



November 20, 2013

Mr. Chuck Cornell  
Shell Exploration and Production Company  
4582 South Ulster Street Parkway, Suite 1400  
Denver, Colorado 80237

**RE: Third Quarter 2013 Groundwater Monitoring Report  
WT Durham #4 Flowline Release  
Remediation #4990  
Moffat County, Colorado**

Dear Mr. Cornell:

LT Environmental, Inc. (LTE) has been contracted by Shell Exploration and Production Company (SEPCO) to conduct quarterly groundwater monitoring activities and to evaluate geochemical indicators to assess the potential for monitored natural attenuation (MNA) at the WT Durham #4 Flowline Release (Site).

Site history and remediation activities were outlined in the Form 27 - Site Investigation and Remediation Workplan (Remediation #4990) submitted to the Colorado Oil and Gas Conservation Commission (COGCC) on June 17, 2010. The Site Location Map is provided as Figure 1.

## **QUARTERLY GROUNDWATER MONITORING ACTIVITIES**

### **Depth to Groundwater Measurements**

Depth to groundwater was measured in monitoring wells MW01 through MW11 on September 18, 2013, and recorded to calculate potentiometric surfaces and purge volumes. During the third quarter 2013 sampling event, the static groundwater level generally decreased. The depths to static groundwater level ranged from 3.51 feet below top of casing (BTOC) in MW05 to 5.77 feet BTOC in MW03 (Table 1).

Calculating the difference in the top of casing and depth to groundwater, LTE determined the groundwater elevation in each monitoring well and generated a groundwater elevation and contour map (Figure 2). Based on the groundwater elevation map, groundwater flow during this monitoring event was generally to the north-northeast, toward Waddle Creek.

### **Groundwater Sampling Procedures**

Each monitoring well was purged of a minimum of three well casing volumes or until dry prior to collection of groundwater samples. Groundwater samples were collected from each monitoring well utilizing disposable 1.6-inch diameter polyethylene bailers. Groundwater samples were collected in laboratory-prepared sample bottles, placed on ice, and delivered under



chain-of-custody (COC) protocol to Origins Laboratory (Origins) in Denver, Colorado. Samples were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) by United States Environmental Protection Agency (EPA) Method 8260C.

Additionally, monitoring wells MW02, MW06, and MW11 were sampled for geochemical indicators and analyzed for dissolved manganese and total iron by EPA Method 3005A/6010C and nitrate and sulfate by EPA Method 300.

The groundwater samples submitted for dissolved manganese analysis were collected by advancing disposable 3/16-inch diameter polyethylene tubing into groundwater within the 2-inch diameter polyvinyl chloride (PVC) well casing. A peristaltic pump was utilized to collect the groundwater samples. LTE filtered the manganese samples with a 0.45 micron cartridge-style filter prior to placement into the laboratory-prepared sample bottles.

### **Groundwater Analytical Results**

The COGCC and the Colorado Department of Public Health and Environmental (CDPHE) Water Quality Control Commission (WQCC) have both established groundwater standards for BTEX of 5.0 micrograms per liter ( $\mu\text{g/L}$ ), 560  $\mu\text{g/L}$ , 700  $\mu\text{g/L}$ , and 1,400  $\mu\text{g/L}$ , respectively.

Eleven groundwater samples were collected and submitted to Origins for BTEX analysis during the September 2013 groundwater monitoring event. Groundwater analytical results indicated benzene exceeded the COGCC standard in one monitoring well (MW09) at a concentration of 12.2  $\mu\text{g/L}$ . BTEX compounds were not detected above the laboratory method detection limits or were within compliance of COGCC standards in the ten remaining groundwater samples. Groundwater analytical results for the September 2013 monitoring event are represented on Figure 3. Table 1 summarizes historical BTEX analytical data for all sampling events. The laboratory analytical report, laboratory quality assurance/quality control data, and COC documentation are attached.

## **MONITORED NATURAL ATTENUATION EVALUATION**

LTE utilized groundwater quality parameters and geochemical indicators to determine if natural attenuation of petroleum hydrocarbon compounds is occurring at the Site and whether MNA remains an effective remedial method to achieve site cleanup goals.

### **Groundwater Quality Parameter Results**

LTE personnel collected general water quality parameters during sampling activities to establish whether the appropriate site conditions existed for biodegradation of residual dissolved phase hydrocarbons. General water quality parameters included pH, temperature, conductivity, dissolved oxygen (DO), oxidation reduction potential (ORP), and total dissolved solids (TDS). General water quality parameters are summarized in Table 2.



Initial field screening results indicated pH readings are within a range for optimal biodegradation. Differences in temperature readings are attributable to seasonal groundwater fluctuations and ambient weather conditions.

The COGCC standard for TDS in groundwater should be less than 1.25 times the background concentration. The TDS concentrations observed in monitoring wells MW01 through MW11 ranged from 0.864 grams per liter (g/L) to 1.475 g/L. LTE believes the TDS concentrations observed at the Site are representative of background conditions.

During the third quarter, DO concentrations have decreased somewhat since June 2013. However, aerobic groundwater conditions still appear to exist within the interior of the plume. Even though the DO concentrations have fluctuated to some degree within the plume during the last two quarters, the data indicates that oxygen is currently available and being utilized by microbes to biologically degrade dissolved phase hydrocarbons within the plume.

### **Geochemical Indicators**

In order to further evaluate secondary lines of evidence to detail subsurface biodegradation processes, LTE collected groundwater samples for geochemical indicators that included manganese, total iron (representative of ferrous iron), nitrate, and sulfate. In the absence or near absence of DO, microorganisms metabolize petroleum contaminants through the use of these alternate electron acceptors. General groundwater quality parameters indicate DO is available throughout the Site, establishing an aerobic environment. Geochemical data is summarized in Table 3.

As indicated in Table 3, monitoring wells MW02, MW06, and MW11 were sampled for these secondary electron acceptors in downgradient, in-plume, and upgradient locations, respectively. The data indicate that iron, manganese, and sulfate are available as electron acceptors.

During the third quarter, total iron (representative of ferrous iron) concentrations have not changed significantly from the second quarter observations, and are generally consistent with historical results with the exclusions of second and third quarters of 2012. Analytical results for nitrate indicate that there is no presence of nitrate upgradient, in-plume, or downgradient. Manganese and sulfate concentrations have remained constant throughout historical groundwater monitoring activities.

DO concentration have fluctuated somewhat but still remain above 1.0 mg/L, with the exception of MW05. Currently, aerobic conditions appear to be the major means of MNA at this time.

### **SUMMARY AND CONCLUSIONS**

On September 18, 2013, LTE conducted the third quarterly groundwater monitoring event. Groundwater elevations decreased in seven wells. Depth to water measurements ranged from 3.51 feet in MW05 to 5.77 feet in MW03. Groundwater elevations increased in monitoring wells



MW05 and MW09. Based on the groundwater elevation data, groundwater generally flows to the north-northeast toward Waddle Creek.

The benzene concentration in monitoring well MW09 has decreased to 12.2 µg/L from the June 2013 monitoring event. This exceeds the COGCC standard of 5 µg/L. BTEX concentrations in all other wells were observed to be below the COGCC Table 910-1 concentration levels.

LTE evaluated groundwater quality parameters and geochemical indicators to determine if biodegradation of dissolved phase hydrocarbon concentrations is occurring and whether MNA is an effective remedial method to achieve site cleanup goals. Based on general water quality data, the biodegradation of benzene in groundwater appears to be naturally occurring through aerobic mechanisms; therefore MNA remains as the current remedial action occurring at the Site. LTE recommends continuing quarterly groundwater monitoring at the Site. The next sampling event is scheduled for December 2013.

### **Limitations**

No investigation is infallible. Some uncertainty will always exist concerning the presence or absence of potential contaminants at a particular property, irrespective of the rigor of the investigation. Accordingly, LTE does not warrant that contaminants, other than those identified in this report, do not exist at the subject property or may not exist there in the future.

LTE believes that it has performed the services summarized in this report in a manner consistent with the level of care and skill ordinarily exercised by members of the environmental profession practicing at the same time and under similar conditions in the area of the project.

Sincerely,

LT ENVIRONMENTAL, INC.

A handwritten signature in black ink, appearing to read 'Chris McKisson', written in a cursive style.

Chris McKisson  
Project Environmental Scientist

A handwritten signature in black ink, appearing to read 'Rob Fishburn', written in a cursive style.

Rob Fishburn, P.G.  
Senior Hydrogeologist



Attachments:

Figure 1- Site Location Map

Figure 2 - Groundwater Elevation Map

Figure 3 – Groundwater Analytical Results

Table 1 - Groundwater Analytical Results

Table 2 - General Water Quality Results

Table 3 - Geochemical Results

Attachment 1 - Laboratory Analytical Report

## FIGURES





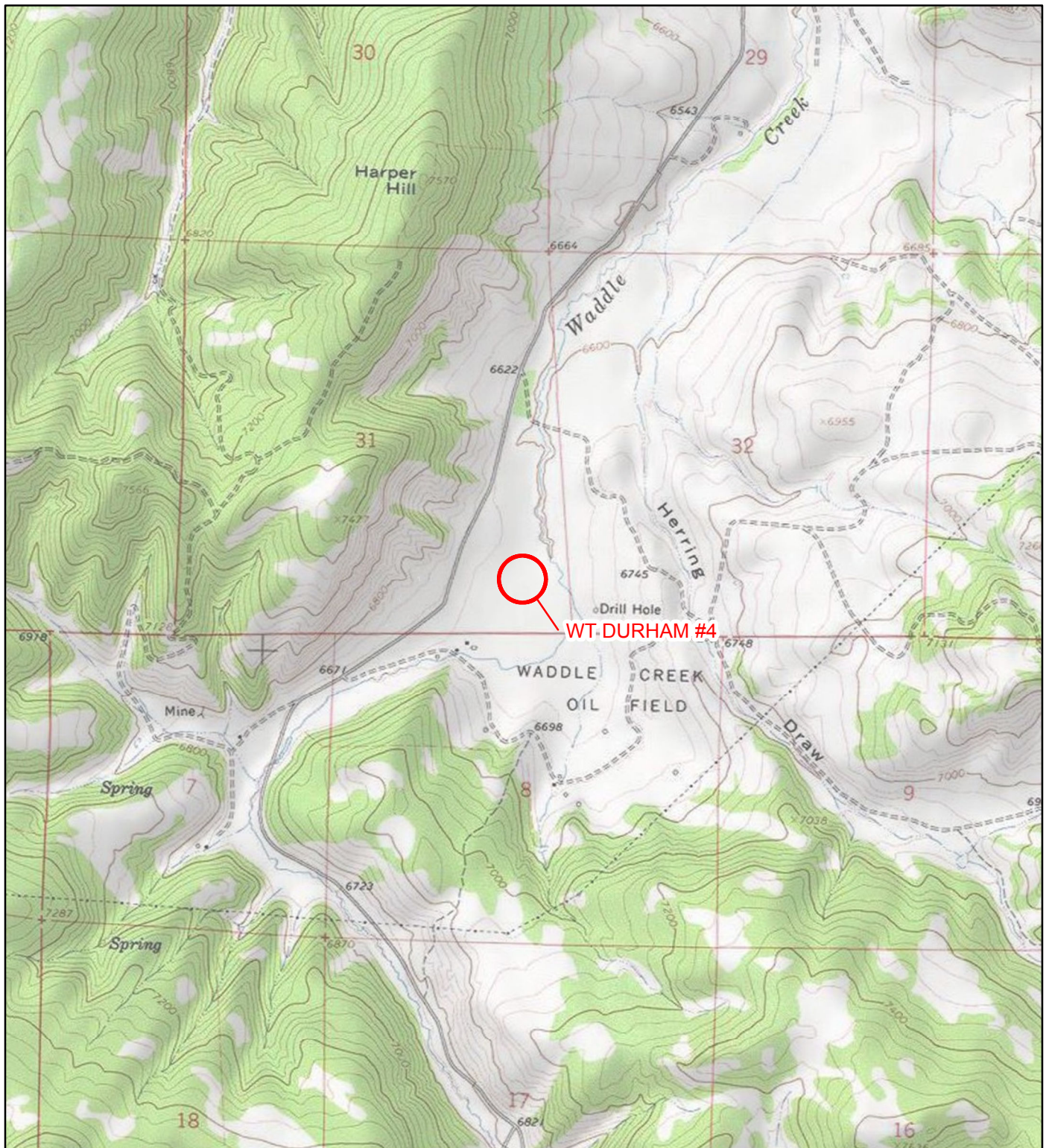
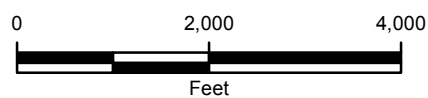


IMAGE COURTESY OF ESRI/BING MAPS

## LEGEND

 SITE LOCATION



**FIGURE 1**  
**SITE LOCATION MAP**  
**WT DURHAM #4 FLOWLINE RELEASE**  
**SESE SEC 31 T5N R90W 6PM**  
**MOFFAT COUNTY, COLORADO**  
**SHELL EXPLORATION AND PRODUCTION COMPANY**





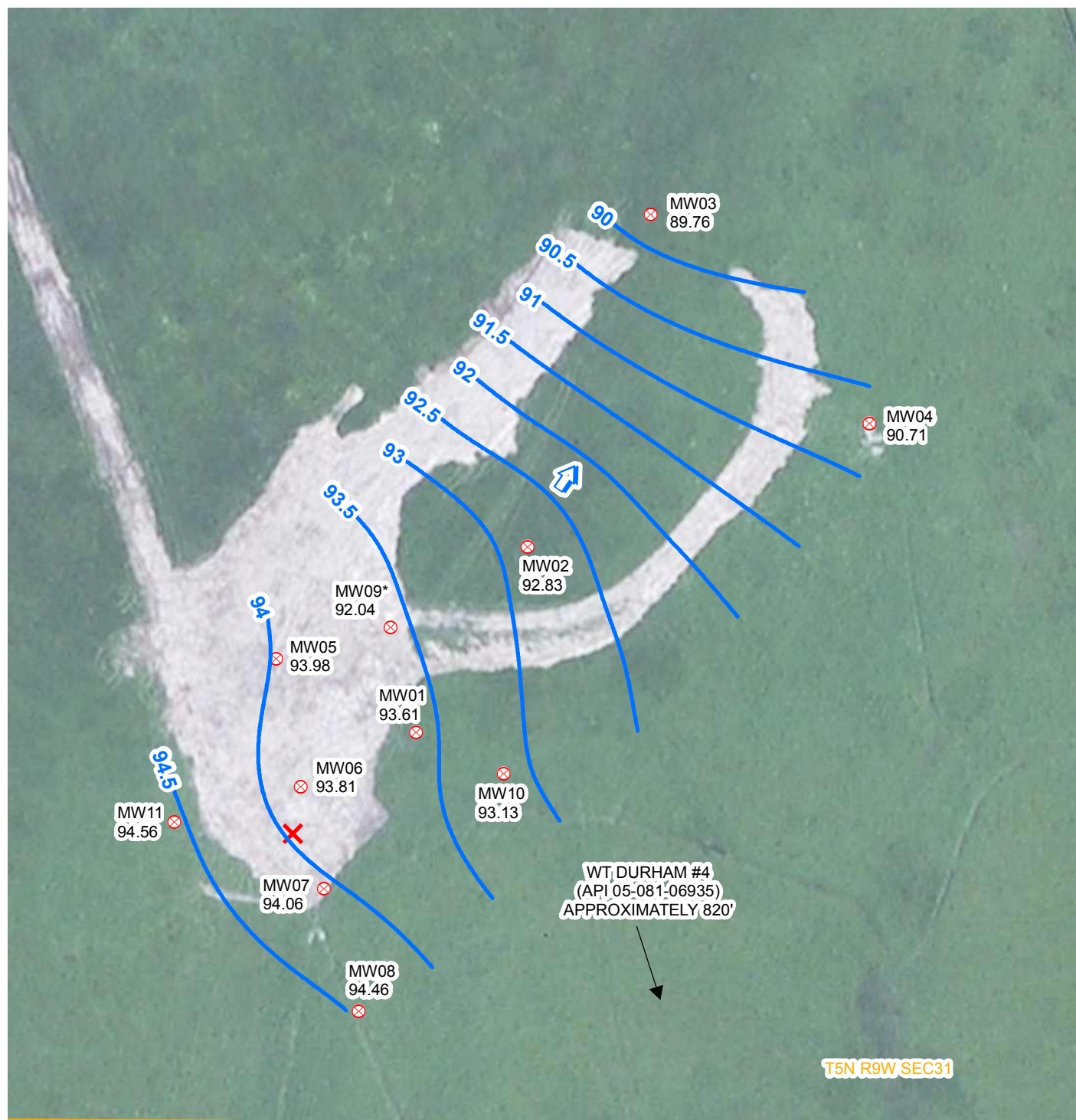


IMAGE COURTESY OF ESRI/BING MAPS

## LEGEND

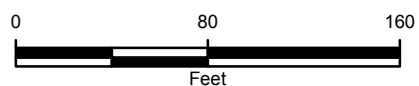
⊗ MONITORING WELL WITH RELATIVE GROUNDWATER ELEVATION IN FEET

✗ RELEASE

↑ ESTIMATED GROUNDWATER FLOW DIRECTION

SECTION

— RELATIVE GROUNDWATER ELEVATION CONTOUR  
CONTOUR INTERVAL = 0.5 FEET  
GROUNDWATER ELEVATIONS  
WERE MEASURED ON SEPTEMBER 18, 2013  
\*MW09 NOT USED TO GENERATE  
GROUNDWATER ELEVATION CONTOURS

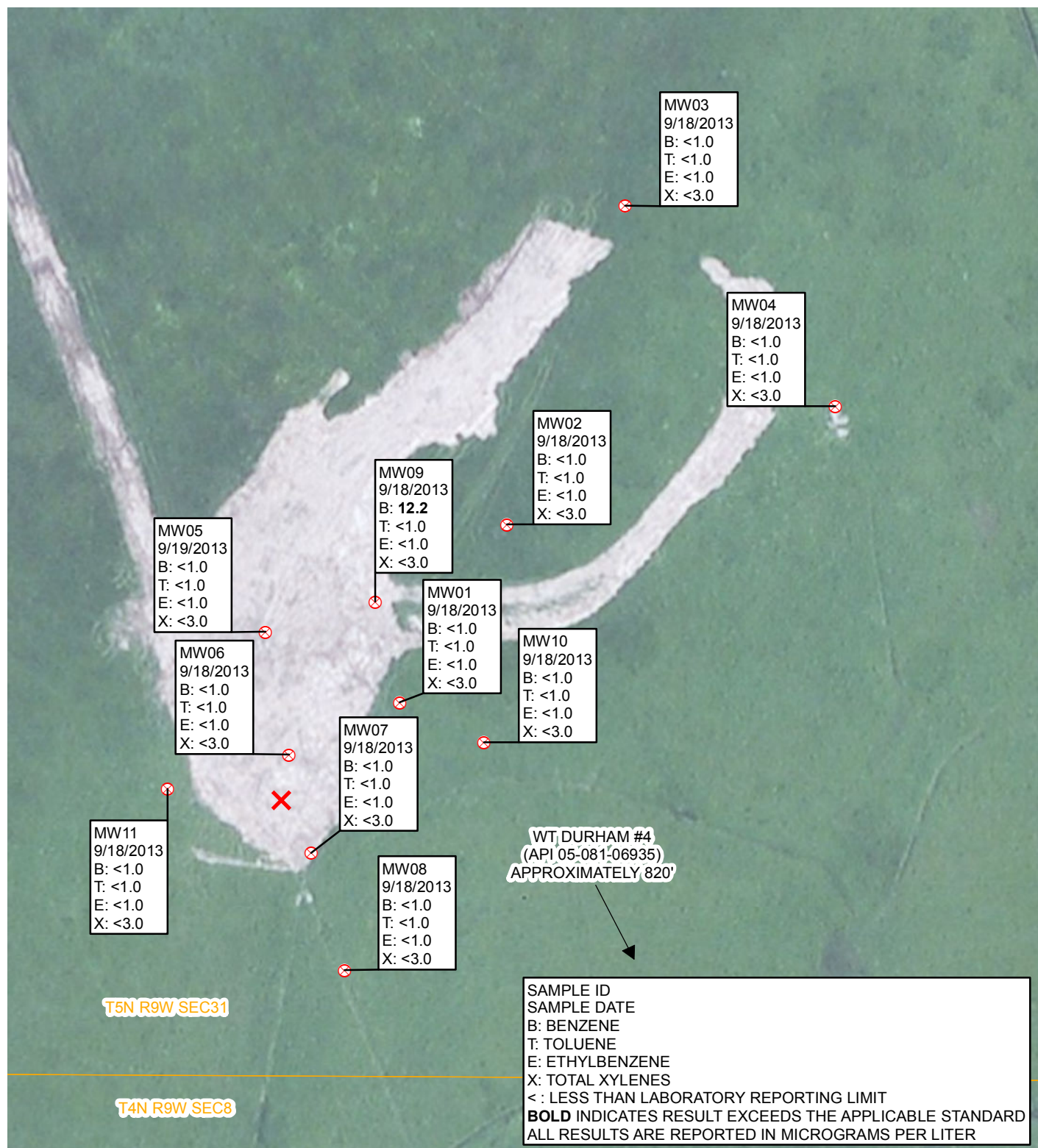


**FIGURE 2**  
**GROUNDWATER ELEVATION MAP**  
**WT DURHAM #4 (API 05-081-06935)**  
**SESE SEC 31 T5N R90W 6PM**  
**MOFFAT COUNTY, COLORADO**

**SHELL EXPLORATION AND PRODUCTION COMPANY**

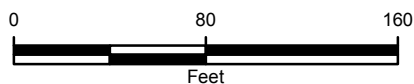






# LEGEND

- ⊗ MONITORING WELL
- X RELEASE
- SECTION



**FIGURE 3**  
 GROUNDWATER ANALYTICAL RESULTS  
 WT DURHAM #4 (API 05-081-06935)  
 SESE SEC 31 T5N R90W 6PM  
 MOFFAT COUNTY, COLORADO  
 SHELL EXPLORATION AND PRODUCTION COMPANY



## TABLES

**TABLE 1**  
**GROUNDWATER ANALYTICAL RESULTS**  
**WT DURHAM #4 FLOWLINE RELEASE**  
**MOFFAT COUNTY, COLORADO**  
**SHELL EXPLORATION AND PRODUCTION COMPANY**

Well ID	Date	Depth to Water (ft btoc)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
MW01	5/4/10	3.52	3.1	<2	<2	<2
	7/14/10	4.21	9	<1	<1	<3
	9/16/10	9.15	10.1	<1	<1	<3
	12/28/10	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM
	5/3/11	2.25	<1	<1	<1	<3
	8/24/11	5.15	<1	<1	<1	<3
	11/23/11	NM	NM	NM	NM	NM
	3/29/12	3.72	<1.0	<1.0	<1.0	<1.0
	6/27/12	5.96	<1.0	<1.0	<1.0	<1.0
	9/19/12	7.43	<1.0	<1.0	<1.0	<1.0
	12/12/12	4.70	<1.0	<1.0	<1.0	<1.0
	3/27/13	NM	NM	NM	NM	NM
	6/12/13	5.20	<1.0	<1.0	<1.0	<1.0
	9/18/13	5.24	<1.0	<1.0	<1.0	<3.0
MW02	5/4/10	2.86	<2	<2	<2	<2
	7/14/10	3.65	<1	<1	<1	<3
	9/16/10	9.81	<1	<1	<1	<3
	12/28/10	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM
	5/3/11	3.00	<1	<1	<1	<3
	8/24/11	4.82	<1	<1	<1	<3
	11/23/11	NM	NM	NM	NM	NM
	3/29/12	2.97	<1.0	<1.0	<1.0	<1.0
	6/27/12	5.78	<1.0	<1.0	<1.0	<1.0
	9/19/12	6.89	<1.0	<1.0	<1.0	<1.0
	12/12/12	3.65	<1.0	<1.0	<1.0	<1.0
	3/27/13	NM	NM	NM	NM	NM
	6/12/13	4.72	<1.0	<1.0	<1.0	<1.0
	9/18/13	4.72	<1.0	<1.0	<1.0	<3.0
MW03	5/4/10	3.30	<2	2	<2	3.3
	7/14/10	3.66	<1	<1	<1	<3
	9/16/10	9.81	<1	<1	<1	<3
	12/28/10	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM
	5/3/11	3.05	<1	<1	<1	<3
	8/24/11	5.54	<1	<1	<1	<3
	11/23/11	NM	NM	NM	NM	NM
	3/29/12	3.37	<1.0	<1.0	<1.0	<1.0
	6/27/12	6.52	<1.0	<1.0	<1.0	<1.0
	9/19/12	8.70	<1.0	<1.0	<1.0	<1.0
	12/12/12	NM	NM	NM	NM	NM
	3/27/13	NM	NM	NM	NM	NM
	6/12/13	4.50	<1.0	<1.0	<1.0	<1.0
	9/18/13	5.77	<1.0	<1.0	<1.0	<3.0



TABLE 1  
GROUNDWATER ANALYTICAL RESULTS  
WT DURHAM #4 FLOWLINE RELEASE  
MOFFAT COUNTY, COLORADO  
SHELL EXPLORATION AND PRODUCTION COMPANY

Well ID	Date	Depth to Water (ft btoc)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
MW04	5/4/10	2.69	<2	2.4	<2	<2
	7/14/10	3.16	1.12	1.71	<1	<3
	9/16/10	9.83	<1	<1	<1	<3
	12/28/10	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM
	5/3/11	2.97	<1	<1	<1	<3
	8/24/11	4.32	<1	1	<1	<3
	11/23/11	NM	NM	NM	NM	NM
	3/29/12	2.50	<1.0	<1.0	<1.0	<1.0
	6/27/12	4.59	<1.0	<1.0	<1.0	<1.0
	9/19/12	6.19	<1.0	<1.0	<1.0	<1.0
	12/12/12	2.84	<1.0	<1.0	<1.0	<1.0
	3/27/13	NM	NM	NM	NM	NM
	6/12/13	3.82	<1.0	<1.0	<1.0	<1.0
	9/18/13	4.40	<1.0	<1.0	<1.0	<3.0
MW05	7/14/10	2.70	<1	<1	<1	<3
	9/16/10	10.01	<1	<1	<1	<3
	12/28/10	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM
	5/3/11	3.24	<1	<1	<1	<3
	8/24/11	4.09	<b>26.1</b>	<1	<1	<3
	11/23/11	NM	NM	NM	NM	NM
	3/29/12	2.54	<b>22.2</b>	<1.0	<1.0	<1.0
	6/27/12	5.23	<b>30</b>	<1.0	<1.0	<1.0
	9/19/12	6.01	<b>14.5</b>	<1.0	<1.0	<1.0
	12/12/12	3.00	2.51	<1.0	<1.0	<1.0
	3/27/13	NM	NM	NM	NM	NM
	6/12/13	3.95	<1.0	<1.0	<1.0	<1.0
	9/18/13	3.51	<1.0	<1.0	<1.0	<3.0
MW06	7/14/10	3.61	<b>1,520</b>	78.1	88.1	198.1
	9/16/10	9.96	<b>354</b>	<1	44.4	16.3
	12/28/10	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM
	5/3/11	2.88	<b>651</b>	<1	10.7	12.2
	8/24/11	4.71	<b>475</b>	1.5	1.6	3
	11/23/11	NM	NM	NM	NM	NM
	3/29/12	3.35	<b>92.9</b>	<1.0	<1.0	<1.0
	6/27/12	5.58	<b>109</b>	<1.0	7.49	12.4
	9/19/12	6.73	1.83	<1.0	<1.0	1.73
	12/12/12	3.87	<b>6.4</b>	<1.0	<1.0	<1.0
	3/27/13	NM	NM	NM	NM	NM
	6/12/13	4.65	3.19	<1.0	<1.0	<1.0
	9/18/13	4.67	<1.0	<1.0	<1.0	<3.0





**TABLE 1**  
**GROUNDWATER ANALYTICAL RESULTS**  
**WT DURHAM #4 FLOWLINE RELEASE**  
**MOFFAT COUNTY, COLORADO**  
**SHELL EXPLORATION AND PRODUCTION COMPANY**

Well ID	Date	Depth to Water (ft btoc)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
MW07	7/14/10	3.99	<b>58.7</b>	<1	1.52	8.16
	9/16/10	9.73	<1	<1	<1	<3
	12/28/10	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM
	5/3/11	2.97	<b>280</b>	<1	4.4	11.6
	8/24/11	4.89	<1	<1	<1	<3
	11/23/11	NM	NM	NM	NM	NM
	3/29/12	3.66	<1.0	<1.0	<1.0	<1.0
	6/27/12	5.71	<1.0	<1.0	<1.0	<1.0
	9/19/12	6.97	<1.0	<1.0	<1.0	<1.0
	12/12/12	4.25	<1.0	<1.0	<1.0	<1.0
	3/27/13	NM	NM	NM	NM	NM
	6/12/13	4.90	<1.0	<1.0	<1.0	<1.0
	9/18/13	5.24	<1.0	<1.0	<1.0	<3.0
MW08	9/16/10	10.13	<1	<1	<1	<3
	12/28/10	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM
	5/2/11	2.84	<1	<1	<1	<3
	8/24/11	5.00	<1	<1	<1	<3
	11/23/11	NM	NM	NM	NM	NM
	3/29/12	3.86	<1.0	<1.0	<1.0	<1.0
	6/27/12	5.70	<1.0	<1.0	<1.0	<1.0
	9/19/12	7.04	<1.0	<1.0	<1.0	<1.0
	12/12/12	4.22	<1.0	<1.0	<1.0	<1.0
	3/27/13	NM	NM	NM	NM	NM
	6/12/13	4.80	<1.0	<1.0	<1.0	<1.0
	9/18/13	5.38	<1.0	<1.0	<1.0	<3.0
MW09	9/16/10	10.30	<1	<1	<1	<3
	12/28/10	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM
	5/3/11	3.10	<1	<1	<1	<3
	8/24/11	4.43	<1	<1	<1	<3
	11/23/11	NM	NM	NM	NM	NM
	3/29/12	2.90	2.03	<1.0	<1.0	<1.0
	6/27/12	5.60	1.88	<1.0	<1.0	<1.0
	9/19/12	6.68	3.81	<1.0	<1.0	<1.0
	12/12/12	3.60	2.20	<1.0	<1.0	<1.0
	3/27/13	NM	NM	NM	NM	NM
	6/12/13	5.60	<b>41.7</b>	<1.0	<1.0	<1.0
	9/18/13	5.25	<b>12.2</b>	<1.0	<1.0	<3.0



**TABLE 1**  
**GROUNDWATER ANALYTICAL RESULTS**  
**WT DURHAM #4 FLOWLINE RELEASE**  
**MOFFAT COUNTY, COLORADO**  
**SHELL EXPLORATION AND PRODUCTION COMPANY**

Well ID	Date	Depth to Water (ft btoc)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
MW10	9/16/10	9.93	<1	<1	<1	<3
	12/28/10	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM
	5/3/11	3.22	<1	<1	<1	<3
	8/24/11	5.10	<1	<1	<1	<3
	11/23/11	NM	NM	NM	NM	NM
	3/29/12	3.70	<1.0	<1.0	<1.0	<1.0
	6/27/12	5.85	<1.0	<1.0	<1.0	<1.0
	9/19/12	7.55	<1.0	<1.0	<1.0	<1.0
	12/12/12	5.00	<1.0	<1.0	<1.0	<1.0
	3/27/13	NM	NM	NM	NM	NM
	6/12/13	4.50	<1.0	<1.0	<1.0	<1.0
	9/18/13	5.71	<1.0	<1.0	<1.0	<3.0
MW11	9/16/10	10.05	<1	<1	<1	<3
	12/28/10	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM
	5/3/11	3.07	<1	<1	<1	<3
	8/24/11	5.41	<1	<1	<1	<3
	11/23/11	NM	NM	NM	NM	NM
	3/29/12	3.91	<1.0	<1.0	<1.0	<1.0
	6/27/12	6.53	<1.0	<1.0	<1.0	<1.0
	9/19/12	7.40	<1.0	<1.0	<1.0	<1.0
	12/12/12	4.45	<1.0	<1.0	<1.0	<1.0
	3/27/13	NM	NM	NM	NM	NM
	6/12/13	5.45	<1.0	<1.0	<1.0	<1.0
	9/18/13	5.45	<1.0	<1.0	<1.0	<3.0
GW01	5/11/10	-	<b>1,370</b>	<b>1,730</b>	72.3	752
GW02	5/18/10	-	<b>332</b>	319	12.8	258
<b>CDPHE WQCC Reg 41</b>			<b>5</b>	<b>560</b>	<b>700</b>	<b>1,400</b>

**NOTES:**

ft btoc - feet below top of well casing

µg/L - micrograms per liter

< - indicates result is less than the stated laboratory method reporting limit

**BOLD** - indicates result exceeds the applicable standard

Benzene, toluene, ethylbenzene, and total xylenes analyzed by EPA Method 8260C

CDPHE WQCC Reg 41 - Colorado Department of Public Health and Environment-

Water Quality Control Commission Regulation 41 covering The Basic Standards

for Ground Water

NM - Not Monitored due to frozen groundwater



**TABLE 2**  
**GENERAL WATER QUALITY RESULTS**  
**WT DURHAM #4 FLOWLINE RELEASE**  
**MOFFAT COUNTY, COLORADO**  
**SHELL EXPLORATION AND PRODUCTION COMPANY**

Well ID	Date	pH	Temp (C°)	Conductivity (µ-S)	DO (mg/L)	ORP (mV)	TDS (g/L)
MW01	9/16/10	6.93	13.30	2,331	2.80	-49.6	1.515
	12/28/10	NM	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM	NM
	5/2/11	7.43	4.65	1,100	2.23	199.5	1.169
	8/24/11	6.73	13.40	3,724	2.02	228	3.243
	11/23/11	NM	NM	NM	NM	NM	NM
	3/28/12	7.35	2.58	2,403	2.17	-64.9	1.559
	6/27/12	7.32	10.13	1,553	1.27	-39.4	1.010
	9/19/12	7.24	12.21	1,111	0.85	-295.1	0.722
	12/12/12	7.93	6.37	386	2.31	59.2	0.389
	3/27/13	NM	NM	NM	NM	NM	NM
	6/12/13	7.27	10.10	1,358	4.01	-55.7	1.235
	9/18/13	7.21	13.80	1,378	1.46	231.4	1.137
MW02	9/16/10	7.17	12.48	2,126	2.04	-89.4	2.4
	12/28/10	NM	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM	NM
	5/3/11	7.27	5.05	1,396	3.37	198.6	1.190
	8/24/11	6.76	12.64	3,500	1.85	226.8	2.971
	11/23/11	NM	NM	NM	NM	NM	NM
	3/28/12	7.19	2.93	2,333	3.42	-59.4	1.517
	6/27/12	7.23	9.36	1,476	3.01	-60.5	0.960
	9/19/12	7.1	11.39	1,052	2.21	-195	0.648
	12/12/12	7.7	6.28	370	2.65	-21.2	0.373
	3/27/13	NM	NM	NM	NM	NM	NM
	6/12/13	7.16	9.20	1,318	4.49	-75.5	1.224
	9/18/13	7.09	12.90	1,294	2.67	92.1	1.092
MW03	9/16/10	6.42	13.88	3,341	2.41	-84.8	2.171
	12/28/10	NM	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM	NM
	5/2/11	7.35	4.80	1,251	3.01	199.3	1.324
	8/24/11	6.75	11.91	1,313	2.56	227.4	1.144
	11/23/11	NM	NM	NM	NM	NM	NM
	3/28/12	7.31	2.13	3,176	3.07	-54.1	2.067
	6/27/12	7.27	9.04	1,958	3.28	-78.9	1.274
	9/19/12	7.15	11.85	876	3.80	-72.1	0.881
	12/12/12	NM	NM	NM	NM	NM	NM
	3/27/13	NM	NM	NM	NM	NM	NM
	6/12/13	7.32	11.04	1,869	4.33	-56.8	1.654
	9/18/13	6.99	12.20	1,719	1.88	29.0	1.475
MW04	9/16/10	6.55	12.75	2,058	2.17	-75.5	1.338
	12/28/10	NM	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM	NM
	5/2/11	7.35	5.45	1,042	2.49	199.1	1.081
	8/24/11	6.86	12.11	932	6.86	227.2	0.805
	11/23/11	NM	NM	NM	NM	NM	NM
	3/28/12	7.36	3.76	1,886	2.48	-38.8	1.226
	6/27/12	7.40	9.67	1,311	3.36	-38.1	0.853
	9/19/12	7.30	12.57	958	3.29	-147.0	0.623
	12/12/12	7.87	6.91	316	2.94	18.3	0.314
	3/27/13	NM	NM	NM	NM	NM	NM
	6/12/13	7.33	8.90	1,048	4.08	-65.0	0.984
	9/18/13	7.35	13.00	1,021	3.17	119.8	0.864



**TABLE 2**  
**GENERAL WATER QUALITY RESULTS**  
**WT DURHAM #4 FLOWLINE RELEASE**  
**MOFFAT COUNTY, COLORADO**  
**SHELL EXPLORATION AND PRODUCTION COMPANY**

Well ID	Date	pH	Temp (C°)	Conductivity (µ-S)	DO (mg/L)	ORP (mV)	TDS (g/L)
MW05	9/16/10	6.56	15.70	2,581	1.56	-107.5	1.677
	12/28/10	NM	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM	NM
	5/2/11	7.17	5.25	1,371	2.64	199.1	1.430
	8/24/11	6.71	17.17	3,011	4.21	228.1	3.061
	11/23/11	NM	NM	NM	NM	NM	NM
	3/28/12	7.30	3.49	2,552	2.56	-81.9	1.659
	6/27/12	7.24	12.74	1,674	1.62	-96.4	1.088
	9/19/12	7.12	14.67	1,154	0.83	-241.9	0.750
	12/12/12	7.77	6.22	375	3.91	-73.1	0.381
	3/27/13	NM	NM	NM	NM	NM	NM
	6/12/13	7.16	10.37	1,333	3.30	-99.6	1.202
	9/18/13	7.12	15.20	1,384	0.86	-33.0	1.105
MW06	9/16/10	7.15	16.79	2,711	1.38	-102.3	2.4
	12/28/10	NM	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM	NM
	5/3/11	7.19	5.88	1,436	2.47	199.0	1.213
	8/24/11	6.72	16.94	3,071	4.03	228.0	3.073
	11/23/11	NM	NM	NM	NM	NM	NM
	3/28/12	7.33	3.49	2,340	2.53	-70.1	1.519
	6/27/12	7.27	14.21	1,618	2.03	-79.3	1.051
	9/19/12	7.19	15.92	1,155	0.30	-275.6	0.751
	12/12/12	7.78	7.19	403	2.37	-69.0	0.396
	3/27/13	NM	NM	NM	NM	NM	NM
	6/12/13	7.26	10.89	1,407	5.04	-83.5	1.249
	9/18/13	7.19	15.80	1,348	1.52	23.4	1.066
MW07	9/16/10	6.42	13.22	2,456	1.34	-53.5	1.596
	12/28/10	NM	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM	NM
	5/2/11	7.30	4.81	1,134	2.72	199.4	1.210
	8/24/11	6.74	13.80	3,813	1.94	228.3	3.153
	11/23/11	NM	NM	NM	NM	NM	NM
	3/28/12	7.40	2.74	2,386	2.71	-26.8	1.551
	6/27/12	7.43	10.17	1,534	1.77	-5.8	0.998
	9/19/12	7.30	12.24	1,081	0.72	-259.1	0.702
	12/12/12	8.07	6.07	368	1.36	-11.5	0.375
	3/27/12	NM	NM	NM	NM	NM	NM
	6/12/13	7.30	9.76	1,329	2.70	-26.6	1.218
	9/18/13	7.28	13.40	1,266	1.38	206.7	1.053
MW08	9/16/10	6.53	13.28	1,916	2.40	6.9	1.246
	12/28/10	NM	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM	NM
	5/2/11	7.22	5.16	977	3.15	198.5	1.022
	8/24/11	6.78	13.35	3,158	2.02	228.6	2.638
	11/23/11	NM	NM	NM	NM	NM	NM
	3/28/12	7.48	3.11	2,027	3.05	4.4	1.318
	6/27/12	7.45	10.14	1,226	1.73	27.0	0.797
	9/19/12	7.30	11.94	908	2.58	-196.2	0.591
	12/12/12	8.02	6.92	298	2.69	31.7	0.295
	3/27/13	NM	NM	NM	NM	NM	NM
	6/12/13	7.46	9.92	1,077	4.01	4.5	0.988
	9/18/13	7.38	13.40	1,047	2.85	264.0	0.877





**TABLE 2**  
**GENERAL WATER QUALITY RESULTS**  
**WT DURHAM #4 FLOWLINE RELEASE**  
**MOFFAT COUNTY, COLORADO**  
**SHELL EXPLORATION AND PRODUCTION COMPANY**

Well ID	Date	pH	Temp (C°)	Conductivity (µ-S)	DO (mg/L)	ORP (mV)	TDS (g/L)
MW09	9/16/10	6.50	14.55	2,566	3.26	-49.0	1.668
	12/28/10	NM	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM	NM
	5/2/11	7.14	4.88	1,361	2.97	200.4	1.437
	8/24/11	6.68	14.79	4,140	2.32	227.6	3.339
	11/23/11	NM	NM	NM	NM	NM	NM
	3/28/12	7.13	2.77	2,543	2.92	-37.8	1.653
	6/27/12	7.13	11.23	1,683	2.45	-67.8	1.092
	9/19/12	7.14	13.16	1,199	2.55	-177.5	0.780
	12/12/12	7.74	6.24	416	2.65	-48.9	0.421
	3/27/13	NM	NM	NM	NM	NM	NM
	6/12/13	6.98	11.00	1,543	4.46	-72.8	1.368
	9/18/13	7.08	13.90	1,334	2.77	54.6	1.099
MW10	9/16/10	6.56	12.85	2,017	1.90	38.6	1.311
	12/28/10	NM	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM	NM
	5/2/11	7.53	5.01	995	2.17	197.8	1.061
	8/24/11	6.73	13.48	3,485	2.92	228.1	2.908
	11/23/11	NM	NM	NM	NM	NM	NM
	3/28/12	7.43	2.71	2,176	2.51	-13.1	1.414
	6/27/12	7.38	10.06	1,337	2.32	-1.7	0.870
	9/19/12	7.13	11.93	970	1.40	-216	0.633
	12/12/12	8.12	6.35	310	4.63	20	0.312
	3/27/13	NM	NM	NM	NM	NM	NM
	6/12/13	7.44	9.42	1,159	3.32	-1.1	1.072
	9/18/13	7.40	13.60	1,088	2.93	238.3	0.904
MW11	9/16/10	6.99	13.29	2,488	2.2	7.3	1.618
	12/28/10	NM	NM	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM	NM	NM
	5/3/11	7.46	4.84	1,382	2.74	198.4	1.169
	8/24/11	6.72	14.46	3,313	2.23	229	3.262
	11/23/11	NM	NM	NM	NM	NM	NM
	3/28/12	7.42	2.77	2,215	2.86	11.5	1.440
	6/27/12	7.38	10.84	1,605	1.60	-43.3	1.044
	9/19/12	7.20	11.87	1,116	1.83	-200.5	0.725
	12/12/12	7.96	6.21	354	2.34	-8.8	0.358
	3/27/13	NM	NM	NM	NM	NM	NM
	6/12/13	7.58	10.87	1,356	3.79	-26.6	1.204
	9/18/13	7.31	13.20	1,248	2.06	228.7	1.046
CDPHE WQCC Reg 41		NA	NA	NA	NA	NA	<1.25 x background

**NOTES:**

C° - degrees celcius

µ-S - micro siemens

DO - dissolved oxygen

mg/L - milligrams per liter

ORP - oxygen reduction potential

mV - milli volts

TDS - total dissolved solids

g/L - grams per liter

CDPHE WQCC Reg 41 - Colorado Department of Public Health and Environment - Water Quality

Control Commission Regulation 41 covering The Basic Standards for Ground Water

NA - Not Applicable

NM - Not Monitored due to frozen groundwater



**TABLE 3**  
**GEOCHEMICAL RESULTS**  
**WT DURHAM #4 FLOWLINE RELEASE**  
**MOFFAT COUNTY, COLORADO**  
**SHELL EXPLORATION AND PRODUCTION COMPANY**

Well ID	Date	Manganese (µg/l)	Total Iron (µg/l)	Nitrate (mg/L)	Sulfate (mg/L)
MW02	9/16/10	356	3,310	<0.05	292
	12/28/10	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM
	5/3/11	360	2,190	<0.05	316
	8/24/11	409	1,070	<0.05	347
	11/23/11	NM	NM	NM	NM
	3/29/12	390	1,600	<0.23	400
	6/27/12	370	13,000	<0.23	340
	9/19/12	490	96,300	0.174	332
	12/12/12	458	1,220	0.3	388
	3/27/13	NM	NM	NM	NM
	6/12/13	382	2,970	0.101	359
	9/18/13	456	1,660	<0.020	407
MW06	9/16/10	829	3,560	<0.05	465
	12/28/10	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM
	5/3/11	942	644	<0.05	384
	8/24/11	926	1,590	0.185	411
	11/23/11	NM	NM	NM	NM
	3/29/12	840	2,500	<0.23	350
	6/27/12	840	2,100	<0.23	323
	9/19/12	786	175,000	0.18	349
	12/12/12	757	2,250	0.226	340
	3/27/13	NM	NM	NM	NM
	6/12/13	1,030	1,880	0.0886	407
	9/18/13	974	2,470	<0.020	367
MW11	9/16/10	317	<200	0.119	376
	12/28/10	NM	NM	NM	NM
	2/15/11	NM	NM	NM	NM
	5/3/11	171	<200	<0.05	259
	8/24/11	277	<200	0.193	292
	11/23/11	NM	NM	NM	NM
	3/29/12	120	650	<0.23	290
	6/27/12	440	130	<0.23	371
	9/19/12	760	82,700	0.189	365
	12/12/12	127	337	0.246	318
	3/27/13	NM	NM	NM	NM
	6/12/13	218	103	<0.100	332
	9/18/13	281	100	<0.020	346

**NOTES:**

µg/L - micrograms per liter

mg/L - milligrams per liter

< - indicates result is less than the stated laboratory method reporting limit

NM - Not Monitored due to frozen groundwater



**ATTACHMENT 1**  
**LABORATORY ANALYTICAL REPORT**





October 01, 2013

LT Environmental, Inc.

Rob Fishburn

4600 West 60th Avenue

Arvada CO 80003

Project Name - WT Durham #4

Project Number - MS1007

Attached are you analytical results for WT Durham #4 received by Origins Laboratory, Inc. September 19, 2013. This project is associated with Origins project number X309091-01.

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

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

### CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW01	X309091-01	Water	September 18, 2013 14:00	09/19/2013 14:00
MW02	X309091-02	Water	September 18, 2013 14:05	09/19/2013 14:00
MW03	X309091-03	Water	September 18, 2013 14:10	09/19/2013 14:00
MW04	X309091-04	Water	September 18, 2013 14:15	09/19/2013 14:00
MW05	X309091-05	Water	September 18, 2013 14:45	09/19/2013 14:00
MW06	X309091-06	Water	September 18, 2013 14:20	09/19/2013 14:00
MW07	X309091-07	Water	September 18, 2013 14:25	09/19/2013 14:00
MW08	X309091-08	Water	September 18, 2013 14:30	09/19/2013 14:00
MW09	X309091-09	Water	September 18, 2013 14:35	09/19/2013 14:00
MW10	X309091-10	Water	September 18, 2013 14:50	09/19/2013 14:00
MW11	X309091-11	Water	September 18, 2013 14:55	09/19/2013 14:00

Origins Laboratory, Inc.



Noelle E Doyle, President

*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

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

www.originslaboratory.com

page 1 of 2

**ORIGINS**  
LABORATORY, INC

X309091

Client: LTE, Inc.  
Address: 820 Megan Ave Unit B  
Rifle, CO 81650  
Telephone Number: 970 285 9985  
Email Address: rfishburn@lteinc.com

Project Manager: Rob Fishburn  
Project Name: WT Durham #4  
Project Number: MS1007  
Samples Collected By: Steve S. / Risa Z.

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis				Sample Instructions
				Unpreserved	HCl	HNO <sub>3</sub>	Other	Groundwater	Soil	Air Summa #	Other	BTEX	Nitrate	Sulfate	
MW01	9/18/13	1400	3		X			X					X		HNO <sub>3</sub> bottles
MW02	9/18/13	1405	6	X	X	X		X				X	X		were all field
MW03	9/18/13	1410	3	X	X			X				X			Filtered
MW04	9/18/13	1415	3	X	X			X				X			
MW05	9/18/13	1445	3	X	X			X				X			
MW06	9/18/13	1420	6	X	X	X		X				X	X		
MW07	9/18/13	1425	3	X	X			X				X	X		
MW08	9/18/13	1430	3	X	X			X				X			
MW09	9/18/13	1435	3	X	X			X				X			
MW10	9/18/13	1450	3	X	X			X				X			
Relinquished By: <u>Steve S.</u>	Date: <u>9/18/13</u>	Time: <u>16:00</u>	Received By: <u>FedEx</u>	Date: <u>9/19/13</u>	Time: <u>16:00</u>	Turnaround Time: <input type="checkbox"/> Same Day <input type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input checked="" type="checkbox"/> Standard									
Relinquished By: <u>FedEx</u>	Date: <u>9/19/13</u>	Time: <u>14:00</u>	Received By: <u>[Signature]</u>	Date: <u>9/19/13</u>	Time: <u>14:00</u>										

Date Result Needed

Origins Laboratory, Inc.

*Noelle E Doyle*

Noelle E Doyle, President

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

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

Origins Laboratory

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

## Sample Receipt Checklist

Origins Work Order: X309091

Client: LTE

Client Project ID: W.T. Durham #4

Checklist Completed by: Jeff Smith

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

Date/time completed: 9/19/13 15:41

Airbill #: N/A

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

Cooler Number/Temperature: 15.3 °C 1 °C 1 °C 1 °C 1 °C

Thermometer ID: T002

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"/>			
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 <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			<u>Nitrate</u>
Is a chain-of-custody (COC) present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client with date and time recorded <sup>(1)</sup> ?	<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 <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 checked="" type="checkbox"/>			<u>HCL, HNO<sub>3</sub></u>
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 in the additional comments (above) and the case narrative.

Reviewed by (Project Manager): [Signature]

09-24-13 1329  
Date/Time Reviewed

Origins Laboratory, Inc.

[Signature]

Noelle E Doyle, President

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

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

MW01

9/18/2013 2:00:00PM

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

Origins Laboratory, Inc.  
X309091-01 (Water)

### BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3120006	09/20/2013	09/20/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	3.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4  
Surrogate: Toluene-d8  
Surrogate: 4-Bromofluorobenzene

106 % 84-121  
108 % 85-115  
104 % 84-114

" " "  
" " "  
" " "

Origins Laboratory, Inc.



Noelle E Doyle, President

*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

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

MW02  
9/18/2013 2:05:00PM

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

Origins Laboratory, Inc.  
X309091-02 (Water)

## BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3120006	09/20/2013	09/20/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	3.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	103 %	84-121			"	"	"
Surrogate: Toluene-d8	108 %	85-115			"	"	"
Surrogate: 4-Bromofluorobenzene	101 %	84-114			"	"	"

## Metals by SW846 3005A/6010C

Iron	1660	100	ug/L	1	1333266	09/24/2013	09/24/2013
Manganese	456	10.0	"	"	"	"	"

Origins Laboratory, Inc.



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

Noelle E Doyle, President

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

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

MW03

9/18/2013 2:10:00PM

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

Origins Laboratory, Inc.  
X309091-03 (Water)

### BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3120006	09/20/2013	09/20/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	3.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	105 %	84-121	"	"	"
Surrogate: Toluene-d8	109 %	85-115	"	"	"
Surrogate: 4-Bromofluorobenzene	94.6 %	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.*

Noelle E Doyle, President

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

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

MW04

9/18/2013 2:15:00PM

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

Origins Laboratory, Inc.  
X309091-04 (Water)

### BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3120006	09/20/2013	09/20/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	3.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	100 %	84-121	"	"	"
Surrogate: Toluene-d8	107 %	85-115	"	"	"
Surrogate: 4-Bromofluorobenzene	103 %	84-114	"	"	"

Origins Laboratory, Inc.



Noelle E Doyle, President

*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

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

MW05  
9/18/2013 2:45:00PM

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

Origins Laboratory, Inc.  
X309091-05 (Water)

## BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3120006	09/20/2013	09/20/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	3.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	98.6 %	84-121	"	"	"
Surrogate: Toluene-d8	107 %	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.*

Noelle E Doyle, President

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

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

**MW06****9/18/2013 2:20:00PM**

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

**Origins Laboratory, Inc.**  
**X309091-06 (Water)****BTEX by EPA 8260C**

Benzene	ND	1.0	ug/L	1	3120006	09/20/2013	09/20/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	3.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	98.7 %	84-121			"	"	"
Surrogate: Toluene-d8	106 %	85-115			"	"	"
Surrogate: 4-Bromofluorobenzene	104 %	84-114			"	"	"

**Metals by SW846 3005A/6010C**

Iron	2470	100	ug/L	1	1333266	09/24/2013	09/24/2013
Manganese	974	10.0	"	"	"	"	"

Origins Laboratory, Inc.



Noelle E Doyle, President

*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

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

MW07

9/18/2013 2:25:00PM

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

Origins Laboratory, Inc.  
X309091-07 (Water)

### BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3120006	09/20/2013	09/20/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	3.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	99.3 %	84-121	"	"	"
Surrogate: Toluene-d8	106 %	85-115	"	"	"
Surrogate: 4-Bromofluorobenzene	101 %	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.*

Noelle E Doyle, President

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

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

MW08  
9/18/2013 2:30:00PM

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

Origins Laboratory, Inc.  
X309091-08 (Water)

## BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3120006	09/20/2013	09/20/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	3.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4  
Surrogate: Toluene-d8  
Surrogate: 4-Bromofluorobenzene

103 % 84-121  
108 % 85-115  
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.

Noelle E Doyle, President

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

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

MW09

9/18/2013 2:35:00PM

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

Origins Laboratory, Inc.  
X309091-09 (Water)

### BTEX by EPA 8260C

Benzene	12.2	1.0	ug/L	1	3120006	09/20/2013	09/20/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	3.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	97.1 %	84-121	"	"	"
Surrogate: Toluene-d8	109 %	85-115	"	"	"
Surrogate: 4-Bromofluorobenzene	101 %	84-114	"	"	"

Origins Laboratory, Inc.



Noelle E Doyle, President

*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

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

MW10  
9/18/2013 2:50:00PM

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

Origins Laboratory, Inc.  
X309091-10 (Water)

**BTEX by EPA 8260C**

Benzene	ND	1.0	ug/L	1	3120006	09/20/2013	09/20/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	3.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	102 %	84-121	"	"	"
Surrogate: Toluene-d8	109 %	85-115	"	"	"
Surrogate: 4-Bromofluorobenzene	104 %	84-114	"	"	"

Origins Laboratory, Inc.



Noelle E Doyle, President

*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

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

MW11  
9/18/2013 2:55:00PM

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

Origins Laboratory, Inc.  
X309091-11 (Water)

## BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3120006	09/20/2013	09/20/2013
Toluene	ND	1.0	"	"	"	"	"
Ethylbenzene	ND	1.0	"	"	"	"	"
Xylenes, total	ND	3.0	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	95.4 %	84-121			"	"	"
Surrogate: Toluene-d8	107 %	85-115			"	"	"
Surrogate: 4-Bromofluorobenzene	105 %	84-114			"	"	"

## Metals by SW846 3005A/6010C

Iron	100	100	ug/L	1	1333266	09/24/2013	09/24/2013	J
Manganese	281	10.0	"	"	"	"	"	

Origins Laboratory, Inc.



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

Noelle E Doyle, President

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

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

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 3120006 - EPA 5030B (Water)

Blank (3120006-BLK1)

Prepared: 09/20/2013 Analyzed: 09/20/2013

Benzene	ND	1.0	ug/L
Toluene	ND	1.0	"
Ethylbenzene	ND	1.0	"
Xylenes, total	ND	3.0	"

Surrogate: 1,2-Dichloroethane-d4	63	"	62.5	101	84-121
Surrogate: Toluene-d8	66	"	62.5	106	85-115
Surrogate: 4-Bromofluorobenzene	63	"	62.5	101	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.

Noelle E Doyle, President

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

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

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 3I20006 - EPA 5030B (Water)

LCS (3I20006-BS1)

Prepared: 09/20/2013 Analyzed: 09/20/2013

Benzene	57.2	1.0	ug/L	50.0	114	74-130
Toluene	55.6	1.0	"	50.0	111	76-128
Ethylbenzene	55.3	1.0	"	50.0	111	78-130
m,p-Xylene	99.5	2.0	"	100	99.5	75-134
o-Xylene	48.4	1.0	"	50.0	96.7	76-129
Surrogate: 1,2-Dichloroethane-d4	61		"	62.5	97.4	84-121
Surrogate: Toluene-d8	67		"	62.5	107	85-115
Surrogate: 4-Bromofluorobenzene	65		"	62.5	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.

Noelle E Doyle, President



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

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

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 3I20006 - EPA 5030B (Water)

Matrix Spike (3I20006-MS1)		Source: X309091-01			Prepared: 09/20/2013 Analyzed: 09/20/2013					
Benzene	58.4	1.0	ug/L	50.0	ND	117	74-130			
Toluene	56.2	1.0	"	50.0	ND	112	73-131			
Ethylbenzene	54.5	1.0	"	50.0	ND	109	76-132			
m,p-Xylene	101	2.0	"	100	ND	101	69-139			
o-Xylene	48.4	1.0	"	50.0	ND	96.7	74-131			
Surrogate: 1,2-Dichloroethane-d4	58		"	62.5		92.8	84-121			
Surrogate: Toluene-d8	66		"	62.5		106	85-115			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		98.0	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.

Noelle E Doyle, President

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

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

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 3120006 - EPA 5030B (Water)

Matrix Spike Dup (3120006-MSD1)		Source: X309091-01			Prepared: 09/20/2013 Analyzed: 09/20/2013					
Benzene	57.7	1.0	ug/L	50.0	ND	115	74-130	1.05	20	
Toluene	55.7	1.0	"	50.0	ND	111	73-131	1.02	20	
Ethylbenzene	53.7	1.0	"	50.0	ND	107	76-132	1.48	20	
m,p-Xylene	98.2	2.0	"	100	ND	98.2	69-139	2.87	20	
o-Xylene	47.4	1.0	"	50.0	ND	94.8	74-131	2.01	20	
Surrogate: 1,2-Dichloroethane-d4	60		"	62.5		95.8	84-121			
Surrogate: Toluene-d8	68		"	62.5		109	85-115			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		99.3	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.

Noelle E Doyle, President

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

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

**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
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

**Metals by SW846 3005A/6010C - Quality Control**  
**GEL Laboratories, LLC**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch 1333266 - SW846 3005A

**BLANK (1202952994-BLK)**

Prepared: 09/24/2013 Analyzed: 09/24/2013

U

Manganese	ND	2.00	ug/L		0		-			
Iron	ND	30.0	"		0		-			

**LCS (1202952995-BKS)**

Prepared: 09/24/2013 Analyzed: 09/24/2013

Iron	5380	30.0	ug/L	5000	0	108	80-120			
Manganese	502	2.00	"	500	0	100	80-120			

**DUP (1202952996 D)**

Source: X309091-02

Prepared: 09/24/2013 Analyzed: 09/24/2013

Manganese	432	2.00	ug/L		437		0-20	1.04	20	
Iron	1760	30.0	"		1660		0-20	5.76	20	

**MS (1202952997 S)**

Source: X309091-02

Prepared: 09/24/2013 Analyzed: 09/24/2013

Iron	7300	30.0	ug/L	5000	1660	113	75-125			
Manganese	957	2.00	"	500	437	104	75-125			

Origins Laboratory, Inc.



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

Noelle E Doyle, President

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

Rob Fishburn  
Project Number: MS1007  
Project: WT Durham #4

### Notes and Definitions

U Result not detected above the detection limit

J Greater than the detection limit but less than the reporting limit

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

Origins Laboratory, Inc.



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

Noelle E Doyle, President



09/23/13

## Technical Report for

### Origins Laboratory

X309091

Accutest Job Number: D50699

Sampling Date: 09/18/13

#### Report to:

Origins Laboratory  
1725 Elk Place  
Denver, CO 80211  
ndoyle@originslab.com

ATTN: Noelle Doyle

Total number of pages in report: **16**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

A handwritten signature in black ink, appearing to read 'Scott Heideman'.

Scott Heideman  
Laboratory Director

Client Service contact: Renea Jackson 303-425-6021

Certifications: CO (CO00049), ID, NE (CO00049), ND (R-027), NJ (CO 0007), OK (D9942), UT (NELAP CO00049), TX (T104704511)

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories.  
Test results relate only to samples analyzed.

# Table of Contents

-1-

**Section 1: Sample Summary ..... 3**

**Section 2: Case Narrative/Conformance Summary ..... 4**

**Section 3: Summary of Hits ..... 5**

**Section 4: Sample Results ..... 6**

**4.1: D50699-1: X309091-02 ..... 7**

**4.2: D50699-2: X309091-06 ..... 8**

**4.3: D50699-3: X309091-11 ..... 9**

**Section 5: Misc. Forms ..... 10**

**5.1: Chain of Custody ..... 11**

**Section 6: General Chemistry - QC Data Summaries ..... 13**

**6.1: Method Blank and Spike Results Summary ..... 14**

**6.2: Matrix Spike Results Summary ..... 15**

**6.3: Matrix Spike Duplicate Results Summary ..... 16**



Sample Summary

Origins Laboratory  
X309091

Job No: D50699

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
D50699-1	09/18/13	14:05	09/19/13	AQ	Water	X309091-02
D50699-2	09/18/13	14:20	09/19/13	AQ	Water	X309091-06
D50699-3	09/18/13	14:55	09/19/13	AQ	Water	X309091-11



## CASE NARRATIVE / CONFORMANCE SUMMARY

**Client:** Origins Laboratory

**Job No** D50699

**Site:** X309091

**Report Date** 9/23/2013 3:48:02 PM

On 09/19/2013, 3 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 0.7 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D50699 was assigned to the project. The lab sample ID, client sample ID, and date of sample collection are detailed in the report's Results Summary.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

### Wet Chemistry By Method EPA 300.0/SW846 9056

**Matrix** AQ

**Batch ID:** GP10970

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D50700-1MS, D50700-1MSD were used as the QC samples for the Nitrogen, Nitrate, Sulfate, Nitrogen, Nitrate analysis.
- D50699-3 for Nitrogen, Nitrate: Elevated detection limit due to matrix interference.
- D50699-2 for Nitrogen, Nitrate: Elevated detection limit due to matrix interference.
- D50699-1 for Nitrogen, Nitrate: Elevated detection limit due to matrix interference.

AMS certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting AMS's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

AMS is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. This report is authorized by AMS indicated via signature on the report cover.



Summary of Hits

Job Number: D50699  
Account: Origins Laboratory  
Project: X309091  
Collected: 09/18/13



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
D50699-1	X309091-02					
Sulfate		407	25		mg/l	EPA 300.0/SW846 9056
D50699-2	X309091-06					
Sulfate		367	13		mg/l	EPA 300.0/SW846 9056
D50699-3	X309091-11					
Sulfate		346	13		mg/l	EPA 300.0/SW846 9056

Sample Results

Report of Analysis

Report of Analysis

<b>Client Sample ID:</b>	X309091-02	<b>Date Sampled:</b>	09/18/13
<b>Lab Sample ID:</b>	D50699-1	<b>Date Received:</b>	09/19/13
<b>Matrix:</b>	AQ - Water	<b>Percent Solids:</b>	n/a
<b>Project:</b>	X309091		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Nitrogen, Nitrate <sup>a</sup>	< 0.020	0.020	mg/l	2	09/20/13 10:13	SK	EPA 300.0/SW846 9056
Sulfate	407	25	mg/l	50	09/20/13 14:06	SK	EPA 300.0/SW846 9056

(a) Elevated detection limit due to matrix interference.

RL = Reporting Limit

Report of Analysis

Client Sample ID: X309091-06  
Lab Sample ID: D50699-2  
Matrix: AQ - Water  
Project: X309091

Date Sampled: 09/18/13  
Date Received: 09/19/13  
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Nitrogen, Nitrate <sup>a</sup>	< 0.020	0.020	mg/l	2	09/20/13 10:25	SK	EPA 300.0/SW846 9056
Sulfate	367	13	mg/l	25	09/20/13 14:17	SK	EPA 300.0/SW846 9056

(a) Elevated detection limit due to matrix interference.

RL = Reporting Limit

4.2  
4

Report of Analysis

Client Sample ID: X309091-11  
Lab Sample ID: D50699-3  
Matrix: AQ - Water  
Project: X309091

Date Sampled: 09/18/13  
Date Received: 09/19/13  
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Nitrogen, Nitrate <sup>a</sup>	< 0.020	0.020	mg/l	2	09/20/13 10:37	SK	EPA 300.0/SW846 9056
Sulfate	346	13	mg/l	25	09/20/13 15:16	SK	EPA 300.0/SW846 9056

(a) Elevated detection limit due to matrix interference.

RL = Reporting Limit

## Misc. Forms

5

### Custody Documents and Other Forms

---

Includes the following where applicable:

- Chain of Custody

D 50699

page ☐ of ☐

Client: ORIGINS LAB  
Address: 1725 ELK PLACE

Project Manager: NOBLE DOYLE  
Project Name: X309091

Telephone Number: 3/433-1322  
Email Address: NDOYLE@ORIGINS2LAB.COM

Project Number: N/A  
Samples Collected By: N/A

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix				Analysis				Sample Instructions
				Unpreserved	HCl	HNO <sub>3</sub>	Other	Groundwater	Soil	Air Summa Canister #	Other	NITRATE	SULFATE			
X309091-02	9/8/13	14:05	1	X				X					X	X	01	1
X309091-06	↓	14:20	1	X				X					X	X	02	2
X309091-11	↓	14:55	1	X				X					X	X	03	3
																4
																5
																6
																7
																8
																9
																10
Relinquished By:	Date: 9/19/13	Time: 16:00	Received By:				Date:	Time:	Turnaround Time:							
Relinquished By:	Date:	Time:	Received By:				Date:	Time:	Same Day <input type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input type="checkbox"/> 72 Hr <input type="checkbox"/> Standard <input checked="" type="checkbox"/>							

0.7% - p HD

Date Results Needed



D50699: Chain of Custody

Page 1 of 2



## Accutest Laboratories Sample Receipt Summary

**Accutest Job Number:** D50699

**Client:** ORIGINS

**Immediate Client Services Action Required:** No

**Date / Time Received:** 9/19/2013 4:00:00 PM

**No. Coolers:** 1

**Client Service Action Required at Login:** No

**Project:** 309091

**Airbill #'s:** HD

<b>Cooler Security</b>	<b>Y</b>	<b>or</b>	<b>N</b>		<b>Y</b>	<b>or</b>	<b>N</b>
1. Custody Seals Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>		<input type="checkbox"/>

<b>Cooler Temperature</b>	<b>Y</b>	<b>or</b>	<b>N</b>
1. Temp criteria achieved:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Cooler temp verification:			Infrared gun
3. Cooler media:			Ice (bag)

<b>Quality Control Preservation</b>	<b>Y</b>	<b>or</b>	<b>N</b>	<b>N/A</b>
1. Trip Blank present / cooler:	<input type="checkbox"/>		<input type="checkbox"/>	
2. Trip Blank listed on COC:	<input type="checkbox"/>		<input type="checkbox"/>	
3. Samples preserved properly:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. VOCs headspace free:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

<b>Sample Integrity - Documentation</b>	<b>Y</b>	<b>or</b>	<b>N</b>
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>		<input type="checkbox"/>

<b>Sample Integrity - Condition</b>	<b>Y</b>	<b>or</b>	<b>N</b>
1. Sample recvd within HT:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Condition of sample:			Intact

<b>Sample Integrity - Instructions</b>	<b>Y</b>	<b>or</b>	<b>N</b>	<b>N/A</b>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
3. Sufficient volume rec'd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments

 Accutest Laboratories  
 V:(303) 425-6021

 4036 Youngfield Street  
 F: (303) 425-6854

 Wheat Ridge, CO  
 www.accutest.com

## General Chemistry

### QC Data Summaries

---

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D50699  
Account: ORIGLCOD - Origins Laboratory  
Project: X309091

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Chloride	GP10970/GN21979	0.50	0.0	mg/l	20	19.7	98.5	90-110%
Fluoride	GP10970/GN21979	0.10	0.0	mg/l	10	9.58	95.8	90-110%
Nitrogen, Nitrate	GP10970/GN21979	0.010	0.0	mg/l	4.52	4.45	98.5	90-110%
Nitrogen, Nitrite	GP10970/GN21979	0.0040	0.0	mg/l	6.09	6.19	101.6	90-110%
Sulfate	GP10970/GN21979	0.50	0.0	mg/l	30	29.4	98.0	90-110%

Associated Samples:

Batch GP10970: D50699-1, D50699-2, D50699-3

(\*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D50699  
Account: ORIGLCOD - Origins Laboratory  
Project: X309091

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Chloride	GP10970/GN21979	D50700-1	mg/l	3.1	10	13.0	99.0	80-120%
Fluoride	GP10970/GN21979	D50700-1	mg/l	0.34	2.5	2.8	98.4	80-120%
Nitrogen, Nitrate	GP10970/GN21979	D50700-1	mg/l	0.068	0.565	0.64	101.2	80-120%
Nitrogen, Nitrite	GP10970/GN21979	D50700-1	mg/l	0.011	0.305	0.32	101.5	80-120%
Sulfate	GP10970/GN21979	D50700-1	mg/l	21.4	10	31.9	105.0	80-120%

Associated Samples:

Batch GP10970: D50699-1, D50699-2, D50699-3

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

6.2  
6

MATRIX SPIKE DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D50699  
Account: ORIGLCOD - Origins Laboratory  
Project: X309091

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Chloride	GP10970/GN21979	D50700-1	mg/l	3.1	10	13.0	0.0	20%
Fluoride	GP10970/GN21979	D50700-1	mg/l	0.34	2.5	2.8	0.0	20%
Nitrogen, Nitrate	GP10970/GN21979	D50700-1	mg/l	0.068	0.565	0.64	0.0	20%
Nitrogen, Nitrite	GP10970/GN21979	D50700-1	mg/l	0.011	0.305	0.32	0.0	20%
Sulfate	GP10970/GN21979	D50700-1	mg/l	21.4	10	31.9	0.0	20%

Associated Samples:

Batch GP10970: D50699-1, D50699-2, D50699-3

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits