



July 31, 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  
Hanson 14-1  
API# 05-123-09218  
SESW 1-T2S-R65W**

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@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 20 feet north to south by 15 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 were below Colorado Oil and Gas Conservation Commission allowable levels and laboratory reporting limits in soil sample B01@5'. 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 that reads 'Jeremy Espinoza'. The signature is fluid and cursive, with the first and last names being more prominent.

Jeremy Espinoza  
Staff Geologist

A handwritten signature in black ink that reads 'Justin Solomon'. The signature is fluid and cursive, with the first and last names being more prominent.

Justin Solomon  
Project Environmental Scientist

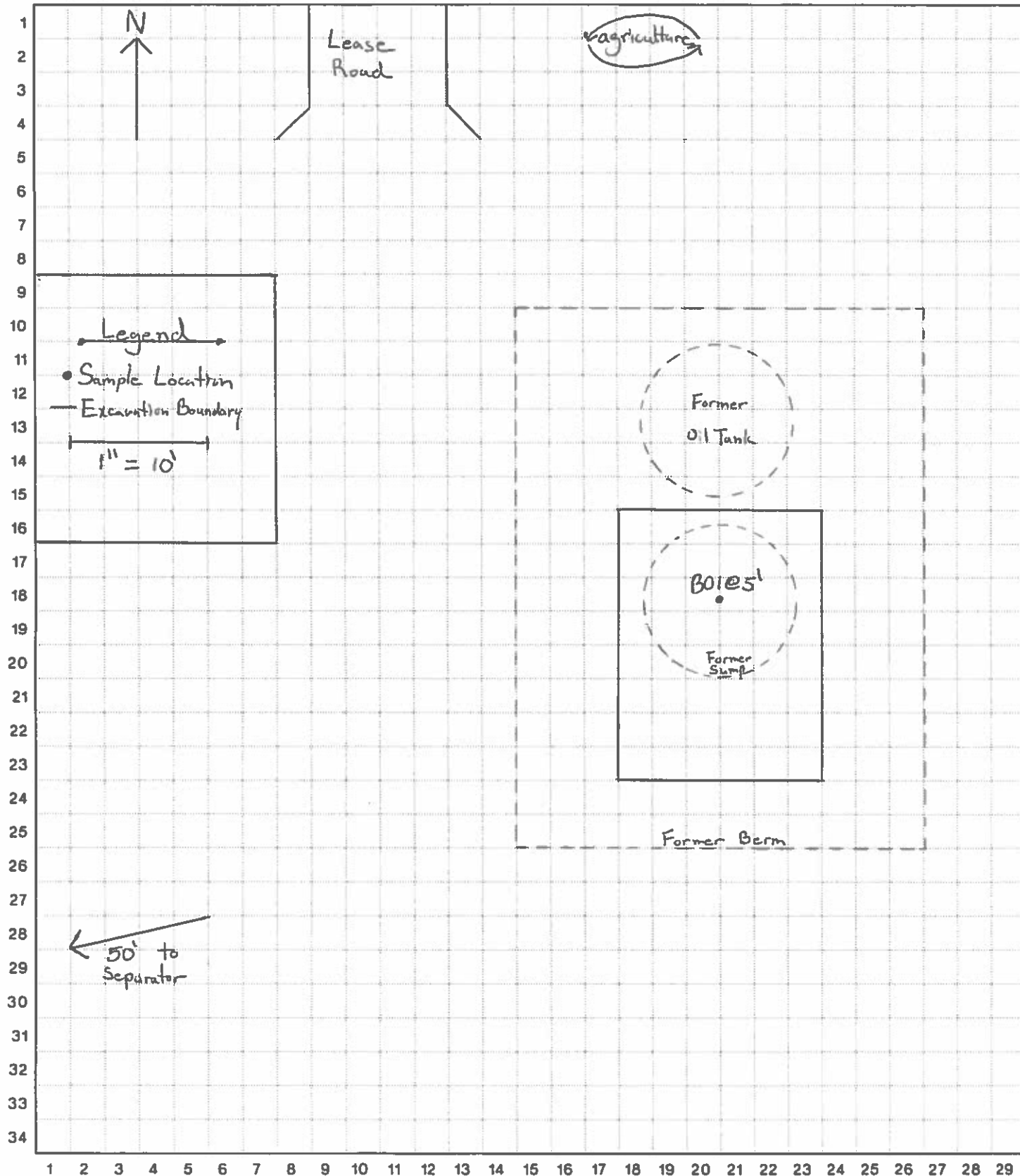
Attachments



PROJECT Hanson 14-1  
PROJECT MANAGER John Cocroft  
JOB No. 0142-13173  
LOCATION 120<sup>th</sup> + Hayesmount, E 1<sup>5</sup>/<sub>10</sub>, S 9<sup>0</sup>/<sub>10</sub> into

DATE 07/30/13  
CONT. No. \_\_\_\_\_  
BY Jeremy Espinoza CHK'D \_\_\_\_\_  
SHEET No. 1 OF 1

BSL 10038 10/1007



**TABLE 1**  
**SOIL SAMPLE ANALYTICAL RESULTS**  
**HANSON 14-1**  
**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@5'	5'	07/01/2013	<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 02, 2013

John Cocroft  
LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada, CO 80003  
RE: KMG - Hansen 14-1

Enclosed are the results of analyses for samples received by Summit Scientific on 07/01/13 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 - Hansen 14-1

Project Number: 0142  
Project Manager: John Cocroft

Reported:  
07/02/13 07:23

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B01@5'	R307007-01	Soil	07/01/13 13:40	07/01/13 17:00

Summit Scientific  
R307007

741 Corporate Circle Suite 1 • Golden, Colorado 80401  
303-277-9310 • 303-277-9331 Fax

Client: LT Environmental, Inc.  
Address: 4600 West 60th Avenue  
City/State/Zip: Arvada, CO 80003  
Phone: (303) 431-5788 Fax: (303) 431-4332  
Project Name: Hansen 14-1  
Project Number: 0142  
Project Manager: John Cocroft  
E-Mail: jcocroft@ltenv.com  
Sample Name: Soil  
Sampler Name: John Cocroft

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative	Matrix	Analyze For:	Special Instructions
B01@5'	7/1/13	1340	1	HCl	Soil	BTX	Hold
B01@4'	7/1/13	1345	1	HCl	Soil	BTX	Hold
B01@3'	7/1/13	1350	1	HCl	Soil	BTX	Hold
B01@2'	7/1/13	1355	1	HCl	Soil	BTX	Hold
B01@1'	7/1/13	1400	1	HCl	Soil	BTX	Hold

Received by: <u>[Signature]</u>	Date/Time: 7/1/13 1710	Turn Around Time (Check): <input checked="" type="checkbox"/> Same Day <input type="checkbox"/> 24 Hours <input type="checkbox"/> 48 Hours <input type="checkbox"/> 72 Hours <input type="checkbox"/> Standard	Notes:
Received by: <u>[Signature]</u>	Date/Time: 7/1/13	Sample Integrity: Temperature Upon Receipt: <u>49</u> Inst: <u>Yes</u> No	
Received by: <u>[Signature]</u>	Date/Time: 7/1/13		

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 - Hansen 14-1

Project Number: 0142  
Project Manager: John Cocroft

**Reported:**  
07/02/13 07:23

**B01@5'**  
**R307007-01 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: 07/01/13 13:40

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (TEPH-DRO)	ND	50	mg/kg	1	3070111	07/01/13	07/01/13	8015M	
C28-C36 (TEPH-ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: 07/01/13 13:40

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		91.2 %	30-150		"	"	"	"	

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

Date Sampled: 07/01/13 13:40

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0050	mg/kg	1	3070109	07/01/13	07/01/13	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: 07/01/13 13:40

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		94.4 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		90.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	21-167		"	"	"	"	

Summit Scientific

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

Project: KMG - Hansen 14-1

Project Number: 0142  
Project Manager: John Cocroft

**Reported:**  
07/02/13 07:23

**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 3070111 - EPA 3550A**

**Blank (3070111-BLK1)**

Prepared & Analyzed: 07/01/13

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

**LCS (3070111-BS1)**

Prepared & Analyzed: 07/01/13

C10-C28 (TEPH-DRO)	607	50	mg/kg	501	121	73-134
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**LCS Dup (3070111-BSD1)**

Prepared & Analyzed: 07/01/13

C10-C28 (TEPH-DRO)	627	50	mg/kg	501	125	73-134	3.23	11
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**Matrix Spike (3070111-MS1)**

Source: R307002-01

Prepared: 07/01/13 Analyzed: 07/02/13

C10-C28 (TEPH-DRO)	687	50	mg/kg	501	ND	137	50-148
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**Matrix Spike Dup (3070111-MSD1)**

Source: R307002-01

Prepared: 07/01/13 Analyzed: 07/02/13

C10-C28 (TEPH-DRO)	655	50	mg/kg	501	ND	131	50-148	4.71	13
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LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada CO, 80003

Project: KMG - Hansen 14-1

Project Number: 0142  
Project Manager: John Cocroft

**Reported:**  
07/02/13 07:23

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

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

**Batch 3070109 - EPA 5030 Soil MS**

**Blank (3070109-BLK1)**

Prepared & Analyzed: 07/01/13

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	0.0375		"	0.0397	94.5	23-173				
Surrogate: Toluene-d8	0.0374		"	0.0400	93.5	20-170				
Surrogate: 4-Bromofluorobenzene	0.0413		"	0.0400	103	21-167				

**LCS (3070109-BS1)**

Prepared & Analyzed: 07/01/13

Benzene	0.0902	0.0050	mg/kg	0.100	90.2	58-130				
Toluene	0.0906	0.0050	"	0.100	90.6	61-134				
Ethylbenzene	0.106	0.0050	"	0.100	106	74-139				
m,p-Xylene	0.209	0.010	"	0.200	105	73-137				
o-Xylene	0.105	0.0050	"	0.100	105	73-141				
Surrogate: 1,2-Dichloroethane-d4	0.0353		"	0.0397	89.0	23-173				
Surrogate: Toluene-d8	0.0381		"	0.0400	95.2	20-170				
Surrogate: 4-Bromofluorobenzene	0.0397		"	0.0400	99.2	21-167				

**LCS Dup (3070109-BSD1)**

Prepared & Analyzed: 07/01/13

Benzene	0.0951	0.0050	mg/kg	0.100	95.1	58-130	5.28	13		
Toluene	0.0946	0.0050	"	0.100	94.6	61-134	4.31	16		
Ethylbenzene	0.109	0.0050	"	0.100	109	74-139	3.33	12		
m,p-Xylene	0.216	0.010	"	0.200	108	73-137	3.05	14		
o-Xylene	0.107	0.0050	"	0.100	107	73-141	1.84	12		
Surrogate: 1,2-Dichloroethane-d4	0.0358		"	0.0397	90.3	23-173				
Surrogate: Toluene-d8	0.0388		"	0.0400	96.9	20-170				
Surrogate: 4-Bromofluorobenzene	0.0407		"	0.0400	102	21-167				

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Arvada CO, 80003

Project: KMG - Hansen 14-1

Project Number: 0142  
Project Manager: John Cocroft

**Reported:**  
07/02/13 07:23

**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 3070109 - EPA 5030 Soil MS**

Matrix Spike (3070109-MS1)		Source: R307002-01			Prepared & Analyzed: 07/01/13					
Benzene	0.0789	0.0050	mg/kg	0.100	ND	78.9	30-131			
Toluene	0.0790	0.0050	"	0.100	ND	79.0	30-134			
Ethylbenzene	0.0886	0.0050	"	0.100	ND	88.6	22-153			
m,p-Xylene	0.175	0.010	"	0.200	ND	87.6	10-159			
o-Xylene	0.0870	0.0050	"	0.100	ND	87.0	31-151			
Surrogate: 1,2-Dichloroethane-d4	0.0405		"	0.0397		102	23-173			
Surrogate: Toluene-d8	0.0386		"	0.0400		96.4	20-170			
Surrogate: 4-Bromofluorobenzene	0.0414		"	0.0400		103	21-167			

Matrix Spike Dup (3070109-MSD1)		Source: R307002-01			Prepared: 07/01/13 Analyzed: 07/02/13					
Benzene	0.0788	0.0050	mg/kg	0.100	ND	78.8	30-131	0.114	34	
Toluene	0.0790	0.0050	"	0.100	ND	79.0	30-134	0.00	30	
Ethylbenzene	0.0876	0.0050	"	0.100	ND	87.6	22-153	1.12	24	
m,p-Xylene	0.175	0.010	"	0.200	ND	87.3	10-159	0.343	68	
o-Xylene	0.0865	0.0050	"	0.100	ND	86.5	31-151	0.553	38	
Surrogate: 1,2-Dichloroethane-d4	0.0402		"	0.0397		101	23-173			
Surrogate: Toluene-d8	0.0382		"	0.0400		95.5	20-170			
Surrogate: 4-Bromofluorobenzene	0.0401		"	0.0400		100	21-167			

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Project Number: 0142  
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**Reported:**  
07/02/13 07:23

### 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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Summit Scientific

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