



December 9, 2014

Mr. Paul Schwarz
HSE Representative
Kerr-McGee Oil & Gas Onshore LP
1099 18th Street, Suite 1800
Denver, Colorado 80202

**Re: Sump Excavation Summary Letter Report
Coors V 6-11
API# 05-123-17244
NWSW 6-T2N-R67W**

Dear Mr. Schwarz:

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@7') 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 8260 and total petroleum hydrocarbons (TPH) by EPA Methods 8015 and 8260. The laboratory analytical results are summarized in Table 1 and provided in the attached laboratory analytical report.

The sump excavation measured approximately 15 feet north to south by 15 feet east to west to an approximate depth of 7 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@7'. Based on the field 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.

A blue ink signature of Jeremy Espinoza, written in a cursive style.

Jeremy Espinoza
Staff Geologist

Reviewed by

A blue ink signature of Kelly L. Kenyon, written in a cursive style.

Kelly L. Kenyon
Project Environmental Scientist

Attachments



PROJECT COORS V 6-11
PROJECT MANAGER John Cocroft
JOB No. 014214378
LOCATION NWSW 6-T2N-R67W

DATE 11/12/14

CONT. No.

BY C. Terry

CHK'D

SHEET No. 1

OF 1

Legend

• Soil Sample location

Lease Road

— Excavation Extent

--- Removed Equipment

Note: Sketch not drawn to scale

Range land



TABLE 1
SOIL SAMPLE ANALYTICAL RESULTS
COORS V 6-11
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 @ 7'	7'	10/29/2014	<0.002	<0.002	<0.002	<0.002	<50.0	<50.0	<200
COGCC Standards			0.17	85	100	175	500*	500*	500*

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





October 30, 2014

LT Environmental, Inc.

John Cocroft

4600 West 60th Avenue

Arvada

CO 80003

Project Name - KMG - Coors V6-11

Project Number - [none]

Attached are your analytical results for KMG - Coors V6-11 received by Origins Laboratory, Inc. October 29, 2014. This project is associated with Origins project number X410347-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.
303.433.1322
o-squad@oelabinc.com



1725 Elk Place, Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

LT Environmental, Inc.

4600 West 60th Avenue

Arvada CO 80003

John Cocroft

Project Number: [none]

Project: KMG - Coors V6-11

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B01 @ 7	X410347-01	Soil	October 29, 2014 11:00	10/29/2014 16:20

Origins Laboratory, Inc.



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

John Cocroft
Project Number: [none]
Project: KMG - Coors V6-11

Origins Laboratory

F-012207-01-R1
Effective Date: 01/09/12

Sample Receipt Checklist

Origins Work Order: X410347

Client: LTE

Client Project ID: Coors V6-11

Checklist Completed by: Jesse Smith

Shipped Via H/D
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 10/25/14

Airbill #: 121

Matrix(s) Received: (Check all that apply): ☒ Soil/Solid ☐ Water ☐ Other: _____

Cooler Number/Temperature: _____ / 4.5 °C _____ / _____ °C _____ / _____ °C (Describe)

Thermometer ID: 1003

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Is there ice present (document if blue ice is used)	<input checked="" type="checkbox"/>			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		<input checked="" type="checkbox"/>		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		<input checked="" type="checkbox"/>		
Were all samples received intact ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?		<input checked="" type="checkbox"/>		
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.			<input checked="" type="checkbox"/>	
Are samples preserved that require preservation and was it checked ⁽¹⁾ ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity) (pH < 2 for samples preserved with HNO ₃ , HCL, H ₂ SO ₄) / (pH > 10 for samples preserved with NaAsO ₂ +NaOH, ZnAc+NaOH)			<input checked="" type="checkbox"/>	
Additional Comments (if any):				

⁽¹⁾If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

[Signature]
Reviewed by (Project Manager)

10/30/14 4:20
Date/Time Reviewed

Origins Laboratory, Inc.

[Signature]

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

John Cocroft
Project Number: [none]
Project: KMG - Coors V6-11

B01 @ 7
10/29/2014 11:00:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X410347-01 (Soil)

BTEX by EPA 8260C

Benzene	ND	0.002	mg/kg	1	4J29013	10/29/2014	10/29/2014
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	92.0 %	70-130			"	"	"
Surrogate: Toluene-d8	102 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	103 %	70-130			"	"	"

TPH-Carbon Chain by EPA Method 8015C

Gasoline (C6-C10)	ND	50.0	mg/kg	1	4J29010	10/29/2014	10/29/2014
Diesel (C10-C28)	ND	50.0	"	"	"	"	"
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"
TPH - Carbon Chain Total	ND	50.0	"	"	"	"	"

Surrogate: o-Terphenyl	71.2 %	65-146			"	"	"
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Origins Laboratory, Inc.



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

John Cocroft
Project Number: [none]
Project: KMG - Coors V6-11

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 4J29013 - EPA 5030 (soil)

Blank (4J29013-BLK1)

Prepared: 10/29/2014 Analyzed: 10/29/2014

Benzene	ND	0.002	mg/kg							
Toluene	ND	0.002	"							
Ethylbenzene	ND	0.002	"							
Xylenes, total	ND	0.002	"							
Surrogate: 1,2-Dichloroethane-d4	61		ug/kg	62.5		96.9	70-130			
Surrogate: Toluene-d8	63		"	62.5		101	70-130			
Surrogate: 4-Bromofluorobenzene	60		"	62.5		95.3	70-130			

Origins Laboratory, Inc.



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.

Ross S Hutto For Noelle Doyle Mathis, President

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

John Cocroft
Project Number: [none]
Project: KMG - Coors V6-11

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4J29013 - EPA 5030 (soil)										
LCS (4J29013-BS1)					Prepared: 10/29/2014 Analyzed: 10/29/2014					
Benzene	0.10	0.002	mg/kg	0.100		96.6	77.1-124			
Toluene	0.09	0.002	"	0.100		91.0	74.5-128			
Ethylbenzene	0.09	0.002	"	0.100		88.5	66.4-127			
m,p-Xylene	0.17	0.004	"	0.200		87.1	76.6-124			
o-Xylene	0.08	0.002	"	0.100		84.8	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	60		ug/kg	62.5		95.4	70-130			
Surrogate: Toluene-d8	65		"	62.5		103	70-130			
Surrogate: 4-Bromofluorobenzene	58		"	62.5		93.4	70-130			

Origins Laboratory, Inc.



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Ross S Hutto For Noelle Doyle Mathis, President

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

John Cocroft
Project Number: [none]
Project: KMG - Coors V6-11

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4J29013 - EPA 5030 (soil)										
Matrix Spike (4J29013-MS1)		Source: X410325-02			Prepared: 10/29/2014 Analyzed: 10/29/2014					
Benzene	0.10	0.002	mg/kg	0.100	ND	95.4	71.8-126			
Toluene	0.09	0.002	"	0.100	ND	91.1	65.1-130			
Ethylbenzene	0.10	0.002	"	0.100	0.005	98.9	62.2-130			
m,p-Xylene	0.42	0.004	"	0.200	0.13	146	46.5-137			QM-07
o-Xylene	0.09	0.002	"	0.100	ND	88.5	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	54		ug/kg	62.5		86.5	70-130			
Surrogate: Toluene-d8	65		"	62.5		104	70-130			
Surrogate: 4-Bromofluorobenzene	57		"	62.5		90.8	70-130			

Origins Laboratory, Inc.



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

John Cocroft
Project Number: [none]
Project: KMG - Coors V6-11

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4J29013 - EPA 5030 (soil)										
Matrix Spike Dup (4J29013-MSD1)	Source: X410325-02				Prepared: 10/29/2014 Analyzed: 10/29/2014					
Benzene	0.10	0.002	mg/kg	0.100	ND	97.1	71.8-126	1.77	11.3	
Toluene	0.09	0.002	"	0.100	ND	89.0	65.1-130	2.27	15.4	
Ethylbenzene	0.10	0.002	"	0.100	0.005	94.3	62.2-130	4.54	19.6	
m,p-Xylene	0.34	0.004	"	0.200	0.13	105	46.5-137	21.8	19.2	QM-07
o-Xylene	0.08	0.002	"	0.100	ND	83.9	54.2-134	5.43	17.9	
Surrogate: 1,2-Dichloroethane-d4	62		ug/kg	62.5		99.8	70-130			
Surrogate: Toluene-d8	62		"	62.5		99.2	70-130			
Surrogate: 4-Bromofluorobenzene	52		"	62.5		82.4	70-130			

Origins Laboratory, Inc.



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

John Cocroft
Project Number: [none]
Project: KMG - Coors V6-11

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Extractable Petroleum Hydrocarbons by 8015M - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 4J29010 - EPA 3580

Blank (4J29010-BLK1)

Prepared: 10/29/2014 Analyzed: 10/29/2014

Gasoline (C6-C10)	ND	50.0	mg/kg							
Diesel (C10-C28)	ND	50.0	"							
Residual Range Organics (C28-C36)	ND	200	"							
TPH - Carbon Chain Total	ND	50.0	"							

Surrogate: o-Terphenyl	41		g	50.0		82.6	65-146			
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LCS (4J29010-BS1)

Prepared: 10/29/2014 Analyzed: 10/29/2014

Gasoline (C6-C10)	931	50.0	mg/kg	1000		93.1	66.7-119			
Diesel (C10-C28)	1140	50.0	"	1000		114	70.1-127			
Residual Range Organics (C28-C36)	882	200	"	1000		88.2	54.5-139			

Surrogate: o-Terphenyl	46		g	50.0		92.0	65-146			
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LCS Dup (4J29010-BSD1)

Prepared: 10/29/2014 Analyzed: 10/29/2014

Gasoline (C6-C10)	987	50.0	mg/kg	1000		98.7	66.7-119	5.91	28.2	
Diesel (C10-C28)	1170	50.0	"	1000		117	70.1-127	2.48	19.1	
Residual Range Organics (C28-C36)	920	200	"	1000		92.0	54.5-139	4.21	21.2	

Surrogate: o-Terphenyl	43		g	50.0		85.7	65-146			
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Origins Laboratory, Inc.

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

John Cocroft
Project Number: [none]
Project: KMG - Coors V6-11

Notes and Definitions

QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

Origins Laboratory, Inc.



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Ross S Hutto For Noelle Doyle Mathis, President