



GROUNDWATER MONITORING REPORT MARCH 2014

CHESNUT G 22-6 TANK BATTERY COGAC REMEDIATION #4316

LT Environmental, Inc. (LTE), under the direction of Noble Energy, Inc. (Noble), conducted groundwater monitoring activities at the Chesnut G 22-6 Tank Battery (Site). The Site is located 0.48 miles south of County Road 44 and 0.07 miles east of County Road 43 in Weld County, Colorado. The legal site description is the southwest quarter of the northwest quarter of Section 22, Township 4 North, Range 65 West, 6th Principal Meridian. The Site Location Map is provided as Figure 1. Site history and remediation activities were described in preceding reports, including Phase I and Phase II of the remediation program involving excavation source removal and operation of an air sparging and soil vapor extraction (AS/SVE) system, respectively. Phase III of the remediation program includes subsurface injections of Chemically Oxygenated Granular Activated Carbon (COGACTM), which is designed for in-situ biological remediation of petroleum hydrocarbon under aerobic conditions. This report details Phase III of the remediation program and the March 2014 groundwater monitoring event.

Soil borings MW01 through MW30 were completed as temporary monitoring wells on January 9 through February 18, 2009. LTE, under direction of Noble, replaced two destroyed monitoring wells (SB18R and SB19R) and installed two new monitoring wells (MW31 and MW32) on March 11, 2011. On March 4, 2013, LTE replaced destroyed monitoring well MW03 with MW03R.

Remediation Activities

Phase III of the remediation program was initiated in March 2014. On January 14 through 17, 2013, in accordance with the United States Environmental Protection Agency (EPA) Rule Authorization (File #CO50000-10209, November 26, 2013), subsurface carbon slurry injections were completed at 41 discrete locations at the Site. The injection locations are depicted on Figure 2. The injections occurred between 5 feet and 20 feet below ground surface with a total of 3,825 pounds of COGACTM being injected into the impacted soil and groundwater. Phase III remediation goals are to remove groundwater impact to the point of compliance with applicable standards established in the Colorado Department of Public Health and Environment (CDPHE)-Water Quality Control Commission Regulation 41-The Basic Standards for Ground Water (WQCC Reg 41).

Groundwater Monitoring Activities

LTE personnel, under the direction of Noble, conducted groundwater monitoring activities on March 4, 2014, in eighteen monitoring wells. Prior to purging, depth to static groundwater was measured and recorded for calculating well-specific target purge volumes. During the March 2014 monitoring event, groundwater ranged from 13.20 feet below top of casing (btoc) in

monitoring well MW04 to 18.23 feet btoc in monitoring well MW08R. Monitoring well MW26 was dry and therefore not sampled. Following purging, samples were collected, placed on ice, and submitted with a complete chain of custody form to Origins Laboratory, Inc. of Denver, Colorado, for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) by United States Environmental Protection Agency Method 8260C.

Hydrogeology

Depth to groundwater measurements were used to calculate relative groundwater elevations. During the March 2014 monitoring event, groundwater was calculated to flow east with an average hydraulic gradient of 0.032 feet per foot. Relative groundwater elevations are presented on Figure 3 and summarized in Table 1.

Groundwater Analytical Results

The CDPHE has established WQCC Reg 41 for BTEX at 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. Groundwater analytical results indicate MW05 exceeded the WQCC Reg 41 standard for benzene at a concentration of 49.8 $\mu\text{g/L}$. All remaining monitoring wells sampled were in compliance with applicable WQCC Reg 41 standards. Groundwater analytical results are presented on Figure 4 and summarized in Table 1. The laboratory analytical report is attached.

Site Summary

The remediation program has been successful in remediating 98% of the pre-remediation groundwater impacts. The Site is characterized with only one groundwater monitoring location in exceedance of the COGCC Table 910-1 benzene standard, compared to the 19 locations that were impacted prior to remedial activities. Monitoring well MW05 exhibited a decrease in dissolved-phase petroleum hydrocarbon impacts in the groundwater following Phase III of the remediation program. It is expected that the chemical and biological reactions will continue to decrease the BTEX concentrations in soil and groundwater.

LTE, under the direction of Noble, will continue to conduct quarterly groundwater monitoring with the goal of obtaining four consecutive quarters with laboratory groundwater analytical results in compliance with applicable WQCC Reg 41 standards. The next quarterly groundwater monitoring event is scheduled for June 2014.

FIGURES

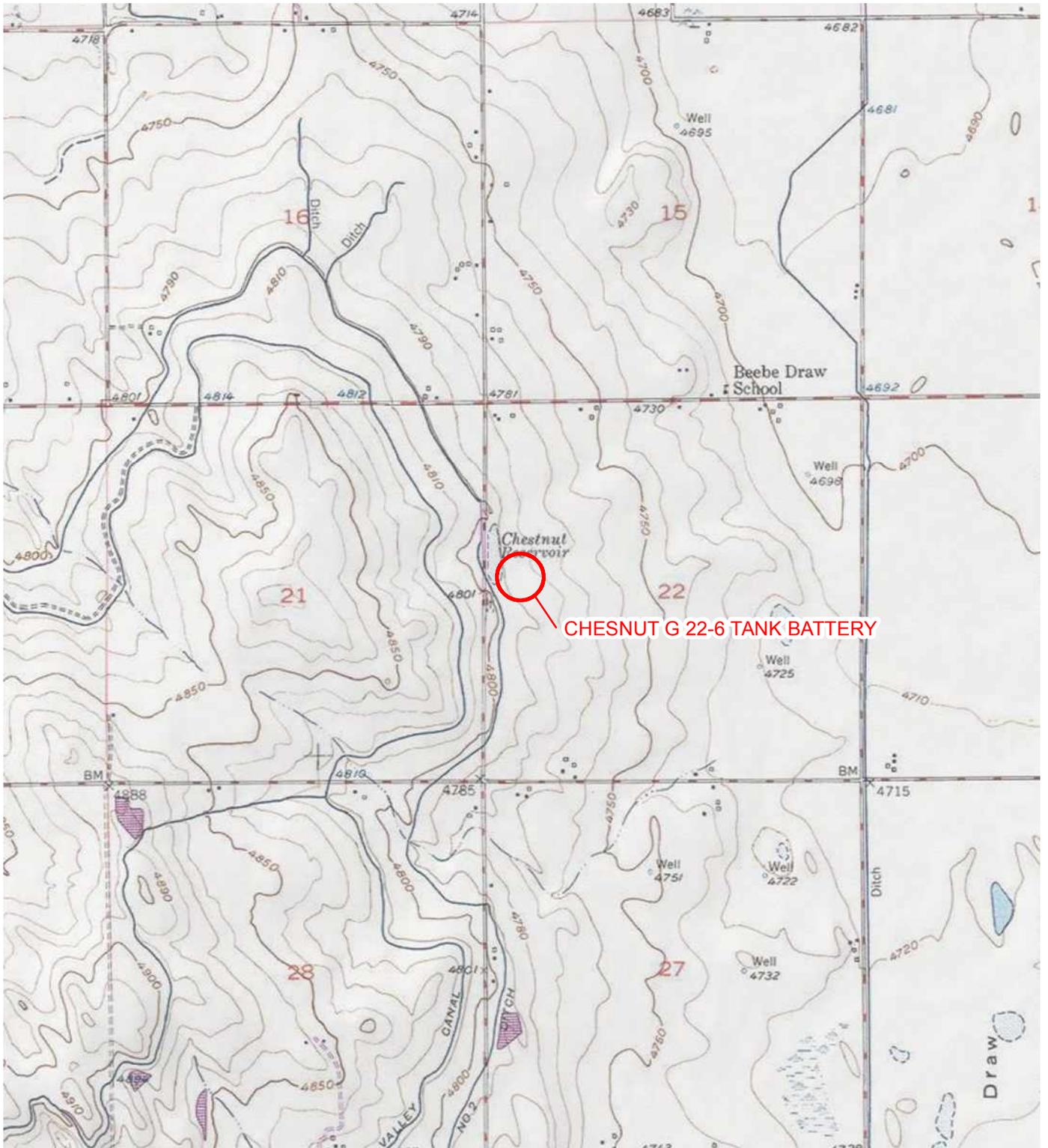


IMAGE COURTESY OF ESRI/USGS

LEGEND

 SITE LOCATION

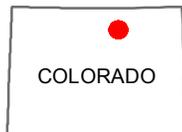
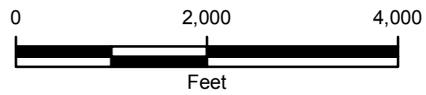
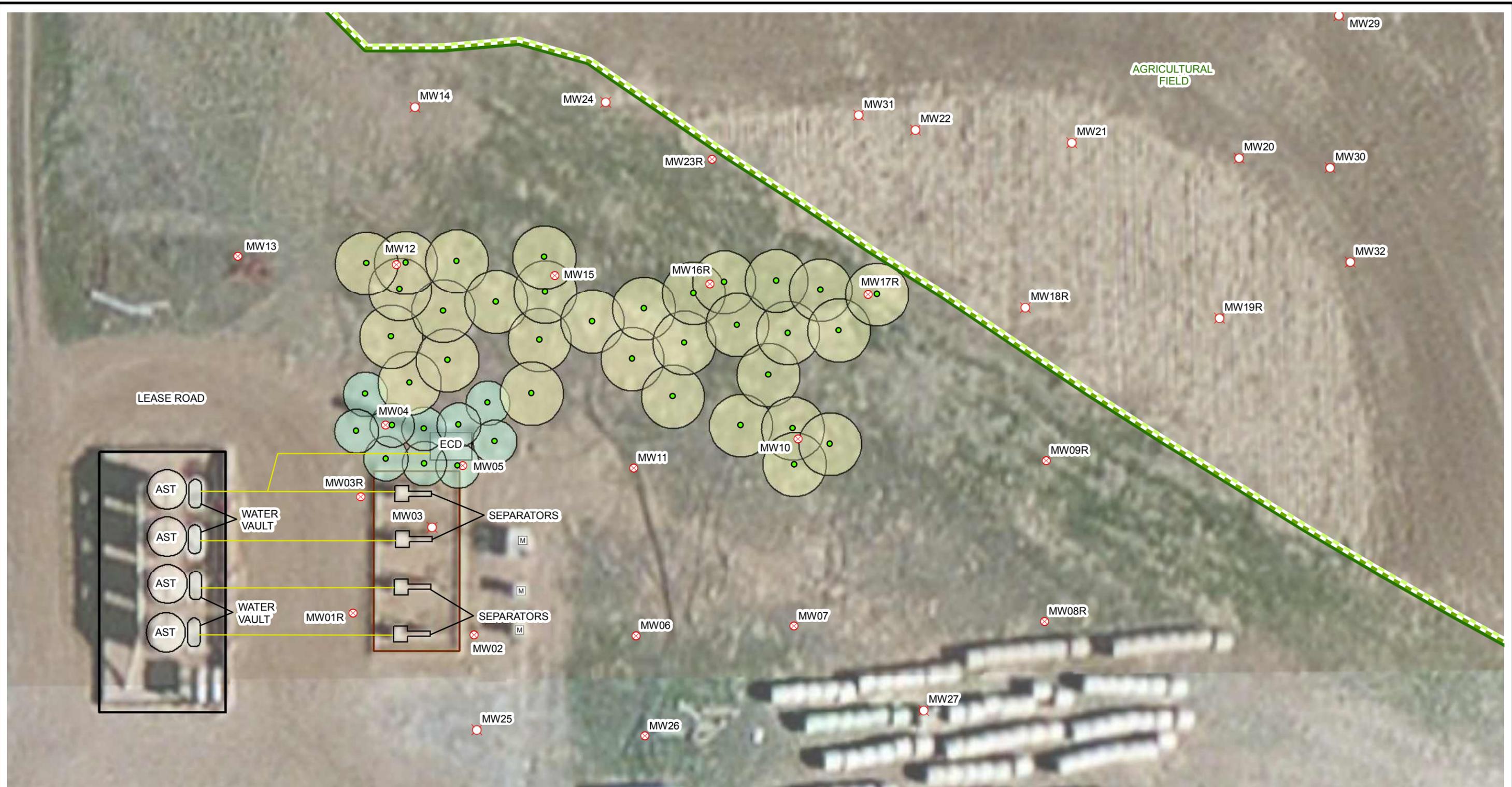


FIGURE 1
SITE LOCATION MAP
CHESNUT G 22-6 TANK BATTERY
WELD COUNTY, COLORADO



NOBLE ENERGY, INC.



LEGEND

- COGAC™ INJECTION LOCATION
- ⊗ MONITORING WELL
- ⊗ ABANDONED/DESTROYED MONITORING WELL
- M METER HOUSE
- AGRICULTURAL FIELD BOUNDARY
- METAL BERM
- DIRT BERM
- 7 FOOT RADIUS OF INFLUENCE
- 10 FOOT RADIUS OF INFLUENCE
- UNDERGROUND UTILITY
- AST: ABOVEGROUND STORAGE TANK
- ECD: EMISSIONS CONTROL DEVICE

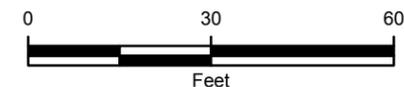


IMAGE COURTESY OF ESRI

FIGURE 2
COGAC™ INJECTION LOCATION MAP
CHESNUT G 22-6 TANK BATTERY
WELD COUNTY, COLORADO
NOBLE ENERGY, INC.





LEGEND

- ⊗ MONITORING WELL
- ⊗ ABANDONED/DESTROYED MONITORING WELL
- Ⓜ METER HOUSE
- ➡ CALCULATED GROUNDWATER FLOW DIRECTION
- UNDERGROUND UTILITY
- AGRICULTURAL FIELD BOUNDARY
- RELATIVE GROUNDWATER ELEVATION CONTOUR IN FEET
CONTOUR INTERVAL = 2 FEET
GRADIENT = 0.032 FEET/FOOT
NM: NOT MEASURED
- ▭ METAL BERM
- ▭ DIRT BERM
- AST: ABOVEGROUND STORAGE TANK
- ECD: EMISSION CONTROL DEVICE

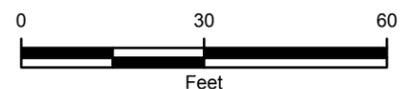
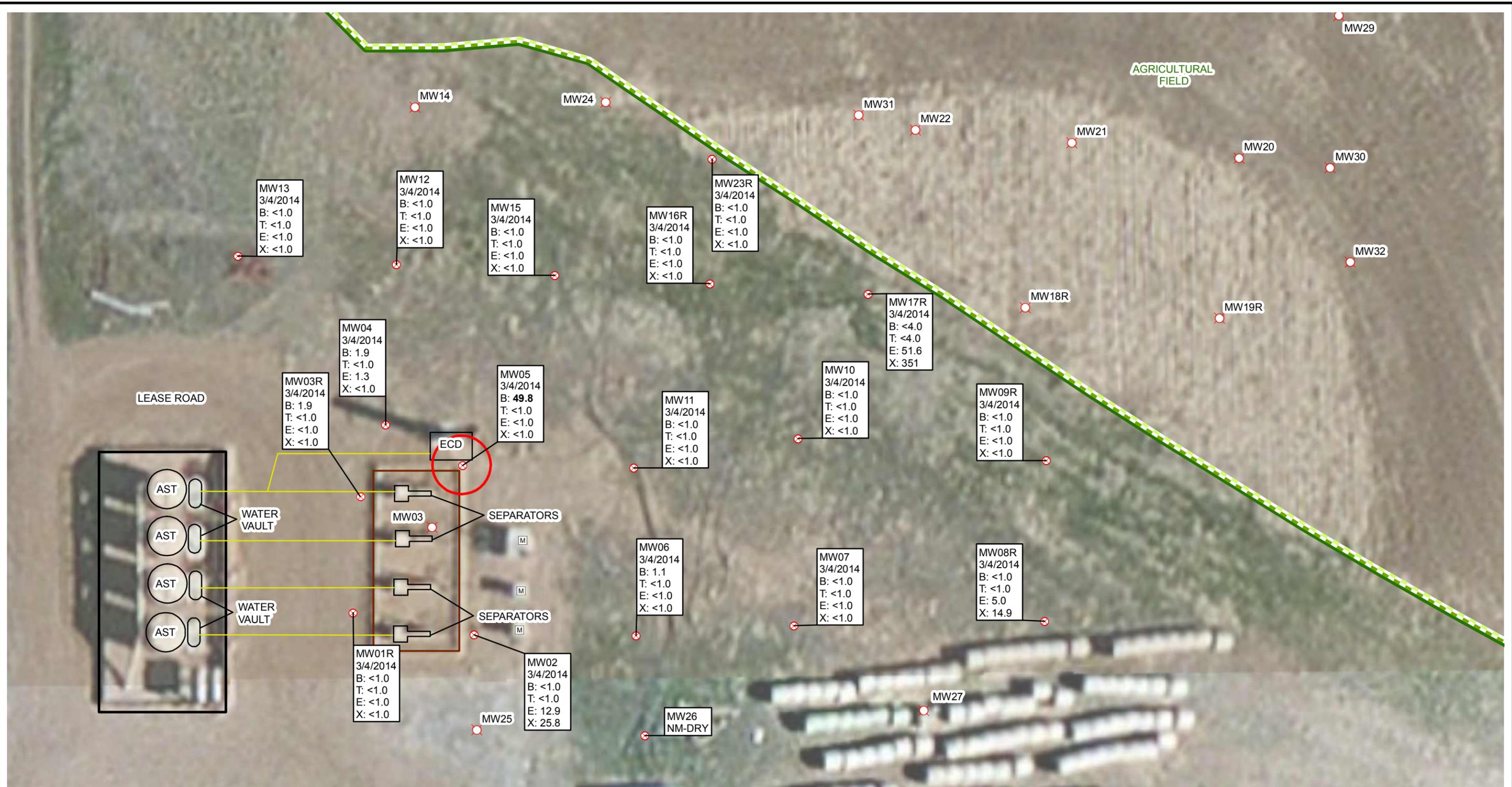


IMAGE COURTESY OF ESRI

FIGURE 3
RELATIVE GROUNDWATER ELEVATION MAP
 MARCH 4, 2014
 CHESNUT G 22-6 TANK BATTERY
 WELD COUNTY, COLORADO
 NOBLE ENERGY, INC.





LEGEND

- MONITORING WELL
- ABANDONED/DESTROYED MONITORING WELL
- METER HOUSE
- UNDERGROUND UTILITY
- AGRICULTURAL FIELD BOUNDARY
- METAL BERM
- DIRT BERM
- AST: ABOVEGROUND STORAGE TANK
- ECD: EMISSIONS CONTROL DEVICE
- MARCH 2014 BENZENE ISOCONCENTRATION CONTOUR (5 µg/L)

SAMPLE ID
 SAMPLE DATE
 B: BENZENE IN MICROGRAMS PER LITER (µg/L)
 T: TOLUENE (µg/L)
 E: ETHYLBENZENE (µg/L)
 X: TOTAL XYLENES (µg/L)
 <: LESS THAN LABORATORY METHOD DETECTION LIMIT
BOLD INDICATES RESULT EXCEEDS APPLICABLE STANDARD

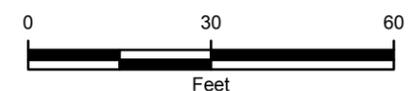


FIGURE 4
GROUNDWATER ANALYTICAL RESULTS
 MARCH 4, 2014
 CHESNUT G 22-6 TANK BATTERY
 WELD COUNTY, COLORADO
 NOBLE ENERGY, INC.



IMAGE COURTESY OF ESRI

TABLE

TABLE 1

**GROUNDWATER ANALYTICAL RESULTS
CHESNUT G 22-6 TANK BATTERY
WELD COUNTY, COLORADO
NOBLE ENERGY, INC.**

Monitoring Well	Date	Depth to Water/<LNAPL> (feet btoc)	Relative Groundwater Elevation (feet)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
MW01	1/13/2009	15.11	NM	26,400	8,320	536	8,800
	3/5/2010	14.60	NM	26,100	6,270	666	11,090
	9/20/2010	NM	NM	Could not locate monitoring well			
MW01R	12/2/2010	8.68	88.25	5,600	161	37.1	1,550
	3/14/2011	15.33	81.60	1,010	<1.00	<1.00	12.8
	6/2/2011	9.89	87.04	1,080	<1.0	13.5	1,400
	9/12/2011	2.96	93.97	1,560	<1.0	84.5	1,510
	12/9/2011	7.80	89.13	427	<1.0	34.5	945
	3/22/2012	13.50	83.43	<1.0	4.17	<1.0	<1.0
	6/8/2012	4.56	92.37	5.8	<1	<1	19.3
	9/18/2012	4.04	92.89	7.1	<1.0	3.1	100
	12/3/2012	6.53	90.40	<1.0	<1.0	<1.0	<1.0
	3/22/2013	13.78	83.15	<1.0	<1.0	<1.0	2.89
	6/18/2013	5.35	91.58	<1.0	<1.0	<1.0	<1.0
	9/17/2013	1.60	95.33	<1.0	<1.0	<1.0	<1.0
	12/11/2013	8.41	88.52	<1.0	<1.0	1.12	4.16
3/4/2014	13.79	83.14	<1.0	<1.0	<1.0	<1.0	
MW02	1/13/2009	15.12	83.02	3,460	1,420	199	6,120
	3/5/2010	15.95	82.19	857	3.61	151	1,448.61
	9/20/2010	6.00	92.14	338	<1.0	104	2,256.14
	12/2/2010	10.04	88.10	125	<1.0	147	1,590
	3/14/2011	16.40	81.74	37.4	<1.00	22.0	266
	6/2/2011	13.02	85.12	<1.0	<1.0	<1.0	<3.0
	9/12/2011	5.38	92.76	4.9	<1.0	2.4	9.5
	12/9/2011	10.00	88.14	<1.0	<1.0	2.17	20.4
	3/22/2012	16.19	81.95	1	2.36	9.88	47.2
	6/8/2012	7.45	90.69	<1	<1	<1	<1
	9/18/2012	6.97	91.17	<1.0	<1.0	<1.0	2.1
	12/3/2012	8.49	89.65	<1.0	<1.0	<1.0	<1.0
	3/18/2013	15.99	82.15	<1.0	<1.0	14.8	60.3
	6/18/2013	7.62	90.52	<1.0	<1.0	<1.0	<1.0
	9/17/2013	3.46	94.68	<1.0	<1.0	<1.0	<1.0
	12/11/2013	10.39	87.75	<1.0	<1.0	<1.0	<1.0
3/4/2014	16.18	81.96	<1.0	<1.0	12.9	25.8	
MW03	1/13/2009	15.06	NM	11,700	7,860	195	5,950
	3/5/2010				Monitoring well destroyed		
MW03R	3/18/2013	17.72	NM	<2.0	<2.0	1.98	27.5
	6/18/2013	10.33	87.92	<1.0	<1.0	<1.0	<1.0
	9/17/2013	5.84	92.41	1.2	<1.0	<1.0	<1.0
	12/11/2013	12.71	85.54	<1.0	<1.0	<1.0	<1.0
	3/4/2014	17.72	80.53	1.9	<1.0	<1.0	<1.0

TABLE 1 (Continued)

**GROUNDWATER ANALYTICAL RESULTS
CHESNUT G 22-6 TANK BATTERY
WELD COUNTY, COLORADO
NOBLE ENERGY, INC.**

Monitoring Well	Date	Depth to Water/<LNAPL> (feet btoc)	Relative Groundwater Elevation (feet)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
MW04	1/13/2009	13.13	84.15	19,700	7,460	555	9,990
	3/5/2010	15.71	81.57		Not sampled - Sheen on water		
	9/20/2010	3.70	93.58	563	<10.0	<10.0	6,027
	12/2/2010	9.33	87.95	664	42	19.1	4,710
	3/14/2011	14.94	82.34	713	<10.0	113	6,510
	6/2/2011	9.10	88.18	233	<1.0	31.8	457
	9/12/2011	3.40	93.88	23.8	<1.0	6.8	124
	12/9/2011	9.60	87.68	57.2	<1.0	3.62	90.3
	3/22/2012	14.21	83.07	295	5.33	5.99	53.7
	6/8/2012	4.57	92.71	14.3	<1	<1	14.4
	9/18/2012	3.32	93.96	3.5	<1.0	1.3	59.0
	12/3/2012	8.80	88.48	<1.0	<1.0	<1.0	<1.0
	3/18/2013	13.83	83.45	10.2	<1.0	1.49	6.27
	6/18/2013	5.54	91.74	27.7	<1.0	<1.0	<1.0
	9/17/2013	1.07	96.21	1.39	<1.0	1.27	3.68
12/11/2013	8.69	88.59	1.26	<1.0	<1.0	<1.0	
3/4/2014	13.20	84.08	1.9	<1.0	1.3	<1.0	
MW05	1/13/2009	14.58	82.39	15,500	14,900	412	6,860
	3/5/2010	16.06	80.91		Not sampled - Sheen on water		
	9/20/2010	6.60	90.37	12,700	1,500	522	8,190
	12/2/2010	10.48	86.49	14,700	185	122	5,650
	3/14/2011	16.16	80.81	67.9	<1.00	<1.00	112
	6/2/2011	13.25	83.72	143	<1.0	<1.0	13.0
	9/12/2011	5.96	91.01	5,050	22.5	59.1	2,680
	12/9/2011	10.70	86.27	8,790	10.6	<10.0	659
	3/22/2012	NM	NM		Not Sampled - Dry		
	6/8/2012	8.36	88.61	337	<1	<1	4.4
	9/18/2012	7.68	89.29	1,249	1.1	3.8	59.3
	12/3/2012	10.08	86.89	<1.0	<1.0	<1.0	<1.0
	3/18/2013	16.25	80.72	<1.3	<1.3	<1.3	<4.0
	6/18/2013	9.58	87.39	2.44	<1.0	<1.0	1.88
	9/17/2013	4.21	92.76	7.97	<1.0	<1.0	2.27
12/11/2013	10.70	86.27	155	<1.0	<1.0	6.04	
3/4/2014	15.92	81.05	49.8	<1.0	<1.0	<1.0	
MW06	2/19/2009	17.24	80.10	305	15.8	167	2,476
	3/5/2010	16.47	80.87	1.27	<1.0	8.77	9.60
	9/20/2010	6.95	90.39	<1.0	<1.0	3.51	13.0
	12/2/2010	11.01	86.33	<1.0	<1.0	28.8	205
	3/14/2011	16.91	80.43	<1.00	<1.00	42.8	317
	6/2/2011	14.30	83.04	<1.0	<1.0	2.1	4.9
	9/12/2011	6.51	90.83	<1.0	<1.0	<1.0	<3.0
	12/9/2011	10.80	86.54	<1.0	<1.0	<1.0	<3.0
	3/22/2012	17.08	80.26	<1.0	<1.0	1.46	4.9
	6/8/2012	9.22	88.12	<1	<1	<1	<1
	9/18/2012	8.21	89.13	<1.0	<1.0	<1.0	<1.0
	12/3/2012	9.50	87.84	<1.0	<1.0	<1.0	<1.0
	3/18/2013	16.70	80.64	<1.0	<1.0	2.84	8.79
	6/18/2013	8.89	88.45	<1.0	<1.0	<1.0	<1.0
	9/17/2013	4.23	93.11	<1.0	<1.0	<1.0	<1.0
12/11/2013	11.36	85.98	<1.0	<1.0	<1.0	<1.0	
3/4/2014	16.94	80.40	1.1	<1.0	<1.0	<1.0	

TABLE 1 (Continued)

**GROUNDWATER ANALYTICAL RESULTS
CHESNUT G 22-6 TANK BATTERY
WELD COUNTY, COLORADO
NOBLE ENERGY, INC.**

Monitoring Well	Date	Depth to Water/<LNAPL> (feet btoc)	Relative Groundwater Elevation (feet)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
MW07	2/19/2009	19.18	75.41	3.99	7.09	64.1	288.67
	3/5/2010	15.93	78.66	5.47	<1.0	4.11	55.02
	9/20/2010	7.35	87.24	<1.0	<1.0	<1.0	<3.0
	12/2/2010	10.32	84.27	<1.0	<1.0	<1.0	<1.0
	3/14/2011	16.12	78.47	<1.00	<1.00	<1.00	<3.00
	6/2/2011	14.59	80.00	<1.0	<1.0	<1.0	<3.0
	9/12/2011	6.25	88.34	<1.0	<1.0	<1.0	<3.0
	12/9/2011	NM	NM		Could not locate monitoring well		
	3/22/2012	16.42	78.17	<1.0	<1.0	<1.0	<1.0
	6/8/2012	8.65	85.94	<1	<1	<1	<1
	9/18/2012	8.12	86.47	<1.0	<1.0	<1.0	<1.0
	12/3/2012	9.14	85.45	<1.0	<1.0	<1.0	<1.0
	3/18/2013	16.13	78.46	<1.0	<1.0	<1.0	<3.0
	6/18/2013	8.72	85.87	<1.0	<1.0	<1.0	<1.0
	9/17/2013	3.62	90.97	<1.0	<1.0	<1.0	<1.0
12/11/2013	10.54	84.05	<1.0	<1.0	<1.0	<1.0	
3/4/2014	16.08	78.51	<1.0	<1.0	<1.0	<1.0	
MW08	2/19/2009	18.03	NM	34.3	2,000	202	4,213
MW08R	9/20/2010	10.90	83.61	1.21	<1.0	118	657.4
	12/2/2010	12.94	81.57	<1.0	<1.0	<1.0	119
	3/14/2011	18.61	75.90	<1.00	<1.00	<1.00	1,070
	6/2/2011	17.80	76.71	<1.0	<1.0	207	587
	9/12/2011	9.66	84.85	<1.0	<1.0	44.6	241
	12/9/2011	12.67	81.84	<1.0	<1.0	9.99	68.6
	3/22/2012	18.67	75.84	<1.0	8.37	16.3	109
	6/8/2012	11.99	82.52	<1	<1	1.7	26.1
	9/18/2012	11.34	83.17	<1.0	<1.0	1.5	4.5
	12/3/2012	11.88	82.63	<1.0	<1.0	2.65	20.2
	3/22/2013	18.68	75.83	<1.0	<1.0	8.47	103
	6/18/2013	12.10	82.41	<1.0	<1.0	1.98	6.85
	9/17/2013	7.41	87.10	<1.0	<1.0	1.65	4.80
	12/11/2013	12.78	81.73	<1.0	<1.0	<1.0	<1.0
	3/4/2014	18.23	76.28	<1.0	<1.0	5.0	14.9
MW09	2/19/2009	18.96	NM	1,250	23.0	19.0	25.28
MW09R	9/20/2010	10.75	82.99	3,350	<1.0	368	1,891.7
	12/2/2010	12.79	80.95	10.2	<10.0	85.2	392
	3/14/2011	17.67	76.07	422	<1.0	200	644
	6/2/2011	17.02	76.72	902	<1.0	303	1,490
	9/12/2011	9.57	84.17	1.1	<1.0	128	609
	12/9/2011	12.50	81.24	1.79	<1.0	13.7	28.5
	3/22/2012	17.81	75.93	1.64	8	14.5	43.4
	6/8/2012	12.34	81.4	<1	<1	5.9	8.9
	9/18/2012	11.43	82.31	<1.0	<1.0	<1.0	<1.0
	12/3/2012	12.00	81.74	<1.0	<1.0	<1.0	<1.0
	3/22/2013	17.92	75.82	<1.0	<1.0	<1.0	<1.0
	6/18/2013	12.70	81.04	<1.0	<1.0	12.7	16
	9/17/2013	7.32	86.42	<1.0	<1.0	<1.0	<1.0
	12/11/2013	12.50	81.24	<1.0	<1.0	<1.0	<1.0
	3/4/2014	17.36	76.38	<1.0	<1.0	<1.0	<1.0

TABLE 1 (Continued)

**GROUNDWATER ANALYTICAL RESULTS
CHESNUT G 22-6 TANK BATTERY
WELD COUNTY, COLORADO
NOBLE ENERGY, INC.**

Monitoring Well	Date	Depth to Water/<LNAPL> (feet btoc)	Relative Groundwater Elevation (feet)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
MW10	2/19/2009	17.34	76.83	10,300	374	412	2,435
	3/5/2010	16.46	77.71	9,790	581	452	3,707
	9/20/2010	7.70	86.47	4,130	50.0	434	4,280
	12/2/2010	10.83	83.34	1,560	<10.0	33.5	1,100
	3/14/2011	12.25	81.92	1,070	<1.00	12.6	476
	6/2/2011	12.35	81.82	<1.0	<1.0	<1.0	<3.0
	9/12/2011	7.01	87.16	310	<1.0	107	250
	12/9/2011	10.62	83.55	243	<1.0	53.2	279
	3/22/2012	16.37	77.80	30.3	1.75	<1.0	<1.0
	6/8/2012	9.60	84.57	18.2	<1	<1	<1
	9/18/2012	8.78	85.39	<1.0	<1.0	<1.0	<1.0
	12/3/2012	10.02	84.15	<1.0	<1.0	<1.0	<1.0
	3/18/2013	16.30	77.87	<1.0	<1.0	<1.0	<3.0
	6/18/2013	10.34	83.83	28.8	<1.0	<1.0	<1.0
	9/17/2013	4.09	90.08	<1.0	<1.0	<1.0	<1.0
12/11/2013	10.78	83.39	<1.0	<1.0	<1.0	<1.0	
3/4/2014	15.95	78.22	<1.0	<1.0	<1.0	<1.0	
MW11	2/19/2009	17.67	78.49	6,130	48.5	43.4	818.6
	3/5/2010	16.38	79.78	10,500	<1.0	10.1	497
	9/20/2010	7.20	88.96	2,670	<1.0	<1.0	235.88
	12/2/2010	11.55	84.61	835	<10.0	<10.0	57.1
	3/14/2011	16.27	79.89	180	<1.00	<1.00	<3.00
	6/2/2011	13.82	82.34	<1.0	<1.0	<1.0	<3.0
	9/12/2011	7.11	89.05	<1.0	<1.0	<1.0	<3.0
	12/9/2011	11.31	84.85	<1.0	<1.0	<1.0	<3.0
	3/22/2012	16.85	79.31	<1.0	2	<1.0	<1.0
	6/8/2012	9.76	86.40	<1	<1	<1	<1
	9/18/2012	8.87	87.29	<1.0	<1.0	<1.0	<1.0
	12/3/2012	10.78	85.38	<1.0	<1.0	<1.0	<1.0
	3/18/2013	16.98	79.18	<1.0	<1.0	<1.0	<3.0
	6/18/2013	10.55	85.61	<1.0	<1.0	<1.0	<1.0
	9/17/2013	4.61	91.55	<1.0	<1.0	<1.0	<1.0
12/11/2013	11.42	84.74	<1.0	<1.0	<1.0	<1.0	
3/4/2014	16.35	79.81	<1.0	<1.0	<1.0	<1.0	
MW12	2/19/2009	14.81	81.95	1,970	257	138	423
	3/5/2010	14.63	82.13	465	24.5	42.7	199.9
	9/20/2010	4.10	92.66	9.92	<1.0	<1.0	171.07
	12/2/2010	13.41	83.35	<1.0	<1.0	<1.0	<1.0
	3/14/2011	14.91	81.85	2.35	<1.00	13.5	250
	6/2/2011	10.42	86.34	<1.0	<1.0	<1.0	<3.0
	9/12/2011	3.47	93.29	58.7	<1.0	<1.0	6.4
	12/9/2011	10.35	86.41	<1.0	<1.0	<1.0	<3.0
	3/22/2012	15.25	81.51	<1.0	2	1.4	4.98
	6/8/2012	5.76	91.00	12.8	<1	3.7	13.7
	9/18/2012	4.41	92.35	<1.0	<1.0	<1.0	1.4
	12/3/2012	10.34	86.42	<1.0	<1.0	<1.0	<1.0
	3/18/2013	15.33	81.43	<1.0	<1.0	1.41	<3.0
	6/18/2013	8.31	88.45	19.8	<1.0	<1.0	<1.0
	9/17/2013	2.40	94.36	1.13	<1.0	<1.0	<1.0
12/11/2013	10.07	86.69	<1.0	<1.0	<1.0	<1.0	
3/4/2014	14.35	82.41	<1.0	<1.0	<1.0	<1.0	

TABLE 1 (Continued)

GROUNDWATER ANALYTICAL RESULTS
 CHESNUT G 22-6 TANK BATTERY
 WELD COUNTY, COLORADO
 NOBLE ENERGY, INC.

Monitoring Well	Date	Depth to Water/<LNAPL> (feet btoc)	Relative Groundwater Elevation (feet)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
MW13	2/19/2009	15.13	83.32	<1.0	<1.0	<1.0	<3.0
	3/5/2010	15.11	83.34	<1.0	<1.0	<1.0	<3.0
	9/20/2010	3.80	94.65	<1.0	<1.0	<1.0	<3.0
	12/2/2010	10.60	87.85	<1.0	<1.0	<1.0	<1.0
	3/14/2011	15.21	83.24	<1.00	<1.00	<1.00	<3.00
	6/2/2011	7.41	91.04	<1.0	<1.0	<1.0	<3.0
	9/12/2011	2.94	95.51	<1.0	<1.0	<1.0	<3.0
	12/9/2011	11.04	87.41	<1.0	<1.0	<1.0	<3.0
	3/22/2012	15.73	82.72	<1.0	1.87	<1.0	<1.0
	6/8/2012	5.01	93.44	<1	<1	<1	<1
	9/18/2012	3.77	94.68	<1.0	<1.0	<1.0	<1.0
	12/3/2012	10.90	87.55	<1.0	<1.0	<1.0	<1.0
	3/18/2013	15.76	82.69	<1.0	<1.0	<1.0	<3.0
	6/18/2013	7.36	91.09	<1.0	<1.0	<1.0	<1.0
	9/17/2013	2.48	95.97	<1.0	<1.0	<1.0	<1.0
12/11/2013	10.68	87.77	<1.0	<1.0	<1.0	<1.0	
3/4/2014	14.81	83.64	<1.0	<1.0	<1.0	<1.0	
MW14	2/19/2009	14.32	NM	<1.0	<1.0	<1.0	<3.0
	3/5/2012	NM	NM		Monitoring well destroyed		
MW15	2/19/2009	14.95	78.55	2,490	3,380	150	1,732
	3/5/2010	13.00	80.50	998	1,890	141	2,026
	9/20/2010	2.80	90.70	107	<1.0	<1.0	417.3
	12/2/2010	8.24	85.26	133	<1.0	<1.0	470
	3/14/2011	12.96	80.54	181	<1.00	135	1,580
	6/2/2011	7.44	86.06	35.4	<1.0	15.6	308
	9/12/2011	2.44	91.06	15.2	<1.0	29.1	249
	12/9/2011	10.30	83.20	<1.0	<1.0	<1.0	<3.0
	3/22/2012	15.31	78.19	<1.0	2.09	<1.0	<1.0
	6/8/2012	5.40	88.10	<1	<1	<1	<1
	9/18/2012	6.38	87.12	<1.0	<1.0	<1.0	<1.0
	12/3/2012	10.06	83.44	<1.0	<1.0	<1.0	<1.0
	3/18/2013	13.81	79.69	36.9	<1.0	60.5	84.6
	6/18/2013	9.20	84.30	<1.0	<1.0	<1.0	<1.0
	9/17/2013	1.02	92.48	7.73	<1.0	9.72	21.9
12/11/2013	10.16	83.34	<1.0	<1.0	<1.0	<1.0	
3/4/2014	14.58	78.92	<1.0	<1.0	<1.0	<1.0	
MW16	2/19/2009	15.25	NM	1,060	16.2	156	37.5
MW16R	3/22/2012	15.58	NM	<1.0	<1.0	<1.0	<1.0
	6/8/2012	8.59	NM	1.1	<1	4.2	<1
	9/18/2012	6.78	NM	3.1	<1.0	2.8	<1.0
	12/3/2012	10.71	NM	<1.0	<1.0	<1.0	<1.0
	3/19/2013	15.91	NM	2.52	<1.0	<1.0	<3.0
	6/18/2013	10.81	NM	19.7	<1.0	<1.0	<1.0
	9/17/2013	3.37	NM	<1.0	<1.0	<1.0	<1.0
	12/11/2013	10.48	NM	<1.0	<1.0	<1.0	<1.0
	3/4/2014	14.80	NM	<1.0	<1.0	<1.0	<1.0

TABLE 1 (Continued)

**GROUNDWATER ANALYTICAL RESULTS
CHESNUT G 22-6 TANK BATTERY
WELD COUNTY, COLORADO
NOBLE ENERGY, INC.**

Monitoring Well	Date	Depth to Water/<LNAPL> (feet btoc)	Relative Groundwater Elevation (feet)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
MW17	2/19/2009	15.93 <15.91>	NM	3,680	9,940	775	1,075
MW17R	9/20/2010	7.92	84.99	<1.0	<1.0	46.1	256.31
	12/2/2010	11.10	81.81	3.10	<1.0	112	570
	3/14/2011	15.62	77.29	9.19	<1.00	52.6	470
	6/2/2011	13.53	79.38	3.4	<1.0	16.5	448
	9/12/2011	6.93	85.98	<1.0	<1.0	45.1	275
	12/9/2011	11.11	81.80	9.28	<1.0	141	1,090
	3/22/2012	15.89	77.02	5.4	2.59	85.3	616
	6/8/2012	10.44	82.47	4.1	<1	117	668
	9/18/2012	9.07	83.84	5.2	<1.0	95.1	522
	12/3/2012	10.98	81.93	24.8	<1.0	97.5	684
	3/22/2013	16.16	76.75	51.4	<1.0	158	1,460
	6/18/2013	11.84	81.07	3.23	<1.0	82.1	474
	9/17/2013	4.61	88.30	3.26	<1.0	40.7	145
	12/11/2013	11.03	81.88	<4.0	<4.0	106	769
	3/4/2014	15.31	77.60	<4.0	<4.0	51.6	351
MW18	2/19/2009	16.22	NM	1,410	80.9	51.0	229.6
MW18R	3/14/2011	16.25	75.85	<1.00	<1.00	<1.00	<3.00
	6/2/2011	15.24	76.86	<1.0	<1.0	<1.0	<3.0
	9/12/2011	8.76	83.34	<1.0	<1.0	<1.0	<3.0
	2/28/2012	NM	NM	Abandoned per COGCC approval			
MW19	2/25/2009	16.67	NM	329	<1.0	1.45	6.65
MW19R	3/14/2011	17.44	74.27	<1.00	<1.00	<1.00	<3.00
	6/2/2011	16.96	74.75	<1.0	<1.0	<1.0	<3.0
	9/12/2011	10.61	81.10	<1.0	<1.0	<1.0	<3.0
	2/28/2012	NM	NM	Abandoned per COGCC approval			
MW20	2/25/2009	17.55	NM	2.13	2.34	16.0	3.27
				Monitoring well destroyed			
MW21	2/25/2009	16.87	NM	2.00	<1.0	<1.0	11.9
				Monitoring well destroyed			
MW22	2/25/2009	16.70	NM	8.70	40.7	3.78	22.65
				Monitoring well destroyed			
MW23	2/25/2009	15.25	NM	32.9	5.29	9.01	38.36
MW23R	3/22/2012	16.20	NM	<1.0	2.33	<1.0	<1.0
	6/8/2012	9.38	NM	<1	<1	<1	<1
	9/18/2012	7.33	NM	<1.0	<1.0	<1.0	1.3
	12/3/2012	11.88	NM	<1.0	<1.0	<1.0	<1.0
	3/19/2013	16.67	NM	<1.0	<1.0	<1.0	<3.0
	6/18/2013	11.73	NM	<1.0	<1.0	<1.0	<1.0
	9/17/2013	4.33	NM	<1.0	<1.0	<1.0	<1.0
	12/11/2013	11.26	NM	<1.0	<1.0	<1.0	<1.0
	3/4/2014	15.31	NM	<1.0	<1.0	<1.0	<1.0
MW24	2/25/2009	14.87	NM	1.02	<1.0	<1.0	<3.0
				Monitoring well destroyed			
MW25	2/25/2009	18.20	NM	<1.0	<1.0	<1.0	4.01
	3/5/2010	17.46	NM	<1.0	<1.0	<1.0	<3.0
				Monitoring well destroyed			

TABLE 1 (Continued)

**GROUNDWATER ANALYTICAL RESULTS
CHESNUT G 22-6 TANK BATTERY
WELD COUNTY, COLORADO
NOBLE ENERGY, INC.**

Monitoring Well	Date	Depth to Water/<LNAPL> (feet btoc)	Relative Groundwater Elevation (feet)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
MW26	2/25/2009	18.02	78.14	<1.0	<1.0	<1.0	<3.0
	3/5/2010	17.36	78.80	<1.0	<1.0	<1.0	<3.0
	9/20/2010	5.10	91.06	<1.0	<1.0	<1.0	<3.0
	12/2/2010	8.78	87.38	<1.0	<1.0	<1.0	<1.0
	3/14/2011	15.63	80.53	<1.00	<1.00	<1.00	<3.00
	6/2/2011	11.67	84.49	<1.0	<1.0	<1.0	<3.0
	9/12/2011	4.02	92.14	<1.0	<1.0	<1.0	<3.0
	12/9/2011	NM	NM	<1.0	<1.0	<1.0	<3.0
	3/22/2012	NM	NM		Not Sampled - Dry		
	6/8/2012	5.99	90.17	<1	<1	<1	<1
	9/18/2012	5.69	90.47	<1.0	<1.0	<1.0	<1.0
	12/3/2012	7.26	88.90	<1.0	<1.0	<1.0	<1.0
	3/18/2013	NM	NM		Not Sampled - Dry		
	6/18/2013	5.91	90.25	<1.0	<1.0	<1.0	<1.0
	9/17/2013	2.20	93.96	<1.0	<1.0	<1.0	<1.0
12/11/2013	9.49	86.67	<1.0	<1.0	<1.0	<1.0	
3/4/2014	NM	NM		Not Sampled - Dry			
MW27	2/25/2009	19.98	NM	<1.0	<1.0	<1.0	<3.0
					Monitoring well destroyed		
MW28	2/25/2009	15.82	NM	<1.0	<1.0	<1.0	<3.0
					Monitoring well destroyed		
MW29	2/25/2009	16.77	NM	<1.0	<1.0	<1.0	<3.0
					Monitoring well destroyed		
MW30	2/25/2009	16.86	NM	<1.0	<1.0	<1.0	<3.0
					Monitoring well destroyed		
MW31	3/14/2011	14.83	76.86	<1.00	<1.00	<1.00	<3.00
	6/2/2011	11.11	80.58	<1.0	<1.0	<1.0	<3.0
	9/12/2011				Monitoring well destroyed		
MW32	3/14/2011	18.47	72.41	<1.00	<1.00	<1.00	<3.00
	6/2/2011	18.27	72.61	<1.0	<1.0	<1.0	<3.0
	9/12/2011	12.92	77.96	<1.0	<1.0	<1.0	<3.0
	2/28/2012	NM	NM		Abandoned per COGCC approval		
CDPHE WQCC Reg 41				5.0	560	700	1,400

NOTES:

btoc - below top of casing

µg/L - micrograms per liter

LNAPL - light non-aqueous phase liquid

NM - not measured

< indicates result is less than the stated laboratory reporting limit

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

BOLD indicates result exceeds applicable standardCDPHE WQCC Reg 41 - Colorado Department of Public Health and Environment-Water Quality Control Commission
Regulation 41-The Basic Standards for Ground Water

COGCC - Colorado Oil and Gas Conservation Commission

ATTACHMENT
LABORATORY ANALYTICAL REPORT

March 07, 2014

LT Environmental, Inc.

Charles Greeson

4600 West 60th Avenue

Arvada CO 80003

Project Name - Noble - Chestnut G 22-6

Project Number - NEP0839

Attached are your analytical results for Noble - Chestnut G 22-6 received by Origins Laboratory, Inc. March 04, 2014. This project is associated with Origins project number X403029-01.

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

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

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

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

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

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



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

Charles Greeson
Project Number: NEP0839
Project: Noble - Chestnut G 22-6

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW01R	X403029-01	Water	March 4, 2014 12:55	03/04/2014 15:40
MW02	X403029-02	Water	March 4, 2014 14:23	03/04/2014 15:40
MW03	X403029-03	Water	March 4, 2014 12:45	03/04/2014 15:40
MW04	X403029-04	Water	March 4, 2014 12:45	03/04/2014 15:40
MW05	X403029-05	Water	March 4, 2014 14:00	03/04/2014 15:40
MW06	X403029-06	Water	March 4, 2014 14:30	03/04/2014 15:40
MW07	X403029-07	Water	March 4, 2014 14:23	03/04/2014 15:40
MW08R	X403029-08	Water	March 4, 2014 13:45	03/04/2014 15:40
MW09R	X403029-09	Water	March 4, 2014 13:35	03/04/2014 15:40
MW10	X403029-10	Water	March 4, 2014 13:45	03/04/2014 15:40
MW11	X403029-11	Water	March 4, 2014 13:35	03/04/2014 15:40
MW12	X403029-12	Water	March 4, 2014 13:10	03/04/2014 15:40
MW13	X403029-13	Water	March 4, 2014 14:15	03/04/2014 15:40
MW15	X403029-14	Water	March 4, 2014 13:05	03/04/2014 15:40

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

Charles Greeson
Project Number: NEP0839
Project: Noble - Chestnut G 22-6

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW16R	X403029-15	Water	March 4, 2014 14:05	03/04/2014 15:40
MW17R	X403029-16	Water	March 4, 2014 13:25	03/04/2014 15:40
MW23R	X403029-17	Water	March 4, 2014 14:15	03/04/2014 15:40

Origins Laboratory, Inc.



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

Noelle Doyle Mathis, President

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

Charles Greeson
 Project Number: NEP0839
 Project: Noble - Chestnut G 22-6

www.originslaboratory.com

X403029

ORIGINS
 LABORATORY, INC

page 1 of 2

Client: LTE Project Manager/Send Report To: Charles Greeson
 Address: _____ Email Address: Greeson@Ltenv.com
 Telephone Number: _____ Project Name/Number: NEP0839 Chestnut 622-6
 Samples Collected By: Jason Evans, L. Stein
David Steinback

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

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis/Method	Sample Instructions	Turnaround Time:
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Air Summa #			
MW01R	3/11/14	1255	3	X				X			BT-EX	Lab Filter	24 Hr <input type="checkbox"/>
MW02		1423	3										48 Hr <input type="checkbox"/>
MW03		1245	3										Standard <input checked="" type="checkbox"/>
MW04		1245	3										
MW05		1400	1										
MW06		1430	3										
MW07		1423	3										
MW08R		1345	3										
MW09R		1335	3										
MW10		1345	3										
Relinquished By:	Date:	Time:	Received By:	Date:	Time:	Received By:	Date:	Time:	Received By:	Date:	Time:	Turnaround Time:	
	2-21-14	2:44					3/1/14	15:40					

Per the Permit Mandate:

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

Charles Greeson
 Project Number: NEP0839
 Project: Noble - Chestnut G 22-6

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: 1403029 Client: LTE
 Client Project ID: Chestnut G22-6
 Checklist Completed by: Jesse Smith Shipped Via: H/D
 Date/time completed: 3/2/12 16:12 (UPS, FedEx, Hand Delivered, Pick-up, etc.)
 Airbill #: 124
 Matrix(s) Received: (Check all that apply): Soil/Solid Water Other: _____
 Cooler Number/Temperature: 110.9 °C / _____ °C / _____ °C / _____ °C
 Thermometer ID: 1002

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C ⁽¹⁾ ?		X		Sampled Same Day
Is there ice present (document if blue ice is used)	X			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		X		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		X		
Were all samples received intact ⁽¹⁾ ?	X			
Was adequate sample volume provided ⁽¹⁾ ?	X			
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?		X		
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	X			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	X			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	X			
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	X			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.		X		
Are samples preserved that require preservation and was it checked ⁽¹⁾ ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)/(pH <2 for samples preserved with HNO3, HCL, H2SO4) / (pH > 10 for samples preserved with NaAsO2+NaOH, ZnAc+NaOH)		X		Samples will be analyzed within 7 Days of collection
Additional Comments (if any):				

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

Reviewed by (Project Manager)

Date/Time Reviewed

Origins Laboratory, Inc.



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

Charles Greeson
 Project Number: NEP0839
 Project: Noble - Chestnut G 22-6

MW01R
 3/4/2014 12:55:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
 X403029-01 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	4C06007	03/06/2014	03/07/2014	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	116 %	87.3-113			"	"	"	S-07
Surrogate: Toluene-d8	99.3 %	90.9-108			"	"	"	
Surrogate: 4-Bromofluorobenzene	97.2 %	88.6-111			"	"	"	

Origins Laboratory, Inc.



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

Charles Greeson
 Project Number: NEP0839
 Project: Noble - Chestnut G 22-6

MW02
 3/4/2014 2:23:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
 X403029-02 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	4C06007	03/06/2014	03/06/2014	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	12.9	1.0	"	"	"	"	"	
Xylenes, total	25.8	1.0	"	"	"	"	"	

<i>Surrogate: 1,2-Dichloroethane-d4</i>	103 %	87.3-113			"	"	"	
<i>Surrogate: Toluene-d8</i>	102 %	90.9-108			"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>	99.6 %	88.6-111			"	"	"	

Origins Laboratory, Inc.



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Noelle Doyle Mathis, President

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

Charles Greeson
 Project Number: NEP0839
 Project: Noble - Chestnut G 22-6

MW03
 3/4/2014 12:45:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
 X403029-03 (Water)

BTEX by EPA 8260C

Benzene	1.9	1.0	ug/L	1	4C06007	03/06/2014	03/07/2014	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

<i>Surrogate: 1,2-Dichloroethane-d4</i>	102 %	87.3-113			"	"	03/06/2014	
<i>Surrogate: Toluene-d8</i>	94.6 %	90.9-108			"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>	101 %	88.6-111			"	"	"	

Origins Laboratory, Inc.



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

Charles Greeson
 Project Number: NEP0839
 Project: Noble - Chestnut G 22-6

MW04
 3/4/2014 12:45:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
 X403029-04 (Water)

BTEX by EPA 8260C

Benzene	1.9	1.0	ug/L	1	4C06007	03/06/2014	03/06/2014	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	1.3	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	105 %	87.3-113			"	"	"	
Surrogate: Toluene-d8	99.4 %	90.9-108			"	"	"	
Surrogate: 4-Bromofluorobenzene	100 %	88.6-111			"	"	"	

Origins Laboratory, Inc.



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

Charles Greeson
 Project Number: NEP0839
 Project: Noble - Chestnut G 22-6

MW05
 3/4/2014 2:00:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
 X403029-05 (Water)

BTEX by EPA 8260C

Benzene	49.8	1.0	ug/L	1	4C06007	03/06/2014	03/06/2014	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

<i>Surrogate: 1,2-Dichloroethane-d4</i>	102 %	87.3-113			"	"	"	
<i>Surrogate: Toluene-d8</i>	96.2 %	90.9-108			"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>	98.7 %	88.6-111			"	"	"	

Origins Laboratory, Inc.



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

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

Charles Greeson
 Project Number: NEP0839
 Project: Noble - Chestnut G 22-6

MW06
 3/4/2014 2:30:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
 X403029-06 (Water)

BTEX by EPA 8260C

Benzene	1.1	1.0	ug/L	1	4C06007	03/06/2014	03/06/2014	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	104 %	87.3-113			"	"	"	
<i>Surrogate: Toluene-d8</i>	101 %	90.9-108			"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>	97.3 %	88.6-111			"	"	"	

Origins Laboratory, Inc.



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

Charles Greeson
 Project Number: NEP0839
 Project: Noble - Chestnut G 22-6

MW07
 3/4/2014 2:23:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
 X403029-07 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	4C06007	03/06/2014	03/06/2014	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	104 %	87.3-113			"	"	"	
<i>Surrogate: Toluene-d8</i>	101 %	90.9-108			"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>	96.6 %	88.6-111			"	"	"	

Origins Laboratory, Inc.



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

Charles Greeson
 Project Number: NEP0839
 Project: Noble - Chestnut G 22-6

MW08R
 3/4/2014 1:45:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
 X403029-08 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	4C06007	03/06/2014	03/06/2014	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	5.0	1.0	"	"	"	"	"	
Xylenes, total	14.9	1.0	"	"	"	"	"	

<i>Surrogate: 1,2-Dichloroethane-d4</i>	104 %	87.3-113			"	"	"	
<i>Surrogate: Toluene-d8</i>	99.4 %	90.9-108			"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>	99.9 %	88.6-111			"	"	"	

Origins Laboratory, Inc.



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

Charles Greeson
 Project Number: NEP0839
 Project: Noble - Chestnut G 22-6

MW09R

3/4/2014 1:35:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
 X403029-09 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	4C06007	03/06/2014	03/06/2014	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	104 %	87.3-113			"	"	"	
Surrogate: Toluene-d8	99.9 %	90.9-108			"	"	"	
Surrogate: 4-Bromofluorobenzene	97.2 %	88.6-111			"	"	"	

Origins Laboratory, Inc.



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

Charles Greeson
 Project Number: NEP0839
 Project: Noble - Chestnut G 22-6

MW10
 3/4/2014 1:45:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
 X403029-10 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	4C06007	03/06/2014	03/06/2014	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	104 %	87.3-113			"	"	"	
<i>Surrogate: Toluene-d8</i>	101 %	90.9-108			"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>	97.2 %	88.6-111			"	"	"	

Origins Laboratory, Inc.



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

Charles Greeson
 Project Number: NEP0839
 Project: Noble - Chestnut G 22-6

MW11
 3/4/2014 1:35:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
 X403029-11 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	4C06007	03/06/2014	03/06/2014	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	105 %	87.3-113			"	"	"	
<i>Surrogate: Toluene-d8</i>	101 %	90.9-108			"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>	96.7 %	88.6-111			"	"	"	

Origins Laboratory, Inc.



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

Charles Greeson
 Project Number: NEP0839
 Project: Noble - Chestnut G 22-6

MW12
 3/4/2014 1:10:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
 X403029-12 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	4C06007	03/06/2014	03/06/2014	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	103 %	87.3-113			"	"	"	
Surrogate: Toluene-d8	101 %	90.9-108			"	"	"	
Surrogate: 4-Bromofluorobenzene	97.7 %	88.6-111			"	"	"	

Origins Laboratory, Inc.



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

Charles Greeson
 Project Number: NEP0839
 Project: Noble - Chestnut G 22-6

MW13
 3/4/2014 2:15:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
 X403029-13 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	4C06007	03/06/2014	03/06/2014	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	105 %	87.3-113			"	"	"	
<i>Surrogate: Toluene-d8</i>	101 %	90.9-108			"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>	97.6 %	88.6-111			"	"	"	

Origins Laboratory, Inc.



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

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

Charles Greeson
 Project Number: NEP0839
 Project: Noble - Chestnut G 22-6

MW15
 3/4/2014 1:05:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
 X403029-14 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	4C06007	03/06/2014	03/06/2014	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	105 %	87.3-113			"	"	"	
Surrogate: Toluene-d8	101 %	90.9-108			"	"	"	
Surrogate: 4-Bromofluorobenzene	96.9 %	88.6-111			"	"	"	

Origins Laboratory, Inc.



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

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

Charles Greeson
 Project Number: NEP0839
 Project: Noble - Chestnut G 22-6

MW16R
 3/4/2014 2:05:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
 X403029-15 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	4C06007	03/06/2014	03/06/2014	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	105 %	87.3-113			"	"	"	
Surrogate: Toluene-d8	99.3 %	90.9-108			"	"	"	
Surrogate: 4-Bromofluorobenzene	97.5 %	88.6-111			"	"	"	

Origins Laboratory, Inc.



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

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

Charles Greeson
 Project Number: NEP0839
 Project: Noble - Chestnut G 22-6

MW17R
 3/4/2014 1:25:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
 X403029-16 (Water)

BTEX by EPA 8260C

Benzene	ND	4.0	ug/L	4	4C06007	03/06/2014	03/06/2014	
Toluene	ND	4.0	"	"	"	"	"	
Ethylbenzene	51.6	4.0	"	"	"	"	"	
Xylenes, total	351	4.0	"	"	"	"	"	

<i>Surrogate: 1,2-Dichloroethane-d4</i>	104 %	87.3-113			"	"	"	
<i>Surrogate: Toluene-d8</i>	99.3 %	90.9-108			"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>	96.9 %	88.6-111			"	"	"	

Origins Laboratory, Inc.



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

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

Charles Greeson
 Project Number: NEP0839
 Project: Noble - Chestnut G 22-6

MW23R
 3/4/2014 2:15:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
 X403029-17 (Water)

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	4C06007	03/06/2014	03/06/2014	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	100 %	87.3-113			"	"	"	
Surrogate: Toluene-d8	98.2 %	90.9-108			"	"	"	
Surrogate: 4-Bromofluorobenzene	103 %	88.6-111			"	"	"	

Origins Laboratory, Inc.



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

Charles Greeson
 Project Number: NEP0839
 Project: Noble - Chestnut G 22-6

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 4C06007 - EPA 5030B (Water)

Blank (4C06007-BLK1)

Prepared: 03/06/2014 Analyzed: 03/06/2014

Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	1.0	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	65		"	62.5	104		87.3-113			
<i>Surrogate: Toluene-d8</i>	62		"	62.5	99.5		90.9-108			
<i>Surrogate: 4-Bromofluorobenzene</i>	62		"	62.5	99.2		88.6-111			

Origins Laboratory, Inc.



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

Noelle Doyle Mathis, President

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

Charles Greeson
 Project Number: NEP0839
 Project: Noble - Chestnut G 22-6

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 4C06007 - EPA 5030B (Water)

LCS (4C06007-BS1)

Prepared: 03/06/2014 Analyzed: 03/06/2014

Benzene	53.7	1.0	ug/L	50.0		107	75-126			
Toluene	50.8	1.0	"	50.0		102	78.7-126			
Ethylbenzene	58.6	1.0	"	50.0		117	81-130			
m,p-Xylene	114	2.0	"	100		114	77.2-133			
o-Xylene	54.4	1.0	"	50.0		109	77.9-126			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>58</i>		<i>"</i>	<i>62.5</i>		<i>92.8</i>	<i>87.3-113</i>			
<i>Surrogate: Toluene-d8</i>	<i>58</i>		<i>"</i>	<i>62.5</i>		<i>93.4</i>	<i>90.9-108</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>62</i>		<i>"</i>	<i>62.5</i>		<i>99.8</i>	<i>88.6-111</i>			

Origins Laboratory, Inc.



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

Charles Greeson
 Project Number: NEP0839
 Project: Noble - Chestnut G 22-6

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 4C06007 - EPA 5030B (Water)

Matrix Spike (4C06007-MS1)	Source: X403029-01			Prepared: 03/06/2014 Analyzed: 03/06/2014						
Benzene	57.7	1.0	ug/L	50.0	ND	115	74-130			
Toluene	58.8	1.0	"	50.0	ND	118	73-131			
Ethylbenzene	69.9	1.0	"	50.0	ND	140	76-132			J-02
m,p-Xylene	140	2.0	"	100	ND	140	69-139			J-02
o-Xylene	59.4	1.0	"	50.0	ND	119	74-131			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>54</i>		<i>"</i>	<i>62.5</i>		<i>86.3</i>	<i>87.3-113</i>			
<i>Surrogate: Toluene-d8</i>	<i>64</i>		<i>"</i>	<i>62.5</i>		<i>103</i>	<i>90.9-108</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>62</i>		<i>"</i>	<i>62.5</i>		<i>99.8</i>	<i>88.6-111</i>			

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 4600 West 60th Avenue
 Arvada CO 80003

Charles Greeson
 Project Number: NEP0839
 Project: Noble - Chestnut G 22-6

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 4C06007 - EPA 5030B (Water)

Matrix Spike Dup (4C06007-MSD1)	Source: X403029-01			Prepared: 03/06/2014 Analyzed: 03/06/2014						
Benzene	54.9	1.0	ug/L	50.0	ND	110	74-130	4.97	20	
Toluene	54.1	1.0	"	50.0	ND	108	73-131	8.34	20	
Ethylbenzene	66.5	1.0	"	50.0	ND	133	76-132	4.99	20	J-02
m,p-Xylene	135	2.0	"	100	ND	135	69-139	3.92	20	
o-Xylene	56.8	1.0	"	50.0	ND	114	74-131	4.61	20	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>58</i>		<i>"</i>	<i>62.5</i>		<i>92.1</i>	<i>87.3-113</i>			
<i>Surrogate: Toluene-d8</i>	<i>63</i>		<i>"</i>	<i>62.5</i>		<i>100</i>	<i>90.9-108</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>61</i>		<i>"</i>	<i>62.5</i>		<i>97.9</i>	<i>88.6-111</i>			

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Notes and Definitions

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

J-02 Reported value failed to meet established quality control criteria for the precision accuracy.

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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Noelle Doyle Mathis, President