



July 11, 2016

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

Re: Sump Closure Summary Letter Report
Powers – USX X – 62N65W27SENE (Powers USX X 28-08)
API: 05-123-24862
Facility ID: 306533
Legal: SENE Sec 27-T2N-R65W
Remediation Project #8961

Dear Mr. Mickelson:

On behalf of Kerr-McGee Oil & Gas Onshore LP (Kerr-McGee), Tasman Geosciences, Inc. (Tasman) has prepared this Sump Closure 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 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 closure of the produced water sump on June 2, 2016. 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 12 feet by 14 feet with an approximate depth of 5 feet below ground surface (bgs). No impacted material was removed during the closure of the produced water sump at this location. A liner was not present at the location and groundwater was not encountered in the excavation.

Confirmation soil samples were collected from the base and sidewalls of the excavation area at approximately 5 feet and 4 feet bgs, respectively. Soil samples were field screened for volatile organic compound (VOC) concentrations using a photoionization detector (PID). The confirmation soil sample collected from the base 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), and 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 base of the final extent of the excavation area indicated that BTEX and TPH concentrations were below the applicable COGCC Table 910-1 standards. The soil sample exhibited a pH level above the regulatory standards but was collected from below the designated root zone. The remaining soil samples collected from the 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 removed and the excavation area was backfilled and contoured to match pre-existing site conditions.

Please contact me at (303) 487-1228 if you have any questions regarding this report or require additional information.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Brock Nelson', is written over a light blue horizontal line.

Brock Nelson
Project Geologist

Attachments:

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

Table

TABLE 1
POWERS-USX X-62N65W27SENE (POWERS USX X28-08)
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 mmhos/cm or 2x BG	6-9
B01@5'	06/02/16	5	<0.002	<0.002	<0.002	<0.002	<0.200	<25.0	<100	0.0608	9.11*

Notes:

1. Standards for soil are taken from 2 CCR 404-1, Table 910-1, effective March 16, 2016.

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.

* = Soil sample was collected from below the designated root zone.

ft. bgs = Feet below ground surface.

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

Attachment A



DATE:	June 6, 2016
DESIGNED BY:	B. Nelson
DRAWN BY:	B. Nelson



Kerr-McGee Oil and Gas Onshore, LP
Powers-USX X-62N65W27SENE (Powers USX X28-8)
SENE, Section 27, Township 2 North, Range 65 West
Weld County, Colorado

Sample Location
Map

FIGURE
1

Attachment B



June 03, 2016

Tasman Geosciences

Bob Cornez

6899 Pecos Street, Unit C

Denver

CO 80211

Project Name - KMG - Powers USX X 28-8

Project Number - [none]

Attached are your analytical results for KMG - Powers USX X 28-8 received by Origins Laboratory, Inc. June 02, 2016. This project is associated with Origins project number X606029-05.

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

Tasman Geosciences

6899 Pecos Street, Unit C

Denver CO 80211

Bob Cornez

Project Number: [none]

Project: KMG - Powers USX X 28-8

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B01@5'	X606029-05	Soil	June 2, 2016 15:10	06/02/2016 17:47

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.

Jen Pellegrini For Noelle Doyle Mathis, President

Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: [none]
Project: KMG - Powers USX X 28-8

www.originslaboratory.com

page 1 of 1

ORIGINS LABORATORY, INC

Tasman Geosciences

Client: Tasman Geosciences

Address: [blank]

Telephone Number: 352 262 9910

Email Address: info@tasman-geo.com

Project Manager: Bob Cornez

Project Name: Powers USX X 28-8

Project Number: Pending

Samples Collected By: Kate Folsom

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

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix				Analysis	Sample Instructions
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Air Summ. #	Other		
N0104	6/2/16	1515	2	X				X				GISTEX S240	1
S0104	6/2/16	1520	3	X				X				TPH DEQ1000 905	2
E0104	6/2/16	1525	3	X				X				pH EC SAR (FEC)	3
W0104	6/2/16	1530	3	X				X					4
B0104	6/2/16	1500	2	X				X					5
													6
													7
													8
													9
													10

Relinquished By: [Signature]

Relinquished By: [Signature]

Date: 6/2/16

Date: 6/2/16

Time: 1747

Time: 1747

Received By: [Signature]

Received By: [Signature]

Date: 6/2/16

Date: 6/2/16

Time: 1747

Time: 1747

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

Date Results Needed: [blank]

Origins Laboratory, Inc.

Jefe Pellegrini

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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: [none]
Project: KMG - Powers USX X 28-8

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: X606029

Client: Tasman Geosciences

Client Project ID: Powers USX X 28-8

Checklist Completed by: Joe Henderson

Shipped Via: H/D

(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 6/2/16

Airbill #: 187

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

Cooler Number/Temperature: 1 / 5.7 °C 1 / _____ °C 1 / _____ °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"/>			<u>PH</u>
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 Na ₂ SO 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.

Reviewed by (Project Manager) [Signature]

Date/Time Reviewed 6/2/16

Origins Laboratory, Inc.

[Signature]

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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: [none]
Project: KMG - Powers USX X 28-8

B01@5'
6/2/2016 3:10:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X606029-05 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	25.0	mg/kg	1	B6F0203	06/02/2016	06/03/2016	U
Residual Range Organics (C28-C40)	ND	100	"	"	"	"	"	U

Surrogate: o-Terphenyl 79.6 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B6F0204	06/02/2016	06/02/2016	U
Benzene	ND	0.002	"	"	"	"	"	U
Toluene	ND	0.002	"	"	"	"	"	U
Ethylbenzene	ND	0.002	"	"	"	"	"	U
Xylenes, total	ND	0.002	"	"	"	"	"	U

Surrogate: 1,2-Dichloroethane-d4 97.3 % 70-130 " " "
Surrogate: Toluene-d8 101 % 70-130 " " "
Surrogate: 4-Bromofluorobenzene 96.9 % 70-130 " " "

pH in Soil by EPA 9045D

pH	9.11		pH Units	1	B6F0205	06/02/2016	06/02/2016	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.0608		mmhos/cm	"	B6F0206	"	06/02/2016	
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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: [none]
Project: KMG - Powers USX X 28-8

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 B6F0204 - EPA 5030 (soil)										
Blank (B6F0204-BLK1)					Prepared: 06/02/2016 Analyzed: 06/02/2016					
Gasoline Range Hydrocarbons	ND	0.200	mg/kg							U
Benzene	ND	0.002	"							U
Toluene	ND	0.002	"							U
Ethylbenzene	ND	0.002	"							U
Xylenes, total	ND	0.002	"							U
Surrogate: 1,2-Dichloroethane-d4	61		ug/kg	62.5		97.7	70-130			
Surrogate: Toluene-d8	62		"	62.5		99.3	70-130			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		98.4	70-130			

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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: [none]
Project: KMG - Powers USX X 28-8

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 B6F0204 - EPA 5030 (soil)										
LCS (B6F0204-BS1)					Prepared: 06/02/2016 Analyzed: 06/02/2016					
Benzene	0.086	0.002	mg/kg	0.100		85.8	77.1-124			
Toluene	0.087	0.002	"	0.100		87.3	74.5-128			
Ethylbenzene	0.093	0.002	"	0.100		93.1	66.4-127			
m,p-Xylene	0.190	0.004	"	0.200		94.8	76.6-124			
o-Xylene	0.094	0.002	"	0.100		94.3	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	60		ug/kg	62.5		96.6	70-130			
Surrogate: Toluene-d8	63		"	62.5		100	70-130			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		99.6	70-130			

Origins Laboratory, Inc.



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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: [none]
Project: KMG - Powers USX X 28-8

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 B6F0204 - EPA 5030 (soil)

Matrix Spike (B6F0204-MS1)		Source: X606028-01			Prepared: 06/02/2016 Analyzed: 06/02/2016					
Benzene	0.059	0.002	mg/kg	0.100	ND	58.9	71.8-126			QM-07
Toluene	0.053	0.002	"	0.100	ND	53.1	65.1-130			QM-07
Ethylbenzene	0.046	0.002	"	0.100	ND	45.5	62.2-130			QM-07
m,p-Xylene	0.101	0.004	"	0.200	ND	50.3	46.5-137			
o-Xylene	0.055	0.002	"	0.100	ND	54.9	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	64		ug/kg	62.5		103	70-130			
Surrogate: Toluene-d8	63		"	62.5		100	70-130			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		97.4	70-130			

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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: [none]
Project: KMG - Powers USX X 28-8

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 B6F0204 - EPA 5030 (soil)										
Matrix Spike Dup (B6F0204-MSD1)		Source: X606028-01			Prepared: 06/02/2016 Analyzed: 06/02/2016					
Benzene	0.083	0.002	mg/kg	0.100	ND	83.4	71.8-126	34.5	11.3	QR-03
Toluene	0.080	0.002	"	0.100	ND	80.0	65.1-130	40.3	15.4	QR-03
Ethylbenzene	0.078	0.002	"	0.100	ND	77.9	62.2-130	52.5	19.6	QR-03
m,p-Xylene	0.171	0.004	"	0.200	ND	85.6	46.5-137	52.1	19.2	QR-02
o-Xylene	0.092	0.002	"	0.100	ND	92.1	54.2-134	50.6	17.9	QR-02
Surrogate: 1,2-Dichloroethane-d4	61		ug/kg	62.5		98.3	70-130			
Surrogate: Toluene-d8	62		"	62.5		98.8	70-130			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		98.8	70-130			

Origins Laboratory, Inc.



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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: [none]
Project: KMG - Powers USX X 28-8

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 B6F0203 - EPA 3580

Blank (B6F0203-BLK1)

Prepared: 06/02/2016 Analyzed: 06/02/2016

Diesel (C10-C28)	ND	50.0	mg/kg							U
Residual Range Organics (C28-C40)	ND	200	"							U
Surrogate: o-Terphenyl	58		"	50.0		117	59-131			

LCS (B6F0203-BS1)

Prepared: 06/02/2016 Analyzed: 06/02/2016

Diesel (C10-C28)	970	50.0	mg/kg	1000		97.0	64-121			
Residual Range Organics (C28-C40)	967	200	"	1000		96.7	58-124			
Surrogate: o-Terphenyl	48		"	50.0		95.2	59-131			

Matrix Spike (B6F0203-MS1)

Source: X606028-01

Prepared: 06/02/2016 Analyzed: 06/02/2016

Diesel (C10-C28)	1050	50.0	mg/kg	1000	ND	105	53-125			
Residual Range Organics (C28-C40)	1060	200	"	1000	12.8	105	47-133			
Surrogate: o-Terphenyl	51		"	50.0		103	59-131			

Matrix Spike Dup (B6F0203-MSD1)

Source: X606028-01

Prepared: 06/02/2016 Analyzed: 06/02/2016

Diesel (C10-C28)	908	50.0	mg/kg	1000	ND	90.8	53-125	14.5	20	
Residual Range Organics (C28-C40)	942	200	"	1000	12.8	93.0	47-133	12.2	20	
Surrogate: o-Terphenyl	46		"	50.0		92.3	59-131			

Origins Laboratory, Inc.



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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: [none]
Project: KMG - Powers USX X 28-8

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 B6F0205 - NO PREP										
Duplicate (B6F0205-DUP1)		Source: X606029-05			Prepared: 06/02/2016 Analyzed: 06/02/2016					
pH	8.81		pH Units		9.11			3.35	25	
Batch B6F0206 - NO PREP										
Blank (B6F0206-BLK1)		Prepared: 06/02/2016 Analyzed: 06/02/2016								
Specific Conductance (EC)	0.00220		mmhos/cm							
Duplicate (B6F0206-DUP1)		Source: X606029-05			Prepared: 06/02/2016 Analyzed: 06/02/2016					
Specific Conductance (EC)	0.0587		mmhos/cm		0.0608			3.51	25	

Origins Laboratory, Inc.



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Tasman Geosciences

6899 Pecos Street, Unit C

Denver CO 80211

Bob Cornez

Project Number: [none]

Project: KMG - Powers USX X 28-8

Notes and Definitions

U Sample is Non-Detect.

QR-03 The RPD value for the sample duplicate or MS/MSD was outside of QC acceptance limits due to matrix interference. QC batch accepted based on LCS and/or LCSD recovery and/or RPD values.

QR-02 The RPD result exceeded the QC control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.

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

All soil results are reported at a wet weight basis.

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.