

# State of Colorado Oil and Gas Conservation Commission

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Document Number:

401734020

Receive Date:

Report taken by:

## Site Investigation and Remediation Workplan (Supplemental Form)

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. However, this shall not preclude the Operator from taking immediate action to protect public health or safety, the environment, wildlife, or livestock.

This Form 27 describes site conditions as currently understood by the Operator; approval of this Form 27 by COGCC is based on the site conditions accurately described herein; any changes in site conditions identified during or subsequent to the performance of the approved workplan may necessitate additional investigation or remediation which shall be described on a supplemental Form 27. This Form 27 is intended to provide basic information regarding the proposed site investigation and remediation actions, but the workplan may be more fully described in attached documentation.

Refer to Rules 340, 905, 906, 907, 908, 909, and 910

### OPERATOR INFORMATION

Name of Operator: KERR MCGEE GATHERING LLC	Operator No: 47121	<b>Phone Numbers</b>
Address: PO BOX 173779		Phone: (720) 929-6000
City: DENVER	State: CO Zip: 80217	Mobile: ( )
Contact Person: Charles Chase	Email: Charles.Chase@anadarko.com	

### PROJECT, PURPOSE & SITE INFORMATION

#### PROJECT INFORMATION

Remediation Project #: 6039 Initial Form 27 Document #: 2215597

#### PURPOSE INFORMATION

- |                                                                                                    |                                                                                                            |
|----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> 901.e. Sensitive Area Determination                                       | <input checked="" type="checkbox"/> 909.c.(5), Rule 910.b.(4): Remediation of impacted ground water        |
| <input type="checkbox"/> 909.c.(1), Rule 905: Pit or PW vessel closure                             | <input type="checkbox"/> Rule 909.e.(2)A.: Notice completion of remediation in accordance with Rule 909.b. |
| <input checked="" type="checkbox"/> 909.c.(2), Rule 906: Spill/Release Remediation                 | <input type="checkbox"/> Rule 909.e.(2)B.: Closure of remediation project                                  |
| <input type="checkbox"/> 909.c.(3), Rule 907.e.: Land treatment of oily waste                      | <input type="checkbox"/> Rule 906.c.: Director request                                                     |
| <input type="checkbox"/> 909.c.(4), Rule 908.g.: Centralized E&P Waste Management Facility closure | <input type="checkbox"/> Other _____                                                                       |

#### SITE INFORMATION

N Multiple Facilities ( in accordance with Rule 909.c. )

Facility Type: SPILL OR RELEASE	Facility ID: -99999	API #: _____	County Name: _____
Facility Name: _____	Latitude: _____	Longitude: _____	
** correct Lat/Long if needed: Latitude: 40.205472		Longitude: -104.637533	
QtrQtr: _____	Sec: _____	Twp: _____	Range: _____ Meridian: _____ Sensitive Area? Yes

#### SITE CONDITIONS

General soil type - USCS Classifications SM Most Sensitive Adjacent Land Use Rangeland

Is domestic water well within 1/4 mile? Yes Is surface water within 1/4 mile? Yes

Is groundwater less than 20 feet below ground surface? Yes

#### Other Potential Receptors within 1/4 mile

Water well located approximately 720 feet (ft) southeast, surface water located approximately 980 ft east, building located approximately 530 ft southeast, livestock approximately 620 ft southeast, and groundwater present at approximately 6 ft below ground surface (bgs).

# SITE INVESTIGATION PLAN

## TYPE OF WASTE:

☒ E&P Waste

☐ Other E&P Waste

☐ Non-E&P Waste

☐ Produced Water

☐ Workover Fluids

☒ Oil

☐ Tank Bottoms

☐ Condensate

☐ Pigging Waste

☐ Drilling Fluids

☐ Rig Wash

☐ Drill Cuttings

☐ Spent Filters

☐ Pit Bottoms

☐ Other (as described by EPA)

## DESCRIPTION OF IMPACT

Impacted?	Impacted Media	Extent of Impact	How Determined
Yes	GROUNDWATER	See Attached Data	Groundwater Samples/Lab Analysis
Yes	SOILS	27' N-S X 33' E-W X 10' bgs	Soil Samples/Lab Analysis

## INITIAL ACTION SUMMARY

Description of initial action or emergency response measures take to abate, investigate, and/or remediate impacts associated with E&P Waste.

The oil dump valve on the separator at the Central Distribution Point #3 facility was stuck in the open position causing oil to spray out of the thief hatch. Approximately 10 barrels (bbls) of oil were released within the earthen berm and onto the surrounding ground surface. The oil dump valve was closed and bypassed the separator. A hydro-vacuum truck was used to recover approximately 6 bbls of standing oil. The petroleum hydrocarbon impacted soil was excavated.

## PROPOSED SAMPLING PLAN

### Proposed Soil Sampling

☒ Will soil samples be collected as part of this investigation? ( Number, type (grab/composite), analyses, and locations of samples ):

Please refer to the Form 27 submitted to the Colorado Oil and Gas Conservation Commission (COGCC) on August 17, 2011.

### Proposed Groundwater Sampling

☒ Will groundwater samples be collected as part of this investigation? ( Number, analyses, and locations of samples ):

Quarterly groundwater monitoring has been conducted at the site since May 2011.

### Proposed Surface Water Sampling

☐ Will surface water samples be collected as part of this investigation? ( Number, analyses, and locations of samples ):

## Additional Investigative Actions

☐ Additional alternative investigative actions described in attached Site Investigation Plan ( summary ):

# SITE INVESTIGATION REPORT

## SAMPLE SUMMARY

### Soil

Number of soil samples collected 14

Number of soil samples exceeding 910-1 3

Was the areal and vertical extent of soil contamination delineated? Yes

Approximate areal extent (square feet) 891

### NA / ND

-- Highest concentration of TPH (mg/kg) 5750

NA Highest concentration of SAR

BTEX > 910-1 Yes

Vertical Extent > 910-1 (in feet) 6

### Groundwater

Number of groundwater samples collected 198

Was extent of groundwater contaminated delineated? Yes

Depth to groundwater (below ground surface, in feet) 6'

Number of groundwater monitoring wells installed 10

Number of groundwater samples exceeding 910-1 33

-- Highest concentration of Benzene (µg/l) 4800

-- Highest concentration of Toluene (µg/l) 4100

-- Highest concentration of Ethylbenzene (µg/l) 150

-- Highest concentration of Xylene (µg/l) 2000

NA Highest concentration of Methane (mg/l)

### Surface Water

0 Number of surface water samples collected

Number of surface water samples exceeding 910-1

If surface water is impacted, other agency notification may be required.

## OTHER INVESTIGATION INFORMATION

☒ Were impacts to adjacent property or offsite impacts identified?

Groundwater impacts were encountered north of the excavation.

☐ Were background samples collected as part of this site investigation?

☐ Was investigation derived waste (IDW) generated as part of this investigation?

Volume of solid waste (cubic yards)

Volume of liquid waste (barrels)

☐ Is further site investigation required?

# REMEDIAL ACTION PLAN

Does this Supplemental Form 27A include changes to a previously approved Remedial Action Plan? No \_\_\_\_\_

## SOURCE REMOVAL SUMMARY

Describe how source is to be removed.

Please refer to the Form 27 submitted to the COGCC on August 17, 2011.

## REMEDICATION SUMMARY

Describe how remediation of existing impacts to soil and groundwater is to be accomplished (i.e. summarize remedial action plan). Provide a brief narrative description including: technical justification, schedule for implementation, estimated time to attain NFA status, plus plans and specifications for the selected remedial action technology.

Please refer to the Form 27 submitted to the COGCC on August 17, 2011.

## Soil Remediation Summary

☐ In Situ

\_\_\_\_\_ Bioremediation ( or enhanced bioremediation )

\_\_\_\_\_ Chemical oxidation

\_\_\_\_\_ Air sparge / Soil vapor extraction

\_\_\_\_\_ Natural Attenuation

\_\_\_\_\_ Other \_\_\_\_\_

☒ Ex Situ

Yes \_\_\_\_\_ Excavate and offsite disposal

If Yes: Estimated Volume (Cubic Yards) \_\_\_\_\_ 330

Name of Licensed Disposal Facility or COGCC Facility ID # \_\_\_\_\_

No \_\_\_\_\_ Excavate and onsite remediation

\_\_\_\_\_ Land Treatment

\_\_\_\_\_ Bioremediation (or enhanced bioremediation)

\_\_\_\_\_ Chemical oxidation

\_\_\_\_\_ Other \_\_\_\_\_

## Groundwater Remediation Summary

Yes \_\_\_\_\_ Bioremediation ( or enhanced bioremediation )

No \_\_\_\_\_ Chemical oxidation

No \_\_\_\_\_ Air sparge / Soil vapor extraction

Yes \_\_\_\_\_ Natural Attenuation

Yes \_\_\_\_\_ Other BOS 200® Application \_\_\_\_\_

## GROUNDWATER MONITORING

If groundwater has been impacted, describe proposed monitoring plan, including # of wells or sample points, monitoring schedule, analytical methods, points of compliance. Attach a groundwater monitoring location diagram.

Since the submittal of the Form 27 to the COGCC on August 17, 2011, four additional groundwater monitoring wells (MW05 through MW08) were installed at the site. Monitoring wells MW03 and MW04 were destroyed as of the November 2011 sampling event and were replaced with monitoring wells MW03R and MW04R. Groundwater monitoring continued on a quarterly basis. Boring logs with well completion diagrams are attached.

Groundwater monitoring wells MW01 through MW08 are sampled on a quarterly basis and submitted for laboratory analysis for benzene, toluene, ethylbenzene, and total xylenes (BTEX) by United States Environmental Protection Agency Method 8260C. The monitoring well locations are depicted on Figure 1. The Groundwater Elevation Contour Map generated using the August 2018 survey data is provided as Figure 2. The groundwater analytical results are summarized in Table 1, and the laboratory analytical report for the August 2018 groundwater monitoring event is attached.

Groundwater monitoring will continue on a quarterly basis until a No Further Action status request is warranted.

## REMEDIATION PROGRESS UPDATE

### PERIODIC REPORTING

**Frequency:** ☐ Quarterly ☐ Semi-Annually ☒ Annually ☐ Other \_\_\_\_\_

**Report Type:** ☒ Groundwater Monitoring ☐ Land Treatment Progress Report ☐ O&M Report  
☐ Other \_\_\_\_\_

### WASTE DISPOSAL INFORMATION

Was E&P waste generated as part of this remediation? Yes

Describe beneficial use, if any, of E&P Waste derived from this remediation project:

NA

Volume of E&P Waste (solid) in cubic yards 330

E&P waste (solid) description Petroleum hydrocarbon impacted soil

COGCC Disposal Facility ID #, if applicable: \_\_\_\_\_

Non-COGCC Disposal Facility: Buffalo Ridge Landfill in Keenesburg, Colorado

Volume of E&P Waste (liquid) in barrels 0

E&P waste (liquid) description \_\_\_\_\_

COGCC Disposal Facility ID #, if applicable: \_\_\_\_\_

Non-COGCC Disposal Facility: \_\_\_\_\_

## REMEDIATION COMPLETION REPORT

### REMEDIATION COMPLETION SUMMARY

Is this a Final Closure Request for this Remediation Project? No

Do all soils meet Table 910-1 standards? Yes

Does the previous reply indicate consideration of background concentrations? No

Are the only residual soil impacts pH, SAR, or EC at depths greater than 3 feet below ground surface? \_\_\_\_\_

Does Groundwater meet Table 910-1 standards? No

Is additional groundwater monitoring to be conducted? Yes

## RECLAMATION PLAN

### RECLAMATION PLANNING

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.

The Kerr-McGee production facility was permanently deconstructed. The site was restored to its pre-release grade.

Is the described reclamation complete? No

Does the reclamation described herein constitute interim or final reclamation of the Oil and Gas Location?

☐ Interim? ☐ Final?

Did the Surface Owner approve the seed mix? \_\_\_\_\_

If NO, does the seed mix comply with local soil conservation district recommendations? \_\_\_\_\_

## IMPLEMENTATION SCHEDULE

### PRIOR DATES

Date of Surface Owner notification/consultation, if required. \_\_\_\_\_

Actual Spill or Release date, if known. 01/07/2011

### SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 01/14/2011

Date of commencement of Site Investigation. 01/14/2011

Date of completion of Site Investigation. 08/27/2015

### REMEDIAL ACTION DATES

Date of commencement of Remediation. 01/14/2011

Date of completion of Remediation. \_\_\_\_\_

### SITE RECLAMATION DATES

Date of commencement of Reclamation. \_\_\_\_\_

Date of completion of Reclamation. \_\_\_\_\_

### OPERATOR COMMENT

A facility ID or spill/release number were not available for this location. The Form 19 (document # 2523735) was submitted on January 17, 2011.

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

Signed: Charles Chase

Title: Staff HSE Representative

Submit Date: \_\_\_\_\_

Email: Charles.Chase@anadarko.com

Based on the information provided herein, this Application for Site Investigation and Remediation Workplan complies with COGCC Rules and applicable orders and is hereby approved.

COGCC Approved: \_\_\_\_\_

Date: \_\_\_\_\_

Remediation Project Number: 6039

### COA Type

### Description

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### Attachment Check List

Upon approval, the approved Form 27 and all listed attachments will be indexed to the Remediation Project file. Only the approved Form 27 will also be indexed to the related Facilities.

#### Att Doc Num

#### Name

401735914	SITE MAP
401735915	GROUND WATER ELEVATION MAP
401736001	ANALYTICAL RESULTS
401736003	LOGS

Total Attach: 4 Files

### General Comments

#### User Group

#### Comment

#### Comment Date

		Stamp Upon Approval
--	--	---------------------

Total: 0 comment(s)

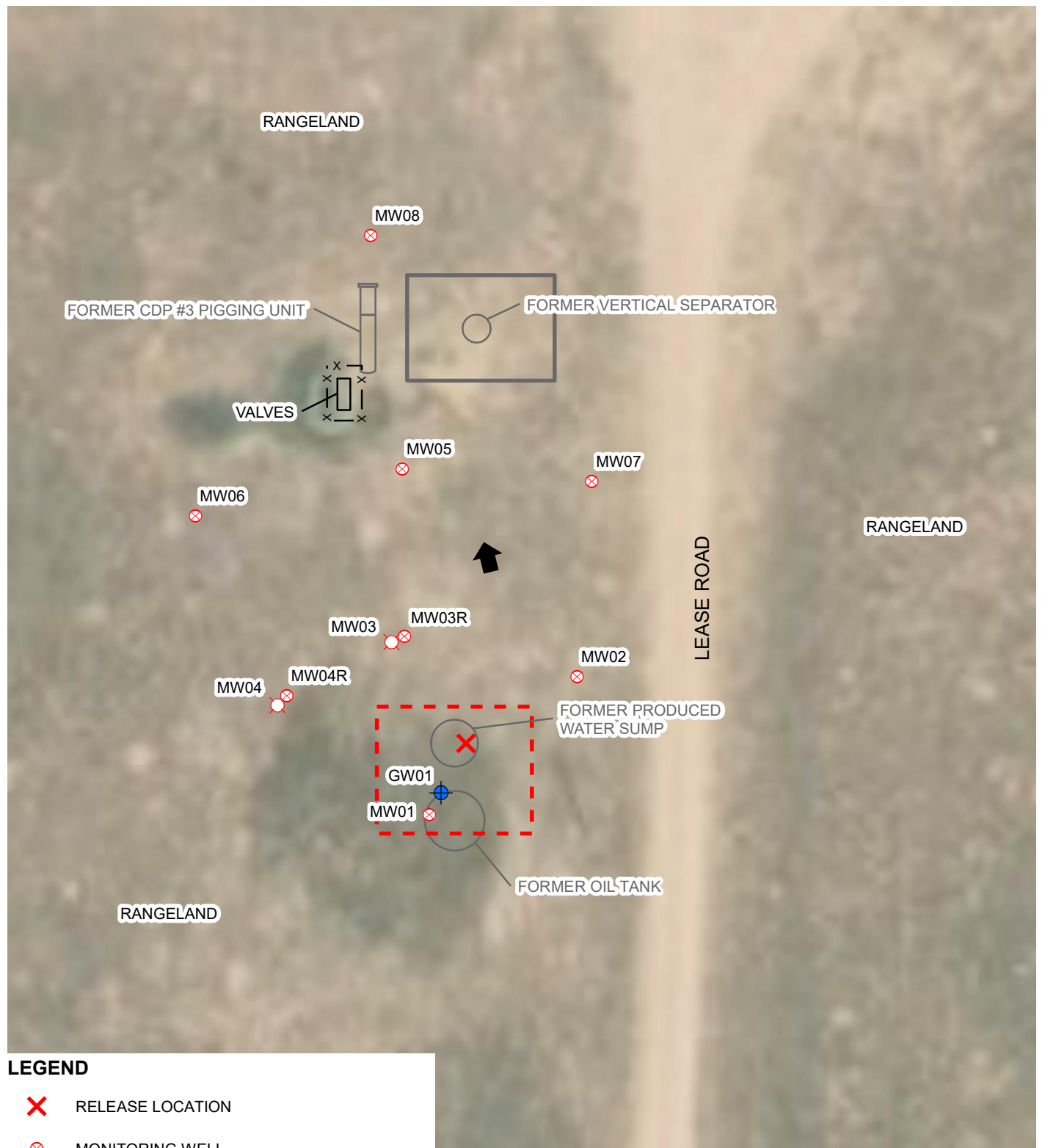
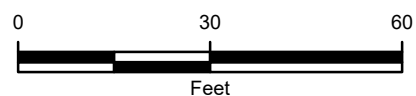


IMAGE COURTESY OF ESRI

## LEGEND

- ✕ RELEASE LOCATION
- ⊗ MONITORING WELL
- ⊗ DESTROYED MONITORING WELL
- ⊕ GROUNDWATER SAMPLE
- ↑ SURVEYED GROUNDWATER FLOW DIRECTION
- x — x FENCE
- - - EXCAVATION EXTENT
- FORMER BERM



**FIGURE 1**  
**SITE MAP**  
 CENTRAL DISTRIBUTION POINT #3  
 SWSW SEC 23-T3N-R65W  
 WELD COUNTY, COLORADO  
 KERR-MCGEE GATHERING LLC



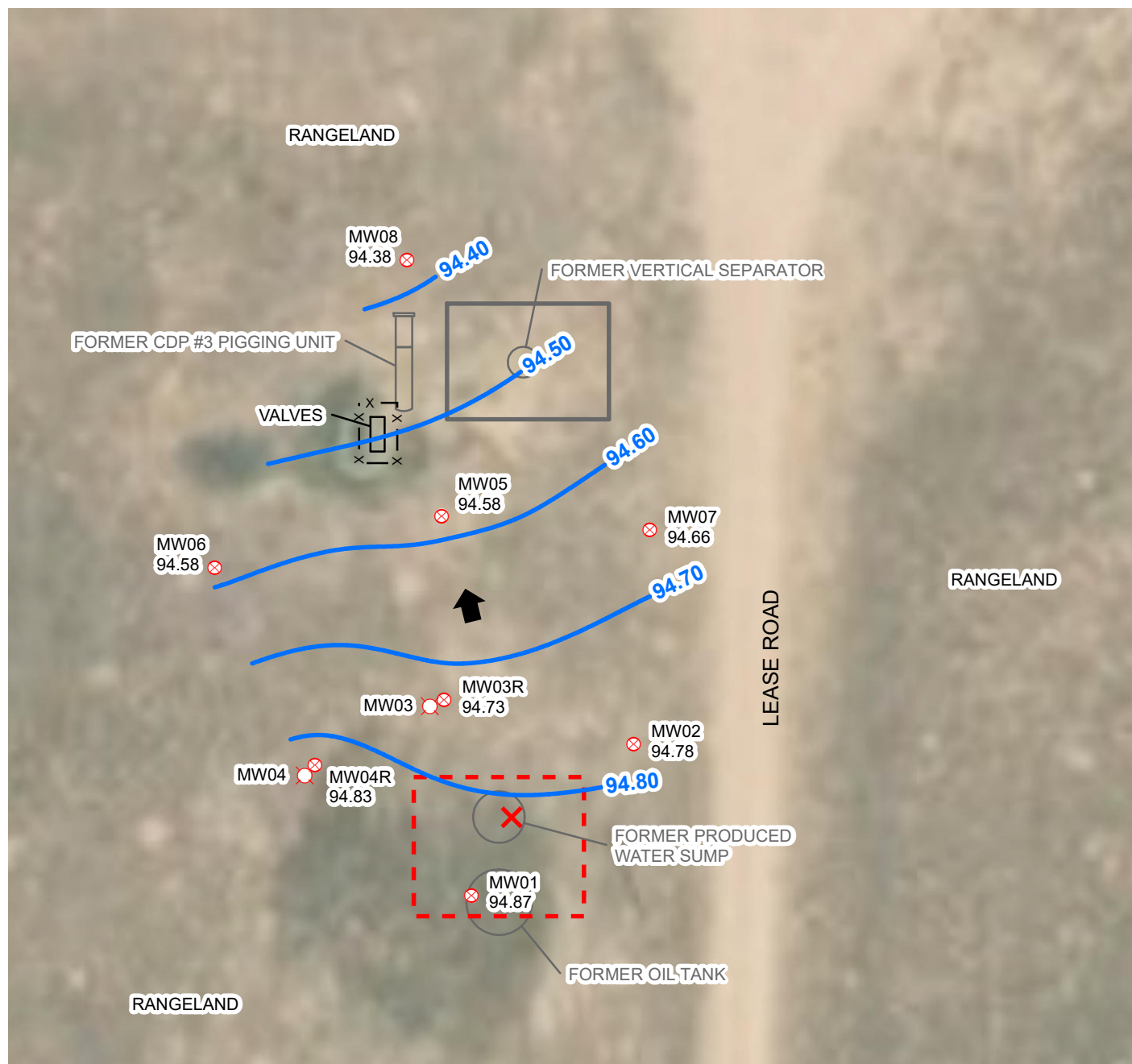


IMAGE COURTESY OF ESRI

## LEGEND

- ✕ RELEASE LOCATION
- ⊗ MONITORING WELL
- ⊗ DESTROYED MONITORING WELL
- ↑ SURVEYED GROUNDWATER FLOW DIRECTION
- x — x FENCE
- RELATIVE GROUNDWATER ELEVATION CONTOUR  
CONTOUR INTERVAL = 0.10 FEET  
GRADIENT = 0.004 FEET/FOOT
- - - EXCAVATION EXTENT
- FORMER BERM

GROUNDWATER ELEVATIONS WERE MEASURED ON AUGUST 7, 2018.

**FIGURE 2**  
**GROUNDWATER ELEVATION CONTOUR MAP**  
**CENTRAL DISTRIBUTION POINT #3**  
**SWSW SEC 23-T3N-R65W**  
**WELD COUNTY, COLORADO**  
**KERR-MCGEE GATHERING LLC**





**TABLE 1**  
**GROUNDWATER ANALYTICAL AND FIELD RESULTS**  
**CENTRAL DISTRIBUTION POINT #3**  
**WELD COUNTY, COLORADO**  
**KERR-MCGEE GATHERING LLC**

Well Name	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth Water/ (Product Thickness) (ft bgs)	Relative GW Elev. (ft)
GW01	1/24/2011	3000	4100	81	740	9	NA
MW01	5/31/2011	2500	2100	140	1900	8.60	91.40
	8/5/2011	4800	1800	120	1300	8.43	91.57
	11/29/2011	3000	86	150	2000	9.97	90.03
	2/23/2012	2300	44	150	1600	9.11	90.89
	5/21/2012	2500	40	3.1	850	9.00	91.00
	8/24/2012	1400	60	82	520	8.75	91.25
	11/27/2012	1200	68	40	580	9.12	90.88
	2/28/2013	1400	3.7	57	240	10.09	89.91
	5/15/2013	2600	6.4	48	240	NM	NA
	8/15/2013	1100	4.1	13	92	9.05	90.95
	11/8/2013	<1.0	<1.0	<1.0	<1.0	NM	NA
	12/3/2013	Surveyed - Not Sampled				8.87	90.55
	2/21/2014	754	144	71	760	9.13	90.87
	5/13/2014	255	<1.0	7.8	92.1	8.82	91.47
	7/28/2014	347	49	30.4	398	8.29	92.00
	11/24/2014	330	11.2	33	488	8.31	91.98
	2/12/2015	183	<4.0	<4.0	30	8.14	92.15
	5/1/2015	359	<4.0	14.6	154	7.72	92.57
	8/27/2015	<1.0	<1.0	<1.0	<1.0	7.03	93.26
	11/12/2015	188	<4.0	<4.0	33.2	7.36	92.93
	2/17/2016	83.6	<1.0	4.5	40.5	6.65	93.64
	5/9/2016	91.8	<1.0	<1.0	6.0	5.12	95.17
	8/3/2016	143	<1.00	6.85	41.1	5.45	94.84
	11/1/2016	229	<1.00	8.69	45.7	6.68	93.61
	2/7/2017	<1.00	<1.00	<1.00	<1.00	6.80	93.49
	5/1/2017	<1.00	<1.00	<1.00	<1.00	6.34	93.95
	8/7/2017	601	<1.00	<1.00	4.00	6.32	93.97
	11/28/2017	<4.00	<4.00	<4.00	<4.00	7.58	92.71
	2/5/2018	461	<1.00	11.1	19.3	5.54	94.75
	4/10/2018	Surveyed - Not Sampled				NM	NA
	5/22/2018	<4.00	<4.00	<4.00	<4.00	4.94	95.35
	8/7/2018	55.8	<1.00	11.0	155	5.42	94.87
MW02	5/31/2011	<1.0	1.3	<1.0	<1.0	8.45	91.50
	8/5/2011	<1.0	<1.0	<1.0	<1.0	8.31	91.64



**TABLE 1**  
**GROUNDWATER ANALYTICAL AND FIELD RESULTS**  
**CENTRAL DISTRIBUTION POINT #3**  
**WELD COUNTY, COLORADO**  
**KERR-MCGEE GATHERING LLC**

Well Name	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth Water/ (Product Thickness) (ft bgs)	Relative GW Elev. (ft)	
	11/29/2011	<1.0	<1.0	<1.0	<1.0	9.17	90.78	
	2/23/2012	<1.0	<1.0	<1.0	<1.0	8.80	91.15	
	5/21/2012	<1.0	<1.0	<1.0	<1.0	8.75	91.20	
	8/24/2012	<1.0	<1.0	<1.0	<1.0	8.36	91.59	
	11/27/2012	<1.0	<1.0	<1.0	<1.0	9.00	90.95	
	2/28/2013	130	<1.0	<1.0	<1.0	9.98	89.97	
	5/15/2013	6.0	<1.0	<1.0	<1.0	NM	NA	
	8/15/2013	<1.0	<1.0	<1.0	<1.0	9.00	90.95	
	11/8/2013	<1.0	<1.0	<1.0	<1.0	NM	NA	
	12/3/2013	Surveyed - Not Sampled				8.98	90.51	
	2/21/2014	<1.0	<1.0	<1.0	<1.0	9.02	90.93	
	5/13/2014	<1.0	<1.0	<1.0	<1.0	8.68	91.50	
	7/28/2014	<1.0	<1.0	<1.0	<1.0	8.16	92.02	
	11/24/2014	<1.0	<1.0	<1.0	<1.0	8.14	92.04	
	2/12/2015	<1.0	<1.0	<1.0	<1.0	7.96	92.22	
	5/1/2015	<1.0	<1.0	<1.0	<1.0	7.51	92.67	
	8/27/2015	<1.0	<1.0	<1.0	<1.0	6.93	93.25	
	11/12/2015	<1.0	<1.0	<1.0	<1.0	7.44	92.74	
	2/17/2016	<1.0	<1.0	<1.0	<1.0	6.63	93.55	
	5/9/2016	<1.0	<1.0	<1.0	<1.0	4.88	95.30	
	8/3/2016	<1.00	<1.00	<1.00	<1.00	5.39	94.79	
	11/1/2016	<1.00	<1.00	<1.00	<1.00	6.68	93.50	
	2/7/2017	<1.00	<1.00	<1.00	<1.00	6.79	93.39	
	5/1/2017	<1.00	<1.00	<1.00	<1.00	6.23	93.95	
	8/7/2017	<1.00	<1.00	<1.00	<1.00	6.35	93.83	
	11/28/2017	<1.00	<1.00	<1.00	<1.00	6.56	93.62	
	2/5/2018	<1.00	<1.00	<1.00	<1.00	5.39	94.79	
	4/10/2018	Surveyed - Not Sampled				NM	NA	
	5/22/2018	<1.00	<1.00	<1.00	<1.00	4.91	95.23	
	8/7/2018	<1.00	<1.00	<1.00	<1.00	5.36	94.78	
	MW03	5/31/2011	<1.0	3.7	<1.0	15	8.12	NA
		8/5/2011	280	<1.0	<1.0	<1.0	8.00	NA
	MW03 destroyed as of 11/29/2011							
MW03R	2/23/2012	33	<1.0	<1.0	<1.0	8.87	90.64	
	5/21/2012	1300	<1.0	<1.0	1.5	8.83	90.68	



**TABLE 1**  
**GROUNDWATER ANALYTICAL AND FIELD RESULTS**  
**CENTRAL DISTRIBUTION POINT #3**  
**WELD COUNTY, COLORADO**  
**KERR-MCGEE GATHERING LLC**

Well Name	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth Water/ (Product Thickness) (ft bgs)	Relative GW Elev. (ft)
	8/24/2012	Not Found - Not Sampled				Not Found	NA
	11/27/2012	<1.0	<1.0	<1.0	<1.0	9.18	90.33
	2/28/2013	<1.0	<1.0	<1.0	<1.0	9.53	89.98
	5/15/2013	<1.0	<1.0	<1.0	<1.0	NM	NA
	8/15/2013	<1.0	<1.0	<1.0	<1.0	8.55	90.96
	11/8/2013	<1.0	<1.0	<1.0	<1.0	NM	NA
	12/3/2013	Surveyed - Not Sampled				8.15	90.50
	2/21/2014	<1.0	<1.0	<1.0	<1.0	8.60	90.91
	5/13/2014	<1.0	<1.0	<1.0	<1.0	8.34	91.60
	7/28/2014	<1.0	<1.0	<1.0	<1.0	8.02	91.92
	11/24/2014	<1.0	<1.0	<1.0	<1.0	7.93	92.01
	2/12/2015	<1.0	<1.0	<1.0	<1.0	7.72	92.22
	5/1/2015	<1.0	<1.0	<1.0	<1.0	7.32	92.62
	8/27/2015	<1.0	<1.0	<1.0	<1.0	6.65	93.29
	11/12/2015	<1.0	<1.0	<1.0	<1.0	7.15	92.79
	2/17/2016	<1.0	<1.0	<1.0	<1.0	6.42	93.52
	5/9/2016	<1.0	<1.0	<1.0	<1.0	4.66	95.28
	8/3/2016	<1.00	<1.00	<1.00	<1.00	5.13	94.81
	11/1/2016	<1.00	<1.00	<1.00	<1.00	6.41	93.53
	2/7/2017	<1.00	<1.00	<1.00	<1.00	6.51	93.43
	5/1/2017	<1.00	<1.00	<1.00	<1.00	5.98	93.96
	8/7/2017	<1.00	<1.00	<1.00	<1.00	6.04	93.90
	11/28/2017	<1.00	<1.00	<1.00	<1.00	7.14	92.80
	2/5/2018	<1.00	<1.00	<1.00	<1.00	5.15	94.79
	4/10/2018	Surveyed - Not Sampled				NM	NA
	5/22/2018	1.83	<1.00	<1.00	<1.00	4.68	95.20
	8/7/2018	<1.00	<1.00	<1.00	<1.00	5.15	94.73
MW04	5/31/2011	<1.0	<1.0	<1.0	<1.0	8.63	NA
	8/5/2011	<1.0	<1.0	<1.0	<1.0	8.35	NA
	MW04 destroyed as of 11/29/2011						
MW04R	2/23/2012	<1.0	<1.0	<1.0	<1.0	9.31	90.60
	5/21/2012	<1.0	<1.0	<1.0	<1.0	9.15	90.76
	8/24/2012	<b>13</b>	<1.0	<1.0	<1.0	8.61	91.30
	11/27/2012	<1.0	<1.0	<1.0	<1.0	9.07	90.84
	2/28/2013	<1.0	<1.0	<1.0	<1.0	9.84	90.07



**TABLE 1**  
**GROUNDWATER ANALYTICAL AND FIELD RESULTS**  
**CENTRAL DISTRIBUTION POINT #3**  
**WELD COUNTY, COLORADO**  
**KERR-MCGEE GATHERING LLC**

Well Name	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth Water/ (Product Thickness) (ft bgs)	Relative GW Elev. (ft)
	5/15/2013	<1.0	<1.0	<1.0	<1.0	NM	NA
	8/15/2013	<1.0	<1.0	<1.0	<1.0	8.90	91.01
	11/8/2013	<1.0	<1.0	<1.0	<1.0	NM	NA
	12/3/2013	Surveyed - Not Sampled				8.85	90.54
	2/21/2014	<1.0	<1.0	<1.0	<1.0	8.95	90.96
	5/13/2014	<1.0	<1.0	<1.0	<1.0	8.80	91.52
	7/28/2014	<1.0	<1.0	<1.0	<1.0	8.29	92.03
	11/24/2014	<1.0	<1.0	<1.0	<1.0	8.27	92.05
	2/12/2015	<1.0	<1.0	<1.0	<1.0	8.08	92.24
	5/1/2015	<1.0	<1.0	<1.0	<1.0	7.67	92.65
	8/27/2015	<1.0	<1.0	<1.0	<1.0	6.94	93.38
	11/12/2015	<1.0	<1.0	<1.0	<1.0	7.43	92.89
	2/17/2016	<1.0	<1.0	<1.0	<1.0	6.73	93.59
	5/9/2016	<1.0	<1.0	<1.0	<1.0	5.01	95.31
	8/3/2016	<1.00	<1.00	<1.00	<1.00	5.41	94.91
	11/1/2016	<1.00	<1.00	<1.00	<1.00	6.69	93.63
	2/7/2017	<1.00	<1.00	<1.00	<1.00	6.78	93.54
	5/1/2017	<1.00	<1.00	<1.00	<1.00	6.27	94.05
	8/7/2017	<1.00	<1.00	<1.00	<1.00	6.23	94.09
	11/28/2017	<1.00	<1.00	<1.00	<1.00	6.19	94.13
	2/5/2018	<1.00	<1.00	<1.00	<1.00	5.48	94.84
	4/10/2018	Surveyed - Not Sampled				NM	NA
	5/22/2018	<1.00	<1.00	<1.00	<1.00	5.00	95.27
	8/7/2018	<1.00	<1.00	<1.00	<1.00	5.44	94.83
MW05	11/29/2011	<1.0	1.1	1.2	20	9.02	90.68
	2/23/2012	<1.0	<1.0	<1.0	<1.0	9.00	90.70
	5/21/2012	<b>200</b>	<1.0	<1.0	<1.0	8.93	90.77
	8/24/2012	Not Found - Not Sampled				Not Found	NA
	11/27/2012	2.6	<1.0	<1.0	<1.0	8.89	90.81
	2/28/2013	<1.0	<1.0	<1.0	<1.0	9.80	89.90
	5/15/2013	<1.0	<1.0	<1.0	<1.0	NM	NA
	8/15/2013	<1.0	<1.0	<1.0	<1.0	8.80	90.90
	11/8/2013	<1.0	<1.0	<1.0	<1.0	NM	NA
	12/3/2013	Surveyed - Not Sampled				8.57	90.41
	2/21/2014	<1.0	<1.0	<1.0	<1.0	8.82	90.88
	5/13/2014	<1.0	<1.0	<1.0	<1.0	8.55	91.51



**TABLE 1**  
**GROUNDWATER ANALYTICAL AND FIELD RESULTS**  
**CENTRAL DISTRIBUTION POINT #3**  
**WELD COUNTY, COLORADO**  
**KERR-MCGEE GATHERING LLC**

Well Name	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth Water/ (Product Thickness) (ft bgs)	Relative GW Elev. (ft)
	7/28/2014	<1.0	<1.0	<1.0	<1.0	8.11	91.95
	11/24/2014	<1.0	<1.0	<1.0	<1.0	8.11	91.95
	2/12/2015	<1.0	<1.0	<1.0	<1.0	7.91	92.15
	5/1/2015	<1.0	<1.0	<1.0	<1.0	7.46	92.60
	8/27/2015	Inaccessible - Not Sampled				Inaccessible	NA
	11/12/2015	<1.0	<1.0	<1.0	<1.0	7.42	92.64
	2/17/2016	<1.0	<1.0	<1.0	<1.0	6.62	93.44
	5/9/2016	<1.0	<1.0	<1.0	<1.0	4.83	95.23
	8/3/2016	<1.00	<1.00	<1.00	<1.00	5.36	94.70
	11/1/2016	<1.00	<1.00	<1.00	<1.00	6.68	93.38
	2/7/2017	<1.00	<1.00	<1.00	<1.00	6.77	93.29
	5/1/2017	<1.00	<1.00	<1.00	<1.00	6.23	93.83
	8/7/2017	<1.00	<1.00	<1.00	<1.00	6.27	93.79
	11/28/2017	<1.00	<1.00	<1.00	<1.00	7.21	92.85
	2/5/2018	<1.00	<1.00	<1.00	<1.00	5.36	94.70
	4/10/2018	Surveyed - Not Sampled				NM	NA
	5/22/2018	<1.00	<1.00	<1.00	<1.00	4.84	95.20
	8/7/2018	<1.00	<1.00	<1.00	<1.00	5.46	94.58
MW06	11/29/2011	<1.0	<1.0	<1.0	6.4	15.40	84.81
	2/23/2012	<1.0	<1.0	<1.0	<1.0	9.41	90.80
	5/21/2012	<1.0	<1.0	<1.0	<1.0	9.24	90.97
	8/24/2012	<b>5.2</b>	<1.0	<1.0	<1.0	9.00	91.21
	11/27/2012	<1.0	<1.0	<1.0	<1.0	9.46	90.75
	2/28/2013	<1.0	<1.0	<1.0	<1.0	10.25	89.96
	5/15/2013	<1.0	<1.0	<1.0	<1.0	NM	NA
	8/15/2013	<1.0	<1.0	<1.0	<1.0	9.35	90.86
	11/8/2013	<1.0	<1.0	<1.0	<1.0	NM	NA
	12/3/2013	Surveyed - Not Sampled				9.17	90.44
	2/21/2014	<1.0	<1.0	<1.0	<1.0	9.35	90.86
	5/13/2014	<1.0	<1.0	<1.0	<1.0	8.98	91.53
	7/28/2014	<1.0	<1.0	<1.0	<1.0	8.57	91.94
	11/24/2014	<1.0	<1.0	<1.0	<1.0	8.59	91.92
	2/12/2015	<1.0	<1.0	<1.0	<1.0	8.38	92.13
	5/1/2015	<1.0	<1.0	<1.0	<1.0	7.97	92.54
	8/27/2015	<1.0	<1.0	<1.0	<1.0	7.30	93.21
	11/12/2015	<1.0	<1.0	<1.0	<1.0	7.81	92.70



**TABLE 1**  
**GROUNDWATER ANALYTICAL AND FIELD RESULTS**  
**CENTRAL DISTRIBUTION POINT #3**  
**WELD COUNTY, COLORADO**  
**KERR-MCGEE GATHERING LLC**

Well Name	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth Water/ (Product Thickness) (ft bgs)	Relative GW Elev. (ft)
	2/17/2016	<1.0	<1.0	<1.0	<1.0	7.07	93.44
	5/9/2016	<1.0	<1.0	<1.0	<1.0	5.30	95.21
	8/3/2016	<1.00	<1.00	<1.00	<1.00	5.77	94.74
	11/1/2016	<1.00	<1.00	<1.00	<1.00	7.07	93.44
	2/7/2017	<1.00	<1.00	<1.00	<1.00	7.19	93.32
	5/1/2017	<1.00	<1.00	<1.00	<1.00	6.62	93.89
	8/7/2017	<1.00	<1.00	<1.00	<1.00	6.63	93.88
	11/28/2017	<1.00	<1.00	<1.00	<1.00	7.49	93.02
	2/5/2018	<1.00	<1.00	<1.00	<1.00	5.81	94.70
	4/10/2018	Surveyed - Not Sampled				NM	NA
	5/22/2018	<1.00	<1.00	<1.00	<1.00	5.30	95.16
	8/7/2018	<1.00	<1.00	<1.00	<1.00	5.88	94.58
MW07	8/27/2015	<1.0	<1.0	<1.0	<1.0	6.32	NA
	11/12/2015	<1.0	<1.0	<1.0	<1.0	6.81	NA
	2/17/2016	<1.0	<1.0	<1.0	<1.0	5.97	NA
	5/9/2016	<1.0	<1.0	<1.0	<1.0	4.19	NA
	8/3/2016	<1.00	<1.00	<1.00	<1.00	4.76	NA
	11/1/2016	<1.00	<1.00	<1.00	<1.00	6.63	NA
	2/7/2017	<1.00	<1.00	<1.00	<1.00	6.73	NA
	5/1/2017	<1.00	<1.00	<1.00	<1.00	6.08	NA
	8/7/2017	<1.00	<1.00	<1.00	<1.00	6.31	NA
	11/28/2017	<1.00	<1.00	<1.00	<1.00	7.12	NA
	2/5/2018	<1.00	<1.00	<1.00	<1.00	5.32	NA
	4/10/2018	Surveyed - Not Sampled				NM	NA
	5/22/2018	<1.00	<1.00	<1.00	<1.00	4.77	95.24
	8/7/2018	<1.00	<1.00	<1.00	<1.00	5.35	94.66
MW08	8/27/2015	<1.0	<1.0	<1.0	<1.0	6.32	NA
	11/12/2015	<1.0	<1.0	<1.0	<1.0	6.82	NA
	2/17/2016	<1.0	<1.0	<1.0	<1.0	5.95	NA
	5/9/2016	<1.0	<1.0	<1.0	<1.0	4.13	NA
	8/3/2016	<1.00	<1.00	<1.00	<1.00	4.74	NA
	11/1/2016	<1.00	<1.00	<1.00	<1.00	6.57	NA
	2/7/2017	<1.00	<1.00	<1.00	<1.00	6.68	NA
	5/1/2017	<1.00	<1.00	<1.00	<1.00	5.98	NA
	8/7/2017	<1.00	<1.00	<1.00	<1.00	6.35	NA



**TABLE 1**  
**GROUNDWATER ANALYTICAL AND FIELD RESULTS**  
**CENTRAL DISTRIBUTION POINT #3**  
**WELD COUNTY, COLORADO**  
**KERR-MCGEE GATHERING LLC**

Well Name	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth Water/ (Product Thickness) (ft bgs)	Relative GW Elev. (ft)
	11/28/2017	<1.00	<1.00	<1.00	<1.00	7.17	NA
	2/5/2018	<1.00	<1.00	<1.00	<1.00	5.24	NA
	4/10/2018	Surveyed - Not Sampled				NM	NA
	5/22/2018	<1.00	<1.00	<1.00	<1.00	4.69	95.08
	8/7/2018	<1.00	<1.00	<1.00	<1.00	5.39	94.38
<b>COGCC Allowable Levels</b>		<b>5</b>	<b>1000</b>	<b>700</b>	<b>1400</b>		

Notes: COGCC - Colorado Oil and Gas Conservation Commission

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



August 09, 2018

LT Environmental, Inc.

Brian Sulzberger

4600 West 60th Avenue

Arvada

CO 80003

**Project Name - KMG - CDP #3**

**Project Number - 014211005/WO #881133**

Attached are your analytical results for KMG - CDP #3 received by Origins Laboratory, Inc. August 07, 2018. This project is associated with Origins project number Y808088-01.

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

Brian Sulzberger  
Project Number: 014211005/WO #88113348  
Project: KMG - CDP #3

### CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW01	Y808088-01	Water	August 7, 2018 13:20	08/07/2018 15:15
MW02	Y808088-02	Water	August 7, 2018 13:25	08/07/2018 15:15
MW03R	Y808088-03	Water	August 7, 2018 13:30	08/07/2018 15:15
MW04R	Y808088-04	Water	August 7, 2018 13:35	08/07/2018 15:15
MW05	Y808088-05	Water	August 7, 2018 13:40	08/07/2018 15:15
MW06	Y808088-06	Water	August 7, 2018 13:45	08/07/2018 15:15
MW07	Y808088-07	Water	August 7, 2018 13:50	08/07/2018 15:15
MW08	Y808088-08	Water	August 7, 2018 13:55	08/07/2018 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


Brian Sulzberger  
Project Number: 014211005/WO #88113348  
Project: KMG - CDP #3

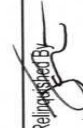
ORIGINS  
LABORATORY, INC

Y460088

1725 Elk Place, Denver, CO 80211  
Laboratory # - 303.433.1322

Client: LT Environmental, Inc.		Project Manager: Brian Sulzberger		Project Number: 014211005WO #88113348			
Project: KMG - CDP #3		Sample Time		Container			
Number	Sample Identification	Matrix	Sample Date	Sample Time	Container	Qty	Analyses
01-001	MW01	Water	6/7/18	1320	GT	3	BTEX by EPA 8260C
02-001	MW02	Water		1325		3	BTEX by EPA 8260C
03-001	MW03R	Water		1330		3	BTEX by EPA 8260C
04-001	MW04R	Water		1335		3	BTEX by EPA 8260C
05-001	MW05	Water		1340		3	BTEX by EPA 8260C
06-001	MW06	Water		1345		3	BTEX by EPA 8260C
07-001	MW07	Water		1350		3	BTEX by EPA 8260C
08-001	MW08	Water		1355		3	BTEX by EPA 8260C

Relinquished By:  Date / Time: 8/7/18

Relinquished By:  Date / Time: 8/7/18 15:15

Received By: \_\_\_\_\_ Date / Time: \_\_\_\_\_

Received By: \_\_\_\_\_ Date / Time: \_\_\_\_\_

Temperature on Receipt: 7.4

Turn Around Time: ☐ 72-hr ☒ Standard ☐ 24-hr ☐ 48-hr

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

Brian Sulzberger  
Project Number: 014211005/WO #88113348  
Project: KMG - CDP #3

Origins Laboratory

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

## Sample Receipt Checklist

Origins Work Order: Y 808088

Client: LTE

Client Project ID: KMG - CDP # 3

Checklist Completed by: JG

Shipped Via: HD

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

Date/time completed: 8/8/2018

Airbill #: N/A

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

Cooler Number/Temperature: 1 / 7.4 °C        /        °C        /        °C (Describe)

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 <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Same Day</u>
Is there ice present (document if blue ice is used)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were all samples received intact <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)</sup> ?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is a chain-of-custody (COC) present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client with date and time recorded <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
For volatiles in water — is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Are samples preserved that require preservation and was it checked <sup>(1)</sup> ? (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 <sub>3</sub> , HCL, H <sub>2</sub> SO <sub>4</sub> ) / (pH >10 for samples preserved with NaAsO <sub>2</sub> +NaOH, ZnAc+NaOH)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Additional Comments (if any):				

<sup>(1)</sup>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) JP

8/8/18  
Date/Time Reviewed

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

Brian Sulzberger  
Project Number: 014211005/WO #88113348  
Project: KMG - CDP #3

## MW01

8/7/2018 1:20:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	---------	----------	----------	-------

## Origins Laboratory, Inc. Y808088-01 (Water)

### BTEX by EPA 8260C

Benzene	55.8	1.00	ug/L	1	B8H0807	JTD	08/08/2018	08/09/2018	
Toluene	ND	1.00	"	"	"	JTD	"	"	U
Ethylbenzene	11.0	1.00	"	"	"	JTD	"	"	
Xylenes, total	155	1.00	"	"	"	JTD	"	"	

Surrogate: 1,2-Dichloroethane-d4	96.4 %	84-121	"	"	"
Surrogate: Toluene-d8	96.9 %	85-115	"	"	"
Surrogate: 4-Bromofluorobenzene	103 %	84-114	"	"	"

Origins Laboratory, Inc.



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

Brian Sulzberger  
Project Number: 014211005/WO #88113348  
Project: KMG - CDP #3

MW02

8/7/2018 1:25:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	---------	----------	----------	-------

Origins Laboratory, Inc.  
Y808088-02 (Water)

BTEX by EPA 8260C

Benzene	ND	1.00	ug/L	1	B8H0807	JTD	08/08/2018	08/09/2018	U
Toluene	ND	1.00	"	"	"	JTD	"	"	U
Ethylbenzene	ND	1.00	"	"	"	JTD	"	"	U
Xylenes, total	ND	1.00	"	"	"	JTD	"	"	U

Surrogate: 1,2-Dichloroethane-d4	97.5 %	84-121	"	"	"
Surrogate: Toluene-d8	99.5 %	85-115	"	"	"
Surrogate: 4-Bromofluorobenzene	102 %	84-114	"	"	"

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

Brian Sulzberger  
Project Number: 014211005/WO #88113348  
Project: KMG - CDP #3

MW03R

8/7/2018 1:30:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	---------	----------	----------	-------

Origins Laboratory, Inc.  
Y808088-03 (Water)

BTEX by EPA 8260C

Benzene	ND	1.00	ug/L	1	B8H0807	JTD	08/08/2018	08/09/2018	U
Toluene	ND	1.00	"	"	"	JTD	"	"	U
Ethylbenzene	ND	1.00	"	"	"	JTD	"	"	U
Xylenes, total	ND	1.00	"	"	"	JTD	"	"	U

Surrogate: 1,2-Dichloroethane-d4	97.7 %	84-121	"	"	"
Surrogate: Toluene-d8	98.7 %	85-115	"	"	"
Surrogate: 4-Bromofluorobenzene	103 %	84-114	"	"	"

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

Brian Sulzberger  
Project Number: 014211005/WO #88113348  
Project: KMG - CDP #3

## MW04R

8/7/2018 1:35:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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## Origins Laboratory, Inc. Y808088-04 (Water)

### BTEX by EPA 8260C

Benzene	ND	1.00	ug/L	1	B8H0807	JTD	08/08/2018	08/09/2018	U
Toluene	ND	1.00	"	"	"	JTD	"	"	U
Ethylbenzene	ND	1.00	"	"	"	JTD	"	"	U
Xylenes, total	ND	1.00	"	"	"	JTD	"	"	U

Surrogate: 1,2-Dichloroethane-d4	97.5 %	84-121	"	"	"
Surrogate: Toluene-d8	99.1 %	85-115	"	"	"
Surrogate: 4-Bromofluorobenzene	103 %	84-114	"	"	"

Origins Laboratory, Inc.



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

Brian Sulzberger  
Project Number: 014211005/WO #88113348  
Project: KMG - CDP #3

## MW05

8/7/2018 1:40:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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## Origins Laboratory, Inc. Y808088-05 (Water)

### BTEX by EPA 8260C

Benzene	ND	1.00	ug/L	1	B8H0807	JTD	08/08/2018	08/09/2018	U
Toluene	ND	1.00	"	"	"	JTD	"	"	U
Ethylbenzene	ND	1.00	"	"	"	JTD	"	"	U
Xylenes, total	ND	1.00	"	"	"	JTD	"	"	U

Surrogate: 1,2-Dichloroethane-d4	98.1 %	84-121	"	"	"
Surrogate: Toluene-d8	98.2 %	85-115	"	"	"
Surrogate: 4-Bromofluorobenzene	104 %	84-114	"	"	"

Origins Laboratory, Inc.



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

Brian Sulzberger  
Project Number: 014211005/WO #88113348  
Project: KMG - CDP #3

## MW06

8/7/2018 1:45:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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## Origins Laboratory, Inc. Y808088-06 (Water)

### BTEX by EPA 8260C

Benzene	ND	1.00	ug/L	1	B8H0807	JTD	08/08/2018	08/09/2018	U
Toluene	ND	1.00	"	"	"	JTD	"	"	U
Ethylbenzene	ND	1.00	"	"	"	JTD	"	"	U
Xylenes, total	ND	1.00	"	"	"	JTD	"	"	U

Surrogate: 1,2-Dichloroethane-d4	119 %	84-121	"	"	"
Surrogate: Toluene-d8	99.5 %	85-115	"	"	"
Surrogate: 4-Bromofluorobenzene	97.6 %	84-114	"	"	"

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Arvada CO 80003

Brian Sulzberger  
Project Number: 014211005/WO #88113348  
Project: KMG - CDP #3

## MW07

8/7/2018 1:50:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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## Origins Laboratory, Inc. Y808088-07 (Water)

### BTEX by EPA 8260C

Benzene	ND	1.00	ug/L	1	B8H0807	JTD	08/08/2018	08/09/2018	U
Toluene	ND	1.00	"	"	"	JTD	"	"	U
Ethylbenzene	ND	1.00	"	"	"	JTD	"	"	U
Xylenes, total	ND	1.00	"	"	"	JTD	"	"	U

Surrogate: 1,2-Dichloroethane-d4	124 %	84-121	"	"	"	"	"	"	S-07
Surrogate: Toluene-d8	99.8 %	85-115	"	"	"	"	"	"	
Surrogate: 4-Bromofluorobenzene	98.5 %	84-114	"	"	"	"	"	"	

Origins Laboratory, Inc.



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4600 West 60th Avenue  
Arvada CO 80003

Brian Sulzberger  
Project Number: 014211005/WO #88113348  
Project: KMG - CDP #3

## MW08

8/7/2018 1:55:00PM

Analyte	Result	Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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## Origins Laboratory, Inc. Y808088-08 (Water)

### BTEX by EPA 8260C

Benzene	ND	1.00	ug/L	1	B8H0807	JTD	08/08/2018	08/09/2018	U
Toluene	ND	1.00	"	"	"	JTD	"	"	U
Ethylbenzene	ND	1.00	"	"	"	JTD	"	"	U
Xylenes, total	ND	1.00	"	"	"	JTD	"	"	U

Surrogate: 1,2-Dichloroethane-d4	126 %	84-121	"	"	"	"	"	"	S-07
Surrogate: Toluene-d8	100 %	85-115	"	"	"	"	"	"	
Surrogate: 4-Bromofluorobenzene	98.0 %	84-114	"	"	"	"	"	"	

Origins Laboratory, Inc.



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

Brian Sulzberger  
Project Number: 014211005/WO #88113348  
Project: KMG - CDP #3

**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 B8H0807 - EPA 5030B (Water)**

**Blank (B8H0807-BLK1)**

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

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	51		"	62.5	81.2		84-121			
Surrogate: Toluene-d8	66		"	62.5	105		85-115			
Surrogate: 4-Bromofluorobenzene	63		"	62.5	101		84-114			

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

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

Brian Sulzberger  
Project Number: 014211005/WO #88113348  
Project: KMG - CDP #3

**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 B8H0807 - EPA 5030B (Water)**

**LCS (B8H0807-BS1)**

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

Benzene	51.2	1.00	ug/L	50.0		102	73.3-129			
Toluene	50.3	1.00	"	50.0		101	76.2-123			
Ethylbenzene	50.5	1.00	"	50.0		101	73.6-130			
m,p-Xylene	102	2.00	"	100		102	76.1-126			
o-Xylene	50.7	1.00	"	50.0		101	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	59		"	62.5		93.8	84-121			
Surrogate: Toluene-d8	62		"	62.5		99.2	85-115			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		100	84-114			

Origins Laboratory, Inc.



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

Brian Sulzberger  
Project Number: 014211005/WO #88113348  
Project: KMG - CDP #3

**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 B8H0807 - EPA 5030B (Water)**

Matrix Spike (B8H0807-MS1)		Source: Y808088-02			Prepared: 08/08/2018 Analyzed: 08/09/2018					
Benzene	53.3	1.00	ug/L	50.0	ND	107	74-130			
Toluene	51.9	1.00	"	50.0	ND	104	73-131			
Ethylbenzene	53.8	1.00	"	50.0	0.070	107	76-132			
m,p-Xylene	108	2.00	"	100	ND	108	69-139			
o-Xylene	53.3	1.00	"	50.0	ND	107	74-131			
Surrogate: 1,2-Dichloroethane-d4	59		"	62.5		94.0	84-121			
Surrogate: Toluene-d8	63		"	62.5		100	85-115			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		102	84-114			

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

Brian Sulzberger  
Project Number: 014211005/WO #88113348  
Project: KMG - CDP #3

**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 B8H0807 - EPA 5030B (Water)**

Matrix Spike Dup (B8H0807-MSD1)		Source: Y808088-02			Prepared: 08/08/2018 Analyzed: 08/09/2018					
Benzene	54.4	1.00	ug/L	50.0	ND	109	74-130	2.04	20	
Toluene	53.1	1.00	"	50.0	ND	106	73-131	2.27	20	
Ethylbenzene	58.0	1.00	"	50.0	0.070	116	76-132	7.51	20	
m,p-Xylene	115	2.00	"	100	ND	115	69-139	6.36	20	
o-Xylene	57.4	1.00	"	50.0	ND	115	74-131	7.30	20	
Surrogate: 1,2-Dichloroethane-d4	56		"	62.5		89.8	84-121			
Surrogate: Toluene-d8	62		"	62.5		99.5	85-115			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		102	84-114			

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Jen Pellegrini For Noelle Doyle Mathis, President

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

Brian Sulzberger  
Project Number: 014211005/WO #88113348  
Project: KMG - CDP #3

### Notes and Definitions

U Sample is Non-Detect.

S-07 High surrogate in sample, however sample is non-detect. High surrogate indicates result values are biased high.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

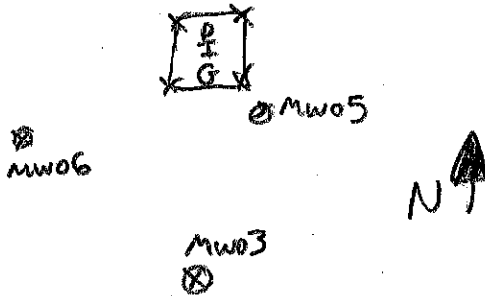
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Location Map:



Compliance | Engineering | Remediation  
 LT Environmental, Inc.  
 4400 West 46th Ave.  
 Denver, Colorado 80212

## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW05	Project: CDP #3
Date: 10-04-11	Project Number:
Logged By: Chris Roy	Drilled By: Drill Pro
Drilling Method: GeoProbe Direct Push	Sampling Method: Continuous
Gravel Pack: Silica Sand	Seal: Bentonite
	Grout: Concrete
Casing Type: PVC	Diameter: 1" Length: 6'
	Hole Diameter: 2.25" Depth to Liquid: 10'
Screen Type: PVC	Slot: 0.020 Diameter: 1" Length: 10'
	Total Depth: 16' Depth to Water: 10'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
	dry	0.0	NONE	NA	0			0'-10' Fine Sand, Medium Brown, No stain, No odor, dry	FLUSH
		0.0			2	4'			
		0.0			4	4'			
		0.0			6	4'		10'-16' Silt & Fine Sand, Tan-Brown, No stain, No odor, Wet	
		0.0			8				
	wet	0.0			10	4'			
		0.0			12				
		0.0			14	4'			
					16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				

Location Map:


See MW05

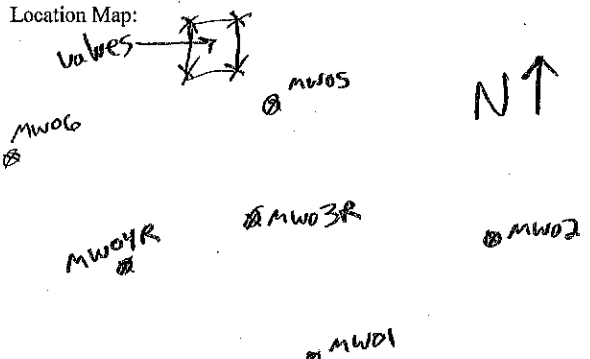



Compliance , Engineering , Remediation  
 LT Environmental, Inc.  
 4400 West 46th Ave.  
 Denver, Colorado 80212

**BORING LOG/MONITORING WELL COMPLETION DIAGRAM**

Boring/Well Number: MW06	Project: CDP#3
Date: 10-04-11	Project Number: 0142-11005
Logged By: Chris Roy	Drilled By: Drill Pro
Drilling Method: GeoProbe Direct Push	Sampling Method: Continuous
Seal: Bentonite	Grout: Concrete
Casing Type: PVC	Diameter: 1" Length: 6'
Hole Diameter: 2.25"	Depth to Liquid: NM
Screen Type: PVC Slot: 0.020	Diameter: 1" Length: 10'
Total Depth: 16'	Depth to Water: NM

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
					0			Not Cored	
					2				
					4				
					6				
					8				
					10				
					12				
					14				
					16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				

Location Map: 				 <b>Compliance , Engineering , Remediation</b> <b>LT Environmental, Inc.</b> 4400 West 46th Ave. Denver, Colorado 80212			
<b>BORING LOG/MONITORING WELL COMPLETION DIAGRAM</b>							
Boring/Well Number: <b>MW03R</b>				Project: <b>CDP#3</b>			
Date: <b>2/22/2012</b>				Project Number: <b>0142-11005</b>			
Logged By: <b>Chris Roy</b>				Drilled By: <b>ACI</b>			
Elevation: <b>Not Measured</b>		Detector: <b>None</b>		Drilling Method: <b>GeoProbe Direct Push</b>		Sampling Method: <b>Continuous</b>	
Gravel Pack: <b>Silica Sand</b>		Seal: <b>Bentonite</b>		Grout: <b>Concrete</b>			
Casing Type: <b>PVC</b>		Diameter: <b>1"</b>		Length: <b>6'</b>		Hole Diameter: <b>2.25"</b>	Depth to Liquid: <b>NM</b>
Screen Type: <b>PVC</b>		Slot: <b>0.020</b>		Diameter: <b>1"</b>		Length: <b>10'</b>	
				Total Depth: <b>16'</b>		Depth to Water: <b>NM</b>	

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
					0			Not sampled	FLUSH
					2				
					4				
					6				
					8				
					10				
					12				
					14				
					16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				

Location Map:



Compliance , Engineering , Remediation  
 LT Environmental, Inc.  
 4400 West 46th Ave.  
 Denver, Colorado 80212

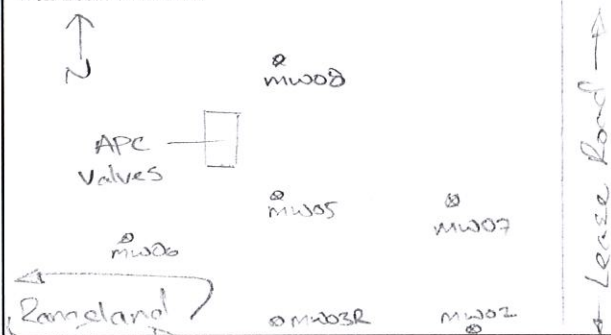
See MW03R

## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW04R	Project: CDP#3
Date: 2/22/2012	Project Number: 0142-11005
Logged By: Chris Roy	Drilled By: ACI
Elevation: Not Measured	Detector: None
Drilling Method: GeoProbe Direct Push	Sampling Method: Continuous
Gravel Pack: silica Sand	Seal: Bentonite
	Grout: Concrete
Casing Type: PVC	Diameter: 1" Length: 6'
	Hole Diameter: 2.25" Depth to Liquid: NM
Screen Type: PVC Slot: 0.020	Diameter: 1" Length: 10'
	Total Depth: 16' Depth to Water: NM

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
					0			Not Sampled	FLUSH
					2				
					4				
					6				
					8				
					10				
					12				
					14				
					16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				

Well Location Sketch:



Compliance · Engineering · Remediation

LT Environmental, Inc.

4600 W. 60th Avenue

Arvada, Colorado 80003

## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW007	Project: CDP #3
Date: 8/10/2015	Project Number: 14211005
Logged By: Kris Shepherd	Drilled By: Drill Pro
Drilling Method: Direct Push	Sampling Method: Continuous
Gravel Pack: Silica Sand	Seal: Bentonite
Casing Type: PVC	Diameter: 1"
Screen Type: PVC	Slot: 0.01
Diameter: 1"	Length: 4'
Hole Diameter: 3"	Depth to Liquid: -
Total Depth: 16'	Depth to Water: ~6'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
					0					
					2				Hydrovac, Not Logged	
					4					
					6					
	Wet	1.2	none		8	2'	2'	SP	6' → 9' fg sand, tan, no odor, no stain, wet, trace mg sand.	
		0.8			10	4'	4'			
		1.0			12			SM	9' → 16' Silty fg sand, tan, no odor, no stain, wet	
		0.3			14	4'	4'			
		0.7			16					
					18				— Push point to 16'	
					20				— flush mount	
					22					
					24					
					26					
					28					
					30					
					32					
					34					
					36					
					38					
					40					

NOTES:

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Well Location Sketch:



Compliance • Engineering • Remediation

LT Environmental, Inc.

4600 W. 60th Avenue

Arvada, Colorado 80003

## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number:

MW08

Project:

CDP #3

Date:

8/10/2015

Project Number:

14211005

Logged By:

Kris Shepherd

Drilled By:

Drill Pro

Elevation:

Detector:

PID

Drilling Method:

Direct Push

Sampling Method:

Continuous

Gravel Pack:

Silica Sand

Seal:

Bentonite

Grout:

-

Casing Type:

PVC

Diameter:

1"

Length:

4'

Hole Diameter:

3"

Depth to Liquid:

-

Screen Type:

PVC

Slot:

0.01

Diameter:

1"

Length:

12'

Total Depth:

16'

Depth to Water:

~6'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
					0					
					2				Hydrovac, Not Logged	
					4					
					6					
	wet	0.6	none		8	2'	2'		6' → 15' fg sand, tan w/ orange mottles, no odor, no stain, wet	
		0.3			10	4'	4'	SP	→ trace clay 7' → 8' bgs	
		0.3			12				15' → 16' clayey fg sand, tan w/ orange mottles, no odor, no stain, wet	
		1.1			14	4'	4'			
	✓	0.5	✓		16			SC		
					18				— Push point to 16' bgs	
					20				— flush mount	
					22					
					24					
					26					
					28					
					30					
					32					
					34					
					36					
					38					
					40					

NOTES:

Page \_\_\_\_ of \_\_\_\_