1R-406

Monitoring Report

August, 2012

HESS CORPORATION
1 Hess Plaza
Woodbridge, NJ 07095

Donald G. Bull
Senior Specialist
Corporate EHS&SR
(732) 750-7099
FAX: (732) 352-7792

February 28, 2013

Mr. Glenn Von Gonten
New Mexico Oil Conservation District
1220 South St. Francis Drive
Santa Fe, NM 87505

VIA: Priority Mail and Delivery Confirmation

Re: Groundwater Monitoring Report Sampled August 2012
Arco Phillips A Battery #63 IRP-406 NMGSAU Battery #63
Unit L, Sec 31, T-19S, R-37E, Lea County

Dear Mr. Von Gonten:

Enclosed please find the Groundwater Monitoring Report for the Arco Phillips A Battery #63 located in Monument, NM. The report includes pertinent historical site information as well as data collected during groundwater sampling in August 2012.

Please note that Hess proposes to install ORC socks in monitoring wells MW-1 and MW-2 to aid the natural attenuation occurring onsite. Hess also proposes that one additional groundwater monitoring well be installed onsite to establish the groundwater gradient.

If you should have any questions or require additional information, please contact the undersigned at 732-750-7099.

Sincerely,

Donald G. Bull
Senior Specialist

cc: Rex Meyer, GeoMonitoring Services
Jim Griswold, New Mexico Oil Conservation Division

ARCO PHILLIPS A BATTERY #63

LEA COUNTY, NEW MEXICO

GROUNDWATER MONITORING REPORT
SAMPLED AUGUST 2012

Prepared for:

Hess Corporation
One Hess Plaza
Woodbridge, New Jersey 07095

Prepared by:

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1.0 INTRODUCTION

The Arco Phillips A Battery #63 site is located on the Byrd Ranch, northwest of Monument, New Mexico in southern Lea County. The site lies within the Pecos River Valley section of the Great Plains physiographic province and is located in the southern margin of the Llano Estacado. The site was formerly a tank battery and associated pit. A regional location map with the site location is included as **Figure 1**.

On July 31, 2001, excavation began at the site to remediate the tank battery pad and an area approximately 50 yards to the east, which is believed to be the associated pit. An area of soil approximately 75 feet (ft) by 120 ft immediately under the tank battery pad was excavated to a depth of approximately 14 ft. An area of soil approximately 75 feet (ft) by 110 ft located 50 yards to the east of the tank battery pad was excavated to a depth of approximately 19 ft. Excavation of soils in this area was restricted in aerial extent due to a six inch gas line running along the eastern side of the excavation.

Soil samples from along the walls and the bottom of each excavation area were collected and analyzed for Benzene, Toluene, Ethylbenzene, and total Xylene (BTEX), and total petroleum hydrocarbons (TPH). The results indicated that the concentrations were within target thresholds. Due to these results, the bottoms of both excavations were lined with two ft of redbed clay and then backfilled with blended material to a depth of approximately three ft below ground level. The remaining three ft were filled with clean material obtained from the landowner. Excavation activities were suspended pending further excavation.

In October 2001, two boreholes were drilled to the top of the naturally occurring redbed clay formation (approximately 45 ft below ground surface [bgs]) on the north and south sides of the excavation. No groundwater was encountered and no hydrocarbon contamination was detected in the drill cuttings from either borehole. At this time, both boreholes were plugged.

In August 2002, a borehole was drilled in the center of the excavation to a depth of 48 ft bgs. Groundwater was detected in the bottom 2 ft of the borehole and a water sample was collected from this location. Laboratory analysis revealed the presence of hydrocarbon and chloride contamination. The borehole was then plugged and a work plan was submitted to the New Mexico Oil Conservation Division (NMOCD) on August 22, 2002 which included drilling four proposed monitoring wells at the site to delineate the extent of contamination.

On June 11, 2003, three monitoring wells were drilled in the immediate vicinity of the excavation. A BBC, Inc. geologist onsite decided that three monitoring wells instead of the original four would sufficiently indicate the extent of contamination onsite. Groundwater was sampled from each of the three monitoring well boreholes prior to setting the well. The analysis from these groundwater samples indicated that the groundwater from each borehole was contaminated with hydrocarbons and chloride levels above the New Mexico Water Quality Control Commission (NM WQCC)

Guidelines. A groundwater assessment was conducted which indicated that groundwater was not available in usable quantities at the site. This information was submitted to the NMOCD along with a closure plan in June 2003. The closure plan was modified after discussions with the landowner. The six inch gas line along the eastern side of the excavation was rerouted and the excavation was extended to remove contaminated material near the line. The NMOCD also approved a proposal to plug and abandon monitoring well MW-3 as part of the closure plan to facilitate the removal of contaminated material. Monitoring well MW-3 was plugged and abandoned on December 10, 2003. The excavation was then closed in January 2004. Approximately 3,940 yards of contaminated material was excavated from the site and disposed of at the C&C Landfarm and the South Monument Surface Waste Facility. The extent of the excavated area is shown along with the monitoring well locations on **Figure 2**.

2.0 MONITORING WELL GAUGING ACTIVITIES

All monitoring wells onsite were gauged on August 21, 2012, with the exception of MW-3, which was plugged and abandoned on December 10, 2003. The monitoring well locations are shown on **Figure 2**.

The depth to water (DTW) and presence of liquid phase hydrocarbon (LPH), if any, were gauged using an oil/water interface probe capable of measuring to the nearest 0.01 ft. The groundwater level measurements were converted to groundwater elevations using the top of monitoring well casing elevations. Groundwater elevations were adjusted for the presence of LPH, as appropriate.

As shown in **Table 1** and on **Figure 3**, groundwater elevations ranged from 3,536.99 feet mean sea level (ft msl) in monitoring well MW-1 to 3,537.07 ft msl in monitoring well MW-2. The interpreted groundwater flow direction is to the south-southeast, which is consistent with the historical groundwater flow direction.

3.0 MONITORING WELL DEVELOPMENT ACTIVITIES

Due to the long period of time since the previous sampling event, all wells onsite were redeveloped by BBC International, Inc. on July 13, 2012 to ensure that the well recharge rates would be sufficient for sampling and that accurate water samples would be obtained. During well redevelopment, monitoring well MW-1 had a DTW of 36.05 ft and monitoring well MW-2 had a DTW of 36.64 ft. A total of 14 gallons of groundwater were purged from monitoring well MW-1 and a total of 10 gallons of groundwater were purged from monitoring well MW-2. No LPH, sheens, or odors were present in any of the monitoring wells onsite during well development. Well redevelopment data can be found on **Table 3**.

4.0 MONITORING WELL SAMPLING ACTIVITIES

On August 21, 2012, monitoring wells MW-1 and MW-2 were sampled. Monitoring well MW-3 was plugged and abandoned on December 10, 2003 and was not sampled.

Groundwater samples were collected via a downhole pneumatic pump utilizing a low flow purging and sampling method. Air flow into the pump was controlled by a GeoTech Micropurge control panel. Disposable Teflon-lined polypropylene tubing was used at each sampling point and sampling equipment was decontaminated after each use. Each monitoring well was purged and sampled at a rate of 300 milliliters/minute or less. Actual purging and sampling rates can be found in **Table 1**.

Prior to collection of water samples, field readings were taken at each well for pH, Conductivity, Dissolved Oxygen (D.O.), Temperature, Salinity, and Oxygen Redox Potential (ORP). During this sampling event, the pH ranged from 7.09 standard units (s.u.) at monitoring well MW-1 to 7.19 s.u. at monitoring well MW-2. Conductivity ranged from 29,517 micro-ohms per centimeter squared ($\mu ohms/cm^2$) at monitoring well MW-2 to 33,952 $\mu ohms/cm^2$ at monitoring well MW-1. D.O. ranged from 0.24 mg/L at monitoring well MW-1 to 1.30 mg/L at monitoring well MW-2. The temperature for both monitoring well MW-1 and MW-2 was 21.75°C. Salinity ranged from 19.63 parts per thousand in monitoring well MW-2 to 23.04 parts per thousand in monitoring well MW-1. And ORP ranged from -51.4 milliVolts (mV) in monitoring well MW-2 to 49.9 mV in monitoring well MW-1.

Groundwater laboratory analysis included analysis of BTEX tested under EPA Method No. 8260B, Polynuclear Aromatic Hydrocarbons (PAHs) analysis under EPA Method No. 8270C, Broad Spectrum Analysis of Total Petroleum Hydrocarbons Gasoline Range Organics (TPH-GRO) under EPA Method No. 8015, and Broad Spectrum Analysis of Total Petroleum Hydrocarbons Diesel Range Organics (TPH-DRO) under EPA Method No. 8015, Chlorides under EPA Method No. 300, and Total Dissolved Solids (TDS) under EPA Method No. 2540C.

Laboratory analysis identified benzene in excess of the NM WQCC Standard of 10 µg/L in monitoring well MW-2 with a reported benzene concentration of 11.5 µg/L.

Toluene, Ethylbenzene, and Xylenes were not detected in monitoring well MW-1 or MW-2 during this sampling event.

PAHs analysis for monitoring well MW-1 did not identify detections for any of the constituents tested. PAH analysis for monitoring well MW-2 identified an Acenaphthene concentration of 0.24 µg/L, a Fluorene concentration of 0.41 µg/L, a Naphthalene concentration of 0.18J, and a Phenanthrene concentration of 0.30 µg/L.

TPH analysis for monitoring well MW-1 identified a TPH-GRO concentration of 0.0975 mg/L and a TPH-DRO concentration of 1.70 mg/L. TPH analysis for monitoring well MW-2 identified a TPH-GRO concentration of 0.168 mg/L and a TPH-DRO concentration of 33.0 mg/L.

Laboratory analysis identified chloride in excess of the NM WQCC Standard of 250 mg/L in both monitoring wells; monitoring well MW-1 had a reported chloride concentration of 18,400 mg/L and monitoring well MW-2 had a reported chloride concentration of 18,000 mg/L.

Laboratory analysis identified TDS above the NM WQCC Standard of 1,000 mg/L in monitoring wells MW-1 and MW-2. Laboratory analysis for monitoring well MW-1 identified a concentration of 25,500 mg/L and analysis for monitoring well MW-2 identified a concentration of 20,300 mg/L. **Table 2** and **Figure 4** provides a summary of the groundwater analytical results. The laboratory analytical report is included in **Appendix A**.

5.0 CONCLUSIONS AND PROPOSALS

Benzene, Chloride, and TDS concentrations were identified in excess of the NM WQCC Standards in both monitoring wells during this sampling event. No LPH, sheens, or odors were detected in any of the monitoring wells onsite.

Based on these results, Hess proposes to install ORC socks in monitoring wells MW-1 and MW-2 to aid the natural attenuation occurring onsite. Hess also proposes that one additional groundwater monitoring well be installed onsite to help establish the groundwater gradient, as this will assist in selecting the best form of remediation at this site. Furthermore, Hess proposes that the site remain on a quarterly groundwater sampling and semi-annual reporting schedule.

Table 1
Groundwater Field Data Summary
Arco Phillips A Battery #63
August 21, 2012

Well No.	Casing Diameter *(inches)*	Date	Top of Casing to Water *(feet)*	Top of Casing Elevation *(feet)*	Groundwater Elevation *(feet)*	Top of Casing to Bottom of Well *(feet)*	Purge pumping Rate *(ml/min)*	Sampling pump Rate *(ml/min)*	Amount Purged *(gal)*	LPH Films Detected by Interface Probe During Well Development	Field Reading	pH *s.u.*	Conductivity μ *ohms/cm²*	Dissolved Oxygen *mg/L*	Temperature °C	Salinity ppt	ORP (mv)
MW-1	2	8/21/2012	36.80	3,573.79	3,536.99	51.21	260	260	1.5	None	Initial Reading	7.31	32,496	2.01	22.75	21.59	38.7
										None	Stabilized Reading	7.09	33,952	0.24	21.75	23.04	49.9
MW-2	2	8/21/2012	36.20	3,573.27	3,537.07	47.62	275	275	2.5	None	Initial Reading	7.42	30,894	0.40	23.29	19.89	-44.6
										None	Stabilized Reading	7.19	29,517	1.30	21.75	19.63	-51.4

NOTE:
LPH = liquid phase hydrocarbon
ml/min = milliliters per minute
gals = gallons
s.u. = standard unit
μ ohms/cm^2 = micro-ohms per centimeter squared
mg/L = milligrams per liter
°C = degrees Celsius
mv = millivolts

GeoMonitoring Services

Table 2
Summary of Groundwater Monitoring Results
Arco Phillips A Battery #63
August 21, 2012

	Units	MW-1	MW-2	NM WQCC Standards
Date Sampled		8/21/2012	8/21/2012	
BTEX (Method 8260B)				
Benzene	µg/L	5.2	**11.5**	10
Toluene	µg/L	<0.26	<0.26	750
Ethylbenzene	µg/L	<0.25	<0.25	750
Xylenes	µg/L	<0.71	<0.71	620
PAHs (Method 8270C)				
Acenaphthene	µg/L	<0.042	0.24	NONE
Acenaphthylene	µg/L	<0.072	<0.072	NONE
Anthracene	µg/L	<0.054	<0.054	NONE
Benzo(a)anthracene	µg/L	<0.042	<0.042	NONE
Benzo(a)pyrene	µg/L	<0.065	<0.065	0.7
Benzo(b)fluoranthene	µg/L	<0.061	<0.061	NONE
Benzo(g,h,i)perylene	µg/L	<0.068	<0.068	NONE
Benzo(k)fluoranthene	µg/L	<0.056	<0.056	NONE
Chrysene	µg/L	<0.045	<0.045	NONE
Dibenzo(a,h)anthracene	µg/L	<0.060	<0.060	NONE
Fluoranthene	µg/L	<0.046	<0.046	NONE
Fluorene	µg/L	<0.065	0.41	NONE
Indeno(1,2,3-cd)pyrene	µg/L	<0.061	<0.061	NONE
2-Methylnaphthalene	µg/L	<0.12	<0.12	NONE
Naphthalene	µg/L	<0.076	0.18J	NONE
Phenanthrene	µg/L	<0.076	0.30	NONE
Pyrene	µg/L	<0.080	<0.080	NONE
TPH (Method 8015)				
TPH-GRO (C6-C10)	mg/L	0.0975	0.168	NONE
TPH-DRO (C10-C28)	mg/L	1.70	33.0	NONE
Chloride				
Chloride	mg/L	**18,400**	**18,000**	250
Total Dissolved Solids				
TDS	mg/L	**25,500**	**20,300**	1,000

NOTE:
NM WQCC = New Mexico Water Quality Control Commission
µg/L = micrograms per Liter
mg/L - milligrams per Liter
J = Indicates an estimated value
NONE = no NM WQCC Standard for this constituent
BOLD values exceed NM WQCC standards

Table 3
Well Development Data
Arco Phillips A Battery #63
July 13, 2012

Well No.	Date	Top of Casing to Water *(feet)*	Top of Casing Elevation *(feet)*	Groundwater Elevation *(feet)*	Top of Casing to Bottom of Well *(feet)*	Top of Casing to LPH *(feet)*	LPH Thickness *(feet)*	Amount Purged *(gal)*
MW-1	7/13/2012	36.05	3573.79	3,537.74	51.21	--	0	14
MW-2	7/13/2012	36.64	3573.27	3,536.63	47.62	--	0	10

NOTE:
LPH = liquid phase hydrocarbon
-- = not applicable or not taken

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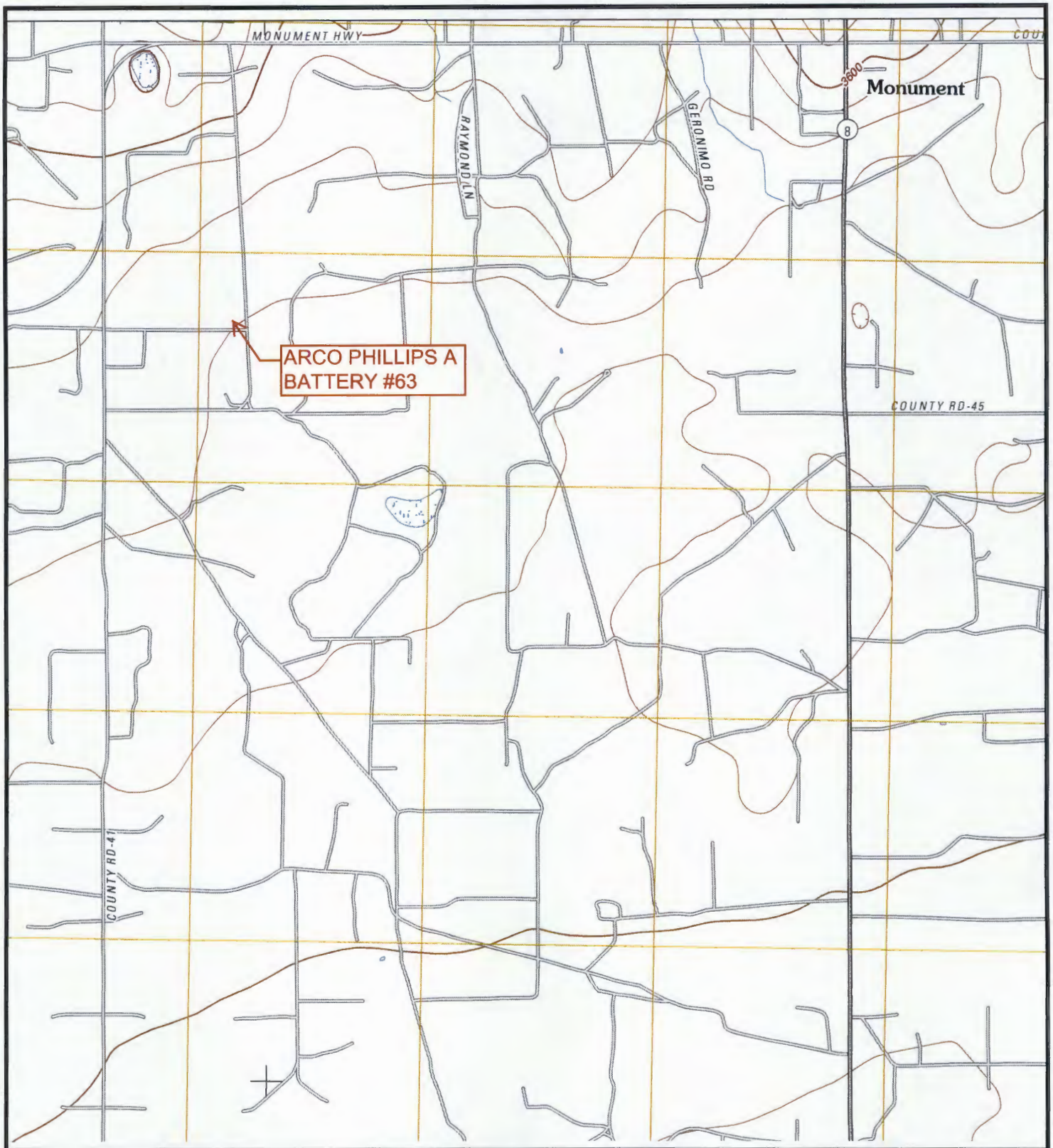
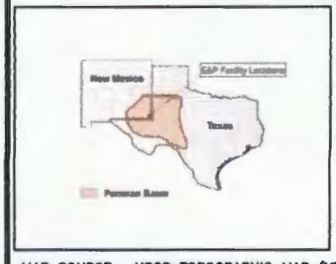




N

0 0.25 0.5 1

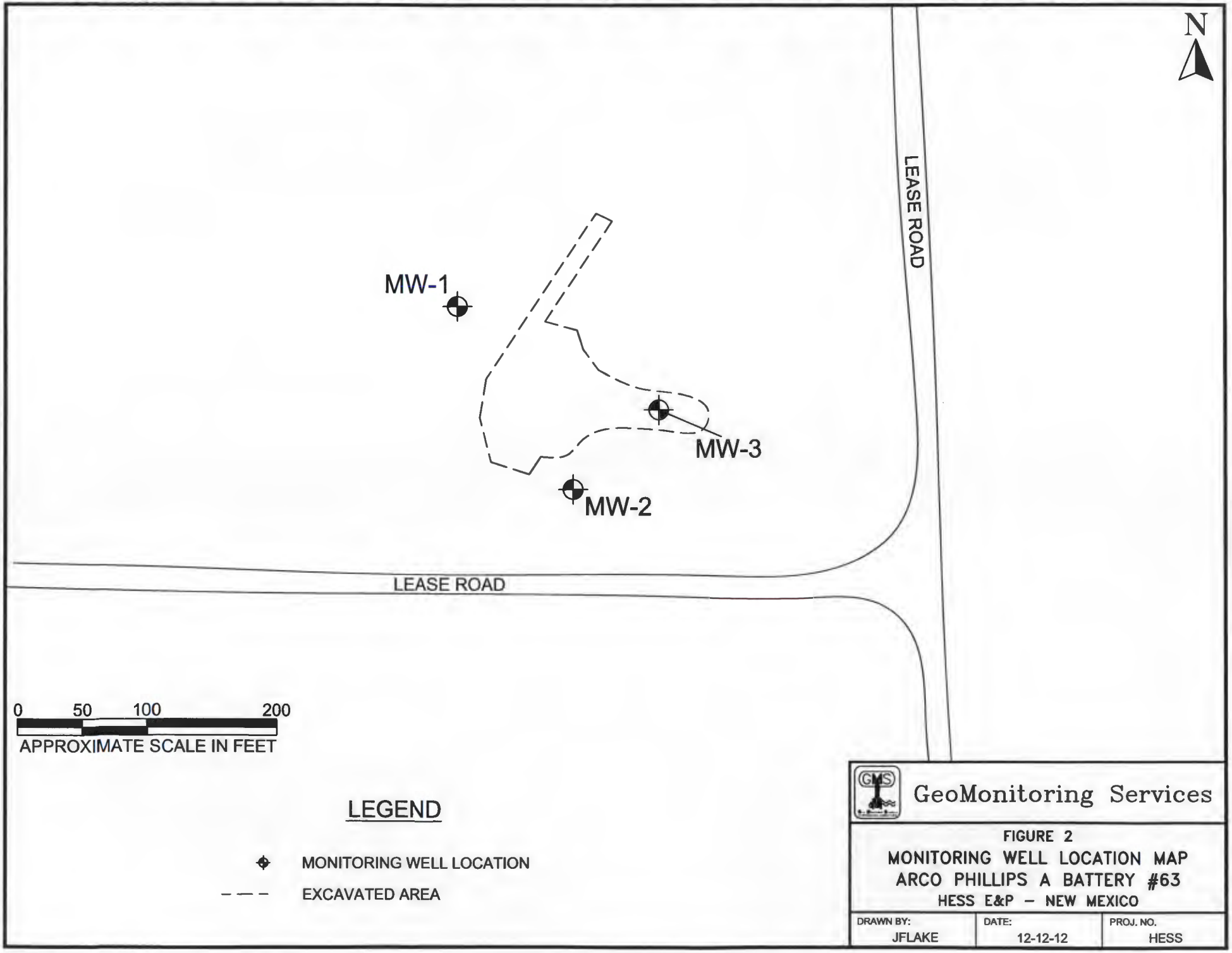
APPROXIMATE SCALE IN MILES

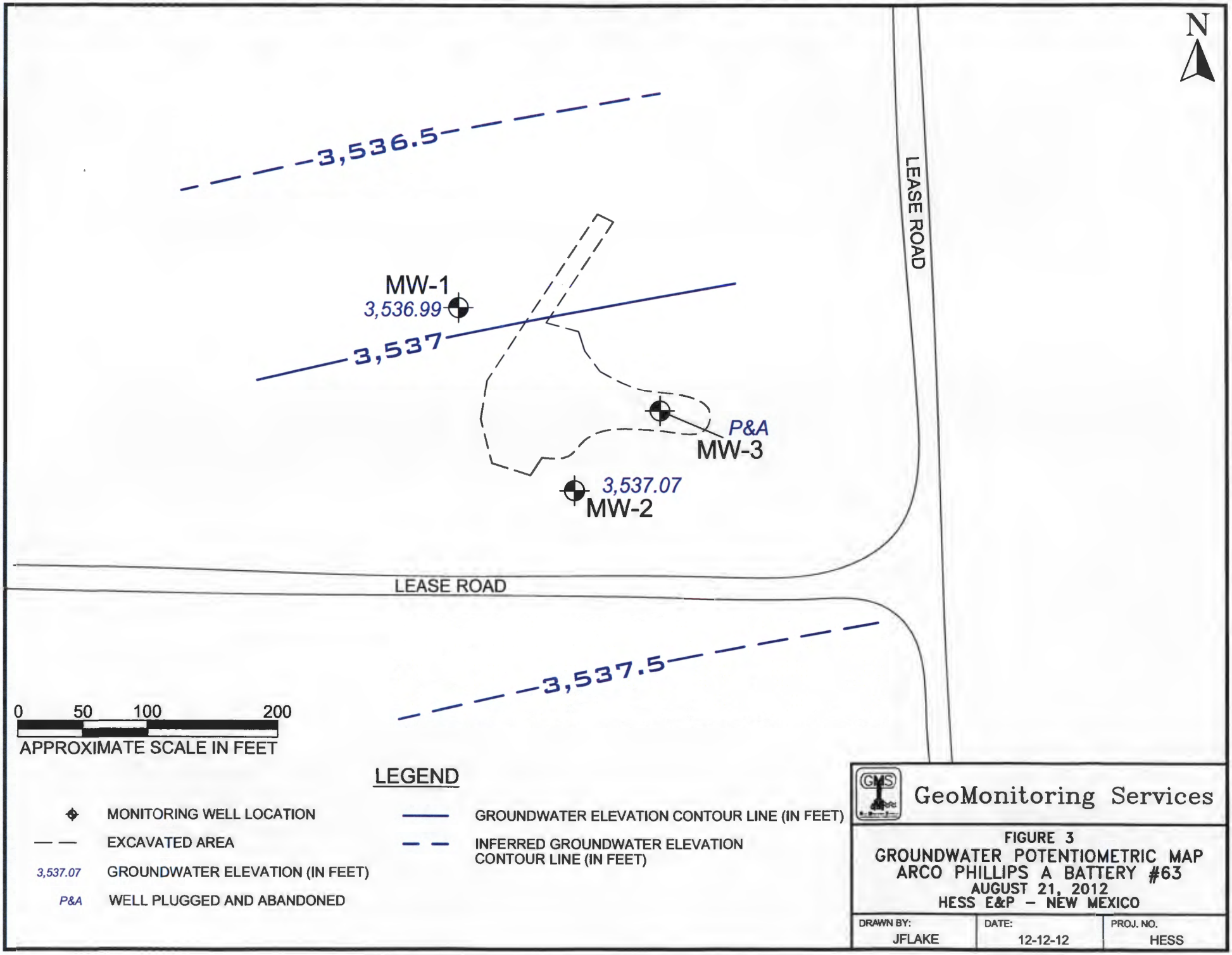
MAP SOURCE: USGS TOPOGRAPHIC MAP (VERSION 2010) – MONUMENT SOUTH QUADRANGLE

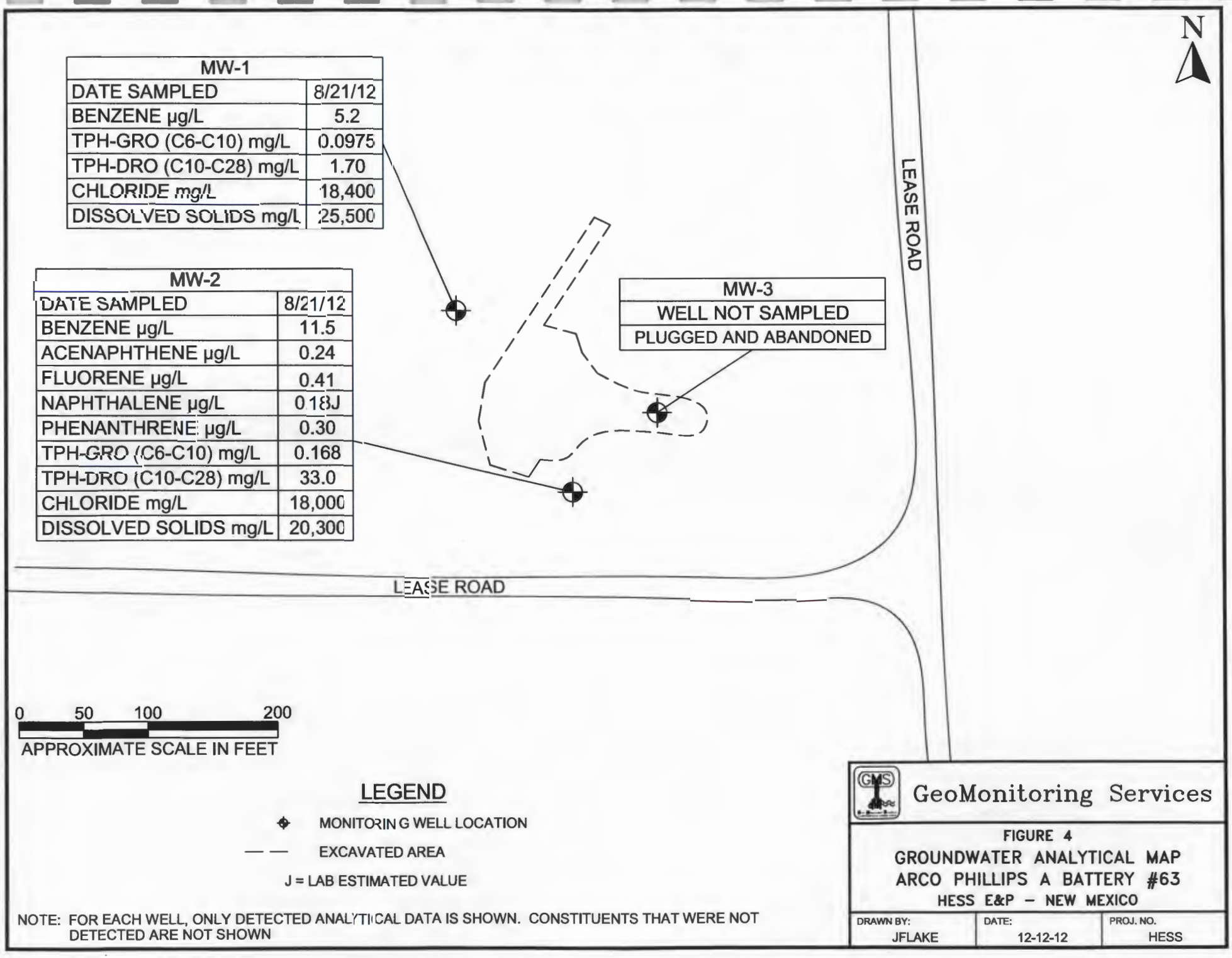
GeoMonitoring Services

FIGURE 1
REGIONAL LOCAITON MAP
ARCO PHILLIPS A BATTERY #63
LEA COUNTY, NEW MEXICO

DRAWN BY:	DATE:	PROJ. NO.
JFLAKE	12-12-12	HESS

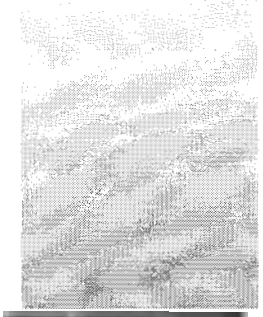

N
LEASE ROAD
MW-1
MW-3
MW-2
LEASE ROAD
0 50 100 200
APPROXIMATE SCALE IN FEET
LEGEND
MONITORING WELL LOCATION
EXCAVATED AREA
GeoMonitoring Services
FIGURE 2
MONITORING WELL LOCATION MAP
ARCO PHILLIPS A BATTERY #63
HESS E&P – NEW MEXICO
DRAWN BY: JFLAKE
DATE: 12-12-12
PROJ. NO. HESS


N
3,536.5
LEASE ROAD
MW-1
3,536.99
3,537
P&A
MW-3
3,537.07
MW-2
LEASE ROAD
3,537.5
0
50
100
200
APPROXIMATE SCALE IN FEET
LEGEND
MONITORING WELL LOCATION
EXCAVATED AREA
3,537.07 GROUNDWATER ELEVATION (IN FEET)
P&A WELL PLUGGED AND ABANDONED
GROUNDWATER ELEVATION CONTOUR LINE (IN FEET)
INFERRED GROUNDWATER ELEVATION CONTOUR LINE (IN FEET)
GMS
GeoMonitoring Services
FIGURE 3
GROUNDWATER POTENTIOMETRIC MAP
ARCO PHILLIPS A BATTERY #63
AUGUST 21, 2012
HESS E&P – NEW MEXICO
DRAWN BY: JFLAKE
DATE: 12-12-12
PROJ. NO. HESS


N
LEASE ROAD
LEASE ROAD
MW-1
DATE SAMPLED 8/21/12
BENZENE µg/L 5.2
TPH-GRO (C6-C10) mg/L 0.0975
TPH-DRO (C10-C28) mg/L 1.70
CHLORIDE mg/L 18,400
DISSOLVED SOLIDS mg/L 25,500
MW-2
DATE SAMPLED 8/21/12
BENZENE µg/L 11.5
ACENAPHTHENE µg/L 0.24
FLUORENE µg/L 0.41
NAPHTHALENE µg/L 0.18J
PHENANTHRENE µg/L 0.30
TPH-GRO (C6-C10) mg/L 0.168
TPH-DRO (C10-C28) mg/L 33.0
CHLORIDE mg/L 18,000
DISSOLVED SOLIDS mg/L 20,300
MW-3
WELL NOT SAMPLED
PLUGGED AND ABANDONED
0 50 100 200
APPROXIMATE SCALE IN FEET
LEGEND
MONITORING WELL LOCATION
EXCAVATED AREA
J = LAB ESTIMATED VALUE
NOTE: FOR EACH WELL, ONLY DETECTED ANALYTICAL DATA IS SHOWN. CONSTITUENTS THAT WERE NOT DETECTED ARE NOT SHOWN
GeoMonitoring Services
FIGURE 4
GROUNDWATER ANALYTICAL MAP
ARCO PHILLIPS A BATTERY #63
HESS E&P – NEW MEXICO
DRAWN BY: JFLAKE
DATE: 12-12-12
PROJ. NO. HESS

Gulf Coast ACCUTEST LABORATORIES

10/01/12



Technical Report for

Geo Monitoring Services

Arco Phillips A Battery #63

Accutest Job Number: TC15143

Sampling Date: 08/21/12

Report to:

Geo Monitoring Services

james@geomon.net

Total number of pages in report: **42**

ACCREDITED IN ACCORDANCE WITH nelac

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Richard Rodriguez
Laboratory Director

Client Service contact: Sylvia Garza 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366) LA (85695/04004) OK (211-035)

Sections: 1 2 3 4 5 6 7 8 9

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Accutest Laboratories

Sample Summary

Geo Monitoring Services

Job No: TC15143

Arco Phillips A Battery #63

Sample Number	Collected Date	Time	By	Received	Matrix Code	Matrix Type	Client Sample ID
TC15143-1	08/21/12	14:48		08/23/12	AQ	Ground Water	MW1
TC15143-2	08/21/12	13:51		08/23/12	AQ	Ground Water	MW2
TC15143-3	08/21/12	00:00		08/23/12	AQ	Trip Blank Water	TRIP BLANK

Summary of Hits

Job Number: TC15143
Account: Geo Monitoring Services
Project: Arco Phillips A Battery #63
Collected: 08/21/12

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	MQL	SDL	Units	Method
TC15143-1	MW1					
Benzene		0.0052	0.0010	0.00025	mg/l	SW846 8260B
TPH-GRO (C6-C10)		0.0975	0.050	0.012	mg/l	SW846 8015
TPH (C10-C28)		1.70	0.51	0.16	mg/l	SW846 8015 M
Chloride		18400	1000	500	mg/l	EPA 300/SW846 9056
Solids, Total Dissolved		25500	200	120	mg/l	SM 2540C
TC15143-2	MW2					
Benzene		0.0115	0.0010	0.00025	mg/l	SW846 8260B
Acenaphthene		0.00024	0.00020	0.000042	mg/l	SW846 8270C BY SIM
Fluorene		0.00041	0.00020	0.000065	mg/l	SW846 8270C BY SIM
Naphthalene		0.00018 J	0.00020	0.000076	mg/l	SW846 8270C BY SIM
Phenanthrene		0.00030	0.00020	0.000076	mg/l	SW846 8270C BY SIM
TPH-GRO (C6-C10)		0.168	0.050	0.012	mg/l	SW846 8015
TPH (C10-C28)		33.0	2.0	0.63	mg/l	SW846 8015 M
Chloride		18000	500	250	mg/l	EPA 300/SW846 9056
Solids, Total Dissolved		20300	200	120	mg/l	SM 2540C
TC15143-3	TRIP BLANK					

No hits reported in this sample.

Gulf Coast ACCUTEST LABORATORIES

Sample Results

Report of Analysis

Accutest Laboratories

Report of Analysis

Client Sample ID:	MW1		
Lab Sample ID:	TC15143-1	Date Sampled:	08/21/12
Matrix:	AQ - Ground Water	Date Received:	08/23/12
Method:	SW846 8260B	Percent Solids:	n/a
Project:	Arco Phillips A Battery #63		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Z028383.D	1	08/27/12	EM	n/a	n/a	VZ3734
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2	Benzene	0.0052	0.0010	0.00025	mg/l	
108-88-3	Toluene	0.00026 U	0.0010	0.00026	mg/l	
100-41-4	Ethylbenzene	0.00025 U	0.0010	0.00025	mg/l	
1330-20-7	Xylene (total)	0.00071 U	0.0030	0.00071	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		79-122%
17060-07-0	1,2-Dichloroethane-D4	91%		75-121%
2037-26-5	Toluene-D8	107%		87-119%
460-00-4	4-Bromofluorobenzene	114%		80-133%

U = Not detected SDL - Sample Detection Limit
MQL = Method Quantitation Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	MW1		
Lab Sample ID:	TC15143-1	Date Sampled:	08/21/12
Matrix:	AQ - Ground Water	Date Received:	08/23/12
Method:	SW846 8270C BY SIM SW846 3510C	Percent Solids:	n/a
Project:	Arco Phillips A Battery #63		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	V12332.D	1	08/27/12	GJ	08/25/12	OP24862	EV691
Run #2							

	Initial Volume	Final Volume
Run #1	990 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	MQL	SDL	Units	Q
83-32-9	Acenaphthene	0.000042 U	0.00020	0.000042	mg/l	
208-96-8	Acenaphthylene	0.000072 U	0.00020	0.000072	mg/l	
120-12-7	Anthracene	0.000054 U	0.00020	0.000054	mg/l	
56-55-3	Benzo(a)anthracene	0.000042 U	0.00020	0.000042	mg/l	
50-32-8	Benzo(a)pyrene	0.000065 U	0.00020	0.000065	mg/l	
205-99-2	Benzo(b)fluoranthene	0.000061 U	0.00020	0.000061	mg/l	
191-24-2	Benzo(g,h,i)perylene	0.000068 U	0.00020	0.000068	mg/l	
207-08-9	Benzo(k)fluoranthene	0.000056 U	0.00020	0.000056	mg/l	
218-01-9	Chrysene	0.000045 U	0.00020	0.000045	mg/l	
53-70-3	Dibenzo(a,h)anthracene	0.000060 U	0.00020	0.000060	mg/l	
206-44-0	Fluoranthene	0.000046 U	0.00020	0.000046	mg/l	
86-73-7	Fluorene	0.000065 U	0.00020	0.000065	mg/l	
193-39-5	Indeno(1,2,3-cd)pyrene	0.000061 U	0.00020	0.000061	mg/l	
91-57-6	2-Methylnaphthalene	0.00012 U	0.00020	0.00012	mg/l	
91-20-3	Naphthalene	0.000076 U	0.00020	0.000076	mg/l	
85-01-8	Phenanthrene	0.000076 U	0.00020	0.000076	mg/l	
129-00-0	Pyrene	0.000080 U	0.00020	0.000080	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	73%		17-131%
321-60-8	2-Fluorobiphenyl	72%		15-137%
1718-51-0	Terphenyl-d14	109%		10-160%

U = Not detected SDL - Sample Detection Limit
MQL = Method Quantitation Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	MW1		
Lab Sample ID:	TC15143-1	Date Sampled:	08/21/12
Matrix:	AQ - Ground Water	Date Received:	08/23/12
Method:	SW846 8015	Percent Solids:	n/a
Project:	Arco Phillips A Battery #63		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH0011614.D	1	08/31/12	LT	n/a	n/a	GHH630
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	MQL	SDL	Units	Q
	TPH-GRO (C6-C10)	0.0975	0.050	0.012	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	76%		52-127%
98-08-8	aaa-Trifluorotoluene	88%		58-141%

U = Not detected SDL - Sample Detection Limit
MQL = Method Quantitation Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	MW1		
Lab Sample ID:	TC15143-1	Date Sampled:	08/21/12
Matrix:	AQ - Ground Water	Date Received:	08/23/12
Method:	SW846 8015 M SW846 3510C	Percent Solids:	n/a
Project:	Arco Phillips A Battery #63		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	CC227573.D	5	08/30/12	FO	08/28/12	OP24916	GCC1393
Run #2							

	Initial Volume	Final Volume
Run #1	990 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	MQL	SDL	Units	Q
	TPH (C10-C28)	1.70	0.51	0.16	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	85%		37-135%

U = Not detected SDL - Sample Detection Limit
MQL = Method Quantitation Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	MW1		
Lab Sample ID:	TC15143-1	Date Sampled:	08/21/12
Matrix:	AQ - Ground Water	Date Received:	08/23/12
		Percent Solids:	n/a
Project:	Arco Phillips A Battery #63		

General Chemistry

Analyte	Result	MQL	SDL	Units	DF	Analyzed	By	Method
Chloride	18400	1000	500	mg/l	2000	08/31/12 14:09	ES	EPA 300/SW846 9056
Solids, Total Dissolved	25500	200	120	mg/l	1	08/24/12	BG	SM 2540C

MQL = Method Quantitation Limit
SDL = Sample Detection Limit

U = Indicates a result < SDL
J = Indicates a result > = SDL but < MQL

Accutest Laboratories

Report of Analysis

Client Sample ID:	MW2		
Lab Sample ID:	TC15143-2	Date Sampled:	08/21/12
Matrix:	AQ - Ground Water	Date Received:	08/23/12
Method:	SW846 8260B	Percent Solids:	n/a
Project:	Arco Phillips A Battery #63		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Z028384.D	1	08/27/12	EM	n/a	n/a	VZ3734
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2	Benzene	0.0115	0.0010	0.00025	mg/l	
108-88-3	Toluene	0.00026 U	0.0010	0.00026	mg/l	
100-41-4	Ethylbenzene	0.00025 U	0.0010	0.00025	mg/l	
1330-20-7	Xylene (total)	0.00071 U	0.0030	0.00071	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		79-122%
17060-07-0	1,2-Dichloroethane-D4	84%		75-121%
2037-26-5	Toluene-D8	102%		87-119%
460-00-4	4-Bromofluorobenzene	111%		80-133%

U = Not detected SDL - Sample Detection Limit
MQL = Method Quantitation Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	MW2		
Lab Sample ID:	TC15143-2	Date Sampled:	08/21/12
Matrix:	AQ - Ground Water	Date Received:	08/23/12
Method:	SW846 8270C BY SIM SW846 3510C	Percent Solids:	n/a
Project:	Arco Phillips A Battery #63		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	V12333.D	1	08/27/12	GJ	08/25/12	OP24862	EV691
Run #2							

	Initial Volume	Final Volume
Run #1	990 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	MQL	SDL	Units	Q
83-32-9	Acenaphthene	0.00024	0.00020	0.000042	mg/l	
208-96-8	Acenaphthylene	0.000072 U	0.00020	0.000072	mg/l	
120-12-7	Anthracene	0.000054 U	0.00020	0.000054	mg/l	
56-55-3	Benzo(a)anthracene	0.000042 U	0.00020	0.000042	mg/l	
50-32-8	Benzo(a)pyrene	0.000065 U	0.00020	0.000065	mg/l	
205-99-2	Benzo(b)fluoranthene	0.000061 U	0.00020	0.000061	mg/l	
191-24-2	Benzo(g,h,i)perylene	0.000068 U	0.00020	0.000068	mg/l	
207-08-9	Benzo(k)fluoranthene	0.000056 U	0.00020	0.000056	mg/l	
218-01-9	Chrysene	0.000045 U	0.00020	0.000045	mg/l	
53-70-3	Dibenzo(a,h)anthracene	0.000060 U	0.00020	0.000060	mg/l	
206-44-0	Fluoranthene	0.000046 U	0.00020	0.000046	mg/l	
86-73-7	Fluorene	0.00041	0.00020	0.000065	mg/l	
193-39-5	Indeno(1,2,3-cd)pyrene	0.000061 U	0.00020	0.000061	mg/l	
91-57-6	2-Methylnaphthalene	0.00012 U	0.00020	0.00012	mg/l	
91-20-3	Naphthalene	0.00018	0.00020	0.000076	mg/l	J
85-01-8	Phenanthrene	0.00030	0.00020	0.000076	mg/l	
129-00-0	Pyrene	0.000080 U	0.00020	0.000080	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	88%		17-131%
321-60-8	2-Fluorobiphenyl	88%		15-137%
1718-51-0	Terphenyl-d14	114%		10-160%

U = Not detected SDL - Sample Detection Limit
MQL = Method Quantitation Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	MW2		
Lab Sample ID:	TC15143-2	Date Sampled:	08/21/12
Matrix:	AQ - Ground Water	Date Received:	08/23/12
Method:	SW846 8015	Percent Solids:	n/a
Project:	Arco Phillips A Battery #63		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH0011615.D	1	08/31/12	LT	n/a	n/a	GHH630
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	MQL	SDL	Units	Q
	TPH-GRO (C6-C10)	0.168	0.050	0.012	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	81%		52-127%
98-08-8	aaa-Trifluorotoluene	87%		58-141%

U = Not detected SDL - Sample Detection Limit
MQL = Method Quantitation Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	MW2		
Lab Sample ID:	TC15143-2	Date Sampled:	08/21/12
Matrix:	AQ - Ground Water	Date Received:	08/23/12
Method:	SW846 8015 M SW846 3510C	Percent Solids:	n/a
Project:	Arco Phillips A Battery #63		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	CC227574.D	20	08/30/12	FO	08/28/12	OP24916	GCC1393
Run #2							

	Initial Volume	Final Volume
Run #1	990 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	MQL	SDL	Units	Q
	TPH (C10-C28)	33.0	2.0	0.63	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	55%		37-135%

U = Not detected SDL - Sample Detection Limit
MQL = Method Quantitation Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	MW2		
Lab Sample ID:	TC15143-2	**Date Sampled:**	08/21/12
Matrix:	AQ - Ground Water	**Date Received:**	08/23/12
		Percent Solids:	n/a
Project:	Arco Phillips A Battery #63		

General Chemistry

Analyte	Result	MQL	SDL	Units	DF	Analyzed	By	Method
Chloride	18000	500	250	mg/l	1000	08/31/12 12:10	ES	EPA 300/SW846 9056
Solids, Total Dissolved	20300	200	120	mg/l	1	08/24/12	BG	SM 2540C

MQL = Method Quantitation Limit
SDL = Sample Detection Limit

U = Indicates a result < SDL
J = Indicates a result > = SDL but < MQL

Accutest Laboratories

Report of Analysis

Client Sample ID:	TRIP BLANK		
Lab Sample ID:	TC15143-3	Date Sampled:	08/21/12
Matrix:	AQ - Trip Blank Water	Date Received:	08/23/12
Method:	SW846 8260B	Percent Solids:	n/a
Project:	Arco Phillips A Battery #63		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K10091.D	1	08/24/12	AK	n/a	n/a	VK451
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2	Benzene	0.00025 U	0.0010	0.00025	mg/l	
108-88-3	Toluene	0.00026 U	0.0010	0.00026	mg/l	
100-41-4	Ethylbenzene	0.00025 U	0.0010	0.00025	mg/l	
1330-20-7	Xylene (total)	0.00071 U	0.0030	0.00071	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		79-122%
17060-07-0	1,2-Dichloroethane-D4	93%		75-121%
2037-26-5	Toluene-D8	102%		87-119%
460-00-4	4-Bromofluorobenzene	124%		80-133%

U = Not detected SDL - Sample Detection Limit
MQL = Method Quantitation Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

CHAIN OF CUSTODY

PAGE 1 OF 1

ACCUTEST LABORATORIES

10165 Harwin Dr, Ste 150 Houston, TX 77036
TEL: 713-271-4700 FAX: 713-271-4770
www.accutest.com

FED-EX Tracking #: | Bottle Order Control #:
Accutest Quote #: | Accutest Job #: TC15143

Client / Reporting Information

Company Name: Geo Monitoring Services
Street Address: 4123 5th St.
City / State / Zip: Brookshire TX 77423
Project Contact / E-mail: Rex Meyer rex@geomon.net
Phone # / Fax #: 281-375-5105
Sampler(s) Name(s) / Phone #: James Flake 843-343-6236

Project Information

Project Name: Arco Phillips A Battery 63
Street:
City / State:
Project #:
Client Purchase Order #:
Project Manager:

Billing Information (If different from Report to)

Company Name:
Street Address:
City / State / Zip:
Attention:

Requested Analyses

Accutest Sample #	Field ID / Point of Collection	Collection: Date	Time	Sampled By	Matrix	# of bottles	Number of preserved Bottles: HCl	NaOH	ZnAcNaOH	HNO3	H2SO4	NONE	DI Water	MEOH	TBP	NaHSO4	ENCORE	OTHER	BTEX 8260	GRO 8015	PAH 8270	DRO 8015	TDS/CHL	LAB USE ONLY
1	MW 1	8/21/12	1448	JF	GW	11	6											5	X	X	X	X	X	
2	MW 2	8/21/12	1351	JF	GW	11	6											5	X	X	X	X	X	
3	Trip Blank					2	2												X					

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL - Sludge
SED-Sediment
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid
WP - Wipe
FB-Field Blank
EB-Equipment Blank
RB- Rinse Blank
TB-Trip Blank

Turnaround Time (Business days)

- [X] Standard
- [ ] 5 Day *RUSH*
- [ ] 4 Day *RUSH*
- [ ] 3 Day *RUSH*
- [ ] 2 Day *RUSH*
- [ ] 1 Day *EMERGENCY*

Emergency & Rush T/A data available VIA Lablink

Approved By (Accutest PM): / Date:

Data Deliverable Information

- [X] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULT1 (Level 3+4)
- [ ] REDT1 (Level 3+4)
- [ ] Commercial "C"
- [ ] TRRP
- [ ] EDD Format
- [ ] Other

Commercial "A" = Results Only
Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC & Surrogate Summary

Comments / Special Instructions

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1	James E. Flake	8/22/12 800	1 X	2 X	8/23/12 915	2
3			3	4		4
5			5	Custody Seal #	☐ Intact ☐ Not Intact	Preserved where applicable ☐ On Ice ☐ Cooler Temp.

4.1 4

TC15143: Chain of Custody
Page 1 of 4

ACCUTEST LABORATORIES

Accutest Laboratories Sample Receipt Summary

Accutest Job Number: TC15143 **Client:** GEO MONITORING **Project:** ARCO PHILLIPS A BATERY 63

Date / Time Received: 8/23/2012 **Delivery Method:** **Airbill #'s:** 535599232064

No. Coolers: 1 **Therm ID:** IRGUN5; **Temp Adjustment Factor:** -0.4;

Cooler Temps (Initial/Adjusted): #1: (2.9/2.5);

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:			
3. Cooler media:	Ice (Bag)		

Quality Control Preservation	Y	or	N	N/A	WTB	STB
1. Trip Blank present / cooler:	☑		☐	☐	☑	☐
2. Trip Blank listed on COC:	☑		☐	☐		
3. Samples preserved properly:	☑		☐			
4. VOCs headspace free:	☑		☐	☐		

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume recvd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

Comments

Accutest Laboratories
V:713.271.4700

10165 Harwin Drive
F: 713.271.4770

Houston, TX 77036
www/accutest.com

TC15143: Chain of Custody
Page 2 of 4

Sample Receipt Log

Job #: TC15143 **Date / Time Received:** 8/23/2012 9:15:00 AM **Initials:** BG

Client: GEO MONITORING

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	pH	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC15143-1	LAG	1	4A	N/P	Note #2 - Preservative check not applicable.	IRGUN5	2.9	-0.4	2.5
1	TC15143-1	LAG	2	4A	N/P	Note #2 - Preservative check not applicable.	IRGUN5	2.9	-0.4	2.5
1	TC15143-1	LAG	3	4A	N/P	Note #2 - Preservative check not applicable.	IRGUN5	2.9	-0.4	2.5
1	TC15143-1	LAG	4	4A	N/P	Note #2 - Preservative check not applicable.	IRGUN5	2.9	-0.4	2.5
1	TC15143-1	1000ml	5	3G	N/P	Note #2 - Preservative check not applicable.	IRGUN5	2.9	-0.4	2.5
1	TC15143-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IRGUN5	2.9	-0.4	2.5
1	TC15143-1	40ml	7	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IRGUN5	2.9	-0.4	2.5
1	TC15143-1	40ml	8	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IRGUN5	2.9	-0.4	2.5
1	TC15143-1	40ml	9	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IRGUN5	2.9	-0.4	2.5
1	TC15143-1	40ml	10	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IRGUN5	2.9	-0.4	2.5
1	TC15143-1	40ml	11	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IRGUN5	2.9	-0.4	2.5
1	TC15143-2	LAG	1	4A	N/P	Note #2 - Preservative check not applicable.	IRGUN5	2.9	-0.4	2.5
1	TC15143-2	LAG	2	4A	N/P	Note #2 - Preservative check not applicable.	IRGUN5	2.9	-0.4	2.5
1	TC15143-2	LAG	3	4A	N/P	Note #2 - Preservative check not applicable.	IRGUN5	2.9	-0.4	2.5
1	TC15143-2	LAG	4	4A	N/P	Note #2 - Preservative check not applicable.	IRGUN5	2.9	-0.4	2.5
1	TC15143-2	1000ml	5	3G	N/P	Note #2 - Preservative check not applicable.	IRGUN5	2.9	-0.4	2.5
1	TC15143-2	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IRGUN5	2.9	-0.4	2.5
1	TC15143-2	40ml	7	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IRGUN5	2.9	-0.4	2.5
1	TC15143-2	40ml	8	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IRGUN5	2.9	-0.4	2.5
1	TC15143-2	40ml	9	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IRGUN5	2.9	-0.4	2.5
1	TC15143-2	40ml	10	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IRGUN5	2.9	-0.4	2.5
1	TC15143-2	40ml	11	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IRGUN5	2.9	-0.4	2.5
1	TC15143-3	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IRGUN5	2.9	-0.4	2.5

TC15143: Chain of Custody
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ACCUTEST LABORATORIES

Sample Receipt Log

Job #: TC15143 **Date / Time Received:** 8/23/2012 9:15:00 AM **Initials:** BG

Client: GEO MONITORING

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	pH	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC15143-3	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IRGUN5	2.9	-0.4	2.5

TC15143: Chain of Custody
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Gulf Coast ACCUTEST LABORATORIES

GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: TC15143
Account: GMSTXFU Geo Monitoring Services
Project: Arco Phillips A Battery #63

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VK451-MB	K10085.D	1	08/24/12	AK	n/a	n/a	VK451

The QC reported here applies to the following samples: Method: SW846 8260B

TC15143-3

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.25	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.25	ug/l	
108-88-3	Toluene	ND	1.0	0.26	ug/l	
1330-20-7	Xylene (total)	ND	3.0	0.71	ug/l	

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	99%	79-122%
17060-07-0	1,2-Dichloroethane-D4	93%	75-121%
2037-26-5	Toluene-D8	101%	87-119%
460-00-4	4-Bromofluorobenzene	122%	80-133%

Method Blank Summary

Job Number: TC15143
Account: GMSTXFU Geo Monitoring Services
Project: Arco Phillips A Battery #63

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VZ3734-MB	Z028371.D	1	08/27/12	EM	n/a	n/a	VZ3734

The QC reported here applies to the following samples: Method: SW846 8260B

TC15143-1, TC15143-2

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.25	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.25	ug/l	
108-88-3	Toluene	ND	1.0	0.26	ug/l	
1330-20-7	Xylene (total)	ND	3.0	0.71	ug/l	

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	105%	79-122%
17060-07-0	1,2-Dichloroethane-D4	91%	75-121%
2037-26-5	Toluene-D8	105%	87-119%
460-00-4	4-Bromofluorobenzene	111%	80-133%

Blank Spike Summary

Job Number: TC15143
Account: GMSTXFU Geo Monitoring Services
Project: Arco Phillips A Battery #63

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VK451-BS	K10083.D	1	08/24/12	AK	n/a	n/a	VK451

The QC reported here applies to the following samples: Method: SW846 8260B

TC15143-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	22.8	91	76-118
100-41-4	Ethylbenzene	25	23.5	94	75-112
108-88-3	Toluene	25	23.3	93	77-114
1330-20-7	Xylene (total)	75	71.6	95	75-111

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	99%	79-122%
17060-07-0	1,2-Dichloroethane-D4	94%	75-121%
2037-26-5	Toluene-D8	102%	87-119%
460-00-4	4-Bromofluorobenzene	122%	80-133%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: TC15143
Account: GMSTXFU Geo Monitoring Services
Project: Arco Phillips A Battery #63

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VZ3734-BS	Z028369.D	1	08/27/12	EM	n/a	n/a	VZ3734

The QC reported here applies to the following samples: Method: SW846 8260B

TC15143-1, TC15143-2

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	24.5	98	76-118
100-41-4	Ethylbenzene	25	24.3	97	75-112
108-88-3	Toluene	25	24.1	96	77-114
1330-20-7	Xylene (total)	75	74.1	99	75-111

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	103%	79-122%
17060-07-0	1,2-Dichloroethane-D4	90%	75-121%
2037-26-5	Toluene-D8	102%	87-119%
460-00-4	4-Bromofluorobenzene	110%	80-133%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: TC15143
Account: GMSTXFU Geo Monitoring Services
Project: Arco Phillips A Battery #63

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC15158-1MS	K10093.D	1	08/24/12	AK	n/a	n/a	VK451
TC15158-1MSD	K10094.D	1	08/24/12	AK	n/a	n/a	VK451
TC15158-1	K10092.D	1	08/24/12	AK	n/a	n/a	VK451

The QC reported here applies to the following samples: Method: SW846 8260B

TC15143-3

CAS No.	Compound	TC15158-1 ug/l	Q	Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND		25	22.1	88	21.6	86	2	76-118/16
100-41-4	Ethylbenzene	ND		25	22.4	90	22.0	88	2	75-112/12
108-88-3	Toluene	ND		25	21.9	88	21.6	86	1	77-114/12
1330-20-7	Xylene (total)	ND		75	68.2	91	66.8	89	2	75-111/12

CAS No.	Surrogate Recoveries	MS	MSD	TC15158-1	Limits
1868-53-7	Dibromofluoromethane	100%	100%	96%	79-122%
17060-07-0	1,2-Dichloroethane-D4	94%	95%	90%	75-121%
2037-26-5	Toluene-D8	100%	101%	98%	87-119%
460-00-4	4-Bromofluorobenzene	123%	121%	119%	80-133%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: TC15143
Account: GMSTXFU Geo Monitoring Services
Project: Arco Phillips A Battery #63

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC15039-3MS	Z028379.D	100	08/27/12	EM	n/a	n/a	VZ3734
TC15039-3MSD	Z028380.D	100	08/27/12	EM	n/a	n/a	VZ3734
TC15039-3 [a]	Z028374.D	100	08/27/12	EM	n/a	n/a	VZ3734

The QC reported here applies to the following samples: Method: SW846 8260B

TC15143-1, TC15143-2

CAS No.	Compound	TC15039-3 ug/l	Q	Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	34.4		2500	2610	103	2410	95	8	76-118/16
100-41-4	Ethylbenzene	ND		2500	2560	102	2380	95	7	75-112/12
108-88-3	Toluene	ND		2500	2560	102	2410	96	6	77-114/12
1330-20-7	Xylene (total)	ND		7500	7730	103	7170	96	8	75-111/12

CAS No.	Surrogate Recoveries	MS	MSD	TC15039-3	Limits
1868-53-7	Dibromofluoromethane	156%* [b]	149%* [b]	99%	79-122%
17060-07-0	1,2-Dichloroethane-D4	139%* [b]	136%* [b]	89%	75-121%
2037-26-5	Toluene-D8	161%* [b]	152%* [b]	100%	87-119%
460-00-4	4-Bromofluorobenzene	160%* [b]	155%* [b]	110%	80-133%

(a) Sample was not preserved to a pH < 2
(b) Outside control limits biased high.

* = Outside of Control Limits.

Gulf Coast ACCUTEST LABORATORIES

GC/MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: TC15143
Account: GMSTXFU Geo Monitoring Services
Project: Arco Phillips A Battery #63

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP24862-MB	V12326.D	1	08/27/12	GJ	08/25/12	OP24862	EV691

The QC reported here applies to the following samples: Method: SW846 8270C BY SIM

TC15143-1, TC15143-2

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	0.20	0.042	ug/l	
208-96-8	Acenaphthylene	ND	0.20	0.072	ug/l	
120-12-7	Anthracene	ND	0.20	0.054	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	0.041	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	0.064	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	0.060	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	0.068	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	0.056	ug/l	
218-01-9	Chrysene	ND	0.20	0.044	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	0.060	ug/l	
206-44-0	Fluoranthene	ND	0.20	0.046	ug/l	
86-73-7	Fluorene	ND	0.20	0.064	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	0.061	ug/l	
91-57-6	2-Methylnaphthalene	ND	0.20	0.12	ug/l	
91-20-3	Naphthalene	ND	0.20	0.075	ug/l	
85-01-8	Phenanthrene	ND	0.20	0.075	ug/l	
129-00-0	Pyrene	ND	0.20	0.079	ug/l	

CAS No.	Surrogate Recoveries		Limits
4165-60-0	Nitrobenzene-d5	94%	17-131%
321-60-8	2-Fluorobiphenyl	87%	15-137%
1718-51-0	Terphenyl-d14	102%	10-160%

Blank Spike/Blank Spike Duplicate Summary

Job Number: TC15143
Account: GMSTXFU Geo Monitoring Services
Project: Arco Phillips A Battery #63

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP24862-BS	V12327.D	1	08/27/12	GJ	08/25/12	OP24862	EV691
OP24862-BSD [a]	V12328.D	1	08/27/12	GJ	08/25/12	OP24862	EV691

The QC reported here applies to the following samples: Method: SW846 8270C BY SIM

TC15143-1, TC15143-2

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
83-32-9	Acenaphthene	5	4.6	92	4.9	98	6	10-125/30
208-96-8	Acenaphthylene	5	4.7	94	5.0	100	6	10-141/30
120-12-7	Anthracene	5	5.0	100	5.1	102	2	13-139/30
56-55-3	Benzo(a)anthracene	5	4.9	98	5.2	104	6	24-151/30
50-32-8	Benzo(a)pyrene	5	7.3	146	7.6	152* [b]	4	36-146/30
205-99-2	Benzo(b)fluoranthene	5	8.2	164* [b]	8.3	166* [b]	1	27-159/30
191-24-2	Benzo(g,h,i)perylene	5	6.9	138	7.9	158* [b]	14	21-156/30
207-08-9	Benzo(k)fluoranthene	5	7.3	146	7.6	152	4	26-157/30
218-01-9	Chrysene	5	5.2	104	5.5	110	6	26-146/30
53-70-3	Dibenzo(a,h)anthracene	5	6.9	138	7.8	156	12	23-161/30
206-44-0	Fluoranthene	5	5.0	100	4.9	98	2	20-140/30
86-73-7	Fluorene	5	4.7	94	4.8	96	2	16-126/30
193-39-5	Indeno(1,2,3-cd)pyrene	5	6.7	134	7.5	150	11	25-153/30
91-57-6	2-Methylnaphthalene	5	4.5	90	4.5	90	0	10-115/30
91-20-3	Naphthalene	5	4.7	94	4.9	98	4	11-111/30
85-01-8	Phenanthrene	5	4.8	96	5.1	102	6	23-135/30
129-00-0	Pyrene	5	5.5	110	5.7	114	4	27-138/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
4165-60-0	Nitrobenzene-d5	99%	103%	17-131%
321-60-8	2-Fluorobiphenyl	89%	95%	15-137%
1718-51-0	Terphenyl-d14	111%	113%	10-160%

(a) Insufficient sample for MS/MSD.
(b) Outside control limits biased high. Analyte not detected in associated samples.

* = Outside of Control Limits.

Gulf Coast ACCUTEST LABORATORIES

GC Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: TC15143
Account: GMSTXFU Geo Monitoring Services
Project: Arco Phillips A Battery #63

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GHH630-MB	HH0011613.D	1	08/31/12	LT	n/a	n/a	GHH630

The QC reported here applies to the following samples: Method: OA-1

TC15143-1, TC15143-2

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	0.10	0.012	mg/l	

CAS No.	Surrogate Recoveries		Limits
460-00-4	4-Bromofluorobenzene	80%	52-127%
98-08-8	aaa-Trifluorotoluene	86%	58-141%

Blank Spike Summary

Job Number: TC15143
Account: GMSTXFU Geo Monitoring Services
Project: Arco Phillips A Battery #63

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GHH630-BS	HH0011611.D	1	08/31/12	LT	n/a	n/a	GHH630

The QC reported here applies to the following samples: Method: OA-1

TC15143-1, TC15143-2

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH-GRO (C6-C10)	0.4	0.435	109	73-122

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	4-Bromofluorobenzene	94%	52-127%
98-08-8	aaa-Trifluorotoluene	98%	58-141%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: TC15143
Account: GMSTXFU Geo Monitoring Services
Project: Arco Phillips A Battery #63

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC15187-1MS	HH0011617.D		08/31/12	LT	n/a	n/a	GHH630
TC15187-1MSD	HH0011618.D		08/31/12	LT	n/a	n/a	GHH630
TC15187-1	HH0011616.D		08/31/12	LT	n/a	n/a	GHH630

The QC reported here applies to the following samples: Method: SW846 8015

TC15143-1, TC15143-2

CAS No.	Compound	TC15187-1 mg/l	Q	Spike mg/l	MS mg/l	MS %	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	0.050	U	0.4	0.438	110	0.422	106	4	73-122/15

CAS No.	Surrogate Recoveries	MS	MSD	TC15187-1	Limits
460-00-4	4-Bromofluorobenzene	92%	91%	81%	52-127%
98-08-8	aaa-Trifluorotoluene	97%	93%	91%	58-141%

* = Outside of Control Limits.

GC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: TC15143
Account: GMSTXFU Geo Monitoring Services
Project: Arco Phillips A Battery #63

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP24916-MB	CC227568.D	1	08/30/12	FO	08/28/12	OP24916	GCC1393

The QC reported here applies to the following samples: Method: SW846 8015 M

TC15143-1, TC15143-2

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	ND	0.10	0.023	mg/l	

CAS No.	Surrogate Recoveries		Limits
84-15-1	o-Terphenyl	85%	25-112%

Blank Spike/Blank Spike Duplicate Summary

Job Number: TC15143
Account: GMSTXFU Geo Monitoring Services
Project: Arco Phillips A Battery #63

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP24916-BS	CC227566.D	1	08/30/12	FO	08/28/12	OP24916	GCC1393
OP24916-BSD [a]	CC227567.D	1	08/30/12	FO	08/28/12	OP24916	GCC1393

The QC reported here applies to the following samples: Method: SW846 8015 M

TC15143-1, TC15143-2

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	BSD mg/l	BSD %	RPD	Limits Rec/RPD
	TPH (C10-C28)	1	0.868	87	0.970	97	11	41-105/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
84-15-1	o-Terphenyl	90%	102%	25-112%

(a) Insufficient sample volume for MS/MSD

* = Outside of Control Limits.

Gulf Coast ACCUTEST LABORATORIES

General Chemistry

QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: TC15143
Account: GMSTXFU - Geo Monitoring Services
Project: Arco Phillips A Battery #63

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Bromide	GP20580/GN44634	0.50	0.0	mg/l	10	10.6	106.0	90-110%
Chloride	GP20580/GN44634	0.50	0.0	mg/l	10	10.3	103.0	90-110%
Solids, Total Dissolved	GN44478	10	0.0	mg/l	500	482	96.4	80-120%
Sulfate	GP20580/GN44634	0.50	0.0	mg/l	10	10.5	105.0	90-110%

Associated Samples:
Batch GN44478: TC15143-1, TC15143-2
Batch GP20580: TC15143-1, TC15143-2
(*) Outside of QC limits

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DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: TC15143
Account: GMSTXFU - Geo Monitoring Services
Project: Arco Phillips A Battery #63

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Bromide	GP20580/GN44634	TC15034-4	mg/l	0.28 U	0.0	0.0	0-20%
Chloride	GP20580/GN44634	TC15034-4	mg/l	27.5	27.3	13.3	0-20%
Solids, Total Dissolved	GN44478	TC15143-1	mg/l	25500	25600	0.4	0-5%
Sulfate	GP20580/GN44634	TC15034-4	mg/l	19.6	19.3	3.1	0-20%

Associated Samples:
Batch GN44478: TC15143-1, TC15143-2
Batch GP20580: TC15143-1, TC15143-2
(*) Outside of QC limits

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MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: TC15143
Account: GMSTXFU - Geo Monitoring Services
Project: Arco Phillips A Battery #63

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Bromide	GP20580/GN44634	TC15034-4	mg/l	0.28 U	10	10.8	108.0	80-120%
Bromide	GP20580/GN44634	TC15034-4	mg/l	0.28 U	50	52.9	105.8	80-120%
Chloride	GP20580/GN44634	TC15034-4	mg/l	27.5	50	82.0	109.0	80-120%
Sulfate	GP20580/GN44634	TC15034-4	mg/l	19.6	50	72.6	106.0	80-120%

Associated Samples:
Batch GP20580: TC15143-1, TC15143-2
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits