

N00639.AR.001960
NSA MID SOUTH
5090.3a

LETTER DISCUSSING WELL INSTALLATION AND SAMPLING AT THE CITGO SERVICE
STATION MILLINGTON SUPPACT TN
7/21/2006
ENSAFE



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5724 Summer Trees Drive | Memphis, Tennessee 38134 | Telephone 901-372-7962 | Facsimile 901-372-2454 | www.ensafe.com

July 21, 2006

Mr. R. Jeff Phillips
Tennessee Department of Environment and Conservation
Memphis Environmental Field Office
Suite E-645, Perimeter Park
2510 Mount Moriah Road
Memphis, Tennessee 38115-1520

Re: Well Installation and Sampling
Naval Support Activity Mid-South — Citgo Service Station
7345 Singleton Avenue, Millington, Shelby County, Tennessee
Facility ID# 0-792653

Dear Mr. Phillips:

As previously reported to your office, a gasoline release occurred at the Citgo Service Station (Citgo) at Naval Support Activity (NSA) Mid-South, Millington, Tennessee. The release occurred within the underground storage tank (UST) pit during a gasoline delivery on April 1, 2006. In a letter dated April 24, 2006, the Tennessee Department of Environment and Conservation (TDEC) approved a request by NSA Mid-South to install two recovery/monitoring wells, conduct water sampling, and perform two mobile enhanced multiphase extraction (MEME) events. In a letter dated June 1, 2006, TDEC granted an extension until July 24, 2006, to submit sample results. This report documents the recovery/monitoring-well installation activities, subsequent UST pit water sampling, and provides sampling results.

Recovery/Monitoring-Well Installation

On June 6, 2006, Tri-State Testing Services, Inc. (TST) of Memphis installed two recovery/monitoring wells at the Citgo using a hollow-stem auger drill rig under supervision of an EnSafe Inc. geologist. One well (MW-01) was installed in the southeast corner of the UST pit; another well (MW-02) was installed in the northwest corner of the UST pit. Water was encountered within the UST pit at approximately five feet below ground surface (bgs). Each four-inch diameter well was installed through the pea gravel backfill to a terminal depth of the bottom of the UST pit, 22 and 18 feet bgs for wells MW-01 and MW-02, respectively. Because of the pea gravel backfill and UST pit water, no soil samples were collected during well installation. A site map is included as Attachment A; copies of the well logs are included in Attachment B.

On June 7, 2006, EnSafe and TST returned to the site to develop the two recovery/monitoring wells. Approximately 70 gallons of water were removed from each well. An electric submersible pump was used for the development activities, which continued until the purge water cleared.

Sampling Methodology and Results

On June 8, 2006, EnSafe conducted recovery/monitoring-well sampling activities. The recovery/monitoring wells were opened and allowed to stabilize prior to the collection of water-level measurements using an oil-water interface probe. The depth to water measured 5.68 and 5.22 feet bgs within MW-01 and MW-02, respectively. Liquid-phase hydrocarbons were not observed in either of the two wells. Three well volumes were then purged from each well using a submersible pump. Following well purging, water samples were collected from each well using a disposable bailer. The samples were placed into laboratory-prepared containers, stored on ice, and hand delivered to Environmental Testing & Consulting, Inc. (ETC) laboratories in Memphis for analysis.

The UST pit water samples were analyzed for benzene, toluene, ethylbenzene, and xylene (BTEX), methyl tertiary butyl ether (MTBE), and naphthalene. BTEX, MTBE, and naphthalene were detected in MW-01; ethylbenzene, MTBE, and naphthalene were detected in MW-02.

Benzene, toluene, and xylene were below the laboratory detection limit in

the sample collected from MW-02. The laboratory results are summarized in Table 1. The original laboratory reports and chain-of-custody records are included in Attachment C.

<u>Compound</u>	<u>RBCL</u>	<u>MW-01</u>	<u>MW-02</u>
Benzene	0.005	0.946	<0.001
toluene	1.0	6.33	<0.005
ethylbenzene	0.7	2.17	0.00480
total xylenes	10.0	12.24	<0.003
MTBE	0.02	0.0970	0.0509
naphthalene	0.02	0.873	0.00509

bold — exceeds the Risk Based Cleanup Level

The water results were compared to the Tennessee Division of Underground Storage Tanks' Risk Based Cleanup Levels (RBCL) for a drinking water supply. Each compound analyzed from the MW-01 water sample exceeded the RBCL; only MTBE exceeded the RBCL in the water sample collected from MW-02. As depicted on the site map in Attachment A, MW-01 and MW-02 were both installed within the backfill of the UST pit and are less than 25 feet apart. The significant difference in contaminant concentrations between the two wells located within the same UST pit backfilled with pea gravel suggests that the gasoline release was small and isolated to the UST pit. To confirm this, NSA Mid-South decided to pump the UST pit water and resample the two recovery/monitoring wells. NSA Mid-South and EnSafe obtained approval from the City of Millington to discharge extracted UST pit water into the sanitary sewer system. However, the quantity could not exceed 10,000 gallons.

On July 12, 2006, EnSafe pumped approximately 5,000 gallons of water from the UST pit and an additional 5,000 gallons on July 13, 2006. Consequently, the water level in the UST pit was reduced approximately two feet. MW-1 and MW-2 were sampled on July 14, 2006. Samples were again analyzed for BTEX, MTBE, and naphthalene by ETC. The laboratory results are summarized in

<u>Compound</u>	<u>RBCl</u>	<u>MW-01</u>	<u>MW-02</u>
benzene	0.005	0.227	0.00459
toluene	1.0	0.403	0.00568
ethylbenzene	0.7	0.953	0.0745
total xylenes	10.0	2.97	0.0315
MTBE	0.02	0.0479	0.0556
naphthalene	0.02	0.780	0.0702

bold — exceeds the Risk Based Cleanup Level

Table 2. The original laboratory reports and chain-of-custody records are included in Attachment C.

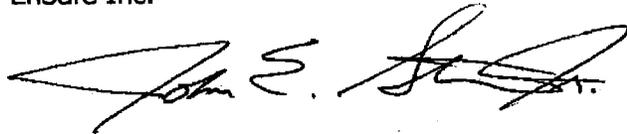
Recommendations

Comparison of the results of water samples collected before and after pumping reveals a significant decrease in contaminant concentrations. MW-01 exhibited a 76% decrease in benzene concentrations. This finding further supports a conclusion that the gasoline release was small and isolated to the UST pit. Therefore, EnSafe recommends pumping additional UST pit water, followed by sampling the two recovery/monitoring wells. Pumping UST pit water should remove contaminant mass more effectively than the previously proposed MEME events because of the large amount of water within the UST pit and the lack of soil contamination. The sampling results should again be evaluated to determine the appropriate next course of action.

If TDEC concurs with this approach, NSA Mid-South anticipates samples results could be submitted to your office within 45 days of a notice to proceed. If you have any questions or comments, please contact me at (901) 372-7962.

Sincerely,

EnSafe Inc.



By: John E. Stedman, Jr., CHMM
Senior Project Manager

cc: Nashville Central Office — Technical Review File
Randy Wilson — Environmental Department, NSA Mid-South
James Heide — Environmental Department, NSA Mid-South

Attachment A
Site Map

I:\PROJECTS-BST\088802764_NSAMS_CITGO\802764W001.dwg 7/11/2006 3:07:23 PM CST

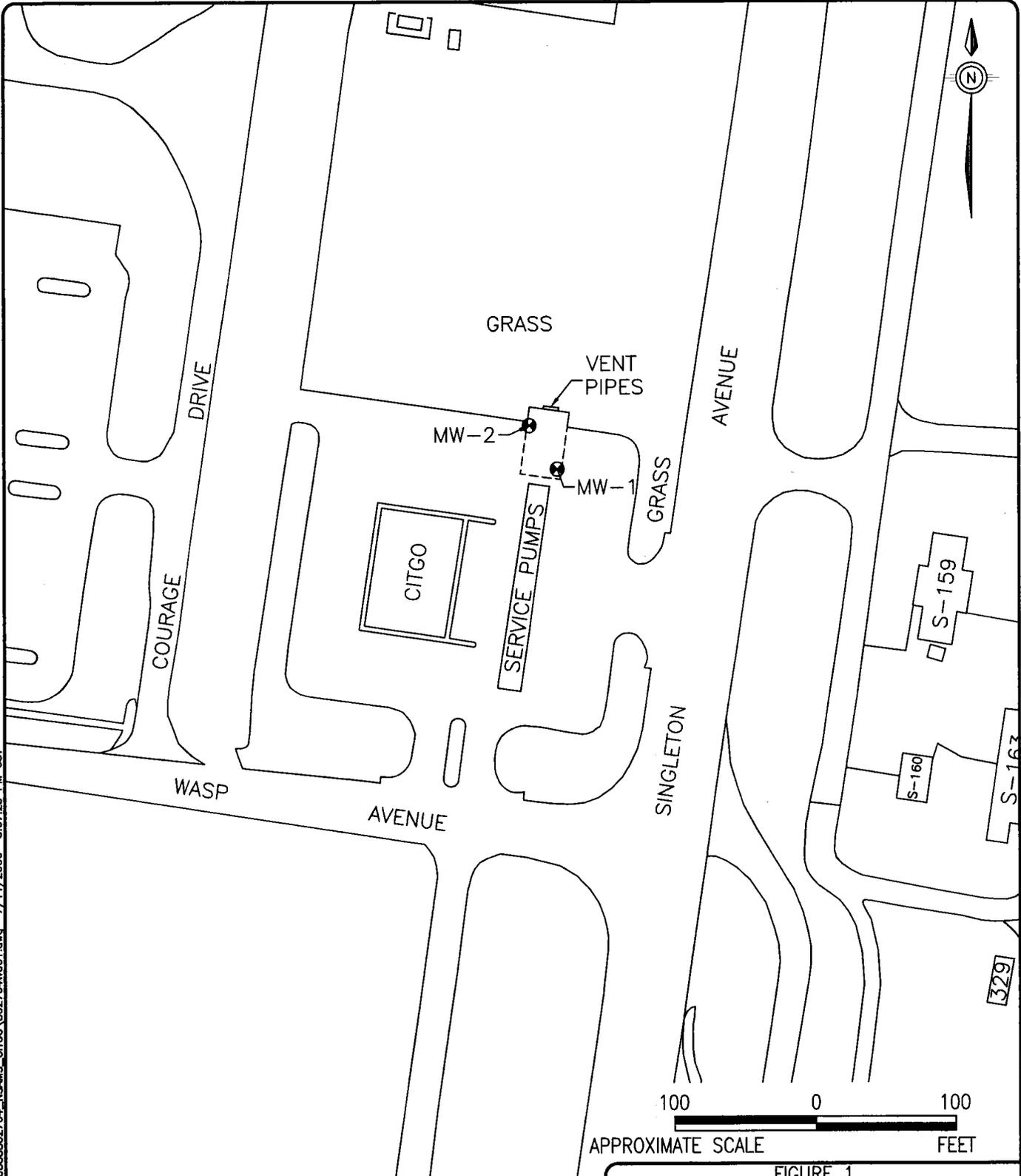


FIGURE 1
 SITE LAYOUT MAP
 CITGO SERVICE STATION
 NSA MID-SOUTH
 MILLINGTON, TN

REQUESTED BY: P.A.
 DRAWN BY: K.W.
 DWG DATE: 07/10/06
 DWG NO: 802764W001



Attachment B
Well Logs

DRILLING CONTR. Tri-State
William Burnette

BY Derrick McNeal
 DATE 6/6/06 CHK'D BY

LOCATION OF BORING				JOB NO.		CLIENT		LOCATION	
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Corb</p> </div> <div style="text-align: center;"> <p>N/A</p> </div> </div>				N/A		NSA		Millington, TN	
DRILLING METHOD:						BORING NO.			
HSA						MW-01			
SAMPLING METHOD:						SHEET			
Continuous						1 of 2			
WATER LEVEL						START		FINISH	
TIME						TIME		TIME	
DATE						DATE		DATE	
CASING DEPTH						6/6/06		6/6/06	
DATUM		ELEVATION		SURFACE CONDITIONS:					
Pumps				Concrete					
SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	WATER CONCENTRATIONS (PPM)	DEPTH IN FEET	SOIL GRAPH		
/	/	/	/	/	/	0	/	0-1 Concrete	
/	/	/	/	/	/	1	/	1-2 Fill material & pea gravel	
/	/	/	/	/	/	2	/	2-6 No recovery from unconsolidated pea gravel & fill. Cuttings observed are all pea gravel & fill material. No odor, slightly moist. Will plug augers & drive to depth (Bottom of pit)	
/	/	/	/	/	/	3	/		
/	/	/	/	/	/	4	/		
/	/	/	/	/	/	5	/		
/	/	/	/	/	/	6	/		
/	/	/	/	/	/	7	/		
/	/	/	/	/	/	8	/	8.5 moisture increasing in cuttings	
/	/	/	/	/	/	9	/		
/	/	/	/	/	/	10	/		
/	/	/	/	/	/	11	/	11.5 Have hit what appears to be concrete. Augers are advancing but obstruction is kicking them back & forth	
/	/	/	/	/	/	12	/		
/	/	/	/	/	/	13	/	13.0 Moisture increasing. Slight odor in pea gravel cuttings	
/	/	/	/	/	/	14	/		
/	/	/	/	/	/	15	/		
/	/	/	/	/	/	16	/	16.5 Moist to wet cuttings	
/	/	/	/	/	/	17	/		
/	/	/	/	/	/	18	/		
/	/	/	/	/	/	19	/		
/	/	/	/	/	/	20	/		

LOCATION OF BORING	JOB NO.	CLIENT	LOCATION
See Page 1	DRILLING METHOD:		BORING NO.
	HSA		MW-01
	SAMPLING METHOD:		SHEET
	Continual		2 of 2
WATER LEVEL		DRILLING	
TIME		START TIME	FINISH TIME
DATE		DATE	DATE
CASING DEPTH			

DRILLING CONTR.

 BY _____ DATE _____
 CHK'D BY _____

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	VAPOR CONCENTRATIONS (PPM)	DEPTH IN FEET	SOIL GRAPH	SURFACE CONDITIONS:
						20		
						1		
						22		At depth, 22' logs. Cutting have fill material. Will set well @ 22'. No odor.
						3		
						4		Screen 22-12
						5		Riser 12-0
						6		Sand 1/20 22-9 (filter pack)
						7		Bentonite pellets 9-7 will Bentonite plug
						8		* Used Bentonite plug chips to set well because grout will not set in pea gravel, will wash through gravel.
						9		Concrete 2-0
						0		Natural collapse 7-2 (when augers removed)
						1		* No plug used due to collapse
						2		
						3		
						4		
						5		
						6		
						7		
						8		
						9		
						0		

LOCATION OF BORING <i>NA</i>	JOB NO.	CLIENT	LOCATION <i>Millington, TN</i>
	DRILLING METHOD: <i>HSA</i>		BORING NO. <i>MW-02</i>
	SAMPLING METHOD: <i>Continuous</i>		SHEET <i>1 of</i>
	WATER LEVEL		DRILLING START TIME <i>1238</i>
	TIME		FINISH TIME <i>1254</i>
DATE		DATE	<i>6/6/06</i>
DATUM <i>Pumps</i>	ELEVATION		CASING DEPTH

DRILLING CONTR
Tri-State
William Bernette

BY *Derrick McNeal*
 DATE *6/6/06* CHK'D BY

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	VAPOR CONCENTRATIONS (PPM)	DEPTH IN FEET	SOIL GRAPH	SURFACE CONDITIONS:
						0		<i>Concrete</i>
						1		<i>0-1.5 Concrete</i>
						2		<i>1.5-3 Pea gravel</i>
	<i>60</i>					3		<i>Will not sample, no recovery. All pea gravel. Moist 3-8</i>
						4		
						5		
						6		
						7		
	<i>60</i>					8		<i>8-13 Moisture in pea gravel cuttings increasing from moist to wet</i>
						9		
						10		
						11		
						12		
	<i>60</i>					13		<i>13-18 Wet cuttings. Seeing natural surface in cuttings. Will set well @ 18'</i>
						14		
						15		
						16		
						17		
						18		<i>Screen 18-8 Riser 8-5 Sund 18-5 Pellets 5-2 Natural collapse 2-1.5 Concrete 1.5-0</i>
						19		
						20		

Attachment C
Laboratory Reports and Chain-of-Custody Records



ENVIRONMENTAL TESTING & CONSULTING, INC.

2790 Whitten Road Memphis, TN 38133 (901)213-2400 FAX (901)213-2440
www.etcmemphis.com

" A Laboratory Management Partner "

June 13, 2006

Mr. John Stedman
Ensafe
5724 Summer Tree Drive
Memphis, TN 38184

Ref: Analytical Testing
Lab Order Number 0606292
Project Description NSA Mid-South Citgo
Site NSA Mid-South
Project Number 0888802764
FID No. 0-792653

Environmental Testing and Consulting, Inc. received 4 sample(s) on 6/8/2006 for the analyses presented in the following report.

The above referenced project has been analyzed per your instructions. The analyses were performed in our laboratory in accordance with Standard Methods, The Solid Waste Manual SW-846, EPA Methods for Chemical Analysis of Water and Wastes and /or 40 CFR part 136.

The EPA requires that analysis for pH, dissolved oxygen and total residual chlorine be analyzed in the field. Analyses and results reported which do not indicate "Field" for these parameters were analyzed outside the holding time as specified in Table II of 40 CFR Part 136.3.

The analytical data has been validated using standard quality control measures performed as required by the analytical method. Quality Assurance, instrumentation maintenance and calibration were performed in accordance with guidelines established by the USEPA, NELAP, and USACE.

The results are shown on the attached analysis sheet(s).

Please do not hesitate to contact me or client services if you have any questions or need additional information.

Sincerely,

Connie Bradberry
Laboratory Project Manager

Attachment
ENSAFE

Certifications

Alabama #40750	Louisiana #04015	Florida #E87943	California #05240CA
Arkansas #88-0650	Mississippi	Pennsylvania #68-3195	Texas #T104704180-05-TX
Illinois #200015	Oklahoma #9311	USDA #S-46279	U.S. Army Corps of Engineers
Kentucky #90047	Tennessee #02027	EPA #TN00012	
Kentucky UST #41	Virginia #00106	NELAP #04015	





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Ensafe
5724 Summer Tree Drive

Memphis, TN 38184

Lab Order Number 0606292

Lab ID 0606292-001A

Field ID CITGMW0101

Project **NSA Mid-South Citgo** Site **NSA Mid-South**
Description

Project No. **0888802764**

FID No **0-792653**

Report of Analysis

Received **06/08/06**

Matrix **Aqueous**

Sampled **06/08/06**

GCMS Volatiles

Prep Method	Prep Batch	10387	Date/Time Prepped	06/09/06 10:36	Analytical Batch	16510		
Compound	Result	Units	MQL	DF	Date/Time Analyzed	By	Analytical Method	
Benzene	0.946	mg/L	0.0500	50	06/12/06 12:39	VS	8260B	
Ethylbenzene	2.17	mg/L	0.0500	50	06/12/06 12:39	VS	8260B	
Methyl tert-butyl ether	0.0970	mg/L	0.0500	50	06/12/06 12:39	VS	8260B	
Naphthalene	0.873	mg/L	0.250	50	06/12/06 12:39	VS	8260B	
Toluene	6.33	mg/L	0.250	50	06/12/06 12:39	VS	8260B	
m,p-Xylene	7.92	mg/L	0.100	50	06/12/06 12:39	VS	8260B	
o-Xylene	4.32	mg/L	0.0500	50	06/12/06 12:39	VS	8260B	
Surrogate:	Dibromofluoromethane		108 %	Limits: 85-115				
Surrogate:	Toluene-d8		110 %	Limits: 85-120				
Surrogate:	4-Bromofluorobenzene		110 %	Limits: 75-120				
Surrogate:	1,2-Dichloroethane-d4		99 %	Limits: 70-120				

Qualifiers/ Definitions	* Surrogate Recovery outside accepted limits.	* I Recoveries affected by interferences or high background.
	B Analyte detected in the associated Method Blank	DF Dilution Factor
	E Value exceeds method calibration range	H Prepped / Analyzed out of holding time.
	J Estimated Value Analyte below reported detection limit	M Minimum value.
	MDL Method Detection Limit (unadjusted)	MQL Method Quantitation Limit (adjusted)
	MRL Method Reporting Limit	SQL Sample Quantitation Limit (adjusted MDL)

06/13/06

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"A Laboratory Management Partner"

Ensafe
5724 Summer Tree Drive

Memphis, TN 38184

Lab Order Number 0606292

Lab ID 0606292-002A

Field ID CITGMW0201

Project NSA Mid-South Citgo Site NSA Mid-South
Description

Project No. 0888802764

FID No 0-792653

Report of Analysis

Received 06/08/06

Matrix Aqueous

Sampled 06/08/06

GCMS Volatiles

Prep Method	Prep Batch 10387	Date/Time Prepped 06/09/06 10:36	Analytical Batch 16510				
Compound	Result	Units	MQL	DF	Date/Time Analyzed	By	Analytical Method
Benzene	< 0.00100	mg/L	0.00100	1	06/12/06 13:11	VS	8260B
Ethylbenzene	0.00480	mg/L	0.00100	1	06/12/06 13:11	VS	8260B
Methyl tert-butyl ether	0.0509	mg/L	0.00100	1	06/12/06 13:11	VS	8260B
Naphthalene	0.00509	mg/L	0.00500	1	06/12/06 13:11	VS	8260B
Toluene	< 0.00500	mg/L	0.00500	1	06/12/06 13:11	VS	8260B
m,p-Xylene	< 0.00200	mg/L	0.00200	1	06/12/06 13:11	VS	8260B
o-Xylene	< 0.00100	mg/L	0.00100	1	06/12/06 13:11	VS	8260B
Surrogate: Dibromofluoromethane			104 %	Limits: 85-115			
Surrogate: Toluene-d8			110 %	Limits: 85-120			
Surrogate: 4-Bromofluorobenzene			107 %	Limits: 75-120			
Surrogate: 1,2-Dichloroethane-d4			99 %	Limits: 70-120			

Qualifiers/ Definitions

* Surrogate Recovery outside accepted limits.	* I Recoveries affected by interferences or high background.
B Analyte detected in the associated Method Blank	DF Dilution Factor
E Value exceeds method calibration range	H Prepped / Analyzed out of holding time.
J Estimated Value Analyte below reported detection limit	M Minimum value.
MDL Method Decision Limit (unadjusted)	MQL Method Quantitation Limit (adjusted)
MRL Method Reporting Limit	SQL Sample Quantitation Limit (adjusted MDL)

06/13/06

ENSAFE



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Ensafe
5724 Summer Tree Drive

Memphis, TN 38184

Lab Order Number 0606292

Lab ID 0606292-003A

Field ID CITSDRUM01

Project **NSA Mid-South Citgo** Site **NSA Mid-South**
Description

Project No. **0888802764**

FID No **0-792653**

Report of Analysis

Received **06/08/06**

Matrix **Soil**

Sampled **06/08/06**

GCMS Volatiles

Prep Method	5035	Prep Batch	10021	Date/Time Prepped	06/10/06 12:28	Analytical Batch	16494
Compound	Result	Units	MQL	DF	Date/Time Analyzed	By	Analytical Method
Benzene	< 0.00247	mg/Kg-dry	0.00247	1	06/10/06 16:31	LS	8260B
Ethylbenzene	< 0.00247	mg/Kg-dry	0.00247	1	06/10/06 16:31	LS	8260B
Methyl tert-butyl ether	< 0.0124	mg/Kg-dry	0.0124	1	06/10/06 16:31	LS	8260B
Naphthalene	< 0.0124	mg/Kg-dry	0.0124	1	06/10/06 16:31	LS	8260B
Toluene	< 0.00494	mg/Kg-dry	0.00494	1	06/10/06 16:31	LS	8260B
m,p-Xylene	< 0.00494	mg/Kg-dry	0.00494	1	06/10/06 16:31	LS	8260B
o-Xylene	< 0.00247	mg/Kg-dry	0.00247	1	06/10/06 16:31	LS	8260B
Surrogate:	Dibromofluoromethane		107 %	Limits: 85-115			
Surrogate:	Toluene-d8		118 %	Limits: 85-120			
Surrogate:	4-Bromofluorobenzene		118 %	Limits: 75-120			
Surrogate:	1,2-Dichloroethane-d4		112 %	Limits: 70-120			

Qualifiers/Definitions	* Surrogate Recovery outside accepted limits.	* I Recoveries affected by interferences or high background.
	B Analyte detected in the associated Method Blank	DF Dilution Factor
	E Value exceeds method calibration range	H Prepped / Analyzed out of holding time.
	J Estimated Value Analyte below reported detection limit	M Minimum value.
	MDL Method Dection Limit (unadjusted)	MQL Method Quantitation Limit (adjusted)
	MRL Method Reporting Limit	SQL Sample Quantitation Limit (adjusted MDL)

06/13/06 ENSAFE



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Ensafe
5724 Summer Tree Drive
Memphis, TN 38184

Project **NSA Mid-South Citgo** Site **NSA Mid-South**
Description
Project No. **0888802764** FID No **0-792653**

Lab Order Number **0606292**
Lab ID **0606292-004A**
Field ID **CITT060806**

Report of Analysis
Received **06/08/06**
Matrix **Aqueous**
Sampled **06/08/06**

GCMS Volatiles

Prep Method	Prep Batch	10387	Date/Time Prepped	06/09/06 10:36	Analytical Batch	16510		
Compound	Result	Units	MQL	DF	Date/Time Analyzed	By	Analytical Method	
Benzene	< 0.00100	mg/L	0.00100	1	06/12/06 12:07	VS	8260B	
Ethylbenzene	< 0.00100	mg/L	0.00100	1	06/12/06 12:07	VS	8260B	
Methyl tert-butyl ether	< 0.00100	mg/L	0.00100	1	06/12/06 12:07	VS	8260B	
Naphthalene	< 0.00500	mg/L	0.00500	1	06/12/06 12:07	VS	8260B	
Toluene	< 0.00500	mg/L	0.00500	1	06/12/06 12:07	VS	8260B	
m,p-Xylene	< 0.00200	mg/L	0.00200	1	06/12/06 12:07	VS	8260B	
o-Xylene	< 0.00100	mg/L	0.00100	1	06/12/06 12:07	VS	8260B	
Surrogate: Dibromofluoromethane			106 %		Limits: 85-115			
Surrogate: Toluene-d8			113 %		Limits: 85-120			
Surrogate: 4-Bromofluorobenzene			111 %		Limits: 75-120			
Surrogate: 1,2-Dichloroethane-d4			98 %		Limits: 70-120			

Qualifiers/ Definitions	* Surrogate Recovery outside accepted limits.	* I Recoveries affected by interferences or high background.
	B Analyte detected in the associated Method Blank	DF Dilution Factor
	E Value exceeds method calibration range	H Prepped / Analyzed out of holding time.
	J Estimated Value Analyte below reported detection limit	M Minimum value.
	MDL Method Detection Limit (unadjusted)	MQL Method Quantitation Limit (adjusted)
	MRL Method Reporting Limit	SQL Sample Quantitation Limit (adjusted MDL)
	06/13/06	ENSAFE

000242

CHAIN OF CUSTODY AND ANALYTICAL REQUEST RECORD							COC No. DRM0608200		Page 1 of 1			
 EnSafe Inc. 800-588-7962	Project Name: Citgo Service Station					PO No.		Project No. 0588802764 Phase		Task		
	Site Location: NSA-Millington, TN							Lab Name ETC				
	Sampler/Site Phone# 901-372-7962					Sample Analysis Requested (Fill in the number of containers for each test)						
Sampler: Derrick McNeal											<--Preservative Type (3)	
Send Results To: John Stedman Email: jstedman@ensite.com												
Data Shipping Address: 5724 Summer Trees DR 38134												
Sample ID (sys_samp_code)	Location ID (sys_loc_code)	Date (mm/dd/yy)	Time (Military) (hhmm)	Matrix Code (1)	Sample Type (2)	Field Filtered (Y/N)	Total No. of Containers	HA	BTEX, MTBE Naphthalene	BTEX, MTBE Naphthalene	Remarks	
CITGMW0101	MW-01	6/8/06		WG	N	N	3	X			8260B	
CITGMW0201	MW-02	1		WG	N	N	3	X			8260B	
CITSDRUM01	DRUM	1		SO	N	N	1		X		8260B	
CITTO60806	-TRIP-								X			
<p>Okay to run trip per Derrick McNeal 6/8/06</p>												
Turnaround Time(specify): Final 3 days Email (if applicable) _____ days							Email Results(check): Yes <input checked="" type="checkbox"/> No _____		Deliverable (check): Level 2 _____ Level 3 _____ Level 4 _____ TX TRRP-13 _____			
Field Comments:							Lab Comments:			Sample Shipment and Delivery Details		
Relinquished by (signature)							Date		Time		Received by (signature)	
1 <i>D. McNeal</i>							06/08/06		1254		1 <i>J. Smith</i>	
2 <i>J. Smith</i>							06/08/06		1258		2 <i>J. Smith</i>	
3 <i>J. Smith</i>							06/08/06		1500		3 <i>J. Smith</i>	
											Number of coolers in shipment: 1	
											Samples Iced?(check) Yes <input checked="" type="checkbox"/> No _____	
											Method of Shipment: Hand deliver	
											Airbill No:	
											Date Shipped: -	

(1) Matrix Code: AA=Air, AQ=Air Quality Control Matrix, DC=Drill Cuttings, GS=Soil Gas, LD=Drilling Fluid, LF=Free Product, LH=Liquid Waste, Oil=Oil, SB=Bentonite, SC=Cement, SE=Sediment, SF=Filter Sandpack, SL=Sludge, SN=Miscellaneous Solid/Building Materials, SO=Soil, SQ=Soil/Solid Quality Control Matrix, ST=Solid Waste, SW=Swab/Wipe, TA=Animal Tissue, TP=Plant Tissue, TQ=Tissue Quality Control Matrix, U=Unknown, WA=Aqueous Drill Cuttings, WE=Estuary, WG=Ground Water, WL=Leachate, WO=Ocean Water, WP=Drinking Water, WQ=Water Quality Control Matrix, WS=Surface Water, WW=Waste Water

(2) Sample Type: AB=Ambient Blank, EB=Equipment Blank, FB=Field Blank, FD=Field Duplicate Sample, FR=Field Replicate, MB=Material Blank, N=Normal Environmental Sample, RB=Material Rinse Blank, TB=Trip Blank

(3) Preservative added: HA=Hydrochloric Acid, NI=Nitric Acid, SH=Sodium Hydroxide, SA=Sulfuric Acid, AA=Ascorbic Acid, HX=Hexane, ME=Methanol, SB=sodium bisulfate, ST=Sodium Thiosulfate, If NO preservative added leave blank

Rev. 06/05



ENVIRONMENTAL TESTING & CONSULTING, INC.

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RECEIVED
JUL 19 2006

July 17, 2006

Mr. John Stedman

Ensafe

5724 Summer Tree Drive

Memphis, TN 38184

Ref: Analytical Testing

Lab Order Number 0607428

Project Description Citgo Service Station, NSA-Millington

Project Number 0888802764

FID No. 0-792653

Environmental Testing and Consulting, Inc. received 2 sample(s) on 7/14/2006 for the analyses presented in the following report.

The above referenced project has been analyzed per your instructions. The analyses were performed in our laboratory in accordance with Standard Methods, The Solid Waste Manual SW-846, EPA Methods for Chemical Analysis of Water and Wastes and /or 40 CFR part 136.

The EPA requires that analysis for pH, dissolved oxygen and total residual chlorine be analyzed in the field. Analyses and results reported which do not indicate "Field" for these parameters were analyzed outside the holding time as specified in Table II of 40 CFR Part 136.3.

The analytical data has been validated using standard quality control measures performed as required by the analytical method. Quality Assurance, instrumentation maintenance and calibration were performed in accordance with guidelines established by the USEPA, NELAP, and USACE.

The results are shown on the attached analysis sheet(s).

Please do not hesitate to contact me or client services if you have any questions or need additional information.

Sincerely,

Connie Bradberry
Laboratory Project Manager

Attachment
ENSAFE

Certifications

Alabama #40750	Louisiana #04015	Florida #E87943	California #05240CA
Arkansas #88-0650	Mississippi	Pennsylvania #68-3195	Texas #T104704180-05-TX
Illinois #200015	Oklahoma #9311	USDA #S-46279	U.S. Army Corps of Engineers
Kentucky #90047	Tennessee #02027	EPA #TN00012	
Kentucky UST #41	Virginia #00106	NELAP #04015	





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Ensafe
5724 Summer Tree Drive

Memphis, TN 38184

Lab Order Number 0607428

Lab ID 0607428-001A

Field ID CITGMW0102

Project **Citgo Service Station,**
Description **NSA-Millington**

Project No. 0888802764

FID No 0-792653

Report of Analysis

Received 07/14/06

Matrix **Aqueous**

Sampled 07/14/06

GCMS Volatiles

Prep Method	5030B	Prep Batch	10885	Date/Time Prepped	07/16/06 08:54	Analytical Batch	17522
Compound	Result	Units	MQL	DF	Date/Time Analyzed	By	Analytical Method
Benzene	0.227	mg/L	0.0100	10	07/16/06 11:48	VS	8260B
Ethylbenzene	0.953	mg/L	0.0100	10	07/16/06 11:48	VS	8260B
Methyl tert-butyl ether	0.0479	mg/L	0.0100	10	07/16/06 11:48	VS	8260B
Naphthalene	0.780	mg/L	0.0500	10	07/16/06 11:48	VS	8260B
Toluene	0.403	mg/L	0.0500	10	07/16/06 11:48	VS	8260B
o-Xylene	1.25	mg/L	0.0100	10	07/16/06 11:48	VS	8260B
	Surrogate: Dibromofluoromethane		109 %	Limits: 85-115			
	Surrogate: Toluene-d8		99 %	Limits: 85-120			
	Surrogate: 4-Bromofluorobenzene		95 %	Limits: 75-120			
	Surrogate: 1,2-Dichloroethane-d4		118 %	Limits: 70-120			

Qualifiers/ Definitions

*	Surrogate Recovery outside accepted limits	* I	Recoveries affected by interferences or high background
B	Analyte detected in the associated Method Blank	DF	Dilution Factor
E	Value exceeds method calibration range	H	Prepped / Analyzed out of holding time.
J	Estimated Value Analyte below reported detection limit	M	Minimum value
MDL	Method Detection Limit (unadjusted)	MQL	Method Quantitation Limit (adjusted)
MRL	Method Reporting Limit	N	Refer to attached Non-Compliance Report
Q	RPD >40% between primary and confirmation columns	SQL	Sample Quantitation Limit (adjusted MDL)

07/17/06

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Ensafe

5724 Summer Tree Drive

Memphis, TN 38184

Lab Order Number 0607428

Lab ID 0607428-002A

Field ID CITGMW0202

Project **Citgo Service Station,**
Description **NSA-Millington**

Project No. **0888802764**

FID No **0-792653**

Report of Analysis

Received **07/14/06**

Matrix **Aqueous**

Sampled **07/14/06**

GCMS Volatiles

Prep Method	5030B	Prep Batch	10885	Date/Time Prepped	07/16/06 08:54	Analytical Batch	17522
Compound	Result	Units	MQL	DF	Date/Time Analyzed	By	Analytical Method
Benzene	0.00459	mg/L	0.00100	1	07/16/06 12:19	VS	8260B
Ethylbenzene	0.0745	mg/L	0.00100	1	07/16/06 12:19	VS	8260B
Methyl tert-butyl ether	0.0556	mg/L	0.00100	1	07/16/06 12:19	VS	8260B
Naphthalene	0.0702	mg/L	0.00500	1	07/16/06 12:19	VS	8260B
Toluene	0.00568	mg/L	0.00500	1	07/16/06 12:19	VS	8260B
o-Xylene	0.0183	mg/L	0.00100	1	07/16/06 12:19	VS	8260B
	Surrogate: Dibromofluoromethane		105 %	Limits: 85-115			
	Surrogate: Toluene-d8		100 %	Limits: 85-120			
	Surrogate: 4-Bromofluorobenzene		93 %	Limits: 75-120			
	Surrogate: 1,2-Dichloroethane-d4		121 % *	Limits: 70-120			

Qualifiers/Definitions

* Surrogate Recovery outside accepted limits	* I Recoveries affected by interferences or high background
B Analyte detected in the associated Method Blank	DF Dilution Factor
E Value exceeds method calibration range	H Prepped / Analyzed out of holding time.
J Estimated Value Analyte below reported detection limit	M Minimum value
MDL Method Detection Limit (unadjusted)	MQL Method Quantitation Limit (adjusted)
MRL Method Reporting Limit	N Refer to attached Non-Compliance Report
Q RPD >40% between primary and confirmation columns	SQL Sample Quantitation Limit (adjusted MDL)

07/17/06

ENSAFE



Analytical QC Summary Report

Form 4

Method Blank Summary

Aqueous

GCMS Volatiles

Ensafe

Project

Citgo Service Station, NSA-Millington

Order Number

0607428

Description

Batch ID 10885

Instrument ID VOC1

10885-LB

This Method Blank applies to the following batch samples:

Lab Sample ID	Lab File ID	Analyzed Date / Time	Dilution Factor
10885-LCS	1001lcs.d	07/16/06 09:24	1
10885-LB	1003.d	07/16/06 10:46	1
0607428-001A	1005.d	07/16/06 11:48	10
0607428-002A	1006.d	07/16/06 12:19	1
0607428-002AMS	1018.d	07/16/06 18:31	1
0607428-002AMSD	1019.d	07/16/06 19:02	1

- Qualifiers:
- * Surrogate Recovery outside accepted limits
 - * I Recoveries affected by interferences or high background
 - B Analyte detected in the associated Method Blank
 - DF Dilution Factor
 - E Value exceeds method calibration range
 - H Prepped / Analyzed out of holding time.
 - J Estimated Value Analyte below reported detection limit
 - M Minimum value
 - MDL Method Detection Limit (unadjusted)
 - MQL Method Quantitation Limit (adjusted)
 - MRL Method Reporting Limit
 - N Refer to attached Non-Compliance Report



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Analytical QC Summary Report

Ensafe

Project

Citgo Service Station, NSA-Millington

Order Number

0607428

Description

Volatiles	Method Blank	10885-LB				Aqueous
Prep Method	5030B	Batch	10885	Date	07/16/06 08:54	
Analytical Method	8260B	Batch	17522	Date	07/16/06 10:46	Dilution Factor 1 By VS

Compound	Result	Units	MQL		
Benzene	< 1.00	µg/L	1.00		
Ethylbenzene	< 1.00	µg/L	1.00		
Methyl tert-butyl ether	< 1.00	µg/L	1.00		
Naphthalene	< 5.00	µg/L	5.00		
Toluene	< 5.00	µg/L	5.00		
o-Xylene	< 1.00	µg/L	1.00		
Surrogate: Dibromofluoromethane			99	%	Limits: 85-115
Surrogate: Toluene-d8			92	%	Limits: 85-120
Surrogate: 4-Bromofluorobenzene			97	%	Limits: 75-120
Surrogate: 1,2-Dichloroethane-d4			111	%	Limits: 70-120

Qualifiers: DF Dilution Factor
MQL Method Quantitation Limit (adjusted)

MDL Method Detection Limit (unadjusted)

Analytical QC Summary Report

Ensafe

Project

Citgo Service Station, NSA-Millington

Order Number

0607428

Description

Volatiles		Laboratory Control Spike			10885-LCS		Aqueous	
Prep	Method	5030B	Batch	10885	Date	07/16/06 08:54		
Analytical Method	8260B	Batch	17522	Date	07/16/06 09:24		Dilution Factor 1	By VS
Compound	LCS Conc.	Units	Spike Added	% Rec	QC Limits			
Benzene	105	µg/L	100	105	80-120			
Ethylbenzene	99.7	µg/L	100	100	80-120			
Methyl tert-butyl ether	103	µg/L	100	103	65-125			
Naphthalene	86.8	µg/L	100	87	55-140			
Toluene	105	µg/L	100	105	80-120			
o-Xylene	99.3	µg/L	100	99	80-120			
Surrogate: Dibromofluoromethane			96	%	Limits: 85-115			
Surrogate: Toluene-d8			99	%	Limits: 85-120			
Surrogate: 4-Bromofluorobenzene			94	%	Limits: 75-120			
Surrogate: 1,2-Dichloroethane-d4			113	%	Limits: 70-120			

Qualifiers: DF Dilution Factor
 MQL Method Quantitation Limit (adjusted)

MDL Method Detection Limit (unadjusted)



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Analytical QC Summary Report

Ensafe

Project

Citgo Service Station, NSA-Millington

Order Number

0607428

Description

Volatiles

Sample Matrix Spike

0607428-002AMS

Aqueous

Prep Method

5030B

Batch 10885

Date

07/16/06 08:54

Analytical Method

8260B

Batch 17522

Date

07/16/06 18:31

Dilution Factor 1

By VS

Compound	MS		Spike Added	Sample		QC Limits
	Conc.	Units		Conc.	% Rec	
Benzene	112	µg/L	100	4.59	107	80-120
Ethylbenzene	169	µg/L	100	74.5	94	80-120
Methyl tert-butyl ether	181	µg/L	100	55.6	125	65-125
Naphthalene	172	µg/L	100	70.2	102	55-140
Toluene	107	µg/L	100	5.68	101	80-120
o-Xylene	109	µg/L	100	18.3	91	80-120
Surrogate: Dibromofluoromethane			103	%	Limits: 85-115	
Surrogate: Toluene-d8			96	%	Limits: 85-120	
Surrogate: 4-Bromofluorobenzene			97	%	Limits: 75-120	
Surrogate: 1,2-Dichloroethane-d4			108	%	Limits: 70-120	

Qualifiers: DF Dilution Factor
MQL Method Quantitation Limit (adjusted)

MDL Method Detection Limit (unadjusted)



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Analytical QC Summary Report

Ensafe

Project
Description

Citgo Service Station, NSA-Millington

Order Number **0607428**

Volatiles		Sample Matrix Spike Duplicate			0607428-002AMSD			Aqueous	
Prep Method	5030B	Batch	10885	Date	07/16/06 08:54				
Analytical Method	8260B	Batch	17522	Date	07/16/06 19:02	Dilution Factor 1		By	VS

Compound	MSD Conc.	Units	Spike Added	Sample Conc.	% Rec	QC Limits	% RPD	RPD Limit
Benzene	106	µg/L	100	4.59	101	80-120	6	30
Ethylbenzene	149	µg/L	100	74.5	74*	80-120	12	30
Methyl tert-butyl ether	166	µg/L	100	55.6	110	65-125	9	30
Naphthalene	146	µg/L	100	70.2	76	55-140	16	30
Toluene	102	µg/L	100	5.68	96	80-120	5	30
o-Xylene	100	µg/L	100	18.3	82	80-120	9	30
Surrogate: Dibromofluoromethane			107	%	Limits: 85-115			
Surrogate: Toluene-d8			98	%	Limits: 85-120			
Surrogate: 4-Bromofluorobenzene			93	%	Limits: 75-120			
Surrogate: 1,2-Dichloroethane-d4			104	%	Limits: 70-120			

Qualifiers: DF Dilution Factor
MQL Method Quantitation Limit (adjusted)

MDL Method Detection Limit (unadjusted)



CLIENT: Ensafe
Project: Citgo Service Station, NSA-Millington
Lab Order: 0607428

CASE NARRATIVE

Date: 07/17/06

ETC01

Volatiles by Method 8260B

Batch 10885

Methyl tert-butyl ether was flagged for high recovery in 0607428-002AMS; however, recovery was within limits in the MSD. Ethylbenzene was flagged for low recovery in 0607428-002AMSD; however, recovery was within limits in the MS. Refer to 10885-LCS for system verification.

