



November 17, 2015

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

**Re: Sump Replacement Summary Letter Report
Western-63N65W30SESE (Western 16-30)
API: 05-123-23000
Facility ID: 305457
Legal: SESE Sec 30-T3N-R65W
Remediation Project #8961**

Dear Mr. LaRue:

On behalf of Kerr-McGee Oil & Gas Onshore LP (Kerr-McGee), Tasman Geosciences, Inc. (Tasman) has prepared this Sump Replacement Summary Letter Report (Report) to document sampling activities and the results of environmental testing at the above-referenced site. This Report is being submitted under the Form 27 Management Plan for Closure/Replacement of Produced Water Vessels, which has been assigned Remediation #8961 by the COGCC. Tasman provided environmental services at the site that included collection of confirmation soil and groundwater samples from the excavation and documentation of field activities, as described below.

Site Assessment Activities

The field activities described herein were performed with the purpose of assessing potential hydrocarbon impacts at the site related to the replacement of the produced water sump on June 22, 2015. Soil sampling activities, laboratory analytical results, and conclusions are presented below. The general site layout and sample locations are provided in the attached site map (Attachment A)

The final extent of the excavation measured approximately 17 feet by 22 feet with an approximate depth of 2.5 feet below ground surface (bgs). No impacted material was removed during the replacement of the produced water sump at this location. A liner was present at the location and groundwater was not encountered in the excavation.

Confirmation soil samples were collected from the sidewalls of the excavation area at approximately 2.5 feet bgs. A soil sample was not collected from the base of the excavation due to the presence of a liner. Soil samples were field screened for volatile organic compound (VOC) concentrations using a photoionization detector (PID). The confirmation soil sample collected from the north sidewall of the excavation area was submitted to Origins Laboratory in Denver, Colorado, for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), total petroleum

hydrocarbons (TPH) – gasoline range organics (GRO) by United States Environmental Protection Agency (USEPA) Method 8260C, TPH – diesel range and oil range organics (DRO and ORO) by USEPA Method 8015, electrical conductivity (EC), pH. Soil analytical data is summarized in Table 1 and the laboratory analytical report is provided in Attachment B.

Results

Soil analytical results from the sample collected from the north sidewall of the final extent of the excavation area indicated that BTEX and TPH concentrations were below the applicable COGCC Table 910-1 standards. The remaining three soil samples collected from the west, south, and north sidewalls of the excavation area were not submitted for laboratory analysis as analytical data confirmed the absence of petroleum hydrocarbon impacts above regulatory standards.

Conclusions

Analytical results described herein confirm BTEX and TPH impacts are not present at concentrations above applicable regulatory standards in the former sump location. Consequently, no further site assessment or remedial activity is recommended at this time. Following site assessment activities, the produced water sump was replaced and the excavation area was backfilled and contoured to match pre-existing site conditions. The production facility remains operational.

Please contact me at (720) 409-8791 if you have any questions regarding this report or require additional information.

Sincerely,

A handwritten signature in blue ink that reads 'Christine Wasko'.

Christine Wasko
Project Scientist

Attachments:

Table 1 – Soil Sample Results Summary Table
Attachment A – Site Map
Attachment B – Laboratory Analytical Report

Table

TABLE 1
WESTERN-63N65W30SESE
SOIL SAMPLE RESULTS SUMMARY TABLE
KERR-McGEE OIL AND GAS ONSHORE LP

Sample ID	Date	Depth (ft. bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	TVPH- GRO (mg/kg)	TEPH- DRO (mg/kg)	TEPH- ORO (mg/kg)	EC (mmhos/cm)	pH (units)
COGCC standards for soil (mg/kg) ⁽¹⁾			0.17	85	100	175	500			4 or 2x BG	6-9
N01 @2.5'	06/22/15	2.5	<0.002	<0.002	<0.002	<0.002	<0.200	<50	<200	0.0377	7.53

Notes:

1. Standards for soil are taken from 2 CCR 404-1, Table 910-1, effective February 1, 2014.

COGCC = Colorado Oil and Gas Conservation Commission

(<) = Analytical result is less than the indicated laboratory reporting limit.

TVPH - GRO = Total volatile petroleum hydrocarbons - gasoline range organics

TEPH - DRO = Total extractable petroleum hydrocarbons - diesel range organics

TEPH - ORO = Total extractable petroleum hydrocarbons - oil range organics

EC = Electrical conductivity

BG = Background

mmhos/cm = Millimhos per centimeter

mg/kg = Milligrams per kilogram.

ft. bgs = Feet below ground surface.

BOLD = Analytical result is in exceedance of COGCC Table 910-1 soil standards.

Attachment A



DATE: November 17, 2015		<p>Kerr-McGee Oil and Gas Onshore, LP Western-63N65W30SESE SESE, Section 30, Township 3 North, Range 65 West Weld County, Colorado</p>	<p>Sample Location Map</p>	<p>FIGURE 1</p>
DESIGNED BY: B. Nelson				
DRAWN BY: B. Nelson				

Attachment B

June 23, 2015

Tasman Geosciences

Christine Wasko

6899 Pecos Street, Unit C

Denver

CO 80211

Project Name - KMG - Western 16-30

Project Number - [none]

Attached are your analytical results for KMG - Western 16-30 received by Origins Laboratory, Inc. June 22, 2015. This project is associated with Origins project number X506289-01.

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



Tasman Geosciences

6899 Pecos Street, Unit C

Denver CO 80211

Christine Wasko

Project Number: [none]

Project: KMG - Western 16-30

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
N01@2.5'	X506289-01	Soil	June 22, 2015 15:20	06/22/2015 16:48

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.

Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Christine Wasko
Project Number: [none]
Project: KMG - Western 16-30

ORIGINS
LABORATORY, INC

Client: Tasman Geo
Address: [blank]
Telephone Number: 352 202 9910
Email Address: lwasko@tasman-geo.com

Project Manager: Christine Wasko
Project Name: Western 16-30
Project Number: [blank]
Samples Collected By: Kate Fismark

www.originslaboratory.com

page 1 of 1

X506291 JH 6/22
X506289

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis	Sample Instructions
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Alk Summa #		
N0102.5'	6/22/15	1520	2	X				X			Gdtes 3200 TPH-D20/OKO 8015 EC, pH SAR, (EC > 40)	1
S0102.5'	6/22/15	1521	1									2
W0102.5'	6/22/15	1522	1									3
E0102.5'	6/22/15	1523	1									4
												5
												6
												7
												8
												9
												10

Relinquished By: [Signature]

Relinquished By: [Signature]

Date: 6/22/15

Date: 6/22/15

Time: 1640

Time: 1648

Received By: [Signature]

Received By: [Signature]

Date: 6-22-15

Date: 6-22-15

Time: 1648

Time: 1648

Turnaround Time: Same Day ☒ 24 Hr ☐ 48 Hr ☐ 72 Hr ☐ Standard ☒

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

Date Results Needed: [blank]

Origins Laboratory, Inc.

Jefe Pellegrini

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.

Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Christine Wasko
Project Number: [none]
Project: KMG - Western 16-30

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: X506289

Client: Tasman
Client Project ID: Western 16-30

Checklist Completed by: J. Anderson

Shipped Via: Pickup
(UPS, FedEx, Hand Delivered, Pick-up, etc.)
Airbill #: N/A

Date/time completed: 6/22/15 1215

Matrix(s) Received: (Check all that apply): X Soil/Solid Water Other:

Cooler Number/Temperature: 1 / 15.3 °C / °C / °C (Describe)

Thermometer ID: T003

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C ⁽¹⁾ ?		X		sampled same day
Is there ice present (document if blue ice is used)	X			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		X		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		X		
Were all samples received intact ⁽¹⁾ ?	X			
Was adequate sample volume provided ⁽¹⁾ ?	X			
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?		X		
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	X			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	X			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	X			
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	X			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.			X	
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)			X	
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.

J. Anderson
Reviewed By (Project Manager)

6/23/15
Date/Time Reviewed

Origins Laboratory, Inc.

Jen Pellegrini

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.

Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Christine Wasko
Project Number: [none]
Project: KMG - Western 16-30

N01@2.5'
6/22/2015 3:20:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X506289-01 (Soil)

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	5F22008	06/22/2015	06/22/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	105 %	70-130			"	"	"
Surrogate: Toluene-d8	96.2 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	102 %	70-130			"	"	"

pH in Soil by EPA 9045D

pH	7.53		pH Units	1	5F22005	06/22/2015	06/22/2015
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.0377		mmhos/cm	"	5F22006	"	06/22/2015
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TPH-Carbon Chain by EPA Method 8015C

Diesel (C10-C28)	ND	50	mg/kg	1	5F22007	06/22/2015	06/22/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

Surrogate: o-Terphenyl	96.6 %	65-146			"	"	"
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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.

Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Christine Wasko
Project Number: [none]
Project: KMG - Western 16-30

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 5F22008 - EPA 5030 (soil)

Blank (5F22008-BLK1)

Prepared: 06/22/2015 Analyzed: 06/22/2015

Gasoline Range Hydrocarbons	ND	0.200	mg/kg							
Benzene	ND	0.002	"							
Toluene	ND	0.002	"							
Ethylbenzene	ND	0.002	"							
Xylenes, total	ND	0.002	"							
Surrogate: 1,2-Dichloroethane-d4	64.4		ug/kg	62.5		103	70-130			
Surrogate: Toluene-d8	61.1		"	62.5		97.7	70-130			
Surrogate: 4-Bromofluorobenzene	61.5		"	62.5		98.4	70-130			

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Christine Wasko
Project Number: [none]
Project: KMG - Western 16-30

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 5F22008 - EPA 5030 (soil)										
LCS (5F22008-BS1)					Prepared: 06/22/2015 Analyzed: 06/22/2015					
Benzene	0.098	0.002	mg/kg	0.100		98.2	77.1-124			
Toluene	0.095	0.002	"	0.100		95.1	74.5-128			
Ethylbenzene	0.094	0.002	"	0.100		94.2	66.4-127			
m,p-Xylene	0.191	0.004	"	0.200		95.6	76.6-124			
o-Xylene	0.094	0.002	"	0.100		94.2	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	59.3		ug/kg	62.5		94.9	70-130			
Surrogate: Toluene-d8	60.9		"	62.5		97.5	70-130			
Surrogate: 4-Bromofluorobenzene	61.6		"	62.5		98.6	70-130			

Origins Laboratory, Inc.



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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Christine Wasko
Project Number: [none]
Project: KMG - Western 16-30

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 5F22008 - EPA 5030 (soil)

Matrix Spike (5F22008-MS1)		Source: X506263-01			Prepared: 06/22/2015 Analyzed: 06/22/2015					
Benzene	0.106	0.002	mg/kg	0.100	ND	106	71.8-126			
Toluene	0.101	0.002	"	0.100	0.002	99.1	65.1-130			
Ethylbenzene	0.102	0.002	"	0.100	ND	102	62.2-130			
m,p-Xylene	0.204	0.004	"	0.200	0.001	101	46.5-137			
o-Xylene	0.101	0.002	"	0.100	ND	101	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	60.0		ug/kg	62.5		96.0	70-130			
Surrogate: Toluene-d8	61.7		"	62.5		98.7	70-130			
Surrogate: 4-Bromofluorobenzene	64.4		"	62.5		103	70-130			

Origins Laboratory, Inc.



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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Christine Wasko
Project Number: [none]
Project: KMG - Western 16-30

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 5F22008 - EPA 5030 (soil)

Matrix Spike Dup (5F22008-MSD1)		Source: X506263-01			Prepared: 06/22/2015 Analyzed: 06/22/2015					
Benzene	0.104	0.002	mg/kg	0.100	ND	104	71.8-126	1.52	11.3	
Toluene	0.100	0.002	"	0.100	0.002	98.2	65.1-130	0.934	15.4	
Ethylbenzene	0.101	0.002	"	0.100	ND	101	62.2-130	1.64	19.6	
m,p-Xylene	0.203	0.004	"	0.200	0.001	101	46.5-137	0.747	19.2	
o-Xylene	0.099	0.002	"	0.100	ND	99.5	54.2-134	1.26	17.9	
Surrogate: 1,2-Dichloroethane-d4	61.7		ug/kg	62.5		98.8	70-130			
Surrogate: Toluene-d8	61.0		"	62.5		97.6	70-130			
Surrogate: 4-Bromofluorobenzene	64.3		"	62.5		103	70-130			

Origins Laboratory, Inc.



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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Christine Wasko
Project Number: [none]
Project: KMG - Western 16-30

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 8015C - 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 5F22007 - EPA 3580

Blank (5F22007-BLK1)

Prepared: 06/22/2015 Analyzed: 06/22/2015

Diesel (C10-C28)	ND	50	mg/kg							
Residual Range Organics (C28-C36)	ND	200	"							
Surrogate: o-Terphenyl	41.3		"	50.0		82.6	65-146			

LCS (5F22007-BS1)

Prepared: 06/22/2015 Analyzed: 06/22/2015

Diesel (C10-C28)	930	50	mg/kg	1000		93.0	70.1-127			
Residual Range Organics (C28-C36)	1100	200	"	1000		110	54.5-139			
Surrogate: o-Terphenyl	49.9		"	50.0		99.9	65-146			

Matrix Spike (5F22007-MS1)

Source: X506263-01

Prepared: 06/22/2015 Analyzed: 06/22/2015

Diesel (C10-C28)	890	50	mg/kg	1000	27	86.0	57.4-138			
Residual Range Organics (C28-C36)	1100	200	"	1000	ND	106	47.7-129			
Surrogate: o-Terphenyl	40.3		"	50.0		80.6	65-146			

Matrix Spike Dup (5F22007-MSD1)

Source: X506263-01

Prepared: 06/22/2015 Analyzed: 06/22/2015

Diesel (C10-C28)	860	50	mg/kg	1000	27	83.0	57.4-138	3.44	18.3	
Residual Range Organics (C28-C36)	1000	200	"	1000	ND	100	47.7-129	5.39	30.1	
Surrogate: o-Terphenyl	39.6		"	50.0		79.2	65-146			

Origins Laboratory, Inc.



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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Christine Wasko
Project Number: [none]
Project: KMG - Western 16-30

Classical Chemistry Parameters - Quality Control Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5F22005 - NO PREP										
Duplicate (5F22005-DUP1)		Source: X506263-01			Prepared: 06/22/2015 Analyzed: 06/22/2015					
pH	8.12		pH Units		8.11			0.123	25	
Batch 5F22006 - NO PREP										
Blank (5F22006-BLK1)		Prepared: 06/22/2015 Analyzed: 06/22/2015								
Specific Conductance (EC)	0.00270		mmhos/cm							
Duplicate (5F22006-DUP1)		Source: X506263-01			Prepared: 06/22/2015 Analyzed: 06/22/2015					
Specific Conductance (EC)	0.107		mmhos/cm		0.114			6.14	25	

Origins Laboratory, Inc.



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Tasman Geosciences

6899 Pecos Street, Unit C

Denver CO 80211

Christine Wasko

Project Number: [none]

Project: KMG - Western 16-30

Notes and Definitions

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President