



January 18, 2019

Greg Hamilton
Sr. Staff HSE Representative
Kerr-McGee Oil & Gas Onshore, LP
1099 18th Street, Suite 1800
Denver, Colorado 80202

**Re: Sump Closure Summary Report
Lisa #1 TANK BATTERY
Location ID: 318971
NESW - Sec18 - T2N - 67W
COGCC Remediation Number 12301**

Dear Mr. Hamilton:

Apex Companies, LLC (Apex) is providing Kerr-McGee Oil & Gas Onshore, LP (Kerr-McGee) with this Sump Closure Summary Report to document sampling activities and the results of environmental testing at the tank battery associated with the Lisa #1 well. This report documents the activities related to the closure of a produced-water sump under Remediation Number 12301, as approved by the COGCC. Apex provided the environmental services at the site that included a collection of confirmation samples from the sump removal excavation, and documentation of field activities, as described below.

Site Assessment Activities

The field activities described herein were performed on December 12, 2018, with the purpose of assessing potential hydrocarbon impacts at the site related to the closure of a partially-buried produced-water sump. Soil sampling activities, laboratory analytical results, and conclusions are presented below. The general site layout and sample locations are provided in Figure 1.

The final extent of excavation measured approximately 19 feet by 17 feet, at an approximate depth of 4 feet below ground surface (bgs). Impacted soil or groundwater was not encountered within the excavation.

Confirmation soil samples were collected from the excavation in relation to the removed sump. A total of seven samples were collected from the decommissioned sump excavation and surrounding area: four sidewall samples at approximately 3 feet bgs, one base sample at 4 feet bgs, one stockpile sample from excavated material, and one background sample. Neither a liner nor groundwater was present. All soil samples were field-screened using a calibrated photoionization detector (PID). PID readings for all seven samples ranged from 0.3 parts per million (ppm) to 193 ppm. Based on these results, the base sample (B01@4) and Eastern sidewall sample (E01@3) were submitted to Origins Laboratory in Denver, Colorado for testing. The samples were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) and total petroleum hydrocarbons (TPH) – gasoline range organics (GRO) by United States Environmental Protection Agency (USEPA) Method 8260, TPH – diesel range and residual range organics

(DRO and RRO, respectively) by USEPA Method 8015, electrical conductivity (EC), and pH. Soil analytical data are summarized in Table 1 and the laboratory analytical report is provided in Attachment A.

Results

Analytical results from the confirmation soil samples (B01@4 and E01@3) collected from the final extent of the excavation indicate that BTEX, TPH, EC, and pH concentrations were in full compliance with COGCC Table 910-1 allowable levels. The remaining samples collected from the excavation area were not submitted for laboratory analysis, as analytical data from the submitted samples confirmed the absence of petroleum hydrocarbon impacts above COGCC Table 910-1 standards.

Conclusions

Analytical results described herein confirm BTEX and TPH impacts are not present at concentrations above applicable regulatory standards at the former partially-buried produced-water sump location. Consequently, no further site assessment or remedial activity is warranted at this time. The produced-water sump was removed and will be not replaced. Following site assessment activities, the excavation area was backfilled and contoured to match pre-development conditions and will be reclaimed according to Series 1000 regulations.

Please contact me at (720) 501-5065 if you have any questions regarding this report or require additional information.

Sincerely,
Apex Companies, LLC

Maggie Graham

Maggie Graham
Senior Project Manager

Attachments:

Figure 1 – Lisa #1 Tank Battery - Facility Layout & Sample Locations
Table 1 – Soil Sample Analytical Results
Attachment A – Laboratory Analytical Report



Figure 1
Lisa #1 Tank
Battery - Facility
Layout & Sample
Locations

Legend

- Soil Sample (12/12/2018)
- Former Crude Oil Tank
- Former Produced Water Sump
- Former Secondary Containment
- Excavation Extent (12/12/2018)

Sample Location

- B: benzene
- T: toluene
- E: ethylbenzene
- X: xylenes
- TPH: total petroleum hydrocarbons

Site Characteristics

Legal Location: NESW, Sec 18, T2N R67W
County: Weld
Land Use: Non-cropland
Topography: 0-3% Slopes
Run-Off Risk: Very low
Soil Type: Vona loamy sand

REVISED	BY	COMMENT
12/19/2018	BJB	Figure 1



Apex Companies, LLC
beau.bergstrom@apexco.com
M:\Projects\Anadarko\DJ_Basin\Remediation\Lisa_1_Battery
Lisa_1_Battery_Fig1_dlg_20181219.mxd



For illustration purposes, spatial data in this diagram (e.g. sample points, excavation perimeter) is representative of field observations, and for illustration purposes may have been adjusted to align with aerial imagery and other pictured spatial data. Apex also collects spatial data using GPS units with real-time differential correction and sub-meter accuracy. Spatial data (e.g. ESRI shapefiles, Google Earth KMZ) provided separately from this diagram, may not be consistent with what is presented in this site diagram, due to adjustments made for illustrative purposes.

Table 1 - Soil Sample Analytical Results

Kerr-McGee Oil and Gas Onshore LP
 Location Name: Lisa #1
 Location ID: 318971
 County: Weld

			Organics (mg/kg)								
COGCC Allowable Concentration (Soil) -->			500			0.17	85	100	175	4	(6-9)
Sample ID:	Sample Date:	Sample Depth:	TPH-GRO (C6-C10) Low Fraction	TPH-DRO (C10-C28) High Fraction	TPH-RRO (C28-C40) High Fraction	Benzene	Toluene	Ethylbenzene	Xylenes - total	EC (<4 mmhos/cm or 2x background)	pH (unit)
E01@3'	12/12/18	3'	0.846	<25.0	<100	<0.002	0.008	0.002	0.023	0.0653	8.51
* B01@4'	12/12/18	4'	<0.200	<25.0	<100	<0.002	<0.002	<0.002	<0.002	0.0636	8.84

Notes:

TPH Total Petroleum Hydrocarbons
 GRO Gasoline Range Organics (C6-C10)
 DRO Diesel Range Organics (C10-C28)
 RRO Residual Range Organics (C28-C36)

bgs below ground surface
 mg/kg milligrams per kilogram
 mmhos/cm millimhos per centimeter
 NA Not analyzed/ Not applicable
 COGCC Colorado Oil and Gas Conservation Commission
 * Sample was collected below the designated root zone (>3' bgs)

Apex Companies, LLC
 1746 Cole Blvd., Suite 250
 Lakewood, CO 80401

Attachment A

Laboratory Analytical Report



December 13, 2018

Apex Companies, LLC

Maggie Graham

4150 Darley Avenue, Suite 1

Boulder CO 80305

Project Name - KMG - Lisa 1

Project Number - [none]

Attached are your analytical results for KMG - Lisa 1 received by Origins Laboratory, Inc. December 12, 2018. This project is associated with Origins project number Y812180-02.

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

Apex Companies, LLC

4150 Darley Avenue, Suite 1

Boulder CO 80305

Maggie Graham

Project Number: [none]

Project: KMG - Lisa 1

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
E01@3'	Y812180-02	Soil	December 12, 2018 15:19	12/12/2018 16:55
B01@4'	Y812180-05	Soil	December 12, 2018 15:29	12/12/2018 16:55



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.

Maggie Graham
Project Number: [none]
Project: KMG - Lisa 1

ORIGINS LABORATORY, INC		Y812180		www.originslaboratory.com
Client:	Apex Companies	Project Manager:	Maggie Graham	page 1 of 1
Address:	1746 Cole Blvd, Lakewood, CO 80401	Project Name:	Lisa L	
Telephone Number:	720-501-5065	Project Number:	WO# TBD Greg Hamilton	
Email Address:	Maggie.Graham@apexcos.com	Samples Collected By:	Ryan Finley	
		Bill to Anadarko		

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative					Matrix		Analysis					Sample Instructions		
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Alt Summa #	Other	GRTEX	DRO/RRO	EG, pH	HOLD SAR			
N01 @ 3	12/12/18	1516	1	X					X								Hold	1
E01 @ 3		1519	1												X	X		2
S01 @ 3		1523	1														Hold	3
W01 @ 3		1526	1														Hold	4
B01 @ 4		1529	1											X	X	X		5
B4G @ 6"	↓	1509	↓														Hold	6
C01	↓	1531	↓	↓						↓							Hold	7
																		8
																		9
																		10
Relinquished By: 	Date: 12/12/18	Time: 1655	Received By: 	Date: 12/12/18	Time: 1655	Turnaround Time: Same Day <input checked="" type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input type="checkbox"/> Standard <input checked="" type="checkbox"/>												
Relinquished By:	Date:	Time:	Received By:	Date:	Time:													

Date Results Needed **Next day, 7am**

17 a

10

1

Origins Laboratory, Inc.

Jeff Pellipini

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.

Apex Companies, LLC
4150 Darley Avenue, Suite 1
Boulder CO 80305

Maggie Graham
Project Number: [none]
Project: KMG - Lisa 1

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: 7812180

Client: Apex

Client Project ID: KMG - Lisa 1

Checklist Completed by: JG

Shipped Via: HD

Date/time completed: 12/12/2018

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

Airbill #: N/A

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

Cooler Number/Temperature: 1 12.9 °C / _____ °C / _____ °C (Describe) _____ °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"/>		<u>Same Day</u>
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.

Reviewed by (Project Manager)

12/12/18
Date/Time Reviewed

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.

Apex Companies, LLC
4150 Darley Avenue, Suite 1
Boulder CO 80305

Maggie Graham
Project Number: [none]
Project: KMG - Lisa 1

E01@3'

12/12/2018 3:19:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y812180-02 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	25.0	mg/kg	1	B8L1202	KDK	12/12/2018	12/12/2018	U
Residual Range Organics (C28-C40)	ND	100	"	"	"	KDK	"	"	U

Surrogate: o-Terphenyl 89.0 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	0.846	0.200	mg/kg	1	B8L1204	KDK	12/12/2018	12/12/2018	
Benzene	ND	0.002	"	"	"	KDK	"	"	U
Toluene	0.008	0.002	"	"	"	KDK	"	"	
Ethylbenzene	0.002	0.002	"	"	"	KDK	"	"	
Xylenes, total	0.023	0.002	"	"	"	KDK	"	"	

Surrogate: 1,2-Dichloroethane-d4 101 % 70-130 " " "
Surrogate: Toluene-d8 97.3 % 70-130 " " "
Surrogate: 4-Bromofluorobenzene 97.4 % 70-130 " " "

pH in Soil by EPA 9045D

pH	8.51		pH Units	1	B8L1206	OLAB	12/12/2018	12/12/2018	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.0653	0.00500	mmhos/cm	"	B8L1207	OLAB	"	"	
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Origins Laboratory, Inc.



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Apex Companies, LLC
4150 Darley Avenue, Suite 1
Boulder CO 80305

Maggie Graham
Project Number: [none]
Project: KMG - Lisa 1

B01@4'

12/12/2018 3:29:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y812180-05 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	25.0	mg/kg	1	B8L1202	KDK	12/12/2018	12/12/2018	U
Residual Range Organics (C28-C40)	ND	100	"	"	"	KDK	"	"	U

Surrogate: o-Terphenyl 82.0 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B8L1204	KDK	12/12/2018	12/12/2018	U
Benzene	ND	0.002	"	"	"	KDK	"	"	U
Toluene	ND	0.002	"	"	"	KDK	"	"	U
Ethylbenzene	ND	0.002	"	"	"	KDK	"	"	U
Xylenes, total	ND	0.002	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4 102 % 70-130 " " "
Surrogate: Toluene-d8 97.5 % 70-130 " " "
Surrogate: 4-Bromofluorobenzene 96.7 % 70-130 " " "

pH in Soil by EPA 9045D

pH	8.84	pH Units	1	B8L1206	OLAB	12/12/2018	12/12/2018
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.0636	0.00500	mmhos/cm	"	B8L1207	OLAB	"	"
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Origins Laboratory, Inc.



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Apex Companies, LLC
4150 Darley Avenue, Suite 1
Boulder CO 80305

Maggie Graham
Project Number: [none]
Project: KMG - Lisa 1

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 B8L1204 - EPA 5030 (soil)										
Blank (B8L1204-BLK1)					Prepared: 12/12/2018 Analyzed: 12/12/2018					
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	0.13		"	0.125		101	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		97.9	70-130			
Surrogate: 4-Bromofluorobenzene	0.12		"	0.125		95.4	70-130			

Origins Laboratory, Inc.



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Apex Companies, LLC
4150 Darley Avenue, Suite 1
Boulder CO 80305

Maggie Graham
Project Number: [none]
Project: KMG - Lisa 1

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 B8L1204 - EPA 5030 (soil)										
Blank (B8L1204-BLK2)					Prepared: 12/12/2018 Analyzed: 12/12/2018					
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	0.13		"	0.125		102	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		97.3	70-130			
Surrogate: 4-Bromofluorobenzene	0.12		"	0.125		94.7	70-130			

Origins Laboratory, Inc.



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Apex Companies, LLC
4150 Darley Avenue, Suite 1
Boulder CO 80305

Maggie Graham
Project Number: [none]
Project: KMG - Lisa 1

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 B8L1204 - EPA 5030 (soil)

LCS (B8L1204-BS1)

Prepared: 12/12/2018 Analyzed: 12/12/2018

Benzene	0.102	0.002	mg/kg	0.100		102	77.1-124			
Toluene	0.093	0.002	"	0.100		93.3	74.5-128			
Ethylbenzene	0.092	0.002	"	0.100		91.8	66.4-127			
m,p-Xylene	0.187	0.004	"	0.200		93.7	76.6-124			
o-Xylene	0.090	0.002	"	0.100		90.3	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	0.12		"	0.125		96.4	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		96.6	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		101	70-130			

Origins Laboratory, Inc.



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Apex Companies, LLC
4150 Darley Avenue, Suite 1
Boulder CO 80305

Maggie Graham
Project Number: [none]
Project: KMG - Lisa 1

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 B8L1204 - EPA 5030 (soil)

LCS (B8L1204-BS2)

Prepared: 12/12/2018 Analyzed: 12/12/2018

Benzene	0.112	0.002	mg/kg	0.100		112	77.1-124			
Toluene	0.102	0.002	"	0.100		102	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	0.098	0.002	"	0.100		98.2	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	0.12		"	0.125		96.3	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		97.3	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		101	70-130			

Origins Laboratory, Inc.



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Apex Companies, LLC
4150 Darley Avenue, Suite 1
Boulder CO 80305

Maggie Graham
Project Number: [none]
Project: KMG - Lisa 1

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 B8L1204 - EPA 5030 (soil)

Matrix Spike (B8L1204-MS1)		Source: Y812130-01			Prepared: 12/12/2018 Analyzed: 12/12/2018					
Benzene	0.112	0.002	mg/kg	0.100	ND	112	71.8-126			
Toluene	0.100	0.002	"	0.100	ND	100	65.1-130			
Ethylbenzene	0.098	0.002	"	0.100	ND	98.1	62.2-130			
m,p-Xylene	0.201	0.004	"	0.200	ND	101	46.5-137			
o-Xylene	0.095	0.002	"	0.100	ND	95.3	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	0.12		"	0.125		99.3	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		95.9	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		102	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.

Apex Companies, LLC
4150 Darley Avenue, Suite 1
Boulder CO 80305

Maggie Graham
Project Number: [none]
Project: KMG - Lisa 1

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 B8L1204 - EPA 5030 (soil)

Matrix Spike (B8L1204-MS2)		Source: Y812130-02			Prepared: 12/12/2018 Analyzed: 12/12/2018					
Benzene	0.104	0.002	mg/kg	0.100	ND	104	71.8-126			
Toluene	0.095	0.002	"	0.100	ND	94.8	65.1-130			
Ethylbenzene	0.093	0.002	"	0.100	ND	92.6	62.2-130			
m,p-Xylene	0.190	0.004	"	0.200	ND	95.2	46.5-137			
o-Xylene	0.091	0.002	"	0.100	ND	91.5	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	0.12		"	0.125		97.3	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		96.4	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		101	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.

Apex Companies, LLC
4150 Darley Avenue, Suite 1
Boulder CO 80305

Maggie Graham
Project Number: [none]
Project: KMG - Lisa 1

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 B8L1204 - EPA 5030 (soil)

Matrix Spike Dup (B8L1204-MSD1)		Source: Y812130-01			Prepared: 12/12/2018 Analyzed: 12/12/2018					
Benzene	0.112	0.002	mg/kg	0.100	ND	112	71.8-126	0.304	11.3	
Toluene	0.102	0.002	"	0.100	ND	102	65.1-130	1.43	15.4	
Ethylbenzene	0.101	0.002	"	0.100	ND	101	62.2-130	2.64	19.6	
m,p-Xylene	0.206	0.004	"	0.200	ND	103	46.5-137	2.45	19.2	
o-Xylene	0.098	0.002	"	0.100	ND	98.3	54.2-134	3.12	17.9	
Surrogate: 1,2-Dichloroethane-d4	0.12		"	0.125		98.7	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		97.2	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		102	70-130			

Origins Laboratory, Inc.



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Apex Companies, LLC
4150 Darley Avenue, Suite 1
Boulder CO 80305

Maggie Graham
Project Number: [none]
Project: KMG - Lisa 1

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 B8L1204 - EPA 5030 (soil)

Matrix Spike Dup (B8L1204-MSD2)		Source: Y812130-02			Prepared: 12/12/2018 Analyzed: 12/12/2018					
Benzene	0.107	0.002	mg/kg	0.100	ND	107	71.8-126	3.33	11.3	
Toluene	0.097	0.002	"	0.100	ND	97.5	65.1-130	2.75	15.4	
Ethylbenzene	0.096	0.002	"	0.100	ND	96.0	62.2-130	3.61	19.6	
m,p-Xylene	0.198	0.004	"	0.200	ND	99.0	46.5-137	3.99	19.2	
o-Xylene	0.094	0.002	"	0.100	ND	94.3	54.2-134	3.08	17.9	
Surrogate: 1,2-Dichloroethane-d4	0.12		"	0.125		99.6	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		95.9	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		101	70-130			

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4150 Darley Avenue, Suite 1
Boulder CO 80305

Maggie Graham
Project Number: [none]
Project: KMG - Lisa 1

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 B8L1202 - EPA 3580

Blank (B8L1202-BLK1)

Prepared: 12/12/2018 Analyzed: 12/12/2018

Diesel (C10-C28)	ND	50.0	mg/kg							U
Residual Range Organics (C28-C40)	ND	200	"							U
Surrogate: o-Terphenyl	47		"	50.0		93.2	59-131			

Blank (B8L1202-BLK2)

Prepared: 12/12/2018 Analyzed: 12/12/2018

Diesel (C10-C28)	ND	50.0	mg/kg							U
Residual Range Organics (C28-C40)	ND	200	"							U
Surrogate: o-Terphenyl	41		"	50.0		81.9	59-131			

LCS (B8L1202-BS1)

Prepared: 12/12/2018 Analyzed: 12/12/2018

Diesel (C10-C28)	946	50.0	mg/kg	1000		94.6	64-121			
Residual Range Organics (C28-C40)	899	200	"	1000		89.9	58-124			
Surrogate: o-Terphenyl	47		"	50.0		93.6	59-131			

Matrix Spike (B8L1202-MS1)

Source: Y812158-01

Prepared: 12/12/2018 Analyzed: 12/12/2018

Diesel (C10-C28)	1120	50.0	mg/kg	1000	214	90.9	53-125			
Residual Range Organics (C28-C40)	855	200	"	1000	5.34	85.0	47-133			
Surrogate: o-Terphenyl	45		"	50.0		89.9	59-131			

Matrix Spike Dup (B8L1202-MSD1)

Source: Y812158-01

Prepared: 12/12/2018 Analyzed: 12/12/2018

Diesel (C10-C28)	1250	50.0	mg/kg	1000	214	104	53-125	13.5	20	
Residual Range Organics (C28-C40)	889	200	"	1000	5.34	88.4	47-133	3.97	20	

Origins Laboratory, Inc.



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Apex Companies, LLC
4150 Darley Avenue, Suite 1
Boulder CO 80305

Maggie Graham
Project Number: [none]
Project: KMG - Lisa 1

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
Batch B8L1202 - EPA 3580										
Matrix Spike Dup (B8L1202-MSD1)		Source: Y812158-01			Prepared: 12/12/2018 Analyzed: 12/12/2018					
Surrogate: o-Terphenyl	45		mg/kg	50.0		91.0	59-131			

Origins Laboratory, Inc.



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Apex Companies, LLC
4150 Darley Avenue, Suite 1
Boulder CO 80305

Maggie Graham
Project Number: [none]
Project: KMG - Lisa 1

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 B8L1206 - NO PREP										
Duplicate (B8L1206-DUP1)		Source: Y812180-02			Prepared: 12/12/2018 Analyzed: 12/12/2018					
pH	8.51		pH Units		8.51			0.00	25	
Batch B8L1207 - NO PREP										
Blank (B8L1207-BLK1)		Prepared: 12/12/2018 Analyzed: 12/12/2018								
Specific Conductance (EC)	0.00320	0.00500	mmhos/cm							
Duplicate (B8L1207-DUP1)		Source: Y812180-02			Prepared: 12/12/2018 Analyzed: 12/12/2018					
Specific Conductance (EC)	0.0653	0.00500	mmhos/cm		0.0653			0.00	25	

Origins Laboratory, Inc.



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Apex Companies, LLC
4150 Darley Avenue, Suite 1
Boulder CO 80305

Maggie Graham
Project Number: [none]
Project: KMG - Lisa 1

Notes and Definitions

U Sample is Non-Detect.

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