



August 5, 2016

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

**Re: Sump Replacement Summary Letter Report
Thomsen 1C-31HZ (Thomsen 34C-18HZ)
API: 05-123-36866
Facility ID: 431921
Legal: SWNW Sec 7-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 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 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 24, 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 18 feet by 18 feet with an approximate depth of 4 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 4 feet bgs. A soil sample was not collected from the base of the excavation area 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 east 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), 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 east 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 soil samples collected from the remaining 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 (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', with a stylized, flowing script.

Brock Nelson
Project Geologist

Attachments:

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

Table

TABLE 1
THOMSEN 1C-31HZ (THOMSEN 34C-18HZ)
SOIL SAMPLE RESULTS SUMMARY TABLE
KERR-McGEE OIL AND GAS ONSHORE LP

Sample Location	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
E01@4'	06/24/16	4	<0.050	<0.050	<0.050	<0.050	<5.00	<25.0	100	0.0461	8.88

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.

ft. bgs = Feet below ground surface.

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

Attachment A



DATE:	July 25, 2016
DESIGNED BY:	B. Nelson
DRAWN BY:	M. Petersen



Kerr-McGee Oil and Gas Onshore, LP
Thomsen 1C-31HZ (Thomsen 34C-18HZ)
SWNW, Section 7, Township 2 North, Range 65 West
Weld County, Colorado

Sample Location
Map

FIGURE
1

Attachment B



June 27, 2016

Tasman Geosciences

Bob Cornez

6899 Pecos Street, Unit C

Denver

CO 80211

Project Name - KMG - Thomsen 34C-18Hz

Project Number - [none]

Attached are your analytical results for KMG - Thomsen 34C-18Hz received by Origins Laboratory, Inc. June 24, 2016. This project is associated with Origins project number X606300-03.

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 - Thomsen 34C-18Hz

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
E01 @ 4'	X606300-03	Soil	June 24, 2016 14:06	06/24/2016 15:57

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

Bob Cornez
Project Number: [none]
Project: KMG - Thomsen 34C-18Hz

ORIGINS

LABORATORY, INC

www.originslaboratory.com

X606300

page 1 of 1

Client: T. Sman 666

Address:

Project Manager: Bob Carver

Project Name: Thomson 34L-18HZ

Project Number: Pending

Telephone Number: 912 236 2807

Email Address: rcarver@tsman-gco.com

Samples Collected By: Bob Carver

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis		Sample Instructions
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	As Summa #	Other	TPH	
N0104'	6/24/16	1400	2	X				X				Hold	1
S0104'	6/24/16	1405	2	X				X				Hold	2
E0104'	6/24/16	1406	2	X				X			X X X		3
W0104'	6/24/16	1405	2	X				X				Hold	4
													5
													6
													7
													8
													9
													10
Relinquished By: [Signature]	Date: 6/24/16	Time: 1557	Received By: [Signature]	Date: 6/24/16	Time: 1557	Turnaround Time: Same Day <input checked="" type="checkbox"/> 24 Hr <input type="checkbox"/>	48 Hr <input type="checkbox"/> 72 Hr <input type="checkbox"/> Standard <input type="checkbox"/>						
Relinquished By: [Signature]	Date: 6/24/16	Time: 1557	Received By: [Signature]	Date: 6/24/16	Time: 1557								

Temp Received - 13 Date Results Needed

Origins Laboratory, Inc.

Jose Pellegrini

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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: [none]
Project: KMG - Thomsen 34C-18Hz

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: X606300

Client: Tasman

Client Project ID: Thomsen 34C-18Hz

Checklist Completed by: Jeff Smith

Shipped Via: H/D

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

Date/time completed: 6/24/16

Airbill #: N/A

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

Cooler Number/Temperature: 1 1-3 °C 1 °C 1 °C (Describe) 1 °C

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⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is there ice present (document if blue ice is used)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input 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"/>	<input checked="" type="checkbox"/>	<input 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"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were all samples received intact ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PH
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.	<input type="checkbox"/>	<input type="checkbox"/>	<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 type="checkbox"/>	<input type="checkbox"/>	<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) Jeff Smith

Date/Time Reviewed 6/24/16

Origins Laboratory, Inc.

Jeff Pellegrini

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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: [none]
Project: KMG - Thomsen 34C-18Hz

E01 @ 4'
6/24/2016 2:06:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X606300-03 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	25.0	mg/kg	1	B6F2404	06/24/2016	06/24/2016	U
Residual Range Organics (C28-C40)	ND	100	"	"	"	"	"	U

Surrogate: o-Terphenyl 65.5 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	5.00	mg/kg	25	B6F2403	06/24/2016	06/24/2016	U
Benzene	ND	0.050	"	"	"	"	"	U
Toluene	ND	0.050	"	"	"	"	"	U
Ethylbenzene	ND	0.050	"	"	"	"	"	U
Xylenes, total	ND	0.050	"	"	"	"	"	U

Surrogate: 1,2-Dichloroethane-d4 94.6 % 70-130 " " "
Surrogate: Toluene-d8 100 % 70-130 " " "
Surrogate: 4-Bromofluorobenzene 109 % 70-130 " " "

pH in Soil by EPA 9045D

pH	8.88	pH Units	1	B6F2401	06/24/2016	06/24/2016
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.0461	mmhos/cm	"	B6F2407	06/24/2016	"
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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: [none]
Project: KMG - Thomsen 34C-18Hz

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 B6F2403 - EPA 5030 (soil)										
Blank (B6F2403-BLK1)					Prepared: 06/24/2016 Analyzed: 06/24/2016					
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	67		ug/kg	62.5		107	70-130			
Surrogate: Toluene-d8	60		"	62.5		96.4	70-130			
Surrogate: 4-Bromofluorobenzene	69		"	62.5		110	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 - Thomsen 34C-18Hz

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 B6F2403 - EPA 5030 (soil)										
Blank (B6F2403-BLK2)					Prepared: 06/24/2016 Analyzed: 06/24/2016					
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	65		ug/kg	62.5		103	70-130			
Surrogate: Toluene-d8	61		"	62.5		97.2	70-130			
Surrogate: 4-Bromofluorobenzene	69		"	62.5		111	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 - Thomsen 34C-18Hz

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 B6F2403 - EPA 5030 (soil)										
LCS (B6F2403-BS1)					Prepared: 06/24/2016 Analyzed: 06/24/2016					
Benzene	0.102	0.002	mg/kg	0.100		102	77.1-124			
Toluene	0.101	0.002	"	0.100		101	74.5-128			
Ethylbenzene	0.100	0.002	"	0.100		100	66.4-127			
m,p-Xylene	0.206	0.004	"	0.200		103	76.6-124			
o-Xylene	0.100	0.002	"	0.100		99.9	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	57		ug/kg	62.5		91.4	70-130			
Surrogate: Toluene-d8	62		"	62.5		100	70-130			
Surrogate: 4-Bromofluorobenzene	68		"	62.5		109	70-130			

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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: [none]
Project: KMG - Thomsen 34C-18Hz

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 B6F2403 - EPA 5030 (soil)										
LCS (B6F2403-BS2)					Prepared: 06/24/2016 Analyzed: 06/24/2016					
Benzene	0.097	0.002	mg/kg	0.100		96.8	77.1-124			
Toluene	0.093	0.002	"	0.100		93.0	74.5-128			
Ethylbenzene	0.090	0.002	"	0.100		89.6	66.4-127			
m,p-Xylene	0.183	0.004	"	0.200		91.7	76.6-124			
o-Xylene	0.092	0.002	"	0.100		91.7	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	62		ug/kg	62.5		98.9	70-130			
Surrogate: Toluene-d8	61		"	62.5		97.8	70-130			
Surrogate: 4-Bromofluorobenzene	67		"	62.5		107	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 - Thomsen 34C-18Hz

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 B6F2403 - EPA 5030 (soil)

Matrix Spike (B6F2403-MS1)		Source: X606280-01			Prepared: 06/24/2016 Analyzed: 06/24/2016					
Benzene	0.103	0.002	mg/kg	0.100	ND	103	71.8-126			
Toluene	0.098	0.002	"	0.100	ND	98.5	65.1-130			
Ethylbenzene	0.094	0.002	"	0.100	ND	94.0	62.2-130			
m,p-Xylene	0.193	0.004	"	0.200	ND	96.7	46.5-137			
o-Xylene	0.096	0.002	"	0.100	ND	95.8	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	72		ug/kg	62.5		114	70-130			
Surrogate: Toluene-d8	61		"	62.5		97.2	70-130			
Surrogate: 4-Bromofluorobenzene	68		"	62.5		109	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 - Thomsen 34C-18Hz

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 B6F2403 - EPA 5030 (soil)

Matrix Spike (B6F2403-MS2)		Source: X606301-01			Prepared: 06/24/2016 Analyzed: 06/25/2016					
Benzene	0.088	0.002	mg/kg	0.100	ND	87.7	71.8-126			
Toluene	0.079	0.002	"	0.100	ND	79.1	65.1-130			
Ethylbenzene	0.069	0.002	"	0.100	ND	68.6	62.2-130			
m,p-Xylene	0.136	0.004	"	0.200	ND	67.8	46.5-137			
o-Xylene	0.068	0.002	"	0.100	ND	67.9	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	61		ug/kg	62.5		97.1	70-130			
Surrogate: Toluene-d8	62		"	62.5		98.7	70-130			
Surrogate: 4-Bromofluorobenzene	69		"	62.5		110	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 - Thomsen 34C-18Hz

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 B6F2403 - EPA 5030 (soil)

Matrix Spike Dup (B6F2403-MSD1)		Source: X606280-01			Prepared: 06/24/2016 Analyzed: 06/24/2016					
Benzene	0.099	0.002	mg/kg	0.100	ND	99.2	71.8-126	3.76	11.3	
Toluene	0.095	0.002	"	0.100	ND	94.8	65.1-130	3.75	15.4	
Ethylbenzene	0.092	0.002	"	0.100	ND	91.8	62.2-130	2.35	19.6	
m,p-Xylene	0.189	0.004	"	0.200	ND	94.3	46.5-137	2.47	19.2	
o-Xylene	0.093	0.002	"	0.100	ND	93.1	54.2-134	2.84	17.9	
Surrogate: 1,2-Dichloroethane-d4	61		ug/kg	62.5		97.0	70-130			
Surrogate: Toluene-d8	61		"	62.5		97.0	70-130			
Surrogate: 4-Bromofluorobenzene	67		"	62.5		107	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 - Thomsen 34C-18Hz

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 B6F2403 - EPA 5030 (soil)										
Matrix Spike Dup (B6F2403-MSD2)	Source: X606301-01				Prepared: 06/24/2016 Analyzed: 06/25/2016					
Benzene	0.103	0.002	mg/kg	0.100	ND	103	71.8-126	16.1	11.3	QR-03
Toluene	0.099	0.002	"	0.100	ND	98.9	65.1-130	22.3	15.4	QR-03
Ethylbenzene	0.096	0.002	"	0.100	ND	96.3	62.2-130	33.5	19.6	QR-03
m,p-Xylene	0.196	0.004	"	0.200	ND	98.1	46.5-137	36.5	19.2	QR-03
o-Xylene	0.097	0.002	"	0.100	ND	96.8	54.2-134	35.1	17.9	QR-03
Surrogate: 1,2-Dichloroethane-d4	61		ug/kg	62.5		97.1	70-130			
Surrogate: Toluene-d8	62		"	62.5		98.7	70-130			
Surrogate: 4-Bromofluorobenzene	70		"	62.5		112	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 - Thomsen 34C-18Hz

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 B6F2404 - EPA 3580

Blank (B6F2404-BLK1)

Prepared: 06/24/2016 Analyzed: 06/24/2016

Diesel (C10-C28)	ND	50.0	mg/kg							U
Residual Range Organics (C28-C40)	ND	200	"							U
Surrogate: o-Terphenyl	68		"	50.0		137	59-131			

LCS (B6F2404-BS1)

Prepared: 06/24/2016 Analyzed: 06/24/2016

Diesel (C10-C28)	876	50.0	mg/kg	1000		87.6	64-121			
Residual Range Organics (C28-C40)	881	200	"	1000		88.1	58-124			
Surrogate: o-Terphenyl	40		"	50.0		79.9	59-131			

Matrix Spike (B6F2404-MS1)

Source: X606280-02

Prepared: 06/24/2016 Analyzed: 06/24/2016

Diesel (C10-C28)	829	50.0	mg/kg	1000	ND	82.9	53-125			
Residual Range Organics (C28-C40)	832	200	"	1000	38.6	79.3	47-133			
Surrogate: o-Terphenyl	34		"	50.0		67.8	59-131			

Matrix Spike Dup (B6F2404-MSD1)

Source: X606280-02

Prepared: 06/24/2016 Analyzed: 06/24/2016

Diesel (C10-C28)	822	50.0	mg/kg	1000	ND	82.2	53-125	0.873	20	
Residual Range Organics (C28-C40)	806	200	"	1000	38.6	76.7	47-133	3.31	20	
Surrogate: o-Terphenyl	37		"	50.0		74.3	59-131			

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

Bob Cornez
Project Number: [none]
Project: KMG - Thomsen 34C-18Hz

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 B6F2401 - NO PREP										
Duplicate (B6F2401-DUP1)		Source: X606281-23			Prepared: 06/24/2016 Analyzed: 06/24/2016					
pH	7.83		pH Units		7.93			1.27	25	
Batch B6F2407 - NO PREP										
Blank (B6F2407-BLK1)		Prepared: 06/24/2016 Analyzed: 06/24/2016								
Specific Conductance (EC)	0.00310		mmhos/cm							
Duplicate (B6F2407-DUP1)		Source: X606297-01			Prepared: 06/24/2016 Analyzed: 06/24/2016					
Specific Conductance (EC)	0.271		mmhos/cm		0.300			10.2	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 - Thomsen 34C-18Hz

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.

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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