

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: <u>47120</u>	Contact Name and Telephone
Name of Operator: <u>Kerr-McGee Oil and Gas Onshore LP</u>	Name: <u>Phillip Hamlin</u>
Address: <u>P.O. Box 173779</u>	No: <u>970-336-3500</u>
City: <u>Denver</u> State: <u>CO</u> Zip: <u>80217-3779</u>	Fax: <u>970-336-3656</u>
API/Facility No: <u>320424</u>	County: <u>Adams</u>
Facility Name: <u>HSR-VAN SCHAACK-62S66W/11NWNW</u>	Facility Number: _____
Well Name: _____	Well Number: _____
Location (Qtr, Sec, Twp, Rng, Meridian): <u>NWNW 11-T2S-R66W</u>	Latitude: <u>39.899697</u> Longitude: <u>-104.749990</u>

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc.): Oil and Produced Water

Site Conditions: Is location within a sensitive area (according to Rule 901e)? Y N If yes, attach evaluation. *Depth to groundwater less than 20 feet bgs.*

Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): Agriculture and Rangeland

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Fine Sand and Clayey Sand

Potential receptors (water wells within 1/4 mi, surface waters, etc.): Buildings approximately 600' N, water well approximately 590' N, livestock approximately 2,000' SW, surface water approximately 180' N, and depth to groundwater is approximately 7' 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	<u>23' N-S x 15' E-W x 7' bgs</u>	<u>Collected soil samples for laboratory analysis</u>
<input type="checkbox"/> Vegetation	_____	_____
<input checked="" type="checkbox"/> Groundwater	<u>See attached Data</u>	<u>Collected groundwater samples for laboratory analysis</u>
<input type="checkbox"/> Surface water	_____	_____

REMEDIALTION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):

During a site inspection, oil and produced water were discovered on the ground surface near the separator resulting from a line failure at the HSR-Van Schaack-62S66W/11NWNW site. Approximately 2 barrels (bbls) of oil and produced water were released onto unlined containment. A hydro-vac truck was used to recover approximately 0.5 bbls of the released oil and produced water. The petroleum hydrocarbon impacted soil was excavated. Groundwater was encountered in the excavation at approximately 7 feet bgs. A topographic Site Location Map showing the general location of the release is attached as Figure 1.

Describe how source is to be removed:

Soil and groundwater samples were collected from the excavation for laboratory analysis. Laboratory analytical results for the confirmation soil samples indicated that total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene, and total xylenes (BTEX) concentrations were less than the Colorado Oil and Gas Conservation Commission Table 910-1 allowable levels at the extent of the excavation. Approximately 90 cubic yards of impacted soil were removed from the excavation and transported to a licensed disposal facility.

Groundwater was encountered in the excavation at approximately 7 feet bgs. A representative groundwater sample (GW01) was collected from the open excavation and submitted for laboratory analysis of BTEX. Laboratory analytical results for the initial excavation groundwater sample (GW01) indicated that the BTEX concentrations exceeded the Colorado Groundwater Quality Standards (CGWQS) at concentrations of 14,500 micrograms per liter (µg/L), 54,500 µg/L, 2,390 µg/L, and 26,200 µg/L, respectively. Approximately 240 bbls of impacted groundwater was removed from the excavation and transported to a licensed injection facility for disposal. A second excavation groundwater sample (GW02) was collected from the excavation after the impacted groundwater was removed. Laboratory analytical results for groundwater sample GW02 indicated that benzene, toluene, and total xylenes continued to exceed the CGWQS at concentrations of 3,120 µg/L, 6,570 µg/L, and 4,150 µg/L, respectively. Prior to backfilling the excavation, 400 pounds of COGAC®, a carbon based remediation product, was applied to the excavation groundwater. The general site layout, excavation dimensions, and soil and groundwater sample locations are shown on the Excavation Site Map attached 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 a licensed disposal facility. The impacted groundwater was removed from the excavation and transported to a licensed injection facility for disposal.

State of Colorado Oil and Gas Conservation Commission

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Tracking Number: Name of Operator: Kerr-McGee Oil and Gas Onshore LP OGCC Operator No: 47120 Received Date: Well Name & No: Facility Name & No.: HSR-VAN SCHAACK-62S66W/11NWNW

REMEDIATION WORKPLAN (CONT.)

OGCC Employee:

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 so that the groundwater flow direction can be accurately determined. Groundwater monitoring activities will be conducted on a quarterly basis and all groundwater samples will be submitted for laboratory analysis of BTEX.

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.

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? [X] Y [] N If yes, describe: After installing the monitoring wells and establishing point of compliance, groundwater monitoring will continue on a quarterly basis.

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.): The impacted soil was transported to a licensed disposal facility. The impacted groundwater was removed from the excavation and transported to a licensed injection facility for disposal.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: 4/9/15 Date Site Investigation Completed: Active Remediation Plan Submitted: Remediation Start Date: 4/10/15 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: [Signature] Title: Senior HSE Representative Date: 6/24/15

OGCC Approved: Title: Date:

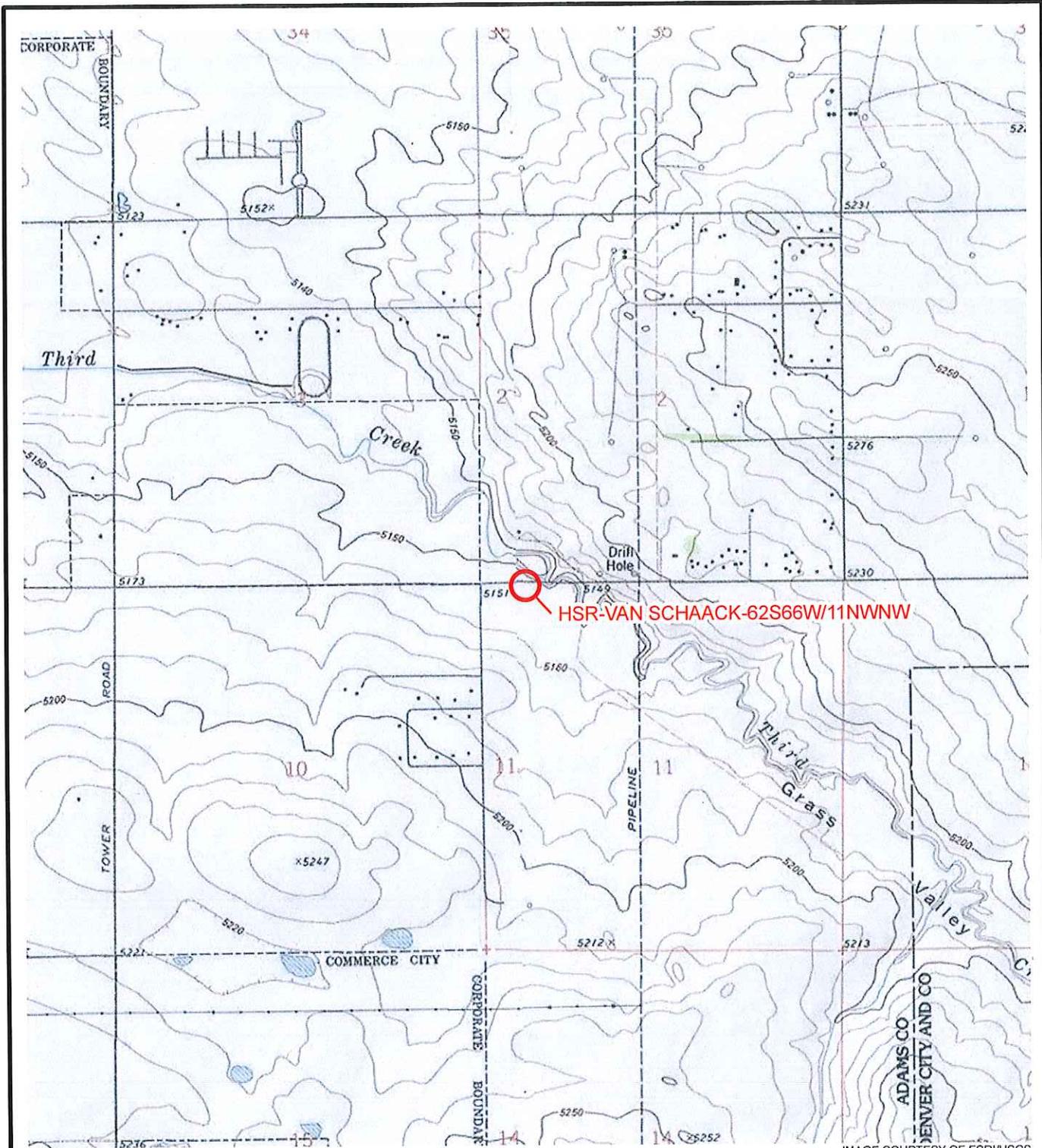


IMAGE COURTESY OF ESRI/USGS

LEGEND

 SITE LOCATION

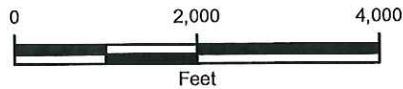
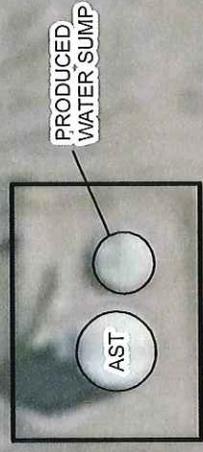


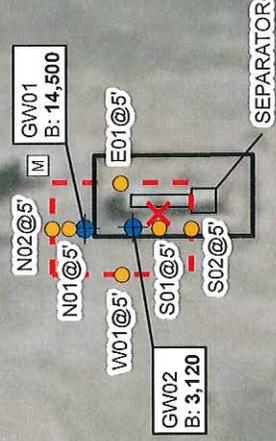
FIGURE 1
SITE LOCATION MAP
 HSR-VAN SCHAACK-62S66W/11NWNW
 NWNW SEC 11-T2S-R66W
 ADAMS COUNTY, COLORADO
 KERR-MCGEE OIL & GAS ONSHORE LP



EAST 112TH AVENUE



AGRICULTURE



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

IMAGE COURTESY OF ESR!

LEGEND

- RELEASE LOCATION
- SOIL SAMPLE
- GROUNDWATER SAMPLE
- METER HOUSE
- EXCAVATION EXTENT
- BERM

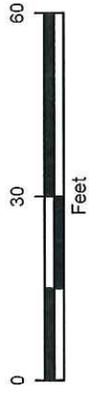


FIGURE 2

EXCAVATION SITE MAP
 HSR-VAN SCHAACK-62S66W/11NWNW
 NWNW SEC 11-T2S-R66W
 ADAMS COUNTY, COLORADO
 KERR-MCGEE OIL & GAS ONSHORE LP



AST: ABOVEGROUND STORAGE TANK

TABLE 1
SOIL SAMPLE ANALYTICAL RESULTS
HSR-VAN SCHAAACK-62S66W/11NWNW
ADAMS 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 @ 5'	5'	04/09/2015	0.138	1.74	0.410	2.25	110	120	<200	8.03	0.117
N01 @ 5'	5'	04/09/2015	9.53	93.7	12.7	70.1	1900	4300	510	7.80	0.101
S01 @ 5'	5'	04/09/2015	60.2	<0.050	36.9	165	6100	18000	1800	7.94	0.0721
W01 @ 5'	5'	04/09/2015	0.018	0.027	0.008	0.048	<50	<50	<200	8.12	0.0618
N02 @ 5'	5'	04/10/2015	0.004	<0.002	<0.002	0.015	<50	<50	<200	8.49	0.0769
S02 @ 5'	5'	04/10/2015	<0.002	<0.002	<0.002	<0.002	<50	<50	<200	8.36	0.0736
COGCC Allowable Levels											
			0.17	85	100	175	500*	500*	500*	6-9	4

Notes: bgs - below ground surface
 < - less than laboratory reporting limit
 DRO - Diesel Range Organics
 ORO - Oil Range Organics
 GRO - Gasoline Range Organics
 * - Standard applies to combined DRO-GRO-ORO
 COGCC - Colorado Oil and Gas Conservation Commission

mg/kg - milligrams per kilogram
 NA - Not Analyzed/Not Available
 Bold numbers indicate result equaled or exceeded allowable level.
 su - standard units
 mmhos/cm - millimhos per centimeter



TABLE 2
GROUNDWATER ANALYTICAL AND FIELD RESULTS
HSR-VAN SCHAACK-62S66W/11NWNW
ADAMS COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP

Well Name	Date	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)	Depth Water/ (Product Thickness) (ft bgs)
GW01	04/09/2015	14500	54500	2390	26200	7.00
GW02	04/23/2015	3120	6570	323	4150	7.00
CGWQS		5	1000	700	1400	

Notes: ug/L - micrograms per Liter
ft bgs - feet below ground surface
Bold numbers indicate result exceeded standard.
< - less than laboratory reporting limit

NA - Not Analyzed/Not Available
NM - Not Measured
CGWQS - Colorado Groundwater Quality Standards
Excavation groundwater depth is approximate





April 10, 2015

LT Environmental, Inc.

John Cocroft

4600 West 60th Avenue

Arvada CO 80003

Project Name - KMG - Van Schaack 4-11

Project Number - 014215071

Attached are your analytical results for KMG - Van Schaack 4-11 received by Origins Laboratory, Inc. April 09, 2015. This project is associated with Origins project number X504120-01.

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: 014215071
Project: KMG - Van Schaack 4-11

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
N01 @ 5'	X504120-01	Soil	April 9, 2015 11:50	04/09/2015 15:15
W01 @ 5'	X504120-02	Soil	April 9, 2015 11:55	04/09/2015 15:15
S01 @ 5'	X504120-03	Soil	April 9, 2015 12:00	04/09/2015 15:15
E01 @ 5'	X504120-04	Soil	April 9, 2015 12:05	04/09/2015 15:15
GW01	X504120-06	Water	April 9, 2015 12:25	04/09/2015 15:15

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: 014215071
 Project: KMG - Van Schaack 4-11

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: X504120 Client: LTE
 Client Project ID: KMG - Van Schaack 4-11
 Checklist Completed by: Jen Pellegrini Shipped Via: HID
 Date/time completed: 4/9/15 (UPS, FedEx, Hand Delivered, Pick-up, etc.)
 Airbill #: N/A
 Matrix(s) Received: (Check all that apply): Soil/Solid Water Other: _____ (Describe)
 Cooler Number/Temperature: 1 15.7 °C _____ °C _____ °C _____ °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⁾ ?	X			
Is there ice present (document if blue ice is used)	X			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		X		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		X		
Were all samples received intact ⁽¹⁾ ?	X			
Was adequate sample volume provided ⁽¹⁾ ?	X			
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?	X			pH
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	Y			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	Y			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	Y			
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	X			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.		Y		
Are samples preserved that require preservation and was it checked ⁽¹⁾ ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for sub-contracted analyses in order to insure sample integrity) (pH < 2 for samples preserved with HNO ₃ , HCL, H ₂ SO ₄ / (pH > 10 for samples preserved with NaAsO ₂ +NaOH, ZnAc+NaOH).		X		
Additional Comments (if any):				

⁽¹⁾If NO, then contact the client before proceeding with analysis and note date, time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

Reviewed by (Project Manager)

Date/Time Reviewed: 4-9-15 1550

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: 014215071
 Project: KMG - Van Schaack 4-11

N01 @ 5'
 4/9/2015 11:50:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
 X504120-01 (Soil)

BTEX by EPA 8260C

Benzene	9.53	0.050	mg/kg	25	5D09009	04/09/2015	04/09/2015	
Toluene	93.7	0.498	"	250	"	"	04/09/2015	
Ethylbenzene	12.7	0.498	"	"	"	"	"	
Xylenes, total	70.1	0.498	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	111 %	70-130			"	"	"	
Surrogate: Toluene-d8	109 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	94.9 %	70-130			"	"	"	

pH in Soil by EPA 9045D

pH	7.80		pH Units	1	5D09007	04/09/2015	04/09/2015	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.101		mmhos/cm	"	5D09006	04/09/2015	04/09/2015	
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TPH-Carbon Chain by EPA Method 8015C

Gasoline (C6-C10)	4300	50	mg/kg	1	5D09008	04/09/2015	04/09/2015	
Diesel (C10-C28)	1900	50	"	"	"	"	"	
Residual Range Organics (C28-C36)	510	200	"	"	"	"	"	

Surrogate: o-Terphenyl	123 %	65-146			"	"	"	
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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: 014215071
 Project: KMG - Van Schaack 4-11

W01 @ 5'
 4/9/2015 11:55:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
 X504120-02 (Soil)

BTEX by EPA 8260C

Benzene	0.018	0.002	mg/kg	1	5D09009	04/09/2015	04/09/2015	
Toluene	0.027	0.002	"	"	"	"	"	
Ethylbenzene	0.008	0.002	"	"	"	"	"	
Xylenes, total	0.048	0.002	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	107 %	70-130			"	"	"	
Surrogate: Toluene-d8	98.0 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	95.0 %	70-130			"	"	"	

pH in Soil by EPA 9045D

pH	8.12		pH Units	1	5D09007	04/09/2015	04/09/2015	
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Specific Conductance by Modified 9050A

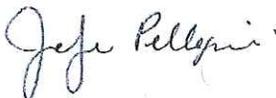
Specific Conductance (EC)	0.0618		mmhos/cm	"	5D09006	04/09/2015	04/09/2015	
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TPH-Carbon Chain by EPA Method 8015C

Gasoline (C6-C10)	ND	50	mg/kg	1	5D09008	04/09/2015	04/09/2015	
Diesel (C10-C28)	ND	50	"	"	"	"	"	
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"	

Surrogate: o-Terphenyl	83.0 %	65-146			"	"	"	
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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: 014215071
 Project: KMG - Van Schaack 4-11

S01 @ 5'
4/9/2015 12:00:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X504120-03 (Soil)

BTEX by EPA 8260C

Benzene	60.2	0.498	mg/kg	250	5D09009	04/09/2015	04/09/2015	
Toluene	ND	0.050	"	25	"	"	04/09/2015	
Ethylbenzene	36.9	0.498	"	250	"	"	04/09/2015	
Xylenes, total	165	0.498	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	122 %	70-130			"	"	"	
Surrogate: Toluene-d8	117 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	92.8 %	70-130			"	"	"	

pH in Soil by EPA 9045D

pH	7.94		pH Units	1	5D09007	04/09/2015	04/09/2015	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.0721		mmhos/cm	"	5D09006	04/09/2015	04/09/2015	
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TPH-Carbon Chain by EPA Method 8015C

Gasoline (C6-C10)	18000	500	mg/kg	10	5D09008	04/09/2015	04/10/2015	
Diesel (C10-C28)	6100	50	"	1	"	"	04/09/2015	
Residual Range Organics (C28-C36)	1800	200	"	"	"	"	"	

Surrogate: o-Terphenyl	243 %	65-146			"	"	"	S-02
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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: 014215071
 Project: KMG - Van Schaack 4-11

E01 @ 5'
 4/9/2015 12:05:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
 X504120-04 (Soil)

BTEX by EPA 8260C

Benzene	0.138	0.050	mg/kg	25	5D09009	04/09/2015	04/09/2015	
Toluene	1.74	0.050	"	"	"	"	"	
Ethylbenzene	0.410	0.050	"	"	"	"	"	
Xylenes, total	2.25	0.050	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	103 %	70-130			"	"	"	
Surrogate: Toluene-d8	102 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	95.6 %	70-130			"	"	"	

pH in Soil by EPA 9045D

pH	8.03		pH Units	1	5D09007	04/09/2015	04/09/2015	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.117		mmhos/cm	"	5D09006	04/09/2015	04/09/2015	
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TPH-Carbon Chain by EPA Method 8015C

Gasoline (C6-C10)	120	50	mg/kg	1	5D09008	04/09/2015	04/10/2015	
Diesel (C10-C28)	110	50	"	"	"	"	"	
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"	

Surrogate: o-Terphenyl	84.7 %	65-146			"	"	"	
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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: 014215071
Project: KMG - Van Schaack 4-11

GW01
4/9/2015 12:25:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X504120-06 (Water)

BTEX by EPA 8260C

Benzene	14500	400	ug/L	400	5D09013	04/09/2015	04/09/2015	
Toluene	54500	400	"	"	"	"	"	
Ethylbenzene	2390	50.0	"	50	"	"	04/09/2015	
Xylenes, total	26200	50.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	102 %	87.3-113			"	"	"	
Surrogate: Toluene-d8	103 %	90.9-108			"	"	"	
Surrogate: 4-Bromofluorobenzene	91.2 %	88.6-111			"	"	"	

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: 014215071
 Project: KMG - Van Schaack 4-11

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 5D09009 - EPA 5030 (soil)

Blank (5D09009-BLK1)

Prepared: 04/09/2015 Analyzed: 04/09/2015

Benzene	ND	0.002	mg/kg							
Toluene	ND	0.002	"							
Ethylbenzene	ND	0.002	"							
Xylenes, total	ND	0.002	"							
Surrogate: 1,2-Dichloroethane-d4	66		ug/kg	62.5	105		70-130			
Surrogate: Toluene-d8	63		"	62.5	101		70-130			
Surrogate: 4-Bromofluorobenzene	65		"	62.5	104		70-130			

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

John Cocroft
 Project Number: 014215071
 Project: KMG - Van Schaack 4-11

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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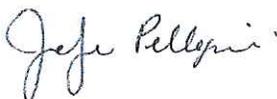
Batch 5D09009 - EPA 5030 (soil)

LCS (5D09009-BS1)

Prepared: 04/09/2015 Analyzed: 04/09/2015

Benzene	0.092	0.002	mg/kg	0.100		91.6	77.1-124			
Toluene	0.093	0.002	"	0.100		93.0	74.5-128			
Ethylbenzene	0.081	0.002	"	0.100		80.9	66.4-127			
m,p-Xylene	0.162	0.004	"	0.200		80.9	76.6-124			
o-Xylene	0.094	0.002	"	0.100		93.9	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	71		ug/kg	62.5		114	70-130			
Surrogate: Toluene-d8	62		"	62.5		99.4	70-130			
Surrogate: 4-Bromofluorobenzene	59		"	62.5		94.4	70-130			

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

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

John Cocroft
 Project Number: 014215071
 Project: KMG - Van Schaack 4-11

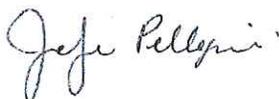
Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 5D09009 - EPA 5030 (soil)

Matrix Spike (5D09009-MS1)	Source: X504091-06			Prepared: 04/09/2015 Analyzed: 04/09/2015						
Benzene	0.091	0.002	mg/kg	0.100	ND	91.1	71.8-126			
Toluene	0.095	0.002	"	0.100	ND	94.9	65.1-130			
Ethylbenzene	0.086	0.002	"	0.100	ND	85.9	62.2-130			
m,p-Xylene	0.172	0.004	"	0.200	ND	85.9	46.5-137			
o-Xylene	0.099	0.002	"	0.100	ND	98.7	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	69		ug/kg	62.5		110	70-130			
Surrogate: Toluene-d8	63		"	62.5		101	70-130			
Surrogate: 4-Bromofluorobenzene	59		"	62.5		94.8	70-130			

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

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

John Cocroft
 Project Number: 014215071
 Project: KMG - Van Schaack 4-11

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 5D09009 - EPA 5030 (soil)

Matrix Spike Dup (5D09009-MSD1)	Source: X504091-06			Prepared: 04/09/2015 Analyzed: 04/09/2015						
Benzene	0.088	0.002	mg/kg	0.100	ND	88.4	71.8-126	2.96	11.3	
Toluene	0.087	0.002	"	0.100	ND	86.9	65.1-130	8.80	15.4	
Ethylbenzene	0.078	0.002	"	0.100	ND	78.3	62.2-130	9.21	19.6	
m,p-Xylene	0.157	0.004	"	0.200	ND	78.3	46.5-137	9.23	19.2	
o-Xylene	0.090	0.002	"	0.100	ND	90.3	54.2-134	8.91	17.9	
Surrogate: 1,2-Dichloroethane-d4	66		ug/kg	62.5		106	70-130			
Surrogate: Toluene-d8	60		"	62.5		96.0	70-130			
Surrogate: 4-Bromofluorobenzene	58		"	62.5		93.0	70-130			

Origins Laboratory, Inc.



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

John Cocroft
 Project Number: 014215071
 Project: KMG - Van Schaack 4-11

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 5D09013 - EPA 5030B (Water)

Blank (5D09013-BLK1)

Prepared: 04/09/2015 Analyzed: 04/09/2015

Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	65		"	62.5	104		87.3-113			
Surrogate: Toluene-d8	64		"	62.5	102		90.9-108			
Surrogate: 4-Bromofluorobenzene	56		"	62.5	90.0		88.6-111			

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

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

John Cocroft
 Project Number: 014215071
 Project: KMG - Van Schaack 4-11

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 5D09013 - EPA 5030B (Water)

LCS (5D09013-BS1)

Prepared: 04/09/2015 Analyzed: 04/09/2015

Benzene	50.6	1.0	ug/L	50.0		101	75-126			
Toluene	51.9	1.0	"	50.0		104	78.7-126			
Ethylbenzene	55.5	1.0	"	50.0		111	80-130			
m,p-Xylene	108	2.0	"	100		108	77.2-133			
o-Xylene	50.9	1.0	"	50.0		102	77.9-126			
Surrogate: 1,2-Dichloroethane-d4	60		"	62.5		96.4	87.3-113			
Surrogate: Toluene-d8	63		"	62.5		101	90.9-108			
Surrogate: 4-Bromofluorobenzene	58		"	62.5		92.2	88.6-111			

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

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

John Cocroft
 Project Number: 014215071
 Project: KMG - Van Schaack 4-11

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 5D09013 - EPA 5030B (Water)

Matrix Spike (5D09013-MS1)	Source: X504089-02			Prepared: 04/09/2015 Analyzed: 04/09/2015						
Benzene	48.7	1.0	ug/L	50.0	ND	97.4	74-130			
Toluene	52.4	1.0	"	50.0	ND	105	73-131			
Ethylbenzene	55.8	1.0	"	50.0	ND	112	76-132			
m,p-Xylene	109	2.0	"	100	ND	109	69-139			
o-Xylene	51.7	1.0	"	50.0	ND	103	74-131			
Surrogate: 1,2-Dichloroethane-d4	61		"	62.5		96.9	87.3-113			
Surrogate: Toluene-d8	64		"	62.5		102	90.9-108			
Surrogate: 4-Bromofluorobenzene	58		"	62.5		92.7	88.6-111			

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

John Cocroft
 Project Number: 014215071
 Project: KMG - Van Schaack 4-11

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 5D09013 - EPA 5030B (Water)

Matrix Spike Dup (5D09013-MSD1)	Source: X504089-02			Prepared: 04/09/2015 Analyzed: 04/09/2015						
Benzene	46.2	1.0	ug/L	50.0	ND	92.5	74-130	5.20	20	
Toluene	48.8	1.0	"	50.0	ND	97.7	73-131	6.98	20	
Ethylbenzene	51.4	1.0	"	50.0	ND	103	76-132	8.22	20	
m,p-Xylene	101	2.0	"	100	ND	101	69-139	7.52	20	
o-Xylene	48.8	1.0	"	50.0	ND	97.7	74-131	5.59	20	
Surrogate: 1,2-Dichloroethane-d4	60		"	62.5		95.3	87.3-113			
Surrogate: Toluene-d8	64		"	62.5		102	90.9-108			
Surrogate: 4-Bromofluorobenzene	58		"	62.5		92.6	88.6-111			

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Jen Pellegrini For Noelle Doyle Mathis, President

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

John Cocroft
 Project Number: 014215071
 Project: KMG - Van Schaack 4-11

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 5D09008 - EPA 3580

Blank (5D09008-BLK1)

Prepared: 04/09/2015 Analyzed: 04/09/2015

Gasoline (C6-C10)	ND	50	mg/kg							
Diesel (C10-C28)	ND	50	"							
Residual Range Organics (C28-C36)	ND	200	"							
Surrogate: o-Terphenyl	43.3		"	50.0		86.6	65-146			

LCS (5D09008-BS1)

Prepared: 04/09/2015 Analyzed: 04/09/2015

Gasoline (C6-C10)	1000	50	mg/kg	1000		105	66.7-119			
Diesel (C10-C28)	980	50	"	1000		97.5	70.1-127			
Residual Range Organics (C28-C36)	970	200	"	1000		96.5	54.5-139			
Surrogate: o-Terphenyl	48.2		"	50.0		96.3	65-146			

Matrix Spike (5D09008-MS1)

Source: X504091-06

Prepared: 04/09/2015 Analyzed: 04/09/2015

Gasoline (C6-C10)	1100	50	mg/kg	1000	ND	112	56.4-132			
Diesel (C10-C28)	1000	50	"	1000	39	96.4	57.4-138			
Residual Range Organics (C28-C36)	1000	200	"	1000	ND	104	47.7-129			
Surrogate: o-Terphenyl	44.3		"	50.0		88.6	65-146			

Matrix Spike Dup (5D09008-MSD1)

Source: X504091-06

Prepared: 04/09/2015 Analyzed: 04/09/2015

Gasoline (C6-C10)	1200	50	mg/kg	1000	ND	115	56.4-132	2.58	22	
Diesel (C10-C28)	1100	50	"	1000	39	102	57.4-138	5.49	18.3	
Residual Range Organics (C28-C36)	1100	200	"	1000	ND	113	47.7-129	7.98	30.1	
Surrogate: o-Terphenyl	44.8		"	50.0		89.5	65-146			

Origins Laboratory, Inc.



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

John Cocroft
 Project Number: 014215071
 Project: KMG - Van Schaack 4-11

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 5D09006 - NO PREP										
Blank (5D09006-BLK1)					Prepared: 04/09/2015 Analyzed: 04/09/2015					
Specific Conductance (EC)	0.00250		mmhos/cm							
Duplicate (5D09006-DUP1)					Source: X504091-05 Prepared: 04/09/2015 Analyzed: 04/09/2015					
Specific Conductance (EC)	0.0195		mmhos/cm		0.0187			4.19	25	
Batch 5D09007 - NO PREP										
Duplicate (5D09007-DUP1)					Source: X504091-05 Prepared: 04/09/2015 Analyzed: 04/09/2015					
pH	7.71		pH Units		7.69			0.260	25	

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

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

John Cocroft
Project Number: 014215071
Project: KMG - Van Schaack 4-11

Notes and Definitions

S-02 The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample extract.

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



April 12, 2015

LT Environmental, Inc.

John Cocroft

4600 West 60th Avenue

Arvada CO 80003

Project Name - KMG - Van Schaack 4-11

Project Number - 014215071

Attached are your analytical results for KMG - Van Schaack 4-11 received by Origins Laboratory, Inc. April 10, 2015. This project is associated with Origins project number X504146-01.

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: 014215071
Project: KMG - Van Schaack 4-11

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
N02 @ 5'	X504146-01	Soil	April 10, 2015 12:40	04/10/2015 16:30
S02 @ 5'	X504146-02	Soil	April 10, 2015 12:45	04/10/2015 16:30

Origins Laboratory, Inc.



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Noelle Doyle Mathis, President

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

John Cocroft
 Project Number: 014215071
 Project: KMG - Van Schaack 4-11

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: X504146

Client: LTE
 Client Project ID: Van Schaack 4-11

Checklist Completed by: Jeff Smith

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

Date/time completed: 4/10/15

Airbill #: NA

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

Cooler Number/Temperature: 1 / 2.1 °C / _____ °C / _____ °C / _____ °C

Thermometer ID: 7003

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"/>			PH
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 HNO3, HCL, H2SO4) / (pH > 10 for samples preserved with NaAsO2+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.

[Signature]
 Reviewed by (Project Manager)

4/10/15
 Date/Time Reviewed

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.

Noelle Doyle Mathis, President

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

John Cocroft
 Project Number: 014215071
 Project: KMG - Van Schaack 4-11

N02 @ 5'
 4/10/2015 12:40:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
 X504146-01 (Soil)

BTEX by EPA 8260C

Benzene	0.004	0.002	mg/kg	1	5D10014	04/10/2015	04/11/2015	
Toluene	ND	0.002	"	"	"	"	"	
Ethylbenzene	ND	0.002	"	"	"	"	"	
Xylenes, total	0.015	0.002	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	104 %	70-130			"	"	"	
Surrogate: Toluene-d8	98.4 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	101 %	70-130			"	"	"	

pH in Soil by EPA 9045D

pH	8.49		pH Units	1	5D10011	04/10/2015	04/10/2015	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.0769		mmhos/cm	"	5D10012	04/10/2015	04/10/2015	
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TPH-Carbon Chain by EPA Method 8015C

Gasoline (C6-C10)	ND	50	mg/kg	1	5D10013	04/10/2015	04/10/2015	
Diesel (C10-C28)	ND	50	"	"	"	"	"	
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"	

Surrogate: o-Terphenyl	69.6 %	65-146			"	"	"	
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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: 014215071
 Project: KMG - Van Schaack 4-11

S02 @ 5'
 4/10/2015 12:45:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
 X504146-02 (Soil)

BTEX by EPA 8260C

Benzene	ND	0.002	mg/kg	1	5D10014	04/10/2015	04/11/2015	
Toluene	ND	0.002	"	"	"	"	"	
Ethylbenzene	ND	0.002	"	"	"	"	"	
Xylenes, total	ND	0.002	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	104 %	70-130			"	"	"	
Surrogate: Toluene-d8	96.1 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	102 %	70-130			"	"	"	

pH in Soil by EPA 9045D

pH	8.36		pH Units	1	5D10011	04/10/2015	04/10/2015	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.0736		mmhos/cm	"	5D10012	04/10/2015	04/10/2015	
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TPH-Carbon Chain by EPA Method 8015C

Gasoline (C6-C10)	ND	50	mg/kg	1	5D10013	04/10/2015	04/10/2015	
Diesel (C10-C28)	ND	50	"	"	"	"	"	
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"	

Surrogate: o-Terphenyl	80.2 %	65-146			"	"	"	
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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO 80003

John Cocroft
 Project Number: 014215071
 Project: KMG - Van Schaack 4-11

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 5D10014 - EPA 5030 (soil)

Blank (5D10014-BLK1)

Prepared: 04/10/2015 Analyzed: 04/10/2015

Benzene	ND	0.002	mg/kg							
Toluene	ND	0.002	"							
Ethylbenzene	ND	0.002	"							
Xylenes, total	ND	0.002	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	64		<i>ug/kg</i>	62.5		102	70-130			
<i>Surrogate: Toluene-d8</i>	62		"	62.5		98.8	70-130			
<i>Surrogate: 4-Bromofluorobenzene</i>	63		"	62.5		101	70-130			

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Noelle Doyle Mathis, President

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

John Cocroft
 Project Number: 014215071
 Project: KMG - Van Schaack 4-11

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 5D10014 - EPA 5030 (soil)

LCS (5D10014-BS1)

Prepared: 04/10/2015 Analyzed: 04/10/2015

Benzene	0.102	0.002	mg/kg	0.100	102	77.1-124				
Toluene	0.101	0.002	"	0.100	101	74.5-128				
Ethylbenzene	0.098	0.002	"	0.100	98.3	66.4-127				
m,p-Xylene	0.204	0.004	"	0.200	102	76.6-124				
o-Xylene	0.104	0.002	"	0.100	104	76.6-124				
Surrogate: 1,2-Dichloroethane-d4	61		ug/kg	62.5	97.3	70-130				
Surrogate: Toluene-d8	63		"	62.5	101	70-130				
Surrogate: 4-Bromofluorobenzene	62		"	62.5	99.5	70-130				

Origins Laboratory, Inc.



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 Project: KMG - Van Schaack 4-11

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 5D10014 - EPA 5030 (soil)

Matrix Spike (5D10014-MS1)	Source: X504121-02			Prepared: 04/10/2015 Analyzed: 04/10/2015						
Benzene	0.061	0.002	mg/kg	0.100	ND	60.7	71.8-126			QM-07
Toluene	0.056	0.002	"	0.100	ND	55.6	65.1-130			QM-07
Ethylbenzene	0.057	0.002	"	0.100	ND	57.0	62.2-130			QM-07
m,p-Xylene	0.111	0.004	"	0.200	ND	55.7	46.5-137			
o-Xylene	0.056	0.002	"	0.100	ND	56.3	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	66		ug/kg	62.5		105	70-130			
Surrogate: Toluene-d8	63		"	62.5		100	70-130			
Surrogate: 4-Bromofluorobenzene	68		"	62.5		108	70-130			

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 Project Number: 014215071
 Project: KMG - Van Schaack 4-11

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 5D10014 - EPA 5030 (soil)

Matrix Spike Dup (5D10014-MSD1)	Source: X504121-02			Prepared: 04/10/2015 Analyzed: 04/10/2015						
Benzene	0.102	0.002	mg/kg	0.100	ND	102	71.8-126	50.9	11.3	QM-07
Toluene	0.100	0.002	"	0.100	ND	99.5	65.1-130	56.7	15.4	QM-07
Ethylbenzene	0.104	0.002	"	0.100	ND	104	62.2-130	58.0	19.6	QM-07
m,p-Xylene	0.204	0.004	"	0.200	ND	102	46.5-137	58.9	19.2	QM-07
o-Xylene	0.103	0.002	"	0.100	ND	103	54.2-134	58.4	17.9	QM-07
Surrogate: 1,2-Dichloroethane-d4	62		ug/kg	62.5		99.7	70-130			
Surrogate: Toluene-d8	63		"	62.5		101	70-130			
Surrogate: 4-Bromofluorobenzene	65		"	62.5		104	70-130			

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 Project: KMG - Van Schaack 4-11

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 5D10013 - EPA 3580

Blank (5D10013-BLK1)

Prepared: 04/10/2015 Analyzed: 04/10/2015

Gasoline (C6-C10)	ND	50	mg/kg							
Diesel (C10-C28)	ND	50	"							
Residual Range Organics (C28-C36)	ND	200	"							
Surrogate: o-Terphenyl	47.2		"	50.0		94.3	65-146			

LCS (5D10013-BS1)

Prepared: 04/10/2015 Analyzed: 04/10/2015

Gasoline (C6-C10)	950	50	mg/kg	1000		94.8	66.7-119			
Diesel (C10-C28)	930	50	"	1000		93.2	70.1-127			
Residual Range Organics (C28-C36)	590	200	"	1000		59.0	54.5-139			
Surrogate: o-Terphenyl	46.8		"	50.0		93.7	65-146			

Matrix Spike (5D10013-MS1)

Source: X504121-02

Prepared: 04/10/2015 Analyzed: 04/10/2015

Gasoline (C6-C10)	980	50	mg/kg	1000	ND	97.7	56.4-132			
Diesel (C10-C28)	1100	50	"	1000	160	99.0	57.4-138			
Residual Range Organics (C28-C36)	730	200	"	1000	47	67.8	47.7-129			
Surrogate: o-Terphenyl	48.7		"	50.0		97.5	65-146			

Matrix Spike Dup (5D10013-MSD1)

Source: X504121-02

Prepared: 04/10/2015 Analyzed: 04/10/2015

Gasoline (C6-C10)	920	50	mg/kg	1000	ND	92.0	56.4-132	5.99	22	
Diesel (C10-C28)	1000	50	"	1000	160	87.4	57.4-138	10.7	18.3	
Residual Range Organics (C28-C36)	630	200	"	1000	47	58.7	47.7-129	13.4	30.1	
Surrogate: o-Terphenyl	46.9		"	50.0		93.8	65-146			

Origins Laboratory, Inc.



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

John Cocroft
 Project Number: 014215071
 Project: KMG - Van Schaack 4-11

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 5D10011 - NO PREP										
Duplicate (5D10011-DUP1)		Source: X504121-01			Prepared: 04/10/2015 Analyzed: 04/10/2015					
pH	8.58		pH Units		8.57			0.117	25	
Batch 5D10012 - NO PREP										
Blank (5D10012-BLK1)					Prepared: 04/10/2015 Analyzed: 04/10/2015					
Specific Conductance (EC)	0.00180		mmhos/cm							
Duplicate (5D10012-DUP1)		Source: X504121-01			Prepared: 04/10/2015 Analyzed: 04/10/2015					
Specific Conductance (EC)	0.225		mmhos/cm		0.229			1.76	25	

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

John Cocroft
Project Number: 014215071
Project: KMG - Van Schaack 4-11

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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Noelle Doyle Mathis, President



April 24, 2015

LT Environmental, Inc.

John Cocroft

4600 West 60th Avenue

Arvada CO 80003

Project Name - KMG - Van Schaack 4-11

Project Number - 014215071

Attached are your analytical results for KMG - Van Schaack 4-11 received by Origins Laboratory, Inc. April 23, 2015. This project is associated with Origins project number X504277-01.

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: 014215071
Project: KMG - Van Schaack 4-11

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
GW02	X504277-01	Water	April 23, 2015 11:10	04/23/2015 16:50

Origins Laboratory, Inc.



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

John Cocroft
 Project Number: 014215071
 Project: KMG - Van Schaack 4-11

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: XSONZ77 Client: LTE
 Client Project ID: Van Schaack 4-11
 Checklist Completed by: John Smith Shipped Via: HQ
 Date/time completed: 4/23/12 (UPS, FedEx, Hand Delivered, Pick-up, etc.)
 Airbill #: NA
 Matrix(s) Received: (Check all that apply): Soil/Solid Water Other: _____ (Describe)
 Cooler Number/Temperature: 1 13.4 °C 1 °C 1 °C 1 °C
 Thermometer ID: T013

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C ⁽¹⁾ ?	X			
Is there ice present (document if blue ice is used)	X			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		X		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		X		
Were all samples received intact ⁽¹⁾ ?	X			
Was adequate sample volume provided ⁽¹⁾ ?	X			
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?		X		
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	X			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	X			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	X			
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	X			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.		X		
Are samples preserved that require preservation and was it checked ⁽¹⁾ ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)/pH < 2 for samples preserved with HNO ₃ , HCL, H ₂ SO ₄ / (pH > 10 for samples preserved with NaAsO ₂ +NaOH, ZnAc+NaOH)		X		
Additional Comments (if any):				

⁽¹⁾If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

Reviewed by (Project Manager) [Signature] Date/Time Reviewed 4/23/12

Origins Laboratory, Inc.

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

John Cocroft
Project Number: 014215071
Project: KMG - Van Schaack 4-11

GW02
4/23/2015 11:10:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X504277-01 (Water)

BTEX by EPA 8260C

Benzene	3120	20.0	ug/L	20	5D22019	04/23/2015	04/23/2015	
Toluene	6570	50.0	"	50	"	"	04/23/2015	
Ethylbenzene	323	20.0	"	20	"	"	04/23/2015	
Xylenes, total	4150	20.0	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	91.7 %	87.3-113			"	"	04/23/2015	
Surrogate: Toluene-d8	107 %	90.9-108			"	"	"	
Surrogate: 4-Bromofluorobenzene	98.2 %	88.6-111			"	"	"	

Origins Laboratory, Inc.



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

John Cocroft
 Project Number: 014215071
 Project: KMG - Van Schaack 4-11

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 5D22019 - EPA 5030B (Water)

Blank (5D22019-BLK1)

Prepared: 04/22/2015 Analyzed: 04/23/2015

Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	1.0	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>62</i>		<i>"</i>	<i>62.5</i>	<i>99.8</i>	<i>99.8</i>	<i>87.3-113</i>			
<i>Surrogate: Toluene-d8</i>	<i>62</i>		<i>"</i>	<i>62.5</i>	<i>99.7</i>	<i>99.7</i>	<i>90.9-108</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>61</i>		<i>"</i>	<i>62.5</i>	<i>96.9</i>	<i>96.9</i>	<i>88.6-111</i>			

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 4600 West 60th Avenue
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John Cocroft
 Project Number: 014215071
 Project: KMG - Van Schaack 4-11

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 5D22019 - EPA 5030B (Water)

Blank (5D22019-BLK2)

Prepared: 04/22/2015 Analyzed: 04/23/2015

Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	63		"	62.5	100		87.3-113			
Surrogate: Toluene-d8	63		"	62.5	100		90.9-108			
Surrogate: 4-Bromofluorobenzene	60		"	62.5	96.5		88.6-111			

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John Cocroft
 Project Number: 014215071
 Project: KMG - Van Schaack 4-11

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 5D22019 - EPA 5030B (Water)										
LCS (5D22019-BS1)					Prepared: 04/22/2015 Analyzed: 04/23/2015					
Benzene	48.2	1.0	ug/L	50.0		96.4	75-126			
Toluene	45.6	1.0	"	50.0		91.3	78.7-126			
Ethylbenzene	44.5	1.0	"	50.0		89.1	80-130			
m,p-Xylene	89.8	2.0	"	100		89.8	77.2-133			
o-Xylene	45.0	1.0	"	50.0		90.0	77.9-126			
Surrogate: 1,2-Dichloroethane-d4	60		"	62.5		96.7	87.3-113			
Surrogate: Toluene-d8	61		"	62.5		98.0	90.9-108			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		98.0	88.6-111			

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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 5D22019 - EPA 5030B (Water)

LCS (5D22019-BS2)

Prepared: 04/22/2015 Analyzed: 04/23/2015

Benzene	55.0	1.0	ug/L	50.0	110	75-126				
Toluene	54.3	1.0	"	50.0	109	78.7-126				
Ethylbenzene	51.9	1.0	"	50.0	104	80-130				
m,p-Xylene	105	2.0	"	100	105	77.2-133				
o-Xylene	52.6	1.0	"	50.0	105	77.9-126				
Surrogate: 1,2-Dichloroethane-d4	62		"	62.5	99.1	87.3-113				
Surrogate: Toluene-d8	63		"	62.5	100	90.9-108				
Surrogate: 4-Bromofluorobenzene	62		"	62.5	99.7	88.6-111				

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 Project: KMG - Van Schaack 4-11

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 5D22019 - EPA 5030B (Water)

Matrix Spike (5D22019-MS1)	Source: X504242-23			Prepared: 04/22/2015 Analyzed: 04/23/2015						
Benzene	61.2	1.0	ug/L	50.0	ND	122	74-130			
Toluene	60.2	1.0	"	50.0	ND	120	73-131			
Ethylbenzene	58.9	1.0	"	50.0	ND	118	76-132			
m,p-Xylene	117	2.0	"	100	ND	117	69-139			
o-Xylene	56.2	1.0	"	50.0	ND	112	74-131			
Surrogate: 1,2-Dichloroethane-d4	63		"	62.5		101	87.3-113			
Surrogate: Toluene-d8	63		"	62.5		101	90.9-108			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		98.3	88.6-111			

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 Arvada CO 80003

John Cocroft
 Project Number: 014215071
 Project: KMG - Van Schaack 4-11

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 5D22019 - EPA 5030B (Water)

Matrix Spike (5D22019-MS2)	Source: X504249-08			Prepared: 04/22/2015 Analyzed: 04/23/2015						
Benzene	58.6	1.0	ug/L	50.0	ND	117	74-130			
Toluene	57.7	1.0	"	50.0	ND	115	73-131			
Ethylbenzene	55.9	1.0	"	50.0	ND	112	76-132			
m,p-Xylene	112	2.0	"	100	ND	112	69-139			
o-Xylene	53.8	1.0	"	50.0	ND	108	74-131			
Surrogate: 1,2-Dichloroethane-d4	64		"	62.5		102	87.3-113			
Surrogate: Toluene-d8	63		"	62.5		101	90.9-108			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		96.7	88.6-111			

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Noelle Doyle Mathis, President

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

John Cocroft
 Project Number: 014215071
 Project: KMG - Van Schaack 4-11

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 5D22019 - EPA 5030B (Water)										
Matrix Spike Dup (5D22019-MSD1)			Source: X504242-23			Prepared: 04/22/2015 Analyzed: 04/23/2015				
Benzene	58.1	1.0	ug/L	50.0	ND	116	74-130	5.22	20	
Toluene	56.5	1.0	"	50.0	ND	113	73-131	6.33	20	
Ethylbenzene	55.7	1.0	"	50.0	ND	111	76-132	5.50	20	
m,p-Xylene	111	2.0	"	100	ND	111	69-139	5.18	20	
o-Xylene	54.0	1.0	"	50.0	ND	108	74-131	4.07	20	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>61</i>		<i>"</i>	<i>62.5</i>		<i>97.8</i>	<i>87.3-113</i>			
<i>Surrogate: Toluene-d8</i>	<i>63</i>		<i>"</i>	<i>62.5</i>		<i>100</i>	<i>90.9-108</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>63</i>		<i>"</i>	<i>62.5</i>		<i>101</i>	<i>88.6-111</i>			

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Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5D22019 - EPA 5030B (Water)										
Matrix Spike Dup (5D22019-MSD2)		Source: X504249-08			Prepared: 04/22/2015 Analyzed: 04/23/2015					
Benzene	62.4	1.0	ug/L	50.0	ND	125	74-130	6.24	20	
Toluene	62.6	1.0	"	50.0	ND	125	73-131	8.19	20	
Ethylbenzene	62.3	1.0	"	50.0	ND	125	76-132	10.9	20	
m,p-Xylene	124	2.0	"	100	ND	124	69-139	10.3	20	
o-Xylene	59.1	1.0	"	50.0	ND	118	74-131	9.39	20	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>62</i>		<i>"</i>	<i>62.5</i>		<i>99.0</i>	<i>87.3-113</i>			
<i>Surrogate: Toluene-d8</i>	<i>63</i>		<i>"</i>	<i>62.5</i>		<i>101</i>	<i>90.9-108</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>63</i>		<i>"</i>	<i>62.5</i>		<i>100</i>	<i>88.6-111</i>			

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Notes and Definitions

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

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