

State of Colorado
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303) 894-2100 Fax 894-2109



FOR OGCC USE ONLY

SITE INVESTIGATION AND REMEDIATION WORKPLAN

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. Form 27 is intended to be used whenever possible. Additional documentation will be required when large volumes of soil and groundwater have been impacted or involve large facilities with multiple source areas. See Rule 910. Attach as many pages as needed to fully describe the proposed work.

OGCC Employee:

☐ Spill ☐ Complaint
☐ Inspection ☐ NOAV

Tracking No:

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

☐ Spill or Release ☐ Plug & Abandon ☐ Central Facility Closure ☒ Site/Facility Closure ☐ Other (describe)

GENERAL INFORMATION

OGCC Operator Number: 47120		Contact Name and Telephone	
Name of Operator: Kerr-McGee Oil and Gas Onshore LP		Name: Phillip Hamlin	
Address: P.O. Box 173779		No: (970) 336-3500	
City: Denver State: CO Zip: 80217-3779		Fax: (970) 336-3656	
API/Facility No: 318057		County: Weld	
Facility Name: Lorenz-63N66W/30SWSW		Facility Number:	
Well Name:		Well Number:	
Location (QtrQtr, Sec, Twp, Rng, Meridian): SWSW Sec 30-T3N-R66W		Latitude: 40.191804 Longitude: -104.824718	

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc.):		Oil, Produced Water, and Condensate	
Site Conditions: Is location within a sensitive area (according to Rule 901e)?		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N If yes, attach evaluation. Groundwater < 20 ft.	
Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.):		Rangeland	
Soil type, if not previously identified on Form 2A or Federal Surface Use Plan:		Fine to coarse grained sand, sandy clay, and clay.	
Potential receptors (water wells within 1/4 mi, surface waters, etc.):		Surface water and wetlands approximately 260' southwest, water well approximately 800' southeast, livestock approximately 20' west, building approximately 750' east, and excavation groundwater approximately 1' below ground surface (bgs).	
Description of Impact (if previously provided, refer to that form or document):			
Impacted Media (check):	Extent of Impact:	How Determined:	
<input checked="" type="checkbox"/> Soils	14' N-S x 44' E-W x 4' bgs (maximum extent)	Collected soil samples for laboratory analysis	
<input type="checkbox"/> Vegetation			
<input checked="" type="checkbox"/> Groundwater	See attached data	Collected groundwater samples for laboratory analysis	
<input type="checkbox"/> Surface water			

REMEDIAL WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):
During deconstruction activities at the Lorenz-63N66W/30SWSW tank battery, petroleum hydrocarbon impacted groundwater was encountered beneath the produced water sump. There were no indications that the dumphines or produced water sump were leaking. The volume of the release is unknown. The petroleum hydrocarbon impacted soil was excavated. Impacted groundwater was encountered in the excavation. A topographic Site Location Map depicting the general location of the release is provided as Figure 1.
Describe how source is to be removed:
Impacted soil was excavated into the phreatic zone to address potential hydrocarbon impacts that may have been present below the current water table due to past seasonal fluctuations. On November 25, 2015, four sidewall soil samples (N01@2.5', E01@2.5', S01@2.5', and W01@2.5') were collected from the excavation and submitted for laboratory analysis of total petroleum hydrocarbons (TPH) by United States Environmental Protection Agency (USEPA) Methods 8015C and 8260C, benzene, toluene, ethylbenzene, and total xylenes (BTEX) by USEPA Method 8260C, pH by USEPA Method 9045D, and specific conductivity (EC) by USEPA Method 9050D. Laboratory results indicated that the TPH concentration in soil sample W01@2.5' exceeded the COGCC Table 910-1 allowable level. An excavation groundwater sample (GW01) was collected for BTEX analysis. Laboratory analytical results for the GW01 groundwater sample indicated the benzene concentration exceeded the Colorado Groundwater Quality Standard (CGWQS) for benzene at a concentration of 96.8 micrograms per liter (µg/L).
On December 1, 2015, two additional excavation sidewall soil samples (N02@2.5' and S02@2.5') were collected following the removal of additional impacted soil. Laboratory analytical results indicated that TPH, BTEX, pH, and EC levels were in compliance with COGCC Table 910-1 allowable levels. Following the removal of additional impacted soil along the western sidewall of the excavation and the removal of approximately 180 barrels of impacted groundwater, the groundwater level in the excavation increased from 3 feet bgs to 1 foot bgs. On December 2, 2015, one additional excavation sidewall soil sample (W02@0.5') was collected at a depth of 0.5 feet bgs. Laboratory analytical results indicated that TPH, BTEX, pH, and EC levels were in compliance with COGCC Table 910-1 allowable levels at the excavation extent. A second groundwater sample (GW02) was collected from the excavation for BTEX analysis. Laboratory analytical results for sample GW02 indicated BTEX concentrations were in compliance with the CGWQS.
Approximately 220 cubic yards of impacted soil were excavated and transported to the Kerr-McGee Land Treatment Facility in Weld County, Colorado. Prior to backfilling, an additional 160 barrels of groundwater were removed from the excavation and transported to a licensed injection facility. In addition, 80 pounds of COGAC [®] , an activated carbon-based bioremediation product, was applied to the groundwater and clean backfill through a series of lifts to ensure distribution through the phreatic and smear zones. The general site layout, excavation dimensions, and soil and groundwater sample locations are depicted on the Excavation Site Map provided as Figure 2. The excavation soil and groundwater sample analytical results are summarized in Tables 1 and 2, respectively. The laboratory analytical reports are attached.
Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:
The impacted soil was transported to the Kerr-McGee Land Treatment Facility in Weld County, Colorado. The impacted groundwater was transported to a licensed injection facility for disposal.

State of Colorado
Oil and Gas Conservation Commission

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REMEDIAL WORKPLAN (CONT.)

OGCC Employee:

Tracking Number: _____
Name of Operator: _____
OGCC Operator No: _____
Received Date: _____
Well Name & No: _____
Facility Name & No.: _____

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):

Groundwater monitoring wells will be installed at the site to fully define the extent and magnitude of the release. The monitoring wells will be surveyed to determine the groundwater flow direction. Groundwater monitoring activities will be conducted and samples will be submitted for laboratory analysis of BTEX. BTEX concentrations in the final excavation groundwater sample (GW02) were in compliance with the CGWQS. If BTEX concentrations in the monitoring well groundwater samples are in compliance with the CGWQS during the initial sampling event, Kerr-McGee will request a No Further Action status for this site. If impacts to groundwater are detected, groundwater monitoring activities will continue on a quarterly basis.

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing. Use additional sheet for description if required.

The site was restored to its pre-release grade and the tank battery will be reconstructed.

Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing.

Is further site investigation required? ☒ Y ☐ N If yes, describe:

After installing the monitoring wells and establishing points of compliance, groundwater monitoring will be conducted.

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):

The impacted soil was transported to the Kerr-McGee Land Treatment Facility in Weld County, Colorado. The impacted groundwater was transported to a licensed injection facility for disposal.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: 11/25/2015	Date Site Investigation Completed: Active	Remediation Plan Submitted: _____
Remediation Start Date: 11/30/2015	Anticipated Completion Date: TBD	Actual Completion Date: _____

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct, and complete.

Print Name: Phillip Hamlin

Signed: Title: Senior HSE Representative Date: 2/8/16

OGCC Approved: _____ Title: _____ Date: _____

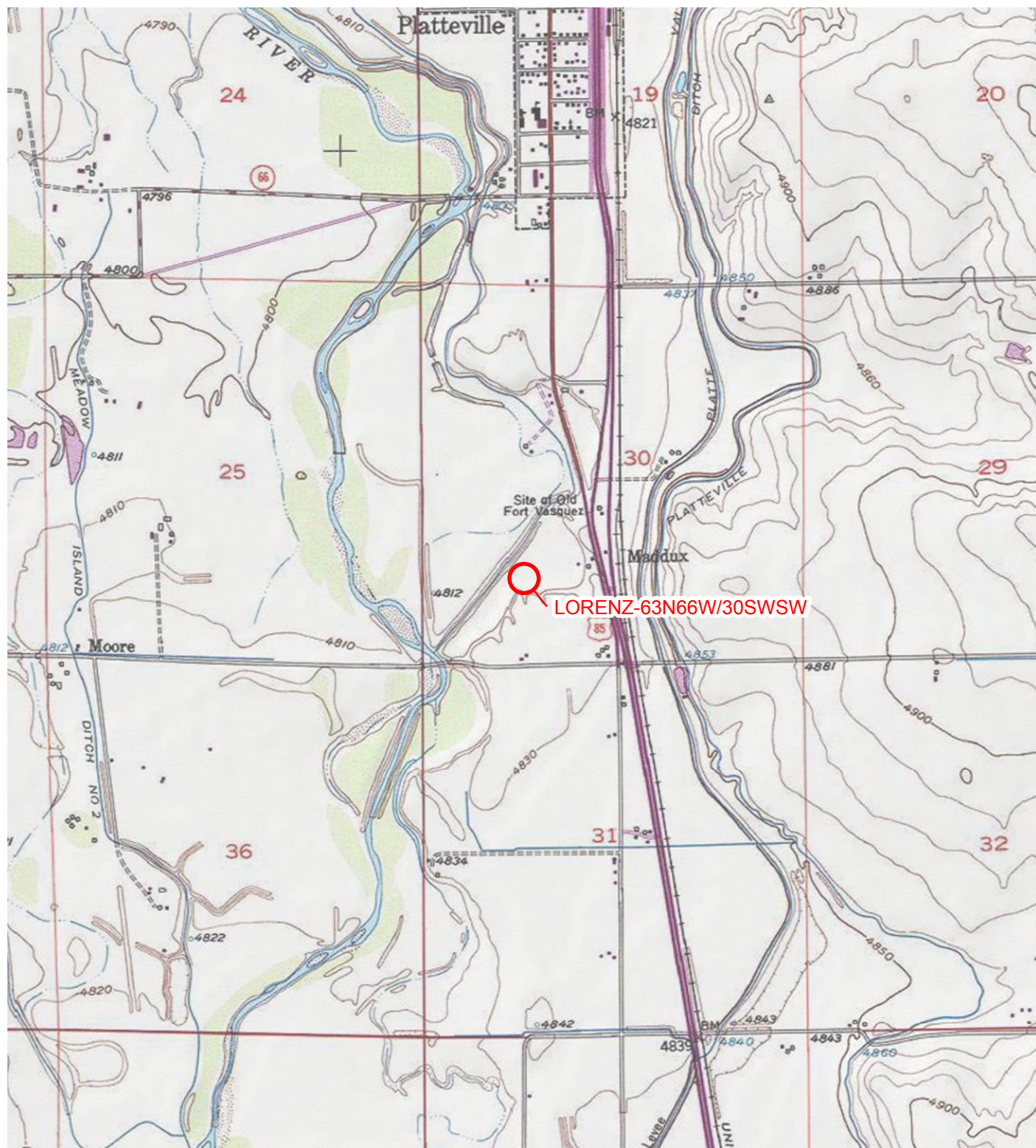


IMAGE COURTESY OF ESRI/USGS

LEGEND

○ SITE LOCATION

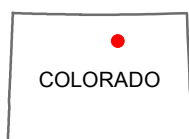
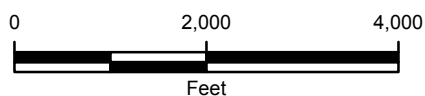


FIGURE 1
SITE LOCATION MAP
 LORENZ-63N66W/30SWSW
 SWSW SEC 30-T3N-R66W
 WELD COUNTY, COLORADO
 KERR-MCGEE OIL & GAS ONSHORE LP



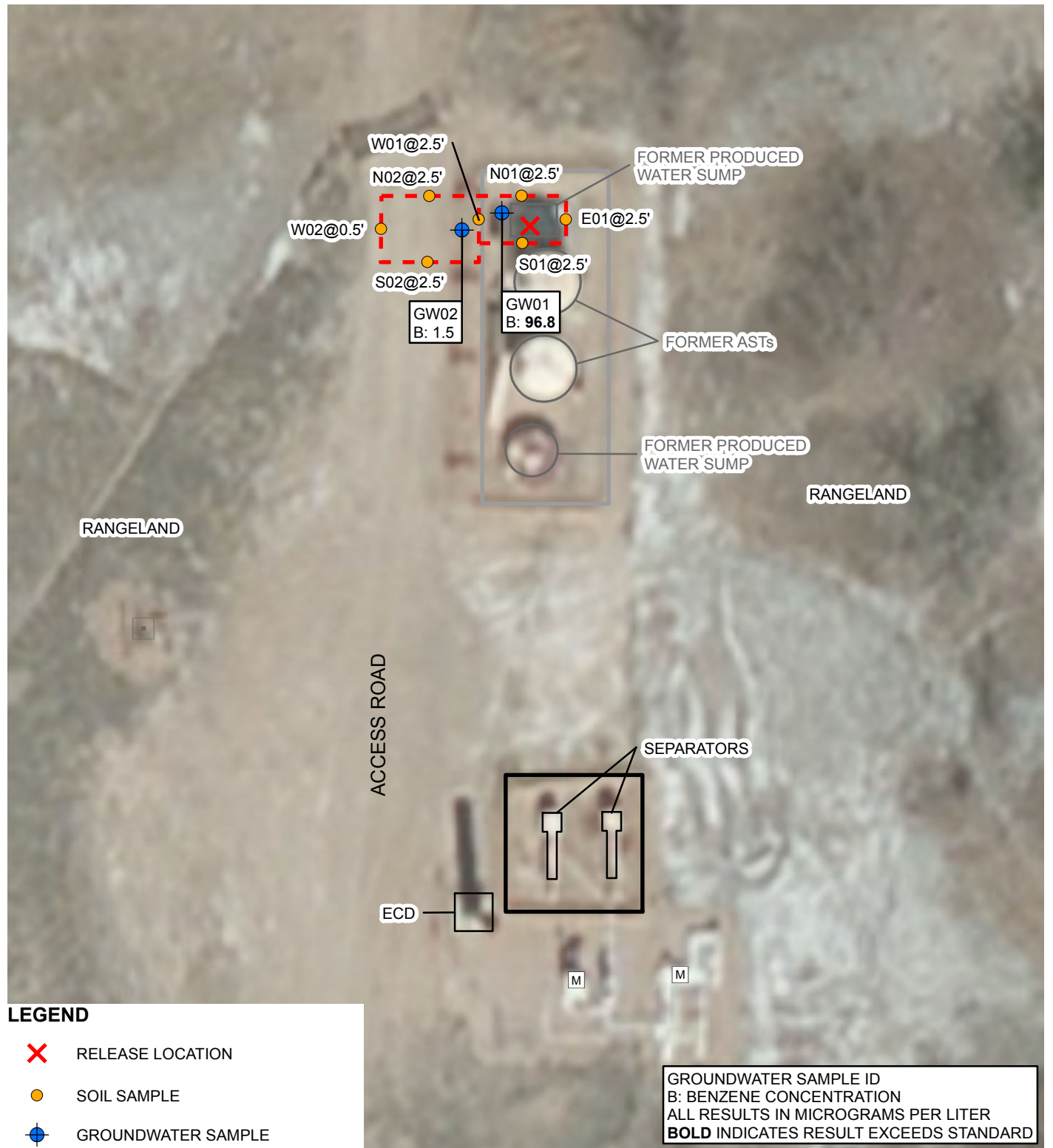


IMAGE COURTESY OF ESRI

LEGEND

- X RELEASE LOCATION
- SOIL SAMPLE
- ⊕ GROUNDWATER SAMPLE
- M METER HOUSE
- FORMER WELLHEAD
- EXCAVATION EXTENT
- BERM
- FORMER BERM

AST: ABOVEGROUND STORAGE TANK

ECD: EMISSION CONTROL DEVICE

GROUNDWATER SAMPLE ID
B: BENZENE CONCENTRATION
ALL RESULTS IN MICROGRAMS PER LITER
BOLD INDICATES RESULT EXCEEDS STANDARD

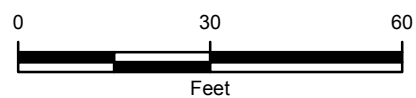


FIGURE 2
EXCAVATION SITE MAP
LORENZ-63N66W/30SW
SWSW SEC 30-T3N-R66W
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP



TABLE 1
SOIL SAMPLE ANALYTICAL RESULTS
LORENZ-63N66W/30SSW
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP

Soil Sample ID	Depth (bgs)	Date	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	DRO (mg/kg)	GRO (mg/kg)	ORO (mg/kg)	pH (su)	Specific Conductance (mmhos/cm)
E01 @ 2.5'	2.5'	11/25/2015	<0.002	<0.002	<0.002	<0.002	<50	<0.200	<200	8.14	0.0833
N01 @ 2.5'	2.5'	11/25/2015	<0.002	<0.002	0.002	<0.002	<50	3.06	<200	7.62	0.258
S01 @ 2.5'	2.5'	11/25/2015	<0.002	<0.002	<0.002	<0.002	<50	<0.200	<200	7.84	0.108
W01 @ 2.5'	2.5'	11/25/2015	<0.050	0.105	0.872	1.39	120	2130	<200	7.70	0.141
N02 @ 2.5'	2.5'	12/01/2015	0.002	<0.002	0.012	0.174	260	1.24	160	8.36	0.0893
S02 @ 2.5'	2.5'	12/01/2015	0.107	<0.050	0.874	<0.050	200	200	<100	7.79	0.131
W02 @ 0.5'	0.5'	12/02/2015	<0.002	<0.002	<0.002	<0.002	<25	<0.200	<100	8.03	0.489
COGCC Allowable Levels			0.17	85	100	175	500*	500*	500*	6-9	4

Notes: bgs - below ground surface
COGCC - Colorado Oil and Gas Conservation Commission
DRO - diesel range organics
GRO - gasoline range organics
mg/kg - milligrams per kilogram
mmhos/cm - millimhos per centimeter

NA - not analyzed/not available
ORO - oil range organics
su - standard units
* - Standard applies to combined DRO-GRO-ORO
< - less than laboratory reporting limit
Bold indicates result exceeds allowable level



TABLE 2
GROUNDWATER ANALYTICAL AND FIELD RESULTS
LORENZ-63N66W/30SSW
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP

Well Name	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth Water/ (Product Thickness) (ft bgs)
GW01	11/25/2015	96.8	282	22.2	244	3.00
GW02	12/02/2015	1.5	<1.0	8.3	49.0	1.00
CGWQS		5	1000	700	1400	

Notes: CGWQS - Colorado Groundwater Quality Standards
ft bgs - feet below ground surface
NA - not analyzed/not available
NM - not measured

µg/L - micrograms per liter
< - less than laboratory reporting limit
Bold indicates result exceeds allowable level
Excavation groundwater depth is approximate





November 30, 2015

LT Environmental, Inc.

John Cocroft

4600 West 60th Avenue

Arvada

CO 80003

Project Name - KMG - Lorenz #1

Project Number - 014215233

Attached are your analytical results for KMG - Lorenz #1 received by Origins Laboratory, Inc. November 25, 2015. This project is associated with Origins project number X511303-01.

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

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

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

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

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

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



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

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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #1

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
N01 @ 2.5'	X511303-01	Soil	November 25, 2015 12:30	11/25/2015 14:45
E01 @ 2.5'	X511303-02	Soil	November 25, 2015 12:35	11/25/2015 14:45
S01 @ 2.5'	X511303-03	Soil	November 25, 2015 12:40	11/25/2015 14:45
W01 @ 2.5'	X511303-04	Soil	November 25, 2015 12:45	11/25/2015 14:45
GW01	X511303-06	Water	November 25, 2015 12:55	11/25/2015 14:45

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #1

www.originslaboratory.com

page 1 of 1

ORIGINS
LABORATORY, INC

XS11303

Client: LTE
Address: 4600 W 60th Ave.
Telephone Number: (303) 433-9788
Email Address: TCocroft@ltenv.com

Project Manager: John Cocroft
Project Name: Lorenz #1
Project Number: 014215233
Samples Collected By: KS
Attn: Sam Lake

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis	Sample Instructions
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	As Summa Container #		
N01 @ 2.5'	11/25/15	1230	2	X				X			X X X X	Hold SAR
E01 @ 2.5'	1	1235	2	X				X			X X X X	
S01 @ 2.5'		1240	2	X				X			X X X X	
N01 @ 2.5'		1245	2	X				X			X X X X	Hold All
B401		1250	2	X				X				Run BTEX
G1201		1255	3	X				X				

Relinquished By: [Signature] Date: 11/25/2015 Time: 1400
Relinquished By: [Signature] Date: 11/25/15 Time: 1445

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

Date Results Needed 12/30/15 (0800)

11.1

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.

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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #1

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: XS1303

Client: LTE

Client Project ID: Lorenz #1

Checklist Completed by: Jeff Smith

Shipped Via: HTD
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 11/25/15

Airbill #: NA

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

Cooler Number/Temperature: 1 / 45 °C 1 / _____ °C 1 / _____ °C 1 / _____ °C

Thermometer ID: JW03

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 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.

Jeff Smith
Reviewed by (Project Manager)

11/25/15
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.

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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #1

N01 @ 2.5'
11/25/2015 12:30:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X511303-01 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50	mg/kg	1	B5K2506	11/25/2015	11/27/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

Surrogate: o-Terphenyl	90.0 %	59-131			"	"	"
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GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	3.06	0.200	mg/kg	1	B5K2507	11/25/2015	11/25/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	0.002	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	113 %	70-130			"	"	"
Surrogate: Toluene-d8	98.0 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	106 %	70-130			"	"	"

pH in Soil by EPA 9045D

pH	7.62		pH Units	1	B5K2504	11/25/2015	11/25/2015
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.258		mmhos/cm	"	B5K2505	11/25/2015	11/25/2015
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Origins Laboratory, Inc.



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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #1

E01 @ 2.5'
11/25/2015 12:35:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X511303-02 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50	mg/kg	1	B5K2506	11/25/2015	11/27/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

Surrogate: o-Terphenyl	84.7 %	59-131			"	"	"
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GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B5K2507	11/25/2015	11/25/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	109 %	70-130			"	"	"
Surrogate: Toluene-d8	92.4 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	105 %	70-130			"	"	"

pH in Soil by EPA 9045D

pH	8.14		pH Units	1	B5K2504	11/25/2015	11/25/2015
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.0833		mmhos/cm	"	B5K2505	11/25/2015	11/25/2015
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Origins Laboratory, Inc.



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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #1

S01 @ 2.5'
11/25/2015 12:40:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X511303-03 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50	mg/kg	1	B5K2506	11/25/2015	11/27/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

Surrogate: o-Terphenyl	75.5 %	59-131			"	"	"
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GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B5K2507	11/25/2015	11/25/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	114 %	70-130			"	"	"
Surrogate: Toluene-d8	91.3 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	106 %	70-130			"	"	"

pH in Soil by EPA 9045D

pH	7.84		pH Units	1	B5K2504	11/25/2015	11/25/2015
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.108		mmhos/cm	"	B5K2505	11/25/2015	11/25/2015
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Origins Laboratory, Inc.



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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #1

W01 @ 2.5'
11/25/2015 12:45:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X511303-04 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	120	50	mg/kg	1	B5K2506	11/25/2015	11/27/2015
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

Surrogate: o-Terphenyl	65.9 %	59-131			"	"	"
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GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	2130	50.0	mg/kg	250	B5K2507	11/25/2015	11/29/2015
Benzene	ND	0.050	"	25	"	"	11/25/2015
Toluene	0.105	0.050	"	"	"	"	"
Ethylbenzene	0.872	0.050	"	"	"	"	"
Xylenes, total	1.39	0.050	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	114 %	70-130			"	"	11/29/2015
Surrogate: Toluene-d8	128 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	113 %	70-130			"	"	"

pH in Soil by EPA 9045D

pH	7.70		pH Units	1	B5K2504	11/25/2015	11/25/2015
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.141		mmhos/cm	"	B5K2505	11/25/2015	11/25/2015
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Origins Laboratory, Inc.



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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #1

GW01

11/25/2015 12:55:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X511303-06 (Water)

BTEX by EPA 8260C

Benzene	96.8	5.0	ug/L	5	B5K2502	11/25/2015	11/25/2015
Toluene	282	5.0	"	"	"	"	"
Ethylbenzene	22.2	5.0	"	"	"	"	"
Xylenes, total	244	5.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	113 %	84-121			"	"	"
Surrogate: Toluene-d8	103 %	85-115			"	"	"
Surrogate: 4-Bromofluorobenzene	100 %	84-114			"	"	"

Origins Laboratory, Inc.



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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #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 B5K2502 - EPA 5030B (Water)

Blank (B5K2502-BLK1)

Prepared: 11/25/2015 Analyzed: 11/25/2015

Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	71		"	62.5	114		84-121			
Surrogate: Toluene-d8	63		"	62.5	100		85-115			
Surrogate: 4-Bromofluorobenzene	62		"	62.5	98.8		84-114			

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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #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 B5K2502 - EPA 5030B (Water)

LCS (B5K2502-BS1)

Prepared: 11/25/2015 Analyzed: 11/25/2015

Benzene	50.7	1.0	ug/L	50.0	101	75-126
Toluene	50.1	1.0	"	50.0	100	78.7-126
Ethylbenzene	51.8	1.0	"	50.0	104	80-130
m,p-Xylene	106	2.0	"	100	106	77.2-133
o-Xylene	53.4	1.0	"	50.0	107	77.9-126
Surrogate: 1,2-Dichloroethane-d4	66		"	62.5	105	84-121
Surrogate: Toluene-d8	64		"	62.5	102	85-115
Surrogate: 4-Bromofluorobenzene	63		"	62.5	101	84-114

Origins Laboratory, Inc.



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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #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 B5K2502 - EPA 5030B (Water)

Matrix Spike (B5K2502-MS1)		Source: X511239-01			Prepared: 11/25/2015 Analyzed: 11/25/2015					
Benzene	52.4	1.0	ug/L	50.0	ND	105	74-130			
Toluene	50.9	1.0	"	50.0	ND	102	73-131			
Ethylbenzene	52.5	1.0	"	50.0	ND	105	76-132			
m,p-Xylene	109	2.0	"	100	ND	109	69-139			
o-Xylene	55.7	1.0	"	50.0	ND	111	74-131			
Surrogate: 1,2-Dichloroethane-d4	68		"	62.5		108	84-121			
Surrogate: Toluene-d8	63		"	62.5		100	85-115			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		99.1	84-114			

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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #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 B5K2502 - EPA 5030B (Water)

Matrix Spike Dup (B5K2502-MSD1)		Source: X511239-01			Prepared: 11/25/2015 Analyzed: 11/25/2015					
Benzene	48.4	1.0	ug/L	50.0	ND	96.8	74-130	7.88	20	
Toluene	47.4	1.0	"	50.0	ND	94.9	73-131	6.98	20	
Ethylbenzene	49.5	1.0	"	50.0	ND	99.0	76-132	5.98	20	
m,p-Xylene	101	2.0	"	100	ND	101	69-139	7.53	20	
o-Xylene	50.8	1.0	"	50.0	ND	102	74-131	9.19	20	
Surrogate: 1,2-Dichloroethane-d4	65		"	62.5		104	84-121			
Surrogate: Toluene-d8	63		"	62.5		101	85-115			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		98.3	84-114			

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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #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 B5K2507 - EPA 5030 (soil)										
Blank (B5K2507-BLK1)					Prepared: 11/25/2015 Analyzed: 11/25/2015					
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	68.5		ug/kg	62.5		110	70-130			
Surrogate: Toluene-d8	57.6		"	62.5		92.2	70-130			
Surrogate: 4-Bromofluorobenzene	64.5		"	62.5		103	70-130			

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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #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 B5K2507 - EPA 5030 (soil)										
LCS (B5K2507-BS1)					Prepared: 11/25/2015 Analyzed: 11/25/2015					
Benzene	0.105	0.002	mg/kg	0.100		105	77.1-124			
Toluene	0.089	0.002	"	0.100		88.7	74.5-128			
Ethylbenzene	0.096	0.002	"	0.100		95.7	66.4-127			
m,p-Xylene	0.197	0.004	"	0.200		98.7	76.6-124			
o-Xylene	0.095	0.002	"	0.100		95.3	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	66.7		ug/kg	62.5		107	70-130			
Surrogate: Toluene-d8	57.5		"	62.5		92.0	70-130			
Surrogate: 4-Bromofluorobenzene	63.3		"	62.5		101	70-130			

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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #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 B5K2507 - EPA 5030 (soil)

Matrix Spike (B5K2507-MS1)		Source: X511301-01			Prepared: 11/25/2015 Analyzed: 11/25/2015					
Benzene	0.101	0.002	mg/kg	0.100	0.004	96.8	71.8-126			
Toluene	0.091	0.002	"	0.100	ND	90.9	65.1-130			
Ethylbenzene	0.093	0.002	"	0.100	ND	92.8	62.2-130			
m,p-Xylene	0.193	0.004	"	0.200	ND	96.5	46.5-137			
o-Xylene	0.092	0.002	"	0.100	ND	91.7	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	66.4		ug/kg	62.5		106	70-130			
Surrogate: Toluene-d8	57.5		"	62.5		92.0	70-130			
Surrogate: 4-Bromofluorobenzene	63.2		"	62.5		101	70-130			

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LT Environmental, Inc.
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Arvada CO 80003

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #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 B5K2507 - EPA 5030 (soil)

Matrix Spike Dup (B5K2507-MSD1)		Source: X511301-01			Prepared: 11/25/2015 Analyzed: 11/25/2015					
Benzene	0.101	0.002	mg/kg	0.100	0.004	96.8	71.8-126	0.00	11.3	
Toluene	0.089	0.002	"	0.100	ND	89.0	65.1-130	2.13	15.4	
Ethylbenzene	0.092	0.002	"	0.100	ND	91.6	62.2-130	1.32	19.6	
m,p-Xylene	0.193	0.004	"	0.200	ND	96.3	46.5-137	0.218	19.2	
o-Xylene	0.091	0.002	"	0.100	ND	90.7	54.2-134	1.14	17.9	
Surrogate: 1,2-Dichloroethane-d4	67.2		ug/kg	62.5		108	70-130			
Surrogate: Toluene-d8	57.3		"	62.5		91.7	70-130			
Surrogate: 4-Bromofluorobenzene	63.7		"	62.5		102	70-130			

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4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #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 B5K2506 - EPA 3580

Blank (B5K2506-BLK1)

Prepared: 11/25/2015 Analyzed: 11/25/2015

Diesel (C10-C28)	ND	50	mg/kg							
Residual Range Organics (C28-C36)	ND	200	"							
Surrogate: o-Terphenyl	42		"	50.0		84.6	59-131			

LCS (B5K2506-BS1)

Prepared: 11/25/2015 Analyzed: 11/25/2015

Diesel (C10-C28)	690	50	mg/kg				64-121			
Residual Range Organics (C28-C36)	750	200	"	1000		75.4	58-124			
Surrogate: o-Terphenyl	41		"	50.0		82.4	59-131			

Matrix Spike (B5K2506-MS1)

Source: X511301-01

Prepared: 11/25/2015 Analyzed: 11/25/2015

Diesel (C10-C28)	1100	50	mg/kg		ND		53-125			
Residual Range Organics (C28-C36)	1200	200	"	1000	18	114	47-133			
Surrogate: o-Terphenyl	52		"	50.0		104	59-131			

Matrix Spike Dup (B5K2506-MSD1)

Source: X511301-01

Prepared: 11/25/2015 Analyzed: 11/25/2015

Diesel (C10-C28)	690	50	mg/kg		ND		53-125	41.5	20	QM-07
Residual Range Organics (C28-C36)	730	200	"	1000	18	71.4	47-133	45.2	20	QM-07
Surrogate: o-Terphenyl	41		"	50.0		81.9	59-131			

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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #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 B5K2504 - NO PREP										
Duplicate (B5K2504-DUP1)		Source: X511301-01			Prepared: 11/25/2015 Analyzed: 11/25/2015					
pH	7.26		pH Units		7.53			3.65	25	
Batch B5K2505 - NO PREP										
Blank (B5K2505-BLK1)		Prepared: 11/25/2015 Analyzed: 11/25/2015								
Specific Conductance (EC)	0.00360		mmhos/cm							
Duplicate (B5K2505-DUP1)		Source: X511301-01			Prepared: 11/25/2015 Analyzed: 11/25/2015					
Specific Conductance (EC)	0.0858		mmhos/cm		0.0909			5.77	25	

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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #1

Notes and Definitions

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

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President



December 02, 2015

LT Environmental, Inc.

John Cocroft

4600 West 60th Avenue

Arvada

CO 80003

Project Name - KMG - Lorenz #1

Project Number - 014215233

Attached are your analytical results for KMG - Lorenz #1 received by Origins Laboratory, Inc. December 01, 2015. This project is associated with Origins project number X512013-01.

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

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

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

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

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

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



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

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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #1

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
N02 @ 2.5'	X512013-01	Soil	December 1, 2015 14:45	12/01/2015 16:58
S02 @ 2.5'	X512013-02	Soil	December 1, 2015 14:55	12/01/2015 16:58

Origins Laboratory, Inc.



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John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #1

ORIGINS

LABORATORY, INC

XS12015

www.originslaboratory.com

Client:

LTE

Address:

4600 W 60th Ave., Arvada, CO

Telephone Number:

(303)433-9788

Email Address:

KS_Jccocroft@trem.com

Project Manager:

John Cocroft

Project Name:

Lot 124 #1

Project Number:

014215233

Samples Collected By:

KS

Invoice to Phil Hamilton

page 1 of 1

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis	Sample Instructions		
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Air Summa #			Other	
N0202.5-1	12/1/15	14:45	2	X					X	X	X	X	Hold SAR	1
S0202.5-1	12/1/15	14:55	2	X					X	X	X	X	Hold SAR	2
														3
														4
														5
														6
														7
														8
														9
														10
Relinquished By:	Date:	Time:	Received By:	Date:	Time:	Turnaround Time:								
	12/1/15	16:15	John Cocroft	12-1-15	16:15	Same Day <input checked="" type="checkbox"/> 24 Hr <input type="checkbox"/>								
Relinquished By:	Date:	Time:	Received By:	Date:	Time:	Standard <input checked="" type="checkbox"/> KS								
	12-1-15	16:58	Phil Hamilton	12/1/15	16:58	48 Hr <input type="checkbox"/> 72 Hr <input type="checkbox"/>								

Date Results Needed 12/2/15 0800

27

Origins Laboratory, Inc.

Jeff Pellipini

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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #1

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: XS12013

Client: LTE

Client Project ID: Lorenz #1

Checklist Completed by: Jeff Smith

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

Date/time completed: 12/1/15

Airbill #: NA

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

Cooler Number/Temperature: 1 / 27 °C 1 °C 1 °C 1 °C

Thermometer ID: 1005

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 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 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, 2NaAs+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 12/1/15

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.

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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #1

N02 @ 2.5'
12/1/2015 2:45:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X512013-01 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	260	25	mg/kg	1	B5L0102	12/01/2015	12/01/2015
Residual Range Organics (C28-C36)	160	100	"	"	"	"	"

Surrogate: o-Terphenyl	75.9 %	59-131			"	"	"
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GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	1.24	0.200	mg/kg	1	B5L0106	12/01/2015	12/01/2015
Benzene	0.002	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	0.012	0.002	"	"	"	"	"
Xylenes, total	0.174	0.002	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	89.6 %	70-130			"	"	"
Surrogate: Toluene-d8	103 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	93.7 %	70-130			"	"	"

pH in Soil by EPA 9045D

pH	8.36		pH Units	1	B5L0107	12/01/2015	12/01/2015
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.0893		mmhos/cm	"	B5L0108	"	12/01/2015
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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.

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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #1

S02 @ 2.5'
12/1/2015 2:55:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X512013-02 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	200	25	mg/kg	1	B5L0102	12/01/2015	12/01/2015
Residual Range Organics (C28-C36)	ND	100	"	"	"	"	"

Surrogate: o-Terphenyl	77.8 %	59-131			"	"	"
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GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	200	5.00	mg/kg	25	B5L0106	12/01/2015	12/01/2015
Benzene	0.107	0.050	"	"	"	"	"
Toluene	ND	0.050	"	"	"	"	"
Ethylbenzene	0.874	0.050	"	"	"	"	"
Xylenes, total	ND	0.050	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	83.6 %	70-130			"	"	"
Surrogate: Toluene-d8	118 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	109 %	70-130			"	"	"

pH in Soil by EPA 9045D

pH	7.79		pH Units	1	B5L0107	12/01/2015	12/01/2015
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.131		mmhos/cm	"	B5L0108	"	12/01/2015
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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.

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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #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 B5L0106 - EPA 5030 (soil)

Blank (B5L0106-BLK1)

Prepared: 12/01/2015 Analyzed: 12/01/2015

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	56.9		ug/kg	62.5		91.0	70-130			
Surrogate: Toluene-d8	64.0		"	62.5		102	70-130			
Surrogate: 4-Bromofluorobenzene	59.9		"	62.5		95.8	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.

Jen Pellegrini For Noelle Doyle Mathis, President

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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #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 B5L0106 - EPA 5030 (soil)										
LCS (B5L0106-BS1)					Prepared: 12/01/2015 Analyzed: 12/01/2015					
Benzene	0.096	0.002	mg/kg	0.100		95.5	77.1-124			
Toluene	0.095	0.002	"	0.100		95.1	74.5-128			
Ethylbenzene	0.082	0.002	"	0.100		82.0	66.4-127			
m,p-Xylene	0.165	0.004	"	0.200		82.4	76.6-124			
o-Xylene	0.083	0.002	"	0.100		83.4	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	57.1		ug/kg	62.5		91.4	70-130			
Surrogate: Toluene-d8	64.7		"	62.5		104	70-130			
Surrogate: 4-Bromofluorobenzene	61.4		"	62.5		98.3	70-130			

Origins Laboratory, Inc.



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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #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 B5L0106 - EPA 5030 (soil)										
Matrix Spike (B5L0106-MS1)		Source: X512013-01			Prepared: 12/01/2015 Analyzed: 12/01/2015					
Benzene	0.099	0.002	mg/kg	0.100	0.002	97.8	71.8-126			
Toluene	0.092	0.002	"	0.100	ND	91.8	65.1-130			
Ethylbenzene	0.111	0.002	"	0.100	0.012	99.2	62.2-130			
m,p-Xylene	0.477	0.004	"	0.200	0.174	151	46.5-137			QM-07, QR-02
o-Xylene	0.081	0.002	"	0.100	ND	81.1	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	59.4		ug/kg	62.5		95.0	70-130			
Surrogate: Toluene-d8	64.6		"	62.5		103	70-130			
Surrogate: 4-Bromofluorobenzene	60.1		"	62.5		96.1	70-130			

Origins Laboratory, Inc.



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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #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 B5L0106 - EPA 5030 (soil)										
Matrix Spike Dup (B5L0106-MSD1)										
					Source: X512013-01					
										Prepared: 12/01/2015 Analyzed: 12/01/2015
Benzene	0.104	0.002	mg/kg	0.100	0.002	102	71.8-126	4.50	11.3	
Toluene	0.101	0.002	"	0.100	ND	101	65.1-130	9.98	15.4	
Ethylbenzene	0.107	0.002	"	0.100	0.012	94.9	62.2-130	3.91	19.6	
m,p-Xylene	0.390	0.004	"	0.200	0.174	108	46.5-137	20.1	19.2	QR-02, QR-03
o-Xylene	0.088	0.002	"	0.100	ND	88.0	54.2-134	8.14	17.9	
Surrogate: 1,2-Dichloroethane-d4	54.0		ug/kg	62.5		86.4	70-130			
Surrogate: Toluene-d8	65.1		"	62.5		104	70-130			
Surrogate: 4-Bromofluorobenzene	58.3		"	62.5		93.3	70-130			

Origins Laboratory, Inc.



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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #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 B5L0102 - EPA 3580

Blank (B5L0102-BLK1)

Prepared: 12/01/2015 Analyzed: 12/01/2015

Diesel (C10-C28) ND 50 mg/kg

Residual Range Organics (C28-C36) ND 200 "

Surrogate: o-Terphenyl 77 " 50.0 155 59-131

LCS (B5L0102-BS1)

Prepared: 12/01/2015 Analyzed: 12/01/2015

Diesel (C10-C28) 890 50 mg/kg 1000 88.6 64-121

Residual Range Organics (C28-C36) 890 200 " 1000 89.5 58-124

Surrogate: o-Terphenyl 48 " 50.0 96.4 59-131

Matrix Spike (B5L0102-MS1)

Source: X512005-01

Prepared: 12/01/2015 Analyzed: 12/01/2015

Diesel (C10-C28) 870 50 mg/kg 1000 ND 87.0 53-125

Residual Range Organics (C28-C36) 940 200 " 1000 26 91.7 47-133

Surrogate: o-Terphenyl 51 " 50.0 101 59-131

Matrix Spike Dup (B5L0102-MSD1)

Source: X512005-01

Prepared: 12/01/2015 Analyzed: 12/01/2015

Diesel (C10-C28) 880 50 mg/kg 1000 ND 87.9 53-125 1.07 20

Residual Range Organics (C28-C36) 930 200 " 1000 26 90.1 47-133 1.76 20

Surrogate: o-Terphenyl 50 " 50.0 101 59-131

Origins Laboratory, Inc.



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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #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 B5L0107 - NO PREP										
Duplicate (B5L0107-DUP1)		Source: X512013-01			Prepared: 12/01/2015 Analyzed: 12/01/2015					
pH	8.38		pH Units		8.36			0.239	25	
Batch B5L0108 - NO PREP										
Blank (B5L0108-BLK1)		Prepared: 12/01/2015 Analyzed: 12/01/2015								
Specific Conductance (EC)	0.00290		mmhos/cm							
Duplicate (B5L0108-DUP1)		Source: X512013-01			Prepared: 12/01/2015 Analyzed: 12/01/2015					
Specific Conductance (EC)	0.0783		mmhos/cm		0.0893			13.1	25	

Origins Laboratory, Inc.



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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #1

Notes and Definitions

- 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.



December 03, 2015

LT Environmental, Inc.

John Cocroft

4600 West 60th Avenue

Arvada

CO 80003

Project Name - KMG - Lorenz #1

Project Number - 014215233

Attached are your analytical results for KMG - Lorenz #1 received by Origins Laboratory, Inc. December 02, 2015. This project is associated with Origins project number X512026-01.

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

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

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

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

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

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



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

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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #1

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
W02 @ 0.5'	X512026-01	Soil	December 2, 2015 10:45	12/02/2015 16:35
GW02	X512026-02	Water	December 2, 2015 15:30	12/02/2015 16:35

Mike changed the sample ID on -01 from W01 @ 0.5' to W02 @ 0.5' on 12/3/15.

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #1

www.originslaboratory.com
page 1 of 1

ORIGINS
LABORATORY, INC

Client: LT
Address: 4600 W 60th Ave
Arvada CO 80003
Telephone Number: 303-433-9788
Email Address: JOCCROFT@GTEMAIL.COM

Project Manager: John Cocroft
Project Name: LORENZ #1
Project Number: 014215233
Samples Collected By: RZ
Art Samalava Walt: TDD

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix				Analysis				Sample Instructions
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Air	Other	TPH	PH	EC	BTEX	
W01@05'	12/2/15	1045	2	X					X			X	X	X		400 SMC
Gw02	12/2/15	1530	3	X				X							X	
Relinquished By: <u>[Signature]</u>	Date: <u>12/2/15</u>	Time: <u>1600</u>	Received By: <u>[Signature]</u>	Date: <u>12/2/15</u>	Time: <u>1500</u>											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: <u>[Signature]</u>	Date: <u>12-2-15</u>	Time: <u>1535</u>	Received By: <u>[Signature]</u>	Date: <u>12/2/15</u>	Time: <u>1635</u>											

Date Results Needed: Thursday 8am
Temp Received: 15

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.

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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #1

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: XS12026

Client: LTE

Client Project ID: Lorenz #1

Checklist Completed by: Jeff Smith

Shipped Via: HTD

Date/time completed: 12/2/15

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

Airbill #: NA

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

Cooler Number/Temperature: 1 / 1.5 °C 1 / _____ °C 1 / _____ °C 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"/>			
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.

Jeff Smith
Reviewed by (Project Manager)

12/2/15
Date/Time Reviewed

Origins Laboratory, Inc.

Jeff 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.

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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #1

W02 @ 0.5'

12/2/2015 10:45:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X512026-01 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	25	mg/kg	1	B5L0205	12/02/2015	12/02/2015
Residual Range Organics (C28-C36)	ND	100	"	"	"	"	"

Surrogate: o-Terphenyl	89.6 %	59-131			"	"	"
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GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B5L0204	12/02/2015	12/02/2015
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	112 %	70-130			"	"	"
Surrogate: Toluene-d8	88.9 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	104 %	70-130			"	"	"

pH in Soil by EPA 9045D

pH	8.03		pH Units	1	B5L0208	12/02/2015	12/02/2015
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.489		mmhos/cm	"	B5L0209	12/02/2015	12/02/2015
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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.

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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #1

GW02
12/2/2015 3:30:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X512026-02 (Water)

BTEX by EPA 8260C

Benzene	1.5	1.0	ug/L	1	B5L0105	12/02/2015	12/02/2015
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	8.3	1.0	"	"	"	"	"
Xylenes, total	49.0	1.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	108 %	87.4-110			"	"	"
Surrogate: Toluene-d8	108 %	83.7-117			"	"	"
Surrogate: 4-Bromofluorobenzene	106 %	84.1-109			"	"	"

Origins Laboratory, Inc.



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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #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 B5L0105 - EPA 5030B (Water)

Blank (B5L0105-BLK1)

Prepared: 12/01/2015 Analyzed: 12/02/2015

Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	55		"	62.5	88.4	84-121				
Surrogate: Toluene-d8	61		"	62.5	98.4	85-115				
Surrogate: 4-Bromofluorobenzene	65		"	62.5	104	84-114				

Origins Laboratory, Inc.



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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #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 B5L0105 - EPA 5030B (Water)

Blank (B5L0105-BLK2)

Prepared: 12/01/2015 Analyzed: 12/02/2015

Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	70		"	62.5	111		84-121			
Surrogate: Toluene-d8	63		"	62.5	100		85-115			
Surrogate: 4-Bromofluorobenzene	65		"	62.5	104		84-114			

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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #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 B5L0105 - EPA 5030B (Water)

LCS (B5L0105-BS1)

Prepared: 12/01/2015 Analyzed: 12/02/2015

Benzene	47.1	1.0	ug/L	50.0	94.2	75-126
Toluene	48.5	1.0	"	50.0	97.1	78.7-126
Ethylbenzene	47.7	1.0	"	50.0	95.3	80-130
m,p-Xylene	93.5	2.0	"	100	93.5	77.2-133
o-Xylene	46.6	1.0	"	50.0	93.2	77.9-126
Surrogate: 1,2-Dichloroethane-d4	54		"	62.5	86.4	84-121
Surrogate: Toluene-d8	61		"	62.5	98.1	85-115
Surrogate: 4-Bromofluorobenzene	65		"	62.5	104	84-114

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B5L0105 - EPA 5030B (Water)

LCS (B5L0105-BS2)

Prepared: 12/01/2015 Analyzed: 12/02/2015

Benzene	55.5	1.0	ug/L	50.0	111	75-126
Toluene	54.8	1.0	"	50.0	110	78.7-126
Ethylbenzene	56.3	1.0	"	50.0	113	80-130
m,p-Xylene	115	2.0	"	100	115	77.2-133
o-Xylene	57.9	1.0	"	50.0	116	77.9-126
Surrogate: 1,2-Dichloroethane-d4	65		"	62.5	104	84-121
Surrogate: Toluene-d8	63		"	62.5	101	85-115
Surrogate: 4-Bromofluorobenzene	62		"	62.5	99.1	84-114

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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 B5L0105 - EPA 5030B (Water)

Matrix Spike (B5L0105-MS1)		Source: X512001-01			Prepared: 12/01/2015 Analyzed: 12/02/2015					
Benzene	57.0	1.0	ug/L	50.0	ND	114	74-130			
Toluene	57.7	1.0	"	50.0	ND	115	73-131			
Ethylbenzene	55.5	1.0	"	50.0	ND	111	76-132			
m,p-Xylene	110	2.0	"	100	ND	110	69-139			
o-Xylene	55.2	1.0	"	50.0	ND	110	74-131			
Surrogate: 1,2-Dichloroethane-d4	54		"	62.5		86.3	84-121			
Surrogate: Toluene-d8	63		"	62.5		100	85-115			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		101	84-114			

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Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B5L0105 - EPA 5030B (Water)

Matrix Spike (B5L0105-MS2)		Source: X512001-02			Prepared: 12/01/2015 Analyzed: 12/02/2015					
Benzene	54.6	1.0	ug/L	50.0	1.2	107	74-130			
Toluene	54.8	1.0	"	50.0	4.4	101	73-131			
Ethylbenzene	115	1.0	"	50.0	63.1	104	76-132			
m,p-Xylene	584	2.0	"	100	471	113	69-139			
o-Xylene	72.9	1.0	"	50.0	22.9	100	74-131			
Surrogate: 1,2-Dichloroethane-d4	66		"	62.5		106	84-121			
Surrogate: Toluene-d8	65		"	62.5		104	85-115			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		101	84-114			

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Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B5L0105 - EPA 5030B (Water)										
Matrix Spike Dup (B5L0105-MSD1)	Source: X512001-01				Prepared: 12/01/2015 Analyzed: 12/02/2015					
Benzene	50.5	1.0	ug/L	50.0	ND	101	74-130	12.0	20	
Toluene	51.9	1.0	"	50.0	ND	104	73-131	10.5	20	
Ethylbenzene	48.4	1.0	"	50.0	ND	96.8	76-132	13.6	20	
m,p-Xylene	98.3	2.0	"	100	ND	98.3	69-139	11.4	20	
o-Xylene	49.4	1.0	"	50.0	ND	98.9	74-131	10.9	20	
Surrogate: 1,2-Dichloroethane-d4	52		"	62.5		83.2	84-121			S-04
Surrogate: Toluene-d8	64		"	62.5		102	85-115			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		102	84-114			

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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 B5L0105 - EPA 5030B (Water)										
Matrix Spike Dup (B5L0105-MSD2)		Source: X512001-02			Prepared: 12/01/2015 Analyzed: 12/02/2015					
Benzene	53.4	1.0	ug/L	50.0	1.2	105	74-130	2.07	20	QM-07
Toluene	54.8	1.0	"	50.0	4.4	101	73-131	0.0729	20	
Ethylbenzene	116	1.0	"	50.0	63.1	106	76-132	1.01	20	
m,p-Xylene	624	2.0	"	100	471	154	69-139	6.65	20	
o-Xylene	76.9	1.0	"	50.0	22.9	108	74-131	5.30	20	
Surrogate: 1,2-Dichloroethane-d4	66		"	62.5		106	84-121			
Surrogate: Toluene-d8	67		"	62.5		106	85-115			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		101	84-114			

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Jeff Pellipini

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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 B5L0204 - EPA 5030 (soil)

Blank (B5L0204-BLK1)

Prepared: 12/02/2015 Analyzed: 12/02/2015

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	72.2		ug/kg	62.5		115	70-130			
Surrogate: Toluene-d8	54.9		"	62.5		87.9	70-130			
Surrogate: 4-Bromofluorobenzene	62.9		"	62.5		101	70-130			

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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 B5L0204 - EPA 5030 (soil)										
LCS (B5L0204-BS1)					Prepared: 12/02/2015 Analyzed: 12/02/2015					
Benzene	0.100	0.002	mg/kg	0.100		100	77.1-124			
Toluene	0.086	0.002	"	0.100		86.4	74.5-128			
Ethylbenzene	0.087	0.002	"	0.100		86.7	66.4-127			
m,p-Xylene	0.181	0.004	"	0.200		90.7	76.6-124			
o-Xylene	0.087	0.002	"	0.100		86.8	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	67.7		ug/kg	62.5		108	70-130			
Surrogate: Toluene-d8	56.2		"	62.5		89.9	70-130			
Surrogate: 4-Bromofluorobenzene	64.8		"	62.5		104	70-130			

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Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B5L0204 - EPA 5030 (soil)

Matrix Spike (B5L0204-MS1)		Source: X512021-02			Prepared: 12/02/2015 Analyzed: 12/02/2015					
Benzene	0.212	0.002	mg/kg	0.200	ND	106	71.8-126			
Toluene	0.182	0.002	"	0.200	ND	90.9	65.1-130			
Ethylbenzene	0.182	0.002	"	0.200	ND	91.2	62.2-130			
m,p-Xylene	0.378	0.004	"	0.400	0.002	93.9	46.5-137			
o-Xylene	0.181	0.002	"	0.200	0.001	89.9	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	68.3		ug/kg	62.5		109	70-130			
Surrogate: Toluene-d8	54.8		"	62.5		87.7	70-130			
Surrogate: 4-Bromofluorobenzene	64.7		"	62.5		104	70-130			

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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 B5L0204 - EPA 5030 (soil)

Matrix Spike Dup (B5L0204-MSD1)		Source: X512021-02			Prepared: 12/02/2015 Analyzed: 12/02/2015					
Benzene	0.220	0.002	mg/kg	0.200	ND	110	71.8-126	3.78	11.3	
Toluene	0.186	0.002	"	0.200	ND	93.1	65.1-130	2.37	15.4	
Ethylbenzene	0.188	0.002	"	0.200	ND	94.1	62.2-130	3.14	19.6	
m,p-Xylene	0.388	0.004	"	0.400	0.002	96.5	46.5-137	2.68	19.2	
o-Xylene	0.187	0.002	"	0.200	0.001	92.8	54.2-134	3.11	17.9	
Surrogate: 1,2-Dichloroethane-d4	68.2		ug/kg	62.5		109	70-130			
Surrogate: Toluene-d8	55.5		"	62.5		88.7	70-130			
Surrogate: 4-Bromofluorobenzene	65.6		"	62.5		105	70-130			

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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 B5L0205 - EPA 3580

Blank (B5L0205-BLK1)

Prepared: 12/02/2015 Analyzed: 12/02/2015

Diesel (C10-C28)	ND	50	mg/kg							
Residual Range Organics (C28-C36)	ND	200	"							
Surrogate: o-Terphenyl	45		"	50.0		90.9	59-131			

LCS (B5L0205-BS1)

Prepared: 12/02/2015 Analyzed: 12/02/2015

Diesel (C10-C28)	860	50	mg/kg	1000		85.6	64-121			
Residual Range Organics (C28-C36)	930	200	"	1000		92.8	58-124			
Surrogate: o-Terphenyl	43		"	50.0		85.0	59-131			

Matrix Spike (B5L0205-MS1)

Source: X512021-02

Prepared: 12/02/2015 Analyzed: 12/02/2015

Diesel (C10-C28)	890	50	mg/kg	1000	ND	88.9	53-125			
Residual Range Organics (C28-C36)	900	200	"	1000	22	87.6	47-133			
Surrogate: o-Terphenyl	39		"	50.0		78.1	59-131			

Matrix Spike Dup (B5L0205-MSD1)

Source: X512021-02

Prepared: 12/02/2015 Analyzed: 12/02/2015

Diesel (C10-C28)	910	50	mg/kg	1000	ND	91.2	53-125	2.50	20	
Residual Range Organics (C28-C36)	890	200	"	1000	22	87.1	47-133	0.553	20	
Surrogate: o-Terphenyl	45		"	50.0		90.7	59-131			

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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 B5L0208 - NO PREP										
Duplicate (B5L0208-DUP1)		Source: X512026-01			Prepared: 12/02/2015 Analyzed: 12/02/2015					
pH	8.07		pH Units		8.03			0.497	25	
Batch B5L0209 - NO PREP										
Blank (B5L0209-BLK1)		Prepared: 12/02/2015 Analyzed: 12/02/2015								
Specific Conductance (EC)	0.00370		mmhos/cm							
Duplicate (B5L0209-DUP1)		Source: X512026-01			Prepared: 12/02/2015 Analyzed: 12/02/2015					
Specific Conductance (EC)	0.497		mmhos/cm		0.489			1.62	25	

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Project: KMG - Lorenz #1

Notes and Definitions

- S-04 The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
- 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.

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