

TABLE 2
GROUNDWATER ANALYTICAL AND FIELD RESULTS
HATCH UPRR 42-11 #1
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	02/12/2018	167	772	130	2180	17.00
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



February 08, 2018

LT Environmental, Inc.

Brian Sulzberger

4600 West 60th Avenue

Arvada CO 80003

Project Name - KMG - Hatch UPRR 42-11 #1

Project Number - 014218028

Attached are your analytical results for KMG - Hatch UPRR 42-11 #1 received by Origins Laboratory, Inc. February 07, 2018. This project is associated with Origins project number Y802116-01.

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



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

Brian Sulzberger
Project Number: 014218028
Project: KMG - Hatch UPRR 42-11 #1

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B01@5'	Y802116-01	Soil	February 7, 2018 11:30	02/07/2018 18:34
N01@4'	Y802116-02	Soil	February 7, 2018 11:31	02/07/2018 18:34
E01@4'	Y802116-03	Soil	February 7, 2018 11:32	02/07/2018 18:34
S01@4'	Y802116-04	Soil	February 7, 2018 11:33	02/07/2018 18:34
W01@4'	Y802116-05	Soil	February 7, 2018 11:34	02/07/2018 18:34

Origins Laboratory, Inc.



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

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #1

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: Y 802116 Client: LSE
 Client Project ID: KMG - Hatch UPRR 42-11 #1
 Checklist Completed by: Da Lee Shipped Via: 10
 Date/time completed: 2-7-18 (UPS, FedEx, Hand Delivered, Pick-up, etc.)
 Airbill #: N/A
 Matrix(s) Received: (Check all that apply): Soil/Solid Water Other: _____
 Cooler Number/Temperature: 1 / 3.3 °C 1 °C 1 °C (Describe)
 Thermometer ID: 1003

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

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

Reviewed by (Project Manager) [Signature]

Date/Time Reviewed 2-7-18

Origins Laboratory, Inc.

Jefe Pellegrini

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

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #1

B01@5'
2/7/2018 11:30:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y802116-01 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	25.0	mg/kg	1	B8B0706	02/07/2018	02/07/2018	U
Residual Range Organics (C28-C40)	ND	100	"	"	"	"	"	U

Surrogate: *o*-Terphenyl 84.7 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	6.45	5.00	mg/kg	25	B8B0705	02/07/2018	02/08/2018	
Benzene	ND	0.050	"	"	"	"	"	U
Toluene	ND	0.050	"	"	"	"	"	U
Ethylbenzene	ND	0.050	"	"	"	"	"	U
Xylenes, total	ND	0.050	"	"	"	"	"	U

Surrogate: 1,2-Dichloroethane-d4 98.9 % 70-130 " " "
 Surrogate: Toluene-d8 100 % 70-130 " " "
 Surrogate: 4-Bromofluorobenzene 102 % 70-130 " " "

pH in Soil by EPA 9045D

pH	8.26		pH Units	1	B8B0707	02/07/2018	02/08/2018	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.0380		mmhos/cm	"	B8B0708	02/07/2018	02/08/2018	
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Origins Laboratory, Inc.



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

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #1

N01@4'
2/7/2018 11:31:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y802116-02 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	25.0	mg/kg	1	B8B0706	02/07/2018	02/07/2018	U
Residual Range Organics (C28-C40)	ND	100	"	"	"	"	"	U

Surrogate: o-Terphenyl 80.7 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B8B0705	02/07/2018	02/08/2018	U
Benzene	ND	0.002	"	"	"	"	"	U
Toluene	0.005	0.002	"	"	"	"	"	
Ethylbenzene	0.010	0.002	"	"	"	"	"	
Xylenes, total	0.018	0.002	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4 109 % 70-130 " " "
Surrogate: Toluene-d8 99.7 % 70-130 " " "
Surrogate: 4-Bromofluorobenzene 105 % 70-130 " " "

pH in Soil by EPA 9045D

pH	6.28		pH Units	1	B8B0707	02/07/2018	02/08/2018	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.0112		mmhos/cm	"	B8B0708	02/07/2018	02/08/2018	
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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO 80003

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #1

E01@4'
2/7/2018 11:32:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y802116-03 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	25.0	mg/kg	1	B8B0706	02/07/2018	02/07/2018	U
Residual Range Organics (C28-C40)	ND	100	"	"	"	"	"	U

<i>Surrogate: o-Terphenyl</i>	82.6 %	59-131			"	"	"	
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GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	4.10	0.200	mg/kg	1	B8B0705	02/07/2018	02/08/2018	
Benzene	0.005	0.002	"	"	"	"	"	
Toluene	0.020	0.002	"	"	"	"	"	
Ethylbenzene	0.145	0.002	"	"	"	"	"	
Xylenes, total	0.313	0.002	"	"	"	"	"	

<i>Surrogate: 1,2-Dichloroethane-d4</i>	107 %	70-130			"	"	"	
<i>Surrogate: Toluene-d8</i>	95.6 %	70-130			"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>	116 %	70-130			"	"	"	

pH in Soil by EPA 9045D

pH	6.28		pH Units	1	B8B0707	02/07/2018	02/08/2018	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.0168		mmhos/cm	"	B8B0708	02/07/2018	02/08/2018	
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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO 80003

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #1

S01@4'
2/7/2018 11:33:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y802116-04 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	25.0	mg/kg	1	B8B0706	02/07/2018	02/07/2018	U
Residual Range Organics (C28-C40)	ND	100	"	"	"	"	"	U

Surrogate: o-Terphenyl 80.0 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	5.00	mg/kg	25	B8B0705	02/07/2018	02/08/2018	U
Benzene	ND	0.050	"	"	"	"	"	U
Toluene	ND	0.050	"	"	"	"	"	U
Ethylbenzene	ND	0.050	"	"	"	"	"	U
Xylenes, total	ND	0.050	"	"	"	"	"	U

Surrogate: 1,2-Dichloroethane-d4 99.7 % 70-130 " " "
Surrogate: Toluene-d8 101 % 70-130 " " "
Surrogate: 4-Bromofluorobenzene 98.4 % 70-130 " " "

pH in Soil by EPA 9045D

pH	6.42		pH Units	1	B8B0707	02/07/2018	02/08/2018	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.0113		mmhos/cm	"	B8B0708	02/07/2018	02/08/2018	
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LT Environmental, Inc.
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 Arvada CO 80003

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #1

W01@4'
2/7/2018 11:34:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y802116-05 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	1070	25.0	mg/kg	1	B8B0706	02/07/2018	02/07/2018	
Residual Range Organics (C28-C40)	ND	100	"	"	"	"	"	U

Surrogate: *o*-Terphenyl 93.1 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	2800	50.0	mg/kg	250	B8B0705	02/07/2018	02/08/2018	
Benzene	0.362	0.050	"	25	"	"	02/08/2018	
Toluene	12.2	0.498	"	250	"	"	02/08/2018	
Ethylbenzene	51.7	0.498	"	"	"	"	"	
Xylenes, total	147	0.498	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4 104 % 70-130 " " "
 Surrogate: Toluene-d8 86.7 % 70-130 " " "
 Surrogate: 4-Bromofluorobenzene 112 % 70-130 " " "

pH in Soil by EPA 9045D

pH	6.26		pH Units	1	B8B0707	02/07/2018	02/08/2018	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.0156		mmhos/cm	"	B8B0708	02/07/2018	02/08/2018	
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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO 80003

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #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 B8B0705 - EPA 5030 (soil)										
Blank (B8B0705-BLK1)										
					Prepared: 02/07/2018 Analyzed: 02/07/2018					
Gasoline Range Hydrocarbons	ND	0.200	mg/kg							U
Benzene	ND	0.002	"							U
Toluene	ND	0.002	"							U
Ethylbenzene	ND	0.002	"							U
Xylenes, total	ND	0.002	"							U
Surrogate: 1,2-Dichloroethane-d4	70		ug/kg	62.5		113	70-130			
Surrogate: Toluene-d8	61		"	62.5		98.3	70-130			
Surrogate: 4-Bromofluorobenzene	65		"	62.5		104	70-130			

Origins Laboratory, Inc.



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Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #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 B8B0705 - EPA 5030 (soil)

LCS (B8B0705-BS1)

Prepared: 02/07/2018 Analyzed: 02/07/2018

Benzene	0.103	0.002	mg/kg	0.100		103	77.1-124			
Toluene	0.099	0.002	"	0.100		98.6	74.5-128			
Ethylbenzene	0.098	0.002	"	0.100		98.3	66.4-127			
m,p-Xylene	0.202	0.004	"	0.200		101	76.6-124			
o-Xylene	0.105	0.002	"	0.100		105	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	64		ug/kg	62.5		102	70-130			
Surrogate: Toluene-d8	62		"	62.5		99.1	70-130			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		100	70-130			

Origins Laboratory, Inc.



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

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #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 B8B0705 - EPA 5030 (soil)

Matrix Spike (B8B0705-MS1)	Source: Y802104-01			Prepared: 02/07/2018 Analyzed: 02/07/2018						
Benzene	0.136	0.002	mg/kg	0.100	ND	136	71.8-126			QM-07
Toluene	0.099	0.002	"	0.100	ND	98.6	65.1-130			
Ethylbenzene	0.100	0.002	"	0.100	ND	100	62.2-130			
m,p-Xylene	0.205	0.004	"	0.200	ND	102	46.5-137			
o-Xylene	0.105	0.002	"	0.100	ND	105	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	62		ug/kg	62.5		99.2	70-130			
Surrogate: Toluene-d8	61		"	62.5		98.1	70-130			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		101	70-130			

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 Arvada CO 80003

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #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 B8B0705 - EPA 5030 (soil)

Matrix Spike Dup (B8B0705-MSD1)	Source: Y802104-01			Prepared: 02/07/2018 Analyzed: 02/07/2018						
Benzene	0.128	0.002	mg/kg	0.100	ND	128	71.8-126	6.09	11.3	QM-07
Toluene	0.096	0.002	"	0.100	ND	96.4	65.1-130	2.34	15.4	
Ethylbenzene	0.096	0.002	"	0.100	ND	95.8	62.2-130	4.69	19.6	
m,p-Xylene	0.196	0.004	"	0.200	ND	98.2	46.5-137	4.04	19.2	
o-Xylene	0.102	0.002	"	0.100	ND	102	54.2-134	2.95	17.9	
Surrogate: 1,2-Dichloroethane-d4	62		ug/kg	62.5		99.3	70-130			
Surrogate: Toluene-d8	61		"	62.5		97.7	70-130			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		100	70-130			

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

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #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 B8B0706 - EPA 3580

Blank (B8B0706-BLK1)

Prepared: 02/07/2018 Analyzed: 02/07/2018

Diesel (C10-C28)	ND	50.0	mg/kg							U
Residual Range Organics (C28-C40)	ND	200	"							U
Surrogate: o-Terphenyl	51		"	50.0		103	59-131			

LCS (B8B0706-BS1)

Prepared: 02/07/2018 Analyzed: 02/07/2018

Diesel (C10-C28)	1090	50.0	mg/kg	1000		109	64-121			
Residual Range Organics (C28-C40)	1060	200	"	1000		106	58-124			
Surrogate: o-Terphenyl	55		"	50.0		111	59-131			

Matrix Spike (B8B0706-MS1)

Source: Y802095-01

Prepared: 02/07/2018 Analyzed: 02/07/2018

Diesel (C10-C28)	1030	50.0	mg/kg	1000	ND	103	53-125			
Residual Range Organics (C28-C40)	994	200	"	1000	11.5	98.2	47-133			
Surrogate: o-Terphenyl	52		"	50.0		105	59-131			

Matrix Spike Dup (B8B0706-MSD1)

Source: Y802095-01

Prepared: 02/07/2018 Analyzed: 02/07/2018

Diesel (C10-C28)	1010	50.0	mg/kg	1000	ND	101	53-125	1.63	20	
Residual Range Organics (C28-C40)	962	200	"	1000	11.5	95.1	47-133	3.28	20	
Surrogate: o-Terphenyl	50		"	50.0		100	59-131			

Origins Laboratory, Inc.



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

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #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 B8B0707 - NO PREP										
Duplicate (B8B0707-DUP1)		Source: Y802111-01			Prepared: 02/07/2018 Analyzed: 02/08/2018					
pH	8.05		pH Units		8.39			4.14	25	
Batch B8B0708 - NO PREP										
Blank (B8B0708-BLK1)		Prepared: 02/07/2018 Analyzed: 02/08/2018								
Specific Conductance (EC)	0.00170		mmhos/cm							
Duplicate (B8B0708-DUP1)		Source: Y802111-01			Prepared: 02/07/2018 Analyzed: 02/08/2018					
Specific Conductance (EC)	0.0924		mmhos/cm		0.0822			11.7	25	

Origins Laboratory, Inc.



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

Brian Sulzberger
Project Number: 014218028
Project: KMG - Hatch UPRR 42-11 #1

Notes and Definitions

U Sample is Non-Detect.

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.

Jen Pellegrini For Noelle Doyle Mathis, President

February 09, 2018

LT Environmental, Inc.

Brian Sulzberger

4600 West 60th Avenue

Arvada CO 80003

Project Name - KMG - Hatch UPRR 42-11 #1

Project Number - 014218028

Attached are your analytical results for KMG - Hatch UPRR 42-11 #1 received by Origins Laboratory, Inc. February 08, 2018. This project is associated with Origins project number Y802129-01.

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



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

Brian Sulzberger
Project Number: 014218028
Project: KMG - Hatch UPRR 42-11 #1

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
W02@13'	Y802129-01	Soil	February 8, 2018 15:15	02/08/2018 17:50

Origins Laboratory, Inc.



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

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #1

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: V802129 Client: LTE
 Client Project ID: KMG - Hatch UPRR
 Checklist Completed by: Don Lee Shipped Via: HD
 (UPS, FedEx, Hand Delivered, Pick-up, etc.)
 Date/time completed: 2-8-12 Airbill #: NA
 Matrix(s) Received: (Check all that apply): Soil/Solid Water Other: _____
 (Describe)
 Cooler Number/Temperature: 1541 °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"/>		sampled same Day
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"/>			pit
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.			<input checked="" type="checkbox"/>	
Are samples preserved that require preservation and was it checked ⁽¹⁾ ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)/(pH <2 for samples preserved with HNO ₃ , HCL, H ₂ SO ₄) / (pH >10 for samples preserved with NaAsO ₂ +NaOH, ZnAc+NaOH)			<input checked="" type="checkbox"/>	
Additional Comments (if any):				

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

Reviewed by (Project Manager) [Signature]

Date/Time Reviewed 2-8-12

Origins Laboratory, Inc.

Jefe Pellegrini

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

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #1

W02@13'
2/8/2018 3:15:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y802129-01 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	229	25.0	mg/kg	1	B8B0803	02/08/2018	02/08/2018	
Residual Range Organics (C28-C40)	ND	100	"	"	"	"	"	U

Surrogate: *o*-Terphenyl 101 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	71.8	5.00	mg/kg	25	B8B0802	02/08/2018	02/08/2018	
Benzene	ND	0.050	"	"	"	"	"	U
Toluene	0.107	0.050	"	"	"	"	"	
Ethylbenzene	0.920	0.050	"	"	"	"	"	
Xylenes, total	1.52	0.050	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4 104 % 70-130 " " "
 Surrogate: Toluene-d8 97.9 % 70-130 " " "
 Surrogate: 4-Bromofluorobenzene 109 % 70-130 " " "

pH in Soil by EPA 9045D

pH	8.59		pH Units	1	B8B0807	02/08/2018	02/08/2018	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.0625		mmhos/cm	"	B8B0808	02/08/2018	"	
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Origins Laboratory, Inc.



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

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #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 B8B0802 - EPA 5030 (soil)										
Blank (B8B0802-BLK1)										
					Prepared: 02/08/2018 Analyzed: 02/08/2018					
Gasoline Range Hydrocarbons	ND	0.200	mg/kg							U
Benzene	ND	0.002	"							U
Toluene	ND	0.002	"							U
Ethylbenzene	ND	0.002	"							U
Xylenes, total	ND	0.002	"							U
Surrogate: 1,2-Dichloroethane-d4	64		ug/kg	62.5		103	70-130			
Surrogate: Toluene-d8	63		"	62.5		100	70-130			
Surrogate: 4-Bromofluorobenzene	65		"	62.5		105	70-130			

Origins Laboratory, Inc.



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LT Environmental, Inc.
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 Arvada CO 80003

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #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 B8B0802 - EPA 5030 (soil)										
Blank (B8B0802-BLK2)										
					Prepared: 02/08/2018 Analyzed: 02/08/2018					
Gasoline Range Hydrocarbons	ND	0.200	mg/kg							U
Benzene	ND	0.002	"							U
Toluene	ND	0.002	"							U
Ethylbenzene	ND	0.002	"							U
Xylenes, total	ND	0.002	"							U
Surrogate: 1,2-Dichloroethane-d4	64		ug/kg	62.5		103	70-130			
Surrogate: Toluene-d8	63		"	62.5		100	70-130			
Surrogate: 4-Bromofluorobenzene	65		"	62.5		105	70-130			

Origins Laboratory, Inc.



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LT Environmental, Inc.
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 Arvada CO 80003

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #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 B8B0802 - EPA 5030 (soil)

LCS (B8B0802-BS1)

Prepared: 02/08/2018 Analyzed: 02/08/2018

Benzene	0.092	0.002	mg/kg	0.100		92.3	77.1-124			
Toluene	0.089	0.002	"	0.100		88.6	74.5-128			
Ethylbenzene	0.087	0.002	"	0.100		86.9	66.4-127			
m,p-Xylene	0.177	0.004	"	0.200		88.3	76.6-124			
o-Xylene	0.092	0.002	"	0.100		92.3	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	60		ug/kg	62.5		96.7	70-130			
Surrogate: Toluene-d8	62		"	62.5		98.6	70-130			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		99.4	70-130			

Origins Laboratory, Inc.



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

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #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 B8B0802 - EPA 5030 (soil)

LCS (B8B0802-BS2)

Prepared: 02/08/2018 Analyzed: 02/08/2018

Benzene	0.100	0.002	mg/kg	0.100		100	77.1-124			
Toluene	0.098	0.002	"	0.100		97.6	74.5-128			
Ethylbenzene	0.097	0.002	"	0.100		97.1	66.4-127			
m,p-Xylene	0.196	0.004	"	0.200		98.1	76.6-124			
o-Xylene	0.103	0.002	"	0.100		103	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	58		ug/kg	62.5		93.0	70-130			
Surrogate: Toluene-d8	62		"	62.5		99.8	70-130			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		100	70-130			

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LT Environmental, Inc.
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 Arvada CO 80003

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #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 B8B0802 - EPA 5030 (soil)

Matrix Spike (B8B0802-MS1)	Source: Y802095-01			Prepared: 02/08/2018 Analyzed: 02/08/2018						
Benzene	0.093	0.002	mg/kg	0.100	ND	92.6	71.8-126			
Toluene	0.091	0.002	"	0.100	ND	90.9	65.1-130			
Ethylbenzene	0.090	0.002	"	0.100	ND	89.6	62.2-130			
m,p-Xylene	0.181	0.004	"	0.200	ND	90.4	46.5-137			
o-Xylene	0.095	0.002	"	0.100	ND	94.9	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	58		ug/kg	62.5		93.5	70-130			
Surrogate: Toluene-d8	62		"	62.5		99.5	70-130			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		102	70-130			

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Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #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 B8B0802 - EPA 5030 (soil)

Matrix Spike (B8B0802-MS2)	Source: Y802095-02			Prepared: 02/08/2018 Analyzed: 02/08/2018						
Benzene	0.088	0.002	mg/kg	0.100	ND	87.7	71.8-126			
Toluene	0.084	0.002	"	0.100	ND	83.9	65.1-130			
Ethylbenzene	0.082	0.002	"	0.100	ND	81.5	62.2-130			
m,p-Xylene	0.165	0.004	"	0.200	ND	82.6	46.5-137			
o-Xylene	0.087	0.002	"	0.100	ND	87.0	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	60		ug/kg	62.5		96.5	70-130			
Surrogate: Toluene-d8	62		"	62.5		99.2	70-130			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		99.1	70-130			

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

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #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 B8B0802 - EPA 5030 (soil)

Matrix Spike Dup (B8B0802-MSD1)	Source: Y802095-01			Prepared: 02/08/2018 Analyzed: 02/08/2018						
Benzene	0.091	0.002	mg/kg	0.100	ND	91.4	71.8-126	1.37	11.3	
Toluene	0.089	0.002	"	0.100	ND	89.2	65.1-130	1.84	15.4	
Ethylbenzene	0.088	0.002	"	0.100	ND	88.2	62.2-130	1.58	19.6	
m,p-Xylene	0.180	0.004	"	0.200	ND	90.0	46.5-137	0.465	19.2	
o-Xylene	0.094	0.002	"	0.100	ND	94.1	54.2-134	0.846	17.9	
Surrogate: 1,2-Dichloroethane-d4	61		ug/kg	62.5		97.5	70-130			
Surrogate: Toluene-d8	62		"	62.5		99.3	70-130			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		101	70-130			

Origins Laboratory, Inc.



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LT Environmental, Inc.
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 Arvada CO 80003

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #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 B8B0802 - EPA 5030 (soil)

Matrix Spike Dup (B8B0802-MSD2)	Source: Y802095-02			Prepared: 02/08/2018 Analyzed: 02/08/2018						
Benzene	0.094	0.002	mg/kg	0.100	ND	93.9	71.8-126	6.83	11.3	
Toluene	0.091	0.002	"	0.100	ND	90.5	65.1-130	7.61	15.4	
Ethylbenzene	0.087	0.002	"	0.100	ND	87.0	62.2-130	6.50	19.6	
m,p-Xylene	0.178	0.004	"	0.200	ND	88.9	46.5-137	7.38	19.2	
o-Xylene	0.094	0.002	"	0.100	ND	93.6	54.2-134	7.31	17.9	
Surrogate: 1,2-Dichloroethane-d4	61		ug/kg	62.5		97.0	70-130			
Surrogate: Toluene-d8	62		"	62.5		99.7	70-130			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		100	70-130			

Origins Laboratory, Inc.



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

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #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 B8B0803 - EPA 3550B

Blank (B8B0803-BLK1)

Prepared: 02/08/2018 Analyzed: 02/08/2018

Diesel (C10-C28)	ND	50.0	mg/kg							U
Residual Range Organics (C28-C40)	ND	200	"							U
Surrogate: o-Terphenyl	43		"	50.0		85.4	59-131			

Blank (B8B0803-BLK2)

Prepared: 02/08/2018 Analyzed: 02/09/2018

Diesel (C10-C28)	ND	50.0	mg/kg							U
Residual Range Organics (C28-C40)	ND	200	"							U
Surrogate: o-Terphenyl	43		"	50.0		85.2	59-131			

LCS (B8B0803-BS1)

Prepared: 02/08/2018 Analyzed: 02/08/2018

Diesel (C10-C28)	1170	50.0	mg/kg	1000		117	64-121			
Residual Range Organics (C28-C40)	1110	200	"	1000		111	58-124			
Surrogate: o-Terphenyl	58		"	50.0		116	59-131			

LCS (B8B0803-BS2)

Prepared: 02/08/2018 Analyzed: 02/09/2018

Diesel (C10-C28)	963	50.0	mg/kg	1000		96.3	64-121			
Residual Range Organics (C28-C40)	957	200	"	1000		95.7	58-124			
Surrogate: o-Terphenyl	49		"	50.0		97.2	59-131			

Matrix Spike (B8B0803-MS1)

Source: Y802097-01

Prepared: 02/08/2018 Analyzed: 02/08/2018

Diesel (C10-C28)	975	50.0	mg/kg	1000	ND	97.5	53-125			
Residual Range Organics (C28-C40)	1060	200	"	1000	18.4	104	47-133			

Origins Laboratory, Inc.



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

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #1

Extractable Petroleum Hydrocarbons by 8015C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B8B0803 - EPA 3550B										
Matrix Spike (B8B0803-MS1)		Source: Y802097-01			Prepared: 02/08/2018 Analyzed: 02/08/2018					
Surrogate: o-Terphenyl	50		mg/kg	50.0		99.1	59-131			
Matrix Spike (B8B0803-MS2)		Source: Y802097-02			Prepared: 02/08/2018 Analyzed: 02/09/2018					
Diesel (C10-C28)	940	50.0	mg/kg	1000		94.0	53-125			
Residual Range Organics (C28-C40)	909	200	"	1000		90.9	47-133			
Surrogate: o-Terphenyl	48		"	50.0		96.6	59-131			
Matrix Spike Dup (B8B0803-MSD1)		Source: Y802097-01			Prepared: 02/08/2018 Analyzed: 02/08/2018					
Diesel (C10-C28)	993	50.0	mg/kg	1000	ND	99.3	53-125	1.79	20	
Residual Range Organics (C28-C40)	969	200	"	1000	18.4	95.0	47-133	8.74	20	
Surrogate: o-Terphenyl	50		"	50.0		99.3	59-131			
Matrix Spike Dup (B8B0803-MSD2)		Source: Y802097-02			Prepared: 02/08/2018 Analyzed: 02/09/2018					
Diesel (C10-C28)	949	50.0	mg/kg	1000		94.9	53-125	0.972	20	
Residual Range Organics (C28-C40)	935	200	"	1000		93.5	47-133	2.80	20	
Surrogate: o-Terphenyl	48		"	50.0		96.2	59-131			

Origins Laboratory, Inc.



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

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #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 B8B0807 - NO PREP										
Duplicate (B8B0807-DUP1)		Source: Y802126-01			Prepared: 02/08/2018 Analyzed: 02/08/2018					
pH	7.51		pH Units		7.81			3.92	25	
Batch B8B0808 - NO PREP										
Blank (B8B0808-BLK1)		Prepared: 02/08/2018 Analyzed: 02/08/2018								
Specific Conductance (EC)	0.00220		mmhos/cm							
Duplicate (B8B0808-DUP1)		Source: Y802126-01			Prepared: 02/08/2018 Analyzed: 02/08/2018					
Specific Conductance (EC)	0.721		mmhos/cm		0.772			6.78	25	

Origins Laboratory, Inc.



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

Brian Sulzberger
Project Number: 014218028
Project: KMG - Hatch UPRR 42-11 #1

Notes and Definitions

U Sample is Non-Detect.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



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February 13, 2018

LT Environmental, Inc.

Brian Sulzberger

4600 West 60th Avenue

Arvada CO 80003

Project Name - KMG - Hatch UPRR 42-11 #1

Project Number - 014218028

Attached are your analytical results for KMG - Hatch UPRR 42-11 #1 received by Origins Laboratory, Inc. February 12, 2018. This project is associated with Origins project number Y802166-01.

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



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

Brian Sulzberger
Project Number: 014218028
Project: KMG - Hatch UPRR 42-11 #1

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
N02@13'	Y802166-01	Soil	February 12, 2018 15:20	02/12/2018 17:13
E02@13'	Y802166-02	Soil	February 12, 2018 15:21	02/12/2018 17:13
S02@13'	Y802166-03	Soil	February 12, 2018 15:22	02/12/2018 17:13
GW01	Y802166-04	Water	February 12, 2018 15:30	02/12/2018 17:13

Origins Laboratory, Inc.



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

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #1

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: Y 802166 Client: LTE
 Checklist Completed by: Jan Lee Client Project ID: KMG - Hatch UPRR 42-11 #1
 Date/time completed: 2-12-12 Shipped Via: AD
 (UPS, FedEx, Hand Delivered, Pick-up, etc.)
 Airbill #: AD
 Matrix(s) Received: (Check all that apply): Soil/Solid Water Other: _____
 (Describe)
 Cooler Number/Temperature: 1 0.6 °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)?}	<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 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.

Reviewed by (Project Manager) _____

2-12-12
 Date/Time Reviewed

Origins Laboratory, Inc.



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

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #1

N02@13'
2/12/2018 3:20:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y802166-01 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	25.0	mg/kg	1	B8B1206	02/12/2018	02/12/2018	U
Residual Range Organics (C28-C40)	ND	100	"	"	"	"	"	U

Surrogate: *o*-Terphenyl 67.3 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B8B1207	02/12/2018	02/12/2018	U
Benzene	ND	0.002	"	"	"	"	"	U
Toluene	ND	0.002	"	"	"	"	"	U
Ethylbenzene	ND	0.002	"	"	"	"	"	U
Xylenes, total	ND	0.002	"	"	"	"	"	U

Surrogate: 1,2-Dichloroethane-d4 110 % 70-130 " " "
 Surrogate: Toluene-d8 101 % 70-130 " " "
 Surrogate: 4-Bromofluorobenzene 101 % 70-130 " " "

pH in Soil by EPA 9045D

pH	8.44		pH Units	1	B8B1209	02/12/2018	02/12/2018	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.0973		mmhos/cm	"	B8B1210	02/12/2018	"	
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Origins Laboratory, Inc.



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

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #1

E02@13'
2/12/2018 3:21:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y802166-02 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	25.0	mg/kg	1	B8B1206	02/12/2018	02/12/2018	U
Residual Range Organics (C28-C40)	ND	100	"	"	"	"	"	U

Surrogate: *o*-Terphenyl 79.5 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	5.00	mg/kg	25	B8B1207	02/12/2018	02/12/2018	U
Benzene	ND	0.050	"	"	"	"	"	U
Toluene	ND	0.050	"	"	"	"	"	U
Ethylbenzene	ND	0.050	"	"	"	"	"	U
Xylenes, total	ND	0.050	"	"	"	"	"	U

Surrogate: 1,2-Dichloroethane-d4 99.5 % 70-130 " " "
 Surrogate: Toluene-d8 102 % 70-130 " " "
 Surrogate: 4-Bromofluorobenzene 97.4 % 70-130 " " "

pH in Soil by EPA 9045D

pH	8.45		pH Units	1	B8B1209	02/12/2018	02/12/2018	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.0711		mmhos/cm	"	B8B1210	02/12/2018	"	
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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO 80003

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #1

S02@13'
2/12/2018 3:22:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y802166-03 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	25.0	mg/kg	1	B8B1206	02/12/2018	02/12/2018	U
Residual Range Organics (C28-C40)	ND	100	"	"	"	"	"	U

Surrogate: *o*-Terphenyl 73.0 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	8.34	5.00	mg/kg	25	B8B1207	02/12/2018	02/12/2018	
Benzene	ND	0.050	"	"	"	"	"	U
Toluene	ND	0.050	"	"	"	"	"	U
Ethylbenzene	ND	0.050	"	"	"	"	"	U
Xylenes, total	ND	0.050	"	"	"	"	"	U

Surrogate: 1,2-Dichloroethane-d4 101 % 70-130 " " "
 Surrogate: Toluene-d8 101 % 70-130 " " "
 Surrogate: 4-Bromofluorobenzene 97.6 % 70-130 " " "

pH in Soil by EPA 9045D

pH	8.23		pH Units	1	B8B1209	02/12/2018	02/12/2018	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.0872		mmhos/cm	"	B8B1210	02/12/2018	"	
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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO 80003

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #1

GW01
2/12/2018 3:30:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y802166-04 (Water)

BTEX by EPA 8260C

Benzene	167	100	ug/L	100	B8B1201	02/12/2018	02/12/2018	
Toluene	772	100	"	"	"	"	"	
Ethylbenzene	130	100	"	"	"	"	"	
Xylenes, total	2180	100	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	103 %	84-121			"	"	"	
Surrogate: Toluene-d8	100 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	99.8 %	84-114			"	"	"	

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LT Environmental, Inc.
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 Arvada CO 80003

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #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 B8B1201 - EPA 5030B (Water)

Blank (B8B1201-BLK1)

Prepared: 02/12/2018 Analyzed: 02/12/2018

Benzene	ND	1.00	ug/L							U
Toluene	ND	1.00	"							U
Ethylbenzene	ND	1.00	"							U
Xylenes, total	ND	1.00	"							U
Surrogate: 1,2-Dichloroethane-d4	61		"	62.5	98.0		84-121			
Surrogate: Toluene-d8	60		"	62.5	95.3		85-115			
Surrogate: 4-Bromofluorobenzene	59		"	62.5	94.3		84-114			

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 Arvada CO 80003

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #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 B8B1201 - EPA 5030B (Water)

Blank (B8B1201-BLK2)

Prepared: 02/12/2018 Analyzed: 02/12/2018

Benzene	ND	1.00	ug/L							U
Toluene	ND	1.00	"							U
Ethylbenzene	ND	1.00	"							U
Xylenes, total	ND	1.00	"							U
Surrogate: 1,2-Dichloroethane-d4	58		"	62.5	92.0		84-121			
Surrogate: Toluene-d8	64		"	62.5	102		85-115			
Surrogate: 4-Bromofluorobenzene	61		"	62.5	97.2		84-114			

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 Arvada CO 80003

Brian Sulzberger
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 Project: KMG - Hatch UPRR 42-11 #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 B8B1201 - EPA 5030B (Water)

LCS (B8B1201-BS1)

Prepared: 02/12/2018 Analyzed: 02/12/2018

Benzene	45.1	1.00	ug/L	50.0		90.3	73.3-129			
Toluene	44.0	1.00	"	50.0		88.0	76.2-123			
Ethylbenzene	43.3	1.00	"	50.0		86.6	73.6-130			
m,p-Xylene	85.6	2.00	"	100		85.6	76.1-126			
o-Xylene	42.4	1.00	"	50.0		84.9	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	60		"	62.5		95.8	84-121			
Surrogate: Toluene-d8	63		"	62.5		101	85-115			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		103	84-114			

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 Arvada CO 80003

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #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 B8B1201 - EPA 5030B (Water)

LCS (B8B1201-BS2)

Prepared: 02/12/2018 Analyzed: 02/12/2018

Benzene	49.2	1.00	ug/L	50.0		98.5	73.3-129			
Toluene	48.7	1.00	"	50.0		97.4	76.2-123			
Ethylbenzene	46.9	1.00	"	50.0		93.8	73.6-130			
m,p-Xylene	91.4	2.00	"	100		91.4	76.1-126			
o-Xylene	44.3	1.00	"	50.0		88.6	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	61		"	62.5		98.0	84-121			
Surrogate: Toluene-d8	65		"	62.5		104	85-115			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		100	84-114			

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 Arvada CO 80003

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 Project Number: 014218028
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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 B8B1201 - EPA 5030B (Water)

Matrix Spike (B8B1201-MS1)	Source: Y802092-05			Prepared: 02/12/2018 Analyzed: 02/12/2018						
Benzene	52.4	1.00	ug/L	50.0	ND	105	74-130			
Toluene	52.2	1.00	"	50.0	ND	104	73-131			
Ethylbenzene	49.9	1.00	"	50.0	ND	99.8	76-132			
m,p-Xylene	96.5	2.00	"	100	ND	96.5	69-139			
o-Xylene	45.7	1.00	"	50.0	ND	91.5	74-131			
Surrogate: 1,2-Dichloroethane-d4	54		"	62.5		87.0	84-121			
Surrogate: Toluene-d8	64		"	62.5		102	85-115			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		99.9	84-114			

Origins Laboratory, Inc.



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

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #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 B8B1201 - EPA 5030B (Water)

Matrix Spike (B8B1201-MS2)	Source: Y802092-08			Prepared: 02/12/2018 Analyzed: 02/12/2018						
Benzene	51.3	1.00	ug/L	50.0	ND	103	74-130			
Toluene	50.9	1.00	"	50.0	ND	102	73-131			
Ethylbenzene	49.1	1.00	"	50.0	0.070	98.1	76-132			
m,p-Xylene	94.6	2.00	"	100	ND	94.6	69-139			
o-Xylene	45.4	1.00	"	50.0	ND	90.8	74-131			
Surrogate: 1,2-Dichloroethane-d4	61		"	62.5		97.8	84-121			
Surrogate: Toluene-d8	64		"	62.5		103	85-115			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		97.6	84-114			

Origins Laboratory, Inc.



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

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #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 B8B1201 - EPA 5030B (Water)

Matrix Spike Dup (B8B1201-MSD1)	Source: Y802092-05			Prepared: 02/12/2018 Analyzed: 02/12/2018						
Benzene	51.5	1.00	ug/L	50.0	ND	103	74-130	1.62	20	
Toluene	51.1	1.00	"	50.0	ND	102	73-131	2.19	20	
Ethylbenzene	48.6	1.00	"	50.0	ND	97.2	76-132	2.68	20	
m,p-Xylene	94.9	2.00	"	100	ND	94.9	69-139	1.69	20	
o-Xylene	45.2	1.00	"	50.0	ND	90.4	74-131	1.12	20	
Surrogate: 1,2-Dichloroethane-d4	54		"	62.5		86.7	84-121			
Surrogate: Toluene-d8	65		"	62.5		105	85-115			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		99.3	84-114			

Origins Laboratory, Inc.



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

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #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 B8B1201 - EPA 5030B (Water)

Matrix Spike Dup (B8B1201-MSD2)	Source: Y802092-08			Prepared: 02/12/2018 Analyzed: 02/12/2018						
Benzene	46.6	1.00	ug/L	50.0	ND	93.1	74-130	9.73	20	
Toluene	46.0	1.00	"	50.0	ND	92.0	73-131	10.2	20	
Ethylbenzene	43.6	1.00	"	50.0	0.070	87.1	76-132	11.9	20	
m,p-Xylene	84.5	2.00	"	100	ND	84.5	69-139	11.3	20	
o-Xylene	41.6	1.00	"	50.0	ND	83.3	74-131	8.68	20	
Surrogate: 1,2-Dichloroethane-d4	61		"	62.5		97.8	84-121			
Surrogate: Toluene-d8	64		"	62.5		103	85-115			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		98.2	84-114			

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

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #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 B8B1207 - EPA 5030 (soil)										
Blank (B8B1207-BLK1)										
					Prepared: 02/12/2018 Analyzed: 02/12/2018					
Gasoline Range Hydrocarbons	ND	0.200	mg/kg							U
Benzene	ND	0.002	"							U
Toluene	ND	0.002	"							U
Ethylbenzene	ND	0.002	"							U
Xylenes, total	ND	0.002	"							U
Surrogate: 1,2-Dichloroethane-d4	68		ug/kg	62.5		109	70-130			
Surrogate: Toluene-d8	63		"	62.5		101	70-130			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		102	70-130			

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

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #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 B8B1207 - EPA 5030 (soil)

LCS (B8B1207-BS1)

Prepared: 02/12/2018 Analyzed: 02/12/2018

Benzene	0.104	0.002	mg/kg	0.100		104	77.1-124			
Toluene	0.100	0.002	"	0.100		99.9	74.5-128			
Ethylbenzene	0.099	0.002	"	0.100		99.5	66.4-127			
m,p-Xylene	0.198	0.004	"	0.200		98.8	76.6-124			
o-Xylene	0.096	0.002	"	0.100		96.4	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	61		ug/kg	62.5		96.9	70-130			
Surrogate: Toluene-d8	62		"	62.5		99.3	70-130			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		97.4	70-130			

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

Brian Sulzberger
 Project Number: 014218028
 Project: KMG - Hatch UPRR 42-11 #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 B8B1207 - EPA 5030 (soil)

Matrix Spike (B8B1207-MS1)	Source: Y802157-01			Prepared: 02/12/2018 Analyzed: 02/12/2018						
Benzene	0.103	0.002	mg/kg	0.100	0.006	96.8	71.8-126			
Toluene	0.099	0.002	"	0.100	0.005	93.8	65.1-130			
Ethylbenzene	0.095	0.002	"	0.100	0.0006	94.7	62.2-130			
m,p-Xylene	0.195	0.004	"	0.200	ND	97.4	46.5-137			
o-Xylene	0.095	0.002	"	0.100	0.0008	94.3	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	65		ug/kg	62.5		104	70-130			
Surrogate: Toluene-d8	61		"	62.5		97.2	70-130			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		99.6	70-130			

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Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8B1207 - EPA 5030 (soil)

Matrix Spike Dup (B8B1207-MSD1)	Source: Y802157-01			Prepared: 02/12/2018 Analyzed: 02/12/2018						
Benzene	0.108	0.002	mg/kg	0.100	0.006	102	71.8-126	5.19	11.3	
Toluene	0.103	0.002	"	0.100	0.005	98.6	65.1-130	4.75	15.4	
Ethylbenzene	0.099	0.002	"	0.100	0.0006	98.1	62.2-130	3.53	19.6	
m,p-Xylene	0.205	0.004	"	0.200	ND	102	46.5-137	5.02	19.2	
o-Xylene	0.100	0.002	"	0.100	0.0008	99.5	54.2-134	5.24	17.9	
Surrogate: 1,2-Dichloroethane-d4	65		ug/kg	62.5		104	70-130			
Surrogate: Toluene-d8	62		"	62.5		98.6	70-130			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		97.5	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 B8B1206 - EPA 3550B

Blank (B8B1206-BLK1)

Prepared: 02/12/2018 Analyzed: 02/12/2018

Diesel (C10-C28)	ND	50.0	mg/kg							U
Residual Range Organics (C28-C40)	ND	200	"							U
Surrogate: o-Terphenyl	44		"	50.0		87.6	59-131			

LCS (B8B1206-BS1)

Prepared: 02/12/2018 Analyzed: 02/12/2018

Diesel (C10-C28)	907	50.0	mg/kg	1000		90.7	64-121			
Residual Range Organics (C28-C40)	833	200	"	1000		83.3	58-124			
Surrogate: o-Terphenyl	43		"	50.0		86.5	59-131			

Matrix Spike (B8B1206-MS1)

Source: Y802123-01

Prepared: 02/12/2018 Analyzed: 02/12/2018

Diesel (C10-C28)	1300	50.0	mg/kg	1000	380	92.3	53-125			
Residual Range Organics (C28-C40)	953	200	"	1000	96.5	85.6	47-133			
Surrogate: o-Terphenyl	52		"	50.0		104	59-131			

Matrix Spike Dup (B8B1206-MSD1)

Source: Y802123-01

Prepared: 02/12/2018 Analyzed: 02/12/2018

Diesel (C10-C28)	1260	50.0	mg/kg	1000	380	87.7	53-125	5.06	20	
Residual Range Organics (C28-C40)	883	200	"	1000	96.5	78.7	47-133	8.42	20	
Surrogate: o-Terphenyl	47		"	50.0		93.0	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 B8B1209 - NO PREP										
Duplicate (B8B1209-DUP1)		Source: Y802165-01			Prepared: 02/12/2018 Analyzed: 02/12/2018					
pH	8.42		pH Units		8.62			2.35	25	
Batch B8B1210 - NO PREP										
Blank (B8B1210-BLK1)		Prepared: 02/12/2018 Analyzed: 02/12/2018								
Specific Conductance (EC)	0.00410		mmhos/cm							
Duplicate (B8B1210-DUP1)		Source: Y802165-01			Prepared: 02/12/2018 Analyzed: 02/12/2018					
Specific Conductance (EC)	0.221		mmhos/cm		0.220			0.499	25	

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Project Number: 014218028
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Notes and Definitions

U Sample is Non-Detect.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

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Jen Pellegrini For Noelle Doyle Mathis, President