HYDRAULIC CONDUCTIVITY**

FT/MIN = 9.60E-04  
FT/DAY = 1.38E+00  
GPD/FT<sup>2</sup> = 1.43E+01  
CM/SEC = 4.87E-04

**SLUG TEST DATA**

TIME (MIN)	DTW (FT)	Yt (FT)	LOG (Yt)
0.00	29.61	0.73	-0.137
0.25	29.52	0.64	-0.194
0.50	29.45	0.57	-0.244
0.75	29.4	0.52	-0.284
1.00	29.36	0.48	-0.319
1.25	29.32	0.44	-0.357
1.50	29.28	0.40	-0.398
1.75	29.23	0.35	-0.456
2.00	29.2	0.32	-0.495
2.25	29.18	0.30	-0.523
2.50	29.15	0.27	-0.569
2.75	29.11	0.23	-0.638
3.00	29.08	0.20	-0.699
3.50	29.05	0.17	-0.770
4.00	29.02	0.14	-0.854
4.50	29	0.12	-0.921
5.00	28.98	0.10	-1.000

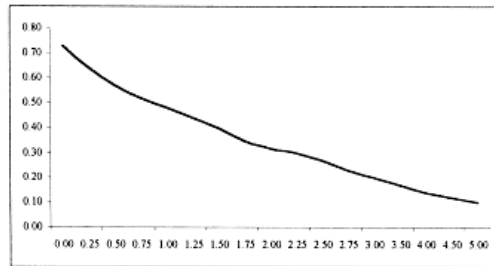
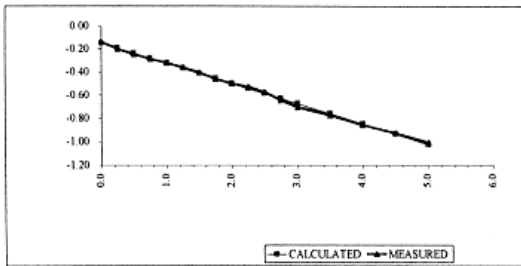
**TIMES FOR LINEAR REGRESSION**  
INITIAL TIME = 0 MIN  
FINAL TIME = 5 MIN

**METHOD:**  
BOUWER & RICE

"A SLUG TEST FOR DETERMINING HYDRAULIC CONDUCTIVITY OF UNCONFINED AQUIFER WITH COMPLETELY OR PARTIALLY PENETRATING WELLS" 1976 AND "BOWER AND RICE SLUG TEST - AN UPDATE", 1989

Regression Statistics

Multiple R	0.998797321		
R <sup>2</sup>	0.997596089	Intercept	0.71
Adjusted R <sup>2</sup>	0.997435828	X Variable 1	-0.173997314
Std. Error	0.013187468		
Observations	17		



## HYDRAULIC CONDUCTIVITY TEST DATA

PROJECT NAME: HOT SPOT #3005  
 PROJECT NUMBER: 1264-99-506

WELL ID: MW-1D  
 TEST DATE: 10/26/00

Rw =	0.2500	FT	Le/Rw =	20
Lw =	29.43	FT	A =	2.181507
H =	46.12	FT	B =	0.337313
Le =	5.00	FT		
Rc =	0.0992	FT		
Rce =	0.1601	FT	ln(H-Lw/Rw) =	4.201104
Yo =	0.71	FT	ln(Re/Rw) =	2.435345
LOG(Yo) =	-0.1473			
i =	10	MIN		
Yi =	0.01	FT		
LOG(Yi) =	-1.89			

### SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.998797321
R Square	0.997596089
Adjusted R Square	0.997435828
Standard Error	0.013187468
Observations	17

### ANOVA

	df	SS	MS	F	Significance F
Regression	1	1.082556196	1.082556196	6224.83	4.61329E-21
Residual	15	0.00260864	0.000173909		
Total	16	1.085164836			

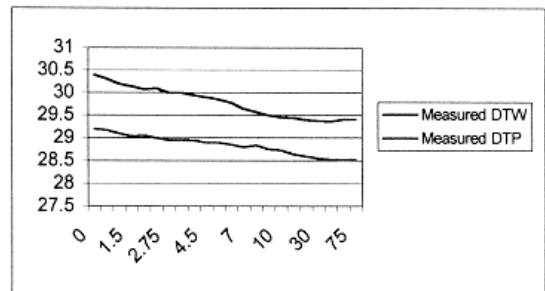
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.147337883	0.005714059	-25.78515477	7.7E-14	-0.159517118	-0.135159	-0.159517118	-0.13515865
X Variable 1	-0.173997314	0.002205356	-78.89760039	4.6E-21	-0.178697923	-0.169297	-0.178697923	-0.16929671

**FREE PRODUCT RECOVERY TEST**

HOT SPOT #3005  
CHESNEE, SOUTH CAROLINA  
S&ME Project 1264-99-506

Date 11/10/2000  
Static Depth to Water 29.84 Ft  
Static Depth to Product 28.17 Ft  
Static Product Thickness 1.67 Ft

Time	Measured DTW	Measured DTP	PT
0	30.4	29.2	1.2
0.25	30.31	29.18	1.13
0.5	30.2	29.1	1.1
1.5	30.15	29.04	1.11
1.75	30.08	29.05	1.03
2.5	30.1	29	1.1
2.75	30	28.96	1.04
3	30	28.96	1.04
4	29.95	28.95	1
4.5	29.9	28.9	1
5	29.86	28.9	0.96
6	29.78	28.85	0.93
7	29.64	28.8	0.84
8	29.58	28.84	0.74
9	29.5	28.76	0.74
10	29.46	28.73	0.73
15	29.44	28.64	0.8
20	29.4	28.6	0.8
30	29.38	28.55	0.83
45	29.37	28.53	0.84
60	29.41	28.52	0.89
75	29.41	28.53	0.88



**FREE PRODUCT RECOVERY TEST**

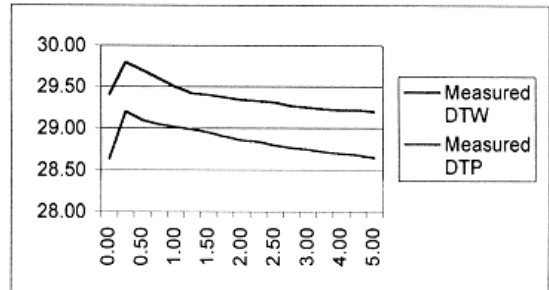
HOT SPOT #3005

CHESNEE, SOUTH CAROLINA

S&ME Project 1264-99-506

Date 11/14/2000  
 Static Depth to Water 29.41 Ft  
 Static Depth to Product 28.64 Ft  
 Static Product Thickness 0.77 Ft

Time	Measured DTW	Measured DTP	PT
0.00	29.41	28.64	0.77
0.25	29.80	29.20	0.6
0.50	29.70	29.10	0.6
0.75	29.60	29.05	0.55
1.00	29.50	29.02	0.48
1.25	29.42	28.99	0.43
1.50	29.40	28.95	0.45
1.75	29.37	28.90	0.47
2.00	29.34	28.86	0.48
2.25	29.33	28.84	0.49
2.50	29.31	28.80	0.51
2.75	29.27	28.77	0.5
3.00	29.25	28.75	0.5
3.50	29.23	28.72	0.51
4.00	29.22	28.70	0.52
4.50	29.22	28.68	0.54
5.00	29.20	28.65	0.55



**APPENDIX E**

**GROUNDWATER FATE AND TRANSPORT MODEL  
CALCULATIONS**

# BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence

Version 1.4

Hot Spot #3005

1264-99-506

Run Name

## Data Input Instructions:

1. Enter value directlv...or
  2. Calculate by filling in grey cells below. (To restore formulas, hit button below).
- Variable\* → Data used directly in model.  
 → Value calculated by model. (Don't enter any data).

### 1. HYDROGEOLOGY

Seepage Velocity*	Vs	8.6	(ft/yr)
		↑ or	
Hydraulic Conductivity	K	7.2E-05	(cm/sec)
Hydraulic Gradient	i	0.035	(ft/ft)
Porosity	n	0.3	(-)

### 2. DISPERSION

Longitudinal Dispersivity*	alpha x	42.0	(ft)
Transverse Dispersivity*	alpha y	14.0	(ft)
Vertical Dispersivity*	alpha z	2.1	(ft)
		↑ or	
Estimated Plume Length	Lp	420	(ft)

### 3. ADSORPTION

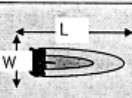
Retardation Factor*	R	1.08	(-)
		↑ or	
Soil Bulk Density	rho	1.7	(kg/l)
Partition Coefficient	Koc	81	(L/kg)
Fraction Organic Carbon	foc	1.8E-4	(-)

### 4. BIODEGRADATION

1st Order Decay Coeff*	lambda	0.0E+0	(per yr)
		↑ or	
Solute Half-Life	t-half	0.00	(year)
<b>or Instantaneous Reaction Model</b>			
Delta Oxygen*	DO	0	(mg/L)
Delta Nitrate*	NO3	0	(mg/L)
Observed Ferrous Iron*	Fe2+	0	(mg/L)
Delta Sulfate*	SO4	0	(mg/L)
Observed Methane*	CH4	0	(mg/L)

### 5. GENERAL

Modeled Area Length*	420	(ft)
Modeled Area Width*	30	(ft)
Simulation Time*	106	(yr)



### 6. SOURCE DATA

Source Thickness in Sat.Zone\* 1.86 (ft)

Source Zones:	Width* (ft)	Conc. (mg/L)*
1		
2		
3	30	1.5
4	0	0
5	0	0

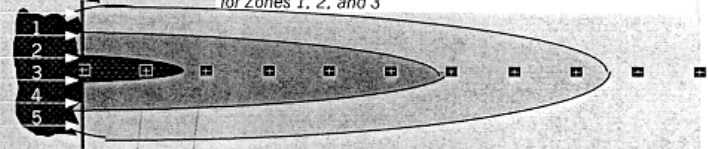
### Source Halflife (see Help):

Infinite	Infinite	(yr)
Inst. React.	1st Order	
Soluble Mass	infinite	(Kg)
In Source NAPL, Soil		

### 7. FIELD DATA FOR COMPARISON

Concentration (mg/L)											
Dist. from Source (ft)	0	42	84	126	168	210	252	294	336	378	420

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells  
If No Data Leave Blank or Enter "0"

### 8. CHOOSE TYPE OF OUTPUT TO SEE:

**RUN CENTERLINE**

View Output

**RUN ARRAY**

View Output

**Help**

Recalculate This Sheet

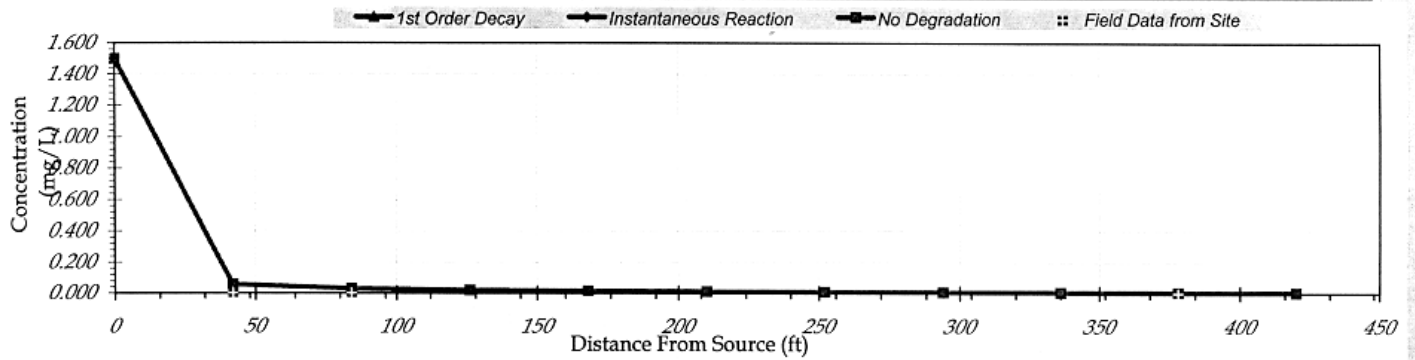
Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

BIOSCREEN Model Results  
Plume Equilibrium  
Benzene (106 years)

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft)										
	0	42	84	126	168	210	252	294	336	378	420
No Degradation	1.500	0.056	0.029	0.019	0.014	0.012	0.010	0.008	0.007	0.006	0.006
1st Order Decay	1.500	0.056	0.029	0.019	0.014	0.012	0.010	0.008	0.007	0.006	0.006
Inst. Reaction	1.500	0.056	0.029	0.019	0.014	0.012	0.010	0.008	0.007	0.006	0.006
Field Data from Site											



Calculate Animation

Time: 106 Years

Return to Input

Recalculate This Sheet

BIOSCREEN Model Results  
 Plume Equilibrium  
 Benzene (106 years)



# BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence

Version 1.4

Hot Spot #3005

1264-99-506

Run Name

## Data Input Instructions:

115  
↑ or  
0.02

1. Enter value directly....or
  2. Calculate by filling in grey cells below. (To restore formulas, hit button below).
- Variable\* → Data used directly in model.  
20 → Value calculated by model. (Don't enter any data).

### 1. HYDROGEOLOGY

Seepage Velocity*	Vs	8.6	(ft/yr)
or		↑ or	
Hydraulic Conductivity	K	7.2E-05	(cm/sec)
Hydraulic Gradient	i	0.035	(ft/ft)
Porosity	n	0.3	(-)

### 2. DISPERSION

Longitudinal Dispersivity*	alpha x	42.0	(ft)
Transverse Dispersivity*	alpha y	14.0	(ft)
Vertical Dispersivity*	alpha z	2.1	(ft)
or		↑ or	
Estimated Plume Length	Lp	420	(ft)

### 3. ADSORPTION

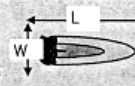
Retardation Factor*	R	1.08	(-)
or		↑ or	
Soil Bulk Density	rho	1.7	(kg/l)
Partition Coefficient	Koc	81	(L/Kg)
Fraction Organic Carbon	foc	1.8E-4	(-)

### 4. BIODEGRADATION

1st Order Decay Coeff*	lambda	0.0E+0	(per yr)
or		↑ or	
Solute Half-Life	t-half	0.00	(year)
<b>or Instantaneous Reaction Model</b>			
Delta Oxygen*	DO	0	(mg/L)
Delta Nitrate*	NO3	0	(mg/L)
Observed Ferrous Iron*	Fe2+	0	(mg/L)
Delta Sulfate*	SO4	0	(mg/L)
Observed Methane*	CH4	0	(mg/L)

### 5. GENERAL

Modeled Area Length*	420	(ft)
Modeled Area Width*	30	(ft)
Simulation Time*	106	(yr)



### 6. SOURCE DATA

Source Thickness in Sat.Zone\* 1.86 (ft)

Source Zones:

Width* (ft)	Conc. (mg/L)*
30	1.48
0	0
0	0

Source Halflife (see Help):

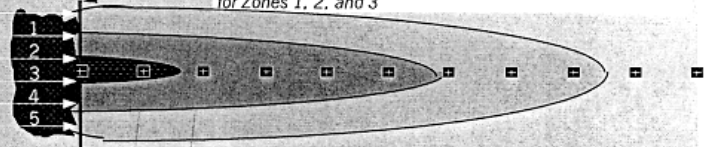
Infinite	Infinite	(yr)
Inst. React.	↑ 1st Order	
Soluble Mass	infinite	(Kg)

In Source NAPL; Soil

### 7. FIELD DATA FOR COMPARISON

Concentration (mg/L)												
Dist. from Source (ft)	0	42	84	126	168	210	252	294	336	378	420	

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells  
If No Data Leave Blank or Enter "0"

### 8. CHOOSE TYPE OF OUTPUT TO SEE:

**RUN CENTERLINE**

View Output

**RUN ARRAY**

View Output

**Help**

Recalculate This Sheet

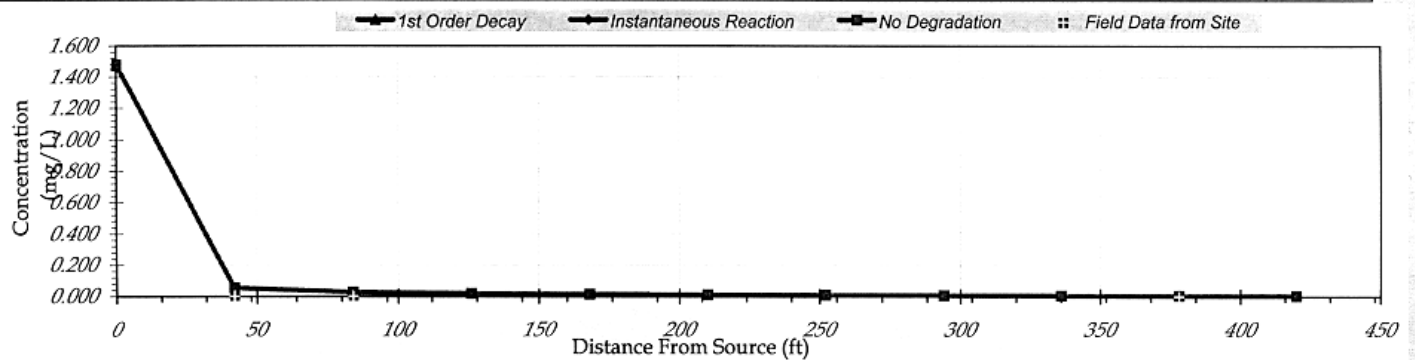
Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

BIOSCREEN Model Results  
SSTL Calculation  
Benzene (106 years)

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft)										
	0	42	84	126	168	210	252	294	336	378	420
No Degradation	1.480	0.056	0.028	0.019	0.014	0.011	0.009	0.008	0.007	0.006	0.005
1st Order Decay	1.480	0.056	0.028	0.019	0.014	0.011	0.009	0.008	0.007	0.006	0.005
Inst. Reaction	1.480	0.056	0.028	0.019	0.014	0.011	0.009	0.008	0.007	0.006	0.005
Field Data from Site											



Calculate Animation

Time: 106 Years

Return to Input

Recalculate This Sheet

BIOSCREEN Model Results  
 SSTL Calculation  
 Benzene (106 years)

# BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence

Version 1.4

Hot Spot #3005

1264-99-506

Run Name

## Data Input Instructions:

115

↑ or

0.02

1. Enter value directly....or
2. Calculate by filling in grey cells below. (To restore formulas, hit button below).

Variable\* → Data used directly in model.

20 → Value calculated by model. (Don't enter any data).

### 1. HYDROGEOLOGY

Seepage Velocity*	Vs	8.6	(ft/yr)
or		↑ or	
Hydraulic Conductivity	K	7.2E-05	(cm/sec)
Hydraulic Gradient	i	0.035	(ft/ft)
Porosity	n	0.3	(-)

### 2. DISPERSION

Longitudinal Dispervivity*	alpha x	42.0	(ft)
Transverse Dispervivity*	alpha y	14.0	(ft)
Vertical Dispervivity*	alpha z	2.1	(ft)
or		↑ or	
Estimated Plume Length	Lp	420	(ft)

### 3. ADSORPTION

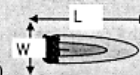
Retardation Factor*	R	1.00	(-)
or		↑ or	
Soil Bulk Density	rho	1.7	(kg/l)
Partition Coefficient	Koc	0	(L/kg)
Fraction Organic Carbon	foc	1.8E-4	(-)

### 4. BIODEGRADATION

1st Order Decay Coeff*	lambda	0.0E+0	(per yr)
or		↑ or	
Solute Half-Life	t-half	0.00	(year)
or Instantaneous Reaction Model			
Delta Oxygen*	DO	0	(mg/L)
Delta Nitrate*	NO3	0	(mg/L)
Observed Ferrous Iron*	Fe2+	0	(mg/L)
Delta Sulfate*	SO4	0	(mg/L)
Observed Methane*	CH4	0	(mg/L)

### 5. GENERAL

Modeled Area Length*	420	(ft)
Modeled Area Width*	30	(ft)
Simulation Time*	143	(yr)



### 6. SOURCE DATA

Source Thickness in Sat.Zone\* 1.86 (ft)

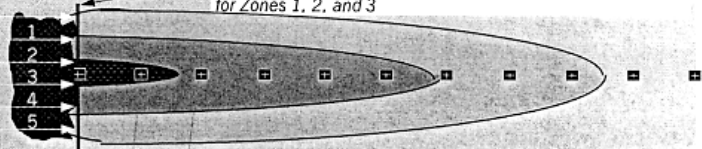
Source Zones:

Width* (ft)	Conc. (mg/L)*
30	2.2
0	0
0	0

Source Half-life (see Help):

Infinite	Infinite	(yr)
Inst. React.	1st Order	
Soluble Mass	infinite	(Kg)
In Source NAPL	Soil	

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells  
If No Data Leave Blank or Enter "0"

### 7. FIELD DATA FOR COMPARISON

Concentration (mg/L)											
Dist. from Source (ft)	0	42	84	126	168	210	252	294	336	378	420

### 8. CHOOSE TYPE OF OUTPUT TO SEE:

**RUN CENTERLINE**

View Output

**RUN ARRAY**

View Output

**Help**

Recalculate This Sheet

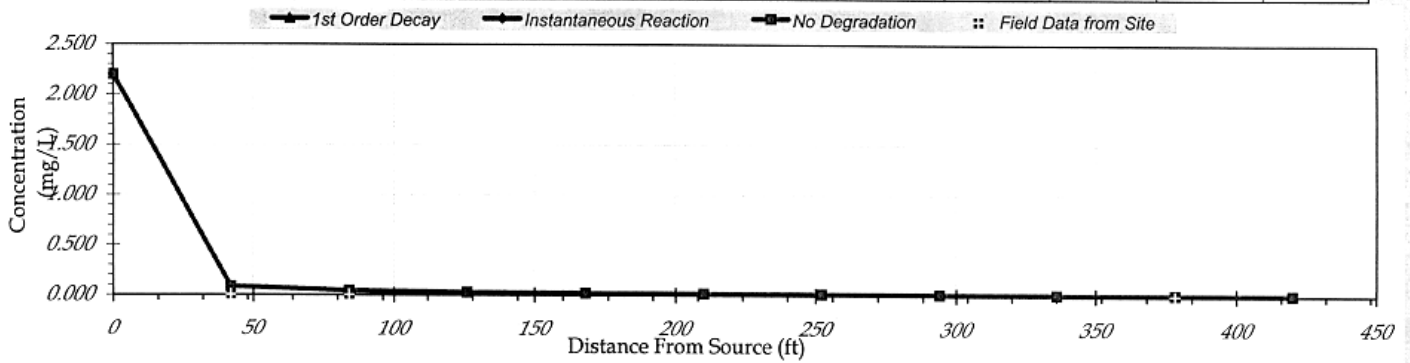
Paste Example Dataset

Restore Formulas for Vs, Dispervivities, R, lambda, other

BIOSCREEN Model Results  
Plume Equilibrium  
MTBE (143 years)

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft)										
	0	42	84	126	168	210	252	294	336	378	420
No Degradation	2.200	0.083	0.042	0.028	0.021	0.017	0.014	0.012	0.011	0.009	0.009
1st Order Decay	2.200	0.083	0.042	0.028	0.021	0.017	0.014	0.012	0.011	0.009	0.009
Inst. Reaction	2.200	0.083	0.042	0.028	0.021	0.017	0.014	0.012	0.011	0.009	0.009
Field Data from Site											



Time:

BIOSCREEN Model Results  
 Plume Equilibrium  
 MTBE (143 years)

# BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence

Version 1.4

Hot Spot #3005

1264-99-506

Run Name

### Data Input Instructions:

115

↑ or

0.02

1. Enter value directly... or
2. Calculate by filling in grey cells below. (To restore formulas, hit button below).

Variable\* → Data used directly in model.

20 → Value calculated by model. (Don't enter any data).

## 1. HYDROGEOLOGY

Seepage Velocity*	Vs	8.6	(ft/yr)
or		↑ or	
Hydraulic Conductivity	K	7.2E-05	(cm/sec)
Hydraulic Gradient	i	0.035	(ft/ft)
Porosity	n	0.3	(-)

## 2. DISPERSION

Longitudinal Dispersivity*	alpha x	42.0	(ft)
Transverse Dispersivity*	alpha y	14.0	(ft)
Vertical Dispersivity*	alpha z	2.1	(ft)
or		↑ or	
Estimated Plume Length	Lp	420	(ft)

## 3. ADSORPTION

Retardation Factor*	R	1.00	(-)
or		↑ or	
Soil Bulk Density	rho	1.7	(kg/l)
Partition Coefficient	Koc	0	(L/kg)
Fraction Organic Carbon	foc	1.8E-4	(-)

## 4. BIODEGRADATION

1st Order Decay Coeff*	lambda	0.0E+0	(per yr)
or		↑ or	
Solute Half-Life	t-half	0.00	(year)
or Instantaneous Reaction Model			
Delta Oxygen*	DO	0	(mg/L)
Delta Nitrate*	NO3	0	(mg/L)
Observed Ferrous Iron*	Fe2+	0	(mg/L)
Delta Sulfate*	SO4	0	(mg/L)
Observed Methane*	CH4	0	(mg/L)

## 5. GENERAL

Modeled Area Length*	420	(ft)
Modeled Area Width*	30	(ft)
Simulation Time*	143	(yr)



## 6. SOURCE DATA

Source Thickness in Sat. Zone\* 1.86 (ft)

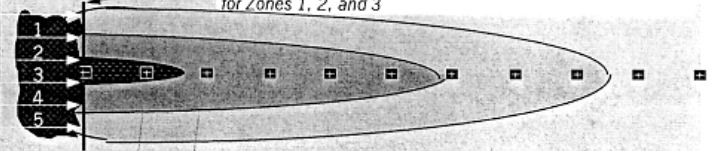
Source Zones:

Width* (ft)	Conc. (mg/L)*
30	10.3
0	0
0	0

Source Half-life (see Help):

Infinite	Infinite	(yr)
Inst. React.	↑ 1st Order	
Soluble Mass	infinite	(Kg)
In Source NAPL, Soil		

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells  
If No Data Leave Blank or Enter "0"

## 7. FIELD DATA FOR COMPARISON

Concentration (mg/L)

Dist. from Source (ft)

0	42	84	126	168	210	252	294	336	378	420
---	----	----	-----	-----	-----	-----	-----	-----	-----	-----

## 8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE

RUN ARRAY

View Output

View Output

Help

Recalculate This Sheet

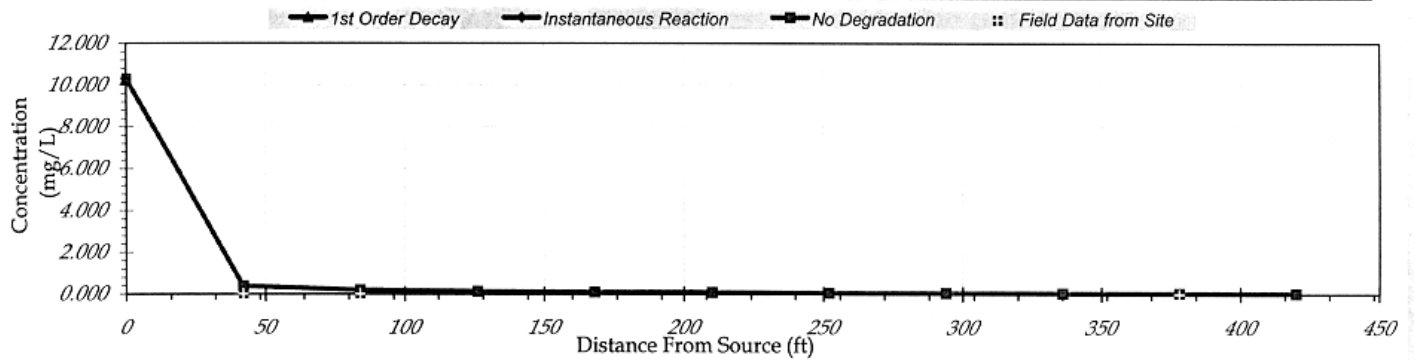
Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

BIOSCREEN Model Results  
SSTL Calculation  
MTBE (143 years)

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft)										
	0	42	84	126	168	210	252	294	336	378	420
No Degradation	10.300	0.388	0.197	0.132	0.099	0.080	0.066	0.057	0.050	0.044	0.040
1st Order Decay	10.300	0.388	0.197	0.132	0.099	0.080	0.066	0.057	0.050	0.044	0.040
Inst. Reaction	10.300	0.388	0.197	0.132	0.099	0.080	0.066	0.057	0.050	0.044	0.040
Field Data from Site											



Calculate Animation

Time:

143 Years

Return to Input

Recalculate This Sheet

BIOSCREEN Model Results  
SSTL Calculation  
MTBE (143 years)

# BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence

Version 1.4

Hot Spot #3005

1264-99-506

Run Name

### Data Input Instructions:

115

↑ or

0.02

1. Enter value directly...or
2. Calculate by filling in grey cells below. (To restore formulas, hit button below).

Variable\* → Data used directly in model.

20 → Value calculated by model. (Don't enter any data).

## 1. HYDROGEOLOGY

Seepage Velocity*	Vs	8.6	(ft/yr)
or		↑ or	
Hydraulic Conductivity	K	7.2E-05	(cm/sec)
Hydraulic Gradient	i	0.035	(ft/ft)
Porosity	n	0.3	(-)

## 2. DISPERSION

Longitudinal Dispersivity*	alpha x	42.0	(ft)
Transverse Dispersivity*	alpha y	14.0	(ft)
Vertical Dispersivity*	alpha z	2.1	(ft)
or		↑ or	
Estimated Plume Length	Lp	420	(ft)

## 3. ADSORPTION

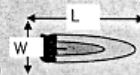
Retardation Factor*	R	2.57	(-)
or		↑ or	
Soil Bulk Density	rho	1.7	(kg/l)
Partition Coefficient	Koc	1543	(L/kg)
Fraction Organic Carbon	foc	1.8E-4	(-)

## 4. BIODEGRADATION

1st Order Decay Coeff*	lambda	0.0E+0	(per yr)
or		↑ or	
Solute Half-Life	t-half	0.00	(year)
<b>or Instantaneous Reaction Model</b>			
Delta Oxygen*	DO	0	(mg/L)
Delta Nitrate*	NO3	0	(mg/L)
Observed Ferrous Iron*	Fe2+	0	(mg/L)
Delta Sulfate*	SO4	0	(mg/L)
Observed Methane*	CH4	0	(mg/L)

## 5. GENERAL

Modeled Area Length*	420	(ft)
Modeled Area Width*	30	(ft)
Simulation Time*	300	(yr)



## 6. SOURCE DATA

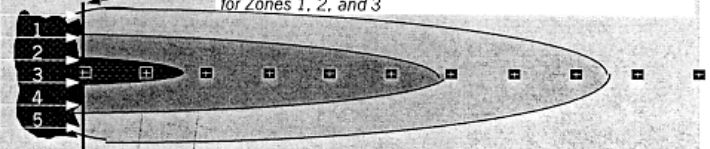
Source Thickness in Sat.Zone\* 1.86 (ft)

Source Zones:	
Width* (ft)	Conc. (mg/L)*
30	2
0	0
0	0

### Source Halflife (see Help):

Infinite	Infinite	(yr)
Inst. React.	↑ 1st Order	
Soluble Mass	infinite	(Kg)
In Source NAPL, Soil		

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells  
If No Data Leave Blank or Enter "0"

## 7. FIELD DATA FOR COMPARISON

Concentration (mg/L)												
Dist. from Source (ft)	0	42	84	126	168	210	252	294	336	378	420	

## 8. CHOOSE TYPE OF OUTPUT TO SEE:

**RUN CENTERLINE**

View Output

**RUN ARRAY**

View Output

**Help**

Recalculate This Sheet

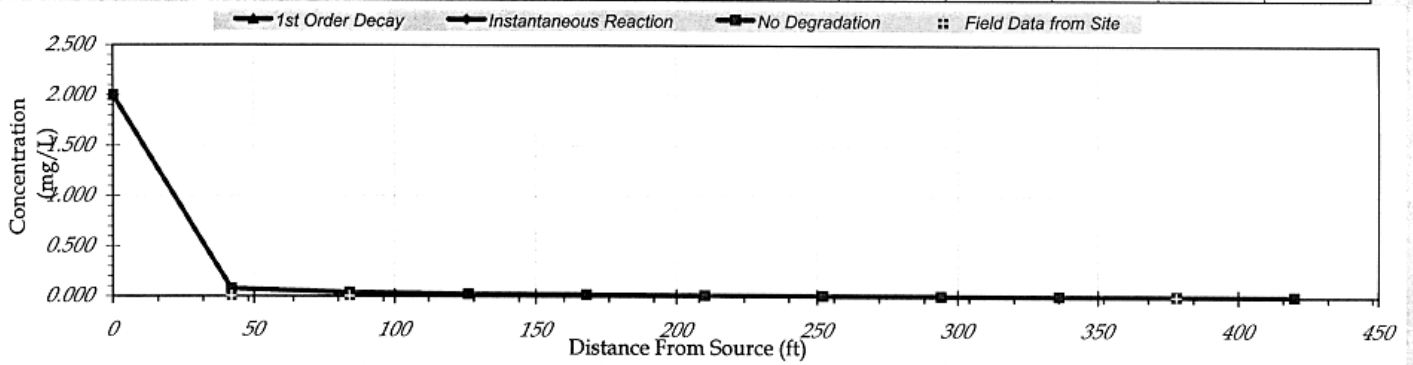
Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

BIOSCREEN Model Results  
Plume Equilibrium  
Naphthalene (300 years)

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft)										
	0	42	84	126	168	210	252	294	336	378	420
No Degradation	2.000	0.075	0.038	0.026	0.019	0.015	0.013	0.011	0.010	0.009	0.008
1st Order Decay	2.000	0.075	0.038	0.026	0.019	0.015	0.013	0.011	0.010	0.009	0.008
Inst. Reaction	2.000	0.075	0.038	0.026	0.019	0.015	0.013	0.011	0.010	0.009	0.008
Field Data from Site											



Time:

BIOSCREEN Model Results  
 Plume Equilibrium  
 Naphthalene (300 years)



# BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence

Version 1.4

Hot Spot #3005

1264-99-506

Run Name

## Data Input Instructions:

115

↑ or

0.02

1. Enter value directly....or
2. Calculate by filling in grey cells below. (To restore formulas, hit button below).

Variable\* → Data used directly in model.  
 20 → Value calculated by model.  
 (Don't enter any data).

### 1. HYDROGEOLOGY

Seepage Velocity*	Vs	8.6	(ft/yr)
or		↑ or	
Hydraulic Conductivity	K	7.2E-05	(cm/sec)
Hydraulic Gradient	i	0.035	(ft/ft)
Porosity	n	0.3	(-)

### 2. DISPERSION

Longitudinal Dispersivity*	alpha x	42.0	(ft)
Transverse Dispersivity*	alpha y	14.0	(ft)
Vertical Dispersivity*	alpha z	2.1	(ft)
or		↑ or	
Estimated Plume Length	Lp	420	(ft)

### 3. ADSORPTION

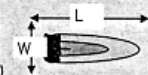
Retardation Factor*	R	2.57	(-)
or		↑ or	
Soil Bulk Density	rho	1.7	(kg/l)
Partition Coefficient	Koc	1543	(L/kg)
Fraction Organic Carbon	foc	1.8E-4	(-)

### 4. BIODEGRADATION

1st Order Decay Coeff*	lambda	0.0E+0	(per yr)
or		↑ or	
Solute Half-Life	t-half	0.00	(year)
or Instantaneous Reaction Model			
Delta Oxygen*	DO	0	(mg/L)
Delta Nitrate*	NO3	0	(mg/L)
Observed Ferrous Iron*	Fe2+	0	(mg/L)
Delta Sulfate*	SO4	0	(mg/L)
Observed Methane*	CH4	0	(mg/L)

### 5. GENERAL

Modeled Area Length*	420	(ft)
Modeled Area Width*	30	(ft)
Simulation Time*	300	(yr)



### 6. SOURCE DATA

Source Thickness in Sat.Zone\* 1.86 (ft)

Source Zones:

Width* (ft)	Conc. (mg/L)*
30	6.5
0	0
0	0

Source Halflife (see Help):

Infinite Infinite (yr)

Inst. React. 1st Order

Soluble Mass infinite (Kg)

In Source NAPL; Soil

### 7. FIELD DATA FOR COMPARISON

Concentration (mg/L)											
Dist. from Source (ft)	0	42	84	126	168	210	252	294	336	378	420

### 8. CHOOSE TYPE OF OUTPUT TO SEE:

**RUN CENTERLINE**

View Output

**RUN ARRAY**

View Output

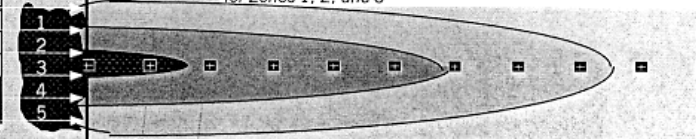
**Help**

Recalculate This Sheet

Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



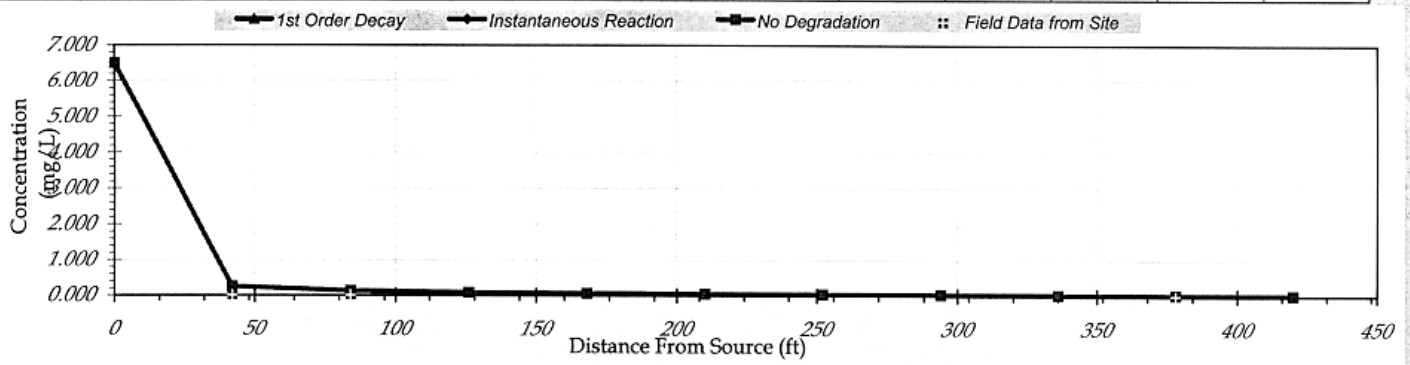
View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells  
 If No Data Leave Blank or Enter "0"

BIOSCREEN Model Results  
 SSTL Calculation  
 Naphthalene (300 years)

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft)										
	0	42	84	126	168	210	252	294	336	378	420
No Degradation	6.500	0.245	0.124	0.083	0.063	0.050	0.042	0.036	0.031	0.028	0.025
1st Order Decay	6.500	0.245	0.124	0.083	0.063	0.050	0.042	0.036	0.031	0.028	0.025
Inst. Reaction	6.500	0.245	0.124	0.083	0.063	0.050	0.042	0.036	0.031	0.028	0.025
Field Data from Site											



Calculate Animation

Time: 300 Years

Return to Input

Recalculate This Sheet

BIOSCREEN Model Results  
 SSTL Calculation  
 Naphthalene (300 years)

## **APPENDIX F**

# **SOIL LEACHING MODELING INFORMATION**



**Leachability Input Parameters**  
**Division of Underground Storage Tank Management**

**Site Data**

Facility Name Hot Spot Facility ID #: 12719

**Input Parameters**

Percent sand in Soil		<u>56.1</u>	%		5% < sand < 70%
Percent clay in soil		<u>23.2</u>	%		5% < clay < 60%
DAF		<u>8</u>			
Worst Case Soil Analyses	Benzene	<u>0.3</u>	mg/kg		C <sub>s</sub>
	Toluene	<u>20</u>	mg/kg		C <sub>s</sub>
	Ethylbenzene	<u>22</u>	mg/kg		C <sub>s</sub>
	Xylenes	<u>210</u>	mg/kg		C <sub>s</sub>
	Naphthalene	<u>67</u>	mg/kg		C <sub>s</sub>
	Other CoC			mg/kg	

Natural organic carbon content		<u>180</u>	mg/kg	f <sub>oc</sub>	<u>Figure</u>
TPH		<u>300</u>	mg/kg	TPH	
Porosity		<u>0.47</u>	decimal %	Φ	C1
Residual water content		<u>0.08</u>	decimal %	W <sub>r</sub>	C2
Bulk density of soil		<u>1.57</u>	g/cc	B <sub>d</sub>	C3
Soil hydraulic conductivity		<u>2.80E-04</u>	cm/sec	K <sub>f</sub>	C4
Average annual recharge		<u>25</u>	cm	H <sub>w</sub>	
Wetting front suction (negative number)		<u>-15</u>	cm	H <sub>f</sub>	C5
Distance from highest soil contamination to water table		<u>450</u>	cm	L	
Groundwater SSTL (or RBSL if appropriate)	<u>Compound Specific</u>		mg/L	C <sub>GWsstl</sub>	

List possible human exposure pathways from soil:

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## Leachability Results and Conclusions

### Site Data

Facility Name: \_\_\_\_\_ Hot Spot \_\_\_\_\_ Facility ID #: \_\_\_\_\_ 12719 \_\_\_\_\_

Chemical of Concern (Benzene, Naphthalene, etc.): \_\_\_\_\_ BENZENE \_\_\_\_\_

(Please use a separate form for each Chemical of Concern that exceeds the RBSL in soil.)

### Chemical Specific Data

Biodegradation half-life period	16	days	$t_{1/2}$	Refer to
Soil/water partitioning coefficient	81	mg/L	$K_{oc}$	Table
Henry's law constant	0.226		H'	C2

### Results

				Equation Set	Step
$GW_{sst}$	1.224	mg/L	$GW_{sst}$		
Total organic carbon content	0.000354	decimal %	$f_{cs}$	I	1
Air filled porosity	0.39	decimal %	$f$	I	2
Leachate concentration	2.32	mg/L	$C_w$	I	3
Infiltration time	487192.1	seconds	$t$	II	1
Velocity of water	954.57	ft/yr	$V_w$	II	2
Soil/water distribution coefficient	0.01458	mL/g	$K_d$	III	1
CoC percolation rate	910.24	ft/yr	$V_c$	III	2
Time to reach groundwater	5.92	days	$T_c$	IV	1
Concentration to protect groundwater	1.58	mg/L	$C_p$	IV	2
Site specific target level	1.63	mg/Kg	$C_{sst}$	V	

### Conclusions

Does concentration of CoC in soil exceed SSTL?	Yes	No
Risk of human exposure due to contaminated soil?	Yes	No



## Leachability Results and Conclusions

### Site Data

Facility Name: Hot Spot Facility ID #: 12719

Chemical of Concern (Benzene, Naphthalene, etc.): TOLUENE

(Please use a separate form for each Chemical of Concern that exceeds the RBSL in soil.)

### Chemical Specific Data

Biodegradation half-life period	<u>22</u>	days	$t_{1/2}$	Refer to
Soil/water partitioning coefficient	<u>133</u>	mg/L	$K_{oc}$	Table
Henry's law constant	<u>0.301</u>		$H'$	C2

### Results

				Equation Set	Step
GW <sub>sst</sub>	<u>1.000</u>	mg/L	GW <sub>sst</sub>		
Total organic carbon content	<u>0.000354</u>	decimal %	$f_{cs}$	I	1
Air filled porosity	<u>0.39</u>	decimal %	$f$	I	2
Leachate concentration	<u>121.63</u>	mg/L	$C_w$	I	3
Infiltration time	<u>487192.1</u>	seconds	$t$	II	1
Velocity of water	<u>954.57</u>	ft/yr	$V_w$	II	2
Soil/water distribution coefficient	<u>0.02394</u>	mL/g	$K_d$	III	1
CoC percolation rate	<u>883.89</u>	ft/yr	$V_c$	III	2
Time to reach groundwater	<u>6.10</u>	days	$T_c$	IV	1
Concentration to protect groundwater	<u>1.21</u>	mg/L	$C_p$	IV	2
Site specific target level	<u>1.59</u>	mg/Kg	$C_{sst}$	V	

### Conclusions

Does concentration of CoC in soil exceed SSTL?	Yes	No
Risk of human exposure due to contaminated soil?	Yes	No



## Leachability Results and Conclusions

### Site Data

Facility Name: \_\_\_\_\_ Hot Spot \_\_\_\_\_ Facility ID #: \_\_\_\_\_ 12719 \_\_\_\_\_

Chemical of Concern (Benzene, Naphthalene, etc.): \_\_\_\_\_ ETHYLBENZENE \_\_\_\_\_

(Please use a separate form for each Chemical of Concern that exceeds the RBSL in soil.)

### Chemical Specific Data

Biodegradation half-life period	10	days	t <sub>1/2</sub>	Refer to
Soil/water partitioning coefficient	176	mg/L	K <sub>oc</sub>	Table
Henry's law constant	0.28		H'	C2

### Results

				Equation Set	Step
GW <sub>sst</sub>	0.700	mg/L	GW <sub>sst</sub>		
Total organic carbon content	0.000354	decimal %	f <sub>cs</sub>	I	1
Air filled porosity	0.39	decimal %	f	I	2
Leachate concentration	126.47	mg/L	C <sub>w</sub>	I	3
Infiltration time	487192.1	seconds	t	II	1
Velocity of water	954.57	ft/yr	V <sub>w</sub>	II	2
Soil/water distribution coefficient	0.03168	mL/g	K <sub>d</sub>	III	1
CoC percolation rate	863.22	ft/yr	V <sub>c</sub>	III	2
Time to reach groundwater	6.24	days	T <sub>c</sub>	IV	1
Concentration to protect groundwater	1.08	mg/L	C <sub>p</sub>	IV	2
Site specific target level	1.50	mg/Kg	C <sub>sst</sub>	V	

### Conclusions

Does concentration of CoC in soil exceed SSTL?      **Yes**    No

Risk of human exposure due to contaminated soil?      **Yes**    No



## Leachability Results and Conclusions

### Site Data

Facility Name: Hot Spot Facility ID #: 12719  
 Chemical of Concern (Benzene, Naphthalene, etc.): XYLENES

(Please use a separate form for each Chemical of Concern that exceeds the RBSL in soil.)

### Chemical Specific Data

Biodegradation half-life period	<u>28</u>	days	t <sub>1/2</sub>	Refer to
Soil/water partitioning coefficient	<u>639</u>	mg/L	K <sub>oc</sub>	Table
Henry's law constant	<u>0.278</u>		H'	C2

### Results

				Equation Set	Step
GW <sub>sstl</sub>	<u>10.000</u>	mg/L	GW <sub>sstl</sub>		
Total organic carbon content	<u>0.000354</u>	decimal %	f <sub>cs</sub>	I	1
Air filled porosity	<u>0.39</u>	decimal %	f	I	2
Leachate concentration	<u>637.44</u>	mg/L	C <sub>w</sub>	I	3
Infiltration time	<u>487192.1</u>	seconds	t	II	1
Velocity of water	<u>954.57</u>	ft/yr	V <sub>w</sub>	II	2
Soil/water distribution coefficient	<u>0.11502</u>	mL/g	K <sub>d</sub>	III	1
CoC percolation rate	<u>689.61</u>	ft/yr	V <sub>c</sub>	III	2
Time to reach groundwater	<u>7.81</u>	days	T <sub>c</sub>	IV	1
Concentration to protect groundwater	<u>12.13</u>	mg/L	C <sub>p</sub>	IV	2
Site specific target level	<u>31.98</u>	mg/Kg	C <sub>sstl</sub>	V	

### Conclusions

Does concentration of CoC in soil exceed SSTL?	Yes	No
Risk of human exposure due to contaminated soil?	Yes	No





## Leachability Results and Conclusions

### Site Data

Facility Name: Hot Spot Facility ID #: 12719  
 Chemical of Concern (Benzene, Naphthalene, etc.): NAPHTHALENE

(Please use a separate form for each Chemical of Concern that exceeds the RBSL in soil.)

### Chemical Specific Data

Biodegradation half-life period	<u>48</u>	days	t <sub>1/2</sub>	Refer to
Soil/water partitioning coefficient	<u>1543</u>	mg/L	K <sub>oc</sub>	Table
Henry's law constant	<u>0.002</u>		H'	C2

### Results

				Equation Set	Step
GW <sub>sst</sub>	<u>0.025</u>	mg/L	GW <sub>sst</sub>		
Total organic carbon content	<u>0.000354</u>	decimal %	f <sub>cs</sub>	I	1
Air filled porosity	<u>0.39</u>	decimal %	f	I	2
Leachate concentration	<u>117.81</u>	mg/L	C <sub>w</sub>	I	3
Infiltration time	<u>487192.1</u>	seconds	t	II	1
Velocity of water	<u>954.57</u>	ft/yr	V <sub>w</sub>	II	2
Soil/water distribution coefficient	<u>0.27774</u>	mL/g	K <sub>d</sub>	III	1
CoC percolation rate	<u>495.17</u>	ft/yr	V <sub>c</sub>	III	2
Time to reach groundwater	<u>10.88</u>	days	T <sub>c</sub>	IV	1
Concentration to protect groundwater	<u>0.03</u>	mg/L	C <sub>p</sub>	IV	2
Site specific target level	<u>0.13</u>	mg/Kg	C <sub>sst</sub>	V	

### Conclusions

Does concentration of CoC in soil exceed SSTL?	<b>Yes</b>	<b>No</b>
Risk of human exposure due to contaminated soil?	<b>Yes</b>	<b>No</b>

**LETTER OF TRANSMITTAL**

S&ME, Inc.  
 155 Tradd Street  
 Spartanburg, South Carolina 29301  
 (864) 574-2360 Fax (864) 576-8730



DATE:	February 26, 2001
JOB NO.:	
ATTENTION:	Scott McInnis
COMPANY:	SCDHEC
ADDRESS:	2600 Bull Street Columbia, SC 29201-1708
RE:	Disposal Manifest

WE ARE SENDING YOU  Attached  Under separate cover via \_\_\_\_\_ the following items:

Shop drawings  Prints  Plans  Samples  Specifications

Copy of letter(s)  Reports  Invoice(s)

COPIES	DATED	NO.	DESCRIPTION
1	2/2/01		Disposal Manifest for Hot Spot #3005 (Tier II); Site ID# 12719

THESE ARE TRANSMITTED as checked below:

- For approval
- For your use
- As requested
- For review and comment
- FOR BIDS DUE \_\_\_\_\_ 20\_\_\_\_
- PRINTS RETURNED AFTER LOAN TO US
- Other \_\_\_\_\_

**RECEIVED**  
 FEB 28 2001  
 Bureau of Underground  
 Storage Tank Management

REMARKS:

SIGNED: Michael P. O'Connell  
 Michael P. O'Connell

IF ENCLOSURES ARE NOT AS NOTED, PLEASE NOTIFY US AT ONCE.

This Letter of Transmittal and the documents accompanying this Letter of Transmittal contain information from S&ME, Inc., which is confidential and legally privileged. The information is intended only for the use of the individual or entity named on this Letter of Transmittal. If you are not the intended recipient, you are hereby notified that any disclosure, copying, distribution or the taking of any action in reliance on these documents is strictly prohibited.

# GARCO, Inc.

---

Environmental, Industrial & Recycling Services

## *Certificate of Disposal*

**GENERATOR:**

Hot Spot #3005  
Chesnee, SC

**MATERIAL ACCEPTED:**

3 drums of non-hazardous water

**DISPOSAL METHOD:**

Waste Water Treatment

GARCO, Inc. accepted the above listed materials on 2/2/01. The material has been assigned the following GARCO identification number(s).

GARCO ID No.(s) AQ-2531 through AQ-2533

GARCO, Inc. has accepted custody of the above referenced non-hazardous material. This material has been determined to be non-hazardous by a material profile, generator knowledge, and/or analytical data provided to GARCO, Inc.



Greg Russell  
President

# GARCO, Inc.

---

Environmental, Industrial & Recycling Services

## *Certificate of Disposal*

**GENERATOR:**

Hot Spot #3005  
Chesnee, SC

**MATERIAL ACCEPTED:**

12 drums of non-hazardous soil

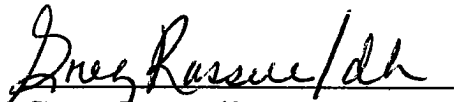
**DISPOSAL METHOD:**

Bio-Remediation

GARCO, Inc. accepted the above listed materials on 2/2/01. The material has been assigned the following GARCO identification number(s).

GARCO ID No.(s) SP-3100 through SP-3111

GARCO, Inc. has accepted custody of the above referenced non-hazardous material. This material has been determined to be non-hazardous by a material profile, generator knowledge, and/or analytical data provided to GARCO, Inc.

  
Greg Russell  
President

# NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

<b>NON-HAZARDOUS WASTE MANIFEST</b>		1. Generator's US EPA ID No. <p style="text-align: center;">NA</p>		Manifest Document No. <b>CLIENT</b>		Page 1 of 1	
3. Generator's Name and Mailing Address <b>Hot Spot 107 Hampton St. Chesnee, SC</b>		4. Generator's Phone ( )		01001		1	
5. Transporter 1 Company Name <b>GARCO, Inc.</b>		6. US EPA ID Number <p style="text-align: center;">NA</p>		A. State Transporter's ID			
7. Transporter 2 Company Name		8. US EPA ID Number		B. Transporter 1 Phone <b>336 683 0911</b>			
9. Designated Facility Name and Site Address <b>GARCO, Inc. 2509 N. Fayetteville St. Asheboro, NC 27203</b>		10. US EPA ID Number <p style="text-align: center;">NA</p>		C. State Transporter's ID			
				D. Transporter 2 Phone			
				E. State Facility's ID			
				F. Facility's Phone <b>336 683 0911</b>			
11. WASTE DESCRIPTION			12. Containers		13. Total Quantity		14. Unit Wt./Vol.
a. <b>Non-hazardous Material</b>			No. Type <b>12 DM</b>		<b>7,200</b>		<b>P</b>
b. <b>Non-hazardous Material</b>			<b>3 DM</b>		<b>900</b>		<b>P</b>
c.							
d.							
G. Additional Descriptions for Materials Listed Above				H. Handling Codes for Wastes Listed Above			
11a). <b>Soll SP-3100 thru SP-3111</b>							
11b). <b>Water AQ-2531 thru AQ-2533</b>							
15. Special Handling Instructions and Additional Information  <b>24 Hour ER# 800-614-1204</b>							
16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.							
Printed/Typed Name				Signature		Date	
						Month Day Year	
17. Transporter 1 Acknowledgement of Receipt of Materials							
Printed/Typed Name <b>James Rowan</b>				Signature		Date	
						Month Day Year <b>2/2/01</b>	
18. Transporter 2 Acknowledgement of Receipt of Materials							
Printed/Typed Name				Signature		Date	
						Month Day Year	
19. Discrepancy Indication Space							
20. Facility Owner or Operator; Certification of receipt of the waste materials covered by this manifest, except as noted in item 19							
Printed/Typed Name <b>Dollie Hilliard</b>				Signature		Date	
						Month Day Year <b>2/2/01</b>	

**NON-HAZARDOUS WASTE**





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JAN 02 2001

Bureau of Underground  
Storage Tank Management

December 29, 2000

South Carolina Department of  
Health and Environmental Control  
2600 Bull Street  
Columbia, SC 29201-1708

2BA

S&ME # 57

CP# 13391

ATTENTION: Scott McInnis

Reference: **CONTINUED ASSESSMENT PLAN**  
Hot Spot #3005  
Site ID #: 12719  
107 Hampton Street  
Chesnee, South Carolina  
S&ME Project No. 1264-99-506

GWS for  
ACA

Dear Mr. McInnis:

In response to the request for an additional sampling event at the referenced site, S&ME is submitting the attached assessment component cost proposal.

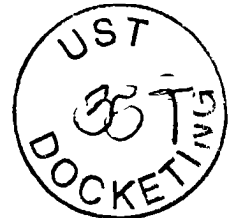
If you have any questions, please call us at (864) 574-2360.

Sincerely,

**S&ME, Inc.**

Michael P. O'Connell  
Staff Professional

Stanford Lummus, P.E.  
Senior Environmental Engineer



*Judith*  
Cc: Judy Laughter, R.L. Jordan Oil Company

Env00/6499506/SamplePlan

P.O. Box 2527  
Spt. SC 29304



UNDERGROUND STORAGE TANK PROGRAM  
BUREAU OF LAND AND WASTE MANAGEMENT  
2600 Bull Street, Columbia, South Carolina 29201  
Phone (800) 826-5435 Fax (803) 898-4330

2600 Bull Street  
Columbia, SC 29201-1708

DEC 20 2000

JORDAN OIL CO.  
JUDITH LAUGHTER  
P.O. BOX 2527  
SPARTANBURG, SC 29304

Re: Hot Spot # 3005  
**UST Permit #12719**  
Tier II Received November 29, 2000  
Spartanburg County

Dear Ms. Laughter:

The referenced report has been reviewed by the Underground Storage Tank Program of the South Carolina Department of Health and Environmental Control (SCDHEC). Chemicals of Concern (COC) were detected above Site Specific Target Levels; therefore, active corrective action (ACA) is required.

The next scope of work to be implemented is an analysis of ground-water samples prior to ACA. Please have your contractor complete and submit the enclosed Assessment Component Cost Proposal form within thirty days of the date of this letter. Every component may not be necessary to complete the above scope of work. The SUPERB allowable cost for each component is included on the Assessment Component Cost Proposal form. All site rehabilitation activities associated with the UST release must be performed by a SCDHEC certified site rehabilitation contractor in accordance with R.61-98.

On all correspondence regarding this site, please reference UST Permit #12719. If you have any questions concerning this correspondence, please contact Scott McInnis at 803-898-4365 or 800-826-5435 (within SC only).

Sincerely,

W.A. (Scotty) McInnis, III, P.G., Hydrogeologist  
Owner/Operator Assistance Section  
Assessment & Corrective Action Division

Enc: Assessment Component Cost Proposal

cc: S&ME, Attn: David Klemm, 155 Tradd Street, Spartanburg, SC 29301 (w/enc)  
Financial Section (w/copy of CP)  
Read and **Technical File** (n/enc)

wam/12719sam.aca  
DHEC/UST/121400



MAR 02 2001

Ms. Judith Laughter  
Jordan Oil Company  
Post Office Box 2527  
Spartanburg, South Carolina 29304



Re: Hot Spot #3005  
UST Permit #12719, CP #13391  
Release Reported November 3, 1993  
Cost Proposal received January 2, 2001  
Spartanburg County

Dear Ms. Laughter:

The Underground Storage Tank Program of the Bureau of Land and Waste Management recognizes your commitment to continue work at this site using your own contractor.

All releases from regulated underground storage tanks that have been reported to the Department have been prioritized using a ranking system that evaluates the risk to human health and the environment. Due to impact of petroleum hydrocarbons in an off-site private supply well, your site's priority classification is 2A. Therefore, SUPERB funds are available, or will soon become available, for additional site investigative activities at this time.

The Bureau has reviewed the technical file of the referenced facility. The file documents that Active Corrective Action (ACA) will be required at the site in the near future. Before this ACA may be implemented, it is necessary to obtain current ground-water data from all monitoring wells associated with the release. Cost Proposal #13391 has been approved to sample all monitoring wells associated with the release for the constituents outlined in the enclosed cost agreement.

Please have your consultant complete the sampling report and submit an assessment component invoice within sixty days of the date of this letter. All documents involving geologic interpretation or engineering must be prepared by a qualified professional registered in the State of South Carolina.

S&ME, Inc. can submit an invoice for direct billing from the SUPERB account. Please note that all applicable South Carolina certification requirements apply to the laboratory services, well installation, and report preparation. All site rehabilitation activities must be performed and submitted by a South Carolina Certified Underground Storage Tank Site Rehabilitation Contractor.

**A Report of Findings and the invoice is due within 60 days from the date of this letter. Interim invoices may not be submitted for this scope of work. 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 Department is obtained. If for any reason additional tasks will be completed, these additional tasks and the associated cost must be preapproved by the Department for the cost to be paid. The SCDHEC 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, SCDHEC reserves the right to question and/or reject costs if deemed unreasonable. The SCDHEC reserves the right to audit project records at any time during the project or after completion of work.

The Bureau grants preapproval for transportation of virgin petroleum contaminated soil and groundwater from the referenced site to a permitted treatment facility. The contaminated soil or groundwater must be properly stored in labeled containers or covered with plastic as appropriate. The contaminated soil and/or ground water must be accepted by the approved treatment facility. There can be no spillage or leakage in transport. 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 final report. If the levels of petroleum contamination based on laboratory analysis are below risk-based screening levels, please contact the project manager for approval to dispose of soil and/or ground water on site. The SUPERB Account will not compensate for transportation or treatment of clean soil and/or ground water.

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

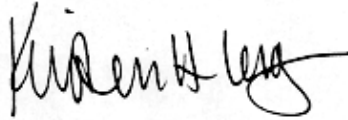


Ms. Laughter  
Page 2

NOV 15 10 00 AM

On all correspondence concerning this site, please reference **UST Permit #12719 and Cost Proposal #13391**. If there are any questions concerning this project, please contact me at (803) 898-4325 or (800) 826-5435 (within South Carolina only).

Sincerely,



Kristen H. Long, Hydrogeologist  
Owner/Operator Assistance Section  
Assessment and Corrective Action Division  
Underground Storage Tank Program  
Bureau of Land and Waste Management

enc: Approved Cost Proposal

cc: **Technical File**  
Financial File  
Mr. Michael O'Connell, S&ME, 155 Tradd Street, Spartanburg, South Carolina 29301

SCDHEC/UST/021201



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APR 04 2001

Underground Storage  
Tank Program

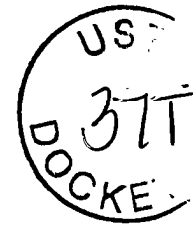
March 30, 2001

R.L. Jordan Oil Company  
P.O. Box 2527  
Spartanburg, SC 29304-2527

.76 FT

ATTENTION: Judy Laughter

Reference: **GROUNDWATER SAMPLING**  
Hot Spot #3005  
Site ID #: 12719, CP #13391  
107 Hampton Street  
Chesnee, South Carolina  
S&ME Project No. 1264-99-506



na  
**SCANNED**

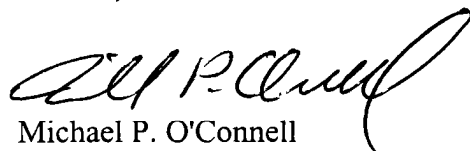
Dear Ms. Laughter:

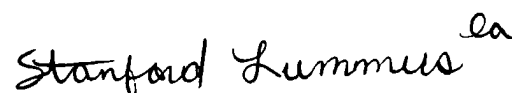
Attached is the analytical data from the groundwater sampling event performed at Hot Spot #3005 on Hampton Street in Chesnee, South Carolina. Table 1 is a summary of the historical CoC concentrations at the site. An updated groundwater potentiometric surface map, the analytical results, and disposal manifest are attached. Note that MW-5 has not been sampled during the past two sampling events because it has been dry.

If you have any questions, please call us at (864) 574-2360.

Sincerely,

**S&ME, Inc.**

  
Michael P. O'Connell  
Staff Professional

  
Stanford Lummus, P.E.  
Senior Environmental Engineer

cc: Eric Owens, SCDHEC

Env01/6499506/sampling

S&ME, Inc.  
155 Tradd Street  
Spartanburg, South Carolina 29301

(864) 574-2360  
(864) 576-8730 fax  
(864) 232-8987 Greenville

[www.smeinc.com](http://www.smeinc.com)

**TABLE 1**  
**HISTORICAL GROUNDWATER QUALITY DATA**  
**HOT SPOT #3005**  
**HIGHWAY 221**  
**CHESNEE, SOUTH CAROLINA**  
**S&ME PROJECT 1264-99-506**

WELL	DATE μg/L	B μg/L	E μg/L	T μg/L	X μg/L	MTBE μg/L	NAPHTH μg/L	PAHs μg/L
• MW-1	04/24/96	27.4	46	88.3	170.1	NA	55.7	<10
	09/15/99	FP	FP	FP	FP	FP	FP	FP
	10/13/00	FP	FP	FP	FP	FP	FP	FP
	03/09/01	FP	FP	FP	FP	FP	FP	FP
• MW-3	09/15/99	500	100	220	460	1100	<5.0	<5.0
	10/16/00	1500	290	170	2000	2200	3.6	<10
	03/09/01	3000	400	130	3100	6400	<10	<10
• MW-4	09/20/99	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
• MW-5	09/15/99	<5.0	5	21	20	<5.0	<5.0	<5.0
	10/13/00	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	03/08/01	DRY	DRY	DRY	DRY	DRY	DRY	DRY
• MW-6	10/16/00	7.4	29	3.5	81	<1.0	44	<10
	03/08/01	3.3	36	<2.0	76	<2.0	68	<10
• MW-7	10/16/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
	03/09/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
• MW-8	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
• MW-9	10/16/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
	03/09/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
• MW-10	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
• MW-11	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
• MW-12	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
• MW-13	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
• MW-1D	10/16/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10

B - Benzene

T - Toluene

MTBE - Methyl tert butyl ether

E - Ethylbenzene

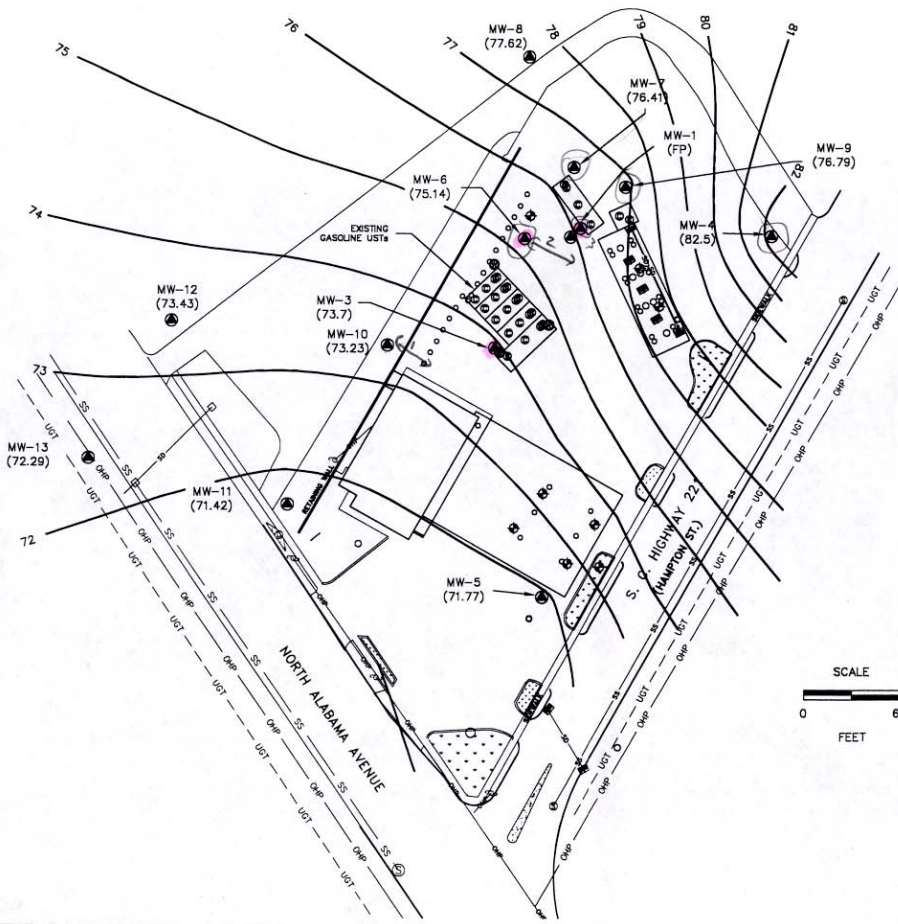
X - Xylenes

NAPHTH - Naphthalene

PAHs - Poly Nuclear Aromatic Hydrocarbons

FP - Free Product in the well

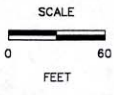
NA - Not Analyzed



**LEGEND**

- MONITORING WELL LOCATION
- ⊕ SOIL BORING LOCATION
- 75— GROUNDWATER CONTOUR
- (75.14) GROUNDWATER ELEVATION

SOURCE: SITE MAP OF HOT SPOT STORE #36  
 FOR S&ME  
 BY GRAMLING BROS. SURVEYING  
 DATE: SEPTEMBER 20, 1999



GROUNDWATER POTENTIOMETRIC SURFACE  
 HOT SPOT #3005  
 SITE ID #12719  
 S.C. HIGHWAY 221  
 CHESNEE, SOUTH CAROLINA

SCALE: 1" = 60'	DRAWN BY: SB	CHK'D BY:
JOB NO: 1264-99-506	DATE: 03-29-01	FIGURE NO: 1

CAD FILE: K:\WORK\2264\1000A\1000A\1000A.DWG



**ENVIRONMENTAL  
SCIENCE CORP.**

**RECEIVED**

**MAR 25 2001**

12065 Lebanon Rd.  
Mt. Juliet, TN 37122  
(615) 758-5858  
1-800-767-5859  
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

**REPORT OF ANALYSIS**

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

March 19, 2001

Date Received : March 09, 2001  
Description : Water - Hot Spot 3005  
Sample ID : MW-8  
Collected By : Bill Hatton  
Collection Date : 03/08/01 12:15

ESC Sample # : L38205-01  
ESC Key : SMESPAR-1264-99-506  
Site ID :  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Methane	BDL		ug/l	8015M	03/16/01	1
Nitrate	1300	100	ug/l	9056	03/09/01	1
Sulfate	BDL	5000	ug/l	9056	03/09/01	1
Ferrous Iron	250	25.	ug/l	3500Fe	03/09/01	1
Lead	7.6	5.0	ug/l	6010	03/12/01	1
Benzene	BDL	1.0	ug/l	8260B	03/10/01	1
Toluene	BDL	1.0	ug/l	8260B	03/10/01	1
Ethylbenzene	BDL	1.0	ug/l	8260B	03/10/01	1
Total Xylenes	BDL	3.0	ug/l	8260B	03/10/01	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	03/10/01	1
Naphthalene	BDL	1.0	ug/l	8260B	03/10/01	1
1,2-Dibromoethane	BDL	1.0	ug/l	8260B	03/10/01	1
Surrogate Recovery						
Toluene-d8	100		% Rec.	8260B	03/10/01	1
Dibromofluoromethane	110		% Rec.	8260B	03/10/01	1
4-Bromofluorobenzene	100		% Rec.	8260B	03/10/01	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	10.	ug/l	8270C	03/16/01	1
Acenaphthene	BDL	10.	ug/l	8270C	03/16/01	1
Acenaphthylene	BDL	10.	ug/l	8270C	03/16/01	1
Benzo(a)anthracene	BDL	10.	ug/l	8270C	03/16/01	1
Benzo(a)pyrene	BDL	10.	ug/l	8270C	03/16/01	1
Benzo(b)fluoranthene	BDL	10.	ug/l	8270C	03/16/01	1
Benzo(k)fluoranthene	BDL	10.	ug/l	8270C	03/16/01	1
Chrysene	BDL	10.	ug/l	8270C	03/16/01	1
Dibenz(a,h)anthracene	BDL	10.	ug/l	8270C	03/16/01	1
Fluoranthene	BDL	10.	ug/l	8270C	03/16/01	1
Fluorene	BDL	10.	ug/l	8270C	03/16/01	1
Indeno(1,2,3-cd)pyrene	BDL	10.	ug/l	8270C	03/16/01	1
Naphthalene	BDL	10.	ug/l	8270C	03/16/01	1
Phenanthrene	BDL	10.	ug/l	8270C	03/16/01	1
Pyrene	BDL	10.	ug/l	8270C	03/16/01	1
Surrogate Recovery						
Nitrobenzene-d5	86.		% Rec.	8270C	03/16/01	1

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233



**ENVIRONMENTAL  
SCIENCE CORP.**

12065 Lebanon Rd.  
Mt. Juliet, TN 37122  
(615) 758-5858  
1-800-767-5859  
Fax (615) 758-5859  
  
Tax I.D. 62-0814289  
  
Est. 1970

REPORT OF ANALYSIS

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

March 19, 2001

Date Received : March 09, 2001  
Description : Water - Hot Spot 3005  
Sample ID : MW-8  
Collected By : Bill Hatton  
Collection Date : 03/08/01 12:15

ESC Sample # : L38205-01  
ESC Key : SMESPAR-1264-99-506  
Site ID :  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
2-Fluorobiphenyl	80.		% Rec.	8270C	03/16/01	1
p-Terphenyl-d14	67.		% Rec.	8270C	03/16/01	1

Tom Mellette, ESC Representative

BDL - Below Detection Limit  
Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:  
A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233  
Note:

The reported analytical results relate only to the sample submitted.  
This report shall not be reproduced, except in full, without the written approval from ESC.



**ENVIRONMENTAL  
SCIENCE CORP.**

12065 Lebanon Rd.  
Mt. Juliet, TN 37122  
(615) 758-5858  
1-800-767-5859  
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

March 19, 2001

Date Received : March 09, 2001  
Description : Water - Hot Spot 3005  
Sample ID : MW-12  
Collected By : Bill Hatton  
Collection Date : 03/08/01 12:30

ESC Sample # : L38205-02  
ESC Key : SMESPAR-1264-99-506  
Site ID :  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Methane	BDL		ug/l	8015M	03/16/01	1
Nitrate	1500	100	ug/l	9056	03/09/01	1
Sulfate	20000	5000	ug/l	9056	03/11/01	1
Ferrous Iron	120	25.	ug/l	3500Fe	03/09/01	1
Lead	BDL	5.0	ug/l	6010	03/12/01	1
Benzene	BDL	1.0	ug/l	8260B	03/10/01	1
Toluene	BDL	1.0	ug/l	8260B	03/10/01	1
Ethylbenzene	BDL	1.0	ug/l	8260B	03/10/01	1
Total Xylenes	BDL	3.0	ug/l	8260B	03/10/01	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	03/10/01	1
Naphthalene	BDL	1.0	ug/l	8260B	03/10/01	1
1,2-Dibromoethane	BDL	1.0	ug/l	8260B	03/10/01	1
Surrogate Recovery						
Toluene-d8	100		% Rec.	8260B	03/10/01	1
Dibromofluoromethane	110		% Rec.	8260B	03/10/01	1
4-Bromofluorobenzene	110		% Rec.	8260B	03/10/01	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	10.	ug/l	8270C	03/15/01	1
Acenaphthene	BDL	10.	ug/l	8270C	03/15/01	1
Acenaphthylene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(a)anthracene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(a)pyrene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(b)fluoranthene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(g,h,i)perylene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(k)fluoranthene	BDL	10.	ug/l	8270C	03/15/01	1
Chrysene	BDL	10.	ug/l	8270C	03/15/01	1
Dibenz(a,h)anthracene	BDL	10.	ug/l	8270C	03/15/01	1
Fluoranthene	BDL	10.	ug/l	8270C	03/15/01	1
Fluorene	BDL	10.	ug/l	8270C	03/15/01	1
Indeno(1,2,3-cd)pyrene	BDL	10.	ug/l	8270C	03/15/01	1
Naphthalene	BDL	10.	ug/l	8270C	03/15/01	1
Phenanthrene	BDL	10.	ug/l	8270C	03/15/01	1
Pyrene	BDL	10.	ug/l	8270C	03/15/01	1
Surrogate Recovery						

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233



**ENVIRONMENTAL  
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12065 Lebanon Rd.  
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(615) 758-5858  
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Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

March 19, 2001

Date Received : March 09, 2001  
Description : Water - Hot Spot 3005  
Sample ID : MW-12  
Collected By : Bill Hatton  
Collection Date : 03/08/01 12:30

ESC Sample # : L38205-02  
ESC Key : SMESPAR-1264-99-506  
Site ID :  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Nitrobenzene-d5	78.		% Rec.	8270C	03/15/01	1
2-Fluorobiphenyl	83.		% Rec.	8270C	03/15/01	1
p-Terphenyl-d14	67.		% Rec.	8270C	03/15/01	1

Tom Mellette, ESC Representative

BDL - Below Detection Limit  
Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

Note:

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**REPORT OF ANALYSIS**

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

March 19, 2001

Date Received : March 09, 2001  
Description : Water - Hot Spot 3005  
Sample ID : MW-13  
Collected By : Bill Hatton  
Collection Date : 03/08/01 12:45

ESC Sample # : L38205-03  
ESC Key : SMESPAR-1264-99-506  
Site ID :  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Methane	BDL		ug/l	8015M	03/16/01	1
Nitrate	1600	100	ug/l	9056	03/09/01	1
Sulfate	23000	5000	ug/l	9056	03/09/01	1
Ferrous Iron	480	25.	ug/l	3500Fe	03/09/01	1
Lead	BDL	5.0	ug/l	6010	03/12/01	1
Benzene	BDL	1.0	ug/l	8260B	03/10/01	1
Toluene	BDL	1.0	ug/l	8260B	03/10/01	1
Ethylbenzene	BDL	1.0	ug/l	8260B	03/10/01	1
Total Xylenes	BDL	3.0	ug/l	8260B	03/10/01	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	03/10/01	1
Naphthalene	BDL	1.0	ug/l	8260B	03/10/01	1
1,2-Dibromoethane	BDL	1.0	ug/l	8260B	03/10/01	1
Surrogate Recovery						
Toluene-d8	100		% Rec.	8260B	03/10/01	1
Dibromofluoromethane	100		% Rec.	8260B	03/10/01	1
4-Bromofluorobenzene	110		% Rec.	8260B	03/10/01	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	10.	ug/l	8270C	03/15/01	1
Acenaphthene	BDL	10.	ug/l	8270C	03/15/01	1
Acenaphthylene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(a)anthracene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(a)pyrene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(b)fluoranthene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(g,h,i)perylene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(k)fluoranthene	BDL	10.	ug/l	8270C	03/15/01	1
Chrysene	BDL	10.	ug/l	8270C	03/15/01	1
Dibenz(a,h)anthracene	BDL	10.	ug/l	8270C	03/15/01	1
Fluoranthene	BDL	10.	ug/l	8270C	03/15/01	1
Fluorene	BDL	10.	ug/l	8270C	03/15/01	1
Indeno(1,2,3-cd)pyrene	BDL	10.	ug/l	8270C	03/15/01	1
Naphthalene	BDL	10.	ug/l	8270C	03/15/01	1
Phenanthrene	BDL	10.	ug/l	8270C	03/15/01	1
Pyrene	BDL	10.	ug/l	8270C	03/15/01	1
Surrogate Recovery						

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233



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Tax I.D. 62-0814289

Est. 1970

**REPORT OF ANALYSIS**

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

March 19, 2001

Date Received : March 09, 2001  
Description : Water - Hot Spot 3005  
Sample ID : MW-13  
Collected By : Bill Hatton  
Collection Date : 03/08/01 12:45

ESC Sample # : L38205-03  
ESC Key : SMESPAR-1264-99-506  
Site ID :  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Nitrobenzene-d5	74.		% Rec.	8270C	03/15/01	1
2-Fluorobiphenyl	78.		% Rec.	8270C	03/15/01	1
p-Terphenyl-d14	60.		% Rec.	8270C	03/15/01	1

Tom Mellette ESC Representative

BDL - Below Detection Limit  
Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:  
A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
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REPORT OF ANALYSIS

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

March 19, 2001

Date Received : March 09, 2001  
Description : Water - Hot Spot 3005  
Sample ID : MW-11  
Collected By : Bill Hatton  
Collection Date : 03/08/01 12:58

ESC Sample # : L38205-04  
ESC Key : SMESPAR-1264-99-506  
Site ID :  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Methane	BDL		ug/l	8015M	03/16/01	1
Nitrate	3100	100	ug/l	9056	03/09/01	1
Sulfate	6700	5000	ug/l	9056	03/09/01	1
Ferrous Iron	210	25.	ug/l	3500Fe	03/09/01	1
Lead	BDL	5.0	ug/l	6010	03/12/01	1
Benzene	BDL	1.0	ug/l	8260B	03/10/01	1
Toluene	BDL	1.0	ug/l	8260B	03/10/01	1
Ethylbenzene	BDL	1.0	ug/l	8260B	03/10/01	1
Total Xylenes	BDL	3.0	ug/l	8260B	03/10/01	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	03/10/01	1
Naphthalene	BDL	1.0	ug/l	8260B	03/10/01	1
1,2-Dibromoethane	BDL	1.0	ug/l	8260B	03/10/01	1
Surrogate Recovery						
Toluene-d8	100		% Rec.	8260B	03/10/01	1
Dibromofluoromethane	110		% Rec.	8260B	03/10/01	1
4-Bromofluorobenzene	93.		% Rec.	8260B	03/10/01	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	10.	ug/l	8270C	03/15/01	1
Acenaphthene	BDL	10.	ug/l	8270C	03/15/01	1
Acenaphthylene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(a)anthracene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(a)pyrene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(b)fluoranthene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(g,h,i)perylene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(k)fluoranthene	BDL	10.	ug/l	8270C	03/15/01	1
Chrysene	BDL	10.	ug/l	8270C	03/15/01	1
Dibenz(a,h)anthracene	BDL	10.	ug/l	8270C	03/15/01	1
Fluoranthene	BDL	10.	ug/l	8270C	03/15/01	1
Fluorene	BDL	10.	ug/l	8270C	03/15/01	1
Indeno(1,2,3-cd)pyrene	BDL	10.	ug/l	8270C	03/15/01	1
Naphthalene	BDL	10.	ug/l	8270C	03/15/01	1
Phenanthrene	BDL	10.	ug/l	8270C	03/15/01	1
Pyrene	BDL	10.	ug/l	8270C	03/15/01	1
Surrogate Recovery						

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233



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Tax I.D. 62-0814289

Est. 1970

**REPORT OF ANALYSIS**

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

March 19, 2001

Date Received : March 09, 2001  
Description : Water - Hot Spot 3005  
Sample ID : MW-11  
Collected By : Bill Hatton  
Collection Date : 03/08/01 12:58

ESC Sample # : L38205-04  
ESC Key : SMESPAR-1264-99-506  
Site ID :  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Nitrobenzene-d5	75.		% Rec.	8270C	03/15/01	1
2-Fluorobiphenyl	78.		% Rec.	8270C	03/15/01	1
p-Terphenyl-d14	62.		% Rec.	8270C	03/15/01	1

Tom Mellette, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
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REPORT OF ANALYSIS

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

March 19, 2001

Date Received : March 09, 2001  
Description : Water - Hot Spot 3005  
Sample ID : MW-10  
Collected By : Bill Hatton  
Collection Date : 03/08/01 13:15

ESC Sample # : L38205-05  
ESC Key : SMESPAR-1264-99-506  
Site ID :  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Methane	BDL		ug/l	8015M	03/16/01	1
Nitrate	2500	100	ug/l	9056	03/09/01	1
Sulfate	BDL	5000	ug/l	9056	03/09/01	1
Ferrous Iron	830	25.	ug/l	3500Fe	03/09/01	1
Lead	22.	5.0	ug/l	6010	03/12/01	1
Benzene	BDL	1.0	ug/l	8260B	03/10/01	1
Toluene	BDL	1.0	ug/l	8260B	03/10/01	1
Ethylbenzene	BDL	1.0	ug/l	8260B	03/10/01	1
Total Xylenes	BDL	3.0	ug/l	8260B	03/10/01	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	03/10/01	1
Naphthalene	BDL	1.0	ug/l	8260B	03/10/01	1
1,2-Dibromoethane	BDL	1.0	ug/l	8260B	03/10/01	1
Surrogate Recovery						
Toluene-d8	100		% Rec.	8260B	03/10/01	1
Dibromofluoromethane	110		% Rec.	8260B	03/10/01	1
4-Bromofluorobenzene	100		% Rec.	8260B	03/10/01	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	10.	ug/l	8270C	03/15/01	1
Acenaphthene	BDL	10.	ug/l	8270C	03/15/01	1
Acenaphthylene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(a)anthracene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(a)pyrene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(b)fluoranthene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(g,h,i)perylene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(k)fluoranthene	BDL	10.	ug/l	8270C	03/15/01	1
Chrysene	BDL	10.	ug/l	8270C	03/15/01	1
Dibenz(a,h)anthracene	BDL	10.	ug/l	8270C	03/15/01	1
Fluoranthene	BDL	10.	ug/l	8270C	03/15/01	1
Fluorene	BDL	10.	ug/l	8270C	03/15/01	1
Indeno(1,2,3-cd)pyrene	BDL	10.	ug/l	8270C	03/15/01	1
Naphthalene	BDL	10.	ug/l	8270C	03/15/01	1
Phenanthrene	BDL	10.	ug/l	8270C	03/15/01	1
Pyrene	BDL	10.	ug/l	8270C	03/15/01	1
Surrogate Recovery						

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375,DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233



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Est. 1970

REPORT OF ANALYSIS

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

March 19, 2001

Date Received : March 09, 2001  
Description : Water - Hot Spot 3005  
Sample ID : MW-10  
Collected By : Bill Hatton  
Collection Date : 03/08/01 13:15

ESC Sample # : L38205-05  
ESC Key : SMESPAR-1264-99-506  
Site ID :  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Nitrobenzene-d5	72.		% Rec.	8270C	03/15/01	1
2-Fluorobiphenyl	75.		% Rec.	8270C	03/15/01	1
p-Terphenyl-d14	65.		% Rec.	8270C	03/15/01	1

Tom Mellette, ESC Representative

BDL - Below Detection Limit  
Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:  
A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233  
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REPORT OF ANALYSIS

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

March 19, 2001

Date Received : March 09, 2001  
Description : Water - Hot Spot 3005  
Sample ID : MW-4  
Collected By : Bill Hatton  
Collection Date : 03/08/01 13:30

ESC Sample # : L38205-06  
ESC Key : SMESPAR-1264-99-506  
Site ID :  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Methane	BDL		ug/l	8015M	03/16/01	1
Nitrate	310 -	100	ug/l	9056	03/09/01	1
Sulfate	12000 -	5000	ug/l	9056	03/09/01	1
Ferrous Iron	690 -	25.	ug/l	3500Fe	03/09/01	1
Lead	BDL -	5.0	ug/l	6010	03/12/01	1
Benzene	BDL	1.0	ug/l	8260B	03/10/01	1
Toluene	BDL	1.0	ug/l	8260B	03/10/01	1
Ethylbenzene	BDL	1.0	ug/l	8260B	03/10/01	1
Total Xylenes	BDL	3.0	ug/l	8260B	03/10/01	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	03/10/01	1
Naphthalene	BDL	1.0	ug/l	8260B	03/10/01	1
1,2-Dibromoethane	BDL	1.0	ug/l	8260B	03/10/01	1
Surrogate Recovery						
Toluene-d8	100		% Rec.	8260B	03/10/01	1
Dibromofluoromethane	110		% Rec.	8260B	03/10/01	1
4-Bromofluorobenzene	95.		% Rec.	8260B	03/10/01	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	10.	ug/l	8270C	03/15/01	1
Acenaphthene	BDL	10.	ug/l	8270C	03/15/01	1
Acenaphthylene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(a)anthracene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(a)pyrene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(b)fluoranthene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(g,h,i)perylene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(k)fluoranthene	BDL	10.	ug/l	8270C	03/15/01	1
Chrysene	BDL	10.	ug/l	8270C	03/15/01	1
Dibenz(a,h)anthracene	BDL	10.	ug/l	8270C	03/15/01	1
Fluoranthene	BDL	10.	ug/l	8270C	03/15/01	1
Fluorene	BDL	10.	ug/l	8270C	03/15/01	1
Indeno(1,2,3-cd)pyrene	BDL	10.	ug/l	8270C	03/15/01	1
Naphthalene	BDL	10.	ug/l	8270C	03/15/01	1
Phenanthrene	BDL	10.	ug/l	8270C	03/15/01	1
Pyrene	BDL	10.	ug/l	8270C	03/15/01	1
Surrogate Recovery						

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
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Tax I.D. 62-0814289

Est. 1970

**REPORT OF ANALYSIS**

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

March 19, 2001

Date Received : March 09, 2001  
Description : Water - Hot Spot 3005  
Sample ID : MW-4  
Collected By : Bill Hatton  
Collection Date : 03/08/01 13:30

ESC Sample # : L38205-06  
ESC Key : SMESPAR-1264-99-506  
Site ID :  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Nitrobenzene-d5	80.		% Rec.	8270C	03/15/01	1
2-Fluorobiphenyl	84.		% Rec.	8270C	03/15/01	1
p-Terphenyl-d14	80.		% Rec.	8270C	03/15/01	1

Tom Mallette, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

Note:

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Tax I.D. 62-0814289  
  
Est. 1970

REPORT OF ANALYSIS

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

March 19, 2001

Date Received : March 09, 2001  
Description : Water - Hot Spot 3005  
Sample ID : MW-6  
Collected By : Bill Hatton  
Collection Date : 03/08/01 13:45

ESC Sample # : L38205-07  
ESC Key : SMESPAR-1264-99-506  
Site ID :  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Methane	BDL		ug/l	8015M	03/16/01	1
Nitrate	1200	100	ug/l	9056	03/09/01	1
Sulfate	BDL	5000	ug/l	9056	03/09/01	1
Ferrous Iron	260	25.	ug/l	3500Fe	03/09/01	1
Lead	BDL	5.0	ug/l	6010	03/12/01	1
Benzene	3.3	2.0	ug/l	8260B	03/10/01	2
Toluene	BDL	2.0	ug/l	8260B	03/10/01	2
Ethylbenzene	36.	2.0	ug/l	8260B	03/10/01	2
Total Xylenes	76.	6.0	ug/l	8260B	03/10/01	2
Methyl tert-butyl ether	BDL	2.0	ug/l	8260B	03/10/01	2
Naphthalene	68.	2.0	ug/l	8260B	03/10/01	2
1,2-Dibromoethane	BDL	2.0	ug/l	8260B	03/10/01	2
Surrogate Recovery						
Toluene-d8	100		% Rec.	8260B	03/10/01	2
Dibromofluoromethane	110		% Rec.	8260B	03/10/01	2
4-Bromofluorobenzene	110		% Rec.	8260B	03/10/01	2
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	10.	ug/l	8270C	03/15/01	1
Acenaphthene	BDL	10.	ug/l	8270C	03/15/01	1
Acenaphthylene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(a)anthracene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(a)pyrene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(b)fluoranthene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(g,h,i)perylene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(k)fluoranthene	BDL	10.	ug/l	8270C	03/15/01	1
Chrysene	BDL	10.	ug/l	8270C	03/15/01	1
Dibenz(a,h)anthracene	BDL	10.	ug/l	8270C	03/15/01	1
Fluoranthene	BDL	10.	ug/l	8270C	03/15/01	1
Fluorene	BDL	10.	ug/l	8270C	03/15/01	1
Indeno(1,2,3-cd)pyrene	BDL	10.	ug/l	8270C	03/15/01	1
Naphthalene	30.	10.	ug/l	8270C	03/15/01	1
Phenanthrene	BDL	10.	ug/l	8270C	03/15/01	1
Pyrene	BDL	10.	ug/l	8270C	03/15/01	1
Surrogate Recovery						

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233



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**REPORT OF ANALYSIS**

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

March 19, 2001

Date Received : March 09, 2001  
Description : Water - Hot Spot 3005  
Sample ID : MW-6  
Collected By : Bill Hatton  
Collection Date : 03/08/01 13:45

ESC Sample # : L38205-07  
ESC Key : SMESPAR-1264-99-506  
Site ID :  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Nitrobenzene-d5	78.		% Rec.	8270C	03/15/01	1
2-Fluorobiphenyl	80.		% Rec.	8270C	03/15/01	1
p-Terphenyl-d14	78.		% Rec.	8270C	03/15/01	1

Tom Bellette, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
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REPORT OF ANALYSIS

March 19, 2001

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

Date Received : March 09, 2001  
Description : Water - Hot Spot 3005  
Sample ID : MW-1D  
Collected By : Bill Hatton  
Collection Date : 03/08/01 14:45

ESC Sample # : L38205-08  
ESC Key : SMESPAR-1264-99-506  
Site ID :  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Methane	BDL		ug/l	8015M	03/16/01	1
Nitrate	2700	100	ug/l	9056	03/09/01	1
Sulfate	BDL	5000	ug/l	9056	03/09/01	1
Ferrous Iron	3000	25.	ug/l	3500Fe	03/09/01	1
Lead	BDL	5.0	ug/l	6010	03/12/01	1
Benzene	BDL	1.0	ug/l	8260B	03/10/01	1
Toluene	BDL	1.0	ug/l	8260B	03/10/01	1
Ethylbenzene	BDL	1.0	ug/l	8260B	03/10/01	1
Total Xylenes	BDL	3.0	ug/l	8260B	03/10/01	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	03/10/01	1
Naphthalene	BDL	1.0	ug/l	8260B	03/10/01	1
1,2-Dibromoethane	BDL	1.0	ug/l	8260B	03/10/01	1
Surrogate Recovery						
Toluene-d8	98.		% Rec.	8260B	03/10/01	1
Dibromofluoromethane	110		% Rec.	8260B	03/10/01	1
4-Bromofluorobenzene	110		% Rec.	8260B	03/10/01	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	10.	ug/l	8270C	03/15/01	1
Acenaphthene	BDL	10.	ug/l	8270C	03/15/01	1
Acenaphthylene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(a)anthracene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(a)pyrene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(b)fluoranthene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(g,h,i)perylene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(k)fluoranthene	BDL	10.	ug/l	8270C	03/15/01	1
Chrysene	BDL	10.	ug/l	8270C	03/15/01	1
Dibenz(a,h)anthracene	BDL	10.	ug/l	8270C	03/15/01	1
Fluoranthene	BDL	10.	ug/l	8270C	03/15/01	1
Fluorene	BDL	10.	ug/l	8270C	03/15/01	1
Indeno(1,2,3-cd)pyrene	BDL	10.	ug/l	8270C	03/15/01	1
Naphthalene	BDL	10.	ug/l	8270C	03/15/01	1
Phenanthrene	BDL	10.	ug/l	8270C	03/15/01	1
Pyrene	BDL	10.	ug/l	8270C	03/15/01	1
Surrogate Recovery						

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

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**REPORT OF ANALYSIS**

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

March 19, 2001

Date Received : March 09, 2001  
Description : Water - Hot Spot 3005  
Sample ID : MW-1D  
Collected By : Bill Hatton  
Collection Date : 03/08/01 14:45

ESC Sample # : L38205-08  
ESC Key : SMESPAR-1264-99-506  
Site ID :  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Nitrobenzene-d5	68.		% Rec.	8270C	03/15/01	1
2-Fluorobiphenyl	70.		% Rec.	8270C	03/15/01	1
p-Terphenyl-d14	72.		% Rec.	8270C	03/15/01	1

Tom Mellette, ESC Representative

BDL - Below Detection Limit  
Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:  
A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

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S & M E

155 Tradd Street  
Spartanburg, SC 29301

Alternate billing information

Analysis/Container/Preservative

Chain of Custody  
Page 1 of 2

Prepared by

**ENVIRONMENTAL  
SCIENCE CORP.**

12065 Lebanon Road  
Mt Juliet, TN 37122

Phone (800) 767-5859  
FAX (615) 758-5859

Mr. Mike O'Connell

Description

**Waters for Hot Spot 3005**

(864) 574-2360  
(864) 576-8730

Client Project #

1264-99-506

Lab Project #

SMESPAR-1264-99-506

Site/Facility ID#

P.O #

2665

Rush? (Lab MUST Be Notified)

\_\_\_ Same Day 200%  
\_\_\_ Next Day 100%  
\_\_\_ Two Day 50%

Date Results Needed

FAX? \_\_\_ No \_\_\_ Yes

No of  
Cnts

FERUSFE 250ml/Amb-HCI  
METHANE 40ml/Amb-NoPres  
NO3 125mlHDPE-NoPres  
PBICP 250mlHDPE-HNO3  
SO4 250mlHDPE-NoPres  
SV8270PAH 1L-Amb-NoPres  
V8260BTEXMNE 40ml/Amb-HCI

CoCode **SMESPA** (lab use only)

Template/Prelogin **T8081 / P28515**

Cooler #: 3/7/01 *CB*

Shipped Via: **UPS Ground**

Remarks/Contaminant Sample # (lab only)

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No of Cnts	FERUSFE 250ml/Amb-HCI	METHANE 40ml/Amb-NoPres	NO3 125mlHDPE-NoPres	PBICP 250mlHDPE-HNO3	SO4 250mlHDPE-NoPres	SV8270PAH 1L-Amb-NoPres	V8260BTEXMNE 40ml/Amb-HCI	Remarks/Contaminant	Sample # (lab only)
MW-8	Grab	GW	NA	3/8/01	12:15	9	X	X	X	X	X	X	X		43820501
MW-12		GW			12:30	9	X	X	X	X	X	X	X		--02
MW-13		GW			12:45	9	X	X	X	X	X	X	X		-03
MW-11		GW			12:58	9	X	X	X	X	X	X	X		-04
MW-10		GW			13:15	9	X	X	X	X	X	X	X		-05
MW-4		GW			13:30	9	X	X	X	X	X	X	X		-06
MW-6		GW			13:45	9	X	X	X	X	X	X	X		-07
MW-1D		GW			14:45	9	X	X	X	X	X	X	X		-08
<i>man</i>		<del>GW</del>					<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>		

Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other

pH \_\_\_\_\_ Temp \_\_\_\_\_

Flow \_\_\_\_\_ Other \_\_\_\_\_

Received by (Signature) <i>Bill Hattan</i>	Date 3/8/01	Time 17:00	Received by (Signature)	Samples returned via <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> UPS <input type="checkbox"/> Courier	Condition (lab use only)
Requested by (Signature)	Date	Time	Received by (Signature)	Temp 30C	Bottles Received 72
Requested by (Signature)	Date	Time	Received for lab by (Signature) <i>Janice Cox</i>	Date 030901	Time 0930
				pH Checked 2	NCF

Attachment A  
List of Analytes with QC Qualifiers

Sample #	Analyte	Qualifier
L38205-07	Benzene	F
	Toluene	F
	Ethylbenzene	F
	Total Xylenes	F
	Methyl tert-butyl ether	F
	Naphthalene	F
	1,2-Dibromoethane	F

Attachment B  
Explanation of QC Qualifier Codes

Qualifier	Meaning
F	SRN (EPA) - Diluted: The original sample was diluted due to high amounts of one or more target analytes. All associated method analytes will be subject to an elevated detection limit relative to the dilution factor.

Qualifier Report Information

ESC recognizes and utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program. We firmly believe that information pertaining to sample analysis should be made available to the ESC client. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC.

Definitions:

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.



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**REPORT OF ANALYSIS**

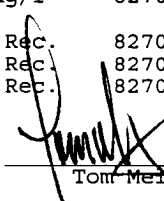
Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

March 16, 2001

Date Received : March 10, 2001  
Description : Waters for Hot Spot 3005  
Sample ID : MW-7  
Collected By : Lanny Lowery  
Collection Date : 03/09/01 10:15

ESC Sample # : L38346-01  
ESC Key : SMESPAR-1264-99-506  
Site ID :  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Methane	BDL		ug/l	8015M	03/16/01	1
Nitrate	1400	100	ug/l	9056	03/11/01	1
Sulfate	BDL	5000	ug/l	9056	03/11/01	1
Ferrous Iron	250	25.	ug/l	3500Fe	03/10/01	1
Lead	35.	5.0	ug/l	6010	03/14/01	1
Benzene	BDL	1.0	ug/l	8260B	03/13/01	1
Toluene	BDL	1.0	ug/l	8260B	03/13/01	1
Ethylbenzene	BDL	1.0	ug/l	8260B	03/13/01	1
Total Xylenes	BDL	3.0	ug/l	8260B	03/13/01	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	03/13/01	1
Naphthalene	BDL	1.0	ug/l	8260B	03/13/01	1
Surrogate Recovery						
Toluene-d8	97.		% Rec.	8260B	03/13/01	1
Dibromofluoromethane	87.		% Rec.	8260B	03/13/01	1
4-Bromofluorobenzene	100		% Rec.	8260B	03/13/01	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	10.	ug/l	8270C	03/15/01	1
Acenaphthene	BDL	10.	ug/l	8270C	03/15/01	1
Acenaphthylene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(a)anthracene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(a)pyrene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(b)fluoranthene	BDL	10.	ug/l	8270C	03/15/01	1
Benzo(k)fluoranthene	BDL	10.	ug/l	8270C	03/15/01	1
Chrysene	BDL	10.	ug/l	8270C	03/15/01	1
Fluoranthene	BDL	10.	ug/l	8270C	03/15/01	1
Fluorene	BDL	10.	ug/l	8270C	03/15/01	1
Naphthalene	BDL	10.	ug/l	8270C	03/15/01	1
Phenanthrene	BDL	10.	ug/l	8270C	03/15/01	1
Pyrene	BDL	10.	ug/l	8270C	03/15/01	1
Surrogate Recovery						
Nitrobenzene-d5	83.		% Rec.	8270C	03/15/01	1
2-Fluorobiphenyl	83.		% Rec.	8270C	03/15/01	1
p-Terphenyl-d14	83.		% Rec.	8270C	03/15/01	1

  
Tom Merlette, ESC Representative

BDL - Below Detection Limit  
Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:  
A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

March 16, 2001

Date Received : March 10, 2001  
Description : Waters for Hot Spot 3005  
Sample ID : MW-9  
Collected By : Lanny Lowery  
Collection Date : 03/09/01 10:35

ESC Sample # : L38346-02  
ESC Key : SMESPAR-1264-99-506  
Site ID :  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Methane	BDL		ug/l	8015M	03/16/01	1
Nitrate	1700	100	ug/l	9056	03/11/01	1
Sulfate	BDL	5000	ug/l	9056	03/11/01	1
Ferrous Iron	10000	25.	ug/l	3500Fe	03/10/01	1
Lead	28.	5.0	ug/l	6010	03/14/01	1
Benzene	BDL	1.0	ug/l	8260B	03/13/01	1
Toluene	BDL	1.0	ug/l	8260B	03/13/01	1
Ethylbenzene	BDL	1.0	ug/l	8260B	03/13/01	1
Total Xylenes	BDL	3.0	ug/l	8260B	03/13/01	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	03/13/01	1
Naphthalene	BDL	1.0	ug/l	8260B	03/13/01	1
Surrogate Recovery						
Toluene-d8	98.		% Rec.	8260B	03/13/01	1
Dibromofluoromethane	87.		% Rec.	8260B	03/13/01	1
4-Bromofluorobenzene	91.		% Rec.	8260B	03/13/01	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	10.	ug/l	8270C	03/16/01	1
Acenaphthene	BDL	10.	ug/l	8270C	03/16/01	1
Acenaphthylene	BDL	10.	ug/l	8270C	03/16/01	1
Benzo(a)anthracene	BDL	10.	ug/l	8270C	03/16/01	1
Benzo(a)pyrene	BDL	10.	ug/l	8270C	03/16/01	1
Benzo(b)fluoranthene	BDL	10.	ug/l	8270C	03/16/01	1
Benzo(g,h,i)perylene	BDL	10.	ug/l	8270C	03/16/01	1
Benzo(k)fluoranthene	BDL	10.	ug/l	8270C	03/16/01	1
Chrysene	BDL	10.	ug/l	8270C	03/16/01	1
Dibenz(a,h)anthracene	BDL	10.	ug/l	8270C	03/16/01	1
Fluoranthene	BDL	10.	ug/l	8270C	03/16/01	1
Fluorene	BDL	10.	ug/l	8270C	03/16/01	1
Indeno(1,2,3-cd)pyrene	BDL	10.	ug/l	8270C	03/16/01	1
Naphthalene	BDL	10.	ug/l	8270C	03/16/01	1
Phenanthrene	BDL	10.	ug/l	8270C	03/16/01	1
Pyrene	BDL	10.	ug/l	8270C	03/16/01	1
Surrogate Recovery						
Nitrobenzene-d5	70.		% Rec.	8270C	03/16/01	1

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233



**ENVIRONMENTAL  
SCIENCE CORP.**

12065 Lebanon Rd.  
Mt. Juliet, TN 37122  
(615) 758-5858  
1-800-767-5859  
Fax (615) 758-5859  
  
Tax I.D. 62-0814289  
  
Est. 1970

**REPORT OF ANALYSIS**

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

March 16, 2001

Date Received : March 10, 2001  
Description : Waters for Hot Spot 3005  
Sample ID : MW-9  
Collected By : Lanny Lowery  
Collection Date : 03/09/01 10:35

ESC Sample # : L38346-02  
ESC Key : SMESPAR-1264-99-506  
Site ID :  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
2-Fluorobiphenyl	68.		% Rec.	8270C	03/16/01	1
p-Terphenyl-d14	79.		% Rec.	8270C	03/16/01	1

Tom Mellette, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

Note:

The reported analytical results relate only to the sample submitted.

This report shall not be reproduced, except in full, without the written approval from ESC.



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SCIENCE CORP.**

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Tax I.D. 62-0814289

Est. 1970

**REPORT OF ANALYSIS**

Mr. Mike O'Connell  
S & M E  
155 Tradd Street  
Spartanburg, SC 29301

March 16, 2001

Date Received : March 10, 2001  
Description : Waters for Hot Spot 3005  
Sample ID : MW-3  
Collected By : Lanny Lowery  
Collection Date : 03/09/01 11:00

ESC Sample # : L38346-03  
ESC Key : SMESPAR-1264-99-506  
Site ID :  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	3000	25.	ug/l	8260B	03/15/01	25
Toluene	130	25.	ug/l	8260B	03/15/01	25
Ethylbenzene	400	25.	ug/l	8260B	03/15/01	25
Total Xylenes	3100	75.	ug/l	8260B	03/15/01	25
Methyl tert-butyl ether	6400	25.	ug/l	8260B	03/15/01	25
Naphthalene	BDL	25.	ug/l	8260B	03/15/01	25
Surrogate Recovery						
Toluene-d8	100		% Rec.	8260B	03/15/01	25
Dibromofluoromethane	110		% Rec.	8260B	03/15/01	25
4-Bromofluorobenzene	110		% Rec.	8260B	03/15/01	25
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	10.	ug/l	8270C	03/16/01	1
Acenaphthene	BDL	10.	ug/l	8270C	03/16/01	1
Acenaphthylene	BDL	10.	ug/l	8270C	03/16/01	1
Benzo(a)anthracene	BDL	10.	ug/l	8270C	03/16/01	1
Benzo(a)pyrene	BDL	10.	ug/l	8270C	03/16/01	1
Benzo(b)fluoranthene	BDL	10.	ug/l	8270C	03/16/01	1
Benzo(g,h,i)perylene	BDL	10.	ug/l	8270C	03/16/01	1
Benzo(k)fluoranthene	BDL	10.	ug/l	8270C	03/16/01	1
Chrysene	BDL	10.	ug/l	8270C	03/16/01	1
Dibenz(a,h)anthracene	BDL	10.	ug/l	8270C	03/16/01	1
Fluoranthene	BDL	10.	ug/l	8270C	03/16/01	1
Fluorene	BDL	10.	ug/l	8270C	03/16/01	1
Indeno(1,2,3-cd)pyrene	BDL	10.	ug/l	8270C	03/16/01	1
Naphthalene	BDL	10.	ug/l	8270C	03/16/01	1
Phenanthrene	BDL	10.	ug/l	8270C	03/16/01	1
Pyrene	BDL	10.	ug/l	8270C	03/16/01	1
Surrogate Recovery						
Nitrobenzene-d5	73.		% Rec.	8270C	03/16/01	1
2-Fluorobiphenyl	69.		% Rec.	8270C	03/16/01	1
p-Terphenyl-d14	82.		% Rec.	8270C	03/16/01	1

Tom Mellette, ESC Representative

BDL - Below Detection Limit  
Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

Note:

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Attachment A  
List of Analytes with QC Qualifiers

Sample #	Analyte	Qualifier
L38346-01	Lead	J4
L38346-02	Lead	J4
L38346-03	Benzene	EF
	Toluene	F
	Ethylbenzene	F
	Total Xylenes	EF
	Methyl tert-butyl ether	EF
	Naphthalene	F

Attachment B  
Explanation of QC Qualifier Codes

Qualifier	Meaning
F	SRN (EPA) - Diluted: The original sample was diluted due to high amounts of one or more target analytes. All associated method analytes will be subject to an elevated detection limit relative to the dilution factor.
E	GTL (EPA) - Greater than upper calibration limit: Actual value is known to be greater than the upper calibration range.
J4	The reported value failed to meet the established quality control criteria for accuracy.

Qualifier Report Information

ESC recognizes and utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program. We firmly believe that information pertaining to sample analysis should be made available to the ESC client. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC.

Definitions:

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

S & M E

155 Tradd Street  
Spartanburg, SC 29301

Alternate billing information:

Analysis/Container/Preservative

Chain of Custody  
Page 1 of 1

Prepared by:

**ENVIRONMENTAL  
SCIENCE CORP.**  
12065 Lebanon Road  
Mt. Juliet, TN 37122  
Phone (615) 758-5858  
Phone (800) 767-5859  
FAX (615) 758-5859

Report  
Mike O'Connell  
Phone (864) 574-2360  
FAX (864) 576-8730

Project name:  
Hot Spot # 3005  
Client Project #:  
1264-99-506

ESC Key:

Collected by  
(print) Lanny Lowery  
Collected by (signature):  
Lanny Lowery

Site/Facility ID#: P.O.#:  
2665

Rush? (Lab MUST Be Notified)  
Same Day.....200%  
Next Day.....100%  
Two Day.....50%

Date Results Needed:  
Standard TAT  
FAX?  No  Yes

No  
or  
Chrs

8260 B - BTEX/MTBE/Naph.  
8270 - PAH's  
Lead  
NO3  
SO4  
Ferrons Iron  
Methane

CoCode: SMESPAR (lab use only)  
Template/Prelogin  
Cooler #:  
Shipped Via:

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No	Chrs	Remarks/Contaminant	Sample # (lab only)
MW-7	G	GW	-	3/9/01	1015	9	X X X X X X X		L38346-01
MW-9	G	GW	-	3/9/01	1035	9	X X X X X X X		
MW-3	G	GW	-	3/9/01	1100	3	X X		

\*Matrix SS - Soil/Solid GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other

Remarks

pH \_\_\_\_\_ Temp \_\_\_\_\_  
Flow \_\_\_\_\_ Other \_\_\_\_\_

Requested by (Signature): Lanny Lowery	Date: 3/9/01	Time: 1700	Received by: (Signature):	Samples returned via: <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Courier <input type="checkbox"/> UPS	Condition: (lab use only) Custody seal intact sv.
Requested by (Signature):	Date:	Time:	Received by: (Signature):	Temp: 40 Bottles Received: 21	
Requested by (Signature):	Date:	Time:	Received for lab by (Signature): David Frantz	Date: 3/10/01 Time: 4:45	pH Checked: 42 NCF:

SD

# GARCO, Inc.

---

Environmental, Industrial & Recycling Services

## *Certificate of Disposal*

**GENERATOR:**

Hot Spot  
Chesnee, SC

**MATERIAL ACCEPTED:**

1 drum of non-hazardous water

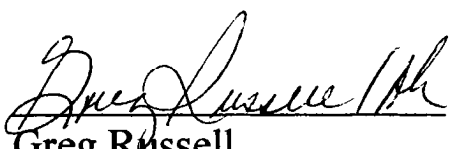
**DISPOSAL METHOD:**

Waste Water Treatment

GARCO, Inc. accepted the above listed materials on 3/22/01. The material has been assigned the following GARCO identification number(s).

GARCO ID No.(s) AQ-2590

GARCO, Inc. has accepted custody of the above referenced non-hazardous material. This material has been determined to be non-hazardous by a material profile, generator knowledge, and/or analytical data provided to GARCO, Inc.



Greg Russell  
President

# NON-HAZARDOUS WASTE MANIFEST CLIENT

Please print or type (Form designed for use on elite (12 pitch) typewriter)

<b>NON-HAZARDOUS WASTE MANIFEST</b>		1 Generator's US EPA ID No <p style="text-align: center;">NA</p>		Manifest Document No. <p style="text-align: center;">12401</p>	2 Page 1 of
3. Generator's Name and Mailing Address <p style="text-align: center;">High Street 13005 107 Hampton St. Chesnee SC</p>		4 Generator's Phone ( )			
5. Transporter 1 Company Name <p style="text-align: center;">GARCO, Inc</p>		6. US EPA ID Number <p style="text-align: center;">NCR00013534</p>		A. State Transporter's ID	
7. Transporter 2 Company Name		8. US EPA ID Number		B. Transporter 1 Phone <p style="text-align: center;">336-383-0911</p>	
9 Designated Facility Name and Site Address <p style="text-align: center;">GARCO, Inc 2508 N. Foverville St. Asheboro NC 27203</p>		10. US EPA ID Number <p style="text-align: center;">NA</p>		C. State Transporter's ID	
				D. Transporter 2 Phone	
				E. State Facility's ID	
				F. Facility's Phone <p style="text-align: center;">336-683-0911</p>	
11. WASTE DESCRIPTION			12. Containers	13. Total Quantity	14. Unit Wt./Vol.
			No	Type	
a. Non-hazardous Material			1	DM	400
b.					
c.					
d.					
G. Additional Descriptions for Materials Listed Above <p style="text-align: center;">113 Surgewater A92590</p>			H. Handling Codes for Wastes Listed Above		
15. Special Handling Instructions and Additional Information <p style="text-align: center;">24 Hour ER# 300-814-1204</p>					
16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.					
Printed/Typed Name				Date	
Signature		Month		Day Year	
17. Transporter 1 Acknowledgement of Receipt of Materials				Date	
Printed/Typed Name <i>Bobby Jamet</i>		Signature <i>Bobby Jamet</i>		Month Day Year 03 21 01	
18. Transporter 2 Acknowledgement of Receipt of Materials				Date	
Printed/Typed Name		Signature		Month Day Year	
19. Discrepancy Indication Space					
20. Facility Owner or Operator; Certification of receipt of the waste materials covered by this manifest, except as noted in item 19					
Printed/Typed Name <i>Dollie Hilliard</i>				Date	
Signature <i>Dollie Hilliard</i>		Month		Day Year 3 22 01	

GENERATOR

TRANSPORTER

FACILITY





**S & M E**  
 155 Tradd Street  
 Spartanburg, SC 29301

Alternate billing information:

Analysis/Container/Preservative

Chain of Custody  
 Page 1 of 1

Prepared by:  
**ENVIRONMENTAL SCIENCE CORP.**  
 12065 Lebanon Road  
 Mt. Juliet, TN 37122  
 Phone (800) 767-5859  
 FAX (615) 758-5859

Client: **Mr. Mike O'Connell**  
 Description: **Waters for Hot Spot 3005**  
 Client Project #: **1264-99-506**  
 Lab Project #: **SMESPAR-1264-99-506**  
 Site/Facility ID#: \_\_\_\_\_  
 P.O.#: **2665**  
 Rush? (Lab MUST Be Notified)  
 Same Day ..... 200%  
 Next Day ..... 100%  
 Two Day ..... 50%  
 Date Results Needed: \_\_\_\_\_  
 FAX? No Yes

FERUSFE 250mlAmb-HCl  
 METHANE 40mlAmb-NoPres  
 NO3 125mlHDPE-NoPres  
 PBICP 250mlHDPE-HNO3  
 SO4 250mlHDPE-NoPres  
 SV8270PAH 1L-Amb-NoPres  
 V8260BTEXMNE 40mlAmb-HCl

CoCode: **SMESPA** (lab use only)  
 Template/Prelogin: **T8081 / P28515**  
 Cooler #: \_\_\_\_\_  
 Shipped Via: **UPS Ground**

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	FERUSFE	METHANE	NO3	PBICP	SO4	SV8270PAH	V8260BTEXMNE	Remarks/Contaminant	Sample # (lab only)
MW-8	Grab	GW	NA	3/8/01	12:15	9	X	X	X	X	X	X	X		
MW-12		GW			12:30	9	X	X	X	X	X	X	X		
MW-13		GW			12:45	9	X	X	X	X	X	X	X		
MW-11		GW			12:58	9	X	X	X	X	X	X	X		
MW-10		GW			13:15	9	X	X	X	X	X	X	X		
MW-4		GW			13:30	9	X	X	X	X	X	X	X		
MW-6		GW			13:45	9	X	X	X	X	X	X	X		
MW-1D		GW			14:45	9	X	X	X	X	X	X	X		
<del>MW-2</del>	<del>GW</del>						<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>X</del>		

Legend: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other \_\_\_\_\_  
 pH \_\_\_\_\_ Temp \_\_\_\_\_  
 Flow \_\_\_\_\_ Other \_\_\_\_\_

Received by: (Signature) <i>[Signature]</i>	Date: <b>3/8/01</b>	Time: <b>17:00</b>	Received by: (Signature)	Samples returned via: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> Courier	Condition: (lab use only)
Received by: (Signature)	Date:	Time:	Received by: (Signature)	Temp: _____	Bottles Received: _____
Received by: (Signature)	Date:	Time:	Received for lab by: (Signature)	Date:	Time:
				pH Checked	NCS:

MAY-14-01 14:15 FROM: S&M E INC RT SPARTANBURG ID: 864 576 8730 PAGE 2/15



**SAMPLE COLLECTION SUMMARY SHEET**



General

- 1. Job Name: Hot Spot # 3005
- 2. Project No.: 1264-99-506
- 3. Sampled By: LL/BH
- 4. Weather: Sunny/Cool
- 5. Location: Chesnee, S.C.
- 6. Well #: MW-1-D
- 7. Well Condition: OK
- 8. Personnel Present: LL/BH

Water Level Information:

- 1. Date: 3-8-01 2. Time: 14:30 3. State Water Level: 29.39 Ft. Below M.P.
- 4. Description of Measuring Point (M.P.): Toe
- 5. Height of M.P. above below (Circle) Land Surface: 3"
- 6. Method of Water Level Measurement: Elec. Wl Tape

Evacuation Procedure (Wells):

- 1. Date: 3-8-01 2. Time Evacuation Started: 14:35 3. Time Evacuation Finished: 14:40
- 4. Method of Evacuation: Bailer 5. Total Well Depth: 58.42 Ft. Below M.P.
- 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft
- 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
(Well Volume X # Volumes = Total Gallons Purged)
- 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 6.98 Actual Buffer pH 4.0 or 10.0 4.01 Actual 100 Standard Cond: 110 Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	<u>3</u>	<u>6</u>	<u>9</u>			
Water Temperature (F)(C)	<u>20°</u>	<u>19.9°</u>	<u>19.7°</u>			
pH (Standard Units)	<u>7.15</u>	<u>7.10</u>	<u>7.11</u>			
Specific Cond. (M/MHOS) (PPM)	<u>74.1</u>	<u>104.6</u>	<u>76.9</u>			
Turbidity (Subjective)	<u>0</u>	<u>0</u>	<u>0</u>			
Odor (Subjective)	<u>0</u>	<u>0</u>	<u>0</u>			
Other:						

Sampling Information

- 1. Date: 3-8-01 2. Time: 14:45 3. Sample Containers (Number/Size/Type): 4/40ml/G, 1/1L/G, 2/250ml/P
- 4. Analyses requested: BTEX/MTBE/Naph., PAH's, Pb, NO<sub>2</sub>, SO<sub>4</sub>, -Fe, c.H<sub>4</sub>
- 5. Samples Filtered: No 6. Filtration Equipment: N/A
- 7. Samples Preserved: Yes 8. Preservative: Acid, HNO<sub>3</sub>, Ice
- 9. Lab Performing Analyses: ESC 10. Sample Type: Well  Stream

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION SUMMARY SHEET**



General

1. Job Name: Hot Spot # 3005 2. Project No.: 1264-99-506  
 3. Sampled By: LL/BH 4. Weather: Sunny/Cool  
 5. Location: Chesnee, SC. 6. Well #: MW-3  
 7. Well Condition: OK 8. Personnel Present: LL/BH

Water Level Information:

1. Date: 3/8/01 2. Time: 1:350 3. State Water Level: 31.22 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOC  
 5. Height of M.P. above/below (Circle) Land Surface: 3"  
 6. Method of Water Level Measurement: Elev. W/L Tape

Evacuation Procedure (Wells):

1. Date: 3/8/01 2. Time Evacuation Started: 1:353 3. Time Evacuation Finished: 1:355  
 4. Method of Evacuation: Bailer 5. Total Well Depth: 32.20 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 6.98 Actual Buffer pH 4.0 or 10.0 4.01 Actual 100 Standard Cond: 110 Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	0.2	0.4	0.6			
Water Temperature (F) (C)	20°					
pH (Standard Units)	7.06					
Specific Cond. (M/MHOS) (PPM)	159	Dry				
Turbidity (Subjective)	High					
Odor (Subjective)	Slight					
Other:						

Sampling Information

1. Date: 3/9/01 2. Time: 1:00 3. Sample Containers (Number/Size/Type): 2/40ml/G  
 4. Analyses requested: BTEX/MTBE/Naph. PAH's  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: Yes 8. Preservative: HCl, Ice  
 9. Lab Performing Analyses: ESC 10. Sample Type: Well ; Stream

Remarks: No recharge on 3/8/01. Checked well on 3/9/01 and had enough water for 2/40ml vials and 1/2 of a 1 L bottle.

**SAMPLE COLLECTION SUMMARY SHEET**



General

- 1. Job Name: Hot Spot # 3005
- 2. Project No.: 1264-99-506
- 3. Sampled By: LL/BH
- 4. Weather: Sunny/Cool
- 5. Location: Chesnee, S.C.
- 6. Well #: MW-4
- 7. Well Condition: OK
- 8. Personnel Present: LL/BH

Water Level Information:

- 1. Date: 3-8-01 2. Time: 13:18 3. State Water Level: 28.82 Ft. Below M.P.
- 4. Description of Measuring Point (M.P.): TRC
- 5. Height of M.P. above (below) (Circle) Land Surface: 3"
- 6. Method of Water Level Measurement: Elec. W/L Tape

Evacuation Procedure (Wells):

- 1. Date: 3-8-01 2. Time Evacuation Started: 13:20 3. Time Evacuation Finished: 13:25
- 4. Method of Evacuation: Bailer 5. Total Well Depth: 45.50 Ft. Below M.P.
- 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft
- 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ Gallons  
(Well Volume X # Volumes = Total Gallons Purged)
- 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 6.98 Actual      Buffer pH 4.0 or 10.0 4.01 Actual      100 Standard      Cond: 110 Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	3	6	9			
Water Temperature (F)(C)	19.9°	19.9°				
pH (Standard Units)	7.05	7.01				
Specific Cond. (M/MHOS) (PPM)	232	196.0	<del>DRY</del>			
Turbidity (Subjective)	0					
Odor (Subjective)	0					
Other:						

Sampling Information

- 1. Date: 3-8-01 2. Time: 13:30 3. Sample Containers (Number/Size/Type): 4/40ml/G 1/12/G 2/250ml/P
- 4. Analyses requested: BTEX/MTBE/Alaph., PAH's, Pb, NO<sub>3</sub>, SO<sub>4</sub>, Fe, CH<sub>4</sub>
- 5. Samples Filtered: No 6. Filtration Equipment: N/A
- 7. Samples Preserved: Yes 8. Preservative: ACI, H<sub>2</sub>O<sub>2</sub>, Ice
- 9. Lab Performing Analyses: Esc 10. Sample Type: Well ; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION SUMMARY SHEET**



General

- 1. Job Name: Hot Spot #3005
- 2. Project No.: 1264-99-506
- 3. Sampled By: LL/BH
- 4. Weather: Sunny/Cool
- 5. Location: Chesnee, S.C.
- 6. Well #: MW-5
- 7. Well Condition: OK
- 8. Personnel Present: LL/BH

Water Level Information:

- 1. Date: 3/8/01 2. Time: 1400 3. State Water Level: 31.80 Ft. Below M.P.
- 4. Description of Measuring Point (M.P.): TOC
- 5. Height of M.P. above/below (Circle) Land Surface: 3"
- 6. Method of Water Level Measurement: Elec. WL Tape

Evacuation Procedure (Wells):

- 1. Date: 3/8/01 2. Time Evacuation Started: 1405 3. Time Evacuation Finished: 1406
- 4. Method of Evacuation: Bailer 5. Total Well Depth: 32.20 Ft. Below M.P.
- 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft
- 8. Volume of Water in Well ( $0.041D^2H$ ) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
(Well Volume X # Volumes = Total Gallons Purged)
- 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 6.98 Actual      Buffer pH 4.0 or 10.0 4.01 Actual      100 Standard      Cond: 110 Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	0.1	0.2	0.3			
Water Temperature (F) (C)	21°			DRY / No Recharge - No Sample		
pH (Standard Units)	7.02					
Specific Cond. (M/MHOS) (PPM)	137					
Turbidity (Subjective)	High					
Odor (Subjective)	0					
Other:						

Sampling Information

- 1. Date: \_\_\_\_\_ 2. Time: \_\_\_\_\_ 3. Sample Containers (Number/Size/Type): \_\_\_\_\_
- 4. Analyses requested: \_\_\_\_\_
- 5. Samples Filtered: \_\_\_\_\_ 6. Filtration Equipment: \_\_\_\_\_
- 7. Samples Preserved: \_\_\_\_\_ 8. Preservative: \_\_\_\_\_
- 9. Lab Performing Analyses: \_\_\_\_\_ 10. Sample Type: Well \_\_\_\_\_ ; Stream \_\_\_\_\_

Remarks: Checked well for recharge on 3/9/01; no recovery.

**SAMPLE COLLECTION SUMMARY SHEET**



General

- 1. Job Name: Hot Spot #3005
- 2. Project No.: 1264-99-506
- 3. Sampled By: LL/BH
- 4. Weather: Sunny/Cool
- 5. Location: Chesnee, S.C.
- 6. Well #: MW-6
- 7. Well Condition: OK
- 8. Personnel Present: LL/BH

Water Level Information:

- 1. Date: 3-8-01 2. Time: 13:35 3. State Water Level: 29.00 Ft. Below M.P.
- 4. Description of Measuring Point (M.P.): Tec
- 5. Height of M.P. above/below (Circle) Land Surface: 3"
- 6. Method of Water Level Measurement: Elec. W/L Tape

Evacuation Procedure (Wells):

- 1. Date: 3-8-01 2. Time Evacuation Started: 13:38 3. Time Evacuation Finished: 13:40
- 4. Method of Evacuation: Bailer 5. Total Well Depth: 36.12 Ft. Below M.P.
- 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft
- 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
(Well Volume X # Volumes = Total Gallons Purged)
- 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 6.98 Actual Buffer pH 4.0 or 10.0 4.01 Actual 100 Standard Cond: 110 Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	1	2	3			
Water Temperature (F)(C)	20°	21°	21°			
pH (Standard Units)	7.19	7.24	7.24			
Specific Cond. (M/MHOS) (PPM)	72	61	57			
Turbidity (Subjective)	High	High	High			
Odor (Subjective)	Slight	Slight	Slight			
Other:						

Sampling Information

- 1. Date: 3-8-01 2. Time: 13:45 3. Sample Containers (Number/Size/Type): 4/40ml/G, 1/12/G, 2/250ml/P
- 4. Analyses requested: BTEX/MTEB/Naph, PAH's, Pb, No<sub>2</sub>, Se<sub>4</sub>, Fe, CH<sub>4</sub>
- 5. Samples Filtered: No 6. Filtration Equipment: N/A
- 7. Samples Preserved: Yes 8. Preservative: Ac<sub>2</sub>, H<sub>2</sub>O<sub>2</sub>, Ice
- 9. Lab Performing Analyses: ESC 10. Sample Type: Well  ; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_



**SAMPLE COLLECTION SUMMARY SHEET**



General

- 1. Job Name: Hot Spot # 3005
- 2. Project No.: 1264-99-506
- 3. Sampled By: LL/BH
- 4. Weather: Sunny/Cool
- 5. Location: Chesnee, S.C.
- 6. Well #: MW-7
- 7. Well Condition: OK
- 8. Personnel Present: LL/BH

Water Level Information:

- 1. Date: 3-9-01 2. Time: 10:00 3. State Water Level: 28.11 Ft. Below M.P.
- 4. Description of Measuring Point (M.P.): TOC
- 5. Height of M.P. above/below (Circle) Land Surface: 3"
- 6. Method of Water Level Measurement: Elec. Wk. Tape

Evacuation Procedure (Wells):

- 1. Date: 3-9-01 2. Time Evacuation Started: 10:03 3. Time Evacuation Finished: 10:05
- 4. Method of Evacuation: Bailer 5. Total Well Depth: 36.15 Ft. Below M.P.
- 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft
- 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
(Well Volume X # Volumes = Total Gallons Purged)
- 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 6.98 Actual Buffer pH 4.0 or 10.0 4.01 Actual 100 Standard Cond: 110 Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	1	2	3	4		
Water Temperature (F)(C)	17.8°	18.8°	19.5°	19.9°		
pH (Standard Units)	7.53	7.88	7.62	7.48		
Specific Cond. (M/MHOS) (PPM)	139.4	37.5	33.2	33.2		
Turbidity (Subjective)	High	High	High	High		
Odor (Subjective)	0	0	0	0		
Other:						

Sampling Information

- 1. Date: 3-9-01 2. Time: 10:15 3. Sample Containers (Number/Size/Type): 4/40ml/G 1/16/6
- 4. Analyses requested: BTEX/MTBE/Naph., PAH's, Pb, No<sub>2</sub>, Sox, - Fe, Cd, H<sub>2</sub>
- 5. Samples Filtered: No 6. Filtration Equipment: N/A
- 7. Samples Preserved: Yes 8. Preservative: ACL, H<sub>2</sub>O<sub>2</sub>, Ice
- 9. Lab Performing Analyses: ESC 10. Sample Type: Well ; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION SUMMARY SHEET**



General

- 1. Job Name: Hot Spot # 3005
- 2. Project No.: 1264-99-506
- 3. Sampled By: LL/BH
- 4. Weather: Sunny/Cool
- 5. Location: Chesnee, S.C.
- 6. Well #: MW-8
- 7. Well Condition: OK
- 8. Personnel Present: LL/BH

Water Level Information:

- 1. Date: 3/6/01 2. Time: 12:00 3. State Water Level: 24.12 Ft. Below M.P.
- 4. Description of Measuring Point (M.P.): TOC
- 5. Height of M.P. above (below) (Circle) Land Surface: 3"
- 6. Method of Water Level Measurement: Elec. WL Tape

Evacuation Procedure (Wells):

- 1. Date: 3/4/01 2. Time Evacuation Started: 12:03 3. Time Evacuation Finished: 12:05
- 4. Method of Evacuation: Bailer 5. Total Well Depth: 33.20 Ft. Below M.P.
- 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft
- 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ Gallons  
(Well Volume X # Volumes = Total Gallons Purged)
- 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 6.98 Actual      Buffer pH 4.0 or 10.0 4.01 Actual      100 Standard      Cond: 110 Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	1.5	3	4.5			
Water Temperature (F)(C)	19°	19.8°				
pH (Standard Units)	7.88	7.63				
Specific Cond. (M/MHOS) (PPM)	41.4	29.5				
Turbidity (Subjective)	High	High				
Odor (Subjective)	0	0				
Other:						

Sampling Information

- 1. Date: 3/9/01 2. Time: 12:15 3. Sample Containers (Number/Size/Type): 4/10ml/G 1/16/G 2/250ml/P
- 4. Analyses requested: BTEX/MTBE/Alph., PAH's, Ph, NO<sub>3</sub>, SO<sub>4</sub> - Fe, CH<sub>4</sub>
- 5. Samples Filtered: No 6. Filtration Equipment: N/A
- 7. Samples Preserved: Yes 8. Preservative: ACI, HNO<sub>3</sub>, Ice
- 9. Lab Performing Analyses: ESC 10. Sample Type: Well  ; Stream

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION SUMMARY SHEET**



General

- 1. Job Name: Hot Spot # 3005
- 2. Project No.: 1264-99-506
- 3. Sampled By: LL/BH
- 4. Weather: Sunny / Cool
- 5. Location: Chesnee, S.C.
- 6. Well #: MW-9
- 7. Well Condition: OK
- 8. Personnel Present: LL/BH

Water Level Information:

- 1. Date: 3-9-01 2. Time: 10:20 3. State Water Level: 28.64 Ft. Below M.P.
- 4. Description of Measuring Point (M.P.): TOC
- 5. Height of M.P. above (below) Land Surface: 3"
- 6. Method of Water Level Measurement: Elec. W/L Tape

Evacuation Procedure (Wells):

- 1. Date: 3-9-01 2. Time Evacuation Started: 10:25 3. Time Evacuation Finished: 10:30
- 4. Method of Evacuation: Bailer 5. Total Well Depth: 35.12 Ft. Below M.P.
- 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft
- 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
(Well Volume X # Volumes = Total Gallons Purged)
- 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 6.98 Actual Buffer pH 4.0 or 10.0 4.01 Actual 100 Standard Cond: 110 Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	1	2	3			
Water Temperature (F)(C)	19.5					
pH (Standard Units)	7.32	Dry				
Specific Cond. (M/MHOS) (PPM)	36.9					
Turbidity (Subjective)	High					
Odor (Subjective)	0					
Other:						

Sampling Information

- 1. Date: 3-9-01 2. Time: 10:35 3. Sample Containers (Number/Size/Type): 2/2 50ml/P
- 4. Analyses requested: BTEX/MTBE/naph., PAH's, Pb, NO<sub>2</sub>, SO<sub>4</sub>, -Fe, CH<sub>4</sub>
- 5. Samples Filtered: No 6. Filtration Equipment: N/A
- 7. Samples Preserved: Yes 8. Preservative: HCl, HNO<sub>3</sub>, Ice
- 9. Lab Performing Analyses: ESC 10. Sample Type: Well ✓; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION SUMMARY SHEET**



General

- 1. Job Name: Hot Spot # 3005
- 2. Project No.: 1264-99-506
- 3. Sampled By: LL/BH
- 4. Weather: Sunny/Cool
- 5. Location: Chesnee, S.C.
- 6. Well #: MW-10
- 7. Well Condition: OK
- 8. Personnel Present: LL/BH

Water Level Information:

- 1. Date: 3-8-01 2. Time: 13:00 3. State Water Level: 23.34 Ft. Below M.P.
- 4. Description of Measuring Point (M.P.): TOC
- 5. Height of M.P. above/below (Circle) Land Surface: 3"
- 6. Method of Water Level Measurement: Elec. WL Tape

Evacuation Procedure (Wells):

- 1. Date: 3-8-01 2. Time Evacuation Started: 13:03 3. Time Evacuation Finished: 13:05
- 4. Method of Evacuation: Bailer 5. Total Well Depth: 27.15 Ft. Below M.P.
- 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft
- 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ Gallons  
(Well Volume X # Volumes = Total Gallons Purged)
- 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 6.98 Actual Buffer pH 4.0 or 10.0 4.01 Actual 100 Standard Cond: 110 Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	<u>1.5</u>	<u>1</u>	<u>1.5</u>		
Water Temperature (F)(C)	<u>20.8°</u>				
pH (Standard Units)	<u>7.49</u>				
Specific Cond. (M/MHOS) (PPM)	<u>75.0</u>				
Turbidity (Subjective)					
Odor (Subjective)					
Other:					

Sampling Information

- 1. Date: 3-8-01 2. Time: 13:15 3. Sample Containers (Number/Size/Type): 4/40ml/G 1/12/G
- 4. Analyses requested: BTEX/MTBE/Naph., PAH's, Pb, NO<sub>2</sub>, SO<sub>4</sub> - Fe, CH<sub>4</sub>
- 5. Samples Filtered: No 6. Filtration Equipment: N/A
- 7. Samples Preserved: Yes 8. Preservative: ACL H<sub>2</sub>O<sub>2</sub>, Ice
- 9. Lab Performing Analyses: ESC 10. Sample Type: Well X; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION SUMMARY SHEET**



General

- 1. Job Name: Hot Spot # 3005
- 2. Project No.: 1264-99-506
- 3. Sampled By: LL/BH
- 4. Weather: Sunny/Cool
- 5. Location: Chesnee, S.C.
- 6. Well #: MW-11
- 7. Well Condition: OK
- 8. Personnel Present: LL/BH

Water Level Information:

- 1. Date: 3-8-01
- 2. Time: 12:48
- 3. State Water Level: 23.73 Ft. Below M.P.
- 4. Description of Measuring Point (M.P.): Tec
- 5. Height of M.P. above/below (Circle) Land Surface: 3"
- 6. Method of Water Level Measurement: Elec. Wk Tape

Evacuation Procedure (Wells):

- 1. Date: 3-8-01
- 2. Time Evacuation Started: 12:50
- 3. Time Evacuation Finished: 12:54
- 4. Method of Evacuation: Bailer
- 5. Total Well Depth: 28.10 Ft. Below M.P.
- 6. Casing Diameter (D): 2 Inches
- 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft
- 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
(Well Volume X # Volumes = Total Gallons Purged)
- 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 6.98 Actual      Buffer pH 4.0 or 10.0 4.01 Actual      100 Standard      Cond: 110 Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	1	2	3			
Water Temperature (F/C)	20°					
pH (Standard Units)	7.21					
Specific Cond. (M/MHOS) (PPM)	56					
Turbidity (Subjective)	High					
Odor (Subjective)	0					
Other:						

Sampling Information

- 1. Date: 3-8-01
- 2. Time: 12:58
- 3. Sample Containers (Number/Size/Type): 4/40ml/G, 1/12/16, 2/250ml/P
- 4. Analyses requested: BTEX/MTBE/Alaph., PAH's, Pb, Ni, Se, S, - Fe, Cd, Hg
- 5. Samples Filtered: No
- 6. Filtration Equipment: N/A
- 7. Samples Preserved: Yes
- 8. Preservative: HCl, HNO<sub>3</sub>, Ice
- 9. Lab Performing Analyses: ESC
- 10. Sample Type: Well  ; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION SUMMARY SHEET**



General

- 1. Job Name: Hot Spot # 3005
- 2. Project No.: 1264-99-506
- 3. Sampled By: LL/BH
- 4. Weather: Sunny / Cool
- 5. Location: Chesnee, S.C.
- 6. Well #: MW-12
- 7. Well Condition: OK
- 8. Personnel Present: LL/BH

Water Level Information:

- 1. Date: 3-8-01 2. Time: 12:18 3. State Water Level: 23.60 Ft. Below M.P.
- 4. Description of Measuring Point (M.P.): Tec
- 5. Height of M.P. above (below) Land Surface: 3"
- 6. Method of Water Level Measurement: Elec. Wl Tape

Evacuation Procedure (Wells):

- 1. Date: 3-8-01 2. Time Evacuation Started: 12:20 3. Time Evacuation Finished: 12:25
- 4. Method of Evacuation: Bailer 5. Total Well Depth: 30.30 Ft. Below M.P.
- 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft
- 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ Gallons  
(Well Volume X # Volumes = Total Gallons Purged)
- 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 6.98 Actual      Buffer pH 4.0 or 10.0 4.01 Actual      100 Standard      Cond: 110 Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	2	4	6			
Water Temperature (F)(C)	21°					
pH (Standard Units)	7.23	<b>DRY</b>				
Specific Cond. (M/MHOS) (PPM)	88					
Turbidity (Subjective)	High					
Odor (Subjective)	0					
Other:						

Sampling Information

- 1. Date: 3-8-01 2. Time: 12:30 3. Sample Containers (Number/Size/Type): 2/2 50ml/P
- 4. Analyses requested: BTEX/MTBE/Naph., PAH's, Pb, No<sub>2</sub>, So<sub>4</sub>, - Fe, C, H<sub>2</sub>
- 5. Samples Filtered: No 6. Filtration Equipment: N/A
- 7. Samples Preserved: Yes 8. Preservative: HCl, H<sub>2</sub>O<sub>2</sub>, Ice
- 9. Lab Performing Analyses: ESC 10. Sample Type: Well ; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION SUMMARY SHEET**



General

- 1. Job Name: Hot Spot # 3005
- 2. Project No.: 1264-99-506
- 3. Sampled By: LL / BH
- 4. Weather: Sunny / Cool
- 5. Location: Chesnee, S.C.
- 6. Well #: MW-13
- 7. Well Condition: OK
- 8. Personnel Present: LL / BH

Water Level Information:

- 1. Date: 3-8-01 2. Time: 12:35 3. State Water Level: 23.60 Ft. Below M.P.
- 4. Description of Measuring Point (M.P.): TOC
- 5. Height of M.P. above (below) Land Surface: 3"
- 6. Method of Water Level Measurement: Elec. Well Tape

Evacuation Procedure (Wells):

- 1. Date: 3-8-01 2. Time Evacuation Started: 12:38 3. Time Evacuation Finished: 12:40
- 4. Method of Evacuation: Bailer 5. Total Well Depth: 26.92 Ft. Below M.P.
- 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft
- 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ Gallons  
(Well Volume X # Volumes = Total Gallons Purged)
- 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 6.98 Actual Buffer pH 4.0 or 10.0 4.01 Actual 100 Standard Cond. 110 Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	<u>1.5</u>	<u>1</u>	<u>1.5</u>			
Water Temperature (F)(C)	<u>20.2°</u>					
pH (Standard Units)	<u>7.03</u>					
Specific Cond. (M/MHOS) (PPM)	<u>1087</u>	<u>DRY</u>				
Turbidity (Subjective)	<u>High</u>					
Odor (Subjective)	<u>0</u>					
Other:						

Sampling Information

- 1. Date: 3-8-01 2. Time: 12:45 3. Sample Containers (Number/Size/Type): 4/100ml/G 1/1L/G
- 4. Analyses requested: BTEX/MTBE/Alph., PAH's, Pb, NO<sub>3</sub>, SO<sub>4</sub>, -Fe, CH<sub>4</sub>
- 5. Samples Filtered: No 6. Filtration Equipment: N/A
- 7. Samples Preserved: Yes 8. Preservative: HCl, HNO<sub>3</sub>, Ice
- 9. Lab Performing Analyses: ESC 10. Sample Type: Well  ; Stream

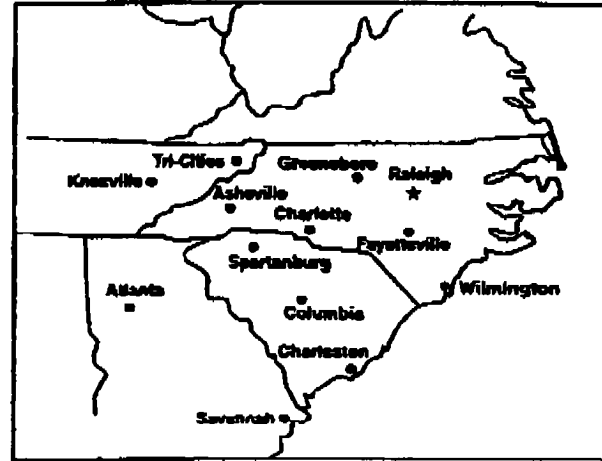
Remarks: \_\_\_\_\_

# FAX TRANSMITTAL COVER SHEET



**S&ME, Inc.**  
 155 Tradd Street  
 Spartanburg, South Carolina 29301  
 (864) 574-2360  
 Fax (864) 576-8730

TO: Eric Owens  
 FIRM: SCDHEC  
 LOCATION: Columbia, SC  
 RECIPIENT FAX NUMBER: (803) 898-9330  
 FROM: Mike O'Connell  
 SPARTANBURG, SOUTH CAROLINA



DATE: 5/11/01 TIME: 9:40 am pm

RETURN FAX NUMBER: (864) 576-8730

NUMBER OF PAGES INCLUDING COVER SHEET: 2  
 (If all pages not received, call (864) 574-2360)

COMMENTS: \_\_\_\_\_

Eric,

The only D.O. measurements I could find for this site were from the Tier I (SLA) report. Hopefully these will help.

-Mike

\* values on the attached sheet.

**RECEIVED**  
 MAY 11 2001  
 Underground Storage Tank Program

S&ME Project Number: \_\_\_\_\_



Enter field data measures (temperature, pH, conductivity) taken during well purging on the form provided. Complete for each well.

Monitoring Well	MW-3	MW-4	M-5
Temperature (°C)	20	24	20
pH	8.4	7.5	6.7
Conductivity (MMHOS)	380	100	70

Enter dissolved oxygen measurements for each well in the table below.

Monitoring Well	MW-3	MW-4	M-5
Dissolved Oxygen (mg/l)	1.8	5.2	3.0

Enter ground water analytical data for each monitoring well for all CoC in the table below. If free product is present, indicate the measured thickness to the nearest 0.01 feet.

CoC	RBSL (µg/l)	MW-1	MW-3	MW-4	MW-5
Free Product Thickness	None	3.84	None	None	None
Benzene (µg/L)	5	N/A	500	<5.0	<5.0
Toluene (µg/L)	1,000	N/A	220	<5.0	21
Ethylbenzene (µg/L)	700	N/A	100	<5.0	5.0
Xylenes (µg/L)	10,000	N/A	460	<5.0	20
Total BTEX (µg/L)	N/A	N/A	1280	<5.0	46
MTBE (µg/L)	40	N/A	1100	<5.0	<5.0
Naphthalene (µg/L)	25	N/A	<5.0	<5.0	<5.0
Benzo(a)anthracene (µg/L)	10	N/A	<5.0	<5.0	<5.0
Benzo(b)flouranthene (µg/L)	10	N/A	<5.0	<5.0	<5.0
Benzo(k)flouranthene (µg/L)	10	N/A	<5.0	<5.0	<5.0
Chrysene (µg/L)	10	N/A	<5.0	<5.0	<5.0
Dibenz(a,h)anthracene (µg/L)	10	N/A	<5.0	<5.0	<5.0
Ferrous Iron (mg/L)	N/A	N/A	15	19	12
Lead (mg/L)	Site Specific	N/A	.020	.0080	.023
Nitrates (mg/L)	N/A	N/A	.923	.038	1.43
Sulfates (mg/L)	N/A	N/A	36.1	9.49	7.16

Additional Comments: MW-1 was not sampled due to the presence of free product.  
 (depth to product: 26.01 feet; depth to product/water interface: 29.85 feet)

**G. Aquifer Characteristics**

Hydraulic Conductivity: 7.83E-02 ft/day for MW-3  
 1.34E-01 ft/day for MW-4

Hydraulic Gradient: .053

Porosity: Estimated at .25

Estimated Seepage Velocity: .0166 ft/day from MW-3  
 .0284 ft/day from MW-4

*Handwritten notes:*  
 mg 3.10 mg Nitrate  
 mg 1200 mg Surface  
 BDL METT  
 mg 690 mg Iron  
 .000000

**UNDERGROUND STORAGE TANK AND PROPERTY OWNER**

**PERMISSION FORM - UST Permit # 12719**

If you are the owner of the former or existing underground storage tanks and the property owner, please complete this form.

I, Judith A. Loughton, Agent certify that I am the legal owner of the underground storage tanks and property located at the facility identified below or serve as the authorized representative for the owner. I grant permission to the South Carolina Department of Health and Environmental Control (SCDHEC) to secure on my behalf contractor services to conduct assessment and corrective action activities as required, and authorize SCDHEC, or a contractor selected by SCDHEC, to enter this property at reasonable times only to accomplish these site rehabilitation tasks. The contractor(s) will be designated as my contractor for only the required site rehabilitation activities. Compensation to the contractor(s) will be from the SUPERB Account and I will have no obligation to pay the contractor(s). I understand that SCDHEC will be responsible for notifying me of all activities that are necessary prior to their initiation and will promptly provide to me a copy of each environmental report. I understand that I may choose to select my own contractor at the completion of any phase of work by notifying the Bureau of Underground Storage Tank Management in writing.

Name of Facility HotSpot # 3005 Phone # 864-461-8500

Street Address of Facility 107 Hampton St.,

Town, City, District, Suburb Chesnee, SC 29323

Name of nearest intersecting street, road, highway, alley  
SC Hwy 221

Is this facility within the city limits? (yes or no) yes

Is this facility serviced by a public water or sewer utility? (yes or no) yes, if no, please provide the name and phone number of a person that we can contact that can assist in the location of private water and septic tank lines \_\_\_\_\_, phone number \_\_\_\_\_

Were underground storage tanks previously removed from the ground at this facility? (yes or no) NO, if yes, please provide the name of a person we can contact that can assist in the location of the former underground storage tank excavation \_\_\_\_\_, Phone number \_\_\_\_\_

Is the property currently leased or rented to someone? (yes or no) NO, if yes, please provide their name \_\_\_\_\_ and phone number \_\_\_\_\_ and let them know about the pending assessment activities. If vehicles or other mobile structures are parked over the former or existing underground storage tanks, they should be moved before SCDHEC's contractor gets to the site.

NAME of UST/property owner (Please Print): R.L. Jordan Oil Company of North Carolina, Inc.

Phone Number (<sup>work</sup>/<sub>home</sub>) 864-585-2784 Ext. 116 (work) cell 864-316-2845

Signature of UST/property Owner: Judith A. Loughton, Agent

Witness: Crystal Powell

Date: Aug Month 27 Day 2001 Year



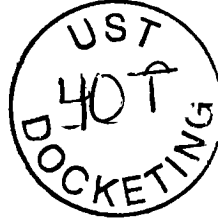


**UNDERGROUND STORAGE TANK PROGRAM  
BUREAU OF LAND AND WASTE MANAGEMENT**

Phone (800) 826-5435 Fax (803) 898-4330

2600 Bull Street  
Columbia, SC 29201-1708

Geological Resources, Inc.  
Attn: Shawn Lambert  
4913 Albemarle Rd, Ste. 101  
Charlotte, NC 28205



**SEP 21 2001**

**Re: Notice to Proceed**  
Sampling Contract Bid # SB-10772-04/06/00 PO# 247174

Dear Ms. Lambert:

Based on the award of the referenced bid package, enclosed are the information packets to conduct ten (10) groundwater sampling events. The packets contain all necessary information for work to begin. The facilities have been assigned an individual Cost Proposal (CP) number as listed below. Please reference the CP number and Purchase Order #247174 on the appropriate invoice submitted for payment against each facility.

UST Permit #	Facility	County	# wells	Parameters	Test America CP#	GRI CP#
09374	Handy Pantry 55	York	10	BTEX, Naph, MTBE (8260), Nitrate, Sulfate, & Ferrous Iron	14671:P	14672:P
12719	Hot Spot 3005	Spartanburg	14	BTEX, Naph, MTBE (8260)	14705:P	14743:P
11636	Buddys Inc	Greenville	6	BTEX, Naph, MTBE, EDB (8260)	14488:P	14489:P
16099	Madden Station	Anderson	10	BTEX, Naph, MTBE (8260), Nitrate, Sulfate, & Ferrous Iron	14675:P	14676:P
04714	Greenwood Cty	Greenwood	8	BTEX, Naph, MTBE (8260), Nitrate, Sulfate, & Ferrous Iron	14439:P	14440:P
05826	Southern Bakeries	Lexington	4	BTEX, Naph, MTBE (8260), Nitrate, Sulfate, & Ferrous Iron	14443:P	14444:P
14842	Sam Sharpe	Lexington	11	BTEX, Naph, MTBE (8260), Nitrate, Sulfate, & Ferrous Iron	14453:P	14454:P
15849	Abandoned Gulf	Lexington	10	BTEX, Naph, MTBE (8260), EDB (8011), Lead, Nitrate, Sulfate, & Fe2+	14712:P	14713:P
07798	Cheapo's Truck Stop	Lexington	33	BTEX, Naph, MTBE (8260)	13972:P	13973:P
16158	American Storage	Richland	10	BTEX, Naph, MTBE (8260), Lead, Nitrate, Sulfate, & Ferrous Iron	14455:P	14456:P

Geological Resources, Inc. will perform services at the sites on behalf of the sites' responsible party (RP); however, payment will be made from the SUPERB Account. The sites' RP has no obligation for payment for this scope of work. **Please coordinate access to the facilities with the property owner.** Contact information has been provided in the information packets.

The Bureau grants pre-approval for transportation of drums of groundwater from the referenced sites to a permitted treatment facility. The contaminated groundwater must be properly stored in labeled 55-gallon drums or equivalent containers. The contaminated groundwater must be accepted by the approved treatment facility. There can be no spillage or leakage in transport. A copy of the disposal manifest from the receiving facility that clearly designates the quantity received must be included with the final report.

Please contact Bob Faller before commencing work at these facilities. If you have any questions or need further assistance, please contact Bob Faller at (803) 898-4326 or (800) 826-5435 (within SC only)

Sincerely,



Debra L. Thoma, Hydrogeologist  
State Lead & Field Services Section  
Assessment & Corrective Action Division

enc: Information Packet (10)  
Chains of Custody (10)

cc: Karen Moore, Test America, 9440 Two Notch Rd, Ste. B, Columbia, SC 29223  
Pete Overton, PO Box 2359, Gastonia, NC, 28053 (UST Permit #09374)  
Judith Laughter, PO Box 2527, Spartanburg, SC, 29304 (UST Permit #12719)  
Charles White, 2314 W. Parker Rd., Greenville, SC, 29617 (UST Permit #11636)  
Mildred Schumpert, 8 Lusk St., Honea Path, SC, 29654 (UST Permit #16099)  
Larry Smith, 528 Monument St, Rm B-03, Greenwood, SC, 29646 (UST Permit #04714)  
Southern Bakeries, Inc., 1135 Broughton St. SE, Orangeburg, SC, 29155 (UST Permit #05826)  
Sam Sharpe, 1534 Hazel St., Cayce, SC, 29033 (UST Permit #14842)  
Lucius Martin, PO Box 429, Swansea, SC, 29160 (UST Permit #15849)  
Martha Worrell, PO Box 1375, Lexington, SC, 29071 (UST Permit #07798)  
Mark Wood, PO Box 2885, Spartanburg, SC, 29304 (UST Permit #16158)  
Bob Faller, State Lead & Field Services  
Debra L. Thoma, State Lead & Field Services  
Technical File (10)  
Financial File (10)

**Water Well Record**  
**Ground Water Protection Division**

2600 Bull Street, Columbia, SC 29201, (803) 734-5331

1. LOCATION OF WELL:  
County: Spartanburg System Name: MW-1  
Latitude: 35° 09' 06" Longitude: 81° 51' 35"  
Distance and Direction from Road Intersections:  
~ 200-400 feet from Hwy 221 in Chesney, South Carolina  
Street Address & City of Well Location:

Sketch Map:  
see attached

2. CUTTING SAMPLES:  Yes  No  
Geophysical Logs:  Yes (please enclose)  No

Formation Description	*Thickness of Stratum	Depth To Bottom of Stratum
Concrete	0.8'	0.8'
Gravel	0.2'	1.0'
Fill-Red Sandy CLAY	2.5'	3.5'
Fill-Grey SAND	11'	14.5'
Residual-Red to Brown Sandy SILT	15.5'	30.0'
Residual-Brown sandy Silty CLAY	5.0'	35.0'

4. OWNER OF WELL: R.L. Jordan Oil Company  
Address: P.O. Box 2527, Spartanburg, SC 29304  
Telephone No.: (864) 585-2784  
Engineer: Froehling & Robertson, Inc.  
Address: P.O. Box 17186, Greenville, SC 29606  
Telephone No.: (864) 271-2840

5. WELL DEPTH (completed) 30.0 ft. Date Started: 4/23/96  
Date Completed: 4/24/96  
6.  Mud Rotary  Jetted  Bored  Dug  
 Air Rotary  Driven  Cable tool  Other

7. USE:  
 Domestic  Public Supply-Permit No. \_\_\_\_\_  Industry  
 Irrigation  Air Conditioning  Commercial  
 Test Well  Monitor Well  \_\_\_\_\_

8. CASING:  Threaded  Welded  
Diam.: 2 inch Height: Above/Below Surface ~0.3 ft.  
Type:  PVC  Galvanized  Steel  Other  
0 in. to 15 ft. depth  Yes  No  
\_\_\_\_\_ in. to \_\_\_\_\_ ft. depth

9. SCREEN: PVC Diam.: 2 inch  
Slot/Gauge: 0.010 inch Length: 15 feet  
Set Between: 15 ft. and 30 ft. **NOTE: MULTIPLE SCREENS USE SECOND SHEET**  
Sieve Analysis  Yes (please enclose)  No

10. STATIC WATER LEVEL 22.50 ft. below land surface after 24 hours

11. PUMPING LEVEL Below Land Surface \_\_\_\_\_ ft. after \_\_\_\_\_ hrs. Pumping \_\_\_\_\_ G.P.M.  
Pumping Test:  Yes (please enclose)  No  
Yield: \_\_\_\_\_

12. WATER QUALITY  
Chemical Analysis  Yes  No Bacterial Analysis  Yes  No  
Please enclose lab results.

13. ARTIFICIAL FILTER (gravel pack)  Yes  No  
Installed from 13 ft. to 35 ft.  
Effective size Fx-50 Uniformity Coefficient \_\_\_\_\_

14. WELL GROUTED?  Yes  No  
Neat Cement  Sand Cement  Concrete  Other  \_\_\_\_\_  
Depth: From 0 ft. to 12 ft.

15. NEAREST SOURCE OF POSSIBLE CONTAMINATION: ~6 ft. E direction  
petroleum Type well disinfected  Yes  No upon completion  No Amount: \_\_\_\_\_

16. PUMP: Date installed: \_\_\_\_\_ Not installed   
Mfr. Name: \_\_\_\_\_ Model No.: \_\_\_\_\_  
H.P. \_\_\_\_\_ Volts \_\_\_\_\_ Length of drop pipe \_\_\_\_\_ ft. Capacity \_\_\_\_\_ gpm  
TYPE:  Submersible  Jet (shallow)  Turbine  
 Jet (deep)  Reciprocating  Centrifugal

17. WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my direction and this report is true to the best of my knowledge and belief.  
Registered Business Name: Froehling & Robertson, Inc. Date: \_\_\_\_\_  
Address: P.O. Box 17186; Greenville, SC 29606  
Signed: Carl Lawrence Cert No.: 897  
Authorized Representative

\* Indicate Water Bearing Zones (Use a 2nd sheet if needed)  
3. REMARKS: This well is a groundwater monitoring well installed as part of an SCDHEC I.G.W.A. at G.W.P.D # 12719

RECEIVED  
JUN 14 1996  
Groundwater Protection Division





**FROEHLING & ROBERTSON, INC.**  
 GEOTECHNICAL • ENVIRONMENTAL • MATERIALS  
 ENGINEERS • LABORATORIES  
 "OVER ONE HUNDRED YEARS OF SERVICE"

CERTIFICATE OF ANALYSIS

April 29, 1996

Page 1 of 2

LAB #: 9604181  
 CLIENT: F&R Greenville  
 Attn: Craig Lee

PROJECT: Chesnee Hot Spot

SAMPLES COLLECTED BY: C. Lee  
 LAB RECEIPT: 04/25/96, 0936

<u>PARAMETER</u>	<u>ANALYSIS DATE/TIME</u>	<u>METHOD</u>	<u>ANALYST</u>
BTEX/Naphthalene	04/26/96, 1241	SW846/8260	EVY
PAH-Extraction	04/25/96, 0940	SW846/8270	TS
PAH	04/26/96, 1134	SW846/8270	EVY

**RESULTS:**

F&R #: 9604181-01  
 SAMPLE ID: MW-1  
 DATE/TIME: 04/24/96, 1530  
 TYPE: Water/Grab

**Det'n Limit:**

BTEX/Naphthalene (µg/L)		
Benzene	27.4	5
Ethylbenzene	46.0	5
Toluene	88.3	5
m,p-Xylene	70.2	5
o-Xylene	99.9	5
Naphthalene	55.7	5

µg/L = microgram per Liter

**Audrey N. Brubeck**  
 Laboratory Supervisor

AB/psg

HEADQUARTERS: 3015 DUMBARTON ROAD • BOX 27524 • RICHMOND, VA 23261-7524  
 TELEPHONE (804) 264-2701 • FAX (804) 264-1202

BRANCHES: ASHEVILLE, NC • BALTIMORE, MD • CHARLOTTE, NC • CHESAPEAKE, VA  
 CROZET, VA • FAYETTEVILLE, NC • FREDERICKSBURG, VA  
 GREENVILLE, SC • RALEIGH, NC • ROANOKE, VA • STERLING, VA



**RESULTS:**

**F&R #:** 9604181-01  
**SAMPLE ID:** MW-1  
**DATE/TIME:** 04/24/96, 1530  
**TYPE:** Water/Grab

**Det'n Limit:**

<b>PAH (<math>\mu\text{g/L}</math>)</b>		
Acenaphthene	BDL	10
Acenaphthylene	BDL	10
Anthracene	BDL	10
Benzo[a]anthracene	BDL	10
Benzo[a]pyrene	BDL	10
Benzo[b]fluoranthene	BDL	10
Benzo[g,h,i]perylene	BDL	10
Benzo[k]fluoranthene	BDL	10
Chrysene	BDL	10
Dibenz[a,h]anthracene	BDL	10
Fluoranthene	BDL	10
Fluorene	BDL	10
Indeno[1,2,3-cd]pyrene	BDL	10
Naphthalene	41.9	10
Phenanthrene	BDL	10
Pyrene	BDL	10

$\mu\text{g/L}$  = microgram per Liter      **BDL = Below Detection Limit**





# CHAIN OF CUSTODY RECORD

Please Print CLIENT ADDRESS: F&R - Greenville  
 ATTN: Craig Lee / Jim Buschur  
 PHONE/FAX: \_\_\_\_\_

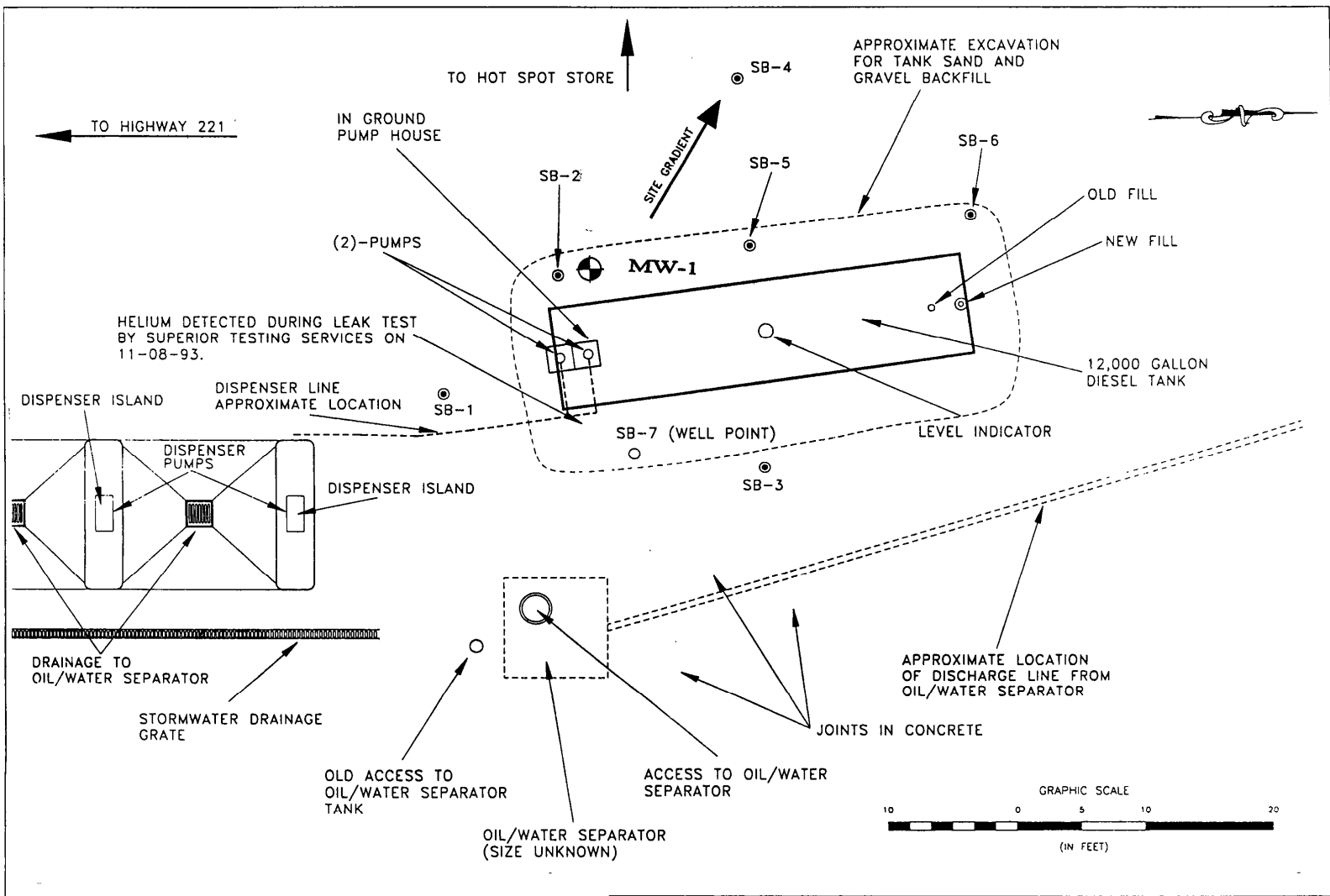
FROEHLING & ROBERTSON, INC.  
 P.O. BOX 27524  
 RICHMOND, VIRGINIA 23261  
 TEL: (804) 264-2701  
 FAX: (804) 264-1202

LAB PROJECT #		PROJECT NAME/NUMBER - Please Print				CONTAINERS # OF	SAMPLE (MATRIX)	REQUESTED TEST PARAMETERS													
SAMPLED BY - Please Print							4-26-96	Water	8TEX + Naphthalene PAH-8270												
LAB ID	DATE	TIME	QMS	CONT	SAMPLE IDENTIFICATION																
9604181	Chesnee Hot Spot																				
Carl Landford / Craig Lee						7															
01	4-24-96	15:30	X		MW-1	1134															

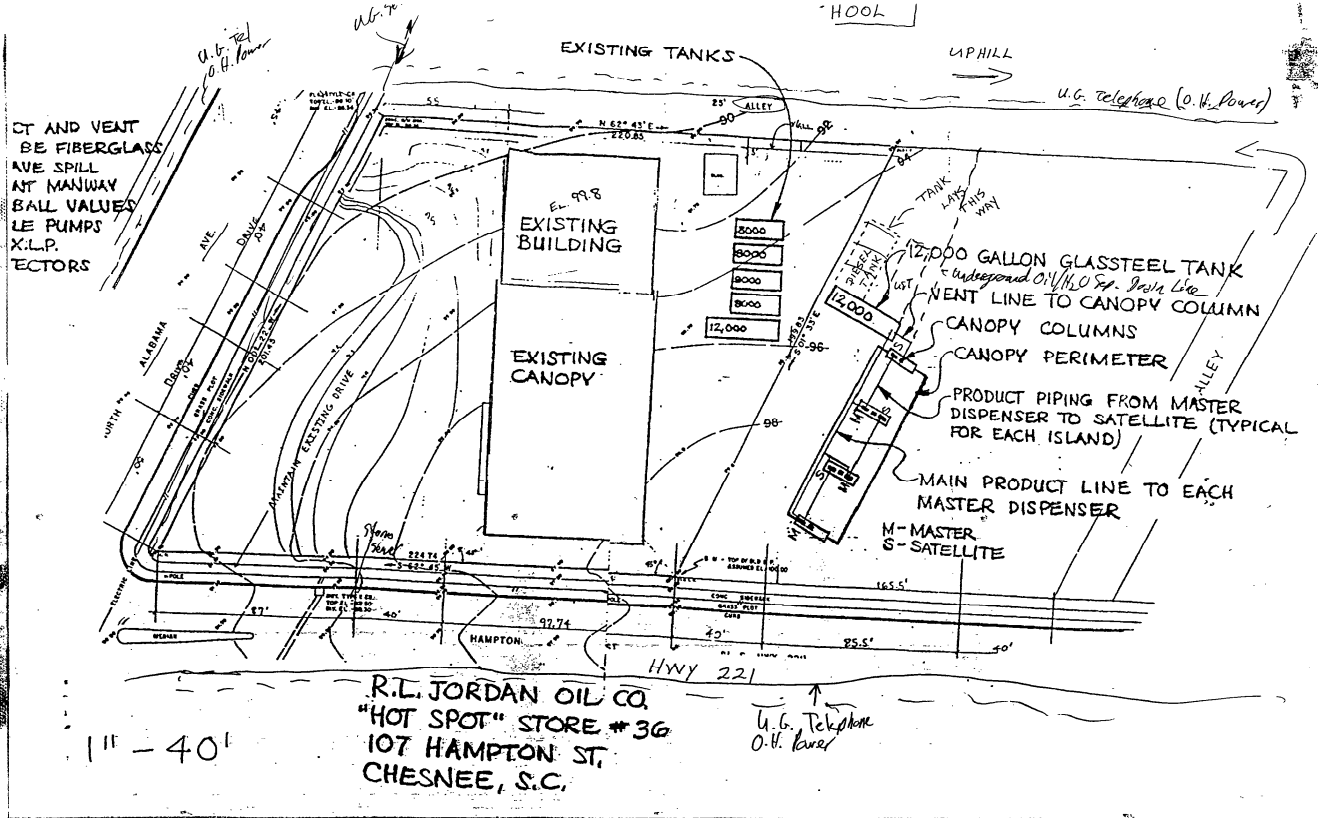
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY	DATE	TIME	FIELD COMMENTS: Please Print	
<i>Craig Lee</i>	4-24-96	16:45	<i>J. deRose</i>	4-25-96	09:30		24 hr. Turnaround - As per SC DHEC UST guidelines In ice

SHIPPED VIA Fed-Ex Airbill # 4580547904 DATE 4-24-96

pH \_\_\_\_\_ TEMP. \_\_\_\_\_



<b>GREENVILLE BRANCH</b>		<small>F&amp;R</small> <b>FROENLING &amp; ROBERTSON, INC.</b> <small>1982</small> <b>HAZARDOUS WASTE SERVICE LABORATORIES-ENGINEERING/ENVIRONMENTAL</b> <small>"OVER ONE HUNDRED YEARS OF SERVICE"</small>	
SCALE: <b>NOT TO SCALE</b>	F&R FILE NUMBER: <b>X-65-014</b>	DRAWN BY: <b>C.A.L.</b>	
DATE: <b>04/29/96</b>		REVISED:	
<b>R.L. JORDAN OIL COMPANY: HOT SPOT #36 - SCHEC ID # 12719</b>			
<b>UST AREA MAP</b>			DRAWING NUMBER <b>2</b>





35538

P.O. Box 16590 • GREENSBORO, NC 27416-0590 • (336) 273-2718

# MATERIAL MANIFEST

MANIFEST# 35538

F.S.E. JOB # 121098 TOP

Date: 9-28-01

Generator: Hot Spot 3005

Phone No: \_\_\_\_\_

EPA ID No: \_\_\_\_\_

### Process which generated material:

I certify that the materials described below are properly classified, packaged, marked & labeled, and are in the proper condition to be transported as specified by the Department of Transportation. I certify that the material described below is not a hazardous waste in accordance with the Environmental Protection Agency. I certify that the specific material was delivered to the carrier named below for transport to the facility indicated.

Date 9-28-01 Signature Alvin A. Egle

HM	PROPER SHIPPING NAME AS LISTED ON 172.101 TABLE	HAZ CLASS	DOT I.D. NUMBER	PG GROUP	QUANTITY	CIRCLE UNIT	CONTAINER NO. TYPE	ERG. NO.
	<u>Pure Water</u> NOW Regulated NOW RCRA HAZ	<u>NA</u>	<u>UN 0000</u>	<u>I</u> <u>II</u> <u>III</u>	<u>31.5</u>	<u>Gals.</u> Pounds Tons Cu. Yds.	<u>TT</u> <u>DT</u> <u>CM</u> <u>DM</u> <u>DF</u>	

## FOUR SEASONS ENVIRONMENTAL USE ONLY

DESCRIPTION OF MATERIAL	CIRCLE FORM	AMOUNT SOLIDS		AMOUNT LIQUIDS	
		GALLONS	TONS	NO. DRUMS	GALLONS
<u>Pure Water</u>	<u>SOLID</u>				
CONTAINER NUMBER	<u>LIQUID</u>				
<u>DM</u>	<u>SLUDGE</u>				

## FACILITY USE ONLY

Transporter: PTA Unit Number: \_\_\_\_\_  
4113 Albemarle Road Phone No: \_\_\_\_\_  
Charlotte NC 28205 EPA ID No: \_\_\_\_\_

Vehicle License Tag Number(s): \_\_\_\_\_ Container: \_\_\_\_\_

Transporter Certification: \_\_\_\_\_  
 I certify that the specified material was transferred in a registered (licensed) vehicle to the facility named and was accepted.

Pick-up Driver's Signature: Alvin A. Egle Date: 9/28/01

Delivering Driver's Signature: Alvin A. Egle Date: 9/28/01

Facility: Four Seasons Env Phone No: 800-722-0263  
4920 Old Pineville Road Contact: Sally Johnson  
Charlotte NC 28217

Handling Method: RT503Z

Facility Certification: \_\_\_\_\_  
 I certify that the transporter above delivered the specified material to this facility and was handled in the above listed handling method. We authorize and qualified by the State of NC to handle this material.

Date: 9-28-01 Signature: Alvin A. Egle

**TestAmerica**  
INCORPORATED

Division/Laboratory Name:

FAX CHAIN

TO COLUMBIA RECEPT

To assist us in using the proper analytical methods,  
is this work being conducted for regulatory purposes?  
Compliance Monitoring

Pg 1 of 2

Client Name: SCDHFC-UST Client #: 2200

OCT 08 2001

Address: 2600 Bull Street

Project Name: Hot Spot 3005

City/State/Zip Code: Columbia, SC 29201

Underground Storage Tank Program # 12719

Project Manager: D Thoma

Site/Location ID: Spartanburg State: SC

Telephone Number: 803-898-4350 Fax: 803-898-4330

Report To: D Thoma

Sampler Name: (Print Name) Allison Engle

Invoice To: Pat Holland

Sampler Signature: Allison Engle

Quote #: — PO#: 179220

254823

TAT <input checked="" type="checkbox"/> Standard <input type="checkbox"/> Rush (surcharges may apply)	Date Needed: <u>10-5-01</u>	Fax Results: <u>Y</u> <input checked="" type="radio"/> <u>N</u>	Date Sampled	Time Sampled	G = Grab, C = Composite	Field Filtered	Matrix SL - Sludge DW - Drinking Water GW - Groundwater S - Soil/Solid WW - Wastewater Specify Other	Preservation & # of Containers							Analyze For:	QC Deliverables <input type="checkbox"/> None <input type="checkbox"/> Level 2 <input type="checkbox"/> Level 3 <input type="checkbox"/> Level 4 Other: _____	REMARKS		
								HNO <sub>3</sub>	HCl	NaOH	H <sub>2</sub> SO <sub>4</sub>	Methanol	None	Other (Specify)					
			<u>9-28-01</u>	<u>12:01</u>	<u>G</u>		<u>BW</u>	<u>3</u>											<u>LPH</u>
			<u>9-28-01</u>	<u>11:00</u>	<u>G</u>		<u>BW</u>	<u>3</u>											<u>Retained</u>
			<u>9-28-01</u>	<u>11:52</u>	<u>G</u>		<u>BW</u>	<u>3</u>											<u>Dry</u>
			<u>9-28-01</u>	<u>11:35</u>	<u>G</u>		<u>BW</u>	<u>3</u>											
			<u>9-28-01</u>	<u>9:56</u>	<u>G</u>		<u>BW</u>	<u>3</u>											
			<u>9-28-01</u>	<u>11:17</u>	<u>G</u>		<u>BW</u>	<u>3</u>											
			<u>9-28-01</u>	<u>10:09</u>	<u>G</u>		<u>BW</u>	<u>3</u>											
Special Instructions: <u>CP# 14705:P</u>													LABORATORY COMMENTS: Init Lab Temp: Rec Lab Temp: <u>3°C</u> Custody Seals: <input checked="" type="radio"/> Y <input type="radio"/> N <input type="radio"/> N/A Bottles Supplied by TestAmerica: <input checked="" type="radio"/> Y <input type="radio"/> N Method of Shipment:						
Relinquished By: <u>Allison Engle</u>	Date: <u>9-28-01</u>	Time: <u>17:15</u>	Received By:	Date:	Time:														
Relinquished By:	Date:	Time:	Received By:	Date:	Time:														
Relinquished By:	Date:	Time:	Received By: <u>Pat Holland</u>	Date: <u>9-21-01</u>	Time: <u>09:00</u>														



BTEX, NAP, HTSE  
BGLLO

FAX CHAIN TO COLUMBIA

**TestAmerica**  
INCORPORATED

Division/Laboratory Name: \_\_\_\_\_

To assist us in using the proper analytical methods, is this work being conducted for regulatory purposes? Compliance Monitoring \_\_\_\_\_

Client Name: SCDHEC-LIST Client #: 2200

Address: 8600 Bull Street

City/State/Zip Code: Columbia, SC 29201

Project Manager: D Thoma

Telephone Number: 803-898-4350 Fax: 803-898-4330

Sampler Name: (Print Name) Allison Engle

Sampler Signature: Allison A. Engle

Project Name: Hot Spot 3005

Project #: 12719

Site/Location ID: Spaulding State: SC

Report To: D Thoma

Invoice To: Pat Holland

Quote #: \_\_\_\_\_ PO#: 179220

TAT <input checked="" type="checkbox"/> Standard <input type="checkbox"/> Rush (surcharges may apply)	Date Needed: <u>10-5-01</u>	Fax Results: <u>Y</u> <u>(N)</u>	Date Sampled	Time Sampled	G = Grab, C = Composite	Field Filtered	Matrix	Preservation & # of Containers							Analyze For:	QC Deliverables <input type="checkbox"/> None <input type="checkbox"/> Level 2 (Batch QC) <input type="checkbox"/> Level 3 <input type="checkbox"/> Level 4 Other: _____		
							SL - Sludge DW - Drinking Water GW - Groundwater S - Soil/Solid WW - Wastewater Specify Other	HNO <sub>3</sub>	HCl	NaOH	H <sub>2</sub> SO <sub>4</sub>	Methanol	None	Other (Specify)				
			<u>9-28-01</u>	<u>10:21</u>	<u>G</u>			<u>3</u>										<u>01-A138483</u>
			<u>9-28-01</u>	<u>9:28</u>	<u>G</u>			<u>3</u>										<u>84</u>
			<u>9-28-01</u>	<u>10:35</u>	<u>G</u>			<u>3</u>										<u>85</u>
			<u>9-28-01</u>	<u>12:58</u>	<u>G</u>			<u>3</u>										<u>138486</u>
<b>Special Instructions:</b>							<b>LABORATORY COMMENTS:</b>											
<u>CP # 14705:P</u>							Init Lab Temp: _____ Rec Lab Temp: <u>3°C</u> Custody Seals: <u>Y</u> N N/A Bottles Supplied by TestAmerica: <u>Y</u> N Method of Shipment: _____											
Relinquished By: <u>Allison A. Engle</u>			Date: <u>9-28-01</u>	Time: <u>17:15</u>	Received By: _____		Date: _____	Time: _____										
Relinquished By: _____			Date: _____	Time: _____	Received By: _____		Date: _____	Time: _____										
Relinquished By: _____			Date: _____	Time: _____	Received By: <u>Pat Holland</u>		Date: <u>9-28-01</u>	Time: <u>0900</u>										

TEST AMERICA, INC. NASHVILLE  
COOLER RECEIPT FORM

Client: SCDHCC

BC# 254823

Cooler Received On: 9-29-01 And Opened On: 9-29-01 By: Mike McBride

MMB  
(Signature)

1. Temperature of Cooler when opened 30 Degrees Celsius
2. Were custody seals on outside of cooler and intact?..... YES  NO
  - a. If yes, what kind and where: (2) FRONT/BACK/SIDE
  - b. Were the signature and date correct?..... YES  NO
  - c. Were custody seals on containers and intact?..... YES  NO
3. Were custody papers inside cooler?..... YES  NO
4. Were custody papers properly filled out (ink, signed, etc)?..... YES  NO
5. Did you sign the custody papers in the appropriate place?..... YES  NO
6. What kind of packing material used? BUBBLEWRAP PEANUTS VERMICULITE OTHER
7. Was sufficient ice used (if appropriate)?..... YES  NO
8. Did all bottles arrive in good condition (unbroken)?..... YES  NO
9. Were all bottle labels complete (#, date, signed, pres, etc)?..... YES  NO
10. Did all bottle labels and tags agree with custody papers?..... YES  NO
11. Were correct bottles used for the analysis requested?..... YES  NO
12. Were VOA vials present?..... YES  NO
  - a. If so were air bubbles present?..... YES  NO
13. Was sufficient amount of sample sent in each bottle?..... YES  NO
14. Were correct preservatives used?..... YES  NO
15. Was residual chlorine present?..... NO  YES
16. Corrective action taken, if necessary:
  - a. Name of person contacted: \_\_\_\_\_
  - b. Date: \_\_\_\_\_

## ANALYTICAL REPORT

SCDHEC 2200  
 UNDERGRD STOR TANK-DEBRA THOMA  
 2600 BULL STREET  
 COLUMBIA, SC 29201

Lab Number: 01-A138476  
 Sample ID: MW-3  
 Sample Type: Water  
 Site ID:

Project: 12719  
 Project Name: HOT SPOT 3005  
 Sampler: ALLISON ENGLE

Date Collected: 9/28/01  
 Time Collected: 12:09  
 Date Received: 9/29/01  
 Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
*VOLATILE ORGANICS*										
Benzene	2140	ug/l	50.0	2.0	50	10/ 5/01	1:53	M.Himelick	8260B	1281
Toluene	155.	ug/l	50.0	2.0	50	10/ 5/01	1:53	M.Himelick	8260B	1281
Ethylbenzene	295.	ug/l	50.0	2.0	50	10/ 5/01	1:53	M.Himelick	8260B	1281
Xylenes, Total	2260	ug/l	50.0	2.0	50	10/ 5/01	1:53	M.Himelick	8260B	1281
Methyl-t-butyl ether	7460	ug/l	50.0	2.0	50	10/ 5/01	1:53	M.Himelick	8260B	1281
Naphthalene	300.	ug/l	50.0	5.0	50	10/ 5/01	1:53	M.Himelick	8260B	1281

ND - Not detected at the report limit.

Surrogate	% Recovery	Target Range
VOA Surr 1,2-DCA-d4	101.	68. - 143.
VOA Surr Toluene-d8	86.	78. - 127.
VOA Surr, 4-BFB	97.	73. - 127.
VOA Surr, DBFM	117.	76. - 135.

# - Recovery outside Laboratory historical or method prescribed limits.

Sample report continued . . .



## ANALYTICAL REPORT

SCDHEC 2200  
 UNDERGRD STOR TANK-DEBRA THOMA  
 2600 BULL STREET  
 COLUMBIA, SC 29201

Lab Number: 01-A138477  
 Sample ID: MW-4  
 Sample Type: Water  
 Site ID:

Project: 12719  
 Project Name: HOT SPOT 3005  
 Sampler: ALLISON ENGLE

Date Collected: 9/28/01  
 Time Collected: 11:00  
 Date Received: 9/29/01  
 Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
*VOLATILE ORGANICS*										
Benzene	ND	ug/l	1.0	1.0	1	10/ 5/01	2:31	M.Himelick	8260B	1281
Toluene	ND	ug/l	1.0	1.0	1	10/ 5/01	2:31	M.Himelick	8260B	1281
Ethylbenzene	ND	ug/l	1.0	1.0	1	10/ 5/01	2:31	M.Himelick	8260B	1281
Xylenes, Total	ND	ug/l	1.0	1.0	1	10/ 5/01	2:31	M.Himelick	8260B	1281
Methyl-t-butyl ether	ND	ug/l	5.0	2.0	1	10/ 5/01	2:31	M.Himelick	8260B	1281
Naphthalene	ND	ug/l	5.0	5.0	1	10/ 5/01	2:31	M.Himelick	8260B	1281

ND - Not detected at the report limit.

Surrogate	% Recovery	Target Range
VOA Surr 1,2-DCA-d4	104.	68. - 143.
VOA Surr Toluene-d8	87.	78. - 127.
VOA Surr, 4-BFB	109.	73. - 127.
VOA Surr, DBFM	110.	76. - 135.

# - Recovery outside Laboratory historical or method prescribed limits.

Sample report continued . . .

## ANALYTICAL REPORT

SCDHEC 2200  
 UNDERGRD STOR TANK-DEBRA THOMA  
 2600 BULL STREET  
 COLUMBIA, SC 29201

Lab Number: 01-A138478  
 Sample ID: MW-6  
 Sample Type: Water  
 Site ID:

Project: 12719  
 Project Name: HOT SPOT 3005  
 Sampler: ALLISON ENGLE

Date Collected: 9/28/01  
 Time Collected: 11:52  
 Date Received: 9/29/01  
 Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
<b>*VOLATILE ORGANICS*</b>										
Benzene	6.5	ug/l	1.0	1.0	1	10/ 5/01	3:07	M.Himelick	8260B	1281
Toluene	1.9	ug/l	1.0	1.0	1	10/ 5/01	3:07	M.Himelick	8260B	1281
Ethylbenzene	23.9	ug/l	1.0	1.0	1	10/ 5/01	3:07	M.Himelick	8260B	1281
Xylenes, Total	97.0	ug/l	1.0	1.0	1	10/ 5/01	3:07	M.Himelick	8260B	1281
Methyl-t-butyl ether	ND	ug/l	5.0	2.0	1	10/ 5/01	3:07	M.Himelick	8260B	1281
Naphthalene	138.	ug/l	1.0	1.0	1	10/ 5/01	3:07	M.Himelick	8260B	1281

ND - Not detected at the report limit.

Surrogate	% Recovery	Target Range
VOA Surr 1,2-DCA-d4	101.	68. - 143.
VOA Surr Toluene-d8	91.	78. - 127.
VOA Surr, 4-BFB	110.	73. - 127.
VOA Surr, DBFM	110.	76. - 135.

# - Recovery outside Laboratory historical or method prescribed limits.

Sample report continued . . .

## ANALYTICAL REPORT

SCDHEC 2200  
 UNDERGRD STOR TANK-DEBRA THOMA  
 2600 BULL STREET  
 COLUMBIA, SC 29201

Lab Number: 01-A138479  
 Sample ID: MW-7  
 Sample Type: Water  
 Site ID:

Project: 12719  
 Project Name: HOT SPOT 3005  
 Sampler: ALLISON ENGLE

Date Collected: 9/28/01  
 Time Collected: 11:35  
 Date Received: 9/29/01  
 Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
*VOLATILE ORGANICS*										
Benzene	ND	ug/l	1.0	1.0	1	10/ 5/01	3:44	M.Himelick	8260B	1281
Toluene	ND	ug/l	1.0	1.0	1	10/ 5/01	3:44	M.Himelick	8260B	1281
Ethylbenzene	ND	ug/l	1.0	1.0	1	10/ 5/01	3:44	M.Himelick	8260B	1281
Xylenes, Total	ND	ug/l	1.0	1.0	1	10/ 5/01	3:44	M.Himelick	8260B	1281
Methyl-t-butyl ether	ND	ug/l	5.0	2.0	1	10/ 5/01	3:44	M.Himelick	8260B	1281
Naphthalene	ND	ug/l	5.0	5.0	1	10/ 5/01	3:44	M.Himelick	8260B	1281

ND - Not detected at the report limit.

Surrogate	% Recovery	Target Range
VOA Surr 1,2-DCA-d4	94.	68. - 143.
VOA Surr Toluene-d8	84.	78. - 127.
VOA Surr, 4-BFB	106.	73. - 127.
VOA Surr, DBFM	106.	76. - 135.

# - Recovery outside Laboratory historical or method prescribed limits.

Sample report continued . . .

## ANALYTICAL REPORT

SCDHEC 2200  
 UNDERGRD STOR TANK-DEBRA THOMA  
 2600 BULL STREET  
 COLUMBIA, SC 29201

Lab Number: 01-A138480  
 Sample ID: MW-8  
 Sample Type: Water  
 Site ID:

Project: 12719  
 Project Name: HOT SPOT 3005  
 Sampler: ALLISON ENGLE

Date Collected: 9/28/01  
 Time Collected: 9:56  
 Date Received: 9/29/01  
 Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
*VOLATILE ORGANICS*										
Benzene	ND	ug/l	1.0	1.0	1	10/ 5/01	4:22	M.Himelick	8260B	1281
Toluene	ND	ug/l	1.0	1.0	1	10/ 5/01	4:22	M.Himelick	8260B	1281
Ethylbenzene	ND	ug/l	1.0	1.0	1	10/ 5/01	4:22	M.Himelick	8260B	1281
Xylenes, Total	ND	ug/l	1.0	1.0	1	10/ 5/01	4:22	M.Himelick	8260B	1281
Methyl-t-butyl ether	ND	ug/l	5.0	2.0	1	10/ 5/01	4:22	M.Himelick	8260B	1281
Naphthalene	ND	ug/l	5.0	5.0	1	10/ 5/01	4:22	M.Himelick	8260B	1281

ND - Not detected at the report limit.

Surrogate	% Recovery	Target Range
VOA Surr 1,2-DCA-d4	109.	68. - 143.
VOA Surr Toluene-d8	99.	78. - 127.
VOA Surr, 4-BFB	105.	73. - 127.
VOA Surr, DBFM	119.	76. - 135.

# - Recovery outside Laboratory historical or method prescribed limits.

Sample report continued . . .

## ANALYTICAL REPORT

SCDHEC 2200  
 UNDERGRD STOR TANK-DEBRA THOMA  
 2600 BULL STREET  
 COLUMBIA, SC 29201

Lab Number: 01-A138481  
 Sample ID: MW-9  
 Sample Type: Water  
 Site ID:

Project: 12719  
 Project Name: HOT SPOT 3005  
 Sampler: ALLISON ENGLE

Date Collected: 9/28/01  
 Time Collected: 11:17  
 Date Received: 9/29/01  
 Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
<b>*VOLATILE ORGANICS*</b>										
Benzene	ND	ug/l	1.0	1.0	1	10/ 5/01	9:59	M.Himelick	8260B	1281
Toluene	ND	ug/l	1.0	1.0	1	10/ 5/01	9:59	M.Himelick	8260B	1281
Ethylbenzene	ND	ug/l	1.0	1.0	1	10/ 5/01	9:59	M.Himelick	8260B	1281
Xylenes, Total	ND	ug/l	1.0	1.0	1	10/ 5/01	9:59	M.Himelick	8260B	1281
Methyl-t-butyl ether	ND	ug/l	5.0	2.0	1	10/ 5/01	9:59	M.Himelick	8260B	1281
Naphthalene	ND	ug/l	5.0	5.0	1	10/ 5/01	9:59	M.Himelick	8260B	1281

ND - Not detected at the report limit.

Surrogate	% Recovery	Target Range
VOA Surr 1,2-DCA-d4	106.	68. - 143.
VOA Surr Toluene-d8	112.	78. - 127.
VOA Surr, 4-BFB	98.	73. - 127.
VOA Surr, DBFM	113.	76. - 135.

# - Recovery outside Laboratory historical or method prescribed limits.

Sample report continued . . .

## ANALYTICAL REPORT

SCDHEC 2200  
 UNDERGRD STOR TANK-DEBRA THOMA  
 2600 BULL STREET  
 COLUMBIA, SC 29201

Lab Number: 01-A138482  
 Sample ID: MW-10  
 Sample Type: Water  
 Site ID:

Project: 12719  
 Project Name: HOT SPOT 3005  
 Sampler: ALLISON ENGLE

Date Collected: 9/28/01  
 Time Collected: 10:09  
 Date Received: 9/29/01  
 Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
<b>*VOLATILE ORGANICS*</b>										
Benzene	ND	ug/l	1.0	1.0	1	10/ 5/01	10:36	M.Himelick	8260B	1281
Toluene	ND	ug/l	1.0	1.0	1	10/ 5/01	10:36	M.Himelick	8260B	1281
Ethylbenzene	ND	ug/l	1.0	1.0	1	10/ 5/01	10:36	M.Himelick	8260B	1281
Xylenes, Total	ND	ug/l	1.0	1.0	1	10/ 5/01	10:36	M.Himelick	8260B	1281
Methyl-t-butyl ether	ND	ug/l	5.0	2.0	1	10/ 5/01	10:36	M.Himelick	8260B	1281
Naphthalene	ND	ug/l	5.0	5.0	1	10/ 5/01	10:36	M.Himelick	8260B	1281

ND - Not detected at the report limit.

Surrogate	% Recovery	Target Range
VOA Surr 1,2-DCA-d4	113.	68. - 143.
VOA Surr Toluene-d8	102.	78. - 127.
VOA Surr, 4-BFB	100.	73. - 127.
VOA Surr, DBFM	117.	76. - 135.

# - Recovery outside Laboratory historical or method prescribed limits.

Sample report continued . . .

## ANALYTICAL REPORT

SCDHEC 2200  
 UNDERGRD STOR TANK-DEBRA THOMA  
 2600 BULL STREET  
 COLUMBIA, SC 29201

Lab Number: 01-A138483.  
 Sample ID: MW-11  
 Sample Type: Water  
 Site ID:

Project: 12719  
 Project Name: HOT SPOT 3005  
 Sampler: ALLISON ENGLE

Date Collected: 9/28/01  
 Time Collected: 10:21  
 Date Received: 9/29/01  
 Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
<b>*VOLATILE ORGANICS*</b>										
Benzene	ND	ug/l	1.0	1.0	1	10/ 5/01	11:13	M.Himelick	8260B	1281
Toluene	ND	ug/l	1.0	1.0	1	10/ 5/01	11:13	M.Himelick	8260B	1281
Ethylbenzene	ND	ug/l	1.0	1.0	1	10/ 5/01	11:13	M.Himelick	8260B	1281
Xylenes, Total	ND	ug/l	1.0	1.0	1	10/ 5/01	11:13	M.Himelick	8260B	1281
Methyl-t-butyl ether	ND	ug/l	5.0	2.0	1	10/ 5/01	11:13	M.Himelick	8260B	1281
Naphthalene	ND	ug/l	5.0	5.0	1	10/ 5/01	11:13	M.Himelick	8260B	1281

ND - Not detected at the report limit.

Surrogate	% Recovery	Target Range
VOA Surr 1,2-DCA-d4	114.	68. - 143.
VOA Surr Toluene-d8	104.	78. - 127.
VOA Surr, 4-BFB	102.	73. - 127.
VOA Surr, DBFM	122.	76. - 135.

# - Recovery outside Laboratory historical or method prescribed limits.

Sample report continued . . .

# TestAmerica

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## ANALYTICAL REPORT

SCDHEC 2200  
 UNDERGRD STOR TANK-DEBRA THOMA  
 2600 BULL STREET  
 COLUMBIA, SC 29201

Lab Number: 01-A138484  
 Sample ID: MW-12  
 Sample Type: Water  
 Site ID:

Project: 12719  
 Project Name: HOT SPOT 3005  
 Sampler: ALLISON ENGLE

Date Collected: 9/28/01  
 Time Collected: 9:38  
 Date Received: 9/29/01  
 Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
<b>*VOLATILE ORGANICS*</b>										
Benzene	ND	ug/l	1.0	1.0	1	10/ 5/01	11:50	M.Himelick	8260B	1281
Toluene	ND	ug/l	1.0	1.0	1	10/ 5/01	11:50	M.Himelick	8260B	1281
Ethylbenzene	ND	ug/l	1.0	1.0	1	10/ 5/01	11:50	M.Himelick	8260B	1281
Xylenes, Total	ND	ug/l	1.0	1.0	1	10/ 5/01	11:50	M.Himelick	8260B	1281
Methyl-t-butyl ether	ND	ug/l	5.0	2.0	1	10/ 5/01	11:50	M.Himelick	8260B	1281
Naphthalene	ND	ug/l	5.0	5.0	1	10/ 5/01	11:50	M.Himelick	8260B	1281

ND - Not detected at the report limit.

Surrogate	% Recovery	Target Range
VOA Surr 1,2-DCA-d4	111.	68. - 143.
VOA Surr Toluene-d8	105.	78. - 127.
VOA Surr, 4-BFB	104.	73. - 127.
VOA Surr, DBFM	113.	76. - 135.

# - Recovery outside Laboratory historical or method prescribed limits.

Sample report continued . . .



## ANALYTICAL REPORT

SCDHEC 2200  
 UNDERGRD STOR TANK-DEBRA THOMA  
 2600 BULL STREET  
 COLUMBIA, SC 29201

Lab Number: 01-A138485  
 Sample ID: MW-13  
 Sample Type: Water  
 Site ID:

Project: 12719  
 Project Name: HOT SPOT 3005  
 Sampler: ALLISON ENGLE

Date Collected: 9/28/01  
 Time Collected: 10:33  
 Date Received: 9/29/01  
 Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
<b>*VOLATILE ORGANICS*</b>										
Benzene	ND	ug/l	1.0	1.0	1	10/ 5/01	12:27	M.Himelick	8260B	1281
Toluene	ND	ug/l	1.0	1.0	1	10/ 5/01	12:27	M.Himelick	8260B	1281
Ethylbenzene	ND	ug/l	1.0	1.0	1	10/ 5/01	12:27	M.Himelick	8260B	1281
Xylenes, Total	ND	ug/l	1.0	1.0	1	10/ 5/01	12:27	M.Himelick	8260B	1281
Methyl-t-butyl ether	ND	ug/l	5.0	2.0	1	10/ 5/01	12:27	M.Himelick	8260B	1281
Naphthalene	ND	ug/l	5.0	5.0	1	10/ 5/01	12:27	M.Himelick	8260B	1281

ND - Not detected at the report limit.

Surrogate	% Recovery	Target Range
VOA Surr 1,2-DCA-d4	108.	68. - 143.
VOA Surr Toluene-d8	105.	78. - 127.
VOA Surr, 4-BFB	105.	73. - 127.
VOA Surr, DBFM	114.	76. - 135.

# - Recovery outside Laboratory historical or method prescribed limits.

Sample report continued . . .

## ANALYTICAL REPORT

SCDHEC 2200  
 UNDERGRD STOR TANK-DEBRA THOMA  
 2600 BULL STREET  
 COLUMBIA, SC 29201

Lab Number: 01-A138486  
 Sample ID: MW-1D  
 Sample Type: Water  
 Site ID:

Project: 12719  
 Project Name: HOT SPOT 3005  
 Sampler: ALLISON ENGLE

Date Collected: 9/28/01  
 Time Collected: 12:58  
 Date Received: 9/29/01  
 Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
<b>*VOLATILE ORGANICS*</b>										
Benzene	ND	ug/l	1.0	1.0	1	10/ 5/01	13:04	M.Himelick	8260B	1281
Toluene	ND	ug/l	1.0	1.0	1	10/ 5/01	13:04	M.Himelick	8260B	1281
Ethylbenzene	ND	ug/l	1.0	1.0	1	10/ 5/01	13:04	M.Himelick	8260B	1281
Xylenes, Total	ND	ug/l	1.0	1.0	1	10/ 5/01	13:04	M.Himelick	8260B	1281
Methyl-t-butyl ether	ND	ug/l	5.0	2.0	1	10/ 5/01	13:04	M.Himelick	8260B	1281
Naphthalene	ND	ug/l	5.0	5.0	1	10/ 5/01	13:04	M.Himelick	8260B	1281

ND - Not detected at the report limit.

Surrogate	% Recovery	Target Range
VOA Surr 1,2-DCA-d4	108.	68. - 143.
VOA Surr Toluene-d8	95.	78. - 127.
VOA Surr, 4-BFB	104.	73. - 127.
VOA Surr, DBFM	108.	76. - 135.

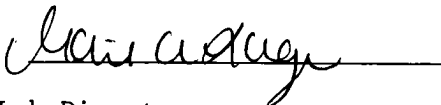
# - Recovery outside Laboratory historical or method prescribed limits.

Sample report continued . . .

## ANALYTICAL REPORT

Laboratory Number: 01-A138476  
Sample ID: MW-3  
Project: 12719  
Page 2

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Report Approved By: 

Report Date: 10/ 5/01

Paul E. Lane, Jr., Lab Director  
Michael H. Dunn, M.S., Technical Director  
Johnny A. Mitchell, Dir. Technical Serv.  
Eric S. Smith, Assistant Technical Director

Gail A. Lage, Technical Serv.  
Glenn L. Norton, Technical Serv.  
Kelly S. Comstock, Technical Serv.  
Pamela A. Langford, Technical Serv.

Laboratory Certification Number: 84009

End of Sample Report.

## ANALYTICAL REPORT

Laboratory Number: 01-A138477  
Sample ID: MW-4  
Project: 12719  
Page 2

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Report Approved By: 

Report Date: 10/ 5/01

Paul E. Lane, Jr., Lab Director  
Michael H. Dunn, M.S., Technical Director  
Johnny A. Mitchell, Dir. Technical Serv.  
Eric S. Smith, Assistant Technical Director

Gail A. Lage, Technical Serv.  
Glenn L. Norton, Technical Serv.  
Kelly S. Comstock, Technical Serv.  
Pamela A. Langford, Technical Serv.

Laboratory Certification Number: 84009

End of Sample Report.

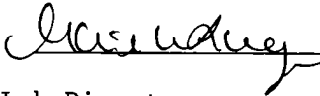
# TestAmerica

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## ANALYTICAL REPORT

Laboratory Number: 01-A138478  
Sample ID: MW-6  
Project: 12719  
Page 2

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Report Date: 10/ 5/01

Paul E. Lane, Jr., Lab Director  
Michael H. Dunn, M.S., Technical Director  
Johnny A. Mitchell, Dir. Technical Serv.  
Eric S. Smith, Assistant Technical Director

Gail A. Lage, Technical Serv.  
Glenn L. Norton, Technical Serv.  
Kelly S. Comstock, Technical Serv.  
Pamela A. Langford, Technical Serv.

Laboratory Certification Number: 84009

End of Sample Report.

## ANALYTICAL REPORT

Laboratory Number: 01-A138479  
Sample ID: MW-7  
Project: 12719  
Page 2

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Report Date: 10/ 5/01

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Michael H. Dunn, M.S., Technical Director  
Johnny A. Mitchell, Dir. Technical Serv.  
Eric S. Smith, Assistant Technical Director

Gail A. Lage, Technical Serv.  
Glenn L. Norton, Technical Serv.  
Kelly S. Comstock, Technical Serv.  
Pamela A. Langford, Technical Serv.

Laboratory Certification Number: 84009

End of Sample Report.

## ANALYTICAL REPORT

Laboratory Number: 01-A138480  
Sample ID: MW-8  
Project: 12719  
Page 2

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Paul E. Lane, Jr., Lab Director  
Michael H. Dunn, M.S., Technical Director  
Johnny A. Mitchell, Dir. Technical Serv.  
Eric S. Smith, Assistant Technical Director

Gail A. Lage, Technical Serv.  
Glenn L. Norton, Technical Serv.  
Kelly S. Comstock, Technical Serv.  
Pamela A. Langford, Technical Serv.

Laboratory Certification Number: 84009

End of Sample Report.

## ANALYTICAL REPORT

Laboratory Number: 01-A138481  
Sample ID: MW-9  
Project: 12719  
Page 2

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Report Date: 10/ 5/01

Paul E. Lane, Jr., Lab Director  
Michael H. Dunn, M.S., Technical Director  
Johnny A. Mitchell, Dir. Technical Serv.  
Eric S. Smith, Assistant Technical Director

Gail A. Lage, Technical Serv.  
Glenn L. Norton, Technical Serv.  
Kelly S. Comstock, Technical Serv.  
Pamela A. Langford, Technical Serv.

Laboratory Certification Number: 84009


End of Sample Report.



## ANALYTICAL REPORT

Laboratory Number: 01-A138482  
Sample ID: MW-10  
Project: 12719  
Page 2

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Report Approved By: 

Report Date: 10/ 5/01

Paul E. Lane, Jr., Lab Director  
Michael H. Dunn, M.S., Technical Director  
Johnny A. Mitchell, Dir. Technical Serv.  
Eric S. Smith, Assistant Technical Director

Gail A. Lage, Technical Serv.  
Glenn L. Norton, Technical Serv.  
Kelly S. Comstock, Technical Serv.  
Pamela A. Langford, Technical Serv.

Laboratory Certification Number: 84009

End of Sample Report.

## ANALYTICAL REPORT

Laboratory Number: 01-A138483  
Sample ID: MW-11  
Project: 12719  
Page 2

These results relate only to the items tested.  
This report shall not be reproduced except in full and with  
permission of the laboratory.

Report Approved By: 

Report Date: 10/ 5/01

Paul E. Lane, Jr., Lab Director  
Michael H. Dunn, M.S., Technical Director  
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Eric S. Smith, Assistant Technical Director

Gail A. Lage, Technical Serv.  
Glenn L. Norton, Technical Serv.  
Kelly S. Comstock, Technical Serv.  
Pamela A. Langford, Technical Serv.

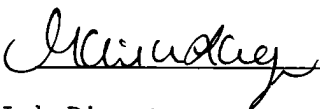
Laboratory Certification Number: 84009

End of Sample Report.

## ANALYTICAL REPORT

Laboratory Number: 01-A138484  
Sample ID: MW-12  
Project: 12719  
Page 2

These results relate only to the items tested.  
This report shall not be reproduced except in full and with  
permission of the laboratory.

Report Approved By:  \_\_\_\_\_

Report Date: 10/ 5/01

Paul E. Lane, Jr., Lab Director  
Michael H. Dunn, M.S., Technical Director  
Johnny A. Mitchell, Dir. Technical Serv.  
Eric S. Smith, Assistant Technical Director

Gail A. Lage, Technical Serv.  
Glenn L. Norton, Technical Serv.  
Kelly S. Comstock, Technical Serv.  
Pamela A. Langford, Technical Serv.

Laboratory Certification Number: 84009

End of Sample Report.

## ANALYTICAL REPORT

Laboratory Number: 01-A138485  
Sample ID: MW-13  
Project: 12719  
Page 2

These results relate only to the items tested.  
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permission of the laboratory.

Report Approved By: Paul E. Lane, Jr.

Report Date: 10/ 5/01

Paul E. Lane, Jr., Lab Director  
Michael H. Dunn, M.S., Technical Director  
Johnny A. Mitchell, Dir. Technical Serv.  
Eric S. Smith, Assistant Technical Director

Gail A. Lage, Technical Serv.  
Glenn L. Norton, Technical Serv.  
Kelly S. Comstock, Technical Serv.  
Pamela A. Langford, Technical Serv.

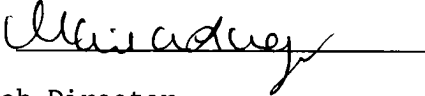
Laboratory Certification Number: 84009

End of Sample Report.

## ANALYTICAL REPORT

Laboratory Number: 01-A138486  
Sample ID: MW-1D  
Project: 12719  
Page 2

These results relate only to the items tested.  
This report shall not be reproduced except in full and with  
permission of the laboratory.

Report Approved By: 

Report Date: 10/ 5/01

Paul E. Lane, Jr., Lab Director  
Michael H. Dunn, M.S., Technical Director  
Johnny A. Mitchell, Dir. Technical Serv.  
Eric S. Smith, Assistant Technical Director

Gail A. Lage, Technical Serv.  
Glenn L. Norton, Technical Serv.  
Kelly S. Comstock, Technical Serv.  
Pamela A. Langford, Technical Serv.

Laboratory Certification Number: 84009

End of Sample Report.

**PROJECT QUALITY CONTROL DATA**  
**Project Number: 12719**

Matrix Spike Recovery

Analyte	units	Orig. Val.	MS Val	Spike Conc	Recovery	Target Range	Q.C. Batch	Spike Sample
**VOA PARAMETERS**								
Benzene	mg/l	< 0.00100	0.04350	0.05000	87	70. - 136.	1281	blank
Toluene	mg/l	< 0.00100	0.04440	0.05000	89	69. - 137.	1281	blank

Matrix Spike Duplicate

Analyte	units	Orig. Val.	Duplicate	RPD	Limit	Q.C. Batch
**VOA PARAMETERS**						
Benzene	mg/l	0.04350	0.04440	2.05	21.	1281
Toluene	mg/l	0.04440	0.05040	12.66	22.	1281

Laboratory Control Data

Analyte	units	Known Val.	Analyzed Val	% Recovery	Target Range	Q.C. Batch
**VOA PARAMETERS**						
Benzene	mg/l	0.1000	0.1007	101	79 - 124	1281
Ethylbenzene	mg/l	0.1000	0.1041	104	77 - 126	1281
Naphthalene	mg/l	0.1000	0.0948	95	57 - 143	1281
Toluene	mg/l	0.1000	0.1163	116	78 - 124	1281
Xylenes, Total	mg/l	0.2000	0.2099	105	76 - 127	1281
Methyl-t-butyl ether	mg/l	0.1000	0.1175	118	68 - 131	1281

**PROJECT QUALITY CONTROL DATA**  
**Project Number: 12719**

Blank Data

Analyte	Blank Value	Units	Q.C. Batch	Analysis Date	Analysis Time
-----	-----	-----	-----	-----	-----

Blank Data

Analyte	Blank Value	Units	Q.C. Batch	Date Analyzed	Time Analyzed
-----	-----	-----	-----	-----	-----

**\*\*VOA PARAMETERS\*\***

Benzene	< 0.00100	mg/l	1281	10/ 4/01	21:29
Ethylbenzene	< 0.00100	mg/l	1281	10/ 4/01	21:29
Naphthalene	< 0.0050	mg/l	1281	10/ 4/01	21:29
Toluene	< 0.00100	mg/l	1281	10/ 4/01	21:29
Xylenes, Total	< 0.00100	mg/l	1281	10/ 4/01	21:29
Methyl-t-butyl ether	< 0.0050	mg/l	1281	10/ 4/01	21:29
VOA Surr 1,2-DCA-d4	114.	% Rec	1281	10/ 4/01	21:29
VOA Surr Toluene-d8	110.	% Rec	1281	10/ 4/01	21:29
VOA Surr, 4-BFB	97.	% Rec	1281	10/ 4/01	21:29

# - Value outside Laboratory historical or method prescribed QC limits.

End of Report for Project 254823

# GEOLOGICAL RESOURCES, INC.

27  
10/22/01

4913 Albemarle Road, Suite 101 • Charlotte, NC 28205 • 704-563-1663 • Fax: 704-563-1662

October 11, 2001

RECEIVED

OCT 15 2001

Underground Storage  
Tank Program

Mr. Robert Faller  
Environmental Health Manager  
Bureau of Underground Storage Tank Management  
South Carolina Department of Health and Environmental Control  
2600 Bull Street  
Columbia, SC 29201-1708

Re: Hot Spot 3005  
Site ID# 12719  
CP # 14743:P; PO # 247174

Dear Mr. Faller:

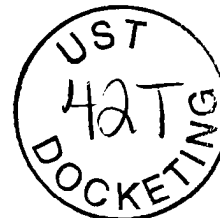
Please find enclosed the **original report** for the above referenced site.

The original invoice has been submitted to Ms. Pat Holland of the Finance Section as specified in the contract.

Sincerely,



Shawn R. Lambert  
Administrative Manager





# FIELD ACTIVITY WORKSHEET ORDER

Date of Request: \_\_\_\_\_

**Type of Request:**

(Please indicate your request with a check mark)

Emergency (<2 Working Days)

Specific (1-5 Working Days)

Routine (10 Working Days)

ACA  
Baseline

Please specify the type of work to be completed:

Sample 14 monitoring wells (MW-1, MW-1D, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, MW-9, MW-10, MW-11, MW-12, & MW-13) for BTEX, Naph, MTBE

Facility Name: Hot Spot 3005

Permit Number: 12719

Project Manager: D. Thoma

County: Spartanburg

(Field Staff Only)

Date Field Activity Completed:	_____
Completed by Field Staff:	_____
Date Field Notes Entered into EFIS:	_____

Field Staff Comments:

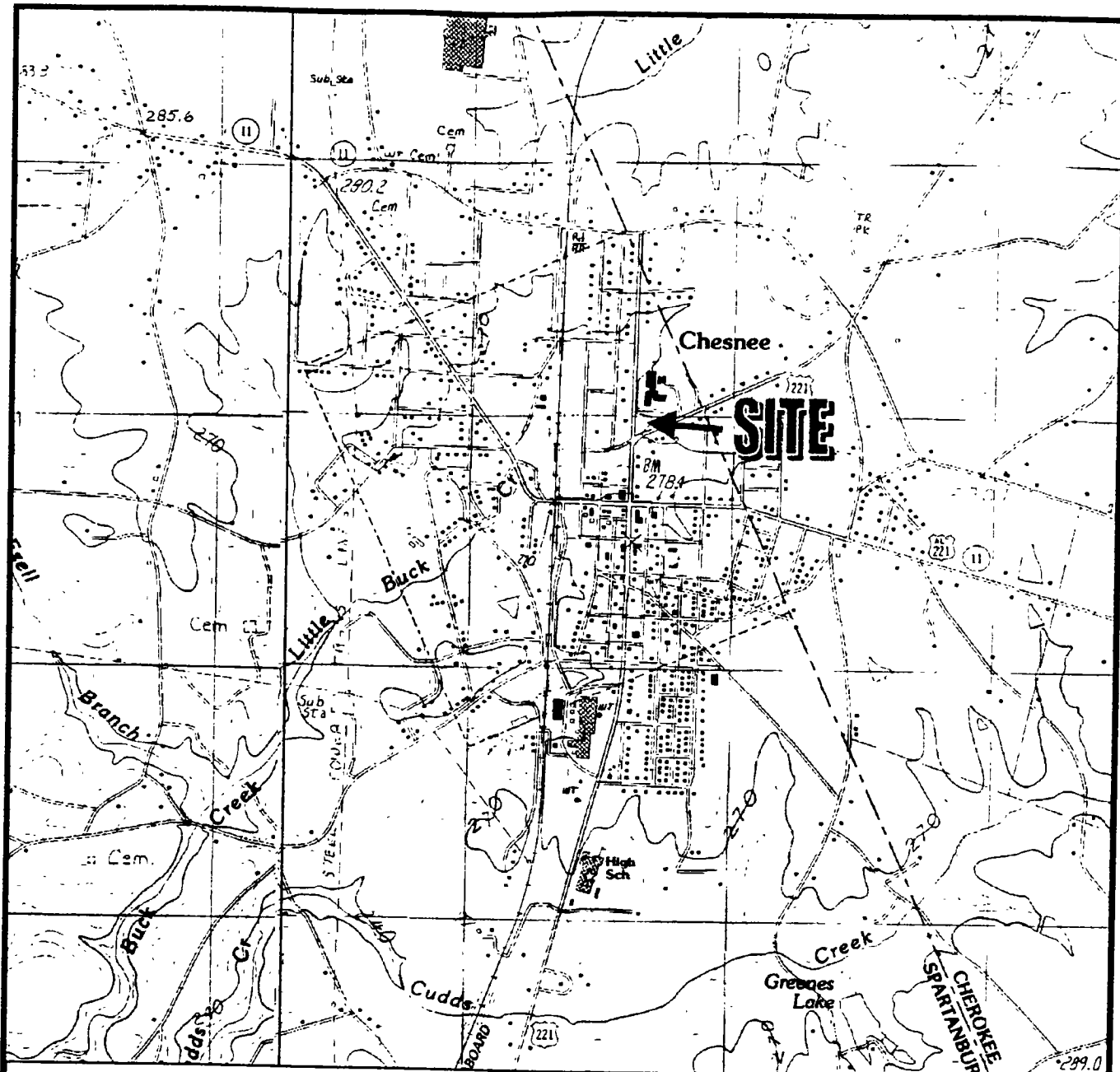
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**REMEMBER TO ESTABLISH COST PROPOSALS**

TEST AMERICA CP#: 14705:P GRI CP#: 14743:P

PALMETTO ENV GROUP CP#: \_\_\_\_\_

Fill out back of this form. Photocopy, attach a completed CP cover for each CP. Thank you very much!



SOURCE: TOPOGRAPHIC MAP OF CHESNEE, SOUTH CAROLINA  
 QUADRANGLE, 7.5 MINUTE SERIES, 1983

SCALE 1"=2000'  
 CHECK BY:  
 DRAWN BY: Klemm  
 DATE: 17-Nov-00



SITE LOCATION MAP  
 HOT SPOT #3005  
 Site ID# 12719  
 SC HWY 221, CHESNEE, SOUTH CAROLINA  
 1264-99-506

FIGURE NO:  
 1

UST Permit # 12719Facility Name Hot Spot 3005TEST AMERICA CP#:  
PO # 17922014705:P

## GROUNDWATER ANALYSES

TASK CODE	WATER/METHOD	QUANTITY	RATE	TOTAL
11A	BTEX+NAPH+MTBE (8260)	14	\$55.00	\$770.00
11A	BTEX+NAPH+MTBE (8021)		\$30.00	\$0.00
VB26	EDB (8011)		\$45.00	\$0.00
11C	PAHs (8270)		\$64.00	\$0.00
11F	METALS (various)		\$6.00	\$0.00
11D	LEAD (7421/6010)		\$7.00	\$0.00
11G	TPH (9070)		\$20.00	\$0.00
VB 11	TOC (9060)		\$14.00	\$0.00
11H	pH (150.1)		\$3.00	\$0.00
11J	NITRATES (9056/9210)		\$14.00	\$0.00
11K	SULFATES (9056/9038)		\$14.00	\$0.00
11M	METHANE		\$50.00	\$0.00
VB 12	Total dissolved iron (200.7)		\$7.00	\$0.00
11L	Fe+2 (SM3500FeD)		\$7.00	\$0.00
VB 13	Fe+3 (200.7)		\$7.00	\$0.00
VB 24	Tic Analysis		\$105.00	\$0.00
VB 25	Add. Tics		\$10.00	\$0.00

## SOIL ANALYSES

TASK CODE	SOIL/METHOD	QUANTITY	RATE	TOTAL
11O	BTEX (8260-5035)		\$55.00	\$0.00
11O	BTEX (8021-5035)		\$30.00	\$0.00
VB 14	ENCORE SAMPLERS		\$8.00	\$0.00
11P	PAHs (8270)		\$64.00	\$0.00
11Q	METALS (various)		\$6.00	\$0.00
VB 15	LEAD (7421/6010)		\$7.00	\$0.00
11S	TPH (diesel)		\$25.00	\$0.00
11T	TPH (gas)		\$25.00	\$0.00
11R	TPH (9071)		\$20.00	\$0.00
11V	TOC (9060)		\$14.00	\$0.00
	<b>Expedite Cost</b>	0.50		\$0.00

TEST AMERICA TOTAL: \$770.00

Palmetto Env. Group CP# \_\_\_\_\_

PO #337210

TASK CODE	TASK	QUANTITY	RATE	TOTAL
VB 17	New GAC & Installation		\$1,744.00	\$0.00
VB 18	Installation w/o GAC		\$1,004.00	\$0.00
VB 19	Carbon, gravel, & filter replacement		\$395.00	\$0.00
VB 20	Disassemble & Clean		\$400.00	\$0.00
VB 21	Mobilization		\$75.00	\$0.00
VB 22	Locks		\$20.00	\$0.00
VB 23	Housing Unit		\$350.00	\$0.00
VB 29	Inline Particulate Filter		\$125.00	\$0.00
VB 7	Additional Piping		\$2.00	\$0.00

Palmetto TOTAL \$0.00

GRI CP# \_\_\_\_\_

PO # 247174

TASK CODE	TASK	QUANTITY	RATE	TOTAL
10	PURGE & SAMPLE	14	\$16.60	\$232.40
VB 16	TAP SAMPLE		\$0.00	\$0.00
17A2	DISPOSAL/WATER	200	\$0.62	\$124.00
4B	MOB	1	\$40.63	\$40.63

GRI TOTAL: \$397.03

UNDERGROUND STORAGE TANK AND PROPERTY OWNER

PERMISSION FORM - UST Permit # 12719

If you are the owner of the former or existing underground storage tanks and the property owner, please complete this form.

I, Judith A. Laughter, Agent certify that I am the legal owner of the underground storage tanks and property located at the facility identified below or serve as the authorized representative for the owner. I grant permission to the South Carolina Department of Health and Environmental Control (SCDHEC) to secure on my behalf contractor services to conduct assessment and corrective action activities as required, and authorize SCDHEC, or a contractor selected by SCDHEC, to enter this property at reasonable times only to accomplish these site rehabilitation tasks. The contractor(s) will be designated as my contractor for only the required site rehabilitation activities. Compensation to the contractor(s) will be from the SUPERB Account and I will have no obligation to pay the contractor(s). I understand that SCDHEC will be responsible for notifying me of all activities that are necessary prior to their initiation and will promptly provide to me a copy of each environmental report. I understand that I may choose to select my own contractor at the completion of any phase of work by notifying the Bureau of Underground Storage Tank Management in writing.

Name of Facility Hot Spot # 3005 Phone # 864-461-8500

Street Address of Facility 107 Hampton St.,

Town, City, District, Suburb Chesnee, SC 29323

Name of nearest intersecting street, road, highway, alley SC Hwy 221

Is this facility within the city limits? (yes or no) yes

Is this facility serviced by a public water or sewer utility? (yes or no) yes, if no, please provide the name and phone number of a person that we can contact that can assist in the location of private water and septic tank lines \_\_\_\_\_, phone number \_\_\_\_\_

Were underground storage tanks previously removed from the ground at this facility? (yes or no) NO, if yes, please provide the name of a person we can contact that can assist in the location of the former underground storage tank excavation \_\_\_\_\_, Phone number \_\_\_\_\_

Is the property currently leased or rented to someone? (yes or no) NO, if yes, please provide their name \_\_\_\_\_ and phone number \_\_\_\_\_ and let them know about the pending assessment activities. If vehicles or other mobile structures are parked over the former or existing underground storage tanks, they should be moved before SCDHEC's contractor gets to the site.

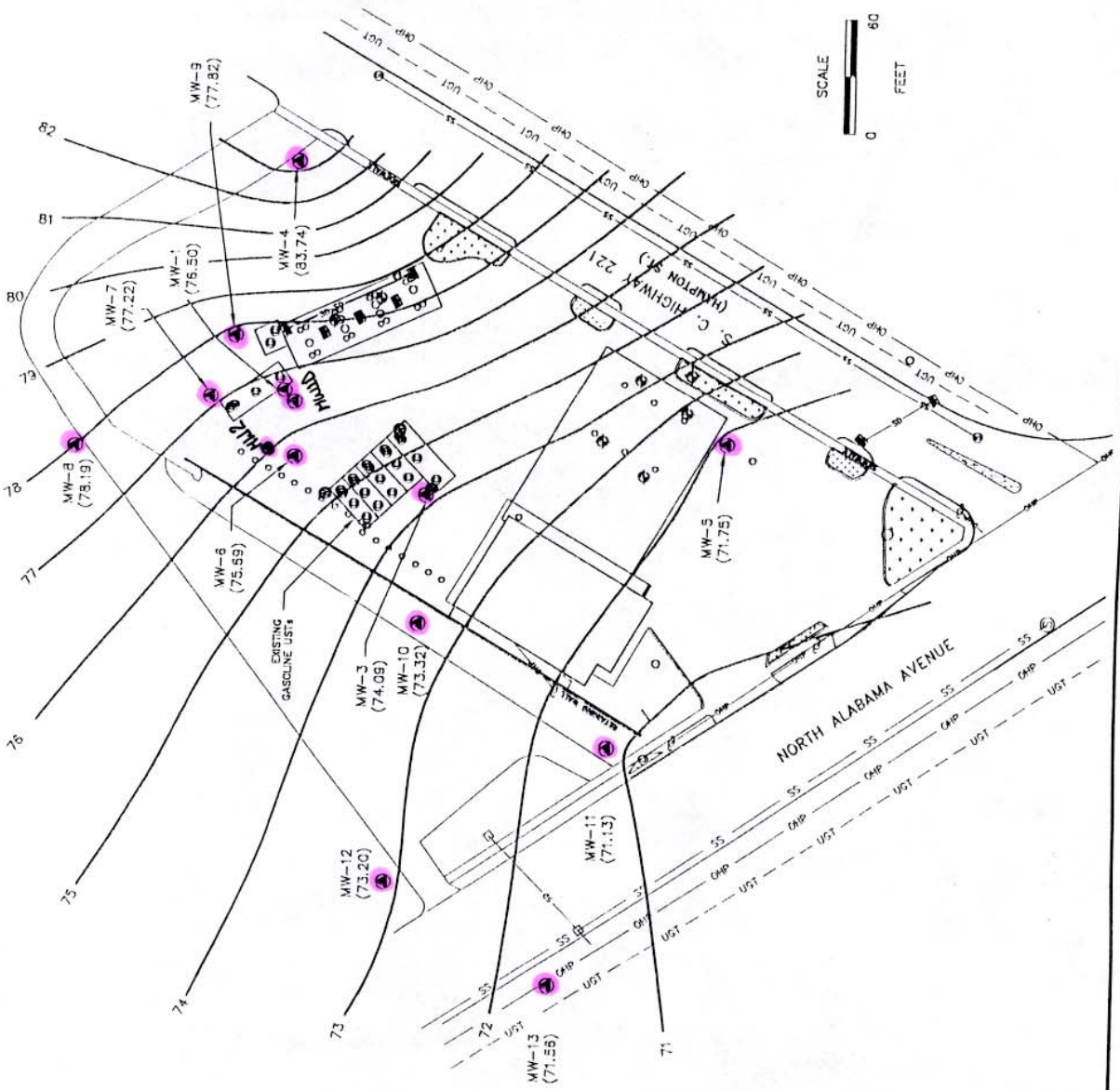
NAME of UST/property owner (Please Print): R.L. Jordan Oil Company of North Carolina, Inc.

Phone Number (<sup>work</sup>/<sub>home</sub>) 864-585-2784 Ext. 116 (<sup>work</sup>/<sub>home</sub>) cell 864-316-2845

Signature of UST/property Owner: Judith A. Laughter, Agent

Witness: Crystal Powell

Date: Aug Month 27 Day 2001 Year



SOURCE: SITE MAP OF HOT SPOT STORE #36  
 FOR S&ME  
 BY GRAMLING BROS. SURVEYING  
 DATE: SEPTEMBER 20, 1999



ENGINEERING, TESTING  
 ENVIRONMENTAL SERVICES

GROUNDWATER POTENTIOMETRIC SURFACE  
 HOT SPOT #3005  
 SITE ID #12719  
 S.C. HIGHWAY 221  
 CHESNEE, SOUTH CAROLINA

SCALE: 1" = 60' DRAWN BY: SB CHK'D BY:

JOB NO: 1264-99-506 DATE: 11-20-00 FIGURE NO: 9

Field Data Information Sheet for Ground-Water Sampling  
 South Carolina Department of Health and Environmental Control  
 Bureau of Underground Storage Tank Management

Date (mm/dd/yy): 9-28-01  
 Field Personnel: AE  
 General Weather Conditions: Sunny  
 Ambient Air Temperature: 70°F c

Quality Assurance

pH Meter	Conductivity Meter
serial no. _____	serial no. _____
pH=4.0 _____	Standard _____
pH=7.0 _____	Standard _____
pH=10.0 _____	Standard _____

Chain of Custody

Relinquished by	Date/Time	Received by	Date/Time

Facility Name: Hot Spot 3005  
 Site ID # 12719 Monitoring Well # MW-1  
 Well Diameter (D): .167 feet  
 Conversion factor (C): 3.14 X (D/2)<sup>2</sup> for a 2 inch well C = 0.163  
 for a 4 inch well C = 0.652

\* Free Product Thickness: .43 feet  
 Depth to Ground Water (DGW) 29.78 feet  
 Total Well Depth (TWD) 30.12 feet  
 Length of the water column (LWC = TWD-DGW) .34 feet

1 casing volume (CV = LWC X C) = .06 gals  
 3 casing volume 3 X CV = .17 gals (standard purge volume)

Total volume of Water Purged Before Sampling \_\_\_\_\_ gals  
 Total volume of Water Purged for Post Sampling \_\_\_\_\_ gals  
 Total Purged \_\_\_\_\_ gals

\*If free product is present over 1/8 inch, sampling will not be required.

	Initial	1st Vol.	2nd Vol.	3rd Vol.	4th Vol.	5th Vol.	Post Sampling	Sample
Cumulative Volume Purged (gallons)								
Time (military)								
pH (s.u.)								<u>12.34</u>
Specific Cond. (umhos/cm)								
Water Temperature (degrees C)								
Turbidity (subjective: clear, slightly cloudy, cloudy)								
Dissolved Oxygen (mg/l)								
PID readings, if required								
Remarks:	<u>No enough H<sub>2</sub>O for H<sub>2</sub>O<sub>2</sub> readings</u>							

Field Data Information Sheet for Ground-Water Sampling  
 South Carolina Department of Health and Environmental Control  
 Bureau of Underground Storage Tank Management

Date (mm/dd/yy): 9-28-01

Field Personnel: HE

General Weather Conditions: Sunny

Ambient Air Temperature: 70°F c

Quality Assurance

pH Meter	Conductivity Meter
serial no. _____	serial no. _____
pH=4.0 _____	Standard _____
pH=7.0 _____	Standard _____
pH=10.0 _____	Standard _____

Chain of Custody

Relinquished by	Date/Time	Received by	Date/Time

Facility Name: Hot Spot 3005

Site ID # 12719 Monitoring Well # MW-2

Well Diameter (D): .167 feet

Conversion factor (C): 3.14 X (D/2)<sup>2</sup> for a 2 inch well C = 0.163  
 for a 4 inch well C = 0.652

\* Free Product Thickness: \_\_\_\_\_ feet

Depth to Ground Water (DGW) \_\_\_\_\_ feet

Total Well Depth (TWD) \_\_\_\_\_ feet

Length of the water column (LWC = TWD-DGW) \_\_\_\_\_ feet

1 casing volume (CV = LWC X C) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ gals

3 casing volume 3 X CV = \_\_\_\_\_ gals (standard purge volume)

Total volume of Water Purged Before Sampling \_\_\_\_\_ gals

Total volume of Water Purged for Post Sampling \_\_\_\_\_ gals

Total Purged \_\_\_\_\_

\*If free product is present over 1/8 inch, sampling will not be required.

	Initial	1st Vol.	2nd Vol.	3rd Vol.	4th Vol.	5th Vol.	Post Sampling	Sample
Cumulative Volume Purged (gallons)								
Time (military)								
pH (s.u.)								
Specific Cond. (umhos/cm)								
Water Temperature (degrees C)								
Turbidity (subjective: clear, slightly cloudy, cloudy)								
Dissolved Oxygen (mg/l)								
PID readings, if required								
Remarks:	<u>Destroyed</u>							

Field Data Information Sheet for Ground-Water Sampling  
 South Carolina Department of Health and Environmental Control  
 Bureau of Underground Storage Tank Management

Date (mm/dd/yy): 9-28-0  
 Field Personnel: AC  
 General Weather Conditions: Sunny  
 Ambient Air Temperature: 70°F c

Quality Assurance

pH Meter	Conductivity Meter
serial no.	serial no.
pH=4.0	Standard
pH=7.0	Standard
pH=10.0	Standard

Chain of Custody

Relinquished by	Date/Time	Received by	Date/Time

Facility Name: Hot Spot 3005  
 Site ID # 12719 Monitoring Well # MW-3  
 Well Diameter (D): .167 feet  
 Conversion factor (C):  $3.14 \times (D/2)^2$  for a 2 inch well C = 0.163  
 for a 4 inch well C = 0.652

\* Free Product Thickness:  
 Depth to Ground Water (DGW) 31.40 feet  
 Total Well Depth (TWD) 32.13 feet  
 Length of the water column (LWC = TWD-DGW) .73 feet

1 casing volume (CV = LWC X C) = .73 x .163 = .12 gals  
 3 casing volume 3 X CV = .36 gals (standard purge volume)

Total volume of Water Purged Before Sampling .25 gals  
 Total volume of Water Purged for Post Sampling .25 gals  
 Total Purged .50

\*If free product is present over 1/8 inch, sampling will not be required.

	Initial	1st Vol.	2nd Vol.	3rd Vol.	4th Vol.	5th Vol.	Post Sampling	Sample
Cumulative Volume Purged (gallons)								
Time (military)							<u>.25</u>	
pH (s.u.)							<u>12:15</u>	<u>12:09</u>
Specific Cond. (umhos/cm)							<u>573</u>	
Water Temperature (degrees C)							<u>14</u>	
Turbidity (subjective: clear, slightly cloudy, cloudy)							<u>210°</u>	
Dissolved Oxygen (mg/l)							<u>cloudy</u>	
PID readings, if required							<u>13.3</u>	

Bailed Dry @ .25





Field Data Information Sheet for Ground-Water Sampling  
 South Carolina Department of Health and Environmental Control  
 Bureau of Underground Storage Tank Management

Date (mm/dd/yy): 4-28-01  
 Field Personnel: AE  
 General Weather Conditions: Sunny  
 Ambient Air Temperature: 70.1 °C

Quality Assurance

pH Meter	Conductivity Meter
serial no. _____	serial no. _____
pH=4.0 _____	Standard _____
pH=7.0 _____	Standard _____
pH=10.0 _____	Standard _____

Chain of Custody

Relinquished by	Date/Time	Received by	Date/Time

Facility Name: Hot Spot 3005  
 Site ID # 12719 Monitoring Well # MW 5  
 Well Diameter (D): .167 feet  
 Conversion factor (C): 3.14 X (D/2)<sup>2</sup> for a 2 inch well C = 0.163  
 for a 4 inch well C = 0.652

\* Free Product Thickness: \_\_\_\_\_ feet  
 Depth to Ground Water (DGW) 38.81 feet  
 Total Well Depth (TWD) 39.20 feet  
 Length of the water column (LWC = TWD-DGW) .39 feet

1 casing volume (CV = LWC X C) = .19 .39 x .163 = .06 gals  
 3 casing volume 3 X CV = \_\_\_\_\_ gals (standard purge volume)

Total volume of Water Purged Before Sampling \_\_\_\_\_ gals  
 Total volume of Water Purged for Post Sampling \_\_\_\_\_ gals  
 Total Purged \_\_\_\_\_ gals

\*If free product is present over 1/8 inch, sampling will not be required.

	Initial	1st Vol.	2nd Vol.	3rd Vol.	4th Vol.	5th Vol.	Post Sampling	Sample
Cumulative Volume Purged (gallons)								
Time (military)								
pH (s.u.)								<del>13.0</del>
Specific Cond. (umhos/cm)								
Water Temperature (degrees C)								
Turbidity (subjective: clear, slightly cloudy, cloudy)								
Dissolved Oxygen (mg/l)								
PID readings, if required								
Remarks:	<p align="center"><u>Not enough flow for sample making.</u></p>							





Field Data Information Sheet for Ground-Water Sampling  
 South Carolina Department of Health and Environmental Control  
 Bureau of Underground Storage Tank Management

Date (mm/dd/yy): 9-28-01  
 Field Personnel: HE  
 General Weather Conditions: Sunny  
 Ambient Air Temperature: 65°F c

Quality Assurance

pH Meter	Conductivity Meter
serial no. _____	serial no. _____
pH=4.0 _____	Standard _____
pH=7.0 _____	Standard _____
pH=10.0 _____	Standard _____

Chain of Custody

Relinquished by	Date/Time	Received by	Date/Time

Facility Name: Hot Spot 3005  
 Site ID # 12719 Monitoring Well # MW-8  
 Well Diameter (D): 167 feet  
 Conversion factor (C):  $3.14 \times (D/2)^2$  for a 2 inch well C = 0.163  
 for a 4 inch well C = 0.652

\* Free Product Thickness: \_\_\_\_\_ feet  
 Depth to Ground Water (DGW) 24.40 feet  
 Total Well Depth (TWD) 33.52 feet  
 Length of the water column (LWC = TWD-DGW) 9.12 feet

1 casing volume (CV = LWC X C) = 9.12 x 0.163 = 1.49 gals  
 3 casing volume 3 X CV = 4.46 gals (standard purge volume)

Total volume of Water Purged Before Sampling 2.75 gals  
 Total volume of Water Purged for Post Sampling 0.25 gals  
3.00 Total Purged

\*If free product is present over 1/8 inch, sampling will not be required.

	Initial	1st Vol.	2nd Vol.	3rd Vol.	4th Vol.	5th Vol.	Post Sampling	Sample
Cumulative Volume Purged (gallons)	.25	1.75						
Time (military)	9:50	9:54					9:57	9:56
pH (s.u.)	5.17	5.04					5.06	
Specific Cond. (umhos/cm)	ND	23.4	23.7				23.9	
Water Temperature (degrees C)	18.5	18.8					18.8	
Turbidity (subjective: clear, slightly cloudy, cloudy)		cloudy	cloudy				cloudy	
Dissolved Oxygen (mg/l)	ppm	16.1	16.2				14.3	
PID readings, if required								
Remarks:	<u>Bailed Dry @ 2.75</u>							

Field Data Information Sheet for Ground-Water Sampling  
 South Carolina Department of Health and Environmental Control  
 Bureau of Underground Storage Tank Management

Date (mm/dd/yy): 9-28-01  
 Field Personnel: AC  
 General Weather Conditions: Sunny  
 Ambient Air Temperature: 70°F c

Quality Assurance

pH Meter	Conductivity Meter
serial no. _____	serial no. _____
pH=4.0 _____	Standard _____
pH=7.0 _____	Standard _____
pH=10.0 _____	Standard _____

Chain of Custody

Relinquished by	Date/Time	Received by	Date/Time

Facility Name: Hot Spot 3005  
 Site ID #: 12719 Monitoring Well #: MW-9  
 Well Diameter (D): .167 feet  
 Conversion factor (C): 3.14 X (D/2)<sup>2</sup> for a 2 inch well C = 0.163  
 for a 4 inch well C = 0.652

\* Free Product Thickness:  
 Depth to Ground Water (DGW) \_\_\_\_\_ feet  
 Total Well Depth (TWD) 38.75 feet  
 Length of the water column (LWC = TWD-DGW) 35.78 feet  
6.47 feet

1 casing volume (CV = LWC X C) = 6.47 x .163 = 1.05 gals  
 3 casing volume 3 X CV = 3.16 gals (standard purge volume)

Total volume of Water Purged Before Sampling 1.50 gals  
 Total volume of Water Purged for Post Sampling .25 gals  
1.75 Total Purged

\*If free product is present over 1/8 inch, sampling will not be required.

	Initial	1st Vol.	2nd Vol.	3rd Vol.	4th Vol.	5th Vol.	Post Sampling	Sample
Cumulative Volume Purged (gallons)	.25						.25	
Time (military)	11:14						11:19	11:17
pH (s.u.)	7.59						6.03	
Specific Cond. (umhos/cm)	46.6						50.1	
Water Temperature (degrees C)	19.8°						19.8°	
Turbidity (subjective: clear, slightly cloudy, cloudy)	S Cloudy						cloudy	
Dissolved Oxygen (mg/l)	14.4						15.8	
PID readings, if required								
Remarks:								

Bailed Dry @ 150

Field Data Information Sheet for Ground-Water Sampling  
 South Carolina Department of Health and Environmental Control  
 Bureau of Underground Storage Tank Management

Date (mm/dd/yy): 9-28-01  
 Field Personnel: AC  
 General Weather Conditions: Sunny  
 Ambient Air Temperature: 65°F °C

Quality Assurance

pH Meter	Conductivity Meter
serial no. _____	serial no. _____
pH=4.0 _____	Standard _____
pH=7.0 _____	Standard _____
pH=10.0 _____	Standard _____

Chain of Custody

Relinquished by	Date/Time	Received by	Date/Time

Facility Name: Hot Spot 3005  
 Site ID # 12719 Monitoring Well # MW-10  
 Well Diameter (D): .167 feet  
 Conversion factor (C): 3.14 X (D/2)<sup>2</sup> for a 2 inch well C = 0.163  
 for a 4 inch well C = 0.652

\* Free Product Thickness:

Depth to Ground Water (DGW)	<u>23.72</u>	feet
Total Well Depth (TWD)	<u>27.17</u>	feet
Length of the water column (LWC = TWD-DGW)	<u>3.45</u>	feet

1 casing volume (CV = LWC X C) = 3.45 x .163 = .56 gals  
 3 casing volume 3 X CV = 1.69 gals (standard purge volume)

Total volume of Water Purged Before Sampling .75 gals  
 Total volume of Water Purged for Post Sampling .25 gals  
1.00 Total Purged

\*If free product is present over 1/8 inch, sampling will not be required.

	Initial	1st Vol.	2nd Vol.	3rd Vol.	4th Vol.	5th Vol.	Post Sampling	Sample
Cumulative Volume Purged (gallons)	<u>.25</u>							
Time (military)	<u>10:07</u>						<u>.25</u>	
pH (s.u.)	<u>4.82</u>						<u>10:10</u>	<u>10:09</u>
Specific Cond. (umhos/cm)	<u>201</u>						<u>4.87</u>	
Water Temperature (degrees C)	<u>18.8°</u>						<u>71.9</u>	
Turbidity (subjective: clear, slightly cloudy, cloudy)	<u>Slightly</u>						<u>19.0°</u>	
Dissolved Oxygen (mg/l)	<u>13.8</u>						<u>cloudy</u>	
PID readings, if required							<u>13.9</u>	
Remarks:	<u>Bailed Dry @ .75</u>							

Field Data Information Sheet for Ground-Water Sampling  
 South Carolina Department of Health and Environmental Control  
 Bureau of Underground Storage Tank Management

Date (mm/dd/yy): 9-28-01  
 Field Personnel: AE  
 General Weather Conditions: Sunny  
 Ambient Air Temperature: 65°F c

Quality Assurance

pH Meter serial no.	Conductivity Meter serial no.
pH=4.0	Standard
pH=7.0	Standard
pH=10.0	Standard

Chain of Custody

Relinquished by	Date/Time	Received by	Date/Time

Facility Name: Hot Spot 3005  
 Site ID # 12719 Monitoring Well # MW-11  
 Well Diameter (D): .167 feet  
 Conversion factor (C): 3.14 X (D/2)<sup>2</sup> for a 2 inch well C = 0.163  
 for a 4 inch well C = 0.652

\* Free Product Thickness:  
 Depth to Ground Water (DGW) 24.42 feet  
 Total Well Depth (TWD) 28.13 feet  
 Length of the water column (LWC = TWD-DGW) 3.71 feet

1 casing volume (CV = LWC X C) = 3.71 x .163 = .60 gals  
 3 casing volume 3 X CV = 1.81 gals (standard purge volume)

Total volume of Water Purged Before Sampling 1.00 gals  
 Total volume of Water Purged for Post Sampling .25 gals  
1.25 Total Purged

\*If free product is present over 1/8 inch, sampling will not be required.

	Initial	1st Vol.	2nd Vol.	3rd Vol.	4th Vol.	5th Vol.	Post Sampling	Sample
Cumulative Volume Purged (gallons)	<u>.25</u>							
Time (military)	<u>10:19</u>						<u>.25</u>	
pH (s.u.)	<u>4.81</u>						<u>10:22</u>	<u>10:21</u>
Specific Cond. (umhos/cm)	<u>48.6</u>						<u>48.6</u>	
Water Temperature (degrees C)	<u>18.7°</u>						<u>48.0</u>	
Turbidity (subjective: clear, slightly cloudy, cloudy)	<u>slightly cloudy</u>						<u>18.8°</u>	
Dissolved Oxygen (mg/l)	<u>18.3</u>						<u>cloudy</u>	
PID readings, if required	<u>PPM</u>						<u>18.6</u>	
Remarks:								

Bail & Dry @ 1.00



Field Data Information Sheet for Ground-Water Sampling  
 South Carolina Department of Health and Environmental Control  
 Bureau of Underground Storage Tank Management

Date (mm/dd/yy): 9-28-01  
 Field Personnel: AE  
 General Weather Conditions: Sunny  
 Ambient Air Temperature: 65°F c

Quality Assurance

pH Meter	Conductivity Meter
serial no. _____	serial no. _____
pH=4.0 _____	Standard _____
pH=7.0 _____	Standard _____
pH=10.0 _____	Standard _____

Chain of Custody

Relinquished by	Date/Time	Received by	Date/Time

Facility Name: Hot Spot 3005  
 Site ID # 12719 Monitoring Well # MW-12  
 Well Diameter (D): 167 feet  
 Conversion factor (C): 3.14 X (D/2)<sup>2</sup> for a 2 inch well C = 0.163  
 for a 4 inch well C = 0.652

\* Free Product Thickness:  
 Depth to Ground Water (DGW) 84.27 feet  
 Total Well Depth (TWD) 30.33 feet  
 Length of the water column (LWC = TWD-DGW) 6.06 feet

1 casing volume (CV = LWC X C) = 6.06 x .163 = .99 gals  
 3 casing volume 3 X CV = 2.97 gals (standard purge volume)

Total volume of Water Purged Before Sampling 1.00 gals  
 Total volume of Water Purged for Post Sampling .25 gals  
1.25 Total Purged

\*If free product is present over 1/8 inch, sampling will not be required.

	Initial	1st Vol.	2nd Vol.	3rd Vol.	4th Vol.	5th Vol.	Post Sampling	Sample
Cumulative Volume Purged (gallons)	.25						.25	
Time (military)	9:36						9:40	9:38
pH (s.u.)	5.77						5.41	
Specific Cond. (umhos/cm)	NS 77.8						76.3	
Water Temperature (degrees C)	19.0°						18.4°	
Turbidity (subjective: clear, slightly cloudy, cloudy)	Slightly cloudy						cloudy	
Dissolved Oxygen (mg/l)	PPM 14.8						16.2	
PID readings, if required								
Remarks:								

Bailed Dry @ 1.00

Field Data Information Sheet for Ground-Water Sampling  
 South Carolina Department of Health and Environmental Control  
 Bureau of Underground Storage Tank Management

Date (mm/dd/yy): 9-28-01  
 Field Personnel: AC  
 General Weather Conditions: Sunny  
 Ambient Air Temperature: 65<sup>o</sup>F c

Quality Assurance

pH Meter	Conductivity Meter
serial no. _____	serial no. _____
pH=4.0 _____	Standard _____
pH=7.0 _____	Standard _____
pH=10.0 _____	Standard _____

Chain of Custody

Relinquished by	Date/Time	Received by	Date/Time

Facility Name: Hot Spot 3005  
 Site ID # 12719 Monitoring Well # MW-13  
 Well Diameter (D): .167 feet  
 Conversion factor (C): 3.14 X (D/2)<sup>2</sup> for a 2 inch well C = 0.163  
 for a 4 inch well C = 0.652

\* Free Product Thickness: \_\_\_\_\_ feet  
 Depth to Ground Water (DGW) 24.70 feet  
 Total Well Depth (TWD) 26.95 feet  
 Length of the water column (LWC = TWD-DGW) 2.25 feet

1 casing volume (CV = LWC X C) = 2.25 x .163 = .37 gals  
 3 casing volume 3 X CV = 1.10 gals (standard purge volume)

Total volume of Water Purged Before Sampling .50 gals  
 Total volume of Water Purged for Post Sampling .25 gals  
.75 Total Purged

\*If free product is present over 1/8 inch, sampling will not be required.

	Initial	1st Vol.	2nd Vol.	3rd Vol.	4th Vol.	5th Vol.	Post Sampling	Sample
Cumulative Volume Purged (gallons)	.25							
Time (military)	10:32						.25	
pH (s.u.)	5.16						10:35	10:33
Specific Cond. (umhos/cm)	<u>S</u> 94.9						5.32	
Water Temperature (degrees C)	18.7 <sup>o</sup>						98.2	
Turbidity (subjective: clear, slightly cloudy, cloudy)	cloudy						18.9 <sup>o</sup>	
Dissolved Oxygen (mg/l)	<u>ppm</u> 15.2						cloudy	
PID readings, if required							15.0	
Remarks:	<u>Bailed Dry @ .50</u>							









**UNDERGROUND STORAGE TANK PROGRAM  
BUREAU OF LAND AND WASTE MANAGEMENT  
2600 Bull Street, Columbia, SC 29201  
Telephone (803) 898-4350, Fax (803) 898-4330**

## MEMORANDUM

**Date:** December 27, 2001

**To:** Henry Wigfall, Procurement Officer  
Bureau of Business Management

**From:** Laura Pace, CGFO, CPM, Manager *lp*  
Finance Section

**Subject:** Bid Award, SB-18123, Requisition #18122  
Site #1, Hot Spot 3005, UST Permit #12719

A review of the submitted bids indicates that it is more advantageous for the state to split Sites #1, #2, and Site #3.

As the proposed corrective action methodology can be permitted in South Carolina and the estimated time frame is protective of human health, the low bid for Site #1 submitted by Brooks & Medlock Engineering, Inc. is acceptable. Therefore, this Bureau recommends immediate award of the contract for Site #1 (UST Permit #12719) to Brooks & Medlock Engineering, Inc.

The purchase order should be generated for one half of the accepted bid award amount, \$42,500.00. Please note, the full amount of the bid award (\$85,000.00) should be noted in the body of the generated purchase order. The purchase order should indicate it is for the facilities indicated above. Please provide Debra Thoma a copy of the purchase order.

**cc:** Debra Thoma, Underground Storage Tank Program  
Christopher S. Doll, P.G., Manager, UST Program





**UNDERGROUND STORAGE TANK PROGRAM  
BUREAU OF LAND AND WASTE MANAGEMENT  
2600 Bull Street, Columbia, SC 29201  
Telephone (803) 898-4350, Fax (803) 898-4330**

## MEMORANDUM

Date: January 2, 2002

To: Henry Wigfall, Procurement Officer  
Bureau of Business Management

From: Laura Pace, CGFO, CPM, Manager  
Finance Section *lp*

Subject: Bid Award, SB-18123, Requisition #18122  
Site #1, Hot Spot 3005, UST Permit #12719

A review of the submitted bids indicates that it is more advantageous for the state to split Sites #1, #2, and Site #3.

As the proposed corrective action methodology can be permitted in South Carolina and the estimated time frame is protective of human health, the low bid for Site #1 submitted by Brooks & Medlock Engineering, Inc. is acceptable. Therefore, this Bureau recommends immediate award of the contract for Site #1 (UST Permit #12719) to Brooks & Medlock Engineering, Inc.

The purchase order should be generated for one half of the accepted bid award amount, \$42,500.00. Please note, the full amount of the bid award (\$85,000.00) should be noted in the body of the generated purchase order. The purchase order should indicate it is for the facilities indicated above. Please provide Debra Thoma a copy of the purchase order.

cc: Debra Thoma, Underground Storage Tank Program  
Christopher S. Doll, P.G., Manager, UST Program





South Carolina Department of Health and Environmental Control

**RECEIVED**

JAN 10 2002

Underground Storage Tank Program

VENDOR: **BROOKS & MEDLOCK ENGINEERING**  
**712 MERRIMAN AVENUE**  
**ASHVILLE, NC 28804**

Purchase Order		
PURCHASE ORDER NO.	REVISION	PAGE
385179	0	1 of 2
THIS PURCHASE ORDER NO. MUST APPEAR ON ALL INVOICES, PACKING LISTS, CARTONS AND CORRESPONDENCE RELATED TO THIS ORDER.		
SHIP TO:		
UST MANAGEMENT SC DHEC 2600 BULL STREET COLUMBIA, SC 29201-1708 United States		
BILL TO:		
UST MANAGEMENT SC DHEC 2600 BULL STREET COLUMBIA, SC 29201-1708 United States		

CUSTOMER ACCOUNT NO.	VENDOR NO.	DATE OF ORDER/BUYER	REVISED BY / BUYER
	32014	08-JAN-02 WINSLOW, E	
PAYMENT TERMS		SHIP VIA	F.O.B.
NET 30			Destination
FREIGHT TERMS		REQUESTOR/DELIVER TO	CONFIRM TO / TELEPHONE
Prepaid		PACE, Ms. LAURA J	(828) 232-4700

ITEM	PART NUMBER / DESCRIPTION	DELIVERY DATE	QUANTITY	UNIT	UNIT PRICE	EXTENSION
------	---------------------------	---------------	----------	------	------------	-----------

BUYER: Matt Winslow, (803) 898-3487

DHEC PROJECT MANAGER: Christopher S. Doll, (803)898-4366.

CONTRACTOR CONTACT PERSON: Mark Brooks, (828) 232-4700.

PRICE PER COMPETITIVE SEALED BID #18123-12/20/01-HW (Sites 1 and 2), SIGNED BY MARK BROOKS, PARTNER.

ALL TERMS AND CONDITIONS OF THE SOLICITATION DO APPLY.

SEE REVERSE SIDE OF PURCHASE ORDER FOR ADDITIONAL TERMS AND CONDITIONS THAT APPLY.

Planned Purchase Order  
 Effective From: 08-JAN-02 To:

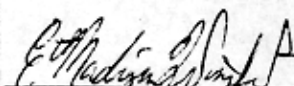
1	918.43		110,000	US D		1 110,000.00
Corrective action at sites 12719 and 04517						

Payments through cost proposal method of expenses incurred in remediation or release from underground storage tanks as provided under Section 44-2-130 S Code of Laws (SUPERB Act).

Contract total cost: \$220,000.00.

BY ACCEPTANCE OF THIS PURCHASE ORDER, YOU AGREE TO THE TERMS AND CONDITIONS LOCATED ON THE REVERSE PAGE.

**Purchase Order**

Total	Continued
 AUTHORIZED SIGNATURE	





South Carolina Department of Health  
and Environmental Control

Purchase Order		
PURCHASE ORDER NO	REVISION	PAGE
385179	02 of 2	
THIS PURCHASE ORDER NO. MUST APPEAR ON ALL INVOICES, PACKING LISTS, CARTONS AND CORRESPONDENCE RELATED TO THIS ORDER.		

SHIP TO:  
**UST MANAGEMENT**  
**SC DHEC**  
**2600 BULL STREET**  
**COLUMBIA, SC 29201-1708**  
**United States**

BILL TO:  
**UST MANAGEMENT**  
**SC DHEC**  
**2600 BULL STREET**  
**COLUMBIA, SC 29201-1708**  
**United States**

VENDOR: **BROOKS & MEDLOCK ENGINEERING**  
**712 MERRIMAN AVENUE**  
**ASHVILLE, NC 28804**

CUSTOMER ACCOUNT NO.	VENDOR NO.	DATE OF ORDER/BUYER	REVISED DATE / BUYER
	<b>32014</b>	<b>08-JAN-02 WINSLOW, E</b>	
PAYMENT TERMS	SHIP VIA	REQUESTOR/DELIVER TO	F.O.B.
<b>NET 30</b>		<b>PACE, Ms. LAURA J</b>	<b>Destination</b>
FREIGHT TERMS			CONFIRM TO / TELEPHONE
<b>Prepaid</b>			<b>(828) 232-4700</b>

ITEM	PART NUMBER / DESCRIPTION	DELIVERY DATE	QUANTITY	UNIT	UNIT PRICE	EXTENSION
------	---------------------------	---------------	----------	------	------------	-----------

THIS CONTRACT WILL CONTINUE UNTIL THE SITE REHABILITATION ACTIVITY AS DESCRIBED IN THE SOLICITATION HAS BEEN COMPLETED; PROVIDED, HOWEVER, THAT COMMITTED FUNDS FOR THE SITE REHABILITATION ACTIVITY UNDER THIS CONTRACT REVERT TO UNCOMMITTED STATUS AFTER FOUR MONTHS OF THE DATE OF THE CONTRACT AWARD IF NO INVOICE FOR THE SITE REHABILITATION ACTIVITIES HAVE BEEN RECEIVED BY THE DEPARTMENT, PURSUANT TO SC CODE 44-2-40(B)(1976), AS AMENDED. IF THE FUNDS REVERT TO UNCOMMITTED STATUS, ANY SUBSEQUENT INVOICE WILL NOT BE PROCESSED FOR PAYMENT UNTIL ALL OTHER COMMITTED FUNDS ARE PAID OR MONEY BECOMES AVAILABLE.

BY ACCEPTANCE OF THIS PURCHASE ORDER, YOU AGREE TO THE TERMS AND CONDITIONS LOCATED ON THE REVERSE PAGE.

# Purchase Order

**Total** **110,000.00**

*E. Madison Winslow*  
 AUTHORIZED SIGNATURE

UST BID SHEET

SOUTH CAROLINA  
DEPARTMENT OF HEALTH & ENVIRONMENTAL CONTROL

SOLICITATION NUMBER: SB 18/23  
 OPENING/CLOSING DATE: 12/20/01  
 TIME: 2:30

PROCUREMENT OFFICER: \_\_\_\_\_  
 BID CLERK: [Signature]  
 DATE AWARD WILL BE POSTED: 1/8/02

COMPANY NAME	Site #1	Site #2	Site #3	Total of All 3
Palmetto Environmental	265,000.00	380,000.00	395,000.00	999,000.00
Subsurface Waste Mgmt	No Bid	No Bid	No Bid	No Bid
Consultech	150,000.00	381,000.00	50,250.00	563,850.00
Brooks & Medlock Engineering	85,000.00	135,000.00	65,000.00	285,000.00
CRB	133,706.00	779,311.00	116,380.00	1,029,397.00
EnviroSouth	127,000.00	No Bid	No Bid	
BLF	230,000.00	185,000.00	105,000.00	520,000.00
H2O	No Bid	No Bid	No Bid	No Bid
Gage Group	262,000.00	456,000.00	268,000.00	986,000.00
Terry Environmental	86,790.98	158,739.50	145,000.00	378,364.00



**BUREAU OF  
BUSINESS MANAGEMENT  
DIVISION OF PROCUREMENT SERVICES  
2600 Bull Street  
Columbia, SC 29201-1708  
Telephone (803) 898-3501 Fax (803) 898-3505**

## **STATEMENT OF AWARD**

**DATE:** January 2, 2002

**DHEC REQUISITION NO:** 18123

**BID NUMBER:** SB-18123-12/20/01-HW (Site #3)

**PURCHASE ORDER NO:** 384571

**FOR FURNISHING:** To perform active corrective action of petroleum releases from a regulated underground storage tank.

**BID ISSUED:** 11/26/01

**DATE BID OPENED:** 12/20/01

**AWARD DATE:** January 2, 2002

**AMOUNT OF AWARD:** \$50,250.00

### **AWARD IS MADE TO:**

Consultech Environmental, Inc.  
1800 MacLeod Drive, Suite F  
Lawrenceville, GA 30043

A handwritten signature in black ink, appearing to read 'E. Madison Winslow', written over a horizontal line.

E. Madison Winslow  
Procurement Officer  
(803) 898-3487

**NOTE: QUESTIONS REGARDING THIS AWARD SHOULD BE DIRECTED TO THE PROCUREMENT OFFICER.**

**ANY ACTUAL BIDDER WHO IS AGGRIEVED IN CONNECTION WITH THE AWARD OF A CONTRACT SHALL SUBMIT A LETTER OF CONCERN TO THE DHEC PROCUREMENT OFFICER RESPONSIBLE FOR THE SOLICITATION WITHIN SEVEN CALENDAR DAYS OF THE AWARD PUBLICATION DATE.**

Cc: Requester.

Handwritten initials 'm' in black ink.

award 11/01/96



**BUREAU OF  
BUSINESS MANAGEMENT  
DIVISION OF PROCUREMENT SERVICES  
2600 Bull Street  
Columbia, SC 29201-1708  
Telephone (803) 898-3501 Fax (803) 898-3505**

## **STATEMENT OF AWARD**

**DATE:** January 8, 2002

**DHEC REQUISITION NO:** 18121, 18122

**BID NUMBER:** SB-18123-12/20/01-HW (Sites #1 and #2)

**PURCHASE ORDER NO:** 385179

**FOR FURNISHING:** To perform active corrective action of petroleum releases from a regulated underground storage tank.

**BID ISSUED:** 11/26/01

**DATE BID OPENED:** 12/20/01

**AWARD DATE:** January 2, 2002

**AMOUNT OF AWARD:** \$220,000.00

### **AWARD IS MADE TO:**

Brooks and Medlock Engineering  
712 Merrimon Avenue  
Asheville, NC 28804

A handwritten signature in black ink, appearing to read 'E. Madison Winslow', written over a horizontal line.

E. Madison Winslow  
Procurement Officer  
(803) 898-3487

**NOTE: QUESTIONS REGARDING THIS AWARD SHOULD BE DIRECTED TO THE PROCUREMENT OFFICER.**

**ANY ACTUAL BIDDER WHO IS AGGRIEVED IN CONNECTION WITH THE AWARD OF A CONTRACT SHALL SUBMIT A LETTER OF CONCERN TO THE DHEC PROCUREMENT OFFICER RESPONSIBLE FOR THE SOLICITATION WITHIN SEVEN CALENDAR DAYS OF THE AWARD PUBLICATION DATE.**

Cc: Requester.

award 11/01/96

Handwritten initials 'm' in black ink.



South Carolina Department of Health and Environmental Control

**BUREAU OF  
BUSINESS MANAGEMENT**  
DIVISION OF PROCUREMENT SERVICES  
2600 Bull Street  
Columbia, SC 29201-1708  
Telephone (803) 898-3501 Fax (803) 898-3505

## SEALED BID INVITATION

**BID MUST BE SUBMITTED ON THIS FORM TO BE ACCEPTED**

SOLICITATION NUMBER: **SB-18123-12/20/01-HW**

DATE ISSUED: 11/26/01

PAGE 1 OF 247

*Number Must Be Shown On Front Of Envelope)*

SEALED BIDS WILL BE RECEIVED UNTIL:

TIME: 2:30 pm DATE: 12/20/01  
(EST)

AND THEN PUBLICLY OPENED

**Mail To:**

ATTENTION: BID CLERK

SOLICITATION NO.: **SB-18123-12/20/01-HW**

S.C. Department of Health & Environmental Control

Division of Procurement Services

2600 Bull Street

Columbia, South Carolina 29201-1708

DIRECT INQUIRIES TO: HENRY WIGFALL

Phone: **(803) 898 -3472**

REASON FOR NO BID:

**This Section Must Be Completed By Vendor:**

Vendor Name \_\_\_\_\_

Mailing Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Telephone Number: ( ) \_\_\_\_\_

Fax Number: ( ) \_\_\_\_\_

E-mail Address: \_\_\_\_\_

Toll Free Number: ( ) \_\_\_\_\_

FEIN Or SSN: \_\_\_\_\_

By signing this bid I certify:

- This bid is made without prior understanding, agreement or connection with any corporation, firm or person submitting a bid for the same materials, supplies or equipment and is in all respects fair and without collusion or fraud.

By signing this bid I agree:

- To abide by all conditions of this bid and certify that I am authorized to sign this bid for the bidder.
- If this quotation is accepted within 60 days from date of opening, to furnish any and all items/services at the prices quoted.

Drug-Free Workplace: Required by Section 44-107-10 (Drug Free Workplace Act) of the South Carolina Code of Laws, 1976, as amended. By submission of a bid, the bidder certifies that he/she will comply with all aspects of the Drug-Free Workplace Act and will not engage in the unlawful manufacture, distribution, dispensation, possession or use of a controlled substance in the performance of this contract. This certification also applies to any individual or firm employed by the contractor.

Authorized Signature (Manual) \_\_\_\_\_

Authorized Signature (Typed) Title \_\_\_\_\_

Date Signed \_\_\_\_\_

COMMODITY: Perform corrective action of a petroleum release from a regulated underground storage tank site.

METHOD OF BID AWARD: Award will be made to a South Carolina Certified UST Site Rehabilitation Contractor based on the total cost of active correction action and other factors. (See Special Conditions #3)

# SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

**BID NUMBER: SB-18123—12/20/01-HW**

## PURPOSE and SCOPE OF WORK

The Underground Storage Tank (UST) Program of the South Carolina Department of Health and Environmental Control (DHEC) is seeking services to perform active corrective action of petroleum releases from regulated underground storage tank sites in accordance with defined remediation goals. The objective is to *remove measurable free product AND/OR reduce the levels of chemicals of concern (CoC) in the ground water to or below defined site-specific target levels (SSTLs)*. All offerors must be South Carolina Certified Class I Site Rehabilitation Contractors. The three scopes of work defined in this solicitation are to be implemented at the **Hot Spot #3005, (UST Permit #12719), 107 Hampton Street, Chesnee, South Carolina; the Greenville Maintenance Facility, (UST Permit #04517), 13 Saluda Dam Road, Greenville, South Carolina; and the Cherokee County Sheriff's Department, (UST Permit #15793), 127 Baker Boulevard, Gaffney, South Carolina.**

## SPECIAL CONDITIONS

1. **CONTRACT PERIOD:** The contract will be effective from date of award until the corrective action is complete as described in this contract.
2. This contract is for corrective action at three sites in South Carolina. Compensation from the SUPERB Account is not considered a state contract for purposes of procurement or subject to state bid requirements in accordance with Section 44-2-130(D) of the SUPERB Act.
3. **AWARD:** Award will be made to a South Carolina Certified UST Site Rehabilitation Contractor based on the method(s), estimated time, and total cost for active corrective action to SSTLs and removal or abandonment of assessment and rehabilitation items. The methods, estimated time, and total cost to complete the contract must be advantageous to the State of South Carolina. Proposed active corrective action remedies, estimated time frame, and cost will be evaluated by the following criteria:
  - 1) Long term reliability and effectiveness of each proposed remedy must protect human health and the environment and not increase the threat or risk;
  - 2) Each proposed remedy must be eligible for permitting by DHEC and must reduce toxicity, mobility, and volume or mass of chemicals of concern to ensure successful completion and ensure no additional receptors are impacted;
  - 3) The amount of time to implement each proposed remedy and the estimated total time to meet the final cleanup goals must ensure protection of unaffected receptors; and
  - 4) The lowest total operation and maintenance cost to implement and operate the proposed remedies, and return the site to the original conditions will be considered the reasonable cost to the SUPERB Account for site rehabilitation.

**DHEC may award sites on an individual basis or as a block of sites, whichever is deemed most advantageous to the State.**
4. **REASONABLE COST:** DHEC reserves the right to reject any and all bids that appear to be above the customary and reasonable cost for the same scope of work in a similar geologic setting, that propose a technology that cannot be permitted in South Carolina, or that propose an estimated time frame for cleanup that is not protective of human health or the environment.
5. Contractor must agree to make positive efforts to employ women- and minority-owned businesses.

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6. **AMENDMENTS:** All amendments to this solicitation shall be in writing from the DHEC Procurement Officer indicated on page one of this solicitation. DHEC shall not be legally bound by any amendment or interpretation that is not in writing.
7. **QUESTIONS:** Questions or requests for information must be submitted in writing and received by 5:00 P.M. ,December 10, 2001. After this date, no further questions will be addressed. A written response will be mailed to all requestors of the solicitation. The questions may be faxed to Henry Wigfall, fax number (803) 898-3505.
8. **NOTE . . . THE ONLY OFFICIAL CONTACT PERSON AT DHEC DURING THE SOLICITATION AND AWARDING PROCESS IS THE PROCUREMENT OFFICER INDICATED ON PAGE ONE OF THIS SOLICITATION. OFFERORS ARE NOT TO CONTACT DHEC PERSONNEL LOCATED OUTSIDE THE BUREAU OF BUSINESS MANAGEMENT.**
9. The contractor(s) will be required to treat the area where the dissolved petroleum chemicals of concern are above site-specific target levels for each site in Attachment A. Verification that interim corrective action goals have been met will be based upon ground-water quality samples collected from the monitoring wells indicated for each site in Attachment A. Verification that final corrective action goals have been met will be based upon ground-water quality samples for each site from all existing monitoring wells and additional verification wells to be installed at locations designated by SCDHEC (See Specification #11 for more details).
10. **REPORTS:** Deliver the reports to: SCDHEC, Bureau of Land and Waste Management, UST Program, 2600 Bull Street, Columbia, SC 29201. A minimum of three (3) copies of each plan and two (2) copies of each report for each site in Attachment A must be delivered to the above address to the attention of the UST Program Project Manager. Based on permitting and other requirements, an engineering report, UIC permits, air-modeling forms, or NPDES Permits may be required. Please contact the Department for the exact number of copies of each document to be submitted.
11. **INVOICING:** Invoices will be submitted to: SCDHEC, Bureau of Land and Waste Management, UST Program, ATTN.: Financial Section, 2600 Bull Street, Columbia, SC 29201, using the Department's Corrective Action (CA) Invoice form. The initial invoice must be received at the above address within four months of CAP approval or funds will be uncommitted as required by the Section 44-2-40(B) of the SUPERB Act. If funds are uncommitted the submitted invoice will be held until funding is available. **Payment will only be made for achieving the corrective action goals as specified in this contract. No interim or partial payments will be made once corrective action is initiated, except as outlined in Specification #4.** Payment to the contractor will be a pay for performance system as follows:
  - A. Payment of forty percent (40%) of the total corrective action price for each site will be made within 90 days of operation of the remediation system or implementation of corrective action as described in the approved corrective action plan (CAP) for each site, subject to the limitations of Section 44-2-40 of the SUPERB Act. Implementation should be documented in the first corrective action monitoring report for each site.

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B. Payment of thirty-five percent (35%) of the total corrective action price for each site will be made based on achieving interim CoC mass reduction goals at the site as verified in the monitoring wells listed in Attachment A for each site. Payment will be made for interim goals of 25, 50, and 75 percent reduction of total CoC mass by the implementation of corrective action. The CoC mass requiring reduction at each site is listed in Attachment A.

1) 25 percent total mass reduction will be achieved when free product has been removed to 0.01 foot (if required) and one-quarter of the initial BTEX, MTBE, Naphthalene, and EDB mass from the monitoring wells specified for each site in Attachment A is removed as compared to the SSTLs. The following formula will be used to calculate the percent total mass reduction: total mass above SSTLs from initial sampling less total mass above SSTLs from subsequent sampling divided by total mass above SSTLs from initial sampling. Payment of 10 percent (10%) of the total corrective action price will be made upon verification (see Specifications item 11 for the method of verification) of at least one-quarter of the total CoC mass above SSTLs is removed.

The following is an example to demonstrate the CoC Mass Reduction Calculation: Table 1

Well		Benzene	Toluene	Ethylbenzene	Xylene	MTBE	Naphthalene	Mass > SSTL
MW-1	Initial <sup>A</sup>	7,500	4,000	2,000	15,000	3,000	1,000	<sup>A</sup>
	SSTL <sup>B</sup>	10	2,000	1,400	10,000	80	50	<sup>B</sup>
	Initial > SSTL <sup>C</sup>	7,490	2,000	600	5,000	2,920	950	18,960 <sup>C</sup>
	Subsequent <sup>D</sup>	3,000	1,000	900	13,000	2,000	5	<sup>D</sup>
	SSTL <sup>E</sup>	10	2,000	1,400	10,000	80	50	<sup>E</sup>
	Subsequent > SSTL <sup>F</sup>	2,990	0	0	3,000	1,920	0	7,910 <sup>F</sup>
MW-4	Initial <sup>G</sup>	150	400	50	250	300	25	<sup>G</sup>
	SSTL <sup>H</sup>	5	400	50	250	40	25	<sup>H</sup>
	Initial > SSTL <sup>I</sup>	145	0	0	0	260	0	405 <sup>I</sup>
	Subsequent <sup>J</sup>	100	100	1	1	100	1	<sup>J</sup>
	SSTL <sup>K</sup>	5	400	50	250	40	25	<sup>K</sup>
	Subsequent > SSTL <sup>L</sup>	95	0	0	0	60	0	155 <sup>L</sup>
Totals	Initial > SSTL <sup>M</sup>	(sum of initial mass above SSTL for all wells) (C+I)						19,365 <sup>M</sup>
	Subsequent > SSTL <sup>N</sup>	(sum of subsequent mass above SSTL for all wells) (F+L)						8,065 <sup>N</sup>

Notes: If subsequent sampling indicates a CoC concentration at or below the SSTL and/or a CoC concentration at BDL but the reporting limit is at/or below the SSTL value for any constituent, the value for the mass reduction will be 0 (no negative numbers).

If subsequent sampling indicates a CoC concentration at BDL but the reporting limit is above the SSTL, the value for any constituent will be the analytical reporting limit.

### Mass Reduction Calculation

$$\text{CoC Mass Reduction} = \frac{(M-N)}{(M)} = \frac{(19,365-8,065)}{19,365} = 0.5835 * 100 = 58.35\% \text{ CoC Reduction}$$



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- 2) 50 percent total mass reduction will be achieved when one-half of the initial BTEX, MTBE, Naphthalene, and EDB mass from the monitoring wells specified for each site in Attachment A is removed as compared to the SSTLs. The formula outlined in Item 11. B. (1) will be used. Payment of 10 percent (10%) of the total corrective action price will be made upon verification (see Specifications Item 11 for the method of verification) of at least one-half of the total CoC mass above SSTLs removed.
  - 3) 75 percent total mass reduction will be achieved when three-quarters of the initial BTEX, MTBE, Naphthalene, and EDB mass from the monitoring wells specified for each site in Attachment A is removed as compared to the SSTLs. The formula outlined in Item 11 B (1) will be used. Payment of 15 percent (15%) of the total corrective action price will be made upon verification (see Specifications Item 11 for the method of verification) of at least three-quarters of the total CoC mass above SSTLs removed.
- C. The final 25 percent (25%) of the total corrective action price will be paid upon: 1) verification that the thickness of free product does not exceed 0.01 foot and the levels of CoC do not exceed the site specific target levels (SSTLs) defined in Specification 11 for each site at any point in the area of concern for that site. Verification that the SSTLs have been met will be based upon ground-water quality samples collected from all existing monitoring wells and additional verification wells to be installed at locations designated by DHEC (see specification #11 for more details); and 2) all remediation and assessment items installed by the contractor (e.g., wells [including pre-existing wells], trenches, etc.) are removed from the site or properly abandoned. The SSTLs for each site are given in Attachment A.**
12. **NOTIFICATION FOR FAILURE TO PERFORM:** If the contractor fails to meet any specification of corrective action as outlined in this document, DHEC will notify the contractor by certified letter of the deficiency(ies). If the contractor does not correct the deficiency(ies) within 30 days, the contractor will be in breach of contract and the corrective action award may be voided by DHEC. DHEC will notify the contractor by certified letter that the corrective action award is void and any invoices are payable upon review and approval by DHEC. If the contractor corrects the deficiency(ies) within 30 days, the corrective action award will continue. Please note contractor-owned items used on-site for the contract that are destroyed by acts of nature, improper maintenance or handling, theft or vandalism will not be replaced or reimbursed by the SUPERB Account. The accepted corrective action cost will be final and will not be increased for any reason (e.g., unanticipated iron fouling of a system, wells clogging because of biological activity or sediments, increased subcontractor costs, loss of utilities, modification to the system to meet the remediation goals, etc.) with the exception of unforeseen geologic circumstances or identification of additional CoC from another release. **Payment will only be made for achieving the corrective action goals as specified in this contract. No interim or partial payments will be made once corrective action is initiated, except as outlined in Specification #4.**
13. **SITE SPECIFIC DETAILS:** A brief technical summary of the releases, including location map and specifics of existing wells for each site are provided in Attachments **B (Hot Spot #3005), C (Greenville County Maintenance Facility), and D (Cherokee County Sheriff's Department)**. The detailed technical files will be available for review through the Freedom of Information (FOI) Office located on the third floor of the Sims Building, 2600 Bull Street, Columbia, SC. **Review of the detailed technical file is not mandatory; however, offerers are strongly encouraged to review the**

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file to ensure a complete understanding of the contract requirements. The successful offeror will be responsible for all information in the technical file. Appointments to view the technical files may be scheduled on weekdays between the hours of 8:30 A.M. to 5:00 P.M. by calling the SCDHEC Freedom of Information Office at (803) 898-3882. Please request file #12719 for Hot Spot #3005, #04517 for Greenville County Maintenance Facility, and #15793 for Cherokee County Sheriff's Department. NOTE: Free phase product may be present at these sites. Free product was detected in the baseline-sampling event at #12719 and #04517. No free phase product was detected in the baseline-sampling event at #15793; however, free phase product was detected in MW-1 in November 1998 at a thickness of 0.04 feet. The application of corrective action technologies can result in the mobilization and possible appearance or increased thickness of free phase product or elevated CoC concentrations in the monitoring wells.

- UST Permit #04517 EXCLUSION: Chemicals of concern (CoC) that are not associated with the underground storage tank release have been detected in ground water at the site. The assessment and remediation of these CoC are not part of this bid scope, nor are the costs for assessment and remediation of these CoC eligible for SUPERB funding. These costs will be paid by the SCDOT. Please contact the Division of Hydrogeology at (803) 896-4000.
14. The contractor will submit a Corrective Action Plan (CAP) for each site within 30 days of the date the Purchase Order is issued from the Bureau of Business Management in accordance with Specification item #2. The implementation of the CAP will be initiated immediately upon DHEC approval of the CAP and all associated permit(s), and in accordance with the schedule presented in the CAP. A performance bond or irrevocable standby letter of credit, equal to the total award price, will be required by DHEC. The issuing institution for an irrevocable standby letter of credit must be an entity that has authority to issue letters of credit in South Carolina and whose letter-of-credit operations are regulated and examined by a federal or state agency. The original performance bond or irrevocable standby letter of credit will be submitted to the Bureau of Land and Waste Management, UST Program, Attn: Pat Holland, within 30 days of award. The performance bond or irrevocable standby letter of credit will specify the SUPERB Account as the recipient of any forfeiture. Since DHEC is responsible for disbursement of funds from the SUPERB Account, the financial responsibility mechanism (i.e., bond or letter of credit) will be held by the Bureau of Land and Waste Management, UST Program until the work is successfully completed at all awarded sites.
15. MINIMUM REQUIREMENTS: Corrective action will be considered complete at each site once the levels of CoC in the area of concern for that site are verified to be at or below the SSTLs for that site and the removal or abandonment of all remediation and assessment items installed by the contractor (e.g., wells [including pre-existing wells], trenches, etc.) is complete. All rehabilitation activities associated with a UST release must be performed by a SCDHEC certified Class I Site Rehabilitation Contractor as required by R.61-98. All corrective action plans and reports must be sealed by a Professional Engineer or Professional Geologist registered in the State of South Carolina. All engineering reports, drawings and plans must be sealed by a Professional Engineer registered in the State of South Carolina. All laboratory analysis for CoC must be performed by a SC certified laboratory. All monitoring, verification, injection, or recovery wells must be installed and abandoned by a SC certified well driller. All applicable certification, training, permits, applications, and fees associated with well installation; injection, discharge, treatment, or transportation of ground water, air, or soil; construction or operation of a remediation system; and any other action requiring a permit are the responsibility of the contractor. Any required business or occupation license and occupational

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safety and health training (e.g., OSHA) as defined by the laws and regulations of the United States of America, the State of South Carolina, the county or city is also the responsibility of the contractor. The terms and conditions of all applicable permits will be met. Any contaminated ground water, soil, or construction material must be properly transported and disposed of, or treated at an approved facility with prior approval from DHEC. Any costs for utilities construction and service (electric, telephone, sewer, etc.) required by the corrective action are the responsibility of the contractor.

**SPECIFICATIONS for CORRECTIVE ACTION**

All offerors must meet the following specifications for each site as required by the proposed treatment method(s) or corrective action technology(ies):

1. Submit a Corrective Action Solicitation Response. The response will outline in general terms an approach to achieve the remediation goals (e.g., reduction of each CoC to SSTL). The proposal must outline the following:
  - A. A description of the proposed treatment method(s) or technology(ies) for corrective action.
  - B. The estimated amount of time in months to complete site rehabilitation to meet the remediation goals and remove or abandon all assessment and remediation items installed as part of corrective action.
  - C. The total cost (in U.S. dollars) to complete site rehabilitation to meet the remediation goals and to remove or abandon all assessment and remediation items installed as part of corrective action.
2. **The successful contractor must complete and submit a detailed CAP (three copies) for each site: 1) Hot Spot #3005, (UST Permit #12719), 107 Hampton Street, Chesnee, South Carolina; 2) Greenville Maintenance Facility, (UST Permit #04517), 13 Saluda Dam Road, Greenville, South Carolina; and 3) Cherokee County Sheriff's Department, (UST Permit #15793), 127 Baker Boulevard, Gaffney, South Carolina within 30 days from the date the Purchase Order is issued by the Bureau of Business Management. NOTE: Use of monitoring well(s) for injection, extraction, or free phase product recovery purposes is not allowed.** A condition of the plan may include installation of additional recovery, sparge, compliance, or injection wells. The plan must define all active (pump and treat, sparge, vapor extraction, excavation of impacted soils, bioremediation, etc.) and passive (intrinsic remediation, monitoring, etc.) corrective action method(s) proposed to reduce CoC to SSTLs. It must be shown, by use of scientific models, computations, or discussion, how each CoC will be reduced to the SSTL for each remediation method proposed for the release. Any assumptions used in a model will be listed or shown, as well as appropriate references. Intrinsic corrective action will require monitoring to verify remediation. General construction details will be included (e.g., install four additional recovery wells, construct a compliance point, install four air injection wells, excavate 3,000 cubic yards of impacted soils, etc.) as well as details of well abandonment and equipment removal. A remediation timetable including abandonment of wells and removal of equipment will be included with the CAP. The Bureau of Land and Waste Management, UST Program will review the CAP and initiate a public notice period for a maximum of 30 days. The contractor must obtain a copy of the applicable portion of the tax map. This map will depict the location of the facility, all impacted properties, and all properties located adjacent to the impacted properties. The names and addresses of the owners of each of these properties will be provided. The

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contractor may be required to attend or provide input at a public meeting upon request by DHC. Any CAP amendments and modification arising from public notice must be submitted within 15 days of notification by DHEC. The CAP and any amendments or modifications must be sealed by a qualified Professional Geologist or Engineer registered in the State of South Carolina. The owner/operator of each site, R.L. Jordan Oil Company (#12719), South Carolina Department of Transportation (#04517), and Cherokee County (#15793), and any other affected property owners will be consulted and will approve the location of the corrective action system. If permanent, the system must be enclosed in a fenced area or small building.

3. Complete and submit all applications for permits (injection, NPDES, BAQC modeling form, thermal treatment, construction, etc.; 3 copies) and an engineering report (ER; 4 copies) with the CAP for each site. Any required permit changes or corrections will be submitted within 15 days of notification by DHEC. The ER and any ER amendments and modifications, must be sealed by a Professional Engineer registered in the State of South Carolina. After review and approval of the CAPs and all permit applications by DHEC, the Bureau of Land and Waste Management, UST Program will issue a notice to proceed with CAP implementation.
4. An initial monitoring report for each site documenting CoC concentrations in all wells and potentiometric conditions prior to start up must be submitted to the Bureau of Land and Waste Management, UST Program **within 45 days** after award.

Based on naturally occurring conditions, the dissolved concentration of petroleum chemicals of concern (CoC) will increase or decrease. For the purposes of this contract, the total CoC mass for the wells included in the bid package may reasonably increase up to 150 percent or decrease as much as 50 percent. If the total CoC concentration in all wells for any site listed in Attachment A increases more than 150 percent based on this initial sampling or if measurable free product that has not been previously documented in any report is detected during the initial sampling event, the contractor may request in writing that the award for that site be canceled. If either of these conditions occurs, the contractor will contact the UST project manager within two days of problem identification and will submit written documentation within five days of notification. The contractor will be reimbursed for one personnel mobilization to collect samples, one sample collection and one analytical fee each monitoring well sampled as outlined in SUPERB Allowable Costs, plus \$6,000 for all other costs incurred (e.g., CAP preparation, obtaining performance bond, business license, etc.). The contract will be amended to remove the site in question and the performance bond or irrevocable letter of credit will be amended to exclude the site removed from the contract. If the total CoC concentration in all wells for any site listed in Attachment A decreases more than 50 percent based on this initial sampling the DHEC may amend the award to remove the site in question. If the corrective action system is started or treatment is performed, the contractor will be required to complete the contract unless unforeseen geological conditions are encountered or another release is confirmed. See special condition 12. If the contract is amended by DHEC, the contractor will be notified by certified letter and an invoice for the above outlined items shall be submitted within 20 days from the date of the certified letter amending the contract.

5. Implement the CAPs within 30 days of receipt of notice to proceed and any required permit(s) to construct. Disruption to the owner/operator's normal business will be kept to a minimum. The contractor will repair the site to the condition as it existed prior to installation of the corrective action system (e.g., asphalt paved areas will be repaved with asphalt, concrete areas replaced with concrete,

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grass area will have soil replaced to the original grade and reseeded or sodded with grass, etc.) Upon completion of any required construction, DHEC will inspect the system and issue a permit to operate. The contractor will, at all times, keep the site free from waste materials and rubbish related to the corrective action. Until completion of the corrective action, the contractor will keep the premises in a clean, neat and workmanlike condition satisfactory to DHEC. Disposition of all generated soil and wastewater must be included in the appropriate report.

Implementation of the corrective action plan(s) before the completion of the public notice process and approval of all permits by DHEC is not authorized. If premature implementation occurs, the UST Program will not reimburse those costs from the SUPERB Account and the corrective action price will be reduced by that amount. If the Department agrees with early implementation to better protect human health in an emergency and provides approval in writing, early implementation without any reduction to the corrective action amount will be authorized.

6. Gain access to adjacent or other affected properties to sample monitoring wells and to install any corrective action equipment, as required. The contractor will repair the site to the condition as it existed prior to installation of the corrective action system (e.g., asphalt paved areas will be repaved with asphalt, concrete areas will be replaced with concrete, grass areas will have soil replaced to the original grade and reseeded or sodded with grass, etc.).
7. Initiate system startup within 15 days of receipt of the permit to operate. Remediation as defined in the CAPs and ERs will begin upon system startup. **If any problem with CAP implementation occurs, the contractor will contact the UST project manager for the site within 24 hours of problem identification and will submit written documentation within five days of notification.** *NOTE: Free phase product may be present at these sites. Free product was detected in the baseline-sampling event at #12719 and #04517. No free phase product was detected in the baseline-sampling event at #15793; however, free phase product was detected in MW-1 in November 1998 at a thickness of 0.04 feet. The application of corrective action technologies can result in the mobilization and possible appearance or increased thickness of free phase product or elevated CoC concentrations in the monitoring wells.*
8. Complete and submit a corrective action monitoring report (2 copies for each site plus one copy for any DHEC Bureau that issued a permit) on a quarterly basis. A copy of the corrective action monitoring report for each site will be mailed directly to the ~~owner/operator~~ of each site. The first quarter corrective action monitoring report for each site is due within 90 days of the permit to operate. The corrective action monitoring reports must include:
  - A. A narrative portion that documents current site conditions, verification of system operation or CAP implementation, and system effectiveness in achieving the remediation goals (e.g., free product removal, reducing CoC to the SSTLs) as outlined in the CAP. Any system down time and the associated reason(s) will be included in the report.
  - B. Conclusions and recommendations based on the reported data.
  - C. Ground-water laboratory analytical data for all monitoring wells in the following format (additional parameters such as dissolved oxygen may be required; do not sample wells containing measurable free product):

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Monitoring Well	Date	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	Naphthalene
MW-1	7/15/97	145	200	146	1,000	170	47
	10/15/97	140	190	140	900	50	165
MW-2	7/15/97	580	800	300	1,000	60	20
	10/15/97	480	90	257	912	50	19

D. Ground-water potentiometric data for all monitoring wells in the following format:

Monitoring Well	Date	TOC Elevation	TOC to GW	TOC to FP	FP Thickness	GW Elevation
MW-1	7/15/97	98.0	17.54			80.46
	10/15/97	98.0	17.90			80.10
MW-2	7/15/97	100.0	20.50	20.47	0.03	79.50
	10/15/97	100.0	21.50	21.48	0.02	78.50

E. A ground-water elevation contour map of the site based on current ground-water potentiometric data.

F. A CoC map based upon current ground-water laboratory analytical data. The ground-water data should be adjacent to the relevant monitoring well using the following format (additional parameters such as dissolved oxygen may be required):

MW - Number  
 Benzene ( $\mu\text{g/l}$ )  
 Toluene ( $\mu\text{g/l}$ )  
 Ethylbenzene ( $\mu\text{g/l}$ )  
 Xylenes ( $\mu\text{g/l}$ )  
 MTBE ( $\mu\text{g/l}$ )  
 Naphthalene ( $\mu\text{g/l}$ )

G. A copy of the DHEC approval letter and manifests for any contaminated soil and ground water removed from the site for treatment and/or disposal.

H. Additional data required by permits (e.g., air analyses, wastewater effluent analyses and amounts, etc.). The data should be reported on a form or in a format specified in the permits, and attached to the monitoring report as an addendum.

All rehabilitation activities associated with the UST release must be performed by a SCDHEC Certified Site Rehabilitation Contractor. All air, soil, and ground-water analyses must be performed by a South Carolina certified laboratory. The corrective action monitoring report must be sealed by a Professional Engineer or Geologist registered in the State of South Carolina. All monitoring wells associated with the release will be sampled on a quarterly basis for the first year. Thereafter, the number of wells sampled may be reduced and/or the interval between corrective action monitoring reports may be lengthened upon clear demonstration of CoC reduction, unless restricted by permit requirements. Any

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approval to reduce the number of wells sampled or the frequency of sampling must be in writing from the UST Program. DHEC may require data to be reported on a form or in a specific format. The contractor will be provided with the proper report forms and format prior to system startup. The contractor will be notified of any revisions to the report forms or format 90 days prior to the due date for the next corrective action monitoring report.

9. Collect one (1) ground-water sample per monitoring event for all monitoring wells associated with the release for each site. For UST Permit #15793, the storm sewer shall be sampled during each sampling. For UST Permit # 04517, the drainage ditch shall be sampled during each sampling event in which sufficient water is present at location SW-1. Each well should be purged prior to sampling. Purging is considered complete once the ground-water temperature and pH have stabilized. Sampling logs should note all temperature and pH measurements, as well as the location and type of each sample submitted for laboratory analysis. Each ground-water sample will be collected in accordance with established QA/QC protocol and submitted to a certified laboratory for analysis. The samples must be analyzed for the following parameters:

Table 4

Analyte	Analytical Method	Reporting Limit (µg/l)
BTEX**	8260B/5030B	5
Naphthalene**	8260B/5030B	5
MTBE**	8260B/5030B	5
EDB <sup>+</sup>	8011	0.02

\*or EPA equivalent method that can achieve the same reporting level

\*\*The UST Program no longer accepts equivalent methods for VOC Analysis.

+ EDB Analysis is required for UST Permit #15793 and #04517 only

Additional samples (air, groundwater, effluent, soil) required by permits must be collected in accordance with established QA/QC protocol and submitted to a certified laboratory for analysis. The samples will be analyzed for parameters stipulated in the permits. Sampling and analytical data for each sample (e.g., field sampling logs, chain of custody forms, certificates of analysis, and the lab certification number) will be included in the corrective action monitoring report.

10. Properly dispose of all contaminated soil and ground water generated during the implementation of the CAPs and installation of verification wells. DHEC must approve the disposal facility selected for treatment and disposal of the free product and contaminated soil and ground water. The owner/operator of the facility is considered the generator for any contaminated soil and ground water. The contractor must document all disposal of free product and contaminated soil and ground water in the corrective action monitoring reports.
11. Verification for the removal of free product will be conducted by SCDHEC personnel with an interface probe. If the remediation technology is in-situ (e.g., pump and treat, air sparging, vapor extraction): suspend operation of the system once the remediation goals for all CoC have been maintained for a period of 30 days. Samples are to be taken after one (1) quarter or after all CoC levels have reached equilibrium and again after a second quarter. Along with the parameters listed in Specification #9, the

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ground-water samples should also be sampled for the following parameters:

Table 5

Analyte	Analytical Method*	Reporting Limit (µg/l)
Dissolved Oxygen	SM4500-O G	500
Ferrous Iron	SM3500-Fe D	30
Methane	Kerr	1000
Nitrate	9056/9210	100
Sulfate	9038/9056	1000

\*or EPA equivalent method that can achieve the same reporting level

If sample results indicate that the remediation goals are not sustained, the contractor must submit a corrective action status report (3 copies) that outlines the deficiency(ies) and offers recommendations for achieving the remediation goals with a revised timetable. Modifying and restarting of the system may be necessary. All remediation goals must be again maintained for a minimum of 30 days. Corrective action will then be suspended again and samples taken to verify that remediation goals are sustained. This cycle of activity, including status reports, will be repeated until all CoC levels remain below SSTLs for all wells listed in Attachment A for two (2) consecutive quarters. Verification wells may be installed at locations designated by DHEC (See Attachment A for number of verification wells for each site). Costs for verification well installation are considered part of this bid price. Each well will be sampled in accordance with Specifications item 9 and the analyses compared to the calculated SSTLs for the CoC at that well location. If the laboratory analyses are at or below the SSTLs, corrective action will be considered complete. If any analysis is above the SSTL, the corrective action will not be considered complete, and the activity cycle described above must be repeated until all CoC levels remain below SSTLs for those wells listed in Attachment A. Split or duplicate samples may be collected by DHEC (or its subcontractors) to verify achievement of remediation goals. In addition to the ground water collected from the monitoring wells, the UST Program may provide up to three standards or prepared blanks for the contractor's laboratory to analyze. The laboratory analysis from the contractor's and the UST Program's laboratory will be compared. In the event of substantial variance (more than 15%), a second sampling event with field and trip blanks will be sent to a SC certified laboratory by the UST Program for analysis. The contractor will be notified when the wells will be resampled, can observe this second sampling event, and will be provided analytical results for comment. DHEC Laboratory Certification will be provided copies of all sample data sets with all relevant quality assurance/quality control data to assist the UST program in determining the cause of a laboratory variation. The Director of the Assessment and Corrective Action Division will make the final decision on which analytical values will be the basis for payment or closure based on the recommendation of the site rehabilitation contractor, DHEC Laboratory Certification, the UST Section Manager, and the UST Project Manager. The site rehabilitation contractor will be provided a written record of any decision. **At least two weeks notice will be provided to the UST Project Manager prior to mobilizing to the site for sampling to verify attainment of remediation goals.** Costs for transportation and analysis of split or duplicate samples will be paid by DHEC.



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or

If the remediation technology is a single event (e. g. excavation of impacted soils, vacuum enhanced recovery): collect sufficient samples as outlined in the CAP to verify the reduction of CoC to the remediation goals. The contractor may be required to install and sample verification wells at locations designated by DHEC. (See Appendix A for number of verification wells for each site). If the levels of CoC in all samples are at or below SSTLs, corrective action will be considered complete. If the level of any CoC is above the SSTL, additional corrective action will be required. The contractor will submit one (1) corrective action status report to document the reduction of CoC to the remediation goals. Split or duplicate samples will be collected by DHEC (or its subcontractors) to verify achievement of remediation goals. **At least two weeks notice will be provided to the UST Project Manager prior to mobilizing to the site for sampling to verify attainment of remediation goals.** Costs for transportation and analysis of split or duplicate samples will be paid by DHEC.

12. Disassemble and remove the remediation system and all associated remediation items including utilities from the site within 60 days of notification by DHEC that the remediation goal for the release associated with the UST(s) at the site has been achieved. Disruption to the owner/operator's normal business will be kept to a minimum.
13. Properly abandon all monitoring, recovery, and/or injection wells (including pre-existing wells), borings, trenches, and piping/utility runs installed by the contractor as part of corrective action within 60 days of notification by DHEC that the remediation goal for the release associated with the UST(s) at the site has been achieved. The abandonment will be in accordance with South Carolina Well Standards and Regulations R. 61-71 and accepted industry standards for abandonment of trenches and piping/utility runs. Disruption to the owner/operator normal business will be kept to a minimum. The contractor must notify DHEC of the method of well abandonment and final disposal of any free product and contaminated soil or ground water. The contractor will return the site to the condition prior to corrective action (e.g., asphalt paved areas will be repaved with asphalt, concrete areas will be replaced with concrete, grass areas will have soil replaced to the original grade and reseeded or sodded with grass, etc.).

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**CORRECTIVE ACTION SOLICITATION RESPONSE**

**Please respond to the following questions:**

**A. SITE 1 – Hot Spot #3005, (UST Permit #12719), 107 Hampton Street, Chesnee, South Carolina.**

1. The corrective action method(s) or technology (ies) that will be proposed in the CAP will be (list all active and/or intrinsic methods or technologies for remediation of the aquifer:

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2. The estimated time in months to complete the corrective action from the date of bid award, corrective action goals are met, and all corrective action items are removed from the site or properly abandoned is approximately \_\_\_\_\_ months. This time assumes all submitted plans and reports will be reviewed by DHEC within 30 days of receipt.

3. The total cost in dollars, regardless of the type, quantity, or duration of the permitted technology applied, to treat the area of concern (see Attachment B, Figure #3) such that the thickness of free product does not exceed .01 foot and the levels of CoC do not exceed the site-specific target levels (SSTLs) defined in item 11.C. at any point, complete all associated monitoring and post-remediation verification, prepare all plans, reports, and correspondence; obtain and meet all terms and conditions of all required permits and licenses; design, install, monitor, operate, maintain, and when completed, properly abandon or remove all assessment and remediation items installed as part of corrective action; provide evidence of performance bond; and other items outlined in this solicitation is: \$\_\_\_\_\_

**B. SITE 2 – Greenville County Maintenance Facility, (UST Permit #04517), 13 Saluda Dam Road, Greenville, South Carolina.**

**EXCLUSION:** Chemicals of concern (CoC) that are not associated with the underground storage tank release have been detected in ground water at the site. The assessment and remediation of these CoC are not part of this bid scope, nor are the costs for assessment and remediation of these CoC eligible for SUPERB funding. These costs will be paid by the SCDOT. Please contact the Division of Hydrogeology at (803) 896-4000.

1. The corrective action method(s) or technology (ies) that will be proposed in the CAP will be (list all active and/or intrinsic methods or technologies for remediation of the aquifer:

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2. The estimated time in months to complete the corrective action from the date of bid award, corrective action goals are met, and all corrective action items are removed from the site or properly abandoned is approximately \_\_\_\_\_ months. This time assumes all submitted plans and reports will be reviewed by DHEC within 30 days of receipt.

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3. The total cost in dollars, regardless of the type, quantity, or duration of the permitted technology applied, to treat the area of concern (see Attachment C, Figure #2) such that the thickness of free product does not exceed .01 foot and the levels of CoC do not exceed the site-specific target levels (SSTLs) defined in item 11.C. at any point, complete all associated monitoring and post-remediation verification, prepare all plans, reports, and correspondence; obtain and meet all terms and conditions of all required permits and licenses; design, install, monitor, operate, maintain, and when completed, properly abandon or remove all assessment and remediation items installed as part of corrective action; provide evidence of performance bond; and other items outlined in this solicitation is: \$ \_\_\_\_\_

**C. SITE 3 – Cherokee County Sheriff’s Department, (UST Permit #15793), 127 Baker Boulevard, Gaffney, South Carolina.**

1. The corrective action method(s) or technology (ies) that will be proposed in the CAP will be (list all active and/or intrinsic methods or technologies for remediation of the aquifer:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
2. The estimated time in months to complete the corrective action from the date of bid award, corrective action goals are met, and all corrective action items are removed from the site or properly abandoned is approximately \_\_\_\_\_ months. This time assumes all submitted plans and reports will be reviewed by DHEC within 30 days of receipt.
3. The total cost in dollars, regardless of the type, quantity, or duration of the permitted technology applied, to treat the area of concern (see Attachment D Figure #6) such that the thickness of free product does not exceed .01 foot and the levels of CoC do not exceed the site-specific target levels (SSTLs) defined in item 11.C. at any point, complete all associated monitoring and post-remediation verification, prepare all plans, reports, and correspondence; obtain and meet all terms and conditions of all required permits and licenses; design, install, monitor, operate, maintain, and when completed, properly abandon or remove all assessment and remediation items installed as part of corrective action; provide evidence of performance bond; and other items outlined in this solicitation is: \$ \_\_\_\_\_

**D. Total Cost for Sites 1, 2, 3, is \$ \_\_\_\_\_**

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**E. ACCEPTANCE and DELIVERY STATEMENT**

In compliance with the solicitation and subject to all conditions thereof, the offeror agrees, if this bid is accepted within \_\_\_\_\_ days from date of opening, to complete the corrective action as specified at the price set forth (combined cost for all sites or individual cost for each site as stated above).

For the purpose of this submittal and acceptance of financial approval should it occur, I certify that this company understands the nature of the release and the geologic conditions at this facility as documented in the technical file and this solicitation. Additionally, I certify that this company understands that acceptance is based on total cost to treat the area of concern.

\_\_\_\_\_  
Contractor (Print) Certification No. \_\_\_\_\_

\_\_\_\_\_  
Authorized Representative (Print) Signature \_\_\_\_\_

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**PLEASE READ THE FOLLOWING CAREFULLY PRIOR TO COMPLETING BID****INSTRUCTIONS TO BIDDERS**

DISCUSSIONS AND NEGOTIATIONS: By submission of a bid, bidder agrees that during the period following issuance of this solicitation and prior to notification of intent or award of a contract, the bidder shall not discuss this procurement with any party except members of the DHEC Procurement Division or other parties designated in this solicitation. Bidder shall not discuss or attempt to negotiate with the using area or program any aspects of the procurement without prior approval of the DHEC Procurement Division Buyer responsible for the procurement. Infractions may result in rejection of the violator's bid.

1. Unless otherwise required herein, only one signed copy of the invitation to bid is required.
2. Bids "faxed" directly to the DHEC Procurement Office will not be accepted or considered for award.
3. Bids, amendments thereto or withdrawal request must be received by the time advertised for bid opening. It is the bidder's sole responsibility to insure that these documents are received by the person (or office) at the time indicated in this solicitation document. Any withdrawal request received after the time of the bid opening shall be governed by DHEC Underground Storage Tank Environmental Remediation Procedures.
4. When specifications or descriptive papers are submitted with the bid submission, enter bidder's name thereon.
5. Submit your signed bid on this form. Show the bid number on the envelope as instructed. DHEC assumes no responsibility for unmarked or improperly marked envelopes. All envelopes received showing a bid number are placed directly under locked security until the date and time of opening. Do not include more than one bid invitation per envelope. If directing any other correspondence, address the envelope to the Procurement Officer but do not include the bid number on the envelope since it does not include your bid.
6. Bidders must clearly mark as "CONFIDENTIAL" each part of their bid which they consider to be proprietary information that could be **exempt from disclosure** under Section 30-4-40, Code of Laws of South Carolina 1976 (1986 Cum. Supp.; Freedom of Information Act). If any part is designated as confidential, there must be attached to that part an explanation of how this information fits within one or more categories listed in Section 30-4-40. DHEC reserves the right to determine whether this information should be exempt from disclosure and no legal action may be brought against the State, DHEC or its agents for its determination in this regard.
7. By submission of a bid, **you are guaranteeing** that all goods and services meet the requirements of this solicitation during the contract period.
8. **Tie bids** will be resolved as outlined in DHEC Underground Storage Tank Environmental Remediation Procedures.
9. **Do not include any taxes** that DHEC may be required to pay in the bid price. Upon submission of a bid by a state agency, the Procurement Officer will compute a 5% sales and use tax to the non-state agency bids when applicable (service and labor excluded) in determining the low bidder. This procedure conforms with the SC Tax Commission Sales and Use Tax Regulation 117-174-.95.
10. **Correction of errors on this bid form:** All prices and notations should be printed in ink or typewritten. Errors should be crossed out, corrections entered and initialed by the person signing the bid. Erasures or use of typewriter correction fluid may be cause for rejection. No bid shall be altered or amended after the time specified for the bid opening.
11. **Ambiguous bids** which are uncertain as to terms, delivery, quantity or compliance with this solicitation may be rejected or otherwise disregarded.
12. Any bidder desiring to exercise a grievance may do so under section IV of DHEC Underground Storage Tank Environmental Remediation Procedures. All correspondence should be directed to the Director of Procurement Services, Bureau of Business Management, 2600 Bull Street, Columbia, SC 29201.
13. **Failure to respond** to three consecutive bid notices may result in removal of bidder's name from the mailing list.

**GENERAL PROVISIONS**

14. DHEC reserves the right to reject any and all bids, and to cancel this solicitation.
15. **Unit prices** will govern over extended prices unless otherwise stated in this solicitation.

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16. **Prohibition of Gratuities:** Amended section 8-13-420 of the 1976 Code of Laws of South Carolina States: "Whoever gives or offers to any public official or public employee any compensation, including a promise of future employment, to influence his action, vote, opinion or judgment as a public official or public employee or such public official solicits or accepts such compensation to influence his action, vote, opinion or judgment shall be subject to the punishment as provided by Section 16-9-210 and Section 16-9-220. The provisions of this section shall not apply to political contributions unless such contributions are conditioned upon the performance of specific actions of the person accepting such contribution nor shall they prohibit a parent, grand-parent or relative from making a gift to a child, grandchild, or other close relative for love and affection except as hereafter provided".
17. **Bidder's Qualification:** Bidders must, upon request of DHEC, furnish satisfactory evidence of their ability to furnish products or services in accordance with the terms and conditions of these specifications. DHEC reserves the right to make the final determination as to the bidder's ability to provide the products or services requested herein.
18. **Bidder's Responsibility:** Each bidder shall fully acquaint himself with conditions relating to the scope and restrictions attending the execution of the work under the conditions of this solicitation. It is expected that this will sometimes require on-site observation. The failure or omission of a bidder to acquaint himself with existing conditions shall in no way relieve him of any obligation with respect to this bid or to the subsequent contract.
19. **Amendments:** All amendments to and interpretations of this solicitation shall be in writing from the DHEC Procurement Office. Neither DHEC or the Procurement Officer shall be legally bound by any amendment or interpretation that is not in writing.
20. **Award Criteria:** Award shall be as indicated herein to the lowest responsible and responsive bidder whose bid meets the requirements and criteria set forth in this solicitation. Award may take longer than fourteen days. A copy of the award notice should be posted on the Procurement Bulletin Board located at 2600 Bull Street in the Aycock Building directly across from the Personnel Division and next to the Bureau of Business Management Procurement Services Division.
21. **Rejection:** DHEC reserves the right to reject any bid that contains prices for individual items or services that are unreasonable when compared to the same or other bids if the rejection is in the best interest of the State.
22. **Competition:** This solicitation is intended to promote competition. If the language, specifications, terms and conditions, or any combination thereof restricts or limits the requirements in this solicitation to a single source, it shall be the responsibility of the interested bidders to notify the DHEC Procurement Office in writing so as to be received five days prior to the opening date. Notification may be "faxed" to the DHEC Procurement Office, (803) 734-4874. The solicitation may or may not be changed but a review of such notification will be made prior to award.
23. **Order of Precedence:** In the event of inconsistency between provisions of this solicitation, the inconsistency shall be resolved by giving precedence in the following order; (A) the bidding schedule, (B) the specifications, (C) general conditions, (D) special provisions or special conditions of the contract whether incorporated by reference or otherwise, and (E) instruction to bidders.

**GENERAL CONDITIONS**

24. **Contract Administration:** Questions or problems arising after award of this solicitation/contract shall be directed to the DHEC Procurement Office, 2600 Bull Street, Columbia, SC, 29201. Reference the solicitation and contract number.
25. **Default:** In case of default by the contractor, DHEC reserves the right to purchase any or all items in default in the open market, charging the contractor with any additional costs. The defaulting contractor shall not be considered a responsible bidder until the assessed charge has been satisfied.
26. **Save Harmless:** (This General Condition does not apply to solicitations for service requirements). The successful bidder shall indemnify and save harmless the State of South Carolina and DHEC and all its officers, agents and employees from all suits or claims of any character brought by reason of infringing on any patent, trade mark or copyright. The bidder shall have no liability to DHEC if such patent, trade mark or copyright infringement or claim is based upon the bidder's use of material furnished to the bidder by the State.
27. **Publicity Releases:** By submission of a bid, the contractor agrees not to refer to award of this contract in commercial advertising in such a manner as to state or imply that the products or services provided are endorsed or preferred by DHEC or user.
28. **Tax Credit Availability:** Bidders interested in income tax credit availability by subcontracting with Certified Minority Firms should contact the Office of Minority Business Assistance, 1205 Pendleton Street, Columbia, SC, 29201. (803-734-0562)

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29. **Affirmative Action:** The successful bidder will take affirmative action in complying with all Federal and State requirements concerning fair employment and employment of the handicapped, and concerning the treatment of all employees, without regard or discrimination by reason of race, color, religion, sex, national origin or physical handicap.
30. **Assignment:** Unless otherwise indicated in this solicitation, no contract or its provisions may be assigned, sublet, subcontracted, or transferred without the prior written consent of the DHEC Procurement Office.
31. **Termination:** Any contract resulting from this solicitation may be terminated by DHEC by providing a thirty-day advance notice in writing to the successful contractor.
32. **Non-Appropriations:** Any contract entered into by DHEC resulting from this solicitation shall be subject to cancellation without damages or further obligation when funds are not appropriated or otherwise made available to support continuation of performance in a subsequent fiscal period or appropriated year.
33. **Convenience:** In the event that this contract is terminated or canceled upon request and for the convenience of DHEC without the required thirty days advance written notification, then DHEC shall negotiate reasonable applicable termination costs.
34. **Cause:** Any contract resulting from this solicitation may be terminated without advance notice by DHEC for cause, default or negligence on the part of the successful contractor.
35. **S.C. Law Clause:** Upon award of a contract under this bid, the person/partnership, association or corporation to whom the award is made must comply with the laws of South Carolina which require such person or entity to be authorized and/or licensed to do business with this State. Notwithstanding the fact that applicable statutes may exempt or exclude the successful bidder from requirements that it be authorized and/or licensed to do business in this State. By submission of a bid, the bidder agrees to subject himself to the jurisdiction and process of the courts of the State of South Carolina as to all matters and disputes arising or to arise under the contract and the performance thereof, including any questions as to the liability for taxes, licenses or fees levied by the State of South Carolina.
36. **Quality of Product:** (This general condition does not apply to solicitations for printing or service requirements.) Unless otherwise indicated in this solicitation, it is understood and agreed that any item offered or shipped as a result of this solicitation shall be new and in first class condition, that all containers shall be new and suitable for storage or shipment, and that prices include standard commercial packaging. If items that are other than new (i.e., remanufactured or refurbished) are desired to be bid, the bidder must obtain written permission to bid such items at least five days in advance of the bid opening date. Written permission must be obtained from the DHEC Procurement Office.
37. **Compliance with Federal Requirements:** S.C. State or Federal requirements that are more restrictive shall be followed in bidding, awarding and performance of this contract.
38. **Drug-Free Workplace:** Required by Section 44-107-10 (Drug Free Work-Place Act) of the SC Code of Laws, 1976, as amended. By submission of a bid, the bidder certifies that he will comply with all aspects of the Drug-Free Workplace Act and will not engage in the unlawful manufacture, distribution, dispensation, possession or use of a controlled substance in the performance of this contract. This certification also applies to any individual or firm employed by the contractor.
39. **Confidentiality Policy:** The successful contractor agrees to abide by DHEC's policy of confidentiality which states in part that all information as to personal facts and circumstances given or made available to employees and/or contractors of DHEC in administration of programs shall be held confidential and shall not be divulged without the express written consent of the individual(s) to which it pertains.
40. **Item Substitution:** No substitution of items will be allowed on any purchase made from the awarded contract without written permission from the DHEC Procurement Office.
  
41. **Outside Contractor Program:** If applicable to scope of contract, contracted employees working on DHEC properties are entitled to information about hazardous chemicals present at DHEC; and DHEC's personnel are entitled to information about hazardous chemicals brought to the facilities by contractors. In order to assure continued compliance with the Hazard Communication Standards while contractors are on DHEC property and to control potential compliance obligations under the Superfund Amendments and Re-authorization Act, it is DHEC's policy to:
  - A. Obtain written assurance that the contractor's employees have been trained to understand the hazards of the chemicals at DHEC and how to use appropriate personal protective equipment. All personal

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- protective equipment and training required for the contractor's employees will be provided by the contractor at the contractor's expense. (This includes SC State General Services employees).
- B. Require the contractor to notify the DHEC Bureau of Business Management or the appropriate DHEC unit Director when introducing hazardous chemicals into DHEC work areas, which may harmfully expose DHEC employees. If the contractor is introducing such hazardous chemicals into any DHEC facility or onto DHEC property, the contractor shall provide the DHEC Division of Procurement Services or the DHEC unit Director copies of the Material Safety Data Sheets (MSDS) for those chemicals. The DHEC Division of Procurement Services or the DHEC unit Director should provide appropriate information to the DHEC employees before the contractor(s) enter any DHEC facility with chemicals.
- C. DHEC reserves the right to refuse to allow any contractor to bring any chemical onto DHEC property. DHEC also reserves the right to refuse to allow any contractor to bring certain quantities of chemicals on DHEC property.



**Attachment A**

(Baseline CoC Mass, SSTL Mass, Number of Verification Wells)

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SITE 1 - Hot Spot #3005, (UST Permit #12719), 107 Hampton Street, Chesnee, South Carolina.

CoC mass in parts per billion ( $\mu\text{g/l}$ ) based on September 29, 2001 sampling: Table A-1

Well	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	Naphthalene	Total Mass
MW-1**	226,000	301,000	280,000	278,000	5,110,000	2,000	6,197,000
MW-3	2,140	155	295	2,260	7,460	300	12,610
MW-6	7	2	24	97	<5	138	273
MW-7	<1	<1	<1	<1	<5	<5	14
MW-9	<1	<1	<1	<1	<5	<5	14
MW-10	<1	<1	<1	<1	<5	<5	14
MW-11	<1	<1	<1	<1	<5	<5	14
Initial Mass*	228,151	301,161	280,323	280,361	5,117,485	2,458	6,209,939
SSTL Mass	15,151	47,161	39,323	208,361	365	2,458	312,819
Initial Mass above SSTL	213,000	254,000	241,000	72,000	5,117,120	0	5,897,120

\* CoC Mass may vary due to changes in the groundwater elevation

\*\* CoC values based on maximum solubility. Free product thickness was 0.43 feet.

Site-specific target levels (SSTLs) in parts per billion ( $\mu\text{g/l}$ )

Well	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	Naphthalene
MW-1	13,000	47,000	39,000	206,000	190	2,000*
MW-3	2,140*	155*	295*	2,260*	150	300*
MW-6	7*	2*	24*	97*	5**	138*
MW-7	1**	1**	1**	1**	5**	5**
MW-9	1**	1**	1**	1**	5**	5**
MW-10	1**	1**	1**	1**	5**	5**
MW-11	1**	1**	1**	1**	5**	5**
Total	15,151	47,161	39,323	208,361	365	2,458

\* Laboratory analysis is less than calculated SSTLs; therefore, SSTL mass is set equal to laboratory mass.

\*\* Laboratory analysis is below detection limits; therefore, SSTL mass is set equal to detection limits.

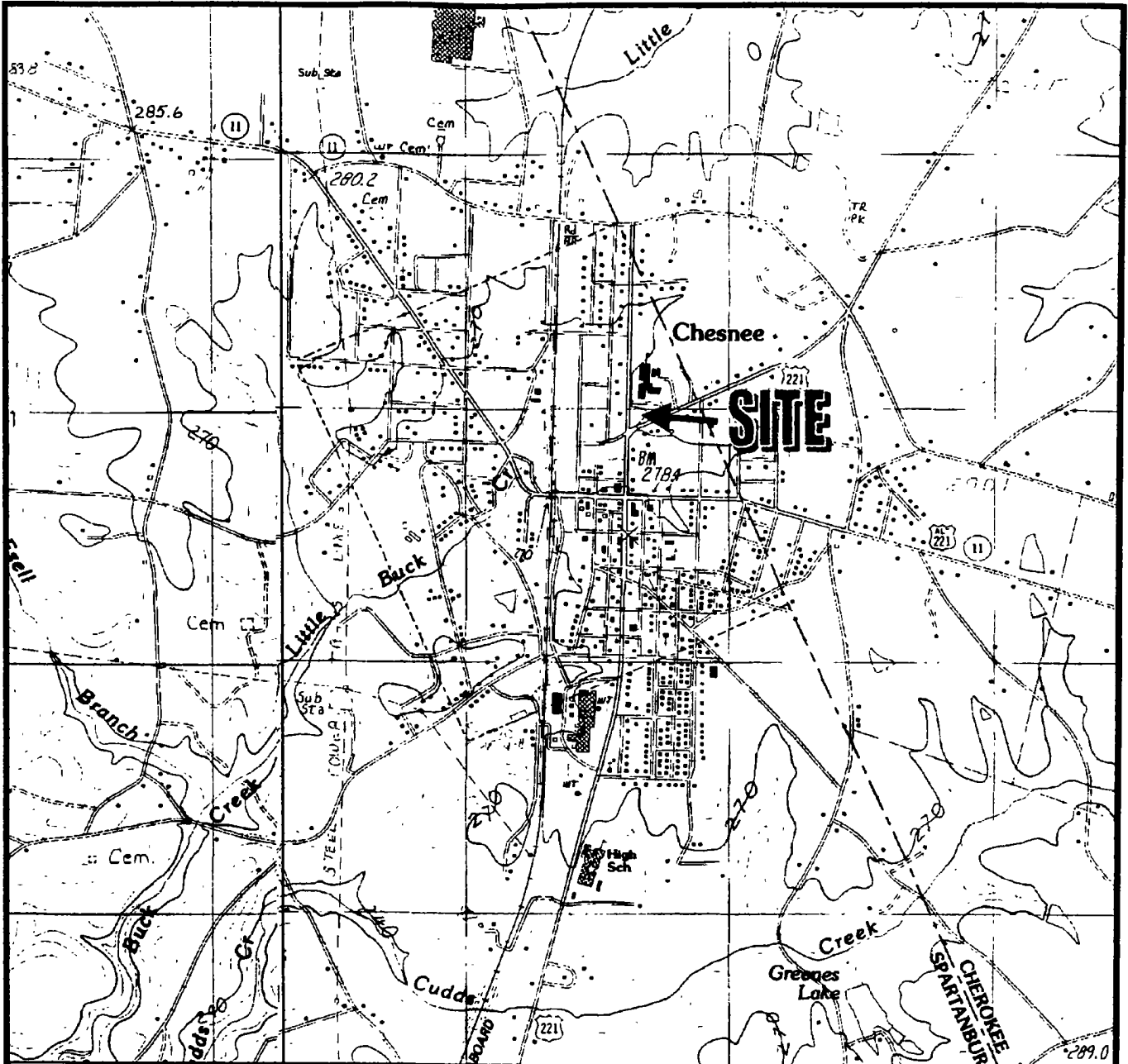
Number of Verification Wells that may be installed: 3UST Program Project Manager: Debra L. Thoma

## **ATTACHMENT B**

**Hot Spot #3005, (UST Permit #12719), 107 Hampton Street, Chesnee, South Carolina  
(Technical Summary)**

The Hot Spot #3005 (UST Permit #12719) has 6 operating USTs.

The following facility adjacent to the site has regulated USTs (operating/abandoned) registered with DHEC: Dons Quick Shops Inc 1, UST Permit #08532, (0 operating/3 abandoned)



SOURCE: TOPOGRAPHIC MAP OF CHESNEE, SOUTH CAROLINA  
QUADRANGLE, 7.5 MINUTE SERIES, 1983



SCALE 1"=2000'

CHECK BY:

DRAWN BY: Klemm

DATE: 17-Nov-00



ENGINEERING TESTING  
ENVIRONMENTAL SERVICES

### SITE LOCATION MAP

HOT SPOT #3005

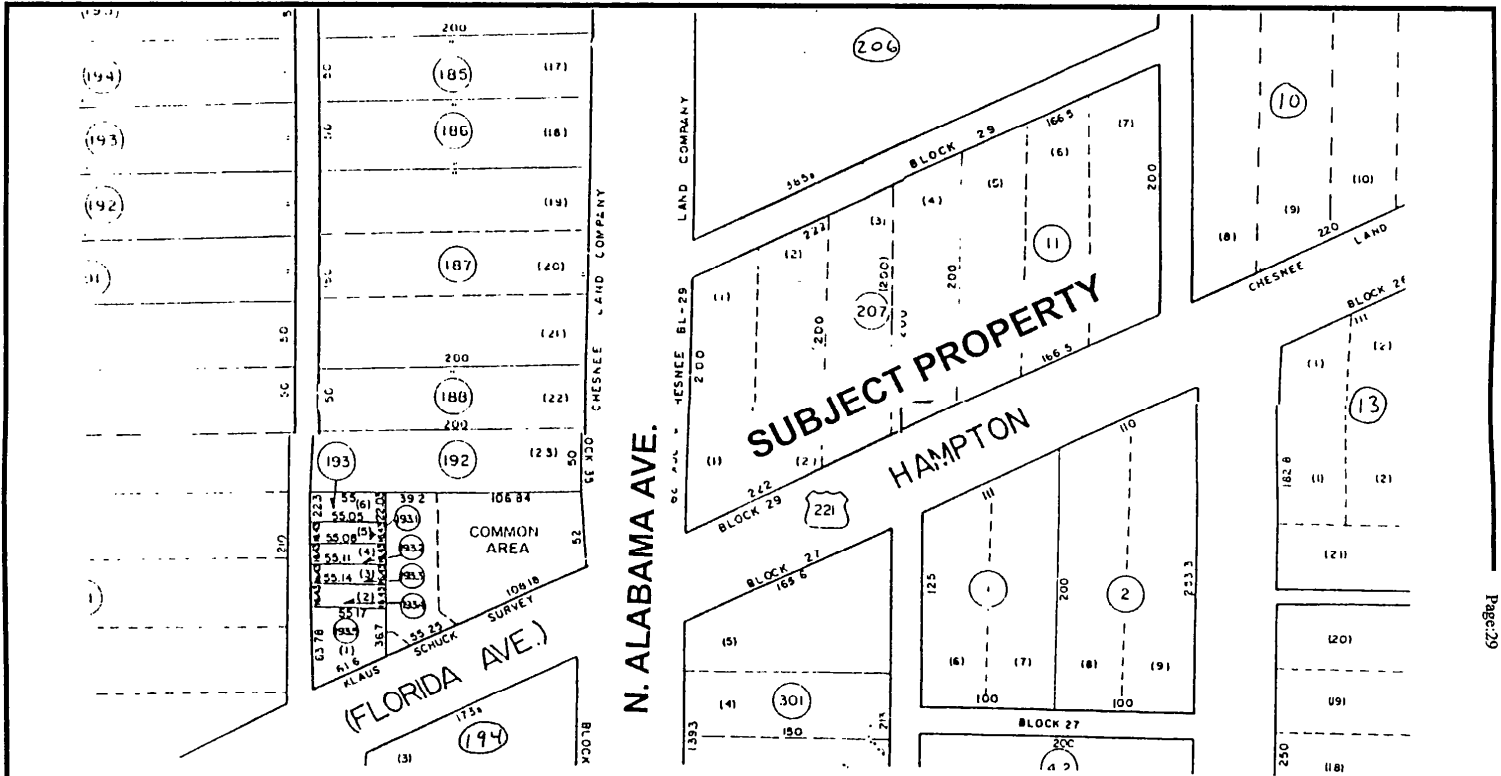
Site ID# 12719

SC HWY 221, CHESNEE, SOUTH CAROLINA

1264-99-506


FIGURE NO:

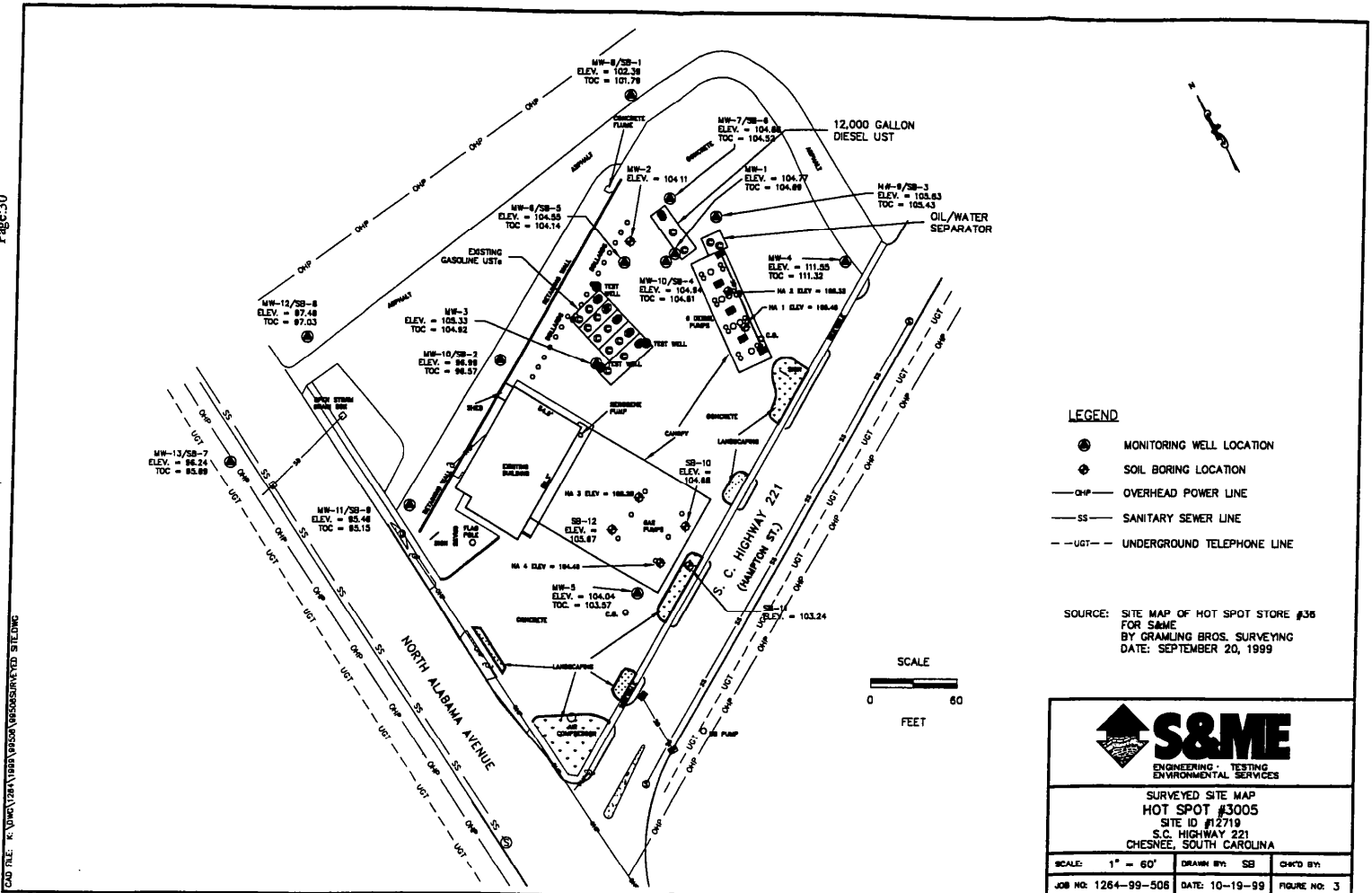
1



SOURCE: SPARTANBURG COUNTY PROPERTY MAP  
 Compiled from Sheets 2-14-5, 2-14-6, 2-14-10, 2-14-11

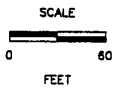
SCD/HEC  
 SB-18123-12/20/01-HW  
 Page: 29


CHECK BY: DRAWN BY: DATE:	 <p><b>ENGINEERING TESTING          ENVIRONMENTAL SERVICES</b></p>	<p><b>MAP OF SURROUNDING PROPERTIES</b></p> <p><b>HOT SPOT #3005</b></p> <p>SITE ID 12719</p> <p>Highway 221, Chesnee, South Carolina</p> <p>1264-99-506</p>	FIGURE NO <p style="font-size: 2em; text-align: center;">2</p>
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- LEGEND**
- MONITORING WELL LOCATION
  - ⊙ SOIL BORING LOCATION
  - OHP — OVERHEAD POWER LINE
  - SS — SANITARY SEWER LINE
  - UGT — UNDERGROUND TELEPHONE LINE

SOURCE: SITE MAP OF HOT SPOT STORE #305 FOR S&ME BY GRAMING BROS. SURVEYING DATE: SEPTEMBER 20, 1999



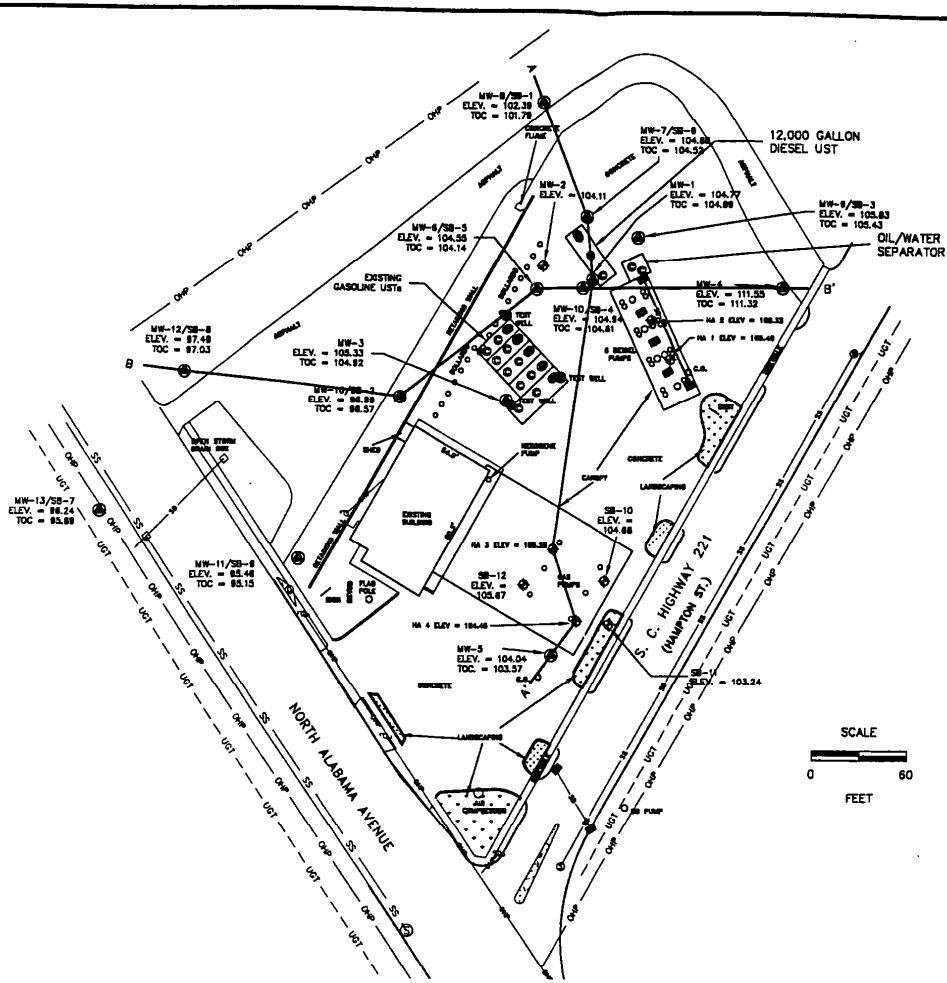


**ENGINEERING · TESTING  
ENVIRONMENTAL SERVICES**

SURVEYED SITE MAP  
**HOT SPOT #3005**  
SITE ID #12719  
S.C. HIGHWAY 221  
CHESNEE, SOUTH CAROLINA

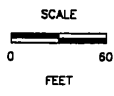
SCALE: 1" = 60'	DRAWN BY: SB	CHKD BY:
JOB NO: 1264-99-506	DATE: 10-19-99	FIGURE NO: 3


CAD FILE: K:\DATA\1999\12\20\01\HW\SCDHEC\SB-18123-12\20\01-HW\UNRESERVED\SITE.MXD



- LEGEND**
- MONITORING WELL LOCATION
  - ⊕ SOIL BORING LOCATION
  - OHP— OVERHEAD POWER LINE
  - SS— SANITARY SEWER LINE
  - - -UGT- - UNDERGROUND TELEPHONE LINE

SOURCE: SITE MAP OF HOT SPOT STORE #36 FOR S&ME BY GRAMLING BROS. SURVEYING DATE: SEPTEMBER 20, 1999





**S&ME**  
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 ENVIRONMENTAL SERVICES

LIMITS OF LITHOLOGIC CROSS SECTION  
 HOT SPOT #3005  
 SITE ID #12719  
 S.C. HIGHWAY 221  
 CHESNEE, SOUTH CAROLINA

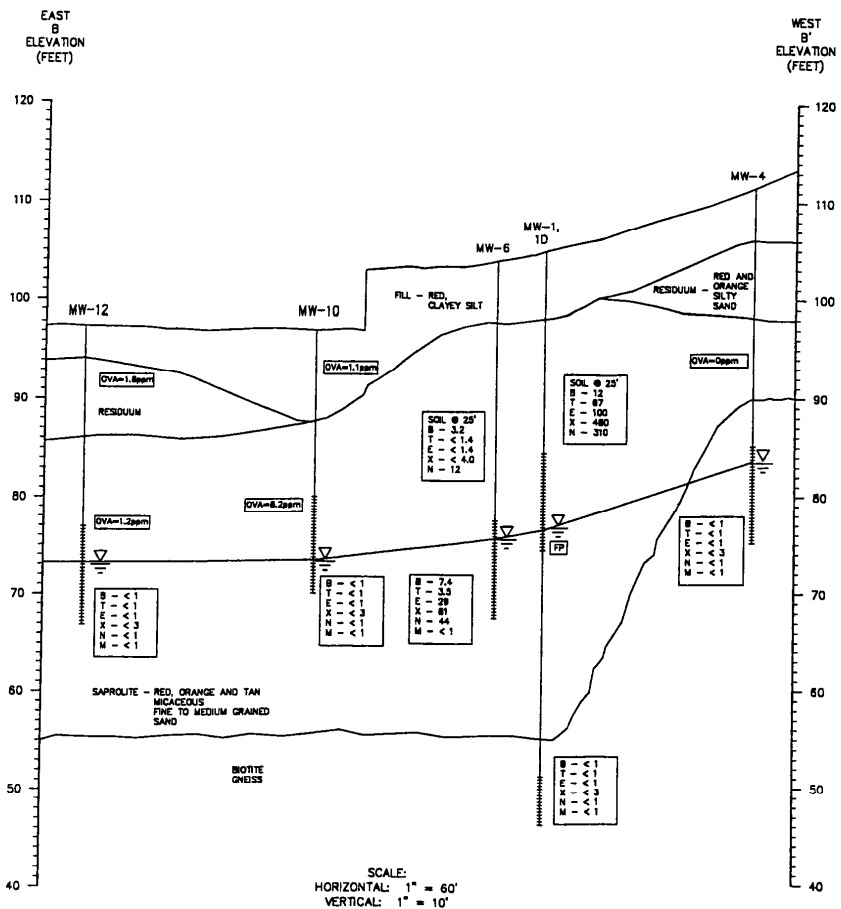
SCALE: 1" = 60'	DRAWN BY: SB	CHK'D BY:
JOB NO: 1264-99-506	DATE: 11-14-00	FIGURE NO: 4

DWG FILE: K:\DWG\1264\1264-99-506-01.LITHOLOG.CWG






CAD FILE: K:\WORK\1284\1284\BRACK\BRACK CROSS SECTION B-B.DWG



**LEGEND**

- B BENZENE CONCENTRATION IN µg/L
- T TOLUENE CONCENTRATION IN µg/L
- E ETHYLBENZENE CONCENTRATION IN µg/L
- X XYLENE CONCENTRATION IN µg/L
- N NAPHTHALENE CONCENTRATION IN µg/L
- M MTBE CONCENTRATION IN µg/L
- FP FREE PRODUCT
- ▽ WATER LEVEL IN WELL ON 10-16-00

SCALE:  
HORIZONTAL: 1" = 60'  
VERTICAL: 1" = 10'

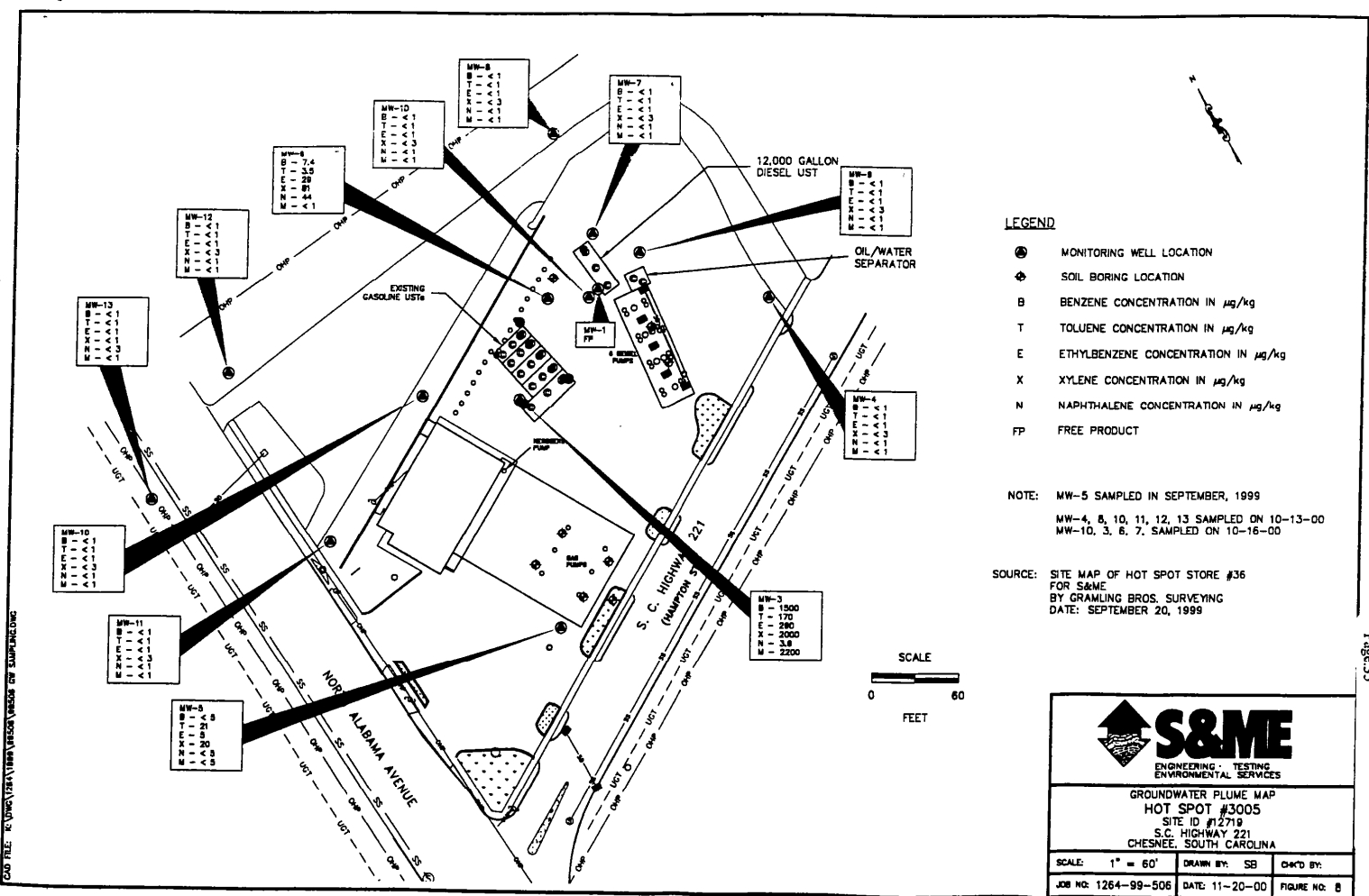


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ENVIRONMENTAL SERVICES

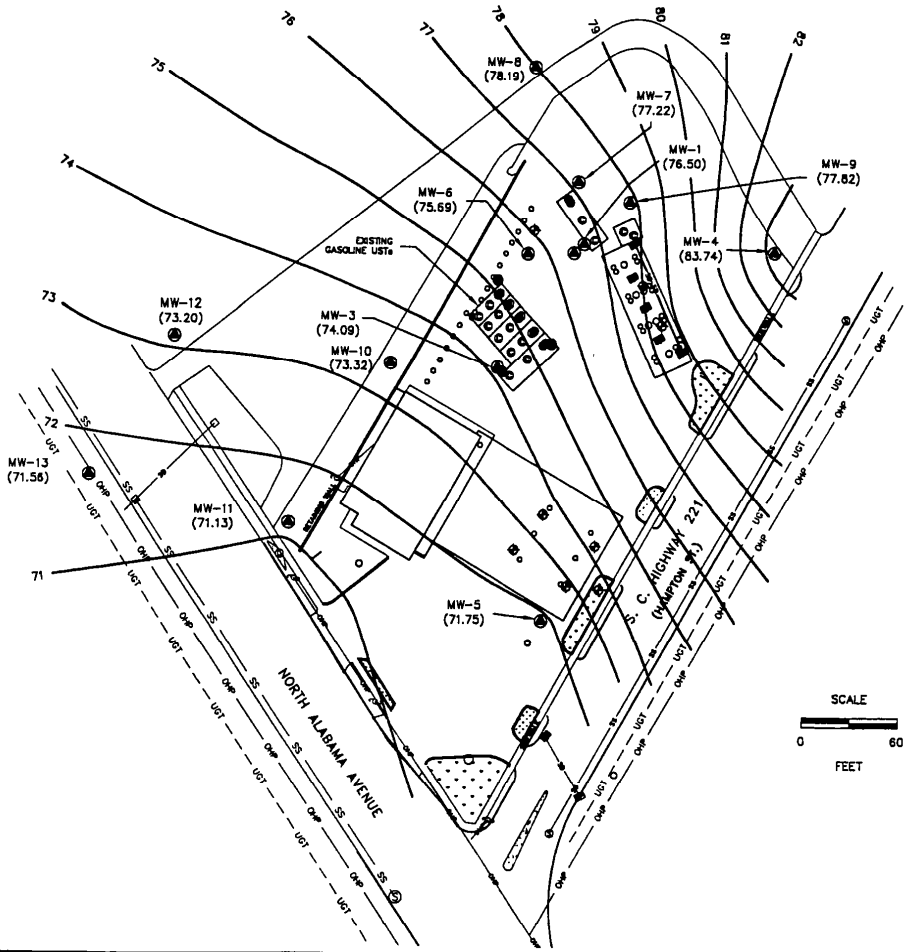
LITHOLOGIC CROSS SECTION B-B'  
HOT SPOT #3005  
SITE ID #12719  
S.C. HIGHWAY 221  
CHESNEE, SOUTH CAROLINA

SCALE: AS SHOWN	DRAWN BY: SB	CHECKED BY:
JOB NO: 1264-99-506	DATE: 11-14-00	FIGURE NO: 8





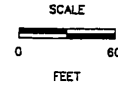
CAD FILE: 1264-99-506-11-20-00-08.DWG



**LEGEND**

- MONITORING WELL LOCATION
- ⊕ SOIL BORING LOCATION
- 75— GROUNDWATER CONTOUR
- (73.20) GROUNDWATER ELEVATION

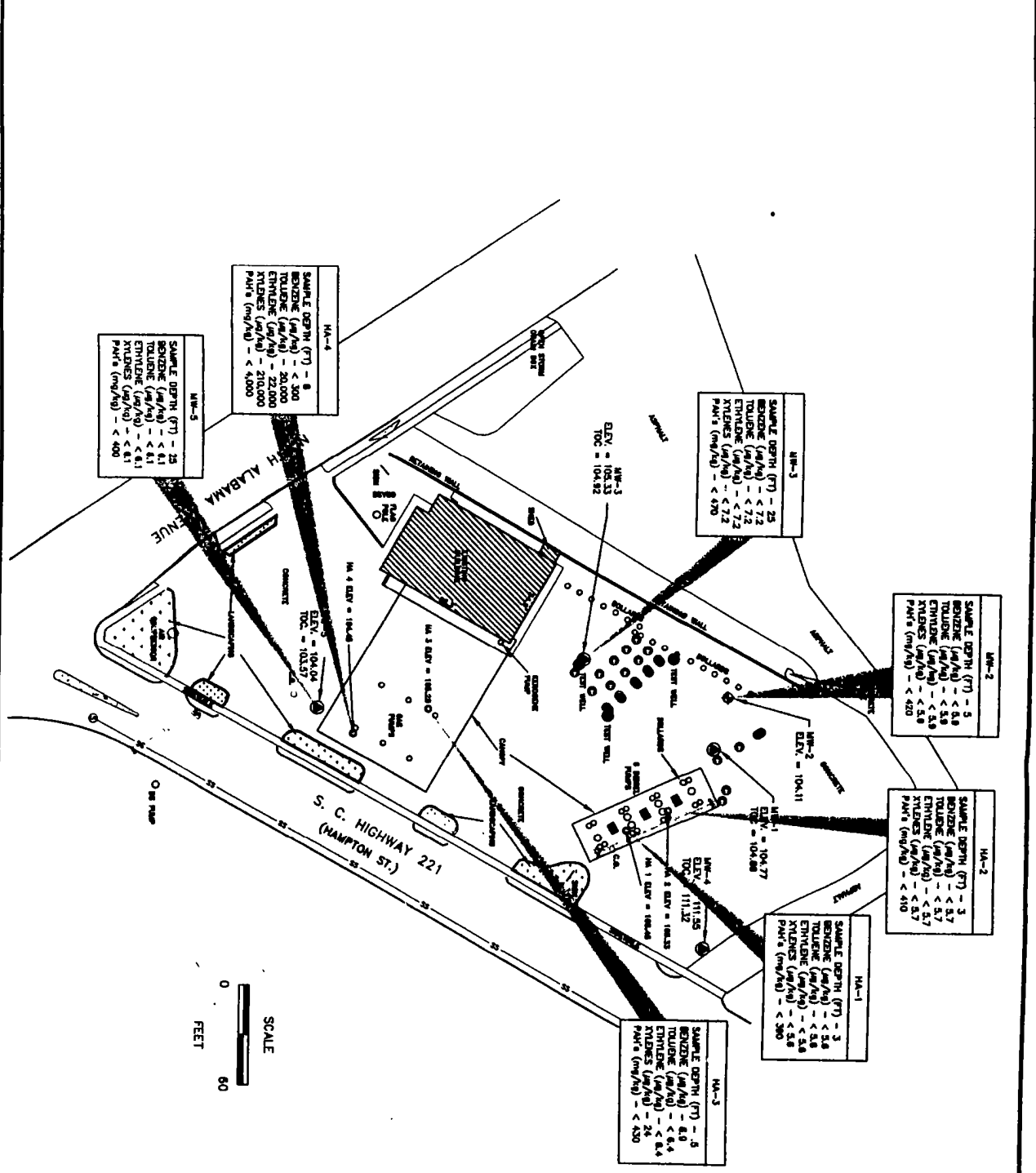
SOURCE: SITE MAP OF HOT SPOT STORE #36  
 FOR S&ME  
 BY GRAMLING BROS. SURVEYING  
 DATE: SEPTEMBER 20, 1999



GROUNDWATER POTENTIOMETRIC SURFACE  
 HOT SPOT #3005  
 SITE ID #12719  
 S.C. HIGHWAY 221  
 CHESNEE, SOUTH CAROLINA

SCALE: 1" = 60'	DRAWN BY: SB	CHECKED BY:
JOB NO: 1264-99-506	DATE: 11-20-00	FIGURE NO: 9

CAD FILE: K:\DWG\1264\1999\09506\09506SCDC.DWG



**S&ME**  
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 ENVIRONMENTAL SERVICES

SOL COC SITE MAP  
 HOT SPOT #36  
 SITE ID #12719  
 S.C. HIGHWAY 221  
 CHESHAM, SOUTH CAROLINA

SCALE: 1" = 60'	DRAWN BY: SB	CHKD BY:
JOB NO: 1264-99-506	DATE: 09-24-99	FIGURE NO: 4

**LEGEND**

● MONITORING WELL LOCATION

SOURCE: SITE MAP OF HOT SPOT STORE #36  
 FOR SKAKE  
 BY GRAMLING BROS. SURVEYING  
 DATE: SEPTEMBER 20, 1999

# LOG OF BORING NO. HA-1

SCDHEC  
SB-18123-12/20/01-HW  
Page:38

PROJECT: **Hot Spot #36**  
PROJECT NO: **1264-99-506**  
PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **Not Encountered @ TOB**

DATE DRILLED: **9/9/99**  
DRILLING CONTRACTOR: **S&ME, Inc.**  
DRILLING METHOD: **Hand Auger**

GROUND SURFACE ELEVATION: **Not Measured**  
LOGGED BY: **Jeff Lindsey**

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.								
				0			8" CONCRETE	
1	1	0				2" GRAVEL		
2	1	0				Orange brown clayey SILT		
3	1	0				Pea GRAVEL		
							HAND AUGER REFUSAL AT 3 FEET ON CONCRETE PIPE	

NOTES:

HAND AUGER LOG 6499506 GPJ S&ME GDT 9/24/99



155 Tradd Street  
Spartanburg, SC 29301

**LOG OF BORING HA-1**

# LOG OF BORING NO. HA-2

SCDHEC  
SB-18123-12/20/01-HW  
Page:39

PROJECT: **Hot Spot #36**  
PROJECT NO: **1264-99-506**  
PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **Not Encountered @ TOB**

DATE DRILLED: **9/9/99**  
DRILLING CONTRACTOR: **S&ME, Inc.**  
DRILLING METHOD: **Hand Auger**

GROUND SURFACE ELEVATION: **Not Measured**  
LOGGED BY: **Jeff Lindsey**

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
<p>This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.</p>								
1	1	0		0			0-8" CONCRETE	
2	1	0					8-10" GRAVEL	
3	1	0					Orange brown clayey SILT	
							REFUSAL AT 3 FEET ON CONCRETE PIPE	

NOTES:

HAND AUGER LOG 6499506 GP J. S&ME GDT 9/24/99



155 Tradd Street  
Spartanburg, SC 29301

LOG OF BORING HA-2

# LOG OF BORING NO. HA-3

PROJECT: **Hot Spot #36**  
PROJECT NO: **1264-99-506**  
PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **Not Encountered @ TOB**

DATE DRILLED: **9/9/99**  
DRILLING CONTRACTOR: **S&ME, Inc.**  
DRILLING METHOD: **Hand Auger**

GROUND SURFACE ELEVATION: **Not Measured**  
LOGGED BY: **Jeff Lindsey**

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	<p style="font-size: small;">This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.</p>	
							DESCRIPTION	REMARKS
1	1	56.7		0			<b>6" CONCRETE</b>	
2	1	1.7				Red orange sandy clayey SILT		
3	2	1				Red-brown silty sandy CLAY		
4	2	0		5				
5	2	1						
6	2	1		10			<b>BORING TERMINATED AT 10 FEET</b>	

HAND AUGER LOG 6499506 GPJ, S&ME, GDT 9/24/99

NOTES:



155 Tradd Street  
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**LOG OF BORING HA-3**



# LOG OF BORING NO. HA-4

PROJECT: **Hot Spot #36**  
PROJECT NO: **1264-99-506**  
PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **Not Encountered @ TOB**

DATE DRILLED: **9/9/99**  
DRILLING CONTRACTOR: **S&ME, Inc.**  
DRILLING METHOD: **Hand Auger**

GROUND SURFACE ELEVATION: **Not Measured**  
LOGGED BY: **Jeff Lindsey**

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	
							DESCRIPTION	REMARKS
				0			<b>0-8" CONCRETE</b>	
1	1	1,932 PPM				/ / / /	Brown orange clayey SILT with strong petroluem odor	
2	1	2%				/ / / /	Orange clayey sandy SILT with strong petroleum odor and organic debris	
3	2	2%				/ / / /	Red orange sandy SILT with strong petroleum odor	
4	2	17%		5		/ / / /	Tan silty SAND with strong petroleum odor	
5	2	17%				/ / / /		
6	2	1.5%				/ / / /		
				10		/ / / /	<b>BORING TERMINATED AT 10 FEET</b>	

NOTES:

HAND AUGER LOG 6499506 GPJ S&ME GDT 9/24/99



155 Tradd Street  
Spartanburg, SC 29301

**LOG OF BORING HA-4**

# LOG OF BORING NO. MW-2

SCDHEC  
SB-18123-12/20/01-HW  
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PROJECT: **Hot Spot #36**  
PROJECT NO: **1264-99-506**  
PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **Not Encountered @ TOB**

DATE COMPLETED: **9/13/99**  
DRILLING CONTRACTOR: **S&ME, Inc.**  
DRILLER: **Costello & Giles**  
DRILLING METHOD: **4 1/4" H.S.A.**  
SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: **104.11**  
DATUM: **Site Benchmark**  
WEATHER:  
LOGGED BY: **Jeff Lindsesy**

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS GRAPHIC SYMBOL	This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	
									DESCRIPTION	REMARKS
						104.11	0		8" CONCRETE	
1	5		12		64			Fill - Stiff red sandy silty CLAY		
2	5		21		5	99.11	5			
3	5		15		7.6	94.11	10			
4	5		17		10	89.11	15		Residuum- very stiff red-orange slightly micaceous sandy SILT with rock fragments	
5	5		21		3.6	84.11	20			
6	5		21		0.4	79.11	25			
						74.11	30		BORING TERMINATED AT 30 FEET	

NOTES:

ENV BORING LOG 6499506 GPJ S&ME GDT 9/24/99



155 Tradd Street  
Spartanburg, SC 29301

LOG OF BORING MW-2

# LOG OF BORING NO. MW-3

SCDHEC  
SB-18123-12/20/01-HW  
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PROJECT: **Hot Spot #36**  
PROJECT NO: **1264-99-506**  
PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **29.35 on 9/15/99**

DATE COMPLETED: **9/13/99**  
DRILLING CONTRACTOR: **S&ME, Inc.**  
DRILLER: **Costello & Giles**  
DRILLING METHOD: **4 1/4" H.S.A.**  
SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: **105.33**  
DATUM: **Site Benchmark**  
WEATHER:  
LOGGED BY: **Jeff Lindsey**

This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
						105.33	0			8" CONCRETE	
1	5		19		160						
						100.33	5			Fill - Very stiff brown to red, sandy SILT with organic debris fine to medium	
2	5		22		120						
						95.33	10				
3	5		17		56						
						90.33	15			Residuum - Very stiff red-orange-white fine to medium sandy SILT with rock fragments	
4	5		23		76						
						85.33	20				
5	5		20		110						
						80.33	25			Very stiff red-orange slightly micaceous fine to medium sandy SILT	▼
6	5		20		9						
						75.33	30				
<b>BORING TERMINATED AT 32 FEET</b>											

NOTES:

ENV BORING LOG 8499506 GPJ S&ME GDT 9/24/99



155 Tradd Street  
Spartanburg, SC 29301

**LOG OF BORING MW-3**



# LOG OF BORING NO. MW-5

PROJECT: **Hot Spot #36**  
PROJECT NO: **1264-99-506**  
PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **30.86 on 9/16/99**

DATE COMPLETED: **9/14/99**  
DRILLING CONTRACTOR: **S&ME, Inc.**  
DRILLER: **Costello & Giles**  
DRILLING METHOD: **4 1/4" H.S.A.**  
SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: **104.04**  
DATUM: **Site Benchmark**  
WEATHER:  
LOGGED BY: **Jeff Lindsey**

This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION		REMARKS
						104.04	0			10" CONCRETE		
1	5		34		0					Fill - Dense red-orange medium to fine silty SAND		
2	5		19		0	99.04	5					
3	5		21		0	94.04	10					
4	5		26		0	89.04	15					
5	5		23		0	84.04	20			Residuum - Very stiff red-orange to tan slightly micaceous medium to fine sandy SILT		
6	5		21		0	79.04	25					
						74.04	30					▼
										BORING TERMINATED AT 32 FEET		

ENV BORING LOG 6499506 GPJ S&ME GDT 9/24/99

NOTES:



155 Tradd Street  
Spartanburg, SC 29301

LOG OF BORING MW-5

# LOG OF BORING NO. SB-1 (MW-8)

SCDHEC  
SB-18123-12/20/01-HW  
Page:46

PROJECT: **Hot Spot #3005**  
PROJECT NO: **1264-99-506**  
PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **23.6 feet on 10/16/00**

DATE COMPLETED: **9/26/00**  
DRILLING CONTRACTOR: **S&ME, Inc.**  
DRILLER: **Costello**  
DRILLING METHOD: **HSA**  
SAMPLING METHOD: **Geoprobe**

GROUND SURFACE ELEVATION: **102.39**  
DATUM: **Site Benchmark**  
WEATHER: **Sunny, Warm**  
LOGGED BY: **M. O'Connell**

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.											
1	5			.5		102.39	0		[Cross-hatched symbol]	Fill - red clayey SILT	
2	4			.3		97.39	5		[Dotted symbol]	Residuum - red, slightly micaceous, silty to fine SAND	
3	4			.4		92.39	10		[Dotted symbol]	Residuum - red and orange mottled, slightly micaceous, silty, fine SAND	
4	4			.75		87.39	15		[Dotted symbol]	Residuum - red and orange mottled, slightly micaceous, silty, fine SAND Saprolite - brown, red and tan, micaceous, silty to fine SAND	
5	4			.9		82.39	20		[Dotted symbol]		
6	3					77.39	25		[Dotted symbol]	Saprolite - red and tan, very micaceous, fine to medium SAND	▼
						72.39	30		[Dotted symbol]		

ENV BORING LOG 6499506 GPJ S&ME GDT 11/22/00

NOTES:



155 Tradd Street  
Spartanburg, SC 29301

LOG OF BORING SB-1 (MW-8)

# LOG OF BORING NO. SB-2 (MW-10)

SCDHEC  
SB-18123-12/20/01-HW  
Page:47

PROJECT: Hot Spot #3005  
PROJECT NO: 1264-99-506  
PROJECT LOCATION: Chesnee, South Carolina

WATER LEVEL: 23.25 feet on 10/16/00

DATE COMPLETED: 9/27/00  
DRILLING CONTRACTOR: S&ME, Inc.  
DRILLER: Costello  
DRILLING METHOD: HSA  
SAMPLING METHOD: Geoprobe

GROUND SURFACE ELEVATION: 96.99  
DATUM: Site Benchmark  
WEATHER: Sunny, Warm  
LOGGED BY: M. O'Connell

This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% ROD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	
										DESCRIPTION	REMARKS
						96.99	0				
1	5				.8						
2	4				9	91.99	5			Fill - brown-red, clayey SILT	
3	4				1.1	86.99	10				
4	3				1.15	81.99	15				
5	4				1.8					Saprolite - tan and red micaceous, silty, fine to medium SAND	
6	3				8.2	76.99	20				
						71.99	25			Saprolite - medium dense, brown and orange very micaceous, fine SAND	▼

NOTES:

ENV BORING LOG 6499506 GPJ S&ME GDT 11/22/00



155 Tradd Street  
Spartanburg, SC 29301

LOG OF BORING SB-2 (MW-10)

# LOG OF BORING NO. SB-3 (MW-9)








SCDHEC  
SB-18123-12/20/01-HW  
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PROJECT: **Hot Spot #3005**  
PROJECT NO: **1264-99-506**  
PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **27.61 feet on 10/16/00**

DATE COMPLETED: **9/27/00**  
DRILLING CONTRACTOR: **S&ME, Inc.**  
DRILLER: **Costello**  
DRILLING METHOD: **HSA**  
SAMPLING METHOD: **Geoprobe**

GROUND SURFACE ELEVATION: **105.83**  
DATUM: **Site Benchmark**  
WEATHER: **Sunny, Warm**  
LOGGED BY: **M. O'Connell**

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% ROD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	
										DESCRIPTION	REMARKS
						105.83	0				
1	5				12					Fill - red, clayey SILT	
2	4				171	100.83	5			Saprolite - tan, white micaceous, medium SAND	
3	4				438	95.83	10			Saprolite - brown, red, tan micaceous, fine to medium SAND	
4	4				354	90.83	15			Saprolite - brown, red, tan micaceous, fine to medium SAND	
5	4				515	85.83	20			Saprolite - medium dense tan and red very micaceous, fine SAND	
6	4				480	80.83	25			Saprolite - medium dense gray, brown and white micaceous, medium SAND	
7	1.5		28			75.83	30			Saprolite - medium dense gray, brown and white micaceous, medium SAND	▼
8	1.5		26			70.83	35				

NOTES:

ENV BORING LOG 6499506 GPJ S&ME GDT 11/22/00



155 Tradd Street  
Spartanburg, SC 29301

LOG OF BORING SB-3 (MW-9)

Sheet 1 of 1



# LOG OF BORING NO. SB-4 (MW-1D)



SCDHEC  
SB-18123-12/20/01-HW  
Page:49

PROJECT: **Hot Spot #3005**  
PROJECT NO: **1264-99-506**  
PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **28.69 feet on 10/16/00**

DATE COMPLETED: **9/28/00**  
DRILLING CONTRACTOR: **S&ME, Inc.**  
DRILLER: **Costello**  
DRILLING METHOD: **HSA/Rock Coring**  
SAMPLING METHOD: **Geoprobe**

GROUND SURFACE ELEVATION: **104.94**  
DATUM: **Site Benchmark**  
WEATHER: **Sunny, Warm**  
LOGGED BY: **M. O'Connell**

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	
										DESCRIPTION	REMARKS
						104.94	0				
1	5				.95					Fill - red, clayey SILT	
						99.94	5				
2	4				.92					Saprolite - white, orange, micaceous, fine to medium SAND	
						94.94	10			Saprolite - tan and red micaceous, fine to medium SAND	
3	4				7.8					Saprolite - tan and red micaceous, fine to medium SAND	
						89.94	15			Saprolite - tan and red micaceous, fine to medium SAND	
4	5				23.5					Saprolite - tan and red micaceous, fine to medium SAND	
						84.94	20			Saprolite - tan and red micaceous, fine to medium SAND	
5	4				456					Saprolite - tan and red micaceous, fine to medium SAND	
						79.94	25			Saprolite - tan and red micaceous, fine to medium SAND	
6	3				615					Saprolite - tan and red micaceous, fine to medium SAND	
						74.94	30			Saprolite - medium dense tan and red very micaceous, fine SAND	▼
7	1.5		15							No Recovery	
						69.94	35				
8	1.5		20								

NOTES:

ENV BORING LOG 6499506.GPJ, S&ME.GDT 11/22/00



155 Tradd Street  
Spartanburg, SC 29301

LOG OF BORING SB-4 (MW-1D)

SAMPLE NUMBER	SAMPLE ADVANCE (ft)	SAMPLE RECOVERY (ft)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	
										DESCRIPTION	REMARKS
						69.94	35			No Recovery (continued)	
9	1.5		20			64.94	40			Saprolite - medium dense brown and tan very micaceous, fine SAND with occasional very coarse quartz veins.	
10	1.5		15			59.94	45			Saprolite - medium dense, tan and orange very micaceous, fine to medium SAND	
11	1.5		45			54.94	50			8" Saprolite - dense brown and red very micaceous medium SAND 10" - Black, brown and gray PARTIALLY WEATHERED ROCK	
						49.94	55			Rock - biotite-gneiss	
Boring terminated at 58.64 feet.											

NOTES:

EMV BORING LOG 6499506 GPJ S&ME GDT 11/22/00



155 Tradd Street  
 Spartanburg, SC 29301

**LOG OF BORING SB-4 (MW-1D)**

# LOG OF BORING NO. SB-5 (MW-6)






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PROJECT: **Hot Spot #3005**  
PROJECT NO: **1264-99-506**  
PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **28.45 feet on 10/16/00**

DATE COMPLETED: **9/25/00**  
DRILLING CONTRACTOR: **S&ME, Inc.**  
DRILLER: **Costello**  
DRILLING METHOD: **HSA**  
SAMPLING METHOD: **Geoprobe**

GROUND SURFACE ELEVATION: **104.55**  
DATUM: **Site Benchmark**  
WEATHER: **Sunny, hot**  
LOGGED BY: **M. O'Connell**

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% ROD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION		REMARKS
						104.55	0					
1	1.5				74	99.55	5			Fill - red clayey SILT with some medium grain sand		
2	1.5				142	94.55	10			Saprolite - red and tan very micaceous, silty fine to medium SAND		
3	1.5				112	89.55	15					
4	1.5				154	84.55	20			Saprolite - medium dense red and tan very micaceous, silty fine to medium SAND		
5	1.5				376	79.55	25					
6	1.5		12			74.55	30					▼
7	1.5		13			69.55	35					

This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

NOTES:

ENV BORING LOG 6499506 GPJ S&ME GDT 11/22/00



155 Tradd Street  
Spartanburg, SC 29301

LOG OF BORING SB-5 (MW-6)

# LOG OF BORING NO. SB-6 (MW-7)

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PROJECT: **Hot Spot #3005**  
PROJECT NO: **1264-99-506**  
PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **27.3 feet on 10/16/00**

DATE COMPLETED: **9/25/00**  
DRILLING CONTRACTOR: **S&ME, Inc.**  
DRILLER: **Costello**  
DRILLING METHOD: **HSA**  
SAMPLING METHOD: **Geoprobe**

GROUND SURFACE ELEVATION: **104.88**  
DATUM: **Site Benchmark**  
WEATHER: **Partly cloudy, hot**  
LOGGED BY: **M. O'Connell**

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION		REMARKS
						104.88	0			This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.		
1	5				0	99.88	5			Fill - red, clayey SILT		
2	4				16	94.88	10			Fill - red, clayey SILT Residuum - tan and red mottled micaceous, silty, fine SAND Saprolite - tan and orange, micaceous, silty, fine to medium SAND		
3	4				12.2	89.88	15			Saprolite - tan and orange, micaceous, silty, fine to medium SAND		
4	4				9.02	84.88	20			Saprolite - tan and brown and white micaceous, medium SAND		
5	4				12.89	79.88	25			Saprolite - tan and brown and white micaceous, medium SAND		
6	4				16	74.88	30			Saprolite - brown, red, and tan micaceous, medium SAND with small quartz veins		▼
7	1.5		12			69.88	35			Saprolite - brown, red, and tan micaceous, medium SAND with small quartz veins		
8	1.5		13									

NOTES:

ENV BORING LOG 6495506 GPJ S&ME GDT 11/22/00



155 Tradd Street  
Spartanburg, SC 29301

LOG OF BORING SB-6 (MW-7)

# LOG OF BORING NO. SB-7 (MW-13)

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PROJECT: Hot Spot #3005  
PROJECT NO: 1264-99-506  
PROJECT LOCATION: Chesnee, South Carolina

WATER LEVEL: 24.33 feet on 10/16/00

DATE COMPLETED: 9/29/00  
DRILLING CONTRACTOR: S&ME, Inc.  
DRILLER: Costello  
DRILLING METHOD: HSA  
SAMPLING METHOD: Geoprobe

GROUND SURFACE ELEVATION: 96.24  
DATUM: Site Benchmark  
WEATHER: Sunny, warm  
LOGGED BY: M. O'Connell

This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
						96.24	0				
1	10			.5		91.24	5		[Cross-hatched symbol]	Fill - red - brown clayey SILT	
4	5			38		86.24	10		[Diagonal hatched symbol]	Residuum - orange-brown, clayey SILT	
5	5			.1		81.24	15		[Dotted symbol]	Saprolite - red, orange and tan, micaceous, silty, fine to medium SAND	
6	4			.15		76.24	20		[Dotted symbol]	Saprolite - red, orange and tan, micaceous, silty, fine to medium SAND	
						71.24	25		[Dotted symbol]	Saprolite - red, orange and tan, micaceous, silty, fine to medium SAND	▼

NOTES:

ENV BORING LOG 6499506 GPJ S&ME GDT 11/22/00



155 Tradd Street  
Spartanburg, SC 29301

LOG OF BORING SB-7 (MW-13)

# LOG OF BORING NO. SB-8 (MW-12)









SCDHEC  
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PROJECT: **Hot Spot #3005**  
PROJECT NO: **1264-99-506**  
PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **23.83 feet on 10/16/00**

DATE COMPLETED: **9/29/00**  
DRILLING CONTRACTOR: **S&ME, Inc.**  
DRILLER: **Costello**  
DRILLING METHOD: **HSA**  
SAMPLING METHOD: **Geoprobe**

GROUND SURFACE ELEVATION: **97.49**  
DATUM: **Site Benchmark**  
WEATHER: **Sunny, warm**  
LOGGED BY: **M. O'Connell**

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	
										DESCRIPTION	REMARKS
						97.49	0				
1	5				1.8					Fill - red - orange SILT	
2	5				1.8	92.49	5			Residuum - red and orange (mottled) micaceous, SILT	
3	5				1.5	87.49	10			Residuum - red and orange (mottled) micaceous SILT	
						82.49	15			Saprolite - tan - orange micaceous, medium SAND	
4	5				1.2					Saprolite - tan - orange micaceous, medium SAND	
5	5				1.0	77.49	20			Saprolite - tan - orange micaceous, medium SAND	
						72.49	25			Saprolite - tan - orange micaceous, medium SAND	▼
6	1.5		15			67.49	30			Saprolite - tan - orange micaceous, medium SAND	

NOTES:

ENV BORING LOG 6499506 GPFJ S&ME GDT 11/22/00



155 Tradd Street  
Spartanburg, SC 29301

LOG OF BORING SB-8 (MW-12)

# LOG OF BORING NO. SB-9 (MW-11)

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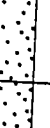
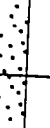

PROJECT: **Hot Spot #3005**  
PROJECT NO: **1264-99-506**  
PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **24.02 feet on 10/16/00**

DATE COMPLETED: **9/27/00**  
DRILLING CONTRACTOR: **S&ME, Inc.**  
DRILLER: **Costello**  
DRILLING METHOD: **HSA**  
SAMPLING METHOD: **Geoprobe**

GROUND SURFACE ELEVATION: **95.46**  
DATUM: **Site Benchmark**  
WEATHER: **Sunny, warm**  
LOGGED BY: **M. O'Connell**

This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
1	5					95.46	0			Fill - red, clayey SILT	
2	5					90.46	5			Residuum - red and orange (mottled) micaceous, silty, fine SAND	
3	4					85.46	10			Saprolite - tan and orange, micaceous, medium SAND	
4	5					80.46	15			Saprolite - tan and orange, micaceous, medium SAND	
5	4					75.46	20			Saprolite - tan and orange, micaceous, medium SAND	
6	5	25				70.46	25			Saprolite - medium-dense, brown, tan and white, very micaceous, fine to medium SAND with some coarse quartz veins	▼

NOTES:

ENV BORING LOG 6499506 GPJ S&ME GDT 11/22/00



155 Tradd Street  
Spartanburg, SC 29301

LOG OF BORING SB-9 (MW-11)

# LOG OF BORING NO. SB-10



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PROJECT: **Hot Spot #3005**  
PROJECT NO: **1264-99-506**  
PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **Not Encountered**

DATE COMPLETED: **9/7/00**  
DRILLING CONTRACTOR: **Troxler Geologic**  
DRILLER: **Costello**  
DRILLING METHOD: **Geoprobe**  
SAMPLING METHOD: **Geoprobe**

GROUND SURFACE ELEVATION: **104.68**  
DATUM: **Site Benchmark**  
WEATHER: **Sunny, cool**  
LOGGED BY: **M. O'Connell**

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.											
						104.68	0			Fill - red, clayey SILT	
1	5				23.8						
						99.68	5			Saprolite - tan and orange, very micaceous, fine to medium SAND	
2	5				3.1						
						94.68	10			Boring terminated at 10 feet.	

NOTES:

ENVIRONMENTAL LOG 849908 GPJ SAME DOT 1/12/00



155 Tradd Street  
Spartanburg, SC 29301

**LOG OF BORING SB-10**



# LOG OF BORING NO. SB-11



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PROJECT: **Hot Spot #3005**  
PROJECT NO: **1264-99-506**  
PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **Not Encountered**

DATE COMPLETED: **9/7/00**  
DRILLING CONTRACTOR: **Troxler Geologic**  
DRILLER: **Costello**  
DRILLING METHOD: **Geoprobe**  
SAMPLING METHOD: **Geoprobe**

GROUND SURFACE ELEVATION: **103.24**  
DATUM: **Site Benchmark**  
WEATHER: **Sunny, cool**  
LOGGED BY: **M. O'Connell**

SAMPLE NUMBER	SAMPLE ADVANCE (ft)	SAMPLE RECOVERY (ft)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	<p style="font-size: small;">This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.</p>	
										DESCRIPTION	REMARKS
						103.24	0			Fill - red, clayey SILT	
1	5				2.09	98.24	5			Saprolite - tan and orange very micaceous fine to medium SAND	
2	5				7.04	93.24	10			Boring terminated t 10 feet.	

NOTES:

ENV BORING LOG 6499506 GPJ S&ME GDT 11/22/00



155 Tradd Street  
Spartanburg, SC 29301

**LOG OF BORING SB-11**

# LOG OF BORING NO. SB-12



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PROJECT: **Hot Spot #3005**  
PROJECT NO: **1264-99-506**  
PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **Not Encountered**

DATE COMPLETED: **9/7/00**  
DRILLING CONTRACTOR: **Troxler Geologic**  
DRILLER: **Costello**  
DRILLING METHOD: **Geoprobe**  
SAMPLING METHOD: **Geoprobe**

GROUND SURFACE ELEVATION: **105.67**  
DATUM: **Site Benchmark**  
WEATHER: **Sunny, cool**  
LOGGED BY: **M. O'Connell**

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	
										DESCRIPTION	REMARKS
						105.67	0			Fill - red, clayey SILT	
1	5				1.71						
						100.67	5			Saprolite - tan and orange, micaceous, medium SAND	
2	5				1.08						
						95.67	10			Boring terminated at 10 feet.	

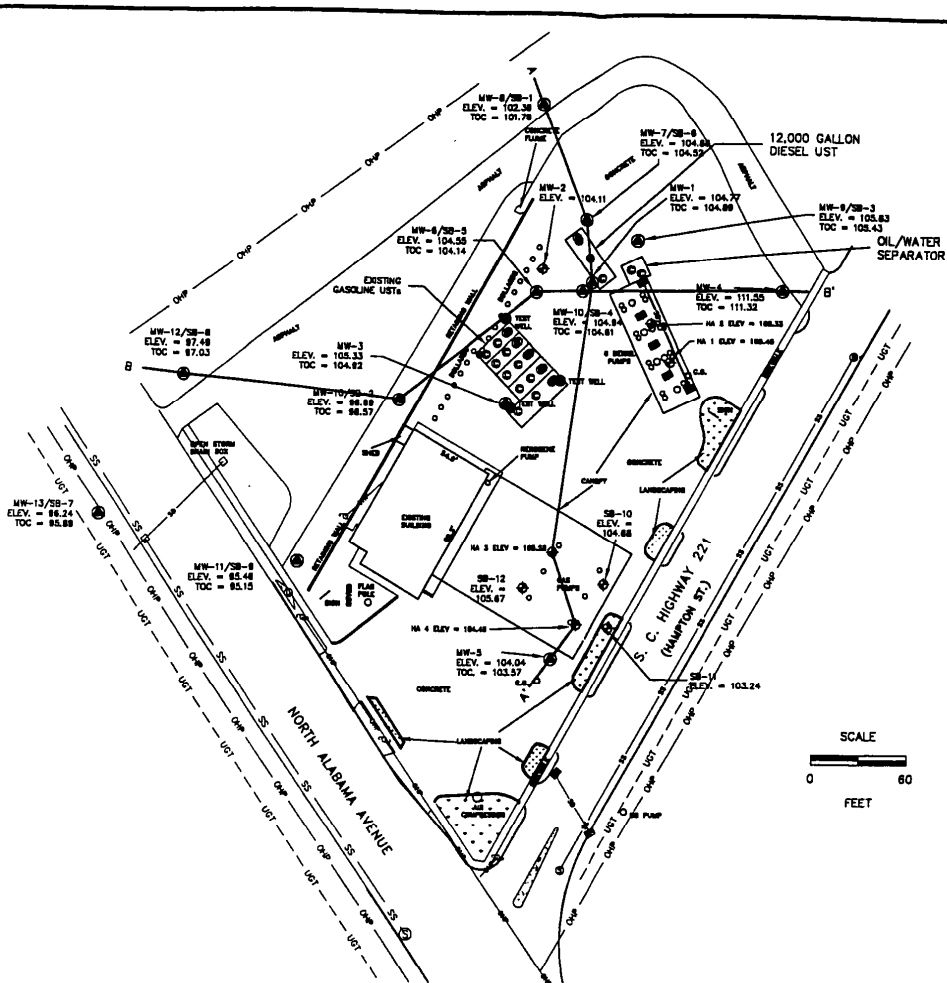
NOTES:

ENV BORING LOG: 6499506 GPJ S&ME GDT 11/22/00



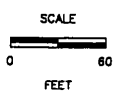
155 Tradd Street  
Spartanburg, SC 29301


**LOG OF BORING SB-12**



- LEGEND**
- MONITORING WELL LOCATION
  - ⊕ SOIL BORING LOCATION
  - OHP— OVERHEAD POWER LINE
  - SS— SANITARY SEWER LINE
  - UGT--- UNDERGROUND TELEPHONE LINE

SOURCE: SITE MAP OF HOT SPOT STORE #36  
 FOR S&ME  
 BY GRAMLING BROS. SURVEYING  
 DATE: SEPTEMBER 20, 1999





**S&ME**  
 ENGINEERING · TESTING  
 ENVIRONMENTAL SERVICES

LIMITS OF LITHOLOGIC CROSS SECTION  
 HOT SPOT #3005  
 SITE ID #12719  
 S.C. HIGHWAY 221  
 CHESNEE, SOUTH CAROLINA

SCALE: 1" = 60'	DRAWN BY: SB	CHK'D BY:
JOB NO: 1264-99-506	DATE: 11-14-00	FIGURE NO: 4

CAD FILE: K:\WORK\221\1999\1999\1999\LITHOLOGIC.DWG

**TABLE 1**  
**HISTORICAL GROUNDWATER QUALITY DATA**  
**HOT SPOT #3005**  
**HIGHWAY 221**  
**CHESNEE, SOUTH CAROLINA**  
**S&ME PROJECT 1264-99-506**

WELL	DATE	B µg/L	E µg/L	T µg/L	X µg/L	MTBE µg/L	NAPHTH µg/L	PAHs µg/L
MW-1	04/24/96	27.4	46	88.3	170.1	NA	55.7	<10
	09/15/99	FP	FP	FP	FP	FP	FP	FP
	10/13/00	FP	FP	FP	FP	FP	FP	FP
	03/09/01	FP	FP	FP	FP	FP	FP	FP
MW-3	09/15/99	500	100	220	460	1100	<5.0	<5.0
	10/16/00	1500	290	170	2000	2200	3.6	<10
	03/09/01	3000	400	130	3100	6400	<10	<10
MW-4	09/20/99	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
MW-5	09/15/99	<5.0	5	21	20	<5.0	<5.0	<5.0
	10/13/00	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	03/08/01	DRY	DRY	DRY	DRY	DRY	DRY	DRY
MW-6	10/16/00	7.4	29	3.5	81	<1.0	44	<10
	03/08/01	3.3	36	<2.0	76	<2.0	68	<10
MW-7	10/16/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
	03/09/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
MW-8	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
MW-9	10/16/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
	03/09/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
MW-10	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
MW-11	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
MW-12	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
MW-13	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
MW-1D	10/16/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<10

B - Benzene                      T - Toluene                      MTBE - Methyl tert butyl ether  
 E - Ethylbenzene                X- Xylenes                      NAPHTH - Naphthalene  
 PAHs - Poly Nuclear Aromatic Hydrocarbons  
 FP - Free Product in the well  
 NA - Not Analyzed

**F. Chemicals of Concern – Ground Water**

Provide well installation information in the table below.

MW#	Installation Date	Development Date	Sampling Date
MW-1	4/23/96	4/24/96	4/24/96
MW-3	9/13/99	9/15/99	9/15/99
MW-4	9/17/99	9/20/99	9/20/99
MW-5	9/14/99	9/15/99	9/15/99

Enter the soil analytical data for each monitoring well for all CoC in the table below.

CoC	MW-3	MW-4	MW-5
Depth of sample (feet)	25	10	25
Benzene (µg/kg)	<7.2	not analyzed	<6.1
Toluene (µg/kg)	<7.2	not analyzed	<6.1
Ethylbenzene (µg/kg)	<7.2	not analyzed	<6.1
Xylenes (µg/kg)	<7.2	not analyzed	<6.1
Total BTEX (µg/kg)	<7.2	not analyzed	<6.1
Naphthalene (µg/kg)	<7.2	not analyzed	<6.1
Benzo(a)anthracene (µg/kg)	<470	not analyzed	<400
Benzo(b)flouranthene (µg/kg)	<470	not analyzed	<400
Benzo(k)flouranthene (µg/kg)	<470	not analyzed	<400
Chrysene (µg/kg)	<470	not analyzed	<400
Dibenz(a,h)anthracene (µg/kg)	<470	not analyzed	<400
Lead (mg/kg)	not analyzed	not analyzed	not analyzed
EDB	not analyzed	not analyzed	not analyzed

Summarize the monitoring well and ground-water data in the table below.

MW#	TOC Elevation (ft)	Screened Interval (ft)	Depth to Water (ft)	Water Table Elevation (ft)
MW-1	104.11	15-30	26.81 (corrected)	77.30
MW-3	104.92	22.28-32.28	30.05	74.87
MW-4	111.32	35.4-45.4	26.65	84.67
MW-5	103.57	22.25-32.25	30.86	72.71

Enter field data measures (temperature, pH, conductivity) taken during well purging on the form provided. Complete for each well.

Monitoring Well	MW-3	MW-4	M-5
Temperature (°C)	20	24	20
pH	8.4	7.5	6.7
Conductivity (M/MHOS)	380	100	70

Enter dissolved oxygen measurements for each well in the table below.

Monitoring Well	MW-3	MW-4	M-5
Dissolved Oxygen (mg/l)	1.8	5.2	3.0

Enter ground water analytical data for each monitoring well for all CoC in the table below. If free product is present, indicate the measured thickness to the nearest 0.01 feet.

CoC	RBSL (µg/l)	MW-1	MW-3	MW-4	MW-5
Free Product Thickness	None	3.84	None	None	None
Benzene (µg/L)	5	N/A	500	<5.0	<5.0
Toluene (µg/L)	1,000	N/A	220	<5.0	21
Ethylbenzene (µg/L)	700	N/A	100	<5.0	5.0
Xylenes (µg/L)	10,000	N/A	460	<5.0	20
Total BTEX (µg/L)	N/A	N/A	1280	<5.0	46
MTBE (µg/L)	40	N/A	1100	<5.0	<5.0
Naphthalene (µg/L)	25	N/A	<5.0	<5.0	<5.0
Benzo(a)anthracene (µg/L)	10	N/A	<5.0	<5.0	<5.0
Benzo(b)flouranthene (µg/L)	10	N/A	<5.0	<5.0	<5.0
Benzo(k)flouranthene (µg/L)	10	N/A	<5.0	<5.0	<5.0
Chrysene (µg/L)	10	N/A	<5.0	<5.0	<5.0
Dibenz(a,h)anthracene (µg/L)	10	N/A	<5.0	<5.0	<5.0
Ferrous Iron (mg/L)	N/A	N/A	15	19	12
Lead (mg/L)	Site Specific	N/A	.020	.0080	.023
Nitrates (mg/L)	N/A	N/A	.923	.038	1.43
Sulfates (mg/L)	N/A	N/A	36.1	9.49	7.16

Additional Comments:           MW-1 was not sampled due to the presence of free product.  
(depth to product: 26.01 feet; depth to product/water interface: 29.85 feet)

**G. Aquifer Characteristics**

Hydraulic Conductivity: 7.83E-02 ft/day for MW-3  
 1.34E-01 ft/day for MW-4

Hydraulic Gradient: .053

Porosity: Estimated at .25

Estimated Seepage Velocity: .0166 ft/day from MW-3  
 .0284 ft/day from MW-4

### 2.2.3 Monitoring Well Installation, Sampling and Testing

A total of thirteen monitoring wells have been installed at the site. Monitoring well MW-1 was installed in 1996 for the Initial Groundwater Assessment. Monitoring wells MW-3, MW-4, and MW-5 were installed during the 1999 SLA. Monitoring wells MW-1D and MW-6 through MW-13 were installed during this Tier II assessment. Each well, with the exception of MW-1D, is constructed within the surficial aquifer for the purpose of determining groundwater elevations and monitoring shallow groundwater quality. The locations and elevations of the monitoring wells are shown on Figure 3. Well construction details are shown on Table 5. Boring Logs for the monitoring wells are attached in Appendix A.

WELL ID	Installation Date	Boring Depth (ft)	Boring Diameter (in)	Casing Diameter (in)	Screen Interval (ft)	Screen Slot Size (in)	TOC elevation (ft)
MW-1	4/24/96	35	8	2	15-30	0.01	104.89
MW-3	9/13/99	32.28	6	2	22.28-32.28	0.01	104.92
MW-4	9/14/99	45.40	6	2	35.40-45.40	0.01	111.32
MW-5	9/14/99	32.25	6	2	22.25-32.25	0.01	103.57
MW-6	9/25/00	36.61	6	2	26.61-36.61	0.01	104.14
MW-7	9/25/00	36.37	6	2	26.37-36.37	0.01	104.52
MW-8	9/26/00	33.69	6	2	23.69-33.69	0.01	101.79
MW-9	9/27/00	35.40	6	2	25.40-35.40	0.01	105.43
MW-10	9/27/00	27.44	6	2	17.44-27.44	0.01	96.57
MW-11	9/27/00	28.28	6	2	18.28-28.28	0.01	95.15
MW-12	9/29/00	30.60	6	2	20.60-30.60	0.01	97.03
MW-13	9/29/00	27.11	6	2	17.11-27.11	0.01	95.89
MW-1D	9/28/00	58.64	6/3	2	53.64-58.64	0.01	104.61

Groundwater sampling events were performed following each monitoring well installation event. The most recent round of sampling was performed on October 13<sup>th</sup> and 16<sup>th</sup>, 2000. Monitoring well MW-1 was not sampled due to the presence of separate phase product and MW-5 could not be sampled because it was dry. The groundwater samples were collected with dedicated 1-liter polyethylene bailers following purging of the wells. The samples were placed immediately on ice in a laboratory-supplied cooler to await shipment to Environmental Science Corp. for analysis. Each sample was analyzed for BTEX, naphthalene, MTBE, and EDB by EPA Method 8260B, PAHs by Method 8270, total lead by EPA Method 6010B, ferrous iron by EPA method 3500, and nitrates and sulfates by EPA method 9056. The results of the organic groundwater testing are shown on Table 6. The inorganic results are shown on Table 7. The laboratory reports are attached in Appendix C.

**TABLE 6**  
**GROUNDWATER SAMPLING RESULTS (ORGANICS)**  
**HOT SPOT #3005**  
**CHESNEE, SOUTH CAROLINA**  
**UST PERMIT NO. 12719**

WELL ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	Naphthalene (µg/L)	MTBE (µg/L)	EDB (µg/L)
MW-1	10/13/00	FP	FP	FP	FP	FP	FP	FP
MW-3	10/16/00	1500	170	290	2000	3.6	2200	<1.0
MW-4	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
MW-5	10/13/00	DRY	DRY	DRY	DRY	DRY	DRY	DRY
MW-6	10/16/00	7.4	3.5	29	81	44	<1.0	<1.0
MW-7	10/16/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
MW-8	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
MW-9	10/16/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
MW-10	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
MW-11	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
MW-12	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
MW-13	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
MW-1D	10/16/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0



**TABLE 7**  
**GROUNDWATER SAMPLING RESULTS (INORGANICS)**  
**HOT SPOT #3005**  
**CHESNEE, SOUTH CAROLINA**  
**UST PERMIT NO. 12719**

WELL ID	Date	Lead (mg/L)	Ferrous Iron (mg/L)	Nitrate (mg/L)	Sulfate (mg/L)
MW-1	10/13/00	NS	NS	NS	NS
MW-3	10/16/00	56	5,000	730	<5,000
MW-4	10/13/00	<5.0	220	<100	12,000
MW-5	10/13/00	DRY	DRY	DRY	DRY
MW-6	10/16/00	<5.0	250	1,300	<5,000
MW-7	10/16/00	14	60	1,300	<5,000
MW-8	10/13/00	<5.0	290	1,100	<10,000
MW-9	10/16/00	5.4	1,700	1,800	<5,000
MW-10	10/13/00	67	1,000	2,600	<10,000
MW-11	10/13/00	<5.0	1,100	2,900	<10,000
MW-12	10/13/00	<5.0	80	1,300	32,000
MW-13	10/13/00	<5.0	7,700	1,500	25,000
MW-1D	10/16/00	14	8,000	2,800	<5,000

The current analytical results identify BETX/MTBE, naphthalene, and lead as the CoC in the groundwater. A groundwater plume map is attached as Figure 8.

#### 2.2.4 Aquifer Evaluation

On October 16, 2000, S&ME personnel gauged the depth to groundwater in the seven existing groundwater monitoring wells. Gramling Brothers Surveying performed a comprehensive site survey of the site on September 20, 1999. A subsequent survey performed in October 2000 established the location, top of casing (TOC) elevation, and ground surface elevation of each well relative to a site benchmark with an assumed elevation of 100 feet. The groundwater level information was subtracted from the TOC elevations to calculate the elevation of the saturated groundwater interface in each well. The groundwater elevation data was placed on a site plan to depict the approximate groundwater surface below the site. The resulting groundwater surface was used to estimate the groundwater flow direction and gradient. The groundwater elevation data is included on Table 8. A Groundwater Potentiometric Surface Map is attached as Figure 9.

Based on this data, it appears that groundwater flow within the surficial aquifer is toward the east under an approximate hydraulic gradient of 0.035 feet per foot.

**TABLE 8**  
**GROUNDWATER ELEVATION DATA**  
**HOT SPOT #3005**  
**CHESNEE, SOUTH CAROLINA**  
**UST PERMIT NO. 12719**

WELL ID	Date	Top of Casing Elevation (ft)	Depth to Water (ft)	Depth to Liquid (ft)	Product Thickness (ft)	Relative Groundwater Elevation
MW-1	10/16/00	104.77	29.76	27.90	1.86	76.50
MW-3	10/16/00	104.92	30.83	30.83	0.00	74.09
MW-4	10/16/00	111.32	27.58	27.58	0.00	83.74
MW-5	10/16/00	103.57	31.82	31.82	0.00	71.75
MW-6	10/16/00	104.14	28.45	28.45	0.00	75.69
MW-7	10/16/00	104.52	27.30	27.30	0.00	77.22
MW-8	10/16/00	101.79	23.60	23.60	0.00	78.19
MW-9	10/16/00	105.43	27.61	27.61	0.00	77.82
MW-10	10/16/00	96.57	23.25	23.25	0.00	73.32
MW-11	10/16/00	95.15	24.02	24.02	0.00	71.13
MW-12	10/16/00	97.03	23.83	23.83	0.00	73.20
MW-13	10/16/00	95.89	24.33	24.33	0.00	71.56
MW-1D	10/16/00	104.61	28.69	28.69	0.00	75.92

Three independent slug tests were performed to assist in determining the hydraulic characteristics of the surficial and bedrock aquifers. The slug tests were performed by bailing/pumping the water table down as far as possible and measuring the rate of recharge. The tests were performed in two shallow aquifer wells (MW-11 and MW-12) and one deep aquifer rock well (MW-1D). The slug test data was reduced using the formula derived by Bower and Rice. The hydraulic conductivity values for the shallow aquifer were  $9.51 \times 10^{-5}$  and  $3.20 \times 10^{-4}$  ft/min for MW-11 and MW-12, respectively. The hydraulic conductivity value for the deep aquifer rock well was  $9.6 \times 10^{-4}$  ft/min. The measured hydraulic conductivity values for monitoring wells MW-3 and MW-4, performed during the Standard Limited Assessment were  $5.4 \times 10^{-5}$  and  $9.3 \times 10^{-5}$  ft/min, respectively. The average hydraulic conductivity in the shallow aquifer using the four values is  $1.41 \times 10^{-4}$  ft/min. Based on an estimated effective hydraulic

Date: 5/4	# Of Pages	<b>QUICK FAX</b> OfficeMax	
TO: Eric Owens		From: Mike O'Connell	
Co./Dept: SCDHEC		Co./Dept: S+ME	
Fax: (803) 898-4330		Fax:	
Phone:		Phone: 574-2360	
Note:		E-Mail:	

OB NAME: Hot Spot #3005

OB NUMBER: 1264-99-506

DATE	WELL NO.	TAPE DEPTH TO FREE PRODUCT	TAPE DEPTH TO WATER	COMMENTS
3/8/01	MW-1	29.03	29.79	= 76 ft
	MW-1D		29.39	
	MW-3		31.22	73.7
	MW-4		28.82	82.5
	MW-5		31.80	71.77
	MW-6		29.00	75.14
	MW-7		28.11	76.41
	MW-8		24.12	77.67
	MW-9		28.64	76.79
	MW-10		23.34	73.23
	MW-11		23.73	71.42
	MW-12		23.60	73.43
	MW-13		23.60	72.29

**RECEIVED**  
 MAY 14 2001  
 U. Ground Storage  
 Program

## HYDRAULIC CONDUCTIVITY TEST DATA

PROJECT NAME: HOT SPOT #3005  
 PROJECT NUMBER: 1264-99-506

WELL ID: MW-12  
 TEST DATE: 11/14/00

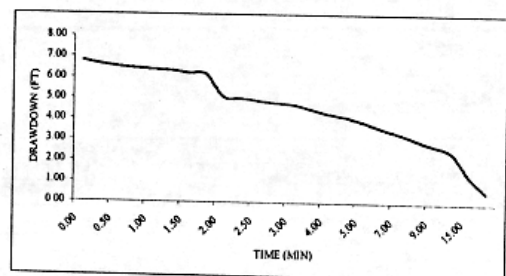
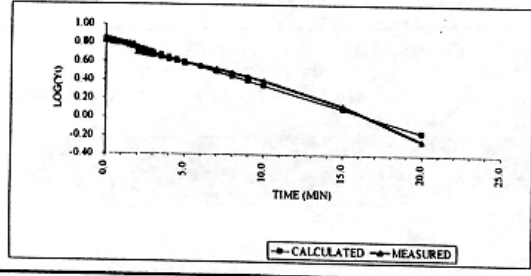
LEVELS MEASURED RELATIVE TO TOP OF CASING OR MEASURING POINT	SLUG TEST DATA				TIMES FOR LINEAR REGRESSION
DEPTH TO BASE OF AQUIFER = 50.00 FT	TIME (MIN)	DTW (FT)	Y1 (FT)	LOG (Y1)	INITIAL TIME = 0 MIN
DEPTH TO WATER = 23.91 FT	0.00	30.71	6.80	0.833	FINAL TIME = 20 MIN
DEPTH TO TOP OF SCREEN = 20.14 FT	0.25	30.55	6.64	0.822	<p><b>METHOD:</b></p> <p><b>BOUWER &amp; RICE</b></p> <hr/> <p>"A SLUG TEST FOR DETERMINING HYDRAULIC CONDUCTIVITY OF UNCONFINED AQUIFER WITH COMPLETELY OR PARTIALLY PENETRATING WELLS", 1976 AND "BOUWER AND RICE SLUG TEST - AN UPDATE", 1989</p>
DEPTH TO BASE OF SCREEN = 30.14 FT	0.50	30.43	6.52	0.814	
CASING DIAMETER = 2.38 IN	0.75	30.33	6.44	0.809	
BOREHOLE DIAMETER = 6.00 IN	1.00	30.3	6.39	0.806	
SAND PACK POROSITY = 0.30	1.25	30.27	6.36	0.803	
	1.50	30.15	6.24	0.795	
	1.75	30.1	6.19	0.792	
	2.00	29	5.09	0.707	
	2.25	28.92	5.01	0.700	
	2.50	28.8	4.89	0.689	
	2.75	28.72	4.81	0.682	
	3.00	28.63	4.72	0.674	
	3.50	28.42	4.51	0.654	
	4.00	28.21	4.30	0.633	
	4.50	28.05	4.14	0.617	
	5.00	27.82	3.91	0.592	
	6.00	27.52	3.61	0.558	
	7.00	27.29	3.38	0.529	
	8.00	26.97	3.06	0.486	
	9.00	26.69	2.78	0.444	
	10.00	26.41	2.50	0.398	
	15.00	25.27	1.36	0.134	
	20.00	24.49	0.58	-0.237	

**HYDRAULIC CONDUCTIVITY**

FT/MIN = 3.5E-04  
 FT/DAY = 4.61E-01  
 GPD/FT = 3.45E-06  
 CM/SEC = 1.13E-04

Regression Statistics

Multiple R	0.991404591		
R <sup>2</sup>	0.982883063	Intercept	7.01 0
Adjusted R <sup>2</sup>	0.982105021	X Variable 1	-0.049883348 0
Std. Error	0.032947867		
Observations	24		



**HYDRAULIC CONDUCTIVITY TEST DATA**

**PROJECT NAME: HOT SPOT #3005**

**PROJECT NUMBER: 1264-99-506**

**WELL ID: MW-12**

**TEST DATE: 11/14/00**

R <sup>2</sup> =	0.2500	FT
L <sub>w</sub> =	6.23	FT
H =	26.09	FT
L <sub>a</sub> =	10.00	FT
R <sub>c</sub> =	0.0992	FT
R <sub>ad</sub> =	0.1601	FT
Y <sub>0</sub> =	7.01	FT
LOOK(Y <sub>0</sub> ) =	0.8456	MIN
t =	10	
Y <sub>t</sub> =	2.22	FT
LOOK(Y <sub>t</sub> ) =	0.35	

L<sub>w</sub>R<sub>w</sub> = 40  
 A = 2.79888  
 B = 0.437957  
 h(L<sub>w</sub>R<sub>w</sub>) = 4.175002  
 h(R<sub>w</sub>) = 2.174156

**SUMMARY OUTPUT**

Multiple R 0.991404591  
 Regression Statistics  
 R Square 0.982883063  
 Adjusted R Square 0.982105021  
 Standard Error 0.032947867  
 Observations 24

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	1.371365113	1.371365113	1263.28	6.26493E-21
Residual	22	0.023882363	0.001085562		
Total	23	1.395247476			

Coefficients		Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	0.845646149	0.009367312	90.27628916	9.1E-30	0.826219513	0.8650728
X Variable 1	-0.049883348	0.00140348	-35.54260393	6.3E-21	-0.052793992	-0.046973

Lower 95.0%  
Upper 95.0%

## HYDRAULIC CONDUCTIVITY TEST DATA

**PROJECT NAME:** HOT SPOT #3005  
**PROJECT NUMBER:** 1264-99-506

**WELL ID:** MW-11  
**TEST DATE:** 11/10/00

**LEVELS MEASURED RELATIVE TO TOP OF CASING OR MEASURING POINT**

DEPTH TO BASE OF AQUIFER = 50.00 FT  
 DEPTH TO WATER = 24.12 FT  
 DEPTH TO TOP OF SCREEN = 17.97 FT  
 DEPTH TO BASE OF SCREEN = 27.97 FT  
 CASING DIAMETER = 2.38 IN  
 BOREHOLE DIAMETER = 6.00 IN  
 SAND PACK POROSITY = 0.30

**SLUG TEST DATA**

TIME (MIN)	DTW (FT)	Y1 (FT)	LOG (Y1)
0.00	26.82	2.70	0.431
0.25	26.71	2.59	0.413
0.50	26.62	2.50	0.398
0.75	26.6	2.48	0.394
1.00	26.59	2.47	0.393
1.25	26.55	2.43	0.386
1.50	26.53	2.41	0.382
1.75	26.49	2.37	0.375
2.00	26.45	2.33	0.367
2.25	26.43	2.31	0.364
2.50	26.41	2.29	0.360
2.75	26.39	2.27	0.356
3.00	26.37	2.25	0.352
3.50	26.32	2.20	0.342
4.00	26.28	2.16	0.334
4.50	26.22	2.10	0.322
5.00	26.18	2.06	0.314
6.00	26.12	2.00	0.301
7.00	26.02	1.90	0.279
8.00	25.93	1.81	0.258
9.00	25.85	1.73	0.238
10.00	25.8	1.68	0.225
15.00	25.52	1.40	0.146
20.00	25.31	1.19	0.076
30.00	24.94	0.82	-0.086

**TIMES FOR LINEAR REGRESSION**

INITIAL TIME = 0 MIN  
 FINAL TIME = 30 MIN

**METHOD:**

**BOUWER & RICE**

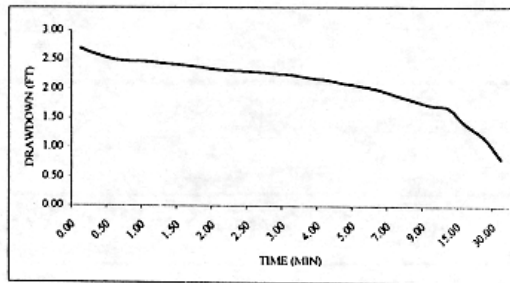
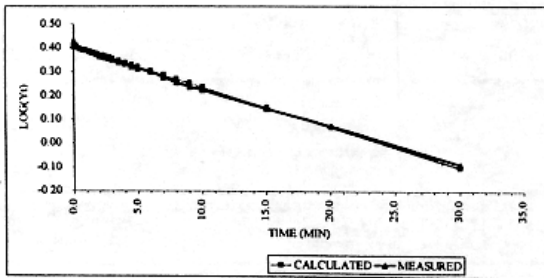
"A SLUG TEST FOR DETERMINING HYDRAULIC CONDUCTIVITY OF UNCONFINED AQUIFER WITH COMPLETELY OR PARTIALLY PENETRATING WELLS" 1976 AND "BOWER AND RICE SLUG TEST - AN UPDATE", 1989

**HYDRAULIC CONDUCTIVITY**

FT/MIN = 5.51E-05  
 FT/DAY = 1.37E-01  
 GPM/FT = 1.81E+00  
 CM/SEC = 4.83E-05

**Regression Statistics**

		Coefficients	Standard Error
Multiple R	0.997088426		
R <sup>2</sup>	0.994185328	Intercept 2.53	0
Adjusted R <sup>2</sup>	0.993932517	X Variable 1 -0.016794984	0
Std. Error	0.009153975		
Observations	25		



**HYDRAULIC CONDUCTIVITY TEST DATA**

**PROJECT NAME:** HOT SPOT #3005  
**PROJECT NUMBER:** 1264-99-506

**WELL ID:** MW-11  
**TEST DATE:** 11/10/00

Rw =	0.2500	FT
Lw =	3.85	FT
H =	25.88	FT
Lc =	10.00	FT
Rc =	0.0992	FT
Rc =	0.1601	FT
Yo =	2.53	FT
LOG(Yo) =	0.4039	FT
Yl =	10	MIN
Yl =	1.72	FT
LOG(Yo) =	0.24	FT

Lc/Rw = 40  
 A = 2.79889  
 B = 0.43796  
 ln(Lw/Rw) = 4.4787  
 ln(Rc/Rw) = 1.9183

<b>Regression Statistics</b>			
Multiple R	0.997088426		
R Square	0.994185328		
Adjusted R Square	0.993932517		
Standard Error	0.009153975		
Observations	25		

<b>ANOVA</b>			
	df	SS	MS
Regression	1	0.329525779	329.525779
Residual	23	0.001927291	8.37953E-05
Total	24	0.33145307	

<b>Coefficients</b>			
	Standard Error	t Stat	P value
Intercept	0.403875806	169.9169104	3.8E-27
X Variable 1	-0.016794984	62.70973912	3.2E-27
	0.000267821		
	0.002376902		
	0.398358817		
	0.408793		
	0.398358817		
	0.017349013		
	-0.016241		
	-0.01734901		
	-0.01624095		

SUMMARY OUTPUT

## HYDRAULIC CONDUCTIVITY TEST DATA

PROJECT NAME: HOT SPOT #3005  
 PROJECT NUMBER: 1264-99-506

WELL ID: MW-1D  
 TEST DATE: 10/26/00

**LEVELS MEASURED RELATIVE TO TOP OF CASING OR MEASURING POINT**

DEPTH TO BASE OF AQUIFER = 75.00 FT  
 DEPTH TO WATER = 28.88 FT  
 DEPTH TO TOP OF SCREEN = 53.31 FT  
 DEPTH TO BASE OF SCREEN = 58.31 FT  
 CASING DIAMETER = 2.38 IN  
 BOREHOLE DIAMETER = 6.09 IN  
 SAND PACK POROSITY = 0.30

**SLUG TEST DATA**

TIME (MIN)	DTW (FT)	Y1 (FT)	LOG (Y1)
0.00	29.61	0.73	-0.137
0.25	29.52	0.64	-0.194
0.50	29.45	0.57	-0.244
0.75	29.4	0.52	-0.284
1.00	29.36	0.48	-0.319
1.25	29.32	0.44	-0.357
1.50	29.28	0.40	-0.398
1.75	29.23	0.35	-0.456
2.00	29.2	0.32	-0.495
2.25	29.18	0.30	-0.523
2.50	29.15	0.27	-0.569
2.75	29.11	0.23	-0.638
3.00	29.08	0.20	-0.699
3.50	29.05	0.17	-0.770
4.00	29.02	0.14	-0.854
4.50	29	0.12	-0.921
5.00	28.98	0.10	-1.000

TIMES FOR LINEAR REGRESSION  
 INITIAL TIME = 0 MIN  
 FINAL TIME = 5 MIN

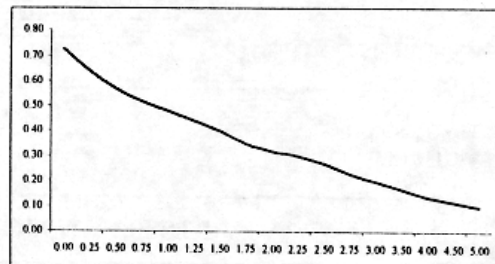
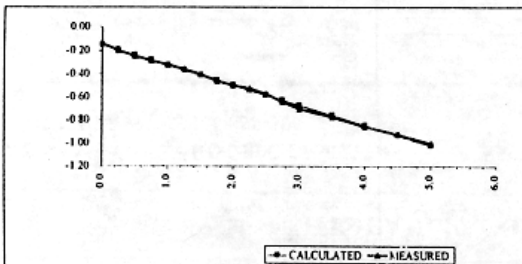
**METHOD:**  
 BOUWER & RICE

"A SLUG TEST FOR DETERMINING HYDRAULIC CONDUCTIVITY OF UNCONFINED AQUIFER WITH COMPLETELY OR PARTIALLY PENETRATING WELLS".  
 1976 AND "BOWER AND RICE SLUG TEST - AN UPDATE", 1989

**HYDRAULIC CONDUCTIVITY**  
 FT/MIN = 5.69E-04  
 FT/DAY = 1.38E+00  
 GPD/FT2 = 1.83E+01  
 CM/SEC = 4.87E-04

**Regression Statistics**

		Coefficients	Standard Error
Multiple R	0.998797321		
R <sup>2</sup>	0.997596089	Intercept	0.71
Adjusted R <sup>2</sup>	0.997435828	X Variable 1	-0.173997314
Std. Error	0.013187468		
Observations	17		





**HYDRAULIC CONDUCTIVITY TEST DATA**

**PROJECT NAME:** HOT SPOT #3005  
**PROJECT NUMBER:** 1264-99-506

**WELL ID:** MW-1D  
**TEST DATE:** 10/26/00

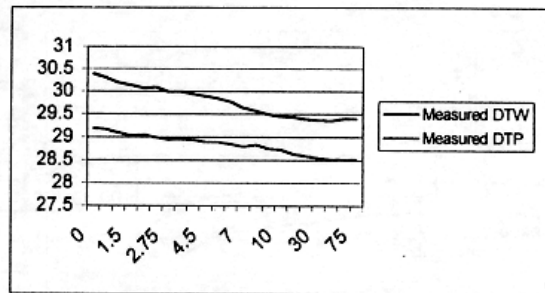
SUMMARY OUTPUT				
Regression Statistics				
Multiple R	0.99879321			
R Square	0.997596089			
Adjusted R Square	0.997435828			
Standard Error	0.013187468			
Observations	17			
ANOVA				
	df	SS	MS	F
Regression	1	1.082556196	1.082556196	6224.83
Residual	15	0.00260864	0.000173909	
Total	16	1.085164836		
Coefficients				
Intercept	Standard Error	t Stat	P-value	Lower 95%
0.147337883	0.005714059	25.78515477	7.7E-14	-0.159517118
X Variable 1	Standard Error	t Stat	P-value	Lower 95%
-0.173997314	0.002205356	-78.89760039	4.6E-21	-0.178697923
				Upper 95.0%
				-0.169297
				-0.178697923
				-0.159517118
				-0.16929671

Rw =	0.2500	FT	L&Rw =	20
Lw =	29.43	FT	A =	2.181507
H =	46.12	FT	B =	0.337313
Lc =	5.00	FT		
Rc =	0.0992	FT		
Rce =	0.1601	FT	Initial(L&Rw) =	4.201104
Yo =	0.71	FT	Initial(Rw) =	2.433445
LOOK(Yo) =	-0.1433	FT		
t =	10			
Yi =	0.01			
LOOK(Yi) =	-1.89	FT		

**FREE PRODUCT RECOVERY TEST**  
**HOT SPOT #3005**  
**CHESNEE, SOUTH CAROLINA**  
**S&ME Project 1264-99-506**

Date 11/10/2000  
 Static Depth to Water 29.84 Ft  
 Static Depth to Product 28.17 Ft  
 Static Product Thickness 1.67 Ft

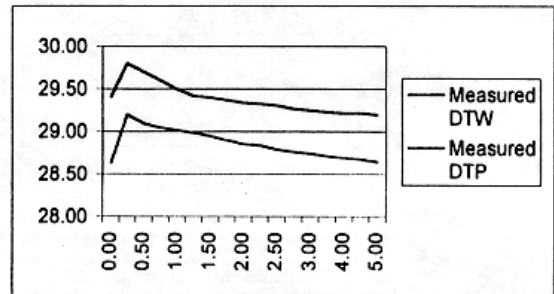
Time	Measured DTW	Measured DTP	PT
0	30.4	29.2	1.2
0.25	30.31	29.18	1.13
0.5	30.2	29.1	1.1
1.5	30.15	29.04	1.11
1.75	30.08	29.05	1.03
2.5	30.1	29	1.1
2.75	30	28.96	1.04
3	30	28.96	1.04
4	29.95	28.95	1
4.5	29.9	28.9	1
5	29.86	28.9	0.96
6	29.78	28.85	0.93
7	29.64	28.8	0.84
8	29.58	28.84	0.74
9	29.5	28.76	0.74
10	29.46	28.73	0.73
15	29.44	28.64	0.8
20	29.4	28.6	0.8
30	29.38	28.55	0.83
45	29.37	28.53	0.84
60	29.41	28.52	0.89
75	29.41	28.53	0.88



**FREE PRODUCT RECOVERY TEST**  
**HOT SPOT #3005**  
**CHESNEE, SOUTH CAROLINA**  
**S&ME Project 1264-99-506**

Date 11/14/2000  
 Static Depth to Water 29.41 Ft  
 Static Depth to Product 28.64 Ft  
 Static Product Thickness 0.77 Ft

Time	Measured DTW	Measured DTP	PT
0.00	29.41	28.64	0.77
0.25	29.80	29.20	0.6
0.50	29.70	29.10	0.6
0.75	29.60	29.05	0.55
1.00	29.50	29.02	0.48
1.25	29.42	28.99	0.43
1.50	29.40	28.95	0.45
1.75	29.37	28.90	0.47
2.00	29.34	28.86	0.48
2.25	29.33	28.84	0.49
2.50	29.31	28.80	0.51
2.75	29.27	28.77	0.5
3.00	29.25	28.75	0.5
3.50	29.23	28.72	0.51
4.00	29.22	28.70	0.52
4.50	29.22	28.68	0.54
5.00	29.20	28.65	0.55



**E. Soil Boring Data**

Drilling Dates. September 9-14, 1999

Provide a brief justification for the location of the soil borings

MW-3 monitoring well installed down gradient near existing USTs and where release occurred

MW-4 background boring and monitoring well

MW-5 monitoring well installed further down gradient near dispenser island

MW-2 Soil boring performed near abandoned UST

HA-1 hand auger boring located near dispenser island

HA-2 hand auger boring located near dispenser island

HA-3 hand auger boring located near dispenser island

HA-4 hand auger boring located near dispenser island

Complete the table below for each soil boring.

Monitoring Well – MW-3      Sampling Date – 9/13/99      Sample Depth – 25 feet

Split Spoon Interval (ft.)	Field Screening Results (ppm)	Lithology (soil type, color, rocks/minerals present)	Soil conditions (dry, moist, Etc.; petroleum odor)
3.5 / 5	160	Fill-Red/Brown sandy SILT	Dry - no odor
8.5 / 10	120	Fill-Red/Brown sandy SILT	Dry - no odor
13.5 / 15	56	Residuum-Red, orange, white sandy SILT w/ some rock fragments	Dry - no odor
18.5 / 20	76	Residuum-Red, orange, white sandy SILT w/ some rock fragments	Dry - no odor
23.5-25	110	Residuum- Red-orange, slightly micaceous sandy SILT	Dry - no odor
28.5-30	9	Residuum- Red-orange, slightly micaceous sandy SILT	Saturated - no odor

Monitoring Well – MW-4      Sampling Date – 9/14/98      Sample Depth – 10 feet

Split Spoon Interval (ft.)	Field Screening Results (ppm)	Lithology (soil type, color, rocks/minerals present)	Soil conditions (dry, moist, Etc.; petroleum odor)
3.5 / 5	0	Fill-Red-orange sandy CLAY	Dry - no odor
8.5 / 10	0	Residuum-red-orange sandy SILT	Dry - no odor
13.5 / 15	0	Residuum-tan-gray slightly micaceous silty SAND w/ rock fragments	Dry - no odor
18.5 / 20	0	Residuum-tan-gray slightly micaceous silty SAND w/ rock fragments	Dry - no odor
22 - 46.3	N/A	Rock- Biotite gneiss	

Monitoring Well – MW-5      Sampling Date – 9/14/99      Sample Depth – 25 feet

Split Spoon Interval (ft.)	Field Screening Results (ppm)	Lithology (soil type, color, rocks/minerals present)	Soil conditions (dry, moist, Etc.; petroleum odor)
3.5 / 5	0	Fill-Red-orange silty SAND	Dry – no odor
8.5 / 10	0	Residuum- Red-orange, tan slightly micaceous sandy SILT	Dry – no odor
13.5 / 15	0	Residuum- Red-orange, tan slightly micaceous sandy SILT	Dry – no odor
18.5 / 20	0	Residuum- Red-orange, tan slightly micaceous sandy SILT	Dry – no odor
23.5 / 25	0	Residuum- Red-orange, tan slightly micaceous sandy SILT	Dry – no odor
28.5 / 30	0	Residuum- Red-orange, tan slightly micaceous sandy SILT	Dry – no odor

Borehole –MW-2      Sampling Date – 9/13/99      Sample Depth – 5 feet

Split Spoon Interval (ft.)	Field Screening Results (ppm)	Lithology (soil type, color, rocks/minerals present)	Soil conditions (dry, moist, Etc.; petroleum odor)
3.5 / 5.0	64	Fill-Red-orange sandy CLAY	Dry – no odor
8.5 / 10	5	Residuum-Red-orange slightly micaceous sandy SILT w/ rock fragments	Dry – no odor
13.5 / 15	7.6	Residuum-Red-orange slightly micaceous sandy SILT w/ rock fragments	Dry – no odor
18.5 / 20	10	Residuum-Red-orange slightly micaceous sandy SILT w/ rock fragments	Dry – no odor
23.5 / 25	3.6	Residuum-Red-orange slightly micaceous sandy SILT w/ rock fragments	Dry – no odor
28.5 / 30	4	Residuum-Red-orange slightly micaceous sandy SILT w/ rock fragments	Dry – no odor

Borehole –HA-1      Sampling Date – 9/9/99      Sample Depth – 3 feet

Split Spoon Interval (ft.)	Field Screening Results (ppm)	Lithology (soil type, color, rocks/minerals present)	Soil conditions (dry, moist, Etc.; petroleum odor)
0-1	0	concrete and gravel	Dry – no odor
1-2	0	Fill- Orange-brown clayey SILT	Dry – no odor
2-3	0	Pea gravel	Dry – no odor

Borehole –HA-2      Sampling Date – 9/9/99      Sample Depth – 3 feet

Split Spoon Interval (ft.)	Field Screening Results (ppm)	Lithology (soil type, color, rocks/minerals present)	Soil conditions (dry, moist, Etc.; petroleum odor)
0-1	0	concrete and gravel	Dry – no odor
1-3	0	Orange-brown clayey SILT	Dry – no odor

Borehole –HA-3                      Sampling Date – 9/9/99                      Sample Depth – .5 feet

Split Spoon Interval (ft.)	Field Screening Results (ppm)	Lithology (soil type, color, rocks/minerals present)	Soil conditions (dry, moist, Etc.; petroleum odor)
0-5	56.7	concrete	Dry – no odor
.5-2	1.7	Fill-Red orange clayey SILT	Dry – no odor
2-10	0-1	Fill-Red-brown silty sandy CLAY	Dry – no odor

Borehole –HA-4                      Sampling Date – 9/9/99                      Sampling Depth – 8 feet

Split Spoon Interval (ft.)	Field Screening Results (ppm)	Lithology (soil type, color, rocks/minerals present)	Soil conditions (dry, moist, Etc.; petroleum odor)
0-1	1932	concrete	
1-2	2000	Fill-Brown orange clayey SILT	Dry – strong petroleum odor
2-4	2000	Fill-Orange clayey sandy SILT	Dry – strong petroleum odor
4-6	17000	Fill-Orange clayey sandy SILT	Dry – strong petroleum odor
6-8	17000	Fill- Red-orange sandy SILT	Dry – strong petroleum odor
8-10	1500	Tan silty SAND	Dry – strong petroleum odor

Enter the soil analytical data for each soil boring for all COC in the table below and on the following page. Enter the appropriate RBSL for the soil type from Tables 4 through 8 in SCDHEC Risk-Based Corrective Action (RBCA) for Petroleum Releases Guidance Document.

COC	RBSL (ug/kg)	MW-3	MW-4	MW-5	MW-2	HA-1	HA-2	HA-3	HA-4
Benzene ug/kg	7	<7.2		<6.1	<5.9	<5.6	<5.7	6.9	<300
Toluene ug/kg	1,700	<7.2		<6.1	<5.9	<5.6	<5.7	<6.4	20000
Ethylbenzene ug/kg	1,500	<7.2		<6.1	<5.9	<5.6	<5.7	<6.4	22000
Xylenes ug/kg	44,000	<7.2		<6.1	<5.9	<5.6	<5.7	24	210000
Total BTEX ug/kg	N/A	<7.2		<6.1	<5.9	<5.6	<5.7	30.9	252000
Naphthalene ug/kg	200	<7.2		<6.1	<5.9	<5.6	<5.7	<6.4	67000

CoC	RBSL	MW-3	MW-4	MW-5	MW-2	HA-1	HA-2	HA-3	HA-4
Benzo (a)anthracene, ug/kg	700	<470		<400	<420	<390	<410	<430	<4000
Benzo(b)flouranthene, ug/kg	660	<470		<400	<420	<390	<410	<430	<4000
Benzo(k)flouranthene, ug/kg	4,600	<470		<400	<420	<390	<410	<430	<4000
Chrysene, ug/kg	660	<470		<400	<420	<390	<410	<430	<4000
Dibenz(a,h)anthracene, ug/kg	2,600	<470		<400	<420	<390	<410	<430	<4000
TPH (EPA 3550), mg/kg	NA								1800
TOC, mg/kg	NA		<12						

Discuss the horizontal and vertical extent of COC in the soil. The RBSLs for all COC were exceeded only in one sample (HA-4 at 8 feet). OVA detected low concentrations in the near surface sample of that boring increasing in concentrations to 8 feet before decreasing below 8 feet.

Additional Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



**Water Well Record**  
**Ground Water Protection Division**  
2600 Bull Street, Columbia, SC 29201, (803) 734-5331

1. LOCATION OF WELL:  
County: Spartanburg System Name: MW-1

Latitude: 35° 09' 06" Longitude: 81° 51' 35"

Distance and Direction from Road Intersections:  
~ 200-400 feet from Hwy 221 in Chesnee, South Carolina

Street Address & City of Well Location:  
Sketch Map:  
see attached

4. OWNER OF WELL: R.L. Jordan Oil Company  
Address: P.O. Box 2527  
Spartanburg, SC 29304  
Telephone No.: (864) 585-2784

Engineer: Froehling & Robertson, Inc.  
Address: P.O. Box 17186  
Greenville, SC 29606  
Telephone No.: (864) 271-2840

5. WELL DEPTH (completed) \_\_\_\_\_ ft. Date Started: 4/23/96  
30.0 ft. Date Completed: 4/24/96

6.  Mud Rotary  Jetted  Bored  Dug  
 Air Rotary  Driven  Cable tool  Other

7. USE:  
 Domestic  Public Supply-Permit No. \_\_\_\_\_  Industry  
 Irrigation  Air Conditioning  Commercial  
 Test Well  Monitor Well  \_\_\_\_\_

8. CASING:  Threaded  Welded  
Diam.: 2 inch Height: Above/Below ~0.3 ft.  
Type:  PVC  Galvanized Surface \_\_\_\_\_ ft.  
 Steel  Other Weight \_\_\_\_\_ lbs./ft.  
0 in. to 15 ft. depth Drive Shoe?  Yes  No  
\_\_\_\_\_ in. to \_\_\_\_\_ ft. depth

2. CUTTING SAMPLES:  Yes  No  
Geophysical Logs:  Yes (please enclose)  No

Formation Description	*Thickness of Stratum	Depth To Bottom of Stratum
Concrete	0.8'	0.8'
Gravel	0.2'	1.0'
Fill - Red Sandy CLAY	2.5'	3.5'
Fill - Grey SAND	11'	14.5'
Residual - Red to Brown Sandy SILT	15.5'	30.0'
Residual - Brown sandy Silty CLAY	5.0'	35.0'

9. SCREEN: PVC Diam.: 2 inch  
Type: \_\_\_\_\_ Slot/Gauge: 0.010 inch Length: 15 feet  
Set Between: 15 ft. and 30 ft. NOTE: MULTIPLE SCREENS USE SECOND SHEET  
\_\_\_\_\_ ft. and \_\_\_\_\_ ft.  
Sieve Analysis  Yes (please enclose)  No

10. STATIC WATER LEVEL  
22.50 ft. below land surface after 24 hours

11. PUMPING LEVEL Below Land Surface.  
\_\_\_\_\_ ft. after \_\_\_\_\_ hrs. Pumping \_\_\_\_\_ G.P.M.  
Pumping Test:  Yes (please enclose)  No  
Yield: \_\_\_\_\_

12. WATER QUALITY  
Chemical Analysis  Yes  No Bacterial Analysis  Yes  No  
Please enclose lab results.

13. ARTIFICIAL FILTER (gravel pack)  Yes  No  
Installed from 13 ft. to 35 ft.  
Effective size Ex-50 Uniformity Coefficient \_\_\_\_\_

14. WELL GROUTED?  Yes  No  
Neat Cement  Sand Cement  Concrete  Other  \_\_\_\_\_  
Depth: From 0 ft. to 12 ft.

15. NEAREST SOURCE OF POSSIBLE CONTAMINATION: ~6 ft. E direction  
petroleum Type well disinfected  Yes  No Type: \_\_\_\_\_  
upon completion  No Amount: \_\_\_\_\_

16. PUMP: Date installed: \_\_\_\_\_ Not installed   
Mfr. Name: \_\_\_\_\_ Model No.: \_\_\_\_\_  
H.P. \_\_\_\_\_ Volts \_\_\_\_\_ Length of drop pipe \_\_\_\_\_ ft. Capacity \_\_\_\_\_ gpm  
TYPE:  Submersible  Jet (shallow)  Turbine  
 Jet (deep)  Reciprocating  Centrifugal

17. WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my direction and this report is true to the best of my knowledge and belief.

Registered Business Name: Froehling & Robertson, Inc. Date: \_\_\_\_\_  
Address: P.O. Box 17186; Greenville, SC 29606  
Signed: Carl [Signature] Cert No.: 897  
Authorized Representative

**RECEIVED**

JUN 14 1996

Groundwater Protection Division

\* Indicate Water Bearing Zones  
(Use a 2nd sheet if needed)

3. REMARKS: This well is a groundwater monitoring well installed as part of an SCDHEC I.G.W.A. at G.W.P.D # 12719

# COMPLETION REPORT OF WELL No. MW-3

SCDHEC  
SB-18123-12/20/01-HW  
Page: 79

PROJECT: **Hot Spot #36**  
PROJECT NO: **1264-99-506**  
PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **29.35 on 9/15/99**

DRILLING CONTRACTOR: **S&ME, Inc.**  
DRILLING METHOD: **4 1/4" H.S.A.**  
DATE COMPLETED: **9/13/99**

LATITUDE: **N 35° 9.069 min.**  
LONGITUDE: **W 81° 51.604 min.**  
TOP OF CASING ELEVATION: **104.92**  
DATUM: **Site Benchmark**  
LOGGED BY: **Jeff Lindsey**

STRATA		WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)	WELL CONSTRUCTION DETAILS
DESCRIPTION	SYMBOL					
			0.00	GS	105.33	<b>PROTECTIVE CASING</b> Diameter: <b>8 inch</b> Type: <b>Man-Hole Cover</b> Interval: <b>0 to 8 inches</b>
<b>8" CONCRETE</b>			0.41	TOC	104.92	
Fill - Very stiff brown to red, sandy SILT with organic debris fine to medium			5			<b>RISER CASING</b> Diameter: <b>2 inch</b> Type: <b>Sch 40 PVC</b> Interval: <b>.41 to 22.28 feet</b>
			10			
			15			
Residuum - Very stiff red-orange-white fine to medium sandy SILT with rock fragments			18.00	CG	87.33	<b>GROUT</b> Type: <b>Portland Cement</b> Interval: <b>0.75 to 18 feet</b>
			20.00	BS	85.33	
			22.28	TSC	83.05	
Very stiff red-orange slightly micaceous fine to medium sandy SILT			22.28	TSC	83.05	<b>SEAL</b> Type: <b>Bentonite</b> Interval: <b>18 to 20 feet</b>
			32.28	BSC	73.05	
<b>BORING TERMINATED AT 32.28 FEET</b>						<b>FILTERPACK</b> Type: <b>Clean, Medium Grain Filter Sand</b> Interval: <b>20 to 32.28 feet</b>
						<b>SCREEN</b> Diameter: <b>2 inch</b> Type: <b>Sch 40 PVC, 0.01 Slot</b> Interval: <b>22.28 to 32.28 feet</b>
						<b>LEGEND</b>
						FILTER PACK BENTONITE CEMENT GROUT CUTTINGS / BACKFILL STATIC WATER LEVEL
						TOC TOP OF CASING GS GROUND SURFACE BS BENTONITE SEAL BOC BASE OF OUTER CASING TSC TOP OF SCREEN BSC BOTTOM OF SCREEN TD TOTAL DEPTH CG CEMENT GROUT

MONITORING WELL 649506 GPJ S&ME GDT 9/24/99



155 Tradd Street  
Spartanburg, SC 29301

**COMPLETION REPORT OF WELL No. MW-3**



# COMPLETION REPORT OF WELL No. MW-5

SCDHEC  
SB-18123-12/20/01-HW  
Page:81

PROJECT: Hot Spot #36  
PROJECT NO: 1264-99-506  
PROJECT LOCATION: Chesnee, South Carolina

WATER LEVEL: 30.86 on 9/16/99

DRILLING CONTRACTOR: S&ME, Inc.  
DRILLING METHOD: 4 1/4" H.S.A.  
DATE COMPLETED: 9/14/99

LATITUDE: N 35° 9.069 min.  
LONGITUDE: W 81° 51.604 min.  
TOP OF CASING ELEVATION: 103.57  
DATUM: Site Benchmark  
LOGGED BY: Jeff Lindsey

STRATA		WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)	WELL CONSTRUCTION DETAILS																																
DESCRIPTION	SYMBOL						DEPTH (ft.)																															
0	GS	104.04	<b>PROTECTIVE CASING</b> Diameter: 8 inch Type: Man-Hole Cover Interval: 0 to 8 inches																																			
10" CONCRETE	TOC	103.57																																				
5	<b>RISER CASING</b> Diameter: 2 inch Type: Sch 40 PVC Interval: 0.47 to 22.25 feet																																					
Fill - Dense red-orange medium to fine silty SAND																																						
10	<b>GROUT</b> Type: Portland Cement Interval: 0.75 to 18 feet																																					
15																																						
18.00	CG	86.04	<b>SEAL</b> Type: Bentonite Interval: 18 to 20 feet																																			
Residuum - Very stiff red-orange to tan slightly micaceous medium to fine sandy SILT	BS	84.04																																				
20.00	<b>FILTERPACK</b> Type: Clean, Medium Grain Filter Interval: 20 to 32.25 feet																																					
22.25						TSC	81.79																															
25	<b>SCREEN</b> Diameter: 2 inch Type: Sch 40 PVC, 0.01 Slot Interval: 22.25 to 32.25 feet																																					
30																																						
32.25	BSC	71.79	<b>LEGEND</b> <table style="width: 100%; border: none;"> <tr> <td style="width: 50px;"></td> <td>FILTER PACK</td> <td style="width: 50px;"></td> <td>TOC TOP OF CASING</td> </tr> <tr> <td></td> <td>BENTONITE</td> <td></td> <td>GS GROUND SURFACE</td> </tr> <tr> <td></td> <td>CEMENT GROUT</td> <td></td> <td>BS BENTONITE SEAL</td> </tr> <tr> <td></td> <td>CUTTINGS / BACKFILL</td> <td></td> <td>BOC BASE OF OUTER CASING</td> </tr> <tr> <td></td> <td>STATIC WATER LEVEL</td> <td></td> <td>TSC TOP OF SCREEN</td> </tr> <tr> <td></td> <td></td> <td></td> <td>BSC BOTTOM OF SCREEN</td> </tr> <tr> <td></td> <td></td> <td></td> <td>TD TOTAL DEPTH</td> </tr> <tr> <td></td> <td></td> <td></td> <td>CG CEMENT GROUT</td> </tr> </table>					FILTER PACK		TOC TOP OF CASING		BENTONITE		GS GROUND SURFACE		CEMENT GROUT		BS BENTONITE SEAL		CUTTINGS / BACKFILL		BOC BASE OF OUTER CASING		STATIC WATER LEVEL		TSC TOP OF SCREEN				BSC BOTTOM OF SCREEN				TD TOTAL DEPTH				CG CEMENT GROUT
	FILTER PACK						TOC TOP OF CASING																															
	BENTONITE		GS GROUND SURFACE																																			
	CEMENT GROUT		BS BENTONITE SEAL																																			
	CUTTINGS / BACKFILL		BOC BASE OF OUTER CASING																																			
	STATIC WATER LEVEL		TSC TOP OF SCREEN																																			
			BSC BOTTOM OF SCREEN																																			
			TD TOTAL DEPTH																																			
			CG CEMENT GROUT																																			
BORING TERMINATED AT 32.25 FEET																																						

MONITORING WELL - 6496506 GP J S&ME GDT 9/24/99



155 Tradd Street  
Spartanburg, SC 29301

**COMPLETION REPORT OF  
WELL No. MW-5**

# COMPLETION REPORT OF WELL No. SB-6 (MW-7)

PROJECT: Hot Spot #3005  
 PROJECT NO: 1264-99-506  
 PROJECT LOCATION: Chesnee, South Carolina

WATER LEVEL: 27.3 feet on 10/16/00

DRILLING CONTRACTOR: S&ME, Inc.  
 DRILLING METHOD: HSA  
 DATE COMPLETED: 9/25/00

LATITUDE: N 35° 9.069'  
 LONGITUDE: W 81° 51.604'  
 TOP OF CASING ELEVATION: 104.52  
 DATUM: Site Benchmark  
 LOGGED BY: M. O'Connell

STRATA			WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)	WELL CONSTRUCTION DETAILS
DESCRIPTION	SYMBOL	DEPTH (ft.)					
		0		0.00	GS	104.88	<b>PROTECTIVE CASING</b> Diameter: 8 inch Type: Flushmount Interval: 0 to 8 inches bgs
Fill - red, clayey SILT		0.36		0.36	TOC	104.52	
Fill - red, clayey SILT		5					<b>RISER CASING</b> Diameter: 2 inch Type: Sch 40 PVC Interval: .36 to 26.37 feet bgs
Residuum - tan and red mottled micaceous, silty, fine SAND		10					
Saprolite - tan and orange, micaceous, silty, fine to medium SAND		15					<b>GROUT</b> Type: Portland Cement Interval: 0 to 22.37 feet bgs
Saprolite - tan and orange, micaceous, silty, fine to medium SAND		20					
Saprolite - tan and brown and white micaceous, medium SAND		22.37		22.37	CG	82.51	<b>SEAL</b> Type: Bentonite Interval: 22.37 to 24.37 feet bgs
Saprolite - tan and brown and white micaceous, medium SAND		24.37		24.37	BS	80.51	
Saprolite - tan and brown and white micaceous, medium SAND		26.37		26.37	TSC	78.51	<b>FILTERPACK</b> Type: Clean, Medium Grain Filter Sand Interval: 24.37 to 36.37 feet bgs
Saprolite - brown, red, and tan micaceous, medium SAND with small quartz veins		30					
Saprolite - brown, red, and tan micaceous, medium SAND with small quartz veins		35					<b>SCREEN</b> Diameter: 2 inch Type: Sch 40 PVC, 0.01 Slot Interval: 26.37 to 36.37 feet bgs
		36.37		36.37	BSC	68.51	

**LEGEND**

	FILTER PACK	TOC	TOP OF CASING
	BENTONITE	GS	GROUND SURFACE
	CEMENT GROUT	BS	BENTONITE SEAL
	CUTTINGS / BACKFILL	BOC	BASE OF OUTER CASING
	STATIC WATER LEVEL	TSC	TOP OF SCREEN
		BSC	BOTTOM OF SCREEN
		TD	TOTAL DEPTH
		CG	CEMENT GROUT

MONITORING WELL 6499506.GPJ S&ME.GDT 11/22/00



155 Tradd Street  
 Spartanburg, SC 29301

## COMPLETION REPORT OF WELL No. SB-6 (MW-7)

# COMPLETION REPORT OF WELL No. SB-3 (MW-9)

PROJECT: Hot Spot #3005  
 PROJECT NO: 1264-99-506  
 PROJECT LOCATION: Chesnee, South Carolina

WATER LEVEL: 27.61 feet on 10/16/00

DRILLING CONTRACTOR: S&ME, Inc.  
 DRILLING METHOD: HSA  
 DATE COMPLETED: 9/27/00

LATITUDE: N 35° 9.069'  
 LONGITUDE: W 81° 51.604'  
 TOP OF CASING ELEVATION: 105.43  
 DATUM: Site Benchmark  
 LOGGED BY: M. O'Connell

STRATA			WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)	WELL CONSTRUCTION DETAILS
DESCRIPTION	SYMBOL	DEPTH (ft.)					
		0		0.00	GS	105.83	<b>PROTECTIVE CASING</b> Diameter: 8 inch Type: Flushmount Interval: 0 to 8 inches bgs
Fill - red, clayey SILT		0.40		0.40	TOC	105.43	
		5					<b>RISER CASING</b> Diameter: 2 inch Type: Sch 40 PVC Interval: .4 to 25.4 feet bgs
Saprolite - tan, white micaceous, medium SAND		10					
		15					<b>GROUT</b> Type: Portland Cement Interval: 0 to 21.4 feet bgs
Saprolite - brown, red, tan micaceous, fine to medium SAND		20		21.40	CG	84.43	
		23.40		23.40	BS	82.43	<b>SEAL</b> Type: Bentonite Interval: 21.4 to 23.4 feet bgs
		25		25.40	TSC	80.43	
		30					<b>FILTERPACK</b> Type: Clean, Medium Grain Filter Sand Interval: 23.4 to 35.4 feet bgs
Saprolite - medium dense tan and red very micaceous, fine SAND		35					
		35		35.40	BSC	70.43	<b>SCREEN</b> Diameter: 2 inch Type: Sch 40 PVC, 0.01 Slot Interval: 25.4 to 35.4 feet bgs
Saprolite - medium dense gray, brown and white micaceous, medium SAND							

**LEGEND**

- |                     |     |                      |
|---------------------|-----|----------------------|
| FILTER PACK         | TOC | TOP OF CASING        |
| BENTONITE           | GS  | GROUND SURFACE       |
| CEMENT GROUT        | BS  | BENTONITE SEAL       |
| CUTTINGS / BACKFILL | BOC | BASE OF OUTER CASING |
| STATIC WATER LEVEL  | TSC | TOP OF SCREEN        |
|                     | BSC | BOTTOM OF SCREEN     |
|                     | TD  | TOTAL DEPTH          |
|                     | CG  | CEMENT GROUT         |

MONITORING WELL 0499506 GP1 S&ME GDT 11/22/00



155 Tradd Street  
 Spartanburg, SC 29301

## COMPLETION REPORT OF WELL No. SB-3 (MW-9)

# COMPLETION REPORT OF WELL No. SB-9 (MW-11)








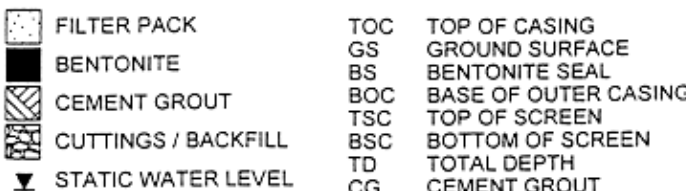
Sheet 1 of 1

PROJECT: Hot Spot #3005  
 PROJECT NO: 1264-99-506  
 PROJECT LOCATION: Chesnee, South Carolina

WATER LEVEL: 24.02 feet on 10/16/00

DRILLING CONTRACTOR: S&ME, Inc.  
 DRILLING METHOD: HSA  
 DATE COMPLETED: 9/27/00

LATITUDE: N 35° 9.069'  
 LONGITUDE: W 81° 51.604'  
 TOP OF CASING ELEVATION: 95.15  
 DATUM: Site Benchmark  
 LOGGED BY: M. O'Connell

STRATA		WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)	WELL CONSTRUCTION DETAILS
DESCRIPTION	SYMBOL					
		0	0.00	GS	95.46	<b>PROTECTIVE CASING</b> Diameter: 8 inch Type: Flushmount Interval: 0 to 8 inches bgs
Fill - red, clayey SILT		0.31	0.31	TOC	95.15	
Residuum - red and orange (mottled) micaceous, silty, fine SAND		5				<b>RISER CASING</b> Diameter: 2 inch Type: Sch 40 PVC Interval: .31 to 18.28 feet bgs
Saprolite - tan and orange, micaceous, medium SAND		10				
Saprolite - tan and orange, micaceous, medium SAND		15	14.28	CG	81.18	<b>GROUT</b> Type: Portland Cement Interval: 0 to 14.28 feet bgs
Saprolite - tan and orange, micaceous, medium SAND		16.28	16.28	BS	79.18	
Saprolite - tan and orange, micaceous, medium SAND		20	18.28	TSC	77.18	<b>SEAL</b> Type: Bentonite Interval: 14.28 to 16.28 feet bgs
Saprolite - medium-dense, brown, tan and white, very micaceous, fine to medium SAND with some coarse quartz veins		25				
		28.18	28.18	BSC	67.28	<b>FILTERPACK</b> Type: Clean, Medium Grain Filter Sand Interval: 16.28 to 28.28 feet bgs
						<b>SCREEN</b> Diameter: 2 inch Type: Sch 40 PVC, 0.01 Slot Interval: 18.28 to 28.28 feet bgs
						<b>LEGEND</b> 

MONITORING WELL 6499506 GPJ S&ME GDT 11/22/00



155 Tradd Street  
 Spartanburg, SC 29301

## COMPLETION REPORT OF WELL No. SB-9 (MW-11)

Sheet 1 of 1

# COMPLETION REPORT OF WELL No. SB-7 (MW-13)

PROJECT: Hot Spot #3005  
 PROJECT NO: 1264-99-506  
 PROJECT LOCATION: Chesnee, South Carolina

WATER LEVEL: 24.33 feet on 10/16/00

DRILLING CONTRACTOR: S&ME, Inc.  
 DRILLING METHOD: HSA  
 DATE COMPLETED: 9/29/00

LATITUDE: N 35° 9.069'  
 LONGITUDE: W 81° 51.604'  
 TOP OF CASING ELEVATION: 95.89  
 DATUM: Site Benchmark  
 LOGGED BY: M. O'Connell

STRATA			WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)	WELL CONSTRUCTION DETAILS
DESCRIPTION	SYMBOL	DEPTH (ft.)					
		0		0.00	GS	96.24	<b>PROTECTIVE CASING</b> Diameter: 8 inch Type: Flushmount Interval: 0 to 8 inches bgs
		0.35		0.35	TOC	95.89	
Fill - red - brown clayey SILT		5					<b>RISER CASING</b> Diameter: 2 inch Type: Sch 40 PVC Interval: .35 to 17.11 feet bgs
		10					
Residuum - orange-brown, clayey SILT		15		13.11	CG	83.13	<b>GROUT</b> Type: Portland Cement Interval: 0 to 13.11 feet bgs
		15		15.11	BS	81.13	
Saprolite - red, orange and tan, micaceous, silty, fine to medium SAND		20		17.11	TSC	79.13	<b>SEAL</b> Type: Bentonite Interval: 13.11 to 15.11 feet bgs
		25		27.11	BSC	69.13	
Saprolite - red, orange and tan, micaceous, silty, fine to medium SAND		25					<b>FILTERPACK</b> Type: Clean, Medium Grain Filter Sand Interval: 15.11 to 27.11 feet bgs
		25					
		25					<b>SCREEN</b> Diameter: 2 inch Type: Sch 40 PVC, 0.01 Slot Interval: 17.11 to 27.11 feet bgs
		25					
							<b>LEGEND</b> FILTER PACK BENTONITE CEMENT GROUT CUTTINGS / BACKFILL STATIC WATER LEVEL TOC TOP OF CASING GS GROUND SURFACE BS BENTONITE SEAL BOC BASE OF OUTER CASING TSC TOP OF SCREEN BSC BOTTOM OF SCREEN TD TOTAL DEPTH CG CEMENT GROUT

MONITORING WELL 6459506 GPJ S&ME.GDT 11/22/00








155 Tradd Street  
 Spartanburg, SC 29301

## COMPLETION REPORT OF WELL No. SB-7 (MW-13)

STRATA			WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)	WELL CONSTRUCTION DETAILS
DESCRIPTION	SYMBOL	DEPTH (ft.)					
(See Page 1)							
No Recovery <i>(continued)</i>		35					
Saprolite - medium dense brown and tan very micaceous, fine SAND with occasional very coarse quartz veins		40					
Saprolite - medium dense, tan and orange very micaceous, fine to medium SAND		45					
8" Saprolite - dense brown and red very micaceous medium SAND						49.64	CG 55.30
10" - Black, brown and gray PARTIALLY WEATHERED ROCK		50				51.64	BS 53.30
						53.64	TSC 51.30
Rock - biotite-gneiss		55					
						58.64	BSC 46.30
Boring terminated at 58.64 feet.							

**LEGEND**

- |                                                                                     |                     |     |                      |
|-------------------------------------------------------------------------------------|---------------------|-----|----------------------|
|  | FILTER PACK         | TOC | TOP OF CASING        |
|  | BENTONITE           | GS  | GROUND SURFACE       |
|  | CEMENT GROUT        | BS  | BENTONITE SEAL       |
|  | CUTTINGS / BACKFILL | BOC | BASE OF OUTER CASING |
|  | STATIC WATER LEVEL  | TSC | TOP OF SCREEN        |
|                                                                                     |                     | BSC | BOTTOM OF SCREEN     |
|                                                                                     |                     | TD  | TOTAL DEPTH          |
|                                                                                     |                     | CG  | CEMENT GROUT         |

MONITORING WELL 6499506 GPJ S&ME GDT 11/22/00



155 Tradd Street  
 Spartanburg, SC 29301

**COMPLETION REPORT OF  
 WELL No. SB-4 (MW-1D)**

Sheet 2 of 2



BUREAU OF  
 BUSINESS MANAGEMENT  
 DIVISION OF PROCUREMENT SERVICES  
 2600 Bull Street  
 Columbia, SC 29201-17 08  
 Telephone (803) 898-3501 Fax (803) 898-3505

**SEALED BID INVITATION**

**BID MUST BE SUBMITTED ON THIS FORM TO BE ACCEPTED**

SOLICITATION NUMBER: <b>SB-18123-12/20/01-HW</b>	DATE ISSUED: 11/26/01
<i>(Number Must Be Shown On Front Of Envelope)</i>	PAGE 1 OF 247

SEALED BIDS WILL BE RECEIVED UNTIL:

TIME 2:30 pm DATE: 12/20/01  
 (EST)

AND THEN PUBLICLY OPENED

**Mail To:**  
 ATTENTION: BID CLERK  
 SOLICITATION NO.: **SB-18123-12/20/01-HW**  
 S.C. Department of Health & Environmental Control  
 Division of Procurement Services  
 2600 Bull Street  
 Columbia, South Carolina 29201-1708

DIRECT INQUIRIES TO: Henry Wigfall **HENRY WIGFALL** Phone: **(803) 898 -3472**

REASON FOR NO BID:

**This Section Must Be Completed By Vendor:**

<u>Consultech Environmental, Inc.</u> Vendor Name	Telephone Number: <u>(678) 377-0400</u>
<u>1800 MacLeod Drive, Suite F</u> Mailing Address	Fax Number: <u>(678) 377-0051</u>
<u>Lawrenceville, GA 30043</u> City State Zip Code	E-mail Address: <u>rgoodspeed@consultechenv.com</u>
	Toll Free Number: ( ) _____
	FEIN Or SSN: <u>58-1975219</u>

By signing this bid I certify:

- This bid is made without prior understanding, agreement or connection with any corporation, firm or person submitting a bid for the same materials, supplies or equipment and is in all respects fair and without collusion or fraud.

By signing this bid I agree:

- To abide by all conditions of this bid and certify that I am authorized to sign this bid for the bidder.
- If this quotation is accepted within 60 days from date of opening, to furnish any and all items/services at the prices quoted.

Drug-Free Workplace: Required by Section 44-107-10 (Drug Free Workplace Act) of the South Carolina Code of Laws, 1976, as amended. By submission of a bid, the bidder certifies that he/she will comply with all aspects of the Drug-Free Workplace Act and will not engage in the unlawful manufacture, distribution, dispensation, possession or use of a controlled substance in the performance of this contract. This certification also applies to any individual or firm employed by the contractor.

Richard Goodspeed **Richard Goodspeed/President** 12 / 17/01  
 Authorized Signature (Manual) Authorized Signature (Typed) Title Date Signed

COMMODITY: Perform corrective action of a petroleum release from a regulated underground storage tank site.

METHOD OF BID AWARD: Award will be made to a South Carolina Certified UST Site Rehabilitation Contractor based on the total cost of active correction action and other factors. (See Special Conditions #3)

## SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

BID NUMBER: SB-18123—12/20/01-HW

**PURPOSE and SCOPE OF WORK**

The Underground Storage Tank (UST) Program of the South Carolina Department of Health and Environmental Control (DHEC) is seeking services to perform active corrective action of petroleum releases from regulated underground storage tank sites in accordance with defined remediation goals. The objective is to *remove measurable free product AND/OR reduce the levels of chemicals of concern (CoC) in the ground water to or below defined site-specific target levels (SSTLs)*. All offerors must be South Carolina Certified Class I Site Rehabilitation Contractors. The three scopes of work defined in this solicitation are to be implemented at the **Hot Spot #3005, (UST Permit #12719), 107 Hampton Street, Chesnee, South Carolina; the Greenville Maintenance Facility, (UST Permit #04517), 13 Saluda Dam Road, Greenville, South Carolina; and the Cherokee County Sheriff's Department, (UST Permit #15793), 127 Baker Boulevard, Gaffney, South Carolina.**

**SPECIAL CONDITIONS**

1. **CONTRACT PERIOD:** The contract will be effective from date of award until the corrective action is complete as described in this contract.
  2. This contract is for corrective action at three sites in South Carolina. Compensation from the SUPERB Account is not considered a state contract for purposes of procurement or subject to state bid requirements in accordance with Section 44-2-130(D) of the SUPERB Act.
  3. **AWARD:** Award will be made to a South Carolina Certified UST Site Rehabilitation Contractor based on the method(s), estimated time, and total cost for active corrective action to SSTLs and removal or abandonment of assessment and rehabilitation items. The methods, estimated time, and total cost to complete the contract must be advantageous to the State of South Carolina. Proposed active corrective action remedies, estimated time frame, and cost will be evaluated by the following criteria:
    - 1) Long term reliability and effectiveness of each proposed remedy must protect human health and the environment and not increase the threat or risk;
    - 2) Each proposed remedy must be eligible for permitting by DHEC and must reduce toxicity, mobility, and volume or mass of chemicals of concern to ensure successful completion and ensure no additional receptors are impacted;
    - 3) The amount of time to implement each proposed remedy and the estimated total time to meet the final cleanup goals must ensure protection of unaffected receptors; and
    - 4) The lowest total operation and maintenance cost to implement and operate the proposed remedies, and return the site to the original conditions will be considered the reasonable cost to the SUPERB Account for site rehabilitation.
- DHEC may award sites on an individual basis or as a block of sites, whichever is deemed most advantageous to the State.**
4. **REASONABLE COST:** DHEC reserves the right to reject any and all bids that appear to be above the customary and reasonable cost for the same scope of work in a similar geologic setting, that propose a technology that cannot be permitted in South Carolina, or that propose an estimated time frame for cleanup that is not protective of human health or the environment.
  5. Contractor must agree to make positive efforts to employ women- and minority-owned businesses.



SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

BID NUMBER: SB-18123—12/20/01-HW

CORRECTIVE ACTION SOLICITATION RESPONSE

Please respond to the following questions:

A. SITE 1 - Hot Spot #3005, (UST Permit #12719), 107 Hampton Street, Chesnee, South Carolina.

- 1. The corrective action method(s) or technology (ies) that will be proposed in the CAP will be (list all active and/or intrinsic methods or technologies for remediation of the aquifer:

Air sparge - Total Fluid Removal

- 2. The estimated time in months to complete the corrective action from the date of bid award, corrective action goals are met, and all corrective action items are removed from the site or properly abandoned is approximately 24 months. This time assumes all submitted plans and reports will be reviewed by DHEC within 30 days of receipt.

- 3. The total cost in dollars, regardless of the type, quantity, or duration of the permitted technology applied, to treat the area of concern (see Attachment B, Figure #3) such that the thickness of free product does not exceed .01 foot and the levels of CoC do not exceed the site-specific target levels (SSTLs) defined in item 11.C. at any point, complete all associated monitoring and post-remediation verification, prepare all plans, reports, and correspondence; obtain and meet all terms and conditions of all required permits and licenses; design, install, monitor, operate, maintain, and when completed, properly abandon or remove all assessment and remediation items installed as part of corrective action; provide evidence of performance bond; and other items outlined in this solicitation is: \$ 150,000.00

B. SITE 2 - Greenville County Maintenance Facility, (UST Permit #04517), 13 Saluda Dam Road, Greenville, South Carolina.

EXCLUSION: Chemicals of concern (CoC) that are not associated with the underground storage tank release have been detected in ground water at the site. The assessment and remediation of these CoC are not part of this bid scope, nor are the costs for assessment and remediation of these CoC eligible for SUPERB funding. These costs will be paid by the SCDOT. Please contact the Division of Hydrogeology at (803) 896-4000.

- 1. The corrective action method(s) or technology (ies) that will be proposed in the CAP will be (list all active and/or intrinsic methods or technologies for remediation of the aquifer:

Air sparge, soil vapor extraction, total fluids removal

- 2. The estimated time in months to complete the corrective action from the date of bid award, corrective action goals are met, and all corrective action items are removed from the site or properly abandoned is approximately 24 months. This time assumes all submitted plans and reports will be reviewed by DHEC within 30 days of receipt.

## SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

BID NUMBER: SB-18123—12/20/01-HW

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or

If the remediation technology is a single event (e. g. excavation of impacted soils, vacuum enhanced recovery): collect sufficient samples as outlined in the CAP to verify the reduction of CoC to the remediation goals. The contractor may be required to install and sample verification wells at locations designated by DHEC. (See Appendix A for number of verification wells for each site). If the levels of CoC in all samples are at or below SSTLs, corrective action will be considered complete. If the level of any CoC is above the SSTL, additional corrective action will be required. The contractor will submit one (1) corrective action status report to document the reduction of CoC to the remediation goals. Split or duplicate samples will be collected by DHEC (or its subcontractors) to verify achievement of remediation goals. **At least two weeks notice will be provided to the UST Project Manager prior to mobilizing to the site for sampling to verify attainment of remediation goals.** Costs for transportation and analysis of split or duplicate samples will be paid by DHEC.

12. Disassemble and remove the remediation system and all associated remediation items including utilities from the site within 60 days of notification by DHEC that the remediation goal for the release associated with the UST(s) at the site has been achieved. Disruption to the owner/operator's normal business will be kept to a minimum.
13. Properly abandon all monitoring, recovery, and/or injection wells (including pre-existing wells), borings, trenches, and piping/utility runs installed by the contractor as part of corrective action within 60 days of notification by DHEC that the remediation goal for the release associated with the UST(s) at the site has been achieved. The abandonment will be in accordance with South Carolina Well Standards and Regulations R. 61-71 and accepted industry standards for abandonment of trenches and piping/utility runs. Disruption to the owner/operator normal business will be kept to a minimum. The contractor must notify DHEC of the method of well abandonment and final disposal of any free product and contaminated soil or ground water. The contractor will return the site to the condition prior to corrective action (e.g., asphalt paved areas will be repaved with asphalt, concrete areas will be replaced with concrete, grass areas will have soil replaced to the original grade and reseeded or sodded with grass, etc.).

**SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL**

**BID NUMBER: SB-18123—12/20/01-HW**

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3. The total cost in dollars, regardless of the type, quantity, or duration of the permitted technology applied, to treat the area of concern (see Attachment C, Figure #2) such that the thickness of free product does not exceed .01 foot and the levels of CoC do not exceed the site-specific target levels (SSTLs) defined in item 11.C. at any point, complete all associated monitoring and post-remediation verification, prepare all plans, reports, and correspondence; obtain and meet all terms and conditions of all required permits and licenses; design, install, monitor, operate, maintain, and when completed, properly abandon or remove all assessment and remediation items installed as part of corrective action; provide evidence of performance bond; and other items outlined in this solicitation is: \$ 381,000.00

**C. SITE 3 - Cherokee County Sheriff's Department, (UST Permit #15793), 127 Baker Boulevard, Gaffney, South Carolina.**

1. The corrective action method(s) or technology (ies) that will be proposed in the CAP will be (list all active and/or intrinsic methods or technologies for remediation of the aquifer:  
Air sparge  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
2. The estimated time in months to complete the corrective action from the date of bid award, corrective action goals are met, and all corrective action items are removed from the site or properly abandoned is approximately 24 months. This time assumes all submitted plans and reports will be reviewed by DHEC within 30 days of receipt.
3. The total cost in dollars, regardless of the type, quantity, or duration of the permitted technology applied, to treat the area of concern (see Attachment D Figure #6) such that the thickness of free product does not exceed .01 foot and the levels of CoC do not exceed the site-specific target levels (SSTLs) defined in item 11.C. at any point, complete all associated monitoring and post-remediation verification, prepare all plans, reports, and correspondence; obtain and meet all terms and conditions of all required permits and licenses; design, install, monitor, operate, maintain, and when completed, properly abandon or remove all assessment and remediation items installed as part of corrective action; provide evidence of performance bond; and other items outlined in this solicitation is: \$ 50,250.00

**D. Total Cost for Sites 1, 2, 3, is \$ 563,850.00**

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

BID NUMBER: SB-18123—12/20/01-HW

E. ACCEPTANCE and DELIVERY STATEMENT

In compliance with the solicitation and subject to all conditions thereof, the offeror agrees, if this bid is accepted within 30 days from date of opening, to complete the corrective action as specified at the price set forth (combined cost for all sites or individual cost for each site as stated above).

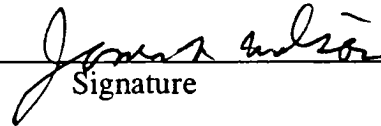
For the purpose of this submittal and acceptance of financial approval should it occur, I certify that this company understands the nature of the release and the geologic conditions at this facility as documented in the technical file and this solicitation. Additionally, I certify that this company understands that acceptance is based on total cost to treat the area of concern.

Consultech Environmental, Inc.

Certification No. 65

Contractor (Print)

James R. Wilson



Authorized Representative (Print)

Signature



South Carolina Department of Health and Environmental Control

BUREAU OF BUSINESS MANAGEMENT
DIVISION OF PROCUREMENT SERVICES
2600 Bull Street
Columbia, SC 29201-1708
Telephone (803) 898-3501 Fax (803) 898-3505

SEALED BID INVITATION

BID MUST BE SUBMITTED ON THIS FORM TO BE ACCEPTED

SOLICITATION NUMBER: SB-18123-12/20/01-HW

DATE ISSUED: 11/26/01

(Number Must Be Shown On Front Of Envelope)

PAGE 1 OF 247

SEALED BIDS WILL BE RECEIVED UNTIL:

Mail To:

TIME 2:30 pm DATE: 12/20/01 (EST)

ATTENTION: BID CLERK

SOLICITATION NO.: SB-18123-12/20/01-HW

S.C. Department of Health & Environmental Control
Division of Procurement Services
2600 Bull Street
Columbia, South Carolina 29201-1708

AND THEN PUBLICLY OPENED

DIRECT INQUIRIES TO: HENRY WIGFALL

Phone: (803) 898 -3472

REASON FOR NO BID:

This Section Must Be Completed By Vendor:

BROOKS + MEDLOCK ENGINEERING
Vendor Name

Telephone Number: ( ) 828-232-4700

Fax Number: ( ) 828-232-1331

712 MERRIMON AVE
Mailing Address

E-mail Address: MCBPE@BELLSOUTH.NET

ASHEVILLE NC 28804
City State Zip Code

Toll Free Number: ( )

FEIN Or SSN: 56-2259612

By signing this bid I certify:

- This bid is made without prior understanding, agreement or connection with any corporation, firm or person submitting a bid for the same materials, supplies or equipment and is in all respects fair and without collusion or fraud.

By signing this bid I agree:

- To abide by all conditions of this bid and certify that I am authorized to sign this bid for the bidder.
If this quotation is accepted within 60 days from date of opening, to furnish any and all items/services at the prices quoted.

Drug-Free Workplace: Required by Section 44-107-10 (Drug Free Workplace Act) of the South Carolina Code of Laws, 1976, as amended. By submission of a bid, the bidder certifies that he/she will comply with all aspects of the Drug-Free Workplace Act and will not engage in the unlawful manufacture, distribution, dispensation, possession or use of a controlled substance in the performance of this contract. This certification also applies to any individual or firm employed by the contractor.

Mark Brooks
Authorized Signature (Manual)

MARK BROOKS - PARTNER
Authorized Signature (Typed) Title

12/11/01
Date Signed

COMMODITY: Perform corrective action of a petroleum release from a regulated underground storage tank site.

METHOD OF BID AWARD: Award will be made to a South Carolina Certified UST Site Rehabilitation Contractor based on the total cost of active correction action and other factors. (See Special Conditions #3)


## SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

BID NUMBER: SB-18123—12/20/01-HW

**PURPOSE and SCOPE OF WORK**

The Underground Storage Tank (UST) Program of the South Carolina Department of Health and Environmental Control (DHEC) is seeking services to perform active corrective action of petroleum releases from regulated underground storage tank sites in accordance with defined remediation goals. The objective is to *remove measurable free product AND/OR reduce the levels of chemicals of concern (CoC) in the ground water to or below defined site-specific target levels (SSTLs)*. All offerors must be South Carolina Certified Class I Site Rehabilitation Contractors. The three scopes of work defined in this solicitation are to be implemented at the **Hot Spot #3005, (UST Permit #12719), 107 Hampton Street, Chesnee, South Carolina; the Greenville Maintenance Facility, (UST Permit #04517), 13 Saluda Dam Road, Greenville, South Carolina; and the Cherokee County Sheriff's Department, (UST Permit #15793), 127 Baker Boulevard, Gaffney, South Carolina.**

**SPECIAL CONDITIONS**

1. **CONTRACT PERIOD:** The contract will be effective from date of award until the corrective action is complete as described in this contract.
  2. This contract is for corrective action at three sites in South Carolina. Compensation from the SUPERB Account is not considered a state contract for purposes of procurement or subject to state bid requirements in accordance with Section 44-2-130(D) of the SUPERB Act.
  3. **AWARD:** Award will be made to a South Carolina Certified UST Site Rehabilitation Contractor based on the method(s), estimated time, and total cost for active corrective action to SSTLs and removal or abandonment of assessment and rehabilitation items. The methods, estimated time, and total cost to complete the contract must be advantageous to the State of South Carolina. Proposed active corrective action remedies, estimated time frame, and cost will be evaluated by the following criteria:
    - 1) Long term reliability and effectiveness of each proposed remedy must protect human health and the environment and not increase the threat or risk;
    - 2) Each proposed remedy must be eligible for permitting by DHEC and must reduce toxicity, mobility, and volume or mass of chemicals of concern to ensure successful completion and ensure no additional receptors are impacted;
    - 3) The amount of time to implement each proposed remedy and the estimated total time to meet the final cleanup goals must ensure protection of unaffected receptors; and
    - 4) The lowest total operation and maintenance cost to implement and operate the proposed remedies, and return the site to the original conditions will be considered the reasonable cost to the SUPERB Account for site rehabilitation.
-  **DHEC may award sites on an individual basis or as a block of sites, whichever is deemed most advantageous to the State.**
4. **REASONABLE COST:** DHEC reserves the right to reject any and all bids that appear to be above the customary and reasonable cost for the same scope of work in a similar geologic setting, that propose a technology that cannot be permitted in South Carolina, or that propose an estimated time frame for cleanup that is not protective of human health or the environment.
  5. Contractor must agree to make positive efforts to employ women- and minority-owned businesses.

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

BID NUMBER: SB-18123—12/20/01-HW

CORRECTIVE ACTION SOLICITATION RESPONSE

Please respond to the following questions:

A. SITE 1 - Hot Spot #3005, (UST Permit #12719), 107 Hampton Street, Chesnee, South Carolina.

1. The corrective action method(s) or technology (ies) that will be proposed in the CAP will be (list all active and/or intrinsic methods or technologies for remediation of the aquifer:

SOIL EXCAVATION AND OFF-SITE TREATMENT AND DISPOSAL  
ENHANCED FLUID RECOVERY (EFR) FOR PRODUCT AND GROUNDWATER

2. The estimated time in months to complete the corrective action from the date of bid award, corrective action goals are met, and all corrective action items are removed from the site or properly abandoned is approximately 24 months. This time assumes all submitted plans and reports will be reviewed by DHEC within 30 days of receipt.

3. The total cost in dollars, regardless of the type, quantity, or duration of the permitted technology applied, to treat the area of concern (see Attachment B, Figure #3) such that the thickness of free product does not exceed .01 foot and the levels of CoC do not exceed the site-specific target levels (SSTLs) defined in item 11.C. at any point, complete all associated monitoring and post-remediation verification, prepare all plans, reports, and correspondence; obtain and meet all terms and conditions of all required permits and licenses; design, install, monitor, operate, maintain, and when completed, properly abandon or remove all assessment and remediation items installed as part of corrective action; provide evidence of performance bond; and other items outlined in this solicitation is: \$ 85,000

B. SITE 2 - Greenville County Maintenance Facility, (UST Permit #04517), 13 Saluda Dam Road, Greenville, South Carolina.

**EXCLUSION:** Chemicals of concern (CoC) that are not associated with the underground storage tank release have been detected in ground water at the site. The assessment and remediation of these CoC are not part of this bid scope, nor are the costs for assessment and remediation of these CoC eligible for SUPERB funding. These costs will be paid by the SCDOT. Please contact the Division of Hydrogeology at (803) 896-4000.

1. The corrective action method(s) or technology (ies) that will be proposed in the CAP will be (list all active and/or intrinsic methods or technologies for remediation of the aquifer:

ENHANCED BIOREMEDIATION WITH THE INJECTION OF OXYGEN-RELEASING COMPOUNDS (ORC). FREE PRODUCT REMOVAL WITH ENHANCED FLUID RECOVERY (EFR) AND GROUNDWATER/SOIL REMEDIATION WITH AIR SPARGING AND SOIL VAPOR EXTRACTION.

2. The estimated time in months to complete the corrective action from the date of bid award, corrective action goals are met, and all corrective action items are removed from the site or properly abandoned is approximately 36 months. This time assumes all submitted plans and reports will be reviewed by DHEC within 30 days of receipt.

## SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

BID NUMBER: SB-18123—12/20/01-HW

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or

If the remediation technology is a single event (e. g. excavation of impacted soils, vacuum enhanced recovery): collect sufficient samples as outlined in the CAP to verify the reduction of CoC to the remediation goals. The contractor may be required to install and sample verification wells at locations designated by DHEC. (See Appendix A for number of verification wells for each site). If the levels of CoC in all samples are at or below SSTLs, corrective action will be considered complete. If the level of any CoC is above the SSTL, additional corrective action will be required. The contractor will submit one (1) corrective action status report to document the reduction of CoC to the remediation goals. Split or duplicate samples will be collected by DHEC (or its subcontractors) to verify achievement of remediation goals. **At least two weeks notice will be provided to the UST Project Manager prior to mobilizing to the site for sampling to verify attainment of remediation goals.** Costs for transportation and analysis of split or duplicate samples will be paid by DHEC.

12. Disassemble and remove the remediation system and all associated remediation items including utilities from the site within 60 days of notification by DHEC that the remediation goal for the release associated with the UST(s) at the site has been achieved. Disruption to the owner/operator's normal business will be kept to a minimum.
13. Properly abandon all monitoring, recovery, and/or injection wells (including pre-existing wells), borings, trenches, and piping/utility runs installed by the contractor as part of corrective action within 60 days of notification by DHEC that the remediation goal for the release associated with the UST(s) at the site has been achieved. The abandonment will be in accordance with South Carolina Well Standards and Regulations R. 61-71 and accepted industry standards for abandonment of trenches and piping/utility runs. Disruption to the owner/operator normal business will be kept to a minimum. The contractor must notify DHEC of the method of well abandonment and final disposal of any free product and contaminated soil or ground water. The contractor will return the site to the condition prior to corrective action (e.g., asphalt paved areas will be repaved with asphalt, concrete areas will be replaced with concrete, grass areas will have soil replaced to the original grade and reseeded or sodded with grass, etc.).



SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

BID NUMBER: SB-18123—12/20/01-HW

3. The total cost in dollars, regardless of the type, quantity, or duration of the permitted technology applied, to treat the area of concern (see Attachment C, Figure #2) such that the thickness of free product does not exceed .01 foot and the levels of CoC do not exceed the site-specific target levels (SSTLs) defined in item 11.C. at any point, complete all associated monitoring and post-remediation verification, prepare all plans, reports, and correspondence; obtain and meet all terms and conditions of all required permits and licenses; design, install, monitor, operate, maintain, and when completed, properly abandon or remove all assessment and remediation items installed as part of corrective action; provide evidence of performance bond; and other items outlined in this solicitation is: \$ 135,000

C. SITE 3 - Cherokee County Sheriff's Department, (UST Permit #15793), 127 Baker Boulevard, Gaffney, South Carolina.

1. The corrective action method(s) or technology (ies) that will be proposed in the CAP will be (list all active and/or intrinsic methods or technologies for remediation of the aquifer:  
FREE PRODUCT REMOVAL WITH ENHANCED FLUID RECOVERY (EFR)  
AND SOIL/GROUNDWATER REMEDIATION WITH AIR SPARGING AND  
SOIL VAPOR EXTRACTION.
2. The estimated time in months to complete the corrective action from the date of bid award, corrective action goals are met, and all corrective action items are removed from the site or properly abandoned is approximately 36 months. This time assumes all submitted plans and reports will be reviewed by DHEC within 30 days of receipt.
3. The total cost in dollars, regardless of the type, quantity, or duration of the permitted technology applied, to treat the area of concern (see Attachment D Figure #6) such that the thickness of free product does not exceed .01 foot and the levels of CoC do not exceed the site-specific target levels (SSTLs) defined in item 11.C. at any point, complete all associated monitoring and post-remediation verification, prepare all plans, reports, and correspondence; obtain and meet all terms and conditions of all required permits and licenses; design, install, monitor, operate, maintain, and when completed, properly abandon or remove all assessment and remediation items installed as part of corrective action; provide evidence of performance bond; and other items outlined in this solicitation is: \$ 65,000

D. Total Cost for Sites 1, 2, 3, is \$ 285,000

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

BID NUMBER: SB-18123—12/20/01-HW

2. ACCEPTANCE and DELIVERY STATEMENT

In compliance with the solicitation and subject to all conditions thereof, the offeror agrees, if this bid is accepted within 30 days from date of opening, to complete the corrective action as specified at the price set forth (combined cost for all sites or individual cost for each site as stated above).

For the purpose of this submittal and acceptance of financial approval should it occur, I certify that this company understands the nature of the release and the geologic conditions at this facility as documented in the technical file and this solicitation. Additionally, I certify that this company understands that acceptance is based on total cost to treat the area of concern.

BROOKS+MEDLOCK ENGINEERING Certification No. 270  
Contractor (Print)

MARK BROOKS Mark Brooks  
Authorized Representative (Print) Signature



South Carolina Department of Health and Environmental Control

BUREAU OF BUSINESS MANAGEMENT
DIVISION OF PROCUREMENT SERVICES
2600 Bull Street
Columbia, SC 29201-1708
Telephone (803) 898-3501 Fax (803) 898-3505

SEALED BID INVITATION

BID MUST BE SUBMITTED ON THIS FORM TO BE ACCEPTED

SOLICITATION NUMBER: SB-18123-12/20/01-HW
DATE ISSUED: 11/26/01
PAGE 1 OF 247

(Number Must Be Shown On Front Of Envelope)

SEALED BIDS WILL BE RECEIVED UNTIL:

TIME 2:30 pm DATE: 12/20/01 (EST)

AND THEN PUBLICLY OPENED

Mail To:

ATTENTION: BID CLERK
SOLICITATION NO: SB-18123-12/20/01-HW
S.C. Department of Health & Environmental Control
Division of Procurement Services
2600 Bull Street
Columbia, South Carolina 29201-1708

DIRECT INQUIRIES TO: HENRY WIGFALL

Phone: (803) 898 -3472

REASON FOR NO BID:

This Section Must Be Completed By Vendor:

Vendor Name: ENNICO South LLC
Mailing Address: 104 Mauldin Rd, Suite I
City: Greenville SC State: SC Zip Code: 29605

Telephone Number: (864) 236-9010
Fax Number: (864) 236-9007
E-mail Address: hennico@ennicosouth.com
Toll Free Number: ( )
FEIN Or SSN: 50-2335120

By signing this bid I certify:

- This bid is made without prior understanding, agreement or connection with any corporation, firm or person submitting a bid for the same materials, supplies or equipment and is in all respects fair and without collusion or fraud.

By signing this bid I agree:

- To abide by all conditions of this bid and certify that I am authorized to sign this bid for the bidder.
If this quotation is accepted within 60 days from date of opening, to furnish any and all items/services at the prices quoted.

Drug-Free Workplace: Required by Section 44-107-10 (Drug Free Workplace Act) of the South Carolina Code of Laws, 1976, as amended. By submission of a bid, the bidder certifies that he/she will comply with all aspects of the Drug-Free Workplace Act and will not engage in the unlawful manufacture, distribution, dispensation, possession or use of a controlled substance in the performance of this contract. This certification also applies to any individual or firm employed by the contractor.

Authorized Signature (Manual)

Principal Authorized Signature (Typed) Title

12/18/01 Date Signed

COMMODITY: Perform corrective action of a petroleum release from a regulated underground storage tank site.

METHOD OF BID AWARD: Award will be made to a South Carolina Certified UST Site Rehabilitation Contractor based on the total cost of active correction action and other factors. (See Special Conditions #3)

## SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

BID NUMBER: SB-18123—12/20/01-HW

**PURPOSE and SCOPE OF WORK**

The Underground Storage Tank (UST) Program of the South Carolina Department of Health and Environmental Control (DHEC) is seeking services to perform active corrective action of petroleum releases from regulated underground storage tank sites in accordance with defined remediation goals. The objective is to *remove measurable free product AND/OR reduce the levels of chemicals of concern (CoC) in the ground water to or below defined site-specific target levels (SSTLs)*. All offerors must be South Carolina Certified Class I Site Rehabilitation Contractors. The three scopes of work defined in this solicitation are to be implemented at the **Hot Spot #3005, (UST Permit #12719), 107 Hampton Street, Chesnee, South Carolina; the Greenville Maintenance Facility, (UST Permit #04517), 13 Saluda Dam Road, Greenville, South Carolina; and the Cherokee County Sheriff's Department, (UST Permit #15793), 127 Baker Boulevard, Gaffney, South Carolina.**

**SPECIAL CONDITIONS**

1. **CONTRACT PERIOD:** The contract will be effective from date of award until the corrective action is complete as described in this contract.
  2. This contract is for corrective action at three sites in South Carolina. Compensation from the SUPERB Account is not considered a state contract for purposes of procurement or subject to state bid requirements in accordance with Section 44-2-130(D) of the SUPERB Act.
  3. **AWARD:** Award will be made to a South Carolina Certified UST Site Rehabilitation Contractor based on the method(s), estimated time, and total cost for active corrective action to SSTLs and removal or abandonment of assessment and rehabilitation items. The methods, estimated time, and total cost to complete the contract must be advantageous to the State of South Carolina. Proposed active corrective action remedies, estimated time frame, and cost will be evaluated by the following criteria:
    - 1) Long term reliability and effectiveness of each proposed remedy must protect human health and the environment and not increase the threat or risk;
    - 2) Each proposed remedy must be eligible for permitting by DHEC and must reduce toxicity, mobility, and volume or mass of chemicals of concern to ensure successful completion and ensure no additional receptors are impacted;
    - 3) The amount of time to implement each proposed remedy and the estimated total time to meet the final cleanup goals must ensure protection of unaffected receptors; and
    - 4) The lowest total operation and maintenance cost to implement and operate the proposed remedies, and return the site to the original conditions will be considered the reasonable cost to the SUPERB Account for site rehabilitation.
- DHEC may award sites on an individual basis or as a block of sites, whichever is deemed most advantageous to the State.**
4. **REASONABLE COST:** DHEC reserves the right to reject any and all bids that appear to be above the customary and reasonable cost for the same scope of work in a similar geologic setting, that propose a technology that cannot be permitted in South Carolina, or that propose an estimated time frame for cleanup that is not protective of human health or the environment.
  5. Contractor must agree to make positive efforts to employ women- and minority-owned businesses.

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

BID NUMBER: SB-18123—12/20/01-HW

CORRECTIVE ACTION SOLICITATION RESPONSE

Please respond to the following questions:

A. SITE 1 - Hot Spot #3005, (UST Permit #12719), 107 Hampton Street, Chesnee, South Carolina.

1. The corrective action method(s) or technology (ies) that will be proposed in the CAP will be (list all active and/or intrinsic methods or technologies for remediation of the aquifer:

VEFR, Air Sparging, Vapor Extraction, ORC

2. The estimated time in months to complete the corrective action from the date of bid award, corrective action goals are met, and all corrective action items are removed from the site or properly abandoned is approximately 36 months. This time assumes all submitted plans and reports will be reviewed by DHEC within 30 days of receipt.

3. The total cost in dollars, regardless of the type, quantity, or duration of the permitted technology applied, to treat the area of concern (see Attachment B, Figure #3) such that the thickness of free product does not exceed .01 foot and the levels of CoC do not exceed the site-specific target levels (SSTLs) defined in item 11.C. at any point, complete all associated monitoring and post-remediation verification, prepare all plans, reports, and correspondence; obtain and meet all terms and conditions of all required permits and licenses; design, install, monitor, operate, maintain, and when completed, properly abandon or remove all assessment and remediation items installed as part of corrective action; provide evidence of performance bond; and other items outlined in this solicitation is: \$ 127,000.

B. SITE 2 - Greenville County Maintenance Facility, (UST Permit #04517), 13 Saluda Dam Road, Greenville, South Carolina.

EXCLUSION: Chemicals of concern (CoC) that are not associated with the underground storage tank release have been detected in ground water at the site. The assessment and remediation of these CoC are not part of this bid scope, nor are the costs for assessment and remediation of these CoC eligible for SUPERB funding. These costs will be paid by the SCDOT. Please contact the Division of Hydrogeology at (803) 896-4000.

1. The corrective action method(s) or technology (ies) that will be proposed in the CAP will be (list all active and/or intrinsic methods or technologies for remediation of the aquifer:

No Bid

2. The estimated time in months to complete the corrective action from the date of bid award, corrective action goals are met, and all corrective action items are removed from the site or properly abandoned is approximately — months. This time assumes all submitted plans and reports will be reviewed by DHEC within 30 days of receipt.

## SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

BID NUMBER: SB-18123—12/20/01-HW

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OR

If the remediation technology is a single event (e. g. excavation of impacted soils, vacuum enhanced recovery): collect sufficient samples as outlined in the CAP to verify the reduction of CoC to the remediation goals. The contractor may be required to install and sample verification wells at locations designated by DHEC. (See Appendix A for number of verification wells for each site). If the levels of CoC in all samples are at or below SSTLs, corrective action will be considered complete. If the level of any CoC is above the SSTL, additional corrective action will be required. The contractor will submit one (1) corrective action status report to document the reduction of CoC to the remediation goals. Split or duplicate samples will be collected by DHEC (or its subcontractors) to verify achievement of remediation goals. **At least two weeks notice will be provided to the UST Project Manager prior to mobilizing to the site for sampling to verify attainment of remediation goals.** Costs for transportation and analysis of split or duplicate samples will be paid by DHEC.

12. Disassemble and remove the remediation system and all associated remediation items including utilities from the site within 60 days of notification by DHEC that the remediation goal for the release associated with the UST(s) at the site has been achieved. Disruption to the owner/operator's normal business will be kept to a minimum.
13. Properly abandon all monitoring, recovery, and/or injection wells (including pre-existing wells), borings, trenches, and piping/utility runs installed by the contractor as part of corrective action within 60 days of notification by DHEC that the remediation goal for the release associated with the UST(s) at the site has been achieved. The abandonment will be in accordance with South Carolina Well Standards and Regulations R. 61-71 and accepted industry standards for abandonment of trenches and piping/utility runs. Disruption to the owner/operator normal business will be kept to a minimum. The contractor must notify DHEC of the method of well abandonment and final disposal of any free product and contaminated soil or ground water. The contractor will return the site to the condition prior to corrective action (e.g., asphalt paved areas will be repaved with asphalt, concrete areas will be replaced with concrete, grass areas will have soil replaced to the original grade and reseeded or sodded with grass, etc.).

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

BID NUMBER: SB-18123—12/20/01-HW

3. The total cost in dollars, regardless of the type, quantity, or duration of the permitted technology applied, to treat the area of concern (see Attachment C, Figure #2) such that the thickness of free product does not exceed .01 foot and the levels of CoC do not exceed the site-specific target levels (SSTLs) defined in item 11.C. at any point, complete all associated monitoring and post-remediation verification, prepare all plans, reports, and correspondence; obtain and meet all terms and conditions of all required permits and licenses; design, install, monitor, operate, maintain, and when completed, properly abandon or remove all assessment and remediation items installed as part of corrective action; provide evidence of performance bond; and other items outlined in this solicitation is: \$ No BID

C. SITE 3 - Cherokee County Sheriff's Department, (UST Permit #15793), 127 Baker Boulevard, Gaffney, South Carolina.

1. The corrective action method(s) or technology (ies) that will be proposed in the CAP will be (list all active and/or intrinsic methods or technologies for remediation of the aquifer:

No BID

2. The estimated time in months to complete the corrective action from the date of bid award, corrective action goals are met, and all corrective action items are removed from the site or properly abandoned is approximately — months. This time assumes all submitted plans and reports will be reviewed by DHEC within 30 days of receipt.

3. The total cost in dollars, regardless of the type, quantity, or duration of the permitted technology applied, to treat the area of concern (see Attachment D Figure #6) such that the thickness of free product does not exceed .01 foot and the levels of CoC do not exceed the site-specific target levels (SSTLs) defined in item 11.C. at any point, complete all associated monitoring and post-remediation verification, prepare all plans, reports, and correspondence; obtain and meet all terms and conditions of all required permits and licenses; design, install, monitor, operate, maintain, and when completed, properly abandon or remove all assessment and remediation items installed as part of corrective action; provide evidence of performance bond; and other items outlined in this solicitation is: \$ No BID

D. Total Cost for Sites 1, 2, 3, is \$ N/A

## SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

BID NUMBER: SB-18123—12/20/01-HW

**E. ACCEPTANCE and DELIVERY STATEMENT**

In compliance with the solicitation and subject to all conditions thereof, the offeror agrees, if this bid is accepted within 60 days from date of opening, to complete the corrective action as specified at the price set forth (combined cost for all sites or individual cost for each site as stated above).

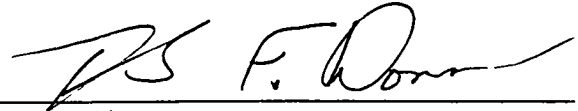
For the purpose of this submittal and acceptance of financial approval should it occur, I certify that this company understands the nature of the release and the geologic conditions at this facility as documented in the technical file and this solicitation. Additionally, I certify that this company understands that acceptance is based on total cost to treat the area of concern.

EnviroSouth, Inc.

Contractor (Print)

Certification No. 257Thomas F. Donn, Principal

Authorized Representative (Print)



Signature





South Carolina Department of Health and Environmental Control

BUREAU OF BUSINESS MANAGEMENT
DIVISION OF PROCUREMENT SERVICES
2600 Bull Street
Columbia, SC 29201-1708
Telephone (803) 898-3501 Fax (803) 898-3505

SEALED BID INVITATION

BID MUST BE SUBMITTED ON THIS FORM TO BE ACCEPTED

SOLICITATION NUMBER: SB-18123-12/20/01-HW

DATE ISSUED: 11/26/01

Number Must Be Shown On Front Of Envelope)

PAGE 1 OF 247

SEALED BIDS WILL BE RECEIVED UNTIL:

TIME 2:30 pm DATE: 12/20/01 (EST)

AND THEN PUBLICLY OPENED

Mail To:

ATTENTION: BID CLERK
SOLICITATION NO.: SB-18123-12/20/01-HW
S.C. Department of Health & Environmental Control
Division of Procurement Services
2600 Bull Street
Columbia, South Carolina 29201-1708

DIRECT INQUIRIES TO: HENRY WIGFALL

Phone: (803) 898 -3472

REASON FOR NO BID:

Provide Corrective Action Services

This Section Must Be Completed By Vendor:

BUNNELL-LAMMONS ENGINEERING, INC.
Vendor Name

1200 Woodruff Rd., Suite B-7
Mailing Address

Greenville, SC 29607
City State Zip Code

Telephone Number: (864) 288-1265

Fax Number: (864) 288-4430

E-mail Address: tom@blecorp.com

Toll Free Number: ( )

FEIN Or SSN: 57-1056336

By signing this bid I certify:

- This bid is made without prior understanding, agreement or connection with any corporation, firm or person submitting a bid for the same materials, supplies or equipment and is in all respects fair and without collusion or fraud.

By signing this bid I agree:

- To abide by all conditions of this bid and certify that I am authorized to sign this bid for the bidder.
If this quotation is accepted within 60 days from date of opening, to furnish any and all items/services at the prices quoted.

Drug-Free Workplace: Required by Section 44-107-10 (Drug Free Workplace Act) of the South Carolina Code of Laws, 1976, as amended. By submission of a bid, the bidder certifies that he/she will comply with all aspects of the Drug-Free Workplace Act and will not engage in the unlawful manufacture, distribution, dispensation, possession or use of a controlled substance in the performance of this contract. This certification also applies to any individual or firm employed by the contractor.

Thomas Lammons
Authorized Signature (Manual)

Thomas L. Lammons, PRINCIPAL
Authorized Signature (Typed) Title
Date Signed 12/19/01

COMMODITY: Perform corrective action of a petroleum release from a regulated underground storage tank site.

METHOD OF BID AWARD: Award will be made to a South Carolina Certified UST Site Rehabilitation Contractor based on the total cost of active correction action and other factors. (See Special Conditions #3)

## SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

BID NUMBER: SB-18123—12/20/01-HW

**PURPOSE and SCOPE OF WORK**

The Underground Storage Tank (UST) Program of the South Carolina Department of Health and Environmental Control (DHEC) is seeking services to perform active corrective action of petroleum releases from regulated underground storage tank sites in accordance with defined remediation goals. The objective is to *remove measurable free product AND/OR reduce the levels of chemicals of concern (CoC) in the ground water to or below defined site-specific target levels (SSTLs)*. All offerors must be South Carolina Certified Class I Site Rehabilitation Contractors. The three scopes of work defined in this solicitation are to be implemented at the **Hot Spot #3005, (UST Permit #12719), 107 Hampton Street, Chesnee, South Carolina; the Greenville Maintenance Facility, (UST Permit #04517), 13 Saluda Dam Road, Greenville, South Carolina; and the Cherokee County Sheriff's Department, (UST Permit #15793), 127 Baker Boulevard, Gaffney, South Carolina.**

**SPECIAL CONDITIONS**

1. **CONTRACT PERIOD:** The contract will be effective from date of award until the corrective action is complete as described in this contract.
  2. This contract is for corrective action at three sites in South Carolina. Compensation from the SUPERB Account is not considered a state contract for purposes of procurement or subject to state bid requirements in accordance with Section 44-2-130(D) of the SUPERB Act.
  3. **AWARD:** Award will be made to a South Carolina Certified UST Site Rehabilitation Contractor based on the method(s), estimated time, and total cost for active corrective action to SSTLs and removal or abandonment of assessment and rehabilitation items. The methods, estimated time, and total cost to complete the contract must be advantageous to the State of South Carolina. Proposed active corrective action remedies, estimated time frame, and cost will be evaluated by the following criteria:
    - 1) Long term reliability and effectiveness of each proposed remedy must protect human health and the environment and not increase the threat or risk;
    - 2) Each proposed remedy must be eligible for permitting by DHEC and must reduce toxicity, mobility, and volume or mass of chemicals of concern to ensure successful completion and ensure no additional receptors are impacted;
    - 3) The amount of time to implement each proposed remedy and the estimated total time to meet the final cleanup goals must ensure protection of unaffected receptors; and
    - 4) The lowest total operation and maintenance cost to implement and operate the proposed remedies, and return the site to the original conditions will be considered the reasonable cost to the SUPERB Account for site rehabilitation.
- DHEC may award sites on an individual basis or as a block of sites, whichever is deemed most advantageous to the State.**
4. **REASONABLE COST:** DHEC reserves the right to reject any and all bids that appear to be above the customary and reasonable cost for the same scope of work in a similar geologic setting, that propose a technology that cannot be permitted in South Carolina, or that propose an estimated time frame for cleanup that is not protective of human health or the environment.
  5. Contractor must agree to make positive efforts to employ women- and minority-owned businesses.

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

BID NUMBER: SB-18123—12/20/01-HW

CORRECTIVE ACTION SOLICITATION RESPONSE

Please respond to the following questions:

A. SITE 1 - Hot Spot #3005, (UST Permit #12719), 107 Hampton Street, Chesnee, South Carolina.

- 1. The corrective action method(s) or technology (ies) that will be proposed in the CAP will be (list all active and/or intrinsic methods or technologies for remediation of the aquifer:

Aggressive Fluid-Vapor Recovery (AFVR), product skimming, AirS purge, (AS)  
Soil Vapor Recovery (SVE)

- 2. The estimated time in months to complete the corrective action from the date of bid award, corrective action goals are met, and all corrective action items are removed from the site or properly abandoned is approximately 42 months. This time assumes all submitted plans and reports will be reviewed by DHEC within 30 days of receipt.

- 3. The total cost in dollars, regardless of the type, quantity, or duration of the permitted technology applied, to treat the area of concern (see Attachment B, Figure #3) such that the thickness of free product does not exceed .01 foot and the levels of CoC do not exceed the site-specific target levels (SSTLs) defined in item 11.C. at any point, complete all associated monitoring and post-remediation verification, prepare all plans, reports, and correspondence; obtain and meet all terms and conditions of all required permits and licenses; design, install, monitor, operate, maintain, and when completed, properly abandon or remove all assessment and remediation items installed as part of corrective action; provide evidence of performance bond; and other items outlined in this solicitation is: \$ 230,000

B. SITE 2 - Greenville County Maintenance Facility, (UST Permit #04517), 13 Saluda Dam Road, Greenville, South Carolina.

EXCLUSION: Chemicals of concern (CoC) that are not associated with the underground storage tank release have been detected in ground water at the site. The assessment and remediation of these CoC are not part of this bid scope, nor are the costs for assessment and remediation of these CoC eligible for SUPERB funding. These costs will be paid by the SCDOT. Please contact the Division of Hydrogeology at (803) 896-4000.

- 1. The corrective action method(s) or technology (ies) that will be proposed in the CAP will be (list all active and/or intrinsic methods or technologies for remediation of the aquifer:

AFVR, AS, SVE, product skimming

- 2. The estimated time in months to complete the corrective action from the date of bid award, corrective action goals are met, and all corrective action items are removed from the site or properly abandoned is approximately 42 months. This time assumes all submitted plans and reports will be reviewed by DHEC within 30 days of receipt.

## SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

BID NUMBER: SB-18123—12/20/01-HW

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or

If the remediation technology is a single event (e. g. excavation of impacted soils, vacuum enhanced recovery): collect sufficient samples as outlined in the CAP to verify the reduction of CoC to the remediation goals. The contractor may be required to install and sample verification wells at locations designated by DHEC. (See Appendix A for number of verification wells for each site). If the levels of CoC in all samples are at or below SSTLs, corrective action will be considered complete. If the level of any CoC is above the SSTL, additional corrective action will be required. The contractor will submit one (1) corrective action status report to document the reduction of CoC to the remediation goals. Split or duplicate samples will be collected by DHEC (or its subcontractors) to verify achievement of remediation goals. **At least two weeks notice will be provided to the UST Project Manager prior to mobilizing to the site for sampling to verify attainment of remediation goals.** Costs for transportation and analysis of split or duplicate samples will be paid by DHEC.

12. Disassemble and remove the remediation system and all associated remediation items including utilities from the site within 60 days of notification by DHEC that the remediation goal for the release associated with the UST(s) at the site has been achieved. Disruption to the owner/operator's normal business will be kept to a minimum.
13. Properly abandon all monitoring, recovery, and/or injection wells (including pre-existing wells), borings, trenches, and piping/utility runs installed by the contractor as part of corrective action within 60 days of notification by DHEC that the remediation goal for the release associated with the UST(s) at the site has been achieved. The abandonment will be in accordance with South Carolina Well Standards and Regulations R. 61-71 and accepted industry standards for abandonment of trenches and piping/utility runs. Disruption to the owner/operator normal business will be kept to a minimum. The contractor must notify DHEC of the method of well abandonment and final disposal of any free product and contaminated soil or ground water. The contractor will return the site to the condition prior to corrective action (e.g., asphalt paved areas will be repaved with asphalt, concrete areas will be replaced with concrete, grass areas will have soil replaced to the original grade and reseeded or sodded with grass, etc.).

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

BID NUMBER: SB-18123—12/20/01-HW

3. The total cost in dollars, regardless of the type, quantity, or duration of the permitted technology applied, to treat the area of concern (see Attachment C, Figure #2) such that the thickness of free product does not exceed .01 foot and the levels of CoC do not exceed the site-specific target levels (SSTLs) defined in item 11.C. at any point, complete all associated monitoring and post-remediation verification, prepare all plans, reports, and correspondence; obtain and meet all terms and conditions of all required permits and licenses; design, install, monitor, operate, maintain, and when completed, properly abandon or remove all assessment and remediation items installed as part of corrective action; provide evidence of performance bond; and other items outlined in this solicitation is: \$ 185,000

C. SITE 3 - Cherokee County Sheriff's Department, (UST Permit #15793), 127 Baker Boulevard, Gaffney, South Carolina.

1. The corrective action method(s) or technology (ies) that will be proposed in the CAP will be (list all active and/or intrinsic methods or technologies for remediation of the aquifer):  
AFVR, AS, SVE, product skimming
2. The estimated time in months to complete the corrective action from the date of bid award, corrective action goals are met, and all corrective action items are removed from the site or properly abandoned is approximately 42 months. This time assumes all submitted plans and reports will be reviewed by DHEC within 30 days of receipt.
3. The total cost in dollars, regardless of the type, quantity, or duration of the permitted technology applied, to treat the area of concern (see Attachment D Figure #6) such that the thickness of free product does not exceed .01 foot and the levels of CoC do not exceed the site-specific target levels (SSTLs) defined in item 11.C. at any point, complete all associated monitoring and post-remediation verification, prepare all plans, reports, and correspondence; obtain and meet all terms and conditions of all required permits and licenses; design, install, monitor, operate, maintain, and when completed, properly abandon or remove all assessment and remediation items installed as part of corrective action; provide evidence of performance bond; and other items outlined in this solicitation is: \$ 105,000

D. Total Cost for Sites 1, 2, 3, is \$ 520,000

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

BID NUMBER: SB-18123—12/20/01-HW

E. ACCEPTANCE and DELIVERY STATEMENT

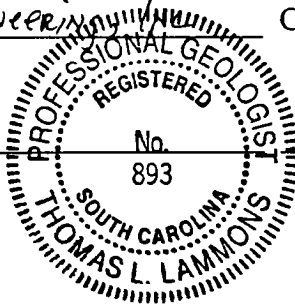
In compliance with the solicitation and subject to all conditions thereof, the offeror agrees, if this bid is accepted within 90 days from date of opening, to complete the corrective action as specified at the price set forth (combined cost for all sites or individual cost for each site as stated above).

For the purpose of this submittal and acceptance of financial approval should it occur, I certify that this company understands the nature of the release and the geologic conditions at this facility as documented in the technical file and this solicitation. Additionally, I certify that this company understands that acceptance is based on total cost to treat the area of concern.

Bunnell-Lammons Engineering  
Contractor (Print)

Certification No. 10

Thomas Lammons  
Authorized Representative (Print)



THOMAS L. LAMMONS  
Signature



1600 Bull Street  
Columbia, SC 29201-1708

**UNDERGROUND STORAGE TANK PROGRAM  
BUREAU OF LAND AND WASTE MANAGEMENT**

Phone: (800) 826-5435 Fax: (803) 898-4330

**JAN 30 2002**

Ms. Judith Laughter  
RL Jordan Oil Company of North Carolina  
PO Box 2527  
Spartanburg, SC 29304-2527

Re: Hot Spot 3005, 107 Hampton St., Chesnee, SC  
UST Permit #12719, CP#: 13851:P  
Bid#: SB-18123-12/20/01-HW, PO#385179  
Corrective Action Award  
Spartanburg County

Dear Ms. Laughter:

As you are aware, the Underground Storage Tank Program determined that active corrective action was necessary at the referenced facility to reduce levels of petroleum constituents to acceptable levels. Per your signed permission form, dated August 28, 2001, you decided to allow the SCDHEC to procure the services of an environmental contractor on your behalf. On January 8, 2002, the SCDHEC awarded Brooks and Medlock Engineering the corrective action contract. Brooks and Medlock submitted the lowest bid in the amount of \$85,000.00, which will be paid by the SUPERB fund. Per the requirements of the contract, Brooks and Medlock is required to submit a corrective action plan within 30 days of the award date. You will receive a copy of the corrective action plan and be given an opportunity to comment on the proposed remediation.

If you have any questions or need additional information, please contact me at (803) 898-4362 or (800) 826-5435.



Sincerely,

Debra L. Thoma, Hydrogeologist  
State Lead & Field Services Section  
Assessment and Corrective Action Division

cc: Mark Brooks, Brooks & Medlock, 712 Merriman Ave., Asheville, NC, 28804  
Technical File  
Financial File

SCDHEC/UST/DLT/1.28.02/06542rp\_awd

RECEIVED

FEB 07 2002

Underground Storage  
Tank Program

**CORRECTIVE ACTION PLAN  
HOT SPOT # 3005  
CHESNEE, SOUTH CAROLINA  
SITE ID: # 12719**

Prepared For:

SOUTH CAROLINA DHEC  
BUREAU OF UST MANAGEMENT  
2600 BULL STREET  
COLUMBIA, SOUTH CAROLINA

Prepared By:



**BROOKS & MEDLOCK**  
ENGINEERING, PLLC

712 Merrimon Avenue  
Asheville, NC 28804

SCDHEC UST CONTRACTOR No. 270

February 5, 2002



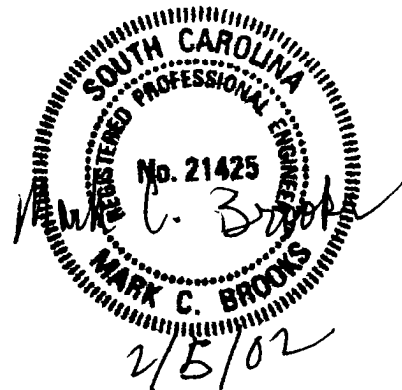


**CORRECTIVE ACTION PLAN  
HOT SPOT # 3005  
CHESNEE, SOUTH CAROLINA  
SITE ID # 12719**

Prepared By:



Mark Brooks, P.E. (SC # 21425)  
Environmental Engineer



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## 1.0 INTRODUCTION

The subject site is the Hot Spot # 3005, which is an operating convenient store owned by R.L. Jordan Oil Company. The subject site is located at 107 Hampton Street in Chesnee, South Carolina. The general site location is provided as Figure 1. A relevant portion of the tax map depicting the adjacent properties and mailing addresses is provided as Figure 2. Locations of existing monitoring wells and utilities are depicted on Figure 3.

The subject site has been fully assessed and evaluated according to South Carolina's Risk-based Corrective Action (RBCA) protocol. A final site assessment report was completed by S&ME, Inc. in November 2000. The data provided was utilized for establishing baseline concentrations in the corrective action scope of work outlined in the South Carolina Department of Health and Environmental Control (SCDHEC) *Request for Corrective Action Bids (Bid Package)* for the subject site dated February November 26, 2001 (Bid No. SB-18123-12/20/01-HW). Provided in this Corrective Action Plan (CAP) are justifications for the selected remediation technology, a summary the remediation system construction and an outline of monitoring and abandonment activities. This report has been prepared in general accordance with the SCDHEC *Corrective Action Guidance*. The scope of work reflects activities requested in the Bid Package.

The objective of the corrective action is to insure adequate protection of human health and the environment as determined by the SCDHEC. This is to be achieved by reducing concentrations OF chemicals of concern (CoC) to the site specific target levels (SSTLs) for selected monitoring wells (compliance points). SSTLs for selected CoC are established in the Bid Package. The Bid Package specifies target clean-up concentrations for groundwater only.

## **2.0 EVALUATION OF REMEDIAL ALTERNATIVES**

Viable remediation technologies are evaluated to provide the selection criteria and justifications for the recommended options.

### **2.1 Pertinent Site Conditions**

This section summarizes the pertinent site conditions presented in recent assessment reports utilized in the evaluation of remedial alternatives.

#### **2.1.1 Soil Conditions and Groundwater Flow**

The subject site is located in Spartanburg County, which is located in the Western Piedmont Physiographic Province. Shallow aquifer soil types reported by S&ME in the Tier 2 Assessment consist of clayey silt fill to an approximate depth of 5 feet below ground surface (bgs), red orange medium grained micaceous saprolite and sand to a depth of approximately 30 to 45 feet bgs. Biotite gneiss bedrock exists below the surficial soils. These soil types are associated with moderate to low permeability. Hydraulic conductivities reportedly range from  $1.6 \times 10^{-3}$  cm/sec to  $4.8 \times 10^{-5}$  cm/sec. The Tier 2 reports the general groundwater flow direction is towards the northeast.

#### **2.1.2 Soil Impact**

The Tier 2 Assessment reports only minor vadose zone soil contamination at the site. The only significant soil CoC concentrations were found near the groundwater table and close to the source area. The scope of work defined in the SCDHEC Bid Package does not require remediation of soils to any target clean-up levels. However, as vadose zone contaminants can serve as a "secondary source" to groundwater contamination, it is anticipated that the remediation effort described in this CAP will significantly reduce CoC concentrations in the vadose zone and capillary fringe.

#### **2.1.3 Groundwater Impact**

Free phase product exists at the site in monitoring well MW-1. The free product plume appears to be confined to the immediate area of the former USTs. The Tier 2 identifies benzene, toluene, ethylbenzene, xylenes, naphthalene, EDB and MTBE as CoC existing above RBSLs in groundwater. The Bid Package scope of work requires elimination of free product and reductions in benzene and MTBE in MW-1 and MTBE in MW-3 as these are the CoC above SSTLs.

#### **2.1.4 Exposure Analysis**

A receptor survey was performed as part of the Tier 2 Evaluation. The exposure analysis identified groundwater exposure and ingestion as the primary exposure pathways. An applicable remediation should eliminate the potential for human exposure and impact of natural resource due to groundwater migration of the COC.

### **2.2 Physical and Chemical Properties of CoC**

Most petroleum fuels are derived from crude oil by distillation. Petroleum fuels are variable mixtures of a large number of hydrocarbon components. The hydrocarbons in gasoline are primarily benzene, ethylbenzene, toluene and xylenes and fall in the C4 to C12 carbon number range (carbon numbers are the number of carbon atoms per molecule and are commonly used to describe and compare the compositions of various petroleum products). The remaining composition of gasoline is typically comprised of oxygenated compounds, such as alcohols and ethers, including MTBE. MTBE is added to gasoline as an octane booster and as an oxidant to reduce carbon monoxide exhaust emissions. Tetraethyl lead was added to gasoline as an octane booster; however, leaded gasoline was phased out of the market by 1989.

The fate and transport of organic chemicals in the subsurface are often dominated by sorption and biological transformations. Other processes of importance include volatilization, hydrolysis and oxidation and reduction. The sorption of organic chemicals to the subsurface soils is linearly related to the organic carbon partition coefficient,  $K_{oc}$ , of the chemical.  $K_{oc}$  is linearly proportional to the equilibrium constant for distribution of the organic chemical between the solid and liquid phases  $K_d$ . Similarly, chemical properties, such as vapor pressure, boiling point, and solubility control the volatilization of organic chemicals. The distribution between the vapor and liquid phases is commonly described by Henry's Law, which states that the Henry's Law constant is linearly proportional to the chemical's vapor pressure and inversely proportional to the chemical's hydrophilic tendencies. Chemicals with a Henry's Law constant of greater than  $10^{-5}$  m<sup>3</sup>-atm/mol are considered "strippable", or readily volatilized by ambient temperature air. Another indicator of "strippable" compounds is vapor pressure. Vapor pressures greater than 1 mm Hg at 25° C indicates the compound volatilizes readily. The physical and chemical properties and the toxicity of each of the CoC as defined in the bid package are summarized below:

**Benzene:**

Physical/Chemical Properties -

Benzene has a relatively high Henry's Law Constant ( $5.5 \times 10^{-3} \text{ m}^3\text{-atm/mol}$ ) and vapor pressure (95.3 mm Hg) and is subject to rapid volatilization. Benzene is mobile in soils due to its relatively high water solubility ( $1.75 \times 10^6 \text{ g/L}$ ) and relatively low sorption capacity ( $\text{Log } K_{oc} = 1.81$ ). Benzene is biodegradable.

Toxicity -

Benzene has been found to be a human carcinogen (Group A). The USEPA has set a drinking water maximum contaminant level (MCL) at 5 g/L and a maximum contaminant level goal (MCLG) at 0 g/L for benzene.

**Toluene:**

Physical/Chemical Properties -

Toluene has a relatively high Henry's Law Constant ( $6.6 \times 10^{-3} \text{ m}^3\text{-atm/mol}$ ) and vapor pressure (28.5 mm Hg) and is subject to rapid volatilization. Toluene is moderately mobile in soils due to its relatively moderate water solubility ( $5.35 \times 10^5 \text{ g/L}$ ) and relatively low capacity to sorb to soils ( $\text{Log } K_{oc} = 2.41$ ). Toluene is biodegradable.

Toxicity -

Based on animal studies, toluene had critical effects on the liver and kidney. The USEPA has set both drinking water MCL and MCLG at 1,000 g/L.

**Ethylbenzene:**

Physical/Chemical Properties -

Ethylbenzene has a relatively high Henry's Law Constant ( $8.7 \times 10^{-3} \text{ m}^3\text{-atm/mol}$ ) and vapor pressure (96.0 mm Hg) and is subject to rapid volatilization. Ethylbenzene is moderately mobile in soils due to its relatively moderate water solubility ( $1.52 \times 10^5 \text{ g/L}$ ) and relatively low capacity to sorb to soils ( $\text{Log } K_{oc} = 2.83$ ). Ethylbenzene is biodegradable.

Toxicity -

Based on animal studies, ethylbenzene has critical effects on the liver and kidney. The USEPA has set both drinking water MCL and MCLG at 700 g/L.

**Xylenes:**

Physical/Chemical Properties -

Xylenes have relatively high Henry's Law Constants ( $5.1 \times 10^{-3} \text{ m}^3\text{-atm/mol}$ ) and vapor pressure (6.6 mm Hg) and are subject to rapid volatilization. Xylenes are moderately mobile in soils due to their relatively

moderate water solubilities ( $1.98 \times 10^5$  g/L) and relatively low capacities to sorb to soils ( $\text{Log } K_{oc} = 2.84$ ). Xylenes are biodegradable.

Toxicity -

Based on animal studies, xylenes had critical effects on hyperactivity, decreased body weight, and increased mortality. The USEPA has set both drinking water MCL and MCLG at 10,000 g/L.

**Naphthalene:**

Physical/Chemical Properties -

Naphthalene has a relatively moderate Henry's Law Constant ( $4.9 \times 10^{-4}$  m<sup>3</sup>-atm/mol) and low vapor pressure (<1 mm Hg). Naphthalene has moderate solubility in water (water solubility = 31.7 mg/L) and capacity to sorb to soils ( $\text{Log } K_{oc} = 3.1$ ). Naphthalene is expected to have a moderate potential to biodegrade.

Toxicity -

Exposure to vapors may cause irritation of eyes, skin or respiratory tract. Ingestion may cause gastrointestinal pain and kidney damage. The USEPA has not set a drinking water MCL or MCLG for Naphthalene.

**MTBE:**

Physical/Chemical Properties -

MTBE has a relatively moderate Henry's Law Constant ( $1.0 \times 10^{-3}$  m<sup>3</sup>-atm/mol) and low vapor pressure (<1 mm Hg). MTBE will migrate at the same velocity as the water in which it is dissolved due to its high water solubility ( $4.8 \times 10^7$  g/L) and low capacity to sorb to soils ( $\text{Log } K_{oc} = 1.08$ ). MTBE is expected to have a moderate potential to biodegrade.

Toxicity -

Based on animal studies, MTBE has critical effects on the liver and kidney. The USEPA has not set a drinking water MCL or MCLG for MTBE.

Each of the CoC are seen to be strippable by either their Henry's Law constants or vapor pressures. All CoC have relatively low adsorption capabilities and are biodegradable. Each of the contaminants is anticipated to biodegrade naturally under aerobic conditions by ubiquitous facultative microorganisms. MTBE and naphthalene are anticipated to be the most recalcitrant CoC, however, remediation of these compounds by stripping and biodegradation is well documented.



## **2.3 Evaluation of Remedial Technologies**

Several remedial technologies are potentially applicable to soil and groundwater remediation at this site. These technologies include pump and treat, air sparging, enhanced bioremediation, natural attenuation, and excavation. An evaluation of the uses of these methods at the subject site is provided below.

### **2.3.1 Evaluation of Pump and Treat**

“Pump and treat” refers to the process of extracting free phase product and contaminated groundwater, treating the effluent and disposing of the treated groundwater on-site. Extracted groundwater is treated ex-situ by an oil/water separator, air stripper and granular activated carbon. The primary advantage of this technology is that it offers excellent treatment of captured groundwater and can effectively control the migration of the plume by gaining hydraulic control of the aquifer. Additionally it allows for treatment of groundwater located in the bedrock aquifer. Pump and treat is not traditionally a cost effective technology for remediation of low CoC concentrations over large areas. However, one the primary objectives at the subject site is to remove free product from a relatively small area, where this particular technology could be effective. Moderate to low groundwater yields would be expected from the relatively low permeability soils, but low influent flow rates should be sufficient to remove the existing free product plume in a timely manner (see section 3.0). Treatment of recalcitrant compounds to low levels can be problematic with pump and treat technology, but the SSTLs for this project are within the capabilities of pump and treat technology. Another primary advantage of this technology is that it lowers the groundwater table, allowing a soil vacuum extraction system to effectively treat free product and sorbed contaminants in the area of groundwater table fluctuations (smear zone). Pump and treat is a recommended technology for this site and it is to be used in combination with soil vapor extraction.

### **2.3.2 Evaluation of Soil Vapor Extraction**

Soil vapor extraction (SVE) remediates vadose zone and smear zone contaminants by “sweeping” contaminated soil pore vapors with clean air. Vapors saturated with vapor phase contaminants are removed. Free phase, sorbed and dissolved phase contaminants with low vapor pressures are transferred into vapor phase as clean air replaces saturated vapors. Factors such as high horizontal-to-vertical conductivity ratios can limit the technology’s effectiveness in anisotropic soils. However, based upon applications in similar soil profiles, SVE is recommended as an applicable technology for the subject site. Soil vapor extraction involves applying an air vacuum to the vadose zone typically by an industrial blower. This facilitates the movement of ambient air through the soil matrix, volatilizing volatile organic compounds (VOCs) and pulling the vapor phase contaminants out of the subsurface for discharge to the

atmosphere. SVE is recognized as effective in the removal free product, sorbed and dissolved phase hydrocarbons from at or above the water table. SVE is a recommended technology for this site and it is to be used in combination with pump and treat.

### **2.3.3 Evaluation of Air Sparging**

Air sparging is facilitated by injecting air into the aquifer in the area of hydrocarbon impact. As the air migrates through the groundwater to the surface, turbulence, groundwater mixing and inherent phase transfer properties of the CoC cause the dissolved hydrocarbons to volatilize. Biodegradation is also enhanced as dissolved oxygen levels are elevated, increasing aerobic microbial activity.

Air sparging is not applicable in the source area because of the presence of free product. Also, the disadvantage of air sparging in the source area is that this system does not offer hydraulic control of the plume and could cause to free product plume to expand. However, air sparging would be applicable in areas where only dissolved phase contaminants are present as air sparging has been demonstrated as an effective remedial technology for dissolved phase VOCs and has the capability to effectively reduce VOCs to low concentrations in groundwater. As only MW-1 and MW-3 have CoC to be reduced and both of these compliance points can be treated with other recommended technologies, air sparging will not be utilized at the subject site.

### **2.3.4 Evaluation of Enhanced Bioremediation**

As stated in Section 2.2, most of the dissolved constituents found at this site are readily biodegradable. Enhanced bioremediation involves the addition of preferential electron acceptors into the aquifer to allow indigenous microorganisms to utilize dissolved petroleum hydrocarbons as a carbon source in cellular mass production. As aerobic microbial respiratory processes are thermodynamically favorable to anaerobic processes, elevating dissolved oxygen (DO) levels in the aquifer is the most commonly used technique of enhanced bioremediation.

As DO levels in the surficial aquifer are at or near threshold levels for aerobic biodegradation (1 to 2 mg/l), the addition of oxygen should significantly increase microbial biodegradation activity. Enhanced bioremediation should be effective in areas where free product does not exist. Enhanced biodegradation of free product is not practical as typically the VOC concentrations are toxic to most indigenous microorganisms.

The addition of DO to the aquifer can be implemented by injecting gaseous oxygen (or air) or injecting oxygen-releasing compounds (such as H<sub>2</sub>O<sub>2</sub> or MgO<sub>2</sub>). The SVE portion of the remediation effort to be utilized in this CAP will provide oxygen for bioremediation of dissolved phase contaminants in the source area. No additional enhanced bioremediation efforts will be implemented as only MW-1 and MW-3 have CoC to be reduced and both of these compliance points can be treated with other recommended technologies

### **2.3.5 Evaluation of Natural Attenuation**

The potential for natural attenuation exists at the subject site as concentrations in many monitoring wells have decreased through time. Currently it is unknown if sufficient anaerobic electron acceptors (nitrates, sulfates, ferrous iron) are present in groundwater. Also, anaerobic biodegradation processes can be slow and incomplete. As sensitive receptors are close to the site and a three-year time constraint exists for this CAP, a more pro-active remedial approach is recommended.

### **2.3.6 Source Removal by Excavation**

Removal of soils containing multi-phase contaminants by excavation and off-site treatment is an effective but invasive remediation approach. The depth to groundwater and the fact that the facility is currently in use make this approach impractical.

### **3.0 APPLICATION OF REMEDIAL ALTERNATIVES**

Remedial technologies prescribed in Section 2.0 include pump and treat and soil vapor extraction. The application of each of the technologies is based upon the varying phases of CoC present, current CoC concentrations, access to impacted areas, and the SSTL to be achieved. How and where each technology is to be implemented is presented in this section.

#### **3.1 Pump and Treat**

Pump and treat technology is to be implemented in the source zone area where free product exists. The objective of the pump and treat technology is to recover the free product, reduce the dissolved phase CoC levels to below the SSTLs in the source area, and to lower the groundwater table to increase the effectiveness of the SVE system. The extent of free product is not precisely delineated in the Tier 2 Assessment, but it is estimated to be approximately 35 feet by 35 feet in the vicinity of MW-1.

Effective application of the system is dependent upon the pumping system having an effective radius of influence (ROI) that encompasses the area of the free product plume. The radius of influence is dependent upon the soil conditions and drawdown achieved in the well. The achievable radius of influence with a 5-foot drawdown is calculated to be 17 feet based upon a median range of reported soil hydraulic conductivities. Therefore two extraction wells are to be utilized. The minimum flow rate required to achieve a 17-foot radius of influence from a single extraction is calculated to be less than 1 gpm. The actual total flow rate utilized is estimated to be between 1 and 6 gpm and will be determined in the field. The pump and treat system can treat between 1 and 15 gallons per minute (see Section 4.0). The locations of the groundwater extraction wells are depicted on Figure 3. The calculations are provided in Appendix I.

#### **3.2 Soil Vapor Extraction**

The objective of the SVE system is to facilitate a reduction in free product, particularly product bound in interstitial pores in the "smear zone" of the soil, where water table fluctuations have spread free product in the soil matrix. Additionally, the SVE system is to remove vapor phase CoC where these concentrations will be particularly high. Based upon these objectives, SVE is to be facilitated in the source area only. Proper application of this technology is dependent upon providing sufficient ROI. Based upon professional experience in similar soil conditions, an estimated ROI for a 4-inch extraction

well operating at approximately 80 cfm is 30 feet. Therefore it is anticipated two SVE wells will be required to provide air extraction in the source area. The actual ROI will be determined with data collected in the field after start-up. The locations of the SVE wells are depicted in Figure 3.

## **4.0 REMEDIAL SYSTEM CONSTRUCTION**

The remedial technologies recommended in Section 2.0 include pump and treat and soil vapor extraction. Section 3.0 described how and where these technologies are to be implemented. This section provides details concerning the construction of the remediation systems.

### **4.1 Soil Vapor Extraction System**

The soil vapor extraction will be performed by a mobile air sparging unit that is constructed as part of a Mobile Remediation Unit (see Figure 4). All of the SVE components with the exception of the extraction wells and the distribution lines are contained in a single trailer along with components of other treatment systems. Individual components are discussed below.

#### **4.1.1 Soil Vapor Extraction Wells**

Two (2) new SVE wells will be installed in the source area. The well annulus will be drilled with a hollow stem auger to a termination depth of 40 feet below ground surface (bgs). The wells will be constructed with a screened interval from 40 feet bgs to 30 feet bgs with 4-inch # 20 slotted schedule 40 PVC well screen. The annulus will be filled with a filter sand to 29 feet bgs and bentonite seal to 4-foot below ground surface. A cement slurry will be tremmied into the augers until the grout reaches a depth of 2 feet bgs. The boring will be finished with an 18-inch diameter steel well vault placed in a 2-foot by 2-foot concrete pad flush with the ground surface.

#### **4.1.2 Blower and Controls**

The mobile unit's vacuum is provided by a 7.5-horsepower regenerative blower. The blower can provide 225 cfm free air flow with a maximum vacuum of 125 mbar. Flow to the two wells is controlled by a two-way PVC manifold. The manifold feeds in to a 10-gallon knock-out tank to prevent water infiltration into the blower. The knock-out tank is equipped with a high level override switch which will terminate operation in the event the tank becomes full. An ambient air inlet (bleeder) valve is installed prior to the blower intake to regulate vacuum pressure at the well. Pressures are monitored on the influent and effluent side of the blower. The blower effluent is discharged from a stack approximately 12 feet above ground surface. A four-inch rubber coupling and an adjustable hose clamp will be utilized for connection to the SVE well. Specification sheets for the blower are provided in Appendix II.

## **4.2 Pump and Treat System**

The pump and treat will be performed by a mobile unit that is constructed as part of a Mobile Remediation Unit (see Figure 4). All of the components with the exception of the extraction wells and the distribution lines are contained in a single trailer along with components of other treatment systems. Individual components are discussed below.

### **4.2.1 Pumps**

Three pneumatic total fluid recovery pumps are to be utilized in each of the three extraction wells. The pumps are to be operated by the same compressor system that facilitates the air sparging unit. The manifold will direct and control air flow to the pumps. The pumps are to be placed in the wells such that the fluid intake at the top of the pump is at the lowered oil/water interface surface. Specifications for the pumps are provided in Appendix II.

### **4.2.2 Oil/water Separator**

A Hydro-flo™ fiberglass oil/water separator located in the Mobile Remediation Unit will be utilized to separate the free product extracted from the groundwater. The separator is rated for 15 gpm. A 1.0 hp transfer pump will deliver the effluent to the air stripper for treatment. The contained product will periodically be pumped out by a certified subcontractor and transferred to either an appropriately permitted disposal or recycling facility. Specifications are provided in Appendix II.

### **4.2.3 Air Stripper**

A NEEP™ low profile air stripper mounted in the Mobile Remediation Unit is to be utilized for treatment of dissolved phase hydrocarbons in the oil/water separator effluent. The air stripper is rated for up to 15 gpm. The stripping of VOCs in a shallow tray air stripper is dependent upon an adequate air/water ratio. These ratios are based upon mass transfer rates, which are inherent to the design of the air stripper. Mass transfer rates ( $Kl_a$ ) for individual CoC are determined by manufacturer testing and empirical data. Based upon this testing, an air/water ratio of 231:1 cubic feet is provided for the NEEP air stripper and a 99.99% reduction of VOCs is anticipated. Specifications are provided in Appendix II.

### **4.2.4 Carbon Adsorption**

Final polishing effluent is to be performed by granular activated carbon. A primary and a secondary carbon unit each containing approximately 200 pounds of granular activated carbon are to be installed to treat the

air stripper effluent prior to discharge. The carbon units typically provide 99.99% VOC removal at lower concentrations.



## **5.0 MONITORING PLAN**

A groundwater sampling event will be conducted prior to the system's initial engagement and quarterly groundwater monitoring will be conducted to comply with the terms of the Bid Package. A mechanical system monitoring plan will be implemented to ensure the Mobile Remediation Unit components are operating properly.

### **5.1 Baseline Monitoring**

The baseline monitoring will be conducted prior to construction of the systems as prescribed in the Bid Package. Each monitoring well will be sampled for each CoC including BTEX compounds and MTBE. Additional required parameters include dissolved oxygen, ferrous iron, methane, nitrate and sulfate. The results of this sampling event will be reported to SCDHEC within six weeks from the date of the project award letter.

#### **5.1.1 Water Elevation Data**

To determine groundwater flow direction and gradient across the site, water levels will be measured in the monitoring wells relative to each well's top of casing. The water levels, relative to an assumed benchmark, will be used to convert the water level data to groundwater elevations. Any free phase petroleum product levels will be measured utilizing an oil/water interface probe and product levels will be monitored during the remediation process. All system extraction will be suspended at least 24 hours prior to groundwater elevation measurements to ensure a return to a natural potentiometric levels.

#### **5.1.2 Pressure Response**

Baseline pressure responses will be measured at selected monitoring wells to measure the ROI of the SVE system. The effective area of SVE influence should indicate a negative pressure response. This will be measured at surrounding monitoring wells with a mounted magnehelic gauge. This data will be analyzed to determine the effectiveness of the system configuration. Any deficiencies will be addressed.

#### **5.1.3 Groundwater CoC Sampling**

Selected CoC are established in the Bid Package. Benzene, toluene, ethylbenzene, xylenes, naphthalene, MTBE, dissolved oxygen, ferrous iron, methane, nitrate, and sulfate will be analyzed by the methods specified in the Bid Package. Each compliance point established in the Bid Package will be sampled initially. If a trend is established in selected wells, these may be eliminated from quarterly sampling.

Samples will be collected according to methods outlined in SCDHEC's *Analytical Methodology for Ground-water and Soil Assessment Guidelines* dated March 15, 2000.

#### **5.1.4 Organic Vapor Monitoring**

Organic vapors will be measured at the emission stack of the SVE system and the air stripper to measure the amount of gas-phase CoC removed and to ensure compliance with SCDHEC BAQC regulations. Vapors will be measured with a calibrated photoionization detector (PID). The emission rate will be calculated in dry standard cubic feet per minute.

#### **5.2 Quarterly Monitoring**

Quarterly sampling events are to be conducted for benzene, toluene, ethylbenzene, xylenes, naphthalene, MTBE, dissolved oxygen, ferrous iron, methane, nitrate, and sulfate as prescribed in the Bid Package.

#### **5.3 Mechanical Operation Monitoring**

System monitoring will include continuous monitoring of the blowers during operation. The blowers will be monitored for line pressure, differential pressure across the separator, amperage and temperature.

SVE system monitoring will include monitoring of inlet vacuum pressure and blower amperage. Total air flow and temperature will be monitored from the blower emission stack. Also, water levels in the air/water separator will be monitored. The SVE blower will require routine maintenance including filter cleaning and air/water separator emptying. If necessary, water will be removed from the separator and transported to an approved treatment facility.

#### **5.4 NPDES Monitoring**

The pump and treat system will require monitoring consistent with the National Pollution Discharge Elimination System (NPDES) permit. A monthly Discharge Monitoring Report will be required by the Bureau of Water Quality. The permit typically this calls for bi-weekly checks by a Level A Physical/Chemical Wastewater Operator of the system with sampling for parameters designated in the permit.

## 6.0 SYSTEM ABANDONMENT

Once remediation is complete, defined by all compliance wells remain at the SSTL goals for two successive quarters, the remediation system will be abandoned. Abandonment will include:

- terminating electrical service to the Mobile Remediation Unit and removal of service meter;
- removal of Mobile Remediation System;
- abandonment of subsurface vapor extraction wells, monitoring wells, and groundwater extraction wells in accordance with South Carolina Well Standards and Regulations R.61-71;
- any existing wastewater or sludge will be pumped out and hauled to the appropriate disposal facility; and
- all impacted surfaces will be re-finished with original type materials, including re-grading and re-seeding of impacted groundwater.

## 7.0 CORRECTIVE ACTION PLAN IMPLEMENTATION SCHEDULE

CAP implementation, including construction, monitoring and abandonment are tentatively scheduled below:

Submit CAP	by February 7, 2002
Apply for UIC Permit for air injection	by February 7, 2002
Apply for UIC Permit for ORC injection	by February 7, 2002
Apply for NPDES Permit for Pump and Treat	by February 7, 2002
BAQC exclusion letter for air stripper	by February 7, 2002
BAQC exclusion letter for SVE	by February 7, 2002
System Installation	within 4 weeks after CAP and permit approval
System Start-up	within 4 weeks after the CAP approval
Abandon System	Within six months after required SSTL's are reached

South Carolina law requires that the first invoice in the “pay-for performance” criteria be submitted within 120 days from receipt of the letter awarding the project (May 8, 2002) or the funds will be uncommitted within the SUPERB fund. Therefore, timely review and approval of the CAP and permits is essential. For the proposed schedule to be implemented, review of the CAP and permit applications should be completed within four weeks of their submittal.

## **8.0 STATEMENT OF PROVISIONS AND QUALIFICATIONS**

This plan has been prepared for the use of R.L. Jordan Oil Company and the SCDHEC for specific application to this project. This plan has been prepared in accordance with generally accepted engineering and hydrogeologic practices for projects of this type. The findings and conclusions contained in this plan were based on information contained within the hydrogeologic assessment reports. The findings and conclusions are based on the applicable standards of our profession at the time this plan was prepared. No other warranty, expressed or implied, is made.

## 9.0 REFERENCES

C.W. Fetter, *Contaminant Hydrogeology*, 1993.

D.P. Ahfeld, et. al., A Conceptual Model of Field Behavior of Air Sparging and Its Implications for Application, *Groundwater Monitoring Review*, Fall 1994.

J.W. Mercer and R.M. Cohen, A Review of Immiscible Fluids in the Subsurface: Properties, Models, Characterization and Remediation, *Journal of Contaminant Hydrology*, 1990.

Michael G. Ellerd, Subsurface Contaminant Retardation and the Exponential Removal Model, 1993.

R.L. Johnson, Enhancing Biodegradation With In-situ Air Sparging: A Conceptual Model, Air Sparging for Site Remediation, R.E. Hinchee, ed., 1994.

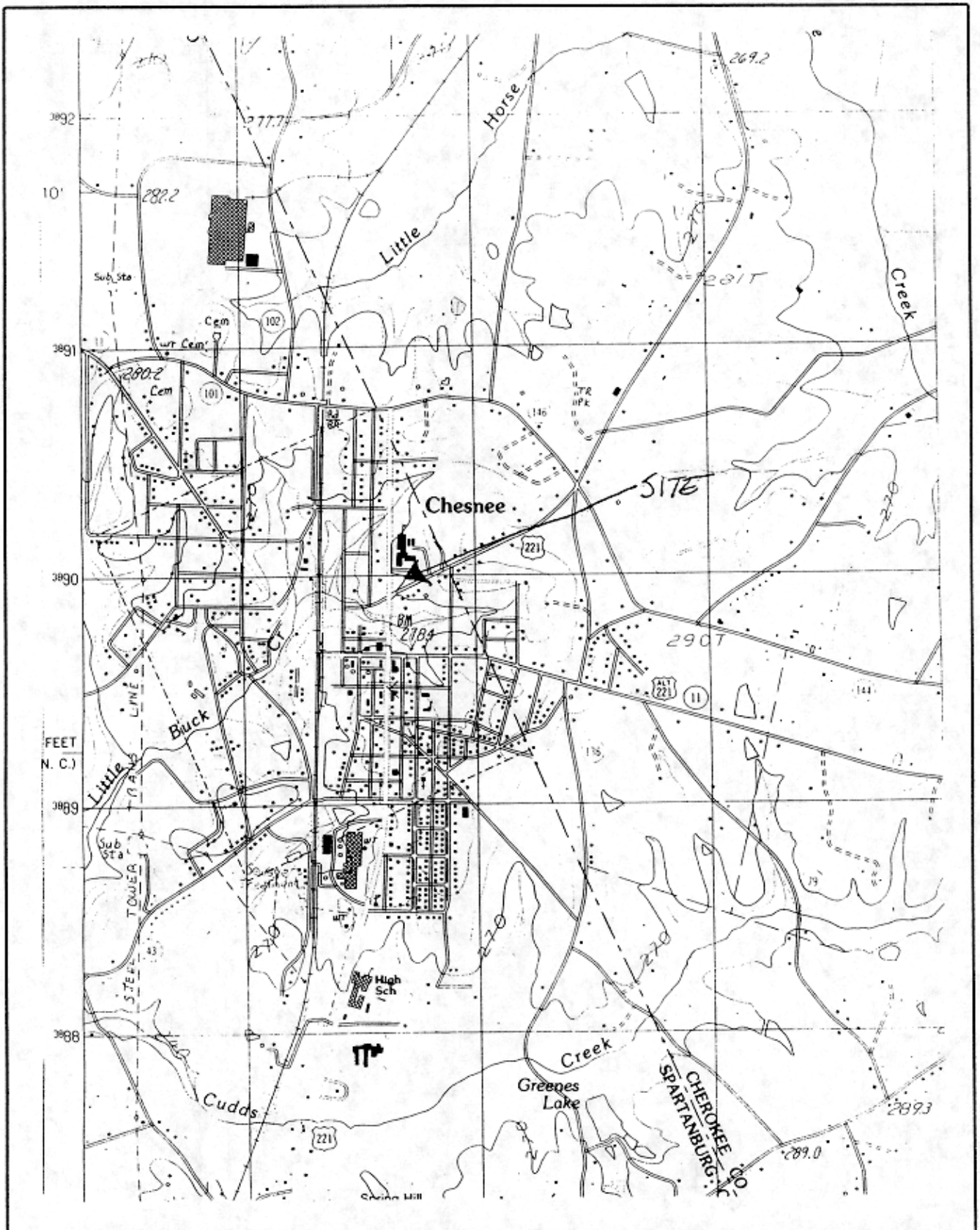
R.L. Johnson, et. al., An Overview of In-situ Air Sparging, *Groundwater Monitoring Review*, Fall 1993.

R.L. Johnson, et. al., Quantitative Analysis for the Clean-up of Hydrocarbon Contaminated Soils By In-situ Venting, *Ground Water*, 1990.

South Carolina Department of Health and Environmental Control, *Corrective Action Guidance*, June 20, 1997.

South Carolina Department of Health and Environmental Control, *Risk Based Corrective Action Guidance*, June 20, 1997.

## FIGURES

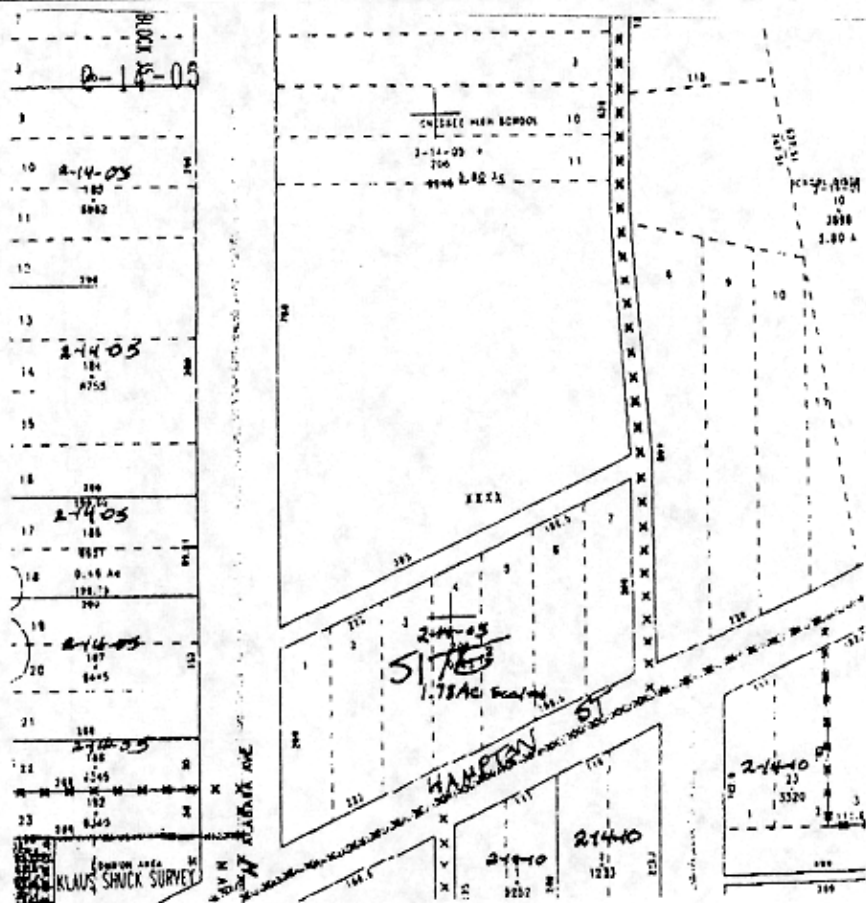


USGS 7.5 min. Topo.  
Chesnee Quad

  
**BROOKS & MEDLOCK**  
 ENGINEERING, PLLC

**Figure 1**  
General Site Location



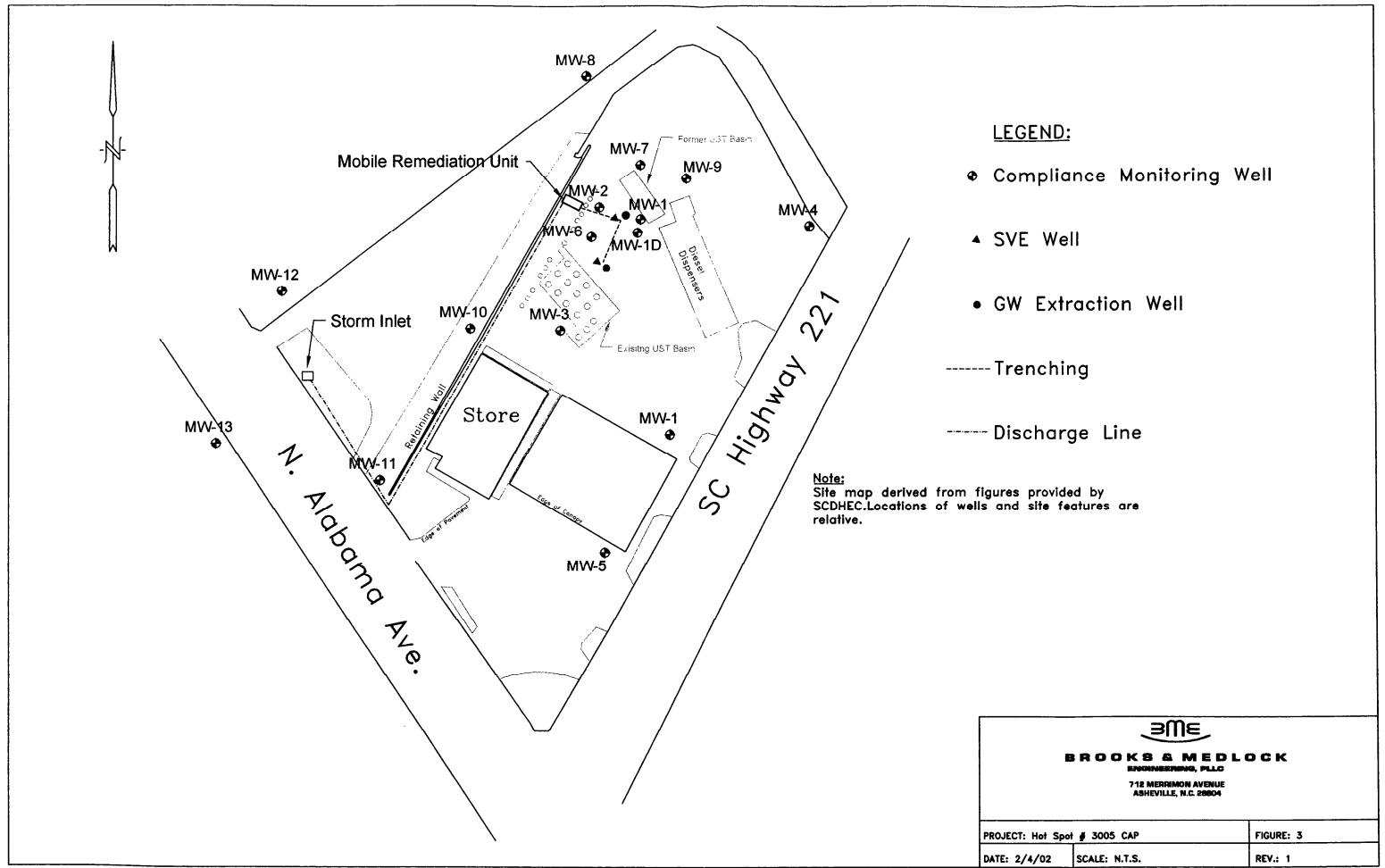


HOT SPOT #3005 CAP ADJACENT PROPERTIES TAX MAP IDENTIFICATION		
Parcel	Owner	Mailing Address
2-14-06-010	Spartanburg County Schools	Chesnee High School 212 N. Alabama Ave. Chesnee, SC 29323
2-14-06-014	Frieda Harmon	P.O. Box 97 Chesnee, SC 29327
2-14-06-015	Claude Schmid	130 Winfield Drive Spartanburg, SC 29307
2-14-10-001	James Thorne	P.O. Box 358 Chesnee, SC 29323
2-14-10-004	Rocky Blackwell	115 Eber Drive Cowpens, SC 29330
2-14-10-006 thru 014	Ruth McBrayer	P.O. Box 68 Chesnee, SC 29323
2-14-10-004.01	Daniel Meeks	108 Hampton Street Chesnee, SC 29323
2-14-10-004.02	Lola Blackwell	110 Hampton Street Chesnee, SC 29323
2-14-05-185	Bobby Bearden	1132 S. Rutherford Street Blacksburg, SC 29702
2-14-05-187	Hannah Lancaster	P.O. Box 301 Chesnee, SC 29323
2-14-05-188	Michael Henderson	128 W. Cherokee Street Chesnee, SC 29323

Hot Spot # 3005  
Chesnee, SC



Figure 2  
Tax Map ID



**APPENDIX I**  
**CALCULATIONS**

## Estimate for Minimum Pumping Rate From Extraction Well

\*Estimate the Radius of Influence from soil permeability:

$$R = C (H - h_w) k^{1/2}$$

Where:

C = imperial coefficient = 3 for gravity flow to a well

H = original piezometric surface

$h_w$  = height above confining layer during pumping

k = aquifer hydraulic conductivity in  $10^{-4}$  cm/s

k =	1.15E-04 cm/sec	equals	1.15 $10^{-4}$ cm/s
H =	10 ft	equals	10 ft
$h_w$ =	5 ft	equals	4.5 ft
R =			17.69427874 ft

Flow for a fully penetrating well at steady state:

$$Q = \pi k [(H^2 - h_w^2) / \ln(R/r_w)]$$

where:

Q = pumping rate

k = aquifer hydraulic conductivity

R = radius of influence

$r_w$  = extraction well radius

H = original piezometric surface

$h_w$  = height above confining layer during pumping

k =	1.15E-04 cm/sec	equals	2.26E-04 ft/min
R =		equals	17.6942787 ft
$r_w$ =	2 in	equals	0.16666667 ft
H =	10 ft	equals	10 ft
$h_w$ =	4.5 ft	equals	4.5 ft
Q =	0.01215 cfm	equals	0.09087264 gpm

\*Source: Army Corp. of Engineers TM 5-818-5

**APPENDIX II**  
**MANUFACTURERS SPECIFICATIONS**

**NPDES PERMIT APPLICATION PACKAGE**

NOTICE OF INTENT  
NPDES GENERAL PERMIT  
PERMIT NO. SCG830000

The following are items required for the Notice of Intent for discharge of petroleum contaminated groundwater as specified in Permit No. SCG830000.

1. Name of facility: Hot Spot # 3005  
Address of facility: 107 Hampton Street  
Chesnee, SC  
Physical Address: Same  
  
Location: Intersection of SC Highway 221 and N. Alabama Rd. in Chesnee, SC.  
The outfall latitude/longitude is 35° 9' 5.8" / 81° 5' 36"
2. No SIC Code represents the activities at the site as the facility operates as a retail convenient store.
3. Operator's Name: Brooks & Medlock Engineering, PLLC  
Operator's Address: 712 Merrimon Ave.  
Asheville, NC 28804  
Operator's Phone: (828) 232-4700  
Operator's Status: Private Corporation
4. No other NPDES Permits exist for this site.
5. The discharge is into the storm sewer system near the corner of S.C. Highway 221 and N. Alabama Blvd. The storm sewer drains into Little Buck Creek which is a tributary of Buck Creek which drains into the Pacolet River.
6. A summary of the most recent lab analysis is attached. This summary is provided by SCDHEC Bureau of UST Management. Copies of laboratory analytical are on file at the Bureau of UST Management for Site ID No. 12719.
7. A copy of a topographic quadrant map showing the proposed point of discharge is attached.
8. The groundwater contamination was the result of a leaking underground petroleum storage tank. The petroleum product is either gasoline or diesel fuel.
9. The flow discharge is estimated to be between 6 and 10 gpm.
10. The only easement required to discharge to the storm sewer inlet is an encroachment permit from the South Carolina Department of Transportation. An encroachment permit has been applied for and should be approved within 30 days of the submittal of the permit application.

<b>FORM 1</b>		<b>U.S. ENVIRONMENTAL PROTECTION AGENCY</b> <b>GENERAL INFORMATION</b> <i>Consolidated Permits Program</i> <i>(Read the "General Instructions" before starting.)</i>	<b>I. EPA I.D. NUMBER</b> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:5%;">S</td> <td style="width:5%;">T</td> <td style="width:5%;">A</td> <td style="width:5%;">C</td> </tr> <tr> <td style="width:5%;">F</td> <td style="width:5%;"> </td> <td style="width:5%;"> </td> <td style="width:5%;">D</td> </tr> <tr> <td style="width:5%;">1</td> <td style="width:5%;">2</td> <td style="width:5%;">13</td> <td style="width:5%;">15</td> </tr> </table>	S	T	A	C	F			D	1	2	13	15
S	T	A	C												
F			D												
1	2	13	15												
<b>LABEL ITEMS</b> I. EPA I.D. NUMBER III. FACILITY NAME V. FACILITY MAILING ADDRESS VI. FACILITY LOCATION		<b>PLEASE PLACE LABEL IN THIS SPACE</b>	<b>GENERAL INSTRUCTIONS</b> If a preprinted label has been provided, affix it in the designated space. Review the information carefully. If any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent (the area to the left of the label space lists the information that should appear), please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete items I, III, V, and VI (except VI-B which must be completed regardless). Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.												

**II. POLLUTANT CHARACTERISTICS**

**INSTRUCTIONS:** Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms.

SPECIFIC QUESTIONS	MARK 'X'			SPECIFIC QUESTIONS	MARK 'X'		
	YES	NO	FORM ATTACHED		YES	NO	FORM ATTACHED
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)	X			B. Does or will this facility (either existing or proposed) include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)	X		
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)	X			D. Is this a proposed facility (other than those described in A or B above) which will result in a discharge to waters of the U.S.? (FORM 2D)	X		X
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)	X			F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)	X		
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)	X			H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)	X		
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)	X			J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)	X		

**III. NAME OF FACILITY**

C	1	SKIP	HOT SPOT #3005
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**IV. FACILITY CONTACT**

A. NAME & TITLE (last, first, & title)	B. PHONE (area code & no.)
2 LAUTHER, JUDY ENV. COMPLIANCE	864 585

**V. FACILITY MAILING ADDRESS**

A. STREET OR P.O. BOX			
C	3	P.O. BOX 2527	
B. CITY OR TOWN		C. STATE	D. ZIP CODE
4 SPARTANBURG		SC	29304

**VI. FACILITY LOCATION**

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER			
C	5	107 HAMPTON ST.	
B. COUNTY NAME			
SPARTANBURG			
C. CITY OR TOWN		D. STATE	E. ZIP CODE
6 CHESNEE		SC	29323
F. COUNTY CODE (if known)			



**VII. SIC CODES (4-digit, in order of priority)**

A. FIRST				B. SECOND			
C	7	(specify)	E	7	(specify)		
15	16	17	18	19	20	21	22
C. THIRD				D. FOURTH			
C	7	(specify)	E	7	(specify)		
15	16	17	18	19	20	21	22

**VIII. OPERATOR INFORMATION**

A. NAME  
 B. BROOKS & MEDLOCK ENGINEERING

B. Is the name listed in Item VIII-A also the owner?  
 YES  NO

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box, if "Other", specify.)  
 F = FEDERAL M = PUBLIC (other than federal or state) P (specify)  
 S = STATE O = OTHER (specify)

D. PHONE (area code & no.)

E. STREET OR P.O. BOX  
 712 MERRIMON AVE.

F. CITY OR TOWN  
 B. ASHEVILLE

G. STATE  
 NC

H. ZIP CODE  
 28804

IX. INDIAN LAND  
 Is the facility located on Indian lands?  
 YES  NO

**X. EXISTING ENVIRONMENTAL PERMITS**

A. NPDES (Discharges to Surface Water)				D. PSD (Air Emissions from Proposed Sources)			
C	T	I		C	T	I	
9	N			9	P		
15	16	17	18	19	20	21	22
B. UIC (Underground Injection of Fluids)				E. OTHER (specify)			
C	T	I		C	T	I	(specify)
9	U			9			
15	16	17	18	19	20	21	22
C. RCRA (Hazardous Wastes)				E. OTHER (specify)			
C	T	I		C	T	I	(specify)
9	R			9			
15	16	17	18	19	20	21	22

**XI. MAP**  
 Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

**XII. NATURE OF BUSINESS (provide a brief description)**  
 THE FACILITY IS CURRENTLY AN OPERATIONAL CONVENIENT STORE. THE DISCHARGE IS FROM AN ON-SITE REMEDIATION EFFORT OF PETROLEUM CONTAMINATED GROUNDWATER.

**XIII. CERTIFICATION (see instructions)**  
 I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)  
 MARK BROOKS, ENVIRON. ENGINEER

B. SIGNATURE  


C. DATE SIGNED  
 11/31/02

COMMENTS FOR OFFICIAL USE ONLY



B. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Item III-A. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined (e.g., for certain mining activities), provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

C. Except for storm runoff, leaks, or spills, will any of the discharges described in item III-A be intermittent or seasonal?

Yes (complete the following table)

No (go to item IV)

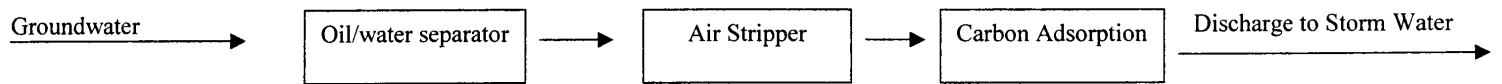
Outfall Number	1. Frequency		2. Flow		c. Duration (in days)
	a. Days Per Week (specify average)	b. Months Per Year (specify average)	a. Maximum Daily Flow Rate (in mgd)	b. Maximum Total Volume (specify with units)	

**IV. Production**

If there is an applicable production-based effluent guideline or NSPS, for each outfall list the estimated level of production (projection of actual production level, not design), expressed in the terms and units used in the applicable effluent guideline or NSPS, for each of the first 3 years of operation. If production is likely to vary, you may also submit alternative estimates (attach a separate sheet).

Year	a. Quantity Per Day	b. Units of Measure	c. Operation, Product, Material, etc (specify)

**Line Diagram for Form 2D of NPDES Permit Application**





C. Use the space below to list any of the pollutants listed in Table 2D-3 of the instructions which you know or have reason to believe will be discharged from any outfall. For every pollutant you list, briefly describe the reasons you believe it will be present.

1. Pollutant	2. Reason for Discharge
BENZENE, TOLUENE, XYLENES, ETHYLBENZENE, NAPHTHALENE, EDB, MTBE	EACH POLLUTANT IS KNOWN TO EXIST IN THE RAW INFLUENT. ADEQUATE TREATMENT BY THE ENGINEERED SYSTEM SHOULD ADEQUATELY RESULT IN NON-DETECTABLE CONCENTRATIONS OF THESE POLLUTANTS.

#### VI. Engineering Report on Wastewater Treatment

A. If there is any technical evaluation concerning your wastewater treatment, including engineering reports or pilot plant studies, check the appropriate box below.

Report Available

No Report

B. Provide the name and location of any existing plant(s) which, to the best of your knowledge, resembles this production facility with respect to production processes, wastewater constituents, or wastewater treatments.

Name	Location

**VII. Other Information (Optional)**

Use the space below to expand upon any of the above questions or to bring to the attention of the reviewer any other information you feel should be considered in establishing permit limitations for the proposed facility. Attach additional sheets if necessary.

THE PROCESS OF TREATING PETROLEUM CONTAMINATED GROUNDWATER IS A COMMON AND VERY WELL DOCUMENTED PROCESS. TREATMENT OF VOLATILE ORGANIC COMPOUNDS BY AIR STRIPPING AND GRANULAR ACTIVATED CARBON ARE DOCUMENTED EFFECTIVE FORMS OF TREATMENT. THE PROJECTED FLOWS AT THIS SITE ARE INCONSEQUENTIAL (<10GPM) WHEN PROPERLY TREATED.

**VIII. Certification**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

A. Name and Official Title (type or print)

B. Phone No.

MARK BROOKS, PE ENVIRONMENTAL ENGINEER

428-232-4700

C. Signature

D. Date Signed



1/31/02



**BUREAU OF WATER**  
**SLUDGE DISPOSAL SUPPLEMENT FOR NPDES AND ND PERMIT APPLICATIONS**

Facility Name: HOT SPOT # 3005

Permit Number: SC00 \_\_\_\_\_ (leave blank for a new facility)

or ND00 \_\_\_\_\_

Please check your proposed or current sludge disposal procedure:

**I. Existing Facilities:**

- Lagoon or other facility with no routine sludge disposal. Please attach a letter that addresses the approximate schedule for sludge removal and address the anticipated disposal method (note that the proposed sludge disposal method must be approved by the Department prior to initiation).
- Sludge disposal at another wastewater treatment facility. Attached is a recent letter of acceptance dated \_\_\_\_\_. This letter must include the NPDES or ND number of the treatment facility accepting the sludge for disposal. If no previous SCDHEC approval has been granted on the disposal method, then please include a detailed report on the existing sludge disposal method. See the attached requirements for Sludge Disposal Report A. If a previous SCDHEC approval has been granted, then include a recent analysis that shows the non-hazardous nature of the sludge or a signed statement that the sludge characteristics have not changes since the last analysis.
- Sludge disposal at a landfill. If the landfill is SWAIP (special waste) approved, an recent acceptance letter from the landfill is acceptable. If the landfill is not SWAIP approved, attached is SCDHEC Solid and Hazardous Waste approval dated \_\_\_\_\_, or other SCDHEC approval dated \_\_\_\_\_. If no previous approval has been granted on the disposal method, then please include a detailed report on the existing sludge disposal method. See the attached requirements for Sludge Disposal Report B.
- Sludge disposal by Beneficial Use of Sludge. Attached is SCDHEC approval letter or program approval dated \_\_\_\_\_. If no previous approval has been granted on the disposal method, then please include a detailed report on the existing sludge disposal method. See the attached requirements for Sludge Disposal Report C.

**II. Proposed Facilities:**

- Lagoon or other facility with no routine sludge disposal. Please attach a letter that addresses the approximate schedule for sludge removal and address the anticipated disposal method (note that the proposed sludge disposal method must be approved by the Department prior to initiation).
- Sludge disposal at another wastewater treatment facility. Please include a detailed report on the proposed sludge disposal method. See the attached requirements for Sludge Disposal Report A.
- Sludge disposal at a landfill. Please include a detailed report on the proposed sludge disposal method. See the attached requirements for Sludge Disposal Report B.
- Sludge disposal by Beneficial Use. Please include a detailed report on the proposed sludge disposal method. See the attached requirements for Sludge Disposal Report C.

**Send this form and the appropriate disposal report (if applicable) with your NPDES or ND permit application.**

**ALSO SEE ATTACHED INSTRUCTIONS**



## **SLUDGE DISPOSAL ATTACHMENT**

No sludge will be generated from the treatment of contaminated groundwater at the site referenced in the attached DHEC Sludge Disposal Supplement for NPDES Permit Applications.

**SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL  
BUREAU OF WATER**

**LOCATION SUPPLEMENT FOR ND AND NPDES PERMIT APPLICATIONS**

FACILITY: HOT SPOT # 3005 DATE: 11/31/02

ITEM 1: Please give a short description of the plant location, if the address is not a specific location. Example: Plant is located at the interchange of Interstate 26 and U.S. Highway #1.

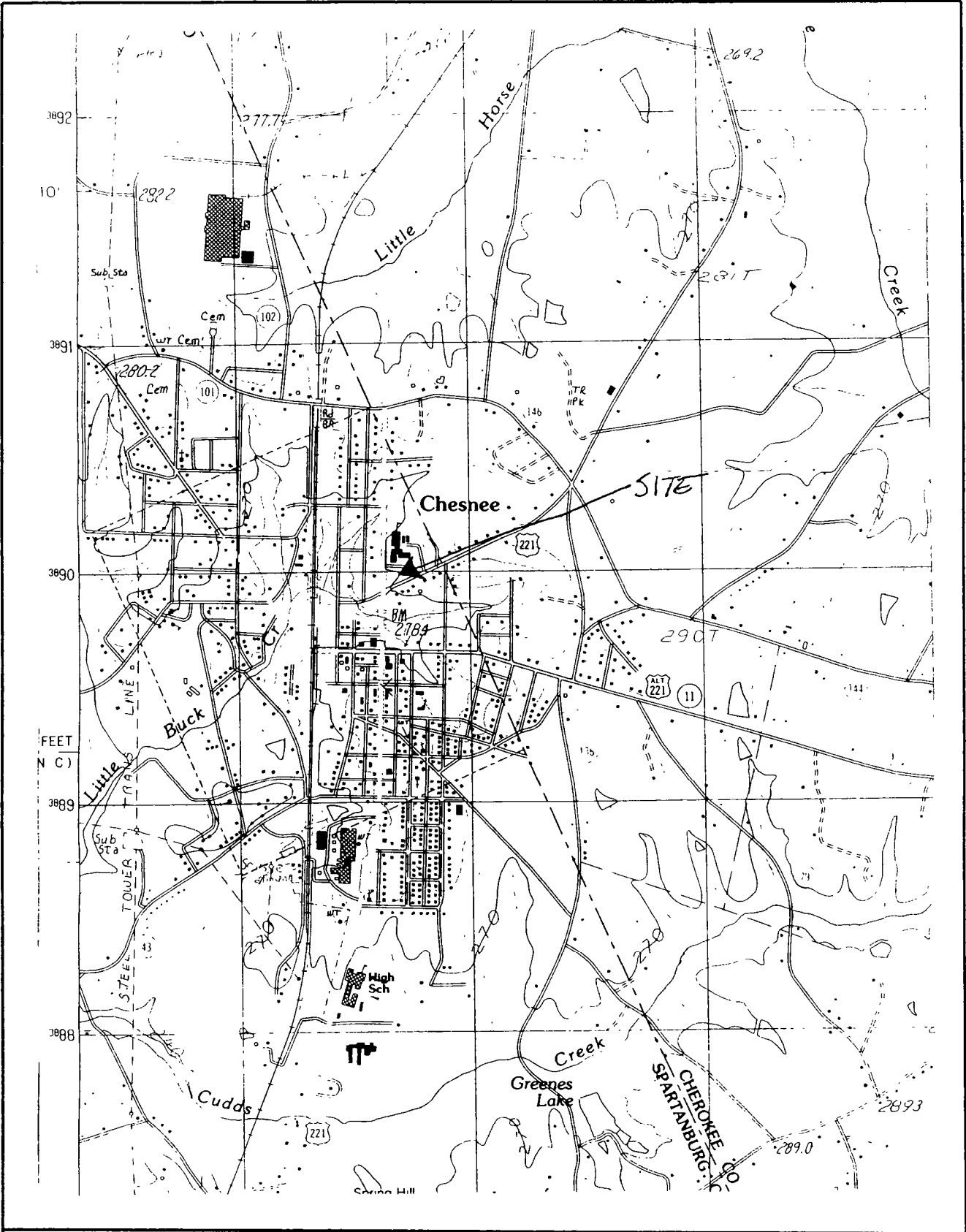
SITE ADDRESS IS 107 HARTON ST. CHESNEE, SC, NEAR THE INTERSECTION OF N. ALABAMA AVE. AND SC HIGHWAY 221 IN CHESNEE.

ITEM 2: Please give a description of the location of the discharge point into the receiving stream using some landmark as a reference point, i.e., bridge, stream, road junction, the plant itself, etc. Give the direction and the distance in feet from the reference point. Example: Discharge #001 is into Johnny Creek approximately 300 feet directly behind the plant. Discharge #002 is into Doris Creek 150 feet downstream from U.S. Highway #30 bridge.

THE POINT OF DISCHARGE IS A STORM DRAIN INLET ON N. ALABAMA AVE. THE STORM DRAIN IS ADJACENT TO THE HOT SPOT # 3005 STORAGE, APPROXIMATELY 100 FEET NORTHWEST OF THE INTERSECTION WITH N. ALABAMA AVE. AND SC HIGHWAY 221.

ITEM 3: Please locate the discharge on a U.S. Geological Survey 7 1/2 minute quad sheet (or a 15 minute quad if a 7 1/2 quad is not available for the area). The entire quad sheet need not be submitted. An 8 1/2 by 11 inch photocopy of the applicable portion of the map is sufficient. The quad sheet name must be provided on the copy submitted to the Department. USGS Maps are available at the SC Dept. Of Natural Resources/Map Division, 2221 Devine Street, Suite 222, Columbia, SC 29205. Phone number is 734-9108.

RETURN TO: SCDHEC  
Bureau of Water  
NPDES Administration  
2600 Bull Street  
Columbia, SC 29201



USGS 7.5 min. Topo.  
Chesnee Quad

  
**BROOKS & MEDLOCK**  
 ENGINEERING, PLLC

**Figure 1**  
General Site Location

**BAQC PERMIT EXEMPTION REQUEST**

February 5, 2002

South Carolina DHEC  
Bureau of Air Quality Control  
2600 Bull Street  
Columbia, South Carolina 29201

ATTENTION: Mr. Kevin Clark

Reference: **AIR PERMIT EXEMPTION REQUEST**  
Groundwater Remediation System  
Hot Spot # 3005  
Site ID # 12719  
Chesnee, South Carolina

Dear Mr. Clark:

This letter is to serve as a request to exempt the groundwater remediation system at the Hot Spot # 3005 in Chesnee, South Carolina from air permitting requirements. This request is presented as part of the Corrective Action Plan for the referenced site. Brooks & Medlock Engineering has been chosen as the contractor for the site remediation under the Bureau of UST Management's "Pay-for-Performance" Corrective Action program.

The groundwater remediation system planned for this site employs several remedial technologies. In accordance with BAQC Air Pollution Control Regulations 62.1 Section II F(2)(g), "sources with with...uncontrolled VOC emissions less than 1000 lbs./mo. may not require permits". Each of the remedial technologies proposed herein are estimated to generate significantly less than 1,000 lb./mo. VOC emissions. Each is described below along with potential air emissions.

Groundwater Extraction, Treatment and Discharge

Groundwater extraction, or Pump and Treat, technology is to be employed in a small "source zone" area at the subject site. Extracted groundwater is to be treated with an oil/water separator, shallow tray air stripper granular activated carbon filtration. Based upon the concentration of targeted VOCs in the groundwater plume, we calculate less than 15 pounds of BTEX compounds exist at the site. The system is anticipated to operate for approximately two years. Emissions are anticipated to be somewhat higher initially than they will be later in the life of the project. We estimate monthly emissions to be approximately 3 pounds per month (lb/mo) for the first three months, then rapidly falling to less than 1 lb/mo for the remainder of the project. This is based upon professional experience.

In an effort to comply with BAQC protocol, a BAQC UST Modeling Information sheet is attached for the groundwater extraction system. The Air Toxic Information presents "worst case" emission rates as the input CoC concentrations are maximum dissolved phase solubility for each VOC. The resulting emission rate is based upon the Henry's Law constant for each VOC and the air flow rate of the air stripper. The results indicate that less than 8 lbs/mo. of total VOCs identified will be emitted. We plan to monitor the emissions upon start-up of the system to verify our estimates. Treatment of blower emissions can be implemented should the monitoring results deem this necessary.

#### Soil Vapor Extraction

Remediation of vadose zone CoC and free product on the water table will be initiated with an SVE system. Two (2) 4" diameter vapor extraction wells will be screened at the water table and in the vadose zone and connected to a regenerative blower. As with the air sparging, the emission rate of the SVE system is difficult to estimate as the emission rate is dependent upon air contact with dissolved phase CoC and NAPL. It is assumed that the emission rate will be less than that of air stripper described above and will therefore be inconsequential.

We appreciate your timely review of this exemption request. Please call us at (828) 232-4700 with any questions.

Sincerely,

**Brooks & Medlock Engineering, PLLC**

A handwritten signature in cursive script, appearing to read "Mark Brooks".

Mark Brooks, P.E.

Attachments: BAQC Modeling Sheet  
Calculations



Board: William E Applegate, III. Chairman  
 Hon H Buriss. Vice Chairman  
 Richard E. Jabbour, DDS Secretary

Toney Graham, Jr., MD  
 Sandra J Molander  
 John B. Pate, MD  
 Robert J Stripling, Jr.

Promoting Health, Protecting the Environment

2600 Bull Street, Columbia, SC 29201

**BAQC UST MODELING INFORMATION**

PLEASE FILL OUT COMPLETELY

SITE/COMPANY NAME: Hot Spot # 3005 GWPD ID#: 12719

CLEANUP LOCATION: 107 Hampton Street  
Chesnee, SC

TYPE OF OPERATION (i.e. AIR STRIPPER): Air Stripper

CONTACT: Mark Brooks, PE PHONE: 828-232-4700

**SITE MAPS:**

Please include a scaled plot plan of the site location that clearly shows distances from the stack to the property boundaries. All buildings and/or structures within a radius of 5 stack heights (measured from the stack/vent) shall be incorporated on this plot plan and information on each building and/or structure's height, width, and length shall also be included.

**STACK INFORMATION**

HEIGHT ABOVE GROUND Est. 12' FEET; DIAMETER .333 FEET  
 TEMPERATURE Est. 120 deg F; VELOCITY 23.0 FEET/SECOND

**AIR TOXIC INFORMATION**

AIR TOXIC EMITTED (i.e. BENZENE)	CHEMICAL ABSTRACT SERVICE (CAS) NUMBER	EMISSION RATE LB/HR
A) <u>Benzene</u>	<u>71432</u>	<u>.0016</u>
B) <u>Toluene</u>	<u>108883</u>	<u>.0028</u>
C) <u>Ethylbenzene</u>	<u>100414</u>	<u>.0023</u>
D) <u>Xylenes</u>	<u>1330207</u>	<u>.0027</u>
E) <u>Naphthalene</u>	<u>91203</u>	<u>1.2E-7</u>

Please submit this completed sheet with scaled site maps to the appropriate SCDHEC project manager at the Ground-Water Protection Division, 2600 Bull Street, Columbia, SC 29201.

## Air Stripping Dissolved Phase Volatilization Mass Removal Rate\*

I Calculate gas phase concentrations

$$C_g = H_i C_a / RT$$

where:  $C_g$  = gas phase concentration of CoC in mg/l

$H_i$  = Henry's law constant

R = universal gas constant = .082 L-atm/mol

T = temperature in degrees Kelvin = 273.15+20°C

$C_a$  = aqueous concentration (worst case)

	Benzene	Toluene	Ethylbenz.	Xylenes	Naphth.	MTBE
$H_i =$	5.59	6.37	6.43	7.62	0.048	0.15
RT =	24.1	24.1	24.1	24.1	24.1	24.1
$C_a =$	226	301	280	278	2	5,110
$C_g$ (mg/l) =	52.4207	79.5589	74.705394	87.8988	0.00398	31.8049793

II Calculate Emission Rate

$$ER = C_g \times Q$$

where: ER = VOC Emission rate

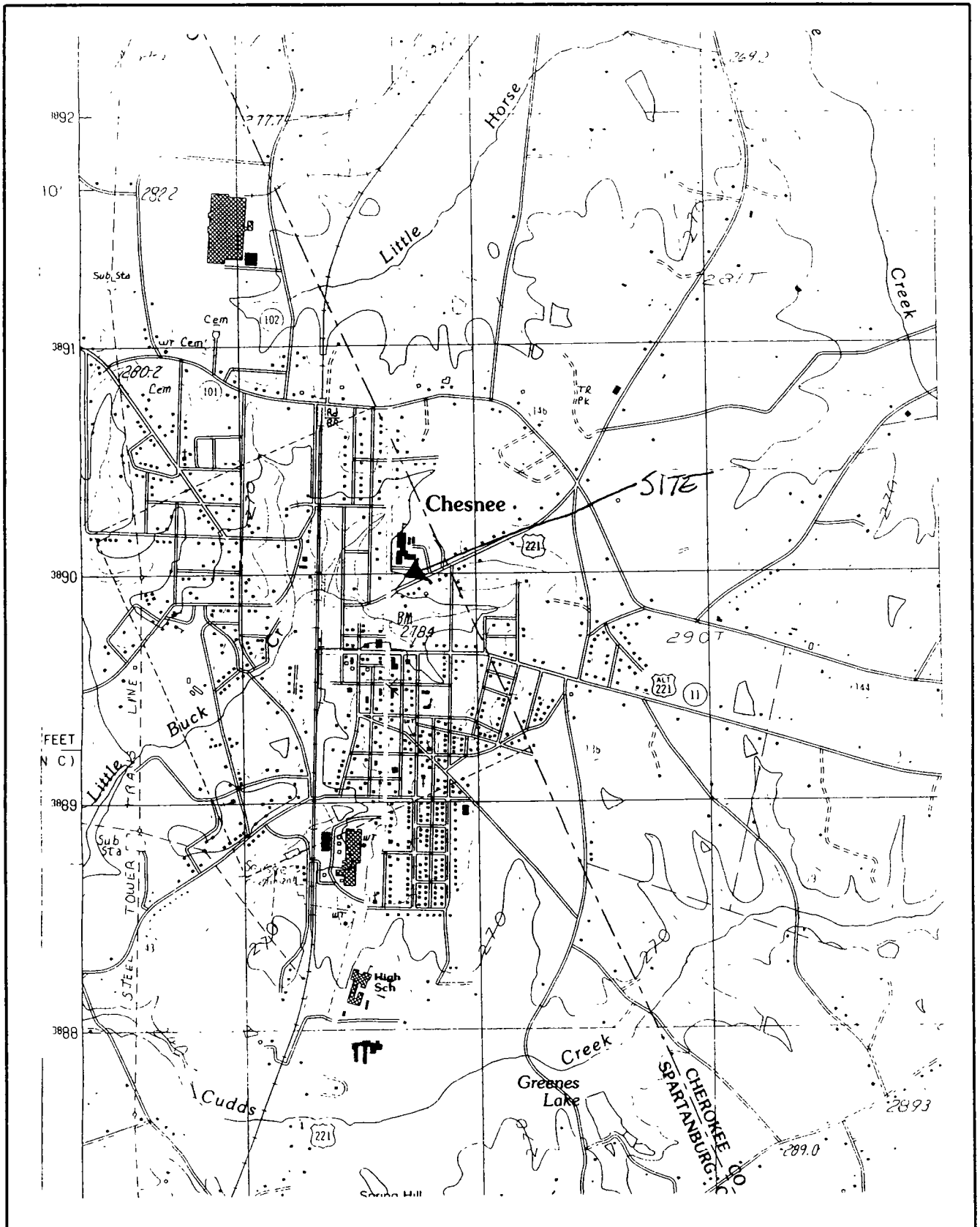
Q = air flow rate

	Benzene	Toluene	Ethylbenz.	Xylenes	Naphth.	MTBE
$C_g$ (mg/l) =	52.4207	79.5589	74.705394	87.8988	0.00398	31.8049793
Q (cfm) =	120	120	120	120	120	120

**ER = (mg/min)** 12.3626 18.7626 17.618022 20.7295 0.00094 7.50067427

**ER Total (lb/mo) 7.57537**

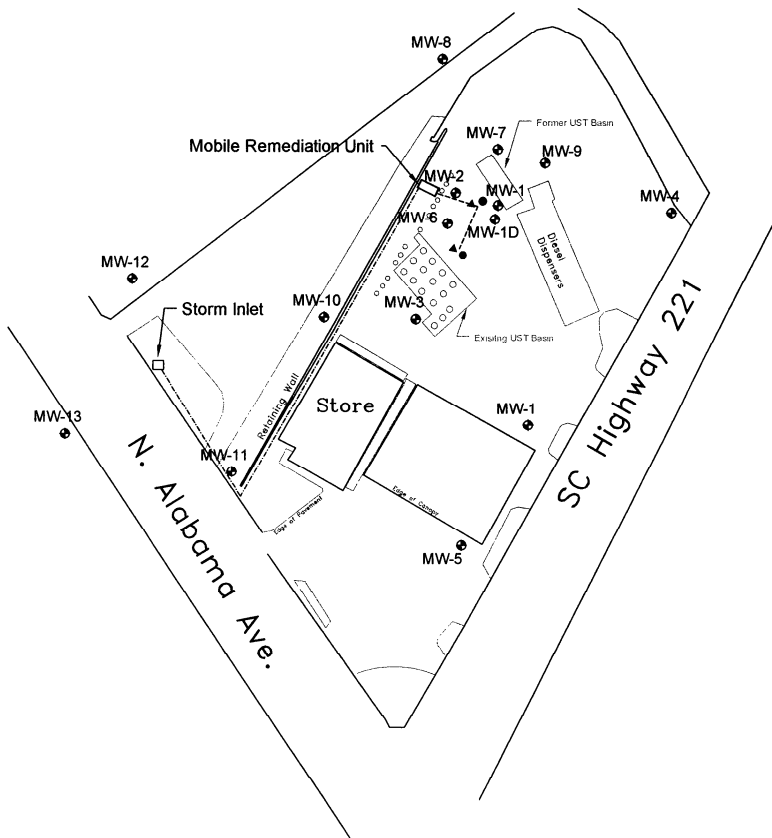




USGS 7.5 min. Topo.  
Chesnee Quad

  
**BROOKS & MEDLOCK**  
 ENGINEERING, PLLC


**Figure 1**  
General Site Location



**LEGEND:**

- Compliance Monitoring Well
- ▲ SVE Well
- GW Extraction Well
- Trenching
- . - . - Discharge Line

**Note:**  
 Site map derived from figures provided by  
 SCDHEC. Locations of wells and site features are  
 relative.

 <b>BROOKS &amp; MEDLOCK</b> <small>ENGINEERING, PLLC</small> <small>712 MERRIMON AVENUE</small> <small>ASHEVILLE, N.C. 28804</small>		
PROJECT: Hot Spot # 3005 CAP	FIGURE: 3	
DATE: 2/4/02	SCALE: N.T.S.	REV.: 1



UNDERGROUND STORAGE TANK PROGRAM  
BUREAU OF LAND AND WASTE MANAGEMENT

Phone (800) 826-5435 Fax (803) 898-4330

500 Bull Street  
Columbia, SC 29201-1708

FEB 15 2002

Ms. Frieda Harmon  
PO Box 97  
Chesnee, SC 29327

Re: Hot Spot 3005, 107 Hampton St., Chesnee, SC  
UST Permit # 12719  
Release reported on November 3, 1993  
Corrective Action Plan received February 7, 2002  
Spartanburg County

Dear Ms. Harmon:

As you may be aware, gasoline constituents have been identified in the soil and ground water at the referenced facility. Cleanup is warranted to protect human health and the environment. Brooks & Medlock Engineering has been retained on behalf of R.L. Jordan Oil Company of North Carolina to respond to the petroleum release. Brooks & Medlock has submitted a Corrective Action Plan to clean up the impacted soil and ground water using groundwater pumping combined with oil/water separation, air stripping, and carbon absorption and soil vapor extraction.

Section 280.67 of the South Carolina Underground Storage Tank Regulations requires the Bureau of Land and Waste Management Underground Storage Tank Program to provide notice to those members of the public that may be affected by the planned corrective action. No impact or construction activity on your property is anticipated. Your continued patience is appreciated.

If you have any questions or comments regarding the proposed corrective actions, please call or write me at (803) 898-4362 or (800) 826-5435 (within SC only). All comments should be submitted within twenty (20) days of the date of this correspondence.

Sincerely,

Debra L. Thoma, Hydrogeologist  
State Lead and Field Services Section  
Assessment and Corrective Action Division



Enc.: Public Notice  
Citizen's Guide to Soil Vapor Extraction and Air Sparging

cc: Technical/Read Files  
DHEC/UST/DLT/2.8.02/14472PN\_LTRS



2600 Bull Street  
Columbia, SC 29201-1708

# NOTICE

State of South Carolina  
Department of Health and Environmental Control  
Columbia, South Carolina

Public Notice #: 12719-01

Date: February 14, 2002

## NOTICE OF PROPOSED CORRECTIVE ACTION

Section 280.67 of the S.C. Underground Storage Tank Control Regulations (R.61-92) requires that any Corrective Action Plan prepared to meet the requirements of 280.66 must be placed on notice for public comment. The following applicant has submitted a Corrective Action Plan for the rehabilitation of ground water contaminated by petroleum constituents released from underground storage tanks (USTs).

**Applicant:** *R.L. Jordan Oil Company of North Carolina, PO Box 2527, Spartanburg, South Carolina, 29304.* The Hot Spot #3005 Station has six USTs used for storage of petroleum products, which are still in operation. The facility is located at 107 Hampton Street in Spartanburg County, South Carolina.

**Corrective action will consist of removing the groundwater by pumping and treating with an oil/water separator, air stripper, and activated carbon followed by natural attenuation. Soil Vapor extraction will be used to remove residual petroleum.**

A copy of the Corrective Action Plan is available for review at the Department's Freedom of Information Office, 2600 Bull Street in Columbia, SC. Please call (803) 898-3882 to schedule an appointment.

**Persons wishing to comment upon or object to Corrective Action approval are invited to submit same in writing within twenty (20) days of the date of this notice to South Carolina Department of Health and Environmental Control, Underground Storage Tank Program, 2600 Bull Street, Columbia, S.C. 29201 or call Debra Thoma at (803) 898-4350.** The public notice # should be placed at the top of the first page of comments. Where there is a significant degree of public interest, the Department will hold a public hearing.

Please bring the foregoing to the attention of persons who you know will be interested in this matter.



UNDERGROUND STORAGE TANK PROGRAM  
BUREAU OF LAND AND WASTE MANAGEMENT

Phone (800) 826-5435 Fax (803) 898-4330

FEB 15 2002

100 Bull Street  
Columbia, SC 29201-1708

Mr. Claude Schmid  
130 Winfield Dr.  
Spartanburg, SC 29307

Re: Hot Spot 3005, 107 Hampton St., Chesnee, SC  
UST Permit # 12719  
Release reported on November 3, 1993  
Corrective Action Plan received February 7, 2002  
Spartanburg County

Dear Mr. Schmid:

As you may be aware, gasoline constituents have been identified in the soil and ground water at the referenced facility. Cleanup is warranted to protect human health and the environment. Brooks & Medlock Engineering has been retained on behalf of R.L. Jordan Oil Company of North Carolina to respond to the petroleum release. Brooks & Medlock has submitted a Corrective Action Plan to clean up the impacted soil and ground water using groundwater pumping combined with oil/water separation, air stripping, and carbon absorption and soil vapor extraction.

Section 280.67 of the South Carolina Underground Storage Tank Regulations requires the Bureau of Land and Waste Management Underground Storage Tank Program to provide notice to those members of the public that may be affected by the planned corrective action. No impact or construction activity on your property is anticipated. Your continued patience is appreciated.

If you have any questions or comments regarding the proposed corrective actions, please call or write me at (803) 898-4362 or (800) 826-5435 (within SC only). All comments should be submitted within twenty (20) days of the date of this correspondence.

Sincerely,

Debra L. Thoma, Hydrogeologist  
State Lead and Field Services Section  
Assessment and Corrective Action Division

Enc.: Public Notice  
Citizen's Guide to Soil Vapor Extraction and Air Sparging

cc: Technical/Read Files

DHEC/UST/DLT/2.8.02/14472PN\_LTRS



UNDERGROUND STORAGE TANK PROGRAM  
BUREAU OF LAND AND WASTE MANAGEMENT

Phone (800) 826-5435 Fax (803) 898-4330

FEB 15 2002

500 Bull Street  
Columbia, SC 29201-1708

Mr. James Thorne  
PO Box 358  
Inman, SC 29349

Re: Hot Spot 3005, 107 Hampton St., Chesnee, SC  
UST Permit # 12719  
Release reported on November 3, 1993  
Corrective Action Plan received February 7, 2002  
Spartanburg County

Dear Mr. Thorne:

As you may be aware, gasoline constituents have been identified in the soil and ground water at the referenced facility. Cleanup is warranted to protect human health and the environment. Brooks & Medlock Engineering has been retained on behalf of R.L. Jordan Oil Company of North Carolina to respond to the petroleum release. Brooks & Medlock has submitted a Corrective Action Plan to clean up the impacted soil and ground water using groundwater pumping combined with oil/water separation, air stripping, and carbon absorption and soil vapor extraction.

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Sincerely,

Debra L. Thoma, Hydrogeologist  
State Lead and Field Services Section  
Assessment and Corrective Action Division

Enc.: Public Notice  
Citizen's Guide to Soil Vapor Extraction and Air Sparging

cc: Technical/Read Files

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UNDERGROUND STORAGE TANK PROGRAM  
BUREAU OF LAND AND WASTE MANAGEMENT

Phone (800) 826-5435 Fax (803) 898-4330

500 Bull Street  
Columbia, SC 29201-1708

FEB 15 2002

Mr. Rocky Blackwell  
115 Eber Dr.  
Chesnee, SC 29330

Re: Hot Spot 3005, 107 Hampton St., Chesnee, SC  
UST Permit # 12719  
Release reported on November 3, 1993  
Corrective Action Plan received February 7, 2002  
Spartanburg County

Dear Mr. Blackwell:

As you may be aware, gasoline constituents have been identified in the soil and ground water at the referenced facility. Cleanup is warranted to protect human health and the environment. Brooks & Medlock Engineering has been retained on behalf of R.L. Jordan Oil Company of North Carolina to respond to the petroleum release. Brooks & Medlock has submitted a Corrective Action Plan to clean up the impacted soil and ground water using groundwater pumping combined with oil/water separation, air stripping, and carbon absorption and soil vapor extraction.

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Sincerely,

Debra L. Thoma, Hydrogeologist  
State Lead and Field Services Section  
Assessment and Corrective Action Division

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cc: Technical/Read Files

DHEC/UST/DLT/2.8.02/14472PN\_LTRS



UNDERGROUND STORAGE TANK PROGRAM  
BUREAU OF LAND AND WASTE MANAGEMENT

Phone (800) 826-5435 Fax (803) 898-4330

100 Bull Street  
Columbia, SC 29201-1708

FEB 15 2002

Ms. Ruth McBrayer  
PO Box 68  
Chesnee, SC 29323

Re: Hot Spot 3005, 107 Hampton St., Chesnee, SC  
UST Permit # 12719  
Release reported on November 3, 1993  
Corrective Action Plan received February 7, 2002  
Spartanburg County

Dear Ms. McBrayer:

As you may be aware, gasoline constituents have been identified in the soil and ground water at the referenced facility. Cleanup is warranted to protect human health and the environment. Brooks & Medlock Engineering has been retained on behalf of R.L. Jordan Oil Company of North Carolina to respond to the petroleum release. Brooks & Medlock has submitted a Corrective Action Plan to clean up the impacted soil and ground water using groundwater pumping combined with oil/water separation, air stripping, and carbon absorption and soil vapor extraction.

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Sincerely,

Debra L. Thoma, Hydrogeologist  
State Lead and Field Services Section  
Assessment and Corrective Action Division

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DHEC/UST/DLT/2.8.02/14472PN\_LTRS





UNDERGROUND STORAGE TANK PROGRAM  
BUREAU OF LAND AND WASTE MANAGEMENT

Phone (800) 826-5435 Fax (803) 898-4330

100 Bull Street  
Columbia, SC 29201-1708

FEB 15 2002

Mr. Daniel Meeks  
108 Hampton Street  
Chesnee, SC 29323

Re: Hot Spot 3005, 107 Hampton St., Chesnee, SC  
UST Permit # 12719  
Release reported on November 3, 1993  
Corrective Action Plan received February 7, 2002  
Spartanburg County

Dear Mr. Meeks:

As you may be aware, gasoline constituents have been identified in the soil and ground water at the referenced facility. Cleanup is warranted to protect human health and the environment. Brooks & Medlock Engineering has been retained on behalf of R.L. Jordan Oil Company of North Carolina to respond to the petroleum release. Brooks & Medlock has submitted a Corrective Action Plan to clean up the impacted soil and ground water using groundwater pumping combined with oil/water separation, air stripping, and carbon absorption and soil vapor extraction.

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Sincerely,

Debra L. Thoma, Hydrogeologist  
State Lead and Field Services Section  
Assessment and Corrective Action Division

Enc.: Public Notice  
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cc: Technical/Read Files

DHEC/UST/DLT/2.8.02/14472PN\_LTRS



UNDERGROUND STORAGE TANK PROGRAM  
BUREAU OF LAND AND WASTE MANAGEMENT

Phone (800) 826-5435 Fax (803) 898-4330

100 Bull Street  
Columbia, SC 29201-1708

FEB 15 2002

Ms. Lola Blackwell  
110 Hampton Street  
Chesnee, SC 29323

Re: Hot Spot 3005, 107 Hampton St., Chesnee, SC  
UST Permit # 12719  
Release reported on November 3, 1993  
Corrective Action Plan received February 7, 2002  
Spartanburg County

Dear Ms. Blackwell:

As you may be aware, gasoline constituents have been identified in the soil and ground water at the referenced facility. Cleanup is warranted to protect human health and the environment. Brooks & Medlock Engineering has been retained on behalf of R.L. Jordan Oil Company of North Carolina to respond to the petroleum release. Brooks & Medlock has submitted a Corrective Action Plan to clean up the impacted soil and ground water using groundwater pumping combined with oil/water separation, air stripping, and carbon absorption and soil vapor extraction.

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Sincerely,

Debra L. Thoma, Hydrogeologist  
State Lead and Field Services Section  
Assessment and Corrective Action Division

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cc: Technical/Read Files



UNDERGROUND STORAGE TANK PROGRAM  
BUREAU OF LAND AND WASTE MANAGEMENT

Phone (800) 826-5435 Fax (803) 898-4330

100 Bull Street  
Columbia, SC 29201-1708

FEB 15 2002

Mr. Bobby Bearden  
1132 S. Rutherford St.  
Blacksburg, SC 29702

Re: Hot Spot 3005, 107 Hampton St., Chesnee, SC  
UST Permit # 12719  
Release reported on November 3, 1993  
Corrective Action Plan received February 7, 2002  
Spartanburg County

Dear Mr. Bearden:

As you may be aware, gasoline constituents have been identified in the soil and ground water at the referenced facility. Cleanup is warranted to protect human health and the environment. Brooks & Medlock Engineering has been retained on behalf of R.L. Jordan Oil Company of North Carolina to respond to the petroleum release. Brooks & Medlock has submitted a Corrective Action Plan to clean up the impacted soil and ground water using groundwater pumping combined with oil/water separation, air stripping, and carbon absorption and soil vapor extraction.

Section 280.67 of the South Carolina Underground Storage Tank Regulations requires the Bureau of Land and Waste Management Underground Storage Tank Program to provide notice to those members of the public that may be affected by the planned corrective action. No impact or construction activity on your property is anticipated. Your continued patience is appreciated.

If you have any questions or comments regarding the proposed corrective actions, please call or write me at (803) 898-4362 or (800) 826-5435 (within SC only). All comments should be submitted within twenty (20) days of the date of this correspondence.

Sincerely,

Debra L. Thoma, Hydrogeologist  
State Lead and Field Services Section  
Assessment and Corrective Action Division

Enc.: Public Notice  
Citizen's Guide to Soil Vapor Extraction and Air Sparging

cc: Technical/Read Files



UNDERGROUND STORAGE TANK PROGRAM  
BUREAU OF LAND AND WASTE MANAGEMENT

Phone (800) 826-5435 Fax (803) 898-4330

500 Bull Street  
Columbia, SC 29201-1708

FEB 15 2002

Ms. Hannah Lancaster  
PO Box 301  
Chesnee, SC 29323

Re: Hot Spot 3005, 107 Hampton St., Chesnee, SC  
UST Permit # 12719  
Release reported on November 3, 1993  
Corrective Action Plan received February 7, 2002  
Spartanburg County

Dear Ms. Lancaster:

As you may be aware, gasoline constituents have been identified in the soil and ground water at the referenced facility. Cleanup is warranted to protect human health and the environment. Brooks & Medlock Engineering has been retained on behalf of R.L. Jordan Oil Company of North Carolina to respond to the petroleum release. Brooks & Medlock has submitted a Corrective Action Plan to clean up the impacted soil and ground water using groundwater pumping combined with oil/water separation, air stripping, and carbon absorption and soil vapor extraction.

Section 280.67 of the South Carolina Underground Storage Tank Regulations requires the Bureau of Land and Waste Management Underground Storage Tank Program to provide notice to those members of the public that may be affected by the planned corrective action. No impact or construction activity on your property is anticipated. Your continued patience is appreciated.

If you have any questions or comments regarding the proposed corrective actions, please call or write me at (803) 898-4362 or (800) 826-5435 (within SC only). All comments should be submitted within twenty (20) days of the date of this correspondence.

Sincerely,

Debra L. Thoma, Hydrogeologist  
State Lead and Field Services Section  
Assessment and Corrective Action Division

Enc.: Public Notice  
Citizen's Guide to Soil Vapor Extraction and Air Sparging

cc: Technical/Read Files



600 Bull Street  
Columbia, SC 29201-1708

UNDERGROUND STORAGE TANK PROGRAM  
BUREAU OF LAND AND WASTE MANAGEMENT

Phone (800) 826-5435 Fax (803) 898-4330

FEB 15 2002

Ms. Judith Laughter  
R.L. Jordan Oil Company of North Carolina  
PO Box 2527  
Spartanburg, SC 29304

Re: Hot Spot 3005, 107 Hampton St., Chesnee, SC  
UST Permit # 12719; CA#13851  
Bid #: SB-18123-12/20/01-HW; PO#: 385179  
Release reported on November 3, 1993  
Corrective Action Plan received February 7, 2002  
Spartanburg County

Dear Ms. Laughter:

As you may be aware, gasoline constituents have been identified in the soil and ground water at the referenced facility. To protect human health, Brooks & Medlock Engineering has been retained on your behalf to initiate corrective action of the impacted groundwater by reducing the concentration of gasoline constituents to acceptable levels using groundwater pumping combined with oil/water separation, air stripping, and carbon absorption and soil vapor extraction. A copy of the proposed corrective action plan is enclosed for your records.

Section 280.67 of the South Carolina Underground Storage Tank Regulations requires the Bureau of Land and Waste Management Underground Storage Tank Program to provide notice to those members of the public that may be affected by the planned corrective action. The installation of the permanent soil vapor extraction points, associated piping, and the collection of ground-water samples from the monitoring wells is necessary as part of the corrective action measures; however, Brooks & Medlock has been directed to coordinate with you and to minimize any inconvenience to you. Your continued cooperation is appreciated. A copy of the public notice is enclosed for your information.

If you have any questions or comments regarding the proposed corrective actions, please call or write me at (803) 898-4362 or (800) 826-5435 (within SC only). All comments should be submitted within twenty (20) days of the date of this correspondence.

Sincerely,

Debra L. Thoma, Hydrogeologist  
State Lead and Field Services Section  
Assessment and Corrective Action Division

Enc.: Corrective Action Plan  
Public Notice  
Citizen's Guide to Soil Vapor Extraction and Air Sparging

cc: Technical/Read File  
DHEC/UST/DLT/2.8.02/14472PN\_LTRS



500 Bull Street  
Columbia, SC 29201-1708

UNDERGROUND STORAGE TANK PROGRAM  
BUREAU OF LAND AND WASTE MANAGEMENT

Phone (800) 826-5435 Fax (803) 898-4330

FEB 15 2002

Mr. Scott Turner, Principal  
Chesnee High School  
795 S. Alabama Ave.  
Chesnee, SC 29323

Re: Hot Spot 3005, 107 Hampton St., Chesnee, SC  
UST Permit # 12719  
Release reported on November 3, 1993  
Corrective Action Plan received February 7, 2002  
Spartanburg County

Dear Mr. Turner:

As you may be aware, gasoline constituents have been identified in the soil and ground water at the referenced facility. Cleanup is warranted to protect human health and the environment. Brooks & Medlock Engineering has been retained on behalf of R.L. Jordan Oil Company of North Carolina to respond to the petroleum release. Brooks & Medlock has submitted a Corrective Action Plan to clean up the impacted soil and ground water using groundwater pumping combined with oil/water separation, air stripping, and carbon absorption and soil vapor extraction.

Section 280.67 of the South Carolina Underground Storage Tank Regulations requires the Bureau of Land and Waste Management Underground Storage Tank Program to provide notice to those members of the public that may be affected by the planned corrective action. No impact or construction activity on your property is anticipated. Your continued patience is appreciated.

If you have any questions or comments regarding the proposed corrective actions, please call or write me at (803) 898-4362 or (800) 826-5435 (within SC only). All comments should be submitted within twenty (20) days of the date of this correspondence.

Sincerely,

Debra L. Thoma, Hydrogeologist  
State Lead and Field Services Section  
Assessment and Corrective Action Division

Enc.: Public Notice  
Citizen's Guide to Soil Vapor Extraction and Air Sparging

cc: Technical/Read Files



100 Bull Street  
Columbia, SC 29201-1708

UNDERGROUND STORAGE TANK PROGRAM  
BUREAU OF LAND AND WASTE MANAGEMENT

Phone (800) 826-5435 Fax (803) 898-4330

FEB 15 2002

Mr. Michael Henderson  
128 W. Cherokee St.  
Chesnee, SC 29323

Re: Hot Spot 3005, 107 Hampton St., Chesnee, SC  
UST Permit # 12719  
Release reported on November 3, 1993  
Corrective Action Plan received February 7, 2002  
Spartanburg County

Dear Mr. Henderson:

As you may be aware, gasoline constituents have been identified in the soil and ground water at the referenced facility. Cleanup is warranted to protect human health and the environment. Brooks & Medlock Engineering has been retained on behalf of R.L. Jordan Oil Company of North Carolina to respond to the petroleum release. Brooks & Medlock has submitted a Corrective Action Plan to clean up the impacted soil and ground water using groundwater pumping combined with oil/water separation, air stripping, and carbon absorption and soil vapor extraction.

Section 280.67 of the South Carolina Underground Storage Tank Regulations requires the Bureau of Land and Waste Management Underground Storage Tank Program to provide notice to those members of the public that may be affected by the planned corrective action. No impact or construction activity on your property is anticipated. Your continued patience is appreciated.

If you have any questions or comments regarding the proposed corrective actions, please call or write me at (803) 898-4362 or (800) 826-5435 (within SC only). All comments should be submitted within twenty (20) days of the date of this correspondence.

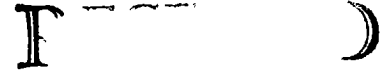
Sincerely,

Debra L. Thoma, Hydrogeologist  
State Lead and Field Services Section  
Assessment and Corrective Action Division

Enc.: Public Notice  
Citizen's Guide to Soil Vapor Extraction and Air Sparging

cc: Technical/Read Files

# Letter Of Transmittal



FEB 20 2002

712 Merrimon Avenue  
Asheville, NC 28804  
Phone (828) 232-4700  
Fax (828) 232-1331

**Underground Storage  
Tank Program**

<b>Send to:</b> Debra Thomas SCDHEC Bureau of UST Management 2600 Bull Street Columbia, SC 29201	<b>From:</b> Mark Brooks, PE Brooks & Medlock Engineering 712 Merrimon Ave. Asheville, NC 28804
Attention:	Date: February 19, 2002
Office Location:	Project No.: 15402-117-01
Re: Engineering Report for Industrial Wastewater	

**Transmittal**

Document	Date	Use
Original Construction Permit Application	2/19/02	Application Approval
3 copies Construction Permit App. w/ Attachments	2/19/02	Application Approval
Original Preliminary Engineering Report	2/19/02	Application Approval
1 Copy Preliminary Engineering Report	2/19/02	Application Approval
\$200 application fee check	2/19/02	Application Approval

Debra:  
Please forward this to Melinda Vickers at the Bureau of Water ASAP. She's expecting it.  
Please let me know what else I need to do, if anything, for getting all of the permits and applications approved.

Mark







**BROOKS & MEDLOCK**  
ENGINEERING, PLLC

February 11, 2002

South Carolina DHEC  
Bureau of Underground Storage Tank Management  
2600 Bull Street  
Columbia, South Carolina 29201

RECEIVED

FEB 13 2002

Underground  
Tank

ATTENTION: Ms. Debra Thomas

Reference: **CORRECTIVE ACTION PLAN - ADDENDUM**  
Hot Spot # 3005  
Site ID # 12719

Dear Ms. Thomas:

Enclosed are the missing Attachments to the referenced Corrective Action Plan submitted to your office February 7, 2002. They include Figure 5 (Mobile Remediation Unit Diagram) and Manufacturers Specifications (cut-sheets) for equipment incorporated in the Mobile Remediation Unit. I apologize for the delay in getting you this information. The Corrective Action Plan and accompanying permit applications should now be complete.

If you have any questions or comments, please contact me at (828) 232-4700.

Sincerely,

**Brooks & Medlock Engineering, PLLC**

Mark Brooks, P.E.  
Environmental Engineer

  
**BROOKS & MEDLOCK**  
ENGINEERING, PLLC

February 5, 2002

South Carolina DHEC  
Bureau of Underground Storage Tank Management  
2600 Bull Street  
Columbia, South Carolina 29201



FEB 07 2002

Underground Storage  
Tank Program

ATTENTION: Ms. Debra Thomas

Reference: **CORRECTIVE ACTION PLAN**  
Hot Spot # 3005  
Site ID # 12719

Dear Ms. Thomas:

In accordance with South Carolina Department of Health and Environmental Control (SCDHEC) procurement policy and procedures, Brooks & Medlock Engineering, PLLC (B&ME) has been selected the corrective action contractor for the Hot Spot # 3005 (Site ID # 12719). Enclosed is the completed Corrective Action Plan (CAP) for the referenced site. This report has been prepared in general accordance with the SCDHEC *Corrective Action Guidance*. The requested number of CAP copies (3) is attached.

Also included are the following permit applications and request letters:

- NPDES Permit Application and attachments for treated groundwater discharge;
- BAQC exemption letter request for soil vapor extraction system; and
- BAQC exemption letter request for air stripper.

As the first invoice and verification of the system installation must be submitted by May 8, 2002, we would appreciate your timely review of this CAP. If you have any questions or comments, please contact me at (828) 232-4700.

Sincerely,

**Brooks & Medlock Engineering, PLLC**



Mark Brooks, P.E.  
Environmental Engineer

cc: Judy Laughter, R.L. Jordan Oil Company



FORM: 90-411\*  
(Rev. 3/96)

200 Clay Avenue  
Middlesex, NJ 08846  
Tel: (908) 752-5000  
Fax: (908) 752-5020

Box 1007, 1730 Miller Steer  
McMinnville, Or 97128  
Tel: (503) 434-5964  
Fax: (503) 472-1989

## Installation, Operating Instructions and Parts List 27 Modular Series Regulator

### APPLICATION

The 27 Series modular regulator is constructed of lightweight aluminum in a compact configuration, combining ease of installation with superior system design flexibility. Each unit is adaptable for conversion to duo or trio systems either with clamps which connect without disturbing existing piping or with standard nipples. A modular distribution block allows a portion of the air supply to be directed to a branch line or device.

### FEATURES & BENEFITS

- Supplied with either 3/8", 1/2" or 3/4" in/out ports and two (2) full flow 1/4" gauge ports.
- Balanced poppet valve design assures superior performance.
- Diaphragm type regulator allows low initial pressure droop while maintaining high sensitivity.
- Nonrising regulation adjustment knob locks in place and maintains desired pressure setting.

### TECHNICAL DATA

Maximum Supply Pressure .....300 PSIG

Maximum Operating Temperature .....250°F

#### Pressure Range:

Standard .....0-125 psi

Option .....0-250 psi

Option .....0-25 psi

Option .....0-60 psi

#### Material:

Body .....Die Cast Aluminum

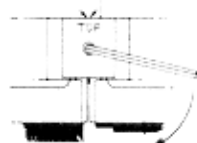
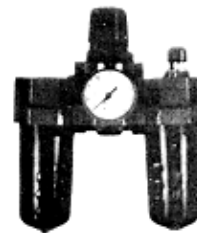
Adjusting Knob .....High Impact Plastic

#### Dimensions and Weights:

Height .....5 1/2"

Width .....2 3/4"

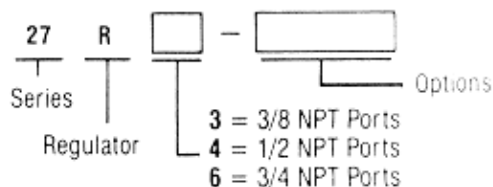
Weight .....1 3/4 lb.



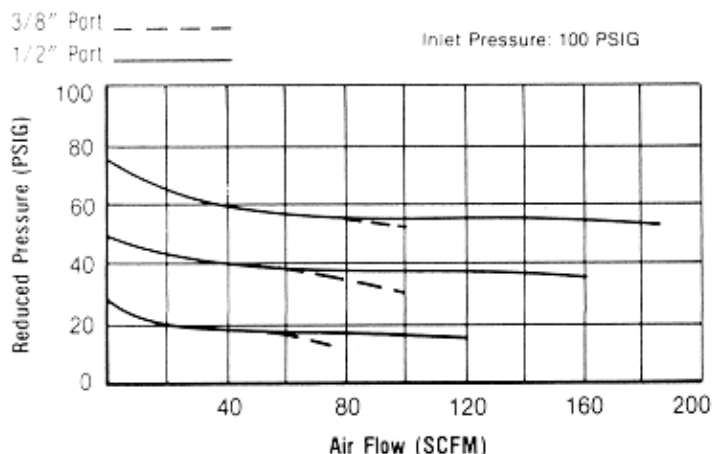
Modular clamp eliminates the need for a hex nipple between units

### ORDERING INFORMATION

Select the basic model number representing the required port size. Choose the desired option(s) from the table below and add the corresponding suffix(es) to the basic model number in alphabetical order.



### REGULATOR PERFORMANCE DATA



### OPTIONS

OPTIONS	SUFFIX
Gauge	G
High Pressure Spring (0-250 psi)	H
Extra Low Pressure Spring (0-25 psi)	J
Low Pressure Spring (0-60 psi)	L
Panel Mount	P

### ACCESSORIES

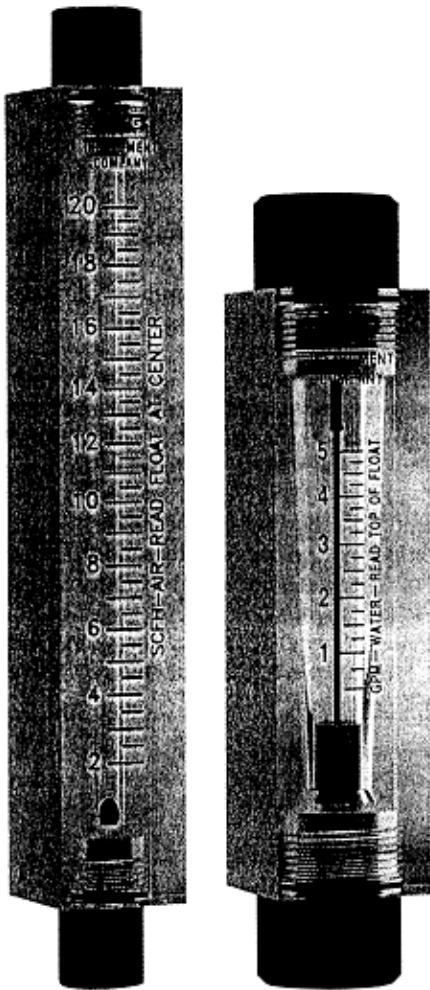
Mounting Bracket	27RBA
Panel Nut	27RPA
Recommended Std. Press. Gauge 0-160 PSI (2" dial)	8800-160
Recommended Optional Gauge 0-300 PSI (2" dial)	8800-300
0-60 PSI (2" dial)	8800-60
Connecting Clamp Kit (includes two connecting clamps, two screws, one o-ring and one allen wrench)	27MB01
Wall Mount Connecting Clamp Kit (includes one wall mount connecting clamp, one connecting clamp, two screws, one o-ring and one allen wrench)	27MB02
Distribution Block	27DB01

# 7500 SERIES

## MACHINED CAST ACRYLIC, BLOCK TYPE,

### 7500 SERIES

- All meter blocks are precision CNC machined from solid cast acrylic stock. (Cast material is made from the most durable of all Acrylic resins.)
- Direct reading scales for Water or Air are standard. (Special scales are available.)
- A uniform white back on all 7500 Series meters enhances scale reading ability.
- Factory certified calibrations are available.



### 7510 MODELS

- Connections are in line (vertical) type.
- Scale lengths are 50mm (2"), 100mm (4"), 127mm (5") and 250mm (10").
- Fitting material is either PVC or Brass depending on model. (316 Stainless Steel is optional.)
- Panel mounting threaded inserts are included.

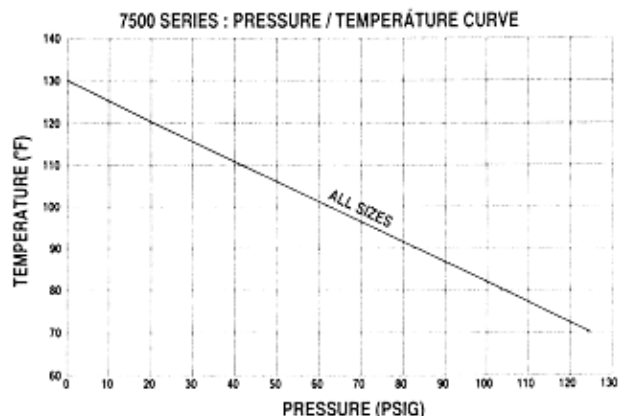
### 7511 MODELS

- Large diameter taper and floats provide reduced pressure loss and superior float stability.
- Same in line connections and panel mount capability as 7510 models.
- Choose from either 50mm (2") or 127mm (5") scale lengths.
- Seven flow ranges are available from 1 to 5 GPM-- Water and 8 to 20 SCFM Air.
- Connections are 1/2" FNPT.
- PVC fittings are standard. (Brass or 316 Stainless Steel is optional.)
- Panel mounting threaded inserts are included.

#### METER CAPACITIES

7 GPH to 20 GPM--Water  
2 SCFH to 62 SCFM--Air

SCALE LENGTH	FULL SCALE ACCURACY (+)
50 mm (2")	6%
75 mm (3")	4%
100 mm (4")	4%
127 mm (5")	3%
250 mm (10")	2%





TUTHILL CORPORATION

M-D Pneumatics Division

COMPETTOR®  
A-16 Product Brochure

## Rotary Positive Blowers



**LEADING THE SEARCH  
FOR NEW SOLUTIONS**

Feb. 08 2002 04:14PM P3

PHONE NO. :

FROM : Panasonic FAX SYSTEM

Feb. 08 2002 04:16PM P3

PHONE NO. :

FROM : Panasonic FAX SYSTEM

11 P. 1/10

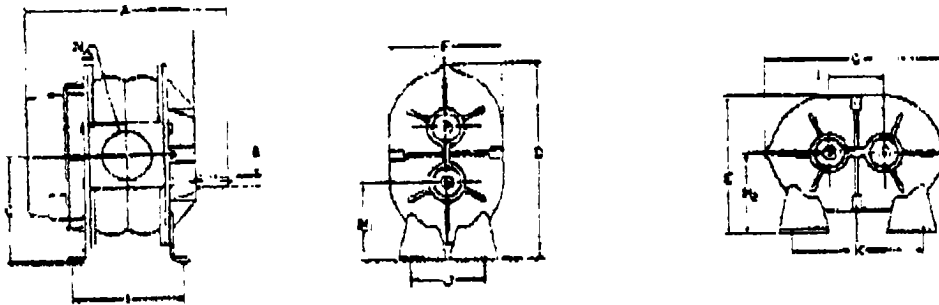
## Upgrade to M-D Quality Without Changing Your Piping

- **Taper mounted timing gears**  
Carburized, precision ground timing gears reduce gear noise and provide for long gear life. Gears are taper mounted to rotor shafts with locknuts for easy removal and installation.
- **Oversized bearings**  
Oversized bearings for long operating life. Rotor shafts include ball bearings. Bearing on drive shaft is cylindrical roller type for the load of V-belt drive applications.
- **Effective lubrication and sealing**  
Timing gears and gear end bearings are oil splash lubricated. Drive end bearings are grease lubricated. Lubricant chambers are isolated by Viton® lip seals, and blower end plates are vented to atmosphere to prevent pressure accumulation against the seals. A hypocycloidal gear housing provides extra gear and bearing lubrication.
- **One piece housing**  
Rugged, single piece housing of precision machined grey iron. Integral standard pipe connections for easy installation. Models 4000 through 7000 include extra heavy housings for reduction of noise.
- **Lobe type rotors**  
High strength, ductile iron rotors are dynamically balanced for vibration free, bi-directional rotation.
- **Horizontal or vertical mounting**  
A horizontal or vertical air flow is easily achieved by rearranging the mounting feet positions.
- **Drive shaft**  
Drive shaft is supported by a cylindrical roller bearing to handle greater overhung V-belt loads. Drive shaft location can be specified in any position, top or bottom for horizontal flow machines, left or right for vertical flow machines.

### Dimensions

Horizontal Flow Configuration

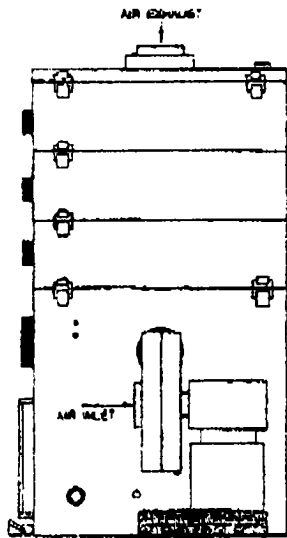
Vertical Flow Configuration



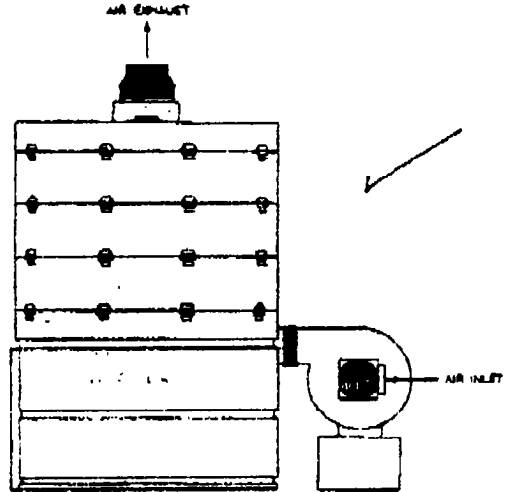
MODEL	A	B	C	D	E	F	G	H <sub>1</sub>	H <sub>2</sub>	I	J	K	L	M	WT. (LBS.)
2502	3.75	0.625	5.00	9.69	6.38	6.25	8.28	3.75	3.75	4.00	3.50	3.50	2.50	1"NPT	38
2504	11.75	0.625	5.00	9.69	6.38	6.25	8.28	3.75	3.75	6.00	3.50	3.50	2.50	2"NPT	48
3003	12.19	0.750	6.75	2.81	8.66	7.75	11.13	5.00	5.00	5.25	5.38	5.38	3.50	2"NPT	78
3006	14.58	0.750	6.75	2.81	8.66	7.75	11.13	5.00	5.00	6.82	5.38	5.38	3.50	2 1/2"NPT	108
4002	12.58	0.875	8.25	15.13	10.63	8.75	12.63	8.25	8.25	5.06	6.13	7.00	4.00	1 1/2"NPT	90
4005	15.31	0.875	8.25	15.13	10.63	8.75	12.63	8.25	8.25	7.81	6.13	7.00	4.00	2 1/2"NPT	114
4007	17.34	0.875	8.25	15.13	10.50	8.75	12.63	8.25	8.25	9.56	6.13	7.00	4.00	3"NPT	133
5003	14.44	1.125	8.75	17.36	11.68	11.00	15.75	8.25	8.75	8.13	7.00	7.00	5.00	2 1/2"NPT	145
5006	17.90	1.125	8.75	17.36	12.28	11.00	15.75	8.25	8.75	9.28	7.00	7.00	5.00	4"NPT	173
5008	20.90	1.125	8.75	17.36	12.28	11.00	15.75	8.25	8.75	12.25	7.00	7.00	5.00	4"NPT	215
6005	18.34	1.375	11.75	21.69	15.13	12.75	19.81	8.75	8.75	7.83	8.00	11.00	6.00	3"NPT	240
6008	21.34	1.375	11.75	21.69	15.13	12.75	19.81	8.75	8.75	10.83	8.00	11.00	6.00	5"NPT	300
6016	26.38	1.375	11.75	21.69	16.25	12.75	19.81	8.75	8.75	17.83	8.00	11.00	6.00	6"FLG	446
7006	19.94	1.562	14.50	26.13	20.68	19.38	23.25	11.00	11.00	8.75	11.00	18.00	7.00	4"NPT	425
7011	25.14	1.562	14.50	26.13	19.50	19.00	23.25	11.00	11.00	14.75	11.00	18.00	7.00	6"FLG	566
7018	32.16	1.562	14.50	26.13	18.50	19.00	23.25	11.00	11.00	21.75	11.00	18.00	7.00	8"FLG	675

All dimensions are approximate and should not be used for construction. Certified drawings are available from your local M-D representative or distributor.

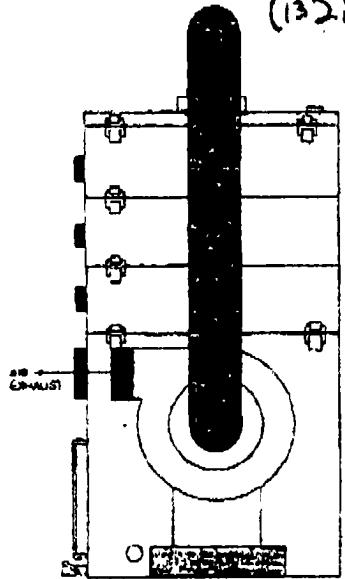
**The ShallowTray  
Basic System**



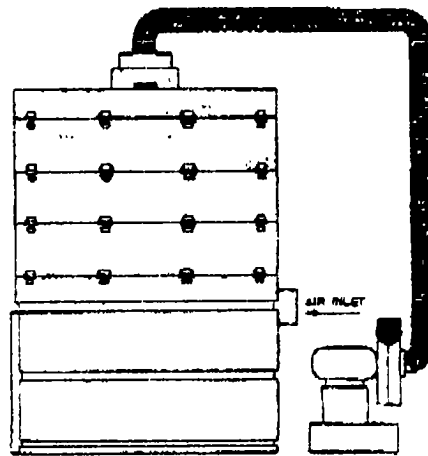
1. 2331 STAINLESS PRESSURE SYSTEM (FORCED DRAFT)



2. 2331 LLOPE PRESSURE SYSTEM (FORCED DRAFT)



3. 2331 STAINLESS VACUUM SYSTEM (INDUCED DRAFT)



4. 2331 LLOPE VACUUM SYSTEM (INDUCED DRAFT)

# BASIC SYSTEM

ShallowTray systems are fabricated from rugged 304L stainless steel, 316L stainless steel, or molded polyethylene, and are typically supplied with all the components listed in this section. Read through each component description for a better understanding of its function.

## Pressure Versus Vacuum Set-up

There are two versions of the basic system referred to in this manual. They are defined as follows:

- 1. Pressure System** – The blower is installed so that the stripper tank and aeration trays are pressurized. This arrangement can be used when the maximum total system pressure (air stripper plus other downstream air equipment) does not exceed 22 inches (55.8cm) Water Column (W.C.) pressure or vacuum for plastic stripper, and 32 inches (81.6cm) W.C. for stainless steel stripper.
- 2. Vacuum System** – The blower is installed so that the stripper cover and aeration trays are under a vacuum. Removal efficiency is the same as for a pressure system. This is the proper arrangement when total system pressure would exceed the values listed above. In this setup, the blower induces the required vacuum on the stripper, and also provides the required additional pressure for downstream air equipment.

## High Water Flow Versus Low Water Flow Systems

There are two water flow range options for the basic system. They are referred to in this manual as **Low Flow** and **High Flow** systems. The high flow system requires a blower that produces an additional 4 inches (10.2cm) W.C. pressure/vacuum compared to the low flow system blower. The low and high water flow ranges for each ShallowTray series are listed in the table below:

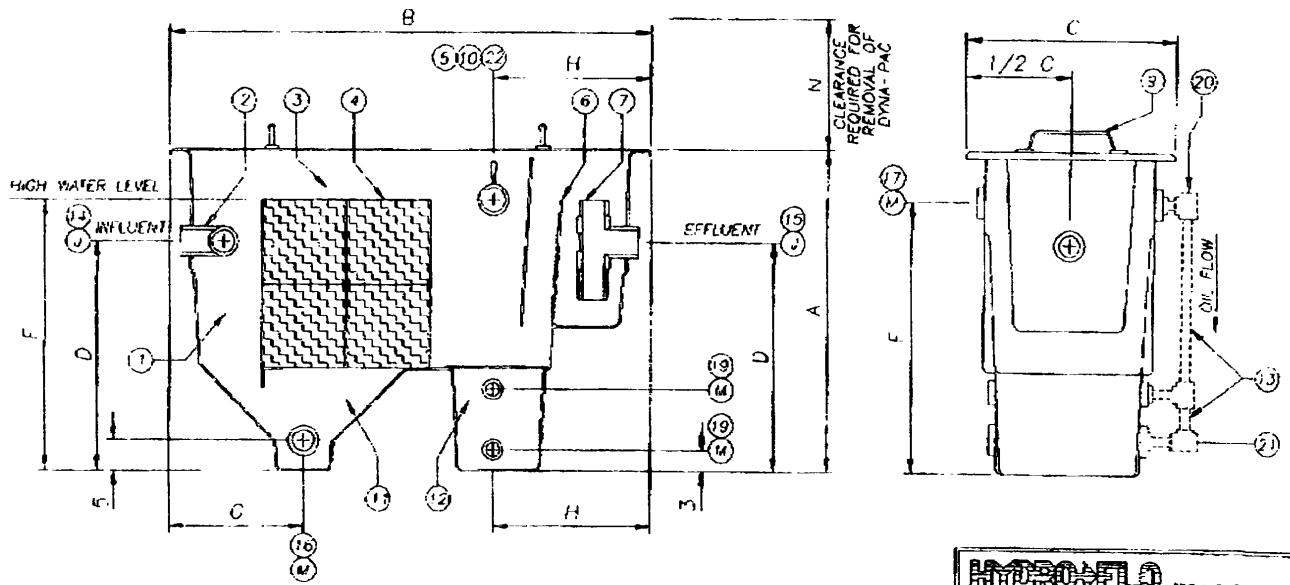
ShallowTray Series	Low Water Flow Range	High Water Flow Range
1300P	0.5 - 15 gpm	N/A
1300	0.5 - 15 gpm	16 - 30 gpm
✓ 2300P	1 - 30 gpm	31 - 50 gpm
2300	1 - 30 gpm	31 - 45 gpm
2600	2 - 60 gpm	61 - 115 gpm
3600	3 - 90 gpm	91 - 160 gpm
31200	4 - 150 gpm	151 - 425 gpm
41200	6 - 200 gpm	201 - 550 gpm



THE SEPARATOR SHALL BE FABRICATED OF FIBERGLASS REINFORCED POLYESTER RESIN CONSISTING OF 25% CHOPPED FIBERGLASS AS A MINIMUM

THE ENTIRE EXTERIOR SURFACE OF THE SEPARATOR SHALL BE COVERED WITH A CONTINUOUS LAYER OF CHEMICALLY RESISTANT, ULTRAVIOLET STABILIZED, POLYESTER GELCOAT

ITEM	QTY	DESCRIPTION	ITEM	QTY	DESCRIPTION
1	1	INFLUENT DIFFUSION CHAMBER	12	1	OIL RESERVOIR
2	1	INFLUENT DIFFUSION BAFFLE	13	1	SIGHT GLASS ASSY (OPTIONAL)
3	1	SEPARATION CHAMBER	14	1	INFLUENT
4	1	REMOVABLE DYNA-PAC	15	1	EFFLUENT
5	1	ADJUSTABLE OIL SKIMMING WEIR	16	2	SLUDGE CUTLET/DRAIN
6	1	EFFLUENT WEIR	17	2	OIL OUTLET
7	2	EFFLUENT SKIMM BAFFLE	18	2	OIL RESERVOIR INLET
8	2	EFFLUENT CHAMBER	19	2	OIL RESERVOIR OUTLET
9	1	REMOVABLE LID WITH HANDLES	20	1	ITEM 13 ASSY INLET, 1" S
10	1	ROTARY PIPE SKIMMER	21	1	ITEM 13 ASSY OUTLET, 1" V
11	1	SLUDGE COLLECTION CHAMBER	22	2	VENT 1"



**HYDROFLOW TECHNOLOGIES INC**

DYNA-PAC COMPRESSING TYPE OIL/WATER SEPARATOR  
 WITH ROTARY PIPE SKIMMER  
 MOLDER FIBERGLASS CONSTRUCTION  
 DP-7 (MRL) DP-36 C. & DRAWING

DESIGNED BY: [Signature] DATE: 10-14-93  
 DRAWN BY: [Signature] DATE: 5/16/93  
 CHECKED BY: [Signature] DATE: [Blank]  
 TOLERANCE ON FRACTIONS +/- 3/16  
 DRAWING NUMBER: DP-GA00-BU4

**Performance Tables**

Pressure performance is based on inlet temperature of 70°F, and inlet pressure of 14.70 PSIA.

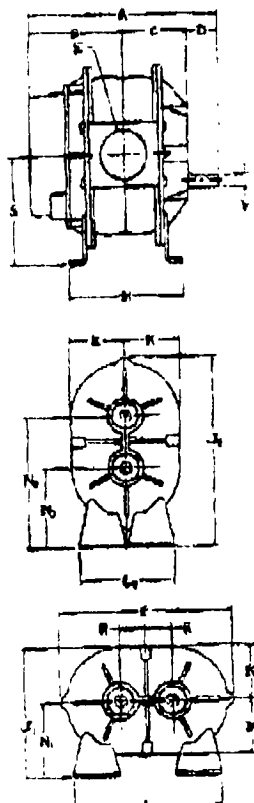
Vacuum performance is based on inlet temperature of 70°F, and discharge pressure of 14.70 PSIA.

In conjunction with our program of continuous testing and design upgrading, all specifications are subject to change without notice.

All data are approximate. Request a quotation for your specific application.

For heavy-duty applications, request information on M-D PD PLUS® rotary blowers.

BLOWER MODEL	SPEED (RPM)	2 PSIG		4 PSIG		6 PSIG		7 PSIG		10 PSIG		12 PSIG		15 PSIG		Max. Vacuum		
		CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	in Hg	CFM @ 10 in Hg	
2002	1170	7	0.3													6	3	0.5
	3600	46	0.8	41	1.3	38	1.8	36	2.1	32	2.8	29	8.3			14	25	2.1
	6276	73	1.3	68	1.8	64	2.7	63	3.1	58	4.2	56	4.9			14	65	3.0
2004	1170	19	0.4	12	0.8											6	13	0.8
	3600	97	1.3	89	2.3	83	3.3	81	3.8							14	69	3.8
	6276	160	1.9	143	3.4	137	4.9	134	5.6							14	122	5.5
3003	1170	48	0.8	38	1.4	31	2.1	28	2.4							10	27	1.7
	2700	109	1.9	103	3.3	129	4.8	122	5.5	114	7.7	108	9.1			14	107	5.4
	3600	158	2.5	148	4.5	181	6.4	178	7.4	169	10	164	12			14	162	7.2
3005	1170	88	1.2	72	2.3	62	3.3	57	3.8							10	56	2.7
	2700	242	2.8	228	6.2	319	7.8	213	8.9							12	202	7.5
	3600	334	3.9	320	7.0	310	10	305	12							14	283	12
4002	880	34	0.8	28	1.1	19	1.8	17	1.8							10	18	1.3
	1760	87	1.3	79	2.2	73	3.1	70	3.6	63	5.0	59	5.9			14	57	3.5
	3600	198	2.8	190	4.5	184	6.4	181	7.4	174	10	170	12	164	15	14	168	7.3
4005	880	70	1.1	56	2.0	44	3.0	39	3.4							8	47	2.0
	1760	177	2.2	162	4.1	160	5.9	146	6.9	132	9.6					12	132	5.8
	3600	309	4.5	304	6.3	373	12	368	14	365	20					14	243	14
4007	880	93	1.4	74	2.6	59	3.8	52	4.5							8	68	2.6
	1760	234	2.8	214	6.3	199	7.7	193	8.8							12	178	7.8
	3600	327	3.7	308	11	298	16	294	18							14	254	18
5003	710	84	1.0	68	1.8	43	2.7	39	3.1							10	37	2.2
	1760	203	2.6	191	4.8	181	6.6	177	7.6	167	11	160	13	152	16	14	159	7.5
	2860	349	4.1	334	7.4	325	11	321	12	310	17	304	21	285	25	14	301	12
5006	710	109	1.6	87	3.0	71	4.3	65	5.0							10	82	3.0
	1760	340	3.9	319	7.3	303	11	297	12	278	17					14	263	10
	2850	581	6.4	560	12	544	17	537	20	519	28					14	504	20
5009	710	179	2.2	151	4.2	133	6.2	126	7.2							10	122	5.1
	1760	513	5.5	490	10	472	15	464	18							12	445	15
	2850	865	8.9	842	17	824	26	816	28							14	779	28
6006	710	129	1.8	110	3.3	86	4.8	89	5.5	72	7.9					12	79	4.8
	1760	367	4.8	348	8.3	364	12	347	14	330	20	180	23	307	28	18	300	16
	2350	532	6.0	513	11	499	16	482	19	478	26	304	31	452	38	16	445	21
6008	710	207	2.7	178	5.2	153	7.8	143	8.9	116	13					12	117	7.5
	1760	581	6.6	561	13	568	19	567	22	530	31	515	37	448	45	18	481	26
	2350	854	9.1	824	17	801	26	780	29	764	41	748	50			18	714	33
6013	710	387	4.9	350	9.6	298	14									8	300	8.3
	1760	1104	12	1107	23	1083	36									12	986	34
	2350	1601	16	1544	31	1600	46									12	1439	46



Model Size	A	B	C	D	E	F	J	K	L	M	N	P	R	S	V			
2002	3.76	4.63	2.88	2.80	1 1/2" NPT	5.00	6.28	8.86	9.13	5.19	8.19	3.75	6.25	6.75	9.20	1.25	5.00	485
2004	11.75	8.69	3.89		2" NPT	7.00												
3003	13.10	6.94	3.76	2.40	2" NPT	7.63	8.94	12.81	3.84	7.26	7.26	6.00	8.80	3.75	12.18	1.79	8.75	780
3005	14.50	7.13	4.84		2 1/2" NPT	10.00												
4002	12.69	5.88	3.88		1 1/2" NPT	7.35												
4005	16.31	7.25	6.08	3.00	2 1/2" NPT	10.80	10.53	16.13	4.38	8.00	8.00	8.25	10.25	5.00	13.69	2.00	6.25	874
4007	17.05	8.13	5.84		3" NPT	11.75												
5003	14.88	7.88	4.60		2" NPT	9.58												
5006	17.60	8.31	8.81	3.38	4" NPT	11.80	12.19	17.38	5.38	10.60	10.60	6.75	11.25	6.28	17.19	2.50	6.78	1186
5009	20.50	9.31	7.31		4" NPT	14.00												
6006	18.38	8.98	6.88	3.60	3" NPT	10.13												
6008	21.38	10.68	7.18		6" NPT	13.13	15.08	21.69	8.25	17.00	11.00	8.75	14.75	8.75	19.81	3.00	11.75	1375
6013	28.38	14.08	10.88		8" PLG	20.18												

Values shown are approximate and should not be used for construction. Certified drawings are available through your local M-D representative or distributor.

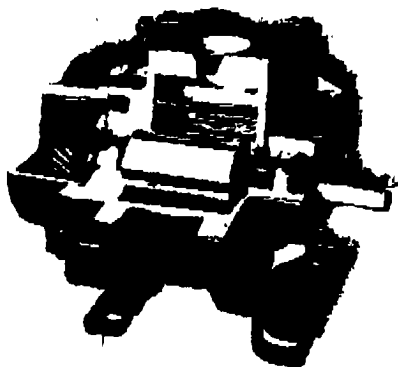
LEADING THE SEARCH FOR NEW SOLUTIONS



4640 West Kearney Street, P.O. Box 2877  
Springfield, Missouri USA 65801-2877  
Tel: 417 865-6716 800 836-8827 Fax: 417 865-2950



www.mdps.com



## COMPETITOR PLUS™

### Rotary Positive Blowers

COMPETITOR PLUS rotary blowers are designed to be interchangeable with equivalent sizes of Roots Universal RA/R, and many Sutorbilt California Series B and F, and Legend™ Series L and P blowers. COMPETITOR PLUS models are rated up to 15 PSIG discharge pressure or 18" Hg dry vacuum.

In addition to interchangeability, M-D has improved on existing designs with the following superior features ordinarily found only on premium blowers:

#### Helical Gearing

COMPETITOR PLUS blowers are timed with hardened, precision helical gears, keyed to the rotor shafts, not taper fit spur gears offered by other manufacturers which have greater backlash, and can slip and lose timing. Helical gears are also quieter, reducing mechanical noise.

#### Stronger Bearings

COMPETITOR PLUS blowers include double row ball bearings at the gear end, stronger than single row ball bearings offered by other manufacturers. Drive shaft bearing is cylindrical roller type for additional strength against side loading from V-belt drives. As a result of this superior design, COMPETITOR PLUS blowers offer an average design bearing life of up to 50% greater than models offered by other manufacturers.

#### Rotors with Integral Shafts

COMPETITOR PLUS blowers include precision machined ductile iron rotors with large, integrally cast shafts, not press fit and/or pinned shafts offered by other manufacturers which can loosen over time and cause rotor clash. All rotors are dynamically balanced for vibration-free rotation.

#### Positive End Clearances

End clearances are positively established at the blower gear end, eliminating the risk of shifting end clearances when installing or removing drive components. This also eliminates the need for those special fork and saddle tools required by other brands to reset end clearances.

#### Polished Sealing Surfaces

All shaft surfaces in contact with sealing members are polished to reduce seal wear and risk of leakage.

#### Individually Tested

Every COMPETITOR PLUS blower is factory tested to assure you of the highest quality. While some manufacturers perform only sample testing, M-D goes the distance to insure that your blower meets our rigid ISO 9001 registered quality standards.

#### ISO 9001 Registration

COMPETITOR PLUS blowers are manufactured under M-D's ISO 9001 registered quality assurance program, the first American manufacturer of rotary blowers to gain such international recognition.

#### Warranty

Every COMPETITOR PLUS blower is backed by M-D's limited warranty for a period of 18 months after installation or 2 years after original blower shipment, whichever occurs first.

#### Versatility

COMPETITOR PLUS blowers can be field converted from horizontal to vertical flow, or vice versa, without any special tools or additional components.

#### Metric Availability

All COMPETITOR PLUS blowers are available with metric drive shaft and process connections.

#### Worldwide Sales and Service

With sales offices and service facilities located on six continents, you can be assured of availability and service for your COMPETITOR PLUS blowers.

#### Material Specifications:

Housing: Cast iron  
 End Plates: Cast iron  
 End Cover: Cast iron  
 Rotors: Ductile iron  
 Shafts: Ductile iron cast integrally with rotors  
 Bearings: Gear end - Double row ball, both rotors  
                   Drive end - Cylindrical roller on drive rotor  
                                           Single row ball on driven rotor  
 Drive Shaft: Ductile iron, cast integrally with drive rotor  
 Gears: Heat treated alloy steel, helical cut  
 Seals: Lip seals on rotor shafts and drive shaft  
 Lubrication: Oil splash on gear end, grease on drive end

Model Size	Max. Press. PSI	Max. Vac (in. Hg)	Nom Min RPM @ Max. Disch. Press.	Nom Max RPM @ Max. Disch. Press.	Disch. CFM
2008	12	14	2940	5275	.018
2004	7	14	1480	5275	.032
3003	12	14	2080	3600	.0816
3008	7	12	1160	3600	.102
4002	15	14	1820	3600	.061
4008	10	14	1300	3600	.121
4007	7	12	1000	3600	.160
6003	15	14	1900	2950	.138
6008	10	14	980	2950	.221
9009	7	12	700	2950	.325
6015	15	16	1240	2950	.248
6008	12	16	860	2950	.395
8015	6	12	800	2950	.780

### LEADING THE SEARCH FOR NEW SOLUTIONS



**TUTHILL CORPORATION**

**M-D Pneumatics Division**

8840 West Kearney Street, P.O. Box 2877  
 Springfield, Missouri USA 65801-2877  
 Tel 417 865-8715 800 825-8807 Fax 417 865-8960



[www.m-d-pneumatics.com](http://www.m-d-pneumatics.com)

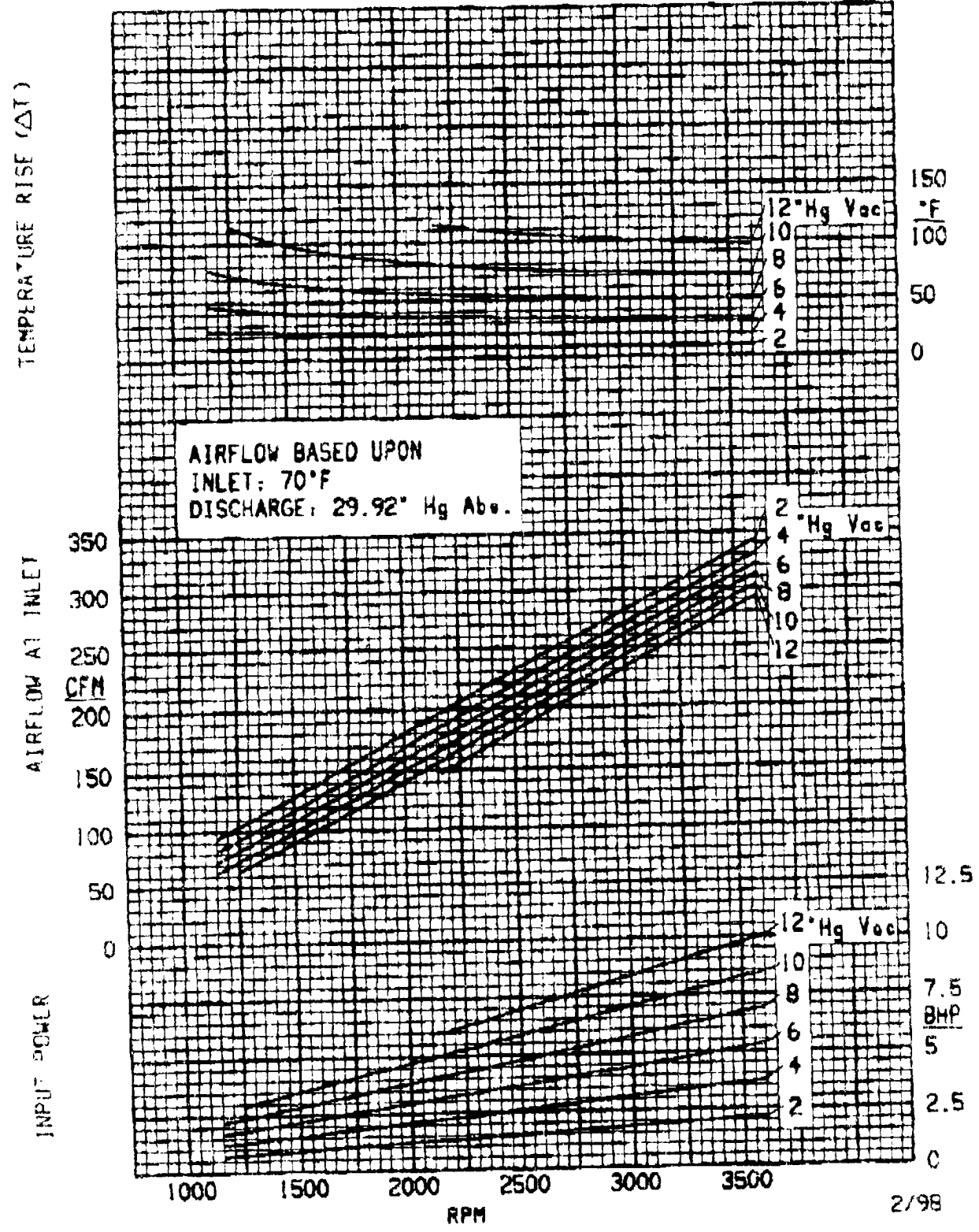
[www.pneumatics.com](http://www.pneumatics.com)

C-1413



**TUTHILL CORPORATION** M-D Pneumatics Division Springfield Missouri USA

# 3006 COMPETITOR PLUS™ VACUUM CURVE (.102 CFR DISPL.)



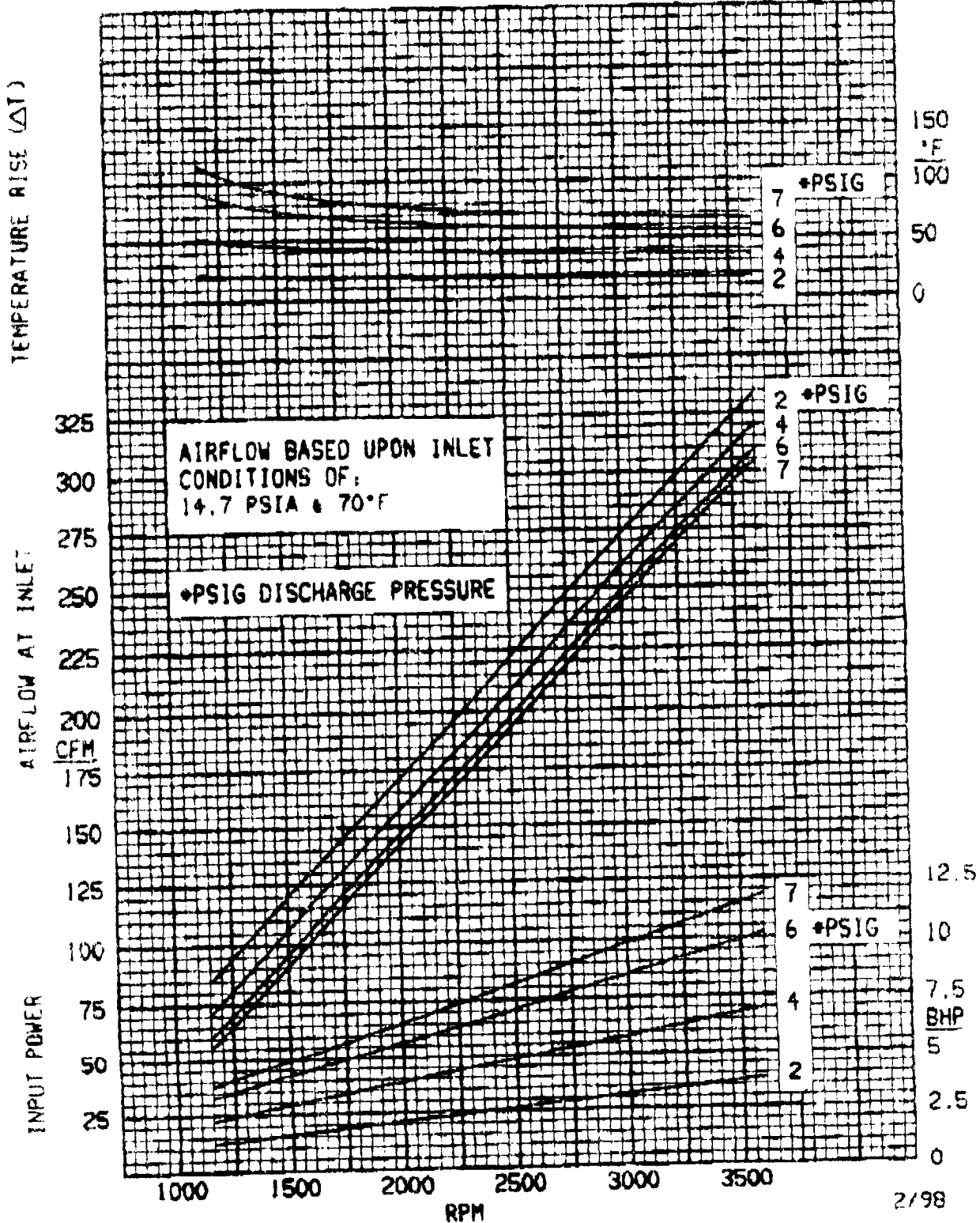


TUTHILL CORPORATION

M-D Pneumatics Division

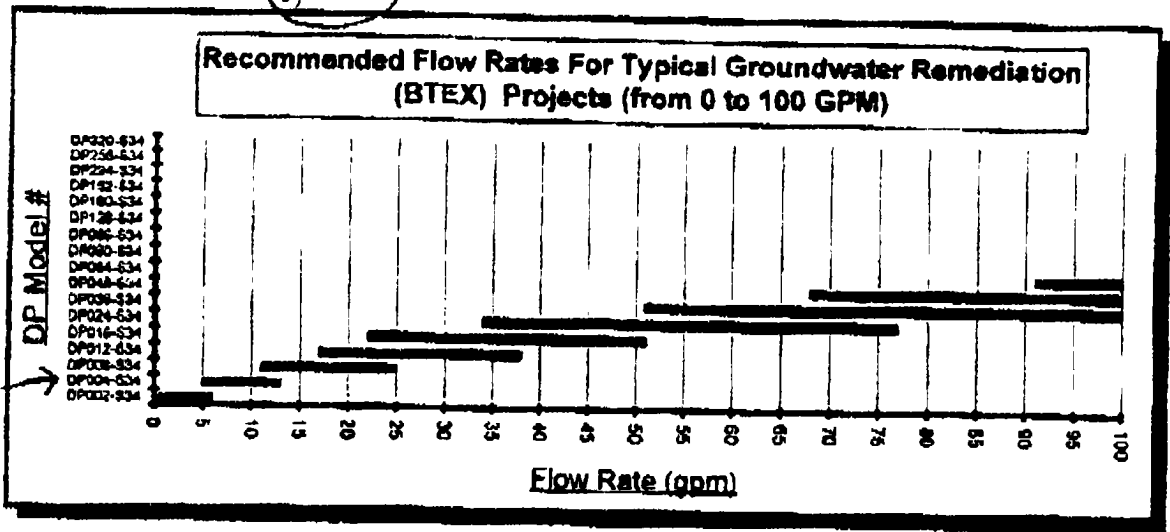
Springfield Missouri USA

# 3006 COMPETITOR PLUS™ PRESSURE CURVE (.102 CFR DISPL.)

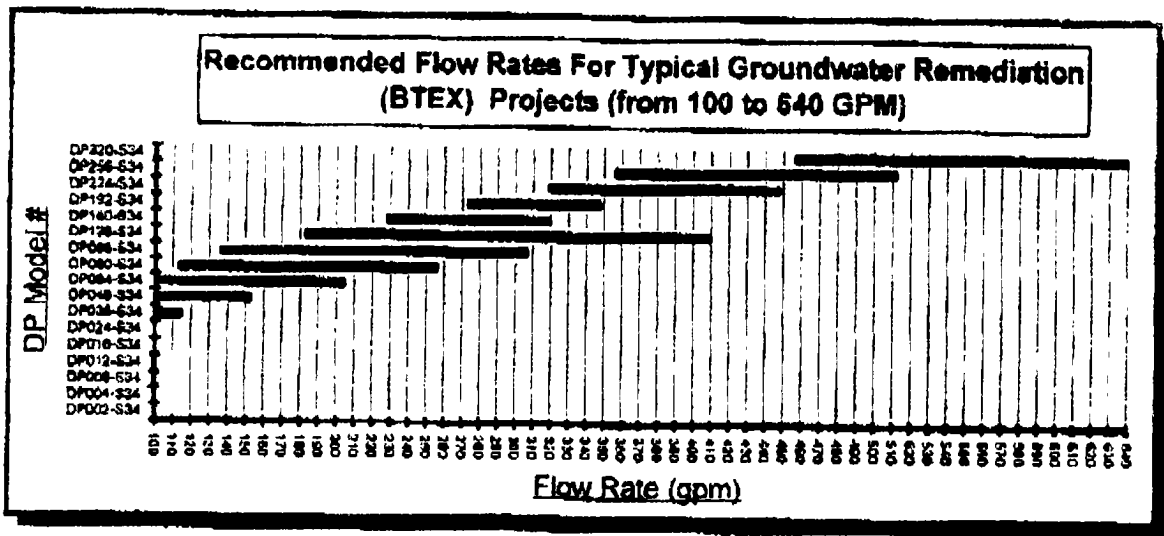


# HYDRO-FLO TECHNOLOGIES, INC.

Mastering the Art of Oil/Water Separation



The above chart is to be used as a guideline for typical groundwater remediation applications. The recommendations are based on removal rates of 20 microns at the low end of the chart to 30 microns at the high end. All calculations are based on oil with a specific gravity of .85. Please consult the factory for specialized sizing.



The above chart is to be used as a guideline for typical groundwater remediation applications. The recommendations are based on removal rates of 20 microns at the low end of the chart to 30 microns at the high end. All calculations are based on oil with a specific gravity of .85. Please consult the factory for specialized sizing.

## "DP" SERIES COALESCING TYPE

Cross Corrugated Plate Oil/Water Separator

## HYDRO-FLO TECHNOLOGIES, INC. DP- SERIES DIMENSIONAL INFORMATION

(Inches)

**FIBERGLASS DP-SERIES** See drawing DP-GA00-B04

MODEL #	HGT A	LEN B	WID C	D	HWL F	G	H	DIA J	DIA M	DIA N	(cu. ft.) PROJECTED SURFACE AREA			WEIGHTS (lbs)		(gal) SLUDGE CHAMBER CAPACITY	(gal) SEPARATION CHAMBER CAPACITY	(gal) SEPARATOR CIL CAPACITY	MODEL #
											MEDIA # 15	MEDIA # 21	MEDIA # 34	SHIPPING	OPERATING				
DP- 2	34	64	31	15	21	13.5	22.5	2	2	24	30	42	68	75	2400	16	37	15	DP- 2
DP- 4	37	76	31	21	27	20	22.5	2	2	24	60	84	138	150	3100	16	52	30	DP- 4
DP- 8	49	76	31	33	39.5	20	22.5	2	2	24	120	188	272	250	4200	16	105	30	DP- 8
DP- 12	40	76	43	33	39.5	20	22.5	3	3	24	180	252	408	350	5900	26	157	45	DP- 12
DP- 16	49	76	55	33	39.5	20	22.5	3	3	24	240	336	544	450	7500	35	209	55	DP- 16
DP- 24	55	88	55	45	51.5	32	22.5	3	3	24	360	504	816	750	9900	69	269	70	DP- 24
DP- 36	67	88	55	57	63.5	32	22.5	3	3	24	540	756	1224	1000	12200	69	404	100	DP- 36

**STEEL DP-SERIES** See drawing DP-GA00-B01

DP- 4	33	66	30	21	25	15	17	2	2	24	60	84	136	450	2700	14	60	30	DP- 4
DP- 8	45	66	30	30	37	15	17	2	2	24	120	188	272	650	3700	14	120	30	DP- 8
DP- 12	45	66	42	30	37	15	17	3	3	24	180	252	408	800	5100	21	180	45	DP- 12
DP- 16	45	66	54	30	37	15	17	3	3	24	240	336	544	1000	6500	28	240	55	DP- 16

**STEEL DP-SERIES** See drawing DP-GA00-B02

DP- 24	69	108	36	51	61	30	25.5	4	3	48	360	504	816	1200	10000	58	300	70	DP- 24
DP- 36	69	108	48	51	61	30	25.5	4	3	48	540	756	1224	1500	13000	84	450	90	DP- 36
DP- 48	69	108	60	51	61	30	25.5	6	3	48	720	1008	1632	1800	17000	112	600	120	DP- 48
DP- 64	81	108	60	60	73	30	25.5	6	3	60	960	1344	2178	2200	20000	112	800	120	DP- 64
DP- 80	81	108	72	60	73	30	25.5	6	3	60	1200	1680	2720	2500	24000	140	1000	140	DP- 80
DP- 96	81	108	84	60	73	30	25.5	8	3	60	1440	2016	3264	2800	26000	168	1200	170	DP- 96
DP- 128	81	108	108	60	73	30	26.5	8	3	60	1920	2888	4362	3500	36000	224	1600	220	DP- 128

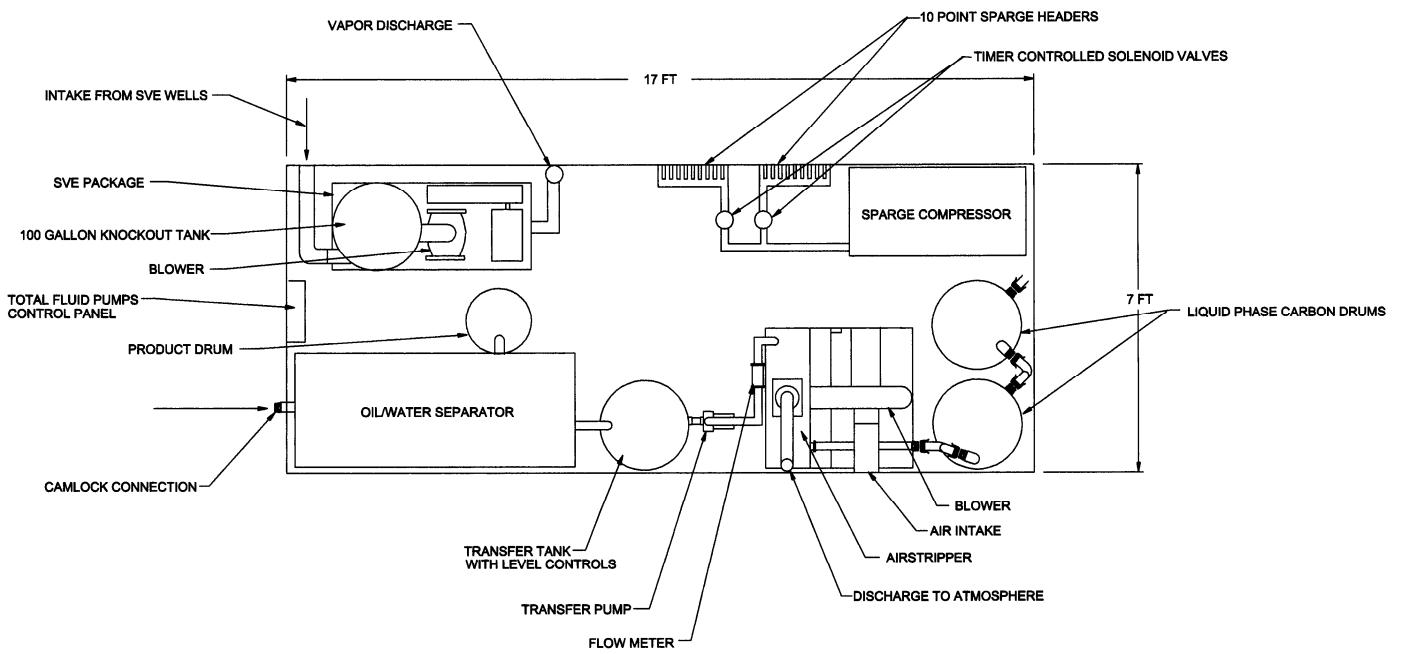
**STEEL DP-SERIES** See drawing DP-GA00-B03

DP- 160	81	181	72.5	60	73	30	26	6	3	60	2400	3360	5440	7500	44000	280	1945	180	DP- 160
DP- 192	81	181	84.5	60	73	30	26	8	3	60	2880	4032	6528	9000	51000	336	2334	210	DP- 192
DP- 224	81	181	96.5	60	73	30	26	8	3	60	3360	4704	7616	10500	59000	392	2773	240	DP- 224
DP- 256	81	181	109	60	73	30	26	8	3	60	3840	5376	8704	12000	67000	448	3112	270	DP- 256
DP- 320	81	181	133	60	73	30	26	10	3	60	4800	6720	10880	15000	82000	560	3888	330	DP- 320


FROM : Panasonic FAX SYSTEM

PHONE NO. :

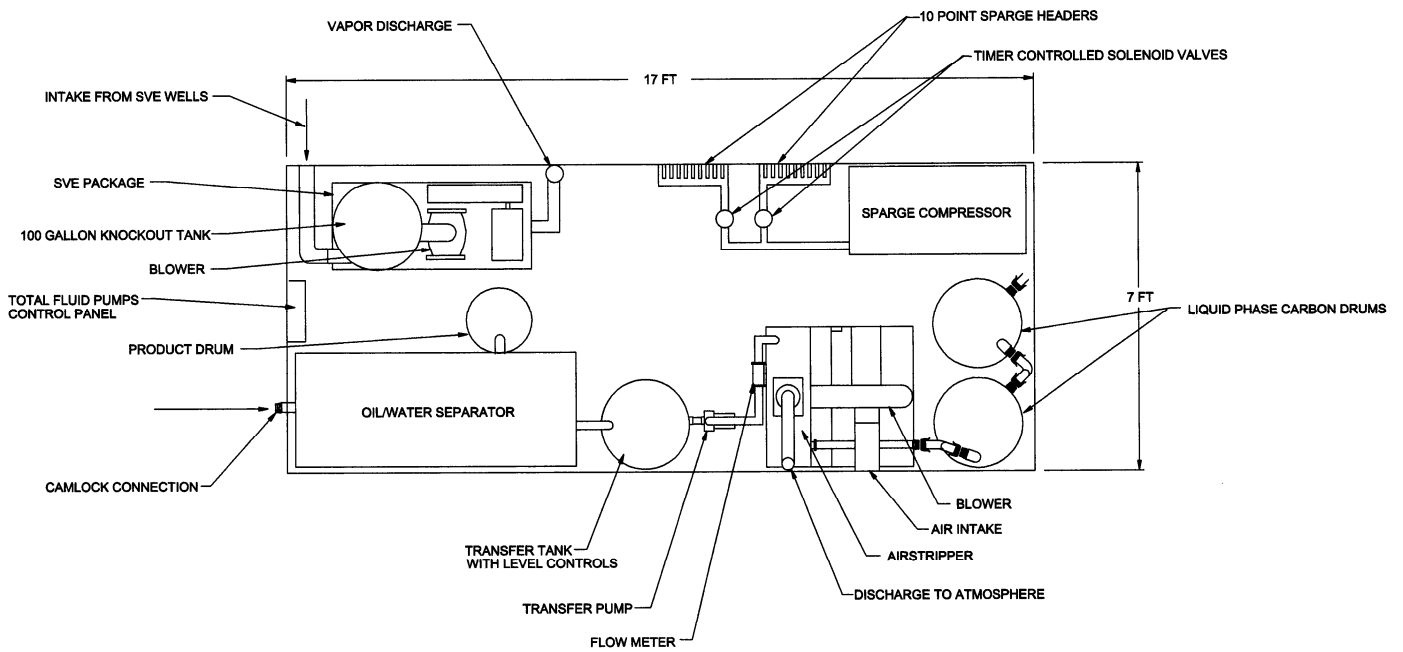
Feb. 08 2002 04:20PM P9



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 <b>BROOKS &amp; MEDLOCK</b> ENGINEERING, PLLC 712 MERRIMON AVENUE ASHEVILLE, N.C. 28804		
PROJECT: Greenville County Maintenance Facility CAP		FIGURE: 4
DATE: 2/5/02	SCALE: NTS	REV.

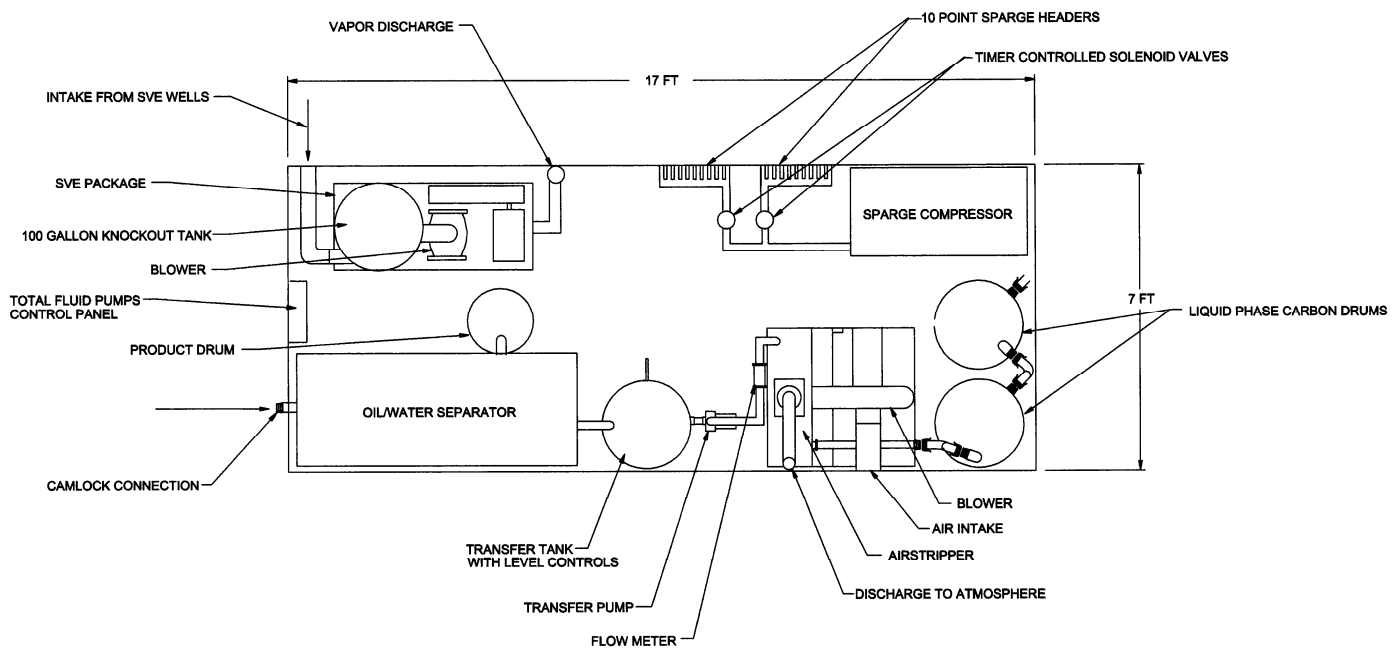





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**BME**  
**BROOKS & MEDLOCK**  
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 712 MEDBRON AVENUE  
 ASHEVILLE, N.C. 28804

PROJECT: Greenville County Maintenance Facility CAP		FIGURE: 4
DATE: 2/5/02	SCALE: NTS	REV.



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 <b>BROOKS &amp; MEDLOCK</b> <small>ENGINEERING, PLLC</small> <small>718 MERRIMON AVENUE</small> <small>ASHEVILLE, N.C. 28804</small>		
PROJECT: Greenville County Maintenance Facility CAP	FIGURE: 4	
DATE: 2/5/02	SCALE: NTS	REV.



February 5, 2002

South Carolina DHEC  
Bureau of Air Quality Control  
2600 Bull Street  
Columbia, South Carolina 29201

ATTENTION: Mr. Kevin Clark

Reference: **AIR PERMIT EXEMPTION REQUEST**  
Groundwater Remediation System  
Hot Spot # 3005  
Site ID # 12719  
Chesnee, South Carolina

Dear Mr. Clark:

This letter is to serve as a request to exempt the groundwater remediation system at the Hot Spot # 3005 in Chesnee, South Carolina from air permitting requirements. This request is presented as part of the Corrective Action Plan for the referenced site. Brooks & Medlock Engineering has been chosen as the contractor for the site remediation under the Bureau of UST Management's "Pay-for-Performance" Corrective Action program.

The groundwater remediation system planned for this site employs several remedial technologies. In accordance with BAQC Air Pollution Control Regulations 62.1 Section II F(2)(g), "sources with with...uncontrolled VOC emissions less than 1000 lbs./mo. may not require permits". Each of the remedial technologies proposed herein are estimated to generate significantly less than 1,000 lb./mo. VOC emissions. Each is described below along with potential air emissions.

Groundwater Extraction, Treatment and Discharge

Groundwater extraction, or Pump and Treat, technology is to be employed in a small "source zone" area at the subject site. Extracted groundwater is to be treated with an oil/water separator, shallow tray air stripper granular activated carbon filtration. Based upon the concentration of targeted VOCs in the groundwater plume, we calculate less than 15 pounds of BTEX compounds exist at the site. The system is anticipated to operate for approximately two years. Emissions are anticipated to be somewhat higher initially than they will be later in the life of the project. We estimate monthly emissions to be approximately 3 pounds per month (lb/mo) for the first three months, then rapidly falling to less than 1 lb/mo for the remainder of the project. This is based upon professional experience.

In an effort to comply with BAQC protocol, a BAQC UST Modeling Information sheet is attached for the groundwater extraction system. The Air Toxic Information presents “worst case” emission rates as the input CoC concentrations are maximum dissolved phase solubility for each VOC. The resulting emission rate is based upon the Henry’s Law constant for each VOC and the air flow rate of the air stripper. The results indicate that less than 8 lbs/mo. of total VOCs identified will be emitted. We plan to monitor the emissions upon start-up of the system to verify our estimates. Treatment of blower emissions can be implemented should the monitoring results deem this necessary.

#### Soil Vapor Extraction

Remediation of vadose zone CoC and free product on the water table will be initiated with an SVE system. Two (2) 4” diameter vapor extraction wells will be screened at the water table and in the vadose zone and connected to a regenerative blower. As with the air sparging, the emission rate of the SVE system is difficult to estimate as the emission rate is dependent upon air contact with dissolved phase CoC and NAPL. It is assumed that the emission rate will be less than that of air stripper described above and will therefore be inconsequential.

We appreciate your timely review of this exemption request. Please call us at (828) 232-4700 with any questions.

Sincerely,

**Brooks & Medlock Engineering, PLLC**

A handwritten signature in black ink, appearing to read "Mark Brooks". The signature is fluid and cursive, with a long horizontal flourish extending to the right.

Mark Brooks, P.E.

Attachments: BAQC Modeling Sheet  
Calculations



Board: William E. Applegate, III. Chairman  
 Hon H. Buriss, Vice Chairman  
 Richard E. Jabbour, DDS. Secretary

Toney Graham, Jr., MD  
 Sandra J. Molander  
 John B. Pate, MD  
 Robert J. Stripling, Jr.

*Promoting Health, Protecting the Environment*

2600 Bull Street, Columbia, SC 29201

**BAQC UST MODELING INFORMATION**

PLEASE FILL OUT COMPLETELY

SITE/COMPANY NAME: Hot Spot # 3005 GWPD ID#: 12719

CLEANUP LOCATION: 107 Hampton Street  
Chesnee, SC

TYPE OF OPERATION (i.e. AIR STRIPPER): Air Stripper

CONTACT: Mark Brooks, PE PHONE: 828-232-4700

**SITE MAPS:**

Please include a scaled plot plan of the site location that clearly shows distances from the stack to the property boundaries. All buildings and/or structures within a radius of 5 stack heights (measured from the stack/vent) shall be incorporated on this plot plan and information on each building and/or structure's height, width, and length shall also be included.

**STACK INFORMATION**

HEIGHT ABOVE GROUND Est. 12' FEET; DIAMETER .333 FEET  
 TEMPERATURE Est. 120 deg F; VELOCITY 23.0 FEET/SECOND

**AIR TOXIC INFORMATION**

AIR TOXIC EMITTED (i.e. BENZENE)	CHEMICAL ABSTRACT SERVICE (CAS) NUMBER	EMISSION RATE LB/HR
A) <u>Benzene</u>	<u>71432</u>	<u>.0016</u>
B) <u>Toluene</u>	<u>108883</u>	<u>.0028</u>
C) <u>Ethylbenzene</u>	<u>100414</u>	<u>.0023</u>
D) <u>Xylenes</u>	<u>1330207</u>	<u>.0027</u>
E) <u>Naphthalene</u>	<u>91203</u>	<u>1.2E-7</u>

Please submit this completed sheet with scaled site maps to the appropriate SCDHEC project manager at the Ground-Water Protection Division, 2600 Bull Street, Columbia, SC 29201.

## Air Stripping Dissolved Phase Volatilization Mass Removal Rate\*

### I Calculate gas phase concentrations

$$C_g = H_i C_a / RT$$

where:  $C_g$  = gas phase concentration of CoC in mg/l

$H_i$  = Henry's law constant

$R$  = universal gas constant = .082 L-atm/mol

$T$  = temperature in degrees Kelvin = 273.15+20°C

$C_a$  = aqueous concentration (worst case)

	Benzene	Toluene	Ethylbenz.	Xylenes	Naphth.	MTBE
$H_i$ =	5.59	6.37	6.43	7.62	0.048	0.15
$RT$ =	24.1	24.1	24.1	24.1	24.1	24.1
$C_a$ =	226	301	280	278	2	5,110
$C_g$ (mg/l) =	52.4207	79.5589	74.705394	87.8988	0.00398	31.8049793

### II Calculate Emission Rate

$$ER = C_g \times Q$$

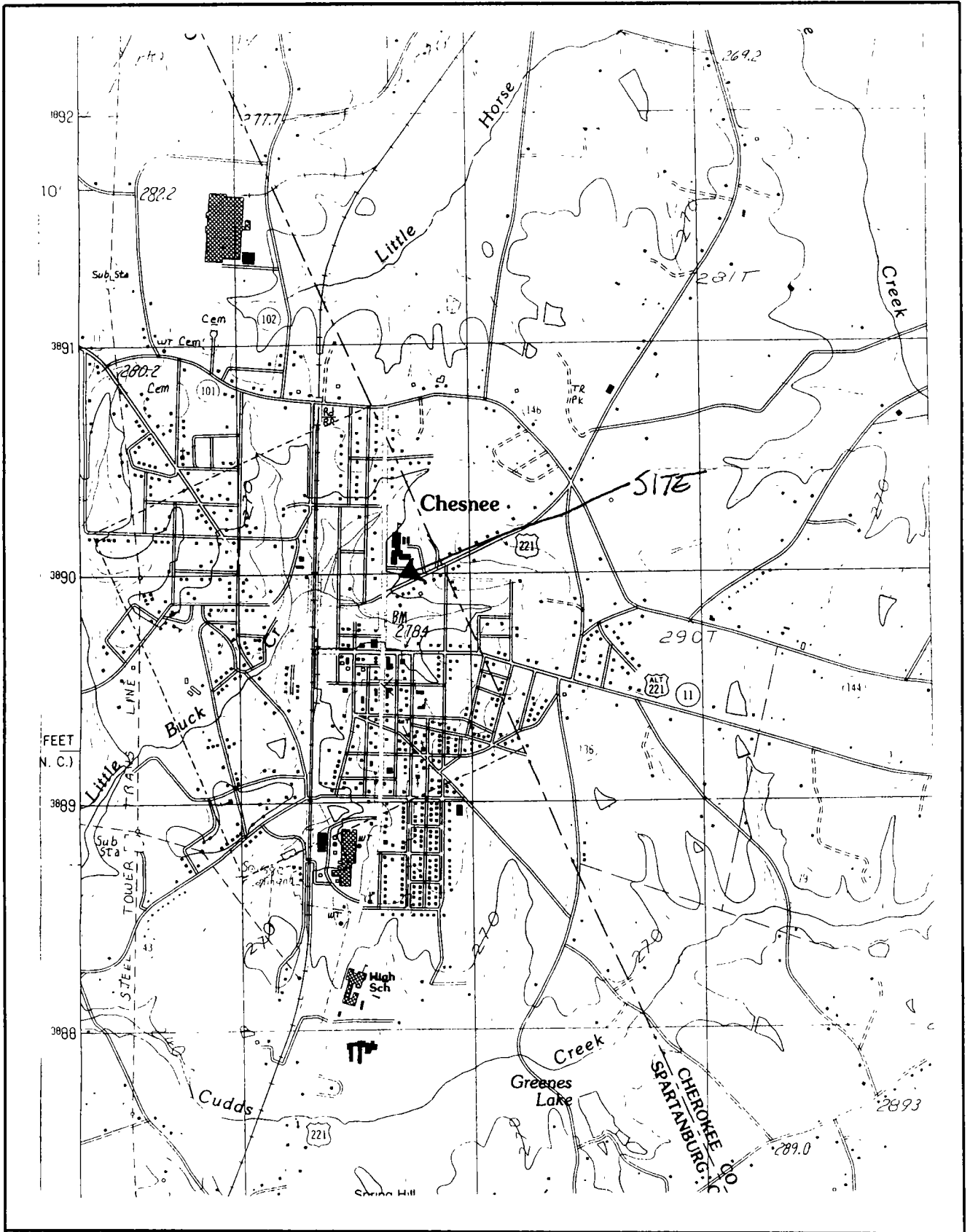
where:  $ER$  = VOC Emission rate

$Q$  = air flow rate

	Benzene	Toluene	Ethylbenz.	Xylenes	Naphth.	MTBE
$C_g$ (mg/l) =	52.4207	79.5589	74.705394	87.8988	0.00398	31.8049793
$Q$ (cfm) =	120	120	120	120	120	120

**ER = (mg/min)** 12.3626 18.7626 17.618022 20.7295 0.00094 7.50067427

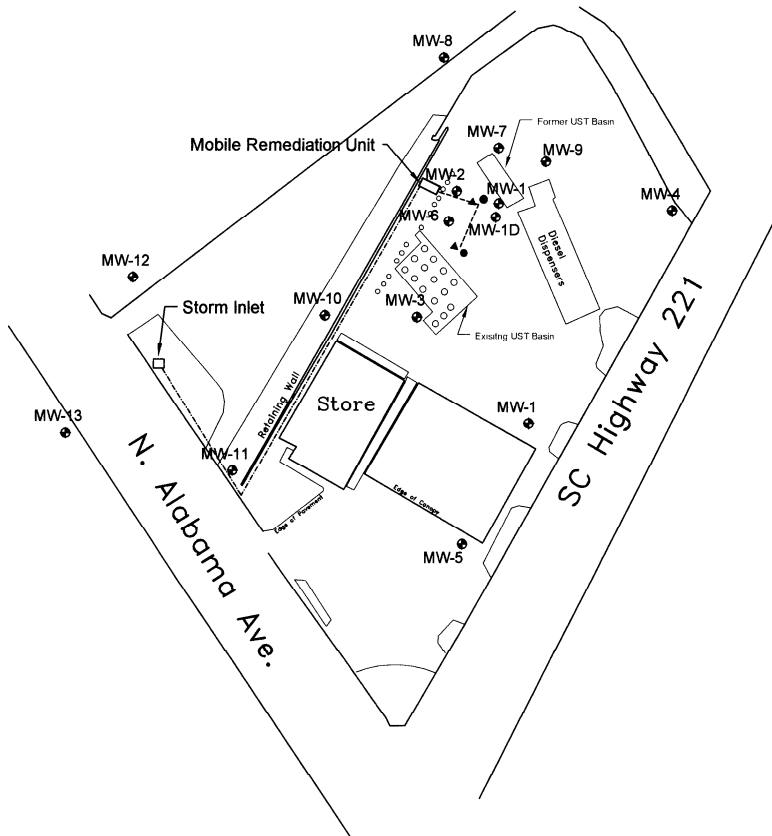
**ER Total (lb/mo) 7.57537**



USGS 7.5 min. Topo.  
Chesnee Quad

  
**BROOKS & MEDLOCK**  
 ENGINEERING, PLLC

**Figure 1**  
 General Site Location



**LEGEND:**

● Compliance Monitoring Well


▲ SVE Well

● GW Extraction Well

----- Trenching

----- Discharge Line

**Note:**  
Site map derived from figures provided by SCDHEC. Locations of wells and site features are relative.

 <b>BROOKS &amp; MEDLOCK</b> <small>ENGINEERING, PLLC</small> <small>712 MERRIMON AVENUE</small> <small>ASHEVILLE, N.C. 28804</small>		
PROJECT: Hot Spot # 3005 CAP	FIGURE: 3	
DATE: 2/4/02	SCALE: N.T.S.	REV.: 1



**NPDES PERMIT APPLICATION PACKAGE**

NOTICE OF INTENT  
NPDES GENERAL PERMIT  
PERMIT NO. SCG830000

The following are items required for the Notice of Intent for discharge of petroleum contaminated groundwater as specified in Permit No. SCG830000.

1. Name of facility: Hot Spot # 3005  
Address of facility: 107 Hampton Street  
Chesnee, SC  
Physical Address: Same  
  
Location: Intersection of SC Highway 221 and N. Alabama Rd. in Chesnee, SC.  
The outfall latitude/longitude is 35° 9' 5.8" / 81° 5' 36"
2. No SIC Code represents the activities at the site as the facility operates as a retail convenient store.
3. Operator's Name: Brooks & Medlock Engineering, PLLC  
Operator's Address: 712 Merrimon Ave.  
Asheville, NC 28804  
Operator's Phone: (828) 232-4700  
Operator's Status: Private Corporation
4. No other NPDES Permits exist for this site.
5. The discharge is into the storm sewer system near the corner of S.C. Highway 221 and N. Alabama Blvd. The storm sewer drains into Little Buck Creek which is a tributary of Buck Creek which drains into the Pacolet River.
6. A summary of the most recent lab analysis is attached. This summary is provided by SCDHEC Bureau of UST Management. Copies of laboratory analytical are on file at the Bureau of UST Management for Site ID No. 12719.
7. A copy of a topographic quadrant map showing the proposed point of discharge is attached.
8. The groundwater contamination was the result of a leaking underground petroleum storage tank. The petroleum product is either gasoline or diesel fuel.
9. The flow discharge is estimated to be between 6 and 10 gpm.
10. The only easement required to discharge to the storm sewer inlet is an encroachment permit from the South Carolina Department of Transportation. An encroachment permit has been applied for and should be approved within 30 days of the submittal of the permit application.

FORM <b>1</b> GENERAL		U.S. ENVIRONMENTAL PROTECTION AGENCY <b>GENERAL INFORMATION</b> <i>Consolidated Permits Program</i> <i>(Read the "General Instructions" before starting.)</i>	I. EPA I.D. NUMBER							
			5					A	C	
LABEL ITEMS I. EPA I.D. NUMBER III. FACILITY NAME V. FACILITY MAILING ADDRESS VI. FACILITY LOCATION  <b>PLEASE PLACE LABEL IN THIS SPACE</b>			GENERAL INSTRUCTIONS							
			If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent (the area to the left of the label space lists the information that should appear), please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete items I, III, V, and VI (except VI-B which must be completed regardless). Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.							
			1	2				13	14	15
			F							D

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms.

SPECIFIC QUESTIONS	MARK 'X'			SPECIFIC QUESTIONS	MARK 'X'		
	YES	NO	FORM ATTACHED		YES	NO	FORM ATTACHED
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)		X		B. Does or will this facility (either existing or proposed) include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)		X	
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)		X		D. Is this a proposed facility (other than those described in A or B above) which will result in a discharge to waters of the U.S.? (FORM 2D)	X		X
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)		X		F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X		H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X		J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

III. NAME OF FACILITY

1	SKIP	HOT SPOT #3005
---	------	----------------

IV. FACILITY CONTACT

A. NAME & TITLE (last, first, & title)		B. PHONE (area code & no.)	
2	LAUTHER, JUDY ENV. COMPLIANCE	864	585

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX			
3	P.O. BOX 2527		
B. CITY OR TOWN		C. STATE	D. ZIP CODE
4	SPARTANBURG	SC	29304

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER			
5	107 HAMPTON ST.		
B. COUNTY NAME			
SPARTANBURG			
C. CITY OR TOWN		D. STATE	E. ZIP CODE
6	CHEESNEE	SC	29323

**VII. SIC CODES (4-digit, in order of priority)**

A. FIRST				B. SECOND			
C	7	(specify)		C	7	(specify)	
13	16	19		13	16	19	
C. THIRD				D. FOURTH			
C	7	(specify)		C	7	(specify)	
13	16	19		13	16	19	

**VIII. OPERATOR INFORMATION**

A. NAME: **BROOKS & MEDLOCK ENGINEERING**

B. Is the name listed in Item VIII-A also the owner?  YES  NO

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box, if "Other", specify.)  
 F = FEDERAL M = PUBLIC (other than federal or state) P (specify)  
 S = STATE O = OTHER (specify)  
 P = PRIVATE

D. PHONE (area code & no.)

E. STREET OR P.O. BOX: **712 MERRIMON AVE.**

F. CITY OR TOWN: **ASHEVILLE**

G. STATE: **NC** H. ZIP CODE: **28804**

IX. INDIAN LAND: Is the facility located on Indian lands?  YES  NO

**X. EXISTING ENVIRONMENTAL PERMITS**

A. NPDES (Discharges to Surface Water)				D. PSD (Air Emissions from Proposed Sources)			
C	T	I		C	T	I	
9	N			9	P		
15	16	17	18	15	16	17	18
B. UIC (Underground Injection of Fluids)				E. OTHER (specify)			
C	T	I		(specify)			
9	U						
15	16	17	18				
C. RCRA (Hazardous Wastes)				E. OTHER (specify)			
C	T	I		(specify)			
9	R						
15	16	17	18				

**XI. MAP**

Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

**XII. NATURE OF BUSINESS (provide a brief description)**

THE FACILITY IS CURRENTLY AN OPERATIONAL CONVENIENT STORE. THE DISCHARGE IS FROM AN ON-SITE REMEDIATION EFFORT OF PETROLEUM CONTAMINATED GROUNDWATER.

**XIII. CERTIFICATION (see instructions)**

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print) <b>MARK BROOKS, ENVIRON. ENGINEER</b>	B. SIGNATURE <i>Mark Brooks</i>	C. DATE SIGNED <b>11/31/02</b>
-----------------------------------------------------------------------------------	------------------------------------	-----------------------------------

**COMMENTS FOR OFFICIAL USE ONLY**

C	
13	16

EPA ID Number (copy from Item 1 of Form 1)

Please type or print in the unshaded areas only

Form  
**2D**  
NPDES



# New Sources and New Dischargers Application for Permit to Discharge Process Wastewater

## I. Outfall Location

For each outfall, list the latitude and longitude, and the name of the receiving water.

Outfall Number <i>(list)</i>	Latitude			Longitude			Receiving Water <i>(name)</i>
	Deg	Min	Sec	Deg	Min	Sec	
SW-1	35	09	5.8	81	51	36.9	LITTLE BUCK CREEK

## II. Discharge Date (When do you expect to begin discharging?)

## III. Flows, Sources of Pollution, and Treatment Technologies

A. For each outfall, provide a description of (1) All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and stormwater runoff; (2) The average flow contributed by each operation; and (3) The treatment received by the wastewater. Continue on additional sheets if necessary.

Outfall Number	1. Operations Contributing Flow <i>(list)</i>	2. Average Flow <i>(include units)</i>	3. Treatment <i>(Description or List Codes from Table 2D-1)</i>
SW-1	GROUNDWATER TREATMENT	8 GPM	AIR STRIPPING, CARBON ADSORPTION (2-A)

B. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Item III-A. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined (e.g., for certain mining activities), provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

C. Except for storm runoff, leaks, or spills, will any of the discharges described in item III-A be intermittent or seasonal?

Yes (complete the following table)

No (go to item IV)

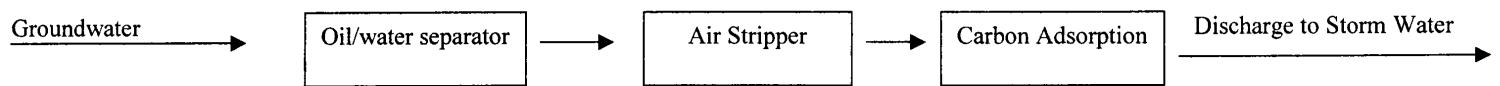
Outfall Number	1. Frequency		2. Flow		c. Duration (in days)
	a. Days Per Week (specify average)	b. Months Per Year (specify average)	a. Maximum Daily Flow Rate (in mgd)	b. Maximum Total Volume (specify with units)	

**IV. Production**

If there is an applicable production-based effluent guideline or NSPS, for each outfall list the estimated level of production (projection of actual production level, not design), expressed in the terms and units used in the applicable effluent guideline or NSPS, for each of the first 3 years of operation. If production is likely to vary, you may also submit alternative estimates (attach a separate sheet).

Year	a. Quantity Per Day	b. Units of Measure	c. Operation, Product, Material, etc (specify)

**Line Diagram for Form 2D of NPDES Permit Application**



**V. Effluent Characteristics**

A, and B: These items require you to report estimated amounts (both concentration and mass) of the pollutants to be discharged from each of your outfalls. Each part of this item addresses a different set of pollutants and should be completed in accordance with the specific instructions for that part. Data for each outfall should be on a separate page. Attach additional sheets of paper if necessary.

**General Instructions (See table 2D-2 for Pollutants)**

Each part of this item requests you to provide an estimated daily maximum and average for certain pollutants and the source of information. Data for all pollutants in Group A, for all outfalls, must be submitted unless waived by the permitting authority. For all outfalls, data for pollutants in Group B should be reported only for pollutants which you believe will be present or are limited directly by an effluent limitations guideline or NSPS or indirectly through limitations on an indicator pollutant.

1. Pollutant	2. Maximum Daily Value (include units)	3. Average Daily Value (include units)	4. Source (see instructions)
BENZENE	1 PPB	< 1 PPB	AIR STRIPPER + GAC MODELING.
TOLUENE	1 PPB	< 1 PPB	" " " "
ETHYL BENZENE	1 PPB	< 1 PPB	" " " "
XYLENES	1 PPB	< 1 PPB	" " " "
MTBE	1 PPB	< 1 PPB	" " " "
NAPHTHALENE	1 PPB	< 1 PPB	" " " "
EDB	1 PPB	< 1 PPB	" " " "



C. Use the space below to list any of the pollutants listed in Table 2D-3 of the instructions which you know or have reason to believe will be discharged from any outfall. For every pollutant you list, briefly describe the reasons you believe it will be present.

1. Pollutant	2. Reason for Discharge
BENZENE, TOLUENE, XYLENES, ETHYLBENZENE, NAPHTHALENE, EDB, MTBE	EACH POLLUTANT IS KNOWN TO EXIST IN THE RAW INFLUENT. ADEQUATE TREATMENT BY THE ENGINEERED SYSTEM SHOULD ADEQUATELY RESULT IN NON-DETECTABLE CONCENTRATIONS OF THESE POLLUTANTS.

#### VI. Engineering Report on Wastewater Treatment

A. If there is any technical evaluation concerning your wastewater treatment, including engineering reports or pilot plant studies, check the appropriate box below.

Report Available

No Report

B. Provide the name and location of any existing plant(s) which, to the best of your knowledge, resembles this production facility with respect to production processes, wastewater constituents, or wastewater treatments.

Name	Location

VII. Other Information (Optional)

Use the space below to expand upon any of the above questions or to bring to the attention of the reviewer any other information you feel should be considered in establishing permit limitations for the proposed facility. Attach additional sheets if necessary.

THE PROCESS OF TREATING PETROLEUM CONTAMINATED GROUNDWATER IS A COMMON AND VERY WELL DOCUMENTED PROCESS. TREATMENT OF VOLATILE ORGANIC COMPOUNDS BY AIR STRIPPING AND GRANULAR ACTIVATED CARBON ARE DOCUMENTED EFFECTIVE FORMS OF TREATMENT. THE PROJECTED FLOWS AT THIS SITE ARE INCONSEQUENTIAL (<10GPM) WHEN PROPERLY TREATED.

VIII. Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

A. Name and Official Title (type or print)

MARK BROOKS, PE ENVIRONMENTAL ENGINEER

B. Phone No.

428-232-4700

C. Signature

*Mark Brooks*

D. Date Signed

1/31/02



**BUREAU OF WATER**  
**SLUDGE DISPOSAL SUPPLEMENT FOR NPDES AND ND PERMIT APPLICATIONS**

Facility Name: HOT SPOT # 3005

Permit Number: SC00 \_\_\_\_\_ (leave blank for a new facility)

or ND00 \_\_\_\_\_

Please check your proposed or current sludge disposal procedure:

I. Existing Facilities:

- Lagoon or other facility with no routine sludge disposal. Please attach a letter that addresses the approximate schedule for sludge removal and address the anticipated disposal method (note that the proposed sludge disposal method must be approved by the Department prior to initiation).
- Sludge disposal at another wastewater treatment facility. Attached is a recent letter of acceptance dated \_\_\_\_\_. This letter must include the NPDES or ND number of the treatment facility accepting the sludge for disposal. If no previous SCDHEC approval has been granted on the disposal method, then please include a detailed report on the existing sludge disposal method. See the attached requirements for Sludge Disposal Report A. If a previous SCDHEC approval has been granted, then include a recent analysis that shows the non-hazardous nature of the sludge or a signed statement that the sludge characteristics have not changes since the last analysis.
- Sludge disposal at a landfill. If the landfill is SWAIP (special waste) approved, an recent acceptance letter from the landfill is acceptable. If the landfill is not SWAIP approved, attached is SCDHEC Solid and Hazardous Waste approval dated \_\_\_\_\_, or other SCDHEC approval dated \_\_\_\_\_. If no previous approval has been granted on the disposal method, then please include a detailed report on the existing sludge disposal method. See the attached requirements for Sludge Disposal Report B.
- Sludge disposal by Beneficial Use of Sludge. Attached is SCDHEC approval letter or program approval dated \_\_\_\_\_. If no previous approval has been granted on the disposal method, then please include a detailed report on the existing sludge disposal method. See the attached requirements for Sludge Disposal Report C.

II. Proposed Facilities:

- Lagoon or other facility with no routine sludge disposal. Please attach a letter that addresses the approximate schedule for sludge removal and address the anticipated disposal method (note that the proposed sludge disposal method must be approved by the Department prior to initiation).
- Sludge disposal at another wastewater treatment facility. Please include a detailed report on the proposed sludge disposal method. See the attached requirements for Sludge Disposal Report A.
- Sludge disposal at a landfill. Please include a detailed report on the proposed sludge disposal method. See the attached requirements for Sludge Disposal Report B.
- Sludge disposal by Beneficial Use. Please include a detailed report on the proposed sludge disposal method. See the attached requirements for Sludge Disposal Report C.

**Send this form and the appropriate disposal report (if applicable) with your NPDES or ND permit application.**

**ALSO SEE ATTACHED INSTRUCTIONS**

## **SLUDGE DISPOSAL ATTACHMENT**

No sludge will be generated from the treatment of contaminated groundwater at the site referenced in the attached DHEC Sludge Disposal Supplement for NPDES Permit Applications.

**SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL  
BUREAU OF WATER**

**LOCATION SUPPLEMENT FOR ND AND NPDES PERMIT APPLICATIONS**

FACILITY: HOT SPOT # 3005      DATE: 1/31/02

ITEM 1:      Please give a short description of the plant location, if the address is not a specific location. Example: Plant is located at the interchange of Interstate 26 and U.S. Highway #1.

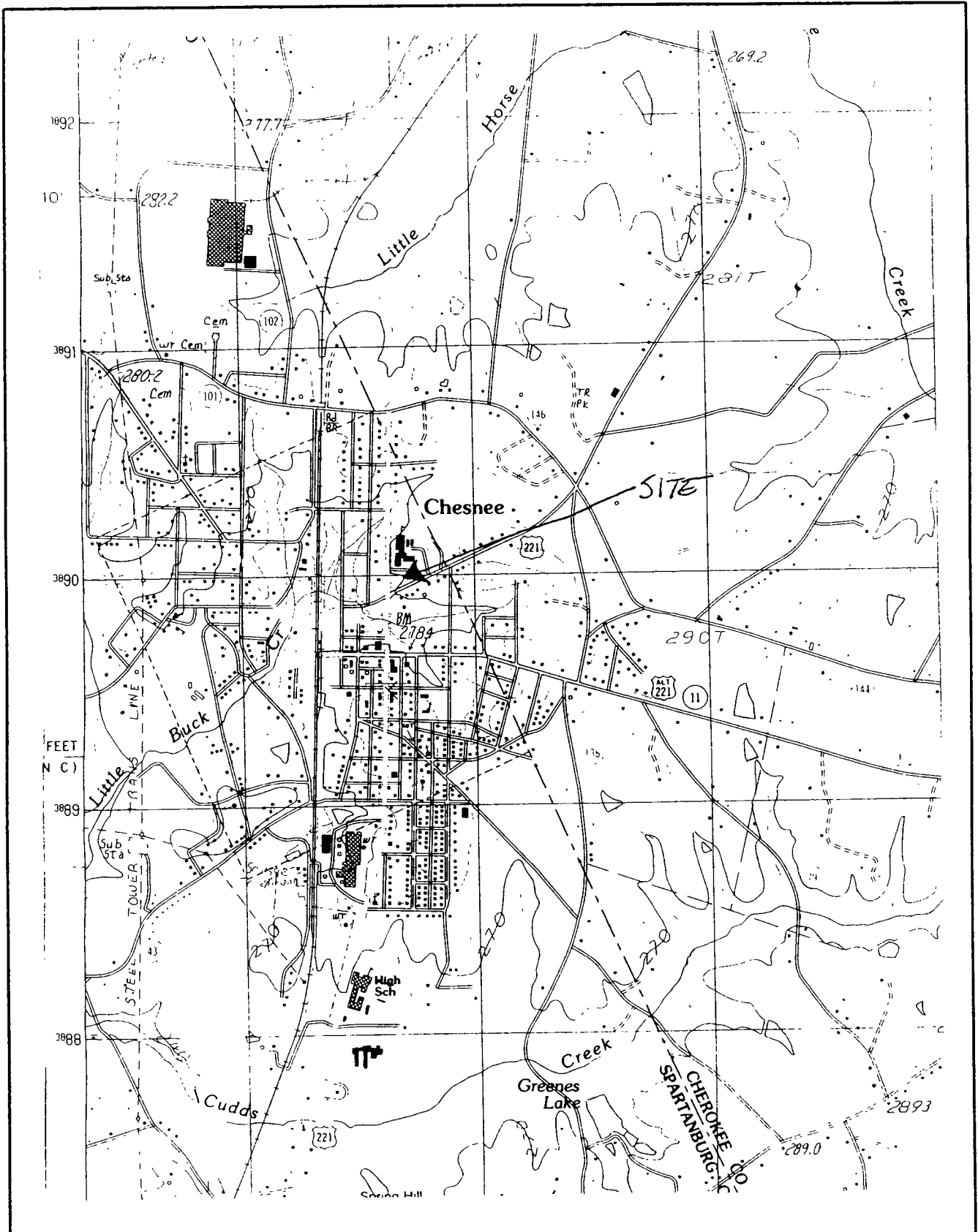
*SITE ADDRESS IS 107 HARTON ST. CHESNEE, SC, NEAR THE INTERSECTION OF N. ALABAMA AVE. AND SC HIGHWAY 221 IN CHESNEE.*

ITEM 2:      Please give a description of the location of the discharge point into the receiving stream using some landmark as a reference point, i.e., bridge, stream, road junction, the plant itself, etc. Give the direction and the distance in feet from the reference point. Example: Discharge #001 is into Johnny Creek approximately 300 feet directly behind the plant. Discharge #002 is into Doris Creek 150 feet downstream from U.S. Highway #30 bridge.

*THE POINT OF DISCHARGE IS A STORM DRAIN INLET ON N. ALABAMA AVE.. THE STORM DRAIN IS ADJACENT TO THE HOT SPOT # 3005 STORE, APPROXIMATELY 100 FEET NORTHWEST OF THE INTERSECTION WITH N. ALABAMA AVE. AND SC HIGHWAY 221.*

ITEM 3:      Please locate the discharge on a U.S. Geological Survey 7 1/2 minute quad sheet (or a 15 minute quad if a 7 1/2 quad is not available for the area). The entire quad sheet need not be submitted. An 8 1/2 by 11 inch photocopy of the applicable portion of the map is sufficient. The quad sheet name must be provided on the copy submitted to the Department. USGS Maps are available at the SC Dept. Of Natural Resources/Map Division, 2221 Devine Street, Suite 222, Columbia, SC 29205. Phone number is 734-9108.

RETURN TO:      SCDHEC  
                         Bureau of Water  
                         NPDES Administration  
                         2600 Bull Street  
                         Columbia, SC 29201



USGS 7.5 min. Topo.  
Chesnee Quad

**BME**  
**BROOKS & MEDLOCK**  
ENGINEERING, PLLC

**Figure 1**  
General Site Location

**BAQC PERMIT EXEMPTION REQUEST**

February 5, 2002

South Carolina DHEC  
Bureau of Air Quality Control  
2600 Bull Street  
Columbia, South Carolina 29201

ATTENTION: Mr. Kevin Clark

Reference: **AIR PERMIT EXEMPTION REQUEST**  
Groundwater Remediation System  
Hot Spot # 3005  
Site ID # 12719  
Chesnee, South Carolina

Dear Mr. Clark:

This letter is to serve as a request to exempt the groundwater remediation system at the Hot Spot # 3005 in Chesnee, South Carolina from air permitting requirements. This request is presented as part of the Corrective Action Plan for the referenced site. Brooks & Medlock Engineering has been chosen as the contractor for the site remediation under the Bureau of UST Management's "Pay-for-Performance" Corrective Action program.

The groundwater remediation system planned for this site employs several remedial technologies. In accordance with BAQC Air Pollution Control Regulations 62.1 Section II F(2)(g), "sources with with...uncontrolled VOC emissions less than 1000 lbs./mo. may not require permits". Each of the remedial technologies proposed herein are estimated to generate significantly less than 1,000 lb./mo. VOC emissions. Each is described below along with potential air emissions.

Groundwater Extraction, Treatment and Discharge

Groundwater extraction, or Pump and Treat, technology is to be employed in a small "source zone" area at the subject site. Extracted groundwater is to be treated with an oil/water separator, shallow tray air stripper granular activated carbon filtration. Based upon the concentration of targeted VOCs in the groundwater plume, we calculate less than 15 pounds of BTEX compounds exist at the site. The system is anticipated to operate for approximately two years. Emissions are anticipated to be somewhat higher initially than they will be later in the life of the project. We estimate monthly emissions to be approximately 3 pounds per month (lb/mo) for the first three months, then rapidly falling to less than 1 lb/mo for the remainder of the project. This is based upon professional experience.



In an effort to comply with BAQC protocol, a BAQC UST Modeling Information sheet is attached for the groundwater extraction system. The Air Toxic Information presents “worst case” emission rates as the input CoC concentrations are maximum dissolved phase solubility for each VOC. The resulting emission rate is based upon the Henry’s Law constant for each VOC and the air flow rate of the air stripper. The results indicate that less than 8 lbs/mo. of total VOCs identified will be emitted. We plan to monitor the emissions upon start-up of the system to verify our estimates. Treatment of blower emissions can be implemented should the monitoring results deem this necessary.

#### Soil Vapor Extraction

Remediation of vadose zone CoC and free product on the water table will be initiated with an SVE system. Two (2) 4” diameter vapor extraction wells will be screened at the water table and in the vadose zone and connected to a regenerative blower. As with the air sparging, the emission rate of the SVE system is difficult to estimate as the emission rate is dependent upon air contact with dissolved phase CoC and NAPL. It is assumed that the emission rate will be less than that of air stripper described above and will therefore be inconsequential.

We appreciate your timely review of this exemption request. Please call us at (828) 232-4700 with any questions.

Sincerely,

**Brooks & Medlock Engineering, PLLC**

A handwritten signature in black ink, appearing to read "Mark Brooks".

Mark Brooks, P.E.

Attachments: BAQC Modeling Sheet  
Calculations



Board: William E. Applegate, III, Chairman  
 Hon H Buriss, Vice Chairman  
 Richard E Jabbour, DDS, Secretary

Toney Graham, Jr., MD  
 Sandra J. Molander  
 John B Pate, MD  
 Robert J. Stripling, Jr

Promoting Health, Protecting the Environment

2600 Bull Street, Columbia, SC 29201

**BAQC UST MODELING INFORMATION**

PLEASE FILL OUT COMPLETELY

SITE/COMPANY NAME: Hot Spot # 3005 GWPD ID#: 12719

CLEANUP LOCATION: 107 Hampton Street  
Chesnee, SC

TYPE OF OPERATION (i.e. AIR STRIPPER): Air Stripper

CONTACT: Mark Brooks, PE PHONE: 828-232-4700

**SITE MAPS:**

Please include a scaled plot plan of the site location that clearly shows distances from the stack to the property boundaries. All buildings and/or structures within a radius of 5 stack heights (measured from the stack/vent) shall be incorporated on this plot plan and information on each building and/or structure's height, width, and length shall also be included.

**STACK INFORMATION**

HEIGHT ABOVE GROUND Est. 12' FEET; DIAMETER .333 FEET  
 TEMPERATURE Est. 120 deg F; VELOCITY 23.0 FEET/SECOND

**AIR TOXIC INFORMATION**

AIR TOXIC EMITTED (i.e. BENZENE)	CHEMICAL ABSTRACT SERVICE (CAS) NUMBER	EMISSION RATE LB/HR
A) <u>Benzene</u>	<u>71432</u>	<u>.0016</u>
B) <u>Toluene</u>	<u>108883</u>	<u>.0028</u>
C) <u>Ethylbenzene</u>	<u>100414</u>	<u>.0023</u>
D) <u>Xylenes</u>	<u>1330207</u>	<u>.0027</u>
E) <u>Naphthalene</u>	<u>91203</u>	<u>1.2E-7</u>

Please submit this completed sheet with scaled site maps to the appropriate SCDHEC project manager at the Ground-Water Protection Division, 2600 Bull Street, Columbia, SC 29201.

## Air Stripping Dissolved Phase Volatilization Mass Removal Rate\*

**I Calculate gas phase concentrations**

$$C_g = H_i C_a / RT$$

where:  $C_g$  = gas phase concentration of CoC in mg/l

$H_i$  = Henry's law constant

R = universal gas constant = .082 L-atm/mol

T = temperature in degrees Kelvin = 273.15+20°C

$C_a$  = aqueous concentration (worst case)

	Benzene	Toluene	Ethylbenz.	Xylenes	Naphth.	MTBE
$H_i =$	5.59	6.37	6.43	7.62	0.048	0.15
RT =	24.1	24.1	24.1	24.1	24.1	24.1
$C_a =$	226	301	280	278	2	5,110
$C_g$ (mg/l) =	52.4207	79.5589	74.705394	87.8988	0.00398	31.8049793

**II Calculate Emission Rate**

$$ER = C_g \times Q$$

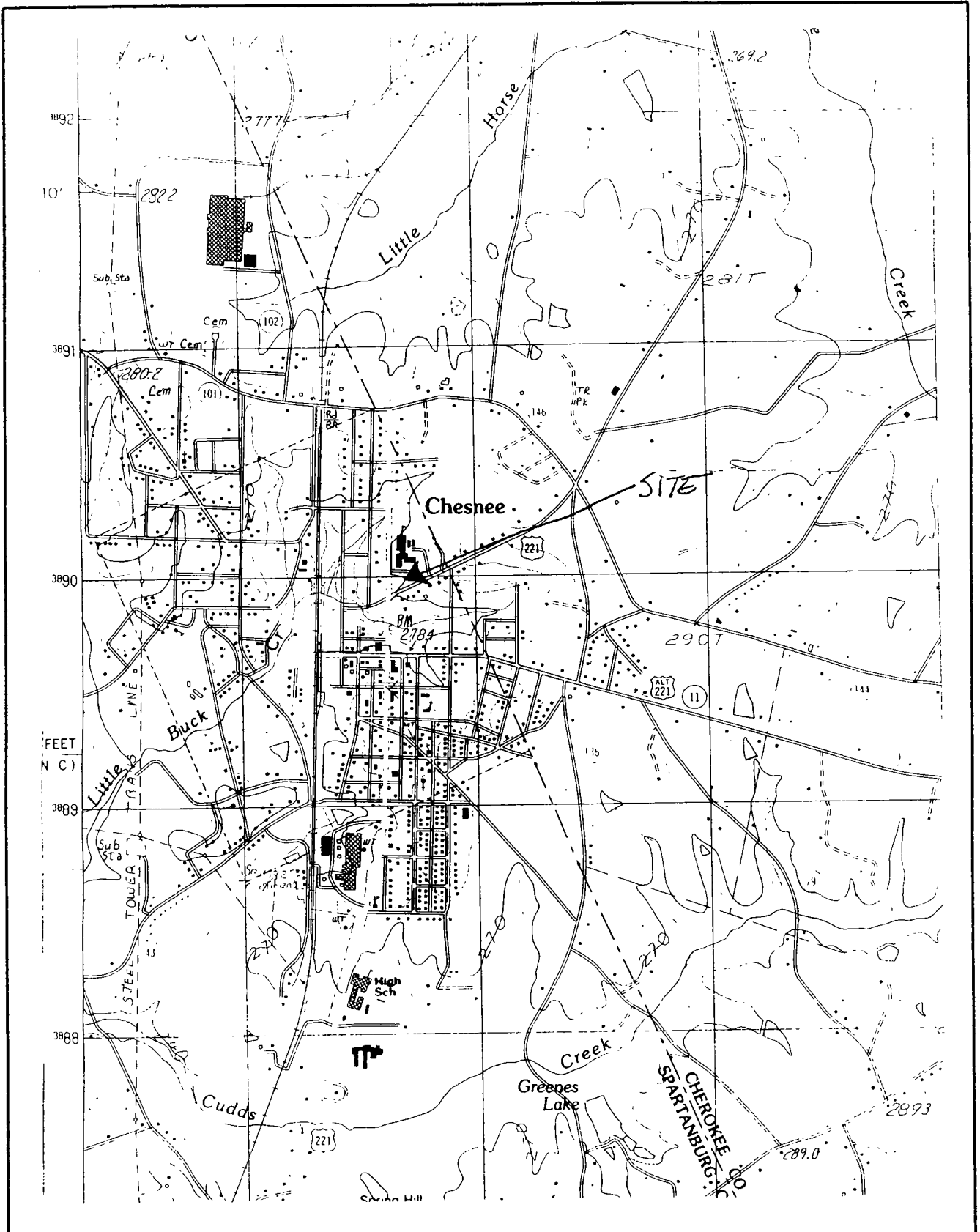
where: ER = VOC Emission rate

Q = air flow rate

	Benzene	Toluene	Ethylbenz.	Xylenes	Naphth.	MTBE
$C_g$ (mg/l) =	52.4207	79.5589	74.705394	87.8988	0.00398	31.8049793
Q (cfm) =	120	120	120	120	120	120

**ER = (mg/min)** 12.3626 18.7626 17.618022 20.7295 0.00094 7.50067427

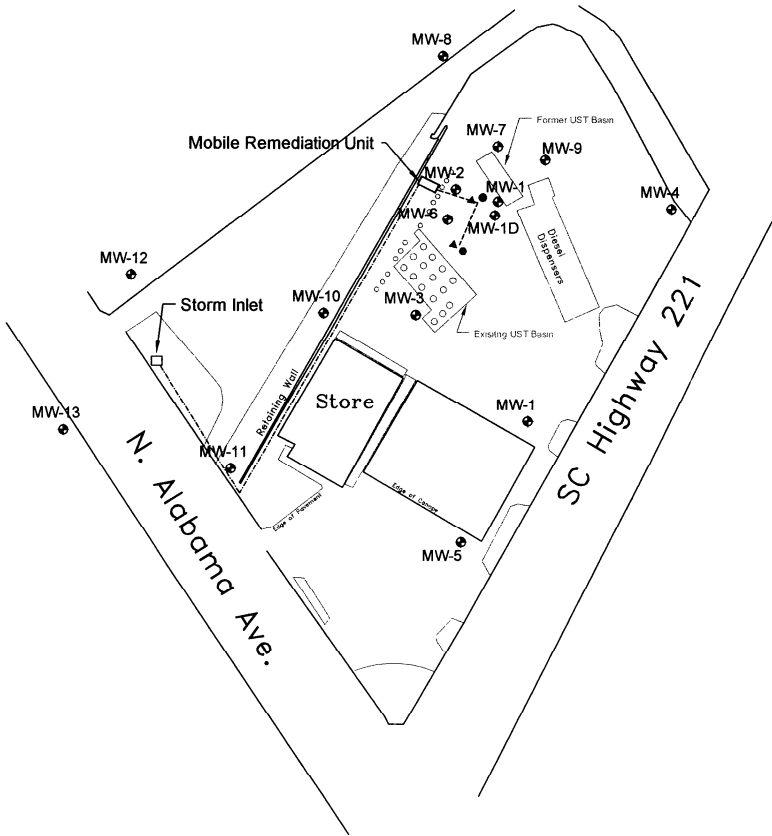
**ER Total (lb/mo) 7.57537**



USGS 7.5 min. Topo.  
Chesnee Quad

**BME**  
**BROOKS & MEDLOCK**  
ENGINEERING, PLLC


**Figure 1**  
General Site Location



**LEGEND:**

- Compliance Monitoring Well
- ▲ SVE Well
- GW Extraction Well
- Trenching
- Discharge Line

**Note:**  
 Site map derived from figures provided by  
 SCDHEC. Locations of wells and site features are  
 relative.

 <b>BROOKS &amp; MEDLOCK</b> <small>ENGINEERING, PLLC</small> <small>718 MERRIMON AVENUE</small> <small>ASHEVILLE, N.C. 28604</small>		
PROJECT: Hot Spot # 3005 CAP	FIGURE: 3	
DATE: 2/4/02	SCALE: N.T.S.	REV.: 1



**UNDERGROUND STORAGE TANK PROGRAM**  
**BUREAU OF LAND AND WASTE MANAGEMENT**  
2600 Bull Street  
Columbia, SC 29201  
Telephone (803) 898-4350  
Fax (803) 898-5330

## MEMORANDUM

**DATE:** February 21, 2002

**TO:** Melinda Vickers  
Industrial, Agricultural, Stormwater Permitting Division  
Bureau of Water

**FROM:** Debra L. Thoma *DLT*  
Underground Storage Tank Program

**SUBJECT:** Hot Spot 3005, 107 Hampton Ave., Chesnee, SC  
UST Permit #12719  
Corrective Action Plan received February 7, 2002  
Engineering Report & Construction Permit Application received February 20, 2002  
Spartanburg County

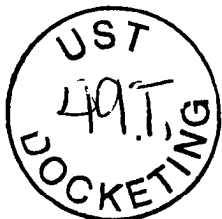
Attached for your review and approval is the Engineering Report and Construction Permit Application for the above referenced site submitted by Brooks & Medlock Engineering.

Questions may be referred to my attention at (803) 898-4362.

**Enc:** Preliminary Engineering Report (2 copies)  
Construction Permit Application (4 copies)  
Application Fee

**Cc:** Technical File

SCDHEC/UST/DLT/2.21.02





Communication Slip

Date: 2/21/02

To: Debra Thoma

UST

Approval

As Requested

Necessary Action

Note and Return

Prepare Reply

Note and File

Comment

FEB 21 2002

RECEIVED

Remarks:

Underground Storage Tank Program

From: Mary Peyton Davis, BAQ



2600 Bull Street  
Columbia, SC 29201-1708

## MEMORANDUM

COMMISSIONER:  
C. Earl Hunter

BOARD:  
Bradford W. Wyche  
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Mark B. Kent  
Vice Chairman

Howard L. Brilliant, MD  
Secretary

Carl L. Brazell


Louisiana W. Wright

L. Michael Blackmon

Larry R. Chewning, Jr., DMD

DATE: February 21, 2002

TO: Debra L. Thoma  
Underground Storage Tank Program

FROM: Mary Peyton Davis   
Air Modeling Section  
Bureau of Air Quality

SUBJECT: Hot Spot 3005, GWPD #12719  
107 Hampton Avenue  
Chesnee, Spartanburg County, South Carolina

The Bureau of Air Quality has reviewed the air emission information for the air sparging system and soil vapor extraction event to be located at Hot Spot 3005 in Chesnee, SC. Air dispersion modeling results indicate that the air toxics emitted (Benzene, Toluene, Ethylbenzene, Xylenes, and Naphthalene) will result in off-site concentrations of these toxics that will meet the air toxic standards (Standard No. 8). Since the total volatile organic compound (VOC) emissions are less than 1000 lbs./month, an air permit will not be required for the air sparging system and soil vapor extraction event. If the 1000 lb. VOC limit is reached during the air sparging system and soil vapor extraction event, the system will be shut down, and an air permit will be obtained from the Bureau of Air Quality before operation may continue. This is in accordance with Section II, Part F, Paragraph G of the SC Dept. of Health and Environmental Control Air Pollution Control Regulation No. 62.1.

cc: Ron Garrett, Appalachia III EQC District  
Randy Price, BAQ Permitting  
Engineering File



## AIR DISPERSION MODELING SUMMARY SHEET

SITE NAME: Hot Spot 3005

DATE: 2/21/02

LOCATION: Chesnee

REVIEWED BY: MPD

GWPD NO.: 12719

MODEL: De minimis

SOURCE DESCRIPTION: Air sparging system and soil vapor extraction event

RESULTS:

POLLUTANT	CAS NO.	AVERAGING PERIOD	EMISSION RATE (LBS/DAY)	DE MINIMIS LEVEL (LBS/DAY)
Benzene	71-43-2	24 Hour	0.0384	1.8
Toluene	108-88-3	24 Hour	0.0672	24.0
Ethyl benzene	100-41-4	24 Hour	0.0552	52.2
Xylene	1330-20-7	24 Hour	0.0648	52.2
Naphthalene	91-20-3	24 Hour	2.88E-06	15.0



**UNDERGROUND STORAGE TANK PROGRAM  
BUREAU OF LAND AND WASTE MANAGEMENT**

2600 Bull Street  
Columbia, SC 29201  
Telephone (803) 898-4350  
Fax (803) 898-5330

**MEMORANDUM**

DATE: February 8, 2002

TO: Mary Peyton Davis  
Air Modeling Section  
Bureau of Air Quality

**RECEIVED**

FEB 15 2002

FROM: Debra L. Thoma *DT*  
Underground Storage Tank Program

BUREAU OF AIR QUALITY

SUBJECT: Hot Spot 3005, 107 Hampton Ave., Chesnee, SC  
UST Permit #12719  
Corrective Action Plan received February 7, 2002  
Air Permit Request received February 7, 2002  
Spartanburg County

Attached for your review and approval is the BAQ Modeling/ Air Toxic Questionnaire for the above referenced site submitted by Brooks & Medlock Engineering Initial review by this Bureau indicates the Corrective Action Plan can be permitted in South Carolina.

Questions may be referred to my attention at (803) 898-4362.

Enc: BAQ Permit Exemption Request

SCDHEC/UST/DLT/2.8.02

**BAQC PERMIT EXEMPTION REQUEST**

February 5, 2002

South Carolina DHEC  
Bureau of Air Quality Control  
2600 Bull Street  
Columbia, South Carolina 29201

ATTENTION: Mr. Kevin Clark

Reference: **AIR PERMIT EXEMPTION REQUEST**  
Groundwater Remediation System  
Hot Spot # 3005  
Site ID # 12719  
Chesnee, South Carolina

Dear Mr. Clark:

This letter is to serve as a request to exempt the groundwater remediation system at the Hot Spot # 3005 in Chesnee, South Carolina from air permitting requirements. This request is presented as part of the Corrective Action Plan for the referenced site. Brooks & Medlock Engineering has been chosen as the contractor for the site remediation under the Bureau of UST Management's "Pay-for-Performance" Corrective Action program.

The groundwater remediation system planned for this site employs several remedial technologies. In accordance with BAQC Air Pollution Control Regulations 62.1 Section II F(2)(g), "sources with with...uncontrolled VOC emissions less than 1000 lbs./mo. may not require permits". Each of the remedial technologies proposed herein are estimated to generate significantly less than 1,000 lb./mo. VOC emissions. Each is described below along with potential air emissions.

Groundwater Extraction, Treatment and Discharge

Groundwater extraction, or Pump and Treat, technology is to be employed in a small "source zone" area at the subject site. Extracted groundwater is to be treated with an oil/water separator, shallow tray air stripper granular activated carbon filtration. Based upon the concentration of targeted VOCs in the groundwater plume, we calculate less than 15 pounds of BTEX compounds exist at the site. The system is anticipated to operate for approximately two years. Emissions are anticipated to be somewhat higher initially than they will be later in the life of the project. We estimate monthly emissions to be approximately 3 pounds per month (lb/mo) for the first three months, then rapidly falling to less than 1 lb/mo for the remainder of the project. This is based upon professional experience.

In an effort to comply with BAQC protocol, a BAQC UST Modeling Information sheet is attached for the groundwater extraction system. The Air Toxic Information presents "worst case" emission rates as the input CoC concentrations are maximum dissolved phase solubility for each VOC. The resulting emission rate is based upon the Henry's Law constant for each VOC and the air flow rate of the air stripper. The results indicate that less than 8 lbs/mo. of total VOCs identified will be emitted. We plan to monitor the emissions upon start-up of the system to verify our estimates. Treatment of blower emissions can be implemented should the monitoring results deem this necessary.

Soil Vapor Extraction

Remediation of vadose zone CoC and free product on the water table will be initiated with an SVE system. Two (2) 4" diameter vapor extraction wells will be screened at the water table and in the vadose zone and connected to a regenerative blower. As with the air sparging, the emission rate of the SVE system is difficult to estimate as the emission rate is dependent upon air contact with dissolved phase CoC and NAPL. It is assumed that the emission rate will be less than that of air stripper described above and will therefore be inconsequential.

We appreciate your timely review of this exemption request. Please call us at (828) 232-4700 with any questions.

Sincerely,

**Brooks & Medlock Engineering, PLLC**

A handwritten signature in cursive script, appearing to read "Mark Brooks".

Mark Brooks, P.E.

Attachments: BAQC Modeling Sheet  
Calculations



Board: William E. Applegate, III, Chairman  
 Hon H. Buriss, Vice Chairman  
 Richard E. Jabbour, DDS, Secretary

Toney Graham, Jr., MD  
 Sandra J. Molander  
 John B. Pate, MD  
 Robert J. Stripling, Jr.

Promoting Health, Protecting the Environment

2600 Bull Street, Columbia, SC 29201

**BAQC UST MODELING INFORMATION**

PLEASE FILL OUT COMPLETELY

SITE/COMPANY NAME: Hot Spot # 3005 GWPD ID#: 12719

CLEANUP LOCATION: 107 Hampton Street  
Chesnee, SC

TYPE OF OPERATION (i.e. AIR STRIPPER): Air Stripper

CONTACT: Mark Brooks, PE PHONE: 828-232-4700

**SITE MAPS:**

Please include a scaled plot plan of the site location that clearly shows distances from the stack to the property boundaries. All buildings and/or structures within a radius of 5 stack heights (measured from the stack/vent) shall be incorporated on this plot plan and information on each building and/or structure's height, width, and length shall also be included.

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 TEMPERATURE Est. 120 deg F; VELOCITY 23.0 FEET/SECOND

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Please submit this completed sheet with scaled site maps to the appropriate SCDHEC project manager at the Ground-Water Protection Division, 2600 Bull Street, Columbia, SC 29201.

## Air Stripping Dissolved Phase Volatilization Mass Removal Rate\*

### I Calculate gas phase concentrations

$$C_g = H_i C_a / RT$$

where:  $C_g$  = gas phase concentration of CoC in mg/l

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$R$  = universal gas constant = .082 L-atm/mol

$T$  = temperature in degrees Kelvin = 273.15+20°C

$C_a$  = aqueous concentration (worst case)

	Benzene	Toluene	Ethylbenz.	Xylenes	Naphth.	MTBE
$H_i =$	5.59	6.37	6.43	7.62	0.048	0.15
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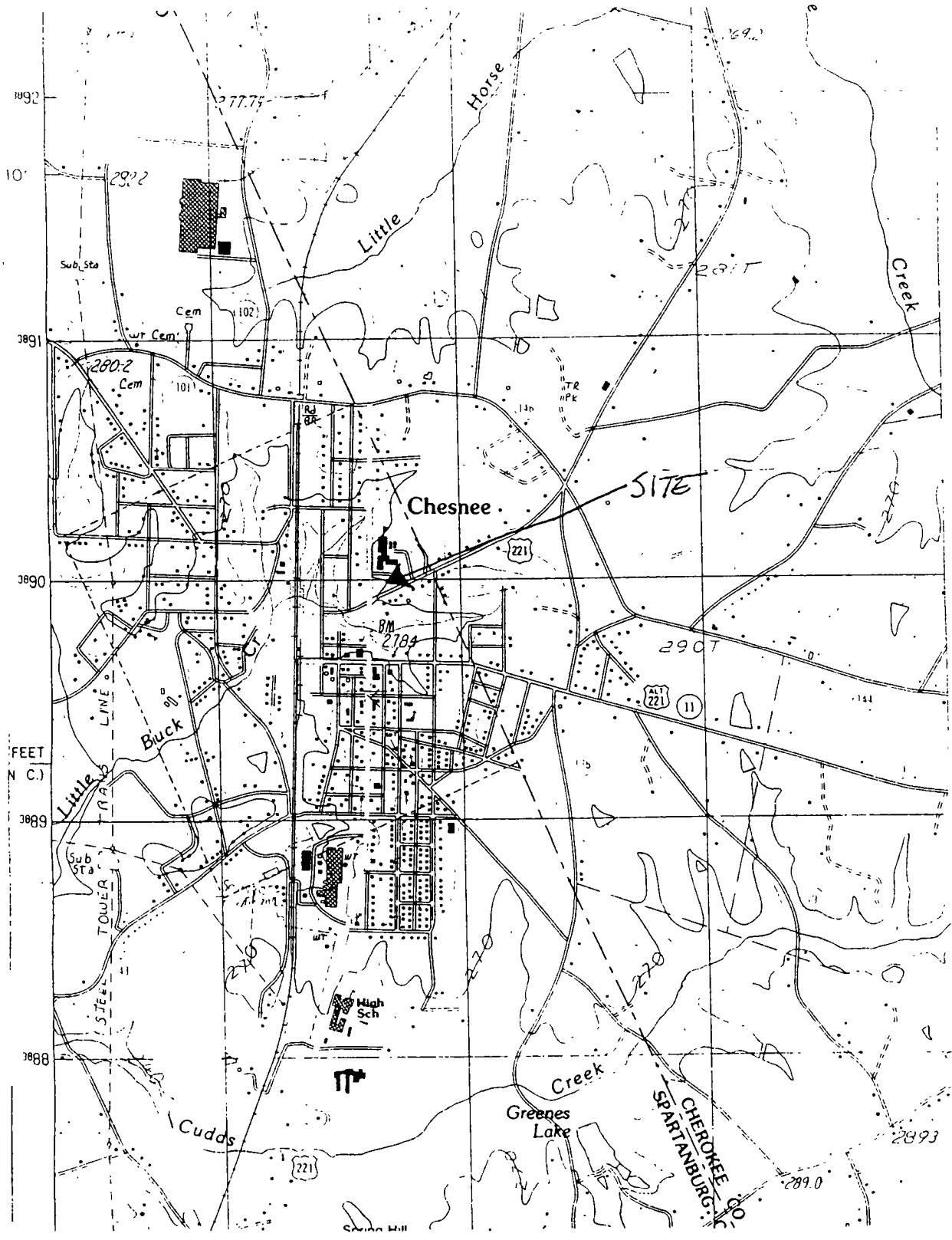
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**ER = (mg/min)** 12.3626 18.7626 17.618022 20.7295 0.00094 7.50067427

**ER Total (lb/mo) 7.57537**

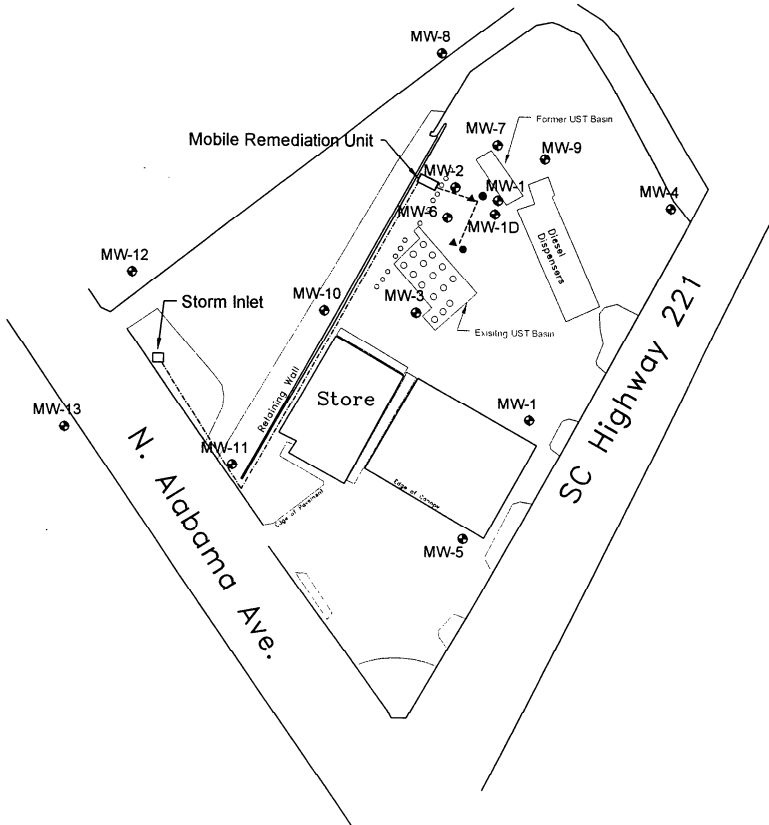


USGS 7.5 min. Topo.  
Chesnee Quad



**Figure 1**  
General Site Location






**LEGEND:**

- Compliance Monitoring Well
- ▲ SVE Well
- GW Extraction Well
- Trenching
- Discharge Line

**Note:**  
 Site map derived from figures provided by  
 SCDHEC. Locations of wells and site features are  
 relative.

 <b>BROOKS &amp; MEDLOCK</b> <small>ENGINEERING, PLLC</small> <small>712 MERRIMON AVENUE</small> <small>ASHEVILLE, N.C. 28904</small>		
PROJECT: Hot Spot # 3005 CAP	SCALE: N.T.S.	FIGURE: 3
DATE: 2/4/02	SCALE: N.T.S.	REV.: 1

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FEB 25 2002

Underground Storage  
Tank Program

February 22, 2002

South Carolina DHEC  
Bureau of Underground Storage Tank Management  
2600 Bull Street  
Columbia, South Carolina 29201

ATTENTION: Ms. Debra Thomas

Reference: **PRELIMINARY SAMPLING REPORT**  
Hot Spot # 3005  
Site ID No. 12719



Dear Ms. Thomas:

Brooks & Medlock Engineering, PLLC (BME) has performed a preliminary sampling event for the referenced site. This sampling event was required as part of the scope of work outlined in Bid Number SB-18123-12/20/01-HW (Bid Package). This Preliminary Sampling Report provides the details and results of the sampling event.

***Sampling Event***

Field personnel from BME conducted a sampling event at the Hot Spot # 3005 located in Chesnee, SC on February 15<sup>th</sup>. Groundwater samples were collected in accordance with the South Carolina DHEC *Analytical Methodology for Groundwater and Soil Assessment Guidelines* dated March 15, 2000. Each monitoring well designated as a compliance point in the Bid Package was sampled according to the following steps:

1. A fresh pair of disposable Nitril<sup>TM</sup> gloves are donned to prevent cross-contamination.
2. The groundwater level is measured with a water level indicator and recorded. If free product is present, the product level is measured with an oil/water interface probe. Wells with free product are not sampled.
3. The well is purged with either a disposal polyethylene disposable bailer or a submersible well pump equipped with disposable vinyl tubing.
4. Periodic geochemical characteristic measurements are taken for pH, conductivity and temperature. Once the geochemical characteristics are stabilized (less than a 10% differential), the appropriate sample containers are filled. Care is taken on VOC vials to ensure no head space is allowed. The vials are provided by the analyzing laboratory.
5. Samples are placed on ice for shipment.
6. Non-disposal sampling equipment is decontaminated utilizing an Alconox<sup>TM</sup> wash and triple rinse.
7. Purge water and "de-con" water are containerized for off-site transport to a properly permitted non-hazardous waste treatment and disposal facility.
8. Gloves and other disposal equipment (bailers, tubing) are changed out and containerized.

Copies of the field sheets with geochemical purge data for each monitoring well are provided as Attachment I. Purge water is to be temporarily stored on site for treatment and disposal by the

# Letter Of Transmittal



**RECEIVED**

**FEB 25 2002**

712 Merrimon Avenue  
Asheville, NC 28804  
Phone (828) 232-4700  
Fax (828) 232-1331

Underground Storage  
Tank Program

<b>Send to:</b> Debra Thomas SCDHEC Bureau of UST Management 2600 Bull Street Columbia, SC 29201	<b>From:</b> Mark Brooks, PE Brooks & Medlock Engineering 712 Merrimon Ave. Asheville, NC 28804
Copy:	Date: February 22, 2002
Office Location:	Project No.: 14702-117-01
Re: Sampling Report	

**Transmittal**

Document	Date	Use
Original Preliminary Sampling Report	1/22/02	review
Copy of Sampling Report	1/22/02	review

groundwater treatment system proposed in the Corrective Action Plan once all operation and discharge permits have been approved.

### ***Sampling Results***

The groundwater elevation data was utilized to generate a potentiometric map depicting the site's surficial aquifer flow direction and gradient. Table 1 summarizes the groundwater elevation data. The general groundwater flow direction is towards the west side of the property, as previously reported. The potentiometric map is provided as Figure 1.

Groundwater samples were analyzed by Access Analytical (SC Lab Certification No. 96023). Samples were analyzed for benzene, toluene, ethylbenzene, xylene, naphthalene and MTBE by EPA Method 8260. The results are summarized in Table 2. Copies of the laboratory analytical are provided in Attachment II. The results are very similar to the CoC concentrations reported in the Bid Package. The only sampling event anomaly was that no sample was obtained for MW-3. Although a water level reading was obtained at the very bottom of the well, sufficient sample volume could not be obtained with either the purge pump or a bailer.

### ***Closing***

BME is prepared to proceed with the remediation system installation once the Corrective Action Plan submitted February 6, 2002 is approved and all of the necessary permit inspections have been conducted. If you have any questions or comments, please contact me at (828) 232-4700.

Sincerely,

**Brooks & Medlock Engineering, PLLC**



Mark Brooks, P.E.  
Environmental Engineer

Cc: Judy Laughter, R.L. Jordan Oil Co.

Attachments: Figures  
Tables  
Attachment I: Sample Logs  
Attachment II: Laboratory Analytical

## **TABLES**

**BROOKS & MEDLOCK ENGINEERING, PLLC**

**TABLE 1  
GROUNDWATER ELEVATION DATA**

<b><i>Well ID</i></b>	<b><i>Well TOC* Elevation</i></b>	<b><i>Depth to Water</i></b>	<b><i>Depth to Product</i></b>	<b><i>Product Thickness</i></b>	<b><i>Groundwater Elevation</i></b>
MW-1**	104.89	29.89	29.41	0.48	75.46
MW-3	104.92	32.12	-	-	72.80
MW-6	104.14	30.15	-	-	73.99
MW-7	104.52	29.56	-	-	74.96
MW-9	105.43	29.11	-	-	76.32
MW-10	96.57	23.69	-	-	72.88
MW-11	95.15	23.97	-	-	71.18

\*TOC = top of casing

\*\* Elevation adjusted for free product

**BROOKS & MEDLOCK ENGINEERING, PLLC**

**TABLE 2  
CoC CONCENTRATIONS**

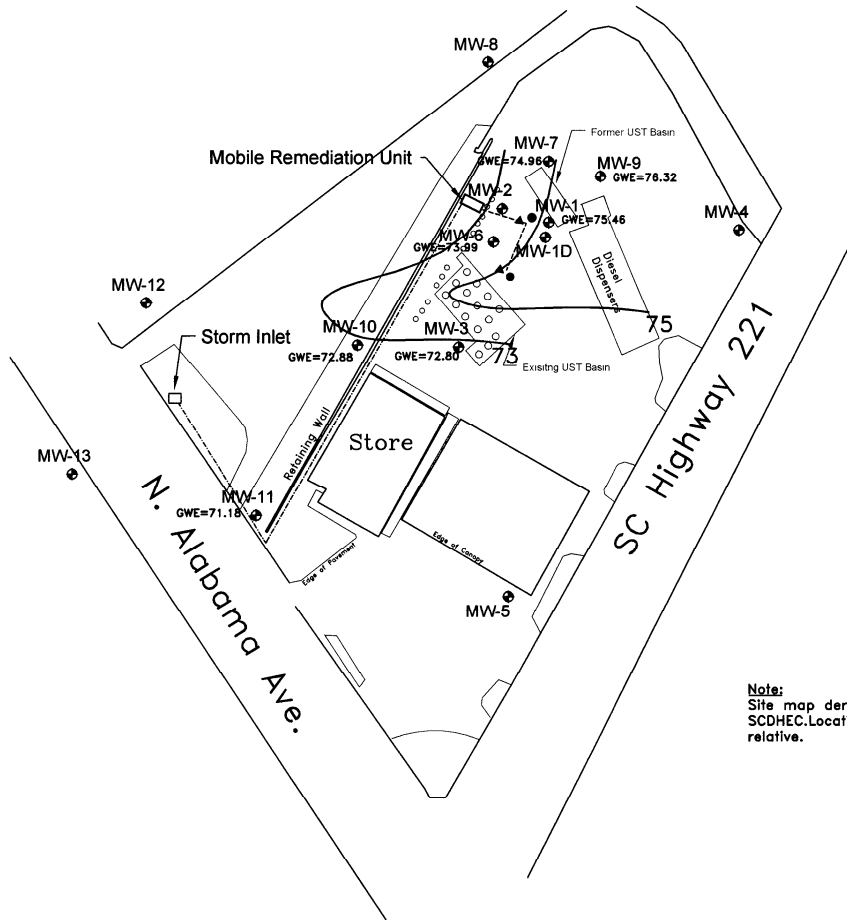
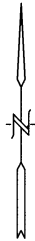
<i>Well</i>	<i>Date</i>	<i>Parameters (ug/l)</i>					
		<i>Benzene</i>	<i>Toluene</i>	<i>Ethylbenzene</i>	<i>Xylenes</i>	<i>Naphth.</i>	<i>MTBE</i>
SC GW Std.	NA	5	1,000	700	10,000	25	40
MW-1*	9/29/01	226,000	301,000	280,000	278,000	2,000	5,110,000
	2/15/02	NS	NS	NS	NS	NS	NS
MW-3	9/29/01	2,140	155	295	2,260	300	7,460
	2/15/02	NS	NS	NS	NS	NS	NS
MW-6	9/29/01	7	2	24	97	<5	<5
	2/15/02	3	<1	8	25.8	26.8	<1
MW-7	9/29/01	<1	<1	<1	<1	<5	<5
	2/15/02	<1	<1	<1	<1	<1	<1
MW-9	9/29/01	<1	<1	<1	<1	<5	<5
	2/15/02	<1	<1	<1	<1	<1	<1
MW-10	9/29/01	<1	<1	<1	<1	<5	<5
	2/15/02	<1	<1	<1	<1	<1	<1
MW-11	9/29/01	<1	<1	<1	<1	<5	<5
	2/15/02	<1	<1	<1	<1	<1	<1

\*Free product in well. Concentration estimated at solubility.

NS = Not

## **FIGURES**





**LEGEND:**

GWE = Groundwater Elevation

— Groundwater Contour

● Compliance Monitoring Well


▲ SVE Well

■ GW Extraction Well

--- Trenching

--- Discharge Line

**Note:**  
Site map derived from figures provided by SCDHEC. Locations of wells and site features are relative.

 <b>BROOKS &amp; MEDLOCK</b> <small>ENGINEERS, PLLC</small> <small>718 MEDISON AVENUE</small> <small>ASHEVILLE, N.C. 28804</small>		
TITLE: Potentiometric Map		
PROJECT: Hot Spot # 3005 CAP	FIGURE: 1	
DATE: 2/20/02	SCALE: N.T.S.	REV.: 1

**ATTACHEMENT I**

**SAMPLE LOGS**





**BROOKS & MEDLOCK ENGINEERING  
SAMPLE LOG**

Date: 2/15

Site: HOT SPOT

Well ID: MW ~~11~~ 6 Sample ID: \_\_\_\_\_

Well Depth: 32.5 DTW: 29.38 DTP: \_\_\_\_\_

Well Dia.: 2 inches

Well Vol. .43 gallons  
 (2 in. = .163 X DTW-WD)  
 (4 in. = .652 X DTW-WD)  
 (6 in. = 1.47 X DTW-WD)

Time	Gal.	pH	Conductivity	Temp. (F)	DO
11:22	4	4.34	61.1	19.2	NT
11:26	12	4.88	51.1	19.8	NT
11:30	20	5.18	50.1	19.9	NT
2nd DIT - SAMPLED					

vs











**ATTACHMENT II**  
**LABORATORY DATA**

M. Brooks  
 Brooks & Medlock Eng.  
 712 Merrimon Ave.  
 Asheville, NC 28804

Page 3  
 February 21, 2002  
 Report # 202000751  
 Order # 13794  
 South Carolina Cert ID# 96023

Site Location/Project  
 DHEC-HOT SPOT #3005

Sample I.D.: HS-6  
 Collected: 02/15/02 11:45  
 Received: 02/16/02 10:00  
 Collected by: Client.


PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT	DATE EXT.	DATE ANALY.	ANALYST
E260B BTEX w/Naph+MTBE in Water by GC-MS (S.C.)			MEDF	1			
Methyl-Tert-Butyl-Ether	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:03 ME
Benzene	2.59	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:03 ME
Toluene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:03 ME
Ethylbenzene	4.09	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:03 ME
m & p-Xylene	25.8	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:03 ME
o-Xylene	38.4	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:03 ME
Naphthalene	36.8	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:03 ME
SURROGATE: Toluene-D8	97.00%						
SURROGATE: Bromofluorobenzene	122.00%						
SURROGATE: Dibromofluoromethane	90.75%						

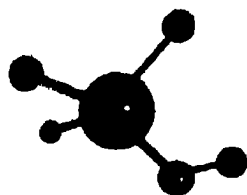
**REPORT COMMENTS:**

BDL: Indicates Analyte is Below Detection Limit MEDF: Matrix Effect Dilution Factor  
 Unless otherwise noted, mg/Kg denotes wet weight

Unless otherwise noted in analyst section, all work performed by STL MIAMI.  
 10200 USA Today Way, Miramar Florida 33025. (954) 431-4550 (South Carolina Cert ID# 96023)  
 Certs: AL.=#41180, CT.=#PH0217, KS.=#E270 + E1245, KY.=#90087, LA.=#9601, MD.=#271, MA.=#M-FL535  
 ND.=#R163, OK.=#9523, SC.=#96023, TN.=#TN02826

Unless otherwise noted, samples submitted for EPA 5035 were collected, preserved and analyzed in accordance with all methodology requirements.

  
 \_\_\_\_\_  
 Company Representative



**ACCESS  
ANALYTICAL, INC.**

**M. Brooks**  
Brooks & Medlock Eng.  
712 Merrimon Ave.  
Asheville, NC 28804

Page 1  
February 21, 2002  
Report # 202000751  
Order # 13792  
South Carolina Cert ID# 96023

Site Location/Project  
**DHEC-HOT SPOT #3005**

Sample I.D.: HS-7  
Collected: 02/15/02 11:20  
Received: 02/16/02 10:00  
Collected by: Client.

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT	DATE EXT.	DATE ANALY.	ANALYST
8260B BTEX w/Naph+MTBE in Water by GC-MS (S.C.)			MEDF	1			
Methyl-Tert-Butyl-Ether	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:02 ME
Benzene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:02 ME
Toluene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:02 ME
Ethylbenzene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:02 ME
m & p-Xylene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:02 ME
o-Xylene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:02 ME
Naphthalene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:02 ME
SURROGATE: Toluene-D8	102.00%						
SURROGATE: Bromofluorobenzene	118.25%						
SURROGATE: Dibromofluoromethane	97.25%						

**REPORT COMMENTS:**

BDL: Indicates Analyte is Below Detection Limit MEDF: Matrix Effected Dilution Factor  
Unless otherwise noted, mg/Kg denotes wet weight

Unless otherwise noted in analyst section, all work performed by STL MIAMI.  
10200 USA Today Way, Miramar Florida 33025. (954) 431-4550 (South Carolina Cert ID# 96023)  
Corte: AL.=#41180, Ct.=#PH0217, Ks.=#E270 + E1245, Ky.=#90087, La.=#9601, Md.=#271, Ma.=#M-FL535  
ND.=#R163, OK.=#9523, SC.=#96023, Tn.=#TN02826  
Unless otherwise noted, samples submitted for EPA 5035 were collected,preserved and analyzed in accordance with all methodology requirements.

\_\_\_\_\_  
Company Representative

M. Brooks  
 Brooks & Medlock Eng.  
 712 Merrimon Ave.  
 Asheville, NC 28804

Page 2  
 February 21, 2002  
 Report # 202000751  
 Order # 13793  
 South Carolina Cert ID# 96023

Site Location/Project  
 DHEC-HOT SPOT #3005

Sample I.D.: HS-9  
 Collected: 02/15/02 10:42  
 Received: 02/16/02 10:00  
 Collected by: Client.

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT	DATE EXT.	DATE ANALY.	ANALYST
8260B BTEX w/Naph+MTBE in Water by GC-MS (S.C.)			MEDF	1			
Methyl-Tert-Butyl-Ether	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:03 ME
Benzene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:03 ME
Toluene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:03 ME
Ethylbenzene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:03 ME
m & p-Xylene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:03 ME
o-Xylene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:03 ME
Naphthalene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:03 ME
SURROGATE: Toluene-D8	98.00%						
SURROGATE: Bromofluorobenzene	122.25%						
SURROGATE: Dibromofluoromethane	97.00%						

REPORT COMMENTS:

BDL: Indicates Analyte is Below Detection Limit MEDF: Matrix Effected Dilution Factor  
 Unless otherwise noted, mg/Kg denotes wet weight

Unless otherwise noted in analyst section, all work performed by STL MIAMI.

10200 USA Today Way, Miramar Florida 33025. (954) 431-4550 (South Carolina Cert ID# 96023)

Certs: AL. = #41180, Ct. = #PH0217, Ks. = #E270 + E1245, Ky. = #90087, La. = #9601, Md. = #271, Ma. = #M-FL535

ND. = #R163, OK. = #9523, SC. = #96023, Tx. = #TN02826

Unless otherwise noted, samples submitted for EPA 5035 were collected, preserved and analyzed in accordance with all methodology requirements.

  
 \_\_\_\_\_  
 Company Representative

M. Brooks  
 Brooks & Medlock Eng.  
 712 Merrimon Ave.  
 Asheville, NC 28804

Page 4  
 February 21, 2002  
 Report # 202000751  
 Order # 13795  
 South Carolina Cert ID# 96023

Site Location/Project  
 DHEC-HOT SPOT #3005

Sample I.D.: HS-11  
 Collected: 02/15/02 10:05  
 Received: 02/16/02 10:00  
 Collected by: Client.

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT	DATE EXT.	DATE ANALY.	ANALYST
8260B BTEX w/Naph+MTBB in Water by GC-MS (S.C.)			MEDF	1			
Methyl-Tert-Butyl-Ether	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:05 ME
Benzene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:05 ME
Toluene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:05 ME
Ethylbenzene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:05 ME
m & p-Xylene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:05 ME
o-Xylene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:05 ME
Naphthalene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:05 ME
SURROGATE: Toluene-D8	101.75%						
SURROGATE: Bromofluorobenzene	111.75%						
SURROGATE: Dibromofluoromethane	96.25%						

REPORT COMMENTS:

BDL: Indicates Analyte is Below Detection Limit MEDF: Matrix Effected Dilution Factor  
 Unless otherwise noted, mg/Kg denotes wet weight

Unless otherwise noted in analyst section, all work performed by STL MIAMI.  
 10200 USA Today Way, Miramar Florida 33025. (954) 431-4550 (South Carolina Cert ID# 96023)  
 Certs: Al.=#41180, Ct.=#PH0217, Ks.=#E270 + E1245, Ky.=#90087, La.=#9601, Md.=#271, Ma.=#M-FL535  
 ND.=#R163, OK.=#9523, SC.=#96023, Tn.=#TN02826

Unless otherwise noted, samples submitted for EPA 5035 were collected, preserved and analyzed in accordance with all methodology requirements.

  
 \_\_\_\_\_  
 Company Representative

M. Brooks  
 Brooks & Medlock Eng.  
 712 Merrimon Ave.  
 Asheville, NC 28804

Page 5  
 February 21, 2002  
 Report # 202000751  
 Order # 13796  
 South Carolina Cert ID# 96023

Site Location/Project  
 DHEC-HOT SPOT #3005

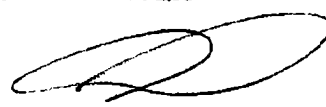
Sample I.D.: HS-10  
 Collected: 02/15/02 10:22  
 Received: 02/16/02 10:00  
 Collected by: Client.

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT	DATE EXT.	DATE ANALY.	ANALYST
8260B BTEX w/Naph+MTBE in Water by GC-MS (S.C.)			MEDF	1			
Methyl-Tert-Butyl-Ether	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:05 ME
Benzene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:05 ME
Toluene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:05 ME
Ethylbenzene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:05 ME
m & p-Xylene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:05 ME
o-Xylene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:05 ME
Naphthalene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:05 ME
SURROGATE: Toluene-D8	96.75%						
SURROGATE: Bromofluorobenzene	127.25%						
SURROGATE: Dibromofluoromethane	96.75%						

REPORT COMMENTS:

BDL: Indicates Analyte is Below Detection Limit MEDF: Matrix Effected Dilution Factor  
 Unless otherwise noted, mg/Kg denotes wet weight

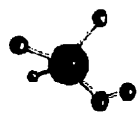
Unless otherwise noted in analyst section, all work performed by STL MIAMI.  
 10200 USA Today Way, Miramar Florida 33025. (954) 431-4550 (South Carolina Cert ID# 96023)  
 Certs: AL.=#41180, Cl.=#PH0217, Ks.=#E270 + E1245, Ky.=#90087, La.=#9601, Md.=#271, Ma.=#M-FLS35  
 ND.=#R163, OK.=#9523, SC.=#96023, Tn.=#TN02826  
 Unless otherwise noted, samples submitted for EPA 5035 were collected, preserved and analyzed in accordance  
 with all methodology requirements.

  
 \_\_\_\_\_  
 Company Representative

02/21/2002 15:54 FAX 8037814303  
 FILE No. 403 02/21 '02 14:38 ID:  
 ACCESS ANALYTICAL  
 FAX:  
 PAGE 6/6

E-M  
 Project Submission #: 02/02-0751  
 Ord #: 13792-13796  
 RUSH # (if applicable):

PO #:

Company Name: <b>BROOKS &amp; MEDLOCK ENG.</b>					<b>REQUESTED LAB ANALYSIS:</b>					 <p>ACCESS ANALYTICAL, INC.</p> <p>1248 Lake Murray Blvd. Irmo, SC 29063</p> <p>Phone: (803) 701-4243 Fax: 781-4303 Toll Free (888) 315-4243</p>			
Address: <b>712 MERRIMON AVE.</b>					<b>P A R A M E T E R</b>						NOTES / COMMENTS		
City: <b>ASHEVILLE NC</b>		State: <b>NC</b>		Zip: <b>28804</b>									
Project Name: <b>DHEC - HOT SPOT #3005</b>													
Report To: <b>M. BROOKS</b>													
Sample Label	Date Collected	Time Collected	Matr	# of Cont									
HS-7	2/15	11:20	W	2	<input checked="" type="checkbox"/>					13792			
HS-9	2/15	10:42	W	2	<input checked="" type="checkbox"/>					13793			
HS-6	2/15	11:45	W	2	<input checked="" type="checkbox"/>					13794			
HS-11	2/15	10:05	W	2	<input checked="" type="checkbox"/>					13795			
HS-10	2/15	10:22	W	2	<input checked="" type="checkbox"/>					13796			
Turnaround Time: <input checked="" type="checkbox"/> Std. (5-7 Bus. days) <input checked="" type="checkbox"/> RUSH* *Date Required: <b>2/14</b> (For rush work, results faxed by end of business day on date required)					Samples Recd. on Ice! <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Project Location: <input checked="" type="checkbox"/> SC <input type="checkbox"/> NC <input type="checkbox"/> Other _____ (specify)		Relinquished By: <b>Mark [Signature]</b>		Date: <b>2/15</b>	Time: <b>9:00</b>	Received By: <b>E-A STL 02/16/02</b>





**BROOKS & MEDLOCK**  
ENGINEERING, PLLC

RECEIVED

FEB 25 2002

Under  
Tenn.

February 22, 2002

South Carolina DHEC  
Bureau of Underground Storage Tank Management  
2600 Bull Street  
Columbia, South Carolina 29201

ATTENTION: Ms. Debra Thomas

Reference: **PRELIMINARY SAMPLING REPORT**  
Hot Spot # 3005  
Site ID No. 12719

Dear Ms. Thomas:

Brooks & Medlock Engineering, PLLC (BME) has performed a preliminary sampling event for the referenced site. This sampling event was required as part of the scope of work outlined in Bid Number SB-18123-12/20/01-HW (Bid Package). This Preliminary Sampling Report provides the details and results of the sampling event.

***Sampling Event***

Field personnel from BME conducted a sampling event at the Hot Spot # 3005 located in Chesnee, SC on February 15<sup>th</sup>. Groundwater samples were collected in accordance with the South Carolina DHEC *Analytical Methodology for Groundwater and Soil Assessment Guidelines* dated March 15, 2000. Each monitoring well designated as a compliance point in the Bid Package was sampled according to the following steps:

1. A fresh pair of disposable Nitril™ gloves are donned to prevent cross-contamination.
2. The groundwater level is measured with a water level indicator and recorded. If free product is present, the product level is measured with an oil/water interface probe. Wells with free product are not sampled.
3. The well is purged with either a disposal polyethylene disposable bailer or a submersible well pump equipped with disposable vinyl tubing.
4. Periodic geochemical characteristic measurements are taken for pH, conductivity and temperature. Once the geochemical characteristics are stabilized (less than a 10% differential), the appropriate sample containers are filled. Care is taken on VOC vials to ensure no head space is allowed. The vials are provided by the analyzing laboratory.
5. Samples are placed on ice for shipment.
6. Non-disposal sampling equipment is decontaminated utilizing an Alconox™ wash and triple rinse.
7. Purge water and "de-con" water are containerized for off-site transport to a properly permitted non-hazardous waste treatment and disposal facility.
8. Gloves and other disposal equipment (bailers, tubing) are changed out and containerized.

Copies of the field sheets with geochemical purge data for each monitoring well are provided as Attachment I. Purge water is to be temporarily stored on site for treatment and disposal by the

groundwater treatment system proposed in the Corrective Action Plan once all operation and discharge permits have been approved.

### ***Sampling Results***

The groundwater elevation data was utilized to generate a potentiometric map depicting the site's surficial aquifer flow direction and gradient. Table 1 summarizes the groundwater elevation data. The general groundwater flow direction is towards the west side of the property, as previously reported. The potentiometric map is provided as Figure 1.

Groundwater samples were analyzed by Access Analytical (SC Lab Certification No. 96023). Samples were analyzed for benzene, toluene, ethylbenzene, xylene, naphthalene and MTBE by EPA Method 8260. The results are summarized in Table 2. Copies of the laboratory analytical are provided in Attachment II. The results are very similar to the CoC concentrations reported in the Bid Package. The only sampling event anomaly was that no sample was obtained for MW-3. Although a water level reading was obtained at the very bottom of the well, sufficient sample volume could not be obtained with either the purge pump or a bailer.

### ***Closing***

BME is prepared to proceed with the remediation system installation once the Corrective Action Plan submitted February 6, 2002 is approved and all of the necessary permit inspections have been conducted. If you have any questions or comments, please contact me at (828) 232-4700.

Sincerely,

**Brooks & Medlock Engineering, PLLC**



Mark Brooks, P.E.  
Environmental Engineer

Cc: Judy Laughter, R.L. Jordan Oil Co.

Attachments: Figures  
Tables  
Attachment I: Sample Logs  
Attachment II: Laboratory Analytical

## **TABLES**

BROOKS & MEDLOCK ENGINEERING, PLLC

TABLE 1  
GROUNDWATER ELEVATION DATA

<i>Well ID</i>	<i>Well TOC* Elevation</i>	<i>Depth to Water</i>	<i>Depth to Product</i>	<i>Product Thickness</i>	<i>Groundwater Elevation</i>
MW-1**	104.89	29.89	29.41	0.48	75.46
MW-3	104.92	32.12	-	-	72.80
MW-6	104.14	30.15	-	-	73.99
MW-7	104.52	29.56	-	-	74.96
MW-9	105.43	29.11	-	-	76.32
MW-10	96.57	23.69	-	-	72.88
MW-11	95.15	23.97	-	-	71.18

\*TOC = top of casing

\*\* Elevation adjusted for free product

**BROOKS & MEDLOCK ENGINEERING, PLLC**

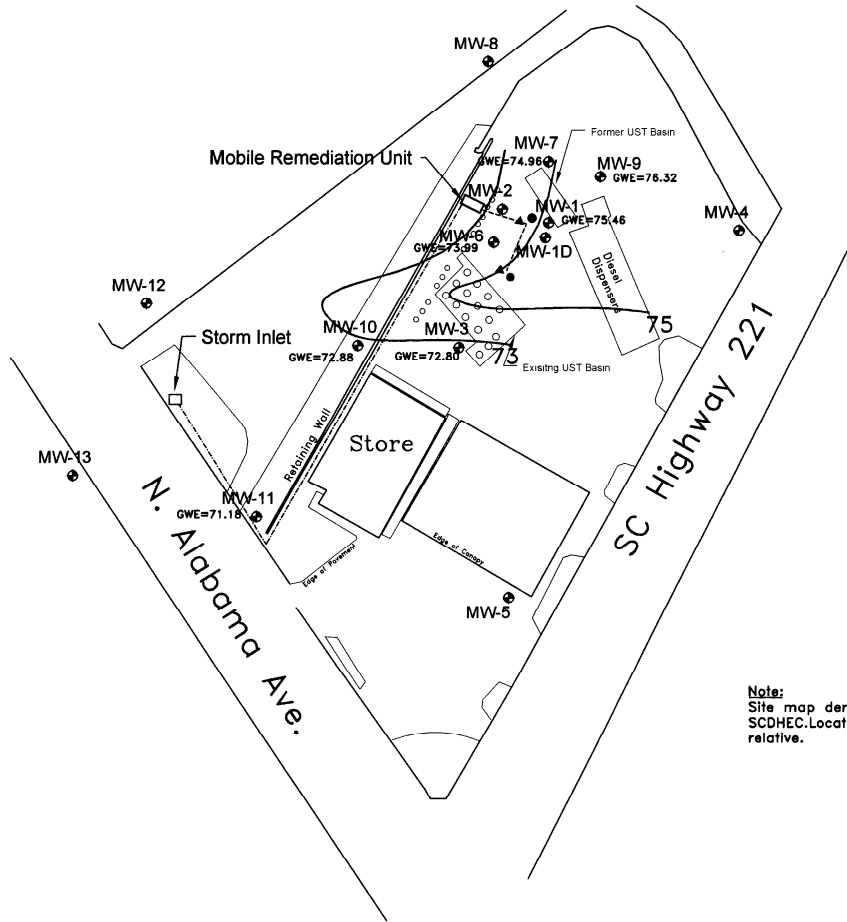
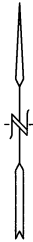
**TABLE 2  
CoC CONCENTRATIONS**

<i>Well</i>	<i>Date</i>	<i>Parameters (ug/l)</i>					
		<i>Benzene</i>	<i>Toluene</i>	<i>Ethylbenzene</i>	<i>Xylenes</i>	<i>Naphth.</i>	<i>MTBE</i>
SC GW Std.	NA	5	1,000	700	10,000	25	40
MW-1*	9/29/01	226,000	301,000	280,000	278,000	2,000	5,110,000
	2/15/02	NS	NS	NS	NS	NS	NS
MW-3	9/29/01	2,140	155	295	2,260	300	7,460
	2/15/02	NS	NS	NS	NS	NS	NS
MW-6	9/29/01	7	2	24	97	<5	<5
	2/15/02	3	<1	8	25.8	26.8	<1
MW-7	9/29/01	<1	<1	<1	<1	<5	<5
	2/15/02	<1	<1	<1	<1	<1	<1
MW-9	9/29/01	<1	<1	<1	<1	<5	<5
	2/15/02	<1	<1	<1	<1	<1	<1
MW-10	9/29/01	<1	<1	<1	<1	<5	<5
	2/15/02	<1	<1	<1	<1	<1	<1
MW-11	9/29/01	<1	<1	<1	<1	<5	<5
	2/15/02	<1	<1	<1	<1	<1	<1

\*Free product in well. Concentration estimated at solubility.

NS = Not


## **FIGURES**



**LEGEND:**

- GWE = Groundwater Elevation
- Groundwater Contour
- Compliance Monitoring Well
- ▲ SVE Well
- GW Extraction Well
- Trenching
- Discharge Line

**Note:**  
 Site map derived from figures provided by SCDHEC. Locations of wells and site features are relative.

 <b>BROOKS &amp; MEDLOCK</b> <small>ENGINEERING, PLLC</small> <small>718 MCCRIMMON AVENUE</small> <small>ASHEVILLE, N.C. 28804</small>		
TITLE: Potentiometric Map		
PROJECT: Hot Spot # 3005 CAP	FIGURE: 1	
DATE: 2/20/02	SCALE: N.T.S.	REV.: 1

**ATTACHEMENT I**  
**SAMPLE LOGS**

















**ATTACHMENT II**  
**LABORATORY DATA**



M. Brooks  
 Brooks & Medlock Eng.  
 712 Merrimon Ave.  
 Asheville, NC 28804

Page 3  
 February 21, 2002  
 Report # 202000751  
 Order # 13794  
 South Carolina Cert ID# 96023

Site Location/Project  
 DHEC-HOT SPOT #3005

Sample I.D.: HS-6  
 Collected: 02/15/02 11:45  
 Received: 02/16/02 10:00  
 Collected by: Client.

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT	DATE EXT.	DATE ANALY.	ANALYST
E260B BTEX w/Naph + MTBE in Water by GC-MS (S.C.)			MEDF	1			
Methyl-Tert-Butyl-Ether	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:03 ME
Benzene	2.99	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:03 ME
Toluene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:03 ME
Ethylbenzene	2.09	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:03 ME
m & p-Xylene	25.8	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:03 ME
o-Xylene	38.4	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:03 ME
Naphthalene	36.8	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:03 ME
SURROGATE: Toluene-D8	97.00%						
SURROGATE: Bromofluorobenzene	122.00%						
SURROGATE: Dibromofluoromethane	90.75%						

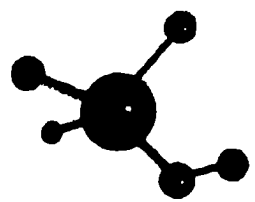
**REPORT COMMENTS:**

BDL: Indicates Analyte is Below Detection Limit MEDF: Matrix Effect Dilution Factor  
 Unless otherwise noted, mg/Kg denotes wet weight

Unless otherwise noted in analyst section, all work performed by STL MIAMI.  
 10200 USA Today Way, Miramar Florida 33025. (954) 431-4550 (South Carolina Cert ID# 96023)  
 certs: Al.=#41180, Ct.=#PH0217, Ks.=#E270 + E1245, Ky.=#90087, La.=#9601, Md.=#271, Ma.=#M-FL535  
 ND.=#R163, OK.=#9523, SC.=#96023, Tn.=#TN02826

Unless otherwise noted, samples submitted for EPA 5035 were collected, preserved and analyzed in accordance with all methodology requirements.

  
 Company Representative



# ACCESS ANALYTICAL, INC.

M. Brooks  
Brooks & Medlock Eng.  
712 Merrimon Ave.  
Asheville, NC 28804

Page 1  
February 21, 2002  
Report # 202000751  
Order # 13792  
South Carolina Cert ID# 96023

Site Location/Project  
DHEC-HOT SPOT #3005

Sample I.D.: HS-7  
Collected: 02/15/02 11:20  
Received: 02/16/02 10:00  
Collected by: Client.


PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT	DATE EXT.	DATE ANALY.	ANALYST
8260B BTEX w/Naph+MTBE in Water by GC-MS (S.C.)			MEDF	1			
Methyl-Tert-Butyl-Ether	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:02 ME
Benzene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:02 ME
Toluene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:02 ME
Ethylbenzene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:02 ME
m & p-Xylene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:02 ME
o-Xylene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:02 ME
Naphthalene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:02 ME
SURROGATE: Toluene-D8	102.00%						
SURROGATE: Bromofluorobenzene	118.25%						
SURROGATE: Dibromofluoromethane	97.25%						

**REPORT COMMENTS:**

BDL: Indicates Analyte is Below Detection Limit MEDF: Matrix Effect Dilution Factor  
Unless otherwise noted, mg/Kg denotes wet weight

Unless otherwise noted in analyst section, all work performed by STL MIAMI.  
10200 USA Today Way, Miramar Florida 33025. (954) 431-4550 (South Carolina Cert ID# 96023)  
Ct. = #PH0217, Ka. = #E270 + E1245, Ky. = #90087, La. = #9601, Md. = #271, Ma = #M-FL535  
ND. = #R163, OK. = #9523, SC. = #96023, Tn. = #TN02826

Unless otherwise noted, samples submitted for EPA 5035 were collected, preserved and analyzed in accordance with all methodology requirements.

  
\_\_\_\_\_  
Company Representative

M. Brooks  
Brooks & Medlock Eng.  
712 Merrimon Ave.

Asheville, NC 28804

Page 2  
February 21, 2002  
Report # 202000751  
Order # 13793  
South Carolina Cert ID# 96023

Site Location/Project

DHEC-HOT SPOT #3005

Sample I.D.: HS-9  
Collected: 02/15/02 10:42  
Received: 02/16/02 10:00  
Collected by: Client.

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT	DATE EXT.	DATE ANALY.	ANALYST
E260B BTEX w/Naph+MTBE in Water by GC-MS (S.C.)			MEDF	1			
Methyl-Tert-Butyl-Ether	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:03 ME
Benzene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:03 ME
Toluene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:03 ME
Ethylbenzene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:03 ME
m & p-Xylene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:03 ME
o-Xylene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:03 ME
Naphthalene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:03 ME
SURROGATE: Toluene-D8	98.00%						
SURROGATE: Bromofluorobenzene	122.25%						
SURROGATE: Dibromofluoromethane	97.00%						

REPORT COMMENTS:

BDL: Indicates Analyte is Below Detection Limit MEDF: Matrix Effect Dilution Factor  
Unless otherwise noted, mg/Kg denotes wet weight

Unless otherwise noted in analyst section, all work performed by STL MIAMI.

10200 USA Today Way, Miramar Florida 33025. (954) 431-4550 (South Carolina Cert ID# 96023)

certs: AL.=#41180, Ct.=#PH0217, Ks.=#E270 + E1245, Ky.=#90087, La.=#9601, Md.=#271, Ma.=#M-FL535

ND.=#R163, OK.=#9523, SC.=#96023, Tx.=#TN02826  
Unless otherwise noted, samples submitted for EPA 5035 were collected, preserved and analyzed in accordance with all methodology requirements.

  
\_\_\_\_\_  
Company Representative

M. Brooks  
Brooks & Medlock Eng.  
712 Merrimon Ave.

Asheville, NC 28804

Page 4  
February 21, 2002  
Report # 202000751  
Order # 13795  
South Carolina Cert ID# 96023

Site Location/Project

DHEC-HOT SPOT #3005

Sample I.D.: HS-11  
Collected: 02/15/02 10:05  
Received: 02/16/02 10:00  
Collected by: Client.

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT	DATE EXT.	DATE ANALY.	ANALYST
8260B BTEX w/Naph+MTBE in Water by GC-MS (S.C.)			MEDF	1			
Methyl-Tert-Butyl-Ether	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:05 ME
Benzene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:05 ME
Toluene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:05 ME
Ethylbenzene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:05 ME
m & p-Xylene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:05 ME
o-Xylene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:05 ME
Naphthalene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:05 ME
SURROGATE: Toluene-D8	101.75%						
SURROGATE: Bromofluorobenzene	111.75%						
SURROGATE: Dibromofluoromethane	96.25%						

**REPORT COMMENTS:**

BDL: Indicates Analyte is Below Detection Limit MEDF: Matrix Effect Dilution Factor  
Unless otherwise noted, mg/Kg denotes wet weight

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10200 USA Today Way, Miramar Florida 33025. (954) 431-4550 (South Carolina Cert ID# 96023)

Certs: AL.=#41180, Ct.=#PH0217, Ks.=#E270 + E1245, Ky.=#90087, La.=#9601, Md.=#271, Ma.=#M-FL535

ND.=#R163, OK.=#9523, SC.=#96023, Tn.=#TN02826  
Unless otherwise noted, samples submitted for EPA 5035 were collected, preserved and analyzed in accordance with all methodology requirements.

  
\_\_\_\_\_  
Company Representative

M. Brooks  
Brooks & Medlock Eng.  
712 Merrimon Ave.  
Asheville, NC 28804

Page 5  
February 21, 2002  
Report # 202000751  
Order # 13796  
South Carolina Cert ID# 96023

Site Location/Project  
DHEC-HOT SPOT #3005

Sample I.D.: HS-10  
Collected: 02/15/02 10:22  
Received: 02/16/02 10:00  
Collected by: Client.

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT	DATE EXT.	DATE ANALY.	ANALYST
8260B BTEX w/Naph+MTBE in Water by GC-MS (S.C)			MEDF	1			
Methyl-Tert-Butyl-Ether	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:05 ME
Benzene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:05 ME
Toluene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:05 ME
Ethylbenzene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:05 ME
m & p-Xylene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:05 ME
o-Xylene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:05 ME
Naphthalene	BDL	ug/L	5030/8260B	1.000	02/20/2002	02/20/2002	11:05 ME
SURROGATE: Toluene-D8	96.75%						
SURROGATE: Bromofluorobenzene	127.25%						
SURROGATE: Dibromofluoromethane	94.75%						

REPORT COMMENTS:

BDL: Indicates Analyte is Below Detection Limit MEDF: Matrix Effected Dilution Factor  
Unless otherwise noted, mg/Kg denotes wet weight

Unless otherwise noted in analyst section, all work performed by STL MIAMI.  
10200 USA Today Way, Miramar Florida 33025. (954) 431-4550 (South Carolina Cert ID# 96023)  
Certs: Al.=#41180, Cl.=#PH0217, Ka.=#B270 + E1245, Ky.=#90087, La.=#9601, Md.=#271, Ma.=#M-FL535  
ND.=#R163, OK.=#9523, SC.=#96023, Ta.=#TN02826  
Unless otherwise noted, samples submitted for EPA 5035 were collected, preserved and analyzed in accordance with all methodology requirements.

  
\_\_\_\_\_  
Company Representative

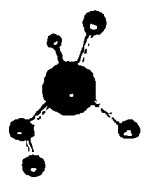
E-H

Project Submission #: 02/02-0751

ORD# 13792-13798  
RUSH # (if applicable):

PO #:

Company Name: <b>PROXYS &amp; MEDICAL ENG.</b> Address: <b>712 MERIDIAN AVE.</b> City: <b>RENEVILLE</b> State: <b>NC</b> Zip: <b>28869</b> Project Name: <b>DHCL - HOT STBT #3005</b> Report To: <b>M. BEARDS</b>				REQUESTED LAB ANALYSIS: <b>P A R A M E T E R</b>				
Sample Label	Date Collected	Time Collected	Matr	# of Cont	Requested By	Date	Time	Received By
HS-7	2/15	11:20	W	2	BTX, NH, MTBE			
HS-9	2/15	10:42	W	2				
HS-6	2/15	11:45	W	2				
HS-11	2/15	10:05	W	2				
HS-10	2/15	10:22	W	2				
Turnaround Time: <input checked="" type="checkbox"/> Std. (5-7 Bus. days) <input type="checkbox"/> RUSH* *Date Required: <b>2/14</b> (Four rush work, results faxed by end of business day on date required)					Samples Recd. on kcal: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Project Location: <input checked="" type="checkbox"/> SC <input type="checkbox"/> NC <input type="checkbox"/> Other (specify)	
Release/Prepared By: <b>Mark Beards</b>					Date: <b>2/15</b>		Time: <b>9:00</b>	
Received By: <b>E-A STC</b>					Date: <b>02/16/02</b>		Time:	



1248 Lake Murray Blvd.  
 King, SC 29063  
 Phone: (803) 781-4243  
 Fax: 781-4303  
 Toll Free (888) 315-4243

NOTES / COMMENTS

Page 1 of 1

Access Analytical, Inc.

Original Copy - Returned w/Report  
 Yellow Copy - Access Analytical Copy  
 Pink Copy - Client Copy  
 See reverse for Terms and Conditions



500 Bull Street  
Columbia, SC 29201-1708

UNDERGROUND STORAGE TANK PROGRAM  
BUREAU OF LAND AND WASTE MANAGEMENT

Phone: (800) 826-5435 Fax: (803) 898-4330

FEB 27 2002

MR MARK BROOKS  
BROOKS & MEDLOCK ENGINEERING  
712 MERRIMAN AVE  
ASHEVILLE NC 28804

Re: Hot Spot 3005, 107 Hampton St., Chesnee, SC  
UST Permit #12719, CP#: 13851:P  
Bid#: SB-18123-12/20/01-HW, PO#385179  
Preliminary Sampling Report received February 25, 2002  
Spartanburg County

Dear Mr. Brooks:

The Underground Storage Tank Program has reviewed the referenced report. The following deficiency was noted. Specification 4 of the Corrective Action contract requires that the CoC concentrations in all wells be documented. Brooks & Medlock only sampled the SSTL wells. Monitoring wells MW-2, MW-4, MW-5, MW-8, MW-12, MW-13, and MW-1D were not sampled. Please note, per specification #9 all monitoring wells associated with the release are required to be sampled quarterly for the first year. The corrected Preliminary Sampling Report is due within 30 days from the date of this letter.

If you have any questions or need additional information, please contact me at (803) 898-4362 or (800) 826-5435.



Sincerely,

Debra L. Thoma, Hydrogeologist  
State Lead & Field Services Section  
Assessment and Corrective Action Division

cc: Judith Laughter, RL Jordan Oil Co., PO Box 2527, Spartanburg, SC, 29304-2527  
Technical File

SCDHEC/UST/DLT/2.26.02/06542rp\_awd

RECEIVED

MAR 26 2002

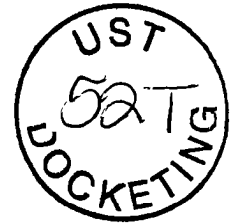
Underground Storage  
Tank Program

March 25, 2002

South Carolina DHEC  
Bureau of Underground Storage Tank Management  
2600 Bull Street  
Columbia, South Carolina 29201

ATTENTION: Ms. Debra Thomas

Reference: **PRELIMINARY SAMPLING REPORT - ADDENDUM**  
Hot Spot # 3005  
Site ID No. 12719



Dear Ms. Thomas:

Per your correspondence dated February 27, 2002, Brooks & Medlock Engineering, PLLC (BME) has collected additional samples for monitoring wells at the referenced site. These samples were collected as part of the preliminary sampling event required in the scope of work outlined in Bid Number SB-18123-12/20/01-HW (Bid Package). This is to serve as an addendum to the sampling report submitted to your office by BME February 22, 2002. The details and results of this additional sampling are provided herein.

***Sampling Event***

Field personnel from BME conducted a sampling event at the Hot Spot # 3005 located in Chesnee, SC on March 14<sup>th</sup>. Groundwater samples were collected in accordance with the South Carolina DHEC *Analytical Methodology for Groundwater and Soil Assessment Guidelines* dated March 15, 2000. Each monitoring well specified in the referenced correspondence was sampled according to the following steps:

1. A fresh pair of disposable Nitril™ gloves are donned to prevent cross-contamination.
2. The groundwater level is measured with a water level indicator and recorded. If free product is present, the product level is measured with an oil/water interface probe. Wells with free product are not sampled.
3. The well is purged with either a disposal polyethylene disposable bailer or a submersible well pump equipped with disposable vinyl tubing.
4. Periodic geochemical characteristic measurements are taken for pH, conductivity and temperature. Once the geochemical characteristics are stabilized (less than a 10% differential), the appropriate sample containers are filled. Care is taken on VOC vials to ensure no head space is allowed. The vials are provided by the analyzing laboratory.
5. Samples are placed on ice for shipment.
6. Non-disposal sampling equipment is decontaminated utilizing an Alconox™ wash and triple rinse.
7. Purge water and "de-con" water are containerized for off-site transport to a properly permitted non-hazardous waste treatment and disposal facility.
8. Gloves and other disposal equipment (bailers, tubing) are changed out and containerized.

Copies of the field sheets with geochemical purge data for each monitoring well are provided as Attachment I. Purge water is to be temporarily stored on site for treatment and disposal by the



groundwater treatment system proposed in the Corrective Action Plan once all operation and discharge permits have been approved.

### ***Sampling Results***

The groundwater elevation data was utilized to generate a potentiometric map depicting the site's surficial aquifer flow direction and gradient. Table 1 summarizes the groundwater elevation data. The general groundwater flow direction is towards the west side of the property, with an anomaly towards the northwest in the vicinity of the retaining wall, as previously reported. The potentiometric map is provided as Figure 1.

Groundwater samples were analyzed by Access Analytical (SC Lab Certification No. 96023). Samples were analyzed for benzene, toluene, ethylbenzene, xylene, naphthalene and MTBE by EPA Method 8260. The results from the additional wells sampled and the wells sampled for the original Preliminary Sampling report are summarized in Table 2. Copies of the laboratory analytical are provided in Attachment II. The results are very similar to the CoC concentrations reported in the Bid Package. The only sampling event anomaly was that no sample was obtained for MW-3 or MW-5. Both wells were dry and consequently sufficient sample volume could not be obtained with either the purge pump or a bailer.

### ***Closing***

BME is prepared to proceed with the remediation system installation once the Corrective Action Plan submitted February 6, 2002 is approved and all of the necessary permit inspections have been conducted. If you have any questions or comments, please contact me at (828) 232-4700.

Sincerely,

**Brooks & Medlock Engineering, PLLC**



Mark Brooks, P.E.  
Environmental Engineer

Cc: Judy Laughter, R.L. Jordan Oil Co.

Attachments: Figures  
Tables  
Attachment I: Sample Logs  
Attachment II: Laboratory Analytical

## **TABLES**

BROOKS & MEDLOCK ENGINEERING, PLLC

TABLE 1  
GROUNDWATER ELEVATION DATA  
HOT SPOT # 3005

<i>Well ID</i>	<i>Well TOC* Elevation</i>	<i>Depth to Water</i>	<i>Depth to Product</i>	<i>Product Thickness</i>	<i>Groundwater Elevation</i>
MW-1**	104.89	29.89	29.41	0.48	75.46
MW-3	104.92	32.12	-	-	72.80
MW-6	104.14	30.15	-	-	73.99
MW-7	104.52	29.56	-	-	74.96
MW-9	105.43	29.11	-	-	76.32
MW-10	96.57	23.69	-	-	72.88
MW-11	95.15	23.97	-	-	71.18
MW-4	111.32	29.66	-	-	81.66
MW-5	103.57	dry	-	-	-
MW-8	101.79	24.97	-	-	76.82
MW-12	97.03	24.51	-	-	72.52
MW-13	95.89	24.60	-	-	71.29
MW-2	No Data	29.94	-	-	-

\*TOC = top of casing

\*\* Elevation adjusted for free product

**BROOKS & MEDLOCK ENGINEERING, PLLC**

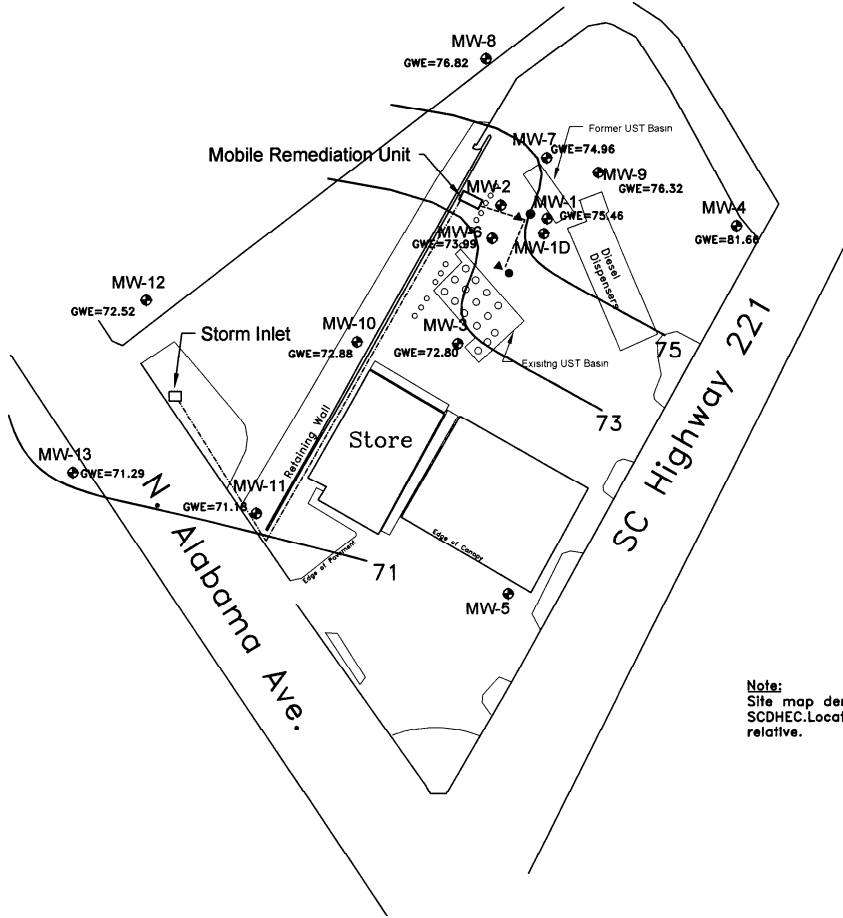
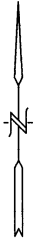
**TABLE 2  
CoC CONCENTRATIONS  
HOT SPOT #3005**

<i>Well</i>	<i>Date</i>	<i>Parameters (ug/l)</i>					
		<i>Benzene</i>	<i>Toluene</i>	<i>Ethylbenzene</i>	<i>Xylenes</i>	<i>Naphth.</i>	<i>MTBE</i>
SC GW Std.	NA	5	1,000	700	10,000	25	40
MW-1*	9/29/01	226,000	301,000	280,000	278,000	2,000	5,110,000
	2/15/02	NS	NS	NS	NS	NS	NS
MW-3	9/29/01	2,140	155	295	2,260	300	7,460
	2/15/02	NS	NS	NS	NS	NS	NS
MW-6	9/29/01	7	2	24	97	<5	<5
	2/15/02	3	<1	8	25.8	26.8	<1
MW-7	9/29/01	<1	<1	<1	<1	<5	<5
	2/15/02	<1	<1	<1	<1	<1	<1
MW-9	9/29/01	<1	<1	<1	<1	<5	<5
	2/15/02	<1	<1	<1	<1	<1	<1
MW-10	9/29/01	<1	<1	<1	<1	<5	<5
	2/15/02	<1	<1	<1	<1	<1	<1
MW-11	9/29/01	<1	<1	<1	<1	<5	<5
	2/15/02	<1	<1	<1	<1	<1	<1
MW-1D	3/9/01	<1	<1	<1	<3	<1	<1
	3/14/02	<1	<1	<1	<3	<1	<1
MW-2	No recent data						
	3/14/02	5.62	<1	68.8	233	61.7	<1
MW-4	3/9/01	<1	<1	<1	<3	<1	<1
	3/14/02	<1	<1	<1	<2	<1	<1
MW-5	3/9/01	NS	NS	NS	NS	NS	NS
	3/14/02	NS	NS	NS	NS	NS	NS
MW-8	3/9/01	<1	<1	<1	<3	<1	<1
	3/14/02	<1	<1	<1	<2	<1	<1
MW-12	3/9/01	<1	<1	<1	<3	<1	<1
	3/14/02	<1	<1	<1	<2	<1	<1
MW-13	3/9/01	<1	<1	<1	<3	<1	<1
	3/14/02	<1	<1	<1	<2	<1	<1

\*Free product in well. Concentration estimated at solubility.

NS = Not Sampled


## **FIGURES**



**LEGEND:**

- GWE = Groundwater Elevation
- Groundwater Contour
- Compliance Monitoring Well
- ▲ SVE Well
- GW Extraction Well
- Trenching
- Discharge Line

**Note:**  
Site map derived from figures provided by SCDHEC. Locations of wells and site features are relative.

 <b>BROOKS &amp; MEDLOCK</b> <small>ENGINEERS, PLLC</small> <small>718 MERRIMON AVENUE</small> <small>ASHEVILLE, N.C. 28804</small>		
TITLE: Potentiometric Map		
PROJECT: Hot Spot # 3005 CAP	FIGURE: 1	
DATE: 3/25/02	SCALE: N.T.S.	REV.: 2

**ATTACHEMENT I**  
**SAMPLE LOGS**















**ATTACHMENT II**  
**LABORATORY DATA**

M. Brooks  
 Brooks & Medlock Eng.  
 712 Merrimon Ave.  
 Asheville, NC 28804

Page 1  
 March 22, 2002  
 Report # 203000016  
 Order # 22390  
 South Carolina Cert ID# 96023

Site Location/Project


Sample I.D.: MW-1D  
 Collected: 03/14/02 14:40  
 Received: 03/15/02 10:00  
 Collected by: Client

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT	DATE EXT.	DATE ANALY.	ANALYST
82608 BTEX w/Naph+MTBE in Water by GC-MS (S C.)			MEDF	1			
Methyl-Tert-Butyl-Ether	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:29 ME
Benzene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:29 ME
Toluene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:29 ME
Ethylbenzene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:29 ME
m & p-Xylene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:29 ME
o-Xylene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:29 ME
Naphthalene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:29 ME
SURROGATE: Toluene-D8	101.75%						
SURROGATE: Bromofluorobenzene	114.00%						
SURROGATE: Dibromofluoromethane	97.00%						

**REPORT COMMENTS:**

BDL: Indicates Analyte is Below Detection Limit MEDF: Matrix Effected Dilution Factor  
 Unless otherwise noted, mg/Kg denotes wet weight

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 Unless otherwise noted, samples submitted for EPA 5035 were collected,preserved and analyzed in accordance  
 with all methodology requirements.

  
 \_\_\_\_\_  
 Company Representative

M. Brooks  
 Brooks & Medlock Eng.  
 712 Marrinson Ave.  
 Asheville, NC 28804

Page 2  
 March 22, 2002  
 Report # 203000816  
 Order # 22391  
 South Carolina Cert ID# 96023

Site Location/Project

Sample I.D.: MW-2  
 Collected: 03/14/02 15:30  
 Received: 03/15/02 10:00  
 Collected by: Client

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT	DATE EXT.	DATE ANALY.	ANALYST
8260B BTEX w/Naph+MTBE in Water by GC-MS (S.C.)			MEDF	1			
Methyl-Tert-Butyl-Ether	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:29 ME
Benzene	5.62	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:29 ME
Toluene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:29 ME
Ethylbenzene	68.8	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:29 ME
m & p-Xylene	84.0	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:29 ME
o-Xylene	149	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:29 ME
Naphthalene	61.7	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:29 ME
SURROGATE: Toluene-D8	97.00%						
SURROGATE: Bromofluorobenzene	119.75%						
SURROGATE: Dibromofluoromethane	97.00%						

REPORT COMMENTS:


BDL: Indicates Analyte is Below Detection Limit MEDF: Matrix Effected Dilution Factor  
 Unless otherwise noted, mg/Kg denotes wet weight

Unless otherwise noted in analyst section, all work performed by STL MIAMI.

10200 USA Today Way, Miramar Florida 33025. (954) 431-4550 (South Carolina Cert ID# 96023)

Certs: Al.=#41180, Ct.=#PH0217, Ks.=#E270 + B1245, Ky.=#90087, La.=#9601, Md.=#271, Ma.=#M-FL535  
 ND.=#R163, OK.=#9523, SC.=#96023, Tn.=#TN02826

Unless otherwise noted, samples submitted for EPA 5035 were collected,preserved and analyzed in accordance with all methodology requirements.

  
 \_\_\_\_\_  
 Company Representative



M. Brooks  
 Brooks & Medlock Eng.  
 712 Merrimon Ave.

Asheville, NC 28904

Page 4  
 March 22, 2002  
 Report # 203000816  
 Order # 22393  
 South Carolina Cert ID# 96023

Site Location/Project

Sample I.D.: MW-4  
 Collected: 03/14/02 14:05  
 Received: 03/15/02 10:00  
 Collected by: Client

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT	DATE EXT.	DATE ANALY.	ANALYST
8260B BTX w/Naph+MTBE in Water by GC-MS (S.C.)			MEDF	1			
Methyl-Tert-Butyl-Ether	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:31 ME
Benzene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:31 ME
Toluene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:31 ME
Ethylbenzene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:31 ME
m & p-Xylene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:31 ME
o-Xylene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:31 ME
Naphthalene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:31 ME
SURROGATE: Toluene-D8	100.75%						
SURROGATE: Bromofluorobenzene	116.50%						
SURROGATE: Dibromofluoromethane	100.50%						

REPORT COMMENTS:

BDL: Indicates Analyte is Below Detection Limit MEDF: Matrix Effect Dilution Factor  
 Unless otherwise noted, mg/Kg denotes wet weight

Unless otherwise noted in analyst section, all work performed by STL MIAMI.  
 10200 USA Today Way, Miramar Florida 33025. (954) 431-4550 (South Carolina Cert ID# 96023)  
 certs: Al.=#41180, Ct.=#PH0217, Ks.=#E270 + E1245, Ky.=#90087, La.=#9601, Md.=#271, Ma.=#M-PL535  
 ND.=#R163, OK.=#9523, SC.=#96023, Tn.=#TN02826  
 Unless otherwise noted, samples submitted for EPA 5035 were collected, preserved and analyzed in accordance with all methodology requirements.

  
 \_\_\_\_\_  
 Company Representative

M. Brooks  
Brooks & Medlock Eng.  
712 Merrimon Ave.  
Asheville, NC 28804

Page 3  
March 22, 2002  
Report # 203000816  
Order # 22392  
South Carolina Cert ID# 96023

Site Location/Project

Sample I.D.: MW-8  
Collected: 03/14/02 12:58  
Received: 03/15/02 10:00  
Collected by: Client

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT	DATE EXT.	DATE ANALY.	ANALYST
E260B BTEX w/Naph + MTBE in Water by GC-MS (S.C.)			MEDF	1			
Methyl-Tert-Butyl-Ether	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:30 ME
Benzene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:30 ME
Toluene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:30 ME
Ethylbenzene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:30 ME
m & p-Xylene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:30 ME
o-Xylene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:30 ME
Naphthalene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:30 ME
SURROGATE: Toluene-D8	99.50%						
SURROGATE: Bromofluorobenzene	123.75%						
SURROGATE: Dibromofluoromethane	96.00%						

REPORT COMMENTS:

BDL: Indicates Analyte is Below Detection Limit MEDF: Matrix Effected Dilution Factor  
Unless otherwise noted, mg/Kg denotes wet weight

Unless otherwise noted in analyst section, all work performed by STL MIAMI.

10200 USA Today Way, Miramar Florida 33025. (954) 431-4550 (South Carolina Cert ID# 96023)

certs: Al.=#41180, Ct.=#PH0217, Ks.=#E270 + E1245, Ky.=#90087, La.=#9601, Md.=#271, Ma.=#M-FL535

ND.=#R163, OK.=#9523, SC.=#96023, Tn.=#TN02826

Unless otherwise noted, samples submitted for EPA 5035 were collected, preserved and analyzed in accordance with all methodology requirements.

  
\_\_\_\_\_  
Company Representative

M. Brooks  
 Brooks & Medlock Eng.  
 712 Merrimon Ave.  
 Asheville, NC 28804

Page 5  
 March 22, 2002  
 Report # 203000816  
 Order # 22394  
 South Carolina Cert ID# 96023

Site Location/Project

Sample I.D.: MW-12  
 Collected: 03/14/02 13:15  
 Received: 03/15/02 10:00  
 Collected by: Client

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT	DATE EXT.	DATE ANALY.	ANALYST
8260B BTEX w/Naph+MTBE in Water by GC-MS (S.C.)			MEDF	1			
Methyl-Tert-Butyl-Ether	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:31 ME
Benzene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:31 ME
Toluene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:31 ME
Ethylbenzene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:31 ME
m & p-Xylene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:31 ME
o-Xylene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:31 ME
Naphthalene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:31 ME
SURROGATE: Toluene-D8	98.25X						
SURROGATE: Bromofluorobenzene	119.50X						
SURROGATE: Dibromofluoromethane	100.50X						

REPORT COMMENTS:

BDL: Indicates Analyte is Below Detection Limit MEDF: Matrix Effected Dilution Factor  
 Unless otherwise noted, mg/Kg denotes wet weight

Unless otherwise noted in analyst section, all work performed by STL MIAMI.

10200 USA Today Way, Miramar Florida 33025. (954) 431-4550 (South Carolina Cert ID# 96023)

certs: AL.=#41180, Ct.=#PH0217, Ka.=#B270 + E1245, Ky.=#90087, La.=#9601, Md.=#271, Ma.=#M-FL535  
 ND.=#R163, OK.=#9523, SC.=#96023, Tn.=#TN02826

Unless otherwise noted, samples submitted for EPA 5035 were collected, preserved and analyzed in accordance with all methodology requirements.

  
 \_\_\_\_\_  
 Company Representative

M. Brooks  
 Brooks & Medlock Eng.  
 712 Merrimon Ave.  
 Asheville, NC 28804

Page 6  
 March 22, 2002  
 Report # 203000816  
 Order # 22395  
 South Carolina Cert ID# 96023

Site Location/Project

Sample I.D.: MW-13  
 Collected: 03/14/02 13:40  
 Received: 03/15/02 10:00  
 Collected by: Client

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT	DATE EXT.	DATE ANALY.	ANALYST
B260B BTEX w/Naph+MTBE in Water by GC-MS (S.C.)			MEDF	1			
Methyl-Tert-Butyl-Ether	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:32 ME
Benzene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:32 ME
Toluene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:32 ME
Ethylbenzene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:32 ME
m & p-Xylene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:32 ME
o-Xylene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:32 ME
Napthalene	BDL	ug/L	5030/8260B	1.000	03/19/2002	03/19/2002	14:32 ME
SURROGATE: Toluene-D8	97.00%						
SURROGATE: Bromofluorobenzene	122.00%						
SURROGATE: Dibromofluoromethane	98.7%						

REPORT COMMENTS:

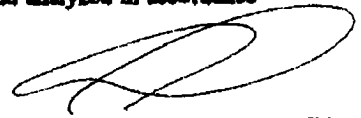
BDL: Indicates Analyte is Below Detection Limit MEDF: Matrix Effected Dilution Factor  
 Unless otherwise noted, mg/Kg denotes wet weight

Unless otherwise noted in analyst section, all work performed by STL MIAMI.

10200 USA Today Way, Miramar Florida 33025. (954) 431-4550 (South Carolina Cert ID# 96023)

certs: AL=#41180, Ct.=#PH0217, Ks.=#E270 + E1245, Ky.=#90087, La.=#9601, Md.=#271, Ma.=#M-FL535  
 ND.=#R163, OK.=#9523, SC.=#96023, Tn.=#TN02826

Unless otherwise noted, samples submitted for EPA 5035 were collected,preserved and analyzed in accordance with all methodology requirements.



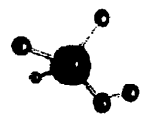
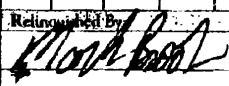
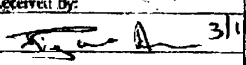
Company Representative

ord# 22370

Project Submission #: 02/03-816

RUSH # (if applicable):

PO #:

Company Name: <b>BROOKS + MEDLOCK ENGINEERING</b>					<b>REQUESTED LAB ANALYSIS:</b>					 <p>ACCESS ANALYTICAL, INC.</p> <p>Phone: (803) 781-4243 1248 Lake Murray Blvd. Fax: 781-4309 Irmo, SC 29063 Toll Free (888) 315-4243</p>			
Address: <b>712 MERRIMON AVE</b>					<b>P A R A M E T E R</b>							<b>NOTES / COMMENTS</b>	
City: State: Zip:													
Project Name:													
Report To:													
Sample Label	Date Collected	Time Collected	Matr	# of Cont						ORD #			
MW-1D	3/14	2:10	W	2						22390	820		
MW-2	3/14	3:35	W	2						22391			
MW-3	3/14	12:58	W	2						22392			
MW-4	3/14	2:05	W	2						22393			
MW-1	3/14	1:15	W	2						22394			
MW-12	3/14	1:40	W	2						22395			
Turnaround Time:					Samples Recd. on ice/		Project Location:		Relinquished By:		Date:	Time:	Received By:
<input checked="" type="checkbox"/> Std. (5-7 Bus. days) <input checked="" type="checkbox"/> RUSH* *Date Required: (For rush work, results faxed by end of business day on site required)					<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<input checked="" type="checkbox"/> SC <input type="checkbox"/> NC <input type="checkbox"/> Other (specify)				3/14	4:55	 SJZ

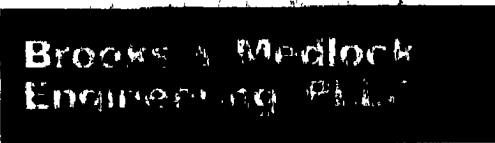
Pg. of

Access Analytical, Inc.

Original Copy - Returned w/Report  
Yellow Copy - Access Analytical Copy  
Pink Copy - Client Copy  
See reverse for Terms and Conditions

712 Merrimon Ave.  
Asheville, NC 28804

Phone: (828) 232-4700  
Fax: (828) 232-1331



RECEIVED

APR 10 2002

Underground Storage  
Tank Program

Fax

To: Debra Thomas

From: Mark Brooks, PE

Bureau of UST Mgmt.

Fax: 803-896-6245

Pages: 9(including cover)

Phone:

Date: 4/9/2002

Re:

CC:

- Urgent
- For Review
- Please Comment
- Please Reply
- Please Recycle

Debra:

Here's a copy of my NPDES Permit coverage letter, construction permit for the mobile remediation unit, and letter of approval to commence operation of the mobile unit at the Chesnee Hot Spot.

I believe this has me covered for permits. I'll look forward to receiving a Permit to Construct from your office in a few days. Please let me know if anything else is needed.

Thank you for your cooperation...

Mark





2600 Bull Street  
Columbia, SC 29201-1708

March 5, 2002

Mr. Mark Brooks, Env Engineer  
Brooks & Medlock Engineering  
712 Merrimon Avenue  
Asheville, NC 28804

RE: General Permit Coverage for  
HOT SPOTS #3005  
GENERAL NPDES Permit # SCG830029  
Spartanburg County

Dear Mr. Brooks:

A Notice of Intent for coverage under a general NPDES permit was received on 02/08/02. This office has determined your facility should be covered under the General NPDES Permit for Petroleum Contaminated Ground Water Discharges in lieu of issuing an individual permit. A copy of this General Permit and Discharge Monitoring Reports (DMRs) are enclosed for your use.

Your facility has been assigned General NPDES Permit number SCG830029. All correspondence should reference this General NPDES Permit number.

Your sampling days will be the first and third Wednesday of each month. Please be sure all samples are collected on these days.

General Permit coverage is effective on March 05, 2002, provided no appeal for an adjudicatory hearing is made. The granting of General Permit coverage represents a final staff decision that may be appealed to the Board of DHEC. Such appeal must be made within fifteen (15) days of the receipt of this letter.

In the event an appeal is filed, no discharge is allowed since General NPDES Permit coverage will be stayed pending the results of the appeal.

If you wish to appeal the staff's decision, you must submit an initial pleading in accordance with Regulation 61-72, Volume 25, S.C. Code of Laws, 1976, as amended. As required by this regulation, the initial pleading must be served on the Board of SCDHEC, Attn: Clerk of the Board, 2600 Bull Street, Columbia, S.C. 29201, (803)898-3300. The submission of the initial appeal will be within the time period if delivered by First Class mail or other parcel delivery service on or before the fifteenth day.

The following elements must, at a minimum, be included within the request:

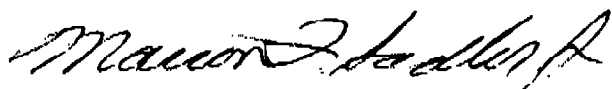
1. The name of the party requesting the hearing and the issue(s) for which a hearing is requested;
2. The caption or other information sufficient to identify the permit decision being appealed;
3. The relief requested;

In addition, the Administrative Law Judge Division now requires that a person requesting a contested case hearing must file a copy of the request and a filing fee in the amount of \$70.00 with the Administrative Law Judge Division at the following address:

Clerk, Administrative Law Judge Division  
1205 Pendleton Street, Suite 224  
P.O. Box 11667  
Columbia, SC 29211

If you have any questions about the technical aspects of this permit, please contact me at (803) 898-4167. Information pertaining to adjudicatory matters may be obtained by contacting the Legal Office, SCDHEC, 2600 Bull Street, Columbia, S.C. 29201, or by calling them at (803) 898-3350.

Sincerely,



Marion F. Sadler, Jr.  
Industrial, Agricultural, and  
Storm Water Permitting Division

Enclosure

cc: EPA  
Betty Lou Foster, NPDES Permit Administration  
Glenn Trofatter, Compliance Assurance Division  
EQC District Office





2600 Bull Street  
Columbia, SC 29201-1708

April 9, 2002

Mr. Mark Brooks  
Brooks & Medlock Engineering, PLLC  
712 Merrimon Avenue  
Asheville, NC 28804

RE: Approval Letter for GW Remediation at HotSpot No. 3005  
Spartanburg County

Dear Mr. Brooks:

Please allow this letter to serve as approval to operate the Mobile Groundwater Treatment System in accordance with South Carolina Department of Health and Environmental Control (SCDHEC) Construction Permit Number 18,691-IW at the above referenced site.

Site Location: 107 Hampton Street, Chesnee, SC

Location of unit on site: Map attached.

Waste Description: Former UST release.

Complete analysis of GW indicates the following parameters are present: Benzene, Toluene, Ethylbenzene, Xylenes, MTBE and Naphthalene.

Expected flow rate: 1-5 gpm.

Letter of acceptance from municipality (discharge to sewer): N/A

SC NPDES/ID Number (discharge to surface water or land): SCG830029 (to town of Chesnee storm water system)

Name and certification number of operator responsible for project: Daniel G. Godfrey #A1173

Site plan showing: 1) Position of treatment system in relation to monitoring wells; 2) Discharge location; and 3) Size of receiving sewer line (if applicable): Site Plan Attached.

Waste oil and/or sludge to be disposed of by/at: A&R Environmental, EPA ID No. SCR000904150

F:\USERS\GARVON\JL\Portable Air Stripper\HotSpot\Approval Letter.doc

• Page 2

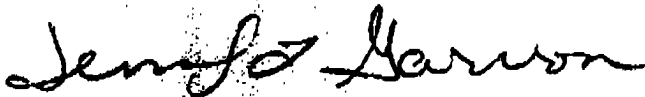
April 9, 2002

Before any discharge begins, the District office shall be notified. The district engineer for this project is Mark Cann, Appalachia III EQC District, 975-C North Church Street, Spartanburg, SC 29303-2712, phone 864.596.3800.

This approval will expire on February 29, 2004. This date corresponds with the expiration date of General Permit Number SCG830000 (Petroleum Contaminated Groundwater). If the project is to continue beyond the expiration date, updated information in accordance with Construction Permit Number 18,681-IW shall be submitted and a continued Letter of Approval may then be issued contingent upon reissued General Permit Number SCG830000.

If you have any questions, or would like to discuss, I can be contacted at the above address or by phone at 803.898.4166.

Sincerely,



Jennifer L. Garvon  
Environmental Engineering Associate  
Industrial, Agricultural and Storm Water  
Permitting Division  
Bureau of Water

Cc: Barney Harrison, App III EQC District (with attachments)



2600 Bull Street  
Columbia, SC 29201-1708

April 3, 2002

Brooks and Medlock Engineering, PLLC  
712 Morrison Avenue  
Asheville, NC 28804

Re: Construction Permit Number 18,691-JW  
Mobile Home Water Treatment System

Dear Mr. Brooks,

Enclosed is a State Construction Permit for the above referenced wastewater collection and treatment system. Construction is to be performed in accordance with this permit and the supporting engineering report, plans, and specifications approved by this Office.

Your facility will be required to have an operator in charge who has been certified by the Environmental Certification Board of the South Carolina Department of Labor, Licensing and Regulation. Your facility has been classified in I-P/C necessitating an operator holding a Grade D-P/C or higher certificate. Questions regarding operator certifications should be directed to Mr. Doug J. Caldwell, Board Coordinator, Environmental Certification Board, P.O. Box 11409 Columbia, SC 29211, (803) 896-4430.

This system cannot be placed into operation until final approval is granted by the appropriate Environmental Quality Control (EQC) District Office.

Upon completion of construction, a letter must be submitted to the EQC District office from a registered engineer certifying that the construction has been completed in accordance with the approved plans and specifications. A final inspection may also be scheduled. A properly qualified operator(s) must be obtained prior to receiving approval to operate. The EQC District office will approve the system for operation upon successful completion of the project.

Also, information is available on the Department's Center for Waste Minimization. A representative of the Center may be in contact to assist your interests in the Center's assistance in starting or expanding a Pollution Prevention/Waste Minimization program.

Sincerely,

Marion F. Sadler, Jr., Director  
Industrial, Agricultural & Storm  
Water Permitting Division  
Bureau of Water

MFS/jlg

cc: All EQC District Directors

Page 2 of 3  
Special Conditions  
Construction Permit Number 18,691-IW  
04/03/2002

### SPECIAL CONDITIONS

1. The permittee shall develop and maintain at the permitted facility a complete Operations and Maintenance (O&M) Manual for the wastewater treatment system. The manual shall be made available for on-site review during normal working hours. The manual shall contain operation and maintenance instructions for all equipment and appurtenances associated with the waste water treatment system. The manual shall contain a general description of the treatment process(es), operating characteristics that will produce maximum treatment efficiency and corrective action to be taken should operating difficulties be encountered.
2. Broock and Medlock, Engineering, PLLC, shall obtain written approval from South Carolina Department of Health and Environmental Control (SCDHEC) Industrial Wastewater Section prior to groundwater remediation activities at any site. The following information shall be provided, at a minimum, with each request prior to mobilization of the unit to a site:
  - A. Location where equipment will be utilized.
  - B. A complete analysis of the groundwater to be treated.
  - C. Expected flow rate and time period the system shall be in use. Design calculations showing the adequacy of the system to treat the groundwater must be provided for each site.
  - D. For discharge to Sewer: A letter of acceptance from the municipality receiving the treated effluent....
  - E. For NPDES or ND Discharge. Permit must be in place prior to issuance of Letter of Approval. Include date of permit application submittal and permit number....
  - F. The name and certification number of the operator responsible for the project.
  - G. A site plan showing the position of the treatment system in relation to recovery well(s). The plan must also indicate the discharge location and information (size, etc.) of the receiving sewer line.
  - H. Contact Bureau of Air Quality per individual project.
3. The permittee shall develop and implement a Best Management Practices (BMP) Plan to identify and control the discharge of significant amounts of oils and the hazardous and toxic substances listed in 40 CFR, Part 117 and Tables II and III of Appendix D to 40 CFR, Part 112. The plan shall include a listing of all potential sources of spills or leaks of these materials, a method of containment, a description of training, inspection and security procedures, and emergency response measures to be taken in the event of a discharge to surface water or plans and/or procedures which constitute an equivalent BMP. Sources of such discharges may include materials storage areas; in-plant transfer, process and materials handling areas; loading and unloading operations; plant site run-off; and sludge and disposal areas. The BMP plan shall be developed in accordance with good engineering practices, shall be documented in narrative form, and shall include any necessary plot plans, drawings, or maps. The BMP plan shall be developed no later than six (6) months after issuance of the Construction Permit. The BMP plan shall be maintained at the plant



South Carolina Department of Health  
and Environmental Control

# BUREAU OF WATER

## Permit to Construct

Permission is hereby granted to:

**Brooks and Medlock Engineering,**  
712 Merrimon Avenue  
Asheville, NC 28804

for the construction of a wastewater treatment system in accordance with the construction plans, specifications, engineering report and Construction Permit Application signed by Mark Brooks, Registered Professional Engineer, SC Registration Number SC#21425.

**Project Name: Mobile Groundwater Treatment System**

**County: \***

**Project Description:** Mobile Remediation Unit equipped with pump-and-treat (groundwater treatment), soil vapor extraction and air sparging subsystem components. The groundwater treatment system consists of two submersible pneumatic pumps located in 4-inch extraction wells that pump to the treatment system consisting of an oil/water separator, low profile air stripper, and carbon adsorption.

The effluent will be discharged to \* at a daily rate not to exceed \* gallons per day

The effluent concentrations of those constituents the wastewater treatment system is designed to remove or reduce are contained in the Letter of Approval issued for each individual project.

**Treatment Plant Classification: I-P/C**

**Special Conditions: See Attached**

**Permit Number: 18691-JW**

**Date of Issue: April 3, 2002**

**Expiration Dates:**

Unless construction begins prior to  
and construction is completed prior to  
this permit will expire.

April 3, 2003

April 3, 2004

\* To be specified in Letter of Approval for each individual project.

In accepting this permit, the owner agrees to the admission of properly authorized persons at all reasonable hours for the purpose of sampling and inspection.

**THIS IS A PERMIT FOR CONSTRUCTION ONLY AND DOES NOT CONSTITUTE STATE DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL APPROVAL, TEMPORARY OR OTHERWISE, TO PLACE THIS SYSTEM IN OPERATION.**

Bureau of Water

MFS/jlg

Page 3 of 3

Special Conditions

Construction Permit Number 18,691-IW

04/03/2002

site and shall be available for inspection by Department personnel.

4. The permittee shall provide for the performance of routine daily treatment system inspections by a certified operator of the appropriate grade, when the treatment system is in operation. Weekend and holiday inspections may be performed by an operator with a minimum certification of one grade lower than the certified operator required by the Rules and Regulations of the Environmental Certification Board based on the treatment plant classification designated in this Permit to Construct. The inspections shall include, but are not limited to, areas which require a visual observation to determine efficient operations and for which immediate corrective measures can be taken using the O&M Manual as a guide. All inspections shall be recorded and shall include the date, time, and name of the person making the inspection, corrective measures taken, and routine equipment maintenance, repair or replacement performed. The certified operator shall review and validate all inspection sheets generated by the weekend and holiday operator. Any unusual or significant problems encountered by the weekend and holiday operator shall be reported immediately to the certified operator who shall initiate corrective action. The permittee shall maintain records of inspections at the permitted facility, where possible. The records shall be made available for on-site review during normal working hours.
5. Modifications to the treatment system may require approval from SCDHEC Industrial Wastewater Section. Prior to construction, any modifications shall be submitted to the Department for review and approval.
6. All sludge, grease, oil, and solid and hazardous waste shall be properly disposed of in accordance with the rules and regulations of the Bureau of Land and Waste Management of SCDHEC. Non-hazardous sludge shall be disposed of by a licensed subcontractor, A&R Environmental (EPA ID# SCR000004150).



2600 Bull Street  
Columbia, SC 29201-1708

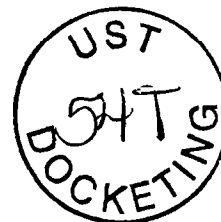
**UNDERGROUND STORAGE TANK PROGRAM  
BUREAU OF LAND AND WASTE MANAGEMENT**

Phone (800) 826-5435 Fax (803) 896-6245

~~APR 19 2002~~

APR 19 2002

**MR MARK BROOKS  
BROOKS & MEDLOCK ENGINEERING  
712 MERRIMON AVE  
ASHEVILLE NC 28804**



Re: Hot Spot 3005, 107 Hampton St., Chesnee, SC  
UST Permit #12719; CA# 13851:P  
Bid #: SB-18123-12/20/01-HW; PO #385179  
Corrective Action Plan /Engineering Report received February 7, 2002  
BAQC Permit Exemption received February 21, 2002  
NPDES General Permit received April 10, 2002  
Wastewater Treatment Construction Permit received April 10, 2002  
Spartanburg County

Dear Mr. Brooks:

The Underground Storage Tank Program has reviewed the referenced documents. As required by Section 280.67 of the South Carolina Underground Storage Tank Regulations R.61-92, the Bureau has provided a public notice period including notice of the pending corrective actions to the surrounding landowners via certified correspondence. No objections to the proposed actions were expressed; therefore, corrective action may proceed at this time. A copy of the Bureau of Air Quality Memorandum, Monitoring Well Installation Permit, and Permission Form are enclosed.

As stated in specification #4, the Corrective Action Plan is to be implemented within 30 days from receipt of this letter. As stated in specification #7, monitoring reports are to be submitted on a quarterly basis. The first Corrective Action Status Report will be due 3 months from the date of this letter.

The Bureau grants pre-approval for transportation of drums of virgin petroleum contaminated soil and/or drums of groundwater from the referenced site to a permitted treatment facility. The contaminated soil and/or groundwater must be properly stored in labeled 55-gallon drums or equivalent containers. The contaminated soil and/or groundwater must be accepted by the approved treatment facility. There can be no spillage or leakage in transport. A copy of the disposal manifest from the receiving facility that clearly designates the quantity received must be included in the monitoring reports.

All future invoices and/or other rehabilitation activities must comply with current SUPERB criteria per Section 44-2-20(2) and the referenced bid special conditions. Please reference **Cost Proposal Number 13851:P** on all pay-for-performance invoices. Please note,

Mr. Brooks

Page 2

per Section 44-2-40 of the SUPERB Statute, an invoice for site rehabilitation activities must be submitted on or before May 8, 2002 (four months from Statement of Award) or the Cost Agreement will be uncommitted.

On all correspondence regarding this site, please reference the UST Permit Number. On the invoices, please reference the UST Permit Number and Cost Agreement Number. If you have questions concerning this correspondence, feel free to contact me at (803) 896-6397 or (800) 826-5435 (within SC only).

Sincerely,



Debra L. Thoma, Hydrogeologist  
State Lead and Field Services Section  
Assessment and Corrective Action Division

enc: SCDHEC Permission Form  
Monitoring Well Installation Permit  
Bureau of Air Quality Memorandum  
Corrective Action Invoice Form (3687)

cc: Judith Laughter, RL Jordan Oil Co., PO Box 2527, Spartanburg, SC, 29304  
Technical/ Read File (w/o enc.)  
Financial File (w/out enc.)

DHEC/UST/DLT/4.12.02/11290ca-go





## Monitoring Well Installation Approval Form

2600 Bull Street  
Columbia, SC 29201-1708

Date of Issue: April 12, 2002

Approval No.: UMW-16127


Approval is hereby granted to: Brooks and Medlock Engineering  
On Behalf of: RL Jordan Oil Company  
UST Permit # 12719  
County: Spartanburg

This approval is for the construction of up to four (4) permanent extraction wells in accordance with the construction plans and technical specifications outlined in the SC Well Standards and Regulations. The well(s) are to be constructed within the surficial aquifer for the intended purpose of monitoring ground-water quality and/or water level(s) at the referenced facility. Approval is provided with the following conditions:

1. The latitude and longitude, surveyed elevations, boring and/or geologist logs and actual (as built) construction details for each well be submitted to my attention as part of the Tier II Assessment Report.
2. Each well shall be labeled with an identification plate constructed of a durable material affixed to the casing or surface pad where it is readily visible. The plate shall provide monitoring well I.D.#, date of construction, static water level, and driller name and state certification #.
3. Temporary wells must be properly abandoned within 30 days from the date of installation.
4. Well construction and sampling derived waste including, but not necessarily limited to, drill cuttings, drilling fluids, development and purge water should be managed properly and in compliance with applicable requirements. If containerized, each vessel should be clearly labeled with regard to contents, source, and date of activity.
5. A minimum of forty-eight (48) hours prior to initiation of drilling activities, please provide notice to Debra L. Thoma at (803) 896-6397 or thomadl@dhec.state.sc.us.
6. Please provide ground-water quality analytical data (chemical analysis and/or water level(s)) associated measurements (i.e., in-situ field measurements) to my attention with the Assessment Report.
7. Monitoring wells shall be installed by a permanently licensed well driller certified by the State of South Carolina.

This approval is pursuant to the provisions of Section 44-55-40 of the 1976 South Carolina Code of Laws and the Department of Health and Environmental Control Regulations R.61-71. **Please remember to have a copy of this form available during site assessment activities.**

Approved by:

  
Debra L. Thoma, Hydrogeologist  
State Lead and Field Services Section  
Assessment and Corrective Action Division  
Underground Storage Tank Program

cc: Appalachia III District EQC  
✓ Technical File



**BROOKS & MEDLOCK**  
ENGINEERING, PLLC

August 23, 2002

South Carolina DHEC  
Bureau of Underground Storage Tank Management  
2600 Bull Street  
Columbia, South Carolina 29201

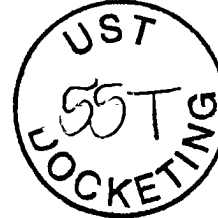
ATTENTION: Ms. Debra Thomas

Reference: **QUARTERLY SAMPLING REPORT**  
Hot Spot # 3005  
Site ID No. 12719

RECEIVED

AUG 29 2002

Underground Storage  
Tank Program



Dear Ms. Thomas:

Brooks & Medlock Engineering, PLLC (BME) has performed a quarterly sampling event for the referenced site. This sampling event was required as part of the scope of work outlined in Bid Number SB-18123-12/20/01-HW (Bid Package). This Preliminary Sampling Report provides the details and results of the sampling event.

***Corrective Action Progress Summary***

The mobile remediation system described in the Corrective Action Plan has been in operation for the majority of the prior three months. Periodic shutdowns have occurred due to equipment failure, but repairs were promptly made to continue the remediation effort. Approximately 30,000 gallons of groundwater and petroleum product have been pumped, treated and discharged by the system. It appears that the combination of pump and treat and soil vapor extraction have proven very effective. Currently there is no free-phase petroleum product layer detected in any of the monitoring wells, specifically MW-1, and the CoC mass has been reduced by over 95%. Based upon these results, the system has been temporarily shutdown to see if the product removal and CoC reductions are sustained. In accordance with the Bid Package specifications, accompanying this Quarterly Sampling Report is a Corrective Action Invoice.

***Sampling Event***

Field personnel from BME conducted a sampling event at the Hot Spot # 3005 located in Chesnee, SC on August 15<sup>th</sup>. The remediation system was inactivated for at least 24 hours prior to the sampling event. Groundwater samples were collected in accordance with the South Carolina DHEC *Analytical Methodology for Groundwater and Soil Assessment Guidelines* dated March 15, 2000. Each monitoring well designated as a compliance point in the Bid Package was sampled according to the following steps:

1. A fresh pair of disposable Nitril™ gloves are donned to prevent cross-contamination.
2. The groundwater level is measured with a water level indicator and recorded. If free product is present, the product level is measured with an oil/water interface probe. Wells with free product are not sampled.
3. The well is purged with either a disposal polyethylene disposable bailer or a submersible well pump equipped with disposable vinyl tubing.
4. Periodic geochemical characteristic measurements are taken for pH, conductivity and temperature. Once the geochemical characteristics are stabilized (less than a 10% differential), the appropriate sample containers are filled. Care is taken on VOC vials to ensure no head space is allowed. The vials are provided by the analyzing laboratory.

5. Samples are placed on ice for shipment.
6. Non-disposal sampling equipment is decontaminated utilizing an Alconox™ wash and triple rinse.
7. Purge water and “de-con” water were introduced into the groundwater remediation system for treatment and discharge.
8. Gloves and other disposal equipment (bailers, tubing) are changed out and containerized.

Copies of the field sheets with geochemical purge data for each monitoring well are provided as Attachment I.

### ***Sampling Results***

The groundwater elevation data was utilized to generate a potentiometric map depicting the site's surficial aquifer flow direction and gradient. Table 1 summarizes the groundwater elevation data. The general groundwater flow direction is towards the west side of the property, as previously reported. The potentiometric map is provided as Figure 1.


Groundwater samples were analyzed by Access Analytical (SC Lab Certification No. 96023). Samples were analyzed for benzene, toluene, ethylbenzene, xylene, naphthalene and MTBE by EPA Method 8260. The results are summarized in Table 2. Copies of the laboratory analytical are provided in Attachment II. The results show that the CoC mass has been reduced by over 95%. The original sample for MW-6 was broken during shipment. MW-6 was re-sampled August 24, 2002. The only other sampling event anomaly was that two monitoring wells, MW-3 and MW-5 could not be sampled due to dry well conditions, which was the case in the previous sampling event. MW-2 could not be located at the site. It is believed that this well has been abandoned and did not exist at the beginning of this Corrective Action initiative.

### ***Closing***

BME is prepared to proceed with the remediation system installation once the Corrective Action Plan submitted February 6, 2002 is approved and all of the necessary permit inspections have been conducted. If you have any questions or comments, please contact me at (828) 232-4700.

Sincerely,

**Brooks & Medlock Engineering, PLLC**



Mark Brooks, P.E.  
Environmental Engineer

Cc: Judy Laughter, R.L. Jordan Oil Co.

Attachments: Figures  
Tables  
Attachment I: Sample Logs  
Attachment II: Laboratory Analytical

BROOKS & MEDLOCK ENGINEERING, PLLC

TABLE 1  
GROUNDWATER ELEVATION DATA  
HOT SPOT # 3005  
August 15, 2002

<i>Well ID</i>	<i>Well TOC* Elevation</i>	<i>Depth to Water</i>	<i>Depth to Product</i>	<i>Product Thickness</i>	<i>Groundwater Elevation</i>
MW-1	104.89	30.08	-	-	74.81
MW-3	104.92	dry	-	-	-
MW-6	104.14	30.96	-	-	73.18
MW-7	104.52	30.31	-	-	74.21
MW-9	105.43	29.65	-	-	75.78
MW-10	96.57	24.42	-	-	72.15
MW-11	95.15	25.12	-	-	70.03
MW-4	111.32	29.01	-	-	82.31
MW-5	103.57	dry	-	-	-
MW-8	101.79	25.34	-	-	76.45
MW-12	97.03	24.86	-	-	72.17
MW-13	95.89	25.31	-	-	70.58
MW-2	No Data	No Data	-	-	-

\*TOC = top of casing

\*\* Elevation adjusted for free product

BROOKS & MEDLOCK ENGINEERING, PLLC

TABLE 2  
CoC CONCENTRATIONS  
HOT SPOT #3005

Well	Date	Parameters (ug/l)						Total Mass
		Benzene	Toluene	Ethylbenzene	Xylenes	Naphth.	MTBE	
SC GW Std.	NA	5	1,000	700	10,000	25	40	
MW-1	SSTL	13,000	47,000	39,000	206,000	2,000	190	307,190
	9/29/01	226,000	301,000	280,000	278,000	2,000	5,110,000	6,197,000
	2/15/02	NS	NS	NS	NS	NS	NS	-
	8/15/02	<100	<100	2.68	129.6	2,060	<100	2,492
MW-3	SSTL	2,140	155	295	2,260	300	150	5,300
	9/29/01	2,140	155	295	2,260	300	7,460	12,610
	2/15/02	NS	NS	NS	NS	NS	NS	-
	8/15/02	NS	NS	NS	NS	NS	NS	12,610
MW-6	SSTL	7	2	24	97	138	5	273
	9/29/01	7	2	24	97	138	<5	273
	2/15/02	3	<1	8	25.8	26.8	<1	66
	8/15/02	<1	<1	2	44.9	38.9	<1	90
MW-7	SSTL	1	1	1	1	5	5	14
	9/29/01	<1	<1	<1	<1	<5	<5	14
	2/15/02	<1	<1	<1	<2	<1	<1	7
	8/15/02	<1	<1	<1	<2	<1	<1	7
MW-9	SSTL	1	1	1	1	5	5	14
	9/29/01	<1	<1	<1	<1	<5	<5	14
	2/15/02	<1	<1	<1	<2	<1	<1	7
	8/15/02	<1	<1	<1	<2	<1	<1	7
MW-10	SSTL	1	1	1	1	5	5	14
	9/29/01	<1	<1	<1	<1	<5	<5	14
	2/15/02	<1	<1	<1	<2	<1	<1	7
	8/15/02	<1	<1	<1	<2	<1	<1	7
MW-11	SSTL	1	1	1	1	5	5	14
	9/29/01	<1	<1	<1	<1	<5	<5	14
	2/15/02	<1	<1	<1	<2	<1	<1	7
	8/15/02	<1	<1	<1	<2	<1	<1	7

SSTL MASS 312,819  
CURRENT SAMPLING MASS 15,220  
% DIFFERENCE 95.13%

**BROOKS & MEDLOCK ENGINEERING, PLLC**

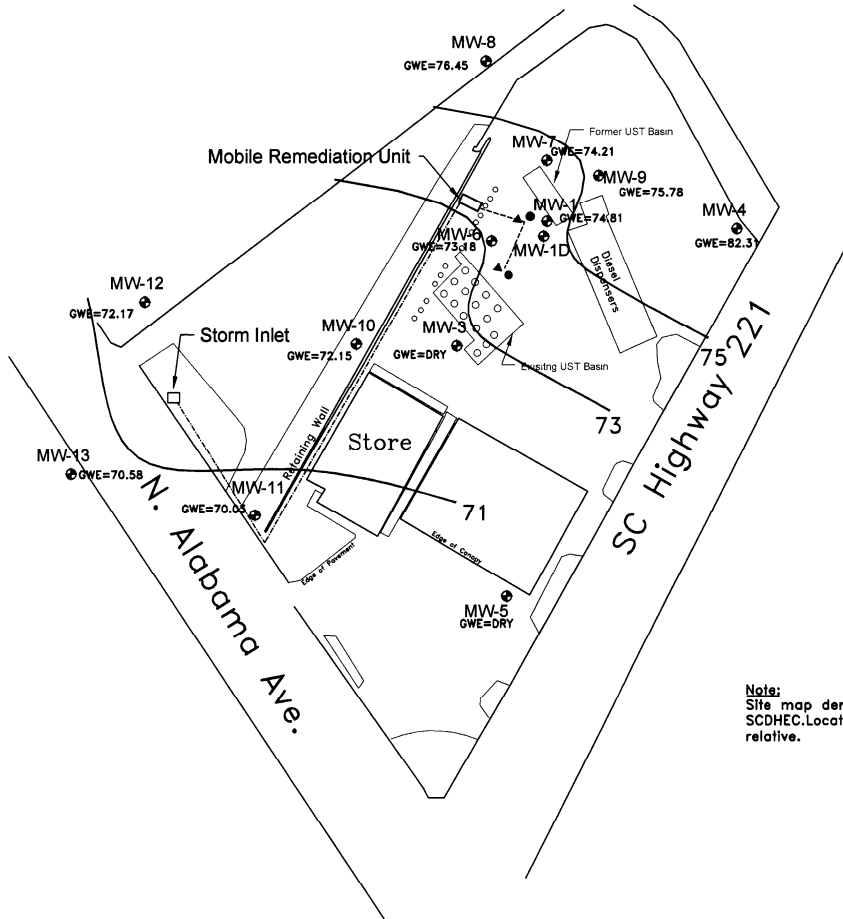
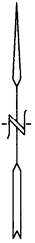
ADDITIONAL WELLS SAMPLED PER BID PACKAGE

MW-1D	3/9/01	<1	<1	<1	<3	<1	<1
	3/14/02	<1	<1	<1	<3	<1	<1
	8/15/02	<1	<1	<1	<2	<1	<1
MW-2	No recent data						
	3/14/02	5.62	<1	68.8	233	61.7	<1
	8/15/02	NS	NS	NS	NS	NS	NS
MW-4	3/9/01	<1	<1	<1	<3	<1	<1
	3/14/02	<1	<1	<1	<2	<1	<1
	8/15/02	<1	<1	<1	<2	<1	<1
MW-5	3/9/01	NS	NS	NS	NS	NS	NS
	3/14/02	NS	NS	NS	NS	NS	NS
	8/15/02	NS	NS	NS	NS	NS	NS
MW-8	3/9/01	<1	<1	<1	<3	<1	<1
	3/14/02	<1	<1	<1	<2	<1	<1
	8/15/02	<1	<1	<1	<2	<1	<1
MW-12	3/9/01	<1	<1	<1	<3	<1	<1
	3/14/02	<1	<1	<1	<2	<1	<1
	8/15/02	<1	<1	<1	<2	<1	<1
MW-13	3/9/01	<1	<1	<1	<3	<1	<1
	3/14/02	<1	<1	<1	<2	<1	<1
	8/15/02	<1	<1	<1	<2	<1	<1

\*CoC Mass Assumed Unaltered

NS = Not Sampled due to dry well conditions

## **FIGURES**




**LEGEND:**

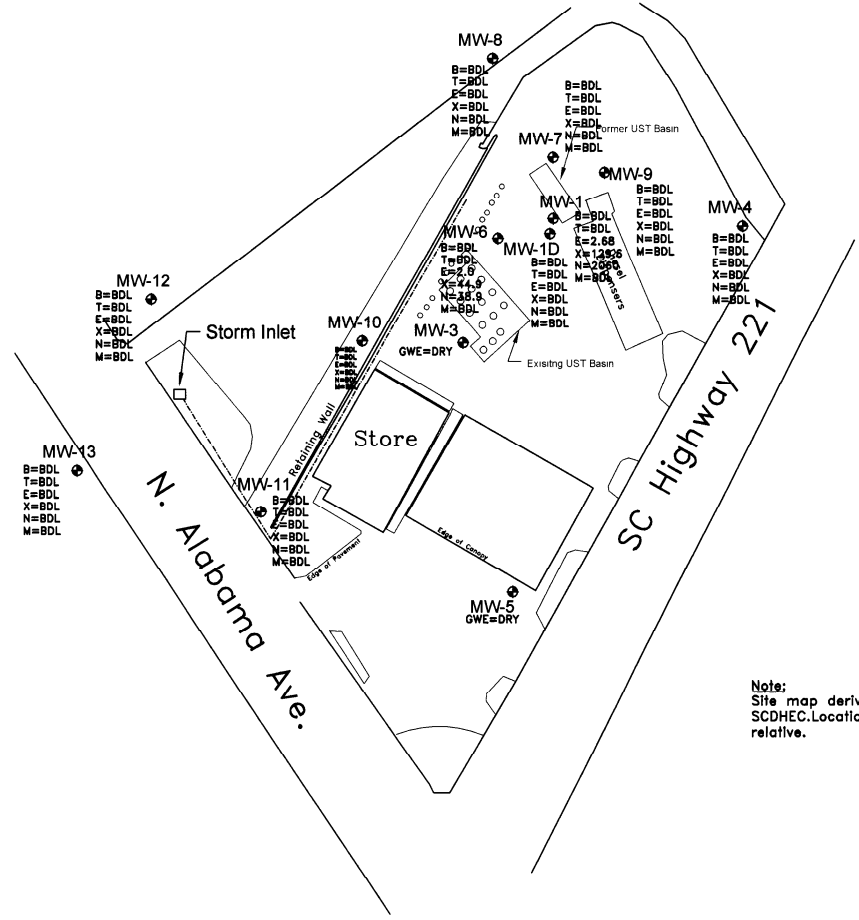
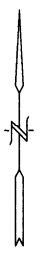
GWE = Groundwater Elevation

- Groundwater Contour
- Compliance Monitoring Well
- ▲ SVE Well
- GW Extraction Well
- Trenching
- Discharge Line

**Notes:**  
 Site map derived from figures provided by SCDHEC. Locations of wells and site features are relative.

 <b>BROOKS &amp; MEDLOCK</b> ENGINEERING, PLLC 712 MERRIMON AVENUE ASHEVILLE, N.C. 28804		
TITLE: Potentiometric Map		
PROJECT: Hot Spot # 3005 CAP	FIGURE: 1	
DATE: 8/23/02	SCALE: N.T.S.	REV.: 2






**LEGEND:**

GWE = Groundwater  
Elevation

- Compliance Monitoring Well
- B=Benzene in ug/l
- T=Toluene in ug/l
- E=Ethylbenzene in ug/l
- X=Xylene in ug/l
- N=Naphthalene in ug/l
- M=MTBE in ug/l

**Note:**  
Site map derived from figures provided by  
SCDHEC. Locations of wells and site features are  
relative.

 <b>BROOKS &amp; MEDLOCK</b> ENGINEERING, PLLC 712 MERRIMON AVENUE ASHEVILLE, N.C. 28804		
TITLE: SITE COC MAP		
PROJECT: Hot Spot # 3005 CAP	FIGURE: 2	
DATE: 8/23/02	SCALE: N.T.S.	REV.: 1

**ATTACHEMENT I**  
**SAMPLE LOGS**

**BROOKS & MEDLOCK ENGINEERING  
SAMPLE LOG**

Date: 8/15

Site: HOT SPOT

Well ID: MW-1

Sample ID: \_\_\_\_\_

Well Depth: 1.20

DTW: 30.18

D \_\_\_\_\_

Well Dia.: \_\_\_\_\_

2

inches

Well Vol. \_\_\_\_\_

gallons

( )

)

( )

)

)

Time	Gal.	pH	Conductivity	Temp
<u>2:02</u>	<u>2</u>	<u>9.05</u>	<u>112</u>	
<u>SMH</u>	<u>SAMPLE</u>	<u>VOL</u>	<u>1/1</u>	

DRY



## BROOKS & MEDLOCK ENGINEERING SAMPLE LOG

Date: 8/15

Site: HOT SPOT

Well ID: MW-4

Sample ID: 4

Well Depth \_\_\_\_\_

DTW: 29.01

Well Dia.: 2 inches

Well Vol. \_\_\_\_\_ gallons

(D)  
D)  
D)

Time	Gal.	pH	Conductivity
1:26	1.5	4.40	312
1:29	2.5	4.43	322

0

-DRY  
-DRY















**BROOKS & MEDLOCK ENGINEERING  
SAMPLE LOG**

Date: 8/15

Site: HOT SPOT

Well ID: MW-810 Sample ID: 1

Well Depth: \_\_\_\_\_ DTW: 24.42 D' \_\_\_\_\_

Well Dia.: 2 inches

Well Vol. \_\_\_\_\_ gallons (2 in. A-WD)  
 (4 in. B-WD)  
 (6 in. C-WD)

Time	Gal.	pH	Conductivity	Tem	DO
12:52	1	4.58	194	2	
12:54	2.5	4.59	192	1	

→ DRY  
→ DRY

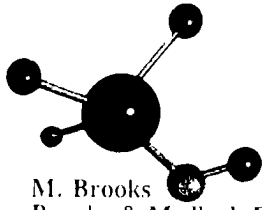






**ATTACHMENT II**  
**LABORATORY DATA**





ACCESS  
ANALYTICAL, INC.

M. Brooks  
Brooks & Medlock Eng.  
712 Merrimon Ave.

Asheville, NC 28804

Page 1  
August 18, 2002  
Report # 208000821  
Order # 69670  
South Carolina Cert ID# 96023

Site Location/Project  
South Carolina  
Hot Spot

Sample I.D.: MW-1  
Collected: 08/15/02 14:00  
Received: 08/16/02 10:00  
Collected by: Mark Brooks

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT	DATE EXT	DATE ANALY	ANALY
8260B BTEX w/Naph+MTBE in Water by GC/MS (S C )			MEDF	100			
Methyl-Tert Butyl-Ether	BDL	ug/L	5030/8260B	100 000	08/16/2002	08/16/2002	10 38 AR
Benzene	BDL	ug/L	5030/8260B	100 000	08/16/2002	08/16/2002	10 38 AR
Toluene	BDL	ug/L	5030/8260B	100 000	08/16/2002	08/16/2002	10 38 AR
Ethylbenzene	1.2 68	ug/L	5030/8260B	100 000	08/16/2002	08/16/2002	10 38 AR
m & p Xylene	1.39 9	ug/L	5030/8260B	100 000	08/16/2002	08/16/2002	10 38 AR
o-Xylene	1.89 7	ug/L	5030/8260B	100 000	08/16/2002	08/16/2002	10 38 AR
Naphthalene	2060	ug/L	5030/8260B	100 000	08/16/2002	08/16/2002	10 38 AR
SURROGATE Toluene D8	100.50%						
SURROGATE Bromofluorobenzene	114.00%						
SURROGATE Dibromofluoromethane	111.75%						

REPORT COMMENTS:

BDL: Indicates Analyte is Below Detection Limit MEDF: Matrix Effect Dilution Factor  
Unless otherwise noted, mg/Kg denotes wet weight


Unless otherwise noted in analyst section, all work performed by STL MIAMI.  
10200 USA Today Way, Miramar Florida 33025. (954) 431-4550 (South Carolina Cert ID# 96023)

Certs: Ct. = #PH0217, La. = #9601, Md. = #271, Ma. = #M-FL535

OK = #9523, SC. = #96023, Tn. = #TN02826, P.R. = FL-00535

Unless otherwise noted, samples submitted for EPA 5035 were collected, preserved and analyzed in accordance with all methodology requirements.

\* UNABLE TO RUN STRAIGHT DUE TO MATRIX; NO BENZENE.



Company Representative

M. Brooks  
 Brooks & Medlock Eng.  
 712 Merrimon Ave.  
 Asheville, NC 28804

Page 2  
 August 18, 2002  
 Report # 208000821  
 Order # 69672  
 South Carolina Cert ID# 96023

Site Location/Project  
 South Carolina  
 Hot Spot

Sample I.D.: MW-9  
 Collected: 08/15/02 15:10  
 Received: 08/16/02 10:00  
 Collected by: Mark Brooks


PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT	DATE EXT.	DATE ANALY.	ANALYST
8260B BTEX w/Naph+MTBE in Water by GC/MS (S C)			MEDF	1			
Methyl-Tert-Butyl-Ether	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 39 AR
Benzene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 39 AR
Toluene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 39 AR
Ethylbenzene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 39 AR
m & p-Xylene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 39 AR
o-Xylene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 39 AR
Naphthalene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 39 AR
SURROGATE Toluene-D8	100.00%						
SURROGATE Bromofluorobenzene	79.25%						
SURROGATE Dibromofluoromethane	87.00%						

REPORT COMMENTS:

BDL: Indicates Analyte is Below Detection Limit MEDF: Matrix Effect Dilution Factor  
 Unless otherwise noted, mg/Kg denotes wet weight

Unless otherwise noted in analyst section, all work performed by STL MIAMI.  
 10200 USA Today Way, Miramar Florida 33025. (954) 431-4550 (South Carolina Cert ID# 96023)  
 certs: Ct. = #PH0217, La. = #9601, Md. = #271, Ma. = #M-FL535  
 OK. = #9523, SC. = #96023, Tn. = #TN02826, P.R. = FL-00535

Unless otherwise noted, samples submitted for EPA 5035 were collected, preserved and analyzed in accordance with all methodology requirements.

  
 \_\_\_\_\_  
 Company Representative

M. Brooks  
Brooks & Medlock Eng.  
712 Merrimon Ave.

Asheville, NC 28804

Page 3  
August 18, 2002  
Report # 208000821  
Order # 69673  
South Carolina Cert ID# 96023

Site Location/Project  
South Carolina  
Hot Spot

Sample I.D.: MW-4  
Collected: 08/15/02 13:30  
Received: 08/16/02 10:00  
Collected by: Mark Brooks

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT	DATE EXT.	DATE ANALY.	ANALYST
8260B BTEX w/Naph+MTBE in Water by GC/MS (S.C.)			MEDF	1			
Methyl-Tert-Butyl-Ether	BDL	ug/L	5030/8260B	1 000	08/17/2002	08/17/2002	08 34 AR
Benzene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 34 AR
Toluene	BDL	ug/L	5030/8260B	1 000	08/17/2002	08/17/2002	08 34 AR
Ethylbenzene	BDL	ug/L	5030/8260B	1 000	08/17/2002	08/17/2002	08 34 AR
m & p-Xylene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 34 AR
o-Xylene	BDL	ug/L	5030/8260B	1 000	08/17/2002	08/17/2002	08 34 AR
Naphthalene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 34 AR
SURROGATE Toluene-D8	95.00%						
SURROGATE Bromofluorobenzene	119.20%						
SURROGATE Dibromofluoromethane	124.00%						

REPORT COMMENTS:

BDL: Indicates Analyte is Below Detection Limit MEDF: Matrix Effected Dilution Factor  
Unless otherwise noted, mg/Kg denotes wet weight

Unless otherwise noted in analyst section, all work performed by STL MIAMI.  
10200 USA Today Way, Miramar Florida 33025. (954) 431-4550 (South Carolina Cert ID# 96023)  
Certs: Ct. = #PH0217, La. = #9601, Md. = #271, Ma. = #M-FL535  
OK. = #9523, SC. = #96023, Tn. = #TN02826, P.R. = FL-00535

Unless otherwise noted, samples submitted for EPA 5035 were collected, preserved and analyzed in accordance with all methodology requirements.

  
\_\_\_\_\_  
Company Representative

M. Brooks  
 Brooks & Medlock Eng.  
 712 Merrimon Ave.  
 Asheville, NC 28804

Page 4  
 August 18, 2002  
 Report # 208000821  
 Order # 69675  
 South Carolina Cert ID# 96023

Site Location/Project  
 South Carolina  
 Hot Spot

Sample I.D.: MW-8  
 Collected: 08/15/02 13:15  
 Received: 08/16/02 10:00  
 Collected by: Mark Brooks

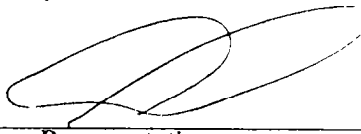
PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT	DATE EXT.	DATE ANALY.	ANALYST
8260B BTEX w/Naph+MTBE in Water by GC/MS (S.C.)			MEDF	1			
Methyl-Tert-Butyl-Ether	BDL	ug/L	5030/8260B	1 000	08/17/2002	08/17/2002	08 38 AR
Benzene	BDL	ug/L	5030/8260B	1 000	08/17/2002	08/17/2002	08 38 AR
Toluene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 38 AR
Ethylbenzene	BDL	ug/L	5030/8260B	1 000	08/17/2002	08/17/2002	08 38 AR
m & p-Xylene	BDL	ug/L	5030/8260B	1 000	08/17/2002	08/17/2002	08 38 AR
o-Xylene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 38 AR
Naphthalene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 38 AR
SURROGATE Toluene-D8	94.50%						
SURROGATE Bromofluorobenzene	78.00%						
SURROGATE Dibromofluoromethane	94.75%						

REPORT COMMENTS:

BDL: Indicates Analyte is Below Detection Limit MEDF: Matrix Effect Dilution Factor  
 Unless otherwise noted, mg/Kg denotes wet weight

Unless otherwise noted in analyst section, all work performed by STL MIAMI.  
 10200 USA Today Way, Miramar Florida 33025. (954) 431-4550 (South Carolina Cert ID# 96023)  
 certs: Ct.=#PH0217, La.=#9601, Md.=#271, Ma.=#M-FL535  
 OK.=#9523, SC.=#96023, Tn.=#TN02826,P.R.=FL-00535

Unless otherwise noted, samples submitted for EPA 5035 were collected,preserved and analyzed in accordance with all methodology requirements.

  
 \_\_\_\_\_  
 Company Representative

M. Brooks  
 Brooks & Medlock Eng.  
 712 Merrimon Ave.  
 Asheville, NC 28804

Page 5  
 August 18, 2002  
 Report # 208000821  
 Order # 69677  
 South Carolina Cert ID# 96023

Site Location/Project  
 South Carolina  
 Hot Spot

Sample I.D.: MW-1D  
 Collected: 08/15/02 14:30  
 Received: 08/16/02 10:00  
 Collected by: Mark Brooks

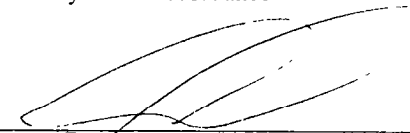
PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT	DATE EXT.	DATE ANALY.	ANALYST
8260B BTEX w/Naph+MTBE in Water by GC/MS (S C )			MEDF	1			
Methyl-Tert-Butyl-Ether	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 36 AR
Benzene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 36 AR
Toluene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 36 AR
Ethylbenzene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 36 AR
m & p-Xylene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 36 AR
o-Xylene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 36 AR
Naphthalene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 36 AR
SURROGATE Toluene-D8	96.75%						
SURROGATE Bromofluorobenzene	108.80%						
SURROGATE Dibromofluoromethane	93.75%						

REPORT COMMENTS:

BDL: Indicates Analyte is Below Detection Limit MEDF: Matrix Effect Dilution Factor  
 Unless otherwise noted, mg/Kg denotes wet weight

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 10200 USA Today Way, Miramar Florida 33025. (954) 431-4550 (South Carolina Cert ID# 96023)  
 certs: Ct. = #PH0217, La. = #9601, Md. = #271, Ma. = #M-FL535  
 OK. = #9523, SC. = #96023, Tn. = #TN02826, P.R. = FL-00535

Unless otherwise noted, samples submitted for EPA 5035 were collected, preserved and analyzed in accordance with all methodology requirements.

  
 \_\_\_\_\_  
 Company Representative

M. Brooks  
 Brooks & Medlock Eng.  
 712 Merrimon Ave.  
 Asheville, NC 28804

Page 6  
 August 18, 2002  
 Report # 208000821  
 Order # 69678  
 South Carolina Cert ID# 96023

Site Location/Project  
 South Carolina  
 Hot Spot

Sample I.D.: MW-7  
 Collected: 08/15/02 15:30  
 Received: 08/16/02 10:00  
 Collected by: Mark Brooks

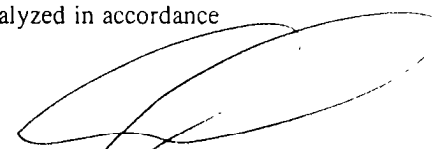
PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT	DATE EXT.	DATE ANALY.	ANALYST
8260B BTEX w/Naph+MTBE in Water by GC/MS (S.C.)			MEDF	1			
Methyl-Tert-Butyl-Ether	BDL	ug/L	5030/8260B	1 000	08/17/2002	08/17/2002	10 12 AR
Benzene	BDL	ug/L	5030/8260B	1 000	08/17/2002	08/17/2002	10 12 AR
Toluene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	10 12 AR
Ethylbenzene	BDL	ug/L	5030/8260B	1 000	08/17/2002	08/17/2002	10 12 AR
m & p-Xylene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	10 12 AR
o-Xylene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	10 12 AR
Naphthalene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	10 12 AR
SURROGATE Toluene-D8	98.00%						
SURROGATE Bromofluorobenzene	96.00%						
SURROGATE Dibromofluoromethane	101.25%						

REPORT COMMENTS:

BDL: Indicates Analyte is Below Detection Limit MEDF: Matrix Effect Dilution Factor  
 Unless otherwise noted, mg/Kg denotes wet weight

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 10200 USA Today Way, Miramar Florida 33025. (954) 431-4550 (South Carolina Cert ID# 96023)  
 certs: Ct. = #PH0217, La. = #9601, Md. = #271, Ma. = #M-FL535  
 OK. = #9523, SC. = #96023, Tn. = #TN02826, P.R. = FL-00535

Unless otherwise noted, samples submitted for EPA 5035 were collected, preserved and analyzed in accordance with all methodology requirements.



\_\_\_\_\_  
 Company Representative

M. Brooks  
 Brooks & Medlock Eng.  
 712 Merrimon Ave.  
 Asheville, NC 28804

Page 7  
 August 18, 2002  
 Report # 208000821  
 Order # 69679  
 South Carolina Cert ID# 96023

Site Location/Project  
 South Carolina  
 Hot Spot

Sample I.D.: MW-10  
 Collected: 08/15/02 13:00  
 Received: 08/16/02 10:00  
 Collected by: Mark Brooks

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT	DATE EXT.	DATE ANALY.	ANALYST
8260B BTEX w/Naph+MTBE in Water by GC/MS (S.C )			MEDF	1			
Methyl-Tert-Butyl-Ether	BDL	ug/L	5030/8260B	1 000	08/17/2002	08/17/2002	10 18 AR
Benzene	BDL	ug/L	5030/8260B	1 000	08/17/2002	08/17/2002	10 18 AR
Toluene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	10 18 AR
Ethylbenzene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	10 18 AR
m & p-Xylene	BDL	ug/L	5030/8260B	1 000	08/17/2002	08/17/2002	10 18 AR
o-Xylene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	10 18 AR
Naphthalene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	10 18 AR
SURROGATE: Toluene-D8	96.25%						
SURROGATE: Bromofluorobenzene	109.20%						
SURROGATE: Dibromofluoromethane	96.25%						

REPORT COMMENTS:

BDL: Indicates Analyte is Below Detection Limit MEDF: Matrix Effect Dilution Factor  
 Unless otherwise noted, mg/Kg denotes wet weight

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 10200 USA Today Way, Miramar Florida 33025. (954) 431-4550 (South Carolina Cert ID# 96023)  
 certs: Ct. = #PH0217, La. = #9601, Md. = #271, Ma. = #M-FL535  
 OK. = #9523, SC. = #96023, Tn. = #TN02826, P.R. = FL-00535

Unless otherwise noted, samples submitted for EPA 5035 were collected, preserved and analyzed in accordance with all methodology requirements.

Company Representative

M. Brooks  
 Brooks & Medlock Eng.  
 712 Merrimon Ave.  
 Asheville, NC 28804

Page 8  
 August 18, 2002  
 Report # 208000821  
 Order # 69681  
 South Carolina Cert ID# 96023

Site Location/Project  
 South Carolina  
 Hot Spot

Sample I.D.: MW-11  
 Collected: 08/15/02 12:40  
 Received: 08/16/02 10:00  
 Collected by: Mark Brooks

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT	DATE EXT.	DATE ANALY.	ANALYST
8260B BTEX w/Naph+MTBE in Water by GC/MS (S.C.)			MEDF	1			
Methyl-Tert-Butyl-Ether	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	10 17 AR
Benzene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	10 17 AR
Toluene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	10 17 AR
Ethylbenzene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	10 17 AR
m & p-Xylene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	10 17 AR
o-Xylene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	10 17 AR
Naphthalene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	10 17 AR
SURROGATE Toluene-D8	99.00%						
SURROGATE Bromofluorobenzene	117.20%						
SURROGATE Dibromofluoromethane	97.75%						

REPORT COMMENTS:

BDL: Indicates Analyte is Below Detection Limit MEDF: Matrix Effect Dilution Factor  
 Unless otherwise noted, mg/Kg denotes wet weight

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 10200 USA Today Way, Miramar Florida 33025. (954) 431-4550 (South Carolina Cert ID# 96023)  
 certs: Ct.=#PH0217, La.=#9601, Md.=#271, Ma.=#M-FL535  
 OK.=#9523, SC.=#96023, Tn.=#TN02826,P.R.=FL-00535

Unless otherwise noted, samples submitted for EPA 5035 were collected,preserved and analyzed in accordance with all methodology requirements.



Company Representative



M. Brooks  
 Brooks & Medlock Eng.  
 712 Merrimon Ave.  
 Asheville, NC 28804

Page 9  
 August 18, 2002  
 Report # 208000821  
 Order # 69683  
 South Carolina Cert ID# 96023

Site Location/Project  
 South Carolina  
 Hot Spot

Sample I.D.: MW-12  
 Collected: 08/15/02 12:25  
 Received: 08/16/02 10:00  
 Collected by: Mark Brooks

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT	DATE EXT.	DATE ANALY.	ANALYST
8260B BTEX w/Naph+MTBE in Water by GC/MS (S.C.)			MEDF	1			
Methyl-Tert-Butyl-Ether	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 26 AR
Benzene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 26 AR
Toluene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 26 AR
Ethylbenzene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 26 AR
m & p-Xylene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 26 AR
o-Xylene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 26 AR
Naphthalene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 26 AR
SURROGATE Toluene-D8	97.25%						
SURROGATE Bromofluorobenzene	121.60%						
SURROGATE Dibromofluoromethane	86.75%						

REPORT COMMENTS:

BDL: Indicates Analyte is Below Detection Limit MEDF: Matrix Effect Dilution Factor  
 Unless otherwise noted, mg/Kg denotes wet weight

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 10200 USA Today Way, Miramar Florida 33025. (954) 431-4550 (South Carolina Cert ID# 96023)  
 certs: Ct. = #PH0217, La. = #9601, Md. = #271, Ma. = #M-FL535  
 OK. = #9523, SC. = #96023, Tn. = #TN02826, P.R. = FL-00535  
 Unless otherwise noted, samples submitted for EPA 5035 were collected, preserved and analyzed in accordance with all methodology requirements.

Company Representative

M. Brooks  
 Brooks & Medlock Eng.  
 712 Merrimon Ave.  
 Asheville, NC 28804

Page 10  
 August 18, 2002  
 Report # 208000821  
 Order # 69686  
 South Carolina Cert ID# 96023

Site Location/Project  
 South Carolina  
 Hot Spot

Sample I.D.: MW-13  
 Collected: 08/15/02 12:10  
 Received: 08/16/02 10:00  
 Collected by: Mark Brooks

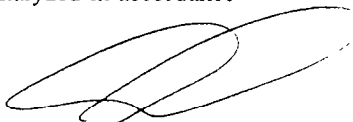
PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT	DATE EXT.	DATE ANALY.	ANALYST
8260B BTEX w/Naph+MTBE in Water by GC/MS (S.C )			MEDF	1			
Methyl-Tert-Butyl-Ether	BDL	ug/L	5030/8260B	1 000	08/17/2002	08/17/2002	08 35 AR
Benzene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 35 AR
Toluene	BDL	ug/L	5030/8260B	1 000	08/17/2002	08/17/2002	08 35 AR
Ethylbenzene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 35 AR
m & p-Xylene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 35 AR
o-Xylene	BDL	ug/L	5030/8260B	1 000	08/17/2002	08/17/2002	08 35 AR
Naphthalene	BDL	ug/L	5030/8260B	1.000	08/17/2002	08/17/2002	08 35 AR
SURROGATE Toluene-D8	96.00%						
SURROGATE Bromofluorobenzene	115.20%						
SURROGATE Dibromofluoromethane	90.25%						

REPORT COMMENTS:

BDL: Indicates Analyte is Below Detection Limit MEDF: Matrix Effect Dilution Factor  
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 10200 USA Today Way, Miramar Florida 33025. (954) 431-4550 (South Carolina Cert ID# 96023)  
 certs: Ct. =#PH0217, La. =#9601, Md. =#271, Ma. =#M-FL535  
 OK. =#9523, SC. =#96023, Tn. =#TN02826, P.R. =FL-00535

Unless otherwise noted, samples submitted for EPA 5035 were collected, preserved and analyzed in accordance with all methodology requirements.

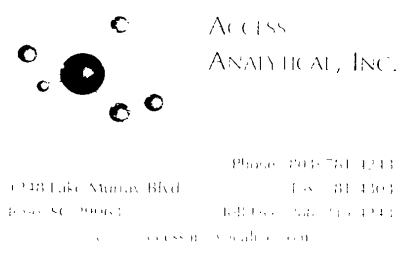
  
 \_\_\_\_\_  
 Company Representative

## Access Analytical - Chain of Custody Record

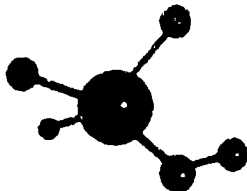
Project Submission #: 2/8-821 69670-69686 RUSH # EC

Laboratory ID:  
PO #:

Company Name <u>BROOKS &amp; MEDLOCK ENG.</u>		Address <u>712 MERRIMON AVE.</u>		City, State, Zip <u>ASHEVILLE NC 28804</u>		Project Name <u>HOT SPOT</u>		Report To <u>MARIL BROOKS</u>		Sampled By (print) <u>MARK BROOKS</u>		
Sample Label		Date Collected	Time Collected	Amount	# of Cont.	REQUESTED LAB ANALYSIS						
MW-1	8/15	2:00	W	2	✓	BTEX, MTHX, MTBE						
MW-9	8/15	3:10	W	1	✓							
MW-4	8/15	1:30	W	2	✓							
MW-8	8/15	1:15	W	2	✓							
MW-10	8/15	2:30	W	2	✓							
MW-7	8/15	3:30	W	1	✓							
MW-10	8/15	1:00	W	2	✓							
MW-11	8/15	12:40	W	2	✓							
MW-12	8/15	12:25	W	2	✓							
MW-13	8/15	12:10	W	2	✓							
Turnaround Time:		Samples Received on Ice	Project Location	Relinquished By	Date			Time	Received By			
✓ Std (5-7 Bus. days) RUSH		✓	✓	<u>Mark Brooks</u>	8/15			4:45	[Signature]			
Date Required: For rush work, results provided end of business day on date required		4.0 ✓			8/16/02			10:00				



NOTES / COMMENTS



# ACCESS ANALYTICAL, INC.

M. Brooks  
Brooks & Medlock Eng.  
712 Merrimon Ave.

Asheville, NC 28804

Page 1  
August 28, 2002  
Report # 208001310  
Order # 73159  
South Carolina Cert ID# 96023

Site Location/Project

Sample I.D.: MW-6  
Collected: 08/24/02 11:20  
Received: 08/27/02 10:00  
Collected by: Client

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT	DATE EXT.	DATE ANALY.	ANALYST
8260B BTEX w/Naph+MTBE in Water by GC/MS (S C)			MEDF	1			
Methyl-Tert-Butyl Ether	BDL	ug/L	5030/8260B	1.000	08/28/2002	08/28/2002	07:19 AR
Benzene	BDL	ug/L	5030/8260B	1.000	08/28/2002	08/28/2002	07:19 AR
Toluene	BDL	ug/L	5030/8260B	1.000	08/28/2002	08/28/2002	07:19 AR
Ethylbenzene	2.07	ug/L	5030/8260B	1.000	08/28/2002	08/28/2002	07:19 AR
m & p-Xylene	13.8	ug/L	5030/8260B	1.000	08/28/2002	08/28/2002	07:19 AR
o-Xylene	31.1	ug/L	5030/8260B	1.000	08/28/2002	08/28/2002	07:19 AR
Naphthalene	38.9	ug/L	5030/8260B	1.000	08/28/2002	08/28/2002	07:19 AR
SURROGATE: Toluene-D8	99.00%						
SURROGATE: Bromofluorobenzene	100.80%						
SURROGATE: Dibromofluoromethane	105.25%						

#### REPORT COMMENTS:

BDL: Indicates Analyte is Below Detection Limit MEDF: Matrix Effect Dilution Factor  
Unless otherwise noted, mg/Kg denotes wet weight

Unless otherwise noted in analyst section, all work performed by STL MIAMI.  
10200 USA Today Way, Miramar Florida 33025. (954) 431-4550 (South Carolina Cert ID# 96023)  
Center: Ct. = #PH0217, La. = #9601, Md. = #271, Ma. = #M-FL535  
OK. = #9523, SC. = #96023, Tx. = #TN02826, P.R. = FL-00535

Unless otherwise noted, samples submitted for EPA 5035 were collected, preserved and analyzed in accordance with all methodology requirements.

  
\_\_\_\_\_  
Company Representative

# Access Analytical - Chain of Custody Record

Project Submission #: 02/08-1310

RUSH # 73159 RA

Laboratory ID: \_\_\_\_\_  
PO #: \_\_\_\_\_

Company Name: <u>BROOKS + MENLOCK ENGINEERING</u>					PRESERVATIVE: (From codes below)  * REQUESTED LAB ANALYSIS: + <u>STEX, MPD, MTBE</u>	ACCESS ANALYTICAL, INC.	
Address: <u>712 MERRIMON AVE.</u>						Main Office: 1748 Lake Murray Blvd. Irmo, SC 29063	
City: <u>ASHEVILLE</u> State: <u>NC</u> Zip: <u>28804</u>						Phone: 803.781.4243 / 888.315.4243 (toll free) Fax: 803.781.4308	
Project Name:						NOTES / COMMENTS	
Report To:							
Sampled By (print):					ORD # <u>73159</u>  SC UST PROSECUT * 24 HR TURN.  RUSH # <u>4P354</u> DUE <u>8-28-02</u>		
Sample Label	Date Collected	Time Collected	Matrix	# of Cont.			
<u>MW-6</u>	<u>8/24</u>	<u>11:20 AM</u>	<u>N</u>	<u>2</u>			
Turnaround Time:		Samples Recd. on Ice?		Project Location		Relinquished By:	
<input type="checkbox"/> Std. (5-7 Bus. days) <input checked="" type="checkbox"/> RUSH* *Date Required: <u>8/28/02</u> (For rush work, results faxed by end of business day on date required)		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<input checked="" type="checkbox"/> SC <input type="checkbox"/> NC Other _____ (specify)		<u>Mark B...</u> <u>8/26</u> <u>12:40</u> Received By: <u>[Signature]</u> <u>SR 8/27/02</u>	

\* Preservative Codes (place corresponding # in block above analysis field). 0 = None, 1 = HCl, 2 = HNO<sub>3</sub>, 3 = H<sub>2</sub>SO<sub>4</sub>, 4 = NaOH, 5 = Na<sub>2</sub>S<sub>2</sub>O<sub>5</sub>, 6 = NaHSO<sub>5</sub>, Other = Specify

Original Copy Returned w/Report

Pg. \_\_\_ of \_\_\_

ACCESS COC.pdf

PAGE 3/3  
FILE NO: 740 08/28 '02 10:15 ID: FAX:

  
**BROOKS & MEDLOCK**  
ENGINEERING, PLLC

RECEIVED

AUG 29 2002

August 28, 2002

South Carolina DHEC  
Bureau of Underground Storage Tank Management  
2600 Bull Street  
Columbia, South Carolina 29201

Underground Storage  
Tank Program

ATTENTION: Ms. Debra Thomas

Reference: **Corrective Action Invoice**  
Hot Spot # 3005  
Site ID # 12719

Dear Mr. Padgett:

The August 23, 2002 quarterly sampling report demonstrates removal of the free product layer at the site and a 95% CoC mass reduction. In accordance with the procurement specifications outlined in Bid Number SB-18123-12/20/01, Brooks & Medlock Engineering is submitting an invoice for 35% of the contract amount.

Please contact me at (828) 232-4700 if you have any questions or comments. We would greatly appreciate your efforts to expedite the invoice process.

Thank you for your time and cooperation with this project.

Sincerely,

**Brooks & Medlock Engineering, PLLC**



Mark Brooks, P.E.  
Environmental Engineer



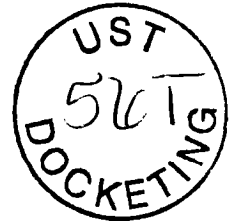
**UNDERGROUND STORAGE TANK PROGRAM  
BUREAU OF LAND AND WASTE MANAGEMENT**

Phone (800) 826-5435 Fax (803) 896-6245

2600 Bull Street  
Columbia, SC 29201-1708

**MS SHAWN JUDD  
GEOLOGICAL RESOURCES, INC.  
4913 ALBEMARLE RD, STE. 101  
CHARLOTTE, NC 28205**

**SEP 12 2002**



Re: **Notice to Proceed**  
Bid # SB-19032-04/09/02; PO# 404342

Dear Ms. Judd:

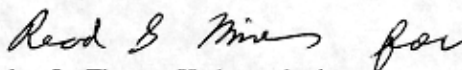
Based on the award of the referenced bid package, enclosed is the information packet to conduct twelve (12) groundwater sampling events. The packets contain all necessary information for work to begin. The facility has been assigned an individual Cost Agreement (CA) number as listed below. Please reference the CA number and Purchase Order #404342 on the appropriate invoice submitted for payment against the facility.

UST Permit #	Facility	County	# wells	Parameters	PACE CA#	GRI CA#
12719	Hot Spot 3005	Spartanburg	10	7-BTEX, Naph, MTBE, Oxygenates (8260)	17180:P	17181:P
14496	Royle Road Assoc.	Berkeley	16	16-BTEX, Naph, MTBE (8260)	17121:P	17122:P
14415	UST-Unknown	Clarendon	14	14-BTEX, Naph, MTBE (8260)	17119:P	17120:P
05158	Pams Corner	Horry	11	11-BTEX, Naph, MTBE (8260)	17117:P	17118:P
03060	Former Greene's Union 76	Dorchester	10	10-BTEX, Naph, MTBE (8260)	17113:P	17114:P
17192	SC Dept of Mental Health	Richland	6	6-BTEX, Naph, MTBE (8260), EDB (8011)	14248:P	14249:P
14825	Bob's Auto Service	Dorchester	11	11-BTEX, Naph, MTBE (8260), Lead (6010)	14368:P	14369:P
03824	Stooksbury Industries	Greenville	11	11-BTEX, Naph, MTBE (8260)	14371:P	14372:P
14981	Former Joyce Hickman Store	Abbeville	6	6-BTEX, Naph, MTBE (8260)	11647:P	11648:P
09456	Lake Wylie Market #2	York	15	15-BTEX, Naph, MTBE (8260)	09860:P	09861:P
15222	Sweatmans Grocery	Dorchester	12	12-BTEX, Naph, MTBE (8260), Lead (6010)	09871:P	09872:P
03558	Power's Grocery	Florence	14	14-BTEX, Naph, MTBE (8260), Lead (6010)	09845:P	09846:P

Geological Resources, Inc. will perform services at the sites on behalf of the site's responsible party (RP); however, payment will be made from the SUPERB Account. The site's RP has no obligation for payment for this scope of work. **Please coordinate access to the facility with the property owner.** Contact information has been provided in the information packet. The Bureau grants pre-approval for transportation of drums of groundwater from the referenced sites to a permitted treatment facility. The contaminated groundwater must be properly stored in labeled 55-gallon drums or equivalent containers. The contaminated groundwater must be accepted by the approved treatment facility. There can be no spillage or leakage in transport. A copy of the disposal manifest from the receiving facility that clearly designates the quantity received must be included with the final report.

Please contact Debra Thoma before commencing work at this facility. If you have any questions or need further assistance, please contact Debra Thoma at (803) 896-6397 or (800) 826-5435 (within SC only)

Sincerely,



Debra L. Thoma, Hydrogeologist  
State Lead & Field Services Section  
Assessment & Corrective Action Division

enc: Field Activity Worksheet Information Packets  
Approved Cost Agreements

cc: Sherri Howard, PACE Analytical Services, 9800 Kinsey Ave. Ste. 100, Huntersville, NC, 28078  
(w/ Approved Cost Agreement)  
Debra Thoma, State Lead & Field Services  
Technical/Read File





2600 Bull Street  
Columbia, SC 29201-1708

*Dickson*

**UNDERGROUND STORAGE TANK PROGRAM  
BUREAU OF LAND AND WASTE MANAGEMENT**

Phone (800) 826-5435 Fax (803) 896-6245

**MS SHAWN JUDD  
GEOLOGICAL RESOURCES INC  
4913 ALBEMARLE RD STE 101  
CHARLOTTE NC 28205**

Re: **Notice to Proceed**  
Bid # SB-19032-04/09/02; PO# 404342

Dear Ms. Judd:

Based on the award of the referenced bid package, enclosed are the information packets to conduct twenty-five (25) groundwater-sampling events. The packets contain all necessary information for work to begin. The facilities have been assigned an individual Cost Agreement (CA) number as listed below. Please reference the CA number and Purchase Order #404342 on the appropriate invoice submitted for payment against each facility.

UST Permit #	Facility	County	# wells	Parameters	PACE CA#	GRI CA#
12325	Greenville Vehicle	Greenville	19	BTEX, Naph, MTBE (8260)	17486:P	17487:P
✓ 12719	Hot Spot #3005	Spartanburg	7	BTEX, Naph, MTBE (8260)	17679:P	17680:P
14243	Iva Rescue Squad	Anderson	6	BTEX, Naph, MTBE (8260)	17637:P	17638:P
02607	Darlington Bus	Darlington	8	BTEX, Naph, MTBE (8260), EDB (8011), & Oxygenates	17604:P	17605:P
02775	Hunters Service	Darlington	8	BTEX, Naph, MTBE (8260), Nitrate, Sulfate, & Ferrous Iron	17652:P	17653:P
17192	SC Mental Health	Richland	6	BTEX, Naph, MTBE (8260)	17608:P	17609:P
11943	Quick Mart	Lexington	12	BTEX, Naph, MTBE (8260), EDB (8011)	17634:P	17635:P
16971	Former Goodyear	Orangeburg	9	BTEX, Naph, MTBE (8260), Nitrate, Sulfate, & Ferrous Iron	17662:P	17663:P
11638	Public Works	Bamberg	6	BTEX, Naph, MTBE (8260)	17484:P	17485:P
16951	Laudenslager Tract	Aiken	7	BTEX, Naph, MTBE (8260), Nitrate, Sulfate, & Ferrous Iron	17660:P	17661:P
12699	Horry Auto Sales	Horry	13	BTEX, Naph, MTBE (8260)	17493:P	17494:P

17558	Midway Chapel	Horry	8	BTEX, Naph, MTBE (8260), Nitrate, Sulfate, & Ferrous Iron	17668:P	17669:P
05205	Sunspot Conven.	Horry	5	BTEX, Naph, MTBE (8260), Nitrate, Sulfate, & Ferrous Iron	17656:P	17657:P
03426	Perry's Grocery	Williamsburg	11	BTEX, Naph, MTBE (8260), EDB (8011)	17610:P	17611:P
18107	Cox Feed & Seed	Williamsburg	11	BTEX, Naph, MTBE (8260), Nitrate, Sulfate, & Ferrous Iron	17670:P	17671:P
18108	Lewis One Stop	Williamsburg	5	BTEX, Naph, MTBE (8260), Nitrate, Sulfate, & Ferrous Iron	17672:P	17673:P
03753	Strong's Grocery	Georgetown	7	BTEX, Naph, MTBE (8260), Nitrate, Sulfate, & Ferrous Iron	17654:P	17655:P
17347	Brown Property	Georgetown	5	BTEX, Naph, MTBE (8260), Nitrate, Sulfate, & Ferrous Iron	17664:P	17665:P
12442	Bryans Service St	Berkeley	3	BTEX, Naph, MTBE (8260), Nitrate, Sulfate, & Ferrous Iron	17658:P	17659:P
01251	Clark's Exxon	Berkeley	5	BTEX, Naph, MTBE (8260), Nitrate, Sulfate, & Ferrous Iron	17648:P	17649:P
17377	Westbury Ace	Dorchester	5	BTEX, Naph, MTBE (8260), Nitrate, Sulfate, & Ferrous Iron	17666:P	17667:P
13783	Prine Provision	Colleton	20	19-BTEX, Naph, MTBE (8260), Oxygenates 1-BTEX, Naph, MTBE	17621:P	17622:P
13159	Fina 6818	Charleston	12	BTEX, Naph, MTBE (8260)	17689:P	17690:P
11042	Melvin's Texaco	Charleston	6	BTEX, Naph, MTBE (8260), Nitrate, Sulfate, & Ferrous Iron	17478:P	17479:P
001801	Pickney Grocery	Charleston	4	BTEX, Naph, MTBE (8260), Nitrate, Sulfate, & Ferrous Iron	17650:P	17651:P

Geological Resources, Inc. will perform services at the sites on behalf of the site's tank owner; however, payment will be made from the SUPERB Account. The site's owner has no obligation for payment for this scope of work. **Please coordinate access to the facilities with the property owner.** Contact information has been provided in the information packets.

The Bureau grants pre-approval for transportation of drums of groundwater from the referenced sites to a permitted treatment facility. The contaminated groundwater must be properly stored in labeled 55-gallon drums or equivalent containers. The contaminated groundwater must be accepted by the approved treatment facility. There can be no spillage or leakage in transport. A copy of the disposal manifest from the receiving facility that clearly designates the quantity received must be included with the final report.

Please contact me before commencing work at these facilities. If you have any questions or need further assistance, please contact me at (803) 896-6397 or (800) 826-5435 (within SC only)

Sincerely,



Debra L. Thoma, Hydrogeologist  
State Lead & Field Services Section  
Assessment & Corrective Action Division

Enc: Approved Cost Agreements 17487, 17680, 17638, 17605, 17653, 17609, 17635, 17663, 17485, 17661, 17494, 17669, 17657, 17611, 17671, 17673, 17655, 17665, 17659, 17649, 17667, 17622, 17690, 17479, 17651)  
Field Activity Worksheets

cc: Sherri Stabel, PACE Analytical Services, 9800 Kincey Ave. Ste. 100, Huntersville, NC, 28078  
(w/ Approved Cost Agreements 17486, 17679, 17637, 17604, 17652, 17608, 17634, 17662, 17484, 17660, 17493, 17668, 17656, 17610, 17670, 17672, 17654, 17664, 17658, 17648, 17666, 17621, 17689, 17478, 17650)  
Bob Faller, State Lead & Field Services Section  
Technical/Read File



2600 Bull Street  
Columbia, SC 29201-1708

UNDERGROUND STORAGE TANK PROGRAM  
BUREAU OF LAND AND WASTE MANAGEMENT

Phone: (800) 826-5435 Fax: (803) 896-6245

SEP 30 2002

MR MARK BROOKS  
BROOKS & MEDLOCK ENGINEERING  
712 MERRIMAN AVE  
ASHEVILLE NC 28804



Re: Hot Spot 3005, 107 Hampton St., Chesnee, SC  
UST Permit #12719, CA#: 13851:P  
Bid#: SB-18123-12/20/01-HW, PO#385179  
Monitoring Report received September 27, 2002  
Spartanburg County

Dear Mr. Brooks:

On September 23, 2002, a Corrective Action verification sampling event was completed at the referenced facility. Several monitoring wells could not be sampled because they had gone dry or had insufficient water for sampling as a result of the drought. The Underground Storage Tank Program has secured the services of a contractor to replace those wells. Please find enclosed a copy of the data from those wells that could be sampled.

If you have any questions or need additional information, please contact me at (803) 896-6397 or (800) 826-5435.

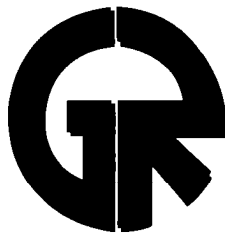
Sincerely,

Debra L. Thoma, Hydrogeologist  
State Lead & Field Services Section  
Assessment and Corrective Action Division

Enc: Monitoring Report

cc: Judith Laughter, RL Jordan Oil Co., PO Box 2527, Spartanburg, SC, 29304-2527 (w/enc.)  
Technical File

SCDHEC/UST/DLT/9.30.02/06542rp\_awd



L.T.  
5/7 wells

## Geological Resources, Inc.

October 4, 2002

Mr. Robert Faller  
Environmental Health Manager  
Bureau of Underground Storage Tank Management  
South Carolina Department of Health and Environmental Control  
2600 Bull Street  
Columbia, SC 29201-1708

10/04/02

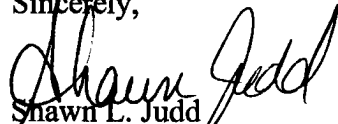
Re: Hot Spot 3005  
Site ID# 12719  
CP # 17181:P; PO # 404342

Dear Mr. Faller:

Please find enclosed the **original report** for the above referenced site.

The original invoice has been submitted to Ms. Pat Holland of the Finance Section as specified in the contract.

Sincerely,

  
Shawn L. Judd  
Administrative Manager



4913 Albemarle Road Suite 101 Charlotte, NC 28205  
Phone: (704) 563-1663 / (888) 870-4133 Fax: (704) 563-1662

[www.geologicalresourcesinc.com](http://www.geologicalresourcesinc.com)

# FIELD ACTIVITY WORKSHEET ORDER

Date of Request: \_\_\_\_\_

**Type of Request:**

(Please indicate your request with a check mark)

Emergency (<2 Working Days)

Specific (1-5 Working Days)

Routine (10 Working Days)

1638-2

Please specify the type of work to be completed:

Sample 7 monitoring wells (MW-1, MW-3, MW-6, MW-7, MW-9, MW-10, & MW-11) for BTEX, Naph, MTBE & Oxygenates

Facility Name: Hot Spot 3005

Permit Number: 12719

Project Manager: D. Thoma

County: Spartanburg

Sample ASAP

(Field Staff Only)

Date Field Activity Completed:	_____
Completed by Field Staff:	_____
Date Field Notes Entered into EFIS:	_____

Field Staff Comments:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**REMEMBER TO ESTABLISH COST PROPOSALS**

PACE CA#: 17180:P

GRI CA#: 17181:P

PALMETTO ENV GROUP CA#: \_\_\_\_\_

Fill out back of this form. Photocopy, attach a completed CP cover for each CP. Thank you very much!

UST Permit # 12719

Facility Name Hot Spot 3005

PACE CA#: \_\_\_\_\_  
PO # 416276

17180:P

**GROUNDWATER ANALYSES**

TASK CODE	WATER/METHOD	QUANTITY	RATE	TOTAL
11A	BTEX+NAPH+MTBE (8260)	7	\$30.00	\$210.00
11A	BTEX+NAPH+MTBE (8021)		\$30.00	\$0.00
11F	EDB (8011)		\$40.00	\$0.00
11D	PAHs (8270)		\$65.00	\$0.00
11G	8 RCRA METALS		\$65.00	\$0.00
11E	LEAD (6010)		\$7.50	\$0.00
11H	TPH (9070)		\$35.00	\$0.00
	TOC (9060)		\$33.00	\$0.00
11I	pH (150.1)		\$5.00	\$0.00
11K	NITRATES (9056/9210)		\$10.00	\$0.00
11L	SULFATES (9056/9038)		\$10.00	\$0.00
11N	METHANE		\$72.50	\$0.00
	Total dissolved iron (200.7)		\$10.00	\$0.00
11M	Fe+2 (SM3500FeD)		\$10.00	\$0.00
	Fe+3 (200.7)		\$10.00	\$0.00
11P	Oxygenates	7	\$200.00	\$1,400.00

**SOIL ANALYSES**

TASK CODE	SOIL/METHOD	QUANTITY	RATE	TOTAL
11Q	BTEX (8260-5035)		\$40.00	\$0.00
11Q	BTEX (8021-5035)		\$40.00	\$0.00
11R	PAHs (8270)		\$65.00	\$0.00
11S	8 RCRA METALS		\$65.00	\$0.00
	LEAD (6010)		\$8.00	\$0.00
11T	TPH (diesel)		\$35.00	\$0.00
11U	TPH (gas)		\$30.00	\$0.00
11V	TPH (9071)		\$55.00	\$0.00
11X	TOC (9060)		\$33.00	\$0.00
	<b>Expedite Cost</b>	1.00		\$0.00

PACE TOTAL: \$1,610.00

Palmetto Env. Group CP# \_\_\_\_\_  
PO #337210

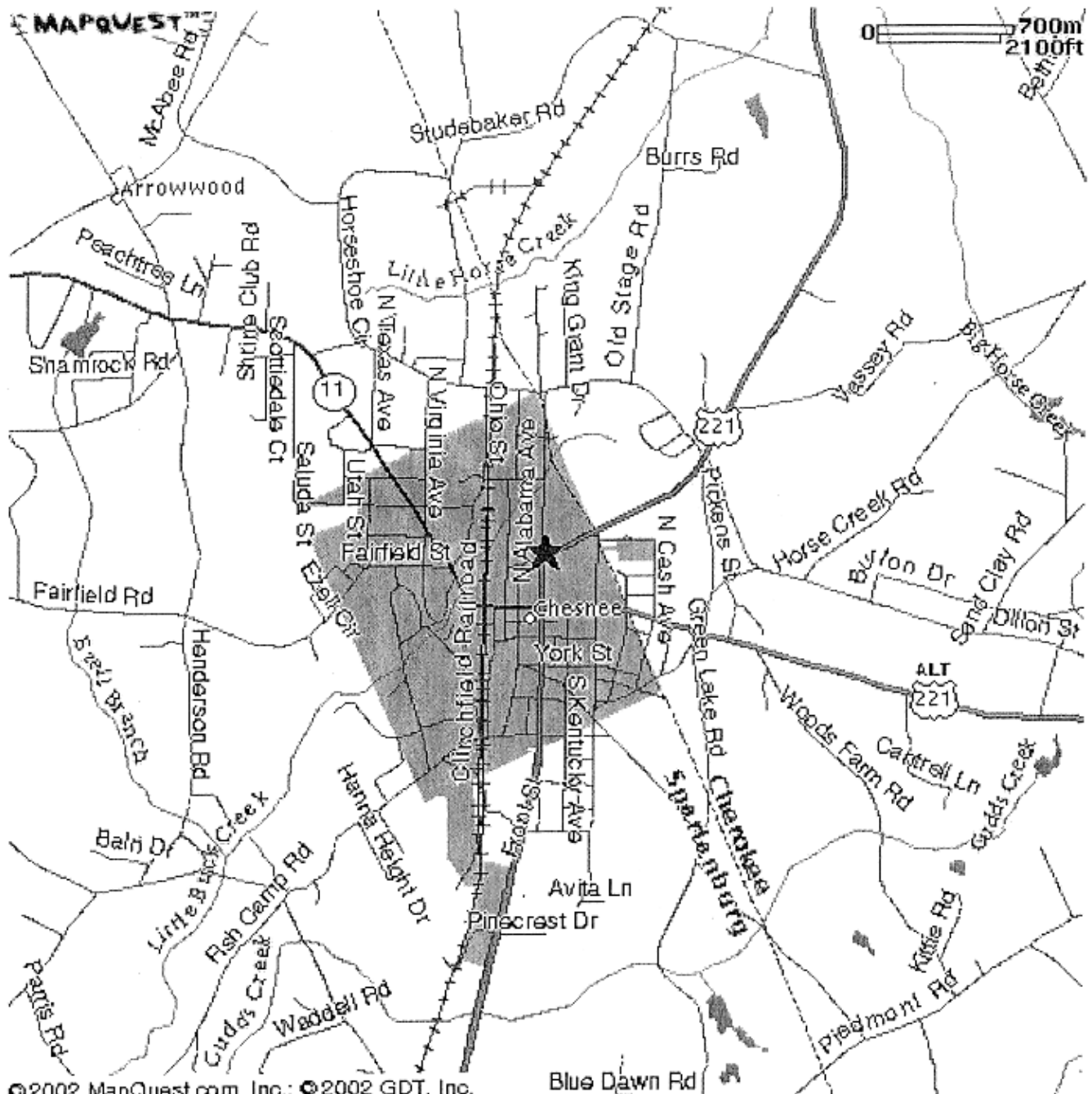
TASK CODE	TASK	QUANTITY	RATE	TOTAL
VB 17	New GAC & Installation		\$1,744.00	\$0.00
VB 18	Installation w/o GAC		\$1,004.00	\$0.00
VB 19	Carbon, gravel, & filter replacement		\$395.00	\$0.00
VB 20	Disassemble & Clean		\$400.00	\$0.00
VB 21	Mobilization		\$75.00	\$0.00
VB 22	Locks		\$20.00	\$0.00
VB 23	Housing Unit		\$350.00	\$0.00
VB 29	Inline Particulate Filter		\$125.00	\$0.00
VB 7	Additional Piping		\$2.00	\$0.00

Palmetto TOTAL \$0.00

GRI CP# 17181:P  
PO # 404342

TASK CODE	TASK	QUANTITY	RATE	TOTAL
10A	PURGE & SAMPLE	7	\$19.95	\$139.65
	GAUGE Only		\$7.25	\$0.00
	TAP SAMPLE		\$4.00	\$0.00
17A2	DISPOSAL/WATER	150	\$0.55	\$82.50
4B	MOB	1	\$49.75	\$49.75

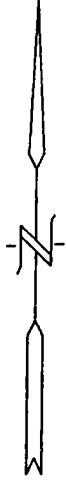
GRI TOTAL: \$271.90



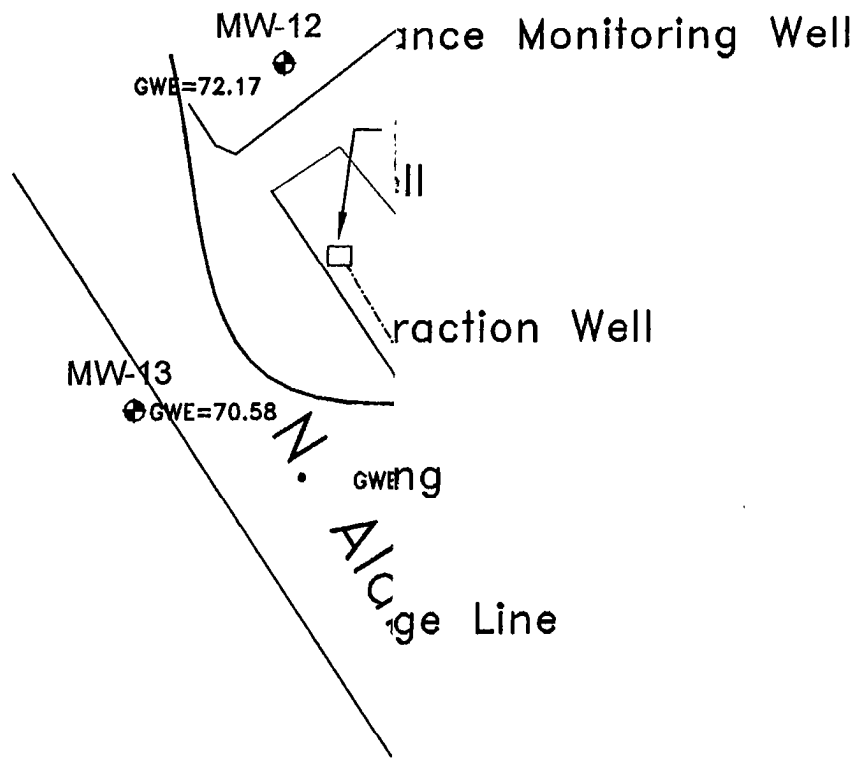
©2002 MapQuest.com, Inc.; ©2002 GDT, Inc.

Blue Dawn Rd





Groundwater  
water Contour



led by  
eatures are



OOKS & MEDLOCK  
ENGINEERING, PLLC

712 MERRIMON AVENUE  
ASHEVILLE, N.C. 28804

tric Map

st # 3005 CAP

FIGURE: 1

SCALE: N.T.S.

REV.: 2

Field Data Information sheet for Ground-Water Sampling

Date (mm/dd/yy): 9-23-02  
 Field Personnel: JL  
 General Weather Conditions: SUN  
 Ambient Air Temperature: 28° C

Quality Assurance

pH Meter		Conductivity Meter	
serial no.	<u>809061</u>	serial no.	
pH=4.0	<input checked="" type="checkbox"/>	Standard	
pH=7.0	<input type="checkbox"/>	Standard	
pH=10.0	<input type="checkbox"/>	Standard	

Chain of Custody

Relinquished by	Date/Time	Received by	Date/Time

Facility Name: Hot Spot 3005  
 Site ID # 12719 Monitoring Well # MW-1  
 Well Diameter (D): .167 feet  
 Conversion factor (C): 3.14 X (D/2)<sup>2</sup> for a 2 inch well C = 0.163  
 for a 4 inch well C = 0.652

\* Free Product Thickness: \_\_\_\_\_ feet  
 Depth to Ground Water (DGW) D27 feet  
 Total Well Depth (TWD) 30.19 feet  
 Length of the water column (LWC = TWD-DGW) \_\_\_\_\_ feet

1 casing volume (CV = LWC X C) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ gals  
 3 casing volume 3 X CV = \_\_\_\_\_ gals (standard purge volume)

Total volume of Water Purged Before Sampling \_\_\_\_\_ gals

\*If free product is present over 1/8 inch, sampling will not be required.

	Initial	1st Vol.	2nd Vol.	3rd Vol.	4th Vol.	5th Vol.	6th Vol.	Sample
Cumulative Volume Purged (gallons)								
Time (military)								<u>D27</u>
pH (s.u.)								
Specific Cond. (umhos/cm)								
Water Temperature (degrees C)								
Turbidity (subjective: clear, slightly cloudy, cloudy)								
Dissolved Oxygen (mg/l)								
PID readings, if required								
Remarks:								



















**HAZ~MAT**  
 TRANSPORTATION AND DISPOSAL  
 P. O. BOX 37392 • CHARLOTTE, N.C. 28237  
 (704) 332-5600  
 FAX (704) 375-7183

Manifest No. 13627  
 P.O. No. \_\_\_\_\_  
 Job No. \_\_\_\_\_

**NON-HAZARDOUS SPECIAL WASTE**

**Section I. GENERATOR** (Generator completes all of Section I)

**GENERATOR LOCATION**  
 NAME HAZ-MAT  
 ORIGINATING ADDRESS 210 DALTON AVENUE  
 MAILING ADDRESS \_\_\_\_\_  
 CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_  
 PHONE NO. \_\_\_\_\_  
 CONTACT NAME \_\_\_\_\_  
 DES. OF WASTE: \_\_\_\_\_

**WORK CONTRACTED BY**  
 Bill To (If different from information at left)  
 NAME \_\_\_\_\_  
 ADDRESS \_\_\_\_\_  
 CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_  
 PHONE NO. \_\_\_\_\_  
 CONTACT NAME \_\_\_\_\_

No.	Type	Units	Quantity

**Section II. INVOICE INFORMATION** **GALLONS** **DRUMS**

DESCRIPTION	QUANTITY	LINE TOTAL
1. WATER, OIL & COOLANT PUMPED FROM TANKS OR DRUMS		
2. OFF SPEC LIGHT OIL, WATER & GAS PUMPED FROM TANKS OR DRUMS		
3. 55 GALLON DRUMS REMOVED - SOLID		
4. 55 GALLON DRUMS REMOVED - LIQUID	9.0	
5. _____		
6. _____		
7. _____		
8. _____		
9. SERVICE CHARGE		
10. TRANSPORTATION		

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Generator Authorized Agent Name \_\_\_\_\_ Signature \_\_\_\_\_ Shipment Date \_\_\_\_\_

**Section III. TRANSPORTER** (Generator complete a-d; Transporter I complete e-g; Transporter II complete h-n)

**HAZ~MAT**  
 TRANSPORTATION AND DISPOSAL  
 P. O. BOX 37392 • CHARLOTTE, N.C. 28237

a. Driver Name / Title \_\_\_\_\_  
 b. Phone No. \_\_\_\_\_ c. Truck No. \_\_\_\_\_

Hazardous Waste Transporter Permits  
 EPA NCR 000003186  
 EPA NCD048461370

d. Driver Signature \_\_\_\_\_ Shipment Date \_\_\_\_\_

**TRANSPORTER II**

e. Name \_\_\_\_\_  
 f. Address \_\_\_\_\_  
 g. Driver Name / Title \_\_\_\_\_  
 h. Phone No. \_\_\_\_\_ i. Truck No. \_\_\_\_\_  
 j. Transporter II Permit Nos. \_\_\_\_\_

Driver Signature \_\_\_\_\_ Shipment Date \_\_\_\_\_

**Section IV. FACILITY INFORMATION AND CERTIFICATE OF DISPOSAL**

Site Name: Haz-Mat Transportation & Disposal, Inc.  
 Physical Address: 210 Dalton Avenue  
Charlotte, N.C. 28237

a. Phone No. 704-332-5600  
 b. Mailing Address: P.O. Box 37392  
Charlotte, N.C. 28237

e. Discrepancy Indication Space \_\_\_\_\_  
 This is to certify that all non-hazardous material removed from above location has been received and will be disposed of in accordance with applicable local, state and federal regulations in the following manner: (1) Petroleum products are blended into a beneficial reusable fuel for use in large industrial burners. (2) Waste waters are to be treated with polymers, pH adjusters, and a flocculant, then flows through a dissolved air flotation system for pretreatment separation, then into the CMUD sanitation sewer system under permit IUP#5012. (3) Sludges from treatment systems are hauled to E.P.A. approved facilities for proper disposal. Manifest and certificate of disposal are on file. (4) Our treatment system operates on a first in, first out basis and product should be processed within seven days.

SIGNATURE OF FACILITY AGENT _____	DATE	MONTH	DAY	YEAR
-----------------------------------	------	-------	-----	------



**Pace Analytical Services, Inc.**  
9800 Kinsey Avenue, Suite 100  
Huntersville, NC 28078  
Phone: 704.875.9092  
Fax: 704.875.9091

October 03, 2002

**RECEIVED**  
OCT 08 2002

Ms. Debra Thoma  
SCDHEC  
UST Program  
2600 Bull Street  
Columbia, SC 29201

RE: Lab Project Number: 9236834  
Client Project ID: Hot Spot 3005 12719

Dear Ms. Thoma:

Enclosed are the analytical results for sample(s) received by the laboratory on September 24, 2002. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report please feel free to contact me.

Sincerely,

Sherri Howard  
Sherri.Howard@pacelabs.com  
Project Manager

Enclosures

Laboratory Certification IDs

NC Wastewater 12  
NC Drinking Water 37706  
SC 99006

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.



Laboratory Certification IDs

LA Wastewater 04034  
VA Drinking Water 213  
FL NELAP E87627



**Pace Analytical Services, Inc.**  
 9800 Kinsey Avenue, Suite 100  
 Huntersville, NC 28078  
 Phone: 704.875.9092  
 Fax: 704.875.9091

Lab Project Number: 9236834  
 Client Project ID: Hot Spot 3005 12719

Lab Sample No: 922530787 Project Sample Number: 9236834-001 Date Collected: 09/23/02 12:01  
 Client Sample ID: MW-6 Matrix: Water Date Received: 09/24/02 10:30

Parameters	Results	Units	Report Limit	DF	Analyzed	By	CAS No.	Qual	RegLmt
<b>GC/MS Volatiles</b>									
GC/MS VOCs by 8260 Method: EPA 8260									
Benzene	ND	ug/l	5.0	1.0	09/25/02 07:24	RWS	71-43-2		
Ethylbenzene	ND	ug/l	5.0	1.0	09/25/02 07:24	RWS	100-41-4		
Methyl-tert-butyl ether	ND	ug/l	5.0	1.0	09/25/02 07:24	RWS	1634-04-4		
Naphthalene	17.	ug/l	5.0	1.0	09/25/02 07:24	RWS	91-20-3		
Toluene	ND	ug/l	5.0	1.0	09/25/02 07:24	RWS	108-88-3		
m&p-Xylene	ND	ug/l	10.	1.0	09/25/02 07:24	RWS			
o-Xylene	25.	ug/l	5.0	1.0	09/25/02 07:24	RWS	95-47-6		
Toluene-d8 (S)	94	%		1.0	09/25/02 07:24	RWS	2037-26-5		
4-Bromofluorobenzene (S)	91	%		1.0	09/25/02 07:24	RWS	460-00-4		
Dibromofluoromethane (S)	105	%		1.0	09/25/02 07:24	RWS	1868-53-7		
1,2-Dichloroethane-d4 (S)	88	%		1.0	09/25/02 07:24	RWS	17060-07-0		

Date: 10/03/02

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Laboratory Certification IDs  
 NC Wastewater 12  
 NC Drinking Water 37706  
 SC 99006

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Laboratory Certification IDs  
 LA Wastewater 04034  
 VA Drinking Water 213  
 FL NELAP E87627



Lab Project Number: 9236834  
Client Project ID: Hot Spot 3005 12719

Lab Sample No: 922530795      Project Sample Number: 9236834-002      Date Collected: 09/23/02 12:21  
Client Sample ID: MW-7      Matrix: Water      Date Received: 09/24/02 10:30

Parameters	Results	Units	Report Limit	DF	Analyzed	By	CAS No.	Qual	ReqLmt
<b>GC/MS Volatiles</b>									
GC/MS VOCs by 8260	Method: EPA 8260								
Benzene	ND	ug/l	5.0	1.0	09/25/02 07:40	RWS	71-43-2		
Ethylbenzene	ND	ug/l	5.0	1.0	09/25/02 07:40	RWS	100-41-4		
Methyl-tert-butyl ether	ND	ug/l	5.0	1.0	09/25/02 07:40	RWS	1634-04-4		
Naphthalene	ND	ug/l	5.0	1.0	09/25/02 07:40	RWS	91-20-3		
Toluene	ND	ug/l	5.0	1.0	09/25/02 07:40	RWS	108-88-3		
m&p-Xylene	ND	ug/l	10.	1.0	09/25/02 07:40	RWS			
o-Xylene	ND	ug/l	5.0	1.0	09/25/02 07:40	RWS	95-47-6		
Toluene-d8 (S)	92	%		1.0	09/25/02 07:40	RWS	2037-26-5		
4-Bromofluorobenzene (S)	95	%		1.0	09/25/02 07:40	RWS	460-00-4		
Dibromofluoromethane (S)	106	%		1.0	09/25/02 07:40	RWS	1868-53-7		
1,2-Dichloroethane-d4 (S)	93	%		1.0	09/25/02 07:40	RWS	17060-07-0		

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VA Drinking Water 213  
FL NELAP E87627



Lab Project Number: 9236834  
Client Project ID: Hot Spot 3005 12719

Lab Sample No: 922530803      Project Sample Number: 9236834-003      Date Collected: 09/23/02 12:31  
Client Sample ID: MW-9      Matrix: Water      Date Received: 09/24/02 10:30

Parameters	Results	Units	Report Limit	DF	Analyzed	By	CAS No.	Qual	RegLmt
<b>GC/MS Volatiles</b>									
GC/MS VOCs by 8260      Method: EPA 8260									
Benzene	ND	ug/l	5.0	1.0	09/25/02 07:55	RWS	71-43-2		
Ethylbenzene	ND	ug/l	5.0	1.0	09/25/02 07:55	RWS	100-41-4		
Methyl-tert-butyl ether	ND	ug/l	5.0	1.0	09/25/02 07:55	RWS	1634-04-4		
Naphthalene	ND	ug/l	5.0	1.0	09/25/02 07:55	RWS	91-20-3		
Toluene	ND	ug/l	5.0	1.0	09/25/02 07:55	RWS	108-88-3		
m&p-Xylene	ND	ug/l	10.	1.0	09/25/02 07:55	RWS			
o-Xylene	ND	ug/l	5.0	1.0	09/25/02 07:55	RWS	95-47-6		
Toluene-d8 (S)	91	%		1.0	09/25/02 07:55	RWS	2037-26-5		
4-Bromofluorobenzene (S)	88	%		1.0	09/25/02 07:55	RWS	460-00-4		
Dibromofluoromethane (S)	105	%		1.0	09/25/02 07:55	RWS	1868-53-7		
1,2-Dichloroethane-d4 (S)	89	%		1.0	09/25/02 07:55	RWS	17060-07-0		

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Lab Project Number: 9236834  
Client Project ID: Hot Spot 3005 12719

Lab Sample No: 922530811      Project Sample Number: 9236834-004      Date Collected: 09/23/02 12:53  
Client Sample ID: MW-10      Matrix: Water      Date Received: 09/24/02 10:30

Parameters      Results      Units      Report Limit      DF      Analyzed      By      CAS No.      Qual      RegLmt

**GC/MS Volatiles**

Parameters	Results	Units	Report Limit	DF	Analyzed	By	CAS No.	Qual	RegLmt
GC/MS VOCs by 8260	Method: EPA 8260								
Benzene	ND	ug/l	5.0	1.0	09/25/02 08:11	RWS	71-43-2		
Ethylbenzene	ND	ug/l	5.0	1.0	09/25/02 08:11	RWS	100-41-4		
Methyl-tert-butyl ether	ND	ug/l	5.0	1.0	09/25/02 08:11	RWS	1634-04-4		
Naphthalene	ND	ug/l	5.0	1.0	09/25/02 08:11	RWS	91-20-3		
Toluene	ND	ug/l	5.0	1.0	09/25/02 08:11	RWS	108-88-3		
m&p-Xylene	ND	ug/l	10.	1.0	09/25/02 08:11	RWS			
o-Xylene	ND	ug/l	5.0	1.0	09/25/02 08:11	RWS	95-47-6		
Toluene-d8 (S)	97	%		1.0	09/25/02 08:11	RWS	2037-26-5		
4-Bromofluorobenzene (S)	94	%		1.0	09/25/02 08:11	RWS	460-00-4		
Dibromofluoromethane (S)	103	%		1.0	09/25/02 08:11	RWS	1868-53-7		
1,2-Dichloroethane-d4 (S)	89	%		1.0	09/25/02 08:11	RWS	17060-07-0		

Date: 10/03/02

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FL NELAP E87627



Lab Project Number: 9236834  
Client Project ID: Hot Spot 3005 12719

Lab Sample No: 922530829      Project Sample Number: 9236834-005      Date Collected: 09/23/02 13:09  
Client Sample ID: MW-11      Matrix: Water      Date Received: 09/24/02 10:30

Parameters      Results      Units      Report Limit      DF      Analyzed      By      CAS No.      Qual      RegLmt

**GC/MS Volatiles**

Parameters	Results	Units	Report Limit	DF	Analyzed	By	CAS No.	Qual	RegLmt
GC/MS VOCs by 8260		Method: EPA 8260							
Benzene	ND	ug/l	5.0	1.0	09/25/02 08:27	RWS	71-43-2		
Ethylbenzene	ND	ug/l	5.0	1.0	09/25/02 08:27	RWS	100-41-4		
Methyl-tert-butyl ether	ND	ug/l	5.0	1.0	09/25/02 08:27	RWS	1634-04-4		
Naphthalene	ND	ug/l	5.0	1.0	09/25/02 08:27	RWS	91-20-3		
Toluene	ND	ug/l	5.0	1.0	09/25/02 08:27	RWS	108-88-3		
m&p-Xylene	ND	ug/l	10.	1.0	09/25/02 08:27	RWS			
o-Xylene	ND	ug/l	5.0	1.0	09/25/02 08:27	RWS	95-47-6		
Toluene-d8 (S)	96	%		1.0	09/25/02 08:27	RWS	2037-26-5		
4-Bromofluorobenzene (S)	90	%		1.0	09/25/02 08:27	RWS	460-00-4		
Dibromofluoromethane (S)	107	%		1.0	09/25/02 08:27	RWS	1868-53-7		
1,2-Dichloroethane-d4 (S)	90	%		1.0	09/25/02 08:27	RWS	17060-07-0		

Date: 10/03/02

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PARAMETER FOOTNOTES

Dilution factor **shown** represents the factor applied to the reported result and reporting limit due to changes in sample preparation, dilution of the extract, or moisture content

- ND Not detected at or above adjusted reporting limit
- NC Not Calculable
- J Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
- MDL Adjusted Method Detection Limit
- (S) Surrogate

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**QUALITY CONTROL DATA**

Lab Project Number: 9236834  
Client Project ID: Hot Spot 3005 12719

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 922537089 922537097

Parameter	Units	922530803	Spike Conc.	MS	MSD	MS	MSD	RPD	Footnotes
		Result		Result	Result	% Rec	% Rec		
Benzene	ug/l	0	50.00	47.36	44.36	95	89	7	
Toluene	ug/l	0	50.00	48.34	45.70	97	91	6	
Toluene-d8 (S)						94	95		
4-Bromofluorobenzene (S)						103	103		
Dibromofluoromethane (S)						94	92		
1,2-Dichloroethane-d4 (S)						101	97		

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**QUALITY CONTROL DATA PARAMETER FOOTNOTES**

Consistent with EPA guidelines, unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

LCS(D) Laboratory Control Sample (Duplicate)  
MS(D) Matrix Spike (Duplicate)  
DUP Sample Duplicate  
ND Not detected at or above adjusted reporting limit  
NC Not Calculable  
J Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit  
MDL Adjusted Method Detection Limit  
RPD Relative Percent Difference  
(S) Surrogate

Date: 10/03/02

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Pace Analytical Services, Inc.  
 900 Gemini Avenue  
 Houston, TX 77058  
 Phone: 281.488.1810  
 Fax: 281.488.4661

Lab Project Number: 8529915  
 Client Project ID: 8260/9236834/SCDHEC

Lab Sample No: 922530787 Project Sample Number: 8529915-001 Date Collected: 09/23/02 12:01  
 Client Sample ID: MW-6 Matrix: Water Date Received: 09/24/02 10:30

Parameters	Results	Units	Report Limit	DF	Analyzed	By	CAS No.	Qual	RegLmt
<b>GC/MS Volatiles</b>									
SW8260 Nonroutine VOCs, Trace	Method: EPA 8260								
2-Methyl-2-propanol	ND	ug/l	10.	1.0	09/30/02 14:11	EAD	75-65-0		
Ethyl-tert-butyl ether	ND	ug/l	1.0	1.0	09/30/02 14:11	EAD	637-92-3		
Diisopropyl ether	ND	ug/l	1.0	1.0	09/30/02 14:11	EAD	108-20-3		
tert-Amylmethyl ether	ND	ug/l	1.0	1.0	09/30/02 14:11	EAD	994-05-8		
Ethanol	ND	ug/l	20.0	1.0	09/30/02 14:11	EAD	64-17-5		
tert-Amyl Alcohol	ND	ug/l	10.0	1.0	09/30/02 14:11	EAD	75-85-4		
tert-Butyl Formate	ND	ug/l	20.0	1.0	09/30/02 14:11	EAD	762-75-4		
3,3-Dimethyl-1-Butanol	ND	ug/l	10.0	1.0	09/30/02 14:11	EAD	625-95-3		
Toluene-d8 (S)	75	%		1.0	09/30/02 14:11	EAD	2037-26-5		
4-Bromofluorobenzene (S)	100	%		1.0	09/30/02 14:11	EAD	460-00-4		
1,2-Dichloroethane-d4 (S)	77	%		1.0	09/30/02 14:11	EAD	17060-07-0		

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Lab Project Number: 8529915  
 Client Project ID: 8260/9236834/SCDHEC

Lab Sample No: 922530795 Project Sample Number: 8529915-002 Date Collected: 09/23/02 12:21  
 Client Sample ID: MW-7 Matrix: Water Date Received: 09/24/02 10:30

Parameters	Results	Units	Report Limit	DF	Analyzed	By	CAS No.	Qual	RegLmt
<b>GC/MS Volatiles</b>									
SW8260 Nonroutine VOCs, Trace Method: EPA 8260									
2-Methyl-2-propanol	ND	ug/l	10.	1.0	09/30/02 14:38	EAD	75-65-0		
Ethyl-tert-butyl ether	ND	ug/l	1.0	1.0	09/30/02 14:38	EAD	637-92-3		
Diisopropyl ether	ND	ug/l	1.0	1.0	09/30/02 14:38	EAD	108-20-3		
tert-Amylmethyl ether	ND	ug/l	1.0	1.0	09/30/02 14:38	EAD	994-05-8		
Ethanol	ND	ug/l	20.0	1.0	09/30/02 14:38	EAD	64-17-5		
tert-Amyl Alcohol	ND	ug/l	10.0	1.0	09/30/02 14:38	EAD	75-85-4		
tert-Butyl Formate	ND	ug/l	20.0	1.0	09/30/02 14:38	EAD	762-75-4		
3,3-Dimethyl-1-Butanol	ND	ug/l	10.0	1.0	09/30/02 14:38	EAD	625-95-3		
Toluene-d8 (S)	75	%		1.0	09/30/02 14:38	EAD	2037-26-5		
4-Bromofluorobenzene (S)	98	%		1.0	09/30/02 14:38	EAD	460-00-4		
1,2-Dichloroethane-d4 (S)	74	%		1.0	09/30/02 14:38	EAD	17060-07-0		

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Lab Project Number: 8529915  
 Client Project ID: 8260/9236834/SCDHEC

Lab Sample No: 922530803 Project Sample Number: 8529915-003 Date Collected: 09/23/02 12:31  
 Client Sample ID: MW-9 Matrix: Water Date Received: 09/24/02 10:30

Parameters	Results	Units	Report Limit	DF	Analyzed	By	CAS No.	Qual	RegLmt
<b>GC/MS Volatiles</b>									
SW8260 Nonroutine VOCs, Trace Method: EPA 8260									
2-Methyl-2-propanol	ND	ug/l	10.	1.0	09/30/02 15:05	EAD	75-65-0		
Ethyl-tert-butyl ether	ND	ug/l	1.0	1.0	09/30/02 15:05	EAD	637-92-3		
Diisopropyl ether	ND	ug/l	1.0	1.0	09/30/02 15:05	EAD	108-20-3		
tert-Amylmethyl ether	ND	ug/l	1.0	1.0	09/30/02 15:05	EAD	994-05-8		
Ethanol	ND	ug/l	20.0	1.0	09/30/02 15:05	EAD	64-17-5		
tert-Amyl Alcohol	ND	ug/l	10.0	1.0	09/30/02 15:05	EAD	75-85-4		
tert-Butyl Formate	ND	ug/l	20.0	1.0	09/30/02 15:05	EAD	762-75-4		
3,3-Dimethyl-1-Butanol	ND	ug/l	10.0	1.0	09/30/02 15:05	EAD	625-95-3		
Toluene-d8 (S)	76	%		1.0	09/30/02 15:05	EAD	2037-26-5		
4-Bromofluorobenzene (S)	99	%		1.0	09/30/02 15:05	EAD	460-00-4		
1,2-Dichloroethane-d4 (S)	77	%		1.0	09/30/02 15:05	EAD	17060-07-0		

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Lab Project Number: 8529915  
 Client Project ID: 8260/9236834/SCDHHC

Lab Sample No: 922530811      Project Sample Number: 8529915-004      Date Collected: 09/23/02 12:53  
 Client Sample ID: MW-10      Matrix: Water      Date Received: 09/24/02 10:30

Parameters	Results	Units	Report Limit	DF	Analyzed	By	CAS No.	Qual	RegLmt
<b>GC/MS Volatiles</b>									
SW8260 Nonroutine VOCs, Trace      Method: EPA 8260									
2-Methyl-2-propanol	ND	ug/l	10.	1.0	09/30/02 15:32	EAD	75-65-0		
Ethyl-tert-butyl ether	ND	ug/l	1.0	1.0	09/30/02 15:32	EAD	637-92-3		
Diisopropyl ether	ND	ug/l	1.0	1.0	09/30/02 15:32	EAD	108-20-3		
tert-Amylmethyl ether	ND	ug/l	1.0	1.0	09/30/02 15:32	EAD	994-05-8		
Ethanol	ND	ug/l	20.0	1.0	09/30/02 15:32	EAD	64-17-5		
tert-Amyl Alcohol	ND	ug/l	10.0	1.0	09/30/02 15:32	EAD	75-85-4		
tert-Butyl Formate	ND	ug/l	20.0	1.0	09/30/02 15:32	EAD	762-75-4		
3,3-Dimethyl-1-Butanol	ND	ug/l	10.0	1.0	09/30/02 15:32	EAD	625-95-3		
Toluene-d8 (S)	75	%		1.0	09/30/02 15:32	EAD	2037-26-5		
4-Bromofluorobenzene (S)	98	%		1.0	09/30/02 15:32	EAD	460-00-4		
1,2-Dichloroethane-d4 (S)	77	%		1.0	09/30/02 15:32	EAD	17060-07-0		

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Lab Project Number: 8529915  
 Client Project ID: 8260/9236834/SCDHRC

Lab Sample No: 922530829 Project Sample Number: 8529915-005 Date Collected: 09/23/02 13:09  
 Client Sample ID: MW-11 Matrix: Water Date Received: 09/24/02 10:30

Parameters	Results	Units	Report Limit	DF	Analyzed	By	CAS No.	Qual	RegLmt
<b>GC/MS Volatiles</b>									
SW8260 Nonroutine VOCs, Trace	Method: EPA 8260								
2-Methyl-2-propanol	ND	ug/l	10.	1.0	09/30/02 15:59	EAD	75-65-0		
Ethyl-tert-butyl ether	ND	ug/l	1.0	1.0	09/30/02 15:59	EAD	637-92-3		
Diisopropyl ether	ND	ug/l	1.0	1.0	09/30/02 15:59	EAD	108-20-3		
tert-Amylmethyl ether	ND	ug/l	1.0	1.0	09/30/02 15:59	EAD	994-05-8		
Ethanol	ND	ug/l	20.0	1.0	09/30/02 15:59	EAD	64-17-5		
tert-Amyl Alcohol	ND	ug/l	10.0	1.0	09/30/02 15:59	EAD	75-85-4		
tert-Butyl Formate	ND	ug/l	20.0	1.0	09/30/02 15:59	EAD	762-75-4		
3,3-Dimethyl-1-Butanol	ND	ug/l	10.0	1.0	09/30/02 15:59	EAD	625-95-3		
Toluene-d8 (S)	75	%		1.0	09/30/02 15:59	EAD	2037-26-5		
4-Bromofluorobenzene (S)	98	%		1.0	09/30/02 15:59	EAD	460-00-4		
1,2-Dichloroethane-d4 (S)	76	%		1.0	09/30/02 15:59	EAD	17060-07-0		

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Fax: 281.488.4661

Lab Project Number: 8529915  
Client Project ID: 8260/9236834/SCDHEC

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**PARAMETER FOOTNOTES**

Dilution factor shown represents the factor applied to the reported result and reporting limit due to changes in sample preparation, dilution of the extract, or moisture content

ND Not detected at or above adjusted reporting limit  
NC Not Calculable  
J Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit  
MDL Adjusted Method Detection Limit  
(S) Surrogate

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Fax: 281.488.4661

Lab Project Number: 8529915  
Client Project ID: 8260/9236834/SCDHEC

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**QUALITY CONTROL DATA PARAMETER FOOTNOTES**

Consistent with EPA guidelines, unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

LCS(D) Laboratory Control Sample (Duplicate)  
MS(D) Matrix Spike (Duplicate)  
DUP Sample Duplicate  
ND Not detected at or above adjusted reporting limit  
NC Not Calculable  
J Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit  
MDL Adjusted Method Detection Limit  
RPD Relative Percent Difference  
(S) Surrogate

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<b>Required Client Information: Section A</b> Company: <u>SE DHEC</u> Address: <u>2600 Bull Street</u> <u>Columbia SC 29801</u> Phone: <u>803-896-6240</u> Fax: <u>803-896-6245</u>		<b>Required Client Information: Section B</b> Report To: <u>Debra</u> Invoice To: <u>TAT</u> P.O.: <u>40434Z</u> Project Name: <u>Hot Spot 3005</u> Project Number: <u>12119</u>		<b>Client Information (Check quote/contract):</b> Quote Reference: Project Manager: <u>SNH</u> Project #: <u>9236934</u> Profile #: <u>1700-1</u> Requested Analysis:																			
<b>Section D Required Client Information:</b> SAMPLE ID One character per box. (A-Z, 0-9 / -) Sample IDs MUST BE UNIQUE		Valid Matrix Codes <table border="1"> <tr><th>MATRIX</th><th>CODE</th></tr> <tr><td>WATER</td><td>WT</td></tr> <tr><td>SOIL</td><td>SL</td></tr> <tr><td>OIL</td><td>OL</td></tr> <tr><td>WIPE</td><td>WP</td></tr> <tr><td>AIR</td><td>AR</td></tr> <tr><td>TISSUE</td><td>TS</td></tr> <tr><td>OTHER</td><td>OT</td></tr> </table>		MATRIX	CODE	WATER	WT	SOIL	SL	OIL	OL	WIPE	WP	AIR	AR	TISSUE	TS	OTHER	OT	DATE COLLECTED: mm / dd / yy TIME COLLECTED: hh: mm a/p Preservatives: # Containers: <u>0</u> Unpreserved: <u>0</u> H <sub>2</sub> SO <sub>4</sub> : <u>0</u> HNO <sub>3</sub> : <u>0</u> HCl: <u>0</u> NaOH: <u>0</u> Na <sub>2</sub> S <sub>2</sub> O <sub>8</sub> : <u>0</u>		Remarks / Lab ID <u>DRY</u> <u>DRY</u> <u>92253078</u> <u>92253079</u> <u>92253080</u> <u>92253081</u> <u>92253082</u>	
MATRIX	CODE																						
WATER	WT																						
SOIL	SL																						
OIL	OL																						
WIPE	WP																						
AIR	AR																						
TISSUE	TS																						
OTHER	OT																						

ITEM #	MATRIX CODE	DATE COLLECTED	TIME COLLECTED	# Containers	Unpreserved	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>8</sub>	Remarks / Lab ID
1	mw-1	9-23-02		0	0						DRY
2	mw-3										DRY
3	mw-6		1201						X	X	92253078
4	mw-7		1221						X	X	92253079
5	mw-9		1231						X	X	92253080
6	mw-10		1283						X	X	92253081
7	mw-11		1309						X	X	92253082
8											
9											
10											
11											
12											

Sample Condition	Sample Notes	Item No.	Relinquished By	Company	Date	Time	Accepted By / Company	Date	Time
Temp in °C:	<u>21</u>		<u>JK</u>	<u>SE</u>	<u>9-23</u>	<u>500</u>	<u>Debra</u>	<u>9/23/02</u>	<u>10:00</u>
Received on ICE:	<u>Y / N</u>								
Sealed Cooler:	<u>Y / N</u>								
Samples Intact:	<u>Y / N</u>								

**Additional Comments:**

**SAMPLER NAME AND SIGNATURE**  
 PRINT Name of SAMPLER:  
 SIGNATURE of SAMPLER: John Link  
 DATE Signed: (MM / DD / YY) 9-23-02

SEE REVERSE SIDE FOR INSTRUCTIONS

512772

Instructions for completing Chain of Custody (COC)

1. Complete all Client Information at top of sheet: name, address, phone, contact (person to whom report will be sent and contact can be made if questions arise), billing information if different from client, PO#, Project Name and/or Project Number as it will appear on the report.
2. Quote Reference, Project Manager, Project No. and Profile No. will be completed by Pace.
3. A separate COC must be filled out for each day of sample collection.
4. Sampler should print their name in the space provided and sign their name followed by the date of the sampling event.
5. Complete Sample Description as it will appear on the laboratory report; include time of sampling, sample matrix, no. of containers and preservative used.
6. Analysis Requested: Complete analysis on the lines provided and place a check in the column for the samples requiring the analysis. It may be necessary to use the space provided for additional comments or include attachments for extended lists of parameters.
7. Submission of samples to laboratory: Indicate Item Number of those samples being transferred; sign relinquished by, and include your affiliation.

\* IMPORTANT NOTE:

**Standard Turnaround Time is 2 weeks.** If this does not satisfy your requirements, arrangements must be made prior to samples being submitted to the laboratory. Contact your project manager.

**Special Project Requirements** such as Low Level Detection Limits or level of QC reported must be indicated on the chain of custody. (Use Additional Comments Section.)

SEE REVERSE SIDE FOR INSTRUCTIONS



2600 Bull Street  
Columbia, SC 29201-1708

7-2002-1000  
**UNDERGROUND STORAGE TANK PROGRAM  
BUREAU OF LAND AND WASTE MANAGEMENT**

Phone (800) 826-5435 Fax (803) 896-6245

OCT 11 2002

**GREG FORCE  
FORCE & ASSOCIATES INC  
147 VERA RD STE A  
LEXINGTON SC 29072**

Re: Hot Spot 3005, 107 Hampton Street, Chesnee, SC  
UST Permit # 12719, CA # 17330; UMW-16630  
SB-19189-04/30/02-EMW; PO # 409044  
Notice to Proceed  
Spartanburg County

Dear Mr. Force:

The Underground Storage Tank Program has prepared a monitoring well installation package for the referenced facility. Monitoring well approval for seven (7) permanent monitoring wells (MW-1, 3, 6, 7, 9, 10, and 11) is enclosed. Please note that all applicable South Carolina certification requirements regarding well installation and report preparation must be met. All wells to be replaced should be gauged prior to drilling commencement. Please contact this office if site conditions have changed.

Cost agreement (CA) # 17330 has been approved up to the amount of the enclosed cost agreement form and will be kept on file so that compensation can begin. **The SCDHEC reserves the authority to pay only for work properly performed and/or technically justified and will only pay rates in accordance with bid number SB-19189-04/30/02-EMW.** Further, SCDHEC reserves the right to question and/or reject costs if deemed unreasonable. The SCDHEC reserves the right to audit project records at any time during the project or after completion of the work. The Monitoring Well Installation Report (two copies) and invoice should be submitted within 60 days from the date of this correspondence.

The Bureau grants pre-approval for transportation of drums of virgin petroleum contaminated soil and/or drums of groundwater from the referenced site to a permitted treatment facility. The contaminated soil and/or groundwater must be properly stored in labeled 55-gallon drums or equivalent containers. The contaminated soil and/or groundwater must be accepted by the approved treatment facility. There can be no spillage or leakage in transport. A copy of the disposal manifest from the receiving facility that clearly designates the quantity received must be included in the report.



A copy of the approved assessment cost agreement is enclosed for your information. Future invoices and/or other criteria included therein must comply with current SUPERB criteria per Section 44-2-20(2). Please reference Cost Agreement #17330 on all pertinent invoices and correspondence. Please note that Sections 44-2-110(4) and 44-2-130(B) of the SUPERB Statute state that no costs will be allowed (considered for payment) unless prior approval from the Department is obtained. If for any reason there is a change in this cost agreement, any associated changes to this cost agreement must be pre-approved by this Department in order for Force & Associates, Inc. to seek future cost compensation.

**Any item(s) not clearly or completely addressed in the report (SC certified driller's number, disposal manifest for soil cuttings, disposal manifests for generated ground water, etc.) WILL NOT be compensated by the SUPERB Account.** As agreed to in the referenced contract, the owner/operator of the underground storage tanks will not be responsible for any costs associated with this assessment.

On all correspondence regarding this site, please reference the UST Permit #12719 and Cost Agreement # 17330. If you have questions concerning this correspondence, or would like to submit additional information, please contact me at (803) 896-6397 or (800) 826-5435 (within SC only).

Sincerely,



Debra L. Thoma, Hydrogeologist  
State Lead and Field Services Section  
Assessment and Corrective Action Division

enc: Approved Cost Agreement # 17330  
Monitoring Well Approval  
Monitoring Well Installation Package

cc: Appalachia III District EQC (w/ copy of Monitoring Well Approval)  
Technical File (w/Monitoring Well Approval)  
Judy Laughter, R. L Jordan Oil Co., PO Box 2527, Spartanburg, SC 29304 (w/enc.)  
John Abernathy, UST Program





## Monitoring Well Installation Approval Form

2600 Bull Street  
Columbia, SC 29201-1708

Date of Issue: September 27, 2002

Approval No.: UMW-16630


Approval is hereby granted to: Force & Associates, Inc.  
On behalf of: R. L. Jordan Oil Company  
UST Permit #: 12719  
County: Spartanburg

This approval is for the construction of 7 permanent monitoring wells in accordance with the South Carolina Well Standards and Regulations. The well(s) are to be constructed within the surficial aquifer for the intended purpose of monitoring ground-water quality and/or water level(s) at the referenced facility. Approval is provided with the following conditions:

1. The latitude and longitude, surveyed elevations, boring and/or geologist logs and actual (as built) construction details for each well will be submitted with the technical report.
2. Each well will be labeled with an identification plate constructed of a durable material affixed to the casing or surface pad where it is readily visible. The plate will provide monitoring well I.D.#, date of construction, static water level, and driller name and state certification #.
3. Well construction and sampling derived waste including, but not necessarily limited to, drill cuttings, drilling fluids, development and purge water should be managed properly and in compliance with applicable requirements. If containerized, each vessel should be clearly labeled with regard to contents, source, and date of activity.
4. A minimum of forty-eight (48) hours prior to initiation of drilling activities, please provide notice to Read Miner at (803) 896-6584 or [Minerrs@dhec.state.sc.us](mailto:Minerrs@dhec.state.sc.us).
5. Please provide ground-water quality analytical data (chemical analysis and/or water level(s)) and associated measurements (i.e., in-situ field measurements) to me with the technical report.
6. Monitoring wells and temporary monitoring wells will be installed by or under the direct supervision of a licensed well driller certified by the State of South Carolina.
7. Monitoring wells and temporary monitoring wells will be abandoned by or under the direct supervision of a licensed well driller certified by the State of South Carolina. Temporary monitoring wells shall not remain in place for longer than 30 days from the date of installation. Monitoring wells may be abandoned only upon concurrence by this Division.

This approval is pursuant to the provisions of Section 44-55-40 of the 1976 South Carolina Code of Laws and the Department of Health and Environmental Control Regulations R.61-71. Please remember to have a copy of this approval on the site during well installation.

Approved by:

  
Read S. Miner, P.G., Hydrogeologist  
State Lead and Field Services Section  
Assessment and Corrective Action Division  
Underground Storage Tank Program  
Bureau of Land and Waste Management

cc: Appalachia III District EQC

RECEIVED

DEC 02 2002

Underground Storage  
Tank Program

**MONITORING  
WELL INSTALLATIONS**

**HOT SPOT 3005  
107 HAMPTON STREET  
CHESNEE, SOUTH CAROLINA**

**SCDHEC SITE ID #12719**

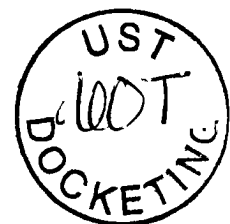
**Submitted to:**

**Bureau of Underground Storage Tank Management  
South Carolina Department of Health and Environmental Control  
2600 Bull Street  
Columbia, South Carolina 29201**

**Prepared By:**

**FORCE & ASSOCIATES, INC.  
147 Vera Road, Suite A  
Lexington, South Carolina 29072  
(803) 359-3200 (803) 359-6682-Fax**

**NOVEMBER 2002**



***Force & Associates, Inc.***

*147 Vera Road, Suite A, Lexington, South Carolina 29072 (803) 359-3200 (803) 359-6682 fax*

*November 27, 2002*

*Ms. Debra L. Thoma, Hydrogeologist  
Owner/Operator Assistance Section  
Assessment & Corrective Action Division  
UST Program  
Bureau of Land and Waste Management  
South Carolina Department of Health and Environmental Control  
2600 Bull Street  
Columbia, South Carolina 29201*

*ATTN: Ms. Debra L. Thoma, Hydrogeologist*

*Re: Monitoring Well Installations  
Hot Spot 3005, SCDHEC Site ID #12719  
107 Hampton Street  
Chesnee, South Carolina*

*Dear Ms. Thoma:*

Force & Associates, Inc., is pleased to submit the attached water well records for monitoring wells MW-1R, MW-3R, MW-10R and MW-11R installed at the referenced facility on November 4 and 5, 2002. Monitoring wells MW-6, MW-7, and MW-9 were not replaced since there was a sufficient amount of water within the wells.

The following measurements were recorded from field personnel on November 5, 2002:

MW #	TOC Elevation (ft)	Depth to Water (ft)	pH (s.u.)	Conductivity (umhos/cm)	Temperature (°C)
MW-1R	104.77	29.21	6.8	95	18.3
MW-3R	104.92	20.74	6.6	298	18.2
MW-10R	96.57	23.81	6.8	97	18.4
MW-11R	95.15	24.37	6.2	124	18.2

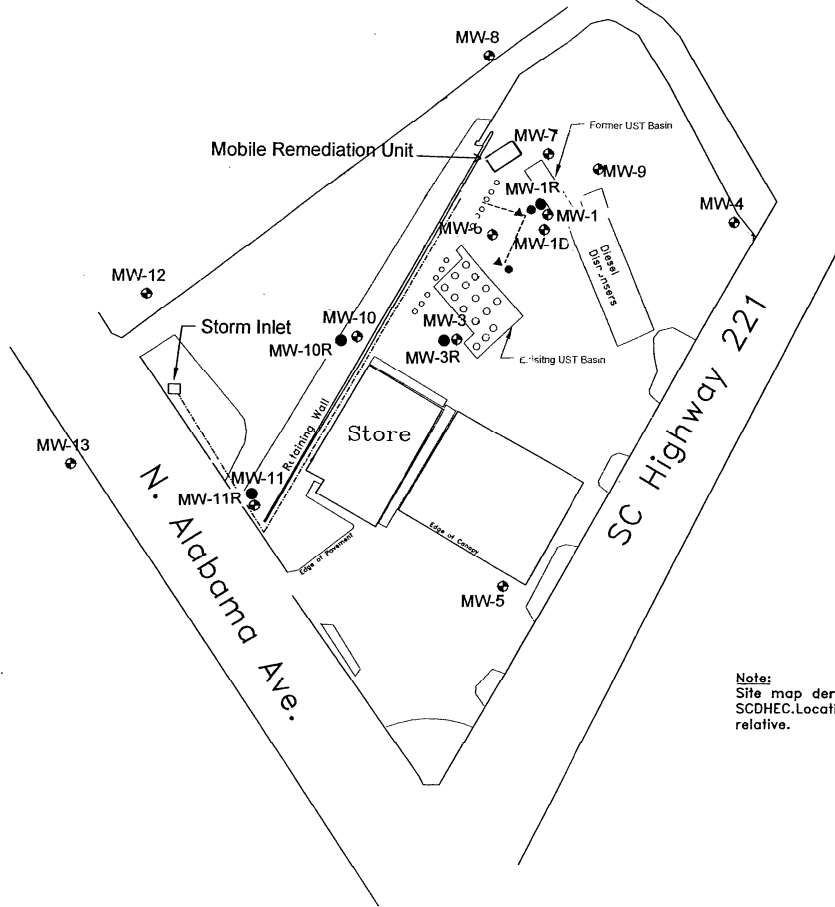
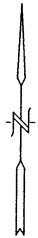
*Page 2*  
*Hot Spot 3005, SCDHEC Site ID #12719*  
*November 27, 2002*

The site map, field data sheets, well construction logs, and the disposal manifests are attached for your review.

Thank you for your assistance with this project. If you have any questions or require additional information, please contact my office at 803-359-3200.

*Sincerely,*  
**FORCE & ASSOCIATES, INC.**


  
*Greg Force, P.G.*  
*President*



**LEGEND:**

- GWE = Groundwater Elevation
- Groundwater Contour
- Compliance Monitoring Well
- ▲ SVE Well
- CW Extraction Well
- Trenching
- Discharge Line

**Note:**  
 Site map derived from figures provided by SCDHEC. Locations of wells and site features are relative.

 <b>BROOKS &amp; MEDLOCK</b> ENGINEERING, PLLC 712 MERRIMON AVENUE ASHEVILLE, N.C. 28904		
TITLE: Potentiometric Map		
PROJECT: Hot Spot # 3005 CAP	FIGURE: 1	
DATE: 8/23/02	SCALE: N.T.S.	REV.: 2

DHEC

Water Well Record

2600 Bull Street, Columbia, SC 29201-1708; (803) 896-6240

1. WELL OWNER INFORMATION:

R.L. Jordan Oil Company of North Carolina, Inc.
Judith A. Laughter, Agent
1451 Fernwood Glendale Road
Spartanburg, SC 29307
864-585-2784

6. PERMIT NUMBER:

7. USE: [ ] Residential [ ] Public Supply [ ] Process
[ ] Irrigation [ ] Air Conditioning [ ] Emergency
[ ] Test Well [x] Monitoring Well [ ] Replacement

8. WELL DEPTH (completed) 36.0 ft. Date Started: 11/5/02
Date Completed: 11/5/02

9. [ ] Mud Rotary [ ] Cable tool [ ] Air Rotary [x] Bored
[ ] Dug [ ] Jetted [ ] Driven [ ] Other

2. LOCATION OF WELL:

Hot Spot #3005
107 Hampton Street
Chesnee, SC 29323
County: Spartanburg
Latitude: Longitude:

10. CASING: [x] Threaded [ ] Welded
Diam.: 2.0"
Type: [x] PVC [ ] Galvanized
[ ] Steel [ ] Other
0 in. to 26.0 ft.
in. to ft.

Height: Above/Below
Surface \_\_\_\_\_ ft.
Weight \_\_\_\_\_ lb./ft.
Drive Shoe? [ ] Yes [x] No

3. SYSTEM NAME: Hot Spot #3005 SYSTEM NUMBER: #12719

4. CUTTING SAMPLES: [x] Yes [ ] No

Geophysical Logs: [ ] Yes (please enclose) [x] No

11. SCREEN Type PVC Diam.: 2.0"
Slot/Gauge: #10 Length: 10.0'
Set Between: 36.0 ft. and 26.0 ft. NOTE: MULTIPLE SCREENS
ft. and ft. USE SECOND SHEET
Sieve Analysis [ ] Yes (please enclose) [x] No

Table with 3 columns: Formation Description, \*Thickness of Stratum, Depth to Bottom of Stratum. Rows include Concrete, Red Clay, Fill, Red Silty Clay, Red Sandy Clay, Red Sandy Pebbly Clay.

12. STATIC WATER LEVEL 29.21 ft.

13. PUMPING LEVEL Below Land Surface.
ft. after hrs. Pumping \_\_\_\_\_ G.P.M.
Pumping Test: [ ] Yes (please enclosed) [x] No
Yield: \_\_\_\_\_

14. WATER QUALITY
Chemical Analysis [x] Yes [ ] No Bacterial Analysis [ ] Yes [x] No
Please enclose lab results.

15. ARTIFICIAL FILTER (filter pack) [x] Yes [ ] No
Installed from 36.0 ft. to 24.0 ft.
Effective size "FX-50" Uniformity Coefficient \_\_\_\_\_

16. WELL GROUTED? [x] Yes [ ] No
[ ] Neat Cement [ ] Sand Cement [ ] Concrete [x] Other Bentonite
Depth: From 24.0 ft. to ground surface

17. NEAREST SOURCE OF POSSIBLE CONTAMINATION: \_\_\_\_\_ ft in \_\_\_\_\_ direction
Type well disinfected [ ] Yes [ ] No Type: \_\_\_\_\_
upon completion [ ] No Amount: \_\_\_\_\_

18. PUMP: Date installed: \_\_\_\_\_ Not installed [x]
Mfr. Name: \_\_\_\_\_ Model No.: \_\_\_\_\_
H.P. \_\_\_\_\_ Volts \_\_\_\_\_ Length of drop pipe \_\_\_\_\_ ft. Capacity \_\_\_\_\_ gpm
TYPE: [ ] Submersible [ ] Jet (shallow) [ ] Turbine
[ ] Jet (deep) [ ] Reciprocating [ ] Centrifugal

19. WELL DRILLER: Owen Astwood Cert. No.: 1647
Force & Associates, Inc.
147 Vera Road, Suite A, Lexington, SC 29072
803-359-3200

20. WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled
under my direction and this report is true to the best of my knowledge and belief.

\*Indicate Water Bearing Zones
(Use a 2nd sheet if needed)
5. REMARKS: MW-1R

Signed: [Signature] Date: 11-18-02
Authorized Representative

DHEC

Water Well Record

2600 Bull Street, Columbia, SC 29201-1708; (803) 896-6240

1. WELL OWNER INFORMATION:

R.L. Jordan Oil Company of North Carolina, Inc.
Judith A. Laughter, Agent
1451 Fernwood Glendale Road
Spartanburg, SC 29307
864-585-2784

6. PERMIT NUMBER:

7. USE: [ ] Residential [ ] Public Supply [ ] Process
[ ] Irrigation [ ] Air Conditioning [ ] Emergency
[ ] Test Well [x] Monitoring Well [ ] Replacement

8. WELL DEPTH (completed) 36.0 ft. Date Started: 11/5/02
Date Completed: 11/5/02

9. [ ] Mud Rotary [ ] Cable tool [ ] Air Rotary [x] Bored
[ ] Dug [ ] Jetted [ ] Driven [ ] Other

2. LOCATION OF WELL:

Hot Spot #3005
107 Hampton Street
Chesnee, SC 29323
County: Spartanburg
Latitude: Longitude:

10. CASING: [x] Threaded [ ] Welded
Diam.: 2.0"
Type: [x] PVC [ ] Galvanized
[ ] Steel [ ] Other
0 in. to 26.0 ft.
in. to ft.

Height: Above/Below
Surface \_\_\_\_\_ ft.
Weight \_\_\_\_\_ lb./ft.
Drive Shoe? [ ] Yes [x] No

3. SYSTEM NAME: Hot Spot #3005 SYSTEM NUMBER: #12719

11. SCREEN Type PVC Diam.: 2.0"
Slot/Gauge: #10 Length: 10.0'
Set Between: 36.0 ft. and 26.0 ft. NOTE: MULTIPLE SCREENS
ft. and ft. USE SECOND SHEET
Sieve Analysis [ ] Yes (please enclose) [x] No

4. CUTTING SAMPLES: [x] Yes [ ] No

Geophysical Logs: [ ] Yes (please enclose) [x] No

12. STATIC WATER LEVEL
20.74 ft.

13. PUMPING LEVEL Below Land Surface.

ft. after hrs. Pumping \_\_\_\_\_ G.P.M.
Pumping Test: [ ] Yes (please enclosed) [x] No
Yield: \_\_\_\_\_

14. WATER QUALITY

Chemical Analysis [x] Yes [ ] No Bacterial Analysis [ ] Yes [x] No
Please enclose lab results.

15. ARTIFICIAL FILTER (filter pack)

[x] Yes [ ] No
Installed from 36.0 ft. to 24.0 ft.
Effective size "FX-50" Uniformity Coefficient \_\_\_\_\_

16. WELL GROUTED?

[x] Yes [ ] No
[ ] Neat Cement [ ] Sand Cement [ ] Concrete [x] Other Bentonite
Depth: From 24.0 ft. to ground surface

17. NEAREST SOURCE OF POSSIBLE CONTAMINATION: \_\_\_\_\_ ft in \_\_\_\_\_ direction

\_\_\_\_\_ Type well disinfected [ ] Yes Type: \_\_\_\_\_
\_\_\_\_\_ upon completion [ ] No Amount: \_\_\_\_\_

18. PUMP: Date installed: \_\_\_\_\_ Not installed [x]

Mfr. Name: \_\_\_\_\_ Model No.: \_\_\_\_\_
H.P. \_\_\_\_\_ Volts \_\_\_\_\_ Length of drop pipe \_\_\_\_\_ ft. Capacity \_\_\_\_\_ gpm
TYPE: [ ] Submersible [ ] Jet (shallow) [ ] Turbine
[ ] Jet (deep) [ ] Reciprocating [ ] Centrifugal

19. WELL DRILLER: Owen Astwood Cert. No.: 1647
Force & Associates, Inc.
147 Vera Road, Suite A, Lexington, SC 29072
803-359-3200

20. WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled
under my direction and this report is true to the best of my knowledge and belief.

\*Indicate Water Bearing Zones
(Use a 2nd sheet if needed)

5. REMARKS: MW-3R

Signed: [Signature] Date: 11-18-02
Authorized Representative

DHEC

Water Well Record

2600 Bull Street, Columbia, SC 29201-1708; (803) 896-6240

1. WELL OWNER INFORMATION:

R.L. Jordan Oil Company of North Carolina, Inc.
Judith A. Laughter, Agent
1451 Fernwood Glendale Road
Spartanburg, SC 29307
864-585-2784

6. PERMIT NUMBER:

7. USE: [ ] Residential [ ] Public Supply [ ] Process
[ ] Irrigation [ ] Air Conditioning [ ] Emergency
[ ] Test Well [x] Monitoring Well [ ] Replacement

8. WELL DEPTH (completed) 32.0 ft. Date Started: 11/4/02
Date Completed: 11/4/02

9. [ ] Mud Rotary [ ] Cable tool [ ] Air Rotary [x] Bored
[ ] Dug [ ] Jetted [ ] Driven [ ] Other

2. LOCATION OF WELL:

Hot Spot #3005
107 Hampton Street
Chesnee, SC 29323
County: Spartanburg
Latitude: Longitude:

10. CASING: [x] Threaded [ ] Welded
Diam.: 2.0"
Type: [x] PVC [ ] Galvanized
[ ] Steel [ ] Other
0 in. to 22.0 ft.
in. to ft.
Height: Above/Below
Surface \_\_\_\_\_ ft.
Weight \_\_\_\_\_ lb./ft.
Drive Shoe? [ ] Yes [x] No

3. SYSTEM NAME: Hot Spot #3005
SYSTEM NUMBER: #12719

11. SCREEN Type PVC Diam.: 2.0"
Slot/Gauge: #10 Length: 10.0'
Set Between: 32.0 ft. and 22.0 ft. NOTE: MULTIPLE SCREENS
\_\_\_\_\_ ft. and \_\_\_\_\_ ft. USE SECOND SHEET
Sieve Analysis [ ] Yes (please enclose) [x] No

4. CUTTING SAMPLES: [x] Yes [ ] No

Geophysical Logs: [ ] Yes (please enclose) [x] No

Table with 3 columns: Formation Description, \*Thickness of Stratum, Depth to Bottom of Stratum. Rows include Topsoil, Gravel; Red/Brown Clay; Red Silty Clay; Red Sandy Clay; Red Sandy Pebbly Clay.

12. STATIC WATER LEVEL 23.81 ft.

13. PUMPING LEVEL Below Land Surface.
\_\_\_\_\_ ft. after \_\_\_\_\_ hrs. Pumping \_\_\_\_\_ G.P.M.
Pumping Test: [ ] Yes (please enclosed) [x] No
Yield: \_\_\_\_\_

14. WATER QUALITY
Chemical Analysis [x] Yes [ ] No Bacterial Analysis [ ] Yes [x] No
Please enclose lab results.

15. ARTIFICIAL FILTER (filter pack) [x] Yes [ ] No
Installed from 32.0 ft. to 20.0 ft.
Effective size "FX-50" Uniformity Coefficient \_\_\_\_\_

16. WELL GROUTED? [x] Yes [ ] No
[ ] Neat Cement [ ] Sand Cement [ ] Concrete [x] Other Bentonite
Depth: From 20.0 ft. to ground surface

17. NEAREST SOURCE OF POSSIBLE CONTAMINATION: \_\_\_\_\_ ft in \_\_\_\_\_ direction
\_\_\_\_\_ Type well disinfected [ ] Yes Type: \_\_\_\_\_
\_\_\_\_\_ upon completion [ ] No Amount: \_\_\_\_\_

18. PUMP: Date installed: \_\_\_\_\_ Not installed [x]
Mfr. Name: \_\_\_\_\_ Model No.: \_\_\_\_\_
H.P. \_\_\_\_\_ Volts \_\_\_\_\_ Length of drop pipe \_\_\_\_\_ ft. Capacity \_\_\_\_\_ gpm
TYPE: [ ] Submersible [ ] Jet (shallow) [ ] Turbine
[ ] Jet (deep) [ ] Reciprocating [ ] Centrifugal

19. WELL DRILLER: Owen Astwood Cert. No.: 1647
Force & Associates, Inc.
147 Vera Road, Suite A, Lexington, SC 29072
803-359-3200

20. WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled
under my direction and this report is true to the best of my knowledge and belief.

\*Indicate Water Bearing Zones
(Use a 2nd sheet if needed)

5. REMARKS: MW-10R

Signed: [Signature] Date: 11-18-02
Authorized Representative



DHEC

Water Well Record

2600 Bull Street, Columbia, SC 29201-1708; (803) 896-6240

1. WELL OWNER INFORMATION:

R.L. Jordan Oil Company of North Carolina, Inc.
Judith A. Laughter, Agent
1451 Fernwood Glendale Road
Spartanburg, SC 29307
864-585-2784

6. PERMIT NUMBER:

7. USE: [ ] Residential [ ] Public Supply [ ] Process
[ ] Irrigation [ ] Air Conditioning [ ] Emergency
[ ] Test Well [x] Monitoring Well [ ] Replacement

8. WELL DEPTH (completed) 32.0 ft. Date Started: 11/4/02
Date Completed: 11/4/02

9. [ ] Mud Rotary [ ] Cable tool [ ] Air Rotary [x] Bored
[ ] Dug [ ] Jetted [ ] Driven [ ] Other

2. LOCATION OF WELL:
Hot Spot #3005
107 Hampton Street
Chesnee, SC 29323
County: Spartanburg
Latitude: Longitude:

10. CASING: [x] Threaded [ ] Welded
Diam.: 2.0"
Type: [x] PVC [ ] Galvanized
[ ] Steel [ ] Other
0 in. to 22.0 ft.
in. to ft.
Height: Above/Below
Surface \_\_\_\_\_ ft.
Weight \_\_\_\_\_ lb./ft.
Drive Shoe? [ ] Yes [x] No

3. SYSTEM NAME: SYSTEM NUMBER:
Hot Spot #3005 #12719

11. SCREEN Type PVC Diam.: 2.0"
Slot/Gauge: #10 Length: 10.0'
Set Between: 32.0 ft. and 22.0 ft. NOTE: MULTIPLE SCREENS
ft. and ft. USE SECOND SHEET
Sieve Analysis [ ] Yes (please enclose) [x] No

4. CUTTING SAMPLES: [x] Yes [ ] No

Geophysical Logs: [ ] Yes (please enclose) [x] No

12. STATIC WATER LEVEL
24.37 ft.

Table with 3 columns: Formation Description, Thickness of Stratum, Depth to Bottom of Stratum. Rows include Topsoil/Gravel/Fill, Red Clayey Sand, Brown Silty Clay, Red Silty Clay, Red Sandy Clay, Red Sandy Pebbly Clay.

13. PUMPING LEVEL Below Land Surface.
ft. after \_\_\_\_\_ hrs. Pumping \_\_\_\_\_ G.P.M.
Pumping Test: [ ] Yes (please enclosed) [x] No
Yield: \_\_\_\_\_

14. WATER QUALITY
Chemical Analysis [x] Yes [ ] No Bacterial Analysis [ ] Yes [x] No
Please enclose lab results.

15. ARTIFICIAL FILTER (filter pack) [x] Yes [ ] No
Installed from 32.0 ft. to 20.0 ft.
Effective size "FX-50" Uniformity Coefficient \_\_\_\_\_

16. WELL GROUTED? [x] Yes [ ] No
[ ] Neat Cement [ ] Sand Cement [ ] Concrete [x] Other Bentonite
Depth: From 20.0 ft. to ground surface

17. NEAREST SOURCE OF POSSIBLE CONTAMINATION: \_\_\_\_\_ ft in \_\_\_\_\_ direction
\_\_\_\_\_ Type well disinfected [ ] Yes Type: \_\_\_\_\_
\_\_\_\_\_ upon completion [ ] No Amount: \_\_\_\_\_

18. PUMP: Date installed: \_\_\_\_\_ Not installed [x]
Mfr. Name: \_\_\_\_\_ Model No.: \_\_\_\_\_
H.P. \_\_\_\_\_ Volts \_\_\_\_\_ Length of drop pipe \_\_\_\_\_ ft. Capacity \_\_\_\_\_ gpm
TYPE: [ ] Submersible [ ] Jet (shallow) [ ] Turbine
[ ] Jet (deep) [ ] Reciprocating [ ] Centrifugal

19. WELL DRILLER: Owen Astwood Cert. No.: 1647
Force & Associates, Inc.
147 Vera Road, Suite A, Lexington, SC 29072
803-359-3200

20. WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled
under my direction and this report is true to the best of my knowledge and belief.

\*Indicate Water Bearing Zones
(Use a 2nd sheet if needed)

5. REMARKS: MW-11R

Signed: [Signature] Date: 11-18-02
Authorized Representative

South Carolina Department of Health and Environmental Control  
Bureau of Underground Storage Tank Management  
**Field Data Information Sheet for Ground Water Sampling**

<p>Date(mm/dd/yy) <u>11-05-02</u>                  Field Personnel <u>DA</u>                  General Weather Conditions <u>RAINY</u>                  Ambient Air Temperature <u>11</u> °C</p> <p>Facility Name <u>HOT SPOT</u> Site ID# <u>12719</u></p> <p><b>Quality Assurance:</b>                  pH Meter: Conductivity Meter                  serial no. serial no.                  pH=4.0 Standard                  pH=7.0 Standard                  pH=10.0 Standard</p> <p style="text-align: center;"><b>Chain of Custody</b></p> <p>Relinquished by _____ Date / Time _____                  Received by _____ Date / Time _____</p>	<p>Well # <u>MW-1R</u></p> <p>Well Diameter(D) <u>2</u> inch or _____ feet                  conversion factor(C): <math>3.143 \times (D/2)^2</math>                  for a 2 inch well C=0.163                  4 inch well C=0.652</p> <p>Total Well Depth(TWD) <u>36</u> ft.                  Depth to GW (DGW) <u>29.21</u> ft.</p> <p>Length of Water Column(LWC=TWD-DGW) <u>6.79</u> ft.</p> <p>1 Csg. Volume(LWC * C) = <math>6.79 \times .163 = 1.11</math> gals.                  3 Csg. Volumes = <math>3 \times 1.11 = 3.33</math> gals. (Std. Purge Volume)</p> <p>Total Volume of Water Purged Before Sampling <u>3.0</u> gals.</p>
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

	Initial	1st vol.	2nd vol.	3rd vol.	4th vol.	5th vol.	Post Sampling
Volume Purged (gallons)		1.11	1.11				
Time (military)	1107	1110	1114				
pH (s.u.)	6.7	6.6	6.8				
Specific Cond. (umhos/cm)	109	101	95				
Water Temp (°C)	17.4	18.0	18.3				
Turbidity (°)	CLEAR	CLOUDY	S.CLOUDY				
PID Readings							

\* subjective (1) None (2) Faint (3) Moderate (4) Strong

Remarks Bailed Dry - RECHARGE CLEAR

South Carolina Department of Health and Environmental Control  
 Bureau of Underground Storage Tank Management  
**Field Data Information Sheet for Ground Water Sampling**

Page    of   

Date(mm/dd/yy) <u>11-5-02</u> Field Personnel <u>DA</u> General Weather Conditions <u>RAINING</u> Ambient Air Temperature <u>11.4 °C</u> Facility Name <u>FOT SPOT 3005</u> Site ID# <u>12719</u>  pH Meter: _____ serial no. _____ pH=4.0 _____ pH=7.0 _____ pH=10.0 _____  <p style="text-align: center;"><u>Quality Assurance:</u></p> Conductivity Meter serial no. _____ Standard _____ Standard _____ Standard _____  <p style="text-align: center;"><u>Chain of Custody</u></p> Relinquished by _____ Date /Time _____ Received by _____ Date/Time _____	Well # <u>MW3R</u> Well Diameter(D) <u>2</u> inch or _____ feet conversion factor(C): $3.143 \cdot (D/2)^2$ for a 2 inch well C=0.163 4 inch well C=0.652 Total Well Depth(TWD) <u>36</u> ft. Depth to GW (DGW) <u>32.47</u> ft. Length of Water Column(LWC=TWD-DGW) <u>3.53</u> ft. 1 Csg. Volume(LWC * C) = $3.53 \times 0.163 = 0.57$ gals. 3 Csg. Volumes = $3 \times 0.57 = 1.71$ gals. (Std. Purge Volume) Total Volume of Water Purged Before Sampling <u>1.5</u> gals.
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

	Initial	1st vol.	2nd vol.	3rd vol.	4th vol.	5th vol.	Post Sampling
Volume Purged (gallons)		0.57	0.57				
Time (military)	1050	1051	1054				
pH (s.u.)	6.7	6.5	6.6				
Specific Cond. (umhos/cm)	297	300	299				
Water Temp (°C)	17.8	18.0	18.2				
Turbidity (*)	CLEAR	CLOUDY	CLOUDY				
PID Readings							
Remarks	<u>BAILED DRY RECHARGE CLEAR</u>						

\* subjective (1) None (2) Faint (3) Moderate (4) Strong

South Carolina Department of Health and Environmental Control  
Bureau of Underground Storage Tank Management  
**Field Data Information Sheet for Ground Water Sampling**

Date(mm/dd/yy) 11-05-02  
 Field Personnel OA  
 General Weather Conditions RAINING  
 Ambient Air Temperature 11 °C  
 Facility Name HOR SPOT 3005 Site ID# 12719

**Quality Assurance:**  
 pII Meter: Conductivity Meter  
 serial no. \_\_\_\_\_ serial no. \_\_\_\_\_  
 pII=4.0 \_\_\_\_\_ Standard \_\_\_\_\_  
 pII=7.0 \_\_\_\_\_ Standard \_\_\_\_\_  
 pII=10.0 \_\_\_\_\_ Standard \_\_\_\_\_

**Chain of Custody**

Relinquished by \_\_\_\_\_ Date/Time \_\_\_\_\_ Received by \_\_\_\_\_ Date/Time \_\_\_\_\_

Well # MW-102  
 Well Diameter(D) 2 inch or \_\_\_\_\_ feet  
 conversion factor(C):  $3.143 \times (D/2)^2$   
 for a 2 inch well C=0.163  
 4 inch well C=0.652  
 Total Well Depth(TWD) 32 ft.  
 Depth to GW (DGW) 23.81 ft.

Length of Water Column(LWC=TWD-DGW) 8.19 ft.  
 1 Csg. Volume(LWC \* C) =  $8.19 \times 0.163 = 1.33$  gals.  
 3 Csg. Volumes =  $3 \times 1.33 = 3.99$  gals. (Std. Purge Volume)

Total Volume of Water Purged Before Sampling 4.5 gals.

	Initial	1st vol.	2nd vol.	3rd vol.	4th vol.	5th vol.	Post	Sampling
Volume Purged (gallons)		1.33	1.33	1.33				
Time (military)	1131	1133	1138	1143				
pH (s.u.)	6.6	6.7	6.6	6.8				
Specific Cond. (umhos/cm)	84	89	92	97				
Water Temp (°C)	17.5	18.0	18.2	18.4				
Turbidity (°)	CLEAR	3-CLOUDY	CLOUDY	CLOUDY				
PID Readings								

\* subjective (1) None (2) Faint (3) Moderate (4) Strong

Remarks RECHARGE CLEAR

**Field Data Information Sheet for Ground Water Sampling**

Date(mm/dd/yy) <u>11-05-02</u> Field Personnel <u>DA</u> General Weather Conditions <u>RAINING</u> Ambient Air Temperature <u>11</u> °C Facility Name <u>HOT SPOT 3005</u> Site ID# <u>12719</u>  Quality Assurance: pH Meter: Conductivity Meter serial no. serial no. pH=4.0 Standard _____ pH=7.0 Standard _____ pH=10.0 Standard _____  Chain of Custody Relinquished by _____ Date /Time _____ Received by _____ Date/Time _____	Well # <u>MW-112</u> Well Diameter(D) <u>2</u> inch or _____ feet conversion factor(C): $3.143 \cdot (D/2)^2$ for a 2 inch well C=0.163 4 inch well C=0.652 Total Well Depth(TWD) <u>32</u> ft. Depth to GW (DGW) <u>24.37</u> ft. Length of Water Column(LWC=TWD-DGW) <u>7.63</u> ft. 1 Csg. Volume(LWC * C) = $7.63 \times 0.163 = 1.24$ gals. 3 Csg. Volumes = $3 \times 1.24 = 3.72$ gals. (Std. Purge Volume) Total Volume of Water Purged Before Sampling <u>4.0</u> gals.
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

	Initial	1st vol.	2nd vol.	3rd vol.	4th vol.	5th vol.	Post	Sampling
Volume Purged (gallons)		1.24	1.24	1.24				
Time (military)	1120	1123	1124	1127				
pH (s.u.)	6.4	6.3	6.4	6.7				
Specific Cond. (umhos/cm)	115	118	121	124				
Water Temp (°C)	17.3	17.5	18.0	18.2				
Turbidity (°)	CLEAR	CLOUDY	CLOUDY	CLOUDY				
PID Readings								
Remarks	<u>RECHARGE CLEAR</u>							

\* subjective (1) None (2) Faint (3) Moderate (4) Strong



## SPECIAL WASTE MANIFEST

WASTE MANAGEMENT

WASTE ID # RC 0112022

 1047 Highway Church Rd.  
 Elgin, SC 29045  
 (803) 788-3054 Phone  
 (803) 736-0995 Fax

EXPIRATION DATE: December 20, 2002

GENERATOR OF WASTE:	FORCE AND ASSOCIATES		
CUSTOMER ACCOUNT:	FORCE AND ASSOCIATES	820-436	
LOCATION OF WASTE :	Shelton's Food Stores, Crawford's Country Store, Hot Spot 3005		
PHONE #	803-359-3200	CONTACT:	SANDRA SEWARD
FAX #	803-359-8682		
GENERATOR'S SIGNATURE	_____	DATE:	_____

TRANSPORTER OF WASTE	_____		
DATE:	11-22-02	TRUCK NO.	1
DRIVER'S SIGNATURE	Mary Phillips		

**** TO BE COMPLETED BY RICHLAND LANDFILL ****			
DISPOSAL SITE:	RICHLAND LANDFILL ELGIN, SC		
DESCRIPTION OF WASTE	Soil Boring for SCDHEC Assessment Program		(Soil)
	Analyticals to be submitted to Sara Adams for review prior to landfill delivery		
TICKET NO.#	418450	TONNAGE	1.13
RECEIVED BY	SB		

**NON-HAZARDOUS WASTE MANIFEST**

1. Generator's US EPA ID No.

C.F.S.O.G. . . . .

Manifest Document No.

2-4-1-4-1

2. Page 1 of 1

3. Generator's Name and Mailing Address

Force & Associates  
147 Vera Road  
Lexington, SC 29070

4. Generator's Phone (903) 359-7847

5. Transporter 1 Company Name

Force & Associates

6. US EPA ID Number

. . . . .

A. Transporter's Phone

(203) 359-7847

7. Transporter 2 Company Name

Providence Environmental, Inc.

8. US EPA ID Number

S.C.R.0.0.0.7.6.0.9.1.9

B. Transporter's Phone

(866) 754-1175

9. Designated Facility Name and Site Address

US Filter  
2115 Speedrail Court  
Concord, NC 28025

10. US EPA ID Number

N.D.R.0.0.0.0.0.3.3.1.9

C. Facility's Phone

(704) 455-1397

11. Waste Shipping Name and Description

a. Non hazardous waste waters

12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
001	D.M	80	E
.	.	.	.
.	.	.	.
.	.	.	.

b.

c.

d.

D. Additional Descriptions for Materials Listed Above

E. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

Emergency Response Contact: 866-754-1175

Hot Spot  
Crawfords  
Don Bryant Prop.  
Shelton's Food

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

Gary Phillips

Signature

*Gary Phillips*

Month Day Year

11 12 2002

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

Gary Phillips

Signature

*Gary Phillips*

Month Day Year

11 12 2002

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Dense Hinson

Signature

*Dense Hinson*

Month Day Year

11 12 2002

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

Signature

Month Day Year

. . .

TRANSPORTER #1

GENERATOR

TRANSPORTER

FACILITY

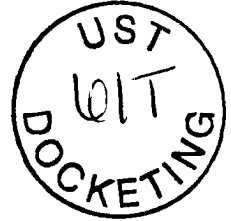


2600 Bull Street  
Columbia, SC 29201-1708

UNDERGROUND STORAGE TANK PROGRAM  
BUREAU OF LAND AND WASTE MANAGEMENT

Phone: (800) 826-5435 Fax: (803) 896-6245

DEC 06 2002



MR MARK BROOKS  
BROOKS & MEDLOCK ENGINEERING  
712 MERRIMAN AVE  
ASHEVILLE NC 28804

Re: Hot Spot 3005, 107 Hampton St., Chesnee, SC  
UST Permit #12719, CP#: 13851:P  
Bid#: SB-18123-12/20/01-HW, PO#385179  
Monitoring Well Installation Report received December 2, 2002  
Spartanburg County

Dear Mr. Brooks:

The Underground Storage Tank Program has reviewed the referenced report submitted by Force & Associates. Several monitoring wells (MW-1, MW-3, MW-10, and MW-11) were replaced with deeper wells because the existing wells had insufficient water for sampling. For future sampling purposes, if the pre-existing wells contain sufficient water, they will be sampled; otherwise, the replacement wells should be sampled.

If you have any questions or need additional information, please contact me at (803) 896-6397 or (800) 826-5435.

Sincerely,

Debra L. Thoma, Hydrogeologist  
State Lead & Field Services Section  
Assessment and Corrective Action Division

cc: Judith Laughter, RL Jordan Oil Co., PO Box 2527, Spartanburg, SC, 29304-2527 (w/ copy)  
Technical File

SCDHEC/UST/DLT/12.5.02/06542rp\_awd





**Pace Analytical Services, Inc.**  
9800 Kinsey Avenue, Suite 100  
Huntersville, NC 28078  
Phone: 704.875.9092  
Fax: 704.875.9091

December 30, 2002

Ms. Debra Thoma  
SCDHEC  
UST Program  
2600 Bull Street  
Columbia, SC 29201

RE: Lab Project Number: 9239655  
Client Project ID: Hot Spot 3005 12719

Dear Ms. Thoma:

Enclosed are the analytical results for sample(s) received by the laboratory on December 19, 2002. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report please feel free to contact me.

Sincerely,

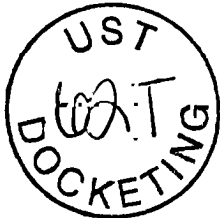
Sherri Stabel  
Sherri.Stabel@pacelabs.com  
Project Manager

**RECEIVED**

**DEC 31 2002**

**UNDERGROUND STORAGE  
TANK PROGRAM**

Enclosures



Laboratory Certification IDs  
NC Wastewater 12  
NC Drinking Water 37706  
SC 99006

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc.

Laboratory Certification IDs  
LA Wastewater 04034  
VA Drinking Water 213  
FL NELAP E87627



Lab Project Number: 9239655  
Client Project ID: Hot Spot 3005 12719

Lab Sample No: 922706734      Project Sample Number: 9239655-001      Date Collected: 12/16/02 13:00  
Client Sample ID: MW-1R      Matrix: Water      Date Received: 12/19/02 10:00

Parameters	Results	Units	Report Limit	DF	Analyzed	By	CAS No.	Qual	RegLmt
<b>GC/MS Volatiles</b>									
GC/MS VOCs by 8260	Method: EPA 8260								
Benzene	ND	ug/l	5.0	1.0	12/21/02 06:05	RWS	71-43-2		
Ethylbenzene	ND	ug/l	5.0	1.0	12/21/02 06:05	RWS	100-41-4		
Methyl-tert-butyl ether	23.	ug/l	5.0	1.0	12/21/02 06:05	RWS	1634-04-4		
Naphthalene	ND	ug/l	5.0	1.0	12/21/02 06:05	RWS	91-20-3		
Toluene	ND	ug/l	5.0	1.0	12/21/02 06:05	RWS	108-88-3		
m&p-Xylene	ND	ug/l	10.	1.0	12/21/02 06:05	RWS			
o-Xylene	14.	ug/l	5.0	1.0	12/21/02 06:05	RWS	95-47-6		
Toluene-d8 (S)	100	%		1.0	12/21/02 06:05	RWS	2037-26-5		
4-Bromofluorobenzene (S)	99	%		1.0	12/21/02 06:05	RWS	460-00-4		
Dibromofluoromethane (S)	107	%		1.0	12/21/02 06:05	RWS	1868-53-7		
1,2-Dichloroethane-d4 (S)	101	%		1.0	12/21/02 06:05	RWS	17060-07-0		

Date: 12/30/02

Page: 1 of 12

Laboratory Certification IDs  
NC Wastewater 12  
NC Drinking Water 37706  
SC 99006

## REPORT OF LABORATORY ANALYSIS

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Laboratory Certification IDs  
LA Wastewater 04034  
VA Drinking Water 213  
FL NELAP E87627



Lab Project Number: 9239655  
Client Project ID: Hot Spot 3005 12719

Lab Sample No: 922706742      Project Sample Number: 9239655-002      Date Collected: 12/16/02 12:28  
Client Sample ID: MW-3R      Matrix: Water      Date Received: 12/19/02 10:00

Parameters	Results	Units	Report Limit	DF	Analyzed	By	CAS No.	Qual	RegLmt
<b>GC/MS Volatiles</b>									
GC/MS VOCs by 8260	Method: EPA 8260								
Benzene	2300	ug/l	250	50.0	12/21/02 06:22	RWS	71-43-2		
Ethylbenzene	600	ug/l	250	50.0	12/21/02 06:22	RWS	100-41-4		
Methyl-tert-butyl ether	9800	ug/l	250	50.0	12/21/02 06:22	RWS	1634-04-4		
Naphthalene	100	ug/l	5.0	1.0	12/21/02 06:22	RWS	91-20-3		
Toluene	1600	ug/l	250	50.0	12/21/02 06:22	RWS	108-88-3		
m&p-Xylene	2600	ug/l	500	50.0	12/21/02 06:22	RWS			
o-Xylene	970	ug/l	250	50.0	12/21/02 06:22	RWS	95-47-6		
Toluene-d8 (S)	90	%		1.0	12/21/02 06:22	RWS	2037-26-5		
4-Bromofluorobenzene (S)	120	%		1.0	12/21/02 06:22	RWS	460-00-4	1	
Dibromofluoromethane (S)	117	%		1.0	12/21/02 06:22	RWS	1868-53-7		
1,2-Dichloroethane-d4 (S)	160	%		1.0	12/21/02 06:22	RWS	17060-07-0	1	

## REPORT OF LABORATORY ANALYSIS

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Lab Project Number: 9239655  
Client Project ID: Hot Spot 3005 12719

Lab Sample No: 922706759      Project Sample Number: 9239655-003      Date Collected: 12/16/02 12:46  
Client Sample ID: MW-6      Matrix: Water      Date Received: 12/19/02 10:00

Parameters	Results	Units	Report Limit	DF	Analyzed	By	CAS No.	Qual	ReqLmt
------------	---------	-------	--------------	----	----------	----	---------	------	--------

**GC/MS Volatiles**

GC/MS VOCs by 8260

Method: EPA 8260

Benzene	ND	ug/l	5.0	1.0	12/24/02 04:22	RWS	71-43-2		
Ethylbenzene	ND	ug/l	5.0	1.0	12/24/02 04:22	RWS	100-41-4		
Methyl-tert-butyl ether	ND	ug/l	5.0	1.0	12/24/02 04:22	RWS	1634-04-4		
Naphthalene	62.	ug/l	5.0	1.0	12/24/02 04:22	RWS	91-20-3		
Toluene	ND	ug/l	5.0	1.0	12/24/02 04:22	RWS	108-88-3		
m&p-Xylene	ND	ug/l	10.	1.0	12/24/02 04:22	RWS			
o-Xylene	39.	ug/l	5.0	1.0	12/24/02 04:22	RWS	95-47-6		
Toluene-d8 (S)	102	%		1.0	12/24/02 04:22	RWS	2037-26-5		
4-Bromofluorobenzene (S)	94	%		1.0	12/24/02 04:22	RWS	460-00-4		
Dibromofluoromethane (S)	123	%		1.0	12/24/02 04:22	RWS	1868-53-7	2	
1,2-Dichloroethane-d4 (S)	125	%		1.0	12/24/02 04:22	RWS	17060-07-0		

Date: 12/30/02

Page: 3 of 12

Laboratory Certification IDs

NC Wastewater 12  
NC Drinking Water 37706  
SC 99006

**REPORT OF LABORATORY ANALYSIS**

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without the written consent of Pace Analytical Services, Inc.

Laboratory Certification IDs

LA Wastewater 04034  
VA Drinking Water 213  
FL NELAP E87627



Lab Project Number: 9239655  
Client Project ID: Hot Spot 3005 12719

Lab Sample No: 922706767      Project Sample Number: 9239655-004      Date Collected: 12/16/02 13:15  
Client Sample ID: MW-7      Matrix: Water      Date Received: 12/19/02 10:00

Parameters	Results	Units	Report Limit	DF	Analyzed	By	CAS No.	Qual	RegLmt
<b>GC/MS Volatiles</b>									
GC/MS VOCs by 8260	Method: EPA 8260								
Benzene	ND	ug/l	5.0	1.0	12/24/02 04:05	RWS	71-43-2		
Ethylbenzene	ND	ug/l	5.0	1.0	12/24/02 04:05	RWS	100-41-4		
Methyl-tert-butyl ether	ND	ug/l	5.0	1.0	12/24/02 04:05	RWS	1634-04-4		
Naphthalene	ND	ug/l	5.0	1.0	12/24/02 04:05	RWS	91-20-3		
Toluene	ND	ug/l	5.0	1.0	12/24/02 04:05	RWS	108-88-3		
m&p-Xylene	ND	ug/l	10.	1.0	12/24/02 04:05	RWS			
o-Xylene	ND	ug/l	5.0	1.0	12/24/02 04:05	RWS	95-47-6		
Toluene-d8 (S)	99	%		1.0	12/24/02 04:05	RWS	2037-26-5		
4-Bromofluorobenzene (S)	86	%		1.0	12/24/02 04:05	RWS	460-00-4		
Dibromofluoromethane (S)	126	%		1.0	12/24/02 04:05	RWS	1868-53-7	2	
1,2-Dichloroethane-d4 (S)	125	%		1.0	12/24/02 04:05	RWS	17060-07-0		

## REPORT OF LABORATORY ANALYSIS

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Lab Project Number: 9239655  
Client Project ID: Hot Spot 3005 12719

Lab Sample No: 922706775      Project Sample Number: 9239655-005      Date Collected: 12/16/02 13:29  
Client Sample ID: MW-9      Matrix: Water      Date Received: 12/19/02 10:00

Parameters	Results	Units	Report Limit	DF	Analyzed	By	CAS No.	Qual	RegLmt
<b>GC/MS Volatiles</b>									
GC/MS VOCs by 8260	Method: EPA 8260								
Benzene	ND	ug/l	5.0	1.0	12/24/02 19:23	DLK	71-43-2		
Ethylbenzene	ND	ug/l	5.0	1.0	12/24/02 19:23	DLK	100-41-4		
Methyl-tert-butyl ether	ND	ug/l	5.0	1.0	12/24/02 19:23	DLK	1634-04-4		
Naphthalene	ND	ug/l	5.0	1.0	12/24/02 19:23	DLK	91-20-3		
Toluene	ND	ug/l	5.0	1.0	12/24/02 19:23	DLK	108-88-3		
m&p-Xylene	ND	ug/l	10.	1.0	12/24/02 19:23	DLK			
o-Xylene	ND	ug/l	5.0	1.0	12/24/02 19:23	DLK	95-47-6		
Toluene-d8 (S)	87	%		1.0	12/24/02 19:23	DLK	2037-26-5		
4-Bromofluorobenzene (S)	87	%		1.0	12/24/02 19:23	DLK	460-00-4		
Dibromofluoromethane (S)	99	%		1.0	12/24/02 19:23	DLK	1868-53-7		
1,2-Dichloroethane-d4 (S)	113	%		1.0	12/24/02 19:23	DLK	17060-07-0		

Date: 12/30/02

Page: 5 of 12

Laboratory Certification IDs  
NC Wastewater 12  
NC Drinking Water 37706  
SC 99006

## REPORT OF LABORATORY ANALYSIS

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Laboratory Certification IDs  
LA Wastewater 04034  
VA Drinking Water 213  
FL NELAP E87627



Lab Project Number: 9239655  
Client Project ID: Hot Spot 3005 12719

Lab Sample No: 922706783      Project Sample Number: 9239655-006      Date Collected: 12/16/02 13:54  
Client Sample ID: MW-10      Matrix: Water      Date Received: 12/19/02 10:00

Parameters	Results	Units	Report Limit	DF	Analyzed	By	CAS No.	Qual	RegLmt
<b>GC/MS Volatiles</b>									
GC/MS VOCs by 8260	Method: EPA 8260								
Benzene	ND	ug/l	5.0	1.0	12/24/02 18:23	DLK	71-43-2		
Ethylbenzene	ND	ug/l	5.0	1.0	12/24/02 18:23	DLK	100-41-4		
Methyl-tert-butyl ether	ND	ug/l	5.0	1.0	12/24/02 18:23	DLK	1634-04-4		
Naphthalene	ND	ug/l	5.0	1.0	12/24/02 18:23	DLK	91-20-3		
Toluene	ND	ug/l	5.0	1.0	12/24/02 18:23	DLK	108-88-3		
m&p-Xylene	ND	ug/l	10.	1.0	12/24/02 18:23	DLK			
o-Xylene	ND	ug/l	5.0	1.0	12/24/02 18:23	DLK	95-47-6		
Toluene-d8 (S)	106	%		1.0	12/24/02 18:23	DLK	2037-26-5		
4-Bromofluorobenzene (S)	93	%		1.0	12/24/02 18:23	DLK	460-00-4		
Dibromofluoromethane (S)	88	%		1.0	12/24/02 18:23	DLK	1868-53-7		
1,2-Dichloroethane-d4 (S)	93	%		1.0	12/24/02 18:23	DLK	17060-07-0		

Date: 12/30/02

Page: 6 of 12

Laboratory Certification IDs  
NC Wastewater 12  
NC Drinking Water 37706  
SC 99006

## REPORT OF LABORATORY ANALYSIS

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Laboratory Certification IDs  
LA Wastewater 04034  
VA Drinking Water 213  
FL NELAP E87627



Lab Project Number: 9239655  
Client Project ID: Hot Spot 3005 12719

Lab Sample No: 922706791      Project Sample Number: 9239655-007      Date Collected: 12/16/02 14:11  
Client Sample ID: MW-11      Matrix: Water      Date Received: 12/19/02 10:00

Parameters	Results	Units	Report Limit	DF	Analyzed	By	CAS No.	Qual	RegLmt
------------	---------	-------	--------------	----	----------	----	---------	------	--------

**GC/MS Volatiles**

GC/MS VOCs by 8260

Method: EPA 8260

Benzene	ND	ug/l	5.0	1.0	12/24/02 18:53	DLK	71-43-2		
Ethylbenzene	ND	ug/l	5.0	1.0	12/24/02 18:53	DLK	100-41-4		
Methyl-tert-butyl ether	ND	ug/l	5.0	1.0	12/24/02 18:53	DLK	1634-04-4		
Naphthalene	ND	ug/l	5.0	1.0	12/24/02 18:53	DLK	91-20-3		
Toluene	ND	ug/l	5.0	1.0	12/24/02 18:53	DLK	108-88-3		
m&p-Xylene	ND	ug/l	10.	1.0	12/24/02 18:53	DLK			
o-Xylene	ND	ug/l	5.0	1.0	12/24/02 18:53	DLK	95-47-6		
Toluene-d8 (S)	102	%		1.0	12/24/02 18:53	DLK	2037-26-5		
4-Bromofluorobenzene (S)	89	%		1.0	12/24/02 18:53	DLK	460-00-4		
Dibromofluoromethane (S)	86	%		1.0	12/24/02 18:53	DLK	1868-53-7		
1,2-Dichloroethane-d4 (S)	95	%		1.0	12/24/02 18:53	DLK	17060-07-0		

Date: 12/30/02

Page: 7 of 12

Laboratory Certification IDs

NC Wastewater 12  
NC Drinking Water 37706  
SC 99006

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Laboratory Certification IDs

LA Wastewater 04034  
VA Drinking Water 213  
FL NELAP E87627





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PARAMETER FOOTNOTES

Dilution factor shown represents the factor applied to the reported result and reporting limit due to changes in sample preparation, dilution of the extract, or moisture content

- ND Not detected at or above adjusted reporting limit
- NC Not Calculable
- J Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
- MDL Adjusted Method Detection Limit
- (S) Surrogate
- [1] High surrogate recovery was confirmed as a matrix effect by a second analysis.
- [2] The surrogate and/or spike recovery was outside acceptance limits.

Laboratory Certification IDs

NC Wastewater 12  
NC Drinking Water 37706  
SC 99006

**REPORT OF LABORATORY ANALYSIS**

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Laboratory Certification IDs

LA Wastewater 04034  
VA Drinking Water 213  
FL NELAP E87627





QUALITY CONTROL DATA

Lab Project Number: 9239655  
Client Project ID: Hot Spot 3005 12719

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 922712765 922712773

Parameter	Units	922706759	Spike	MS	MSD	MS	MSD	RPD	Footnotes
		Result	Conc.	Result	Result	% Rec	% Rec		
Benzene	ug/l	1.353	50.00	45.97	46.20	89	90	0	
Toluene	ug/l	0.7794	50.00	42.68	42.72	84	84	0	
Toluene-d8 (S)						98	98		
4-Bromofluorobenzene (S)						98	100		
Dibromofluoromethane (S)						99	94		
1,2-Dichloroethane-d4 (S)						103	98		

**REPORT OF LABORATORY ANALYSIS**

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**QUALITY CONTROL DATA PARAMETER FOOTNOTES**

Consistent with EPA guidelines, unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

- LCS(D) Laboratory Control Sample (Duplicate)
- MS(D) Matrix Spike (Duplicate)
- DUP Sample Duplicate
- ND Not detected at or above adjusted reporting limit
- NC Not Calculable
- J Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
- MDL Adjusted Method Detection Limit
- RPD Relative Percent Difference
- (S) Surrogate
- [1] The surrogate and/or spike recovery was outside acceptance limits.

**REPORT OF LABORATORY ANALYSIS**

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

676329

<b>Required Client Information: Section A</b>		<b>Required Client Information: Section B</b>		Page: 1 of 1		<b>Section C</b>	
Company: <b>SCDHEC</b>		Report To: <b>D. Thoma</b>		Client Information (Check quote/contract):		To Be Completed by Pace Analytical and Client	
Address: <b>2600 Bull St Columbia SC</b>		Copy To:		Requested Due Date:		Quote Reference:	
Phone: <b>803 896-6240</b> Fax: <b>803 896-6245</b>		Project Name: <b>Hot Spot 3005</b>		* Turn around times less than 14 days subject to laboratory and contractual obligations and may result in a Rush Turnaround Surcharge.		Project Manager:	
Project Number: <b>12719</b>		P.O.:		Turn Around Time (TAT) in calendar days.		Project #: <b>9259055</b>	
Section D Required Client Information:		Valid Matrix Codes		DATE COLLECTED		TIME COLLECTED	

ITEM #	MATRIX	CODE	MATRIX CODE	DATE COLLECTED	TIME COLLECTED	# Containers	Preservatives							Remarks / Lab ID	
							Unpreserved	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol		Other
1	mW	-1R	WT	12/16/02	1300	3			3						922706734
2	mW	-3R		12/16/02	1228	3			3						922706742
3	mW	-6		12/16/02	1246	3			3						922706759
4	mW	-7		12/16/02	1315	3			3						922706767
5	mW	-9		12/16/02	1329	3			3						922706775
6	mW	-10		12/16/02	1354	3			3						922706783
7	mW	-11		12/16/02	1411	3			3						922706791

SHIPMENT METHOD	AIRBILL NO.	SHIPPING DATE	NO. OF COOLERS	ITEM NUMBER	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
								<i>Key Pimienta</i>	12/18/02	1000

**SAMPLE CONDITION**

Temp in °C	11.7
Received on Ice	Y/N
Sealed Cooler	Y/N
Samples Intact	Y/N

**SAMPLE NOTES**

**SAMPLER NAME AND SIGNATURE**

PRINT Name of SAMPLER: **Key Pimienta**

SIGNATURE of SAMPLER: *Key Pimienta*

DATE Signed: (MM / DD / YY) **12/18/02**

Additional Comments:

### Instructions for completing Chain of Custody (COC)

1. Complete all Client Information at top of sheet: name, address, phone, contact (person to whom report will be sent and contact can be made if questions arise), billing information if different from client, PO#, Project Name and/or Project Number as it will appear on the report.
2. Quote Reference, Project Manager, Project No. and Profile No. will be completed by Pace.
3. A separate COC must be filled out for each day of sample collection.
4. Sampler should print their name in the space provided and sign their name followed by the date of the sampling event.
5. Complete Sample Description as it will appear on the laboratory report; include time of sampling, sample matrix, no. of containers and preservative used.
6. Analysis Requested: Complete analysis on the lines provided and place a check in the column for the samples requiring the analysis. It may be necessary to use the space provided for additional comments or include attachments for extended lists of parameters.
7. Submission of samples to laboratory: Indicate Item Number of those samples being transferred; sign relinquished by, and include your affiliation.

**\* IMPORTANT NOTE:**

**Standard Turnaround Time is 2 weeks.** If this does not satisfy your requirements, arrangements must be made prior to samples being submitted to the laboratory. Contact your project manager.

**Special Project Requirements** such as Low Level Detection Limits or level of QC reported must be indicated on the chain of custody. (Use Additional Comments Section.)

SEE REVERSE SIDE FOR INSTRUCTIONS

SAMPLER NAME AND SIGNATURE	DATE
PROJECT NO.	PROJECT NAME
CLIENT NAME	CLIENT ADDRESS
CLIENT PHONE	CLIENT CONTACT
CLIENT PO#	CLIENT BILLING INFO

SAMPLE CONDITION	Temperature
	Relative Humidity
	Container Cooler
	Sealed/Unsealed
	Additional



DT  
7/7  
16.25

## Geological Resources, Inc.

December 31, 2002

**RECEIVED**

JAN 06 2003

UNDERGROUND STORAGE  
TANK PROGRAM

Mr. Robert Faller  
Environmental Health Manager  
Bureau of Underground Storage Tank Management  
South Carolina Department of Health and Environmental Control  
2600 Bull Street  
Columbia, SC 29201-1708

Re: Hot Spot 3005  
Site ID# ~~17680-P~~ 12719  
CP # 17680:P; PO # 404342

Dear Mr. Faller:

Please find enclosed the **original report** for the above referenced site.

The original invoice has been submitted to Ms. Pat Holland of the Finance Section as specified in the contract.

Sincerely,

Shawn L. Judd  
Project Coordinator



4913 Albemarle Road Suite 101 Charlotte, NC 28205  
Phone: (704) 563-1663 / (888) 870-4133 Fax: (704) 563-1662

[www.geologicalresourcesinc.com](http://www.geologicalresourcesinc.com)



# FIELD ACTIVITY WORKSHEET ORDER

Date of Request: \_\_\_\_\_

**Type of Request:**

(Please indicate your request with a check mark)

- Emergency (<2 Working Days)
- Specific (1-5 Working Days)
- Routine (10 Working Days)

1638-3

Please specify the type of work to be completed:

Sample 7 monitoring wells (MW-1<sup>R</sup>, MW-3<sup>R</sup>, MW-6, MW-7, MW-9, MW-10, & MW-11) for BTEX, Naph, MTBE.

Facility Name: Hot Spot 3005

Permit Number: 12719

Project Manager: D. Thoma

County: Spartanburg

Sample  
ASAP

(Field Staff Only)

Date Field Activity Completed:	_____
Completed by Field Staff:	_____
Date Field Notes Entered into EFIS:	_____

Field Staff Comments:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**REMEMBER TO ESTABLISH COST PROPOSALS**

PACE CA#: 17679:P

GRI CA#: 17680:P

PALMETTO ENV GROUP CA#: \_\_\_\_\_

Fill out back of this form. Photocopy, attach a completed CP cover for each CP. Thank you very much!

**UST Permit #** 12719  
**Facility Name** Hot Spot 3005

**PACE CA#:** 17679:P  
**PO #** 416276

**GROUNDWATER ANALYSES**

TASK CODE	WATER/METHOD	QUANTITY	RATE	TOTAL
11A	BTEX+NAPH+MTBE (8260)	7	\$30.00	\$210.00
11A	BTEX+NAPH+MTBE (8021)		\$30.00	\$0.00
11F	EDB (8011)		\$40.00	\$0.00
11D	PAHs (8270)		\$65.00	\$0.00
11G	8 RCRA METALS		\$65.00	\$0.00
11E	LEAD (6010)		\$7.50	\$0.00
11H	TPH (9070)		\$35.00	\$0.00
	TOC (9060)		\$33.00	\$0.00
11I	pH (150.1)		\$5.00	\$0.00
11K	NITRATES (9056/9210)		\$10.00	\$0.00
11L	SULFATES (9056/9038)		\$10.00	\$0.00
11N	METHANE		\$72.50	\$0.00
	Total dissolved iron (200.7)		\$10.00	\$0.00
11M	Fe+2 (SM3500FeD)		\$10.00	\$0.00
	Fe+3 (200.7)		\$10.00	\$0.00
11P	Oxygenates		\$200.00	\$0.00

**SOIL ANALYSES**

TASK CODE	SOIL/METHOD	QUANTITY	RATE	TOTAL
11Q	BTEX (8260-5035)		\$40.00	\$0.00
11Q	BTEX (8021-5035)		\$40.00	\$0.00
11R	PAHs (8270)		\$65.00	\$0.00
11S	8 RCRA METALS		\$65.00	\$0.00
	LEAD (6010)		\$8.00	\$0.00
11T	TPH (diesel)		\$35.00	\$0.00
11U	TPH (gas)		\$30.00	\$0.00
11V	TPH (9071)		\$55.00	\$0.00
11X	TOC (9060)		\$33.00	\$0.00
	<b>Expedite Cost</b>	1.00		\$0.00

**PACE TOTAL:** \$210.00

**Palmetto Env. Group CP#** \_\_\_\_\_  
**PO #** 337210

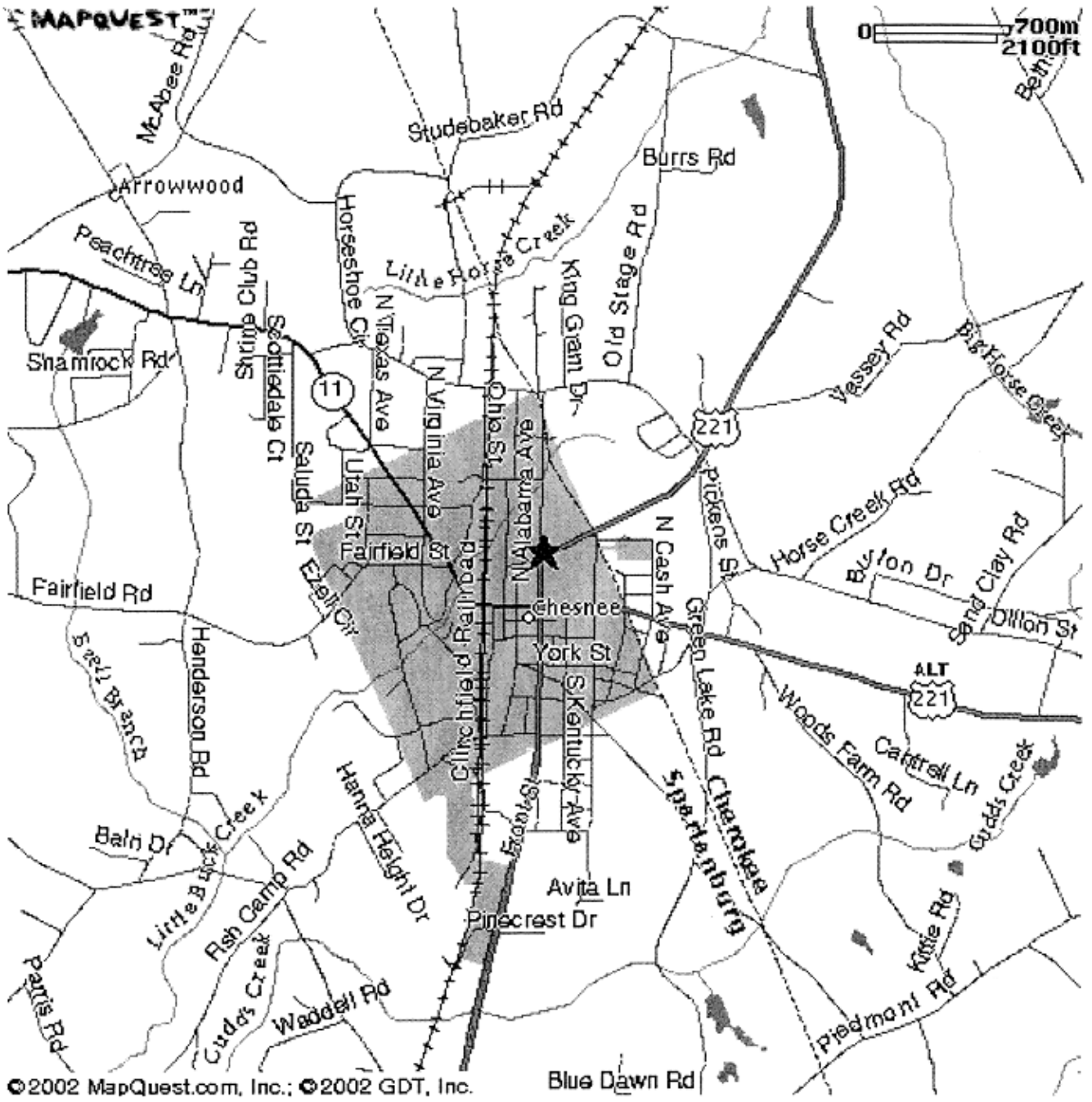
TASK CODE	TASK	QUANTITY	RATE	TOTAL
VB 17	New GAC & Installation		\$1,744.00	\$0.00
VB 18	Installation w/o GAC		\$1,004.00	\$0.00
VB 19	Carbon, gravel, & filter replacement		\$395.00	\$0.00
VB 20	Disassemble & Clean		\$400.00	\$0.00
VB 21	Mobilization		\$75.00	\$0.00
VB 22	Locks		\$20.00	\$0.00
VB 23	Housing Unit		\$350.00	\$0.00
VB 29	Inline Particulate Filter		\$125.00	\$0.00
VB 7	Additional Piping		\$2.00	\$0.00

**Palmetto TOTAL** \$0.00

**GRI CP#** 17680:P  
**PO #** 404342

TASK CODE	TASK	QUANTITY	RATE	TOTAL
10A	PURGE & SAMPLE	7	\$19.95	\$139.65
	GAUGE Only		\$7.25	\$0.00
	TAP SAMPLE		\$4.00	\$0.00
17A2	DISPOSAL/WATER	150	\$0.55	\$82.50
4B	MOB	1	\$49.75	\$49.75

**GRI TOTAL:** \$271.90



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Blue Dawn Rd



Field Data Information Sheet for Ground-Water Sampling  
 South Carolina Department of Health and Environmental Control  
 Bureau of Underground Storage Tank Management

Date (mm/dd/yy): 12/16/02  
 Field Personnel: RP  
 General Weather Conditions: Sunny  
 Ambient Air Temperature: 60°F C

**Quality Assurance**

pH Meter		Conductivity Meter	
serial no.	<u>809061</u>	serial no.	
pH=4.0	<input checked="" type="checkbox"/>	Standard	
pH=7.0	<input type="checkbox"/>	Standard	
pH=10.0	<input type="checkbox"/>	Standard	

**Chain of Custody**

Relinquished by	Date/Time	Received by	Date/Time

Facility Name: Hot Spot 3005  
 Site ID # 12719 Monitoring Well # MW-3R  
 Well Diameter (D): .167 feet  
 Conversion factor (C): 3.14 X (D/2)<sup>2</sup> for a 2 inch well C = 0.163  
 for a 4 inch well C = 0.652

\* Free Product Thickness: \_\_\_\_\_ feet  
 Depth to Ground Water (DGW) 30.87 feet  
 Total Well Depth (TWD) 36.10 feet  
 Length of the water column (LWC = TWD-DGW) 5.23 feet

1 casing volume (CV = LWC X C) = 5.23 x .163 = .85 gals  
 3 casing volume 3 X CV = 2.55 gals (standard purge volume)

Total volume of Water Purged Before Sampling 1.25 gals  
 Total volume of Water Purged for Post Sampling .25 gals  
1.50 Total Purged

*\*If free product is present over 1/8 inch, sampling will not be required.*

	Initial	1st Vol.	2nd Vol.	3rd Vol.	4th Vol.	5th Vol.	Post Sampling	Sample
Cumulative Volume Purged (gallons)	.25	<del>0.25</del>	<del>0.50</del>				.25	
Time (military)	1222	<del>1222</del>	<del>1222</del>				1229	1228
pH (s.u.)	5.0						5.5	
Specific Cond. (umhos/cm)	4.5						.94	
Water Temperature (degrees C)	19						20	
Turbidity (subjective: clear, slightly cloudy, cloudy)	scloudy						cloudy	
Dissolved Oxygen (mg/l)	2.2						1.1	
PID readings, if required								

Remarks: Bailed dry 1.25





Field Data Information Sheet for Ground-Water Sampling  
 South Carolina Department of Health and Environmental Control  
 Bureau of Underground Storage Tank Management

Date (mm/dd/yy): 12/16/02  
 Field Personnel: KP  
 General Weather Conditions: Sunny  
 Ambient Air Temperature: 60°F C

**Quality Assurance**

pH Meter serial no. 809061 Conductivity Meter serial no. \_\_\_\_\_  
 pH=4.0 ✓ Standard \_\_\_\_\_  
 pH=7.0 \_\_\_\_\_ Standard \_\_\_\_\_  
 pH=10.0 \_\_\_\_\_ Standard \_\_\_\_\_

**Chain of Custody**

Relinquished by	Date/Time	Received by	Date/Time

Facility Name: Hot Spot 3005  
 Site ID # 12719 Monitoring Well # MW-9  
 Well Diameter (D): .167 feet  
 Conversion factor (C): 3.14 X (D/2)<sup>2</sup> for a 2 inch well C = 0.163  
 for a 4 inch well C = 0.652

\* Free Product Thickness: \_\_\_\_\_ feet  
 Depth to Ground Water (DGW) 28.12 feet  
 Total Well Depth (TWD) 35.00 feet  
 Length of the water column (LWC = TWD-DGW) 6.88 feet

1 casing volume (CV = LWC X C) = 3.36 6.88 x .163 = 1.12 gals  
 3 casing volume 3 X CV = \_\_\_\_\_ gals (standard purge volume)

Total volume of Water Purged Before Sampling 2.25 gals  
 Total volume of Water Purged for Post Sampling 2.25 gals  
2.25 Total Purged

\*If free product is present over 1/8 inch, sampling will not be required.

	Initial	1st Vol.	2nd Vol.	3rd Vol.	4th Vol.	5th Vol.	Post Sampling	Sample
Cumulative Volume Purged (gallons)	.25	1.5	<del>3.36</del>				.25	
Time (military)	1322	1324	<del>1327</del>				1331	1329
pH (s.u.)	3.3	3.6					3.5	
Specific Cond. (umhos/cm)	104	105					106	
Water Temperature (degrees C)	19	20					19	
Turbidity (subjective: clear, slightly cloudy, cloudy)	cloudy	cloudy					cloudy	
Dissolved Oxygen (mg/l)	3.8	4.1					3.6	
PID readings, if required								

Remarks: Bailed dry 2.25





**Field Data Information Sheet for Ground-Water Sampling**  
 South Carolina Department of Health and Environmental Control  
 Bureau of Underground Storage Tank Management

Date (mm/dd/yy): 12/16/02  
 Field Personnel: KP  
 General Weather Conditions: SUNNY  
 Ambient Air Temperature: 60°F C

Quality Assurance

pH Meter serial no. 809061 Conductivity Meter serial no. \_\_\_\_\_  
 pH=4.0  Standard \_\_\_\_\_  
 pH=7.0 \_\_\_\_\_ Standard \_\_\_\_\_  
 pH=10.0 \_\_\_\_\_ Standard \_\_\_\_\_

Chain of Custody

Relinquished by	Date/Time	Received by	Date/Time

Facility Name: Hot Spot 3005  
 Site ID # 12719 Monitoring Well # MW-11  
 Well Diameter (D): .167 feet  
 Conversion factor (C): 3.14 X (D/2)<sup>2</sup> for a 2 inch well C = 0.163  
 for a 4 inch well C = 0.652

\* Free Product Thickness: \_\_\_\_\_ feet  
 Depth to Ground Water (DGW) 23.23 feet  
 Total Well Depth (TWD) 27.71 feet  
 Length of the water column (LWC = TWD-DGW) 4.48 feet

1 casing volume (CV = LWC X C) = 2.19 4.48 x .163 = .73 gals  
 3 casing volume 3 X CV = \_\_\_\_\_ gals (standard purge volume)

Total volume of Water Purged Before Sampling 1.75 gals  
 Total volume of Water Purged for Post Sampling \_\_\_\_\_ gals  
1.75 Total Purged

**\*If free product is present over 1/8 inch, sampling will not be required.**

	Initial	1st Vol.	2nd Vol.	3rd Vol.	4th Vol.	5th Vol.	Post Sampling	Sample
Cumulative Volume Purged (gallons)	<u>0.25</u>	<u>1.0</u>	<u>1.75</u>					
Time (military)	<u>1404</u>	<u>1407</u>	<u>1410</u>					<u>1411</u>
pH (s.u.)	<u>3.5</u>	<u>3.2</u>	<u>3.0</u>					
Specific Cond. (umhos/cm)	<u>107</u>	<u>.07</u>	<u>.07</u>					
Water Temperature (degrees C)	<u>18</u>	<u>18</u>	<u>19</u>					
Turbidity (subjective: clear, slightly cloudy, cloudy)	<u>Slightly</u>	<u>cloudy</u>	<u>cloudy</u>					
Dissolved Oxygen (mg/l)	<u>3.2</u>	<u>2.9</u>	<u>3.4</u>					
PID readings, if required								

Remarks:



# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

676329

<b>Required Client Information: Section A</b>		<b>Required Client Information: Section B</b>		<b>Page: 1 of 1</b>		<b>To Be Completed by Pace Analytical and Client Section C</b>	
Company: <b>SCDHEC</b>		Report To: <b>D. Thoma</b>		Client Information (Check quote/contract):		Quote Reference:	
Address: <b>2600 Bull St Columbia SC</b>		Copy To:		Requested Due Date:		Project Manager:	
P.O.:		Invoice To:		*TAT:		Project #:	
Project Name: <b>Hot Spot 3005</b>		Project Number: <b>12719</b>		* Turn around times less than 14 days subject to laboratory and contractual obligations and may result in a Rush Turnaround Surcharge. Turn Around Time (TAT) in calendar days.		Profile #:	
Phone: <b>803 896-6240</b> Fax: <b>803 896-6245</b>		Project Number: <b>12719</b>		Requested Analysis:		Requested Analysis:	

ITEM #	Section D Required Client Information: SAMPLE ID			MATRIX CODE	DATE COLLECTED mm / dd / yy	TIME COLLECTED hh:mm a/p	# Containers	Preservatives							Remarks / Lab ID
	One character per box. (A-Z, 0-9 / . -) Sample IDs MUST BE UNIQUE							Valid Matrix Codes	Unpreserved	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	
1	m	w	-1R	WT	12/11/02	1300	3							X	
2	m	w	-3R		12/11/02	1228	3							X	
3	m	w	-6		12/16/02	1246	3							X	
4	m	w	-7		12/16/02	1315	3							X	
5	m	w	-9		12/16/02	1329	3							X	
6	m	w	-10		12/16/02	1354	3							X	
7	m	w	-11		12/16/02	1411	3							X	
8															
9															
10															
11															
12															

SHIPMENT METHOD	AIRBILL NO.	SHIPPING DATE	NO. OF COOLERS	ITEM NUMBER	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME

SAMPLE CONDITION		SAMPLE NOTES
Temp in °C		
Received on Ice	Y/N	
Sealed Cooler	Y/N	
Samples Intact	Y/N	

Additional Comments:

SAMPLER NAME AND SIGNATURE	
PRINT Name of SAMPLER: <b>Key Pimienta</b>	
SIGNATURE of SAMPLER: <i>Key Pimienta</i>	DATE Signed: (MM / DD / YY) <b>12/18/02</b>

CHAIN OF CUSTODY ANALYTICAL REPORT DOCUMENT

828328

1 - 25

Instructions for completing Chain of Custody (COC)

1. Complete all Client Information at top of sheet: name, address, phone, contact (person to whom report will be sent and contact can be made if questions arise), billing information if different from client, PO#, Project Name and/or Project Number as it will appear on the report.
2. Quote Reference, Project Manager, Project No. and Profile No. will be completed by Pace.
3. A separate COC must be filled out for each day of sample collection.
4. Sampler should print their name in the space provided and sign their name followed by the date of the sampling event.
5. Complete Sample Description as it will appear on the laboratory report; include time of sampling, sample matrix, no. of containers and preservative used.
6. Analysis Requested: Complete analysis on the lines provided and place a check in the column for the samples requiring the analysis. It may be necessary to use the space provided for additional comments or include attachments for extended lists of parameters.
7. Submission of samples to laboratory: Indicate Item Number of those samples being transferred; sign relinquished by, and include your affiliation.

**\* IMPORTANT NOTE:**

**Standard Turnaround Time is 2 weeks.** If this does not satisfy your requirements, arrangements must be made prior to samples being submitted to the laboratory. Contact your project manager.

**Special Project Requirements** such as Low Level Detection Limits or level of QC reported must be indicated on the chain of custody. (Use Additional Comments Section.)

SEE REVERSE SIDE FOR INSTRUCTIONS



# HAZ~MAT

TRANSPORTATION AND DISPOSAL  
P. O. BOX 37392 • CHARLOTTE, N.C. 28237  
(704) 332-5600  
FAX (704) 375-7183

Manifest No. 14549

P.O. No. \_\_\_\_\_

Job No. 02-3787

## NON-HAZARDOUS SPECIAL WASTE

### Section I. GENERATOR (Generator completes all of Section I)

<b>GENERATOR LOCATION</b>	<b>WORK CONTRACTED BY</b>								
NAME <u>Hot Spot 3005</u>	Bill To (If different from information at left)								
ORIGINATING ADDRESS _____	NAME <u>Geological Resources</u>								
MAILING ADDRESS _____	ADDRESS <u>4913 Albemarle Rd</u>								
CITY <u>Chesnee</u> STATE <u>SC</u> ZIP _____	CITY <u>Charlotte</u> STATE <u>NC</u> ZIP _____								
PHONE NO. _____	PHONE NO. <u>(704) 563-1663</u>								
CONTACT NAME _____	CONTACT NAME <u>Shawn Judd</u>								
DES. OF WASTE: <u>H2O NON-hazardous</u>	<table border="1"> <tr> <td>No.</td> <td>Type</td> <td>Units</td> <td>Quantity</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	No.	Type	Units	Quantity				
No.	Type	Units	Quantity						

### Section II. INVOICE INFORMATION GALLONS      DRUMS

DESCRIPTION	QUANTITY	LINE TOTAL
1. WATER, OIL & COOLANT PUMPED FROM TANKS OR DRUMS		
2. OFF SPEC LIGHT OIL, WATER & GAS PUMPED FROM TANKS OR DRUMS		
3. 55 GALLON DRUMS REMOVED - SOLID		
4. 55 GALLON DRUMS REMOVED - LIQUID	<u>16.25 gal</u>	
5.		
6.		
7.		
8.		
9. ARRIVAL TIME:		
10. DEPARTURE TIME:		

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if the waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Ken Pimienta Generator Authorized Agent Name      Ken Pimienta Signature      122002 Shipment Date

### Section III. TRANSPORTER TRANSPORTER (Generator complete a-d; Transporter I complete e-g; Transporter II complete h-j)

<b>HAZ~MAT</b> TRANSPORTATION AND DISPOSAL P. O. BOX 37392 • CHARLOTTE, N.C. 28237		<b>TRANSPORTER II</b>					
a. Driver Name / Title _____	b. Phone No. _____	c. Truck No. _____	e. Name <u>GRI</u>				
Hazardous Waste Transporter Permits EPA NCR 000003186 EPA NCD048461370			f. Address <u>4913 Albemarle Rd</u> <u>Charlotte NC</u>				
d. Driver Signature _____	Shipment Date <table border="1"><tr><td> </td><td> </td><td> </td><td> </td></tr></table>						g. Driver Name / Title _____
			h. Phone No. _____				
			i. Truck No. _____				
			j. Transporter II Permit Nos. <u>Ken Pimienta</u> <u>Ken Pimienta</u>				
			Shipment Date <u>122002</u>				

### Section IV. FACILITY INFORMATION AND CERTIFICATE OF DISPOSAL

Site Name: <u>Haz-Mat Transportation &amp; Disposal, Inc.</u>	a. Phone No. <u>704-332-5600</u>
Physical Address: <u>210 Dalton Avenue</u> <u>Charlotte, N.C. 28237</u>	b. Mailing Address: <u>P.O. Box 37392</u> <u>Charlotte, N.C. 28237</u>

e. Discrepancy Indication Space \_\_\_\_\_  
This is to certify that all non-hazardous material removed from above location has been received and will be disposed of in accordance with applicable local, state and federal regulations in the following manner: (1) Petroleum products are blended into a beneficial reusable fuel for use in large industrial burners. (2) Waste waters are to be treated with polymers, pH adjusters, and a flocculant, then flows through a dissolved air flotation system for pretreatment separation, then into the CMUD sanitation sewer system under permit IUP#5012. (3) Sludges from treatment systems are hauled to E.P.A. approved facilities for proper disposal. Manifest and certificate of disposal are on file. (4) Our treatment system operates on a first in, first out basis and product should be processed within seven days.

SIGNATURE OF FACILITY AGENT Shawn Judd      DATE      MONTH 12      DAY 30      YEAR 01



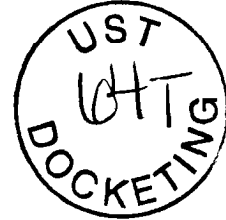
2600 Bull Street  
Columbia, SC 29201-1708

**UNDERGROUND STORAGE TANK PROGRAM  
BUREAU OF LAND AND WASTE MANAGEMENT**

Phone: (800) 826-5435 Fax: (803) 896-6245

**JAN 08 2003**

**MR MARK BROOKS  
BROOKS & MEDLOCK ENGINEERING  
17 ARLINGTON ST  
ASHEVILLE NC 28801-2005**



Re: Hot Spot 3005, 107 Hampton St., Chesnee, SC  
UST Permit #12719, CA#: 13851:P  
Bid#: SB-18123-12/20/01-HW, PO#385179  
Analytical Report received December 31, 2002  
Spartanburg County

Dear Mr. Brooks:

On December 16, 2002, a Corrective Action verification sampling event was completed at the referenced facility. The results (see enclosure) verify that Brooks & Medlock have achieved a 99.78% mass reduction.

If you have any questions or need additional information, please contact me at (803) 896-6397 or (800) 826-5435.

Sincerely,

Debra L. Thoma, Hydrogeologist  
State Lead & Field Services Section  
Assessment and Corrective Action Division

Enc: Analytical Report

cc: Technical File

SCDHEC/UST/DLT/1.6.03/06542rp\_awd



**BROOKS & MEDLOCK**  
ENGINEERING, PLLC

February 19, 2003

South Carolina DHEC  
Groundwater Protection Division  
2600 Bull Street  
Columbia, South Carolina 29201

**RECEIVED**

FEB 24 2003

UNDERGROUND STORAGE  
TANK PROGRAM

ATTENTION: Mr. Rob Devlin

Reference: **UNDERGROUND INJECTION CONTROL PERMIT APPLICATION**  
Hot Spot # 3005  
Site ID No. 12719  
Chesnee, South Carolina

Dear Mr. Devlin:

Brooks & Medlock Engineering, PLLC, on behalf of Jordan Oil Company, is writing to request permission to construct four Class VA-I injection wells at the Hot Spot # 3005 located in Chesnee (UST Site ID# 12719). Enclosed is the Underground Injection Control Permit Application with the associated attachments and figures.

The general site location is depicted on Figure 1, the location of the proposed air injection wells are depicted on Figure 2, and a typical air sparging well is shown in Figure 3.

If you have any questions or comments, please contact me at (828) 232-4700.


Sincerely,

**Brooks & Medlock Engineering, PLLC**

Mark Brooks, P.E.  
Environmental Engineer

c.c. Debra Thomas, Bureau of UST Management



Form  I  UIC	 <b>Underground Injection Control Permit Application</b> <b>Ground-Water Protection Division</b> (Collected under the Authority of Title 48 Chapter 1 of the 1976 South Carolina Code of Laws)	1. EPA ID NUMBER		
			T/A	C
		U		

Read attached instructions before starting.  
For Official Use Only

Application Approved month day year	Date Received month day year	PermitWellNumber

Comments

<b>11. Facility Name and Address</b>	<b>111. Owner/Operator and Address</b>
FacilityName Hot Spot # 3005 Site ID # 12719	Owner/OperatorName  Brooks and Medlock Engineering, PLLC
Street Address 107 Hampton Street	Street Address 17 Arlington Street
City State Zip Code Chesnee SC 29323	City State Zip Code Asheville NC 28801

<b>IV. Ownership Status (Mark "x")</b>	<b>V. SIC Codes</b>
<input type="checkbox"/> A. Federal <input type="checkbox"/> B. State <input checked="" type="checkbox"/> C. Private <input type="checkbox"/> D. Public <input type="checkbox"/> E. Other (Explain)	None

<b>VI. Well Status (Mark "x")</b>		
<input type="checkbox"/> A. Operating	Date Started month day year	<input type="checkbox"/> B. Modification/Conversion <input checked="" type="checkbox"/> C. Proposed

<b>VII. Type of Permit Requested - Class and Type of Well (see reverse)</b>			
A. Class(es) enter code(s) V.A.	B. Type(s) enter code(s) I	C. If class is "other" or type is code 'Y', explain	D. Number of Wells per type 4

<b>VIII. Location of Wells or Approximate Center of field or Project</b>									
C	A. Latitude					B. Longitude			
1	Deg	Min	Sec			Deg	Min	Sec	
	35	9	5.8			81	5	36	

**IX. Attachments**  
Complete the following questions on a separate sheet(s) and number accordingly; see instructions for Classes 11, 111, and V, complete and submit on a separate sheet(s) attachments A-U as appropriate. Attach maps where required. List attachments by letter which are applicable and include with your application.

<b>X. Certification</b>	
I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment.	
A. Name and Title (Type or Print) <i>MARK BROOKS</i>	B. Phone No. ( 828 ) 232-4700
C. Signature <i>Mark Brooks</i>	D. Date Signed <i>2/19/03</i>



## ATTACHMENTS TO UIC FORM 1

### **Attachment A: Activity for Review**

The proposed groundwater remediation project consists of injecting atmospheric air into the shallow subsurface aquifer. The air is to be injected by a mobile air sparge unit. The injected air will "strip" volatile organic compounds from the groundwater and transport them through the unsaturated zone. In addition, this process is expected to increase the natural bioactivity in the subsurface, thereby increasing the natural degradation of hydrocarbon contaminants dissolved in the groundwater and partitioned to soil particles in the vadose zone. Some subsurface air will be collected by a soil vapor extraction unit operating at the site.

### **Attachment B: Well Construction Details**

The construction details for the air injection wells are shown on Figure 2.

### **Attachment C: Operating Data**

The following is a list of the expected operating data:

1. Four (4) air injection wells are anticipated for the project. Each well is anticipated to inject an average of approximately 5 cubic feet of air per minute (cfm). The daily maximum air injection rate would average 28,800 cubic feet per day, based upon a 24 hour injection event.
2. The injection pressure will depend on the hydraulic head in the wells and the soil formation material. The approximate operating pressure will be 12 to 20 psi. The maximum total pressure should not exceed 25 psi.
3. The injection process will be continuous for the duration for the project. The project is anticipated to last 1 year.
4. It is proposed to inject atmospheric air below the contaminated zone of the shallow aquifer. The air will be delivered to the injection wells by a continuous duty air compressor. In order to prevent introducing additional contaminant into the subsurface, the compressor will contain two coalescing filters downstream of the compressor to remove condensed water, dirt, and liquid oil. In addition, an activated carbon filter will be added downstream of the coalescing filters to remove potential vapor phase hydrocarbon in the air stream. Therefore, the injected air should be of the same chemical composition as atmospheric air.
5. The project is anticipated to continue for a 1 year time period.

**Attachment D: Monitoring Program**

1. Baseline sampling events will be conducted prior to and immediately after system start-up. Sampling will be conducted for chemicals of concern (CoC) including benzene, toluene, ethylbenzene, xylenes, naphthalene, and MTBE and analyzed by a South Carolina certified laboratory by EPA method 8021. Samples will be collected according to protocol outlined in SCDHEC's *Analytical Methodology for Ground-water and Soil Assessment Guidelines* dated March 2000. Quarterly monitoring will be conducted for CoC by the same protocol. Pressure response will be monitored at each well head with a Magnelic™ Gauge to estimate the radius of influence.
2. No contaminants are to be injected.
3. The pressure response monitoring should indicate the radius of influence of the injection wells. It is estimated to be 20 feet.

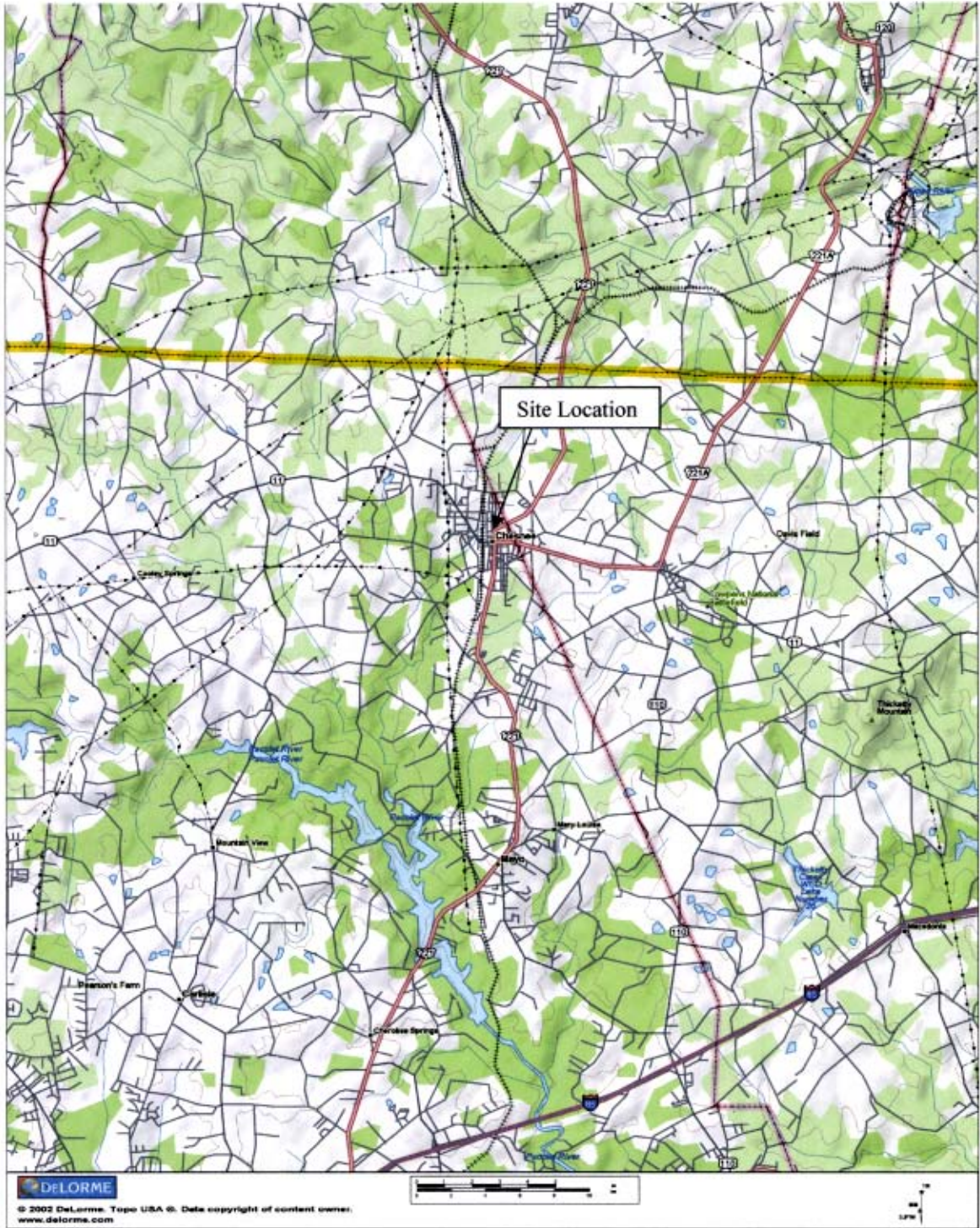
**Attachment E: Existing or Pending State/Federal Permits**

1. Currently, The Hot Spot # 3005 (Site ID # 12719) has a permit for discharge of petroleum contaminated groundwater as specified in Permit No. SCG830000. No other environmental Permits exist for this site.

**Attachment F: Description of Business**

The site is currently utilized as a convenience store and gas station.

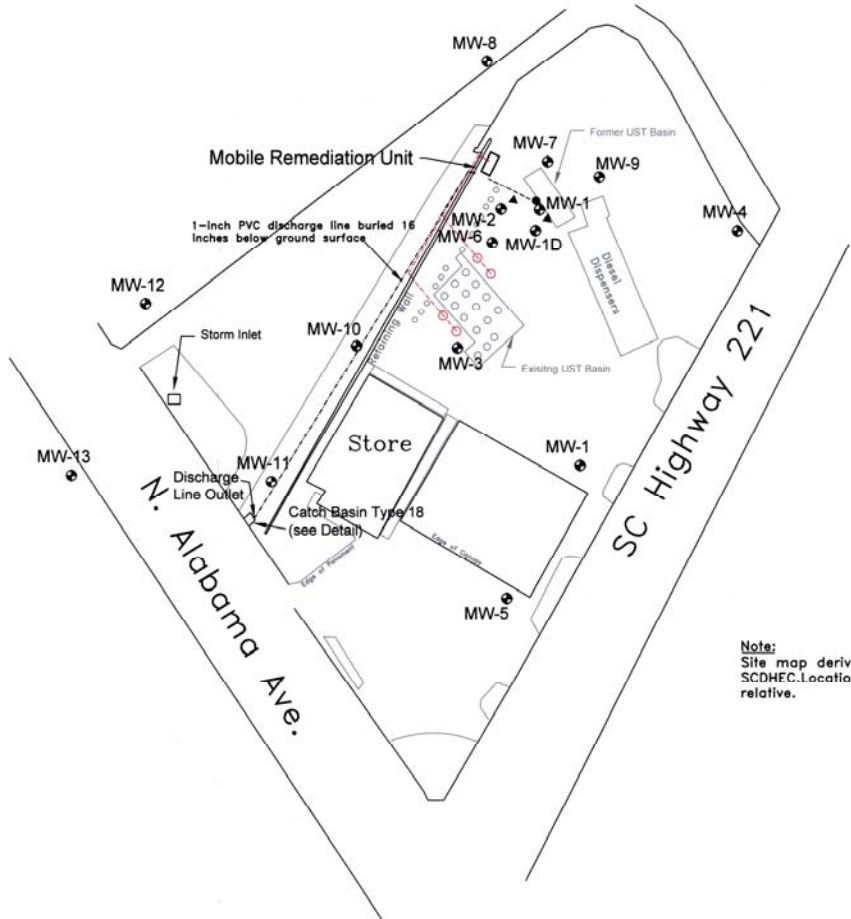
\* ATTACHMENTS G – L WERE NOT COMPLETED DUE TO THE FACT THAT THE INJECTANT FLUID (AIR) DOES NOT EXCEED ANY DRINKING WATER STANDARD, OR POSE AN ADVERSE HEALTH RISK.



Hot Spot # 3005  
Chesnee, SC

**BME**  
**BROOKS & MEDLOCK**  
ENGINEERING, PLLC


**Figure 1**  
General Site Location

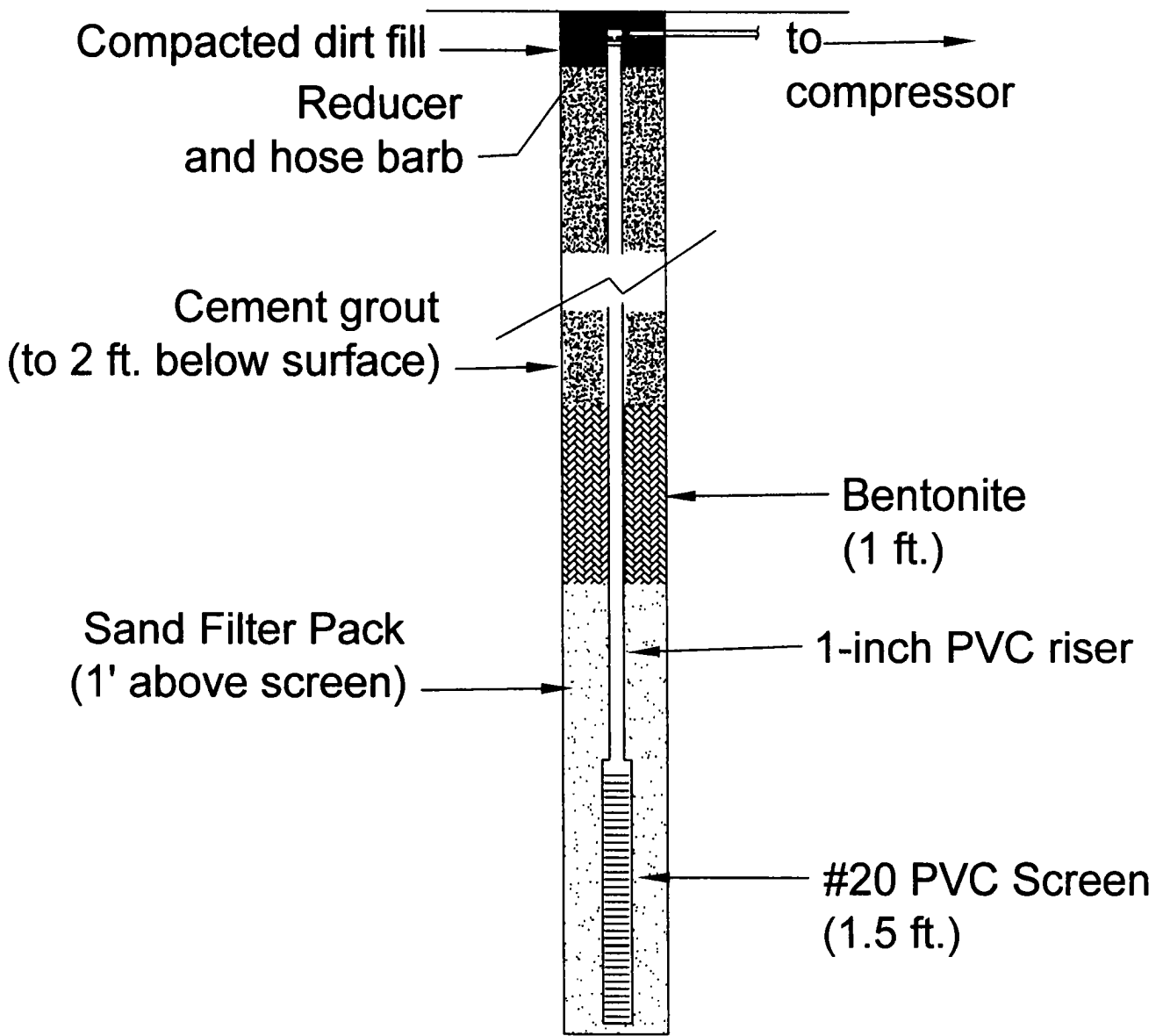


**LEGEND:**

- Compliance Monitoring Well
- ▲ SVE Well
- GW Extraction Well
- Trenching
- Discharge Line
- Proposed Air Sparge Well Location
- Air Sparge Line

**Note:**  
Site map derived from figures provided by SCDHEC. Locations of wells and site features are relative.

 <b>BROOKS &amp; MEDLOCK</b> ENGINEERING, PLLC 17 ARLINGTON STREET ASHEVILLE, N.C. 28801		
PROJECT: Hot Spot # 3005 CAP	FIGURE: 2	
DATE: 02/18/03	SCALE: N.T.S.	REV.: 1



**BROOKS & MEDLOCK**  
ENGINEERING, PLLC

17 ARLINGTON STREET  
ASHEVILLE, N.C. 28801


TITLE: Air Sparging Injection Point Detail

DATE: 2/18/03

SCALE: 1" = 1'

FIGURE: 3

PROJECT NO.: 15402-117-02

Form  I  UIC	 <b>Underground Injection Control Permit Application</b> Ground-Water Protection Division (Collected under the Authority of Title 48 Chapter 1 of the 1976 South Carolina Code of Laws)		1. EPA ID NUMBER			
				T/A	C	
	U					
Read attached instructions before starting. <b>For Official Use Only</b>						
Application Approved month day year		Date Received month day year		PermitWellNumber		
Comments						
11. Facility Name and Address			111. Owner/Operator and Address			
FacilityName			Owner/OperatorName			
Street Address			Street Address			
City	State	Zip Code	City	State	Zip Code	
IV. Ownership Status (Mark-, "x")			V. SIC Codes			
<input type="checkbox"/> A. Federal <input type="checkbox"/> B. State <input type="checkbox"/> C. Private <input type="checkbox"/> D. Public <input type="checkbox"/> E. Other (Explain)						
VI. Well Status (Mark "x")						
<input type="checkbox"/> A. Operating		Date Started month day year		<input type="checkbox"/> B. Modification/Conversion <input type="checkbox"/> C. Proposed		
V11. Type of Permit Requested - Class and Type of Well (see reverse)						
A. Class(es) enter code(s)		B. Type(s) enter code(s)		C. If class is "other" or type is code 'Y', explain		
				D. Number of Wells per type		
V111. Location of Wells or Approximate Center of field or Project						
C	A. Latitude			B. Longitude		
1	Deg	Min	Sec	Deg	Min	Sec
IX. Attachments						
Complete the following questions on a separate sheet(s) and number accordingly; see instructions for Classes 11, 111, and V, complete and submit on a separate sheet(s) attachments A-U as appropriate. Attach maps where required. List attachments by letter which are applicable and include with your application.						
X. Certification						
I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment.						
A. Name and Title (Type or Print)			B. Phone No. (    )			
C. Signature			D. Date Signed			

## Well Class and Type Codes

Class I Industrial, municipal, and other injection wells for the subsurface disposal of fluids. (Prohibited)

Class II Oil and gas production and storage related injection wells.

Type "D" Produced fluid disposal well  
"R" Enhanced recovery well  
"R" Hydrocarbon storage well (excluding natural gas)  
"X" Other Class II wells

Class III Special process injection wells.

Type "G" Solution mining well  
"S" Sulfur mining well by frash process  
"U" Uranium mining well (excluding solution mining of conventional mines)  
"X" Other Class III wells

Class IV Hazardous or radioactive waste disposal injection wells. (Prohibited)

Class V.A Injection wells not included in Class I, II, III, IV or V.B

Type "A" Storm runoff drainage wells  
"B" Aquifer recharge wells  
"C" Salt-water intrusion barrier wells  
"D" Subsidence control wells  
"E" Backfill wells associated with subsurface mining  
"F" Geothermal energy recovery wells  
"G" Experimental technology well  
"H" Natural gas storage wells  
"I" Corrective action wells

Class V.B Non-contact return flow system wells

Type "A" Heat pump return flow wells  
Type "B" Cooling water return flow wells

**Instructions for Attachments to Form 1**  
**Underground Injection Control**  
**for Corrective Action Wells**  
(effective 01/91)

The following ATTACHMENTS should be submitted with an underground injection control (UIC) permit application for Class V.A. corrective action wells associated with aquifer remediation that are to be used to inject fluid whose chemical constituents are below all drinking water standards, as established under R.61-58.5.

Attachment A: Activity for Review

Submit a brief description of the activities to be conducted that require a UIC permit.

Attachment B: Well Construction Details

Submit schematic or other appropriate drawings of the surface and subsurface construction details of the recovery and injection wells.

Attachment C: Operating Data

Submit the following proposed operating data for each injection well:

- 1) Average and maximum daily rate and volume of fluid to be injected. In addition, indicate the average and maximum daily rate and volume of fluid to be withdrawn from each recovery well. Verification of the aquifer's hydraulic ability to produce and accept the quantities proposed should be presented.
- 2) Average and maximum injection pressure.
- 3) Pumping schedule (i.e. continuous, alternating cycles, etc.).
- 4) Proposed ranges in the concentration of all contaminant constituents within the injection fluid. Include comprehensive ground-water quality data from a "worst case" well sample.
- 5) Length of time the project is expected to require injection to complete remediation (to ensure the effective dates of the permit will allow sufficient time to complete the project).

Attachment D: Monitoring Program

Discuss the planned monitoring program in detail:

- 1) Include a discussion of monitoring devices, sampling frequency (sufficient to verify treatment system efficiency), sampling protocol, sampling location, parameters to be analyzed, and proposed method(s) of analysis.
- 2) This plan should indicate how, through monitoring, the proposed contaminant levels in the injectate will be verified.
- 3) This plan should also clearly illustrate exactly how hydraulic control of the contaminant plume (and injectate, where relevant) will be verified through monitoring (i.e., piezometers, quality analyses, etc.).

Attachment E: Existing or Pending State/Federal Permits

List the program and permit number of any existing State or Federal permits for the facility (i.e., NPDES, RCRA, UST, etc.).

Attachment F: Description of Business

Give a brief description of the nature of the business of the facility and any immediately adjacent facilities.

Attachment G: Area of Review

- 1) The area of review should be a fixed radius of 1/4 mile from the injection well, the outermost injection wells (if a wellfield).



- 2) If a fixed radius is not selected, the methods and the calculations used to determine the size of the area of review should be submitted.

Attachment H: Maps of Wells and Area of Review

- 1) Submit a topographic map of the area, extending one mile beyond the project property boundaries. This map should show all hazardous waste treatment, storage, or disposal facilities, and all intake and discharge structures associated with the project facility. Any known areas of soil and/or ground-water contamination within a one mile radius should be indicated. Also indicate all surface bodies of water, springs, mines (surface and subsurface), quarries, and other pertinent surface features such as residences, roads, and geologic faults (known or suspected).
- 2) A scaled map(s) should be included which shows the name and/or number and the location of ALL production, injection, monitoring, abandoned and dry wells within the area of review. This should be accomplished by file and field surveys. Information regarding the construction (i.e., total depth, diameter, casing/screened intervals, grouting, etc.) and the current status (i.e., actively used, temporarily abandoned, permanently abandoned) of ALL wells within the area of review should be submitted. If any wells have been abandoned, details on the method the wells were abandoned (i.e., cemented/grouted, filled with sand, etc.) should be included.
- 3) A potentiometric map of the project site should be submitted which accurately locates all monitoring wells and proposed recovery and injection wells and outlines the horizontal extent of both the free-phase contaminant (where applicable) and dissolved contaminant plumes. Include all water level and product thickness data. The date and time that water levels and product thicknesses were measured should be indicated.

Attachment I: Cross Sections/Diagrams

- 1) Geologic cross sections indicating the lithology and stratigraphy of the site and the horizontal and vertical extent of the contaminant plume, should be submitted. At least two stratigraphic cross sections, one parallel and one perpendicular to the horizontal ground-water flow direction, should be submitted. In areas where the site stratigraphy is complex, additional cross sections should be submitted to clearly illustrate the local conditions.
- 2) A schematic diagram, in the form of a cross section, showing the proposed remediation system with the components of flow (above and below ground) and all associated appurtenances (i.e., stripping tower, piping, wells, etc.).

Attachment J: Name and Depth of Underground Sources of Drinking Water (USDW's)

Identify and describe all aquifers which may be affected by the injection.

Attachment K: Hydraulic Control

- 1) Sufficient supporting data (i.e. time/drawdown data, Theis curves and methods, calculations, etc.), used to determine aquifer characteristics to verify complete hydraulic control over the contaminant plume (and injectate, if proposed injectate quality does not conform to classified ground-water standards) during injection should be submitted. At a minimum, values should be given for transmissivity, hydraulic conductivity, effective porosity and specific yield.
- 2) Demonstrate the presence and magnitude of, or the absence of, any vertical hydraulic gradient at the site. If a vertical hydraulic gradient exists, show how its direction and magnitude are incorporated in the calculations demonstrating hydraulic control.
- 3) Ground-water flow computer models (especially 2-D map view with potentiometric and flow lines) may be utilized and submitted. All calculations should be in English units. All model-derived data and maps should be properly labeled and keyed so as to be clearly understood.

Subsequent Action

After receipt of a complete Underground Injection Control Permit Application, the Department will make a determination to deny or issue a Permit to Construct the injection well(s). After the well(s) is/are constructed, the Department should be notified in writing of the well(s) completion and sent a copy of the completed well record form(s) signed by a South Carolina certified well driller which illustrates the "as built" well construction. If the system is in compliance with the approved application, the Department may then issue an Approval to Operate. This Approval to Operate is the final permission necessary prior to injection.

VIC APP. DOC

+ 16. ) → SPARGE DETAIL. DWG  
FIG 2 - AS-BUILT. DWG

## ATTACHMENTS TO UIC FORM 1

FIG 1. DOC  
→ VIC LTR. DOC

### Attachment A: Activity for Review

✓  
The proposed groundwater remediation project consists of injecting atmospheric air into the shallow subsurface aquifer. The air is to be injected by a mobile air sparge unit. The injected air will "strip" volatile organic compounds from the groundwater and transport them to through the unsaturated zone in to the atmosphere. In addition, this process is expected to increase the natural bioactivity in the subsurface, thereby increasing the natural degradation of hydrocarbon contaminants dissolved in the groundwater and partitioned to soil particles in the vadose zone.

### Attachment B: Well Construction Details

The construction details for the air injection wells are shown on Figure 2.

### Attachment C: Operating Data

The following is a list of the expected operating data:

1. Eighteen <sup>4</sup> ~~(18)~~ air injection wells are anticipated for the project, with only 9 wells being operated ~~at a time~~. Each well is anticipated to inject an average of approximately 5 cubic feet of air per minute (cfm). With a total of 9 injection wells operating, the daily maximum air injection rate would average ~~64,800~~ <sup>28,800</sup> cubic feet per day, based upon a 24 hour injection event.
2. The injection pressure will depend on the hydraulic head in the wells and the formation material. The approximate operating pressure will be 12 to 20 psi. The maximum total pressure should not exceed ~~60~~ <sup>25</sup> psi.
3. The injection process will be continuous for the duration for the project. The project is anticipated to last 2 years.
4. It is proposed to inject atmospheric air below the contaminated zone of the shallow aquifer. The air will be delivered to the injection wells by a continuous duty air compressor. In order to prevent introducing additional contaminant into the subsurface, the compressor will contain two coalescing filters downstream of the compressor to remove condensed water, dirt, and liquid oil. In addition, an activated carbon filter will be added downstream of the coalescing filters to remove potential vapor phase hydrocarbon in the air stream. Therefore, the injected air should be of the same chemical composition as atmospheric air.
5. The project is anticipated to continue for a 2 year time period.

**Attachment D: Monitoring Program**

1. Baseline sampling events will be conducted prior to and immediately after system start-up. Sampling will be conducted for chemicals of concern (CoC) including benzene, toluene, ethylbenzene, xylenes, naphthalene, EDB and MTBE and analyzed by a South Carolina certified laboratory by EPA method 8021. Samples will be collected according to protocol outlined in SCDHEC's *Analytical Methodology for Ground-water and Soil Assessment Guidelines* dated March 2000. Dissolved oxygen will also be sampled and analyzed by analytical method SM 4500-O G. Quarterly monitoring will be conducted for CoC by the same protocol. Pressure response will be monitored at each well head with a Magnelic™ Gauge to estimate the radius of influence.
2. No contaminants are to be injected.
3. The pressure response monitoring should indicate the radius of influence of the injection wells.

**Attachment E: Existing or Pending State/Federal Permits**

Currently, The SCDOT Greenville County Maintenance Facility has no state or federal environmental permits.

**Attachment F: Description of Business**

The site is currently utilized as a maintenance facility for the South Carolina Department of Transportation. Vehicles are fueled and maintained and construction materials are stored at the site. The site also has an office building for SCDOT employees.

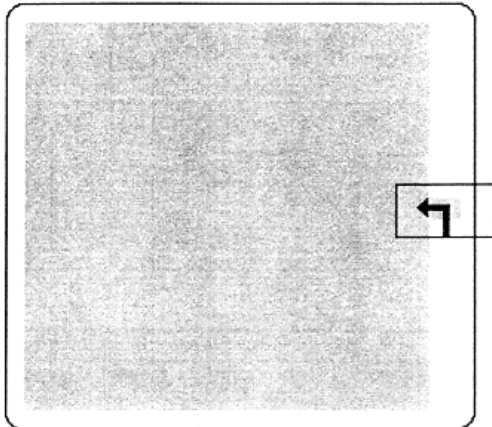
\* ATTACHMENTS G – L WERE NOT COMPLETED DUE TO THE FACT THAT THE INJECTANT FLUID (AIR) DOES NOT EXCEED ANY DRINKING WATER STANDARD, OR POSE AN ADVERSE HEALTH RISK.

# BUREAU OF WATER

South Carolina Department of Health and Environmental Control

## Underground Injection Control Permitting

A guide to permitting injection into the subsurface



July/2002



[www.scdhec.net/water](http://www.scdhec.net/water)

# Preface

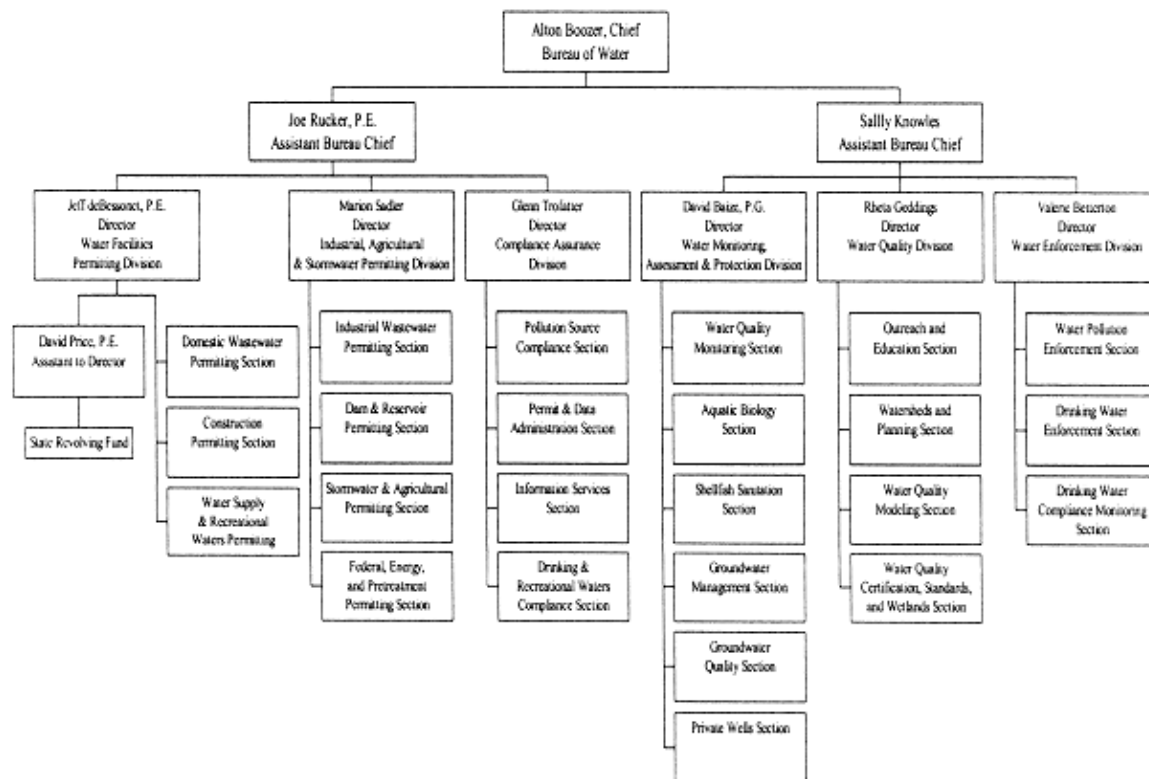
This document has been prepared for use by consulting engineers, developers, industries, and public entities dealing with the underground injection control program issues. It provides:

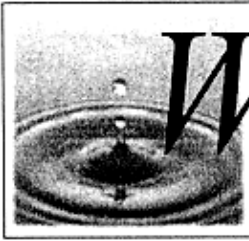
- ⇒ An overview of the Bureau's responsibilities
- ⇒ A summary of regulatory requirements
- ⇒ Identification of the entities involved in permitting, and
- ⇒ Highlights of the review and approval procedures.

We hope this document will help everyone have a better understanding of the underground injection control program. Through this understanding, we feel it will be easier to go through the administrative process, technical reviews, and approval processes of the Bureau.

This document provides an explanation of the Bureau's decision making processes. Our decisions are made based on the technical, administrative, and legal aspects of an underground injection control program with the protection of the environment and public health as the major considerations.

The Bureau is committed to providing quality service in a reasonable time in all aspects of the permit programs. To do this, we need the cooperation of all parties who deal with us in recognizing our responsibilities and the manner in which we implement them. Therefore, please take the time to read this document carefully. This document is not a replacement for the regulations on underground injection control programs. If you have any questions, please let us know. We welcome any comments you may have on this document or suggestions on how we can improve our service to you and the public.





# Why?



*Why is DHEC approval needed for injecting a fluid into the subsurface?*



*It is required by state law/regulations to help insure that proposed injections don't cause degradation to the groundwater quality.*

---

South Carolina's Underground Injection Control Regulation (R.61-87) provides the legal authority and mandate for DHEC to issue construction permits and operation permits for all Class VA Underground Injection systems. These regulations also require notification to DHEC of all Class VB (heat pump return systems) within one year of construction.

DHEC's Underground Injection Control permitting program helps to insure that all underground injection systems are designed and operated to ensure that the groundwater quality of the aquifer receiving the injectate is maintained and all other aquifers are protected.

A permit is required to inject any fluid into the subsurface through a well. This includes injection wells used for storm water drainage, aquifer recharge, salt-water intrusion barriers, experimental technology, natural gas storage, substance control, and corrective action (air sparging, reinjection of treated water, nutrient addition, etc.)



# Where?



*Where do I apply for a permit?*

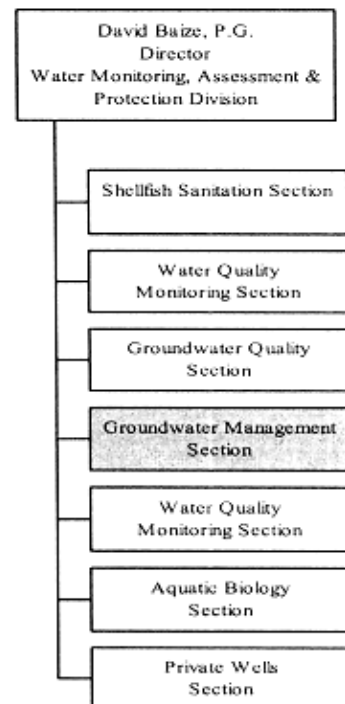


*DHEC's Bureau of Water is responsible for underground injection well permitting: 2600 Bull Street, Columbia, SC 29201.*

The Bureau of Water (Bureau) is under the Office of Environmental Quality Control (EQC) of DHEC. The Bureau is responsible for protecting the quality and quantity of the state's surface and groundwater and ensuring safe drinking water for the public. To meet this responsibility, the Bureau issues permits, approvals, and certifications for a variety of wastewater and drinking water projects. This booklet explains the permitting procedures of the Bureau for the Underground Injection Control Program.

## WATER MONITORING, ASSESSMENT & PROTECTION DIVISION

The Water Monitoring, Assessment & Protection Division handles this permitting responsibility for the Bureau of Water. Applications should be directed to the *Groundwater Management Section* for review. Permit review status can be directed to either the project manager or the section manager.





# How?



*How do I apply for a permit?*



*An applicant should supply DHEC with a completed application for Underground Injection Control Permit and all attachments.*

---

The following processes highlight steps for obtaining DHEC permits to construct and operate.

## **PERMIT TO CONSTRUCT**

Prior to construction of any injection well, a complete application for a permit to construct and all attachments must be submitted in triplicate to DHEC for review. A sample of the application form is attached in the appendix. Permit application forms are available at DHEC or from the DHEC Home Page on the Internet. There is no application fee. The following attachments should be submitted with an Underground Injection Control (UIC) permit application for injection wells:

### Attachment A: Activity for Review

Submit a brief description of the activities to be conducted that require a UIC permit.

### Attachment B: Well Construction Details

Submit schematic or other appropriate drawings of the surface and subsurface construction details of the recovery and injection wells.

### Attachment C: Operating Data

Submit the following proposed operating data for each injection well:

- 1) Average and maximum daily rate and volume of fluid to be injected. In addition, indicate the average and maximum daily rate and volume of fluid to be withdrawn from each recovery well. Verification of the aquifer's hydraulic ability to produce and accept the quantities proposed should be presented.
- 2) Average and maximum injection pressures.
- 3) Pumping schedule (i.e., continuous, alternating cycles, etc.).



## UNDERGROUND INJECTION CONTROL PROGRAM

- 4) Proposed ranges in the concentration of all contaminant constituents within the injection fluid. Include comprehensive groundwater quality data from a "worst case" well sample.
- 5) Length of time the project is expected to require injection to complete remediation (to ensure the effective dates of the permit will allow sufficient time to complete the project).

### Attachment D: Monitoring Program

Discuss the planned monitoring program in detail:

- 1) Include a discussion of monitoring devices, sampling frequency (sufficient to verify treatment system efficiency), sampling protocol, sampling location, parameters to be analyzed, and proposed method(s) of analysis.
- 2) This plan should indicate how, through monitoring, the proposed contaminant levels in the injectate will be verified.
- 3) This plan should also clearly illustrate exactly how hydraulic control of the contaminant plume (and injectate, where relevant) will be verified through monitoring (i.e., piezometers, quality analysis, etc.).

### Attachment E: Existing or Pending State/Federal Permits

List the program and permit number of any existing State or Federal permits for the facility (i.e., NPDES, RCRA, UST, etc.).

### Attachment F: Description of Business

Give a brief description of the nature of the business of the facility and any immediately adjacent facilities.

### Attachment G: Area of Review

- 1) The area of review should be a fixed radius of 1/4 mile from the injection well, the outermost injection wells if a wellfield.
- 2) If a fixed radius is not selected, the methods and the calculations used to determine the size of the area of review should be submitted.

### Attachment H: Maps of Wells and Area of Review

- 1) Submit a topographic map of the area extending one mile beyond the project property boundaries. This map should show all hazardous waste treatment, storage, or disposal facilities, and all intake and discharge structures associated with the project facility. Any known areas of soil and/or groundwater contamination within a one-mile radius should be indicated. Also show all surface bodies of water, springs, mines (surface and subsurface), quarries, and other pertinent surface features such as residences, roads, and geologic faults (known or suspected).
- 2) A scaled map(s) should be included which shows the name and/or number and the location of all production, injection, monitoring, abandoned, and dry wells within the area of review. This should be accomplished by file and field surveys. Information regarding the construction (i.e., total depth, diameter, casing/screened intervals, grouting, etc.) and the current status (i.e., actively used, temporarily abandoned, permanently abandoned) of all wells within the area of review should be submitted. If

## UNDERGROUND INJECTION CONTROL PROGRAM

any wells have been abandoned, details on the method the wells were abandoned (i.e., cemented/grouted, filled with sand, etc.) should be included.

3) A potentiometric map of the project site should be submitted which accurately locates all monitoring wells and proposed recovery and injection wells and outlines the horizontal extent of both the free-phase contaminant (where applicable) and dissolved contaminant plumes. Include all water level and product thickness data. The date and time that water levels and product thickness were measured should be indicated.

### Attachment I: Cross-Sections/Diagrams

1) Geologic cross-sections indicating the lithology and stratigraphy of the site and the horizontal and vertical extent of the contaminant plume, should be submitted. At least two stratigraphic cross-sections, one parallel and one perpendicular to the horizontal groundwater flow direction, should be submitted. In areas where the site stratigraphy is complex, additional cross-sections should be submitted to clearly illustrate the local conditions.

2) A schematic diagram, in the form of a cross-section, showing the proposed remediation system with the components of flow (above and below ground) and all associated appurtenances (i.e., stripping tower, piping, wells, etc.).

### Attachment J: Name and Depth of Underground Sources of Drinking Water (USDW's)

Identify and describe all aquifers that may be affected by the injection.

### Attachment K: Hydraulic Control

1) Sufficient supporting data (i.e., time/drawdown data, Theis curves and methods, calculations, etc.), used to determine aquifer characteristics to verify complete hydraulic control over the contaminant plume (and injectate, if proposed injectate quality does not conform to classified groundwater standards) during injection should be submitted. At a minimum, values should be given for transmissivity, hydraulic conductivity, effective porosity and specific yield.

2) Demonstrate the presence and magnitude of, or the absence of, any vertical hydraulic gradient at the site. If a vertical hydraulic gradient exists, show how its direction and magnitude are incorporated in the calculations demonstrating hydraulic control.

3) Groundwater flow computer models (especially 2-D map view with potentiometric and flow lines) may be utilized and submitted. All calculations should be in English units. All model-derived data and maps should be properly labeled and keyed so as to be clearly understood.

Once an application is received an initial administrative review is conducted. If the application is complete, a draft permit to construct and a statement of basis is prepared for non-major facilities and a draft permit to construct, a fact sheet and public notice is drafted for major facilities. If additional information is needed, the applicant will be contacted before the permit to construct is approved or denied.

The public notice for major facilities must be followed by a minimum 30-day comment period. If any objections to the application are received they will be addressed. Depending upon the number and substance of the objections, a public hearing may be held.

## **UNDERGROUND INJECTION CONTROL PROGRAM**

After the public comment period a permit to construct the well system will be issued or the request will be denied. This permit may be issued for up to ten years.

### **PERMIT TO OPERATE**

After the injection well system is constructed, DHEC should be notified in writing of the well completion and sent a copy of the completed well record forms signed by a South Carolina certified well driller which illustrates the "as built" well construction. The facility must coordinate with DHEC to schedule a site inspection of the well system to ensure the system is in compliance with the approved application. If the injection well system is in full compliance, a permit to operate will be issued. The permit to operate is the final permission necessary prior to the startup of the injection system.

### **PERMIT MODIFICATION**

Procedures for modifying a permit vary depending upon the extent of the modification. In some cases an application must be submitted. In other cases a letter requesting the modification will be sufficient. Modifications may require public notification. It is recommended that DHEC be contacted to determine the type (application or letter) of modification request needed a minimum of 60 days prior to the modification taking place.

### **PERMIT TRANSFER**

Permits can be transferred to a new owner for the same type of use. To request a permit be transferred, the new owner should submit a letter requesting the transferal. The letter should include the name of the current permit holder and the new owner information to include the owner's full name, a contact person (if different from owner), mailing address, telephone number, fax number.

### **PERMIT RENEWAL**

A permit can be issued for a maximum of ten years. On the expiration date of a permit, the permit will become invalid unless a complete application for renewal is made prior to the expiration date.

**NEVIENNE HARDING, E.I.T**

neviemme@hotmail.com

5847 Cedar Croft Lane.  
Lithonia, Georgia 30058  
(404) 358-4184

328004 Georgia Tech Station  
Atlanta, Georgia 30332 - 1190  
(404) 206-4002

**OBJECTIVE** To obtain a challenging entry-level position utilizing my Civil Engineering background.

**EDUCATION** Georgia Institute of Technology, Atlanta, Georgia  
Bachelor of Science in Civil Engineering, expected June 2003  
Overall G.P.A: 3.24 / 4.0

Columbus State University, Columbus, Georgia  
Pre-Engineering Sum1999 – Fall 2001  
Overall G.P.A: 3.11 / 4.0

University of the West Indies, Kingston, Jamaica  
General Sciences Fall 1996 – Summer 1998

**RELEVANT COURSE WORKS** Engineering Graphics                      Reinforced Concrete  
Structural Analysis                              Construction Management  
Transportation Design                          Timber and Masonry Design

**SKILLS** Experience in AutoCAD 2000, Microsoft Package, Prolog

**EXPERIENCE** Department of Civil and Environmental Engineering                      8/02 – Present  
Georgia Institute of Technology, Atlanta, Georgia  
Research assistant in sustainable development and design

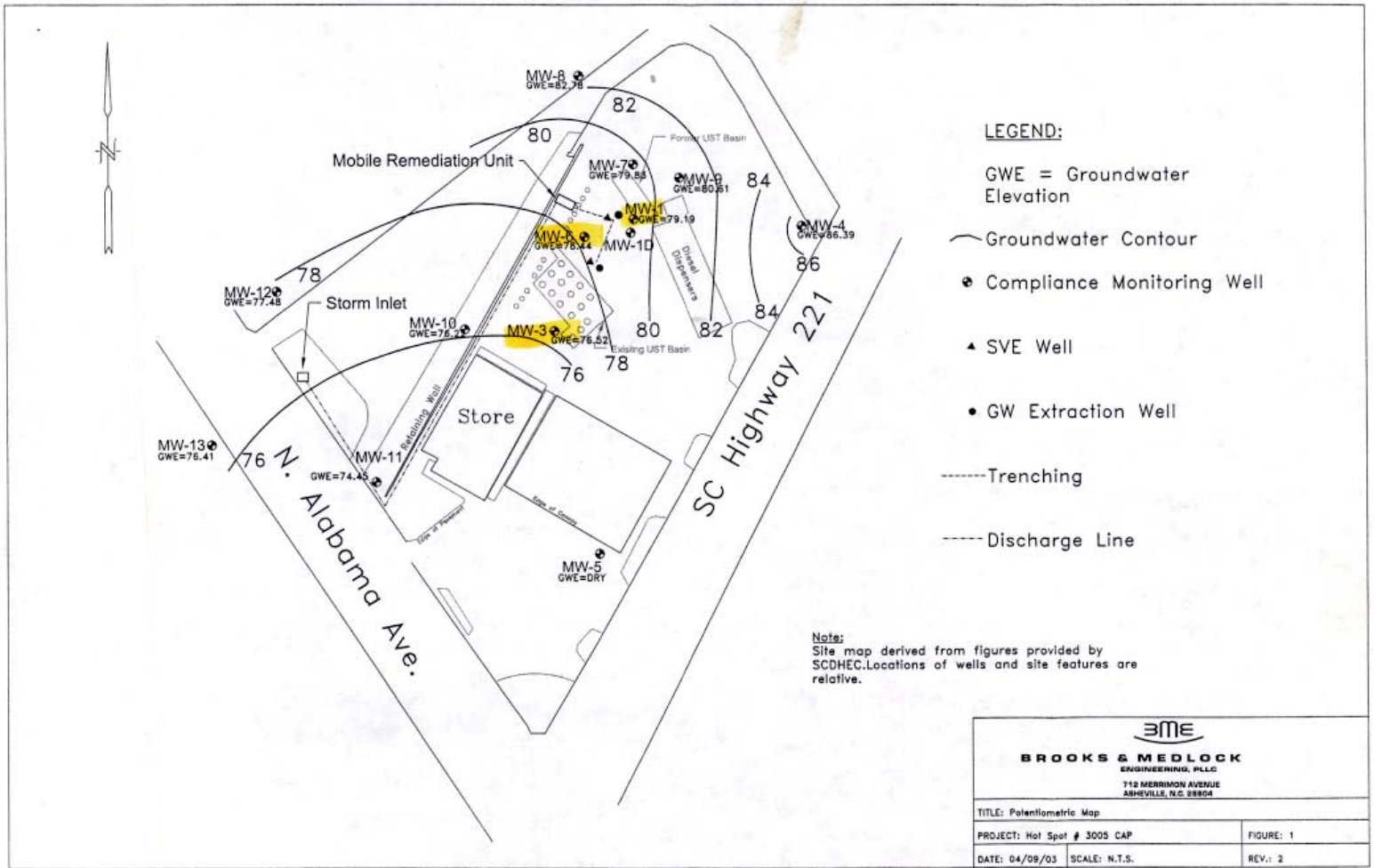
Turner Construction, Atlanta, Georgia                                              5/02 – 8/02  
Summer intern performing tasks of a plan clerk

GTSTRUDL, Georgia Tech                                                                      4/01 – 5/02  
Georgia Institute of Technology, Atlanta, Georgia  
Student Assistant performing data entry and invoicing tasks

Columbus State University, Columbus, Georgia                                      9/99 – 12/00  
Certified tutor of college level Reading and Mathematics courses

**ACTIVITIES** Chi Epsilon: National Honors Society for Civil Engineers  
American Society for Civil Engineers  
Georgia Tech Baptist Student Union  
National Honors Society (Columbus State University)

**AWARDS** Tower Award, FACES Scholar, Undergraduate Research Internship Program, Sidney Goldin Scholar





# UST Compliance Inspection Checklist Underground Storage Tank Program

## LEAK DETECTION

PERMIT ID #: 12719

- IC & TTT     Annual     Every 5 yrs.
- Test Date: \_\_\_\_\_
- 1/8th stick                       Water check
- Stick daily                         Reconcile monthly
- ATG: Records Available \_\_\_\_\_
- MTG: Records Available \_\_\_\_\_
- MTG & TTT: Records Available \_\_\_\_\_
- Test Date: \_\_\_\_\_
- SIR: Records Available \_\_\_\_\_ : Vendor \_\_\_\_\_
- Vapor Monitor: Records Available \_\_\_\_\_
- Ground Water Monitor: Records Available \_\_\_\_\_
- Interstitial Monitor: Records/Sensor Check Record \_\_\_\_\_

## PRESSURE PIPING

## SUCTION PIPING

- Annual Line Test  
Test Date: \_\_\_\_\_
- Mechanical LLD  
Function Check Date: \_\_\_\_\_
- Electronic LLD / ATG: Records Available \_\_\_\_\_  
Function Check Date: \_\_\_\_\_
- Vertical Check Valve
- 3 Year Test  
Test Date: \_\_\_\_\_
- SIR
- Interstitial  
Sensor check/visual check records \_\_\_\_\_
- Other: \_\_\_\_\_

## CORROSION PROTECTION

- Cathodic protection on metal systems
  - Impressed Current - 60-day log maintained \_\_\_\_\_
  - Sacrificial Anode
- Dates of last two system tests : \_\_\_\_\_
- Interior lining: Internal Inspect Date: \_\_\_\_\_
- CP plus interior lining (internal inspect n/a)

## SUPPLIER INFORMATION

## INSPECTION SCHEDULING

Name:	Contact Name: <i>Leak on Truck DL piping</i>
Address:	Time/Date: <i>1st alarm - 7-31-03 - ~1:00 pm</i>
Phone:	Date of Insp.: <i>(7-30-03 - periodic line fail)</i>

Comments: *alarm history repair history*

*PTS - Aug 4 @ 8:00 am Helium Test on DL Piping*

*PTS - Aug 7 @ 9:00 am LTT on Piping repair, awaiting results*

*Froy - Aug 1 @ in eve ~ 7:00 pm - checking eld, put on 1ld*

*reconnected eld & shut down product - closed*

Inspector Signature: *Christa Jordan*                      *sheer valves for Truck DL*

Date: *8-14-03*                      Financial Responsibility Cert.  yes  no                       Registration Certificate

*S&ME sampled ~~with~~ Aug 5 eve. @ Aug 6 eve*

*soil sample at 3' below broken piping run*  
*initial results 3ppm*

□  
I11100  
AUG 12, 2003 2:55 PM

HOT SPOT 3005  
107 HAMPTON ST.  
CHESNEE, S.C. 29363  
864-461-4147SID12719

PRIORITY ALARM HISTORY

ID	CATEGORY	DESCRIPTION	ALARM TYPE	STATE	DATE	TIME
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	CLEAR	8-11-03	2:47PM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	ALARM	8-11-03	2:33PM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	CLEAR	8-11-03	10:09AM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	ALARM	8-11-03	9:59AM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	CLEAR	8-10-03	8:05PM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	ALARM	8-10-03	7:35PM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	CLEAR	8-10-03	3:38PM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	ALARM	8-10-03	3:02PM
Q 6	OTHER	TRUCK DIESEL	PLLD SHUTDOWN ALARM	CLEAR	8-07-03	11:22AM
Q 6	OTHER	TRUCK DIESEL	GROSS LINE FAIL	CLEAR	8-07-03	11:22AM
Q 6	OTHER	TRUCK DIESEL	PLLD SHUTDOWN ALARM	ALARM	8-07-03	9:54AM
Q 6	OTHER	TRUCK DIESEL	GROSS LINE FAIL	ALARM	8-07-03	9:54AM
Q 6	OTHER	TRUCK DIESEL	LOW PRESSURE ALARM	CLEAR	8-07-03	9:41AM
Q 6	OTHER	TRUCK DIESEL	LOW PRESSURE ALARM	ALARM	8-06-03	6:13PM
T 6	TANK	TRUCK DIESEL	OVERFILL ALARM	CLEAR	8-04-03	10:47AM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	CLEAR	8-04-03	10:28AM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	ALARM	8-04-03	10:26AM
T 6	TANK	TRUCK DIESEL	OVERFILL ALARM	ALARM	8-04-03	10:13AM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	CLEAR	8-03-03	4:34PM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	ALARM	8-03-03	4:09PM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	CLEAR	8-03-03	2:31PM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	ALARM	8-03-03	2:29PM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	CLEAR	8-03-03	12:34PM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	ALARM	8-03-03	12:29PM
Q 6	OTHER	TRUCK DIESEL	PLLD SHUTDOWN ALARM	CLEAR	8-02-03	4:21PM
Q 6	OTHER	TRUCK DIESEL	GROSS LINE FAIL	CLEAR	8-02-03	4:21PM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	CLEAR	8-02-03	11:14AM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	ALARM	8-02-03	11:05AM
Q 6	OTHER	TRUCK DIESEL	PLLD SHUTDOWN ALARM	ALARM	8-01-03	7:43PM
Q 6	OTHER	TRUCK DIESEL	GROSS LINE FAIL	ALARM	8-01-03	7:43PM
Q 6	OTHER	TRUCK DIESEL	PLLD SHUTDOWN ALARM	CLEAR	8-01-03	7:13PM
Q 6	OTHER	TRUCK DIESEL	GROSS LINE FAIL	CLEAR	8-01-03	7:13PM
Q 6	OTHER	TRUCK DIESEL	PLLD SHUTDOWN ALARM	ALARM	8-01-03	4:24PM
Q 6	OTHER	TRUCK DIESEL	GROSS LINE FAIL	ALARM	8-01-03	4:24PM
Q 6	OTHER	TRUCK DIESEL	PLLD SHUTDOWN ALARM	CLEAR	8-01-03	4:09PM
Q 6	OTHER	TRUCK DIESEL	GROSS LINE FAIL	CLEAR	8-01-03	4:09PM
Q 6	OTHER	TRUCK DIESEL	PLLD SHUTDOWN ALARM	ALARM	8-01-03	3:44PM
Q 6	OTHER	TRUCK DIESEL	GROSS LINE FAIL	ALARM	8-01-03	3:44PM
Q 6	OTHER	TRUCK DIESEL	PERIODIC LINE FAIL	CLEAR	8-01-03	3:08AM
Q 6	OTHER	TRUCK DIESEL	PLLD SHUTDOWN ALARM	CLEAR	7-31-03	2:24PM
Q 6	OTHER	TRUCK DIESEL	GROSS LINE FAIL	CLEAR	7-31-03	2:24PM
Q 6	OTHER	TRUCK DIESEL	PLLD SHUTDOWN ALARM	ALARM	7-31-03	1:13PM
Q 6	OTHER	TRUCK DIESEL	GROSS LINE FAIL	ALARM	7-31-03	1:13PM
Q 6	OTHER	TRUCK DIESEL	PERIODIC LINE FAIL	ALARM	7-30-03	5:12AM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	CLEAR	7-27-03	11:13AM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	ALARM	7-27-03	11:07AM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	CLEAR	7-26-03	7:43PM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	ALARM	7-26-03	7:37PM
T 1	TANK	UNLEADED	LOW PRODUCT ALARM	CLEAR	7-24-03	11:21PM
T 1	TANK	UNLEADED	LOW PRODUCT ALARM	ALARM	7-24-03	8:13PM

□  
□  
I11200  
AUG 12, 2003 2:55 PM

HOT SPOT 3005  
107 HAMPTON ST.  
CHESNEE, S.C. 29363  
864-461-4147SID12719

NON-PRIORITY ALARM HISTORY

ID	CATEGORY	DESCRIPTION	ALARM TYPE	STATE	DATE	TIME
	SYSTEM		PRINTER ERROR	CLEAR	8-09-03	11:59PM
	SYSTEM		PAPER OUT	CLEAR	8-09-03	11:59PM
	SYSTEM		PRINTER ERROR	ALARM	8-09-03	11:59PM
	SYSTEM		PAPER OUT	ALARM	8-09-03	11:59PM
	SYSTEM		PRINTER ERROR	CLEAR	8-09-03	11:59PM
	SYSTEM		PAPER OUT	CLEAR	8-09-03	11:59PM
	SYSTEM		PRINTER ERROR	ALARM	8-09-03	11:58PM
	SYSTEM		PAPER OUT	ALARM	8-09-03	11:58PM
	SYSTEM		PRINTER ERROR	CLEAR	8-09-03	11:58PM
	SYSTEM		PAPER OUT	CLEAR	8-09-03	11:58PM
	SYSTEM		PRINTER ERROR	ALARM	8-09-03	11:58PM
	SYSTEM		PAPER OUT	ALARM	8-09-03	11:58PM

SYSTEM		PRINTER ERROR	CLEAR	8-09-03	11:58PM
SYSTEM		PAPER OUT	CLEAR	8-09-03	11:58PM
SYSTEM		PRINTER ERROR	ALARM	8-09-03	11:58PM
SYSTEM		PAPER OUT	ALARM	8-09-03	11:58PM
SYSTEM		PRINTER ERROR	CLEAR	8-09-03	11:58PM
SYSTEM		PAPER OUT	CLEAR	8-09-03	11:58PM
SYSTEM		PRINTER ERROR	ALARM	8-09-03	11:58PM
SYSTEM		PAPER OUT	ALARM	8-09-03	11:58PM
SYSTEM		PRINTER ERROR	CLEAR	8-09-03	11:58PM
SYSTEM		PAPER OUT	CLEAR	8-09-03	11:58PM
SYSTEM		PRINTER ERROR	ALARM	8-09-03	11:57PM
SYSTEM		PAPER OUT	ALARM	8-09-03	11:57PM
T 6 TANK	TRUCK DIESEL	DELIVERY NEEDED	CLEAR	7-29-03	10:06PM
T 6 TANK	TRUCK DIESEL	DELIVERY NEEDED	ALARM	7-29-03	9:59PM
SYSTEM		PRINTER ERROR	CLEAR	7-27-03	12:02AM
SYSTEM		PAPER OUT	CLEAR	7-27-03	12:02AM
SYSTEM		PRINTER ERROR	ALARM	7-27-03	12:02AM
SYSTEM		PAPER OUT	ALARM	7-27-03	12:02AM
SYSTEM		PRINTER ERROR	CLEAR	7-27-03	12:02AM
SYSTEM		PAPER OUT	CLEAR	7-27-03	12:02AM
SYSTEM		PRINTER ERROR	ALARM	7-27-03	12:02AM
SYSTEM		PAPER OUT	ALARM	7-27-03	12:02AM
SYSTEM		PRINTER ERROR	CLEAR	7-27-03	12:02AM
SYSTEM		PAPER OUT	CLEAR	7-27-03	12:02AM
SYSTEM		PRINTER ERROR	ALARM	7-26-03	9:56PM
SYSTEM		PAPER OUT	ALARM	7-26-03	9:56PM
T 1 TANK	UNLEADED	DELIVERY NEEDED	CLEAR	7-24-03	11:22PM
T 1 TANK	UNLEADED	INVALID FUEL LEVEL	CLEAR	7-24-03	11:21PM
T 1 TANK	UNLEADED	INVALID FUEL LEVEL	ALARM	7-24-03	8:51PM
T 1 TANK	UNLEADED	DELIVERY NEEDED	ALARM	7-24-03	7:07PM
T 1 TANK	UNLEADED	DELIVERY NEEDED	CLEAR	7-19-03	3:18PM
T 1 TANK	UNLEADED	INVALID FUEL LEVEL	CLEAR	7-19-03	3:17PM
T 1 TANK	UNLEADED	INVALID FUEL LEVEL	ALARM	7-19-03	3:00PM
T 1 TANK	UNLEADED	DELIVERY NEEDED	ALARM	7-19-03	1:58PM
T 1 TANK	UNLEADED	DELIVERY NEEDED	CLEAR	7-18-03	11:19AM
T 1 TANK	UNLEADED	INVALID FUEL LEVEL	CLEAR	7-18-03	11:18AM
T 1 TANK	UNLEADED	INVALID FUEL LEVEL	ALARM	7-18-03	9:56AM
T 1 TANK	UNLEADED	DELIVERY NEEDED	ALARM	7-18-03	7:55AM

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□  
I20700  
MAR 19, 2003 11:09 AM

*Chesnee*

HOT SPOT 3005  
107 HAMPTON ST.  
CHESNEE, S.C. 29363  
864-461-4147SID12719

TANK LEAK TEST HISTORY

T 1: UNLEADED

LAST GROSS TEST PASSED:  
TEST START TIME            HOURS        VOLUME        % VOLUME        TEST TYPE  
MAR 19, 2003 4:42 AM                    10062            83.2            STANDARD

LAST ANNUAL TEST PASSED:

NO TEST PASSED

FULLEST ANNUAL TEST PASS

NO TEST PASSED

LAST PERIODIC TEST PASS:  
TEST START TIME            HOURS        VOLUME        % VOLUME        TEST TYPE  
MAR 19, 2003 5:12 AM                    18            6984            57.7            CSLD

FULLEST PERIODIC TEST  
PASSED EACH MONTH:

TEST START TIME	HOURS	VOLUME	% VOLUME	TEST TYPE
JAN 31, 2003 6:30 AM	22	7867	65.0	CSLD
FEB 5, 2003 5:25 AM	24	8195	67.8	CSLD
MAR 12, 2003 5:04 AM	19	7282	60.2	CSLD
APR 3, 2002 4:39 AM	18	6508	53.8	CSLD
MAY 9, 2002 2:46 AM	20	6933	57.3	CSLD
JUN 18, 2002 1:31 AM	12	7388	61.1	CSLD
JUL 18, 2002 1:49 AM	18	7205	59.6	CSLD
AUG 1, 2002 4:33 AM	16	6936	57.4	CSLD
SEP 11, 2002 2:28 AM	18	7446	61.6	CSLD
OCT 27, 2002 1:07 AM	25	8122	67.2	CSLD
NOV 13, 2002 1:10 AM	17	8664	71.6	CSLD
DEC 1, 2002 2:25 AM	18	6604	54.6	CSLD

TANK LEAK TEST HISTORY

T 2: PLUS

LAST GROSS TEST PASSED:  
TEST START TIME            HOURS        VOLUME        % VOLUME        TEST TYPE  
MAR 19, 2003 9:58 AM                    4155            51.4            STANDARD

LAST ANNUAL TEST PASSED:  
TEST START TIME            HOURS        VOLUME        % VOLUME        TEST TYPE  
FEB 14, 2000 12:01 AM                    4            6169            76.3            STANDARD

FULLEST ANNUAL TEST PASS  
TEST START TIME            HOURS        VOLUME        % VOLUME        TEST TYPE  
FEB 14, 2000 12:01 AM                    4            6169            76.3            STANDARD

LAST PERIODIC TEST PASS:  
TEST START TIME            HOURS        VOLUME        % VOLUME        TEST TYPE  
MAR 19, 2003 10:45 AM                    35            4060            50.2            CSLD

FULLEST PERIODIC TEST  
PASSED EACH MONTH:

TEST START TIME	HOURS	VOLUME	% VOLUME	TEST TYPE
JAN 19, 2003 8:09 PM	34	3850	47.6	CSLD
FEB 27, 2003 8:25 AM	30	4280	53.0	CSLD
MAR 15, 2003 3:44 AM	34	4730	58.5	CSLD
APR 29, 2002 11:18 PM	29	4931	61.0	CSLD
MAY 7, 2002 10:51 AM	29	4939	61.1	CSLD
JUN 23, 2002 5:05 AM	30	3826	47.3	CSLD
JUL 4, 2002 9:02 PM	34	3402	42.1	CSLD
AUG 11, 2002 10:37 PM	29	3833	47.4	CSLD
AUG 18, 2002 7:06 AM	29	3535	43.7	CSLD
AUG 26, 2002 5:28 AM	28	3813	47.2	CSLD
AUG 30, 2002 5:28 AM	27	3723	46.1	CSLD

DEC 1, 2002 11:59 PM 26 3948 48.8 CSLD

TANK LEAK TEST HISTORY

T 3: SUPER

LAST GROSS TEST PASSED:  
TEST START TIME HOURS VOLUME % VOLUME TEST TYPE  
MAR 19, 2003 10:12 AM 3241 40.1 STANDARD

LAST ANNUAL TEST PASSED:  
TEST START TIME HOURS VOLUME % VOLUME TEST TYPE  
FEB 14, 2000 12:01 AM 4 6205 76.8 STANDARD

FULLEST ANNUAL TEST PASS  
TEST START TIME HOURS VOLUME % VOLUME TEST TYPE  
FEB 14, 2000 12:01 AM 4 6205 76.8 STANDARD

LAST PERIODIC TEST PASS:  
TEST START TIME HOURS VOLUME % VOLUME TEST TYPE  
MAR 19, 2003 7:34 AM 33 3244 40.1 CSLD

FULLEST PERIODIC TEST  
PASSED EACH MONTH:

TEST START TIME	HOURS	VOLUME	% VOLUME	TEST TYPE
JAN 6, 2003 8:59 AM	26	4078	50.4	CSLD
FEB 1, 2003 6:28 AM	30	3695	45.7	CSLD
MAR 5, 2003 8:14 AM	30	4147	51.3	CSLD
APR 28, 2002 9:54 AM	29	4395	54.4	CSLD
MAY 8, 2002 7:50 PM	28	5132	63.5	CSLD
JUN 18, 2002 1:23 PM	30	3978	49.2	CSLD
JUL 3, 2002 8:38 AM	31	3473	43.0	CSLD
AUG 15, 2002 5:28 AM	29	4210	52.1	CSLD
SEP 23, 2002 12:57 PM	30	4220	52.2	CSLD
OCT 31, 2002 6:41 PM	27	4166	51.5	CSLD
NOV 2, 2002 6:04 AM	33	4168	51.6	CSLD
DEC 4, 2002 5:28 AM	31	3740	46.3	CSLD

TANK LEAK TEST HISTORY

T 4: CAR DIESEL

LAST GROSS TEST PASSED:  
TEST START TIME HOURS VOLUME % VOLUME TEST TYPE  
MAR 19, 2003 10:22 AM 4939 61.1 STANDARD

LAST ANNUAL TEST PASSED:  
TEST START TIME HOURS VOLUME % VOLUME TEST TYPE  
FEB 14, 2000 12:01 AM 4 6784 83.9 STANDARD

FULLEST ANNUAL TEST PASS  
TEST START TIME HOURS VOLUME % VOLUME TEST TYPE  
FEB 14, 2000 12:01 AM 4 6784 83.9 STANDARD

LAST PERIODIC TEST PASS:  
TEST START TIME HOURS VOLUME % VOLUME TEST TYPE  
MAR 19, 2003 11:08 AM 34 3459 42.8 CSLD

FULLEST PERIODIC TEST  
PASSED EACH MONTH:

TEST START TIME	HOURS	VOLUME	% VOLUME	TEST TYPE
JAN 20, 2003 10:54 PM	29	4594	56.8	CSLD
FEB 5, 2003 5:06 AM	31	4451	55.1	CSLD
MAR 4, 2003 9:28 PM	31	4581	56.7	CSLD
APR 26, 2002 10:07 AM	33	4266	52.8	CSLD
MAY 1, 2002 7:55 PM	30	4223	52.2	CSLD
JUN 11, 2002 5:11 AM	33	4078	50.5	CSLD
JUL 13, 2002 7:41 PM	31	3974	49.2	CSLD
AUG 17, 2002 11:54 AM	32	4758	58.9	CSLD
SEP 14, 2002 9:30 PM	30	3902	48.3	CSLD
OCT 31, 2002 1:02 PM	28	5529	68.4	CSLD
NOV 3, 2002 2:04 PM	31	5548	68.6	CSLD
DEC 15, 2002 6:57 AM	30	4027	49.8	CSLD

TANK LEAK TEST HISTORY

T 5:KERO

LAST GROSS TEST PASSED:  
TEST START TIME            HOURS        VOLUME        % VOLUME        TEST TYPE  
MAR 19, 2003 10:23 AM            4            2895            35.8            STANDARD

LAST ANNUAL TEST PASSED:  
TEST START TIME            HOURS        VOLUME        % VOLUME        TEST TYPE  
FEB 14, 2000 12:01 AM            4            6682            82.7            STANDARD

FULLEST ANNUAL TEST PASS  
TEST START TIME            HOURS        VOLUME        % VOLUME        TEST TYPE  
FEB 14, 2000 12:01 AM            4            6682            82.7            STANDARD

LAST PERIODIC TEST PASS:  
TEST START TIME            HOURS        VOLUME        % VOLUME        TEST TYPE  
MAR 19, 2003 8:59 AM            33           3454            42.7            CSLD

FULLEST PERIODIC TEST  
PASSED EACH MONTH:

TEST START TIME	HOURS	VOLUME	% VOLUME	TEST TYPE
JAN 17, 2003 5:13 AM	33	4459	55.2	CSLD
FEB 18, 2003 1:52 PM	31	5387	66.6	CSLD
MAR 7, 2003 8:31 AM	31	4539	56.1	CSLD
APR 1, 2002 1:01 AM	35	4001	49.5	CSLD
MAY 1, 2002 2:46 AM	75	2870	35.5	CSLD
JUN 1, 2002 1:14 AM	89	2385	29.5	CSLD
JUL 1, 2002 1:04 AM	72	2349	29.1	CSLD
AUG 1, 2002 2:59 AM	81	2325	28.8	CSLD
SEP 1, 2002 2:46 AM	68	2266	28.0	CSLD
OCT 24, 2002 9:07 AM	45	6624	81.9	CSLD
NOV 2, 2002 7:47 AM	41	5595	69.2	CSLD
DEC 10, 2002 7:05 AM	31	4978	61.6	CSLD

TANK LEAK TEST HISTORY

T 6:TRUCK DIESEL

LAST GROSS TEST PASSED:  
TEST START TIME            HOURS        VOLUME        % VOLUME        TEST TYPE  
MAR 19, 2003 10:40 AM            4            6567            54.3            STANDARD

LAST ANNUAL TEST PASSED:  
TEST START TIME            HOURS        VOLUME        % VOLUME        TEST TYPE  
FEB 14, 2000 12:01 AM            4            9106            75.3            STANDARD

FULLEST ANNUAL TEST PASS  
TEST START TIME            HOURS        VOLUME        % VOLUME        TEST TYPE  
FEB 14, 2000 12:01 AM            4            9106            75.3            STANDARD

LAST PERIODIC TEST PASS:  
TEST START TIME            HOURS        VOLUME        % VOLUME        TEST TYPE  
MAR 19, 2003 4:16 AM            37           5290            43.7            CSLD

FULLEST PERIODIC TEST  
PASSED EACH MONTH:

TEST START TIME	HOURS	VOLUME	% VOLUME	TEST TYPE
JAN 15, 2003 3:32 PM	38	6533	54.0	CSLD
FEB 9, 2003 9:52 PM	33	8106	67.0	CSLD
MAR 1, 2003 12:06 AM	31	7602	62.9	CSLD
APR 24, 2002 4:48 AM	36	9008	74.5	CSLD
MAY 31, 2002 4:55 AM	39	7939	65.6	CSLD
JUN 20, 2002 11:05 PM	36	8256	68.3	CSLD
JUL 29, 2002 9:37 PM	36	7536	62.3	CSLD
AUG 25, 2002 12:41 AM	30	7925	65.5	CSLD
SEP 21, 2002 11:47 PM	35	9108	75.3	CSLD
OCT 28, 2002 1:04 PM	34	6467	53.5	CSLD
NOV 30, 2002 11:51 PM	36	6283	51.9	CSLD
DEC 4, 2002 8:10 PM	35	8495	70.2	CSLD

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I37300  
MAR 19, 2003 11:10 AM

HOT SPOT 3005  
107 HAMPTON ST.

CHESNEE,S.C.29363  
864-461-4147SID12719

PRESSURE LINE LEAK TEST RESULTS

Q 1:UNLEADED

3.0 GAL/HR RESULTS:

LAST TEST:  
MAR 19, 2003 11:04 AM PASS

NUMBER OF TESTS PASSED  
PREV 24 HOURS : 130  
SINCE MIDNIGHT : 53

0.10 GAL/HR RESULTS:

MAR 10, 2003 11:33 PM PASS  
AUG 24, 2002 3:49 AM PASS  
FEB 21, 2002 2:32 AM PASS  
AUG 19, 2001 6:30 AM PASS  
FEB 16, 2001 3:18 AM PASS  
AUG 14, 2000 3:13 AM PASS  
FEB 10, 2000 3:29 AM PASS

0.20 GAL/HR RESULTS:

MAR 18, 2003 1:19 AM PASS  
MAR 10, 2003 3:49 AM PASS  
MAR 4, 2003 11:59 PM PASS  
FEB 18, 2003 12:33 AM PASS  
FEB 12, 2003 10:38 PM PASS  
FEB 7, 2003 12:29 AM PASS  
FEB 4, 2003 5:23 AM PASS  
JAN 29, 2003 3:59 AM PASS  
JAN 25, 2003 3:13 AM PASS  
JAN 22, 2003 12:10 AM PASS

NO-VENT TEST ABORTS:  
6 OUT OF 10 TEST

Q 2:PLUS

3.0 GAL/HR RESULTS:

LAST TEST:  
MAR 19, 2003 11:06 AM PASS

NUMBER OF TESTS PASSED  
PREV 24 HOURS : 29  
SINCE MIDNIGHT : 10

0.10 GAL/HR RESULTS:

OCT 9, 2002 6:45 PM PASS  
MAR 31, 2002 12:50 PM PASS  
SEP 26, 2001 7:24 PM PASS  
FEB 16, 2001 1:38 AM PASS  
AUG 12, 2000 12:56 AM PASS  
FEB 9, 2000 12:30 AM PASS

0.20 GAL/HR RESULTS:

MAR 18, 2003 2:17 PM PASS  
MAR 14, 2003 6:28 AM PASS  
MAR 10, 2003 2:45 AM PASS  
MAR 6, 2003 9:46 AM PASS  
MAR 3, 2003 12:54 AM PASS  
FEB 26, 2003 11:26 PM PASS  
FEB 24, 2003 7:42 AM PASS  
FEB 20, 2003 12:42 PM PASS  
FEB 16, 2003 7:08 PM PASS  
FEB 14, 2003 4:20 AM PASS

NO-VENT TEST ABORTS:  
6 OUT OF 10 TEST

Q 3: SUPER

3.0 GAL/HR RESULTS:

LAST TEST:

MAR 19, 2003 8:54 AM PASS

NUMBER OF TESTS PASSED

PREV 24 HOURS : 20

SINCE MIDNIGHT : 6

0.10 GAL/HR RESULTS:

FEB 13, 2003 12:13 AM PASS

AUG 14, 2002 9:56 AM PASS

FEB 11, 2002 6:39 PM PASS

AUG 13, 2001 2:58 AM PASS

FEB 10, 2001 7:39 AM PASS

AUG 10, 2000 1:52 PM PASS

FEB 8, 2000 11:17 PM PASS

0.20 GAL/HR RESULTS:

MAR 16, 2003 8:16 AM PASS

MAR 12, 2003 7:05 PM PASS

MAR 10, 2003 4:29 AM PASS

MAR 6, 2003 4:50 PM PASS

MAR 4, 2003 1:17 AM PASS

FEB 28, 2003 7:58 AM PASS

FEB 24, 2003 10:30 PM PASS

FEB 22, 2003 7:13 AM PASS

FEB 18, 2003 5:18 PM PASS

FEB 16, 2003 1:37 AM PASS

NO-VENT TEST ABORTS:

0 OUT OF 10 TEST

Q 4: CAR DIESEL

3.0 GAL/HR RESULTS:

LAST TEST:

MAR 19, 2003 9:05 AM PASS

NUMBER OF TESTS PASSED

PREV 24 HOURS : 21

SINCE MIDNIGHT : 8

0.10 GAL/HR RESULTS:

MAR 10, 2003 12:07 PM PASS

SEP 1, 2002 7:04 PM PASS

FEB 23, 2002 3:25 PM PASS

AUG 11, 2001 10:09 AM PASS

FEB 8, 2001 11:07 PM PASS

AUG 10, 2000 7:55 AM PASS

FEB 9, 2000 5:32 AM PASS

0.20 GAL/HR RESULTS:

MAR 12, 2003 4:23 PM PASS

MAR 4, 2003 3:19 PM PASS

FEB 24, 2003 11:52 PM PASS

FEB 18, 2003 7:38 PM PASS

FEB 12, 2003 2:45 PM PASS

JAN 29, 2003 8:09 AM PASS

JAN 21, 2003 3:21 PM PASS

JAN 17, 2003 2:49 PM PASS

JAN 11, 2003 10:29 PM PASS

JAN 3, 2003 9:56 AM PASS

NO-VENT TEST ABORTS:

10 OUT OF 10 TEST

Q 5: KERO

3.0 GAL/HR RESULTS:

LAST TEST:  
MAR 19, 2003 10:07 AM PASS

NUMBER OF TESTS PASSED  
PREV 24 HOURS : 28  
SINCE MIDNIGHT : 6

0.10 GAL/HR RESULTS:

FEB 26, 2003 6:27 AM PASS  
AUG 26, 2002 8:55 AM PASS  
FEB 15, 2002 8:29 AM PASS  
AUG 15, 2001 8:10 PM PASS  
FEB 10, 2001 5:07 AM PASS  
AUG 10, 2000 11:41 PM PASS  
FEB 9, 2000 2:33 AM PASS

0.20 GAL/HR RESULTS:

MAR 18, 2003 7:22 AM PASS  
MAR 14, 2003 10:56 AM PASS  
MAR 10, 2003 4:49 PM PASS  
MAR 8, 2003 2:16 AM PASS  
MAR 4, 2003 10:18 PM PASS  
MAR 2, 2003 2:30 AM PASS  
FEB 26, 2003 6:11 AM PASS  
FEB 22, 2003 9:47 PM PASS  
FEB 20, 2003 1:23 AM PASS  
FEB 16, 2003 4:19 AM PASS

NO-VENT TEST ABORTS:  
0 OUT OF 10 TEST

Q 6:TRUCK DIESEL

3.0 GAL/HR RESULTS:

LAST TEST:  
MAR 19, 2003 9:54 AM PASS

NUMBER OF TESTS PASSED  
PREV 24 HOURS : 36  
SINCE MIDNIGHT : 12

0.10 GAL/HR RESULTS:

FEB 14, 2003 7:30 PM PASS  
AUG 16, 2002 2:37 AM PASS  
FEB 13, 2002 3:58 AM PASS  
AUG 13, 2001 11:49 AM PASS  
FEB 10, 2001 9:47 AM PASS  
AUG 10, 2000 1:56 PM PASS  
FEB 9, 2000 8:29 PM PASS

0.20 GAL/HR RESULTS:

MAR 18, 2003 7:32 AM PASS  
MAR 14, 2003 8:05 PM PASS  
MAR 12, 2003 5:11 AM PASS  
MAR 8, 2003 8:30 PM PASS  
MAR 6, 2003 5:21 AM PASS  
MAR 2, 2003 7:43 AM PASS  
FEB 26, 2003 8:00 PM PASS  
FEB 24, 2003 1:49 AM PASS  
FEB 20, 2003 11:16 PM PASS  
FEB 18, 2003 7:45 AM PASS

NO-VENT TEST ABORTS:  
0 OUT OF 10 TEST

□



AUG 9 12:00 AM	2880	1099	456	0	3523	3526	0.00	3
AUG 10 12:00 AM	3526	0	354	0	3172	3173	0.00	1
AUG 11 12:00 AM	3173	0	405	0	2768	2768	0.00	0
AUG 12 12:00 AM	2768	0	436	0	2332	2332	0.00	0

TOTALS 3617 2242 3536 0 2323 2332 0.00 9

THRESHOLD: 165

SIGNATURE \_\_\_\_\_

HOT SPOT 3005  
 107 HAMPTON ST.  
 CHESNEE, S.C. 29363  
 864-461-4147SID12719

AUG 12, 2003 2:47 PM  
 CURRENT PERIODIC RECONCILIATION REPORT

T 4: CAR DIESEL

DATE	TIME	OPENING	METERED	MANUAL	CALC'D	GAUGED	WATER		
		VOLUME	DLVRIES	SALES	ADJUST	INVNTY	INVNTY	HEIGHT	VARIANCE
AUG 1	12:00 AM	4902	0	589	0	4313	4311	0.76	-2
AUG 2	12:14 AM	4311	0	680	0	3631	3631	0.76	0
AUG 3	12:00 AM	3631	0	598	0	3033	3033	0.76	0
AUG 4	12:00 AM	3033	0	1399	0	1634	1633	0.76	-1
AUG 5	12:00 AM	1633	5792	799	0	6626	6627	0.76	1
AUG 6	12:00 AM	6627	0	905	0	5722	5719	0.77	-3
AUG 7	12:00 AM	5719	0	956	0	4763	4760	0.76	-3
AUG 8	12:00 AM	4760	0	610	0	4150	4148	0.76	-2
AUG 9	12:00 AM	4148	0	390	0	3758	3757	0.76	-1
AUG 10	12:00 AM	3757	0	409	0	3348	3346	0.76	-2
AUG 11	12:00 AM	3346	0	364	0	2982	2982	0.76	0
TOTALS		4902	5792	7699	0	2995	2982	0.76	-13

TOTALS 4902 5792 7699 0 2995 2982 0.76 -13

THRESHOLD: 206

SIGNATURE \_\_\_\_\_

HOT SPOT 3005  
 107 HAMPTON ST.  
 CHESNEE, S.C. 29363  
 864-461-4147SID12719

AUG 12, 2003 2:48 PM  
 CURRENT PERIODIC RECONCILIATION REPORT

T 5: KERO

DATE	TIME	OPENING	METERED	MANUAL	CALC'D	GAUGED	WATER		
		VOLUME	DLVRIES	SALES	ADJUST	INVNTY	INVNTY	HEIGHT	VARIANCE
AUG 1	12:00 AM	3709	0	3	0	3706	3706	0.89	0
AUG 2	12:00 AM	3706	0	0	0	3706	3706	0.89	0
AUG 3	12:00 AM	3706	0	0	0	3706	3707	0.89	1
AUG 4	12:00 AM	3707	0	0	0	3707	3707	0.89	0
AUG 5	12:00 AM	3707	0	5	0	3702	3701	0.89	-1
AUG 6	12:00 AM	3701	0	0	0	3701	3701	0.89	0
AUG 7	12:00 AM	3701	0	2	0	3699	3698	0.89	-1
AUG 8	12:00 AM	3698	0	0	0	3698	3698	0.89	0
AUG 9	12:00 AM	3698	0	1	0	3697	3697	0.89	0
AUG 10	12:00 AM	3697	0	1	0	3696	3696	0.89	0
AUG 11	12:00 AM	3696	0	0	0	3696	3696	0.89	0
TOTALS		3709	0	12	0	3697	3696	0.89	-1

TOTALS 3709 0 12 0 3697 3696 0.89 -1

THRESHOLD: 130

SIGNATURE \_\_\_\_\_

HOT SPOT 3005  
 107 HAMPTON ST.  
 CHESNEE, S.C. 29363  
 864-461-4147SID12719

AUG 12, 2003 2:48 PM  
 CURRENT PERIODIC RECONCILIATION REPORT

T 6: TRUCK DIESEL



DATE	TIME	OPENING	METERED	MANUAL	CALC'D	GAUGED	WATER		
		VOLUME	DLVRIES	SALES	ADJUST	INVNTY	INVNTY	HEIGHT	VARIANCE
AUG 1	12:00 AM	5220	0	1573	0	3647	3608	0.00	-39
AUG 2	12:00 AM	3608	0	0	0	3608	3607	0.00	-1
AUG 3	12:00 AM	3607	0	0	0	3607	3606	0.00	-1
AUG 4	12:00 AM	3606	7672	0	0	11278	11319	0.00	41
AUG 5	12:00 AM	11319	0	0	0	11319	11299	0.00	-20
AUG 6	12:00 AM	11299	0	51	0	11248	11270	0.00	22
AUG 7	12:00 AM	11270	0	706	0	10564	10598	0.00	34
AUG 8	12:05 AM	10598	0	1922	0	8676	8591	0.00	-85
AUG 9	12:00 AM	8591	0	598	0	7993	8070	0.00	77
AUG 10	12:00 AM	8070	0	424	0	7646	7645	0.00	-1
AUG 11	12:00 AM	7645	0	2012	0	5633	5631	0.00	-2
AUG 12	12:00 AM								
TOTALS		5220	7672	7286	0	5606	5631	0.00	25

THRESHOLD: 202

SIGNATURE \_\_\_\_\_

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JUL 21 12:04 AM	2511	0	504	0	2007	2004	0.00	-3
JUL 22 12:00 AM	2004	1300	313	0	2991	2989	0.00	-2
JUL 23 12:02 AM	2989	0	299	0	2690	2687	0.00	-3
JUL 24 12:05 AM	2687	0	304	0	2383	2380	0.00	-3
JUL 25 12:00 AM	2380	1244	467	0	3157	3156	0.00	-1
JUL 26 12:00 AM	3156	1302	449	0	4009	4009	0.00	0
JUL 27 12:00 AM	4009	0	605	0	3404	3401	0.00	-3
JUL 28 12:00 AM	3401	1297	476	0	4222	4222	0.00	0
JUL 29 12:00 AM	4222	0	299	0	3923	3922	0.00	-1
JUL 30 12:00 AM	3922	0	270	0	3652	3650	0.00	-2
JUL 31 12:00 AM	3650	0	333	0	3317	3315	0.00	-2
AUG 1 12:00 AM	3315	0	343	0	2972	2971	0.00	-1

TOTALS 2228 14811 13996 0 3043 2971 0.00 -72

THRESHOLD: 269

SIGNATURE \_\_\_\_\_

HOT SPOT 3005  
107 HAMPTON ST.  
CHESNEE, S.C. 29363  
864-461-4147SID12719

AUG 1, 2003 1:17 PM  
CURRENT PERIODIC RECONCILIATION REPORT

T 3: SUPER

DATE	TIME	OPENING	METERED	MANUAL	CALC'D	GAUGED WATER		
		VOLUME	DLVRIES	SALES	ADJUST	INVNTY	INVNTY	HEIGHT VARIANCE
JUL 1 12:00 AM		2943	0	399	0	2544	2544	0.77 0
JUL 2 12:00 AM		2544	0	242	0	2302	2301	0.77 -1
JUL 3 12:00 AM		2301	1194	553	0	2942	2946	0.77 4
JUL 4 12:00 AM		2946	1201	408	0	3739	3741	0.00 2
JUL 5 12:00 AM		3741	0	397	0	3344	3344	0.00 0
JUL 6 12:01 AM		3344	0	503	0	2841	2840	0.00 -1
JUL 7 12:00 AM		2840	0	317	0	2523	2524	0.00 1
JUL 8 12:00 AM		2524	0	339	0	2185	2185	0.00 0
JUL 9 12:00 AM		2185	1194	413	0	2966	2968	0.77 2
JUL 10 12:00 AM		2968	0	272	0	2696	2698	0.78 2
JUL 11 12:00 AM		2698	1194	433	0	3459	3463	0.00 4
JUL 12 12:01 AM		3463	0	396	0	3067	3069	0.00 2
JUL 13 12:00 AM		3069	0	340	0	2729	2729	0.00 0
JUL 14 12:00 AM		2729	1195	287	0	3637	3640	0.00 3
JUL 15 12:00 AM		3640	0	111	0	3529	3529	0.00 0
JUL 16 12:00 AM		3529	0	260	0	3269	3269	0.00 0
JUL 17 12:00 AM		3269	0	298	0	2971	2972	0.00 1
JUL 18 12:00 AM		2972	0	380	0	2592	2592	0.00 0
JUL 19 12:01 AM		2592	0	456	0	2136	2136	0.00 0
JUL 20 12:02 AM		2136	0	489	0	1647	1647	0.00 0
JUL 21 12:02 AM		1647	1193	127	0	2713	2713	0.00 0
JUL 22 12:00 AM		2713	0	267	0	2446	2446	0.00 0
JUL 23 12:02 AM		2446	0	81	0	2365	2365	0.00 0
JUL 24 12:03 AM		2365	1200	177	0	3388	3389	0.00 1
JUL 25 12:00 AM		3389	0	308	0	3081	3083	0.00 2
JUL 26 12:00 AM		3083	0	337	0	2746	2746	0.00 0
JUL 27 12:00 AM		2746	1195	426	0	3515	3519	0.77 4
JUL 28 12:00 AM		3519	0	246	0	3273	3274	0.77 1
JUL 29 12:00 AM		3274	0	170	0	3104	3103	0.78 -1
JUL 30 12:00 AM		3103	1145	288	0	3960	3964	0.00 4
JUL 31 12:00 AM		3964	0	348	0	3616	3617	0.00 1
AUG 1 12:00 AM								

TOTALS 2943 10711 10068 0 3586 3617 0.00 31

THRESHOLD: 230

SIGNATURE \_\_\_\_\_

HOT SPOT 3005  
107 HAMPTON ST.  
CHESNEE, S.C. 29363  
864-461-4147SID12719

AUG 1, 2003 1:18 PM  
CURRENT PERIODIC RECONCILIATION REPORT

T 4: CAR DIESEL

DATE	TIME	OPENING	METERED	MANUAL	CALC'D	GAUGED WATER		
		VOLUME	DLVRIES	SALES	ADJUST	INVNTY	INVNTY	HEIGHT VARIANCE
JUL 1 12:00 AM		1702	2843	481	0	4064	4064	0.76 0

JUL 3 12:00 AM	4064	0	545	0	3519	3518	0.76	-1
JUL 4 12:00 AM	3518	0	520	0	2998	2996	0.76	-2
JUL 5 12:00 AM	2996	0	467	0	2529	2529	0.76	0
JUL 6 12:00 AM	2529	0	376	0	2153	2152	0.75	-1
JUL 7 12:00 AM	2152	0	413	0	1739	1740	0.76	1
JUL 8 12:00 AM	1740	0	652	0	1088	1090	0.76	2
JUL 9 12:00 AM	1090	3943	487	0	4546	4544	0.76	-2
JUL 10 12:00 AM	4544	0	600	0	3944	3943	0.76	-1
JUL 11 12:00 AM	3943	0	155	0	3788	3788	0.76	0
JUL 12 12:00 AM	3788	0	632	0	3156	3156	0.76	0
JUL 13 12:00 AM	3156	0	604	0	2552	2552	0.76	0
JUL 14 12:00 AM	2552	0	497	0	2055	2054	0.76	-1
JUL 15 12:00 AM	2054	0	472	0	1582	1583	0.76	1
JUL 16 12:00 AM	1583	3993	576	0	5000	5004	0.76	4
JUL 17 12:07 AM	5004	0	439	0	4565	4562	0.76	-3
JUL 18 12:00 AM	4562	0	507	0	4055	4054	0.76	-1
JUL 19 12:00 AM	4054	0	529	0	3525	3525	0.76	0
JUL 20 12:00 AM	3525	0	494	0	3031	3031	0.76	0
JUL 21 12:00 AM	3031	0	441	0	2590	2590	0.76	0
JUL 22 12:00 AM	2590	0	512	0	2078	2078	0.76	0
JUL 23 12:00 AM	2078	0	591	0	1487	1488	0.76	1
JUL 24 12:00 AM	1488	2992	562	0	3918	3922	0.76	4
JUL 25 12:00 AM	3922	0	728	0	3194	3195	0.76	1
JUL 26 12:00 AM	3195	0	541	0	2654	2654	0.76	0
JUL 27 12:00 AM	2654	0	644	0	2010	2011	0.76	1
JUL 28 12:00 AM	2011	0	283	0	1728	1727	0.76	-1
JUL 29 12:00 AM	1727	5046	524	0	6249	6251	0.76	2
JUL 30 12:00 AM	6251	0	423	0	5828	5827	0.76	-1
JUL 31 12:00 AM	5827	0	323	0	5504	5503	0.76	-1
AUG 1 12:00 AM	5503	0	600	0	4903	4902	0.76	-1
TOTALS	1702	18817	15618	0	4901	4902	0.76	1

THRESHOLD: 286

SIGNATURE \_\_\_\_\_

HOT SPOT 3005  
 107 HAMPTON ST.  
 CHESNEE, S.C. 29363  
 864-461-4147SID12719

AUG 1, 2003 1:18 PM  
 CURRENT PERIODIC RECONCILIATION REPORT

T 5:KERO

DATE	TIME	OPENING	METERED	MANUAL	CALC'D	GAUGED	WATER		
		VOLUME	DLVRIES	SALES	ADJUST	INVNTY	INVNTY	HEIGHT	VARIANCE
JUL 1 12:00 AM		3743	0	0	0	3743	3743	0.89	0
JUL 2 12:00 AM		3743	0	1	0	3742	3742	0.89	0
JUL 3 12:00 AM		3742	0	1	0	3741	3740	0.89	-1
JUL 4 12:00 AM		3740	0	7	0	3733	3734	0.89	1
JUL 5 12:00 AM		3734	0	0	0	3734	3734	0.89	0
JUL 6 12:00 AM		3734	0	0	0	3734	3734	0.89	0
JUL 7 12:00 AM		3734	0	0	0	3734	3734	0.89	0
JUL 8 12:00 AM		3734	0	8	0	3726	3726	0.89	0
JUL 9 12:00 AM		3726	0	2	0	3724	3723	0.89	-1
JUL 10 12:00 AM		3723	0	0	0	3723	3723	0.89	0
JUL 11 12:00 AM		3723	0	0	0	3723	3724	0.89	1
JUL 12 12:00 AM		3724	0	1	0	3723	3722	0.89	-1
JUL 13 12:00 AM		3722	0	0	0	3722	3722	0.89	0
JUL 14 12:00 AM		3722	0	0	0	3722	3722	0.89	0
JUL 15 12:00 AM		3722	0	1	0	3721	3721	0.89	0
JUL 16 12:00 AM		3721	0	0	0	3721	3721	0.89	0
JUL 17 12:00 AM		3721	0	0	0	3721	3721	0.89	0
JUL 18 12:00 AM		3721	0	0	0	3721	3721	0.89	0
JUL 19 12:00 AM		3721	0	0	0	3721	3721	0.89	0
JUL 20 12:00 AM		3721	0	3	0	3718	3718	0.89	0
JUL 21 12:00 AM		3718	0	0	0	3718	3718	0.89	0
JUL 22 12:00 AM		3718	0	0	0	3718	3718	0.89	0
JUL 23 12:00 AM		3718	0	1	0	3717	3717	0.89	0
JUL 24 12:00 AM		3717	0	0	0	3717	3717	0.89	0
JUL 25 12:00 AM		3717	0	2	0	3715	3714	0.89	-1
JUL 26 12:00 AM		3714	0	0	0	3714	3714	0.89	0
JUL 27 12:00 AM		3714	0	0	0	3714	3714	0.89	0
JUL 28 12:00 AM		3714	0	0	0	3714	3714	0.89	0
JUL 29 12:00 AM		3714	0	0	0	3714	3714	0.89	0
JUL 30 12:00 AM		3714	0	5	0	3709	3709	0.89	0
JUL 31 12:00 AM		3709	0	0	0	3709	3709	0.89	0
AUG 1 12:00 AM		3709	0	0	0	3709	3709	0.89	0
TOTALS		3743	0	32	0	3711	3709	0.89	-2

THRESHOLD: 130

SIGNATURE \_\_\_\_\_

HOT SPOT 3005  
107 HAMPTON ST.  
CHESNEE, S.C. 29363  
864-461-4147SID12719

AUG 1, 2003 1:18 PM  
CURRENT PERIODIC RECONCILIATION REPORT

T 6:TRUCK DIESEL

DATE	TIME	OPENING	METERED	MANUAL	CALC'D	GAUGED WATER			
JUL		VOLUME	DLVRIES	SALES	ADJUST	INVNTY	INVNTY	HEIGHT	VARIANCE
JUL 1	12:00 AM	8858	0	1600	0	7258	7254	0.00	-4
JUL 2	12:00 AM	7254	0	2288	0	4966	4962	0.00	-4
JUL 3	12:00 AM	4962	0	2324	0	2638	2640	0.00	2
JUL 4	12:00 AM	2640	7528	595	0	9573	9571	0.00	-2
JUL 5	12:00 AM	9571	0	370	0	9201	9199	0.00	-2
JUL 6	12:00 AM	9199	0	796	0	8403	8400	0.00	-3
JUL 7	12:00 AM	8400	0	2268	0	6132	6130	0.00	-2
JUL 8	12:00 AM	6130	0	2766	0	3364	3363	0.00	-1
JUL 9	12:00 AM	3363	0	3069	0	294	599	0.00	305
JUL 10	12:00 AM	599	7219	1365	0	6453	6452	0.00	-1
JUL 11	12:00 AM	6452	0	1783	0	4669	4666	0.00	-3
JUL 12	12:00 AM	4666	0	431	0	4235	4234	0.00	-1
JUL 13	12:00 AM	4234	0	927	0	3307	3308	0.00	1
JUL 14	12:00 AM	3308	7514	1905	0	8917	8914	0.00	-3
JUL 15	12:00 AM	8914	0	3004	0	5910	5908	0.00	-2
JUL 16	12:00 AM	5908	0	1699	0	4209	4207	0.00	-2
JUL 17	12:00 AM	4207	7525	2700	0	9032	9037	0.00	5
JUL 18	12:00 AM	9037	0	2721	0	6316	6310	0.00	-6
JUL 19	12:00 AM	6310	0	983	0	5327	5324	0.00	-3
JUL 20	12:00 AM	5324	0	682	0	4642	4640	0.00	-2
JUL 21	12:00 AM	4640	7719	3425	0	8934	8936	0.00	2
JUL 22	12:00 AM	8936	0	2323	0	6613	6607	0.00	-6
JUL 23	12:00 AM	6607	0	1677	0	4930	4926	0.00	-4
JUL 24	12:00 AM	4926	0	2649	0	2277	2278	0.00	1
JUL 25	12:00 AM	2278	7651	1715	0	8214	8214	0.00	0
JUL 26	12:00 AM	8214	0	678	0	7536	7532	0.00	-4
JUL 27	12:00 AM	7532	0	770	0	6762	6755	0.00	-7
JUL 28	12:00 AM	6755	0	3285	0	3470	3454	0.00	-16
JUL 29	12:00 AM	3454	7459	2367	0	8546	8536	0.00	-10
JUL 30	12:00 AM	8536	0	2293	0	6243	6217	0.00	-26
JUL 31	12:00 AM	6217	0	977	0	5240	5220	0.00	-20
AUG 1	12:00 AM								

TOTALS 8858 52615 56435 0 5038 5220 0.00 182

THRESHOLD: 694

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JUN 6 12:00 AM	1965	3941	578	0	5328	5333	0.75	5
JUN 7 12:00 AM	5333	0	592	0	4741	4741	0.75	0
JUN 8 12:00 AM	4741	0	533	0	4208	4208	0.00	0
JUN 9 12:00 AM	4208	0	522	0	3686	3687	0.75	1
JUN 10 12:00 AM	3687	0	458	0	3229	3229	0.75	0
JUN 11 12:00 AM	3229	0	420	0	2809	2809	0.75	0
JUN 12 12:00 AM	2809	0	492	0	2317	2318	0.75	1
JUN 13 12:00 AM	2318	0	606	0	1712	1714	0.75	2
JUN 14 12:00 AM	1714	3088	725	0	4077	4078	0.75	1
JUN 15 12:00 AM	4078	0	400	0	3678	3676	0.75	-2
JUN 16 12:00 AM	3676	0	563	0	3113	3113	0.75	0
JUN 17 12:00 AM	3113	0	502	0	2611	2611	0.75	0
JUN 18 12:00 AM	2611	3997	517	0	6091	6090	0.75	-1
JUN 19 12:00 AM	6090	0	473	0	5617	5615	0.75	-2
JUN 20 12:00 AM	5615	0	635	0	4980	4978	0.76	-2
JUN 21 12:00 AM	4978	0	544	0	4434	4432	0.76	-2
JUN 22 12:00 AM	4432	0	724	0	3708	3708	0.76	0
JUN 23 12:00 AM	3708	0	334	0	3374	3373	0.76	-1
JUN 24 12:00 AM	3373	0	499	0	2874	2874	0.75	0
JUN 25 12:00 AM	2874	0	336	0	2538	2538	0.76	0
JUN 26 12:00 AM	2538	0	457	0	2081	2080	0.75	-1
JUN 27 12:00 AM	2080	0	1001	0	1079	1082	0.75	3
JUN 28 12:00 AM	1082	2742	505	0	3319	3320	0.75	1
JUN 29 12:00 AM	3320	0	484	0	2836	2836	0.76	0
JUN 30 12:00 AM	2836	0	410	0	2426	2426	0.75	0
JUL 1 12:00 AM	2426	0	725	0	1701	1702	0.76	1
TOTALS	3904	13768	15975	0	1697	1702	0.76	5

THRESHOLD: 289

SIGNATURE \_\_\_\_\_

HOT SPOT 3005  
 107 HAMPTON ST.  
 CHESNEE, S.C. 29363  
 864-461-4147SID12719

JUL 3, 2003 11:19 AM  
 PREVIOUS PERIODIC RECONCILIATION REPORT

T 5:KERO

DATE	TIME	OPENING	METERED	MANUAL	CALC'D	GAUGED	WATER		
		VOLUME	DLVRIES	SALES	ADJUST	INVNTY	INVNTY	HEIGHT	VARIANCE
JUN 1 12:00 AM		3765	0	1	0	3764	3764	0.89	0
JUN 2 12:00 AM		3764	0	1	0	3763	3762	0.89	-1
JUN 3 12:00 AM		3762	0	2	0	3760	3760	0.89	0
JUN 4 12:00 AM		3760	0	0	0	3760	3760	0.89	0
JUN 5 12:00 AM		3760	0	0	0	3760	3760	0.89	0
JUN 6 12:00 AM		3760	0	0	0	3760	3760	0.89	0
JUN 7 12:00 AM		3760	0	6	0	3754	3754	0.89	0
JUN 8 12:00 AM		3754	0	0	0	3754	3754	0.89	0
JUN 9 12:00 AM		3754	0	1	0	3753	3754	0.89	1
JUN 10 12:00 AM		3754	0	1	0	3753	3752	0.89	-1
JUN 11 12:00 AM		3752	0	2	0	3750	3749	0.89	-1
JUN 12 12:00 AM		3749	0	0	0	3749	3750	0.89	1
JUN 13 12:00 AM		3750	0	1	0	3749	3749	0.89	0
JUN 14 12:00 AM		3749	0	0	0	3749	3749	0.89	0
JUN 15 12:00 AM		3749	0	3	0	3746	3745	0.89	-1
JUN 16 12:00 AM		3745	0	0	0	3745	3746	0.89	1
JUN 17 12:00 AM		3746	0	0	0	3746	3746	0.89	0
JUN 18 12:00 AM		3746	0	2	0	3744	3743	0.89	-1
JUN 19 12:00 AM		3743	0	0	0	3743	3744	0.89	1
JUN 20 12:00 AM		3744	0	0	0	3744	3744	0.89	0
JUN 21 12:00 AM		3744	0	0	0	3744	3745	0.89	1
JUN 22 12:00 AM		3745	0	2	0	3743	3742	0.89	-1
JUN 23 12:00 AM		3742	0	0	0	3742	3742	0.89	0
JUN 24 12:00 AM		3742	0	0	0	3742	3743	0.89	1
JUN 25 12:00 AM		3743	0	0	0	3743	3743	0.89	0
JUN 26 12:00 AM		3743	0	0	0	3743	3743	0.89	0
JUN 27 12:00 AM		3743	0	0	0	3743	3744	0.89	1
JUN 28 12:00 AM		3744	0	0	0	3744	3744	0.89	0
JUN 29 12:00 AM		3744	0	2	0	3742	3742	0.89	0
JUN 30 12:00 AM		3742	0	0	0	3742	3742	0.89	0
JUL 1 12:00 AM		3742	0	0	0	3742	3743	0.89	1
TOTALS		3765	0	24	0	3741	3743	0.89	2

THRESHOLD: 130

SIGNATURE \_\_\_\_\_



HOT SPOT 3005  
107 HAMPTON ST.  
CHESNEE, S.C. 29363  
864-461-4147SID12719

JUL 3, 2003 11:19 AM  
PREVIOUS PERIODIC RECONCILIATION REPORT

T 6:TRUCK DIESEL

DATE	TIME	OPENING	METERED	MANUAL	CALC'D	GAUGED	WATER		
		VOLUME	DLVRIES	SALES	ADJUST	INVNTY	INVNTY	HEIGHT	VARIANCE
JUN 1	12:00 AM	3089	7535	505	0	10119	10117	0.00	-2
JUN 2	12:00 AM	10117	0	2430	0	7687	7680	0.00	-7
JUN 3	12:00 AM	7680	0	2358	0	5322	5315	0.00	-7
JUN 4	12:00 AM	5315	0	1441	0	3874	3873	0.00	-1
JUN 5	12:00 AM	3873	7313	2378	0	8808	8810	0.00	2
JUN 6	12:00 AM	8810	0	2197	0	6613	6606	0.00	-7
JUN 7	12:00 AM	6606	0	530	0	6076	6073	0.00	-3
JUN 8	12:00 AM	6073	0	614	0	5459	5456	0.00	-3
JUN 9	12:00 AM	5456	0	2155	0	3301	3301	0.00	0
JUN 10	12:00 AM	3301	7475	1863	0	8913	8910	0.00	-3
JUN 11	12:00 AM	8910	0	2424	0	6486	6480	0.00	-6
JUN 12	12:00 AM	6480	0	2046	0	4434	4428	0.00	-6
JUN 13	12:00 AM	4428	0	2616	0	1812	1817	0.00	5
JUN 14	12:00 AM	1817	7500	1139	0	8178	8180	0.00	2
JUN 15	12:00 AM	8180	0	204	0	7976	7976	0.00	0
JUN 16	12:00 AM	7976	0	2493	0	5483	5484	0.00	1
JUN 17	12:00 AM	5484	0	2353	0	3131	3134	0.00	3
JUN 18	12:04 AM	3134	7011	2201	0	7944	7947	0.00	3
JUN 19	12:00 AM	7947	0	2035	0	5912	5913	0.00	1
JUN 20	12:00 AM	5913	0	2702	0	3211	3213	0.00	2
JUN 21	12:00 AM	3213	0	755	0	2458	2459	0.00	1
JUN 22	12:00 AM	2459	7513	275	0	9697	9703	0.00	6
JUN 23	12:00 AM	9703	0	2161	0	7542	7545	0.00	3
JUN 24	12:00 AM	7545	0	2642	0	4903	4904	0.00	1
JUN 25	12:00 AM	4904	0	1997	0	2907	2910	0.00	3
JUN 26	12:00 AM	2910	7516	2595	0	7831	7829	0.00	-2
JUN 27	12:00 AM	7829	0	2432	0	5397	5390	0.00	-7
JUN 28	12:00 AM	5390	0	690	0	4700	4698	0.00	-2
JUN 29	12:00 AM	4698	0	719	0	3979	3978	0.00	-1
JUN 30	12:00 AM	3978	7480	2601	0	8857	8858	0.00	1
JUL 1	12:00 AM								
TOTALS		3089	59343	53551	0	8881	8858	0.00	-23

THRESHOLD:

665

SIGNATURE \_\_\_\_\_

□

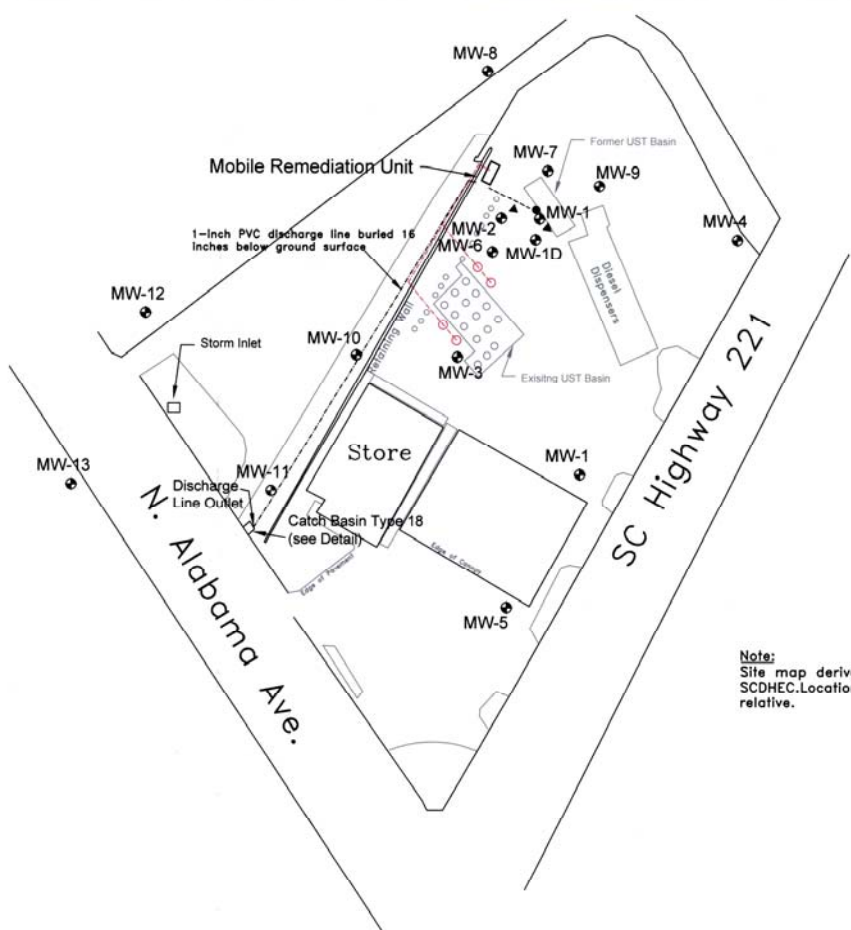
HW 29#I-26

MW 3R - H<sub>2</sub>O @ 24' 7" no free product  
MW 41 - " 24' 5 1/2" " " "  
U2 - dry  
③R ④I  
⑤Z

MW 6? - water 21' 5 1/2" - no free product  
MW 7 - " 20' 3" - " " "

MW 1R - water 21' 1/2" - no free product  
~~MW 1R~~ - 21' 3" free product ≈ 1/4"


~ 8' to rear of 1R toward store - water 22" 0" -  
no free product

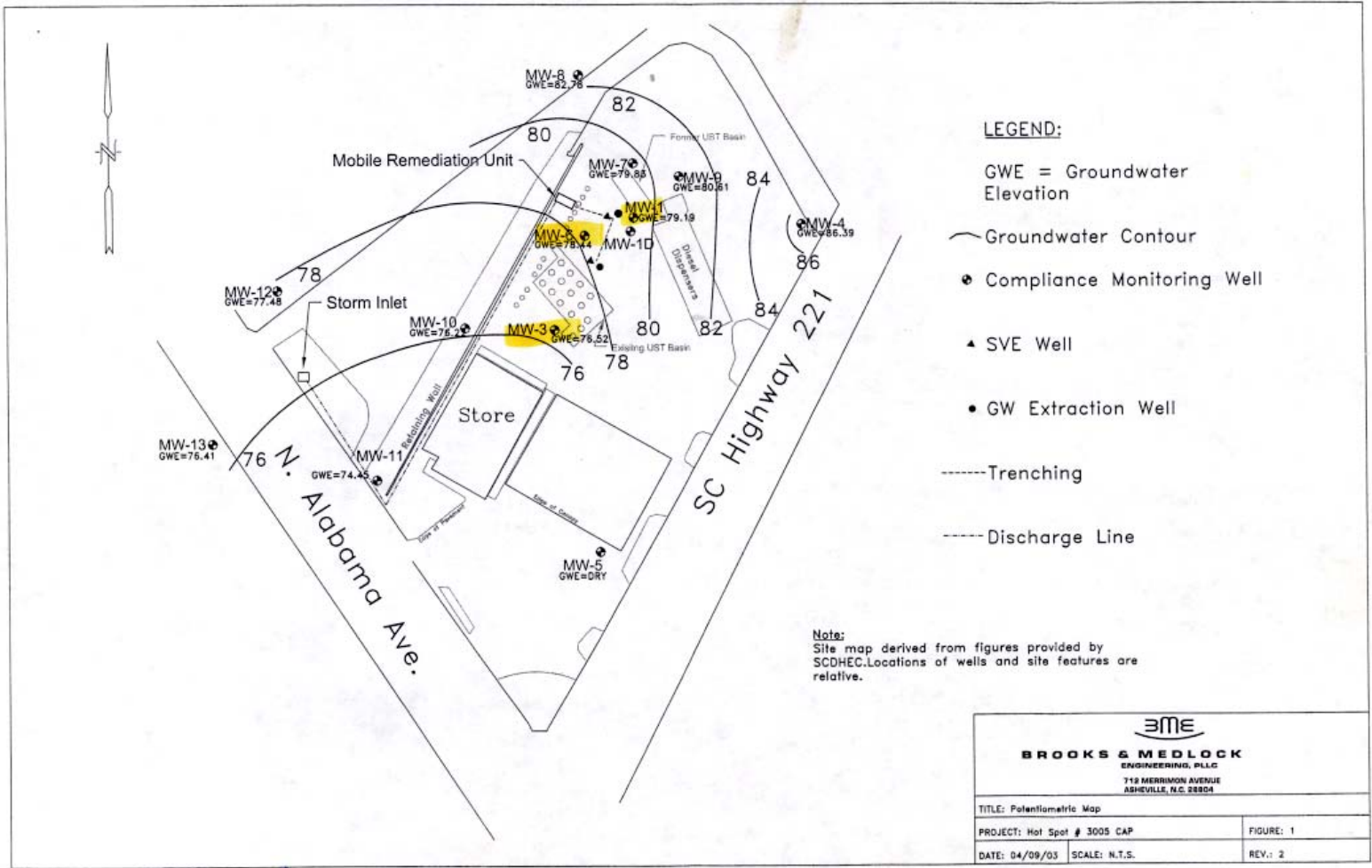


**LEGEND:**

- Compliance Monitoring Well
- ▲ SVE Well
- GW Extraction Well
- Trenching
- Discharge Line
- Proposed Air Sparge Well Location
- Air Sparge Line

**Note:**  
Site map derived from figures provided by SCDHEC. Locations of wells and site features are relative.

 <b>BROOKS &amp; MEDLOCK</b> ENGINEERING, PLLC 17 ARLINGTON STREET ASHEVILLE, N.C. 28801	
PROJECT: Hot Spot # 3005 CAP	FIGURE: 2
DATE: 02/18/03	SCALE: N.T.S.
	REV.: 1



UST  
leak  
DOCKETING

20  
**SCANNED**



# UST Compliance Inspection Checklist Underground Storage Tank Program

## LEAK DETECTION

PERMIT ID #: 12719

- IC & TTT     Annual     Every 5 yrs.
- Test Date: \_\_\_\_\_
- 1/8th stick     Water check
- Stick daily     Reconcile monthly
- ATG: Records Available \_\_\_\_\_
- MTG: Records Available \_\_\_\_\_
- MTG & TTT: Records Available \_\_\_\_\_
- Test Date: \_\_\_\_\_
- SIR: Records Available \_\_\_\_\_ : Vendor \_\_\_\_\_
- Vapor Monitor: Records Available \_\_\_\_\_
- Ground Water Monitor: Records Available \_\_\_\_\_
- Interstitial Monitor: Records/Sensor Check Record \_\_\_\_\_

## PRESSURE PIPING

## SUCTION PIPING

- Annual Line Test  
Test Date: \_\_\_\_\_
- Mechanical LLD  
Function Check Date: \_\_\_\_\_
- Electronic LLD / ATG: Records Available \_\_\_\_\_  
Function Check Date: \_\_\_\_\_
- Vertical Check Valve
- 3 Year Test  
Test Date: \_\_\_\_\_
- SIR
- Interstitial  
Sensor check/visual check records \_\_\_\_\_
- Other: \_\_\_\_\_

## CORROSION PROTECTION

- Cathodic protection on metal systems
  - Impressed Current - 60-day log maintained \_\_\_\_\_
  - Sacrificial Anode
- Dates of last two system tests : \_\_\_\_\_
- Interior lining: Internal Inspect Date: \_\_\_\_\_
- CP plus interior lining (internal inspect n/a)

## SUPPLIER INFORMATION

## INSPECTION SCHEDULING

Name:	Contact Name: <i>Leak on Truck DL piping</i>
Address:	Time/Date: <i>1st alarm - 7-31-03 - ~1:00 pm</i>
Phone:	Date of Insp.: <i>(7-30-03 - periodic line fail)</i>

Comments: *alarm history repair history*  
*PTS - Aug 4 @ 8:00 am Helium Test on DL Piping*  
*PTS - Aug 7 @ 9:00 am LTT on Piping repair, awaiting results*  
*Troy - Aug 1 @ in eve ~ 7:00 pm - checking eld, put on Hld*  
*reconnected eld + shut down product - closed*

Inspector Signature: *Christa Jordan*      *sheer valves for Truck DL*

Date: *8-14-03*      Financial Responsibility Cert.  yes  no       Registration Certificate

*S&ME sampled ~~at~~ Aug 5 eve. @ Aug 14 2003*

*soil sample at 3' below broken piping run*  
*initial results 3ppm*

□  
I11100  
AUG 12, 2003 2:55 PM

HOT SPOT 3005  
107 HAMPTON ST.  
CHESNEE, S.C. 29363  
864-461-4147SID12719

PRIORITY ALARM HISTORY

ID	CATEGORY	DESCRIPTION	ALARM TYPE	STATE	DATE	TIME
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	CLEAR	8-11-03	2:47PM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	ALARM	8-11-03	2:33PM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	CLEAR	8-11-03	10:09AM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	ALARM	8-11-03	9:59AM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	CLEAR	8-10-03	8:05PM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	ALARM	8-10-03	7:35PM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	CLEAR	8-10-03	3:38PM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	ALARM	8-10-03	3:02PM
Q 6	OTHER	TRUCK DIESEL	PLLD SHUTDOWN ALARM	CLEAR	8-07-03	11:22AM
Q 6	OTHER	TRUCK DIESEL	GROSS LINE FAIL	CLEAR	8-07-03	11:22AM
Q 6	OTHER	TRUCK DIESEL	PLLD SHUTDOWN ALARM	ALARM	8-07-03	9:54AM
Q 6	OTHER	TRUCK DIESEL	GROSS LINE FAIL	ALARM	8-07-03	9:54AM
Q 6	OTHER	TRUCK DIESEL	LOW PRESSURE ALARM	CLEAR	8-07-03	9:41AM
Q 6	OTHER	TRUCK DIESEL	LOW PRESSURE ALARM	ALARM	8-06-03	6:13PM
T 6	TANK	TRUCK DIESEL	OVERFILL ALARM	CLEAR	8-04-03	10:47AM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	CLEAR	8-04-03	10:28AM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	ALARM	8-04-03	10:26AM
T 6	TANK	TRUCK DIESEL	OVERFILL ALARM	ALARM	8-04-03	10:13AM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	CLEAR	8-03-03	4:34PM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	ALARM	8-03-03	4:09PM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	CLEAR	8-03-03	2:31PM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	ALARM	8-03-03	2:29PM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	CLEAR	8-03-03	12:34PM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	ALARM	8-03-03	12:29PM
Q 6	OTHER	TRUCK DIESEL	PLLD SHUTDOWN ALARM	CLEAR	8-02-03	4:21PM
Q 6	OTHER	TRUCK DIESEL	GROSS LINE FAIL	CLEAR	8-02-03	4:21PM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	CLEAR	8-02-03	11:14AM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	ALARM	8-02-03	11:05AM
Q 6	OTHER	TRUCK DIESEL	PLLD SHUTDOWN ALARM	ALARM	8-01-03	7:43PM
Q 6	OTHER	TRUCK DIESEL	GROSS LINE FAIL	ALARM	8-01-03	7:43PM
Q 6	OTHER	TRUCK DIESEL	PLLD SHUTDOWN ALARM	CLEAR	8-01-03	7:13PM
Q 6	OTHER	TRUCK DIESEL	GROSS LINE FAIL	CLEAR	8-01-03	7:13PM
Q 6	OTHER	TRUCK DIESEL	PLLD SHUTDOWN ALARM	ALARM	8-01-03	4:24PM
Q 6	OTHER	TRUCK DIESEL	GROSS LINE FAIL	ALARM	8-01-03	4:24PM
Q 6	OTHER	TRUCK DIESEL	PLLD SHUTDOWN ALARM	CLEAR	8-01-03	4:09PM
Q 6	OTHER	TRUCK DIESEL	GROSS LINE FAIL	CLEAR	8-01-03	4:09PM
Q 6	OTHER	TRUCK DIESEL	PLLD SHUTDOWN ALARM	ALARM	8-01-03	3:44PM
Q 6	OTHER	TRUCK DIESEL	GROSS LINE FAIL	ALARM	8-01-03	3:44PM
Q 6	OTHER	TRUCK DIESEL	PERIODIC LINE FAIL	CLEAR	8-01-03	3:08AM
Q 6	OTHER	TRUCK DIESEL	PLLD SHUTDOWN ALARM	CLEAR	7-31-03	2:24PM
Q 6	OTHER	TRUCK DIESEL	GROSS LINE FAIL	CLEAR	7-31-03	2:24PM
Q 6	OTHER	TRUCK DIESEL	PLLD SHUTDOWN ALARM	ALARM	7-31-03	1:13PM
Q 6	OTHER	TRUCK DIESEL	GROSS LINE FAIL	ALARM	7-31-03	1:13PM
Q 6	OTHER	TRUCK DIESEL	PERIODIC LINE FAIL	ALARM	7-30-03	5:12AM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	CLEAR	7-27-03	11:13AM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	ALARM	7-27-03	11:07AM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	CLEAR	7-26-03	7:43PM
Q 2	OTHER	PLUS	LOW PRESSURE ALARM	ALARM	7-26-03	7:37PM
T 1	TANK	UNLEADED	LOW PRODUCT ALARM	CLEAR	7-24-03	11:21PM
T 1	TANK	UNLEADED	LOW PRODUCT ALARM	ALARM	7-24-03	8:13PM

□  
□  
I11200  
AUG 12, 2003 2:55 PM

HOT SPOT 3005  
107 HAMPTON ST.  
CHESNEE, S.C. 29363  
864-461-4147SID12719

NON-PRIORITY ALARM HISTORY

ID	CATEGORY	DESCRIPTION	ALARM TYPE	STATE	DATE	TIME
	SYSTEM		PRINTER ERROR	CLEAR	8-09-03	11:59PM
	SYSTEM		PAPER OUT	CLEAR	8-09-03	11:59PM
	SYSTEM		PRINTER ERROR	ALARM	8-09-03	11:59PM
	SYSTEM		PAPER OUT	ALARM	8-09-03	11:59PM
	SYSTEM		PRINTER ERROR	CLEAR	8-09-03	11:59PM
	SYSTEM		PAPER OUT	CLEAR	8-09-03	11:59PM
	SYSTEM		PRINTER ERROR	ALARM	8-09-03	11:58PM
	SYSTEM		PAPER OUT	ALARM	8-09-03	11:58PM
	SYSTEM		PRINTER ERROR	CLEAR	8-09-03	11:58PM
	SYSTEM		PAPER OUT	CLEAR	8-09-03	11:58PM
	SYSTEM		PRINTER ERROR	ALARM	8-09-03	11:58PM
	SYSTEM		PAPER OUT	ALARM	8-09-03	11:58PM

SYSTEM		PRINTER ERROR	CLEAR	8-09-03	11:58PM
SYSTEM		PAPER OUT	CLEAR	8-09-03	11:58PM
SYSTEM		PRINTER ERROR	ALARM	8-09-03	11:58PM
SYSTEM		PAPER OUT	ALARM	8-09-03	11:58PM
SYSTEM		PRINTER ERROR	CLEAR	8-09-03	11:58PM
SYSTEM		PAPER OUT	CLEAR	8-09-03	11:58PM
SYSTEM		PRINTER ERROR	ALARM	8-09-03	11:58PM
SYSTEM		PAPER OUT	ALARM	8-09-03	11:58PM
SYSTEM		PRINTER ERROR	CLEAR	8-09-03	11:58PM
SYSTEM		PAPER OUT	CLEAR	8-09-03	11:58PM
SYSTEM		PRINTER ERROR	ALARM	8-09-03	11:57PM
SYSTEM		PAPER OUT	ALARM	8-09-03	11:57PM
T 6 TANK	TRUCK DIESEL	DELIVERY NEEDED	CLEAR	7-29-03	10:06PM
T 6 TANK	TRUCK DIESEL	DELIVERY NEEDED	ALARM	7-29-03	9:59PM
SYSTEM		PRINTER ERROR	CLEAR	7-27-03	12:02AM
SYSTEM		PAPER OUT	CLEAR	7-27-03	12:02AM
SYSTEM		PRINTER ERROR	ALARM	7-27-03	12:02AM
SYSTEM		PAPER OUT	ALARM	7-27-03	12:02AM
SYSTEM		PRINTER ERROR	CLEAR	7-27-03	12:02AM
SYSTEM		PAPER OUT	CLEAR	7-27-03	12:02AM
SYSTEM		PRINTER ERROR	ALARM	7-27-03	12:02AM
SYSTEM		PAPER OUT	ALARM	7-27-03	12:02AM
SYSTEM		PRINTER ERROR	CLEAR	7-27-03	12:02AM
SYSTEM		PAPER OUT	CLEAR	7-27-03	12:02AM
SYSTEM		PRINTER ERROR	ALARM	7-26-03	9:56PM
SYSTEM		PAPER OUT	ALARM	7-26-03	9:56PM
T 1 TANK	UNLEADED	DELIVERY NEEDED	CLEAR	7-24-03	11:22PM
T 1 TANK	UNLEADED	INVALID FUEL LEVEL	CLEAR	7-24-03	11:21PM
T 1 TANK	UNLEADED	INVALID FUEL LEVEL	ALARM	7-24-03	8:51PM
T 1 TANK	UNLEADED	DELIVERY NEEDED	ALARM	7-24-03	7:07PM
T 1 TANK	UNLEADED	DELIVERY NEEDED	CLEAR	7-19-03	3:18PM
T 1 TANK	UNLEADED	INVALID FUEL LEVEL	CLEAR	7-19-03	3:17PM
T 1 TANK	UNLEADED	INVALID FUEL LEVEL	ALARM	7-19-03	3:00PM
T 1 TANK	UNLEADED	DELIVERY NEEDED	ALARM	7-19-03	1:58PM
T 1 TANK	UNLEADED	DELIVERY NEEDED	CLEAR	7-18-03	11:19AM
T 1 TANK	UNLEADED	INVALID FUEL LEVEL	CLEAR	7-18-03	11:18AM
T 1 TANK	UNLEADED	INVALID FUEL LEVEL	ALARM	7-18-03	9:56AM
T 1 TANK	UNLEADED	DELIVERY NEEDED	ALARM	7-18-03	7:55AM

□

□  
I20700  
MAR 19, 2003 11:09 AM

HOT SPOT 3005  
107 HAMPTON ST.  
CHESNEE, S.C. 29363  
864-461-4147SID12719

*Chesnee*

TANK LEAK TEST HISTORY

T 1: UNLEADED

LAST GROSS TEST PASSED:  
TEST START TIME            HOURS        VOLUME        % VOLUME        TEST TYPE  
MAR 19, 2003 4:42 AM            18            10062            83.2            STANDARD

LAST ANNUAL TEST PASSED:

NO TEST PASSED

FULLEST ANNUAL TEST PASS

NO TEST PASSED

LAST PERIODIC TEST PASS:  
TEST START TIME            HOURS        VOLUME        % VOLUME        TEST TYPE  
MAR 19, 2003 5:12 AM            18            6984            57.7            CSLD

FULLEST PERIODIC TEST  
PASSED EACH MONTH:

TEST START TIME	HOURS	VOLUME	% VOLUME	TEST TYPE
JAN 31, 2003 6:30 AM	22	7867	65.0	CSLD
FEB 5, 2003 5:25 AM	24	8195	67.8	CSLD
MAR 12, 2003 5:04 AM	19	7282	60.2	CSLD
APR 3, 2002 4:39 AM	18	6508	53.8	CSLD
MAY 9, 2002 2:46 AM	20	6933	57.3	CSLD
JUN 18, 2002 1:31 AM	12	7388	61.1	CSLD
JUL 18, 2002 1:49 AM	18	7205	59.6	CSLD
AUG 1, 2002 4:33 AM	16	6936	57.4	CSLD
SEP 11, 2002 2:28 AM	18	7446	61.6	CSLD
OCT 27, 2002 1:07 AM	25	8122	67.2	CSLD
NOV 13, 2002 1:10 AM	17	8664	71.6	CSLD
DEC 1, 2002 2:25 AM	18	6604	54.6	CSLD

TANK LEAK TEST HISTORY

T 2: PLUS

LAST GROSS TEST PASSED:  
TEST START TIME            HOURS        VOLUME        % VOLUME        TEST TYPE  
MAR 19, 2003 9:58 AM            4            4155            51.4            STANDARD

LAST ANNUAL TEST PASSED:  
TEST START TIME            HOURS        VOLUME        % VOLUME        TEST TYPE  
FEB 14, 2000 12:01 AM            4            6169            76.3            STANDARD

FULLEST ANNUAL TEST PASS  
TEST START TIME            HOURS        VOLUME        % VOLUME        TEST TYPE  
FEB 14, 2000 12:01 AM            4            6169            76.3            STANDARD

LAST PERIODIC TEST PASS:  
TEST START TIME            HOURS        VOLUME        % VOLUME        TEST TYPE  
MAR 19, 2003 10:45 AM            35            4060            50.2            CSLD

FULLEST PERIODIC TEST  
PASSED EACH MONTH:

TEST START TIME	HOURS	VOLUME	% VOLUME	TEST TYPE
JAN 19, 2003 8:09 PM	34	3850	47.6	CSLD
FEB 27, 2003 8:25 AM	30	4280	53.0	CSLD
MAR 15, 2003 3:44 AM	34	4730	58.5	CSLD
APR 29, 2002 11:18 PM	29	4931	61.0	CSLD
MAY 7, 2002 10:51 AM	29	4939	61.1	CSLD
JUN 23, 2002 5:05 AM	30	3826	47.3	CSLD
JUL 4, 2002 9:02 PM	34	3402	42.1	CSLD
AUG 11, 2002 10:37 PM	29	3833	47.4	CSLD
AUG 18, 2002 7:06 AM	29	3535	43.7	CSLD
AUG 26, 2002 5:28 AM	28	3813	47.2	CSLD
AUG 30, 2002 5:28 AM	27	3723	46.1	CSLD



DEC 1, 2002 11:59 PM 26 3948 48.8 CSLD

TANK LEAK TEST HISTORY

T 3: SUPER

LAST GROSS TEST PASSED:  
TEST START TIME HOURS VOLUME % VOLUME TEST TYPE  
MAR 19, 2003 10:12 AM 3241 40.1 STANDARD

LAST ANNUAL TEST PASSED:  
TEST START TIME HOURS VOLUME % VOLUME TEST TYPE  
FEB 14, 2000 12:01 AM 4 6205 76.8 STANDARD

FULLEST ANNUAL TEST PASS  
TEST START TIME HOURS VOLUME % VOLUME TEST TYPE  
FEB 14, 2000 12:01 AM 4 6205 76.8 STANDARD

LAST PERIODIC TEST PASS:  
TEST START TIME HOURS VOLUME % VOLUME TEST TYPE  
MAR 19, 2003 7:34 AM 33 3244 40.1 CSLD

FULLEST PERIODIC TEST  
PASSED EACH MONTH:

TEST START TIME	HOURS	VOLUME	% VOLUME	TEST TYPE
JAN 6, 2003 8:59 AM	26	4078	50.4	CSLD
FEB 1, 2003 6:28 AM	30	3695	45.7	CSLD
MAR 5, 2003 8:14 AM	30	4147	51.3	CSLD
APR 28, 2002 9:54 AM	29	4395	54.4	CSLD
MAY 8, 2002 7:50 PM	28	5132	63.5	CSLD
JUN 18, 2002 1:23 PM	30	3978	49.2	CSLD
JUL 3, 2002 8:38 AM	31	3473	43.0	CSLD
AUG 15, 2002 5:28 AM	29	4210	52.1	CSLD
SEP 23, 2002 12:57 PM	30	4220	52.2	CSLD
OCT 31, 2002 6:41 PM	27	4166	51.5	CSLD
NOV 2, 2002 6:04 AM	33	4168	51.6	CSLD
DEC 4, 2002 5:28 AM	31	3740	46.3	CSLD

TANK LEAK TEST HISTORY

T 4: CAR DIESEL

LAST GROSS TEST PASSED:  
TEST START TIME HOURS VOLUME % VOLUME TEST TYPE  
MAR 19, 2003 10:22 AM 4939 61.1 STANDARD

LAST ANNUAL TEST PASSED:  
TEST START TIME HOURS VOLUME % VOLUME TEST TYPE  
FEB 14, 2000 12:01 AM 4 6784 83.9 STANDARD

FULLEST ANNUAL TEST PASS  
TEST START TIME HOURS VOLUME % VOLUME TEST TYPE  
FEB 14, 2000 12:01 AM 4 6784 83.9 STANDARD

LAST PERIODIC TEST PASS:  
TEST START TIME HOURS VOLUME % VOLUME TEST TYPE  
MAR 19, 2003 11:08 AM 34 3459 42.8 CSLD

FULLEST PERIODIC TEST  
PASSED EACH MONTH:

TEST START TIME	HOURS	VOLUME	% VOLUME	TEST TYPE
JAN 20, 2003 10:54 PM	29	4594	56.8	CSLD
FEB 5, 2003 5:06 AM	31	4451	55.1	CSLD
MAR 4, 2003 9:28 PM	31	4581	56.7	CSLD
APR 26, 2002 10:07 AM	33	4266	52.8	CSLD
MAY 1, 2002 7:55 PM	30	4223	52.2	CSLD
JUN 11, 2002 5:11 AM	33	4078	50.5	CSLD
JUL 13, 2002 7:41 PM	31	3974	49.2	CSLD
AUG 17, 2002 11:54 AM	32	4758	58.9	CSLD
SEP 14, 2002 9:30 PM	30	3902	48.3	CSLD
OCT 31, 2002 1:02 PM	28	5529	68.4	CSLD
NOV 3, 2002 2:04 PM	31	5548	68.6	CSLD
DEC 15, 2002 6:57 AM	30	4027	49.8	CSLD

TANK LEAK TEST HISTORY

T 5:KERO

TEST START TIME	HOURS	VOLUME	% VOLUME	TEST TYPE
LAST GROSS TEST PASSED: MAR 19, 2003 10:23 AM		2895	35.8	STANDARD

TEST START TIME	HOURS	VOLUME	% VOLUME	TEST TYPE
LAST ANNUAL TEST PASSED: FEB 14, 2000 12:01 AM	4	6682	82.7	STANDARD

TEST START TIME	HOURS	VOLUME	% VOLUME	TEST TYPE
FULLEST ANNUAL TEST PASS FEB 14, 2000 12:01 AM	4	6682	82.7	STANDARD

TEST START TIME	HOURS	VOLUME	% VOLUME	TEST TYPE
LAST PERIODIC TEST PASS: MAR 19, 2003 8:59 AM	33	3454	42.7	CSLD

FULLEST PERIODIC TEST PASSED EACH MONTH:

TEST START TIME	HOURS	VOLUME	% VOLUME	TEST TYPE
JAN 17, 2003 5:13 AM	33	4459	55.2	CSLD
FEB 18, 2003 1:52 PM	31	5387	66.6	CSLD
MAR 7, 2003 8:31 AM	31	4539	56.1	CSLD
APR 1, 2002 1:01 AM	35	4001	49.5	CSLD
MAY 1, 2002 2:46 AM	75	2870	35.5	CSLD
JUN 1, 2002 1:14 AM	89	2385	29.5	CSLD
JUL 1, 2002 1:04 AM	72	2349	29.1	CSLD
AUG 1, 2002 2:59 AM	81	2325	28.8	CSLD
SEP 1, 2002 2:46 AM	68	2266	28.0	CSLD
OCT 24, 2002 9:07 AM	45	6624	81.9	CSLD
NOV 2, 2002 7:47 AM	41	5595	69.2	CSLD
DEC 10, 2002 7:05 AM	31	4978	61.6	CSLD

TANK LEAK TEST HISTORY

T 6:TRUCK DIESEL

TEST START TIME	HOURS	VOLUME	% VOLUME	TEST TYPE
LAST GROSS TEST PASSED: MAR 19, 2003 10:40 AM		6567	54.3	STANDARD

TEST START TIME	HOURS	VOLUME	% VOLUME	TEST TYPE
LAST ANNUAL TEST PASSED: FEB 14, 2000 12:01 AM	4	9106	75.3	STANDARD

TEST START TIME	HOURS	VOLUME	% VOLUME	TEST TYPE
FULLEST ANNUAL TEST PASS FEB 14, 2000 12:01 AM	4	9106	75.3	STANDARD

TEST START TIME	HOURS	VOLUME	% VOLUME	TEST TYPE
LAST PERIODIC TEST PASS: MAR 19, 2003 4:16 AM	37	5290	43.7	CSLD

FULLEST PERIODIC TEST PASSED EACH MONTH:

TEST START TIME	HOURS	VOLUME	% VOLUME	TEST TYPE
JAN 15, 2003 3:32 PM	38	6533	54.0	CSLD
FEB 9, 2003 9:52 PM	33	8106	67.0	CSLD
MAR 1, 2003 12:06 AM	31	7602	62.9	CSLD
APR 24, 2002 4:48 AM	36	9008	74.5	CSLD
MAY 31, 2002 4:55 AM	39	7939	65.6	CSLD
JUN 20, 2002 11:05 PM	36	8256	68.3	CSLD
JUL 29, 2002 9:37 PM	36	7536	62.3	CSLD
AUG 25, 2002 12:41 AM	30	7925	65.5	CSLD
SEP 21, 2002 11:47 PM	35	9108	75.3	CSLD
OCT 28, 2002 1:04 PM	34	6467	53.5	CSLD
NOV 30, 2002 11:51 PM	36	6283	51.9	CSLD
DEC 4, 2002 8:10 PM	35	8495	70.2	CSLD

□  
□  
I37300  
MAR 19, 2003 11:10 AM

HOT SPOT 3005  
107 HAMPTON ST.

CHESNEE,S.C.29363  
864-461-4147SID12719

PRESSURE LINE LEAK TEST RESULTS

Q 1:UNLEADED

3.0 GAL/HR RESULTS:

LAST TEST:  
MAR 19, 2003 11:04 AM PASS

NUMBER OF TESTS PASSED  
PREV 24 HOURS : 130  
SINCE MIDNIGHT : 53

0.10 GAL/HR RESULTS:

MAR 10, 2003 11:33 PM PASS  
AUG 24, 2002 3:49 AM PASS  
FEB 21, 2002 2:32 AM PASS  
AUG 19, 2001 6:30 AM PASS  
FEB 16, 2001 3:18 AM PASS  
AUG 14, 2000 3:13 AM PASS  
FEB 10, 2000 3:29 AM PASS

0.20 GAL/HR RESULTS:

MAR 18, 2003 1:19 AM PASS  
MAR 10, 2003 3:49 AM PASS  
MAR 4, 2003 11:59 PM PASS  
FEB 18, 2003 12:33 AM PASS  
FEB 12, 2003 10:38 PM PASS  
FEB 7, 2003 12:29 AM PASS  
FEB 4, 2003 5:23 AM PASS  
JAN 29, 2003 3:59 AM PASS  
JAN 25, 2003 3:13 AM PASS  
JAN 22, 2003 12:10 AM PASS

NO-VENT TEST ABORTS:  
6 OUT OF 10 TEST

Q 2:PLUS

3.0 GAL/HR RESULTS:

LAST TEST:  
MAR 19, 2003 11:06 AM PASS

NUMBER OF TESTS PASSED  
PREV 24 HOURS : 29  
SINCE MIDNIGHT : 10

0.10 GAL/HR RESULTS:

OCT 9, 2002 6:45 PM PASS  
MAR 31, 2002 12:50 PM PASS  
SEP 26, 2001 7:24 PM PASS  
FEB 16, 2001 1:38 AM PASS  
AUG 12, 2000 12:56 AM PASS  
FEB 9, 2000 12:30 AM PASS

0.20 GAL/HR RESULTS:

MAR 18, 2003 2:17 PM PASS  
MAR 14, 2003 6:28 AM PASS  
MAR 10, 2003 2:45 AM PASS  
MAR 6, 2003 9:46 AM PASS  
MAR 3, 2003 12:54 AM PASS  
FEB 26, 2003 11:26 PM PASS  
FEB 24, 2003 7:42 AM PASS  
FEB 20, 2003 12:42 PM PASS  
FEB 16, 2003 7:08 PM PASS  
FEB 14, 2003 4:20 AM PASS

NO-VENT TEST ABORTS:  
6 OUT OF 10 TEST

Q 3: SUPER

3.0 GAL/HR RESULTS:

LAST TEST:

MAR 19, 2003 8:54 AM PASS

NUMBER OF TESTS PASSED

PREV 24 HOURS : 20

SINCE MIDNIGHT : 6

0.10 GAL/HR RESULTS:

FEB 13, 2003 12:13 AM PASS

AUG 14, 2002 9:56 AM PASS

FEB 11, 2002 6:39 PM PASS

AUG 13, 2001 2:58 AM PASS

FEB 10, 2001 7:39 AM PASS

AUG 10, 2000 1:52 PM PASS

FEB 8, 2000 11:17 PM PASS

0.20 GAL/HR RESULTS:

MAR 16, 2003 8:16 AM PASS

MAR 12, 2003 7:05 PM PASS

MAR 10, 2003 4:29 AM PASS

MAR 6, 2003 4:50 PM PASS

MAR 4, 2003 1:17 AM PASS

FEB 28, 2003 7:58 AM PASS

FEB 24, 2003 10:30 PM PASS

FEB 22, 2003 7:13 AM PASS

FEB 18, 2003 5:18 PM PASS

FEB 16, 2003 1:37 AM PASS

NO-VENT TEST ABORTS:

0 OUT OF 10 TEST

Q 4: CAR DIESEL

3.0 GAL/HR RESULTS:

LAST TEST:

MAR 19, 2003 9:05 AM PASS

NUMBER OF TESTS PASSED

PREV 24 HOURS : 21

SINCE MIDNIGHT : 8

0.10 GAL/HR RESULTS:

MAR 10, 2003 12:07 PM PASS

SEP 1, 2002 7:04 PM PASS

FEB 23, 2002 3:25 PM PASS

AUG 11, 2001 10:09 AM PASS

FEB 8, 2001 11:07 PM PASS

AUG 10, 2000 7:55 AM PASS

FEB 9, 2000 5:32 AM PASS

0.20 GAL/HR RESULTS:

MAR 12, 2003 4:23 PM PASS

MAR 4, 2003 3:19 PM PASS

FEB 24, 2003 11:52 PM PASS

FEB 18, 2003 7:38 PM PASS

FEB 12, 2003 2:45 PM PASS

JAN 29, 2003 8:09 AM PASS

JAN 21, 2003 3:21 PM PASS

JAN 17, 2003 2:49 PM PASS

JAN 11, 2003 10:29 PM PASS

JAN 3, 2003 9:56 AM PASS

NO-VENT TEST ABORTS:

10 OUT OF 10 TEST

Q 5: KERO

3.0 GAL/HR RESULTS:

LAST TEST:  
MAR 19, 2003 10:07 AM PASS

NUMBER OF TESTS PASSED  
PREV 24 HOURS : 28  
SINCE MIDNIGHT : 6

0.10 GAL/HR RESULTS:

FEB 26, 2003 6:27 AM PASS  
AUG 26, 2002 8:55 AM PASS  
FEB 15, 2002 8:29 AM PASS  
AUG 15, 2001 8:10 PM PASS  
FEB 10, 2001 5:07 AM PASS  
AUG 10, 2000 11:41 PM PASS  
FEB 9, 2000 2:33 AM PASS

0.20 GAL/HR RESULTS:

MAR 18, 2003 7:22 AM PASS  
MAR 14, 2003 10:56 AM PASS  
MAR 10, 2003 4:49 PM PASS  
MAR 8, 2003 2:16 AM PASS  
MAR 4, 2003 10:18 PM PASS  
MAR 2, 2003 2:30 AM PASS  
FEB 26, 2003 6:11 AM PASS  
FEB 22, 2003 9:47 PM PASS  
FEB 20, 2003 1:23 AM PASS  
FEB 16, 2003 4:19 AM PASS

NO-VENT TEST ABORTS:  
0 OUT OF 10 TEST

Q 6:TRUCK DIESEL

3.0 GAL/HR RESULTS:

LAST TEST:  
MAR 19, 2003 9:54 AM PASS

NUMBER OF TESTS PASSED  
PREV 24 HOURS : 36  
SINCE MIDNIGHT : 12

0.10 GAL/HR RESULTS:

FEB 14, 2003 7:30 PM PASS  
AUG 16, 2002 2:37 AM PASS  
FEB 13, 2002 3:58 AM PASS  
AUG 13, 2001 11:49 AM PASS  
FEB 10, 2001 9:47 AM PASS  
AUG 10, 2000 1:56 PM PASS  
FEB 9, 2000 8:29 PM PASS

0.20 GAL/HR RESULTS:

MAR 18, 2003 7:32 AM PASS  
MAR 14, 2003 8:05 PM PASS  
MAR 12, 2003 5:11 AM PASS  
MAR 8, 2003 8:30 PM PASS  
MAR 6, 2003 5:21 AM PASS  
MAR 2, 2003 7:43 AM PASS  
FEB 26, 2003 8:00 PM PASS  
FEB 24, 2003 1:49 AM PASS  
FEB 20, 2003 11:16 PM PASS  
FEB 18, 2003 7:45 AM PASS

NO-VENT TEST ABORTS:  
0 OUT OF 10 TEST

□



AUG 9 12:00 AM	2880	1099	456	0	3523	3526	0.00	3
AUG 10 12:00 AM	3526	0	354	0	3172	3173	0.00	1
AUG 11 12:00 AM	3173	0	405	0	2768	2768	0.00	0
AUG 12 12:00 AM	2768	0	436	0	2332	2332	0.00	0

TOTALS 3617 2242 3536 0 2323 2332 0.00 9

THRESHOLD: 165

SIGNATURE \_\_\_\_\_

HOT SPOT 3005  
 107 HAMPTON ST.  
 CHESNEE, S.C. 29363  
 864-461-4147SID12719

AUG 12, 2003 2:47 PM  
 CURRENT PERIODIC RECONCILIATION REPORT

T 4: CAR DIESEL

DATE	TIME	OPENING	METERED	MANUAL	CALC'D	GAUGED	WATER		
		VOLUME	DLVRIES	SALES	ADJUST	INVNTY	INVNTY	HEIGHT	VARIANCE
AUG 1	12:00 AM	4902	0	589	0	4313	4311	0.76	-2
AUG 2	12:00 AM	4311	0	680	0	3631	3631	0.76	0
AUG 3	12:14 AM	4311	0	598	0	3033	3033	0.76	0
AUG 4	12:00 AM	3033	0	1399	0	1634	1633	0.76	-1
AUG 5	12:00 AM	1633	5792	799	0	6626	6627	0.76	1
AUG 6	12:00 AM	6627	0	905	0	5722	5719	0.77	-3
AUG 7	12:00 AM	5719	0	956	0	4763	4760	0.76	-3
AUG 8	12:00 AM	4760	0	610	0	4150	4148	0.76	-2
AUG 9	12:00 AM	4148	0	390	0	3758	3757	0.76	-1
AUG 10	12:00 AM	3757	0	409	0	3348	3346	0.76	-2
AUG 11	12:00 AM	3346	0	364	0	2982	2982	0.76	0
AUG 12	12:00 AM								

TOTALS 4902 5792 7699 0 2995 2982 0.76 -13

THRESHOLD: 206

SIGNATURE \_\_\_\_\_

HOT SPOT 3005  
 107 HAMPTON ST.  
 CHESNEE, S.C. 29363  
 864-461-4147SID12719

AUG 12, 2003 2:48 PM  
 CURRENT PERIODIC RECONCILIATION REPORT

T 5: KERO

DATE	TIME	OPENING	METERED	MANUAL	CALC'D	GAUGED	WATER		
		VOLUME	DLVRIES	SALES	ADJUST	INVNTY	INVNTY	HEIGHT	VARIANCE
AUG 1	12:00 AM	3709	0	3	0	3706	3706	0.89	0
AUG 2	12:00 AM	3706	0	0	0	3706	3706	0.89	0
AUG 3	12:00 AM	3706	0	0	0	3706	3707	0.89	1
AUG 4	12:00 AM	3707	0	0	0	3707	3707	0.89	0
AUG 5	12:00 AM	3707	0	5	0	3702	3701	0.89	-1
AUG 6	12:00 AM	3701	0	0	0	3701	3701	0.89	0
AUG 7	12:00 AM	3701	0	2	0	3699	3698	0.89	-1
AUG 8	12:00 AM	3698	0	0	0	3698	3698	0.89	0
AUG 9	12:00 AM	3698	0	1	0	3697	3697	0.89	0
AUG 10	12:00 AM	3697	0	1	0	3696	3696	0.89	0
AUG 11	12:00 AM	3696	0	0	0	3696	3696	0.89	0
AUG 12	12:00 AM								

TOTALS 3709 0 12 0 3697 3696 0.89 -1

THRESHOLD: 130

SIGNATURE \_\_\_\_\_

HOT SPOT 3005  
 107 HAMPTON ST.  
 CHESNEE, S.C. 29363  
 864-461-4147SID12719

AUG 12, 2003 2:48 PM  
 CURRENT PERIODIC RECONCILIATION REPORT

T 6: TRUCK DIESEL

DATE	TIME	OPENING	METERED	MANUAL	CALC'D	GAUGED WATER			
		VOLUME	DLVRIES	SALES	ADJUST	INVNTY	INVNTY	HEIGHT	VARIANCE
AUG 1	12:00 AM	5220	0	1573	0	3647	3608	0.00	-39
AUG 2	12:00 AM	3608	0	0	0	3608	3607	0.00	-1
AUG 3	12:00 AM	3607	0	0	0	3607	3606	0.00	-1
AUG 4	12:00 AM	3606	7672	0	0	11278	11319	0.00	41
AUG 5	12:00 AM	11319	0	0	0	11319	11299	0.00	-20
AUG 6	12:00 AM	11299	0	51	0	11248	11270	0.00	22
AUG 7	12:00 AM	11270	0	706	0	10564	10598	0.00	34
AUG 8	12:05 AM	10598	0	1922	0	8676	8591	0.00	-85
AUG 9	12:00 AM	8591	0	598	0	7993	8070	0.00	77
AUG 10	12:00 AM	8070	0	424	0	7646	7645	0.00	-1
AUG 11	12:00 AM	7645	0	2012	0	5633	5631	0.00	-2
AUG 12	12:00 AM								
TOTALS		5220	7672	7286	0	5606	5631	0.00	25

THRESHOLD: 202

SIGNATURE \_\_\_\_\_

□





JUL 21 12:04 AM	2511	0	504	0	2007	2004	0.00	-3
JUL 22 12:00 AM	2004	1300	313	0	2991	2989	0.00	-2
JUL 23 12:02 AM	2989	0	299	0	2690	2687	0.00	-3
JUL 24 12:05 AM	2687	0	304	0	2383	2380	0.00	-3
JUL 25 12:00 AM	2380	1244	467	0	3157	3156	0.00	-1
JUL 26 12:00 AM	3156	1302	449	0	4009	4009	0.00	0
JUL 27 12:00 AM	4009	0	605	0	3404	3401	0.00	-3
JUL 28 12:00 AM	3401	1297	476	0	4222	4222	0.00	0
JUL 29 12:00 AM	4222	0	299	0	3923	3922	0.00	-1
JUL 30 12:00 AM	3922	0	270	0	3652	3650	0.00	-2
JUL 31 12:00 AM	3650	0	333	0	3317	3315	0.00	-2
AUG 1 12:00 AM	3315	0	343	0	2972	2971	0.00	-1

TOTALS 2228 14811 13996 0 3043 2971 0.00 -72

THRESHOLD: 269

SIGNATURE \_\_\_\_\_

HOT SPOT 3005  
107 HAMPTON ST.  
CHESNEE, S.C. 29363  
864-461-4147SID12719

AUG 1, 2003 1:17 PM  
CURRENT PERIODIC RECONCILIATION REPORT

T 3: SUPER

DATE	TIME	OPENING	METERED	MANUAL	CALC'D	GAUGED	WATER		
		VOLUME	DLVRIES	SALES	ADJUST	INVNTY	INVNTY	HEIGHT	VARIANCE
JUL 1 12:00 AM		2943	0	399	0	2544	2544	0.77	0
JUL 2 12:00 AM		2544	0	242	0	2302	2301	0.77	-1
JUL 3 12:00 AM		2301	1194	553	0	2942	2946	0.77	4
JUL 4 12:00 AM		2946	1201	408	0	3739	3741	0.00	2
JUL 5 12:00 AM		3741	0	397	0	3344	3344	0.00	0
JUL 6 12:01 AM		3344	0	503	0	2841	2840	0.00	-1
JUL 7 12:00 AM		2840	0	317	0	2523	2524	0.00	1
JUL 8 12:00 AM		2524	0	339	0	2185	2185	0.00	0
JUL 9 12:00 AM		2185	1194	413	0	2966	2968	0.77	2
JUL 10 12:00 AM		2968	0	272	0	2696	2698	0.78	2
JUL 11 12:00 AM		2698	1194	433	0	3459	3463	0.00	4
JUL 12 12:01 AM		3463	0	396	0	3067	3069	0.00	2
JUL 13 12:00 AM		3069	0	340	0	2729	2729	0.00	0
JUL 14 12:00 AM		2729	1195	287	0	3637	3640	0.00	3
JUL 15 12:00 AM		3640	0	111	0	3529	3529	0.00	0
JUL 16 12:00 AM		3529	0	260	0	3269	3269	0.00	0
JUL 17 12:00 AM		3269	0	298	0	2971	2972	0.00	1
JUL 18 12:00 AM		2972	0	380	0	2592	2592	0.00	0
JUL 19 12:01 AM		2592	0	456	0	2136	2136	0.00	0
JUL 20 12:02 AM		2136	0	489	0	1647	1647	0.00	0
JUL 21 12:02 AM		1647	1193	127	0	2713	2713	0.00	0
JUL 22 12:00 AM		2713	0	267	0	2446	2446	0.00	0
JUL 23 12:02 AM		2446	0	81	0	2365	2365	0.00	0
JUL 24 12:03 AM		2365	1200	177	0	3388	3389	0.00	1
JUL 25 12:00 AM		3389	0	308	0	3081	3083	0.00	2
JUL 26 12:00 AM		3083	0	337	0	2746	2746	0.00	0
JUL 27 12:00 AM		2746	1195	426	0	3515	3519	0.77	4
JUL 28 12:00 AM		3519	0	246	0	3273	3274	0.77	1
JUL 29 12:00 AM		3274	0	170	0	3104	3103	0.78	-1
JUL 30 12:00 AM		3103	1145	288	0	3960	3964	0.00	4
JUL 31 12:00 AM		3964	0	348	0	3616	3617	0.00	1
AUG 1 12:00 AM									

TOTALS 2943 10711 10068 0 3586 3617 0.00 31

THRESHOLD: 230

SIGNATURE \_\_\_\_\_

HOT SPOT 3005  
107 HAMPTON ST.  
CHESNEE, S.C. 29363  
864-461-4147SID12719

AUG 1, 2003 1:18 PM  
CURRENT PERIODIC RECONCILIATION REPORT

T 4: CAR DIESEL

DATE	TIME	OPENING	METERED	MANUAL	CALC'D	GAUGED	WATER		
		VOLUME	DLVRIES	SALES	ADJUST	INVNTY	INVNTY	HEIGHT	VARIANCE
JUL 1 12:00 AM		1702	2843	481	0	4064	4064	0.76	0

JUL 3 12:00 AM	4064	0	545	0	3519	3518	0.76	-1
JUL 4 12:00 AM	3518	0	520	0	2998	2996	0.76	-2
JUL 5 12:00 AM	2996	0	467	0	2529	2529	0.76	0
JUL 6 12:00 AM	2529	0	376	0	2153	2152	0.75	-1
JUL 7 12:00 AM	2152	0	413	0	1739	1740	0.76	1
JUL 8 12:00 AM	1740	0	652	0	1088	1090	0.76	2
JUL 9 12:00 AM	1090	3943	487	0	4546	4544	0.76	-2
JUL 10 12:00 AM	4544	0	600	0	3944	3943	0.76	-1
JUL 11 12:00 AM	3943	0	155	0	3788	3788	0.76	0
JUL 12 12:00 AM	3788	0	632	0	3156	3156	0.76	0
JUL 13 12:00 AM	3156	0	604	0	2552	2552	0.76	0
JUL 14 12:00 AM	2552	0	497	0	2055	2054	0.76	-1
JUL 15 12:00 AM	2054	0	472	0	1582	1583	0.76	1
JUL 16 12:00 AM	1583	3993	576	0	5000	5004	0.76	4
JUL 17 12:07 AM	5004	0	439	0	4565	4562	0.76	-3
JUL 18 12:00 AM	4562	0	507	0	4055	4054	0.76	-1
JUL 19 12:00 AM	4054	0	529	0	3525	3525	0.76	0
JUL 20 12:00 AM	3525	0	494	0	3031	3031	0.76	0
JUL 21 12:00 AM	3031	0	441	0	2590	2590	0.76	0
JUL 22 12:00 AM	2590	0	512	0	2078	2078	0.76	0
JUL 23 12:00 AM	2078	0	591	0	1487	1488	0.76	1
JUL 24 12:00 AM	1488	2992	562	0	3918	3922	0.76	4
JUL 25 12:00 AM	3922	0	728	0	3194	3195	0.76	1
JUL 26 12:00 AM	3195	0	541	0	2654	2654	0.76	0
JUL 27 12:00 AM	2654	0	644	0	2010	2011	0.76	1
JUL 28 12:00 AM	2011	0	283	0	1728	1727	0.76	-1
JUL 29 12:00 AM	1727	5046	524	0	6249	6251	0.76	2
JUL 30 12:00 AM	6251	0	423	0	5828	5827	0.76	-1
JUL 31 12:00 AM	5827	0	323	0	5504	5503	0.76	-1
AUG 1 12:00 AM	5503	0	600	0	4903	4902	0.76	-1
TOTALS	1702	18817	15618	0	4901	4902	0.76	1

THRESHOLD: 286

SIGNATURE \_\_\_\_\_

HOT SPOT 3005  
107 HAMPTON ST.  
CHESNEE, S.C. 29363  
864-461-4147SID12719

AUG 1, 2003 1:18 PM  
CURRENT PERIODIC RECONCILIATION REPORT

T 5:KERO

DATE	TIME	OPENING	METERED	MANUAL	CALC'D	GAUGED	WATER		
		VOLUME	DLVRIES	SALES	ADJUST	INVNTY	INVNTY	HEIGHT	VARIANCE
JUL 1 12:00 AM		3743	0	0	0	3743	3743	0.89	0
JUL 2 12:00 AM		3743	0	1	0	3742	3742	0.89	0
JUL 3 12:00 AM		3742	0	1	0	3741	3740	0.89	-1
JUL 4 12:00 AM		3740	0	7	0	3733	3734	0.89	1
JUL 5 12:00 AM		3734	0	0	0	3734	3734	0.89	0
JUL 6 12:00 AM		3734	0	0	0	3734	3734	0.89	0
JUL 7 12:00 AM		3734	0	0	0	3734	3734	0.89	0
JUL 8 12:00 AM		3734	0	8	0	3726	3726	0.89	0
JUL 9 12:00 AM		3726	0	2	0	3724	3723	0.89	-1
JUL 10 12:00 AM		3723	0	0	0	3723	3723	0.89	0
JUL 11 12:00 AM		3723	0	0	0	3723	3724	0.89	1
JUL 12 12:00 AM		3724	0	1	0	3723	3722	0.89	-1
JUL 13 12:00 AM		3722	0	0	0	3722	3722	0.89	0
JUL 14 12:00 AM		3722	0	0	0	3722	3722	0.89	0
JUL 15 12:00 AM		3722	0	1	0	3721	3721	0.89	0
JUL 16 12:00 AM		3721	0	0	0	3721	3721	0.89	0
JUL 17 12:00 AM		3721	0	0	0	3721	3721	0.89	0
JUL 18 12:00 AM		3721	0	0	0	3721	3721	0.89	0
JUL 19 12:00 AM		3721	0	0	0	3721	3721	0.89	0
JUL 20 12:00 AM		3721	0	3	0	3718	3718	0.89	0
JUL 21 12:00 AM		3718	0	0	0	3718	3718	0.89	0
JUL 22 12:00 AM		3718	0	0	0	3718	3718	0.89	0
JUL 23 12:00 AM		3718	0	1	0	3717	3717	0.89	0
JUL 24 12:00 AM		3717	0	0	0	3717	3717	0.89	0
JUL 25 12:00 AM		3717	0	2	0	3715	3714	0.89	-1
JUL 26 12:00 AM		3714	0	0	0	3714	3714	0.89	0
JUL 27 12:00 AM		3714	0	0	0	3714	3714	0.89	0
JUL 28 12:00 AM		3714	0	0	0	3714	3714	0.89	0
JUL 29 12:00 AM		3714	0	0	0	3714	3714	0.89	0
JUL 30 12:00 AM		3714	0	5	0	3709	3709	0.89	0
JUL 31 12:00 AM		3709	0	0	0	3709	3709	0.89	0
AUG 1 12:00 AM		3709	0	0	0	3709	3709	0.89	0
TOTALS		3743	0	32	0	3711	3709	0.89	-2

THRESHOLD: 130

SIGNATURE \_\_\_\_\_

HOT SPOT 3005  
107 HAMPTON ST.  
CHESNEE, S.C. 29363  
864-461-4147SID12719

AUG 1, 2003 1:18 PM  
CURRENT PERIODIC RECONCILIATION REPORT

T 6:TRUCK DIESEL

DATE	TIME	OPENING	METERED	MANUAL	CALC'D	GAUGED	WATER			
JUL	1	12:00 AM	VOLUME	DLVRIES	SALES	ADJUST	INVNTY	INVNTY	HEIGHT	VARIANCE
JUL	2	12:00 AM	8858	0	1600	0	7258	7254	0.00	-4
JUL	3	12:00 AM	7254	0	2288	0	4966	4962	0.00	-4
JUL	4	12:00 AM	4962	0	2324	0	2638	2640	0.00	2
JUL	5	12:00 AM	2640	7528	595	0	9573	9571	0.00	-2
JUL	6	12:00 AM	9571	0	370	0	9201	9199	0.00	-2
JUL	7	12:00 AM	9199	0	796	0	8403	8400	0.00	-3
JUL	8	12:00 AM	8400	0	2268	0	6132	6130	0.00	-2
JUL	9	12:00 AM	6130	0	2766	0	3364	3363	0.00	-1
JUL	10	12:00 AM	3363	0	3069	0	294	599	0.00	305
JUL	11	12:00 AM	599	7219	1365	0	6453	6452	0.00	-1
JUL	12	12:00 AM	6452	0	1783	0	4669	4666	0.00	-3
JUL	13	12:00 AM	4666	0	431	0	4235	4234	0.00	-1
JUL	14	12:00 AM	4234	0	927	0	3307	3308	0.00	1
JUL	15	12:00 AM	3308	7514	1905	0	8917	8914	0.00	-3
JUL	16	12:00 AM	8914	0	3004	0	5910	5908	0.00	-2
JUL	17	12:00 AM	5908	0	1699	0	4209	4207	0.00	-2
JUL	18	12:00 AM	4207	7525	2700	0	9032	9037	0.00	5
JUL	19	12:00 AM	9037	0	2721	0	6316	6310	0.00	-6
JUL	20	12:00 AM	6310	0	983	0	5327	5324	0.00	-3
JUL	21	12:00 AM	5324	0	682	0	4642	4640	0.00	-2
JUL	22	12:00 AM	4640	7719	3425	0	8934	8936	0.00	2
JUL	23	12:00 AM	8936	0	2323	0	6613	6607	0.00	-6
JUL	24	12:00 AM	6607	0	1677	0	4930	4926	0.00	-4
JUL	25	12:00 AM	4926	0	2649	0	2277	2278	0.00	1
JUL	26	12:00 AM	2278	7651	1715	0	8214	8214	0.00	0
JUL	27	12:00 AM	8214	0	678	0	7536	7532	0.00	-4
JUL	28	12:00 AM	7532	0	770	0	6762	6755	0.00	-7
JUL	29	12:00 AM	6755	0	3285	0	3470	3454	0.00	-16
JUL	30	12:00 AM	3454	7459	2367	0	8546	8536	0.00	-10
JUL	31	12:00 AM	8536	0	2293	0	6243	6217	0.00	-26
AUG	1	12:00 AM	6217	0	977	0	5240	5220	0.00	-20

TOTALS 8858 52615 56435 0 5038 5220 0.00 182

THRESHOLD: 694

SIGNATURE \_\_\_\_\_

□



JUN 22 12:00 AM	3054	1202	661	0	3595	3589	0.00	-6
JUN 23 12:00 AM	3589	0	446	0	3143	3139	0.00	-4
JUN 24 12:00 AM	3139	1205	330	0	4014	4012	0.00	-2
JUN 25 12:00 AM	4012	0	153	0	3859	3856	0.00	-3
JUN 26 12:00 AM	3856	0	442	0	3414	3411	0.00	-3
JUN 27 12:00 AM	3411	0	471	0	2940	2937	0.00	-3
JUN 28 12:00 AM	2937	0	489	0	2448	2444	0.00	-4
JUN 29 12:00 AM	2444	1198	590	0	3052	3050	0.00	-2
JUN 30 12:00 AM	3050	0	330	0	2720	2718	0.00	-2
JUL 1 12:00 AM	2718	0	488	0	2230	2228	0.00	-2

TOTALS 2616 12134 12445 0 2305 2228 0.00 -77

THRESHOLD: 254

SIGNATURE \_\_\_\_\_

HOT SPOT 3005  
107 HAMPTON ST.  
CHESNEE, S.C.29363  
864-461-4147SID12719

JUL 3, 2003 11:19 AM  
PREVIOUS PERIODIC RECONCILIATION REPORT

T 3: SUPER

DATE	TIME	OPENING	METERED	MANUAL	CALC'D	GAUGED	WATER		
		VOLUME	DLVRIES	SALES	ADJUST	INVNTY	INVNTY	HEIGHT	VARIANCE
JUN 1 12:00 AM		3151	0	412	0	2739	2739	0.00	0
JUN 2 12:00 AM		2739	0	180	0	2559	2558	0.00	-1
JUN 3 12:00 AM		2558	1193	116	0	3635	3637	0.00	2
JUN 4 12:00 AM		3637	0	178	0	3459	3459	0.00	0
JUN 5 12:00 AM		3459	0	345	0	3114	3115	0.00	1
JUN 6 12:00 AM		3115	0	274	0	2841	2841	0.00	0
JUN 7 12:00 AM		2841	1171	326	0	3686	3688	0.00	2
JUN 8 12:00 AM		3688	0	408	0	3280	3280	0.00	0
JUN 9 12:00 AM		3280	0	286	0	2994	2994	0.00	0
JUN 10 12:01 AM		2994	0	211	0	2783	2783	0.00	0
JUN 11 12:00 AM		2783	1148	246	0	3685	3687	0.75	2
JUN 12 12:00 AM		3687	0	213	0	3474	3474	0.75	0
JUN 13 12:00 AM		3474	0	385	0	3089	3090	0.75	1
JUN 14 12:00 AM		3090	0	312	0	2778	2780	0.75	2
JUN 15 12:00 AM		2780	0	356	0	2424	2425	0.75	1
JUN 16 12:00 AM		2425	1295	227	0	3493	3493	0.00	0
JUN 17 12:00 AM		3493	0	212	0	3281	3280	0.00	-1
JUN 18 12:00 AM		3280	0	210	0	3070	3070	0.00	0
JUN 19 12:00 AM		3070	0	324	0	2746	2746	0.00	0
JUN 20 12:00 AM		2746	1193	412	0	3527	3527	0.00	0
JUN 21 12:00 AM		3527	0	337	0	3190	3189	0.00	-1
JUN 22 12:00 AM		3189	0	352	0	2837	2837	0.00	0
JUN 23 12:00 AM		2837	1290	263	0	3864	3864	0.00	0
JUN 24 12:00 AM		3864	0	268	0	3596	3596	0.00	0
JUN 25 12:00 AM		3596	1197	204	0	4589	4589	0.77	0
JUN 26 12:00 AM		4589	0	291	0	4298	4297	0.77	-1
JUN 27 12:00 AM		4297	0	256	0	4041	4040	0.77	-1
JUN 28 12:00 AM		4040	0	361	0	3679	3679	0.77	0
JUN 29 12:00 AM		3679	0	446	0	3233	3234	0.77	1
JUN 30 12:00 AM		3234	0	291	0	2943	2943	0.77	0
JUL 1 12:00 AM									

TOTALS 3151 8487 8702 0 2936 2943 0.77 7

THRESHOLD: 217

SIGNATURE \_\_\_\_\_

HOT SPOT 3005  
107 HAMPTON ST.  
CHESNEE, S.C.29363  
864-461-4147SID12719

JUL 3, 2003 11:19 AM  
PREVIOUS PERIODIC RECONCILIATION REPORT

T 4: CAR DIESEL

DATE	TIME	OPENING	METERED	MANUAL	CALC'D	GAUGED	WATER		
		VOLUME	DLVRIES	SALES	ADJUST	INVNTY	INVNTY	HEIGHT	VARIANCE
JUN 1 12:00 AM		3904	0	453	0	3451	3451	0.75	0
JUN 2 12:00 AM		3451	0	573	0	2878	2879	0.75	1
JUN 3 12:00 AM		2879	0	498	0	2381	2381	0.00	0
JUN 4 12:00 AM		2381	0	416	0	1965	1965	0.75	0

JUN 6 12:00 AM	1965	3941	578	0	5328	5333	0.75	5
JUN 7 12:00 AM	5333	0	592	0	4741	4741	0.75	0
JUN 8 12:00 AM	4741	0	533	0	4208	4208	0.00	0
JUN 9 12:00 AM	4208	0	522	0	3686	3687	0.75	1
JUN 10 12:00 AM	3687	0	458	0	3229	3229	0.75	0
JUN 11 12:00 AM	3229	0	420	0	2809	2809	0.75	0
JUN 12 12:00 AM	2809	0	492	0	2317	2318	0.75	1
JUN 13 12:00 AM	2318	0	606	0	1712	1714	0.75	2
JUN 14 12:00 AM	1714	3088	725	0	4077	4078	0.75	1
JUN 15 12:00 AM	4078	0	400	0	3678	3676	0.75	-2
JUN 16 12:00 AM	3676	0	563	0	3113	3113	0.75	0
JUN 17 12:00 AM	3113	0	502	0	2611	2611	0.75	0
JUN 18 12:00 AM	2611	3997	517	0	6091	6090	0.75	-1
JUN 19 12:00 AM	6090	0	473	0	5617	5615	0.75	-2
JUN 20 12:00 AM	5615	0	635	0	4980	4978	0.76	-2
JUN 21 12:00 AM	4978	0	544	0	4434	4432	0.76	-2
JUN 22 12:00 AM	4432	0	724	0	3708	3708	0.76	0
JUN 23 12:00 AM	3708	0	334	0	3374	3373	0.76	-1
JUN 24 12:00 AM	3373	0	499	0	2874	2874	0.75	0
JUN 25 12:00 AM	2874	0	336	0	2538	2538	0.76	0
JUN 26 12:00 AM	2538	0	457	0	2081	2080	0.75	-1
JUN 27 12:00 AM	2080	0	1001	0	1079	1082	0.75	3
JUN 28 12:00 AM	1082	2742	505	0	3319	3320	0.75	1
JUN 29 12:00 AM	3320	0	484	0	2836	2836	0.76	0
JUN 30 12:00 AM	2836	0	410	0	2426	2426	0.75	0
JUL 1 12:00 AM	2426	0	725	0	1701	1702	0.76	1
TOTALS	3904	13768	15975	0	1697	1702	0.76	5

THRESHOLD:

289

SIGNATURE \_\_\_\_\_

HOT SPOT 3005  
 107 HAMPTON ST.  
 CHESNEE, S.C. 29363  
 864-461-4147SID12719

JUL 3, 2003 11:19 AM  
 PREVIOUS PERIODIC RECONCILIATION REPORT

T 5:KERO

DATE	TIME	OPENING	METERED	MANUAL	CALC'D	GAUGED	WATER		
		VOLUME	DLVRIES	SALES	ADJUST	INVNTY	INVNTY	HEIGHT	VARIANCE
JUN 1 12:00 AM		3765	0	1	0	3764	3764	0.89	0
JUN 2 12:00 AM		3764	0	1	0	3763	3762	0.89	-1
JUN 3 12:00 AM		3762	0	2	0	3760	3760	0.89	0
JUN 4 12:00 AM		3760	0	0	0	3760	3760	0.89	0
JUN 5 12:00 AM		3760	0	0	0	3760	3760	0.89	0
JUN 6 12:00 AM		3760	0	0	0	3760	3760	0.89	0
JUN 7 12:00 AM		3760	0	6	0	3754	3754	0.89	0
JUN 8 12:00 AM		3754	0	0	0	3754	3754	0.89	0
JUN 9 12:00 AM		3754	0	1	0	3753	3754	0.89	1
JUN 10 12:00 AM		3754	0	1	0	3753	3752	0.89	-1
JUN 11 12:00 AM		3752	0	2	0	3750	3749	0.89	-1
JUN 12 12:00 AM		3749	0	0	0	3749	3750	0.89	1
JUN 13 12:00 AM		3750	0	1	0	3749	3749	0.89	0
JUN 14 12:00 AM		3749	0	0	0	3749	3749	0.89	0
JUN 15 12:00 AM		3749	0	3	0	3746	3745	0.89	-1
JUN 16 12:00 AM		3745	0	0	0	3745	3746	0.89	1
JUN 17 12:00 AM		3746	0	0	0	3746	3746	0.89	0
JUN 18 12:00 AM		3746	0	2	0	3744	3743	0.89	-1
JUN 19 12:00 AM		3743	0	0	0	3743	3744	0.89	1
JUN 20 12:00 AM		3744	0	0	0	3744	3744	0.89	0
JUN 21 12:00 AM		3744	0	0	0	3744	3745	0.89	1
JUN 22 12:00 AM		3745	0	2	0	3743	3742	0.89	-1
JUN 23 12:00 AM		3742	0	0	0	3742	3742	0.89	0
JUN 24 12:00 AM		3742	0	0	0	3742	3743	0.89	1
JUN 25 12:00 AM		3743	0	0	0	3743	3743	0.89	0
JUN 26 12:00 AM		3743	0	0	0	3743	3743	0.89	0
JUN 27 12:00 AM		3743	0	0	0	3743	3744	0.89	1
JUN 28 12:00 AM		3744	0	0	0	3744	3744	0.89	0
JUN 29 12:00 AM		3744	0	2	0	3742	3742	0.89	0
JUN 30 12:00 AM		3742	0	0	0	3742	3742	0.89	0
JUL 1 12:00 AM		3742	0	0	0	3742	3743	0.89	1
TOTALS		3765	0	24	0	3741	3743	0.89	2

THRESHOLD:

130

SIGNATURE \_\_\_\_\_

HOT SPOT 3005  
107 HAMPTON ST.  
CHESNEE, S.C. 29363  
864-461-4147SID12719

JUL 3, 2003 11:19 AM  
PREVIOUS PERIODIC RECONCILIATION REPORT

T 6:TRUCK DIESEL

DATE	TIME	OPENING	METERED	MANUAL	CALC'D	GAUGED	WATER		
		VOLUME	DLVRIES	SALES	ADJUST	INVNTY	INVNTY	HEIGHT	VARIANCE
JUN 1	12:00 AM	3089	7535	505	0	10119	10117	0.00	-2
JUN 2	12:00 AM	10117	0	2430	0	7687	7680	0.00	-7
JUN 3	12:00 AM	7680	0	2358	0	5322	5315	0.00	-7
JUN 4	12:00 AM	5315	0	1441	0	3874	3873	0.00	-1
JUN 5	12:00 AM	3873	7313	2378	0	8808	8810	0.00	2
JUN 6	12:00 AM	8810	0	2197	0	6613	6606	0.00	-7
JUN 7	12:00 AM	6606	0	530	0	6076	6073	0.00	-3
JUN 8	12:00 AM	6073	0	614	0	5459	5456	0.00	-3
JUN 9	12:00 AM	5456	0	2155	0	3301	3301	0.00	0
JUN 10	12:00 AM	3301	7475	1863	0	8913	8910	0.00	-3
JUN 11	12:00 AM	8910	0	2424	0	6486	6480	0.00	-6
JUN 12	12:00 AM	6480	0	2046	0	4434	4428	0.00	-6
JUN 13	12:00 AM	4428	0	2616	0	1812	1817	0.00	5
JUN 14	12:00 AM	1817	7500	1139	0	8178	8180	0.00	2
JUN 15	12:00 AM	8180	0	204	0	7976	7976	0.00	0
JUN 16	12:00 AM	7976	0	2493	0	5483	5484	0.00	1
JUN 17	12:00 AM	5484	0	2353	0	3131	3134	0.00	3
JUN 18	12:04 AM	3134	7011	2201	0	7944	7947	0.00	3
JUN 19	12:00 AM	7947	0	2035	0	5912	5913	0.00	1
JUN 20	12:00 AM	5913	0	2702	0	3211	3213	0.00	2
JUN 21	12:00 AM	3213	0	755	0	2458	2459	0.00	1
JUN 22	12:00 AM	2459	7513	275	0	9697	9703	0.00	6
JUN 23	12:00 AM	9703	0	2161	0	7542	7545	0.00	3
JUN 24	12:00 AM	7545	0	2642	0	4903	4904	0.00	1
JUN 25	12:00 AM	4904	0	1997	0	2907	2910	0.00	3
JUN 26	12:00 AM	2910	7516	2595	0	7831	7829	0.00	-2
JUN 27	12:00 AM	7829	0	2432	0	5397	5390	0.00	-7
JUN 28	12:00 AM	5390	0	690	0	4700	4698	0.00	-2
JUN 29	12:00 AM	4698	0	719	0	3979	3978	0.00	-1
JUN 30	12:00 AM	3978	7480	2601	0	8857	8858	0.00	1
JUL 1	12:00 AM								
TOTALS		3089	59343	53551	0	8881	8858	0.00	-23

THRESHOLD:

665

SIGNATURE \_\_\_\_\_

□



HW 29#I-26

MW 3R - H<sub>2</sub>O @ 24' 7" no free product  
MW 41 - " 24' 5 1/2" " " "  
U2 - dry  
③R ④I  
⑤Z

MW 6? - water 21' 5 1/2" - no free product  
MW 7 - " 20' 3" - " " "

MW 1R - water 21' 1/2" - no free product  
~~MW 1R~~ - 21' 3" free product ≈ 1/4"

~ 8' to rear of 1R toward store - water 22" 0" -  
no free product

D H E C



PROMOTE PROTECT PROSPER

2600 Bull Street  
Columbia, SC 29201-1708

COMMISSIONER: Judith A. Laughter  
C. Earl Hunter R.L. Jordan Oil Company  
BOARD: PO Box 2527  
Bradford W. Wyche Spartanburg, SC 29304  
Chairman  
Mark B. Kent  
Vice Chairman

Howard L. Brilliant, MD  
Secretary

Carl L. Brazell

Louisiana W. Wright

L. Michael Blackmon

Lawrence R. Chewning, Jr., DMD

May 14, 2003

RECEIVED

MAY 19 2003

UNDERGROUND STORAGE  
TANK PROGRAM

Re: Underground Injection Control Permit #696  
Hot Spot #3005 Site  
Spartanburg County

Dear Ms. Laughter:

Enclosed is a Permit to Construct for four (4) Class VA-I injection wells at the Hot Spot #3005 Site, Spartanburg County as requested in the permit application received April 9, 2003.

Affected parties may appeal this permit decision in accordance with State Regulation R.61-72. To contest a case, a request for a hearing must be made to the Clerk of the DHEC Board within 15 days of the date of this letter. All requests must include the following information:

- 1) name of the party requesting the hearing,
- 2) issue(s) for which the hearing is requested,
- 3) caption or other information sufficient to identify the decision, order, action or inaction which is the subject of the hearing,
- 4) relief requested.

Note further that Administrative Law Judge (ALJ) Division rules require that persons requesting a contested case hearing must file a copy of the request and pay a filing fee in the amount of \$100 dollars (US) with the ALJ Division at the following address:

Clerk, ALJ Division  
1205 Pendleton Street, Suite 224  
P.O. Box 11667  
Columbia, SC 29211

An inspection of the UIC System must be conducted prior to issuance of Approval to Operate. If you have any question, please call Todd Adams at (803) 898-3549.



Sincerely,

Rob Devlin, Manager  
GroundWater Management Section  
Bureau of Water

cc: Debra Thoma, BLWM-USTP  
Mark Brooks, Brooks & Medlock, 17 Arlington St., Asheville, NC 28801



2600 Bull Street  
Columbia, SC 29201-1708

COMMISSIONER:  
C. Earl Hunter

BOARD:  
Bradford W. Wyche  
Chairman

Mark B. Kent  
Vice Chairman

Howard L. Brilliant, MD  
Secretary

Carl L. Brazell

Louisiana W. Wright

L. Michael Blackmon

Lawrence R. Chewning, Jr., DMD

## WATER MONITORING ASSESSMENT & PROTECTION DIVISION

Injection Well Construction Permit  
for

Class II, III, and V.A. Injection Well(s)


Permit #696

Date Issued: May 14, 2003  
Date Expired: May 14, 2004

For (Operator): Brooks & Medlock

In accordance with provisions of Title 48, Chapter 1, South Carolina Code of Laws, 1976, as amended, permission is granted for construction of four (4) Class V.A.-I injection wells with a true diameter of one inches and a total depth of approximately 20-50 feet located at the Hot Spot #3005 Site, Spartanburg County, SC with the following provisions:

- 1) The operator shall submit completed SCDHEC well record forms to the Departments Water Monitoring, Assessment & Protection Division after completion of the injection wells.
- 2) Upon completion of construction, injection activities shall not commence prior to receiving approval from the Department to operate the injection wells.
- 3) When the injection wells are no longer in use, or upon request by the Department, within sixty (60) days all injection wells must be permanently abandoned in accordance with the South Carolina Well Standards and Regulations (R.61-71).

  
Rob Devlin, Manager  
GroundWater Management Section  
Bureau of Water

May 14, 2003  
Date



DHEC 2104 (6/88)

### **STATEMENT OF BASIS - UIC DRAFT PERMIT #696**

In accordance with the South Carolina Underground Injection Control Regulations, Section R61-87.12.J., this Statement of Basis has been prepared for the Hot Spot #3005 Site Underground Injection Control permit application received March 29, 2003.

Ownership of the proposed injection wells is the R.L. Jordan Oil Company, PO Box 2527, Spartanburg, SC 29304. The permit (UIC #696) is for the construction of four (4) injection wells for a corrective action system at the Hot Spot #3005 Site. The intent of the injection wells is to remediate volatile organic compounds from the ground water by injection into the subsurface of ambient air as described in the Corrective Action Plan. The draft permit for the underground injection proposal has been prepared based on staff review and the application of the Pollution Control Act of South Carolina and the Underground Injection Control Regulations of South Carolina.

Conditions of the permit issuance include the submittal of well records for all injection wells installed and the inspection of well construction by the Department prior to injection.



2600 Bull Street  
Columbia, SC 29201-1708

UNDERGROUND STORAGE TANK PROGRAM  
BUREAU OF LAND AND WASTE MANAGEMENT

Phone: (800) 826-5435 Fax: (803) 898-4330

MAY 21 2003

MR MARK BROOKS  
BROOKS & MEDLOCK ENGINEERING  
712 MERRIMAN AVE  
ASHEVILLE NC 28804

Re: Hot Spot 3005, 107 Hampton St., Chesnee, SC  
UST Permit #12719, CP#: 13851:P  
Bid#: SB-18123-12/20/01-HW, PO#385179  
Quarterly Sampling Report received May 1, 2003  
Spartanburg County

Dear Mr. Brooks:

The Underground Storage Tank Program has reviewed the referenced report and concurs with your recommendation to augment the system with air sparging to address the lingering chemicals of concern in the vicinity of MW-3. Implementation of the system may begin once the Bureau of Water has issued the UIC Permit to Install. The next quarterly sampling report should be submitted on or before August 1, 2003 and should document the installation of the air sparge system.

If you have any questions or need additional information, please contact me at (803) 896-6397 or [thomadl@dhec.sc.gov](mailto:thomadl@dhec.sc.gov).

Sincerely,

Debra L. Thoma, Hydrogeologist  
State Lead & Field Services Section  
Assessment and Corrective Action Division

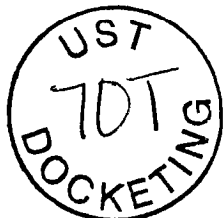
cc: Judith Laughter, RL Jordan Oil Co., PO Box 2527, Spartanburg, SC, 29304-2527  
Technical File

SCDHEC/UST/DLT/5.20.03/12719initial



**UNDERGROUND STORAGE TANK (UST) 72 HOUR RELEASE REPORT**

SITE ID NUMBER: (ON ANNUAL INVOICE) 12719



FACILITY NAME: Hot Spot 3005

Address: 107 Hampton St.

Chesnee, SC 29323

Contact: Judy Laughter Telephone (804) 585-2784

- 1) Number of USTs at this site: In Service 5 Out of Service 1
- 2) Date of LAST System test. \_\_\_\_\_ (Attach copy)
- 3) Are there any drinking water wells on or near the site? Yes No
- 4) Is the drinking water contaminated? Yes No
- 5) Date release discovered. 8-1-03 (Night)
- 6) How was the release discovered? ELLD Alarm
- 7) Type of product(s) discovered DSL

Describe actions taken to: (attach additional sheets if needed)

- 8) Discover the cause of the release. Helium test indicates leak near STP
- 9) Prevent further release. Taken out-of-use 8-1-03
- 10) Clean up the site. Plans to sample when Jones + Frank exposes line.

Follow the directives of Subpart E of the SC UST Control Regulations, notify proper local authorities and neighboring property owners potentially affected by the release. On all correspondence related to a particular site, please reference the GWPD Site ID Number. Questions should be addressed to the Ground-Water Protection Division at (803) 734-5331. FAX (803) 734-3604

Reported by (PRINT) Judy Laughter Telephone (804) 585-2784

Signature Called in to: Connie Anderson Date 8-4-03

-----

**Stamp**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Manager, UST Regulatory Section  
Ground-Water Protection Division  
2600 Bull Street  
Columbia, SC 29201**

-----

**Connie J. Anderson - Re: Hot Spot 3005 # 12719**

---

**From:** Chuck W. Hightower  
**To:** Anderson, Connie J.  
**Date:** 8/4/03 11:07 AM  
**Subject:** Re: Hot Spot 3005 # 12719

---

This one will be fun. 1993 release with free product > 1 foot. January 2003 note states--CA#17679, 99.78% mass above SSTL removed.

>>> Connie J. Anderson 08/04/03 10:59AM >>>

Judy Laughter called in a release report today. The TLS 350 reported a dsl line leak Friday night. The line was taken out of service and the technician tried a mechanical leak detector Saturday. Still, a leak was detected. A helium test found a problem in the line near submerged pump. Jones and Frank are supposed to show up to dig up the line but Judy doesn't know what time. She is onhand to sample when the hole is open. She will try to let us know as far in advance as possible in case Christa wants to swing by. Thanks.



Site Name/ID# Hot Spot 3005 / # 12719  
 Release # \_\_\_\_\_ For UST# \_\_\_\_\_ Release Report Date 8-4-03

Free Product Reported? Yes/No            Impacted water supply well reported? Yes/No             
 Receptor w/in 1000 feet of UST system? (Well, Surface water body, wetland, other)           

Triage (Indicate type of submittal)  
 CR \_\_\_\_\_  
 AR \_\_\_\_\_  
 SC \_\_\_\_\_  
 RLS-S  Inspection checklist \_\_\_\_\_  
 RLS-E \_\_\_\_\_

TST \_\_\_\_\_  
 MWR \_\_\_\_\_  
 T of O \_\_\_\_\_  
 Other \_\_\_\_\_

Worst Case Analysis/Sample #	Soil (mg/kg)/# _____	Water (ug/l)/# _____
Benzene	_____	_____
Toluene	_____	_____
Ethylbenzene	_____	_____
Xylenes	_____	_____
Naphthalene	_____	_____
Benzo(a)anthracene	_____	_____
Benzo(b)flouranthene	_____	_____
Benzo(k)flouranthene	_____	_____
Chrysene	_____	_____
Dibenz(a,h)anthracene	_____	_____
MTBE (water only)	_____	_____
Other _____	_____	_____

**POTENTIAL SC DENIAL? YES / NO**

- All USTs Registered?  Yes / No / NA
- All Applicable Annual Fees Paid?  Yes / No / NA
- Financial Responsibility Certification Received?  Yes / No / NA Type Self
- Insurance Statement Received? Yes / No / NA Dated \_\_\_\_\_ Requested? \_\_\_\_\_
- UST Status (account for all USTs in database)
  - USTs Permanently Closed Date Closed \_\_\_\_\_ Last Used Date \_\_\_\_\_
  - USTs CIU & Passed TT Date Tested \_\_\_\_\_ Date Repaired \_\_\_\_\_
  - USTs TOU & Emptied Date Emptied \_\_\_\_\_ Last Used Date \_\_\_\_\_
- RP - Owner signature? Yes / No
- Site Map Received? Yes  No / Requested? \_\_\_\_\_

*Att. Councilman SI 12719*



**RECEIVED**  
8-15-03

**PRECISION TANK SERVICE, INC.**

08/12/2003

R. L. Jordan Oil Company  
P. O. Box 2527  
Spartanburg, SC 29304

Location: HOT SPOT 3005  
Address: 107 HAMPTON STREET  
City, State: CHESNEE SC  
Test Number: 030804A-52  
Test Date: 08/04/2003  
Technician: Ted Urcinola  
Certification: SS-0381 PT  
PO Number:

Dear Judy Laughter,

Precision testing was performed at the above mentioned location using the Estabrook EZY 3 Locator+ (a non-volumetric test) for tanks, the ACCURITE equipment for lines, and/or the FTA for leak detectors. All tests were performed according to the equipment manufacturers specifications, and meet all state and federal requirements.

PRODUCT	UNLEAD	PLUS	LINES
ISOLATION	B-VALVE	B-VALVE	PREMIUM
PRESSURE	45	45	B-VALVE
LEAK RATE	-0.000	-0.000	45
RESULT	PASS	PASS	-0.000
			PASS



**RECEIVED**

AUG 15 2003  
Underground Storage  
Tank Program

If you have any questions, please feel free to call 800-533-8039.

Thank You,  
Precision Tank Service, Inc.



**PRECISION TANK SERVICE, INC.**

SI 12719  
Hot Spot 3005

08/12/2003

R. L. Jordan Oil Company  
P. O. Box 2527  
Spartanburg, SC 29304

RE: HOT SPOT 3005

Test Number: 030804A-52  
Test Date: 08/04/2003

Dear Judy Laughter,

The following notes were made by the technician concerning the above referenced location.

***LINES TESTED PER JUDY'S REQUEST.***

If you have any questions, please feel free to call 1-800-533-8039.

Thank you,

***Precision Tank Service, Inc.***

SI 12719

PRECISION TANK SERVICE  
HELIUM TEST DATA

Hot Spot 3005

Company: R.L. Jordan

Date: 4 Aug 03

Site Information: HOT SPOT 3005  
107 HAMPTON ST.  
CHESNEE S.C.

Technician: Ted Urcinola

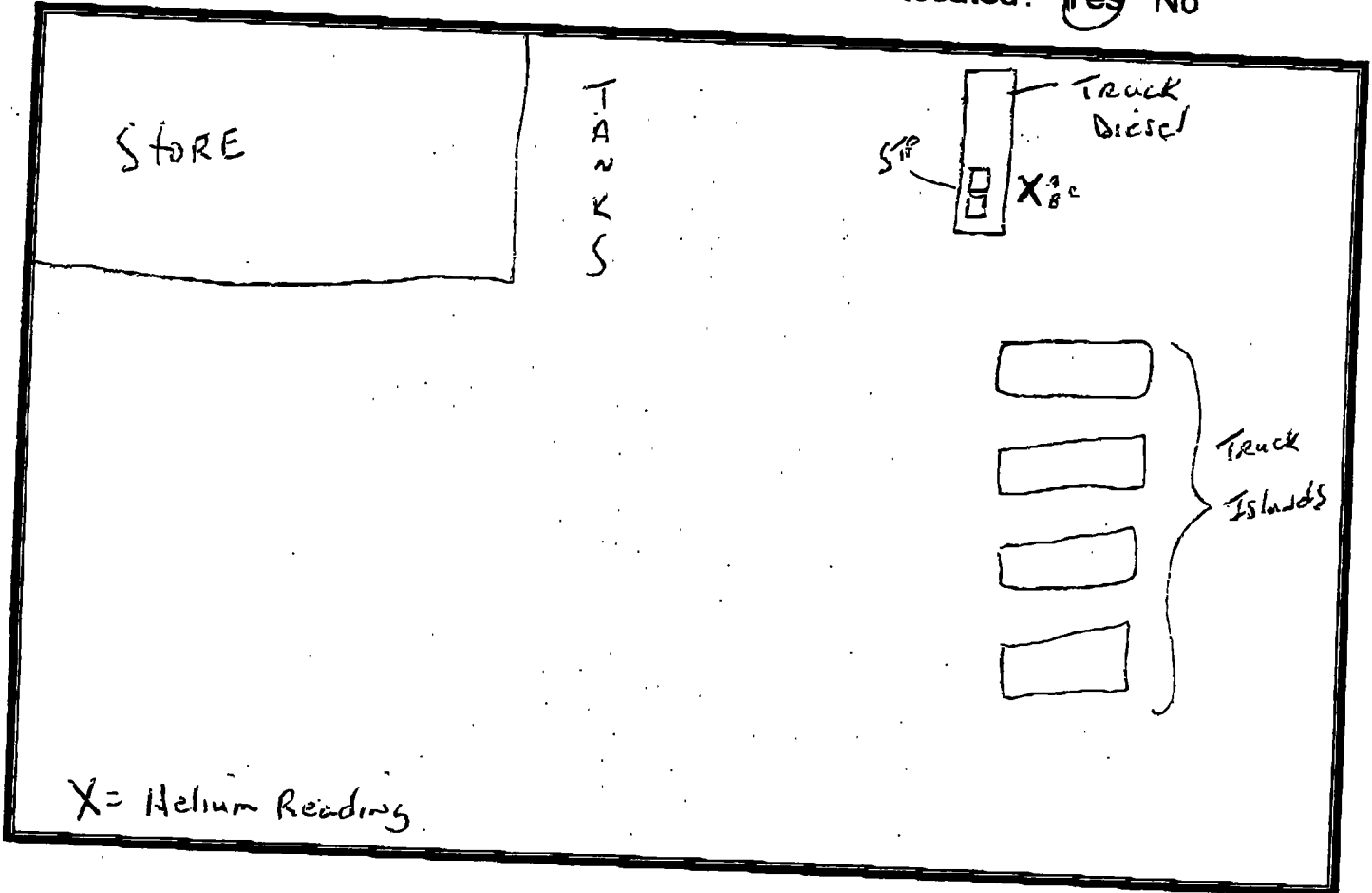
Test #: 030804A-52

Type of Test?  Line  Tank  Both

Amount of Helium Used? (Containers) 1

Number of Tests? 1

Leaks Located?  Yes  No



Helium Levels

A	52%	F		K		P	
B	51%	G		L		Q	
C	56%	H		M		R	
D		I		N		S	
E		J		O		T	

Parts: \_\_\_\_\_



2600 Bull Street  
Columbia, SC 29201-1708

**MEMORANDUM**

TO: Melanie Hall, WP Enforcement Section  
Barney Harmon, Appalachia III  
Art Shrader, UST Management

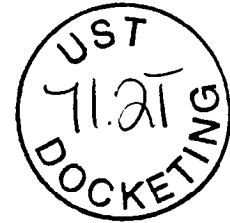
FROM: Betty Lou Foster *BAF*  
NPDES Administration

SUBJECT: Request for NPDES Permit Cancellation

DATE: August 18, 2003

Chris ✓ 8/20  
Debra ✓  
Ok to stop???  
-1 hrs out.  
yes

2003  
UNDERGROUND STORAGE  
TANK PROGRAM



We have received a request from Hot Spots #3005 to cancel NPDES General Permit No. SCG830029. Please indicate your concurrence or non-concurrence in cancelling this permit and return to me. If you do not concur, then indicate why and include a tentative date of cancellation.

Thank you for your prompt response.

Concur *Art Shrader*  
Signature

8/20/03  
Date

Do not concur \_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

Enclosure



**BROOKS & MEDLOCK**  
ENGINEERING, PLLC

August 12, 2003

Ms. Betty Lou Foster  
SCDHEC  
NPDES Administration  
2600 Bull Street  
Columbia, SC 29201

**RECEIVED**

AUG 18 2003

Industrial, Agricultural &  
Stormwater Permitting Division

RE: Recision of NPDES General Permit SCG830029

Dear Ms. Foster:

The above referenced general NPDES permit has a renewal date of September 2, 2003, and expires on February 29, 2004. The permit is for a wastewater discharge system temporarily installed at a petroleum release site at the Hot Spot #3005 located in Chesnee, SC in Spartanburg County (UST Site ID Number 12719). The wastewater treatment system is mounted on a trailer with other treatment systems and the entire trailer configuration is used at multiple sites.

Our work at the Hot Spot #3005 petroleum release site is complete in the sense we will no longer treat the groundwater and release effluent under the NPDES permit. We last used the wastewater treatment/discharge system in December 2002. Our work at the site will use other technologies (i.e., air sparging of the groundwater) to reduce pollutant concentrations. Therefore, we request that SCDHEC rescind the NPDES permit.

If you have questions concerning this request please contact me at 828/232-4700 or at [mark@brooksandmedlock.com](mailto:mark@brooksandmedlock.com). Alternatively, you may contact Dan March at the above phone number.

Sincerely,  
Brooks and Medlock Engineering, PLLC

Mark Brooks, P.E.  
Environmental Engineer



  
**BROOKS & MEDLOCK**  
ENGINEERING, PLLC

August 18, 2003

South Carolina DHEC  
Bureau of UST Management  
Stern Business Center  
8901 Farrow Road  
Columbia, SC 29203

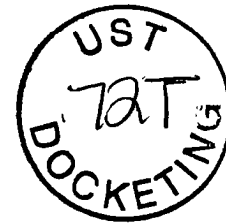
ATTENTION: Ms. Debra Thoma

Reference: **QUARTERLY SAMPLING REPORT**  
Hot Spot # 3005  
Site ID No. 12719

**RECEIVED**

AUG 21 2003

UNDERGROUND STORAGE  
TANK PROGRAM



Dear Ms. Thoma:

Brooks & Medlock Engineering, PLLC (BME) has performed a quarterly sampling event on July 22, 2003 for the referenced site. This sampling event is required as part of the scope of work outlined in Bid Number SB-18123-12/20/01-HW (Bid Package). This Preliminary Sampling Report provides the details and results of the sampling event. Additionally, this report provides details concerning a significant change in site conditions that will necessitate contractual changes in the "Pay-for-Performance" Corrective Action.

***Corrective Action Progress Summary***

The mobile remediation system described in the Corrective Action Plan has not been in operation since November 2002 due to a change in the corrective action plan. The pump and treat system has effectively removed the free product and significantly reduced the CoC levels in the source area. Prior to recent events, only minor CoC remained at the site as evidenced by the 99.93% net CoC removal relative to the Site Specific Target Levels (SSTLs) (see Table 2).

BME had plans to initiate air sparging at the site starting this quarter. An Underground Injection Control Permit had been issued. However, due to a significant change in site conditions, the construction of the air sparging system has not been implemented. The "significant change in site conditions" is a new petroleum release. A transfer line from the diesel underground storage tanks to the dispensers has reportedly ruptured. The line leak is essentially the same location as the release currently being addressed in this Corrective Action effort. This account is based upon the events witnessed on August 4, 2003 at the subject site, which are summarized below.

On August 4, 2003, BME mobilized to the site to locate utilities for the scheduled site work involving the installation of air sparging wells. No site work had been conducted since the initial system installation over a year ago. Upon arrival at the site, Ms Judy Laughter of R.L Jordan Oil company was present and informed us of the release. A petroleum tank testing company (PTI) was on site conducting a helium test on the system. Their results confirmed the release location to be in the diesel piping in the same location

2 Soil Vapor Extraction  
1 GW Extraction  
99.93%  
CNSA vol #1

1. Contact Hunt Brooks  
- interested in staying in  
on want out?
2. Calculated % reduction  
- better understanding will pay  
x% of contract upon removal  
of system + abandonment??
3. Letter to RL Jordan - issue  
CNSA on first release - need  
GIS event on 2nd release  
possible AFUE  $\Rightarrow$  MUIA



where the piping had been previously repaired. The diesel UST monitoring ports were full of product based upon visual inspection. Ms. Laughter indicated that she had already called in a release report to the Bureau of UST Management. BME decided to cease all further plans for the site. It is our understanding that the new release must be assessed under a separate contract. We will be awaiting communication from your office as to how to further proceed at the site.

### ***Sampling Event***

Field personnel from BME conducted a sampling event at the Hot Spot # 3005 located in Chesnee, SC on July 22, 2003. The remediation system had not been active this quarter. Groundwater samples were collected in accordance with the South Carolina DHEC *Analytical Methodology for Groundwater and Soil Assessment Guidelines* dated March 15, 2000. Each monitoring well designated as a compliance point in the Bid Package was sampled according to the following steps:

1. A fresh pair of disposable Nitril™ gloves are donned to prevent cross-contamination.
2. The groundwater level is measured with a water level indicator and recorded. If free product is present, the product level is measured with an oil/water interface probe. Wells with free product are not sampled.
3. The well is purged with either a disposal polyethylene disposable bailer or a submersible well pump equipped with disposable vinyl tubing.
4. Periodic geochemical characteristic measurements are taken for pH, conductivity and temperature. Once the geochemical characteristics are stabilized (less than a 10% differential), the appropriate sample containers are filled. Care is taken on VOC vials to ensure no head space is allowed. The vials are provided by the analyzing laboratory.
5. Samples are placed on ice for shipment.
6. Non-disposal sampling equipment is decontaminated utilizing an Alconox™ wash and a triple rinse.
7. Purge water and “de-con” water were introduced into the groundwater remediation system for treatment and discharge.
8. Gloves and other disposal equipment (bailers, tubing) are changed out and containerized.

Copies of the field sheets with geochemical purge data for each monitoring well are provided as Attachment I.

### ***Sampling Results***

The groundwater elevation data was utilized to generate a potentiometric map depicting the site's surficial aquifer flow direction and gradient. Table 1 summarizes the groundwater elevation data. The general groundwater flow direction is towards the west side of the property, as previously reported. The potentiometric map is provided as Figure 1.

Groundwater samples were analyzed by Pace Analytical (SC Lab Certification No. 99006). Samples were analyzed for benzene, toluene, ethylbenzene, xylene, naphthalene and MTBE by EPA Method 8260. The results are summarized in Table 2. Copies of the laboratory analytical are provided in Attachment II. The results show that the CoC mass has been reduced by over 99.93% relative to the SSTLs.

***Closing***

We anticipate the "Pay-for-Performance" Corrective Action contract will be voided due to the new release. BME is awaiting directive from your office as to how to proceed with any site abandonment and how to handle the changes in contractual obligation. Please contact me at (828) 232-4700.

Sincerely,

**Brooks & Medlock Engineering, PLLC**

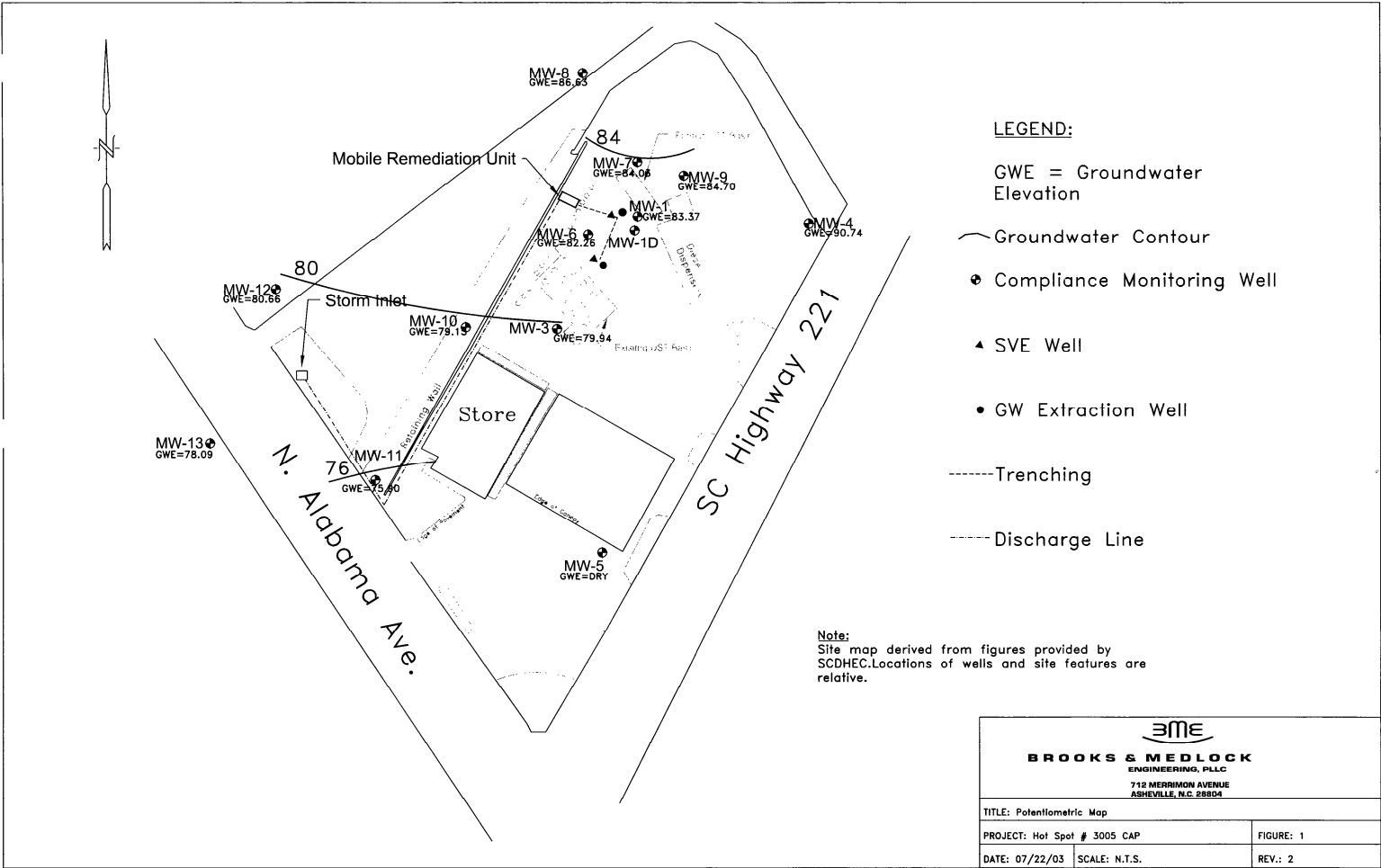
A handwritten signature in black ink, appearing to read "Mark Brooks", written in a cursive style.

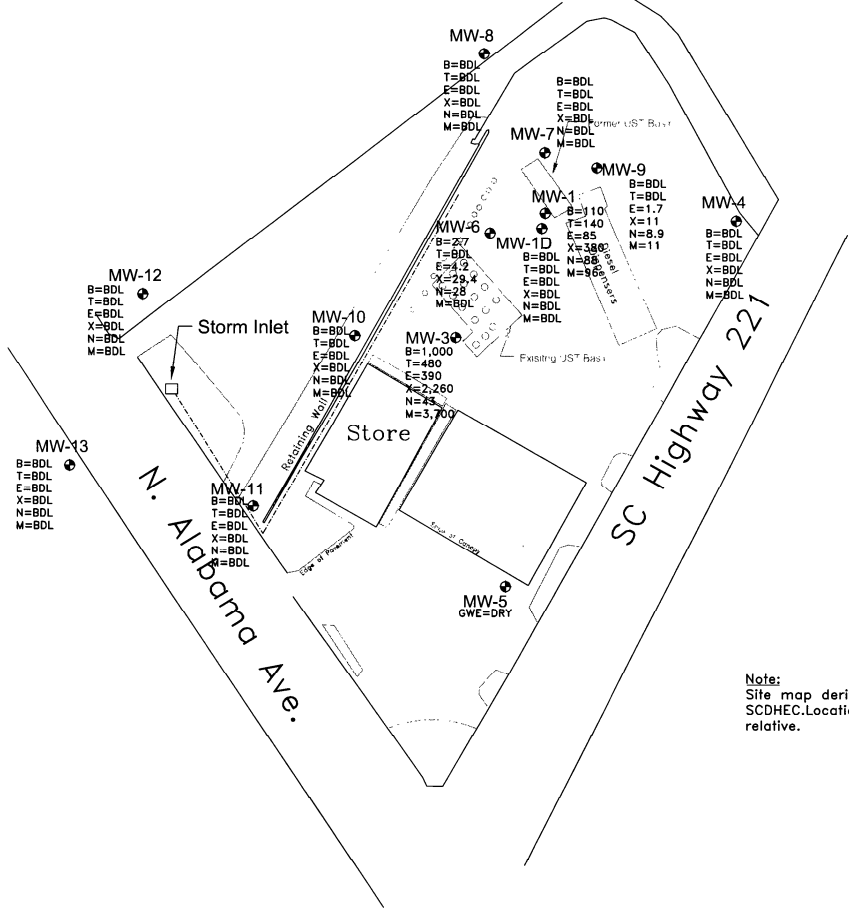
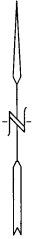
Mark Brooks, P.E.  
Environmental Engineer

Cc: Judy Laughter, R.L. Jordan Oil Co.

Attachments: Figures  
Tables  
Attachment I: Sample Logs  
Attachment II: Laboratory Analytical

## **FIGURES**






**LEGEND:**

GWE = Groundwater Elevation

● Compliance Monitoring Well

- B=Benzene in ug/l
- T=Toluene in ug/l
- E=Ethylbenzene in ug/l
- X=Xylene in ug/l
- N=Naphthalene in ug/l
- M=MTBE in ug/l

Note:  
Site map derived from figures provided by SCDHEC. Locations of wells and site features are relative.

 <b>BROOKS &amp; MEDLOCK</b> ENGINEERING, PLLC 712 MERRIMON AVENUE ASHEVILLE, N.C. 28804		
TITLE: SITE COC MAP		
PROJECT: Hot Spot # 3005 CAP	SCALE: N.T.S.	FIGURE: 2
DATE: 07/22/03	SCALE: N.T.S.	REV.: 1

## **TABLES**

**BROOKS & MEDLOCK ENGINEERING, PLLC**

**TABLE 1  
GROUNDWATER ELEVATION DATA  
HOT SPOT # 3005  
July 22, 2003**

<i>Well ID</i>	<i>Well TOC* Elevation</i>	<i>Depth to Water</i>	<i>Depth to Product</i>	<i>Product Thickness</i>	<i>Groundwater Elevation</i>
MW-1	104.89	21.52	-	-	83.37
MW-2	No Data	No Data	-	-	-
MW-3	104.92	24.98	-	-	79.94
MW-4	111.32	20.58	-	-	90.74
MW-5	103.57	dry	-	-	-
MW-6	104.14	21.88	-	-	82.26
MW-7	104.52	20.49	-	-	84.03
MW-8	101.79	15.16	-	-	86.63
MW-9	105.43	20.73	-	-	84.70
MW-10	96.57	17.42	-	-	79.15
MW-11	95.15	19.25	-	-	75.90
MW-12	97.03	16.37	-	-	80.66
MW-13	95.89	17.80	-	-	78.09

\*TOC = top of casing

\*\* Elevation adjusted for free product

BROOKS & MEDLOCK ENGINEERING, PLLC

TABLE 2  
CoC CONCENTRATIONS  
HOT SPOT #3005

Well	Date	Parameters (ug/l)						Total Mass
		Benzene	Toluene	Ethylbenzene	Xylenes	Naphth.	MTBE	
SC GW Std.	NA	5	1,000	700	10,000	25	40	
<b>MW-1</b>	SSTL	13,000	47,000	39,000	206,000	2,000	190	
	9/29/01	<b>226,000</b>	<b>301,000</b>	<b>280,000</b>	<b>278,000</b>	<b>2,000</b>	<b>5,110,000</b>	
	Initial>SSTL	213,000	254,000	241,000	72,000	0	5,109,810	5,889,810
	7/22/03	110	140	85	380	88	96	
	Subsequent>SSTL	0	0	0	0	0	0	0
<b>MW-3</b>	SSTL	2,140	155	295	2,260	300	150	
	9/29/01	2,140	155	295	2,260	300	<b>7,460</b>	
	Initial>SSTL	0	0	0	0	0	7,310	7,310
	7/22/03	1,000	<b>480</b>	390	2,260	43	<b>3,700</b>	
	Subsequent>SSTL	0	325	95	0	0	<b>3,550</b>	3,970
<b>MW-6</b>	SSTL	7	2	24	97	138	5	
	9/29/01	7	2	24	97	138	<5	
	Initial>SSTL	0	0	0	0	0	0	0
	7/22/03	2.7	<1	4.2	29.4	28.0	<1	
	Subsequent>SSTL	0.0	0.0	0.0	0.0	0.0	0.0	0
<b>MW-7</b>	SSTL	1	1	1	1	5	5	
	9/29/01	<1	<1	<1	<1	<5	<5	
	Initial>SSTL	0	0	0	0	0	0	0
	7/22/03	<1	<1	<1	<2	<1	<1	
	Subsequent>SSTL	0	0	0	1	0	0	1
<b>MW-9</b>	SSTL	1	1	1	1	5	5	
	9/29/01	<1	<1	<1	<1	<5	<5	
	Initial>SSTL	0	0	0	0	0	0	0
	7/22/03	<1	<1	<b>1.7</b>	<b>11</b>	<b>8.9</b>	<b>11</b>	
	Subsequent>SSTL	0	0	1	10	4	6	21
<b>MW-10</b>	SSTL	1	1	1	1	5	5	
	9/29/01	<1	<1	<1	<1	<5	<5	
	Initial>SSTL	0	0	0	0	0	0	0
	7/22/03	<1	<1	<1	<2	<1	<1	
	Subsequent>SSTL	0	0	0	1	0	0	1
<b>MW-11</b>	SSTL	1	1	1	1	5	5	
	9/29/01	<1	<1	<1	<1	<5	<5	
	Initial>SSTL	0	0	0	1	0	0	1
	7/22/03	<1	<1	<1	<2	<1	<1	
	Subsequent>SSTL	0	0	0	0	0	0	0

Initial Mass	5,897,121
Subsequent Mass	3,993
CoC Concentration Reduction (%)	99.93%



**ADDITIONAL WELLS SAMPLED PER BID PACKAGE**

**MW-1D**

3/9/01	<1	<1	<1	<3	<1	<1
3/14/02	<1	<1	<1	<3	<1	<1
8/15/02	<1	<1	<1	<2	<1	<1
4/9/03	<1	<1	<1	<2	<1	<1
7/22/03	<1	<1	<1	<2	<1	<1

**MW-2**

No recent data

3/14/02	5.62	<1	68.8	233	61.7	<1
8/15/02	NS	NS	NS	NS	NS	NS
4/9/03	NS	NS	NS	NS	NS	NS
7/22/03	NS	NS	NS	NS	NS	NS

**MW-4**

3/9/01	<1	<1	<1	<3	<1	<1
3/14/02	<1	<1	<1	<2	<1	<1
8/15/02	<1	<1	<1	<2	<1	<1
4/9/03	<1	<1	<1	<2	<1	<1
7/22/03	<1	<1	<1	<2	<1	<1

**MW-5**

3/9/01	NS	NS	NS	NS	NS	NS
3/14/02	NS	NS	NS	NS	NS	NS
8/15/02	NS	NS	NS	NS	NS	NS
4/9/03	NS	NS	NS	NS	NS	NS
7/22/03	NS	NS	NS	NS	NS	NS

**MW-8**

3/9/01	<1	<1	<1	<3	<1	<1
3/14/02	<1	<1	<1	<2	<1	<1
8/15/02	<1	<1	<1	<2	<1	<1
4/9/03	<1	<1	<1	<2	<1	<1
7/22/03	<1	<1	<1	<2	<1	<1

**MW-12**

3/9/01	<1	<1	<1	<3	<1	<1
3/14/02	<1	<1	<1	<2	<1	<1
8/15/02	<1	<1	<1	<2	<1	<1
4/9/03	<1	<1	<1	<2	<1	<1
7/22/03	<1	<1	<1	<2	<1	<1

**MW-13**

3/9/01	<1	<1	<1	<3	<1	<1
3/14/02	<1	<1	<1	<2	<1	<1
8/15/02	<1	<1	<1	<2	<1	<1
4/9/03	<1	<1	<1	<2	<1	<1
7/22/03	<1	<1	<1	<2	<1	<1

\*CoC Mass Assumed Unaltered

NS = Not Sampled due to dry well conditions

**ATTACHEMENT I**  
**SAMPLE LOGS**



























**ATTACHMENT II**  
**LABORATORY DATA**



**Pace Analytical Services, Inc.**  
9800 Kincey Avenue, Suite 100  
Huntersville, NC 28078  
Phone 704.875.9092  
Fax. 704.875.9091

August 06, 2003

Mr. Mark Brooks  
Brooks & Medlock  
17 Arlington Street  
Asheville, NC 28801

RE: Lab Project Number: 9247730  
Client Project ID: SC DHEC-CHESNEE/15402

Dear Mr. Brooks:

Enclosed are the analytical results for sample(s) received by the laboratory on July 22, 2003. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report please feel free to contact me.

Sincerely,

Lorri Patton  
lorri.patton@pacelabs.com  
Project Manager

Enclosures

Laboratory Certification IDs  
NC Wastewater 12  
NC Drinking Water 37706  
SC 99006

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc

Laboratory Certification IDs  
KY Drinking Water 90090  
VA Drinking Water 213  
FL NELAP E87627



Lab Project Number: 9247730  
Client Project ID: SC DHEC-CHESNEE/15402

Lab Sample No: 923168702      Project Sample Number: 9247730-001      Date Collected: 07/22/03 09:45  
Client Sample ID: MW-12      Matrix: Water      Date Received: 07/22/03 16:13

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	ReqLmt
<b>GC/MS Volatiles</b>								
GC/MS VOCs by 8260, low level      Method: EPA 8260								
Benzene	ND	ug/l	1.0	07/30/03 21:22	BCK	71-43-2		
Ethylbenzene	ND	ug/l	1.0	07/30/03 21:22	BCK	100-41-4		
Methyl-tert-butyl ether	ND	ug/l	1.0	07/30/03 21:22	BCK	1634-04-4		
Naphthalene	ND	ug/l	1.0	07/30/03 21:22	BCK	91-20-3		
Toluene	ND	ug/l	1.0	07/30/03 21:22	BCK	108-88-3		
m&p-Xylene	ND	ug/l	2.0	07/30/03 21:22	BCK			
o-Xylene	ND	ug/l	1.0	07/30/03 21:22	BCK	95-47-6		
Toluene-d8 (S)	98	%		07/30/03 21:22	BCK	2037-26-5		
4-Bromofluorobenzene (S)	95	%		07/30/03 21:22	BCK	460-00-4		
Dibromofluoromethane (S)	96	%		07/30/03 21:22	BCK	1868-53-7		
1,2-Dichloroethane-d4 (S)	96	%		07/30/03 21:22	BCK	17060-07-0		

### REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc

Lab Project Number: 9247730  
Client Project ID: SC DHEC-CHESNEE/15402

Lab Sample No: 923168769      Project Sample Number: 9247730-002      Date Collected: 07/22/03 10:00  
Client Sample ID: MW-13      Matrix: Water      Date Received: 07/22/03 16:13

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
<b>GC/MS Volatiles</b>								
GC/MS VOCs by 8260, low level      Method: EPA 8260								
Benzene	ND	ug/l	1.0	07/30/03 21:49	BCK	71-43-2		
Ethylbenzene	ND	ug/l	1.0	07/30/03 21:49	BCK	100-41-4		
Methyl-tert-butyl ether	ND	ug/l	1.0	07/30/03 21:49	BCK	1634-04-4		
Naphthalene	ND	ug/l	1.0	07/30/03 21:49	BCK	91-20-3		
Toluene	ND	ug/l	1.0	07/30/03 21:49	BCK	108-88-3		
m&p-Xylene	ND	ug/l	2.0	07/30/03 21:49	BCK			
o-Xylene	ND	ug/l	1.0	07/30/03 21:49	BCK	95-47-6		
Toluene-d8 (S)	95	%		07/30/03 21:49	BCK	2037-26-5		
4-Bromofluorobenzene (S)	107	%		07/30/03 21:49	BCK	460-00-4		
Dibromofluoromethane (S)	98	%		07/30/03 21:49	BCK	1868-53-7		
1,2-Dichloroethane-d4 (S)	96	%		07/30/03 21:49	BCK	17060-07-0		

### REPORT OF LABORATORY ANALYSIS

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Lab Project Number: 9247730  
Client Project ID: SC DHEC-CHESSNEE/15402

Lab Sample No: 923168777      Project Sample Number: 9247730-003      Date Collected: 07/22/03 10:30  
Client Sample ID: MW-1D      Matrix: Water      Date Received: 07/22/03 16:13

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
<b>GC/MS Volatiles</b>								
GC/MS VOCs by 8260, low level      Method: EPA 8260								
Benzene	ND	ug/l	1.0	07/30/03 22:16	BCK	71-43-2		
Ethylbenzene	ND	ug/l	1.0	07/30/03 22:16	BCK	100-41-4		
Methyl-tert-butyl ether	ND	ug/l	1.0	07/30/03 22:16	BCK	1634-04-4		
Naphthalene	ND	ug/l	1.0	07/30/03 22:16	BCK	91-20-3		
Toluene	ND	ug/l	1.0	07/30/03 22:16	BCK	108-88-3		
m&p-Xylene	ND	ug/l	2.0	07/30/03 22:16	BCK			
o-Xylene	ND	ug/l	1.0	07/30/03 22:16	BCK	95-47-6		
Toluene-d8 (S)	95	%		07/30/03 22:16	BCK	2037-26-5		
4-Bromofluorobenzene (S)	94	%		07/30/03 22:16	BCK	460-00-4		
Dibromofluoromethane (S)	98	%		07/30/03 22:16	BCK	1868-53-7		
1,2-Dichloroethane-d4 (S)	96	%		07/30/03 22:16	BCK	17060-07-0		

**REPORT OF LABORATORY ANALYSIS**

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Lab Project Number: 9247730  
Client Project ID: SC DHEC-CHESNEE/15402

Lab Sample No: 923168785      Project Sample Number: 9247730-004      Date Collected: 07/22/03 10:45  
Client Sample ID: MW-4      Matrix: Water      Date Received: 07/22/03 16:13

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
<b>GC/MS Volatiles</b>								
GC/MS VOCs by 8260, low level      Method: EPA 8260								
Benzene	ND	ug/l	1.0	07/30/03 22:42	BCK	71-43-2		
Ethylbenzene	ND	ug/l	1.0	07/30/03 22:42	BCK	100-41-4		
Methyl-tert-butyl ether	ND	ug/l	1.0	07/30/03 22:42	BCK	1634-04-4		
Naphthalene	ND	ug/l	1.0	07/30/03 22:42	BCK	91-20-3		
Toluene	ND	ug/l	1.0	07/30/03 22:42	BCK	108-88-3		
m&p-Xylene	ND	ug/l	2.0	07/30/03 22:42	BCK			
o-Xylene	ND	ug/l	1.0	07/30/03 22:42	BCK	95-47-6		
Toluene-d8 (S)	94	%		07/30/03 22:42	BCK	2037-26-5		
4-Bromofluorobenzene (S)	92	%		07/30/03 22:42	BCK	460-00-4		
Dibromofluoromethane (S)	97	%		07/30/03 22:42	BCK	1868-53-7		
1,2-Dichloroethane-d4 (S)	96	%		07/30/03 22:42	BCK	17060-07-0		

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Lab Project Number: 9247730  
Client Project ID: SC DHEC-CHESNEE/15402

Lab Sample No: 923168793      Project Sample Number: 9247730-005      Date Collected: 07/22/03 11:00  
Client Sample ID: MW-8      Matrix: Water      Date Received: 07/22/03 16:13

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	Reqlmt
<b>GC/MS Volatiles</b>								
GC/MS VOCs by 8260, low level      Method: EPA 8260								
Benzene	ND	ug/l	1.0	07/30/03 23:08	BCK	71-43-2		
Ethylbenzene	ND	ug/l	1.0	07/30/03 23:08	BCK	100-41-4		
Methyl-tert-butyl ether	ND	ug/l	1.0	07/30/03 23:08	BCK	1634-04-4		
Naphthalene	ND	ug/l	1.0	07/30/03 23:08	BCK	91-20-3		
Toluene	ND	ug/l	1.0	07/30/03 23:08	BCK	108-88-3		
m&p-Xylene	ND	ug/l	2.0	07/30/03 23:08	BCK			
o-Xylene	ND	ug/l	1.0	07/30/03 23:08	BCK	95-47-6		
Toluene-d8 (S)	96	%		07/30/03 23:08	BCK	2037-26-5		
4-Bromofluorobenzene (S)	90	%		07/30/03 23:08	BCK	460-00-4		
Dibromofluoromethane (S)	96	%		07/30/03 23:08	BCK	1868-53-7		
1,2-Dichloroethane-d4 (S)	96	%		07/30/03 23:08	BCK	17060-07-0		

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Lab Project Number: 9247730  
Client Project ID: SC DHEC-CHESNEE/15402

Lab Sample No: 923168801      Project Sample Number: 9247730-006      Date Collected: 07/22/03 11:15  
Client Sample ID: MW-10      Matrix: Water      Date Received: 07/22/03 16:13

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	ReqLmt
<b>GC/MS Volatiles</b>								
GC/MS VOCs by 8260, low level      Method: EPA 8260								
Benzene	ND	ug/l	1.0	07/31/03 01:47	BCK	71-43-2		
Ethylbenzene	ND	ug/l	1.0	07/31/03 01:47	BCK	100-41-4		
Methyl-tert-butyl ether	ND	ug/l	1.0	07/31/03 01:47	BCK	1634-04-4		
Naphthalene	ND	ug/l	1.0	07/31/03 01:47	BCK	91-20-3		
Toluene	ND	ug/l	1.0	07/31/03 01:47	BCK	108-88-3		
m&p-Xylene	ND	ug/l	2.0	07/31/03 01:47	BCK			
o-Xylene	ND	ug/l	1.0	07/31/03 01:47	BCK	95-47-6		
Toluene-d8 (S)	97	%		07/31/03 01:47	BCK	2037-26-5		
4-Bromofluorobenzene (S)	96	%		07/31/03 01:47	BCK	460-00-4		
Dibromofluoromethane (S)	94	%		07/31/03 01:47	BCK	1868-53-7		
1,2-Dichloroethane-d4 (S)	92	%		07/31/03 01:47	BCK	17060-07-0		

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Lab Project Number: 9247730  
Client Project ID: SC DHEC-CHESNEE/15402

Lab Sample No: 923168819      Project Sample Number: 9247730-007      Date Collected: 07/22/03 11:30  
Client Sample ID: MW-11      Matrix: Water      Date Received: 07/22/03 16:13

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	ReqLmt
<b>GC/MS Volatiles</b>								
GC/MS VOCs by 8260, low level      Method: EPA 8260								
Benzene	ND	ug/l	1.0	07/30/03 23:35	BCK	71-43-2		
Ethylbenzene	ND	ug/l	1.0	07/30/03 23:35	BCK	100-41-4		
Methyl-tert-butyl ether	ND	ug/l	1.0	07/30/03 23:35	BCK	1634-04-4		
Naphthalene	ND	ug/l	1.0	07/30/03 23:35	BCK	91-20-3		
Toluene	ND	ug/l	1.0	07/30/03 23:35	BCK	108-88-3		
m&p-Xylene	ND	ug/l	2.0	07/30/03 23:35	BCK			
o-Xylene	ND	ug/l	1.0	07/30/03 23:35	BCK	95-47-6		
Toluene-d8 (S)	95	%		07/30/03 23:35	BCK	2037-26-5		
4-Bromofluorobenzene (S)	94	%		07/30/03 23:35	BCK	460-00-4		
Dibromofluoromethane (S)	102	%		07/30/03 23:35	BCK	1868-53-7		
1,2-Dichloroethane-d4 (S)	106	%		07/30/03 23:35	BCK	17060-07-0		

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Lab Project Number: 9247730  
Client Project ID: SC DHEC-CHESNEE/15402

Lab Sample No: 923168827      Project Sample Number: 9247730-008      Date Collected: 07/22/03 12:00  
Client Sample ID: MW-7      Matrix: Water      Date Received: 07/22/03 16:13

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	ReqLmt
<b>GC/MS Volatiles</b>								
GC/MS VOCs by 8260, low level      Method: EPA 8260								
Benzene	ND	ug/l	1.0	07/31/03 00:01	BCK	71-43-2		
Ethylbenzene	ND	ug/l	1.0	07/31/03 00:01	BCK	100-41-4		
Methyl-tert-butyl ether	ND	ug/l	1.0	07/31/03 00:01	BCK	1634-04-4		
Naphthalene	ND	ug/l	1.0	07/31/03 00:01	BCK	91-20-3		
Toluene	ND	ug/l	1.0	07/31/03 00:01	BCK	108-88-3		
m&p-Xylene	ND	ug/l	2.0	07/31/03 00:01	BCK			
o-Xylene	ND	ug/l	1.0	07/31/03 00:01	BCK	95-47-6		
Toluene-d8 (S)	93	%		07/31/03 00:01	BCK	2037-26-5		
4-Bromofluorobenzene (S)	90	%		07/31/03 00:01	BCK	460-00-4		
Dibromofluoromethane (S)	99	%		07/31/03 00:01	BCK	1868-53-7		
1,2-Dichloroethane-d4 (S)	94	%		07/31/03 00:01	BCK	17060-07-0		

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Lab Project Number: 9247730  
Client Project ID: SC DHEC-CHESNEE/15402

Lab Sample No: 923168843      Project Sample Number: 9247730-009      Date Collected: 07/22/03 12:30  
Client Sample ID: MW-9      Matrix: Water      Date Received: 07/22/03 16:13

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
<b>GC/MS Volatiles</b>								
GC/MS VOCs by 8260, low level      Method: EPA 8260								
Benzene	ND	ug/l	1.0	07/31/03 00:28	BCK	71-43-2		
Ethylbenzene	1.7	ug/l	1.0	07/31/03 00:28	BCK	100-41-4		
Methyl-tert-butyl ether	11.	ug/l	1.0	07/31/03 00:28	BCK	1634-04-4		
Naphthalene	8.9	ug/l	1.0	07/31/03 00:28	BCK	91-20-3		
Toluene	ND	ug/l	1.0	07/31/03 00:28	BCK	108-88-3		
m&p-Xylene	ND	ug/l	2.0	07/31/03 00:28	BCK			
o-Xylene	11.	ug/l	1.0	07/31/03 00:28	BCK	95-47-6		
Toluene-d8 (S)	98	%		07/31/03 00:28	BCK	2037-26-5		
4-Bromofluorobenzene (S)	96	%		07/31/03 00:28	BCK	460-00-4		
Dibromofluoromethane (S)	100	%		07/31/03 00:28	BCK	1868-53-7		
1,2-Dichloroethane-d4 (S)	102	%		07/31/03 00:28	BCK	17060-07-0		

Lab Project Number: 9247730  
Client Project ID: SC DHEC-CHESNEE/15402

Lab Sample No: 923168850      Project Sample Number: 9247730-010      Date Collected: 07/22/03 12:45  
Client Sample ID: MW-6      Matrix: Water      Date Received: 07/22/03 16:13

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	ReqLmt
<b>GC/MS Volatiles</b>								
GC/MS VOCs by 8260, low level      Method: EPA 8260								
Benzene	2.7	ug/l	1.0	07/31/03 00:54	BCK	71-43-2		
Ethylbenzene	4.2	ug/l	1.0	07/31/03 00:54	BCK	100-41-4		
Methyl-tert-butyl ether	ND	ug/l	1.0	07/31/03 00:54	BCK	1634-04-4		
Naphthalene	28.	ug/l	1.0	07/31/03 00:54	BCK	91-20-3		
Toluene	ND	ug/l	1.0	07/31/03 00:54	BCK	108-88-3		
m&p-Xylene	5.4	ug/l	2.0	07/31/03 00:54	BCK			
o-Xylene	24.	ug/l	1.0	07/31/03 00:54	BCK	95-47-6		
Toluene-d8 (S)	99	%		07/31/03 00:54	BCK	2037-26-5		
4-Bromofluorobenzene (S)	94	%		07/31/03 00:54	BCK	460-00-4		
Dibromofluoromethane (S)	94	%		07/31/03 00:54	BCK	1868-53-7		
1,2-Dichloroethane-d4 (S)	94	%		07/31/03 00:54	BCK	17060-07-0		

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Lab Project Number: 9247730  
Client Project ID: SC DHEC-CHESNEE/15402

Lab Sample No: 923168868      Project Sample Number: 9247730-011      Date Collected: 07/22/03 13:00  
Client Sample ID: MW-1      Matrix: Water      Date Received: 07/22/03 16:13

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	ReqLmt
<b>GC/MS Volatiles</b>								
GC/MS VOCs by 8260, low level      Method: EPA 8260								
Benzene	110	ug/l	1.0	07/31/03 01:21	BCK	71-43-2		
Ethylbenzene	85.	ug/l	1.0	07/31/03 01:21	BCK	100-41-4		
Methyl-tert-butyl ether	96.	ug/l	1.0	07/31/03 01:21	BCK	1634-04-4		
Naphthalene	88.	ug/l	1.0	07/31/03 01:21	BCK	91-20-3		
Toluene	140	ug/l	1.0	07/31/03 01:21	BCK	108-88-3		
m&p-Xylene	190	ug/l	2.0	07/31/03 01:21	BCK			
o-Xylene	190	ug/l	1.0	07/31/03 01:21	BCK	95-47-6		
Toluene-d8 (S)	99	%		07/31/03 01:21	BCK	2037-26-5		
4-Bromofluorobenzene (S)	100	%		07/31/03 01:21	BCK	460-00-4		
Dibromofluoromethane (S)	92	%		07/31/03 01:21	BCK	1868-53-7		
1,2-Dichloroethane-d4 (S)	90	%		07/31/03 01:21	BCK	17060-07-0		

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Lab Project Number: 9247730  
Client Project ID: SC DHEC-CHESNEE/15402

Lab Sample No: 923168876      Project Sample Number: 9247730-012      Date Collected: 07/22/03 13:20  
Client Sample ID: MW-3      Matrix: Water      Date Received: 07/22/03 16:13

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
<b>GC/MS Volatiles</b>								
GC/MS VOCs by 8260	Method: EPA 8260							
Benzene	1000	ug/l	250	07/28/03 20:05	RWS	71-43-2		
2,2-Dichloropropane	ND	ug/l	5.0	07/28/03 20:05	RWS	594-20-7		
Ethylbenzene	390	ug/l	250	07/28/03 20:05	RWS	100-41-4		
Methyl-tert-butyl ether	3700	ug/l	250	07/28/03 20:05	RWS	1634-04-4		
Naphthalene	43.	ug/l	5.0	07/28/03 20:05	RWS	91-20-3		
Toluene	480	ug/l	250	07/28/03 20:05	RWS	108-88-3		
m&p-Xylene	1700	ug/l	500	07/28/03 20:05	RWS			
o-Xylene	560	ug/l	250	07/28/03 20:05	RWS	95-47-6		
Toluene-d8 (S)	98	%		07/28/03 20:05	RWS	2037-26-5		
4-Bromofluorobenzene (S)	97	%		07/28/03 20:05	RWS	460-00-4		
Dibromofluoromethane (S)	94	%		07/28/03 20:05	RWS	1868-53-7		
1,2-Dichloroethane-d4 (S)	97	%		07/28/03 20:05	RWS	17060-07-0		

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Lab Project Number: 9247730  
Client Project ID: SC DHEC-CHESNEE/15402

Lab Sample No: 923168918      Project Sample Number: 9247730-013      Date Collected: 07/22/03 00:00  
Client Sample ID: TRIP BLANK      Matrix: Water      Date Received: 07/22/03 16:13

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	Req/Lmt
<b>GC/MS Volatiles</b>								
GC/MS VOCs by 8260, low level      Method: EPA 8260								
Benzene	ND	ug/l	1.0	07/30/03 20:02	BCK	71-43-2		
Ethylbenzene	ND	ug/l	1.0	07/30/03 20:02	BCK	100-41-4		
Methyl-tert-butyl ether	ND	ug/l	1.0	07/30/03 20:02	BCK	1634-04-4		
Naphthalene	ND	ug/l	1.0	07/30/03 20:02	BCK	91-20-3		
Toluene	ND	ug/l	1.0	07/30/03 20:02	BCK	108-88-3		
m&p-Xylene	ND	ug/l	2.0	07/30/03 20:02	BCK			
o-Xylene	ND	ug/l	1.0	07/30/03 20:02	BCK	95-47-6		
Toluene-d8 (S)	93	%		07/30/03 20:02	BCK	2037-26-5		
4-Bromofluorobenzene (S)	89	%		07/30/03 20:02	BCK	460-00-4		
Dibromofluoromethane (S)	104	%		07/30/03 20:02	BCK	1868-53-7		
1,2-Dichloroethane-d4 (S)	101	%		07/30/03 20:02	BCK	17060-07-0		

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Lab Project Number: 9247730  
Client Project ID: SC DHEC-CHESNEE/15402

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**PARAMETER FOOTNOTES**

Inorganic Wet Chemistry Analyses were performed at our Pace Asheville laboratory and Organic and Metals testing was performed at our Pace Charlotte laboratory unless otherwise footnoted.

ND Not detected at or above adjusted reporting limit  
NC Not Calculable  
J Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit  
MDL Adjusted Method Detection Limit  
(S) Surrogate



# CHAIN OF-CUSTODY / Analytical Request Document

The Chain of Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

763607

<b>Section A</b> Required Client Information Company: <u>BRIDGES AND MEADOWS</u> Address: <u>17 ARLINGTON ST</u> <u>ASHEVILLE NC</u> Project Name: <u>28801 SC DHEC-CHEMEE</u> Project Number: <u>15402</u>		<b>Section B</b> Required Client Information Report To: <u>MARK BROOKS</u> Copy To: _____ Invoice To: _____ P.O: _____ Project Name: <u>SC DHEC-CHEMEE</u> Project Number: <u>15402</u>		Page: <u>1</u> of <u>2</u> Client Information (Check quote/contract): Requested Due Date: <u>AUG 5</u> *TAT: <u>41 Days</u> Project Manager: _____ Project #: <u>15402</u> Profile #: _____ Requested Analysis: _____	
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--

ITEM #	Section D Required Client Information										DATE COLLECTED mm / dd / yy	TIME COLLECTED hh: mm a/p	# Containers	Preservatives						Remarks / Lab ID																	
	SAMPLE ID One character per box. (A-Z, 0-9 / -)													MATRIX CODE	WT	SL	OL	WP	AR		TS	OT	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>8</sub>	Methanol	Other								
1	M	W	1	2								WT	7/22/08	09:45	3																						
2	M	W	1	3										10:00	3																						
3	M	W	1	D										10:30	3																						
4	M	W	1	4										10:45	3																						
5	M	W	1	8										11:00	3																						
6	M	W	1	0										11:15	3																						
7	M	W	1	1										11:30	3																						
8	M	W	1	7										12:00	3																						
9	M	W	1	9										12:50	3																						
10																																					
11																																					
12																																					

SHIPMENT METHOD	AIRBILL NO.	SHIPPING DATE	NO. OF COOLERS	ITEM NUMBER	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
					Lee March	7/22/08				

SAMPLE CONDITION	
Temp in °C	
Received on Ice	Y/N
Sealed Cooler	Y/N
Samples Intact	Y/N

Additional Comments:

SAMPLER NAME AND SIGNATURE	
PRINT Name of SAMPLER	DAN MARCH
SIGNATURE of SAMPLER	<i>Dan March</i>
DATE Signed (MM / DD / YY)	7/22/08

SEE REVERSE SIDE FOR INSTRUCTIONS Form C0001 Rev 0403



# CHAIN OF-CUSTODY / Analytical Request Document

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Page: 2 of 2

<b>Required Client Information Section A</b>		<b>Required Client Information Section B</b>		<b>Section C</b>	
Company Lowe's Home Improvement	Copy To MARK SERRANO	Report To MARK SERRANO	Client Information (Check quote/contract)	Quote Reference	Project Manager
Address 17111 W. HICKORY MCKENNA, NC 28801	Invoice To	Requested Due Date AUG 5	*TAT 14 Days	Project #	
Phone 704-234-1100	Fax 704-234-2211	Project Name SP DISC - CHESNEE	Project Number 15402	Profile #	
<b>Section D Required Client Information</b>			Requested Analysis:		

ITEM #	SAMPLE ID	MATRIX CODE	DATE COLLECTED mm / dd / yy	TIME COLLECTED hh: mm a/p	# Containers	Preservatives						Remarks / Lab ID
						Unpreserved	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	
1	MW6	WT	7/26/12	12:45								
2	MW1	WT	7/26/12	13:00								
3	MW3	WT	7/26/12	13:20								
4	TRIP BLANK	WT	7/26/12	N/A								
5												
6												
7												
8												
9												
10												
11												
12												

SHIPMENT METHOD	AIRBILL NO.	SHIPPING DATE	NO. OF COOLERS	ITEM NUMBER	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
					Sam March	7/26/12				

**SAMPLE CONDITION**

Temp in °C	
Received on Ice	Y/N
Sealed Cooler	Y/N
Samples Intact	Y/N

**SAMPLE NOTES**

**SAMPLER NAME AND SIGNATURE**

PRINT Name of SAMPLER

SIGNATURE of SAMPLER

DATE Signed (MM / DD / YY)

Additional Comments:





2600 Bull Street  
Columbia, SC 29201-1708

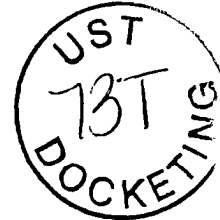
**UNDERGROUND STORAGE TANK PROGRAM  
BUREAU OF LAND AND WASTE MANAGEMENT**

Phone: (800) 826-5435 Fax: (803) 898-4330

**AUG 26 2003**

**MS JUDITH LAUGHTER  
RL JORDAN OIL COMPANY OF NORTH CAROLINA  
PO BOX 2527  
SPARTANBURG SC 29304-2527**

Re: Hot Spot 3005, 107 Hampton St., Chesnee, SC  
UST Permit #12719, CP#: 13851:P  
Bid#: SB-18123-12/20/01-HW, PO#385179  
Quarterly Sampling Report received August 21, 2003  
Spartanburg County



Dear Ms. Laughter:

The Underground Storage Tank Program has reviewed the referenced report. As noted, on August 4, 2003, the UST Program received notification that a release had occurred at the facility. On August 18, 2003, the UST Program confirmed that a release had occurred. In accordance with the provisions of the contract, the UST Program will release Brooks & Medlock Engineering from the corrective action contract.

It is the UST Programs understanding that two soil vapor extraction points and one groundwater extraction point was installed as part of the corrective action. If you wish, the extraction points may be left for future monitoring and/or corrective action that may be required or Brooks and Medlock Engineering will abandon them. Based on the July 22, 2003 analytical data, a contaminant mass reduction of 99.93% had been achieved. Upon abandonment of the extraction points, if necessary, and removal of any non-permanent corrective action equipment, the UST Program will authorize a final payment to Brooks and Medlock Engineering in the amount of \$27,423.00. This is the amount equal to 99.93 percent of the original contract amount (\$110,000.00) minus the money paid to date (\$82,500.00).

As 99.93 percent of the contaminant mass above the site-specific target levels has been achieved, the UST Program will issue a Conditional No Further Action for Release #1 upon final payment and closure of the corrective action with Brooks and Medlock Engineering.

If you have any questions or need additional information, please contact me at (803) 896-6397 or [thomadl@dhec.sc.gov](mailto:thomadl@dhec.sc.gov).

Sincerely,

Debra L. Thoma, Hydrogeologist  
State Lead & Field Services Section  
Assessment and Corrective Action Division

cc: Mark Brooks, Brooks & Medlock, 712 Merriman Ave., Asheville, NC, 28804  
E. Madison Winslow, Bureau of Business Management  
Technical File



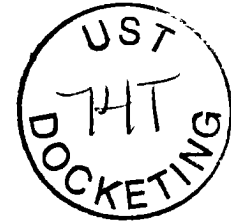
2600 Bull Street  
Columbia, SC 29201-1708

BUREAU OF LAND AND WASTE MANAGEMENT  
UNDERGROUND STORAGE TANK PROGRAM

Phone (803) 896-6240 Fax (803) 896-6245

SEP 04 2003

MS JUDITH LAUGHTER  
RL JORDAN OIL COMPANY OF NORTH CAROLINA  
PO BOX 2527  
SPARTANBURG SC 29304-2527



Re: Hot Spot 3005, 107 Hampton St., Chesnee, SC  
UST Permit #12719; CA# 19928  
Release #2 Reported August 4, 2003  
Spartanburg County

Dear Ms. Laughter:

The Underground Storage Tank (UST) Program of the South Carolina Department of Health and Environmental Control (SCDHEC) requests that a comprehensive groundwater-sampling event be conducted at the referenced facility to determine current site conditions. Cost agreement #19928 has been approved in the amount shown on the enclosed cost agreement form. Samples should be collected from all monitoring wells associated with the release and analyzed for BTEX, Naphthalene, and MTBE by EPA method 8260B and EDB by Method 8011.

According to Program records, the release at the site was reported to SCDHEC on August 4, 2003. In accordance with Section 44-2-40 (B) of the State Underground Petroleum Environmental Response Bank (SUPERB) Act, RL Jordan Oil Company is responsible for the first \$25,000 of site rehabilitation costs. **Should it be determined that the tanks at this facility were not in substantial compliance with the UST Regulations at the time of discovery and reporting of the release, you will be denied SUPERB access for this release.**

Please note that in accordance with R.61-92, Subpart H, Section 280.114, you are required to notify the Program by certified mail within ten (10) days of commencing a voluntary or involuntary proceeding in bankruptcy. State law also requires that an owner/operator or guarantor who files for bankruptcy protection must immediately submit the appropriate forms documenting that entity's ability to demonstrate financial responsibility.

An Insurance Statement forms have not been filed for the facility. **Please be aware that the release cannot be qualified for SUPERB until a completed Insurance Statement form is on-file with the Program.** The enclosed form should be completed and returned to the Program to my attention within fifteen days of the date of this letter.

Our records indicate that you have selected S&ME, Inc. as your site rehabilitation contractor. Please have your site rehabilitation contractor submit the groundwater sampling results to the Program in a monitoring report containing the following items:

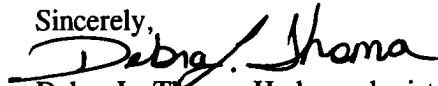
- A narrative portion documenting current site conditions and noting the names of field personnel, date, time, ambient air temperature, and general weather conditions during the sampling event. The report shall also contain well purging data, pH, specific conductivity, water temperature, PID readings (where applicable) and turbidity comments.
- Groundwater elevations, depth to groundwater, measurable free product thickness (where applicable), total well depth and screened interval for all monitoring wells associated with the site, unless otherwise directed by the Program, shall be presented in tabular form. Groundwater laboratory analytical data for all monitoring wells shall be presented in tabular format.
- A groundwater elevation contour map of the site based on current groundwater potentiometric data.
- A CoC map based on current groundwater laboratory analytical data. The groundwater data should be adjacent to the relevant monitoring well location.
- Manifests for any contaminated soil and/or groundwater removed from the site for treatment and/or disposal.
- Signature and seal by a professional geologist or engineer registered in the State of South Carolina.

All site rehabilitation activities must be performed by a SCDHEC-certified site rehabilitation contractor as required by R.61-98. South Carolina certification requirements associated with laboratory services, well installation, and report preparation must also be satisfied.

The groundwater sampling report should be submitted within 90 days of the date of this letter. Upon receipt of a signed SCDHEC invoice form and suitable supporting documentation, up to \$4,335.50 may be applied to the site deductible **provided that the release is qualified for SUPERB**. Supporting documentation can be either a copy of the cancelled check or a notarized statement from your site rehabilitation contractor certifying payment for the Groundwater Sampling Event. Please note that if an invoice is not received within 120 days of the date of this correspondence, the referenced cost agreement will be closed and any eligible costs will not be applied to your deductible. 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 SCDHEC is obtained. If for any reason additional site rehabilitation work is necessary, the work and associated costs must be pre-approved by the UST Program in order to be eligible for payment from SUPERB. SCDHEC reserves the authority to pay only for work properly performed and/or technically justified and will only pay rates in accordance with Program criteria. Furthermore, the Department reserves the right to question and/or reject costs if deemed unreasonable, and the right to audit project records at any time during or after site rehabilitation activities.

The UST Program grants pre-approval for transportation of virgin petroleum-contaminated soil and groundwater generated as a result of the Tier II assessment from the referenced facility to a permitted treatment facility. The contaminated soil and/or groundwater must be accepted by the approved treatment facility. There can be no spillage or leakage during transport. 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 in the Tier II report. If laboratory analyses show that the concentrations of chemicals of concern (COC) in the soil and/or groundwater are below risk-based screening levels, please contact me for approval to dispose of soil and/or groundwater on-site. The SUPERB Account will not compensate for transportation or treatment of clean soil and/or groundwater.

On all future correspondence and invoices, please reference **UST Permit #12719**. Should you have any questions or need additional information, please free to contact me at (803) 896-6397 or [thomadl@dhec.sc.gov](mailto:thomadl@dhec.sc.gov).

Sincerely,  
  
Debra L. Thoma, Hydrogeologist  
State Lead & Field Services Section  
Assessment and Corrective Action Division

enc: Approved Cost Agreement  
Insurance Statement Form

cc: Mike O'Connell, S&ME, Inc., 155 Tradd St., Spartanburg, SC, 29301 (w/ approved cost agreement)  
Technical file (w/o enc.)

# Approved Cost Agreement 11728

Facility: 12719, HOT SPOT 3005

THOMADL

PO Number:

<u>Task / Description</u>	<u>Categories</u>	<u>Item Description</u>	<u>Qty / Pct</u>	<u>Unit Price</u>	<u>Amount</u>
04 MOB/DEMOB		B PERSONNEL	2.0000	250.00	500.00
10 SAMPLE COLLECTION		A GROUND WATER	13.0000	55.00	715.00
11 ANALYSES	GW GROUNDWATER	A BTEX+NAPTH+MTBE	13.0000	100.00	1,300.00
		F EDB	13.0000	55.00	715.00
17 DISPOSAL		A1 WASTEWATER - PURGING/SAMPLING	6.0000	90.00	540.00
19 RPT/PROJECT MNGT & COORDINATIO		PCT PERCENT	0.1500	3,770.00	565.50
			<b>Total Amount</b>		<b>4,335.50</b>

**INSURANCE STATEMENT FORM**

UST Permit #12719, Release #2 is potentially eligible to receive state monies to assist you in site rehabilitation, if required. Before eligibility for State Underground Petroleum Environmental Response Bank (SUPERB) funds can be determined, written confirmation of the existence or non-existence of an environmental insurance policy other than self-insurance for this site is required. Please complete the following information:

I do not have any insurance other than self-insurance or SUPERB that would cover releases from underground storage tanks.

I have an insurance policy other than self-insurance that covers releases from underground storage tanks.

My policy provider is:  
The policy deductible is:  
The policy limit is:

If you have this type of insurance, please include a copy of the policy with this report.

Signature: *R.L. Jordan Oil Company of North Carolina, Inc.*  
Date: *By: Judith A. Laughton, Agent*  
*Sept. 8, 2003*

**To be Completed by Notary Public:**

Sworn before me this 8<sup>th</sup> day of Sept., ~~19~~2003

(Name) *Deanna J. Williamson*

Notary Public for the state of South Carolina

My commission expires May 27, 2007.

Please affix State Seal if you are commissioned outside South Carolina.

**RECEIVED**

SEP 10 2003

UNDERGROUND STORAGE  
TANK PROGRAM

RECEIVED SEP 2 2003

#12719



Since 1973

Three Decades . . . Three Reasons  
We listen. We respond. We solve.

August 28, 2003

R.L. Jordan Oil Company  
Post Office Box 2527  
Spartanburg, South Carolina 29304-2527

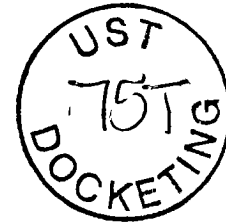
ATTENTION: Ms. Judy Laughter

Reference: **SOIL SAMPLING ACTIVITIES**  
Hot Spot #3005  
S.C. Highway 221  
Chesnee, South Carolina  
S&ME Project No. 1264-99-506

RECEIVED

SEP 09 2003

UNDERGROUND STORAGE  
TANK PROGRAM



Dear Ms. Laughter:

On August 5, 2003, S&ME was retained by Jordan Oil Company to collect a soil sample below product piping associated with the diesel fuel underground storage tank (UST) system. S&ME arrived onsite and observed an excavation measuring approximately 8 feet long by 5 feet wide. The excavation was located off the north end of the diesel fuel dispenser island. Fiberglass product piping was observed in the bottom of the excavation, along with pea gravel. No petroleum staining was observed on the side walls of the excavation. Photographs of the excavation and piping are enclosed.

A stainless steel hand auger was used to collect a soil sample (DPP-1) approximately 2 feet below the product piping. Soil encountered consisted of a red brown micaceous fine sandy silt. The soil sample was screened in the field using a Foxboro Century Organic Vapor Analyzer (OVA). A portion of the sample was placed into a new resealable plastic bag and the bag was sealed. After allowing time (approximately 15 minutes) for potential organic vapors to emanate into the headspace of the bag, the probe was inserted into the bag and the reading recorded. OVA readings provide a semi-quantitative indication of the presence of volatile organic vapors within a sample. The sample demonstrated an OVA reading of 3 parts per million (ppm). The remaining portion of the soil

S&ME, Inc.  
155 Tradd Street  
Spartanburg, South Carolina 29301

(864) 574-2360  
(864) 576-8730 fax  
(864) 232-8987 Greenville

[www.smeinc.com](http://www.smeinc.com)

sample was placed into laboratory supplied sample containers, placed into a cooler with ice, and shipped overnight to a South Carolina certified laboratory. The sample was analyzed for benzene, toluene, ethylbenzene, xylenes (BTEX) and naphthalene by method 8260B, for polynuclear aromatic hydrocarbons (PAH) by method 8270C, and for total petroleum hydrocarbons (TPH) by method 3550.

Laboratory analysis of soil sample DPP-1 reported an ethylbenzene concentration of 0.0031 milligrams per kilogram (mg/kg), a xylenes concentration of 0.018 mg/kg, a naphthalene concentration of 0.045 mg/kg, a fluorene concentration of 0.055 mg/kg, and a TPH concentration of 84 mg/kg. The concentrations of ethylbenzene, xylenes, and naphthalene are below their respective risk-based screening levels according to the *Risk-Based Corrective Action for Petroleum Releases*, SCDHEC, January 5, 1998. A copy of the laboratory analytical report and completed chain-of-custody form are enclosed.

S&ME appreciates the opportunity to provide these environmental services to R.L. Jordan Oil Company. Please contact us if you have any questions regarding the information contained in this report.

Sincerely,

**S&ME, Inc.**



Scott E. Dacus, P.G.  
Project Geologist



David Klemm, P.G.  
Senior Geologist

SED/DEK/env03/6499506/diesel soil sampling ltr





Photo 1. View of excavation north of diesel fuel dispenser island.



Photo 2. View of excavation north of diesel fuel dispenser island.



Photo 3. View of excavated soil and gravel north of diesel fuel dispenser island.



Photo 4. View within excavation north of diesel fuel dispenser island.



**ENVIRONMENTAL  
SCIENCE CORP.**

**RECEIVED**

**AUG 22 2003**

12065 Lebanon Rd.  
Mt. Juliet, TN 37122  
(615) 758-5858  
1-800-767-5859  
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

**REPORT OF ANALYSIS**

August 18, 2003

Mr. Scott Dacus  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

ESC Sample # : L123282-01

Date Received : August 07, 2003  
Description : Hot Spot Chesnee

Site ID :

Sample ID : DPP-1

Project # : 1264-99-506

Collected By : Scott Dacus  
Collection Date : 08/05/03 16:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	82.6		%	2540G	08/09/03	1
Benzene	BDL	0.0012	mg/kg	8260B	08/11/03	1
Toluene	BDL	0.0060	mg/kg	8260B	08/11/03	1
Ethylbenzene	0.0031	0.0012	mg/kg	8260B	08/11/03	1
Xylenes, Total	0.018	0.0036	mg/kg	8260B	08/11/03	1
Naphthalene	0.045	0.0060	mg/kg	8260B	08/11/03	1
Surrogate Recovery						
Toluene-d8	110		% Rec.	8260B	08/11/03	1
Dibromofluoromethane	110		% Rec.	8260B	08/11/03	1
4-Bromofluorobenzene	100		% Rec.	8260B	08/11/03	1
TPH (GC/FID) High Fraction	84.	4.8	mg/kg	DRO	08/12/03	1
Surrogate Recovery (50-150) o-Terphenyl	100		% Rec.	DRO	08/12/03	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.040	mg/kg	8270C	08/15/03	1
Acenaphthene	BDL	0.040	mg/kg	8270C	08/15/03	1
Acenaphthylene	BDL	0.040	mg/kg	8270C	08/15/03	1
Benzo(a)anthracene	BDL	0.040	mg/kg	8270C	08/15/03	1
Benzo(a)pyrene	BDL	0.040	mg/kg	8270C	08/15/03	1
Benzo(b)fluoranthene	BDL	0.040	mg/kg	8270C	08/15/03	1
Benzo(g,h,i)perylene	BDL	0.040	mg/kg	8270C	08/15/03	1
Benzo(k)fluoranthene	BDL	0.040	mg/kg	8270C	08/15/03	1
Chrysene	BDL	0.040	mg/kg	8270C	08/15/03	1
Dibenz(a,h)anthracene	BDL	0.040	mg/kg	8270C	08/15/03	1
Fluoranthene	BDL	0.040	mg/kg	8270C	08/15/03	1
Fluorene	0.055	0.040	mg/kg	8270C	08/15/03	1
Indeno(1,2,3-cd)pyrene	BDL	0.040	mg/kg	8270C	08/15/03	1
Naphthalene	BDL	0.040	mg/kg	8270C	08/15/03	1
Phenanthrene	BDL	0.040	mg/kg	8270C	08/15/03	1
Pyrene	BDL	0.040	mg/kg	8270C	08/15/03	1
Surrogate Recovery						
Nitrobenzene-d5	67.		% Rec.	8270C	08/15/03	1
2-Fluorobiphenyl	75.		% Rec.	8270C	08/15/03	1
p-Terphenyl-d14	84.		% Rec.	8270C	08/15/03	1

Tom Mellette, ESC Representative

Results listed are dry weight basis.

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

Note:

This report shall not be reproduced, except in full, without the written approval from ESC.

The reported analytical results relate only to the sample submitted

Reported: 08/18/03 15:40 Printed: 08/18/03 15:40

**S&ME Inc. - Spartanburg SC**

155 Tradd Street  
Spartanburg, SC 29301

Alternate billing information:

Report to: SCOTT DACUS  
Email to: sdacus@smeinc.com

Analysis/Container/Preservative

Chain of Custody  
Page 1 of 1

Prepared by:

**ENVIRONMENTAL  
SCIENCE CORP.**  
12065 Lebanon Road  
Mt. Juliet, TN 37122  
Phone (615) 758-5858  
Phone (800) 767-5859  
FAX (615) 758-5859

Project Description: <u>HOT SPOT - CHESTER</u>		City/State Collected: <u>SC</u>
Phone: (864) 574-2360	Client Project #: <u>1764-99-506</u>	ESC Key:
FAX: (864) 576-8730	Site/Facility ID#:	P.O.#: <u>5670</u>
Collected by: <u>SCOTT DACUS</u>	Collected by (signature):	
Packed on Ice N <u>Y</u> ✓		<input type="checkbox"/> <b>Rush?</b> ( Lab MUST Be Notified ) <input type="checkbox"/> Same Day.....200% <input type="checkbox"/> Next Day.....100% <input type="checkbox"/> Two Day .....50%
Date Results Needed:		No. of Cntrs
Email? <u>  </u> No <u>  </u> Yes		<u>BTEX/Naphthalene BZOB</u> <u>PAH BITOC</u> <u>TPH - DRO</u>
FAX? <u>  </u> No <u>  </u> Yes		

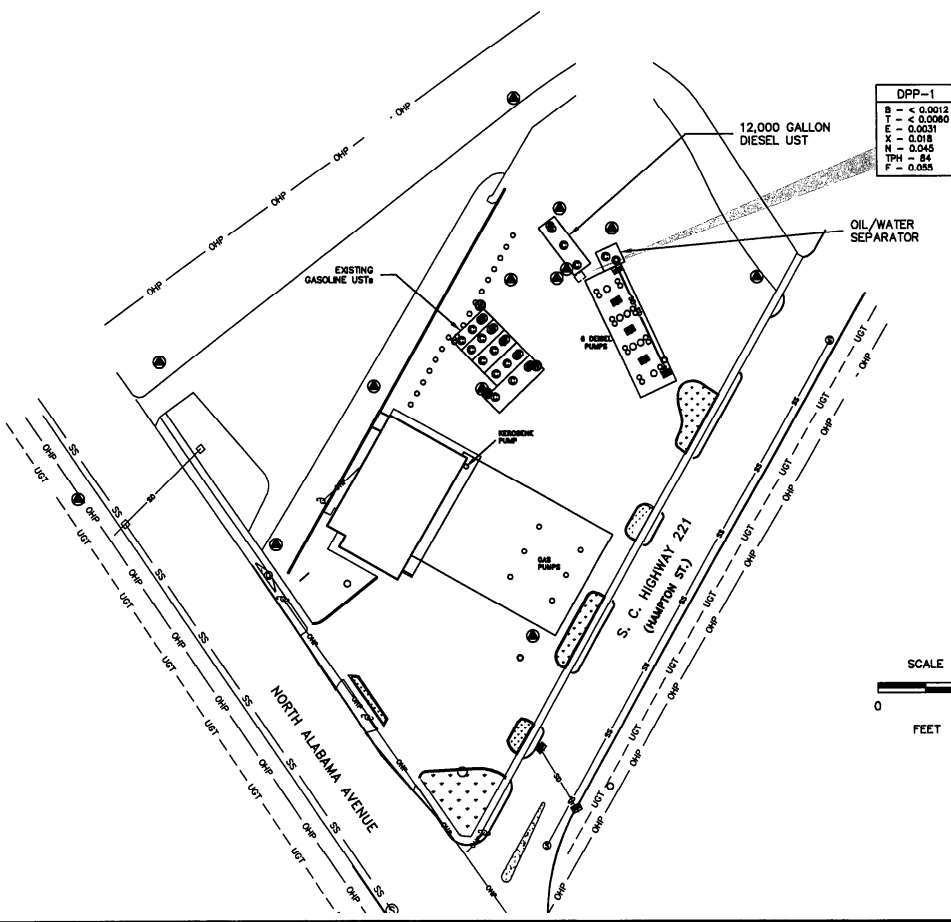
CoCode: **SMESPAR** (lab use only)  
Template/Prelogin  
Shipped Via:

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Remarks/Contaminant	Sample # (lab only)
<u>DPP-1</u>	<u>Grab</u>	<u>SS</u>		<u>8/5/03</u>	<u>1600</u>	<u>6</u>		<u>L123282-01</u>

\*Matrix: SS - Soil/Solid GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other \_\_\_\_\_  
pH \_\_\_\_\_ Temp \_\_\_\_\_  
Remarks: \_\_\_\_\_ Flow \_\_\_\_\_ Other \_\_\_\_\_

Relinquished by: (Signature)	Date: <u>8/6/03</u>	Time: <u>1600</u>	Received by: (Signature) _____	Samples returned via: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> Courier	Condition: (lab use only)
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Temp: <u>2.1°C</u>	Bottles Received: <u>2-V</u>
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: <u>8-7-03</u>	Time: <u>09:30</u>
				pH Checked:	NCF:

CAD FILE: K:\WORK\1284\1284\1284\1284.DWG

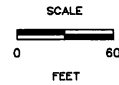



DPP-1	
B	< 0.0012
T	< 0.0060
E	0.0031
X	0.018
N	0.045
TPH	84
F	0.055

**LEGEND**

- MONITORING WELL LOCATION
- EXCAVATION
- B BENZENE CONCENTRATION IN mg/kg
- T TOLUENE CONCENTRATION IN mg/kg
- E ETHYLBENZENE CONCENTRATION IN mg/kg
- X XYLENE CONCENTRATION IN mg/kg
- N NAPHTHALENE CONCENTRATION IN mg/kg
- TPH TOTAL PETROLEUM HYDROCARBONS (mg/kg)
- F FLUORENE (mg/kg)
- mg/kg MILLIGRAMS PER KILOGRAM

SOURCE: SITE MAP OF HOT SPOT STORE #36 FOR S&ME BY GRAMLING BROS. SURVEYING DATE: SEPTEMBER 20, 1999



 <b>S&amp;ME</b> ENGINEERING · TESTING ENVIRONMENTAL SERVICES		
SOIL SAMPLING RESULTS - DIESEL PIPING <b>HOT SPOT #3005</b> SITE ID #12719 S.C. HIGHWAY 221 CHESNEE, SOUTH CAROLINA		
SCALE: 1" = 60'	DRAWN BY: SB	CHKD BY:
JOB NO: 1264-99-506	DATE: 08-22-03	FIGURE NO: 1



C. Earl Hunter, Commissioner

*Promoting and protecting the health of the public and the environment.*

**OCT 31 2003**

**MS JUDITH LAUGHTER  
RL JORDAN OIL COMPANY OF NORTH CAROLINA  
PO BOX 2527  
SPARTANBURG SC 29304-2527**

Re: Hot Spot 3005, 107 Hampton St., Chesnee, SC  
UST Permit #12719, CP#: 13851:P  
Bid#: SB-18123-12/20/01-HW, PO#385179  
Release reported November 3, 1993  
Spartanburg County



Dear Ms. Laughter:

As previously indicated, on August 4, 2003, the UST Program received notification that a release had occurred at the facility. On August 18, 2003, the UST Program confirmed that a release had occurred. In accordance with the provisions of the contract, the UST Program has processed the final payment to Brooks & Medlock Engineering for release from the corrective action contract. It is the UST Program's understanding that the two soil vapor extraction points and one groundwater extraction point installed as part of the corrective action, have been retained at your request.

The above referenced UST release does not present a significant threat to human health or the environment. Therefore, no further action regarding this release will be required at this time. As a subsequent release has been confirmed, assessment activities will proceed under the release reported on August 4, 2003.

The referenced release has been placed on a registry of releases in the SCDHEC Freedom of Information office. The release will remain on this registry until all petroleum CoC have attenuated by natural and biological means to the RBSL.

**The Department intends to report this closure to the United States Environmental Protection Agency. If for any reason you disagree with this decision not to require any further environmental rehabilitation activities, please contact me in writing within thirty (30) days of the date of this letter.**

Ms. Laughter  
Page 2

If you have any questions or need additional information, please contact me at (803) 896-6397 or [thomadl@dhec.sc.gov](mailto:thomadl@dhec.sc.gov).

Sincerely,

A handwritten signature in black ink that reads "Debra L. Thoma". The signature is written in a cursive style with a large, prominent "D" and "T".

Debra L. Thoma, Hydrogeologist  
State Lead & Field Services Section  
Assessment and Corrective Action Division  
Underground Storage Tank Program  
Bureau of Land and Waste Management  
Telephone: (803) 896-6240; Fax: (803) 896-6245

cc: Technical File



Since 1973

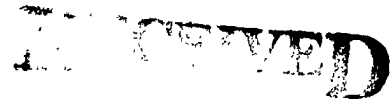
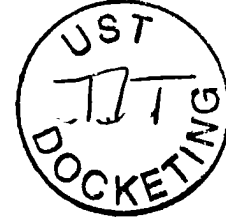
Three Decades . . . Three Reasons  
We listen. We respond. We solve.

November 24, 2003

R.L. Jordan Oil Company, Inc.  
P.O. Box 2527  
Spartanburg, SC 29304-2527

ATTENTION: Judy Laughter

Reference: **GROUNDWATER SAMPLING REPORT**  
Hot Spot #3005  
107 Hampton Street  
Chesnee, South Carolina  
SCDHEC UST Permit No. 12719  
S&ME Project No. 1264-99-506



NOV 25 2003

UNDERGROUND STORAGE  
TANK PROGRAM


Dear Ms. Laughter:


S&ME, Inc. (S&ME) has completed groundwater sampling at the Hot Spot #3005 site as directed by the South Carolina Department of Health and Environmental Control (SCDHEC). A report of the groundwater sampling activities with field and analytical data is enclosed. Chemicals of concern (CoC) exceeding their respective RBSLs were detected in a sample collected from one well (MW-3). The CoC include benzene and MTBE. Also, free product was measured in MW-1.

We appreciate the opportunity to work with you on this project. If you have any questions or comments regarding this report, please contact our office at (864) 574-2360.

Sincerely,

**S&ME, Inc.**

  
Michael O'Connell, G.I.T.  
Staff Professional

  
Robert Hall, P.E.  
Senior Environmental Engineer

Cc: Debra Thoma, SCDHEC

S&ME, Inc.  
155 Tradd Street  
Spartanburg, South Carolina 29301

(864) 574-2360  
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[www.smeinc.com](http://www.smeinc.com)



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NOV 25 2003

UNDERGROUND STORAGE  
TANK PROGRAM

**GROUNDWATER SAMPLING REPORT**

**HOT SPOT #3005  
107 HAMPTON STREET  
CHESNEE, SOUTH CAROLINA  
SCDHEC UST PERMIT NO. 12719  
S&ME PROJECT NO. 1264-99-506**

Prepared For:

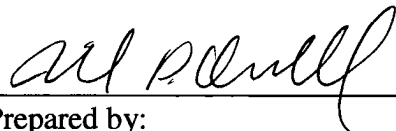
R.L. Jordan Oil Company, Inc.  
P.O. Box 2527  
Spartanburg, South Carolina 29304

Prepared By:




155 Tradd Street  
Spartanburg, South Carolina  
(864) 574-2360

November 2003



Prepared by:  
Michael P. O'Connell, G.I.T.  
Staff Professional



Robert Hall, P.E.  
Senior Engineer

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- A. Sample Collection Summary Sheets**
- B. Laboratory Analytical Data**
- C. Waste Disposal Manifest**

## **1.0 INTRODUCTION**

As directed by the South Carolina Department of Health and Environmental Control (SCDHEC) and on behalf of R.L. Jordan Oil Company, Inc., S&ME, Inc. (S&ME) has completed a groundwater sampling event at the Hot Spot #3005 site (Figure 1). The following sections discuss the results of the sampling and our conclusions based on the collected data.

## **2.0 AQUIFER EVALUATION**

Relative groundwater elevations for the monitoring wells were obtained utilizing the relative top of casing (TOC) elevations and depth to groundwater measurements recorded during the current sampling event. Based on measurements made on September 17, 2003, the depth to groundwater ranged from 15.99 to 26.95 feet from the TOC and the relative groundwater elevations ranged from 76.42 feet in MW-11 to 89.89 feet in MW-4. A summary of groundwater elevation data is presented in Table 1.

In general, the groundwater appears to be generally flowing to the southwest. Monitoring wells MW-1, MW-2, and MW-1D were not used in determination of the water table potentiometric surface.

## **3.0 GROUNDWATER SAMPLING AND ANALYSIS**

On September 17, 2003, S&ME purged and sampled monitoring wells MW-2 through MW-13 and MW-1D at the site. MW-1 was not sampled due to the presence of free product. The groundwater samples were collected with new, dedicated 1-liter polyethylene bailers, slowly poured into laboratory-supplied containers, and immediately placed on ice in a laboratory-supplied cooler. All groundwater samples were shipped by overnight courier to Environmental Science Corporation (ESC) located in Mt. Juliet, Tennessee (SCDHEC Certification No. 84004) for analysis. Copies of the sample collection summary sheets for the groundwater sampling are included as Appendix A.

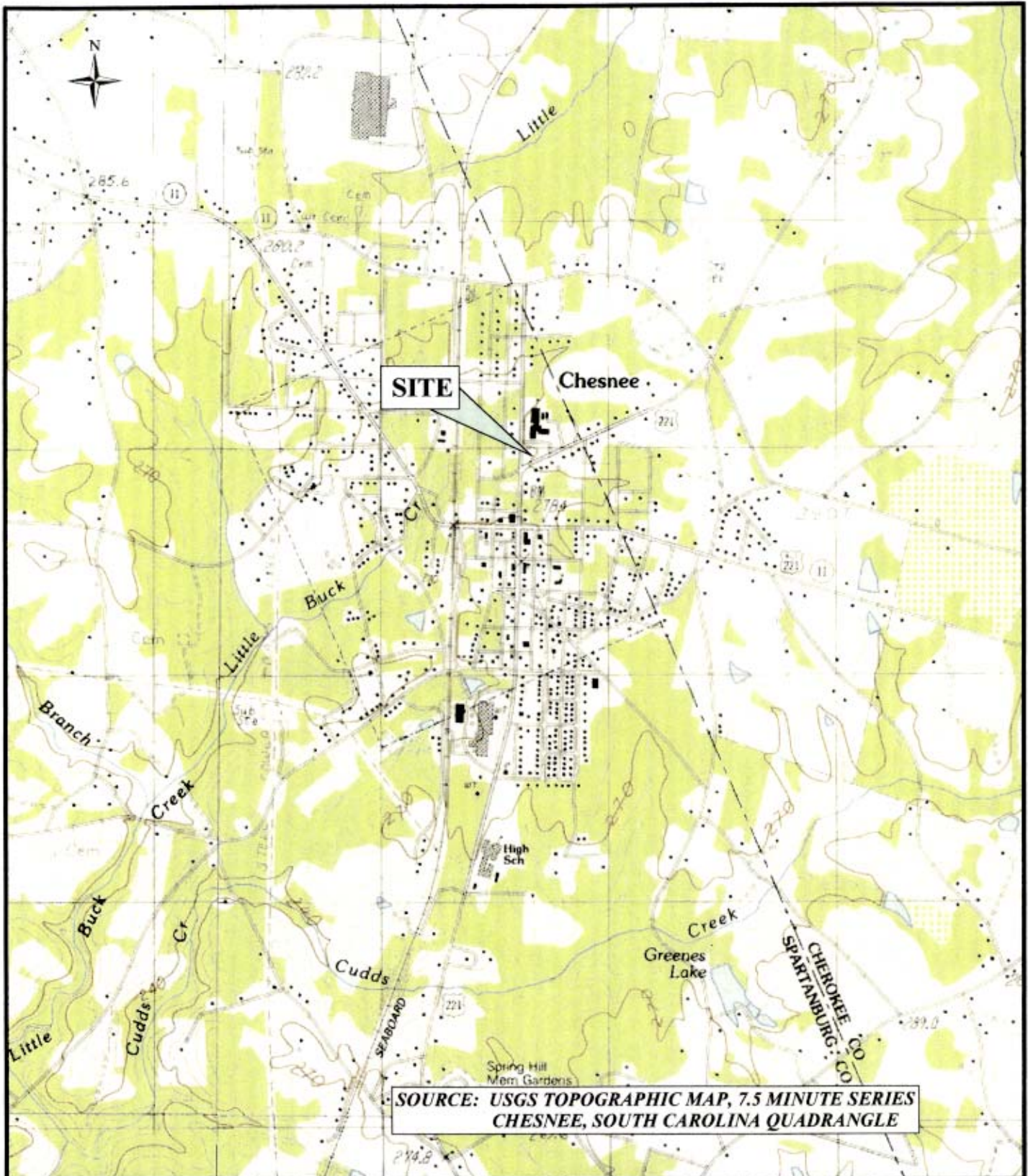
All groundwater samples collected from the monitoring wells were analyzed for the following potential chemicals of concern (CoC): benzene, toluene, ethylbenzene, xylenes (BTEX), naphthalene, and methyl-tertiary-butyl-ether (MTBE) by EPA Method 8260B, and ethylene dibromide (EDB) by EPA Method 8011/504.1. Benzene and MTBE were detected above their respective RBSLs in monitoring well MW-1. The laboratory analytical results are summarized in Table 2. The CoC concentrations are also included on Figure 2. A copy of the laboratory analytical data is provided as Appendix B.

Purge water generated during the sampling event was containerized in one 55-gallon drum. Disposal of the purge water was performed by Palmetto Environmental, Inc. A disposal manifest is attached in Appendix C.

#### 4.0 CONCLUSIONS

Based upon the results and findings of groundwater sampling, the following conclusions are made for the Hot Spot #3005 site:

- Free product was present in MW-1;
- The horizontal and vertical extents of dissolved CoC appear to be adequately defined.



SCALE: 1" = 2000'

CHECK BY:

DRAWN BY: MO

DATE: 9/25/02



**SITE TOPOGRAPHIC MAP**

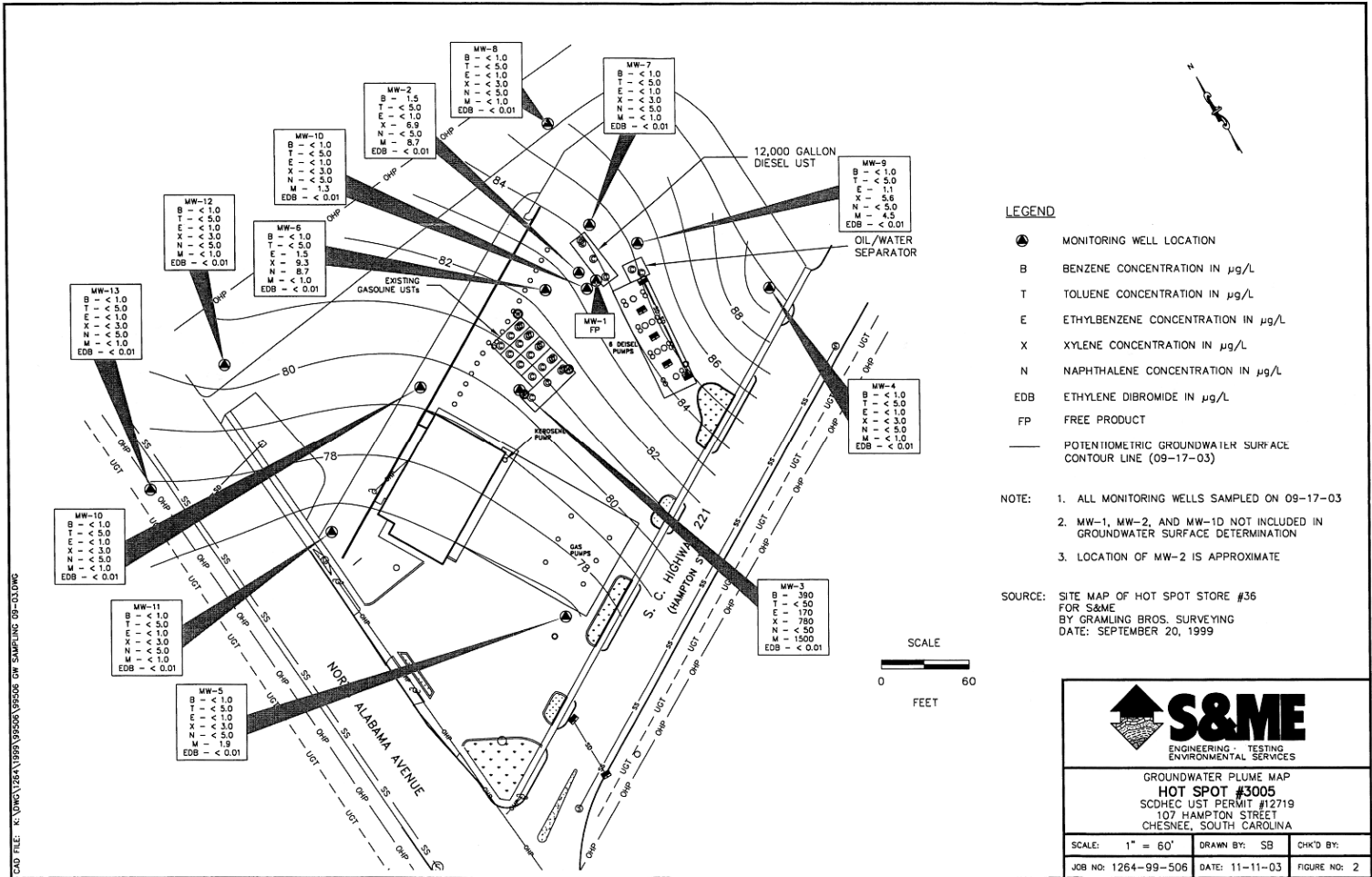
**HOT SPOT #3005**

SITE ID# 12719  
107 HAMPTON STREET  
CHESNEE, SOUTH CAROLINA

1264-99-506

FIGURE NO.

1

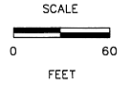


**LEGEND**

- MONITORING WELL LOCATION
- B BENZENE CONCENTRATION IN  $\mu\text{g/L}$
- T TOLUENE CONCENTRATION IN  $\mu\text{g/L}$
- E ETHYLBENZENE CONCENTRATION IN  $\mu\text{g/L}$
- X XYLENE CONCENTRATION IN  $\mu\text{g/L}$
- N NAPHTHALENE CONCENTRATION IN  $\mu\text{g/L}$
- EDB ETHYLENE DIBROMIDE IN  $\mu\text{g/L}$
- FP FREE PRODUCT
- POTENTIOMETRIC GROUNDWATER SURFACE CONTOUR LINE (09-17-03)

- NOTE:
1. ALL MONITORING WELLS SAMPLED ON 09-17-03
  2. MW-1, MW-2, AND MW-1D NOT INCLUDED IN GROUNDWATER SURFACE DETERMINATION
  3. LOCATION OF MW-2 IS APPROXIMATE

SOURCE: SITE MAP OF HOT SPOT STORE #36 FOR S&ME BY GRAMLING BROS. SURVEYING DATE: SEPTEMBER 20, 1999



GROUNDWATER PLUME MAP		
HOT SPOT #3005		
SCDHEC UST PERMIT #12719		
107 HAMPTON STREET		
CHESNEE, SOUTH CAROLINA		
SCALE: 1" = 60'	DRAWN BY: SB	CHK'D BY:
JOB NO: 1264-99-506	DATE: 11-11-03	FIGURE NO: 2

CAD FILE: K:\DWG\1264\1999\95506.GW SAMPLING 09-03.DWG

**TABLE 1**  
**SUMMARY OF GROUNDWATER ELEVATION DATA<sup>(1)</sup>**  
**HOT SPOT #3005**  
**107 HAMPTON STREET**  
**CHESNEE, SOUTH CAROLINA**  
**SCDHEC UST PERMIT #: 12719**  
**S&ME PROJECT 1264-99-506**

Well ID	Installation Date	Well Depth (feet)	Screened Interval (feet below grade)	Top of Casing Elevation (feet)	Depth to Liquid (feet)	Depth to Groundwater <sup>(2)</sup> (feet)	Product Thickness (feet)	Groundwater Elevation <sup>(3)</sup> (feet)
MW-1	4/24/96	35.00	15.00-30.00	104.89	21.43	21.58	0.15	83.59
MW-1D	9/28/00	58.64	53.64-58.64	104.61	22.00	22.00	0.00	82.61
MW-2*	Not Known	34.20	Not Known	Not Known	20.90	20.90	0.00	Not Known
MW-3	9/13/99	32.28	22.28-32.28	104.92	24.59	24.59	0.00	80.33
MW-4	9/14/99	45.40	35.40-45.40	111.32	21.43	21.43	0.00	89.89
MW-5	9/14/99	32.25	22.25-32.25	103.57	26.95	26.95	0.00	76.62
MW-6	9/25/00	36.61	26.61-36.61	104.14	21.78	21.78	0.00	82.36
MW-7	9/25/00	36.37	26.37-36.37	104.52	20.24	20.24	0.00	84.28
MW-8	9/26/00	33.69	23.69-33.69	101.79	15.99	15.99	0.00	85.80
MW-9	9/27/00	35.40	25.40-35.40	105.43	20.21	20.21	0.00	85.22
MW-10	9/27/00	27.44	17.44-27.44	96.57	17.22	17.22	0.00	79.35
MW-11	9/27/00	28.28	18.28-28.28	95.15	18.73	18.73	0.00	76.42
MW-12	9/29/00	30.60	20.60-30.60	97.03	16.41	16.41	0.00	80.62
MW-13	9/29/00	27.11	17.11-27.11	95.89	18.03	18.03	0.00	77.86

Notes:

(1) Elevations are relative to a temporary assumed benchmark established on-site

(2) Depth to groundwater measurements taken on September 17, 2003

(3) Groundwater elevation corrected using a free product density of 0.84

\* MW-2 is believed to be a monitoring well intalled during site remediation activities. Construction details are not known.

**TABLE 2**  
**HISTORICAL GROUNDWATER QUALITY DATA**  
**HOT SPOT #3005**  
**107 HAMPTON STREET**  
**CHESNEE, SOUTH CAROLINA**  
**SCDHEC UST PERMIT #: 12719**  
**S&ME PROJECT 1264-99-506**

WELL	DATE	B µg/L	T µg/L	E µg/L	X µg/L	MTBE µg/L	EDB µg/L	NAPHTH µg/L
MW-1	04/24/96	27.4	88.3	46	170.1	NA	NA	55.7
	09/15/99	FP	FP	FP	FP	FP	FP	FP
	10/13/00	FP	FP	FP	FP	FP	FP	FP
	03/09/01	FP	FP	FP	FP	FP	FP	FP
	09/17/03	FP	FP	FP	FP	FP	FP	FP
MW-2	09/17/03	1.5	<5.0	<1.0	6.9	8.7	<0.010	<5.0
MW-3	09/15/99	500	220	100	460	1100	NA	<5.0
	10/16/00	1500	170	290	2000	2200	<1.0	3.6
	03/09/01	3000	130	400	3100	6400	<1.0	<10
	09/17/03	390	<50	170	780	1500	<0.010	<50
MW-4	09/20/99	<5.0	<5.0	<5.0	<5.0	<5.0	NA	<5.0
	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	09/17/03	<1.0	<5.0	<1.0	<3.0	<1.0	<0.010	<5.0
MW-5	09/15/99	<5.0	21	5	20	<5.0	NA	<5.0
	10/13/00	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	03/08/01	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	09/17/03	<1.0	<5.0	<1.0	<3.0	1.9	<0.010	<5.0
MW-6	10/16/00	7.4	3.5	29	81	<1.0	<1.0	44
	03/08/01	3.3	<2.0	36	76	<2.0	<1.0	68
	09/17/03	<1.0	<5.0	1.5	9.3	<1.0	<0.010	8.7
MW-7	10/16/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	03/09/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	09/17/03	<1.0	<5.0	<1.0	<3.0	<1.0	<0.010	<5.0
MW-8	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	09/17/03	<1.0	<5.0	<1.0	<3.0	<1.0	<0.010	<5.0
MW-9	10/16/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	03/09/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	09/17/03	<1.0	<5.0	1.1	5.6	4.5	<0.010	<5.0
MW-10	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	09/17/03	<1.0	<5.0	<1.0	<3.0	<1.0	<0.010	<5.0
MW-11	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	09/17/03	<1.0	<5.0	<1.0	<3.0	<1.0	<0.010	<5.0
MW-12	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	09/17/03	<1.0	<5.0	<1.0	<3.0	<1.0	<0.010	<5.0
MW-13	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	09/17/03	<1.0	<5.0	<1.0	<3.0	<1.0	<0.010	<5.0
MW-1D	10/16/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	09/17/03	<1.0	<5.0	<1.0	<3.0	1.3	<0.010	<5.0
<b>RBSLs</b>		<b>5</b>	<b>1000</b>	<b>700</b>	<b>10000</b>	<b>40</b>	<b>0.05</b>	<b>10</b>

B - Benzene                      T - Toluene                      MTBE - Methyl tert butyl ether  
E - Ethylbenzene                X- Xylenes                      NAPHTH - Naphthalene  
EDB - Ethylene dibromide  
NA - Not Analyzed  
FP - Free Product in the well  
RBSL - SCDHEC-established risk-based screening levels





**SAMPLE COLLECTION  
SUMMARY SHEET**



General

1. Job Name: Hot Spot # 3005 2. Project No.: 1264-99-506  
 3. Sampled By: LL/BH 4. Weather: Sunny/Warm  
 5. Location: Chesnee, S.C. 6. Well #: MW-1D  
 7. Well Condition: OK 8. Personnel Present: LL/BH

Water Level Information:

1. Date: 9-17-03 2. Time: 13:20 3. State Water Level: 22.0 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOC  
 5. Height of M.P. above (below) Land Surface: 3"  
 6. Method of Water Level Measurement: Elec. Wk Tape

Evacuation Procedure (Wells):

1. Date: 9-17-03 2. Time Evacuation Started: 13:23 3. Time Evacuation Finished: 13:30  
 4. Method of Evacuation: Bailer 5. Total Well Depth: 58.50 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 7.02 Actual Buffer pH 4.0 or 10.0 4.01 Actual 100 Standard Cond: 112 Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	6	12	18			
Water Temperature (F) <u>(C)</u>	22.6	22.8	22.0			
pH (Standard Units)	7.63	5.88	5.87			
Specific Cond. (M/MHOS) (PPM)	60	62	57			
Turbidity (Subjective)	LOW	LOW	LOW			
Odor (Subjective)	Ø	Ø	Ø			
Other: _____						

Sampling Information

1. Date: 9-17-03 2. Time: 13:35 3. Sample Containers (Number/Size/Type): 5/40ml/G  
 4. Analyses requested: 8260, 5011  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: Yes 8. Preservative: Ac, NaThio, Ice  
 9. Lab Performing Analyses: ESC 10. Sample Type: Well ✓ Stream \_\_\_\_\_

Remarks: MW-1 21.43 21.58 FREE PRED.  
Precl. H<sub>2</sub>O

**SAMPLE COLLECTION SUMMARY SHEET**



General

1. Job Name: Hot Spot # 3005 2. Project No.: 1264-99-506  
 3. Sampled By: LL/BH 4. Weather: Sunny/Warm  
 5. Location: Chesnee, S.C. 6. Well #: MW-2  
 7. Well Condition: Needs Repair 8. Personnel Present: LL/BH

Water Level Information:

1. Date: 9-17-03 2. Time: 14:25 3. State Water Level: 20,90 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOC  
 5. Height of M.P. above (below) Land Surface: 3"  
 6. Method of Water Level Measurement: Elec. Wk Tape

Evacuation Procedure (Wells):

1. Date: 9-17-03 2. Time Evacuation Started: 14:30 3. Time Evacuation Finished: 14:35  
 4. Method of Evacuation: Bailer 5. Total Well Depth: 34.20 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 7.02 Actual Buffer pH 4.0 or 10.0 4.01 Actual 100 Standard Cond: 112 Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	<u>2</u>	<u>4</u>	<u>6</u>	<u>8</u>		
Water Temperature (F) <u>(C)</u>	<u>23.8°</u>	<u>22.8°</u>	<u>23°</u>	<u>22.8°</u>		
pH (Standard Units)	<u>6.32</u>	<u>6.40</u>	<u>6.67</u>	<u>6.79</u>		
Specific Cond. (M/MHOS) (PPM)	<u>149</u>	<u>161</u>	<u>167</u>	<u>193</u>		
Turbidity (Subjective)	<u>High</u>	<u>High</u>	<u>High</u>	<u>High</u>		
Odor (Subjective)	<u>Slight</u>	<u>Slight</u>	<u>Slight</u>	<u>Slight</u>		
Other: _____						

Sampling Information

1. Date: 9-17-03 2. Time: 14:40 3. Sample Containers (Number/Size/Type): 5/40ml/G  
 4. Analyses requested: 8260, 8011  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: Yes 8. Preservative: Ac, NaThio, Ice  
 9. Lab Performing Analyses: ESC 10. Sample Type: Well ✓ Stream \_\_\_\_\_

Remarks: SURFACE WATER GOING INTO LARGE OPENING IN PIPE FROM TEE

**SAMPLE COLLECTION SUMMARY SHEET**



**S&ME**

ENVIRONMENTAL SERVICES  
ENGINEERING • TESTING

General

1. Job Name: Hot Spot # 3005 2. Project No.: 1264-99-506  
 3. Sampled By: LL/BH 4. Weather: Sunny/Warm  
 5. Location: Chesnee, S.C. 6. Well #: MW-3  
 7. Well Condition: OK 8. Personnel Present: LL/BH

Water Level Information:

1. Date: 9-17-03 2. Time: 15:05 3. State Water Level: 24.59 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOC  
 5. Height of M.P. above/below (Circle) Land Surface: 3"  
 6. Method of Water Level Measurement: Elec. Wk Tape

Evacuation Procedure (Wells):

1. Date: 9-17-03 2. Time Evacuation Started: 15:10 3. Time Evacuation Finished: 15:15  
 4. Method of Evacuation: Bailer 5. Total Well Depth: 32.20 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well ( $0.041D^2H$ ) = \_\_\_\_\_ x \_\_\_\_\_ = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 7.02 Buffer pH 4.0 or 10.0 4.01 100 Cond: 112  
 Actual Actual Standard Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	<u>1</u>	<u>2</u>	<u>3</u>			
Water Temperature (F) <u>(C)</u>	<u>24.6</u>					
pH (Standard Units)	<u>5.54</u>					
Specific Cond. (M/MHOS) (PPM)	<u>657</u>					
Turbidity (Subjective)	<u>High</u>					
Odor (Subjective)	<u>0</u>					
Other: _____						

Sampling Information

1. Date: 9-17-03 2. Time: 15:20 3. Sample Containers (Number/Size/Type): 5/40ml/G  
 4. Analyses requested: 8260, 8011  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: Yes 8. Preservative: HCl, NaThio, Ice  
 9. Lab Performing Analyses: ESC 10. Sample Type: Well  ; Stream

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION  
SUMMARY SHEET**



General

1. Job Name: Hot Spot # 3005 2. Project No.: 1264-99-506  
 3. Sampled By: LL/BH 4. Weather: Sunny/Warm  
 5. Location: Chesnee, S.C. 6. Well #: MW-21  
 7. Well Condition: OK 8. Personnel Present: LL/BH

Water Level Information:

1. Date: 9-17-03 2. Time: 13:00 3. State Water Level: 21.43 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOC  
 5. Height of M.P. above (below) Land Surface: 3"  
 6. Method of Water Level Measurement: Elec. Wk Tape

Evacuation Procedure (Wells):

1. Date: 9-17-03 2. Time Evacuation Started: 13:05 3. Time Evacuation Finished: 13:10  
 4. Method of Evacuation: Bailer 5. Total Well Depth: 45.50 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 7.02 Actual Buffer pH 4.0 or 10.0 4.01 Actual 100 Standard Cond: 112 Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	3	6	9	12		
Water Temperature (F) <sup>(C)</sup>	21.9°	20.5°	21.2°	19.5		
pH (Standard Units)	6.14	7.02	7.41	7.63		
Specific Cond. (M/MHOS) (PPM)	140	158	159	160		<b>DRY</b>
Turbidity (Subjective)	High	High	High	High		
Odor (Subjective)	Ø	Ø	Ø	Ø		
Other: _____						

Sampling Information

1. Date: 9-17-03 2. Time: 13:15 3. Sample Containers (Number/Size/Type): 5/40ml/G  
 4. Analyses requested: 8260, 8011  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: Yes 8. Preservative: Ac, NaThio, Ice  
 9. Lab Performing Analyses: ESC 10. Sample Type: Well  ; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION SUMMARY SHEET**



General

1. Job Name: Hot Spot # 3005 2. Project No.: 1264-99-506  
 3. Sampled By: LL/BH 4. Weather: Sunny/Warm  
 5. Location: Chesnee, S.C. 6. Well #: MW-5  
 7. Well Condition: OK 8. Personnel Present: LL/BH

Water Level Information:

1. Date: 9-17-03 2. Time: 12:40 3. State Water Level: 26.95 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOC  
 5. Height of M.P. above (below) Land Surface: 3"  
 6. Method of Water Level Measurement: Elec. Wl Tape

Evacuation Procedure (Wells):

1. Date: 9-17-03 2. Time Evacuation Started: 12:45 3. Time Evacuation Finished: 12:50  
 4. Method of Evacuation: Bailer 5. Total Well Depth: 32.20 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 7.02 Actual Buffer pH 4.0 or 10.0 4.01 Actual 100 Standard Cond: 112 Actual

Record of Well Evacuation

	1	2	3			
Vol. Purged (Cummul. Gals)						
Water Temperature (F) <u>(C)</u>	<u>21.00</u>					
pH (Standard Units)	<u>4.55</u>					
Specific Cond. (M/MHOS) (PPM)	<u>41</u>					
Turbidity (Subjective)	<u>High</u>					
Odor (Subjective)	<u>0</u>					
Other: _____						

Sampling Information

1. Date: 9-17-03 2. Time: 12:55 3. Sample Containers (Number/Size/Type): 5/40ml/G  
 4. Analyses requested: 8260, 8011  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: Yes 8. Preservative: HCl, NaThio, Ice  
 9. Lab Performing Analyses: ESC 10. Sample Type: Well ✓; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION  
SUMMARY SHEET**



General

1. Job Name: Hot Spot # 3005 2. Project No.: 1264-99-506  
 3. Sampled By: LL/BH 4. Weather: Sunny/Warm  
 5. Location: Chesnee, S.C. 6. Well #: MW-6  
 7. Well Condition: OK 8. Personnel Present: LL/BH

Water Level Information:

1. Date: 9-17-03 2. Time: 14:45 3. State Water Level: 21.78 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOC  
 5. Height of M.P. above/below (Circle) Land Surface: 3"  
 6. Method of Water Level Measurement: Elec. W/L Tape

Evacuation Procedure (Wells):

1. Date: 9-17-03 2. Time Evacuation Started: 14:50 3. Time Evacuation Finished: 14:55  
 4. Method of Evacuation: Bailer 5. Total Well Depth: 36.10 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 7.02 Buffer pH 4.0 or 10.0 4.01 100 Cond: 112  
 Actual Actual Standard Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	2	4	6	8		
Water Temperature (F) <u>(C)</u>	22.6°	22.1°	21.4°	21.9°		
pH (Standard Units)	5.32	5.20	4.80	4.85		
Specific Cond. (M/MHOS) (PPM)	127	105	104	106		
Turbidity (Subjective)	High	High	High	High		
Odor (Subjective)	Ø	Ø	Ø	Ø		
Other: _____						

Sampling Information

1. Date: 9-17-03 2. Time: 15:00 3. Sample Containers (Number/Size/Type): 5/40ml/G  
 4. Analyses requested: 8260, 5011  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: Yes 8. Preservative: HCl, NaThio, Ice  
 9. Lab Performing Analyses: ESC 10. Sample Type: Well ✓; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION  
SUMMARY SHEET**



**S&ME**

ENVIRONMENTAL SERVICES  
ENGINEERING • TESTING

General

1. Job Name: Hot Spot # 3005 2. Project No.: 1264-99-506  
 3. Sampled By: LL/BH 4. Weather: Sunny/Warm  
 5. Location: Chesnee, S.C. 6. Well #: MW-7  
 7. Well Condition: OK 8. Personnel Present: LL/BH

Water Level Information:

1. Date: 9-17-03 2. Time: 14:05 3. State Water Level: 20.24 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOC  
 5. Height of M.P. above/below (Circle) Land Surface: 3"  
 6. Method of Water Level Measurement: Elec. Wl Tape

Evacuation Procedure (Wells):

1. Date: 9-17-03 2. Time Evacuation Started: 14:10 3. Time Evacuation Finished: 14:15  
 4. Method of Evacuation: Bailer 5. Total Well Depth: 36.15 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 7.02 Actual Buffer pH 4.0 or 10.0 4.01 Actual 100 Standard Cond: 112 Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	<u>2.5</u>	<u>5</u>	<u>7.5</u>		
Water Temperature (F) <sup>(C)</sup>	<u>23.9°</u>	<u>23°</u>	<u>22.4°</u>		
pH (Standard Units)	<u>4.76</u>	<u>4.69</u>	<u>4.68</u>		
Specific Cond. (M/MHOS) (PPM)	<u>56</u>	<u>55</u>	<u>66</u>		
Turbidity (Subjective)	<u>High</u>	<u>High</u>	<u>High</u>		
Odor (Subjective)	<u>Ø</u>	<u>Ø</u>	<u>Ø</u>		
Other: _____					

Sampling Information

1. Date: 9-17-03 2. Time: 14:20 3. Sample Containers (Number/Size/Type): 5/40ml/G  
 4. Analyses requested: 8260, 8011  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: Yes 8. Preservative: HCl, NaThio, Ice  
 9. Lab Performing Analyses: ESC 10. Sample Type: Well ✓; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_



**SAMPLE COLLECTION  
SUMMARY SHEET**



**S&ME**

ENVIRONMENTAL SERVICES  
ENGINEERING • TESTING

General

1. Job Name: Hot Spot # 3005 2. Project No.: 1264-99-506  
 3. Sampled By: LL/BH 4. Weather: Sunny/Warm  
 5. Location: Chesnee, S.C. 6. Well #: MW-8  
 7. Well Condition: OK 8. Personnel Present: LL/BH

Water Level Information:

1. Date: 9-17-03 2. Time: 12:20 3. State Water Level: 15.99 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOC  
 5. Height of M.P. above below (Circle) Land Surface: 3"  
 6. Method of Water Level Measurement: Elec. W.L. Tape

Evacuation Procedure (Wells):

1. Date: 9-17-03 2. Time Evacuation Started: 12:23 3. Time Evacuation Finished: 12:28  
 4. Method of Evacuation: Bailer 5. Total Well Depth: 33.20 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 7.02 Actual Buffer pH 4.0 or 10.0 4.01 Actual 100 Standard Cond: 112 Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	<u>2.5</u>	<u>5</u>	<u>7.5</u>			
Water Temperature (F) <u>(C)</u>	<u>23.2°</u>	<u>22.1°</u>	<u>20.9°</u>			
pH (Standard Units)	<u>4.62</u>	<u>4.53</u>	<u>4.50</u>			
Specific Cond. (M/MHOS) (PPM)	<u>17</u>	<u>19</u>	<u>16</u>			
Turbidity (Subjective)	<u>High</u>	<u>High</u>	<u>High</u>			
Odor (Subjective)	<u>⊘</u>	<u>⊘</u>	<u>⊘</u>			
Other: _____						

Sampling Information

1. Date: 9-17-03 2. Time: 12:35 3. Sample Containers (Number/Size/Type): 5/40ml/G  
 4. Analyses requested: 8260, 8011  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: Yes 8. Preservative: HCl, NaThio, Ice  
 9. Lab Performing Analyses: ESC 10. Sample Type: Well ✓; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION  
SUMMARY SHEET**



**S&ME**

ENVIRONMENTAL SERVICES  
ENGINEERING • TESTING

General

1. Job Name: Hot Spot # 3005 2. Project No.: 1264-99-506  
 3. Sampled By: LL/BH 4. Weather: Sunny/Warm  
 5. Location: Chesnee, S.C. 6. Well #: MW-9  
 7. Well Condition: OK 8. Personnel Present: LL/BH

Water Level Information:

1. Date: 9-17-03 2. Time: 13:48 3. State Water Level: 20.21 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOC  
 5. Height of M.P. above below (Circle) Land Surface: 3"  
 6. Method of Water Level Measurement: Elec. WL Tape

Evacuation Procedure (Wells):

1. Date: 9-17-03 2. Time Evacuation Started: 13:50 3. Time Evacuation Finished: 13:55  
 4. Method of Evacuation: Bailer 5. Total Well Depth: 35.10 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 7.02 Actual Buffer pH 4.0 or 10.0 4.01 Actual 100 Standard Cond: 112 Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	<u>2</u>	<u>4</u>	<u>6</u>			
Water Temperature (F) <u>(C)</u>	<u>23.0°</u>	<u>21.6°</u>	<u>21.7°</u>			
pH (Standard Units)	<u>5.04</u>	<u>4.87</u>	<u>4.90</u>			
Specific Cond. (M/MHOS) (PPM)	<u>65</u>	<u>68</u>	<u>49</u>			
Turbidity (Subjective)	<u>High</u>	<u>High</u>	<u>High</u>			
Odor (Subjective)	<u>Slight</u>	<u>Slight</u>	<u>Slight</u>			
Other: _____						

Sampling Information

1. Date: 9-17-03 2. Time: 14:00 3. Sample Containers (Number/Size/Type): 5/40ml/G  
 4. Analyses requested: 8260, 8011  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: Yes 8. Preservative: HCl, NaThio, Ice  
 9. Lab Performing Analyses: ESC 10. Sample Type: Well ✓; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION SUMMARY SHEET**



**S&ME**

ENVIRONMENTAL SERVICES  
ENGINEERING • TESTING

General

1. Job Name: Hot Spot # 3005 2. Project No.: 1264-99-506  
 3. Sampled By: LL/BH 4. Weather: Sunny/Warm  
 5. Location: Chesnee, S.C. 6. Well #: MW-10  
 7. Well Condition: OK 8. Personnel Present: LL/BH

Water Level Information:

1. Date: 9-17-03 2. Time: 12:00 3. State Water Level: 17.22 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOC  
 5. Height of M.P. above/below (Circle) Land Surface: 3"  
 6. Method of Water Level Measurement: Elec. Wk Tape

Evacuation Procedure (Wells):

1. Date: 9-17-03 2. Time Evacuation Started: 12:03 3. Time Evacuation Finished: 12:10  
 4. Method of Evacuation: Bailer 5. Total Well Depth: 27.15 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well ( $0.041D^2H$ ) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 7.02 Buffer pH 4.0 or 10.0 4.01 100 Cond: 112  
 Actual Actual Standard Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	1.5	3	4.5			
Water Temperature (F) <u>(C)</u>	20.6°	20.2°	20.4°			
pH (Standard Units)	3.99	3.92	3.93			
Specific Cond. (M/MHOS) (PPM)	103	102	103			
Turbidity (Subjective)	High	High	High			
Odor (Subjective)	Ø	Ø	Ø			
Other: _____						

Sampling Information

1. Date: 9-17-03 2. Time: 12:15 3. Sample Containers (Number/Size/Type): 5/40ml/G  
 4. Analyses requested: 8260, 8011  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: Yes 8. Preservative: HCl, NaThio, Ice  
 9. Lab Performing Analyses: ESC 10. Sample Type: Well ✓; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION  
SUMMARY SHEET**



General

1. Job Name: Hot Spot # 3005 2. Project No.: 1264-99-506  
 3. Sampled By: LL/BH 4. Weather: Sunny/Warm  
 5. Location: Chesnee, S.C. 6. Well #: MW-11  
 7. Well Condition: OK 8. Personnel Present: LL/BH

Water Level Information:

1. Date: 9-17-03 2. Time: 11:35 3. State Water Level: 18.73 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOC  
 5. Height of M.P. above (below) Land Surface: 3"  
 6. Method of Water Level Measurement: Elec. WL Tape

Evacuation Procedure (Wells):

1. Date: 9-17-03 2. Time Evacuation Started: 11:38 3. Time Evacuation Finished: 11:45  
 4. Method of Evacuation: Bailer 5. Total Well Depth: 28.10 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 7.02 Buffer pH 4.0 or 10.0 4.01 100 Cond: 112  
 Actual Actual Standard Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	<u>1.5</u>	<u>3</u>	<u>4.5</u>			
Water Temperature (F) <sup>(C)</sup>	<u>22.1°</u>	<u>21.2°</u>	<u>20°</u>			
pH (Standard Units)	<u>4.51</u>	<u>4.27</u>	<u>4.21</u>			
Specific Cond. (M/MHOS) (PPM)	<u>48</u>	<u>49</u>	<u>51</u>			
Turbidity (Subjective)	<u>High</u>	<u>High</u>	<u>High</u>			
Odor (Subjective)	<u>0</u>	<u>0</u>	<u>0</u>			
Other: _____						

Sampling Information

1. Date: 9-17-03 2. Time: 11:55 3. Sample Containers (Number/Size/Type): 5/40ml/G  
 4. Analyses requested: 8260, 8011  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: Yes 8. Preservative: HCl, NaThio, Ice  
 9. Lab Performing Analyses: ESC 10. Sample Type: Well  ; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION  
SUMMARY SHEET**



General

1. Job Name: Hot Spot # 3005 2. Project No.: 1264-99-506  
 3. Sampled By: LL/BH 4. Weather: Sunny/Warm  
 5. Location: Chesnee, S.C. 6. Well #: MW-12  
 7. Well Condition: OK 8. Personnel Present: LL/BH

Water Level Information:

1. Date: 9-17-03 2. Time: 11:05 3. State Water Level: 16.41 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOC  
 5. Height of M.P. above/below (Circle) Land Surface: 3"  
 6. Method of Water Level Measurement: Elec. WL Tape

Evacuation Procedure (Wells):

1. Date: 9-17-03 2. Time Evacuation Started: 11:10 3. Time Evacuation Finished: 11:18  
 4. Method of Evacuation: Bailer 5. Total Well Depth: 30.30 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 7.02 Actual Buffer pH 4.0 or 10.0 4.01 Actual 100 Standard Cond: 112 Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	2	4	6			
Water Temperature (F) <u>(C)</u>	18.7°	18.5°	18.4°			
pH (Standard Units)	5.10	4.97	4.94			
Specific Cond. (M/MHOS) (PPM)	88	89	90			
Turbidity (Subjective)	High	High	High			
Odor (Subjective)	Ø	Ø	Ø			
Other: _____						

Sampling Information

1. Date: 9-17-03 2. Time: 11:30 3. Sample Containers (Number/Size/Type): 5/40ml/G  
 4. Analyses requested: 8260, 8011  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: Yes 8. Preservative: Ac, NaThio, Ice  
 9. Lab Performing Analyses: ESC 10. Sample Type: Well ✓; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION  
SUMMARY SHEET**



**S&ME**

ENVIRONMENTAL SERVICES  
ENGINEERING • TESTING

General

1. Job Name: Hot Spot # 3005 2. Project No.: 1264-99-506  
 3. Sampled By: LL/BH 4. Weather: Sunny/Warm  
 5. Location: Chesnee, S.C. 6. Well #: MW-13  
 7. Well Condition: OK 8. Personnel Present: LL/BH

Water Level Information:

1. Date: 9-17-03 2. Time: 12:30 3. State Water Level: 18.03 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOC  
 5. Height of M.P. above (below) Land Surface: 3"  
 6. Method of Water Level Measurement: Elec. W/L Tape

Evacuation Procedure (Wells):

1. Date: 9-17-03 2. Time Evacuation Started: 12:35 3. Time Evacuation Finished: 12:40  
 4. Method of Evacuation: Bailer 5. Total Well Depth: 26.90 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 7.02 Buffer pH 4.0 or 10.0 4.01 100 Cond: 112  
 Actual Actual Standard Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	1	2	3			
Water Temperature (F) <u>(C)</u>	20.5°	19.9°	19.5°			
pH (Standard Units)	4.56	4.43	4.50			
Specific Cond. (M/MHOS) (PPM)	25	26	34			
Turbidity (Subjective)	High	High	High			
Odor (Subjective)	Ø	Ø	Ø			
Other: _____						

Sampling Information

1. Date: 9-17-03 2. Time: 12:45 3. Sample Containers (Number/Size/Type): 5/40ml/G  
 4. Analyses requested: 8260, 8011  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: Yes 8. Preservative: HCl, NaThio, Ice  
 9. Lab Performing Analyses: ESC 10. Sample Type: Well ✓; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_



**ENVIRONMENTAL  
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**REPORT OF ANALYSIS**

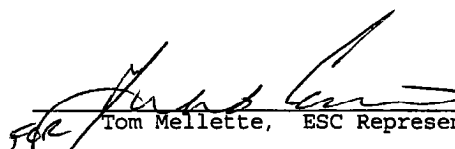
Mr. Mike O Connell  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

September 26, 2003

Date Received : September 18, 2003  
Description : Waters for Hot Spot 3005  
Sample ID : MW-2  
Collected By : Lanny Lowery  
Collection Date : 09/17/03 14:40

ESC Sample # : L128122-01  
Site ID :  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	1.5	1.0	ug/l	8260B	09/24/03	1
Toluene	BDL	5.0	ug/l	8260B	09/24/03	1
Ethylbenzene	BDL	1.0	ug/l	8260B	09/24/03	1
Total Xylenes	6.9	3.0	ug/l	8260B	09/24/03	1
Methyl tert-butyl ether	8.7	1.0	ug/l	8260B	09/24/03	1
Naphthalene	BDL	5.0	ug/l	8260B	09/24/03	1
Surrogate Recovery						
Toluene-d8	100		% Rec.	8260B	09/24/03	1
Dibromofluoromethane	100		% Rec.	8260B	09/24/03	1
4-Bromofluorobenzene	110		% Rec.	8260B	09/24/03	1
Ethylene Dibromide	BDL	0.010	ug/l	504.1	09/25/03	1
1,2-Dibromo-3-Chloropropane	BDL	0.020	ug/l	504.1	09/25/03	1

  
Tom Mellette, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

Note:

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Tax I.D. 62-0814289

Est. 1970

**REPORT OF ANALYSIS**

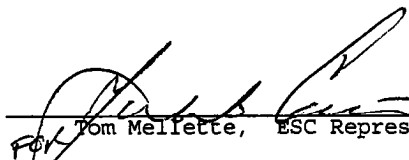
Mr. Mike O Connell  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

September 26, 2003

Date Received : September 18, 2003  
Description : Waters for Hot Spot 3005  
Sample ID : MW-3  
Collected By : Lanny Lowery  
Collection Date : 09/17/03 15:20

ESC Sample # : L128122-02  
Site ID :  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	390	10.	ug/l	8260B	09/23/03	10
Toluene	BDL	50.	ug/l	8260B	09/23/03	10
Ethylbenzene	170	10.	ug/l	8260B	09/23/03	10
Total Xylenes	780	30.	ug/l	8260B	09/23/03	10
Methyl tert-butyl ether	1500	10.	ug/l	8260B	09/23/03	10
Naphthalene	BDL	50.	ug/l	8260B	09/23/03	10
Surrogate Recovery						
Toluene-d8	100		% Rec.	8260B	09/23/03	10
Dibromofluoromethane	110		% Rec.	8260B	09/23/03	10
4-Bromofluorobenzene	98.		% Rec.	8260B	09/23/03	10
Ethylene Dibromide	BDL	0.010	ug/l	504.1	09/25/03	1
1,2-Dibromo-3-Chloropropane	BDL	0.020	ug/l	504.1	09/25/03	1

  
Tom Mellette, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

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**REPORT OF ANALYSIS**

Mr. Mike O Connell  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

September 26, 2003

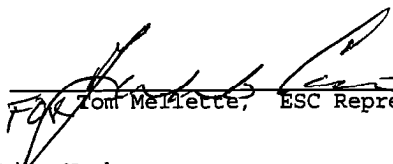
Date Received : September 18, 2003  
Description : Waters for Hot Spot 3005  
Sample ID : MW-4  
Collected By : Lanny Lowery  
Collection Date : 09/17/03 13:15

ESC Sample # : L128122-03

Site ID :

Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	09/22/03	1
Toluene	BDL	5.0	ug/l	8260B	09/22/03	1
Ethylbenzene	BDL	1.0	ug/l	8260B	09/22/03	1
Total Xylenes	BDL	3.0	ug/l	8260B	09/22/03	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	09/22/03	1
Naphthalene	BDL	5.0	ug/l	8260B	09/22/03	1
Surrogate Recovery						
Toluene-d8	98.		% Rec.	8260B	09/22/03	1
Dibromofluoromethane	110		% Rec.	8260B	09/22/03	1
4-Bromofluorobenzene	100		% Rec.	8260B	09/22/03	1
Ethylene Dibromide	BDL	0.010	ug/l	504.1	09/25/03	1
1,2-Dibromo-3-Chloropropane	BDL	0.020	ug/l	504.1	09/25/03	1

  
Tom Mellette, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

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S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

September 26, 2003

Date Received : September 18, 2003  
Description : Waters for Hot Spot 3005  
Sample ID : MW-5  
Collected By : Lanny Lowery  
Collection Date : 09/17/03 12:55

ESC Sample # : L128122-04

Site ID :

Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	09/22/03	1
Toluene	BDL	5.0	ug/l	8260B	09/22/03	1
Ethylbenzene	BDL	1.0	ug/l	8260B	09/22/03	1
Total Xylenes	BDL	3.0	ug/l	8260B	09/22/03	1
Methyl tert-butyl ether	1.9	1.0	ug/l	8260B	09/22/03	1
Naphthalene	BDL	5.0	ug/l	8260B	09/22/03	1
Surrogate Recovery						
Toluene-d8	97.		% Rec.	8260B	09/22/03	1
Dibromofluoromethane	100		% Rec.	8260B	09/22/03	1
4-Bromofluorobenzene	100		% Rec.	8260B	09/22/03	1
Ethylene Dibromide	BDL	0.010	ug/l	504.1	09/25/03	1
1,2-Dibromo-3-Chloropropane	BDL	0.020	ug/l	504.1	09/25/03	1

*Tom Mellette*  
Tom Mellette, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
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September 26, 2003

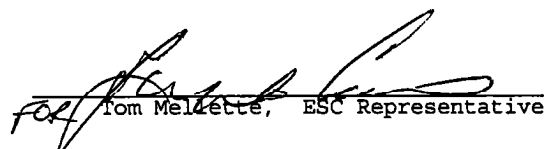
Date Received : September 18, 2003  
Description : Waters for Hot Spot 3005  
Sample ID : MW-6  
Collected By : Lanny Lowery  
Collection Date : 09/17/03 15:00

ESC Sample # : L128122-05

Site ID :

Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	09/22/03	1
Toluene	BDL	5.0	ug/l	8260B	09/22/03	1
Ethylbenzene	1.5	1.0	ug/l	8260B	09/22/03	1
Total Xylenes	9.3	3.0	ug/l	8260B	09/22/03	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	09/22/03	1
Naphthalene	8.7	5.0	ug/l	8260B	09/22/03	1
Surrogate Recovery						
Toluene-d8	100		% Rec.	8260B	09/22/03	1
Dibromofluoromethane	110		% Rec.	8260B	09/22/03	1
4-Bromofluorobenzene	100		% Rec.	8260B	09/22/03	1
Ethylene Dibromide	BDL	0.010	ug/l	504.1	09/25/03	1
1,2-Dibromo-3-Chloropropane	BDL	0.020	ug/l	504.1	09/25/03	1

  
Tom Mellette, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

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September 26, 2003

Mr. Mike O Connell  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

Date Received : September 18, 2003  
Description : Waters for Hot Spot 3005  
Sample ID : MW-7  
Collected By : Lanny Lowery  
Collection Date : 09/17/03 14:20

ESC Sample # : L128122-06  
Site ID :  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	09/24/03	1
Toluene	BDL	5.0	ug/l	8260B	09/24/03	1
Ethylbenzene	BDL	1.0	ug/l	8260B	09/24/03	1
Total Xylenes	BDL	3.0	ug/l	8260B	09/24/03	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	09/24/03	1
Naphthalene	BDL	5.0	ug/l	8260B	09/24/03	1
Surrogate Recovery						
Toluene-d8	100		% Rec.	8260B	09/24/03	1
Dibromofluoromethane	110		% Rec.	8260B	09/24/03	1
4-Bromofluorobenzene	120		% Rec.	8260B	09/24/03	1
Ethylene Dibromide	BDL	0.010	ug/l	504.1	09/25/03	1
1,2-Dibromo-3-Chloropropane	BDL	0.020	ug/l	504.1	09/25/03	1

  
Tom Mellette, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

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155 Tradd Street  
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September 26, 2003

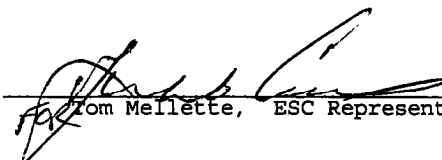
Date Received : September 18, 2003  
Description : Waters for Hot Spot 3005  
Sample ID : MW-8  
Collected By : Lanny Lowery  
Collection Date : 09/17/03 12:35

ESC Sample # : L128122-07

Site ID :

Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	09/24/03	1
Toluene	BDL	5.0	ug/l	8260B	09/24/03	1
Ethylbenzene	BDL	1.0	ug/l	8260B	09/24/03	1
Total Xylenes	BDL	3.0	ug/l	8260B	09/24/03	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	09/24/03	1
Naphthalene	BDL	5.0	ug/l	8260B	09/24/03	1
Surrogate Recovery						
Toluene-d8	100		% Rec.	8260B	09/24/03	1
Dibromofluoromethane	100		% Rec.	8260B	09/24/03	1
4-Bromofluorobenzene	110		% Rec.	8260B	09/24/03	1
Ethylene Dibromide	BDL	0.010	ug/l	504.1	09/25/03	1
1,2-Dibromo-3-Chloropropane	BDL	0.020	ug/l	504.1	09/25/03	1

  
Tom Mellette, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

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Mr. Mike O Connell  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

September 26, 2003

Date Received : September 18, 2003  
Description : Waters for Hot Spot 3005

ESC Sample # : L128122-08

Sample ID : MW-9

Site ID :

Project # : 1264-99-506

Collected By : Lanny Lowery  
Collection Date : 09/17/03 14:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	09/24/03	1
Toluene	BDL	5.0	ug/l	8260B	09/24/03	1
Ethylbenzene	1.1	1.0	ug/l	8260B	09/24/03	1
Total Xylenes	5.6	3.0	ug/l	8260B	09/24/03	1
Methyl tert-butyl ether	4.5	1.0	ug/l	8260B	09/24/03	1
Naphthalene	BDL	5.0	ug/l	8260B	09/24/03	1
Surrogate Recovery						
Toluene-d8	99.		% Rec.	8260B	09/24/03	1
Dibromofluoromethane	110		% Rec.	8260B	09/24/03	1
4-Bromofluorobenzene	110		% Rec.	8260B	09/24/03	1
Ethylene Dibromide	BDL	0.010	ug/l	504.1	09/25/03	1
1,2-Dibromo-3-Chloropropane	BDL	0.020	ug/l	504.1	09/25/03	1

  
Tom Mellette, ESC Representative

BDL - Below Detection Limit  
Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:  
A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233  
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Mr. Mike O Connell  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

September 26, 2003

Date Received : September 18, 2003  
Description : Waters for Hot Spot 3005  
Sample ID : MW-10  
Collected By : Lanny Lowery  
Collection Date : 09/17/03 12:15

ESC Sample # : L128122-09  
Site ID :  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	09/24/03	1
Toluene	BDL	5.0	ug/l	8260B	09/24/03	1
Ethylbenzene	BDL	1.0	ug/l	8260B	09/24/03	1
Total Xylenes	BDL	3.0	ug/l	8260B	09/24/03	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	09/24/03	1
Naphthalene	BDL	5.0	ug/l	8260B	09/24/03	1
Surrogate Recovery						
Toluene-d8	100		% Rec.	8260B	09/24/03	1
Dibromofluoromethane	110		% Rec.	8260B	09/24/03	1
4-Bromofluorobenzene	110		% Rec.	8260B	09/24/03	1
Ethylene Dibromide	BDL	0.010	ug/l	504.1	09/25/03	1
1,2-Dibromo-3-Chloropropane	BDL	0.020	ug/l	504.1	09/25/03	1

  
Tom Mellette, ESC Representative

BDL - Below Detection Limit  
Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:  
A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233  
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S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

September 26, 2003

Date Received : September 18, 2003  
Description : Waters for Hot Spot 3005

ESC Sample # : L128122-10

Sample ID : MW-11

Site ID :

Collected By : Lanny Lowery  
Collection Date : 09/17/03 11:55

Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	09/24/03	1
Toluene	BDL	5.0	ug/l	8260B	09/24/03	1
Ethylbenzene	BDL	1.0	ug/l	8260B	09/24/03	1
Total Xylenes	BDL	3.0	ug/l	8260B	09/24/03	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	09/24/03	1
Naphthalene	BDL	5.0	ug/l	8260B	09/24/03	1
Surrogate Recovery						
Toluene-d8	97.		% Rec.	8260B	09/24/03	1
Dibromofluoromethane	120		% Rec.	8260B	09/24/03	1
4-Bromofluorobenzene	110		% Rec.	8260B	09/24/03	1
Ethylene Dibromide	BDL	0.010	ug/l	504.1	09/25/03	1
1,2-Dibromo-3-Chloropropane	BDL	0.020	ug/l	504.1	09/25/03	1

*Tom Melleste*  
Tom Melleste, ESC Representative

BDL - Below Detection Limit  
Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:  
A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

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155 Tradd Street  
Spartanburg, SC 29301

September 26, 2003

Date Received : September 18, 2003  
Description : Waters for Hot Spot 3005

ESC Sample # : L128122-11

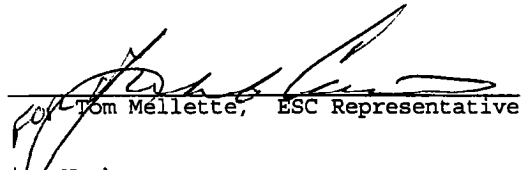
Sample ID : MW-12

Site ID :

Project # : 1264-99-506

Collected By : Lanny Lowery  
Collection Date : 09/17/03 11:30

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	09/24/03	1
Toluene	BDL	5.0	ug/l	8260B	09/24/03	1
Ethylbenzene	BDL	1.0	ug/l	8260B	09/24/03	1
Total Xylenes	BDL	3.0	ug/l	8260B	09/24/03	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	09/24/03	1
Naphthalene	BDL	5.0	ug/l	8260B	09/24/03	1
Surrogate Recovery						
Toluene-d8	98.		% Rec.	8260B	09/24/03	1
Dibromofluoromethane	110		% Rec.	8260B	09/24/03	1
4-Bromofluorobenzene	110		% Rec.	8260B	09/24/03	1
Ethylene Dibromide	BDL	0.010	ug/l	504.1	09/25/03	1
1,2-Dibromo-3-Chloropropane	BDL	0.020	ug/l	504.1	09/25/03	1

  
Tom Mellette, ESC Representative

BDL - Below Detection Limit  
Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:  
A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT - PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

Note:  
The reported analytical results relate only to the sample submitted.  
This report shall not be reproduced, except in full, without the written approval from ESC.

Reported: 09/26/03 11:38 Printed: 09/26/03 11:40



**ENVIRONMENTAL  
SCIENCE CORP.**

12065 Lebanon Rd.  
Mt. Juliet, TN 37122  
(615) 758-5858  
1-800-767-5859  
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

**REPORT OF ANALYSIS**

Mr. Mike O Connell  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

September 26, 2003

Date Received : September 18, 2003  
Description : Waters for Hot Spot 3005

ESC Sample # : L128122-12

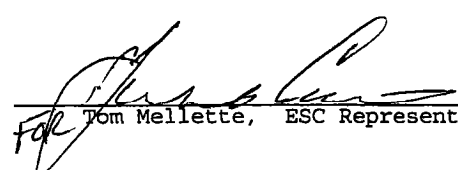
Sample ID : MW-1D

Site ID :

Project # : 1264-99-506

Collected By : Lanny Lowery  
Collection Date : 09/17/03 13:35

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	09/24/03	1
Toluene	BDL	5.0	ug/l	8260B	09/24/03	1
Ethylbenzene	BDL	1.0	ug/l	8260B	09/24/03	1
Total Xylenes	BDL	3.0	ug/l	8260B	09/24/03	1
Methyl tert-butyl ether	1.3	1.0	ug/l	8260B	09/24/03	1
Naphthalene	BDL	5.0	ug/l	8260B	09/24/03	1
Surrogate Recovery						
Toluene-d8	99.		% Rec.	8260B	09/24/03	1
Dibromofluoromethane	100		% Rec.	8260B	09/24/03	1
4-Bromofluorobenzene	120		% Rec.	8260B	09/24/03	1
Ethylene Dibromide	BDL	0.010	ug/l	504.1	09/25/03	1
1,2-Dibromo-3-Chloropropane	BDL	0.020	ug/l	504.1	09/25/03	1

  
Tom Mellette, ESC Representative

BDL - Below Detection Limit  
Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:  
A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

Note:  
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Reported: 09/26/03 11:38 Printed: 09/26/03 11:40



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Est. 1970

**REPORT OF ANALYSIS**

Mr. Mike O Connell  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

September 26, 2003

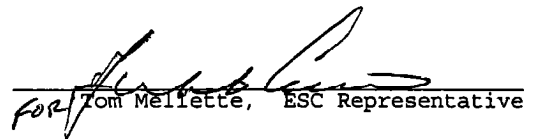
Date Received : September 18, 2003  
Description : Waters for Hot Spot 3005  
Sample ID : MW-13  
Collected By : Lanny Lowery  
Collection Date : 09/17/03 00:00

ESC Sample # : L128122-13

Site ID :

Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	09/24/03	1
Toluene	BDL	5.0	ug/l	8260B	09/24/03	1
Ethylbenzene	BDL	1.0	ug/l	8260B	09/24/03	1
Total Xylenes	BDL	3.0	ug/l	8260B	09/24/03	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	09/24/03	1
Naphthalene	BDL	5.0	ug/l	8260B	09/24/03	1
Surrogate Recovery						
Toluene-d8	100		% Rec.	8260B	09/24/03	1
Dibromofluoromethane	110		% Rec.	8260B	09/24/03	1
4-Bromofluorobenzene	100		% Rec.	8260B	09/24/03	1
Ethylene Dibromide	BDL	0.010	ug/l	504.1	09/25/03	1
1,2-Dibromo-3-Chloropropane	BDL	0.020	ug/l	504.1	09/25/03	1

  
For Tom Mellette, ESC Representative

BDL - Below Detection Limit  
Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

Note:

The reported analytical results relate only to the sample submitted.  
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Reported: 09/26/03 11:38 Printed: 09/26/03 11:40

Attachment A  
List of Analytes with QC Qualifiers

Sample #	Analyte	Qualifier
L128122-01	Methyl tert-butyl ether	J4
L128122-02	Methyl tert-butyl ether	J4
L128122-03	Methyl tert-butyl ether	J4
	Ethylene Dibromide	J2
	1,2-Dibromo-3-Chloropropane	J2
L128122-04	Methyl tert-butyl ether	J4
L128122-05	Methyl tert-butyl ether	J4
L128122-06	Methyl tert-butyl ether	J4J6J3
L128122-07	Methyl tert-butyl ether	J4
L128122-08	Methyl tert-butyl ether	J4
L128122-09	Methyl tert-butyl ether	J4
L128122-10	Methyl tert-butyl ether	J4
	Dibromofluoromethane	J1
L128122-11	Methyl tert-butyl ether	J4
L128122-12	Methyl tert-butyl ether	J4
L128122-13	Methyl tert-butyl ether	J4

Attachment B  
Explanation of QC Qualifier Codes

Qualifier	Meaning
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits
J4	The associated batch QC was outside the established quality control range for accuracy.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable unless qualified as 'R' (Rejected).

Definitions

**Accuracy** - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.

**Precision** - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.

**Surrogate** - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.

Control Limits

2-Fluorophenol	31-119	Nitrobenzene-d5	43-118	Dibromfluoromethane	79-126	83-119
Phenol-d5	12-134	2-Fluorobiphenyl	45-128	Toluene-d8	81-114	82-116
2,4,6-Tribromophenol	51-141	Terphenyl-d14	43-137	4-Bromofluorobenzene	65-129	72-126

**TIC** - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

**S&ME Inc. - Spartanburg SC**

155 Tradd Street  
Spartanburg, SC 29301

Alternate billing information:

Ana. ... sental ... serv...

Origin of Laboratory  
Page 1 of 2

Report to: **Mr. Mike O Connell** Email: **moconnell@smeinc.com**

Project Description: **Waters for Hot Spot 3005** City/State Collected: **S.C.**

Phone: (864) 574-2360 Client Project #: **1264-99-506** Lab Project #: **SMESPAR-1264-99-506**

FAX: (864) 576-8730 Site/Facility ID#: P.O.#: **5823**

Prepared by:  
**ENVIRONMENTAL SCIENCE CORP.**  
12065 Lebanon Road  
Mt. Juliet, TN 37122  
Phone (800) 767-5859  
FAX (615) 758-5859

Collected by (print): *Lanny Lowery*

Collected by (signature): *Lanny Lowery*

Packed on Ice N  Y

**Rush?** ( Lab MUST Be Notified )  
 \_\_\_ Same Day ..... 200%  
 \_\_\_ Next Day ..... 100%  
 \_\_\_ Two Day ..... 50%

Date Results Needed: **Standard**

Email? \_\_\_ No \_\_\_ Yes  
FAX? \_\_\_ No \_\_\_ Yes

SV8011 40ml Clr-NaThio  
V8260BTEXMN 40ml Amb-HCl

CoCode: **SMESPAR** (lab use only)  
Template/Prelogin: **T8081 / P93612**  
Cooler #: **9/8/03**  
Shipped Via: **FedEx Standard CC**

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Remarks/Contaminant	Sample # (lab only)
<del>MW-1</del>		<del>GW</del>				<del>5</del>		<del>U28122</del>
MW-2	Grab	GW		9/17/03	1440	5	-01	12
MW-3		GW			1520	5	-02	13
MW-4		GW			1315	5	-03	14
MW-5		GW			1255	5	-04	15
MW-6		GW			1500	5	-05	16
MW-7		GW			1420	5	-06	17
MW-8		GW			1235	5	-07	18
MW-9		GW			1400	5	-08	19

\*Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other \_\_\_\_\_

pH \_\_\_\_\_ Temp \_\_\_\_\_

Flow \_\_\_\_\_ Other \_\_\_\_\_

Relinquished by: (Signature) <i>Lanny Lowery</i>	Date: 9/17/03	Time: 1700	Received by: (Signature)	Samples returned via: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> Courier <input type="checkbox"/>	Condition: (lab use only)
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Temp: 2.6° Bottles Received: 65 FTB	
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature) <i>[Signature]</i>	Date: 9-18-03 Time: 09:00	pH Checked: NCFX

**S&ME Inc. - Spartanburg SC**

155 Tradd Street  
Spartanburg, SC 29301

Alternate billing information:

Analysis/Container/reservauve

Chain of Custody  
Page 2 of 2

Report to: **Mr. Mike O Connell** Email: **mconnell@smeinc.com**

Project Description: **Waters for Hot Spot 3005** City/State Collected: **S.C.**

Phone: (864) 574-2360 Client Project #: **1264-99-506** Lab Project #: **SMESPAR-1264-99-506**  
FAX: (864) 576-8730

Collected by (print): **Lanny Lowery** Site/Facility ID#: P.O.#: **5823**

Collected by (signature): *Lanny Lowery*  
 Rush? ( Lab MUST Be Notified )  
 Same Day ..... 200%  
 Next Day ..... 100%  
 Two Day ..... 50%  
 Date Results Needed: **Standard**  
 Email?  No  Yes  
 FAX?  No  Yes  
 No. of Cntrs: **5**

Prepared by:  
**ENVIRONMENTAL SCIENCE CORP.**  
12065 Lebanon Road  
Mt. Juliet, TN 37122  
Phone (800) 767-5859  
FAX (615) 758-5859

CoCode: **SMESPAR** (lab use only)  
Template/Prelogin: **T8081 / P93612**  
Cooler #: **9/8/03**  
Shipped Via: **FedEX Standard**

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	SV8011 40ml Clr-NaThio	V8260BTEXMN 40ml Amb-HCI	Remarks/Contaminant	Sample # (lab only)
MW-10	Grab	GW	-	9/17/03	1215	5	X	X	-09	428122-10
MW-11	↓	GW	-		1155	5	X	X	-10	21
MW-12	↓	GW	-		1130	5	X	X	-11	
MW-1D	↓	GW	-		1335	5	X	X	-12	
<del>MW</del>		<del>GW</del>				5	X	X		
MW-13									-13	

\*Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other \_\_\_\_\_

pH \_\_\_\_\_ Temp \_\_\_\_\_

Remarks:

Flow \_\_\_\_\_ Other \_\_\_\_\_

Relinquished by: (Signature) <i>Lanny Lowery</i>	Date: 9/17/03	Time: 1700	Received by: (Signature)	Samples returned via: <input type="checkbox"/> UPS	Condition: (lab use only)
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	<input type="checkbox"/> FedEx <input type="checkbox"/> Courier	
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)	Temp: 2.6°	Bottles Received: 65TTB
				Date: 9-18-03	Time: 09:00
				pH Checked:	NCF: Y



# South Carolina Department of Health and Environmental Control

Bureau of Solid & Hazardous Waste Mgt.  
2600 Bull Street, Columbia, SC 29201  
Phone: (803) 896-4000  
Emergency & Holidays: (803) 253-6488

92273

303858

PLEASE PRINT or TYPE (Form designed for use on elite [12-pitch] typewriter) Form Approved. OMB No. 2050-0039 Expires 9-30-99

<b>UNIFORM HAZARDOUS WASTE MANIFEST</b>		1. Generator's U.S. EPA ID No. CESQG	Manifest Document No. 10033	2. Page 1 of 1	Information in the shaded areas is not required by Federal law, but is by State law.		
3. Generator's Name and Mailing Address HOT SPOT #3005 107 HAMPTON ST CHESNEE, SC. 29323				A. State Manifest Document Number 10033			
4. Generator's Phone ((843) 549-5976)				B. State Generator's ID			
5. Transporter 1 Company Name TRANSGLOBAL		6. U.S. EPA ID Number SCR000075515		C. State Transporter's ID			
7. Transporter 2 Company Name		8. U.S. EPA ID Number		D. Transporter's Phone 843-563-8916			
				E. State Transporter's ID			
				F. Transporter's Phone			
9. Designated Facility Name and Site Address SOUTHEASTERN CHEMICAL & SOLVENT CO. 755 INDUSTRIAL ROAD, SUMTER, SC, 29150				10. U.S. EPA ID Number SCD038275628		G. State Facility's ID	
				H. Facility's Phone 803/773/1400			
11. U.S. Dot Description (including Proper Shipping Name, Hazard Class, and ID Number)			12. Containers No. Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste Number	
a. WATER NON HAZARDOUS NON REGULATED			8.33 05293	001	CHLDIN	55G	NREG
b.							
c.							
d.							
J. Additional Descriptions for Materials Listed Above A. 05293 B. C. D.				K. Handling Codes for Wastes Listed Above PALMETTO PH			
15. Special Handling Instructions and Additional Information Send CD to Global 24 Hour Emergency: Globals Chemtel: 1-800-255-3924 Non Emergency: Global, 1-843-563-8916 and VIC NETTLES, (843) 549-5976				Public reporting burden for this collection of information is estimated to average: 37 minutes for generators, 15 minutes for transporters, and 10 minutes for treatment storage and disposal facilities. This includes time for reviewing instructions, gathering data, and completing and reviewing the form. Send comments regarding the burden estimate, including suggestions for reducing this burden, to Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M St., S.W., Washington, D.C. 20460; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503.			
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and the laws of the State of South Carolina. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.							
Printed/Typed Name VIC NETTLES		Signature Vic Nettles		Month Day Year 11 15 903			
17. Transporter 1 Acknowledgement of Receipt of Materials							
Printed/Type Name Melvin McDuffie		Signature Melvin McDuffie		Month Day Year 11 15 903			
18. Transporter 2 Acknowledgement of Receipt of Materials							
Printed/Typed Name		Signature		Month Day Year			
19. Discrepancy Indication Space							
				a. 458 lbs.		c. lbs.	
				b. lbs.		d. lbs.	
20. Facility Owner or Operator; Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.							
Printed/Typed Name Nathan Anderson		Signature Nathan Anderson		Month Day Year 11 15 2013			





Giant Resource Recovery • 755 Industrial Road • PO Box 1755 • Sumter, SC 29151 • Phone: (803) 773-1400 • Fax: (803) 775-7016

### CERTIFICATE OF RECYCLING/MATERIALS RE-USE

**Generator:** HOYLE STATE SUPPLY  
**Address:** 107 HAMMERSLEY STREET  
CHESHIRE, ALABAMA 36012

**I.D. Number:** 01740001000000000000  
**Manifest Shipment No.:** 116033

**Date Received:** 11/17/99

**Southeastern Chemical I.D. No.:** SCD036275626  
**Facility Address:** 755 Industrial Road  
Sumter SC 29151

On the above date, your waste material was picked up and transported to our facility for the purpose of treatment and/or recycling and/or fuel blending. Any recycled material was returned to either the original generator or subsequent user for beneficial re-use.

If any residue remained or the original intent of the shipment was for fuel blending, the material was blended at our facility and subsequently shipped off-site to any one of several EPA approved rotary cement kilns where the material was used for fuel.

If material is treated, it was processed in accordance with state and federal regulations and disposed of in a proper manner.

THIS ENTIRE PROCESS IS GENERALLY COMPLETED WITHIN A 30-DAY PERIOD FROM THE DATE OF THE SHIPMENT.



C. Earl Hunter, Commissioner

*Promoting and protecting the health of the public and the environment.*

MS JUDY LAUGHTER  
RL JORDAN OIL CO INC  
PO BOX 2527  
SPARTANBURG SC 29304-2527

**FEB 06 2004**



Re: Hot Spot #3005, 107 Hampton St., Chesnee, South Carolina  
UST Permit #12719, CA #21272  
Release #2 Reported August 4, 2003  
Technical File Reviewed February 4, 2004  
Spartanburg County

Dear Ms. Laughter:

The Underground Storage Tank (UST) Program of the South Carolina Department of Health and Environmental Control (SCDHEC) recognizes your commitment to continue work at this site utilizing S&ME, Inc. The Program has reviewed the referenced technical file and determined the next necessary scope of work to be two Enhanced Fluid Recovery (EFR) events to remove free phase product from monitoring well MW-1 followed by a comprehensive groundwater sampling event.

Cost Agreement #21272 has been approved in the amount shown on the enclosed approved cost agreement to perform two EFR events and groundwater sampling of all monitoring wells associated with the release. An initial 8-hour EFR event should be conducted within 30 days of the date of this letter. The EFR events should be conducted at least 30 days apart. Groundwater samples from all monitoring wells associated with the release should be collected no sooner than 30 days after the last EFR event and analyzed for BTEX, naphthalene, and MTBE by EPA method 8260B.

The report submitted at the completion of EFR and groundwater sampling activities should include the following:

- A narrative portion documenting each EFR event noting site conditions, the names of the EFR contractor, field personnel, date, times each EFR event started and ended, ambient air temperature, general weather conditions during the EFR event, and the estimated amount in gallons of the petroleum products removed as a liquid or vapor for each event. Wells containing free phase product should be gauged at the beginning and end of each EFR event. Disposal manifests for each EFR event should be included as part of the final report.
- A narrative portion documenting site conditions after the two EFR events and noting the names of field personnel, date, time, ambient air temperature, and general weather conditions during the sampling event.
- Well purging data, pH, specific conductivity, water temperature, PID readings (where applicable) and turbidity comments.
- Groundwater elevations, depth to groundwater, remaining measurable free product thickness (if any), total well depth and screened interval for all monitoring wells associated with the site, unless otherwise directed by the Department, shall be presented in tabular form. Groundwater laboratory analytical data for all monitoring wells shall be presented in tabular format.
- A groundwater elevation contour map of the site based on current groundwater potentiometric data.

- A CoC map based on current groundwater laboratory analytical data. The groundwater data should be adjacent to the relevant monitoring well.
- Manifests for any contaminated soil and/or groundwater removed from the site for treatment and/or disposal.
- The report must be signed and sealed by a professional geologist or engineer registered in the State of South Carolina.

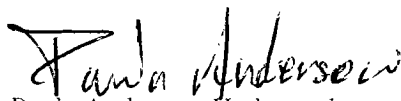
In accordance with Section 44-2-40(D) of the State Underground Petroleum Environmental Response Bank (SUPERB) Act, you are responsible for the first \$25,000 for site rehabilitation. To insure that any expenditure you make apply to this \$25,000 deductible, it is prudent for this agency to pre-approve such costs along with your technical plan of action. By law, the SUPERB Account cannot compensate any costs that are not pre-approved. Eligible costs exceeding the \$25,000 deductible can be compensated from the SUPERB Account. In accordance with R.61-92, Subpart H, Section 280.114, you are required to notify the Program by certified mail within ten (10) days of commencing a voluntary or involuntary proceeding in bankruptcy. State law also requires that an owner/operator or guarantor that files for bankruptcy protection must immediately submit appropriate forms documenting that entity's ability to demonstrate financial responsibility.

Please note that all applicable South Carolina certification requirements apply to the laboratory services, well installation, and report preparation. All site rehabilitation activities must be performed and submitted by a South Carolina Certified Underground Storage Tank Site Rehabilitation Contractor. **A Report of Findings and the invoice is due within 120 days from the date of this letter. If the invoice is not submitted within 150 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.**

The Bureau grants preapproval for transportation of virgin petroleum contaminated soil and groundwater from the referenced site to a permitted treatment facility. The contaminated soil or groundwater must be properly stored in labeled containers or covered with plastic as appropriate. The contaminated soil and/or groundwater must be accepted by the approved treatment facility. There can be no spillage or leakage in transport. 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 final report. If the levels of petroleum contamination based on laboratory analysis are below risk-based screening levels, please contact the project manager for approval to dispose of soil and/or groundwater on site. The SUPERB Account will not compensate for transportation or treatment of clean soil and/or groundwater.

On all correspondence concerning this site, please reference **UST Permit #12719 and CA #21272**. If there are any questions concerning this project, please contact me at (803) 896-6633 or (800) 826-5435 (within South Carolina only), by fax at (803) 896-6245, or by e-mail at [anderspe@dhec.sc.gov](mailto:anderspe@dhec.sc.gov).

Sincerely,



Paula Anderson, Hydrogeologist  
Owner/Operator Support Section  
Assessment and Corrective Action Division  
Underground Storage Tank Program  
Bureau of Land and Waste Management

enc: Approved Cost Agreement (ACA)

cc: Mr. Robert Hall, S&ME, Inc., 155 Tradd St., Spartanburg, SC 29301 (w/ copy of ACA)  
Technical file (w/ copy of ACA)  
SCDHEC/US 1/020404

# Approved Cost Agreement 0072

Facility: 12719 HOT SPOT 3005

ANDERSPE

PO Number:

<u>Task / Description</u>	<u>Categories</u>	<u>Item Description</u>	<u>Qty / Pct</u>	<u>Unit Price</u>	<u>Amount</u>
04 MOB/DEMOB		A EQUIPMENT	2.0000	500.00	1,000.00
		B PERSONNEL	5.0000	250.00	1,250.00
10 SAMPLE COLLECTION		A GROUND WATER	14.0000	55.00	770.00
		E GAUGE WELL ONLY	2.0000	20.00	40.00
11 ANALYSES	GW GROUNDWATER	A BTEX+NAPTH+MTBE	14.0000	100.00	1,400.00
17 DISPOSAL		A1 WASTEWATER - PURGING/SAMPLING	2.0000	90.00	180.00
		A2 WASTEWATER - PUMPING TEST	3,000.0000	0.60	1,800.00
19 RPT/PROJECT MNGT & COORDINATIO		PCT PERCENT	0.1500	12,440.00	1,866.00
23 EFR		A 8 HOUR EVENT	2.0000	3,000.00	6,000.00
				<b>Total Amount</b>	<b>14,306.00</b>

Maia.



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UNDERGROUND STORAGE  
TANK PROGRAM

August 24, 2004

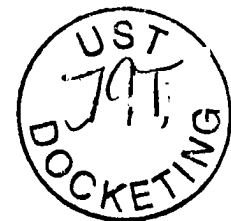
R.L. Jordan Oil Company  
P.O. Box 2527  
Spartanburg, SC 29304

ATTENTION: Ms. Judy Laughter

Subject: **ENHANCED FLUID RECOVERY EVENT WITH SUBSEQUENT  
GROUNDWATER MONITORING REPORT**  
**Hot Spot #3005**  
SC Highway 221  
Chesnee, South Carolina  
Site ID #12719 *rel.#2*  
S&ME Project No. 1264-99-506

Dear Ms. Laughter:

S&ME, Inc. (S&ME) has completed this Fluid Vapor Recovery Report with Subsequent Groundwater Monitoring at the Hot Spot #3005 site as directed by the South Carolina Department of Health and Environmental Control (SCDHEC). This report contains the results of two Enhanced Fluid Recovery (EFR) events and one subsequent Groundwater Monitoring event. Chemicals of concern (CoC) exceeding their respective RBSLs were detected in a sample collected from three wells (MW-2, MW-3, and MW-6). The CoC include benzene, MTBE, and naphthalene. Also, free product was measured in MW-1.



S&ME, Inc.  
155 Tradd Street  
Spartanburg, South Carolina 29301

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(864) 232-8987 Greenville

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We appreciate the opportunity to provide our services to you on this project. If you need additional information or have questions, please contact us at (864) 574-2360.

Sincerely,

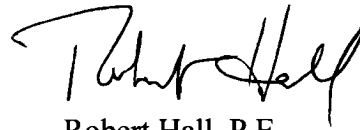
**S&ME, Inc.**



Michael P. O'Connell, P.G.  
Staff Geologist



John Nyvall, E.I.T.  
Staff Professional



Robert Hall, P.E.  
Senior Engineer

S:\ENVIRON\2004\projects\6499506\EFR & GW Report.doc

cc: Maia Milenkova, SCDHEC 2600 Bull St., Columbia, SC 29201

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AUG 27 2004

UNDERGROUND STORAGE  
TANK PROGRAM

**ENHANCED FLUID RECOVERY EVENT  
WITH SUBSEQUENT GROUNDWATER  
MONITORING REPORT**

**HOT SPOT #3005  
107 HAMPTON STREET  
CHESNEE, SOUTH CAROLINA  
SCDHEC UST PERMIT NO. 12719 (rel# 2)  
S&ME PROJECT NO. 1264-99-506**

Prepared For:

R.L. Jordan Oil Company, Inc.  
P.O. Box 2527  
Spartanburg, South Carolina 29304

Prepared By:



155 Tradd Street  
Spartanburg, South Carolina  
(864) 574-2360

August 2004

Prepared by  
John Nyvall, E.I.T.  
Staff Professional

---

Robert Hall, P.E.  
Senior Engineer

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Figure 2 -	Site Plan
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Appendix A -	EFR Field Calculations
Appendix B -	Disposal Manifest for each EFR event
Appendix C -	Sample Collection Summary Sheets
Appendix D -	Laboratory Analytical Data and Chain of Custody



## 1.0 INTRODUCTION

Hot Spot #3005 is located at 107 Hampton Street, just off of South Carolina Highway 221 in Chesnee, South Carolina. A site location map is included as **Figure 1**. A site plan is included as **Figure 2**. The subject facility is currently an operating truck stop/gasoline station. The recent history of site assessment includes a Tier II Assessment performed in 2000 and a comprehensive sampling event in November 2003. During the November 2003 sampling event, free phase petroleum was discovered in MW-1 located near the truck fueling dispensers. The initial free product thickness was 0.15 feet. Dissolved concentrations of BTEX and MTBE are present in one other site well (MW-3). This well is primarily in the vicinity of the storage tanks for the fueling dispensers. In an attempt to recover free phase petroleum, contaminated groundwater, and vapors, S&ME, Inc. recently performed two EFR events at MW-1. The events took place on June 9, 2004 and July 8, 2004.

As directed by the South Carolina Department of Health and Environmental Control (SCDHEC) and on behalf of R.L. Jordan Oil Company, Inc., S&ME, Inc. (S&ME) has also completed a subsequent groundwater sampling event at the Hot Spot #3005 site. The following sections discuss the results of the EFRs and the subsequent sampling as well as our conclusions based on the collected data.

## 2.0 ENHANCED FLUID RECOVERY EVENTS

### 2.1 Description of Enhanced Fluid Recovery Events

For the EFR events, S&ME subcontracted GARCO, Inc., of Asheboro, North Carolina to provide a vacuum truck and a vacuum truck operator. A small diameter stinger pipe was inserted into MW-1. The space between the stinger pipe and the well casing was sealed using a Fernco coupling and two steel bands, and a vacuum of 22 to 24 inches of mercury was applied to the well using the vacuum truck. Any groundwater recovered from the well was collected in a tank mounted on the vacuum truck, and vapors recovered from the well were discharged to the atmosphere.

Each EFR event took place over a period of approximately eight hours. Recovery measurements were collected periodically throughout the day as seen in **Tables 1 and 2**, respectively. The recovery measurements included:

- groundwater levels in surrounding monitoring wells MW-1D, 2, 3, 4, 6, 7, 8 and 9;
- the vacuum at the connection to MW-1;
- the temperature, relative humidity, and flow rate of the extracted vapor; and
- the organic concentration of the extracted vapor with an Organic Vapor Analyzer (OVA) or a Toxic Vapor Analyzer (TVA).

## **2.2 Results from Enhanced Fluid Recovery Events**

The field calculations are provided for the EFR events in **Appendix A**. An estimate of the volume of contaminant recovered during each EFR event was made from the field measurements. The initial volume of diesel in the well was 0.082 gallons on June 9, 2004. The volume of contaminant emitted to the atmosphere was calculated to be 0.018 gallons. The total estimated volume of contaminant recovered from MW-1 on June 9, 2004 is estimated to be greater than or equal to 0.262 gallons (as diesel). No initial product was apparent for the July 8, 2004 EFR event. The total estimated volume of contaminant recovered and emitted to the atmosphere from the July 8, 2004 event was estimated to be greater than or equal to 0.02 gallons (as diesel).

During the June 9, 2004 event, the volume of free phase petroleum product and groundwater recovered was 801 gallons. During the July 8, 2004 event, the volume of free phase petroleum product and groundwater recovered was 967 gallons. Due to the turbulence created during extraction, the recovered volume of liquid petroleum could not be differentiated. The waste disposal manifests for the EFR events are included in **Appendix B**.

### 3.0 GROUNDWATER MONITORING

#### 3.1 Groundwater Gauging

Relative groundwater elevations for the monitoring wells were obtained utilizing the relative top of casing (TOC) elevations and depth to groundwater measurements recorded during the current sampling event. Based on measurements made on August 9, 2004, the depth to groundwater ranged from 19.35 to 29.52 feet from the TOC and the relative groundwater elevations ranged from 73.70 feet in MW-11 to 88.99 feet in MW-4. A summary of groundwater elevation data is presented in **Table 3**.

In general, the groundwater appears to be generally flowing to the southwest as seen in **Figure 3**. Monitoring wells MW-1, MW-2, and MW-1D were not used in determination of the water table potentiometric surface.

#### 3.2 Groundwater Quality

On August 9, 2004, S&ME purged and sampled monitoring wells MW-2 through MW-13 and MW-1D at the site. MW-1 was not sampled due to the presence of free product. The groundwater samples were collected with new, dedicated 1-liter polyethylene bailers, slowly poured into laboratory-supplied containers, and immediately placed on ice in a laboratory-supplied cooler. All groundwater samples were shipped by overnight courier to Environmental Science Corporation (ESC) located in Mt. Juliet, Tennessee (SCDHEC Certification No. 84004) for analysis. Copies of the sample collection summary sheets for the groundwater sampling are included as **Appendix C**.

All groundwater samples collected from the monitoring wells were analyzed for the following potential chemicals of concern (CoC): benzene, toluene, ethylbenzene, xylenes (BTEX), naphthalene, and methyl-tertiary-butyl-ether (MTBE) by EPA Method 8260B. Benzene was

detected above its respective RBSL in monitoring wells MW-2 and MW-3. Naphthalene was detected above its respective RBSL in monitoring wells MW-3 and MW-6. MTBE was detected above its respective RBSL in monitoring well MW-3. The laboratory analytical results are summarized in **Table 4**. The CoC concentrations are also included on **Figure 3**. A copy of the laboratory analytical data is provided as **Appendix D**.

Purge water generated during the sampling event was containerized in one 55-gallon drum. Disposal of the purge water was performed by Palmetto Environmental, Inc. A disposal manifest for the drum will be sent under separate cover.

#### 4.0 CONCLUSIONS

As indicated by the data presented in this report, the EFR events successfully removed petroleum contamination from MW-1. The dissolved CoC concentrations in the surrounding wells have remained relatively consistent since the March 2001 sampling event. The volatilized contaminants or contaminant vapors were drawn into the extraction wells, recovered, and discharged to the atmosphere. Approximately 1768 gallons of groundwater and product were recovered during the two EFR events. Approximately 0.264 gallons of volatilized CoC (as diesel) were extracted and discharged to the atmosphere/collected by the vacuum truck during the EFR events.

Based upon the results and findings of groundwater sampling, the following conclusions are made for the Hot Spot #3005 site:

- Free product was present in MW-1;
- The horizontal and vertical extents of dissolved CoC appear to be adequately defined.

The cumulative effects of multiple EFR events over the last several years have reduced the observed free phase petroleum thickness from 2.40 feet in June 2001 to 0.02 feet on August 8, 2004. S&ME is currently investigating alternative technologies to remove the remaining free

phase petroleum product from the site. Based on the SSTLs included on **Table 4**, a request to SCDHEC for a Conditional No Further Action (CNFA) will be made following the removal of free phase petroleum product from the site.

TABLE 1  
SUMMARY OF GROUNDWATER LEVEL DATA FROM AFVR  
HOT SPOT # 3005  
SC Highway 221  
CHESNEE, SOUTH CAROLINA  
SCDHEC UST PERMIT # 12719  
S&ME PROJECT 1264-99-506

Well ID	Date	Time	Well Depth (feet)	Screened Interval (feet below grade)	Depth to Liquid (feet)	Depth to Groundwater (feet)	Product Thickness (feet)
MW-1	06/09/04	9:00	30.50	15.00'-30.00'	24.45	24.95	0.50
	06/09/04	17:00	30.50	15.00'-30.00'	30.75	30.75	0.00
MW-1D	06/09/04	9:00	58.64	53.64' - 58.64'	25.03	25.03	0.00
	06/09/04	10:00	58.64	53.64' - 58.64'	25.33	25.33	0.00
	06/09/04	11:00	58.64	53.64' - 58.64'	25.51	25.51	0.00
	06/09/04	12:00	58.64	53.64' - 58.64'	25.62	25.62	0.00
	06/09/04	13:00	58.64	53.64' - 58.64'	25.61	25.61	0.00
	06/09/04	14:00	58.64	53.64' - 58.64'	25.61	25.61	0.00
	06/09/04	15:00	58.64	53.64' - 58.64'	25.60	25.60	0.00
	06/09/04	17:00	58.64	53.64' - 58.64'	25.60	25.60	0.00
MW-2	06/09/04	9:00	34.20	Not Known	24.25	24.25	0.00
	06/09/04	10:00	34.20	Not Known	31.70	31.70	0.00
	06/09/04	11:00	34.20	Not Known	31.78	31.78	0.00
	06/09/04	12:00	34.20	Not Known	31.70	31.70	0.00
	06/09/04	13:00	34.20	Not Known	31.68	31.68	0.00
	06/09/04	14:00	34.20	Not Known	31.65	31.65	0.00
	06/09/04	15:00	34.20	Not Known	31.64	31.64	0.00
	06/09/04	17:00	34.20	Not Known	31.64	31.64	0.00
MW-6	06/09/04	9:00	36.61	26.61' - 36.61'	24.85	24.85	0.00
	06/09/04	10:00	36.61	26.61' - 36.61'	24.81	24.81	0.00
	06/09/04	11:00	36.61	26.61' - 36.61'	24.91	24.91	0.00
	06/09/04	12:00	36.61	26.61' - 36.61'	24.99	24.99	0.00
	06/09/04	13:00	36.61	26.61' - 36.61'	25.00	25.00	0.00
	06/09/04	14:00	36.61	26.61' - 36.61'	25.02	25.02	0.00
	06/09/04	15:00	36.61	26.61' - 36.61'	25.02	25.02	0.00
	06/09/04	17:00	36.61	26.61' - 36.61'	25.02	25.02	0.00
MW-7	06/09/04	9:00	36.37	26.37' - 36.37'	23.00	23.00	0.00
	06/09/04	10:00	36.37	26.37' - 36.37'	23.50	23.50	0.00
	06/09/04	11:00	36.37	26.37' - 36.37'	23.65	23.65	0.00
	06/09/04	12:00	36.37	26.37' - 36.37'	23.74	23.74	0.00
	06/09/04	13:00	36.37	26.37' - 36.37'	23.75	23.75	0.00
	06/09/04	14:00	36.37	26.37' - 36.37'	23.77	23.77	0.00
	06/09/04	15:00	36.37	26.37' - 36.37'	23.80	23.80	0.00
	06/09/04	17:00	36.37	26.37' - 36.37'	23.80	23.80	0.00
MW-9	06/09/04	9:00	35.40	25.40' - 35.40'	DRY	DRY	N/A
	06/09/04	9:30	35.40	25.40' - 35.40'	DRY	DRY	N/A
	06/09/04	10:00	35.40	25.40' - 35.40'	DRY	DRY	N/A
	06/09/04	10:30	35.40	25.40' - 35.40'	DRY	DRY	N/A
	06/09/04	11:30	35.40	25.40' - 35.40'	DRY	DRY	N/A
	06/09/04	12:30	35.40	25.40' - 35.40'	DRY	DRY	N/A
	06/09/04	13:30	35.40	25.40' - 35.40'	DRY	DRY	N/A
	06/09/04	14:30	35.40	25.40' - 35.40'	DRY	DRY	N/A
	06/09/04	15:30	35.40	25.40' - 35.40'	DRY	DRY	N/A
	06/09/04	16:30	35.40	25.40' - 35.40'	DRY	DRY	N/A
06/09/04	17:00	35.40	25.40' - 35.40'	DRY	DRY	N/A	

N/A - Not Available

**TABLE 2**  
**SUMMARY OF GROUNDWATER LEVEL DATA FROM AFVR**  
**HOT SPOT # 3005**  
**SC Highway 221**  
**CHESNEE, SOUTH CAROLINA**  
**SCDHEC USE PERMIT # 12719**  
**S&ME PROJECT 1264-99-586**

Well ID	Date	Time	Well Depth (feet)	Screened Interval (feet below grade)	Depth to Liquid (feet)	Depth to Groundwater (feet)	Product Thickness (feet)
MW-1	07/08/04	9:00	35.00	15.00'-30.00'	23.34	23.34	0.00
	07/08/04	17:15	35.00	15.00'-30.00'	29.63	29.63	0.00
MW-1B	07/08/04	9:00	58.64	53.64' - 58.64'	24.88	24.88	0.00
	07/08/04	9:30	58.64	53.64' - 58.64'	25.24	25.24	0.00
	07/08/04	10:00	58.64	53.64' - 58.64'	25.32	25.32	0.00
	07/08/04	10:30	58.64	53.64' - 58.64'	25.37	25.37	0.00
	07/08/04	11:30	58.64	53.64' - 58.64'	25.48	25.48	0.00
	07/08/04	12:30	58.64	53.64' - 58.64'	25.52	25.52	0.00
	07/08/04	13:30	58.64	53.64' - 58.64'	25.57	25.57	0.00
	07/08/04	14:30	58.64	53.64' - 58.64'	25.58	25.58	0.00
	07/08/04	15:30	58.64	53.64' - 58.64'	25.58	25.58	0.00
	07/08/04	16:30	58.64	53.64' - 58.64'	25.55	25.55	0.00
MW-2	07/08/04	9:00	34.20	Not Known	24.12	24.12	0.00
	07/08/04	9:30	34.20	Not Known	31.17	31.17	0.00
	07/08/04	10:00	34.20	Not Known	31.35	31.35	0.00
	07/08/04	10:30	34.20	Not Known	31.43	31.43	0.00
	07/08/04	11:30	34.20	Not Known	31.46	31.46	0.00
	07/08/04	12:30	34.20	Not Known	31.47	31.47	0.00
	07/08/04	13:30	34.20	Not Known	31.47	31.47	0.00
	07/08/04	14:30	34.20	Not Known	31.47	31.47	0.00
	07/08/04	15:30	34.20	Not Known	31.41	31.41	0.00
	07/08/04	16:30	34.20	Not Known	31.45	31.45	0.00
MW-3	07/08/04	9:00	32.28	22.28' - 32.28'	27.23	27.23	0.00
	07/08/04	17:00	32.28	22.28' - 32.28'	27.32	27.32	0.00
MW-3R	07/08/04	9:00	Not Known	Not Known	27.46	27.46	0.00
	07/08/04	17:00	Not Known	Not Known	27.50	27.50	0.00
MW-4	07/08/04	9:00	45.40	35.40' - 45.40'	23.29	23.29	0.00
	07/09/04	17:00	45.40	35.40' - 45.40'	23.58	23.58	0.00
MW-6	07/08/04	9:00	36.61	26.61' - 36.61'	24.61	24.61	0.00
	07/08/04	9:30	36.61	26.61' - 36.61'	24.52	24.52	0.00
	07/08/04	10:00	36.61	26.61' - 36.61'	24.60	24.60	0.00
	07/08/04	10:30	36.61	26.61' - 36.61'	24.62	24.62	0.00
	07/08/04	11:30	36.61	26.61' - 36.61'	24.68	24.68	0.00
	07/08/04	12:30	36.61	26.61' - 36.61'	24.74	24.74	0.00
	07/08/04	13:30	36.61	26.61' - 36.61'	24.80	24.80	0.00
	07/08/04	14:30	36.61	26.61' - 36.61'	24.81	24.81	0.00
	07/08/04	15:30	36.61	26.61' - 36.61'	24.81	24.81	0.00
	07/08/04	16:30	36.61	26.61' - 36.61'	24.81	24.81	0.00
MW-7	07/08/04	9:00	36.37	26.37' - 36.37'	23.43	23.43	0.00
	07/08/04	9:30	36.37	26.37' - 36.37'	23.25	23.25	0.00
	07/08/04	10:00	36.37	26.37' - 36.37'	23.34	23.34	0.00
	07/08/04	10:30	36.37	26.37' - 36.37'	23.40	23.40	0.00
	07/08/04	11:30	36.37	26.37' - 36.37'	23.51	23.51	0.00
	07/08/04	12:30	36.37	26.37' - 36.37'	23.55	23.55	0.00
	07/08/04	13:30	36.37	26.37' - 36.37'	23.59	23.59	0.00
	07/08/04	14:30	36.37	26.37' - 36.37'	23.61	23.61	0.00
	07/08/04	15:30	36.37	26.37' - 36.37'	23.63	23.63	0.00
	07/08/04	16:30	36.37	26.37' - 36.37'	23.63	23.63	0.00
MW-8	07/08/04	9:00	33.69	23.69' - 36.39'	23.04	23.04	0.00
	07/08/04	17:00	33.69	26.39' - 36.39'	23.06	23.06	0.00
MW-9	07/08/04	9:00	35.40	25.40' - 35.40'	DRY	DRY	N/A
	07/08/04	9:30	35.40	25.40' - 35.40'	DRY	DRY	N/A
	07/08/04	10:00	35.40	25.40' - 35.40'	DRY	DRY	N/A
	07/08/04	10:30	35.40	25.40' - 35.40'	DRY	DRY	N/A
	07/08/04	11:30	35.40	25.40' - 35.40'	DRY	DRY	N/A
	07/08/04	12:30	35.40	25.40' - 35.40'	DRY	DRY	N/A
	07/08/04	13:30	35.40	25.40' - 35.40'	DRY	DRY	N/A
	07/08/04	14:30	35.40	25.40' - 35.40'	DRY	DRY	N/A
	07/08/04	15:30	35.40	25.40' - 35.40'	DRY	DRY	N/A
	07/08/04	16:30	35.40	25.40' - 35.40'	DRY	DRY	N/A
07/08/04	17:00	35.40	25.40' - 35.40'	DRY	DRY	N/A	

N/A - Not Available

**TABLE 3**  
**SUMMARY OF GROUNDWATER ELEVATION DATA<sup>(1)</sup>**  
**HOT SPOT #3005**  
**107 HAMPTON STREET**  
**CHESNEE, SOUTH CAROLINA**  
**SCDHEC UST PERMIT #: 12719**  
**S&ME PROJECT 1264-99-506**

Well ID	Installation Date	Well Depth (feet)	Screened Interval (feet below grade)	Top of Casing Elevation (feet)	Depth to Liquid (feet)	Depth to Groundwater <sup>(2)</sup> (feet)	Product Thickness (feet)	Groundwater Elevation <sup>(3)</sup> (feet)
MW-1	4/24/1996	35.00	15.00-30.00	104.89	24.76	24.78	0.02	80.15
MW-1D	9/28/2000	58.64	53.64-58.64	104.61	25.44	25.44	0.00	79.17
MW-2*	Not Known	34.20	Not Known	Not Known	25.23	25.23	0.00	Not Known
MW-3	9/13/1999	32.28	22.28-32.28	104.92	28.54	28.54	0.00	76.38
MW-4	9/14/1999	45.40	35.40-45.40	111.32	22.33	22.33	0.00	88.99
MW-5	9/14/1999	32.25	22.25-32.25	103.57	29.52	29.52	0.00	74.05
MW-6	9/25/2000	36.61	26.61-36.61	104.14	24.97	24.97	0.00	79.17
MW-7	9/25/2000	36.37	26.37-36.37	104.52	23.70	23.70	0.00	80.82
MW-8	9/26/2000	33.69	23.69-33.69	101.79	19.35	19.35	0.00	82.44
MW-9	9/27/2000	35.40	25.40-35.40	105.43	23.63	23.63	0.00	81.80
MW-10	9/27/2000	27.44	17.44-27.44	96.57	20.24	20.24	0.00	76.33
MW-11	9/27/2000	28.28	18.28-28.28	95.15	21.45	21.45	0.00	73.70
MW-12	9/29/2000	30.60	20.60-30.60	97.03	20.29	20.29	0.00	76.74
MW-13	9/29/2000	27.11	17.11-27.11	95.89	21.34	21.34	0.00	74.55

Notes:

(1) Elevations are relative to a temporary assumed benchmark established on-site

(2) Depth to groundwater measurements taken on August 9, 2004

(3) Groundwater elevation corrected using a free product density of 0.84

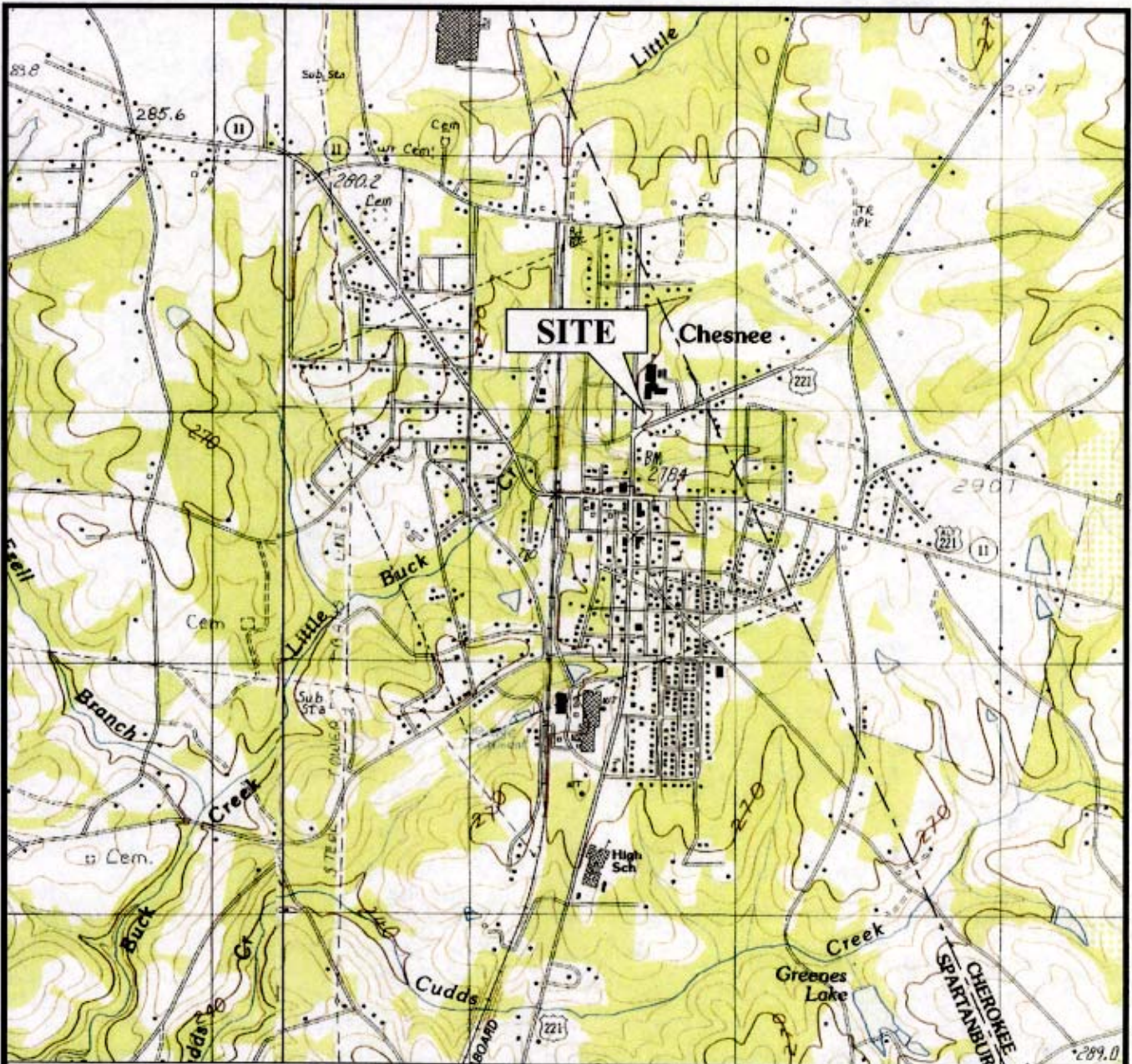
\* MW-2 is believed to be a monitoring well installed during site remediation activities. Construction details are not known.



**TABLE 4**  
**HISTORICAL GROUNDWATER QUALITY DATA**  
**HOT SPOT #3005**  
**107 HAMPTON STREET**  
**CHESNEE, SOUTH CAROLINA**  
**SCDHEC UST PERMIT #: 12719**  
**S&ME PROJECT 1264-99-506**

WELL	DATE	B	T	E	X	MTBE	EDB	NAPHTH
	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L
MW-1	04/24/96	27.4	88.3	46	170.1	NA	NA	55.7
	09/15/99	FP	FP	FP	FP	FP	FP	FP
	10/13/00	FP	FP	FP	FP	FP	FP	FP
	03/09/01	FP	FP	FP	FP	FP	FP	FP
	09/17/03	FP	FP	FP	FP	FP	FP	FP
	08/09/04	FP, 0.0	FP	FP	FP	FP	FP	FP
MW-2	09/17/03	1.5	<5.0	<1.0	6.9	8.7	<0.010	<5.0
	08/09/04	40	27	23	180	25	NA	62
MW-3 RA MR	09/15/99	500	220	100	460	1100	NA	<5.0
	10/16/00	1500	170	290	2000	2200	<1.0	3.6
	03/09/01	3000	130	400	3100	6400	<1.0	<10
	09/17/03	390	<5.0	170	780	1500	<0.010	<5.0
MW-4	08/09/04	130 ↓	<100	57	410	860 ↓	NA	800
	09/20/99	<5.0	<5.0	<5.0	<5.0	<5.0	NA	<5.0
	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	09/17/03	<1.0	<5.0	<1.0	<3.0	<1.0	<0.010	<5.0
	08/09/04	<1.0	<5.0	<1.0	<3.0	<1.0	NA	<5.0
MW-5	09/15/99	<5.0	21	5	20	<5.0	NA	<5.0
	10/13/00	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	03/08/01	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	09/17/03	<1.0	<5.0	<1.0	<3.0	1.9	<0.010	<5.0
MW-6	08/09/04	<1.0	<5.0	<1.0	<3.0	<1.0	NA	<5.0
	10/16/00	7.4	3.5	29	81	<1.0	<1.0	44
	03/08/01	3.3	<2.0	36	76	<2.0	<1.0	68
	09/17/03	<1.0	<5.0	1.5	9.3	<1.0	<0.010	8.7
MW-7	08/09/04	2.2	<5.0	5.7	60	12	NA	22
	10/16/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	03/09/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	09/17/03	<1.0	<5.0	<1.0	<3.0	<1.0	<0.010	<5.0
MW-8	08/09/04	<1.0	<5.0	<1.0	<3.0	<1.0	NA	<5.0
	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	09/17/03	<1.0	<5.0	<1.0	<3.0	<1.0	<0.010	<5.0
MW-9	08/09/04	<1.0	<5.0	<1.0	<3.0	<1.0	NA	<5.0
	10/16/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	03/09/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	09/17/03	<1.0	<5.0	1.1	5.6	4.5	<0.010	<5.0
MW-10	08/09/04	<1.0	<5.0	<1.0	<3.0	<1.0	NA	<5.0
	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	09/17/03	<1.0	<5.0	<1.0	<3.0	<1.0	<0.010	<5.0
MW-11	08/09/04	<1.0	<5.0	<1.0	<3.0	<1.0	NA	<5.0
	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	09/17/03	<1.0	<5.0	<1.0	<3.0	<1.0	<0.010	<5.0
MW-12	08/09/04	<1.0	<5.0	<1.0	<3.0	<1.0	NA	<5.0
	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	09/17/03	<1.0	<5.0	<1.0	<3.0	<1.0	<0.010	<5.0
MW-13	08/09/04	<1.0	<5.0	<1.0	<3.0	<1.0	NA	<5.0
	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	09/17/03	<1.0	<5.0	<1.0	<3.0	<1.0	<0.010	<5.0
MW-1D	08/09/04	<1.0	<5.0	<1.0	<3.0	<1.0	NA	<5.0
	10/16/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	09/17/03	<1.0	<5.0	<1.0	<3.0	1.3	<0.010	<5.0
RBSLs		5	1000	700	10000	40	0.05	10
SSTLs		1480	—	—	—	10300	—	6500

B - Benzene                      T - Toluene                      MTBE - Methyl tert butyl ether  
E - Ethylbenzene                X - Xylenes                      NAPHTH - Naphthalene  
EDB - Ethylene dibromide  
NA - Not Analyzed  
FP - Free Product in the well  
RBSL - SCDHEC-established risk-based screening levels  
SSTL - Site Specific Target Level



SOURCE: USGS TOPOGRAPHIC MAP, 7.5 MINUTE SERIES

SCALE 1"=2000'

CHECK BY: *JN*

DRAWN BY: JN

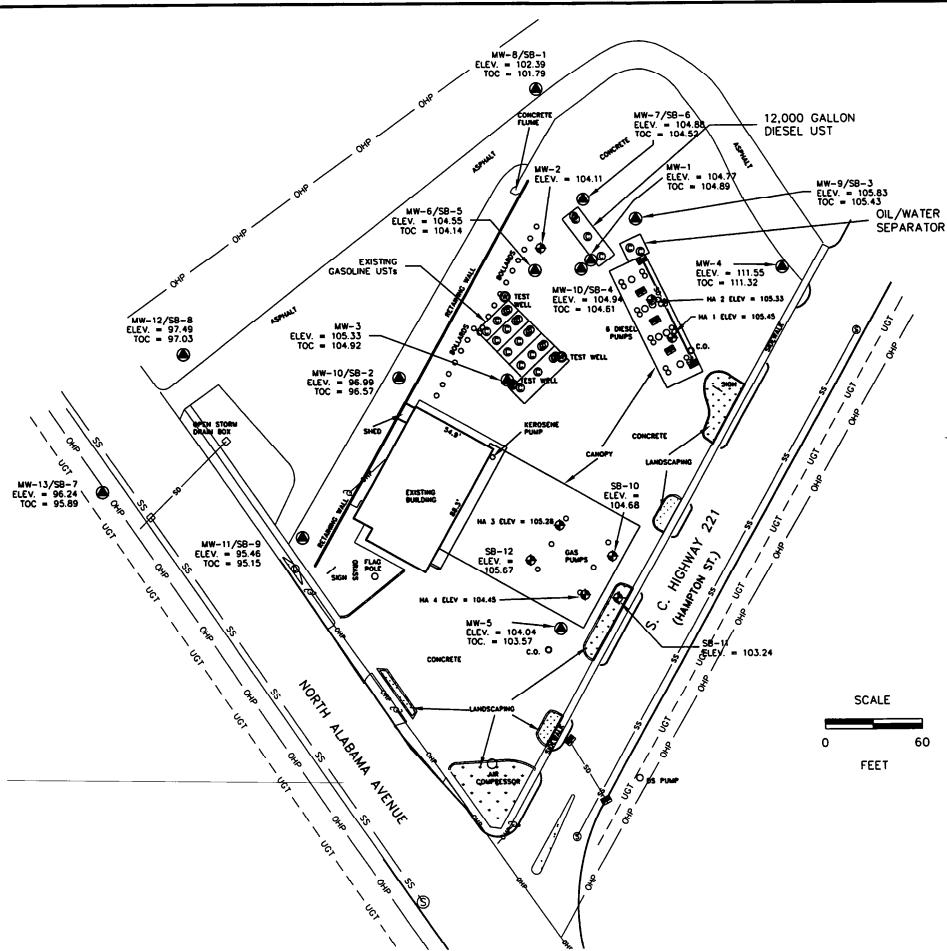
DATE: 08/23/04



**SITE LOCATION MAP**  
**HOT SPOT #3005**  
 Site ID# 12719  
 SC HWY 221, CHESNEE, SOUTH CAROLINA  
 1264-99-506

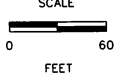
FIGURE NO:  
**1**


CADD FILE: K:\WORK\1064\1064.DWG



- LEGEND**
- ⊙ MONITORING WELL LOCATION
  - ⊕ SOIL BORING LOCATION
  - OHP — OVERHEAD POWER LINE
  - SS — SANITARY SEWER LINE
  - - - UGT - - UNDERGROUND TELEPHONE LINE

SOURCE: SITE MAP OF HOT SPOT STORE #36 FOR S&ME BY GRAMLING BROS. SURVEYING DATE: SEPTEMBER 20, 1999

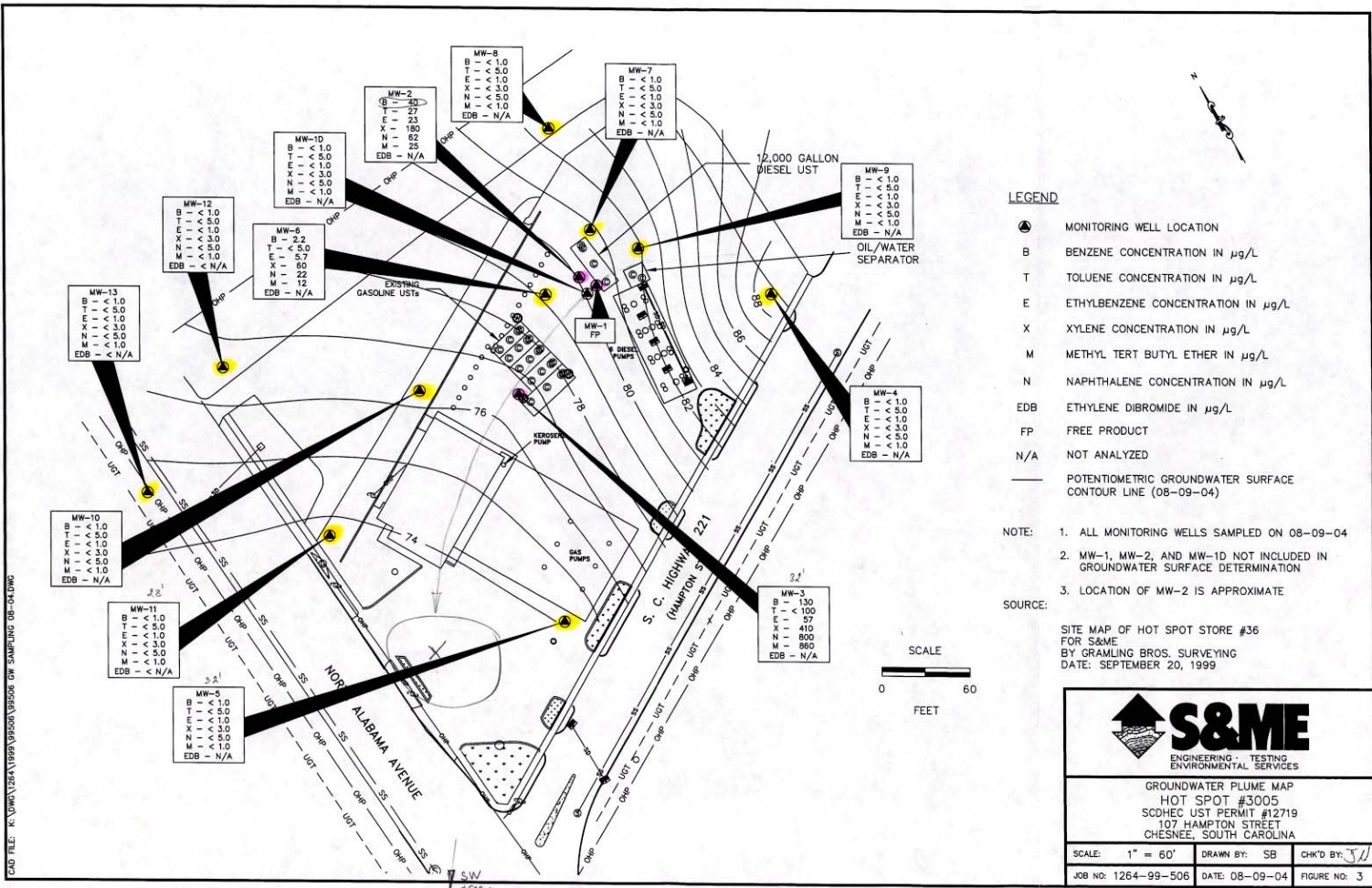




**S&ME**  
 ENGINEERING - TESTING  
 ENVIRONMENTAL SERVICES

SURVEYED SITE MAP  
 HOT SPOT #3005  
 SITE ID #12719  
 S.C. HIGHWAY 221  
 CHESNEE, SOUTH CAROLINA

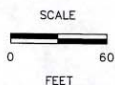
SCALE: 1" = 60'	DRAWN BY: SB	CHK'D BY: <i>JS</i>
JOB NO: 1264-99-506	DATE: 8-24-04	FIGURE NO: 2




- LEGEND**
- MONITORING WELL LOCATION
  - B BENZENE CONCENTRATION IN µg/L
  - T TOLUENE CONCENTRATION IN µg/L
  - E ETHYLBENZENE CONCENTRATION IN µg/L
  - X XYLENE CONCENTRATION IN µg/L
  - M METHYL TERT BUTYL ETHER IN µg/L
  - N NAPHTHALENE CONCENTRATION IN µg/L
  - EDB ETHYLENE DIBROMIDE IN µg/L
  - FP FREE PRODUCT
  - N/A NOT ANALYZED
  - POTENTIOMETRIC GROUNDWATER SURFACE CONTOUR LINE (08-09-04)

- NOTE:**
1. ALL MONITORING WELLS SAMPLED ON 08-09-04
  2. MW-1, MW-2, AND MW-1D NOT INCLUDED IN GROUNDWATER SURFACE DETERMINATION
  3. LOCATION OF MW-2 IS APPROXIMATE

**SOURCE:**  
 SITE MAP OF HOT SPOT STORE #36  
 FOR S&ME  
 BY GRAMLING BROS. SURVEYING  
 DATE: SEPTEMBER 20, 1999





**GROUNDWATER PLUME MAP**  
 HOT SPOT #3005  
 SCDHEC UST PERMIT #12719  
 107 HAMPTON STREET  
 CHESNEE, SOUTH CAROLINA

SCALE: 1" = 60'	DRAWN BY: SB	CHK'D BY: <i>SL</i>
JOB NO: 1264-99-506	DATE: 08-09-04	FIGURE NO: 3

CAD FILE: K:\MWP\1264\1999\0809\0809.DWG

**APPENDIX A**

**EFR Field Calculations**

**ENHANCED FLUID RECOVERY EVENT**

Site Name: **Hot Spot #3005, SC Highway 221, Chesnee, SC**  
 Date: **Wednesday, June 9, 2004**  
 SCDHEC Ust Permit No.: **12719**  
 Average depth to groundwater (ft): **25**  
 Describe Soil in The Saturated Zone: **Sandy Silt**  
 Indicate avg. Hydraulic Conductivity (if known):  
 List the well I.D. and diameter used for AFVR: **MW-1 (2" well; 1.25" stinger)**  
 List blower specifications: **Vacuum Truck**  
 Type of free product: **Diesel**  
 Total gallons of water recovered, as measured from the vacuum truck tank (in gallons): **801**  
 Total gallons of free product recovered, measured from the vacuum truck tank (in gallons): **could not differentiate**

**DRY STANDARD CUBIC FEET PER MINUTE (DSCFM) AIR FLOW CALCULATIONS (Qstd)**

Date	Time	Vacuum (inches of Hg)	Velocity (ft/min)	Pipe ID (in)	Temp (°F)	Temp (°K)	Rel Humid (%)	Water Vapor (%)	Qstd (flow)
6/9/2004	9:00	24	1503	2	148.2	337.71	0.051	0.0078	28.23
6/9/2004	9:15	24	1846	2	154.6	341.26	0.044	0.0079	34.31
6/9/2004	9:30	24	2004	2	189.7	360.76	0.035	0.0141	35.01
6/9/2004	9:45	24	2553	2	190.3	361.09	0.032	0.0130	44.61
6/9/2004	10:00	24	2624	2	191.8	361.93	0.031	0.0130	45.74
6/9/2004	10:15	24	5076	2	192.7	362.43	0.027	0.0115	88.50
6/9/2004	10:30	24	5205	2	194.8	363.59	0.028	0.0125	90.36
6/9/2004	10:45	24	4650	2	193.4	362.82	0.028	0.0121	80.93
6/9/2004	11:00	24	4864	2	194.6	363.48	0.027	0.0120	81.04
6/9/2004	11:30	24	4399	2	192.7	362.43	0.029	0.0124	76.62
6/9/2004	12:00	24	4457	2	193.0	362.59	0.030	0.0129	77.56
6/9/2004	12:30	26	4254	2	194.6	363.48	0.028	0.0125	73.88
6/9/2004	13:00	26	4262	2	194.9	363.65	0.027	0.0121	74.01
6/9/2004	14:00	25	4287	2	194.9	363.65	0.024	0.0107	74.55
6/9/2004	15:00	25	4196	2	194.9	363.65	0.024	0.0107	72.97
6/9/2004	16:00	24	4598	2	194.9	363.65	0.023	0.0103	79.99
6/9/2004	17:00	24	3003	2	194.9	363.65	0.023	0.0103	52.25

average= 0.030

**NOTES**

- Qstd = Flow at DSCFM
- Vacuum = The level of vacuum being applied should be recorded from the vacuum truck tank (inches of Hg)
- Velocity = The rate at which air flows is measured at the blower discharge piping (anemometer or pitot tube)
- Pipe ID = The inside diameter of the blower discharge piping (from the vacuum truck)
- Temperature = The temperature of the air stream exiting the blower discharge piping (dry bulb temp., in deg.°F)
- Relative humidity = The % relative humidity of the air stream exiting the blower discharge piping
- Water Vapor In % = Pounds of water per pound of dry air, derived from the Psychrometric chart (temp Vs relative humidity)

**EQUATION**

$Qstd = (1 - \text{Water Vapor}) * \text{velocity} * (PI * (\text{diameter}/24)^2) * (528^{\circ}R / (\text{Temp} + 460))$

**ENHANCED FLUID RECOVERY EVENT**

Site Name: **Hot Spot #3005, SC Highway 221, Chesnee, SC**  
 Date: **Wednesday, June 9, 2004**  
 SCDHEC Ust Permit No.: **12719**  
 Average depth to groundwater (ft): **25**  
 Describe Soil In The Saturated Zone: **Sandy Silt**  
 Indicate avg. Hydraulic Conductivity (if known):  
 List the well I.D. and diameter used for AFVR: **MW-1 (2" well; 1.25" stinger)**  
 List blower specifications: **Vacuum Truck**  
 Type of free product: **Diesel**  
 Total gallons of water recovered, as measured from the vacuum truck tank (in gallons): **801**  
 Total gallons of free product recovered, measured from the vacuum truck tank (in gallons): **could not differentiate**

**EMISSION CALCULATIONS**

Elapsed Time	Flow	PPM measured	K	PPMg	Cg:m	Cg	PMRg	PMR	PMR	
(min)	(DSCFM)	(ppm)	(#C - gas)		(mg/dsm <sup>3</sup> )	(lb/dscf)	(lb/hr)	(lb)	(gal)	
15	34.31	156.00	1	156.00	1296.22	0.00	0.17	0.04	0.006	
30	35.01	170.00	1	170.00	1412.55	0.00	0.19	0.05	0.007	
45	44.61	155.00	1	155.00	1287.91	0.00	0.22	0.05	0.008	
60	45.74	156.00	1	156.00	1296.22	0.00	0.22	0.06	0.008	
75	88.50	157.00	1	157.00	1304.53	0.00	0.43	0.11	0.015	
90	90.36	118.00	1	118.00	980.47	0.00	0.33	0.08	0.012	
105	80.93	121.00	1	121.00	1005.40	0.00	0.30	0.08	0.011	
120	81.04	119.00	1	119.00	988.78	0.00	0.30	0.08	0.011	
150	76.62	87.96	1	87.96	730.87	0.00	0.21	0.10	0.015	
180	77.56	88.03	1	88.03	731.45	0.00	0.21	0.11	0.015	
210	73.88	64.02	1	64.02	531.95	0.00	0.15	0.07	0.011	
240	74.01	64.21	1	64.21	533.53	0.00	0.15	0.07	0.011	
300	74.55	45.98	1	45.98	382.05	0.00	0.11	0.11	0.015	
360	72.97	46.02	1	46.02	382.38	0.00	0.10	0.10	0.015	
420	79.99	41.94	1	41.94	348.48	0.00	0.10	0.10	0.015	
480	52.25	42.04	1	42.04	349.31	0.00	0.07	0.07	0.010	
<b>Total Emissions</b>								<b>1.28</b>	<b>0.18</b>	

**NOTES**

PPM measured = Actual measurements (ppm) taken with a OVA or TVA at the blower discharge piping  
 K = Number of carbons in calibration gas: (Methane K = 1, or Propane K = 3, or Hexane K = 6)  
 PPMg = PPMv, Volumetric concentration as diesel emission, dry basis at STP  
 Cg:m = mg/dsm<sup>3</sup>, mass concentration of diesel emission  
 Mg = 200 mg/mg-mole, molecular weight of diesel (this value may vary depending on contaminant)  
 K<sub>3</sub> = 24.07 dsm<sup>3</sup>/1E6 mg-mole, mass to volume conversion factor at STP  
 Cg = lb/dscf, mass concentration of diesel emission, dry basis at STP  
 PMRg = lb/hr, pollutant mass removal rate of diesel emission  
 PMR = pollutant mass/volume removal of diesel emission over time

**EQUATIONS**

PPMg = PPM measured \* K  
 Cg:m = PPMg \* (Mg / K<sub>3</sub>)  
 Cg = Cg:m \* 62.43E-09 lb-m<sup>3</sup>/mg-ft<sup>3</sup>  
 PMRg = Cg \* Qstd \* 60 min/hr  
 PMR = PMRg \* ((T<sub>2</sub> - T<sub>1</sub>) / 60)

**ENHANCED FLUID RECOVERY EVENT**

Site Name: **Hot Spot #3005, SC Highway 221, Chesnee, SC**  
 Date: **Thursday, July 8, 2004**  
 SCDHEC Ust Permit No.: **12719**  
 Average depth to groundwater (ft): **25**  
 Describe Soil in The Saturated Zone: **Sandy Silt**  
 Indicate avg. Hydraulic Conductivity (if known):  
 List the well I.D. and diameter used for AFVR: **MW-1 (2" well; 1.25" stinger)**  
 List blower specifications: **Vacuum Truck**  
 Type of free product: **Diesel**  
 Total gallons of water recovered, as measured from the vacuum truck tank (In gallons): **967**  
 Total gallons of free product recovered, measured from the vacuum truck tank (In gallons): **could not differentiate**

**DRY STANDARD CUBIC FEET PER MINUTE (DSCFM) AIR FLOW CALCULATIONS (Qstd)**

Date	Time	Vacuum (inches of Hg)	Velocity (ft/min)	Pipe ID (in)	Temp (°F)	Temp (°K)	Rel Humid (%)	Water Vapor (%)	Qstd (flow)
7/8/2004	9:15	23	600	2	155.0	341.48	0.061	0.0111	11.11
7/8/2004	9:30	23	1300	2	180.0	355.37	0.130	0.0443	22.35
7/8/2004	9:45	23	1050	2	194.9	363.65	0.030	0.0135	18.21
7/8/2004	10:00	23	410	2	194.9	363.65	0.034	0.0153	7.10
7/8/2004	10:15	23	1060	2	194.9	363.65	0.023	0.0103	18.44
7/8/2004	10:30	23	800	2	194.9	363.65	0.018	0.0080	13.95
7/8/2004	10:45	23	947	2	194.9	363.65	0.020	0.0089	16.50
7/8/2004	11:15	23	658	2	194.9	363.65	0.020	0.0089	11.46
7/8/2004	11:45	23	543	2	194.9	363.65	0.020	0.0089	9.46
7/8/2004	12:15	23	780	2	194.9	363.65	0.018	0.0080	13.60
7/8/2004	12:45	22	904	2	194.9	363.65	0.023	0.0103	15.73
7/8/2004	13:15	23	918	2	194.9	363.65	0.021	0.0094	15.99
7/8/2004	13:45	23	942	2	194.9	363.65	0.021	0.0094	16.40
7/8/2004	14:15	23	1008	2	194.9	363.65	0.020	0.0089	17.56
7/8/2004	14:45	23	753	2	194.9	363.65	0.019	0.0085	13.12
7/8/2004	15:15	23	720	2	194.9	363.65	0.023	0.0103	12.53
7/8/2004	15:45	23	751	2	194.9	363.65	0.019	0.0085	13.09
7/8/2004	16:15	23	657	2	194.9	363.65	0.018	0.0080	11.46
7/8/2004	16:45	23	796	2	194.9	363.65	0.020	0.0089	13.87
7/8/2004	17:15	23	802	2	194.9	363.65	0.020	0.0089	13.97

average= 0.029

**NOTES**

Qstd = Flow at DSCFM  
 Vacuum = The level of vacuum being applied should be recorded from the vacuum truck tank (inches of Hg)  
 Velocity = The rate at which air flows is measured at the blower discharge piping (anemometer or pitot tube)  
 Pipe ID = The inside diameter of the blower discharge piping (from the vacuum truck)  
 Temperature = The temperature of the air stream exiting the blower discharge piping (dry bulb temp., in deg.°F)  
 Relative humidity = The % relative humidity of the air stream exiting the blower discharge piping  
 Water Vapor in % = Pounds of water per pound of dry air, derived from the Psychrometric chart (temp Vs relative humidity)

**EQUATION**

Qstd = (1-Water Vapor) \* velocity \* (PI \* (diameter/24)^2) \* (528°R/(Temp + 460))



**ENHANCED FLUID RECOVERY EVENT**

Site Name: **Hot Spot #3005, SC Highway 221, Chesnee, SC**

Date: **Thursday, July 8, 2004**

SCDHEC Ust Permit No.: **12719**

Average depth to groundwater (ft): **25**

Describe Soil In The Saturated Zone: **Sandy Silt**

Indicate avg. Hydraulic Conductivity (if known):

List the well I.D. and diameter used for AFVR: **MW-1 (2" well; 1.25" stinger)**

List blower specifications: **Vacuum Truck**

Type of free product: **Diesel**

Total gallons of water recovered, as measured from the vacuum truck tank (In gallons): **967**

Total gallons of free product recovered, measured from the vacuum truck tank (in gallons): **could not differentiate**

**EMISSION CALCULATIONS**

Elapsed Time	Flow	PPM measured	K	PPMg	Cg:m	Cg	PMRg	PMR	PMR
(min)	(DSCFM)	(ppm)	(#C - gas)		(mg/dsm <sup>3</sup> )	(lb/dscf)	(lb/hr)	(lb)	(gal)
15	22.35	14.50	1	14.50	120.48	0.00	0.01	0.00	0.000
30	18.21	20.57	1	20.57	170.92	0.00	0.01	0.00	0.000
45	7.10	23.30	1	23.30	193.60	0.00	0.01	0.00	0.000
60	18.44	26.10	1	26.10	216.87	0.00	0.01	0.00	0.001
75	13.95	28.63	1	28.63	237.89	0.00	0.01	0.00	0.000
90	16.50	29.57	1	29.57	245.70	0.00	0.02	0.00	0.001
120	11.46	30.02	1	30.02	249.44	0.00	0.01	0.01	0.001
150	9.46	32.81	1	32.81	272.62	0.00	0.01	0.00	0.001
180	13.60	35.63	1	35.63	296.05	0.00	0.02	0.01	0.001
210	15.73	35.95	1	35.95	298.71	0.00	0.02	0.01	0.001
240	15.99	36.01	1	36.01	299.21	0.00	0.02	0.01	0.001
270	16.40	36.12	1	36.12	300.12	0.00	0.02	0.01	0.001
300	17.56	38.56	1	38.56	320.40	0.00	0.02	0.01	0.002
330	13.12	41.02	1	41.02	340.84	0.00	0.02	0.01	0.001
360	12.53	41.08	1	41.08	341.34	0.00	0.02	0.01	0.001
390	13.09	41.09	1	41.09	341.42	0.00	0.02	0.01	0.001
420	11.46	41.63	1	41.63	345.91	0.00	0.01	0.01	0.001
450	13.87	41.71	1	41.71	346.57	0.00	0.02	0.01	0.001
480	13.97	41.84	1	41.84	347.65	0.00	0.02	0.01	0.001
<b>Total Emissions</b>								<b>0.12</b>	<b>0.02</b>

**NOTES**

PPM measured = Actual measurements (ppm) taken with a OVA or TVA at the blower discharge piping

K = Number of carbons in calibration gas: (Methane K = 1, or Propane K = 3, or Hexane K = 6)

PPMg = PPMv, Volumetric concentration as diesel emission, dry basis at STP

Cg:m = mg/dsm<sup>3</sup>, mass concentration of diesel emission

Mg = 200 mg/mg-mole, molecular weight of diesel (this value may vary depending on contaminant)

K<sub>3</sub> = 24.07 dsm<sup>3</sup>/1E6 mg-mole, mass to volume conversion factor at STP

Cg = lb/dscf, mass concentration of diesel emission, dry basis at STP

PMRg = lb/hr, pollutant mass removal rate of diesel emission

PMR = pollutant mass/volume removal of diesel emission over time

**EQUATIONS**

PPMg = PPM measured \* K

Cg:m = PPMg \* (Mg / K<sub>3</sub>)

Cg = Cg:m \* 62.43E-09 lb-m<sup>3</sup>/mg-ft<sup>3</sup>

PMRg = Cg \* Qstd \* 60 min/hr

PMR = PMRg \* ((T<sub>2</sub> - T<sub>1</sub>) / 60)

**APPENDIX B**

**Disposal Manifest of Each EFR Event**

# GARCO, Inc.

## NON-HAZARDOUS WASTE MANIFEST

Form 3524-10-1990

<b>NON-HAZARDOUS WASTE MANIFEST</b>		Manifest Document No. <b>01001</b>	Page 1 of 1
Generator's Name and Mailing Address <b>Hof Dept #3005 107 Hampton Street Chesnut, NC 28624</b>		Generator's US EPA ID No.	
Transporter 1 Company Name <b>GARCO, Inc.</b>		Transporter 1 Phone <b>(336) 653-0911</b>	Transporter 1 US EPA ID No.
Transporter 2 Company Name		Transporter 2 Phone	Transporter 2 US EPA ID No.
Designated Facility Name and Site Address <b>GARCO, Inc. 2503 N. Fayetteville St. Asheboro, NC 27203</b>		Facility's Phone <b>(336) 653-0911</b>	
Facility's US EPA ID No.		Facility's Name	

Waste Description	Condition		Total Quantity	Unit (kg, lbs)
	No.	Type		
Non-Hazardous Material	<b>01</b>	<b>TT</b>	<b>801</b>	<b>Q</b>

Additional Descriptions for Materials Listed Above

A) Petroleum Contaminated Water	C)
B)	D)

General Handling instructions and Additional Information  
24 Hour ERM 800-614-1204

Generator hereby certifies that the contents of this manifest are fully and accurately descriptive and true in all respects as herein stated by generator. The material described on this manifest cannot be used to fulfill hazardous waste regulatory requirements.

Manifest Type: <b>01</b> Name: <b>Dill HATHON</b> Signature: <i>[Signature]</i>	Date: <b>6/9/01</b> Month: <b>6</b> Day: <b>9</b> Year: <b>01</b>
---------------------------------------------------------------------------------------	----------------------------------------------------------------------

Transporter 1 Acknowledgment of Receipt of Material Name: <b>Will H...</b> Signature: <i>[Signature]</i>	Date: <b>6/9/01</b> Month: <b>6</b> Day: <b>9</b> Year: <b>01</b>
----------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------

Transporter 2 Acknowledgment of Receipt of Material Name: _____ Signature: _____	Date: _____ Month: _____ Day: _____ Year: _____
----------------------------------------------------------------------------------------	----------------------------------------------------

Discrepancy Indication Space

Facility Owner or Operator, Certification of receipt for waste materials covered by this manifest, except as noted above. Name: _____ Signature: _____	Date: _____ Month: _____ Day: _____ Year: _____
--------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------

# GARCO, Inc.

## NON-HAZARDOUS WASTE MANIFEST

Name and type

NON-HAZARDOUS WASTE MANIFEST		Manifest Document No. 05002	Page 1 of 1
Generator's Name and Mailing Address Hot Spot #3005 897 Hampton Street Cherokee, SC 29605		Generator's US EPA ID No.	
		Generator's Phone	
Transporter 1 Company Name GARCO, Inc.	NCR000135384	Transporter 1 Phone (336) 653-0911	
Transporter 2 Company Name		Transporter 2 Phone	
Designated Facility Name and Site Address GARCO, Inc. 2001 N. Fayetteville St. Asheboro, NC 27203		US EPA ID Number	
		Facility's Phone (336) 653-0911	

Name Description	Container		Total Quantity	Unit wt./vol.
	No.	Type		
Non-Hazardous Material	01	TT	967	G

Additional Descriptions for Materials Listed Above

A) Generator	C)
B)	D)

24 Hour ERW 800-213-1204

Generator certifies that the contents of this manifest are truly and accurately described and are in all respects proper condition for transport. The materials described on this manifest are not subject to Federal hazardous waste regulations.

Generator's Name <i>C. J. Smith</i>	Signature <i>C. J. Smith</i>	Date Month Day Year 7 19 94
Transporter 1 Acknowledgment of Receipt of Materials		
Generator's Name <i>W. H. Harmon</i>	Signature <i>W. H. Harmon</i>	Date Month Day Year 7 18 94
Transporter 2 Acknowledgment of Receipt of Materials		
Generator's Name	Signature	Date Month Day Year
Responsible Production Source		
Facility Owner or Operator: Declaration of receipt for waste materials covered by this manifest, except as noted above.		
Generator's Name	Signature	Date Month Day Year

**APPENDIX C**

**Sample Collection Summary Sheets**

**SAMPLE COLLECTION SUMMARY SHEET**



General

1. Job Name: Hot Spot #3005 2. Project No.: 1264-99-506  
 3. Sampled By: MO/JN 4. Weather: sunny, warm  
 5. Location: Chesnee, SC 6. Well #: MW-1D  
 7. Well Condition: OK 8. Personnel Present: MO/JN

Water Level Information:

1. Date: 8/9/04 2. Time: \_\_\_\_\_ 3. State Water Level: 25.44 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOC  
 5. Height of M.P. above/below (Circle) Land Surface: ≈ .25  
 6. Method of Water Level Measurement: electric water level meter

Evacuation Procedure (Wells):

1. Date: 8/9/04 2. Time Evacuation Started: \_\_\_\_\_ 3. Time Evacuation Finished: \_\_\_\_\_  
 4. Method of Evacuation: bailey 5. Total Well Depth: 58.50 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft.  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: new bailey

Meter Calibration:

Buffer pH 7.0 \_\_\_\_\_ Actual Buffer pH 4.0 or 10.0 \_\_\_\_\_ Actual Standard Cond: \_\_\_\_\_ Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	7.0	14.0	21.0			
Water Temperature (F) (C)	22.2	20.8	20.6			
pH (Standard Units)	5.62	6.09	5.95			
Specific Cond. (M/MHOS) (PPM)	95	50	47			
Turbidity (Subjective)	Slight					
Odor (Subjective)	None					
Other: _____						

Sampling Information

1. Date: 8/9/04 2. Time: 11:30 3. Sample Containers (Number/Size/Type): 2/40 ml/Amber  
 4. Analyses requested: BTEXNM  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: HCl 8. Preservative: HCl  
 9. Lab Performing Analyses: ESC 10. Sample Type: Well X; Stream \_\_\_\_\_

Remarks:

4  
38  
8.16  
388  
7.08

**SAMPLE COLLECTION  
SUMMARY SHEET**



General

1. Job Name: Hot Spot #3005 2. Project No.: 1264-49-506  
 3. Sampled By: MO/JN 4. Weather: sunny, warm  
 5. Location: Chesnee, SC 6. Well #: MW-2  
 7. Well Condition: OK 8. Personnel Present: MO/JN

Water Level Information:

1. Date: 8/9/04 2. Time: 10:30 3. State Water Level: 25.23 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOC  
 5. Height of M.P. above/below (Circle) Land Surface: -.25  
 6. Method of Water Level Measurement: electric water level meter

Evacuation Procedure (Wells):

1. Date: 8/9/04 2. Time Evacuation Started: 11:15 3. Time Evacuation Finished: \_\_\_\_\_  
 4. Method of Evacuation: boiler 5. Total Well Depth: 34.20 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = 1.5 x 3 = 4.5 Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: new boiler

Meter Calibration:

Buffer pH 7.0 \_\_\_\_\_ Actual Buffer pH 4.0 or 10.0 \_\_\_\_\_ Actual Standard Cond: \_\_\_\_\_ Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	<u>1.5</u>	<u>3.0</u>	<u>dry</u>			
Water Temperature (F) (C)	<u>21.8</u>	<u>22.0</u>				
pH (Standard Units)	<u>5.20</u>	<u>5.10</u>				
Specific Cond. (M/MHOS) (PPM)	<u>89</u>	<u>77</u>				
Turbidity (Subjective)	<u>mod</u>	<u>mod</u>				
Odor (Subjective)	<u>none</u>	<u>none</u>				
Other: _____						

Sampling Information

1. Date: 8/9/04 2. Time: 11:25 3. Sample Containers (Number/Size/Type): 2/40 ml/Amber  
 4. Analyses requested: BTEXNM  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: HCl 8. Preservative: HCl  
 9. Lab Performing Analyses: ESC 10. Sample Type: Well X; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION  
SUMMARY SHEET**



General

1. Job Name: Hot Spot #3005 2. Project No.: 1264-99-506  
 3. Sampled By: MO/JN 4. Weather: sunny, warm  
 5. Location: Chesnee, SC 6. Well #: MW-3  
 7. Well Condition: OK 8. Personnel Present: MO/JN

Water Level Information:

1. Date: 8/9/04 2. Time: 1100 3. State Water Level: 28.54 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOL  
 5. Height of M.P. above/below (Circle) Land Surface: -.25  
 6. Method of Water Level Measurement: electric water level meter

Evacuation Procedure (Wells):

1. Date: 8/9/04 2. Time Evacuation Started: 15:05 3. Time Evacuation Finished: 1510  
 4. Method of Evacuation: boiler 5. Total Well Depth: 32.20 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = .5 X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: new boiler

Meter Calibration:

Buffer pH 7.0 \_\_\_\_\_ Actual Buffer pH 4.0 or 10.0 \_\_\_\_\_ Actual Standard Cond: \_\_\_\_\_ Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	.5	/ DRY				
Water Temperature (F) (C)	22.5					
pH (Standard Units)	6.21					
Specific Cond. (M/MHOS) (PPM)	97					
Turbidity (Subjective)	high					
Odor (Subjective)	v. strong					
Other: _____						

Sampling Information

1. Date: 8/9/04 2. Time: 1515 3. Sample Containers (Number/Size/Type): 2/40 ml / Amber  
 4. Analyses requested: BTEXNM  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: HCl 8. Preservative: HCl  
 9. Lab Performing Analyses: FSC 10. Sample Type: Well X; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_



**SAMPLE COLLECTION  
SUMMARY SHEET**



General

1. Job Name: Hot Spot #3005 2. Project No.: 1264-99-506  
 3. Sampled By: MO/JN 4. Weather: Sunny, warm  
 5. Location: Chesnee, SC 6. Well #: MW-4  
 7. Well Condition: OK 8. Personnel Present: MO/JN

Water Level Information:

1. Date: 8/9/04 2. Time: 1100 3. State Water Level: 22.33 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOL  
 5. Height of M.P. above/below (Circle) Land Surface: -.25  
 6. Method of Water Level Measurement: electric water level meter

Evacuation Procedure (Wells):

1. Date: 8/9/04 2. Time Evacuation Started: 1256 3. Time Evacuation Finished: 1305  
 4. Method of Evacuation: bauler 5. Total Well Depth: 45.50 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = 3 x 3 = 9 Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: new bauler

Meter Calibration:

Buffer pH 7.0 \_\_\_\_\_ Actual Buffer pH 4.0 or 10.0 \_\_\_\_\_ Actual Standard Cond: \_\_\_\_\_ Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	3	6	9			
Water Temperature (F) (C)	22.1	21.6	21.8			
pH (Standard Units)	7.41	7.51	7.63			
Specific Cond. (M/MHOS) (PPM)	70	<del>74</del> 74	79			
Turbidity (Subjective)	v. low	v. low	v. low			
Odor (Subjective)	none	none	none			
Other: _____						

Sampling Information

1. Date: 8/9/04 2. Time: 1300 15 3. Sample Containers (Number/Size/Type): 2/40 ml/Amber  
 4. Analyses requested: BTEX/NM  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: HCl 8. Preservative: HCl  
 9. Lab Performing Analyses: FSC 10. Sample Type: Well X; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION SUMMARY SHEET**



General

- 1. Job Name: Hot Spot #3005
- 2. Project No.: 1264-99-506
- 3. Sampled By: MO/JN
- 4. Weather: sunny, warm
- 5. Location: Chesnee, SC
- 6. Well #: MW-5
- 7. Well Condition: OK
- 8. Personnel Present: MO/JN

Water Level Information:

- 1. Date: 8/9/04
- 2. Time: 11:00
- 3. State Water Level: 29.52 Ft. Below M.P.
- 4. Description of Measuring Point (M.P.): TOC
- 5. Height of M.P. above/below (Circle) Land Surface: ≈ .25
- 6. Method of Water Level Measurement: electric water level meter

Evacuation Procedure (Wells):

- 1. Date: 8/9/04
- 2. Time Evacuation Started: 1455
- 3. Time Evacuation Finished: 1500
- 4. Method of Evacuation: bailey
- 5. Total Well Depth: 32.20 Ft. Below M.P.
- 6. Casing Diameter (D): 2 Inches
- 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft
- 8. Volume of Water in Well (0.041D<sup>2</sup>H) = .25 x 1 = \_\_\_\_\_ Gallons  
(Well Volume X # Volumes = Total Gallons Purged)
- 9. Decontamination Procedure: new bailey

Meter Calibration:

Buffer pH 7.0 \_\_\_\_\_ Actual      Buffer pH 4.0 or 10.0 \_\_\_\_\_ Actual      Standard      Cond: \_\_\_\_\_ Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	.25	.5				
Water Temperature (F) (C)	23.0					
pH (Standard Units)	5.06					
Specific Cond. (M/MHOS) (PPM)	30					
Turbidity (Subjective)	mod					
Odor (Subjective)	none					
Other:						

Sampling Information

- 1. Date: 8/9/04
- 2. Time: 1500
- 3. Sample Containers (Number/Size/Type): 2/40 ml/Ambic
- 4. Analyses requested: BTEXNM
- 5. Samples Filtered: No
- 6. Filtration Equipment: N/A
- 7. Samples Preserved: HCl
- 8. Preservative: HCl
- 9. Lab Performing Analyses: ESC
- 10. Sample Type: Well X ; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION  
SUMMARY SHEET**



General

1. Job Name: Hot Spot #3005 2. Project No.: 1264-99-506  
 3. Sampled By: MO/JN 4. Weather: Sunny, warm  
 5. Location: Chesnee, SC 6. Well #: MW-6  
 7. Well Condition: OK 8. Personnel Present: MO/JN

Water Level Information:

1. Date: 8/9/04 2. Time: 1131 3. State Water Level: 24 97 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOC  
 5. Height of M.P. above/below (Circle) Land Surface: ± .25  
 6. Method of Water Level Measurement: electric water level meter

Evacuation Procedure (Wells):

1. Date: 8/9/04 2. Time Evacuation Started: 1134 3. Time Evacuation Finished: 1140  
 4. Method of Evacuation: bailey 5. Total Well Depth: 36.10 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: new bailey

Meter Calibration:

Buffer pH 7.0 \_\_\_\_\_ Actual Buffer pH 4.0 or 10.0 \_\_\_\_\_ Actual Standard Cond: \_\_\_\_\_ Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	1.5	3.0	4.5			
Water Temperature (F) (C)	21.6	21.2	20.7			
pH (Standard Units)	4.95	4.99	4.95			
Specific Cond. (M/MHOS) (PPM)	74	65	62			
Turbidity (Subjective)						
Odor (Subjective)						
Other:						

Sampling Information

1. Date: 8/9/04 2. Time: 1144 3. Sample Containers (Number/Size/Type): 2/40 ml/Ambic  
 4. Analyses requested: BTEXNM  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: HCl 8. Preservative: HCl  
 9. Lab Performing Analyses: FSC 10. Sample Type: Well X; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION  
SUMMARY SHEET**



General

1. Job Name: Hot Spot #3005 2. Project No.: 1264-44-506  
 3. Sampled By: MO/JN 4. Weather: Sunny, warm  
 5. Location: Chesnee, SC 6. Well #: MW-7  
 7. Well Condition: OK 8. Personnel Present: MO/JN

Water Level Information:

1. Date: 8/9/04 2. Time: 1148 3. State Water Level: 23.70 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOC  
 5. Height of M.P. above/below (Circle) Land Surface: -.25  
 6. Method of Water Level Measurement: electric water level meter

Evacuation Procedure (Wells):

1. Date: 8/9/04 2. Time Evacuation Started: 1150 3. Time Evacuation Finished: \_\_\_\_\_  
 4. Method of Evacuation: bauler 5. Total Well Depth: 36.15 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: new bauler

Meter Calibration:

Buffer pH 7.0 \_\_\_\_\_ Actual Buffer pH 4.0 or 10.0 \_\_\_\_\_ Actual Standard Cond: \_\_\_\_\_ Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	2.0	4.0	6.0		
Water Temperature (F) (C)	21.4	20.8	20.6		
pH (Standard Units)	5.0	5.02	5.03		
Specific Cond. (M/MHOS) (PPM)	28	25	24		
Turbidity (Subjective)	mod-high	high	high		
Odor (Subjective)	none	none	none		
Other:					

Sampling Information

1. Date: 8/9/04 2. Time: 1200 3. Sample Containers (Number/Size/Type): 2/40ml/Amber  
 4. Analyses requested: BTEX/MP  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: HCl 8. Preservative: HCl  
 9. Lab Performing Analyses: FSC 10. Sample Type: Well X ; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION  
SUMMARY SHEET**



General

1. Job Name: Hot Spot #3005 2. Project No.: 1264-99-506  
 3. Sampled By: MO/JN 4. Weather: Sunny, warm  
 5. Location: Chesnee, SC 6. Well #: MW-8  
 7. Well Condition: OK 8. Personnel Present: MO/JN

Water Level Information:

1. Date: 8/9/04 2. Time: 1100 3. State Water Level: 19.35 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOC  
 5. Height of M.P. above (below) (Circle) Land Surface: 2.25  
 6. Method of Water Level Measurement: electric water level meter

Evacuation Procedure (Wells):

1. Date: 8/9/04 2. Time Evacuation Started: 1325 3. Time Evacuation Finished: 13:35  
 4. Method of Evacuation: bailey 5. Total Well Depth: 33.20 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: new bailey

Meter Calibration:

Buffer pH 7.0 \_\_\_\_\_ Actual Buffer pH 4.0 or 10.0 \_\_\_\_\_ Actual Standard Cond: \_\_\_\_\_ Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	<u>2.00</u>	<u>4.00</u>	<u>6.00</u>		
Water Temperature (F) (C)	<u>21.5</u>	<u>20.1</u>	<u>20.0</u>		
pH (Standard Units)	<u>5.26</u>	<u>5.08</u>	<u>4.99</u>		
Specific Cond. (M/MHOS) (PPM)	<u>10</u>	<u>8</u>	<u>8</u>		
Turbidity (Subjective)	<u>high</u>	<u>high</u>	<u>high</u>		
Odor (Subjective)	<u>none</u>	<u>none</u>	<u>none</u>		
Other:					

Sampling Information

1. Date: 8/9/04 2. Time: 1340 3. Sample Containers (Number/Size/Type): 2/40 ml/Ambic  
 4. Analyses requested: BTEXNM  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: HCl 8. Preservative: HCl  
 9. Lab Performing Analyses: FSC 10. Sample Type: Well X; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION  
SUMMARY SHEET**



General

1. Job Name: Hot Spot #3005 2. Project No.: 1264-99-506  
 3. Sampled By: MO/JN 4. Weather: sunny, warm  
 5. Location: Chesnee, SC 6. Well #: MW-9  
 7. Well Condition: OK 8. Personnel Present: MO/JN

Water Level Information:

1. Date: 8/9/04 2. Time: 1130 3. State Water Level: 23.63 Dry Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOC  
 5. Height of M.P. above/below (Circle) Land Surface: below = .25  
 6. Method of Water Level Measurement: electric water level meter

Evacuation Procedure (Wells):

1. Date: 8/9/04 2. Time Evacuation Started: 1135 3. Time Evacuation Finished: 1142  
 4. Method of Evacuation: bauler 5. Total Well Depth: 35.135 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = 1.5 x 3 = 4.5 Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: new bauler

Meter Calibration:

Buffer pH 7.0 \_\_\_\_\_ Actual Buffer pH 4.0 or 10.0 \_\_\_\_\_ Actual Standard Cond: \_\_\_\_\_ Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	<u>1.5</u>	<u>3.0</u>	<u>4.5</u>		
Water Temperature (F) (C)		<u>20.9</u>	<u>20.2</u>		
pH (Standard Units)		<u>5.22</u>	<u>5.11</u>		
Specific Cond. (M/MHOS) (PPM)		<u>28</u>	<u>25</u>		
Turbidity (Subjective)		<u>mod-low</u>	<u>mod/low</u>		
Odor (Subjective)		<u>none-slight</u>	<u>slight</u>		
Other:					

Sampling Information

1. Date: 8/9/04 2. Time: 1145 3. Sample Containers (Number/Size/Type): 2/40 ml/Ambic  
 4. Analyses requested: BTEXNM  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: HCl 8. Preservative: HCl  
 9. Lab Performing Analyses: FSC 10. Sample Type: Well X; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION  
SUMMARY SHEET**



General

1. Job Name: Hot Spot #3005 2. Project No.: 1264-99-506  
 3. Sampled By: MO/JN 4. Weather: sunny, warm  
 5. Location: Chesnee, SC 6. Well #: MW-10  
 7. Well Condition: OK 8. Personnel Present: MO/JN

Water Level Information:

1. Date: 8/9/04 2. Time: 11:00 3. State Water Level: 20.24 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOC  
 5. Height of M.P. above/below (Circle) Land Surface: 2.25  
 6. Method of Water Level Measurement: electric water level meter

Evacuation Procedure (Wells):

1. Date: 8/9/04 2. Time Evacuation Started: 13:46 3. Time Evacuation Finished: 1355  
 4. Method of Evacuation: bauler 5. Total Well Depth: 27.15 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft.  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = 1.0 x 3 = 3 Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: new bauler

Meter Calibration:

Buffer pH 7.0 \_\_\_\_\_ Actual Buffer pH 4.0 or 10.0 \_\_\_\_\_ Actual Standard Cond: \_\_\_\_\_ Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	1.0	2	3		
Water Temperature (F) (C)	21.2	20.5	19.8		
pH (Standard Units)	4.61	4.66	4.67		
Specific Cond. (M/MHOS) (PPM)	48	45	45		
Turbidity (Subjective)	mod	mod	mod		
Odor (Subjective)	none	none	none		
Other: _____					

Sampling Information

1. Date: 8/9/04 2. Time: 14:00 3. Sample Containers (Number/Size/Type): 2/40ml/Ambic  
 4. Analyses requested: BTEXNM  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: HCl 8. Preservative: HCl  
 9. Lab Performing Analyses: FSC 10. Sample Type: Well X; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION  
SUMMARY SHEET**



General

1. Job Name: Hot Sppt #3005 2. Project No.: 1264-44-506  
 3. Sampled By: MO/JN 4. Weather: Sunny, warm  
 5. Location: Chesnee, SC 6. Well #: MW-11  
 7. Well Condition: OK 8. Personnel Present: MO/JN

Water Level Information:

1. Date: 8/9/04 2. Time: 11:00 3. State Water Level: 21.85 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOL  
 5. Height of M.P. above/below (Circle) Land Surface: 2.25  
 6. Method of Water Level Measurement: electric water level meter

Evacuation Procedure (Wells):

1. Date: 8/9/04 2. Time Evacuation Started: 14:05 3. Time Evacuation Finished: 14:12  
 4. Method of Evacuation: bauler 5. Total Well Depth: 28.10 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = 1.0 x 3 = 3.0 Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: new bauler

Meter Calibration:

Buffer pH 7.0 \_\_\_\_\_ Actual Buffer pH 4.0 or 10.0 \_\_\_\_\_ Actual Standard Cond: \_\_\_\_\_ Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	1.0	2.0	3.0		
Water Temperature (F) (C)	21.1	20	20.0		
pH (Standard Units)	4.66	4.63	4.83		
Specific Cond. (M/MHOS) (PPM)	29	30	29		
Turbidity (Subjective)	mod	mod	mod		
Odor (Subjective)	none	none	none		
Other: _____					

Sampling Information

1. Date: 8/9/04 2. Time: 1415 3. Sample Containers (Number/Size/Type): 2/40 ml/Ambic  
 4. Analyses requested: BTEXNM  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: HCl 8. Preservative: HCl  
 9. Lab Performing Analyses: FSC 10. Sample Type: Well X; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_



**SAMPLE COLLECTION  
SUMMARY SHEET**



General

1. Job Name: Hot Spot #3005 2. Project No.: 1264-44-506  
 3. Sampled By: MO/JN 4. Weather: Sunny, warm  
 5. Location: Chesnee, SC 6. Well #: MW-12  
 7. Well Condition: OK 8. Personnel Present: MO/JN

Water Level Information:

1. Date: 8/9/04 2. Time: 14:17 3. State Water Level: 20.29 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOL  
 5. Height of M.P. above (Circle) Land Surface: 0.25  
 6. Method of Water Level Measurement: electric water level meter

Evacuation Procedure (Wells):

1. Date: 8/9/04 2. Time Evacuation Started: 14:20 3. Time Evacuation Finished: 14:30  
 4. Method of Evacuation: bailey 5. Total Well Depth: 30.30 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = 1.5 x 3 = 4.5 Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: new bailey

Meter Calibration:

Buffer pH 7.0 \_\_\_\_\_ Actual Buffer pH 4.0 or 10.0 \_\_\_\_\_ Actual \_\_\_\_\_ Standard Cond: \_\_\_\_\_ Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	1.5	3.0	4.5		
Water Temperature (F) (C)	21.2	19.5	20.0		
pH (Standard Units)	5.18	5.19	5.18		
Specific Cond. (M/MHOS) (PPM)	46	44	47		
Turbidity (Subjective)	mod-high	high	high		
Odor (Subjective)	none	none	none		
Other:					

Sampling Information

1. Date: 8/9/04 2. Time: 1435 3. Sample Containers (Number/Size/Type): 2/40 ml/Ambic  
 4. Analyses requested: BTEXNM  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: HCl 8. Preservative: HCl  
 9. Lab Performing Analyses: FSC 10. Sample Type: Well X; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION  
SUMMARY SHEET**



General

1. Job Name: Hot Spill #3005 2. Project No.: 1264-99-506  
 3. Sampled By: MO/JN 4. Weather: Sunny, warm  
 5. Location: Chesnee, SC 6. Well #: MW-13  
 7. Well Condition: OK 8. Personnel Present: MO/JN

Water Level Information:

1. Date: 8/9/04 2. Time: 11:00 3. State Water Level: 21.34 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOL  
 5. Height of M.P. above/below (Circle) Land Surface: 2.25  
 6. Method of Water Level Measurement: electric water level meter

Evacuation Procedure (Wells):

1. Date: 8/9/04 2. Time Evacuation Started: 1442 3. Time Evacuation Finished: 14:50  
 4. Method of Evacuation: bauler 5. Total Well Depth: 26.90 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = 1.0 x 3 = 3.0 Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: new bauler

Meter Calibration:

Buffer pH 7.0 \_\_\_\_\_ Actual Buffer pH 4.0 or 10.0 \_\_\_\_\_ Actual Standard Cond: \_\_\_\_\_ Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	1.0	2.0	<del>3.0</del> 2.25		
Water Temperature (F) (C)	21.2	20.0	19.9	/	
pH (Standard Units)	5.27	5.28	5.36		
Specific Cond. (M/MHOS) (PPM)	49	46	50		DRY
Turbidity (Subjective)	high	high	mod		
Odor (Subjective)	none	none	none		
Other:					

Sampling Information

1. Date: 8/9/04 2. Time: 14:55 3. Sample Containers (Number/Size/Type): 2/40ml/Amber  
 4. Analyses requested: BTEXNM  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: HCl 8. Preservative: HCl  
 9. Lab Performing Analyses: ESC 10. Sample Type: Well X; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**APPENDIX D**

**Laboratory Analytical Data and Chain of Custody**



**ENVIRONMENTAL  
SCIENCE CORP.**

12065 Lebanon Rd.  
Mt. Juliet, TN 37122  
(615) 758-5858  
1-800-767-5859  
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

**REPORT OF ANALYSIS**

Mr. Mike O Connell  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

August 16, 2004

Date Received : August 10, 2004  
Description : GW - Hot Spot 3005  
Sample ID : MW-1D  
Collected By : Michael OConnell  
Collection Date : 08/09/04 11:30

ESC Sample # : L164886-01  
Site ID :  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	08/11/04	1
Toluene	BDL	5.0	ug/l	8260B	08/11/04	1
Ethylbenzene	BDL	1.0	ug/l	8260B	08/11/04	1
Total Xylenes	BDL	3.0	ug/l	8260B	08/11/04	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	08/11/04	1
Naphthalene	BDL	5.0	ug/l	8260B	08/11/04	1
Surrogate Recovery						
Toluene-d8	100		% Rec.	8260B	08/11/04	1
Dibromofluoromethane	94.		% Rec.	8260B	08/11/04	1
4-Bromofluorobenzene	110		% Rec.	8260B	08/11/04	1

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**AUG 17 2004**

  
\_\_\_\_\_  
Tom Mellette, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

Note:

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**REPORT OF ANALYSIS**

Mr. Mike O Connell  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

August 16, 2004

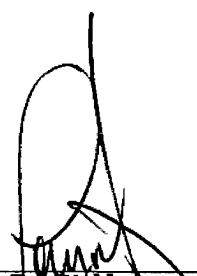
Date Received : August 10, 2004  
Description : GW - Hot Spot 3005  
Sample ID : MW-2  
Collected By : Michael OConnell  
Collection Date : 08/09/04 11:25

ESC Sample # : L164886-02

Site ID :

Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	40.	5.0	ug/l	8260B	08/11/04	5
Toluene	27.	25.	ug/l	8260B	08/11/04	5
Ethylbenzene	23.	5.0	ug/l	8260B	08/11/04	5
Total Xylenes	180	15.	ug/l	8260B	08/11/04	5
Methyl tert-butyl ether	25.	5.0	ug/l	8260B	08/11/04	5
Napthalene	62.	25.	ug/l	8260B	08/11/04	5
Surrogate Recovery						
Toluene-d8	93.		‡ Rec.	8260B	08/11/04	5
Dibromofluoromethane	95.		‡ Rec.	8260B	08/11/04	5
4-Bromofluorobenzene	110		‡ Rec.	8260B	08/11/04	5



Tom Melleite, ESC Representative

BDL - Below Detection Limit  
Det. Limit - Estimated Quantitation Limit (EQL)

**Laboratory Certification Numbers:**

AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

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**REPORT OF ANALYSIS**

Mr. Mike O Connell  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

August 16, 2004

Date Received : August 10, 2004  
Description : GW - Hot Spot 3005

ESC Sample # : L164886-03

Sample ID : MW-3

Site ID :

Collected By : Michael OConnell  
Collection Date : 08/09/04 15:15

Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	130	20.	ug/l	8260B	08/11/04	20
Toluene	BDL	100	ug/l	8260B	08/11/04	20
Ethylbenzene	57.	20.	ug/l	8260B	08/11/04	20
Total Xylenes	410	60.	ug/l	8260B	08/11/04	20
Methyl tert-butyl ether	860	20.	ug/l	8260B	08/11/04	20
Naphthalene	800	100	ug/l	8260B	08/11/04	20
Surrogate Recovery						
Toluene-d8	96.		‡ Rec.	8260B	08/11/04	20
Dibromofluoromethane	94.		‡ Rec.	8260B	08/11/04	20
4-Bromofluorobenzene	110		‡ Rec.	8260B	08/11/04	20

  
Tom Mellette, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers

AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

Note:

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**REPORT OF ANALYSIS**

Mr. Mike O Connell  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

August 16, 2004

Date Received : August 10, 2004  
Description : GW - Hot Spot 3005

ESC Sample # : L164886-04

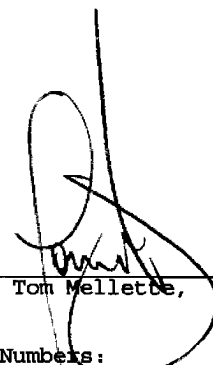
Sample ID : MW-4

Site ID :

Collected By : Michael OConnell  
Collection Date : 08/09/04 13:15

Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	08/11/04	1
Toluene	BDL	5.0	ug/l	8260B	08/11/04	1
Ethylbenzene	BDL	1.0	ug/l	8260B	08/11/04	1
Total Xylenes	BDL	3.0	ug/l	8260B	08/11/04	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	08/11/04	1
Naphthalene	BDL	5.0	ug/l	8260B	08/11/04	1
Surrogate Recovery						
Toluene-d8	100		% Rec.	8260B	08/11/04	1
Dibromofluoromethane	94.		% Rec.	8260B	08/11/04	1
4-Bromofluorobenzene	100		% Rec.	8260B	08/11/04	1



Tom Mellette, ESC Representative

BDL - Below Detection Limit  
Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:  
AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

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**REPORT OF ANALYSIS**

Mr. Mike O Connell  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

August 16, 2004

Date Received : August 10, 2004  
Description : GW - Hot Spot 3005

ESC Sample # : L164886-05

Sample ID : MW-5

Site ID :

Collected By : Michael OConnell  
Collection Date : 08/09/04 15:00

Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	08/11/04	1
Toluene	BDL	5.0	ug/l	8260B	08/11/04	1
Ethylbenzene	BDL	1.0	ug/l	8260B	08/11/04	1
Total Xylenes	BDL	3.0	ug/l	8260B	08/11/04	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	08/11/04	1
Naphthalene	BDL	5.0	ug/l	8260B	08/11/04	1
Surrogate Recovery						
Toluene-d8	98.		% Rec.	8260B	08/11/04	1
Dibromofluoromethane	100		% Rec.	8260B	08/11/04	1
4-Bromofluorobenzene	100		% Rec.	8260B	08/11/04	1



Tom Mellette, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

Note:

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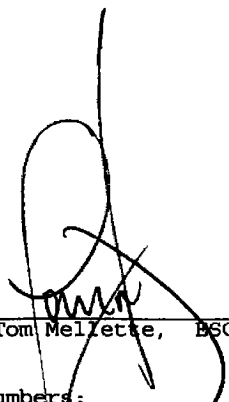
August 16, 2004

Mr. Mike O Connell  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

Date Received : August 10, 2004  
Description : GW - Hot Spot 3005  
Sample ID : MW-6  
Collected By : Michael OConnell  
Collection Date : 08/09/04 11:44

ESC Sample # : L164886-06  
Site ID :  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	2.2	1.0	ug/l	8260B	08/14/04	1
Toluene	BDL	5.0	ug/l	8260B	08/14/04	1
Ethylbenzene	5.7	1.0	ug/l	8260B	08/14/04	1
Total Xylenes	60.	3.0	ug/l	8260B	08/14/04	1
Methyl tert-butyl ether	12.	1.0	ug/l	8260B	08/14/04	1
Naphthalene	22.	5.0	ug/l	8260B	08/14/04	1
Surrogate Recovery						
Toluene-d8	97.		% Rec.	8260B	08/14/04	1
Dibromofluoromethane	100		% Rec.	8260B	08/14/04	1
4-Bromofluorobenzene	94.		% Rec.	8260B	08/14/04	1



Tom Mellette, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E47487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

Note:

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1-800-767-5859  
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

**REPORT OF ANALYSIS**

Mr. Mike O Connell  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

August 16, 2004

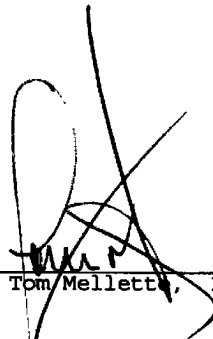
Date Received : August 10, 2004  
Description : GW - Hot Spot 3005  
Sample ID : MW-7  
Collected By : Michael OConnell  
Collection Date : 08/09/04 12:00

ESC Sample # : L164886-07

Site ID :

Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	08/11/04	1
Toluene	BDL	5.0	ug/l	8260B	08/11/04	1
Ethylbenzene	BDL	1.0	ug/l	8260B	08/11/04	1
Total Xylenes	BDL	3.0	ug/l	8260B	08/11/04	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	08/11/04	1
Naphthalene	BDL	5.0	ug/l	8260B	08/11/04	1
Surrogate Recovery						
Toluene-d8	99.		% Rec.	8260B	08/11/04	1
Dibromofluoromethane	97.		% Rec.	8260B	08/11/04	1
4-Bromofluorobenzene	100		% Rec.	8260B	08/11/04	1



Tom Melletts, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

Note:

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**REPORT OF ANALYSIS**

Mr. Mike O Connell  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

August 16, 2004

Date Received : August 10, 2004  
Description : GW - Hot Spot 3005  
Sample ID : MW-8  
Collected By : Michael OConnell  
Collection Date : 08/09/04 13:40

ESC Sample # : L164886-08

Site ID :

Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	08/11/04	1
Toluene	BDL	5.0	ug/l	8260B	08/11/04	1
Ethylbenzene	BDL	1.0	ug/l	8260B	08/11/04	1
Total Xylenes	BDL	3.0	ug/l	8260B	08/11/04	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	08/11/04	1
Naphthalene	BDL	5.0	ug/l	8260B	08/11/04	1
Surrogate Recovery						
Toluene-d8	100		% Rec.	8260B	08/11/04	1
Dibromofluoromethane	94.		% Rec.	8260B	08/11/04	1
4-Bromofluorobenzene	100		% Rec.	8260B	08/11/04	1

  
Tom Mellette, ESC Representative

BDL - Below Detection Limit  
Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:  
AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - B4004, TN - 2006, VA - 00109, WV - 233

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**REPORT OF ANALYSIS**

Mr. Mike O Connell  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

August 16, 2004

Date Received : August 10, 2004  
Description : GW - Hot Spot 3005  
Sample ID : MW-9  
Collected By : Michael OConnell  
Collection Date : 08/09/04 11:45

ESC Sample # : L164886-09

Site ID :

Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	08/11/04	1
Toluene	BDL	5.0	ug/l	8260B	08/11/04	1
Ethylbenzene	BDL	1.0	ug/l	8260B	08/11/04	1
Total Xylenes	BDL	3.0	ug/l	8260B	08/11/04	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	08/11/04	1
Naphthalene	BDL	5.0	ug/l	8260B	08/11/04	1
Surrogate Recovery						
Toluene-d8	97.		% Rec.	8260B	08/11/04	1
Dibromofluoromethane	94.		% Rec.	8260B	08/11/04	1
4-Bromofluorobenzene	100		% Rec.	8260B	08/11/04	1



Tom Mellotte, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

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**REPORT OF ANALYSIS**

Mr. Mike O Connell  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

August 16, 2004

Date Received : August 10, 2004  
Description : GW - Hot Spot 3005  
Sample ID : MW-10  
Collected By : Michael OConnell  
Collection Date : 08/09/04 14:00

ESC Sample # : L164886-10

Site ID :

Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	08/11/04	1
Toluene	BDL	5.0	ug/l	8260B	08/11/04	1
Ethylbenzene	BDL	1.0	ug/l	8260B	08/11/04	1
Total Xylenes	BDL	3.0	ug/l	8260B	08/11/04	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	08/11/04	1
Naphthalene	BDL	5.0	ug/l	8260B	08/11/04	1
Surrogate Recovery						
Toluene-d8	100		% Rec.	8260B	08/11/04	1
Dibromofluoromethane	99.		% Rec.	8260B	08/11/04	1
4-Bromofluorobenzene	100		% Rec.	8260B	08/11/04	1

  
Tom Merlette, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

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**REPORT OF ANALYSIS**

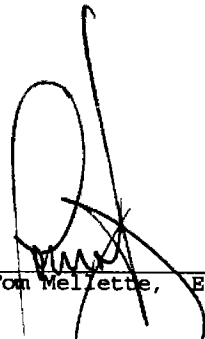
Mr. Mike O Connell  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

August 16, 2004

Date Received : August 10, 2004  
Description : GW - Hot Spot 3005  
Sample ID : MW-11  
Collected By : Michael OConnell  
Collection Date : 08/09/04 14:15

ESC Sample # : L164886-11  
Site ID :  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	08/11/04	1
Toluene	BDL	5.0	ug/l	8260B	08/11/04	1
Ethylbenzene	BDL	1.0	ug/l	8260B	08/11/04	1
Total Xylenes	BDL	3.0	ug/l	8260B	08/11/04	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	08/11/04	1
Naphthalene	BDL	5.0	ug/l	8260B	08/11/04	1
Surrogate Recovery						
Toluene-d8	100		% Rec.	8260B	08/11/04	1
Dibromofluoromethane	99.		% Rec.	8260B	08/11/04	1
4-Bromofluorobenzene	110		% Rec.	8260B	08/11/04	1



Tom Mellette, ESC Representative

BDL - Below Detection Limit  
Det. Limit - Estimated Quantitation Limit (EQL)  
Laboratory Certification Numbers:  
AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

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**REPORT OF ANALYSIS**

Mr. Mike O Connell  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

August 16, 2004

Date Received : August 10, 2004  
Description : GW - Hot Spot 3005  
Sample ID : MW-12  
Collected By : Michael OConnell  
Collection Date : 08/09/04 14:35

ESC Sample # : L164886-12  
Site ID :  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	08/11/04	1
Toluene	BDL	5.0	ug/l	8260B	08/11/04	1
Ethylbenzene	BDL	1.0	ug/l	8260B	08/11/04	1
Total Xylenes	BDL	3.0	ug/l	8260B	08/11/04	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	08/11/04	1
Naphthalene	BDL	5.0	ug/l	8260B	08/11/04	1
Surrogate Recovery						
Toluene-d8	99.		% Rec.	8260B	08/11/04	1
Dibromofluoromethane	100		% Rec.	8260B	08/11/04	1
4-Bromofluorobenzene	93.		% Rec.	8260B	08/11/04	1

  
Tom Melleste, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

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**REPORT OF ANALYSIS**

August 16, 2004

Mr. Mike O Connell  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

Date Received : August 10, 2004  
Description : GW - Hot Spot 3005  
Sample ID : MW-13  
Collected By : Michael OConnell  
Collection Date : 08/09/04 14:55

ESC Sample # : L164886-13  
Site ID :  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	08/11/04	1
Toluene	BDL	5.0	ug/l	8260B	08/11/04	1
Ethylbenzene	BDL	1.0	ug/l	8260B	08/11/04	1
Total Xylenes	BDL	3.0	ug/l	8260B	08/11/04	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	08/11/04	1
Naphthalene	BDL	5.0	ug/l	8260B	08/11/04	1
Surrogate Recovery						
Toluene-d8	100		% Rec.	8260B	08/11/04	1
Dibromofluoromethane	99.		% Rec.	8260B	08/11/04	1
4-Bromofluorobenzene	100		% Rec.	8260B	08/11/04	1

  
Tom Mellette, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233

Note:

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**S&ME Inc. - Spartanburg SC**

155 Tradd Street  
Spartanburg, SC 29301

Report to: **Mr. Mike O Connell** Email: **moconnell@smeinc.com**

Project Description: **Waters for Hot Spot 3005** City/State Collected: **Chassee, SC**

Phone: (864) 574-2360 Client Project #: **1264-99-506** Lab Project #: **SMESPAR-1264-99-506**  
 FAX: (864) 576-8730

Collected by (print): **Michael O'Connell** Site/Facility ID#: \_\_\_\_\_ P.O.#: **1264-99-506**

Collected by (signature): *[Signature]*  
 Rush? ( Lab MUST Be Notified )  
 \_\_\_ Same Day ..... 200%  
 \_\_\_ Next Day ..... 100%  
 \_\_\_ Two Day ..... 50%  
 Packed on Ice: N  Y

Date Results Needed  
 Email? \_\_\_ No  Yes  
 FAX? \_\_\_ No  Yes

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Remarks/Contaminant	Sample # (lab only)
MW-1D	Grab	GW	N/A	8/9/04	1130	2		L164886-01
MW-2		GW			1125	2		02
MW-3		GW			1515	2		03
MW-4		GW			1315	2		04
MW-5		GW			1500	2		05
MW-6		GW			1144	2		06
MW-7		GW			1200	2		07
MW-8		GW			1340	2		08
MW-9		GW			1145	2		09

\*Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other \_\_\_\_\_

pH \_\_\_\_\_ Temp \_\_\_\_\_

Remarks:

Flow \_\_\_\_\_ Other \_\_\_\_\_

TRK # 8446 7389 0805

Relinquished by: (Signature) <i>[Signature]</i>	Date: 8/9/04	Time: 1700	Received by: (Signature) <i>[Signature]</i>	Samples returned via: <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Courier	Condition: (lab use only)
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received by: (Signature) <i>[Signature]</i>	Temp: 2.30	OK
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received for lab by: (Signature) <i>[Signature]</i>	Bottles Received: 20 Date: 8/10/04 Time: 9:00	

**S&ME Inc. - Spartanburg SC**

155 Tradd Street  
Spartanburg, SC 29301

Report to: **Mr. Mike O Connell** Email: **moconnell@smeinc.com**

Project Description: **Waters for Hot Spot 3005** City/State Collected: **Chesnee, SC**

Phone: (864) 574-2360 Client Project #: **1264-99-506** Lab Project #: **SMESPAR-1264-99-506**  
 FAX: (864) 576-8730

Collected by (print): **Michael O'Connell** Site/Facility ID#: \_\_\_\_\_ P.O.#: **1264-99-506**

Collected by (signature): *[Signature]*  
 Rush?  (Lab MUST Be Notified)  
 \_\_\_ Same Day ..... 200%  
 \_\_\_ Next Day ..... 100%  
 \_\_\_ Two Day ..... 50%  
 Packed on Ice: **N**  **Y**   
 Date Results Needed: \_\_\_\_\_  
 Email? \_\_\_ No  Yes  
 FAX? \_\_\_ No  Yes

Prepared by:  
**ENVIRONMENTAL SCIENCE CORP.**  
 12065 Lebanon Road  
 Mt. Juliet, TN 37122  
 Phone (800) 767-5859  
 FAX (615) 758-5859

CoCode: **SMESPAR** (lab use only)  
 Template/Prelogin: **T8081 / P118720**  
 Cooler #: **SAB 7/13**  
 Shipped Via: **FedEX Ground**

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs					Remarks/Contaminant	Sample # (lab only)
MW-10	Grab	GW	N/A	8/9/04	1400	2	X					L104886-10
MW-11	↓	GW	↓	↓	1415	2	X					11
MW-12	↓	GW	↓	↓	1435	2	X					12
MW-13	↓	GW	↓	↓	1455	2	X					13
		GW				2	X					
		GW				2	X					

V8260BTEXMIN 40mlAmb-HCl

\*Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other \_\_\_\_\_

Remarks:

pH \_\_\_\_\_ Temp \_\_\_\_\_  
 Flow \_\_\_\_\_ Other \_\_\_\_\_

Relinquished by: (Signature) <i>[Signature]</i>	Date: <b>8/9/04</b>	Time: <b>1700</b>	Received by: (Signature) <i>[Signature]</i>	Samples returned via: <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Courier	Condition: (lab use only)
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received by: (Signature) <i>[Signature]</i>	Temp: <b>2.3°</b> Bottles Received: <b>26</b>	<b>OK</b>
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received for lab by: (Signature) <i>[Signature]</i>	Date: <b>8/10/04</b> Time: <b>9:00</b>	



C. Earl Hunter, Commissioner

*Promoting and protecting the health of the public and the environment.*

NOV 19 2004

MS JUDY LAUGHTER  
R L JORDAN OIL CO OF NC  
PO BOX 2527  
SPARTANBURG SC 29304

Re: Hot Spot #3005, SC Hwy. 221, Chesnee, SC  
UST Permit # 12719; CA #23299; UMW-18771  
Release #2 reported August 4, 2003  
Monitoring Report received August 27, 2004  
Spartanburg County



Dear Ms. Laughter:

The Underground Storage Tank (UST) Program of the South Carolina Department of Health and Environmental Control (SCDHEC) recognizes your commitment to continue work at this site utilizing your own contractor.

The next scope of work to be implemented at this site is installation of one monitoring well to fully define the contaminant plume, completion of one 8-hr. Aggressive Fluid Vapor Recovery (AFVR) event, and a comprehensive sampling event. Cost Agreement #23299 has been approved in the amount shown on the enclosed Approved Cost Agreement to complete the necessary work. Please be advised that only EPA Method 8260B will be accepted for purgeable aromatics. Please note that all applicable South Carolina certification requirements apply to the laboratory services, well installation, and report preparation. Approval for the installation of one (1) shallow groundwater monitoring well has been provided to your environmental consultant; a copy is enclosed for your records. **A Report of Findings and the invoice are due within 90 days from the date of this letter.** Please have your contractor submit installation and sampling results to the Program in a monitoring report containing the following items:

- Updated site map and subsequent survey including the recently installed monitoring well.
- Completed well installation log for the additional monitoring well.
- A narrative portion documenting the AFVR and sampling event noting current site conditions, the names of the AFVR and sampling contractor, field personnel, date, time the AFVR event started and ended, ambient air temperature, general weather conditions during the AFVR and sampling events, and the estimated amount in gallons of the petroleum products removed as a liquid or vapor for the AFVR event. Wells containing free product should be gauged at the beginning and end of the AFVR event. Disposal manifests for the AFVR event should be included as part of the final report. The report shall also contain well purging data, pH, specific conductivity, water temperature, PID readings (where applicable) and turbidity comments.
- Well measurements (groundwater elevations, depth to groundwater, measurable free product thickness (where applicable), total well depth, screened interval) and groundwater laboratory analytical data for all monitoring wells associated with the site, unless otherwise directed by the Program, shall be presented in tabular format. A groundwater elevation contour map of the site based on current groundwater potentiometric data.
- A CoC map based on current groundwater laboratory analytical data. The groundwater data should be adjacent to the relevant monitoring well.

- Manifests for any contaminated soil and/or groundwater removed from the site for treatment and/or disposal.
- Signature and seal by a professional geologist or engineer registered in the State of South Carolina.

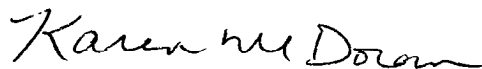
According to our records, the release was reported to the Bureau on August 4, 2003. In accordance with Section 44-2-40(D) of the State Underground Petroleum Environmental Response Bank (SUPERB) Act, you are responsible for the first \$25,000 for site rehabilitation. To insure that any expenditure you make applies to this \$25,000 deductible, it is prudent for this agency to pre-approve such costs along with your technical plan of action. By law, the SUPERB Account cannot compensate any costs that are not pre-approved. Eligible costs exceeding the \$25,000 deductible can be compensated from the SUPERB Account. Please remember that, pursuant to Reg. 61-92, Subpart H, Section 280.114, you are required to notify the Program by certified mail within ten (10) days of commencing a voluntary or involuntary proceeding in bankruptcy. State law also requires that an owner, operator, or guarantor that files for bankruptcy protection must immediately submit the appropriate forms documenting that entity's ability to demonstrate financial responsibility.

Rehabilitation activities at the site should be resumed immediately upon receipt of this letter. One 8-hour Aggressive Fluid Vapor Recovery (AFVR) event should be completed to remove free product from monitoring well MW-1 at the referenced facility. If the monitoring well does not contain measurable free phase product, the AFVR Event should not be conducted and the UST Program contacted immediately. One additional monitoring well should be installed directly downgradient of MW-3. Final monitoring wells shall be properly installed and bracketed at the water table. The comprehensive sampling event should take place no sooner than thirty (30) days following the AFVR event, and should include one sample from the creek located 600 feet south of the site.

The Bureau of Land and Waste Management grants pre-approval for transportation of virgin petroleum contaminated groundwater/soil from the referenced site to a permitted treatment facility. The contaminated groundwater/soil must be properly stored in labeled containers or covered with plastic as appropriate. The contaminated groundwater/soil must be accepted by the approved treatment facility. There can be no spillage or leakage in transport. 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 final report. If the levels of petroleum contamination based on laboratory analysis are below risk-based screening levels, please contact the project manager for approval to dispose of soil and/or groundwater on site. The SUPERB Account will not compensate for transportation or treatment of clean soil and/or groundwater.

On all correspondence regarding this site, please reference UST Permit #12719. If you have any questions, contact me by phone at (803) 896-6586 or (800) 826-5435 (within South Carolina only), by fax at (803) 896-6245, or by email at [dorankm@dhec.sc.gov](mailto:dorankm@dhec.sc.gov).

Sincerely,



Karen M. Doran, Hydrogeologist  
Northeastern SC Corrective Action Section  
Assessment and Corrective Action Division  
Underground Storage Tank Program  
Bureau of Land and Waste Management

enc: Approved Cost Agreement (ACA)  
Copy of Monitoring Well Approval (MWA)  
cc: S&ME, Inc., 155 Tradd St., Spartanburg, SC 29301 (w/ MWA & copy of ACA)  
Technical File (w/ copy of MWA & copy of ACA)



C. Earl Hunter, Commissioner

*Promoting and protecting the health of the public and the environment.*

## Monitoring Well Installation Approval Form

Date of Issue: November 4, 2004

Approval No.: UMW-18771

Approval is hereby granted to: R.L. Jordan Co. of NC, Inc.

UST Permit #: 12719

Facility: Hot Spot #3005, S.C. Hwy. 221, Chesnee, SC

County: Spartanburg

This approval is for the construction of one permanent monitoring well in accordance with the construction plans and technical specifications outlined in the SC Well Standards and Regulations. The well is to be constructed within the surficial aquifer for the intended purpose of contaminant recovery at the referenced facility. Approval is provided with the following conditions:

1. The latitude and longitude, surveyed elevations, boring and/or geologist logs and actual (as built) construction details for each well be submitted to my attention as part of the Monitoring Well Installation Report.
2. Each well shall be labeled with an identification plate constructed of a durable material affixed to the casing or surface pad where it is readily visible. The plate shall provide monitoring well I.D.#, date of construction, static water level, and driller name and state certification #.
3. Temporary wells must be properly abandoned within 30 days from the date of installation.
4. Well construction and sampling derived waste including, but not necessarily limited to, drill cuttings, drilling fluids, development and purge water should be managed properly and in compliance with applicable requirements. If containerized, each vessel should be clearly labeled with regard to contents, source, and date of activity.
5. A minimum of forty-eight (48) hours prior to initiation of drilling activities, please provide notice to Karen Doran at (803) 896-6586 or [dorankm@dhec.sc.gov](mailto:dorankm@dhec.sc.gov) and Aubrey Stewart at (864) 596-3800 or [stewarsa@dhec.sc.gov](mailto:stewarsa@dhec.sc.gov).
6. Please provide ground-water quality analytical data (chemical analysis and/or water level(s)) associated measurements (i.e., in-situ field measurements) to my attention with the Assessment Report.
7. Monitoring wells shall be installed by a permanently licensed well driller certified by the State of South Carolina.

This approval is pursuant to the provisions of Section 44-55-40 of the 1976 South Carolina Code of Laws and the Department of Health and Environmental Control Regulations R.61-71. **Please remember to have a copy of this approval on the site during well installation.**

Approved by:

Karen M. Doran, Hydrogeologist  
Northeastern SC Corrective Action Section  
Assessment and Corrective Action Division  
Underground Storage Tank Program  
Bureau of Land and Waste Management

cc: Technical File

# Approved Cost Agreement 23299

Facility: 12719 HOT SPOT 3005

DORANKM

PO Number:

<u>Task / Description</u>	<u>Categories</u>	<u>Item Description</u>	<u>Qty / Pct</u>	<u>Unit Price</u>	<u>Amount</u>
04 MOB/DEMOB		A EQUIPMENT	2.0000	500.00	1,000.00
		B PERSONNEL	4.0000	250.00	1,000.00
09 WELL INSTALLATION		B WATER TABLE (DRILLED)	35.0000	38.00	1,330.00
10 SAMPLE COLLECTION		A GROUND WATER	9.0000	55.00	495.00
		C WATER SUPPLY	1.0000	25.00	25.00
		D GROUNDWATER NO-PURGE	6.0000	35.00	210.00
		E GAUGE WELL ONLY	1.0000	20.00	20.00
11 ANALYSES	GW GROUNDWATER	A BTEX+NAPTH+MTBE	16.0000	100.00	1,600.00
16 SUBSEQUENT SURVEY		SUBSEQUENT SURVEY	1.0000	260.00	260.00
17 DISPOSAL		A1 WASTEWATER - PURGING/SAMPLING	2.0000	90.00	180.00
		C SOIL (TREATMENT/DISPOSAL)	2.0000	50.00	100.00
19 RPT/PROJECT MNGT & COORDINATIO		PCT PERCENT	0.1500	6,220.00	933.00
			<b>Total Amount</b>		<b>7,153.00</b>

12719



**SC DHEC - UST Owner/Operator Lead Contractor Choice Form**

**RECEIVED**

FEB 03 2005

UNDERGROUND STORAGE TANK PROGRAM

As the UST Owner/Operator of Sites with DHEC ID #'s: **RL Jordan Oil Company** (see attached)

We would like to use the contractor or person(s) listed below and request that they represent me for: (check appropriate listed)

- Initial Groundwater Assessment
- all future assessment scopes.
- all Corrective Actions

Name of SC DHEC Certified Contractor      **TERRY Environmental Services, Inc. Contractor # 223**  
Address      **P.O. Box 25, Summerville, South Carolina 29484**  
Telephone Number      **(843) 873-8200**

Note: Site rehabilitation activities must be performed by a SCDHEC Certified Site Rehabilitation Contractor in accordance with R.61-98. You may change this selection in the future should you so desire. To verify a certified Contractor, please call SCDHEC at 803-896-6240)

**1. FINANCIAL OR FAMILIAL RELATIONSHIP**

Does a financial or familial relationship, as defined below, exist between you and the contractor/person that you listed above? Please initial where applicable.

\_\_\_\_\_ Yes                       No

Financial relationship: A connection or association through a material interest of sources of income which exceed five percent of annual gross income from a business entity.

Familial Relationship: A connection or association by family or relatives, in which a family member or relative has a material interest. Family or relatives include: father, mother, son, daughter, brother, sister, uncle, aunt, first cousin, nephew, niece, husband, wife, father-in-law, mother-in-law, daughter-in-law, step father, stepmother, stepson, stepdaughter, stepbrother, stepsister, half brother, half sister, grandparent, grandchild, great grandchild, step grandparent, step great grandparent, step grandchild, step great grandchild, or fiancée.

**2. PAYMENT**

You can pay the contractor and, upon submittal of the canceled check (or a notarized statement from the contractor), be compensated from the SUPERB Account, or have payment issued directly from us to the contractor. Note: All costs must receive prior financial approval from the Department regardless of payment option. Please initial by your choice.

I request that payment be made to me after I have paid the contractor. \_\_\_\_\_ Yes \_\_\_\_\_ No

I request that payment be made directly to the contractor.  Yes \_\_\_\_\_ No

UST Owner/Operator Signature: *R.L. Jordan Oil Company of North Carolina, Inc.*  
By: *Judith A. Laughters, Agent*

Print Name: Judith A. Laughters, Agent

Date: 2/3/05



**RECEIVED**

MAR 10 2005

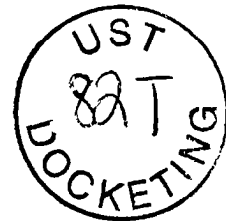
March 9, 2005

R.L. Jordan Oil Company  
P.O. Box 2527  
Spartanburg, South Carolina 29304

UNDERGROUND STORAGE TANK

ATTENTION: Judy Laughter

Reference: **AFVR AND ASSESSMENT REPORT**  
**Hot Spot #3005**  
SC Highway 221  
Chesnee, South Carolina  
SCDHEC UST Permit No. 12719  
S&ME Project No. 1264-99-506



Dear Ms. Laughter:

S&ME, Inc. (S&ME) has completed assessment activities for the Hot Spot #3005 (also known as Hot Spot #36) underground storage tank (UST) facility as directed by the South Carolina Department of Health and Environmental Control (SCDHEC). The work was to have included completion of an Aggressive Fluid Vapor Recovery (AFVR) event, and installation of one type II monitoring well, followed by completion of a comprehensive sampling of all wells associated with the site assessment, and collection of a surface water sample from a nearby stream. Due to lack of free product measurable at the site at the time of the AFVR, the event was cancelled per SCDHEC's direction. However, one new monitoring well was installed, and surface water and groundwater samples were collected. A report of the findings with field and analytical data is enclosed.

Chemicals of concern (CoC) exceeding their respective RBSLs were detected in groundwater samples collected from four wells (MW-1, MW-2, MW-3, and MW-6). The CoC are benzene, toluene, ethylbenzene, xylene, naphthalene, and MTBE. Benzene, naphthalene, and MTBE were detected above their respective RBSLs in at least one well. MTBE was the only analyte detected



from the collected surface water sample. While this concentration was relatively low, no maximum contaminant level has been established for MTBE in surface or drinking water, and so results cannot be evaluated against a cleanup criterion.

We appreciate the opportunity to work with you on this project. If you have any questions or comments regarding this report, please contact our office at (864) 574-2360.

Sincerely,

**S&ME, Inc.**



Heather L. Hollen  
Environmental Scientist



David Klemm, P.G.  
Senior Geologist

Cc: Karen Doran, SCDHEC

AFVR AND ASSESSMENT REPORT

**RECEIVED**

**HOT SPOT #3005**

**MAR 10 2005**

**CHESNEE, SOUTH CAROLINA**

**SCDHEC UST PERMIT NO. 12719** UNDERGROUND STORAGE  
**S&ME PROJECT NO. 1264-99-506** TANK PROGRAM

Prepared For:

*R.L. Jordan Oil Company*

*Hot Spot*

R.L. Jordan Oil Company

P.O. Box 2527

Spartanburg, South Carolina 29304

Prepared By:



155 Tradd Street

Spartanburg, South Carolina

(864) 574-2360

March 2005

*Heather L. Hollen*

Prepared by:  
Heather L. Hollen  
Environmental Scientist

*David Klemm*

David Klemm, P.G.  
Senior Geologist

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1.0 INTRODUCTION.....	1
2.0 AGGRESSIVE FLUID VAPOR RECOVERY EVENT.....	1
3.0 MONITORING WELL INSTALLATION.....	1
4.0 AQUIFER EVALUATION.....	2
5.0 GROUNDWATER SAMPLING AND ANALYSIS.....	2
6.0 SURFACE WATER SAMPLING AND ANALYSIS.....	4
7.0 CONCLUSIONS AND RECOMMENDATIONS.....	4

### LIST OF FIGURES

1. Topographic Map
2. Potentiometric Map
3. CoC Map

**RECEIVED**

MAR 10 2005

UNDERGROUND STORAGE  
TANK PROGRAM

### LIST OF TABLES

1. Summary of Groundwater Elevation Data
2. Historical Groundwater Quality Data
3. Surface Water Quality Data

### LIST OF APPENDICES

- A. AFVR Field Notes
- B. Monitoring Well Construction Log
- C. Sample Collection Summary Sheets
- D. Laboratory Analytical Data

## **1.0 INTRODUCTION**

As directed by the South Carolina Department of Health and Environmental Control (SCDHEC) in a letter dated November 19, 2004 and on behalf of R.L. Jordan Oil Company, S&ME, Inc. (S&ME) has attempted to complete the Aggressive Fluid Vapor Recovery (AFVR) at the Hot Spot #3005 (also known as Hot Spot #36), though the event was cancelled by SCDHEC upon failure to measure free product onsite. S&ME has, however, completed the requested assessment work for the Hot Spot #3005 underground storage tank (UST) facility (Figure 1). The following sections discuss our sampling and evaluation procedures, results, and conclusions based on the collected data.

## **2.0 AGGRESSIVE FLUID VAPOR RECOVERY EVENT**

For the AFVR event, S&ME subcontracted A&D Environmental and Industrial Services of High Point, North Carolina to provide a vacuum truck and a vacuum truck operator. Upon arrival, however, during preparations for commencement of the event, it was noted that no free product was observable in the well intended for recovery, MW-1. Appendix A contains a summary of the depth to water readings and field notes collected during these preparations. Upon consultation with SCDHEC, it was decided to cancel the event. Therefore, no further field measurements nor calculations for the AFVR event are provided.

## **3.0 MONITORING WELL INSTALLATION**

At the request of SCDHEC, a monitoring well was to be installed down-gradient of monitoring well MW-3. The purpose of the new monitoring well was to further define the western boundary of the onsite contaminant plume. On February 10, 2005, monitoring well installation was performed down-gradient of MW-3. One shallow monitoring well (MW-14) was installed to monitor the groundwater quality along the western boundary of the site. The well was installed to a depth of approximately 31 feet by S&ME, Inc. Screen intervals and top of casing (TOC) elevations for the site monitoring wells are included on Table 1. Monitoring well construction detail is included on the well completion report attached in Appendix B.

Soil cuttings and development water generated installation of this well was containerized in one appropriately labeled 55-gallon drum. The drum is scheduled for pick-up by Palmetto Environmental who will transport the drum to a licensed facility for treatment and disposal. The waste disposal manifest will be provided under separate cover.

#### **4.0 AQUIFER EVALUATION**

On February 15, 2005, S&ME personnel measured fluid levels in all monitoring wells associated with the site assessment. Groundwater levels were converted to groundwater elevations utilizing the TOC elevations established during previous surveys performed at the site. The depth to groundwater ranged from 19.39 to 29.18 feet from the TOC and the groundwater elevation ranged from 72.75 to 87.83 feet relative to a site benchmark with an assumed elevation of 100 feet. A summary of groundwater elevation data is presented in Table 1. This data was used to construct the groundwater potentiometric surface shown on the Potentiometric Map attached as Figure 2.

The groundwater flow direction is estimated from elevation contour lines derived from the known groundwater elevations and linear interpolation between these points. The hydraulic gradient can be estimated as the change in hydraulic head ( $\Delta h$ ) divided by the linear distance between the change in head ( $\Delta l$ ). The general groundwater flow direction within the surficial aquifer appears to be generally towards the southwest under unconfined conditions. Using the change in head across the site from MW-8 to MW-14 (9.65 ft.) and the distance between the two monitoring wells (approximately 360 ft.), the average hydraulic gradient ( $\Delta h/\Delta l$ ) beneath the site is approximately 0.027 feet per foot.

#### **5.0 GROUNDWATER SAMPLING AND ANALYSIS**

On February 15, 2005, S&ME purged and sampled monitoring wells MW-1 through MW-8, and MW-10 through MW-14. Monitoring well MW-1D, a deep well installed during the Tier II assessment, was used to monitor the deep-water aquifer. Monitoring well MW-9 was not

sampled due to an apparent blockage in the well that prohibited access to groundwater. The groundwater samples were collected with new, dedicated 1-liter polyethylene bailers, slowly poured into laboratory-supplied containers and immediately placed on ice in a laboratory-supplied cooler. The groundwater samples were shipped by overnight courier to Environmental Science Corporation (ESC) located in Mt. Juliet, Tennessee (SCDHEC Certification No. 84004) for analysis. Copies of the Sample Collection Summary Sheets for the groundwater sampling are included as Appendix C.

The groundwater samples collected from the monitoring wells were analyzed for the following potential chemicals of concern (CoC): benzene, toluene, ethylbenzene, xylenes (BTEX), naphthalene, and methyl-tertiary-butyl-ether (MTBE) by EPA Method 8260B.

The laboratory analytical results are summarized in Table 2 and the CoC concentrations are included on Figure 3. A copy of the laboratory analytical data is provided as Appendix D. Benzene was detected above its respective RBSL in monitoring wells MW-1, MW-2, MW-3, and MW-6. Naphthalene was detected above its respective RBSL in monitoring well MW-6, and the naphthalene detection limit was greater than the RBSL for samples collected from monitoring wells MW-1, MW-2, and MW-3. MTBE was detected above its respective RBSL in monitoring well MW-3. The Site Specific Target Levels (SSTLs) were not exceeded for any of the analytes for which analysis was performed.

The monitoring well purge water generated during this sampling event was containerized in one additional appropriately labeled 55-gallon drum. This drum, along with the drum generated during installation of MW-14, is scheduled for pick-up by Palmetto Environmental who will transport the drums to a licensed facility for treatment and disposal. The waste disposal manifest will be provided under separate cover.

## **6.0 SURFACE WATER SAMPLING AND ANALYSIS**

On February 15, 2005, per direction from SCDHEC, S&ME sampled the creek located approximately 600 ft. south of the site. The surface water sample was collected directly into laboratory-supplied containers and immediately placed on ice in a laboratory-supplied cooler. The sample was shipped by overnight courier to Environmental Science Corporation (ESC) located in Mt. Juliet, Tennessee (SCDHEC Certification No. 84004) for analysis, along with groundwater samples collected on that same day.

The surface water sample collected was analyzed for the following potential chemicals of concern (CoC): benzene, toluene, ethylbenzene, xylenes (BTEX), naphthalene, and methyl-tertiary-butyl-ether (MTBE) by EPA Method 8260B.

The laboratory analytical results are summarized in Table 3. A copy of the laboratory analytical data is provided as Appendix D. Only MTBE was detected from the surface water sample, at 2.7 ug/L.

## **7.0 CONCLUSIONS AND RECOMMENDATIONS**

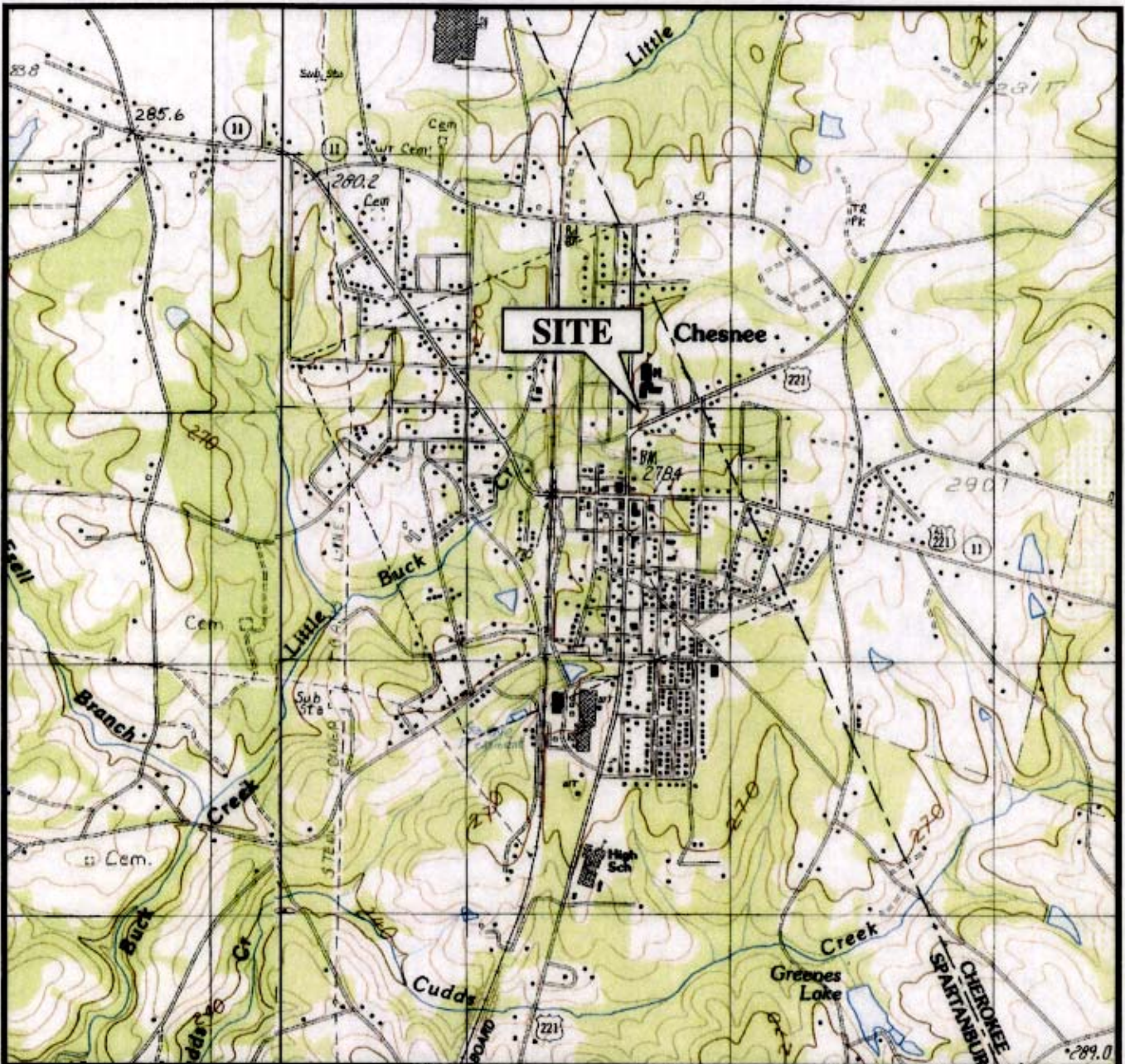
Based upon the results and findings of this phase of assessment, the following conclusions are made for the Hot Spot #3005 site:

- The general trend in groundwater flow is towards the southwest;
- No free product was observed in the well MW-1 where product has historically been noted;
- Benzene, naphthalene, and MTBE were detected at or above their respective RBSLs in at least one well;
- CoC concentrations exceeded RBSLs in four wells (MW-1, -2, -3, and -6) during this most recent sampling event, as they have in previous samplings;
- SSTLs for CoCs were not exceeded in groundwater samples;

- The dissolved CoC concentrations in the wells sampled repeatedly have remained relatively consistent for at least the last two years;
- MW-14 likely defines the down-gradient extent of the contaminant plume as no CoC concentrations were noted above method detection limits;
- The horizontal and vertical extents of dissolved CoC now appear to be adequately defined;  
and
- MTBE, observed at low concentration, was the only analyte detected in a surface water sample from the nearby stream, the most significant receptor as identified during the Tier II Assessment, located approximately 600 ft. south of the site.



# FIGURES



SOURCE: USGS TOPOGRAPHIC MAP, 7.5 MINUTE SERIES

SCALE 1"=2000'

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CHECK BY:

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DRAWN BY: JN

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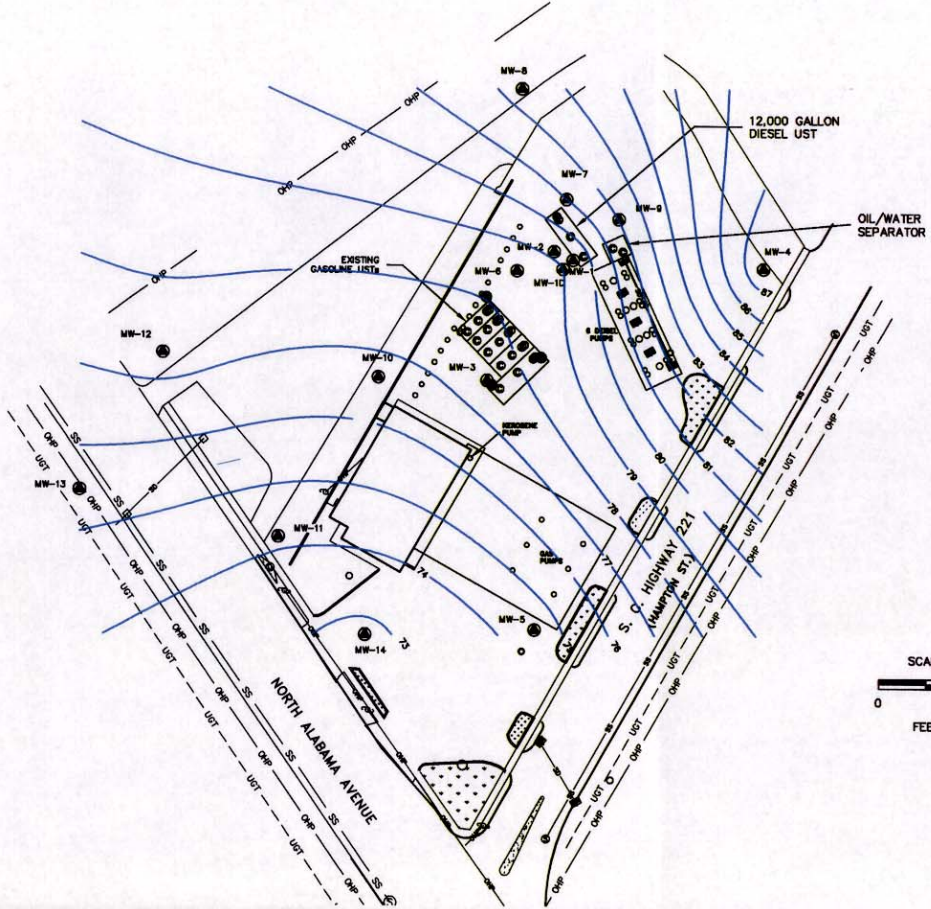
DATE: 08/23/04



**SITE LOCATION MAP**  
**HOT SPOT #3005**  
**Site ID# 12719**  
 SC HWY 221, CHESNEE, SOUTH CAROLINA  
 1264-99-506

FIGURE NO:  
**1**

CADD FILE: \\S:\DATA\1999\0908\3005\3005.POTENTIOMETRIC.MXD



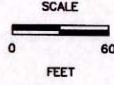
**LEGEND**

- MONITORING WELL LOCATION
- POTENTIOMETRIC GROUNDWATER SURFACE CONTOUR LINE (02-15-05)

- NOTE:
1. MW-2, MW-9 AND MW-10 NOT INCLUDED IN GROUNDWATER SURFACE DETERMINATION
  2. LOCATION OF MW-2 IS APPROXIMATE

SOURCE:

SITE MAP OF HOT SPOT STORE #36  
 FOR S&ME  
 BY GRAMLING BROS. SURVEYING  
 DATE: SEPTEMBER 20, 1999



 <b>S&amp;ME</b> ENGINEERING · TESTING ENVIRONMENTAL SERVICES		
POTENTIOMETRIC MAP <b>HOT SPOT #3005</b> SCDHEC UST PERMIT #12719 107 HAMPTON STREET CHESNEE, SOUTH CAROLINA		
SCALE: 1" = 60'	DRAWN BY: SB	CHK'D BY:
JOB NO: 1264-99-506	DATE: 03-07-2000	FIGURE NO: 2



# **TABLES**

**TABLE 1**  
**SUMMARY OF GROUNDWATER ELEVATION DATA <sup>(1)</sup>**  
**HOT SPOT #3005**  
**107 HAMPTON STREET**  
**CHESNEE, SOUTH CAROLINA**  
**SCDHEC UST PERMIT #: 12719**  
**S&ME PROJECT 1264-99-506**

Well ID	Installation Date	Well Depth (feet)	Screened Interval (feet below grade)	Top of Casing Elevation (feet)	Depth to Liquid (feet)	Depth to Groundwater <sup>(2)</sup> (feet)	Product Thickness (feet)	Groundwater Elevation (feet)
MW-1	4/24/1996	35.00	15.00-30.00	104.89	25.69	25.69	0.00	79.20
MW-1D	9/28/2000	58.64	53.64-58.64	104.61	25.16	25.16	0.00	79.45
MW-2*	Not Known	34.20	Not Known	Not Known	25.94	25.94	0.00	Not Known
MW-3	9/13/1999	32.28	22.28-32.28	104.92	27.38	27.38	0.00	77.54
MW-4	9/14/1999	45.40	35.40-45.40	111.32	23.49	23.49	0.00	87.83
MW-5	9/14/1999	32.25	22.25-32.25	103.57	29.18	29.18	0.00	74.39
MW-6	9/25/2000	36.61	26.61-36.61	104.14	25.78	25.78	0.00	78.36
MW-7	9/25/2000	36.37	26.37-36.37	104.52	23.51	23.51	0.00	81.01
MW-8	9/26/2000	33.69	23.69-33.69	101.79	19.39	19.39	0.00	82.40
MW-9	9/27/2000	35.40	25.40-35.40	105.43	---	---	---	---
MW-10	9/27/2000	27.44	17.44-27.44	96.57	19.92	19.92	0.00	76.65
MW-11	9/27/2000	28.28	18.28-28.28	95.15	20.98	20.98	0.00	74.17
MW-12	9/29/2000	30.60	20.60-30.60	97.03	19.56	19.56	0.00	77.47
MW-13	9/29/2000	27.11	17.11-27.11	95.89	20.43	20.43	0.00	75.46
MW-14	2/10/2005	31.00	21.00-31.00	97.60	24.85	24.85	0.00	72.75

Notes:

(1) Elevations are relative to a temporary assumed benchmark established on-site

(2) Depth to groundwater measurements taken on February 15, 2005.

(3) MW-9 appears to be blocked at approximately 12 feet below ground surface. No water was encountered in the upper, open portion of the well.

\* MW-2 is believed to be a monitoring well installed during site remediation activities. Construction details are not known.

**TABLE 2**  
**HISTORICAL GROUNDWATER QUALITY DATA**  
**HOT SPOT #3005**  
**107 HAMPTON STREET**  
**CHESNEE, SOUTH CAROLINA**  
**SCDHEC UST PERMIT # 12719**  
**S&ME PROJECT 1364-99-506**

WELL	DATE	B µg/L	T µg/L	E µg/L	X µg/L	MTBE µg/L	EDB µg/L	NAPHTH µg/L
MW-1	04/24/96	27.4	88.3	46	170.1	NA	NA	55.7
	09/15/99	FP	FP	FP	FP	FP	FP	FP
	10/13/00	FP	FP	FP	FP	FP	FP	FP
	03/09/01	FP	FP	FP	FP	FP	FP	FP
	09/17/03	FP	FP	FP	FP	FP	FP	FP
	08/09/04	FP	FP	FP	FP	FP	FP	FP
02/15/05	29	<25.0	12	62	37	NA	NA	<25.0
MW-2	09/17/03	1.5	<5.0	<1.0	6.9	8.7	<0.010	<5.0
	08/09/04	40	27	23	180	25	NA	62
	02/15/05	58	<120	<25.0	190	<25.0	NA	<120
MW-3	09/15/99	500	220	100	460	1100	NA	<5.0
	10/16/00	1500	170	290	2000	2200	<1.0	3.6
	03/09/01	3000	130	400	3100	6400	<1.0	<10
	09/17/03	390	<50	170	780	1500	<0.010	<50
	08/09/04	130	<100	57	410	860	NA	800
02/15/05	180	<120	41	320	620	NA	<120	
MW-4	09/20/99	<5.0	<5.0	<5.0	<5.0	<5.0	NA	<5.0
	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	09/17/03	<1.0	<5.0	<1.0	<3.0	<1.0	<0.010	<5.0
	08/09/04	<1.0	<5.0	<1.0	<3.0	<1.0	NA	<5.0
02/15/05	<1.0	<5.0	<1.0	<3.0	<1.0	NA	<5.0	
MW-5	09/15/99	<5.0	21	5	20	<5.0	NA	<5.0
	10/13/00	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	03/08/01	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	09/17/03	<1.0	<5.0	<1.0	<3.0	1.9	<0.010	<5.0
	08/09/04	<1.0	<5.0	<1.0	<3.0	<1.0	NA	<5.0
02/15/05	<1.0	<5.0	<1.0	<3.0	<1.0	NA	<5.0	
MW-6	10/16/00	7.4	3.5	29	81	<1.0	<1.0	44
	03/08/01	3.3	<2.0	36	76	<2.0	<1.0	68
	09/17/03	<1.0	<5.0	1.5	9.3	<1.0	<0.010	8.7
	08/09/04	2.2	<5.0	5.7	60	12	NA	22
	02/15/05	12	20	14	130	19	NA	46
MW-7	10/16/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	03/09/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	09/17/03	<1.0	<5.0	<1.0	<3.0	<1.0	<0.010	<5.0
	08/09/04	<1.0	<5.0	<1.0	<3.0	<1.0	NA	<5.0
	02/15/05	<1.0	<5.0	<1.0	<3.0	<1.0	NA	<5.0
MW-8	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	09/17/03	<1.0	<5.0	<1.0	<3.0	<1.0	<0.010	<5.0
	08/09/04	<1.0	<5.0	<1.0	<3.0	<1.0	NA	<5.0
	02/15/05	<1.0	<5.0	<1.0	<3.0	<1.0	NA	<5.0
MW-9	10/16/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	03/09/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	09/17/03	<1.0	<5.0	1.1	5.6	4.5	<0.010	<5.0
	08/09/04	<1.0	<5.0	<1.0	<3.0	<1.0	NA	<5.0
	02/15/05	NC <sup>(1)</sup>	NC	NC	NC	NC	NC	NC
MW-10	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	09/17/03	<1.0	<5.0	<1.0	<3.0	<1.0	<0.010	<5.0
	08/09/04	<1.0	<5.0	<1.0	<3.0	<1.0	NA	<5.0
	02/15/05	<1.0	<5.0	<1.0	<3.0	<1.0	NA	<5.0
MW-11	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	09/17/03	<1.0	<5.0	<1.0	<3.0	<1.0	<0.010	<5.0
	08/09/04	<1.0	<5.0	<1.0	<3.0	<1.0	NA	<5.0
	02/15/05	<1.0	<5.0	<1.0	<3.0	<1.0	NA	<5.0
MW-12	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	09/17/03	<1.0	<5.0	<1.0	<3.0	<1.0	<0.010	<5.0
	08/09/04	<1.0	<5.0	<1.0	<3.0	<1.0	NA	<5.0
	02/15/05	<1.0	<5.0	<1.0	<3.0	<1.0	NA	<5.0
MW-13	10/13/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	09/17/03	<1.0	<5.0	<1.0	<3.0	<1.0	<0.010	<5.0
	08/09/04	<1.0	<5.0	<1.0	<3.0	<1.0	NA	<5.0
	02/15/05	<1.0	<5.0	<1.0	<3.0	<1.0	NA	<5.0
MW-14	02/15/05	<1.0	<5.0	<1.0	<3.0	2.2	NA	<5.0
MW-1D	10/16/00	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	03/08/01	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0
	09/17/03	<1.0	<5.0	<1.0	<3.0	1.3	<0.010	<5.0
	08/09/04	<1.0	<5.0	<1.0	<3.0	<1.0	NA	<5.0
	02/15/05	<1.0	<5.0	<1.0	<3.0	<1.0	NA	<5.0
RBSLs		5	1000	700	10000	40	0.05	10
SSTLs		1480	---	---	---	10300	---	6500

(1) NC = Sample not collected from this well due to apparent blockage in well at approximately 12 ft. bgs, above the current depth of groundwater.

B - Benzene                      T - Toluene                      MTBE - Methyl tert butyl ether  
E - Ethylbenzene                X - Xylenes                      NAPHTH - Naphthalene  
EDB - Ethylene dibromide

NA - Not Analyzed

FP - Free Product in the well

RBSL - SCDHEC-established risk-based screening levels

SSTL - Site Specific Target Level

**TABLE 3**  
**SURFACE WATER QUALITY DATA**  
**HOT SPOT #3005**  
**107 HAMPTON STREET**  
**CHESNEE, SOUTH CAROLINA**  
 SCDHEC UST PERMIT #: 12719  
 S&ME PROJECT 1264-99-506

WELL	DATE	B	T	E	X	MTBE	EDB	NAPHTH
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
SW-1	02/15/05	<1.0	<5.0	<1.0	<3.0	2.7	NA	<5.0

B - Benzene

T - Toluene

MTBE - Methyl tert butyl ether

E - Ethylbenzene

X- Xylenes

NAPHTH - Naphthalene

EDB - Ethylene dibromide

NA - Not Analyzed



# **APPENDIX A**

## **AFVR FIELD NOTES**



# **APPENDIX B**

## **MONITORING WELL CONSTRUCTION LOG**

# COMPLETION REPORT OF WELL No. MW-14

PROJECT: **Hot Spot #3005**  
 PROJECT NO: **1264-99-506**  
 PROJECT LOCATION: **Chesnee, South Carolina**

WATER LEVEL: **24.85 feet on 2/15/05**

DRILLING CONTRACTOR: **S&ME, Inc.**  
 DRILLING METHOD: **HSA**  
 DATE COMPLETED: **2/10/05**

LATITUDE: **N 35° 9.08 min.**  
 LONGITUDE: **W 81° 51.61 min.**  
 TOP OF CASING ELEVATION: **97.60**  
 DATUM: **Site Benchmark**  
 LOGGED BY: **Justin Millwood**

STRATA			WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)	WELL CONSTRUCTION DETAILS		
DESCRIPTION	SYMBOL	DEPTH (ft.)							
		0		0.00	GS	97.86	<b>PROTECTIVE CASING</b> Diameter: <b>10 inch</b> Type: <b>Flushmount</b> Interval: <b>0 to 6 inches bgs</b>		
		0.26		0.26	TOC	97.60			
Red/Brown Micaceous slightly sandy SILT		5					<b>RISER CASING</b> Diameter: <b>2 inch</b> Type: <b>Sch 40 PVC</b> Interval: <b>0.5 to 21.0 feet bgs</b>		
		10							
Brown Micaceous fine SAND		15					<b>GROUT</b> Type: <b>Portland Cement</b> Interval: <b>0.5 to 17.0 feet bgs</b>		
		17.00		17.00	CG	80.86			
		20		19.00	BS	78.86	<b>SEAL</b> Type: <b>Bentonite</b> Interval: <b>17.0 to 19.0 feet bgs</b>		
		21.00		21.00	TSC	76.86			
Partially weathered ROCK Saprolite		25					<b>FILTERPACK</b> Type: <b>#2 Well Sand</b> Interval: <b>19.0 to 31.0 feet bgs</b>		
		30							
							<b>SCREEN</b> Diameter: <b>2 inch</b> Type: <b>Sch 40 PVC, 0.01 Slot</b> Interval: <b>21.0 to 31.0 feet bgs</b>		
							<b>LEGEND</b> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> <li> FILTER PACK</li> <li> BENTONITE</li> <li> CEMENT GROUT</li> <li> CUTTINGS / BACKFILL</li> <li> STATIC WATER LEVEL</li> <li> WATER LEVEL AT TOB</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> <li>ALS ABOVE LAND SURFACE</li> <li>BLS BELOW LAND SURFACE</li> <li>TOC TOP OF CASING</li> <li>GS GROUND SURFACE</li> <li>BS BENTONITE SEAL</li> <li>BOC BASE OF OUTER CASING</li> <li>TSC TOP OF SCREEN</li> <li>BSC BOTTOM OF SCREEN</li> <li>TD TOTAL DEPTH</li> <li>CG CEMENT GROUT</li> </ul> </td> </tr> </table>	<ul style="list-style-type: none"> <li> FILTER PACK</li> <li> BENTONITE</li> <li> CEMENT GROUT</li> <li> CUTTINGS / BACKFILL</li> <li> STATIC WATER LEVEL</li> <li> WATER LEVEL AT TOB</li> </ul>	<ul style="list-style-type: none"> <li>ALS ABOVE LAND SURFACE</li> <li>BLS BELOW LAND SURFACE</li> <li>TOC TOP OF CASING</li> <li>GS GROUND SURFACE</li> <li>BS BENTONITE SEAL</li> <li>BOC BASE OF OUTER CASING</li> <li>TSC TOP OF SCREEN</li> <li>BSC BOTTOM OF SCREEN</li> <li>TD TOTAL DEPTH</li> <li>CG CEMENT GROUT</li> </ul>
<ul style="list-style-type: none"> <li> FILTER PACK</li> <li> BENTONITE</li> <li> CEMENT GROUT</li> <li> CUTTINGS / BACKFILL</li> <li> STATIC WATER LEVEL</li> <li> WATER LEVEL AT TOB</li> </ul>	<ul style="list-style-type: none"> <li>ALS ABOVE LAND SURFACE</li> <li>BLS BELOW LAND SURFACE</li> <li>TOC TOP OF CASING</li> <li>GS GROUND SURFACE</li> <li>BS BENTONITE SEAL</li> <li>BOC BASE OF OUTER CASING</li> <li>TSC TOP OF SCREEN</li> <li>BSC BOTTOM OF SCREEN</li> <li>TD TOTAL DEPTH</li> <li>CG CEMENT GROUT</li> </ul>								

MONITORING WELL 6498506.GPJ S&ME.GDT 3/9/05



155 Tradd Street  
Spartanburg, SC 29301

**COMPLETION REPORT OF  
WELL No. MW-14**

PROJECT:		Hot Spot #3005 Chesnee, South Carolina S&ME Project No. 1264-99-506			BORING LOG MW-14							
DATE DRILLED: 2/10/05		ELEVATION: 97.9			NOTES:							
DRILLING METHOD: HSA		BORING DEPTH: 31.0										
LOGGED BY: Justin Millwood		WATER LEVEL: 24.85 feet on 2/15/05										
DRILLER: Justin Millwood		DRILL RIG:										
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet-Site Benchmark)	SAMPLE NO.	SAMPLE TYPE	STANDARD PENETRATION TEST DATA (blows/ft)					N VALUE
							10	20	30	60	80	
5		Red/Brown Micaceous slightly sandy SILT		92.9								
10				87.9								
15		Brown Micaceous fine SAND		82.9								
20				77.9								
25		Partially weathered ROCK Saprolite	▼	72.9								
30				67.9								

BORING LOG 6439506.GPJ S&ME.GDT 3/9/05

**NOTES:**

1. THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.
2. BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.
3. STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
4. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



# **APPENDIX C**

## **SAMPLE COLLECTION SUMMARY SHEETS**

**SAMPLE COLLECTION  
SUMMARY SHEET**



General

1. Job Name: Hot Spot # 3005 2. Project No.: 1264-99-506  
 3. Sampled By: L. Lowery 4. Weather: Cloudy/Cool  
 5. Location: Chesnee, S.C. 6. Well #: MW-1  
 7. Well Condition: OK 8. Personnel Present: L. Lowery

Water Level Information:

1. Date: 2-15-05 2. Time: 1255 3. State Water Level: 25.69 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TDC  
 5. Height of M.P. above/below (Circle) Land Surface: 3"  
 6. Method of Water Level Measurement: Elec. Wb Tape

Evacuation Procedure (Wells):

1. Date: 2-15-05 2. Time Evacuation Started: 1300 3. Time Evacuation Finished: 1305  
 4. Method of Evacuation: Bailer 5. Total Well Depth: 31.30 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 7.05 Buffer pH 4.0 or 10.0 4.01 100 Cond: 115  
 Actual Actual Standard Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	1	2	3			
Water Temperature (F) <u>(C)</u>	20	20	20			
pH (Standard Units)	5.17	5.17	5.17			
Specific Cond. (M/MHOS) (PPM)	194	194	175			
Turbidity (Subjective)	High	High	High			
Odor (Subjective)	strong	strong	strong			
Other: _____	sheen	sheen	sheen			

Sampling Information

1. Date: 2-15-05 2. Time: 1310 3. Sample Containers (Number/Size/Type): 3/40ml/G  
 4. Analyses requested: 3760  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: Yes 8. Preservative: Ice  
 9. Lab Performing Analyses: ESC 10. Sample Type: Well ✓; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION  
SUMMARY SHEET**



General

1. Job Name: Hot Spot # 3005 2. Project No.: 1264-99-506  
 3. Sampled By: L. Lowery 4. Weather: Cloudy/Cool  
 5. Location: Chesnee, S.C. 6. Well #: MW-1D  
 7. Well Condition: OK 8. Personnel Present: L. Lowery

Water Level Information:

1. Date: 2-15-05 2. Time: 1225 3. State Water Level: 25.16 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): Top  
 5. Height of M.P. above (below) Land Surface: 3"  
 6. Method of Water Level Measurement: Elec. Wl Tape

Evacuation Procedure (Wells):

1. Date: 2-15-05 2. Time Evacuation Started: 1230 3. Time Evacuation Finished: 1245  
 4. Method of Evacuation: Bailer 5. Total Well Depth: 58.45 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 7.05 Actual Buffer pH 4.0 or 10.0 4.01 Actual 100 Standard Cond: 115 Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	5	10	15			
Water Temperature (F) <u>(C)</u>	17	18	17			
pH (Standard Units)	5.68	5.61	5.66			
Specific Cond. (M/MHOS) (PPM)	61	52	50			
Turbidity (Subjective)	High	Low	Low			
Odor (Subjective)	None	None	None			
Other: _____						

Sampling Information

1. Date: 2-15-05 2. Time: 1250 3. Sample Containers (Number/Size/Type): 3/40ml/G  
 4. Analyses requested: BPLD  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: Yes 8. Preservative: Ice  
 9. Lab Performing Analyses: ESC 10. Sample Type: Well ✓; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



**SAMPLE COLLECTION  
SUMMARY SHEET**



General

1. Job Name: Hot Spot # 3005 2. Project No.: 1264-99-506  
 3. Sampled By: L. Lowery 4. Weather: Cloudy/Cool  
 5. Location: Chesnee, S.C. 6. Well #: MW-2  
 7. Well Condition: OK 8. Personnel Present: L. Lowery

Water Level Information:

1. Date: 2-15-05 2. Time: 1315 3. State Water Level: 25.94 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOC  
 5. Height of M.P. above/below (Circle) Land Surface: 3"  
 6. Method of Water Level Measurement: Elec. Wb Tape

Evacuation Procedure (Wells):

1. Date: 2-15-05 2. Time Evacuation Started: 1320 3. Time Evacuation Finished: 1330  
 4. Method of Evacuation: Bailer 5. Total Well Depth: 37.17 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 7.05 Actual Buffer pH 4.0 or 10.0 4.01 Actual 100 Standard Cond: 115 Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	2	4	6			
Water Temperature (F) <u>(C)</u>	20	20				
pH (Standard Units)	5.02	5.09				
Specific Cond. (M/MHOS) (PPM)	159	154				
Turbidity (Subjective)	High	Med.				
Odor (Subjective)	slight	slight				
Other: _____						

Sampling Information

1. Date: 2-15-05 2. Time: 1335 3. Sample Containers (Number/Size/Type): 3/40ml/1G  
 4. Analyses requested: SP60  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: Yes 8. Preservative: Ice  
 9. Lab Performing Analyses: ESC 10. Sample Type: Well ✓; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION  
SUMMARY SHEET**



General

- 1. Job Name: Hot Spot # 3005
- 2. Project No.: 1264-99-506
- 3. Sampled By: L. Lowery
- 4. Weather: Cloudy/Cool
- 5. Location: Chesnee, S.C.
- 6. Well #: MW-3
- 7. Well Condition: OK
- 8. Personnel Present: L. Lowery

Water Level Information:

- 1. Date: 2-15-05 2. Time: 1440 3. State Water Level: 27.38 Ft. Below M.P.
- 4. Description of Measuring Point (M.P.): TDC
- 5. Height of M.P. above (below) Land Surface: 3"
- 6. Method of Water Level Measurement: Elec. WL Tape

Evacuation Procedure (Wells):

- 1. Date: 2-15-05 2. Time Evacuation Started: 1445 3. Time Evacuation Finished: 1453
- 4. Method of Evacuation: Bailer 5. Total Well Depth: 32.20 Ft. Below M.P.
- 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft
- 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
(Well Volume X # Volumes = Total Gallons Purged)
- 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 7.05 Actual Buffer pH 4.0 or 10.0 4.01 Actual 100 Standard Cond: 115 Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	1	2	3			
Water Temperature (F) <u>(C)</u>	19					
pH (Standard Units)	5.66					
Specific Cond. (M/MHOS) (PPM)	205	<u>DV7</u>				
Turbidity (Subjective)	High					
Odor (Subjective)	Med.					
Other: _____						

Sampling Information

- 1. Date: 2-15-05 2. Time: 1456 3. Sample Containers (Number/Size/Type): 3/40ml/G
- 4. Analyses requested: 8260
- 5. Samples Filtered: No 6. Filtration Equipment: N/A
- 7. Samples Preserved: Yes 8. Preservative: Ice
- 9. Lab Performing Analyses: ESC 10. Sample Type: Well ✓; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION  
SUMMARY SHEET**



General

1. Job Name: Hot Spot # 3005 2. Project No.: 1264-99-506  
 3. Sampled By: L. Lowery 4. Weather: Cloudy/Cool  
 5. Location: Chesnee, S.C. 6. Well #: MW-4  
 7. Well Condition: OK 8. Personnel Present: L. Lowery

Water Level Information:

1. Date: 2/15/05 2. Time: 1405 3. State Water Level: 23.49 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOC  
 5. Height of M.P. above below (Circle) Land Surface: 3"  
 6. Method of Water Level Measurement: Elec. W/L Tape

Evacuation Procedure (Wells):

1. Date: 2/15/05 2. Time Evacuation Started: 1410 3. Time Evacuation Finished: 1430  
 4. Method of Evacuation: Bailer 5. Total Well Depth: 45.50 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 7.05 Actual Buffer pH 4.0 or 10.0 4.01 Actual 100 Standard Cond: 115 Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	3	6	9			
Water Temperature (F) <u>(C)</u>	19	19	19			
pH (Standard Units)	6.18	6.39	6.41			
Specific Cond. (M/MHOS) (PPM)	101	129	137			
Turbidity (Subjective)	High	Med.	Med.			
Odor (Subjective)	None	None	None			
Other: _____						

Sampling Information

1. Date: 2/15/05 2. Time: 1432 3. Sample Containers (Number/Size/Type): 3/40ml/G  
 4. Analyses requested: 3760  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: Yes 8. Preservative: Ice  
 9. Lab Performing Analyses: ESC 10. Sample Type: Well ✓; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION SUMMARY SHEET**



General

- 1. Job Name: Hot Spot # 3005
- 2. Project No.: 1264-99-506
- 3. Sampled By: L. Lowery
- 4. Weather: Cloudy/Cool
- 5. Location: Chesnee, S.C.
- 6. Well #: MW-5
- 7. Well Condition: OK
- 8. Personnel Present: L. Lowery

Water Level Information:

- 1. Date: 2-15-05 2. Time: 1503 3. State Water Level: 29.18 Ft. Below M.P.
- 4. Description of Measuring Point (M.P.): TOC
- 5. Height of M.P. above/below (Circle) Land Surface: 3"
- 6. Method of Water Level Measurement: Elec. Wl Tape

Evacuation Procedure (Wells):

- 1. Date: 2-15-05 2. Time Evacuation Started: 1508 3. Time Evacuation Finished: 1513
- 4. Method of Evacuation: Bailer 5. Total Well Depth: 32.20 Ft. Below M.P.
- 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft
- 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
(Well Volume X # Volumes = Total Gallons Purged)
- 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 7.05 Actual Buffer pH 4.0 or 10.0 4.01 Actual 100 Standard Cond: 115 Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	0.5	1.0	1.5			
Water Temperature (F) <u>(C)</u>	20					
pH (Standard Units)	5.28					
Specific Cond. (M/MHOS) (PPM)	41	<u>DRY</u>				
Turbidity (Subjective)	High					
Odor (Subjective)	None					
Other: _____						

Sampling Information

- 1. Date: 2-15-05 2. Time: 1517 3. Sample Containers (Number/Size/Type): 3/40ml/1G
- 4. Analyses requested: B260
- 5. Samples Filtered: No 6. Filtration Equipment: N/A
- 7. Samples Preserved: Yes 8. Preservative: Ice
- 9. Lab Performing Analyses: ESC 10. Sample Type: Well  ; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION  
SUMMARY SHEET**



General

1. Job Name: Hot Spot # 3005 2. Project No.: 1264-99-506  
 3. Sampled By: L. Lowery 4. Weather: Cloudy/Cool  
 5. Location: Chesnee, S.C. 6. Well #: MW-6  
 7. Well Condition: OK 8. Personnel Present: L. Lowery

Water Level Information:

1. Date: 2-15-05 2. Time: 0930 3. State Water Level: 25.78 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOC  
 5. Height of M.P. above below (Circle) Land Surface: 3"  
 6. Method of Water Level Measurement: Elec. Wb Tape

Evacuation Procedure (Wells):

1. Date: 2-15-05 2. Time Evacuation Started: 0935 3. Time Evacuation Finished: 0945  
 4. Method of Evacuation: Bailer 5. Total Well Depth: 37.20 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 7.05 Actual Buffer pH 4.0 or 10.0 4.01 Actual 100 Standard Cond: 115 Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	<u>2</u>	<u>4</u>	<u>6</u>			
Water Temperature (F) <u>(C)</u>	<u>16</u>	<u>17</u>	<u>18</u>			
pH (Standard Units)	<u>4.99</u>	<u>5.02</u>	<u>5.05</u>			
Specific Cond. (M/MHOS) (PPM)	<u>122</u>	<u>87</u>	<u>93</u>			
Turbidity (Subjective)	<u>High</u>	<u>High</u>	<u>High</u>			
Odor (Subjective)	<u>slight</u>	<u>slight</u>	<u>slight</u>			
Other: _____						

Sampling Information

1. Date: 2-15-05 2. Time: 0947 3. Sample Containers (Number/Size/Type): 3/40ml/IG  
 4. Analyses requested: 8260  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: Yes 8. Preservative: Ice  
 9. Lab Performing Analyses: ESC 10. Sample Type: Well ✓; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**SAMPLE COLLECTION  
SUMMARY SHEET**



General

1. Job Name: Hot Spot # 3005 2. Project No.: 1264-99-506  
 3. Sampled By: L. Lowery 4. Weather: Cloudy/Cool  
 5. Location: Chesnee, S.C. 6. Well #: MW-7  
 7. Well Condition: OK 8. Personnel Present: L. Lowery

Water Level Information:

1. Date: 2-15-05 2. Time: 1340 3. State Water Level: 23.51 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TDC  
 5. Height of M.P. above/below (Circle) Land Surface: 3"  
 6. Method of Water Level Measurement: Elec. Wb Tape

Evacuation Procedure (Wells):

1. Date: 2-15-05 2. Time Evacuation Started: 1345 3. Time Evacuation Finished: 1357  
 4. Method of Evacuation: Bailer 5. Total Well Depth: 36.15 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 7.05 Actual Buffer pH 4.0 or 10.0 4.01 Actual 100 Standard Cond: 115 Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	<u>2</u>	<u>4</u>	<u>6</u>			
Water Temperature (F) <u>(C)</u>	<u>21</u>	<u>20</u>	<u>20</u>			
pH (Standard Units)	<u>4.97</u>	<u>4.89</u>	<u>4.79</u>			
Specific Cond. (M/MHOS) (PPM)	<u>52</u>	<u>33</u>	<u>37</u>			
Turbidity (Subjective)	<u>High</u>	<u>High</u>	<u>High</u>			
Odor (Subjective)	<u>None</u>	<u>None</u>	<u>None</u>			
Other: _____						

Sampling Information

1. Date: 2-15-05 2. Time: 1400 3. Sample Containers (Number/Size/Type): 3/40ml/G  
 4. Analyses requested: SP60  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: Yes 8. Preservative: Ice  
 9. Lab Performing Analyses: ESC 10. Sample Type: Well ✓; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION  
SUMMARY SHEET**



General

1. Job Name: Hot Spot # 3005 2. Project No.: 1264-99-506  
 3. Sampled By: L. Lowery 4. Weather: Cloudy/Cool  
 5. Location: Chesnee, S.C. 6. Well #: MW-6  
 7. Well Condition: OK 8. Personnel Present: L. Lowery

Water Level Information:

1. Date: 2-15-05 2. Time: 1047 3. State Water Level: 19.39 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOC  
 5. Height of M.P. above (below) Land Surface: 3"  
 6. Method of Water Level Measurement: Elec. Wh Tape

Evacuation Procedure (Wells):

1. Date: 2-15-05 2. Time Evacuation Started: 1050 3. Time Evacuation Finished: 1100  
 4. Method of Evacuation: Bailer 5. Total Well Depth: 33.22 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 7.05 Actual Buffer pH 4.0 or 10.0 4.01 Actual 100 Standard Cond: 115 Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	2	4	6			
Water Temperature (F) <u>(C)</u>	18	18	19			
pH (Standard Units)	4.66	4.57	4.44			
Specific Cond. (M/MHOS) (PPM)	11	9	9			
Turbidity (Subjective)	High	High	High			
Odor (Subjective)	None	None	None			
Other: _____						

Sampling Information

1. Date: 2-15-05 2. Time: 1105 3. Sample Containers (Number/Size/Type): 3/40ml/G  
 4. Analyses requested: 3260  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: Yes 8. Preservative: Ice  
 9. Lab Performing Analyses: ESC 10. Sample Type: Well  ; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**SAMPLE COLLECTION  
SUMMARY SHEET**



General

1. Job Name: Hot Spot # 3005 2. Project No.: 1264-99-506  
 3. Sampled By: L. Lowery 4. Weather: Cloudy/Cool  
 5. Location: Chesnee, S.C. 6. Well #: MW-10  
 7. Well Condition: OK 8. Personnel Present: L. Lowery

Water Level Information:

1. Date: 2-15-05 2. Time: 1025 3. State Water Level: 19.92 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOC  
 5. Height of M.P. above (below) (Circle) Land Surface: 3"  
 6. Method of Water Level Measurement: Elec. WL Tap

Evacuation Procedure (Wells):

1. Date: 2-15-05 2. Time Evacuation Started: 1030 3. Time Evacuation Finished: 1040  
 4. Method of Evacuation: Bailer 5. Total Well Depth: 27.17 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 7.05 Actual Buffer pH 4.0 or 10.0 4.01 Actual 100 Standard Cond: 115 Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	1	2	3			
Water Temperature (F) <u>(C)</u>	17	18	18			
pH (Standard Units)	4.57	4.47	4.42			
Specific Cond. (M/MHOS) (PPM)	81	75	73			
Turbidity (Subjective)	High	High	High			
Odor (Subjective)	None	None	None			
Other: _____						

Sampling Information

1. Date: 2-15-05 2. Time: 1042 3. Sample Containers (Number/Size/Type): 3/40ml/G  
 4. Analyses requested: 8260  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: Yes 8. Preservative: Ice  
 9. Lab Performing Analyses: ESC 10. Sample Type: Well ✓; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



**SAMPLE COLLECTION SUMMARY SHEET**



General

1. Job Name: Hot Spot # 3005 2. Project No.: 1264-99-506  
 3. Sampled By: L. Lowery 4. Weather: Cloudy/Cool  
 5. Location: Chesnee, S.C. 6. Well #: MW-11  
 7. Well Condition: OK 8. Personnel Present: L. Lowery

Water Level Information:

1. Date: 2/15/05 2. Time: 1005 3. State Water Level: 20.98 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TRC  
 5. Height of M.P. above/below (Circle) Land Surface: 3"  
 6. Method of Water Level Measurement: Elec. Wl. Tape

Evacuation Procedure (Wells):

1. Date: 2/15/05 2. Time Evacuation Started: 1008 3. Time Evacuation Finished: 1018  
 4. Method of Evacuation: Bailer 5. Total Well Depth: 29.12 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 7.05 Actual Buffer pH 4.0 or 10.0 4.01 Actual 100 Standard Cond: 115 Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	1	2	3			
Water Temperature (F) <u>(C)</u>	17	18	16			
pH (Standard Units)	4.71	4.48	4.45			
Specific Cond. (M/MHOS) (PPM)	53	51	47			
Turbidity (Subjective)	High	High	High			
Odor (Subjective)	None	None	None			
Other: _____						

Sampling Information

1. Date: 2/15/05 2. Time: 1020 3. Sample Containers (Number/Size/Type): 3/40ml/G  
 4. Analyses requested: 8260  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: Yes 8. Preservative: Ice  
 9. Lab Performing Analyses: ESC 10. Sample Type: Well ✓; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**SAMPLE COLLECTION SUMMARY SHEET**



General

1. Job Name: Hot Spot # 3005 2. Project No.: 1264-99-506  
 3. Sampled By: L. Lowery 4. Weather: Cloudy/Cool  
 5. Location: Chesnee, S.C. 6. Well #: MW-12  
 7. Well Condition: OK 8. Personnel Present: L. Lowery

Water Level Information:

1. Date: 2-15-05 2. Time: 1110 3. State Water Level: 19.56 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOC  
 5. Height of M.P. above/below (Circle) Land Surface: 3"  
 6. Method of Water Level Measurement: Elec. WL Tape

Evacuation Procedure (Wells):

1. Date: 2-15-05 2. Time Evacuation Started: 1115 3. Time Evacuation Finished: 1125  
 4. Method of Evacuation: Bailer 5. Total Well Depth: 30.30 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 7.05 Buffer pH 4.0 or 10.0 4.01 100 Cond: 115  
 Actual Actual Standard Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	1.5	3.0	4.5			
Water Temperature (F) <u>(C)</u>	17	17	17			
pH (Standard Units)	4.97	4.91	4.84			
Specific Cond. (M/MHOS) (PPM)	71	73	75			
Turbidity (Subjective)	High	High	High			
Odor (Subjective)	None	None	None			
Other: _____						

Sampling Information

1. Date: 2-15-05 2. Time: 1126 3. Sample Containers (Number/Size/Type): 3/40ml/G  
 4. Analyses requested: 8260  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: Yes 8. Preservative: Ice  
 9. Lab Performing Analyses: ESC 10. Sample Type: Well ✓; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION  
SUMMARY SHEET**



ENVIRONMENTAL SERVICES  
ENGINEERING • TESTING

General

1. Job Name: Hot Spot # 3005 2. Project No.: 1264-99-506  
 3. Sampled By: L. Lowery 4. Weather: Cloudy/Cool  
 5. Location: Chesnee, S.C. 6. Well #: MW-13  
 7. Well Condition: OK 8. Personnel Present: L. Lowery

Water Level Information:

1. Date: 2-15-05 2. Time: 1135 3. State Water Level: 20.43 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOC  
 5. Height of M.P. above/below (Circle) Land Surface: 3"  
 6. Method of Water Level Measurement: Elec. WL Tape

Evacuation Procedure (Wells):

1. Date: 2-15-05 2. Time Evacuation Started: 1140 3. Time Evacuation Finished: 1150  
 4. Method of Evacuation: Bailer 5. Total Well Depth: 26.90 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 7.05 Buffer pH 4.0 or 10.0 4.01 100 Cond: 115  
 Actual Actual Standard Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	1	2	3			
Water Temperature (F) <u>(C)</u>	17	18	18			
pH (Standard Units)	4.86	4.84	4.80			
Specific Cond. (M/MHOS) (PPM)	76	77	76			
Turbidity (Subjective)	High	High	High			
Odor (Subjective)	None	None	None			
Other: _____						

Sampling Information

1. Date: 2-15-05 2. Time: 1153 3. Sample Containers (Number/Size/Type): 3/40ml/G  
 4. Analyses requested: B260  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: Yes 8. Preservative: Ice  
 9. Lab Performing Analyses: ESC 10. Sample Type: Well ✓; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

**SAMPLE COLLECTION SUMMARY SHEET**



General

1. Job Name: Hot Spot # 3005 2. Project No.: 1264-99-506  
 3. Sampled By: L. Lowery 4. Weather: Cloudy/Cool  
 5. Location: Chesnee, S.C. 6. Well #: MW-14  
 7. Well Condition: OK 8. Personnel Present: L. Lowery

Water Level Information:

1. Date: 2-15-05 2. Time: 1527 3. State Water Level: 24.85 Ft. Below M.P.  
 4. Description of Measuring Point (M.P.): TOC  
 5. Height of M.P. above/below (Circle) Land Surface: 3"  
 6. Method of Water Level Measurement: Elec. Wl Tape

Evacuation Procedure (Wells):

1. Date: 2-15-05 2. Time Evacuation Started: 1530 3. Time Evacuation Finished: 1540  
 4. Method of Evacuation: Bailer 5. Total Well Depth: 30.45 Ft. Below M.P.  
 6. Casing Diameter (D): 2 Inches 7. HT. of water column (H - Well Depth - Water Level): \_\_\_\_\_ Ft  
 8. Volume of Water in Well (0.041D<sup>2</sup>H) = \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ Gallons  
 (Well Volume X # Volumes = Total Gallons Purged)  
 9. Decontamination Procedure: New Disp. Bailer

Meter Calibration:

Buffer pH 7.0 7.05 Buffer pH 4.0 or 10.0 4.01 100 Cond: 115  
 Actual Actual Standard Actual

Record of Well Evacuation

Vol. Purged (Cummul. Gals)	1	2	3			
Water Temperature (F) <u>(C)</u>	<u>20</u>					
pH (Standard Units)	<u>5.81</u>					
Specific Cond. (M/MHOS) (PPM)	<u>116</u>	<u>DRY</u>				
Turbidity (Subjective)	<u>High</u>					
Odor (Subjective)	<u>None</u>					
Other: _____						

Sampling Information

1. Date: 2-15-05 2. Time: 1545 3. Sample Containers (Number/Size/Type): 3/40ml/G  
 4. Analyses requested: 826D  
 5. Samples Filtered: No 6. Filtration Equipment: N/A  
 7. Samples Preserved: Yes 8. Preservative: Ice  
 9. Lab Performing Analyses: ESC 10. Sample Type: Well ✓; Stream \_\_\_\_\_

Remarks: \_\_\_\_\_

# **APPENDIX D**

## **LABORATORY ANALYTICAL DATA**



**ENVIRONMENTAL  
SCIENCE CORP.**

12065 Lebanon Rd.  
Mt. Juliet, TN 37122  
(615) 758-5858  
1-800-767-5859  
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Heather Hollen  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

February 22, 2005

Date Received : February 16, 2005  
Description : Hot Spot #3005

ESC Sample # : L188351-01

Sample ID : MW-1

Site ID :

Collected By : Lanny Lowery  
Collection Date : 02/15/05 13:10

Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	29.	5.0	ug/l	8260B	02/21/05	5
Toluene	BDL	25.	ug/l	8260B	02/21/05	5
Ethylbenzene	12.	5.0	ug/l	8260B	02/21/05	5
Total Xylenes	62.	15.	ug/l	8260B	02/21/05	5
Methyl tert-butyl ether	37.	5.0	ug/l	8260B	02/21/05	5
Naphthalene	BDL	25.	ug/l	8260B	02/21/05	5
Surrogate Recovery						
Toluene-d8	110		% Rec.	8260B	02/21/05	5
Dibromofluoromethane	130		% Rec.	8260B	02/21/05	5
4-Bromofluorobenzene	93.		% Rec.	8260B	02/21/05	5

Tom Mellette, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233  
AZ -0612, MN - 047-999-395, NY - 11742, NJ - 81002, WI - 998093910

Note:

The reported analytical results relate only to the sample submitted.  
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Reported: 02/22/05 12:27 Printed: 02/22/05 12:28



**ENVIRONMENTAL  
SCIENCE CORP.**

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Mt. Juliet, TN 37122  
(615) 758-5858  
1-800-767-5859  
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

**REPORT OF ANALYSIS**

Heather Hollen  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

February 22, 2005

Date Received : February 16, 2005  
Description : Hot Spot #3005  
Sample ID : MW-2  
Collected By : Lanny Lowery  
Collection Date : 02/15/05 13:35

ESC Sample # : L188351-02

Site ID :

Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	58.	25.	ug/l	8260B	02/21/05	25
Toluene	BDL	120	ug/l	8260B	02/21/05	25
Ethylbenzene	BDL	25.	ug/l	8260B	02/21/05	25
Total Xylenes	190	75.	ug/l	8260B	02/21/05	25
Methyl tert-butyl ether	BDL	25.	ug/l	8260B	02/21/05	25
Naphthalene	BDL	120	ug/l	8260B	02/21/05	25
Surrogate Recovery						
Toluene-d8	100		‡ Rec.	8260B	02/21/05	25
Dibromofluoromethane	100		‡ Rec.	8260B	02/21/05	25
4-Bromofluorobenzene	99.		‡ Rec.	8260B	02/21/05	25

Tom Mellette, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233  
AZ - 0612, MN - 047-999-395, NY - 11742, NJ - 81002, WI - 998093910

Note:

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**ENVIRONMENTAL  
SCIENCE CORP.**

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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Heather Hollen  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

February 22, 2005

Date Received : February 16, 2005  
Description : Hot Spot #3005  
Sample ID : MW-3  
Collected By : Lanny Lowery  
Collection Date : 02/15/05 14:56

ESC Sample # : L188351-03

Site ID :

Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	180	25.	ug/l	8260B	02/21/05	25
Toluene	BDL	120	ug/l	8260B	02/21/05	25
Ethylbenzene	41.	25.	ug/l	8260B	02/21/05	25
Total Xylenes	320	75.	ug/l	8260B	02/21/05	25
Methyl tert-butyl ether	620	25.	ug/l	8260B	02/21/05	25
Naphthalene	BDL	120	ug/l	8260B	02/21/05	25
Surrogate Recovery						
Toluene-d8	100		% Rec.	8260B	02/21/05	25
Dibromofluoromethane	100		% Rec.	8260B	02/21/05	25
4-Bromofluorobenzene	99.		% Rec.	8260B	02/21/05	25

Tom Mellette, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233  
AZ -0612, MN - 047-999-395, NY - 11742, NJ - 81002, WI - 998093910

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**ENVIRONMENTAL  
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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Heather Hollen  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

February 22, 2005

Date Received : February 16, 2005  
Description : Hot Spot #3005  
Sample ID : MW-4  
Collected By : Lanny Lowery  
Collection Date : 02/15/05 14:32

ESC Sample # : L188351-04

Site ID :

Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	02/21/05	1
Toluene	BDL	5.0	ug/l	8260B	02/21/05	1
Ethylbenzene	BDL	1.0	ug/l	8260B	02/21/05	1
Total Xylenes	BDL	3.0	ug/l	8260B	02/21/05	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	02/21/05	1
Naphthalene	BDL	5.0	ug/l	8260B	02/21/05	1
Surrogate Recovery						
Toluene-d8	100		% Rec.	8260B	02/21/05	1
Dibromofluoromethane	100		% Rec.	8260B	02/21/05	1
4-Bromofluorobenzene	99.		% Rec.	8260B	02/21/05	1

Tom Mallette, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
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AZ -0612, MN - 047-999-395, NY - 11742, NJ - 81002, WI - 998093910

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**REPORT OF ANALYSIS**

Heather Hollen  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

February 22, 2005


Date Received : February 16, 2005  
Description : Hot Spot #3005  
Sample ID : MW-5  
Collected By : Lanny Lowery  
Collection Date : 02/15/05 15:17

ESC Sample # : L188351-05

Site ID :

Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	02/21/05	1
Toluene	BDL	5.0	ug/l	8260B	02/21/05	1
Ethylbenzene	BDL	1.0	ug/l	8260B	02/21/05	1
Total Xylenes	BDL	3.0	ug/l	8260B	02/21/05	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	02/21/05	1
Naphthalene	BDL	5.0	ug/l	8260B	02/21/05	1
Surrogate Recovery						
Toluene-d8	100		‡ Rec.	8260B	02/21/05	1
Dibromofluoromethane	120		‡ Rec.	8260B	02/21/05	1
4-Bromofluorobenzene	97.		‡ Rec.	8260B	02/21/05	1

  
Tom Mellette, ESC Representative

BDL - Below Detection Limit  
Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:  
AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233  
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REPORT OF ANALYSIS

February 22, 2005

Heather Hollen  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

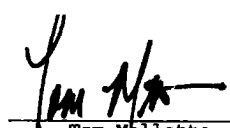
Date Received : February 16, 2005  
Description : Hot Spot #3005  
Sample ID : MW-6  
Collected By : Lanny Lowery  
Collection Date : 02/15/05 09:47

ESC Sample # : L188351-06

Site ID :

Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	12.	1.0	ug/l	8260B	02/18/05	1
Toluene	20.	5.0	ug/l	8260B	02/18/05	1
Ethylbenzene	14.	1.0	ug/l	8260B	02/18/05	1
Total Xylenes	130	3.0	ug/l	8260B	02/18/05	1
Methyl tert-butyl ether	19.	1.0	ug/l	8260B	02/18/05	1
Naphthalene	46.	5.0	ug/l	8260B	02/18/05	1
Surrogate Recovery						
Toluene-d8	100		‡ Rec.	8260B	02/18/05	1
Dibromofluoromethane	110		‡ Rec.	8260B	02/18/05	1
4-Bromofluorobenzene	120		‡ Rec.	8260B	02/18/05	1

  
Tom Mellette, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

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**REPORT OF ANALYSIS**

Heather Hollen  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

February 22, 2005

Date Received : February 16, 2005  
Description : Hot Spot #3005  
Sample ID : MW-7  
Collected By : Lanny Lowery  
Collection Date : 02/15/05 14:00

ESC Sample # : L188351-07

Site ID :

Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	02/18/05	1
Toluene	BDL	5.0	ug/l	8260B	02/18/05	1
Ethylbenzene	BDL	1.0	ug/l	8260B	02/18/05	1
Total Xylenes	BDL	3.0	ug/l	8260B	02/18/05	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	02/18/05	1
Naphthalene	BDL	5.0	ug/l	8260B	02/18/05	1
Surrogate Recovery						
Toluene-d8	97.		‡ Rec.	8260B	02/18/05	1
Dibromofluoromethane	100		‡ Rec.	8260B	02/18/05	1
4-Bromofluorobenzene	100		‡ Rec.	8260B	02/18/05	1

Tom Mallette, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

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**REPORT OF ANALYSIS**

Heather Hollen  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

February 22, 2005

Date Received : February 16, 2005  
Description : Hot Spot #3005  
Sample ID : MW-8  
Collected By : Lanny Lowery  
Collection Date : 02/15/05 11:05

ESC Sample # : L188351-08

Site ID :

Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	02/18/05	1
Toluene	BDL	5.0	ug/l	8260B	02/18/05	1
Ethylbenzene	BDL	1.0	ug/l	8260B	02/18/05	1
Total Xylenes	BDL	3.0	ug/l	8260B	02/18/05	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	02/18/05	1
Naphthalene	BDL	5.0	ug/l	8260B	02/18/05	1
Surrogate Recovery						
Toluene-d8	99.		‡ Rec.	8260B	02/18/05	1
Dibromofluoromethane	100		‡ Rec.	8260B	02/18/05	1
4-Bromofluorobenzene	110		‡ Rec.	8260B	02/18/05	1

Tom Mellette, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit(EQL)

Laboratory Certification Numbers:

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REPORT OF ANALYSIS


Heather Hollen  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

February 22, 2005

Date Received : February 16, 2005  
Description : Hot Spot #3005  
Sample ID : MW-10  
Collected By : Lanny Lowery  
Collection Date : 02/15/05 10:42

ESC Sample # : L188351-09  
Site ID :  
Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	02/18/05	1
Toluene	BDL	5.0	ug/l	8260B	02/18/05	1
Ethylbenzene	BDL	1.0	ug/l	8260B	02/18/05	1
Total Xylenes	BDL	3.0	ug/l	8260B	02/18/05	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	02/18/05	1
Naphthalene	BDL	5.0	ug/l	8260B	02/18/05	1
Surrogate Recovery						
Toluene-d8	100		‡ Rec.	8260B	02/18/05	1
Dibromofluoromethane	110		‡ Rec.	8260B	02/18/05	1
4-Bromofluorobenzene	100		‡ Rec.	8260B	02/18/05	1

  
Tom Mellette, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit(EQL)

Laboratory Certification Numbers:

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February 22, 2005

Heather Hollen  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301


Date Received : February 16, 2005  
Description : Hot Spot #3005  
Sample ID : MW-11  
Collected By : Lanny Lowery  
Collection Date : 02/15/05 10:20

ESC Sample # : L188351-10

Site ID :

Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	02/18/05	1
Toluene	BDL	5.0	ug/l	8260B	02/18/05	1
Ethylbenzene	BDL	1.0	ug/l	8260B	02/18/05	1
Total Xylenes	BDL	3.0	ug/l	8260B	02/18/05	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	02/18/05	1
Naphthalene	BDL	5.0	ug/l	8260B	02/18/05	1
Surrogate Recovery						
Toluene-d8	100		‡ Rec.	8260B	02/18/05	1
Dibromofluoromethane	110		‡ Rec.	8260B	02/18/05	1
4-Bromofluorobenzene	100		‡ Rec.	8260B	02/18/05	1

  
Tom Mallette, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

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REPORT OF ANALYSIS

February 22, 2005

Heather Hollen  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

Date Received : February 16, 2005  
Description : Hot Spot #3005  
Sample ID : MW-12  
Collected By : Lanny Lowery  
Collection Date : 02/15/05 11:28

EBC Sample # : L188351-11

Site ID :

Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	02/18/05	1
Toluene	BDL	5.0	ug/l	8260B	02/18/05	1
Ethylbenzene	BDL	1.0	ug/l	8260B	02/18/05	1
Total Xylenes	BDL	3.0	ug/l	8260B	02/18/05	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	02/18/05	1
Naphthalene	BDL	5.0	ug/l	8260B	02/18/05	1
Surrogate Recovery						
Toluene-d8	100		‡ Rec.	8260B	02/18/05	1
Dibromofluoromethane	110		‡ Rec.	8260B	02/18/05	1
4-Bromofluorobenzene	110		‡ Rec.	8260B	02/18/05	1

Tom Mellette, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

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**REPORT OF ANALYSIS**

Heather Hollen  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

February 22, 2005

Date Received : February 16, 2005  
Description : Hot Spot #3005  
Sample ID : MW-13  
Collected By : Lanny Lowery  
Collection Date : 02/15/05 11:53

ESC Sample # : L188351-12

Site ID :

Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	02/18/05	1
Toluene	BDL	5.0	ug/l	8260B	02/18/05	1
Ethylbenzene	BDL	1.0	ug/l	8260B	02/18/05	1
Total Xylenes	BDL	3.0	ug/l	8260B	02/18/05	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	02/18/05	1
Naphthalene	BDL	5.0	ug/l	8260B	02/18/05	1
Surrogate Recovery						
Toluene-d8	100		‡ Rec.	8260B	02/18/05	1
Dibromofluoromethane	110		‡ Rec.	8260B	02/18/05	1
4-Bromofluorobenzene	110		‡ Rec.	8260B	02/18/05	1

  
Tom Mellette, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
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REPORT OF ANALYSIS

Heather Hollen  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

February 22, 2005

Date Received : February 16, 2005  
Description : Hot Spot #3005  
Sample ID : MW-14  
Collected By : Lanny Lowery  
Collection Date : 02/15/05 15:45

ESC Sample # : L188351-13

Site ID :

Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	02/18/05	1
Toluene	BDL	5.0	ug/l	8260B	02/18/05	1
Ethylbenzene	BDL	1.0	ug/l	8260B	02/18/05	1
Total Xylenes	BDL	3.0	ug/l	8260B	02/18/05	1
Methyl tert-butyl ether	2.2	1.0	ug/l	8260B	02/18/05	1
Naphthalene	BDL	5.0	ug/l	8260B	02/18/05	1
Surrogate Recovery						
Toluene-d8	100		% Rec.	8260B	02/18/05	1
Dibromofluoromethane	110		% Rec.	8260B	02/18/05	1
4-Bromofluorobenzene	100		% Rec.	8260B	02/18/05	1

Tom Mallette, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit(EQL)

Laboratory Certification Numbers:

AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
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**REPORT OF ANALYSIS**

Heather Hollen  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

February 22, 2005

Date Received : February 16, 2005  
Description : Hot Spot #3005  
Sample ID : MW-1D  
Collected By : Lanny Lowery  
Collection Date : 02/15/05 12:50

ESC Sample # : L188351-14

Site ID :

Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	02/18/05	1
Toluene	BDL	5.0	ug/l	8260B	02/18/05	1
Ethylbenzene	BDL	1.0	ug/l	8260B	02/18/05	1
Total Xylenes	BDL	3.0	ug/l	8260B	02/18/05	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	02/18/05	1
Naphthalene	BDL	5.0	ug/l	8260B	02/18/05	1
Surrogate Recovery						
Toluene-d8	100		‡ Rec.	8260B	02/18/05	1
Dibromofluoromethane	110		‡ Rec.	8260B	02/18/05	1
4-Bromofluorobenzene	100		‡ Rec.	8260B	02/18/05	1

Tom Mellette, ESC Representative

BDL - Below Detection Limit  
Det. Limit - Estimated Quantitation Limit(EQL)

Laboratory Certification Numbers:

AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233  
AZ -0612, MN - 047-999-395, NY - 11742, NJ - 81002, WI - 998093910

Note:

The reported analytical results relate only to the sample submitted.  
This report shall not be reproduced, except in full, without the written approval from ESC.

Reported: 02/22/05 12:27 Printed: 02/22/05 12:28



**ENVIRONMENTAL  
SCIENCE CORP.**

12065 Lebanon Rd.  
Mt. Juliet, TN 37122  
(615) 758-5858  
1-800-767-5859  
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

**REPORT OF ANALYSIS**

Heather Hollen  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

February 22, 2005


Date Received : February 16, 2005  
Description : Hot Spot #3005  
Sample ID : SW-1  
Collected By : Lanny Lowery  
Collection Date : 02/15/05 16:00

ESC Sample # : L188351-15

Site ID :

Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	02/18/05	1
Toluene	BDL	5.0	ug/l	8260B	02/18/05	1
Ethylbenzene	BDL	1.0	ug/l	8260B	02/18/05	1
Total Xylenes	BDL	3.0	ug/l	8260B	02/18/05	1
Methyl tert-butyl ether	2.7	1.0	ug/l	8260B	02/18/05	1
Naphthalene	BDL	5.0	ug/l	8260B	02/18/05	1
Surrogate Recovery						
Toluene-d8	100		% Rec.	8260B	02/18/05	1
Dibromofluoromethane	110		% Rec.	8260B	02/18/05	1
4-Bromofluorobenzene	110		% Rec.	8260B	02/18/05	1

  
Tom Mellette, ESC Representative

BDL - Below Detection Limit  
Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:  
AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233  
AZ - 0612, MN - 047-999-395, NY - 11742, NJ - 81002, WI - 998093910

Note:  
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Reported: 02/22/05 12:27 Printed: 02/22/05 12:28



**ENVIRONMENTAL  
SCIENCE CORP.**

12065 Lebanon Rd.  
Mt. Juliet, TN 37122  
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Fax (615) 758-5859

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Est. 1970

REPORT OF ANALYSIS

Heather Hollen  
S&ME Inc. - Spartanburg SC  
155 Tradd Street  
Spartanburg, SC 29301

February 22, 2005


Date Received : February 16, 2005  
Description : Hot Spot #3005  
Sample ID : TRIP BLANK  
Collected By : Lanny Lowery  
Collection Date : 02/15/05 00:00

ESC Sample # : L188351-16

Site ID :

Project # : 1264-99-506

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	1.0	ug/l	8260B	02/17/05	1
Toluene	BDL	5.0	ug/l	8260B	02/17/05	1
Ethylbenzene	BDL	1.0	ug/l	8260B	02/17/05	1
Total Xylenes	BDL	3.0	ug/l	8260B	02/17/05	1
Methyl tert-butyl ether	BDL	1.0	ug/l	8260B	02/17/05	1
Naphthalene	BDL	5.0	ug/l	8260B	02/17/05	1
Surrogate Recovery						
Toluene-d8	100		‡ Rec.	8260B	02/17/05	1
Dibromofluoromethane	110		‡ Rec.	8260B	02/17/05	1
4-Bromofluorobenzene	95.		‡ Rec.	8260B	02/17/05	1

  
Tom Mellette, ESC Representative

BDL - Below Detection Limit

Det. Limit - Estimated Quantitation Limit (EQL)

Laboratory Certification Numbers:

AIHA - 100789, AL - 40660, CA - I-2327, CT- PH-0197, FL - E87487, GA - 923, IN - C-TN-01  
KY - 90010, KYUST - 0016, NC - ENV375, DW21704, ND - R-140, SC - 84004, TN - 2006, VA - 00109, WV - 233  
AZ -0612, MN - 047-999-395, NY - 11742, NJ - 81002, WI - 998093910

Note:

The reported analytical results relate only to the sample submitted.  
This report shall not be reproduced, except in full, without the written approval from ESC.

Reported: 02/22/05 12:27 Printed: 02/22/05 12:28

Attachment A  
List of Analytes with QC Qualifiers

Sample #	Analyte	Qualifier
L188351-01	Methyl tert-butyl ether	J4
	Dibromofluoromethane	J1
L188351-02	Benzene	J3
	Toluene	J3
	Ethylbenzene	J3
	Methyl tert-butyl ether	J3
	Naphthalene	J3
L188351-03	Benzene	J3
	Toluene	J3
	Ethylbenzene	J3
	Methyl tert-butyl ether	J3
	Naphthalene	J3
L188351-04	Benzene	J3
	Toluene	J3
	Ethylbenzene	J3
	Methyl tert-butyl ether	J3
	Naphthalene	J3
L188351-05	Methyl tert-butyl ether	J4
	Dibromofluoromethane	J1

Attachment B  
Explanation of QC Qualifier Codes

Qualifier	Meaning
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits
J3	The associated batch QC was outside the established quality control range for precision.
J4	The associated batch QC was outside the established quality control range for accuracy.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable unless qualified as 'R' (Rejected).

Definitions

**Accuracy** - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.

**Precision** - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.

**Surrogate** - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.

		Control Limits		(AQ)	(SS)
2-Fluorophenol	31-119	Nitrobenzene-d5	43-118	Dibromfluoromethane	79-126 83-119
Phenol-d5	12-134	2-Fluorobiphenyl	45-128	Toluene-d8	81-114 82-116
2,4,6-Tribromophenol	51-141	Terphenyl-d14	43-137	4-Bromofluorobenzene	65-129 72-126

**TIC** - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Summary of Remarks For Samples Printed  
02/22/05 at 12:28:33

TSR Signing Reports: 690  
R5 - Desired TAT

Sample: L188351-01 Account: SMESPAR Received: 02/16/05 09:00 Due Date: 02/23/05 00:00 RPT Date: 02/22/05 12:27  
Sample: L188351-02 Account: SMESPAR Received: 02/16/05 09:00 Due Date: 02/23/05 00:00 RPT Date: 02/22/05 12:27  
Sample: L188351-03 Account: SMESPAR Received: 02/16/05 09:00 Due Date: 02/23/05 00:00 RPT Date: 02/22/05 12:27  
Sample: L188351-04 Account: SMESPAR Received: 02/16/05 09:00 Due Date: 02/23/05 00:00 RPT Date: 02/22/05 12:27  
Sample: L188351-05 Account: SMESPAR Received: 02/16/05 09:00 Due Date: 02/23/05 00:00 RPT Date: 02/22/05 12:27  
Sample: L188351-06 Account: SMESPAR Received: 02/16/05 09:00 Due Date: 02/23/05 00:00 RPT Date: 02/22/05 12:27  
Sample: L188351-07 Account: SMESPAR Received: 02/16/05 09:00 Due Date: 02/23/05 00:00 RPT Date: 02/22/05 12:27  
Sample: L188351-08 Account: SMESPAR Received: 02/16/05 09:00 Due Date: 02/23/05 00:00 RPT Date: 02/22/05 12:27  
Sample: L188351-09 Account: SMESPAR Received: 02/16/05 09:00 Due Date: 02/23/05 00:00 RPT Date: 02/22/05 12:27  
Sample: L188351-10 Account: SMESPAR Received: 02/16/05 09:00 Due Date: 02/23/05 00:00 RPT Date: 02/22/05 12:27  
Sample: L188351-11 Account: SMESPAR Received: 02/16/05 09:00 Due Date: 02/23/05 00:00 RPT Date: 02/22/05 12:27  
Sample: L188351-12 Account: SMESPAR Received: 02/16/05 09:00 Due Date: 02/23/05 00:00 RPT Date: 02/22/05 12:27  
Sample: L188351-13 Account: SMESPAR Received: 02/16/05 09:00 Due Date: 02/23/05 00:00 RPT Date: 02/22/05 12:27  
Sample: L188351-14 Account: SMESPAR Received: 02/16/05 09:00 Due Date: 02/23/05 00:00 RPT Date: 02/22/05 12:27  
Sample: L188351-15 Account: SMESPAR Received: 02/16/05 09:00 Due Date: 02/23/05 00:00 RPT Date: 02/22/05 12:27  
Sample: L188351-16 Account: SMESPAR Received: 02/16/05 09:00 Due Date: 02/23/05 00:00 RPT Date: 02/22/05 12:27



<b>S&amp;ME Inc. - Spartanburg SC</b>		Alternate billing information:		Analysis/Container/Preservative		Chain of Custody Page 1 of 2	
155 Tradd Street Spartanburg, SC 29301						Prepared by: <b>ENVIRONMENTAL SCIENCE CORP.</b> 12065 Lebanon Road Mt. Juliet, TN 37122 Phone (800) 767-5859 FAX (615) 758-5859	
Report to: <b>Heather Hollen</b>		Email: <b>hhollen@smeinc.com</b>					
Project Description: <b>Waters for Hot Spot 3005</b>		City/State Collected: <b>S.C.</b>					
Phone: (864) 574-2360 FAX: (864) 576-8730		Client Project #: <b>1264-99-306</b>		Lab Project #: <b>SMESPAR-1264-99-306</b>			
Collected by (print): <b>Lanny Lowery</b>		Site/Facility ID#:		P.O.#: <b>7591</b>			
Collected by (signature): <i>Lanny Lowery</i>		<input checked="" type="checkbox"/> Rush? (Lab MUST Be Notified) ___ Same Day ..... 200% ___ Next Day ..... 100% ___ Two Day ..... 50%		Date Results Needed: <b>Standard</b>			
Packed on Ice: <input checked="" type="checkbox"/>		Email? ___ No ___ Yes		FAX? ___ No ___ Yes		No. of Cntrs	
Sample ID		Comp/Grab	Matrix*	Depth	Date	Time	
MW-1	Grab	GW	—	2/15/05	1310	3 X	
MW-2		GW	—		1335	3 X	
MW-3		GW	—		1456	3 X	
MW-4		GW	—		1532	3 X	
MW-5		GW	—		1517	3 X	
MW-6		GW	—		0947	3 X	
MW-7		GW	—		1400	3 X	
MW-8		GW	—		1105	3 X	
<del>MW-9</del>	<del>GW</del>					<del>3 X</del>	

Acctnum: **SMESPAR** (lab use only)  
 Template/Prelogin: **T28882/P135747**  
 Cooler #: **218025**  
 Shipped Via: **FedEX Ground**

Remarks/Contaminant	Sample # (lab only)
	<b>L18835-01</b>
	<b>02</b>
	<b>03</b>
	<b>04</b>
	<b>05</b>
	<b>06</b>
	<b>07</b>
	<b>08</b>

\*Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other \_\_\_\_\_  
 pH \_\_\_\_\_ Temp \_\_\_\_\_  
 Flow \_\_\_\_\_ Other *OK*

8454 1898 3365

Relinquished by: (Signature) <i>Lanny Lowery</i>	Date: 2/15/05	Time: 1700	Received by: (Signature) _____	Samples returned via: <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> UPS	Condition: <b>Custody seal intact</b> (lab use only)
Relinquished by: (Signature) _____	Date: _____	Time: _____	Received by: (Signature) _____	Temp: <b>2.80</b>	Bottles Received: <b>46</b>
Relinquished by: (Signature) _____	Date: _____	Time: _____	Received for lab by: (Signature) <i>Walt</i>	Date: 2/16/05	Time: 9:00

**S&ME Inc. - Spartanburg SC**

155 Tradd Street  
Spartanburg, SC 29301

Alternate billing information:

Analysis/Container/Preservative

Chain of Custody  
Page 2 of 2

Report to: **Heather Hollen** Email: **hhollen@smeinc.com**

Prepared by:  
**ENVIRONMENTAL  
SCIENCE CORP.**  
12065 Lebanon Road  
Mt. Juliet, TN 37122  
Phone (800) 767-5859  
FAX (615) 758-5859

Project Description: **Waters for Hot Spot 3005** City/State Collected: **S.C.**  
Client Project #: **1264-99-506** Lab Project #: **SMESPAR-1264-99-506**  
Phone: **(864) 574-2360** Site/Facility ID#: P.O.#: **7591**  
FAX: **(864) 576-8730**

Collected by (print): **Lanny Lowery**  
Collected by (signature): *Lanny Lowery*  
Packed on Ice:  N  Y

Rush? (Lab MUST Be Notified)  
 Same Day ..... 200%  
 Next Day ..... 100%  
 Two Day ..... 50%  
 Date Results Needed: **Standard**  
 Email?  No  Yes  
 FAX?  No  Yes

Acctnum: **SMESPAR** (lab use only)  
 Template/Protocol: **T28882/ P135747**  
 Cooler #: **2805**  
 Shipped Via: **FedEX Ground**

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Remarks/Contaminant	Sample # (lab only)
MW-10	Grab	GW	—	2/15/05	1042	3		X
MW-11		GW	—		1020	3		X
MW-12		GW	—		1128	3		X
MW-13		GW	—		1153	3		X
MW-14		GW	—		1545	3		X
MW-1D		GW	—		1250	3		X
SW-1	d	SW	—	d	1600	3		X
Trip Blank						1		X

\*Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other

pH \_\_\_\_\_ Temp \_\_\_\_\_  
Flow \_\_\_\_\_ Other \_\_\_\_\_

Remarks:

Relinquished by: (Signature) <i>Lanny Lowery</i>	Date: 2/15/05	Time: 1700	Received by: (Signature) <i>[Signature]</i>	Samples returned via: <input checked="" type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> Courier	Condition: <b>OK</b> (lab use only)
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received by: (Signature) <i>[Signature]</i>	Temp: 2-8° Bottles Received: 46	
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received for lab by: (Signature) <i>[Signature]</i>	Date: 2/16/05 Time: 9:00	pH Checked: NCF:

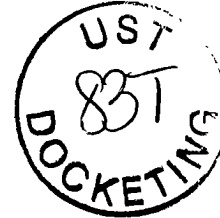


C. Earl Hunter, Commissioner

*Promoting and protecting the health of the public and the environment.*

**MAR 30 2005**

**MS JUDY LAUGHTER  
R L JORDAN OIL CO OF NC  
PO BOX 2527  
SPARTANBURG SC 29304**



Re: Hot Spot #3005, SC Hwy. 221, Chesnee, SC  
UST Permit # 12719; CA #24132  
Release #2 reported August 4, 2003  
Monitoring Report received March 10, 2005  
Spartanburg County

Dear Ms. Laughter:

The Underground Storage Tank (UST) Program of the South Carolina Department of Health and Environmental Control (SCDHEC) recognizes your commitment to continue work at this site utilizing your own contractor.

The next scope of work to be implemented at this site is completion of a comprehensive sampling event. Cost Agreement #24132 has been approved in the amount shown on the enclosed Approved Cost Agreement to complete the necessary work. Please note that all applicable South Carolina certification requirements apply to the laboratory services, well installation, and report preparation. **A Report of Findings and the invoice are due within 60 days from the date of this letter.** Please have your contractor submit sampling results to the Program in a monitoring report containing the following items:

- A narrative portion documenting current site conditions and noting the names of field personnel, date, time, ambient air temperature, and general weather conditions during the sampling event. The report shall also contain well purging data, pH, specific conductivity, water temperature, PID readings (where applicable), turbidity comments, and levels of dissolved oxygen.
- Groundwater elevations, depth to groundwater, measurable free product thickness (where applicable), total well depth and screened interval for all monitoring wells associated with the site, unless otherwise directed by the Department, shall be presented in tabular form. Groundwater laboratory analytical data for all monitoring wells shall be presented in tabular format.
- A groundwater elevation contour map of the site based on current groundwater potentiometric data.
- A CoC map based on current groundwater laboratory analytical data. The groundwater data should be adjacent to the relevant monitoring well.
- Manifests for any contaminated soil and/or groundwater removed from the site for treatment and/or disposal.
- The report must be signed and sealed by a professional geologist or engineer registered in the State of South Carolina.

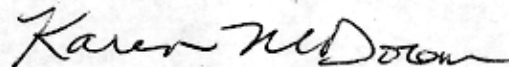
According to our records, the release was reported to the Bureau on August 4, 2003. In accordance with Section 44-2-40(D) of the State Underground Petroleum Environmental Response Bank (SUPERB) Act, you are responsible for the first \$25,000 for site rehabilitation. To insure that any expenditure you make applies to this \$25,000 deductible, it is prudent for this agency to pre-approve such costs along with your technical plan of action. By law, the SUPERB Account cannot compensate any costs that are not pre-approved. Eligible costs exceeding the \$25,000 deductible can be compensated from the SUPERB Account. Please remember that, pursuant to Reg. 61-92, Subpart H, Section 280.114, you are required to notify the Program by certified mail within ten (10) days of commencing a voluntary or involuntary proceeding in bankruptcy. State law also requires that an owner, operator, or guarantor that files for bankruptcy protection must immediately submit the appropriate forms documenting that entity's ability to demonstrate financial responsibility.

Rehabilitation activities at the site should be resumed immediately upon receipt of this letter. All monitoring wells associated with the referenced release in addition to one creek location 600 feet south of the facility should be sampled for BTEX, Naphthalene, and MtBE using EPA Method 8260B.

The Bureau of Land and Waste Management grants pre-approval for transportation of virgin petroleum contaminated groundwater/soil from the referenced site to a permitted treatment facility. The contaminated groundwater/soil must be properly stored in labeled containers or covered with plastic as appropriate. The contaminated groundwater/soil must be accepted by the approved treatment facility. There can be no spillage or leakage in transport. 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 final report. If the levels of petroleum contamination based on laboratory analysis are below risk-based screening levels, please contact the project manager for approval to dispose of soil and/or groundwater on site. The SUPERB Account will not compensate for transportation or treatment of clean soil and/or groundwater.

On all correspondence regarding this site, please reference UST Permit #12719. If you have any questions, contact me by phone at (803) 896-6586 or (800) 826-5435 (within South Carolina only), by fax at (803) 896-6245, or by email at [dorankm@dhec.sc.gov](mailto:dorankm@dhec.sc.gov).

Sincerely,



Karen M. Doran, Hydrogeologist  
Northeastern SC Corrective Action Section  
Assessment and Corrective Action Division  
Underground Storage Tank Program  
Bureau of Land and Waste Management

enc: Approved Cost Agreement (ACA)

cc: Terry Environmental, PO Box 25, Summerville, SC 29484 (w/ enc)  
Technical File (w/ enc)

# Approved Cost Agreement 132

Facility: 12719 HOT SPOT 3005

DORANKM

PO Number:

<u>Task / Description</u>	<u>Categories</u>	<u>Item Description</u>	<u>Qty / Pct</u>	<u>Unit Price</u>	<u>Amount</u>
04 MOB/DEMOB		B PERSONNEL	2.0000	250.00	500.00
10 SAMPLE COLLECTION		A GROUND WATER	9.0000	55.00	495.00
		C WATER SUPPLY	1.0000	25.00	25.00
		D GROUNDWATER NO-PURGE	6.0000	35.00	210.00
11 ANALYSES	GW GROUNDWATER	A BTEX+NAPTH+MTBE	16.0000	100.00	1,600.00
17 DISPOSAL		A1 WASTEWATER - PURGING/SAMPLING	1.0000	90.00	90.00
19 RPT/PROJECT MNGT & COORDINATIO		PCT PERCENT	0.1500	2,920.00	438.00
			<b>Total Amount</b>		<b>3,358.00</b>



**RECEIVED**

MAY 13 2005

May 9, 2005

UNDERGROUND STORAGE  
TANK PROGRAM

South Carolina Department of Health  
And Environmental Control  
2600 Bull Street  
Columbia, South Carolina 29201

Attn.: Ms. Karen Doran, Hydrogeologist

Reference: **MANIFESTS**  
**Hot Spot No. 7001**  
SCDHEC UST Permit #: 05401  
2295 Jefferson Davis Highway  
Camden, South Carolina  
**Hot Spot No. 3005**  
SCDHEC UST Permit #: 12719  
SC Hwy. 221  
Chesnee, South Carolina

Dear Ms. Doran:

Enclosed are soil and groundwater disposal manifests for the referenced Hot Spot sites. Please give me a call if you have any questions.

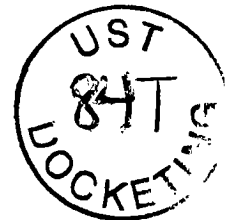
Sincerely,

**S&ME, Inc.**

Richard Bonds  
Environmental Professional

cc: Ms. Judy Laughter – Jordan Oil

s:\environ\2004\projects\6402381\gw work early 05\manifest letter.doc



**NON-HAZARDOUS WASTE MANIFEST**

1. Generator's US EPA ID No.

Manifest Document No. 2334

2. Page 1 of 1

3. Generator's Name and Mailing Address

107 Hampton Street  
Chesnee, Sc

S&ME Mt. Pleasant  
Heather Hollen  
864-574-2360

4. Generator's Phone ( )

5. Transporter 1 Company Name  
NU-WAY INDUSTRIAL SVC, INC.

6. US EPA ID Number  
SCD987598331

A. Transporter's Phone  
803-967-9175

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address

Nu Way Environmental Services  
1741 Calks Ferry Road  
Lexington, Sc 29073

10. US EPA ID Number

C. Facility's Phone

803-967-9175

11. Waste Shipping Name and Description

12. Containers  
No. Type

13. Total Quantity

14. Unit Wt/Vol

a. ~~HAZARDOUS WASTE~~ (Petroleum Contaminated Water) Profile # 1078

4 DM

b. NON-REGULATED, NON-HAZARDOUS MATERIAL (Petroleum Contaminated Soil) Profile # 750

1 DM

**RECEIVED**

MAY 13 2005

d. UNDERGROUND STORAGE TANK PROGRAM

D. Additional Descriptions for Materials Listed Above

Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

UNLAWFUL TO OFFER FOR RECYCLING OR REUSE  
THIS JOB #2005-128

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

Signature

Month Day Year

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

Doug Hardin

Doug Hardin

04 05 05

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

Signature

Month Day Year

JW Hall

JW Hall

04 05 05

GENERATOR

TRANSPORTER

FACILITY

**NON-HAZARDOUS WASTE MANIFEST**

1. Generator's US EPA ID No.

Manifest Document No. 2374

2. Page 1 of 1

3. Generator's Name and Mailing Address

2276 & 2295 Jefferson Davis Hwy  
Camden, Sc

S&ME-Mt. Pleasant  
Heather Hollen  
864-574-2360

4. Generator's Phone ( )

5. Transporter 1 Company Name  
NU-WAY INDUSTRIAL SVC., INC.

6. US EPA ID Number  
SCD987598J31

A. Transporter's Phone  
803-957-9175

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address

NU Way Environmental Services  
1741 Calks Ferry Road  
Lexington, Sc 29073

10. US EPA ID Number

C. Facility's Phone

803-957-9175

11. Waste Shipping Name and Description

12. Containers

13. Total Quantity

14. Unit Wt/Vol

a. NON-REGULATED, NON-HAZARDOUS MATERIAL  
(Petroleum Contaminated ~~Water~~ Soil) Profile # 1078

No.

Type

Quantity

Unit Wt/Vol

7

LJM

b. NON-REGULATED, NON-HAZARDOUS MATERIAL  
(Petroleum Contaminated ~~Soil~~ water) Profile # 750

001

DM

GENERATOR

TRANSPORTER

FACILITY

D. Additional Descriptions for Materials Listed Above

E. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

EMERGENCY CONTACT NUWAY ENVIRONMENTAL, INC. 803-957-9175  
MIS JOB #2005-137

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

Signature

Month Day Year

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

Doug Harding

*Doug Harding*

04/05/05

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

Signature

Month Day Year

Tiv Hill

*Tiv Hill*

04/05/05



**GROUNDWATER MONITORING REPORT  
HOT SPOT # 3005  
CHESNEE, SOUTH CAROLINA  
SITE ID # 12719  
CP # 24132**

Prepared For:

**SCDHEC BUREAU OF UNDERGROUND TANK MANAGEMENT  
2600 BULL ST.  
COLUMBIA, SC 29201**

Submitted By:



***TERRY ENVIRONMENTAL SERVICES***

**P.O. BOX 25  
SUMMERVILLE, SOUTH CAROLINA 29484  
(843) 873-8200  
Fax (843) 873-8765  
[www.terryenvironmental.com](http://www.terryenvironmental.com)**

**UST CONTRACTOR # 223  
PROJECT # 2230.8**

**RECEIVED**

**JUNE 2005**

**JUN 22 2005]**

**UNDERGROUND STORAGE  
TANK PROGRAM**



**GROUNDWATER MONITORING REPORT  
HOT SPOT # 3005  
CHESNEE, SOUTH CAROLINA  
SITE ID # 12719  
CP # 24132**

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UST CONTRACTOR # 223  
PROJECT # 2230.8

**TIM NICKEL  
HYDROGEOLOGIST**

**JASON A. TERRY, PG  
PRESIDENT**

JUNE 2005

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## 1.0 INTRODUCTION

TERRY Environmental Services, Inc. (TERRY) has been contracted by R. L. Jordan Oil Company to serve as their environmental contractor for the Hot Spot # 3005 site, South Carolina Department of Health and Environmental Control (SCDHEC) Site # 12719. The Groundwater Monitoring Event presented herein has been performed to monitor the contaminant levels at the Hot Spot # 3005 site. The site is located at the intersection of SC Highway 221 (Hampton Street) and North Alabama Avenue in Chesnee, South Carolina (Appendix 1, Figures 1A and 1B). The site is bordered to the north by a school, to the east by a vacant field, and to the south and west by residential properties. A site map is provided as Appendix 1, Figure 2.

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## 2.0 SITE SPECIFIC ASSESSMENT INFORMATION

### 2.1 Potentiometric Data

On May 17, 2005 the monitoring wells were gauged with a Keck Oil / Water interface probe by TERRY personnel. Depths to water measurements were taken with reference to the top of well casing (TOC). The TOC elevations were obtained from a previous assessment of the site. The potentiometric data is included in Table 1 and on the Groundwater Sampling Logs provided in Appendix 2. Potentiometric contour lines were created utilizing the potentiometric data and linear interpolation between known groundwater elevations. The resulting potentiometric contour map is included in Appendix 1 as Figure 3.

**TABLE 1**  
**MONITORING WELL AND GROUNDWATER DATA**  
**HOT SPOT # 3005**  
**CHESNEE, SOUTH CAROLINA**  
**SCDHEC SITE ID #12719**

Well #	TOC Elevation	Screened Interval	Depth to Product** (ft)	Depth to Water** (ft)	Product Thickness (ft)	Water Table Elevation (ft)
MW-1	104.89	20'-30'	--	24.21	--	80.68
MW-2	Unknown	26'-36'	--	24.02	--	Unknown
MW-3R	104.92	26'-36'	--	27.13	--	77.79
MW-4	111.32	36'-46'	--	22.92	--	88.40
MW-5	103.57	22'-32'	--	27.85	--	75.72
MW-6	104.14	26'-36'	--	24.31	--	79.83
MW-7	104.52	26'-36'	--	23.10	--	81.42
MW-8	101.79	CNF	CNF	CNF	CNF	CNF
MW-9	105.43	Unknown	DRY	DRY	DRY	DRY
MW-10	96.57	17'-27'	--	19.37	--	77.20
MW-10R	Unknown	22'-32'	--	19.53	--	Unknown
MW-11	95.15	18'-28'	--	20.41	--	74.74
MW-11R	Unknown	22'-32'	--	20.61	--	Unknown
MW-12	97.03	20'-30'	--	18.82	--	78.21
MW-13	95.89	17'-27'	--	19.92	--	75.97
MW-14	Unknown	21'-31'	--	24.41	--	Unknown
MW-1D	104.61	55'-60'	--	24.68	--	79.93

\*\* = Relative to top of casing

-- = No measurable product

CNF = Could Not Find

## 2.2 Groundwater Sampling

TERRY personnel sampled all monitoring wells on site on May 17, 2005. The samples were submitted to Access Analytical, Inc. (SCDHEC Lab Certification # 96023). The groundwater analytical data is provided in Table 2. The analytical data was used to generate a contaminant concentration map for COC's detected by laboratory analyses (Appendix 1, Figure 4). The laboratory analytical report and chain of custody are included in Appendix 3. The disposal manifest is found in Appendix 4.

**TABLE 2  
ANALYTICAL DATA  
HOT SPOT # 3005  
CHESNEE, SOUTH CAROLINA  
SCDHEC SITE ID #12719**

Well #	Benzene (5 ug/l)	Toluene (1000 ug/l)	Ethylbenzene (700 ug/l)	Xylenes (10,000 ug/l)	Naphthalene (25 ug/l)	MTBE (40 ug/l)
MW-1	<b>88</b>	95	35	150	41	7.6
MW-2	<b>94</b>	90	75	320	110	10
MW-3R	<b>250</b>	55	190	950	420	380
MW-4	<1.0	<0.80	<0.90	<1.6	<1.8	<0.89
MW-5	<1.0	<0.80	<0.90	<1.6	<1.8	<0.89
MW-6	<b>5.6</b>	3.2	6.5	42	22	5.4
MW-7	<1.0	<0.80	<0.90	<1.6	<1.8	<0.89
MW-8	CNF	CNF	CNF	CNF	CNF	CNF
MW-9	DRY	DRY	DRY	DRY	DRY	DRY
MW-10	<1.0	<0.80	<0.90	<1.6	<1.8	<0.89
MW-10R	<1.0	<0.80	<0.90	<1.6	<1.8	<0.89
MW-11	<1.0	<0.80	<0.90	<1.6	<1.8	<0.89
MW-11R	<1.0	<0.80	<0.90	<1.6	<1.8	<0.89
MW-12	<1.0	<0.80	<0.90	<1.6	<1.8	<0.89
MW-13	<1.0	<0.80	<0.90	<1.6	<1.8	<0.89
MW-14	<1.0	<0.80	<0.90	<1.6	<1.8	<0.89
MW-1D	<1.0	<0.80	<0.90	<1.6	<1.8	<0.89
WSW-1	<1.0	<0.80	<0.90	<1.6	<1.8	<0.89

MTBE - Methyl Tertiary Butyl Ether

CNF - Could Not Find

All Concentrations in ug/L

Values in **BOLD** are above RBSL's

### 3.0 CONCLUSIONS

The laboratory results indicate groundwater contamination above RBSL's in monitoring wells MW-1, MW-2, MW-3R, AND MW-6. The remaining wells sampled did not have concentrations of the contaminants of concern above or equal to laboratory reporting limits. Given the levels of contamination detected at this location, it appears that this site could be a candidate for remediation by monitored natural attenuation (MNA).

## APPENDIX 1

### Figures





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**FIGURE 1A**

SITE LOCATION – HIGHWAY MAP

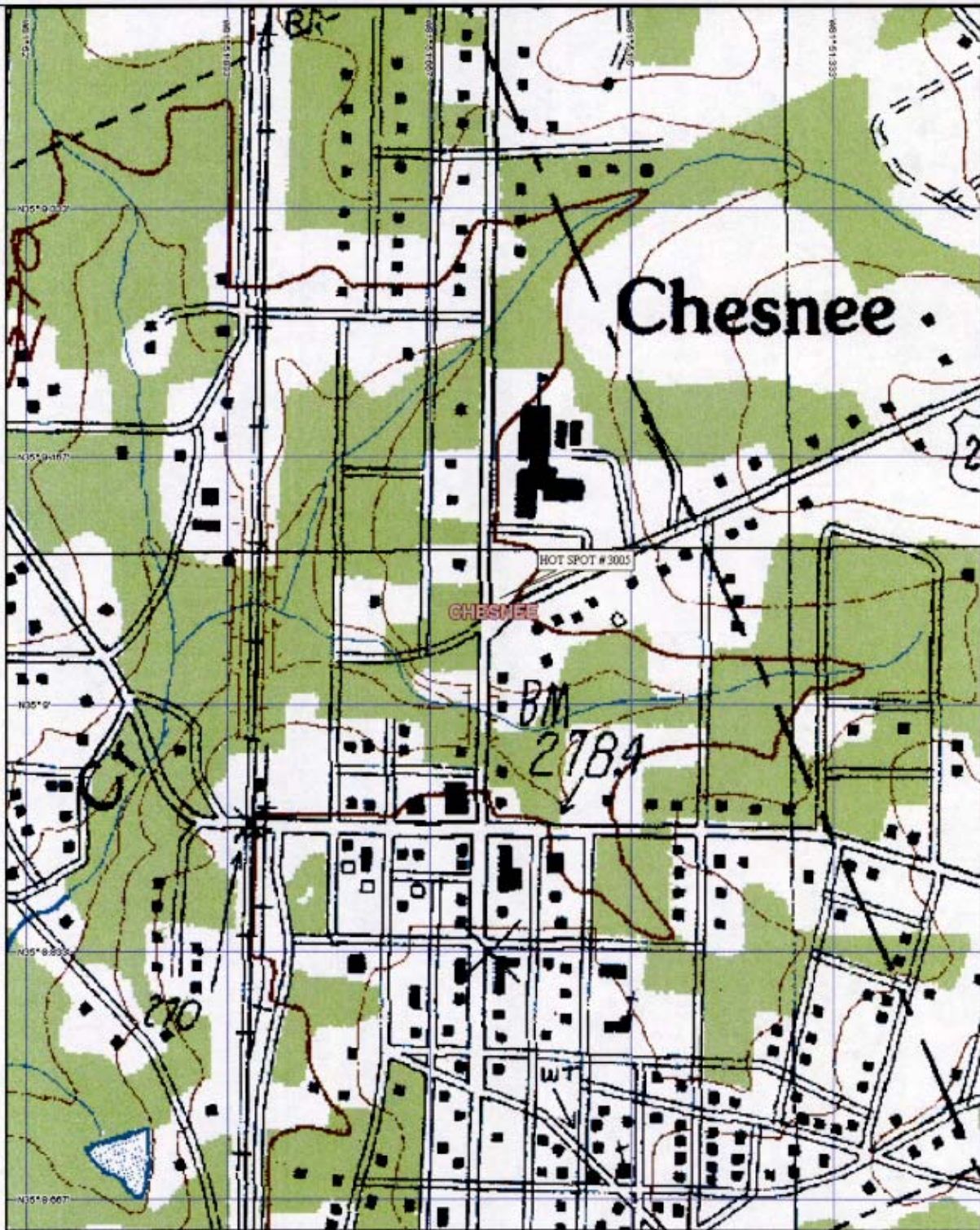
HOT SPOT # 3005

CHESNEE, SOUTH CAROLINA

SCDHEC ID# 12719

PROJECT # 2230.8

JUNE 2005



3-D TopoQuad Copyright © 1999 DeLorme, Yorktown, ME 04096 Source Data: USGS 150 ft Scale 1:6,000 Detail 15-0 Datum: WG84



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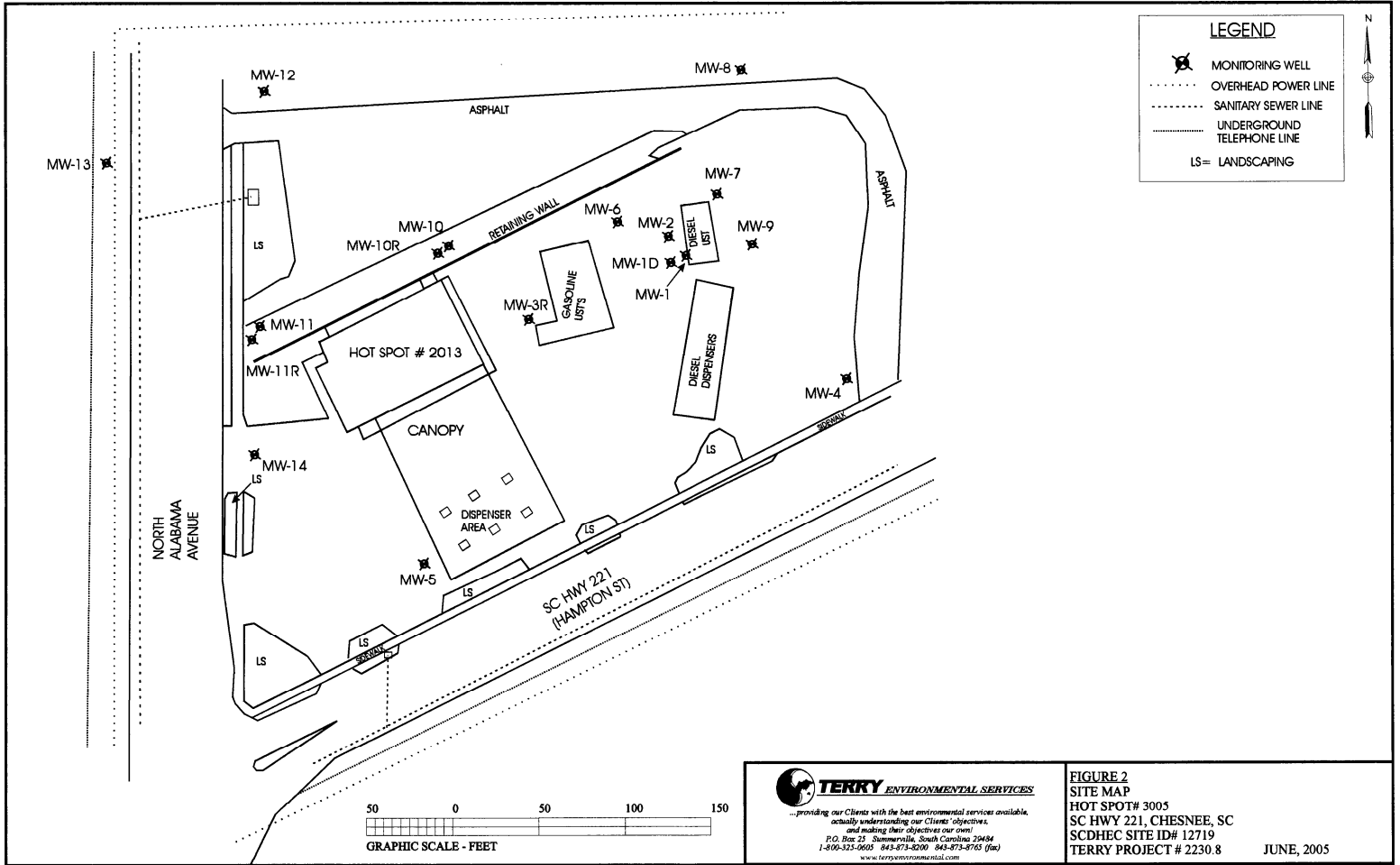
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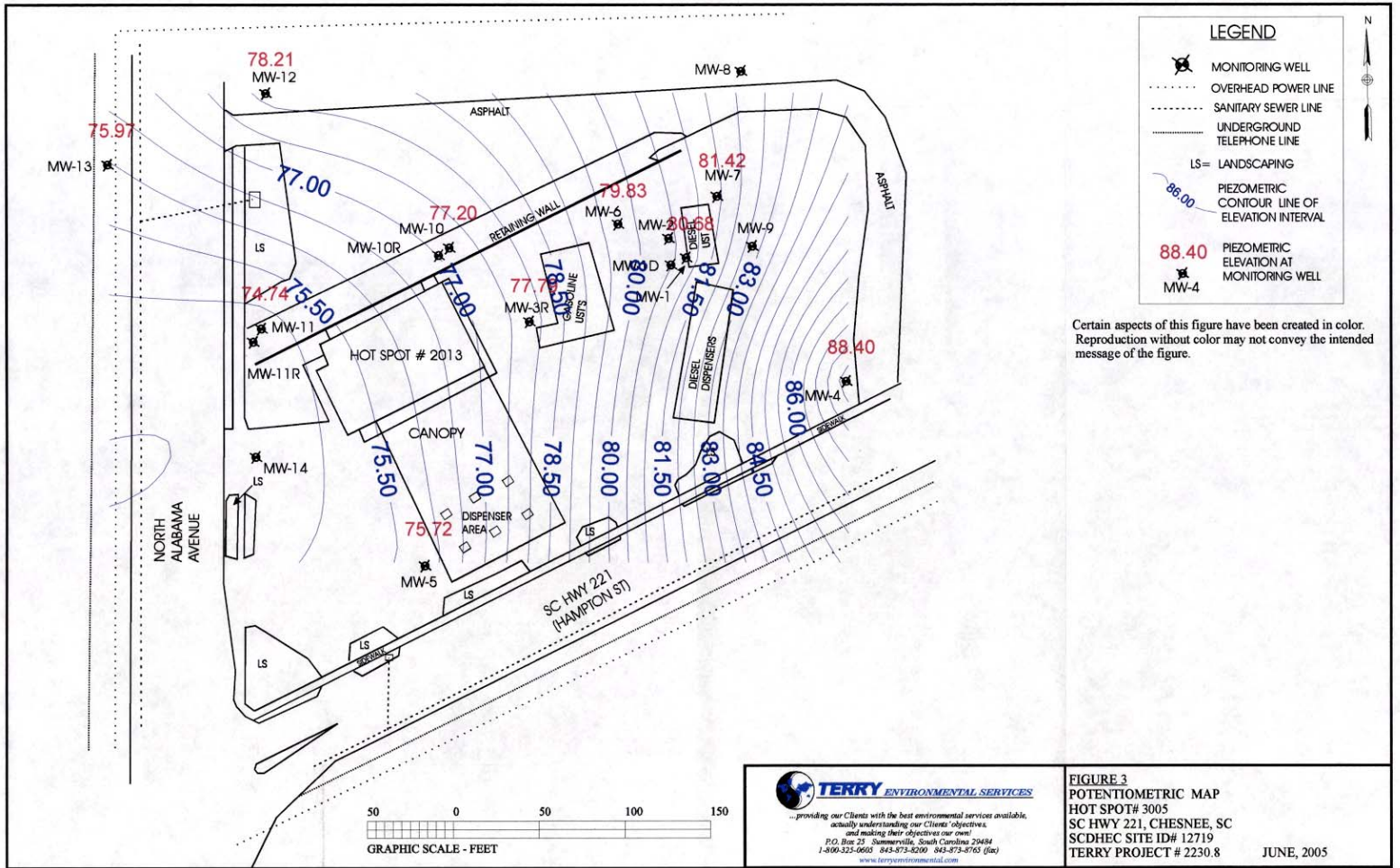
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**FIGURE 1B**

SITE LOCATION – USGS MAP  
HOT SPOT #3005  
CHESNEE, SOUTH CAROLINA  
SCDHEC SITE ID# 12719  
PROJECT # 2230.8  
JUNE 2005





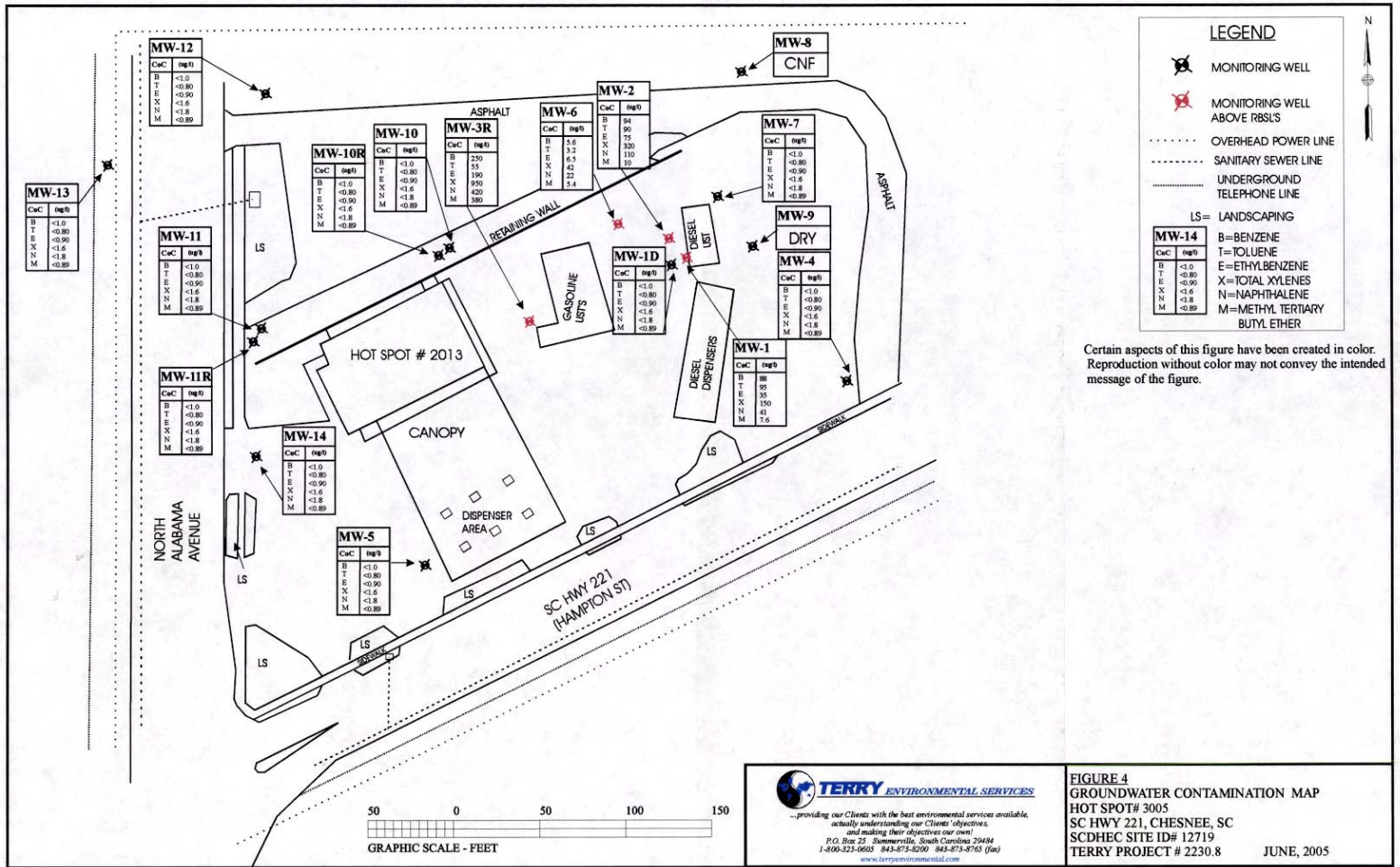
**LEGEND**

- MONITORING WELL
- OVERHEAD POWER LINE
- SANITARY SEWER LINE
- UNDERGROUND TELEPHONE LINE
- LS = LANDSCAPING
- PIEZOMETRIC CONTOUR LINE OF ELEVATION INTERVAL
- 88.40** PIEZOMETRIC ELEVATION AT MONITORING WELL
- MW-4

Certain aspects of this figure have been created in color. Reproduction without color may not convey the intended message of the figure.

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**FIGURE 3**  
 POTENTIOMETRIC MAP  
 HOT SPOT# 3005  
 SC HWY 221, CHESNEE, SC  
 SCDHEC SITE ID# 12719  
 TERRY PROJECT # 2230.8  
 JUNE, 2005



## **APPENDIX 2**

### **Groundwater Sampling Logs**

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TERRY Project #: <u>2230.8</u>		Well #: <u>MW-1</u>	
Project Name: <u>Hot Spot #3005</u>		Well Diameter: <u>2</u> INCHES	
Date: <u>5/17/05</u>		Total Well Depth: <u>30</u> FEET	
Field Personnel: <u>Mike Derrenbacher</u>		Depth to Groundwater: <u>24.21</u> FEET	
General Weather Conditions: <u>Partly Cloudy</u>		Length of Water Column = <u>5.79</u> FEET	
Ambient Air Temperature: <u>76°</u> SCDHEC Site ID: <u>12719</u>		1 casing vol = <u>5.79</u> X 0.163 = <u>0.944</u> GALLONS	
Facility Name: _____		3 casing vols = <u>0.944</u> X 3 = <u>2.832</u> GALLONS	
<b>QUALITY ASSURANCE</b>		Total Volume of Water Purged: <u>0</u> GALLONS	
pH Meter	Oakton	Conductivity Meter	Oakton
Serial No	73168	Cond Serial No:	73168
pH 4:	<u>4.00</u>	Standard1:	<u>1413 <math>\mu</math>S</u>
pH 7:	<u>7.05</u>	Standard2:	<u>447 <math>\mu</math>S</u>
pH 10:	<u>10.06</u>	Standard3:	
Additional Comments: <u>No Purge. Raised well pad</u> <u>Product Sheen on sample</u>			

Volume (gal):	-								
Time:	<u>11:14</u>								
pH (su):	<u>6.52</u>								
Spec Cond (mS/cm):	<u>206 <math>\mu</math>S</u>								
Water Temp (F or C):	<u>21.4</u>								
Turbidity (subjective):	<u>2</u>								
OVA Readings (ppm):	-								
Salinity (%):	-								
Dissolved Oxygen (mg/l):	<u>1.9</u>								

Remarks:

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TERRY Project #: <u>2230.8</u>				Well #: <u>MW-1D</u>			
Project Name: <u>Hot Spot # 3005</u>				Well Diameter: <u>2</u> INCHES			
Date: <u>5/17/05</u>				Total Well Depth: <u>59</u> 0 FEET			
Field Personnel: <u>Mike Derrenbacher</u>				Depth to Groundwater: <u>24.68</u> FEET			
General Weather Conditions: <u>Partly Cloudy</u>				Length of Water Column = <u>34.32</u> 0.00 FEET			
Ambient Air Temperature: <u>76°</u> SCDHEC Site ID: <u>12719</u>				1 casing vol = <u>34.32</u> 0.00 X 0.163 = <u>5.49</u> 0.00 GALLONS			
Facility Name: _____				3 casing vols = <u>5.49</u> 0.00 X 3 = <u>16.47</u> 0.00 GALLONS			
<b>QUALITY ASSURANCE</b>				Total Volume of Water Purged: <u>24.0</u> 0 GALLONS			
pH Meter		Oakton		Conductivity Meter		Oakton	
Serial No		73168		Cond Serial No:		73168	
pH 4:		<u>4.00</u>		Standard1:		<u>1413</u> $\mu$ S	
pH 7:		<u>7.05</u>		Standard2:		<u>447</u> $\mu$ S	
pH 10:		<u>10.06</u>		Standard3:			
Additional Comments: <u>Purge Well</u>							
Volume (gal):	<u>6.0</u>	<u>12.0</u>	<u>18.0</u>	<u>24.0</u>			
Time:	<u>11:45</u>	<u>11:51</u>	<u>11:56</u>	<u>12:04</u>			
pH (su):	<u>5.94</u>	<u>6.13</u>	<u>5.08</u>	<u>6.03</u>			
Spec Cond (mS/cm):	<u>110.2</u> $\mu$ S	<u>81.4</u> $\mu$ S	<u>74.6</u> $\mu$ S	<u>73.1</u> $\mu$ S			
Water Temp (F or C):	<u>21.4</u>	<u>20.3</u>	<u>20.5</u>	<u>21.9</u>			
Turbidity (subjective):	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>			
OVA Readings (ppm):	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>			
Salinity (%):	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>			
Dissolved Oxygen (mg/l):	<u>3.6</u>	<u>5.3</u>	<u>5.9</u>	<u>6.0</u>			

Remarks:



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TERRY Project #: <u>2230.8</u>		Well #: <u>MW-2</u>	
Project Name: <u>Hot Spot #3005</u>		Well Diameter: <u>2</u> INCHES	
Date: <u>5/17/05</u>		Total Well Depth: <u>36</u> FEET	
Field Personnel: <u>Mike Derrenbacher</u>		Depth to Groundwater: <u>24.02</u> FEET	
General Weather Conditions: <u>Partly Cloudy</u>		Length of Water Column = <u>11.98</u> 0.00 FEET	
Ambient Air Temperature: <u>76°</u> SCDHEC Site ID: <u>12719</u>		1 casing vol = <u>11.98</u> 0.00 X 0.163 = <u>1.91</u> 0.00 GALLONS	
Facility Name: _____		3 casing vols = <u>1.91</u> 0.00 X 3 = <u>5.73</u> 0.00 GALLONS	
<b>QUALITY ASSURANCE</b>		Total Volume of Water Purged: <u>5.00</u> 0 GALLONS	
pH Meter	<u>Oakton</u>	Conductivity Meter	<u>Oakton</u>
Serial No	<u>73168</u>	Cond Serial No:	<u>73168</u>
pH 4:	<u>4.00</u>	Standard1:	<u>1413µS</u>
pH 7:	<u>7.05</u>	Standard2:	<u>447µS</u>
pH 10:	<u>10.06</u>	Standard3:	
Additional Comments: <u>Purge Well</u> <u>Well dry @ 5.0 gal</u>			

Volume (gal):	<u>2</u>	<u>4</u>						
Time:	<u>12:10</u>	<u>12:13</u>						
pH (su):	<u>5.83</u>	<u>5.59</u>						
Spec Cond (mS/cm):	<u>190µS</u>	<u>193.6µS</u>						
Water Temp (F or C):	<u>22.2</u>	<u>21.7</u>						
Turbidity (subjective):	<u>1</u>	<u>1</u>						
OVA Readings (ppm):	<u>-</u>	<u>-</u>						
Salinity (%):	<u>-</u>	<u>-</u>						
Dissolved Oxygen (mg/l):	<u>2.3</u>	<u>3.7</u>						

Remarks:

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TERRY Project #: <u>2230.8</u>		Well #: <u>MW-3R</u>	
Project Name: <u>Hot Spot #3005</u>		Well Diameter: <u>2</u> INCHES	
Date: <u>5/17/05</u>		Total Well Depth: <u>36</u> 0 FEET	
Field Personnel: <u>Mike Derrenbacher</u>		Depth to Groundwater: <u>27.13</u> 0 FEET	
General Weather Conditions: <u>Partly Cloudy</u>		Length of Water Column = <u>8.87</u> 0.00 FEET	
Ambient Air Temperature: <u>76°</u> SCDHEC Site ID: <u>12719</u>		1 casing vol = <u>8.87</u> 0.00 X 0.163 = <u>1.45</u> 0.00 GALLONS	
Facility Name: _____		3 casing vols = <u>1.45</u> 0.00 X 3 = <u>4.35</u> 0.00 GALLONS	
<b>QUALITY ASSURANCE</b>			
pH Meter	<u>Oakton</u>	Conductivity Meter	<u>Oakton</u>
Serial No	<u>73168</u>	Cond Serial No:	<u>73168</u>
pH 4:	<u>4.00</u>	Standard1:	<u>1413µS</u>
pH 7:	<u>7.05</u>	Standard2:	<u>447µS</u>
pH 10:	<u>10.06</u>	Standard3:	
Additional Comments: <u>No Purge</u>			
Volume (gal):	<u>-</u>		
Time:	<u>11:07</u>		
pH (su):	<u>6.85</u>		
Spec Cond (mS/cm):	<u>183µS</u>		
Water Temp (F or C):	<u>21.4</u>		
Turbidity (subjective):	<u>1</u>		
OVA Readings (ppm):	<u>-</u>		
Salinity (%):	<u>-</u>		
Dissolved Oxygen (mg/l):	<u>1.8</u>		

Remarks:

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TERRY Project #: <u>2230.8</u>		Well #: <u>MW-4</u>	
Project Name: <u>Hot Spot #3005</u>		Well Diameter: <u>2</u> INCHES	
Date: <u>5/17/05</u>		Total Well Depth: <u>46</u> FEET	
Field Personnel: <u>Mike Derrenbacher</u>		Depth to Groundwater: <u>22.920</u> FEET	
General Weather Conditions: <u>Partly Cloudy</u>		Length of Water Column = <u>23.08</u> FEET	
Ambient Air Temperature: <u>76°</u> SCDHEC Site ID: <u>12719</u>		1 casing vol = <u>23080.00</u> X 0.163 = <u>3690.00</u> GALLONS	
Facility Name: _____		3 casing vols = <u>3690.00</u> X 3 = <u>11070.00</u> GALLONS	
<b>QUALITY ASSURANCE</b>		Total Volume of Water Purged: <u>4.0</u> GALLONS	
pH Meter	<u>Oakton</u>	Conductivity Meter	<u>Oakton</u>
Serial No	<u>73168</u>	Cond Serial No:	<u>73168</u>
pH 4:	<u>4.00</u>	Standard1:	<u>1413µS</u>
pH 7:	<u>7.05</u>	Standard2:	<u>447µS</u>
pH 10:	<u>10.06</u>	Standard3:	
Additional Comments: <u>Purge Well Well Dry @ 4.0 gal</u>			
Volume (gal):	<u>4.0</u>	<u>8.0</u>	<u>12.0</u>
Time:	<u>13:18</u>		
pH (su):	<u>5.89</u>		
Spec Cond (mS/cm):	<u>174.5µS</u>		
Water Temp (F or C):	<u>23.2</u>		
Turbidity (subjective):	<u>2</u>		
OVA Readings (ppm):	<u>-</u>		
Salinity (%):	<u>-</u>		
Dissolved Oxygen (mg/l):	<u>3.3</u>		

Remarks:

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TERRY Project #: <u>2230.8</u>		Well #: <u>MW-5</u>	
Project Name: <u>Hot Spot #3005</u>		Well Diameter: <u>2</u> INCHES	
Date: <u>5/17/05</u>		Total Well Depth: <u>32</u> 0 FEET	
Field Personnel: <u>Mike Derrenbacher</u>		Depth to Groundwater: <u>27.85</u> FEET	
General Weather Conditions: <u>Partly Cloudy</u>		Length of Water Column = <u>4.15</u> 0.00 FEET	
Ambient Air Temperature: <u>76°</u> SCDHEC Site ID: <u>12719</u>		1 casing vol = <u>4.15</u> 0.00 X 0.163 = <u>.676</u> 0.00 GALLONS	
Facility Name: _____		3 casing vols = <u>.676</u> 0.00 X 3 = <u>2.03</u> 0.00 GALLONS	
<b>QUALITY ASSURANCE</b>		Total Volume of Water Purged: <u>0</u> GALLONS	
pH Meter	<u>Oakton</u>	Conductivity Meter	<u>Oakton</u>
Serial No	<u>73168</u>	Cond Serial No:	<u>73168</u>
pH 4:	<u>4.00</u>	Standard1:	<u>1413µS</u>
pH 7:	<u>7.05</u>	Standard2:	<u>447µS</u>
pH 10:	<u>10.06</u>	Standard3:	
Additional Comments: <u>No Purge</u>			
Volume (gal):	<u>-</u>		
Time:	<u>11:23</u>		
pH (su):	<u>6.13</u>		
Spec Cond (mS/cm):	<u>67.8µS</u>		
Water Temp (F or C):	<u>20.8</u>		
Turbidity (subjective):	<u>2</u>		
OVA Readings (ppm):	<u>-</u>		
Salinity (%):	<u>-</u>		
Dissolved Oxygen (mg/l):	<u>3.0</u>		

Remarks: