



July 1, 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  
HSR-Underhill 5-17A, UPRR 42 PAN AM N True #1  
API# 05-123-20433  
NESE 17-T1N-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 (B01@4.5') 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 the laboratory analytical report is attached.

The sump excavation measured approximately 15 feet north to south by 15 feet east to west to an approximate depth of 4.5 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 were below Colorado Oil and Gas Conservation Commission allowable levels in soil sample B01@5'. Based on the field observations and analytical results, there is no indication of a petroleum



hydrocarbon release from the product water sump and 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 that reads 'Jeremy Espinoza'.

Jeremy Espinoza  
Staff Geologist

A handwritten signature in black ink that reads 'Justin Solomon'.

Justin Solomon  
Project Environmental Scientist

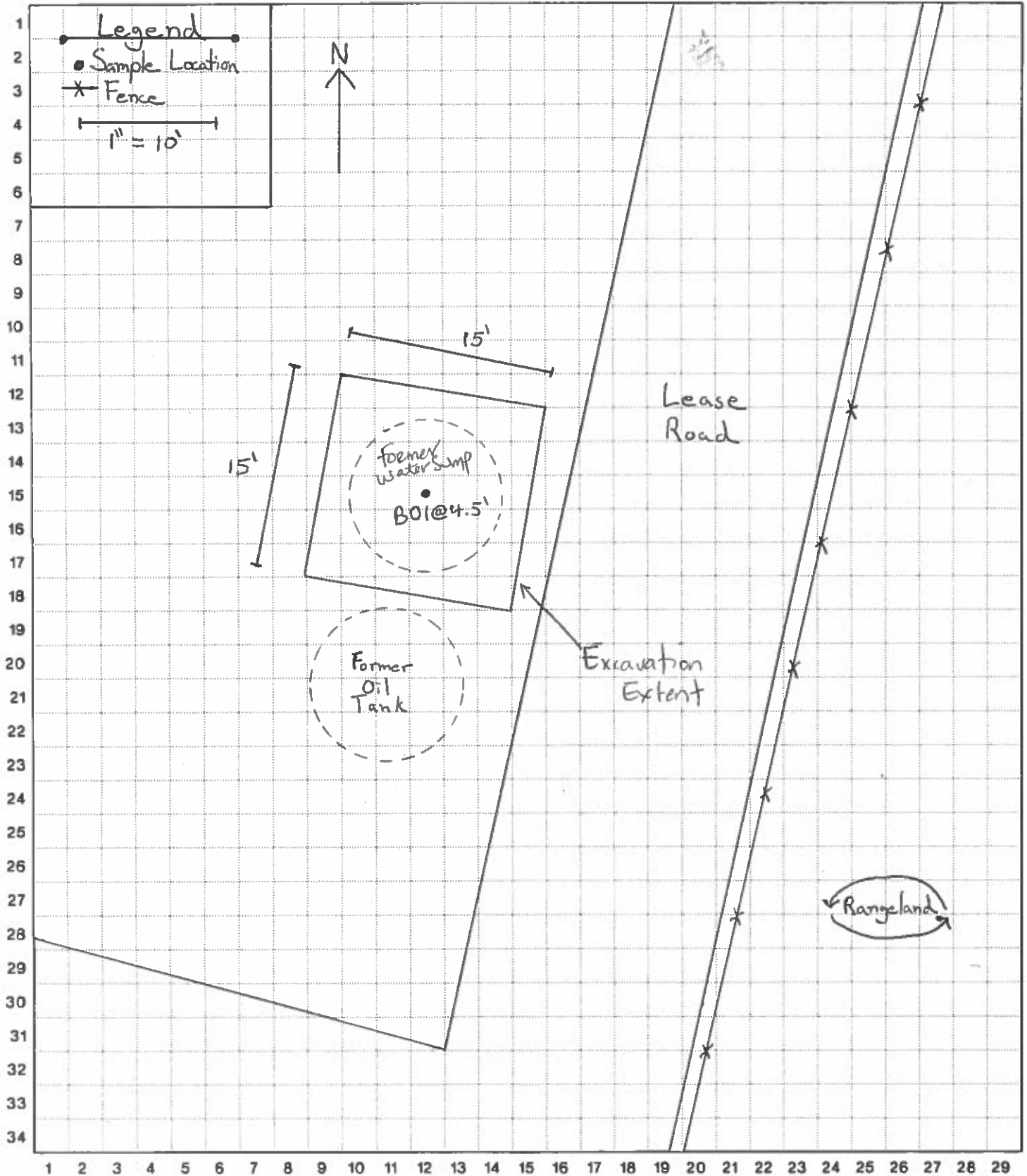
Attachments



PROJECT HSR Underhill 5-17A  
PROJECT MANAGER John Cocroft  
JOB No. 042-13161  
LOCATION WCR 10+17, S 1/2, W 3/4, S into

DATE 6/26/13  
CONT. No. \_\_\_\_\_  
BY Jeremy Espinoza CHK'D \_\_\_\_\_  
SHEET No. 1 OF 1

951 T0038 10/1987



**TABLE 1**  
**SOIL SAMPLE ANALYTICAL RESULTS**  
**HSR-UNDERHILL 5-17A, UPRR 42 PAN AM N TRUE #1**  
**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)
B01 @4.5'	4.5'	06/20/2013	<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

June 21, 2013

John Cocroft  
LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada, CO 80003  
RE: KMG - HSR-Underhill 15-17A

Enclosed are the results of analyses for samples received by Summit Scientific on 06/20/13 17:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury For Ben Shrewsbury  
President / Laboratory Manager

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

Project: KMG - HSR-Underhill 15-17A

Project Number: 0142-13161  
Project Manager: John Cocroft

**Reported:**  
06/21/13 06:37

## ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B01@4.5'	R306156-01	Soil	06/20/13 13:40	06/20/13 17:00

Summit Scientific  
R306/56

741 Corporate Circle Suite 1 • Golden, Colorado 80401  
303-277-9310 • 303-277-9531 Fax

Client:	L.T. Environmental, Inc.	Project Manager:	John Correll
Address:	4600 West 60th Avenue	E-Mail:	jcorrell@ltew.com
City/State/Zip:	Arvuda, CO 80003	Project Name:	HSR Gateway 115-17A
Phone:	(303) 433-9788	Fax:	(303) 433-1432
Sample Name:	Gravelly Earth	Project Number:	01012161

[illegible]

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 - HSR-Underhill 15-17A

Project Number: 0142-13161  
Project Manager: John Cocroft

**Reported:**  
06/21/13 06:37

**B01@4.5'**  
**R306156-01 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: 06/20/13 13:40

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (TEPH-DRO)	ND	50	mg/kg	1	3062006	06/20/13	06/20/13	8015M	
C28-C36 (TEPH-ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: 06/20/13 13:40

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		95.9 %	30-150		"	"	"	"	

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

Date Sampled: 06/20/13 13:40

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0050	mg/kg	1	3062005	06/20/13	06/20/13	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: 06/20/13 13:40

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		114 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.3 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.8 %	21-167		"	"	"	"	

Summit Scientific

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

Project: KMG - HSR-Underhill 15-17A  
Project Number: 0142-13161  
Project Manager: John Cocroft

**Reported:**  
06/21/13 06:37

**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 3062006 - EPA 3550A**

**Blank (3062006-BLK1)**

Prepared & Analyzed: 06/20/13

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

**LCS (3062006-BS1)**

Prepared & Analyzed: 06/20/13

C10-C28 (TEPH-DRO)	569	50	mg/kg	501	114	73-134
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**LCS Dup (3062006-BSD1)**

Prepared & Analyzed: 06/20/13

C10-C28 (TEPH-DRO)	603	50	mg/kg	501	120	73-134	5.83	11
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**Matrix Spike (3062006-MS1)**

**Source: R306149-01**

Prepared: 06/20/13 Analyzed: 06/21/13

C10-C28 (TEPH-DRO)	588	50	mg/kg	501	ND	117	50-148
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**Matrix Spike Dup (3062006-MSD1)**

**Source: R306149-01**

Prepared: 06/20/13 Analyzed: 06/21/13

C10-C28 (TEPH-DRO)	581	50	mg/kg	501	ND	116	50-148	1.18	13
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LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada CO, 80003

Project: KMG - HSR-Underhill 15-17A  
Project Number: 0142-13161  
Project Manager: John Cocroft

**Reported:**  
06/21/13 06:37

**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 3062005 - EPA 5030 Soil MS**

**Blank (3062005-BLK1)**

Prepared & Analyzed: 06/20/13

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	0.0349		"	0.0397	88.0	23-173				
Surrogate: Toluene-d8	0.0393		"	0.0400	98.2	20-170				
Surrogate: 4-Bromofluorobenzene	0.0354		"	0.0400	88.6	21-167				

**LCS (3062005-BS1)**

Prepared & Analyzed: 06/20/13

Benzene	0.0948	0.0050	mg/kg	0.100	94.8	58-130				
Toluene	0.0984	0.0050	"	0.100	98.4	61-134				
Ethylbenzene	0.101	0.0050	"	0.100	101	74-139				
m,p-Xylene	0.210	0.010	"	0.200	105	73-137				
o-Xylene	0.105	0.0050	"	0.100	105	73-141				
Surrogate: 1,2-Dichloroethane-d4	0.0403		"	0.0397	102	23-173				
Surrogate: Toluene-d8	0.0399		"	0.0400	99.8	20-170				
Surrogate: 4-Bromofluorobenzene	0.0379		"	0.0400	94.7	21-167				

**LCS Dup (3062005-BS1)**

Prepared & Analyzed: 06/20/13

Benzene	0.103	0.0050	mg/kg	0.100	103	58-130	8.17	13		
Toluene	0.0989	0.0050	"	0.100	98.9	61-134	0.517	16		
Ethylbenzene	0.109	0.0050	"	0.100	109	74-139	6.83	12		
m,p-Xylene	0.223	0.010	"	0.200	111	73-137	5.92	14		
o-Xylene	0.111	0.0050	"	0.100	111	73-141	5.40	12		
Surrogate: 1,2-Dichloroethane-d4	0.0437		"	0.0397	110	23-173				
Surrogate: Toluene-d8	0.0366		"	0.0400	91.4	20-170				
Surrogate: 4-Bromofluorobenzene	0.0382		"	0.0400	95.6	21-167				

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

Project: KMG - HSR-Underhill 15-17A  
Project Number: 0142-13161  
Project Manager: John Cocroft

**Reported:**  
06/21/13 06:37

**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 3062005 - EPA 5030 Soil MS**

Matrix Spike (3062005-MS1)		Source: R306149-01			Prepared & Analyzed: 06/20/13					
Benzene	0.0839	0.0050	mg/kg	0.100	ND	83.9	30-131			
Toluene	0.0894	0.0050	"	0.100	ND	89.4	30-134			
Ethylbenzene	0.0902	0.0050	"	0.100	ND	90.2	22-153			
m,p-Xylene	0.184	0.010	"	0.200	ND	91.8	10-159			
o-Xylene	0.0899	0.0050	"	0.100	ND	89.9	31-151			
Surrogate: 1,2-Dichloroethane-d4	0.0413		"	0.0397		104	23-173			
Surrogate: Toluene-d8	0.0400		"	0.0400		100	20-170			
Surrogate: 4-Bromofluorobenzene	0.0379		"	0.0400		94.6	21-167			

Matrix Spike Dup (3062005-MSD1)		Source: R306149-01			Prepared: 06/20/13 Analyzed: 06/21/13					
Benzene	0.0889	0.0050	mg/kg	0.100	ND	88.9	30-131	5.76	34	
Toluene	0.0917	0.0050	"	0.100	ND	91.7	30-134	2.55	30	
Ethylbenzene	0.0923	0.0050	"	0.100	ND	92.3	22-153	2.40	24	
m,p-Xylene	0.187	0.010	"	0.200	ND	93.7	10-159	2.04	68	
o-Xylene	0.0922	0.0050	"	0.100	ND	92.2	31-151	2.54	38	
Surrogate: 1,2-Dichloroethane-d4	0.0441		"	0.0397		111	23-173			
Surrogate: Toluene-d8	0.0412		"	0.0400		103	20-170			
Surrogate: 4-Bromofluorobenzene	0.0388		"	0.0400		96.9	21-167			

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Project Number: 0142-13161  
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**Reported:**  
06/21/13 06:37

### 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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