



August 16, 2013

Mr. Paul Schneider  
Senior Staff EHS Representative  
Kerr-McGee Oil & Gas Onshore LP  
1099 18<sup>th</sup> Street, Suite 1800  
Denver, Colorado 80202

**Re: Sump Excavation Summary Letter Report  
Mayer 22-16L  
API# 05-123-17034  
SESE 22-T3N-R67W**

Dear Mr. Schneider:

LT Environmental, Inc. (LTE) was contracted by Kerr-McGee Oil & Gas Onshore LP (Kerr-McGee) to perform environmental oversight activities at the above referenced site. The oversight activities included collection of a confirmation soil sample from the sump excavation, documentation of field activities, and analytical results review.

The objective of the soil sampling was to determine if petroleum hydrocarbon impacts to subsurface soil resulted from Kerr-McGee operating a produced water sump at the site. The soil sampling activities, laboratory analytical results, and conclusions are summarized below. The general site layout, sump excavation dimensions, and soil sample location are shown on the attached hand-sketched map.

After removing the produced water sump, one representative confirmation soil sample (Base@5') was collected from the soil directly beneath the water sump. The soil sample was submitted for laboratory analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) by Environmental Protection Agency (EPA) Method 8260B and total petroleum hydrocarbons (TPH) by EPA Methods 8015 and 8260B. The laboratory analytical results are summarized on Table 1 and provided in the attached analytical laboratory report.

The sump excavation measured approximately 15 feet north to south by 18 feet east to west to an approximate depth of 5 feet below ground surface. No indication of petroleum hydrocarbon impacts, including soil staining or odor, was observed beneath the water sump. In addition, TPH and BTEX concentrations in the soil sample Base@5' were below the Colorado Oil and Gas Conservation Commission allowable levels and below laboratory reporting limits. Based on the field observations and analytical results, no remedial action is required at this site.



Please call us at (303) 433-9788 if you have any questions regarding this Sump Excavation Summary Letter Report or if you require additional information.

Sincerely,  
LT ENVIRONMENTAL, INC.

Reviewed by

A handwritten signature in black ink, reading 'Jeremy Espinoza'. The signature is fluid and cursive, with the first name 'Jeremy' and last name 'Espinoza' clearly legible.

Jeremy Espinoza  
Staff Geologist

A handwritten signature in black ink, reading 'Justin Solomon'. The signature is fluid and cursive, with the first name 'Justin' and last name 'Solomon' clearly legible.

Justin Solomon  
Project Environmental Scientist

Attachments



PROJECT Mayer 22-16L  
PROJECT MANAGER John Cocroft  
JOB No. 0142-13195  
LOCATION Hwy 66 + WCR 21, N 1/2, W into

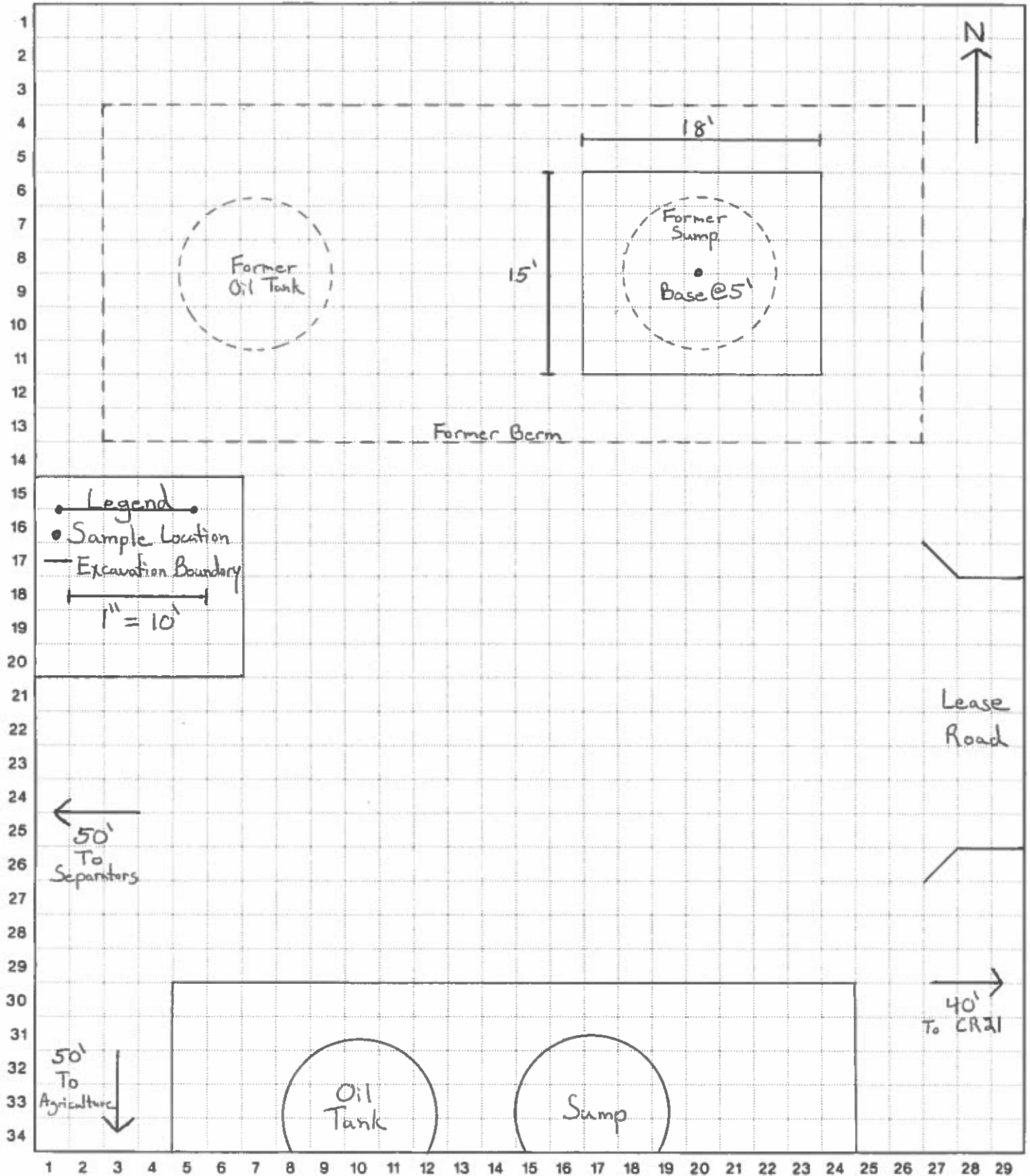
DATE 08/02/2013

CONT. No.

BY Jeremy Espinoza CHK'D

SHEET No. 1 OF 1

9410038 10/1997



**TABLE 1**  
**SOIL SAMPLE ANALYTICAL RESULTS**  
**MAYER 22-16L**  
**WELD COUNTY, COLORADO**  
**KERR-MCGEE OIL & GAS ONSHORE LP**

Soil Sample ID	Depth (bgs)	Date	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	DRO (mg/kg)	GRO (mg/kg)	ORO (mg/kg)
Base@5'	5'	07/22/2013	<0.0050	<0.0050	<0.0050	<0.0050	<50	<0.50	<50
<b>COGCC Standards</b>			<b>0.17</b>	<b>85</b>	<b>100</b>	<b>175</b>	<b>500*</b>	<b>500*</b>	<b>500*</b>

Notes: bgs - below ground surface

< - less than

DRO - Diesel Range Organics

ORO - Oil Range Organics

GRO - Gasoline Range Organics

\* - Standard applies to combined DRO-GRO-ORO

mg/kg - milligrams per kilogram

NA - Not Analyzed/Not Available

Bold numbers indicate result equaled or exceeded standard.

COGCC - Colorado Oil and Gas Conservation Commission



# Summit Scientific

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741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

July 23, 2013

Justin Solomon  
LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada, CO 80003  
RE: KMG - Mayer 16L

Enclosed are the results of analyses for samples received by Summit Scientific on 07/22/13 15:15. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'P. Shrewsbury', is written over a light gray circular background.

Paul Shrewsbury For Joseph J Egry IV  
Laboratory Director



LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada CO, 80003

Project: KMG - Mayer 16L

Project Number: KMG  
Project Manager: Justin Solomon

Reported:  
07/23/13 07:20

## ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Base@5'	R307179-01	Soil	07/22/13 13:35	07/22/13 15:15

R307179  
Summit Scientific

741 Corporate Circle Suite 1 • Golden, Colorado 80401  
303-277-9310 • 303-374-9333 Fax

Client: LT Environmental  
Address: 4408 W. 60th Ave.  
City/State/Zip: Arvada, Colorado 80003  
Phone: 303-433-4788 Fax: 303-433-4332  
Sample Name: Mike Unger  
Project Manager: Justin Solomon  
E-Mail: j.solomon@ltenv.com  
Project Name: Mayer-16L  
Project Number: KMG

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative	Matrix	Analyze For:	Special Instructions
Base @ 5'	7-22-13	1335	1	None	Air - Canister Serial #	BTX	Push
N. Wall @ 5'	7-22-13	1340	1	None	Groundwater	BTX	Hold
S. Wall @ 5'	7-22-13	1345	1	None	Other (Specify)	BTX	
E. Wall @ 5'	7-22-13	1350	1	None	Soil	BTX	
W. Wall @ 5'	7-22-13	1355	1	None	Other (Specify)	BTX	

Requisitioned by:	Date/Time:	Received by:	Date/Time:	Turn Around Time (Check)	Notes:
Mike Unger	7-22-13 1515	[Signature]	7-22-13 1552	<input checked="" type="checkbox"/> Same Day <input type="checkbox"/> 72 Hours <input type="checkbox"/> Standard	Place into the N. wall E. wall S. wall W. wall samples into the base sample results.
Requisitioned by:	Date/Time:	Received by:	Date/Time:	Sample Integrity:	
				Temperature Upon Receipt: 52 Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

www.s2scientific.com

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada CO, 80003

Project: KMG - Mayer 16L  
Project Number: KMG  
Project Manager: Justin Solomon

**Reported:**  
07/23/13 07:20

**Base@5'**  
**R307179-01 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: 07/22/13 13:35

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (TEPH-DRO)	ND	50	mg/kg	1	3072212	07/22/13	07/22/13	8015M	
C28-C36 (TEPH-ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: 07/22/13 13:35

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		74.4 %	30-150		"	"	"	"	

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: 07/22/13 13:35

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0050	mg/kg	1	3072211	07/22/13	07/22/13	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: 07/22/13 13:35

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		115 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		93.3 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %	21-167		"	"	"	"	

Summit Scientific

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LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada CO, 80003

Project: KMG - Mayer 16L  
Project Number: KMG  
Project Manager: Justin Solomon

**Reported:**  
07/23/13 07:20

**Extractable Petroleum Hydrocarbons by 8015 - Quality Control**  
**Summit Scientific**

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

**Batch 3072212 - EPA 3550A**

**Blank (3072212-BLK1)**

Prepared & Analyzed: 07/22/13

C10-C28 (TEPH-DRO)	ND	50	mg/kg
C28-C36 (TEPH-ORO)	ND	50	"

**LCS (3072212-BS1)**

Prepared & Analyzed: 07/22/13

C10-C28 (TEPH-DRO)	531	50	mg/kg	501	106	73-134
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**LCS Dup (3072212-BSD1)**

Prepared & Analyzed: 07/22/13

C10-C28 (TEPH-DRO)	534	50	mg/kg	501	106	73-134	0.382	11
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**Matrix Spike (3072212-MS1)**

Source: R307179-01

Prepared & Analyzed: 07/22/13

C10-C28 (TEPH-DRO)	455	50	mg/kg	501	ND	90.8	50-148
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**Matrix Spike Dup (3072212-MSD1)**

Source: R307179-01

Prepared & Analyzed: 07/22/13

C10-C28 (TEPH-DRO)	434	50	mg/kg	501	ND	86.6	50-148	4.84	13
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Arvada CO, 80003

Project: KMG - Mayer 16L  
Project Number: KMG  
Project Manager: Justin Solomon

**Reported:**  
07/23/13 07:20

**Volatile Organic Compounds by EPA Method 8260B - Quality Control**  
**Summit Scientific**

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

**Batch 3072211 - EPA 5030 Soil MS**

**Blank (3072211-BLK1)**

Prepared & Analyzed: 07/22/13

Benzene	ND	0.0050	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.0050	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0450		"	0.0397	113	23-173				
Surrogate: Toluene-d8	0.0389		"	0.0400	97.3	20-170				
Surrogate: 4-Bromofluorobenzene	0.0418		"	0.0400	105	21-167				

**LCS (3072211-BS1)**

Prepared & Analyzed: 07/22/13

Benzene	0.103	0.0050	mg/kg	0.100	103	58-130				
Toluene	0.107	0.0050	"	0.100	107	61-134				
Ethylbenzene	0.133	0.0050	"	0.100	133	74-139				
m,p-Xylene	0.253	0.010	"	0.200	127	73-137				
o-Xylene	0.128	0.0050	"	0.100	128	73-141				
Surrogate: 1,2-Dichloroethane-d4	0.0443		"	0.0397	112	23-173				
Surrogate: Toluene-d8	0.0389		"	0.0400	97.2	20-170				
Surrogate: 4-Bromofluorobenzene	0.0399		"	0.0400	99.8	21-167				

**LCS Dup (3072211-BSD1)**

Prepared & Analyzed: 07/22/13

Benzene	0.0974	0.0050	mg/kg	0.100	97.4	58-130	5.31	13		
Toluene	0.102	0.0050	"	0.100	102	61-134	4.65	16		
Ethylbenzene	0.133	0.0050	"	0.100	133	74-139	0.0451	12		
m,p-Xylene	0.251	0.010	"	0.200	125	73-137	1.12	14		
o-Xylene	0.126	0.0050	"	0.100	126	73-141	1.46	12		
Surrogate: 1,2-Dichloroethane-d4	0.0431		"	0.0397	109	23-173				
Surrogate: Toluene-d8	0.0377		"	0.0400	94.4	20-170				
Surrogate: 4-Bromofluorobenzene	0.0409		"	0.0400	102	21-167				

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Project: KMG - Mayer 16L  
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**Reported:**  
07/23/13 07:20

**Volatile Organic Compounds by EPA Method 8260B - Quality Control**  
**Summit Scientific**

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

**Batch 3072211 - EPA 5030 Soil MS**

<b>Matrix Spike (3072211-MS1)</b>		<b>Source: R307179-01</b>			<b>Prepared &amp; Analyzed: 07/22/13</b>					
Benzene	0.102	0.0050	mg/kg	0.100	ND	102	30-131			
Toluene	0.109	0.0050	"	0.100	ND	109	30-134			
Ethylbenzene	0.135	0.0050	"	0.100	ND	135	22-153			
m,p-Xylene	0.255	0.010	"	0.200	ND	128	10-159			
o-Xylene	0.130	0.0050	"	0.100	ND	130	31-151			
Surrogate: 1,2-Dichloroethane-d4	0.0475		"	0.0397		120	23-173			
Surrogate: Toluene-d8	0.0386		"	0.0400		96.6	20-170			
Surrogate: 4-Bromofluorobenzene	0.0402		"	0.0400		100	21-167			
<b>Matrix Spike Dup (3072211-MSD1)</b>		<b>Source: R307179-01</b>			<b>Prepared &amp; Analyzed: 07/22/13</b>					
Benzene	0.0988	0.0050	mg/kg	0.100	ND	98.8	30-131	3.26	34	
Toluene	0.110	0.0050	"	0.100	ND	110	30-134	0.770	30	
Ethylbenzene	0.133	0.0050	"	0.100	ND	133	22-153	0.963	24	
m,p-Xylene	0.251	0.010	"	0.200	ND	125	10-159	1.72	68	
o-Xylene	0.129	0.0050	"	0.100	ND	129	31-151	1.04	38	
Surrogate: 1,2-Dichloroethane-d4	0.0463		"	0.0397		117	23-173			
Surrogate: Toluene-d8	0.0393		"	0.0400		98.3	20-170			
Surrogate: 4-Bromofluorobenzene	0.0406		"	0.0400		101	21-167			

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Project Number: KMG  
Project Manager: Justin Solomon

**Reported:**  
07/23/13 07:20

### Notes and Definitions

DET Analyte DETECTED  
ND Analyte NOT DETECTED at or above the reporting limit  
NR Not Reported  
dry Sample results reported on a dry weight basis  
RPD Relative Percent Difference

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