

## FREMONT ENVIRONMENTAL INC.

August 4, 2013

Mr. Jacob Evans  
Noble Energy Inc.  
1625 Broadway, Suite 2000  
Denver, CO 80202

Subject:     **Site Investigation Report**  
              Libsack R G27-15  
              SWSE Sec 27, T4N, R65W  
              API # 05-123-13256  
              Weld County, Colorado  
              Fremont Project No. C013-009  
              Facility ID# 323601

Dear Mr. Evans:

Enclosed please find a copy of the above referenced Site Investigation Report for the Libsack R G27-15 site in Weld County, Colorado. The enclosed report describes site investigation and sampling efforts to assess soil and ground water quality at the site.

Please contact me at (303) 956-8714 if you require any additional information.

Fremont appreciates the opportunity to provide this service.

Sincerely,  
**FREMONT ENVIRONMENTAL INC.**



Paul V. Henehan, P.E.  
Senior Consultant

Enclosure

**SITE INVESTIGATION REPORT**  
**NOBLE ENERGY INC.**  
**LIBSACK R G27-15**  
**WELD COUNTY, COLORADO**  
**FREMONT PROJECT NO. C013-009**

**Prepared by:**

**Fremont Environmental Inc.**  
**12061 Pennsylvania Street, Suite B-101**  
**Thornton, CO 80241**  
**(303) 956-8714**

**August 4, 2013**

## TABLE OF CONTENTS

1.0 INTRODUCTION .....	1
2.0 BACKGROUND INFORMATION .....	1
2.1 Site Location .....	1
2.2 Site History .....	1
3.0 SITE INVESTIGATION ACTIVITIES.....	2
3.1 Soil Borings/Monitoring Wells.....	2
3.2 Ground Water Monitoring .....	3
3.3 Ground Water Sampling and Analysis .....	4
4.0 DISCUSSION .....	5
5.0 REMARKS.....	6

### Tables

Table 1: Summary of Ground Water Chemistry and Elevation Data

### Figures

Figure 1: Site Location Map

Figure 2: Site Map

Figure 3: Ground Water Contour Map

Figure 4: Ground Water Chemistry Map

Figure 5: Benzene Isoconcentration Map

### Appendices

Appendix A: Boring Logs

Appendix B: Sampling Plan

Appendix C: Laboratory Documentation

**SITE INVESTIGATION REPORT**  
**NOBLE ENERGY INC.**  
**LIBSACK R G27-15**  
**WELD COUNTY, COLORADO**  
**FREMONT PROJECT NO. C013-009**

**1.0 INTRODUCTION**

The purpose of this document is to present ground water quality data collected subsequent to remediation by excavation at the Libsack R G27-15 site in Weld County, Colorado. Impacted soil and ground water were identified at this location due to a release from a buried flow line between the well and the separator. Excavation of the impacted soil was completed in June 2013. Further, 30 monitoring wells were installed at this site between June 14, 2012 and July 19, 2013 to delineate the magnitude and extent of subsurface impacts.

**2.0 BACKGROUND INFORMATION**

**2.1 Site Location**

The Libsack R G27-15 facility is located approximately 7 miles east of Gilcrest, Colorado in Weld County as shown on Figure 1. The site includes one storage tank as well as separation and metering equipment.

The facility is located in an agricultural area 0.2 miles west of County Road 45 and 0.1 miles north of County Road 40. The location is further described as the SW  $\frac{1}{4}$  of the SE  $\frac{1}{4}$  of section 27, township 4N, range 65W. A Site Map is included as Figure 2.

**2.2 Site History**

The site is a natural gas production and oil storage facility for the Libsack R G27-15 natural gas well. This well was drilled in 1986 to a depth of approximately 7,225 feet.

Surface impacts were recently identified at the facility during routine operations when stained soil was observed near the flow line adjacent to the separator.

Remediation efforts included the excavation of impacted soil adjacent to the flow lines and separator. A total of 1,860 yards of soil were removed in June 2013; the impacted soil was disposed of as non-hazardous waste. Ground water was present in the excavation at a depth of approximately four feet.

### **3.0 SITE INVESTIGATION ACTIVITIES**

#### **3.1 Soil Borings/Monitoring Wells**

A total of 30 soil borings have been advanced at this site during three drilling mobilizations. All of these borings were completed as 1-inch diameter monitoring wells.

The first 11 monitoring wells (MW-1 through MW-11) were installed on June 14, 2013. These wells were used to partially delineate the extent of ground water impacts at the site. After an initial ground water sampling event, it was determined that the downgradient and cross-gradient extent of impact had not been fully defined. As a result, a second drilling mobilization was undertaken on July 8, 2013 at which time an additional eight monitoring wells (MW-12 through MW-19) were installed. A third drilling mobilization was conducted on July 19, 2013 to fully delineate the magnitude and extent of ground water impacts at this facility. The locations of these monitoring wells are illustrated on the attached figures.

Generally, the subsurface consists of topsoil and clay to a depth of approximately three feet and is then underlain by sand to a depth of approximately eight feet. The sand layer is then underlain by sandy clay to a depth of at least 12 feet. Ground water is present within the sand formation at a depth of approximately three to four feet. The maximum depth of one of the borings was 12 feet (MW-1).

The monitoring wells were constructed with 10 ft sections of screen that were placed at a total depth of approximately 11 feet. Logs of the monitoring wells are presented in Appendix A.

Soil samples for laboratory analyses were not collected from the borings since it is assumed that the excavation conducted in June 2013 removed the soil impacts. Therefore, soil samples in the vadose zone in each of the 30 soil borings would not have been impacted by released petroleum hydrocarbons. Field observations performed during the advancement of the borings confirmed this expectation. However, the smear zone has been impacted in several of the wells suggesting that petroleum constituents have migrated with the ground water flow.

### **3.2 Ground Water Monitoring**

Ground water levels have been measured in the monitoring wells on several occasions in accordance with the Sampling Plan included in Appendix B. Since the wells were installed on three separate drilling mobilizations, a comprehensive set of measurement data could not be collected until the most recent monitoring wells were installed. This comprehensive data set was collected on July 19, 2013. The data are summarized in Table 1.

Water table contours inferred from the July 19, 2013 data are illustrated on Figure 3. Based on these data, ground water is inferred to flow to the northeast. The water table gradient was calculated at approximately 0.004 foot per foot (ft/ft) for the July 2013 data.

As shown on Table 1 and Figure 3, several of the monitoring wells (MW-1, MW-5 and MW-8) were inundated at the time of monitoring due to operation of the center pivot irrigation system. The flush-mounted well vaults were under several inches of standing water at these three well locations. If the cover and well cap had been removed, the standing water would have had an opportunity to flow into the well and alter the depth to water measurement. In addition, a ground water sample from this well would not be representative of ground water at that location. Therefore, these wells were not sampled or measured on July 19, 2013. It should also be noted that ongoing operation of the irrigation system may affect the ground water flow direction in the short term.

### **3.3 Ground Water Sampling and Analysis**

Ground water samples were collected at least once from each of the 30 monitoring wells installed between June 14, 2012 and July 19, 2013. Three of the monitoring wells (MW-4, MW-5 and MW-7) have been sampled twice since these wells exhibited elevated dissolved petroleum constituents in the early stages of this investigation. All ground water samples were submitted to eAnalytics Laboratory, Inc. in Loveland, Colorado for analyses of benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8260C.

The ground water chemistry is shown on Figure 4 and Figure 5 illustrates the benzene isoconcentration contours across the site. As shown on these figures, detectable levels of petroleum hydrocarbons are present north and east (downgradient) from the former excavation.

The ground water analytical data are summarized in Table 1. Copies of the laboratory's reports are presented in Appendix C.

#### **4.0 DISCUSSION**

During the excavation of petroleum impacted soils adjacent to the flow line release location, impacted ground water was observed. As a result, 30 monitoring wells have been installed to determine the ground water flow direction and quality.

The data collected from these monitoring wells indicates that the ground water flow direction is to the northeast and that dissolved petroleum impacts are present to the north and east of the excavation. Referring to Figures 4 and 5, the magnitude and extent of ground water impacts have been delineated. As illustrated, the dissolved petroleum plume extends to the north approximately 30 feet and to the east approximately 80 feet from the excavation area.

Noble is currently evaluating additional ground water remediation alternatives that can be applied at this site. During the backfilling of the excavation, gypsum (hydrated calcium sulfate) was placed at the water table. This substance releases sulfate into the ground water which can enhance anaerobic biodegradation of petroleum constituents thereby improving ground water quality. It is likely that Noble will ultimately pursue a more aggressive remedial approach at this site.

Noble will sample the ground water at this site on a quarterly basis to evaluate the BTEX concentrations relative to the Colorado Oil and Gas Conservation Commission's (COGCC's) Table 910-1 requirements. Noble proposes to monitor and sample all 30 monitoring wells for at least one more quarter. However, after that sampling event, a modified sampling plan may be proposed that limits the number of wells to be sampled

each quarter. After four consecutive quarters of COGCC-compliant BTEX concentrations, Noble will request closure of this site.

### 5.0 REMARKS

The discussion and conclusions contained in this report represent our professional opinions. These opinions are based on currently available information and are arrived at in accordance with currently accepted hydrogeologic and engineering practices at this time and location. Other than this, no warranty is implied or intended.

This report was prepared by **FREMONT ENVIRONMENTAL INC.**



\_\_\_\_\_  
Paul V. Henehan, P.E.  
Senior Consultant

8/5/13  
Date\_\_\_\_\_

Reviewed by:



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Michael R. Gerstner  
Senior Geologist

8/5/13  
Date\_\_\_\_\_

**TABLE**

**TABLE 1**  
**SUMMARY OF GROUND WATER ELEVATION DATA AND CHEMISTRY DATA**  
**NOBLE ENERGY INC.**  
**LIBSACK R G27-15, WELD COUNTY, COLORADO+A30**  
**FREMONT PROJECT NO. C013-009**

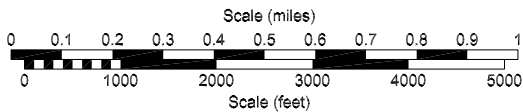
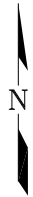
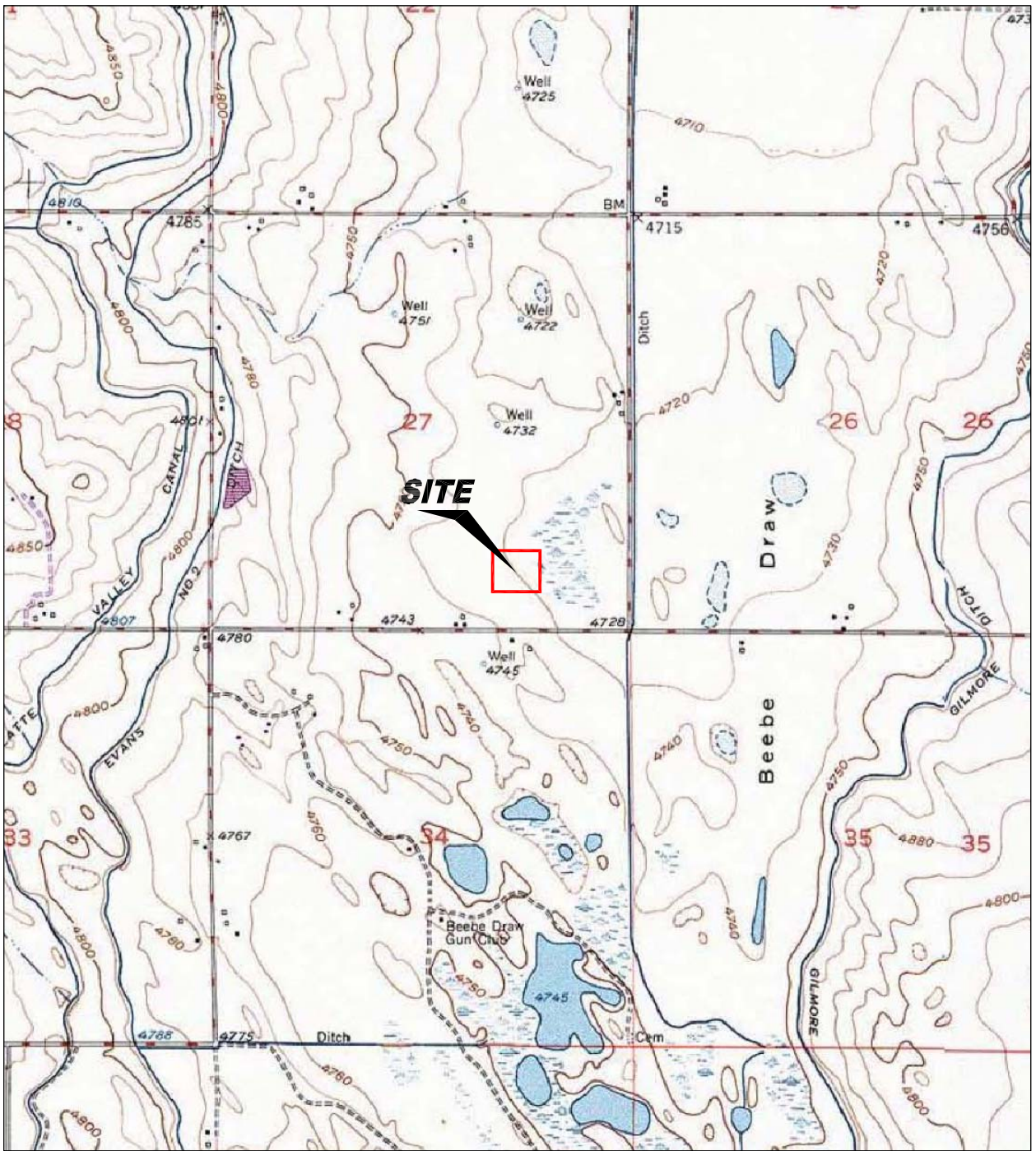
SAMPLE LOCATION	DATE	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYL BENZENE (µg/L)	TOTAL XYLENES (µg/L)	TOC ELEVATION (feet)	DEPTH TO GROUND WATER (ft)	GROUND WATER ELEVATION (ft)	FREE PRODUCT THICKNESS (ft)
MW-1	06/14/13	<1.0	<1.0	<1.0	<1.0	99.89	2.93	96.96	NP
	06/24/13	NS	NS	NS	NS		2.66	97.23	NP
	07/09/13	NS	NS	NS	NS		2.53	97.36	NP
	07/19/13	NS	NS	NS	NS		Inundated	Inundated	Inundated
MW-2	06/14/13	<1.0	<1.0	<1.0	<1.0	100.00	3.01	96.99	NP
	06/24/13	NS	NS	NS	NS		2.75	97.25	NP
	07/09/13	NS	NS	NS	NS		2.62	97.38	NP
	07/19/13	NS	NS	NS	NS		1.95	98.05	NP
MW-3	06/14/13	<1.0	<1.0	<1.0	<1.0	99.92	3.05	96.87	NP
	06/24/13	NS	NS	NS	NS		2.78	97.14	NP
	07/09/13	NS	NS	NS	NS		2.65	97.27	NP
	07/19/13	NS	NS	NS	NS		2.02	97.90	NP
MW-4	06/14/13	<b>4,523</b>	<1.0	<1.0	168	99.47	2.69	96.78	NP
	06/24/13	NS	NS	NS	NS		2.42	97.05	NP
	07/09/13	<b>868</b>	<1.0	<1.0	<1.0		2.28	97.19	NP
	07/19/13	NS	NS	NS	NS		1.61	97.86	NP
MW-5	06/14/13	<b>494</b>	<1.0	1.8	15.7	99.29	2.68	96.61	NP
	06/24/13	NS	NS	NS	NS		2.39	96.90	NP
	07/09/13	<b>535</b>	<1.0	<1.0	<1.0		2.26	97.03	NP
	07/19/13	NS	NS	NS	NS		Inundated	Inundated	Inundated
MW-6	06/14/13	<1.0	<1.0	<1.0	<1.0	99.66	3.01	96.65	NP
	06/24/13	NS	NS	NS	NS		2.74	96.92	NP
	07/09/13	NS	NS	NS	NS		2.61	97.05	NP
	07/19/13	NS	NS	NS	NS		2.01	97.65	NP
MW-7	06/14/13	<b>1,063</b>	27.8	<1.0	104	99.38	2.72	96.66	NP
	06/24/13	NS	NS	NS	NS		2.43	96.95	NP
	07/09/13	<b>2,226</b>	100	58.9	164		2.3	97.08	NP
	07/19/13	NS	NS	NS	NS		1.76	97.62	NP
MW-8	06/14/13	<1.0	<1.0	<1.0	<1.0	99.46	2.69	96.77	NP
	06/24/13	NS	NS	NS	NS		2.39	97.07	NP
	07/09/13	NS	NS	NS	NS		2.27	97.19	NP
	07/19/13	NS	NS	NS	NS		Inundated	Inundated	Inundated
MW-9	06/14/13	<1.0	<1.0	<1.0	<1.0	99.51	3.05	96.46	NP
	06/24/13	NS	NS	NS	NS	99.03	2.25	96.78	NP
	07/09/13	NS	NS	NS	NS		2.14	96.89	NP
	07/19/13	NS	NS	NS	NS		1.18	97.85	NP
MW-10	06/14/13	<1.0	<1.0	<1.0	<1.0	100.01	3.61	96.40	NP
	06/24/13	NS	NS	NS	NS	99.44	2.7	96.74	NP
	07/09/13	NS	NS	NS	NS		2.59	96.85	NP
	07/19/13	NS	NS	NS	NS		1.89	97.55	NP
MW-11	06/14/13	<1.0	<1.0	<1.0	<1.0	100.50	4.1	96.40	NP
	06/24/13	NS	NS	NS	NS	99.98	3.23	96.75	NP
	07/09/13	NS	NS	NS	NS		3.12	96.86	NP
	07/19/13	NS	NS	NS	NS		2.48	97.50	NP
MW-12	07/09/13	<1.0	<1.0	<1.0	<1.0	99.68	2.62	97.06	NP
	07/19/13	NS	NS	NS	NS		2.14	97.54	NP

SAMPLE LOCATION	DATE	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYL BENZENE (µg/L)	TOTAL XYLENES (µg/L)	TOC ELEVATION (feet)	DEPTH TO GROUND WATER (ft)	GROUND WATER ELEVATION (ft)	FREE PRODUCT THICKNESS (ft)
MW-13	07/09/13 07/19/13	<b>71.1</b> NS	NS	160 NS	<b>2,606</b> NS	99.76	2.78 2.28	96.98 97.48	NP NP
MW-14	07/09/13 07/19/13	<b>9.2</b> NS	NS	1.6 NS	16.8 NS	99.42	2.5 1.96	96.92 97.46	NP NP
MW-15	07/09/13 07/19/13	<1.0 NS	<1.0 NS	<1.0 NS	<1.0 NS	99.59	2.68 2.12	96.91 97.47	NP NP
MW-16	07/09/13 07/19/13	<b>177</b> NS	NS	394 NS	<b>5,089</b> NS	99.18	2.3 1.74	96.88 97.44	NP NP
MW-17	07/09/13 07/19/13	<b>851</b> NS	NS	390 NS	<b>9,256</b> NS	99.45	2.5 2.02	96.95 97.43	NP NP
MW-18	07/09/13 07/19/13	<1.0 NS	<1.0 NS	<1.0 NS	<1.0 NS	98.28	1.54 1.02	96.74 97.26	NP NP
MW-19	07/09/13 07/19/13	<1.0 NS	<1.0 NS	<1.0 NS	<1.0 NS	98.47	1.71 1.1	96.76 97.37	NP NP
MW-20	07/19/13	<1.0	<1.0	<1.0	<1.0	99.40	1.33	98.07	NP
MW-21	07/19/13	<1.0	<1.0	<1.0	<1.0	99.31	1.67	97.64	NP
MW-22	07/19/13	<1.0	<1.0	<1.0	<1.0	99.12	2.01	97.11	NP
MW-23	07/19/13	<1.0	<1.0	<1.0	<1.0	98.77	1.41	97.36	NP
MW-24	07/19/13	2.4	<1.0	36.6	1,364	99.08	1.57	97.51	NP
MW-25	07/19/13	<b>803</b>	<1.0	473	<b>10,322</b>	99.36	1.96	97.40	NP
MW-26	07/19/13	<b>198</b>	<1.0	344	<b>2,547</b>	99.30	1.88	97.42	NP
MW-27	07/19/13	<1.0	<1.0	<1.0	<1.0	98.40	0.91	97.49	NP
MW-28	07/19/13	<1.0	<1.0	<1.0	<1.0	98.64	1.14	97.50	NP
MW-29	07/19/13	<1.0	<1.0	<1.0	<1.0	101.04	3.45	97.59	NP
MW-30	07/19/13	<1.0	<1.0	<1.0	<1.0	100.22	2.73	97.49	NP
Table 910-1 Limits		5	560	700	1,400				

Bold face values exceed the COGCC limits

NP - No Free Product

## FIGURES



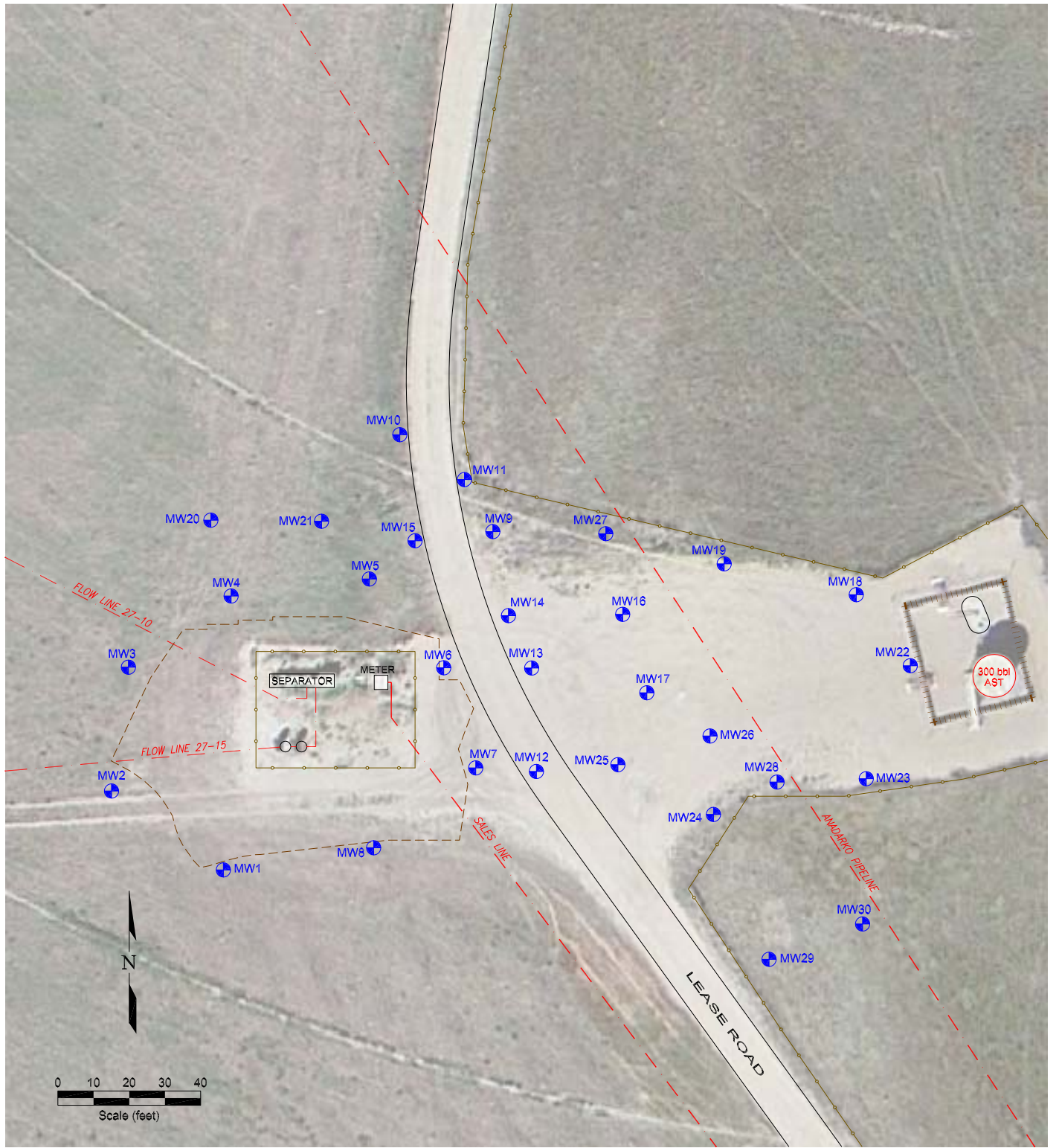
USGS 7.5 MINUTE SERIES (TOPOGRAPHIC)

Figure 1  
SITE LOCATION MAP

Noble Lipsack R G27-15  
SW SE Section 27, T4N, R65W  
Weld County, Colorado

Project No. C013-009	Prepared by	Drawn by JMA
Date 5/21/13	Reviewed by	Filename 13009T





**LEGEND**






-  MONITORING WELL
-  FENCE LINE
-  PIPELINE
-  CONTAINMENT BERM
-  ABOVE GROUND STORAGE TANK

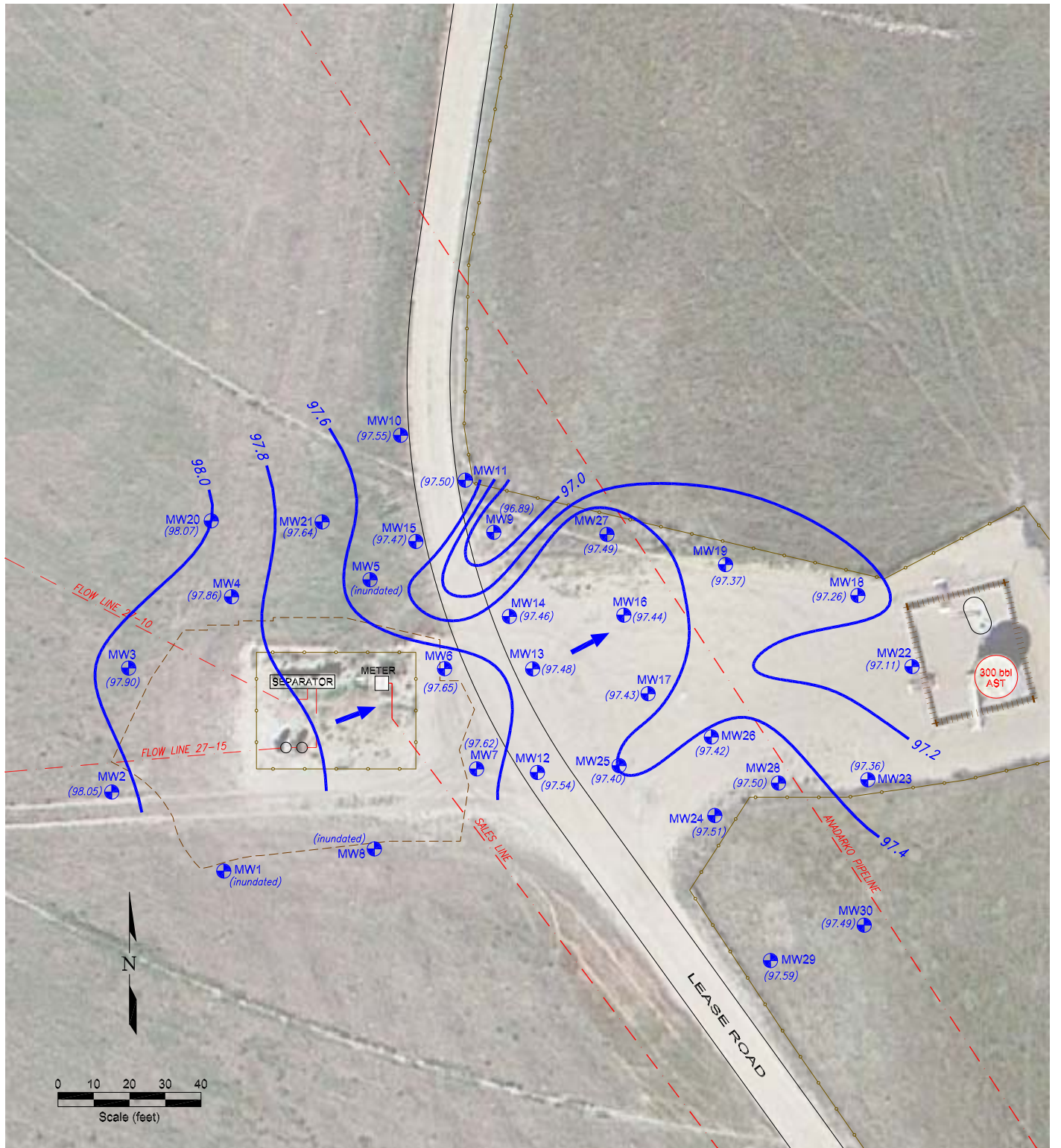
Figure 2

**SITE MAP**

**Noble Libsack R G27-15**  
 SW SE Section 27, T4N, R65W  
 Weld County, Colorado

Project No. C013-009	Prepared by	Drawn by JMA
Date 7/24/13	Reviewed by	Filename 13009R





**LEGEND**







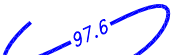

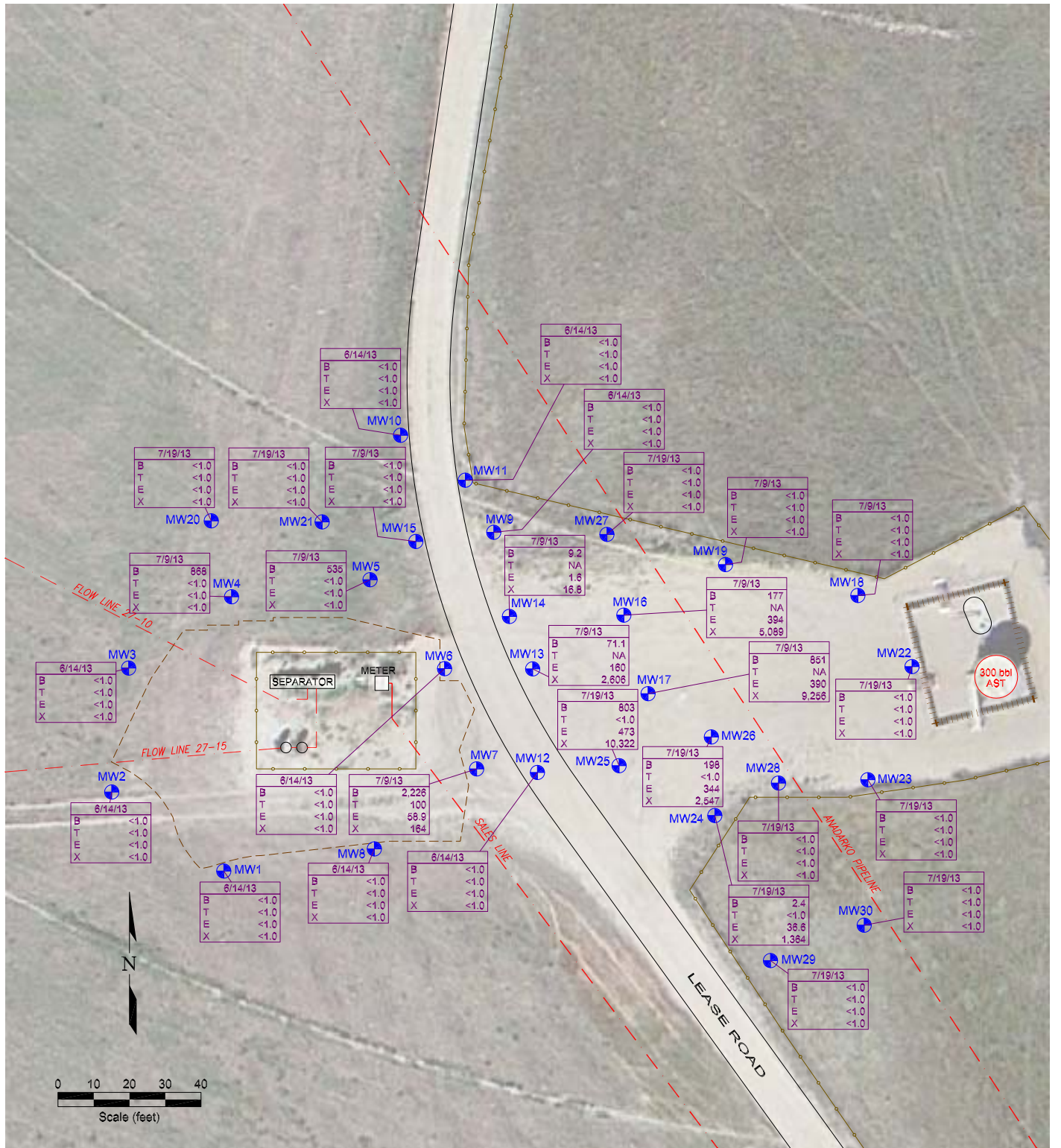
-  MONITORING WELL
-  FENCE LINE
-  PIPELINE
-  CONTAINMENT BERM
-  ABOVE GROUND STORAGE TANK
-  GROUND WATER ELEVATION (ft above arbitrary datum)
-  WATER TABLE CONTOUR
-  GROUND WATER FLOW DIRECTION

Figure 3  
**INFERRED GROUNDWATER CONTOUR**  
 JULY 19, 2013

**Noble Libsack R G27-15**  
 SW SE Section 27, T4N, R65W  
 Weld County, Colorado

Project No. <b>C013-009</b>	Prepared by	Drawn by <b>JMA</b>
Date <b>7/24/13</b>	Reviewed by	Filename <b>13009R</b>





**LEGEND**

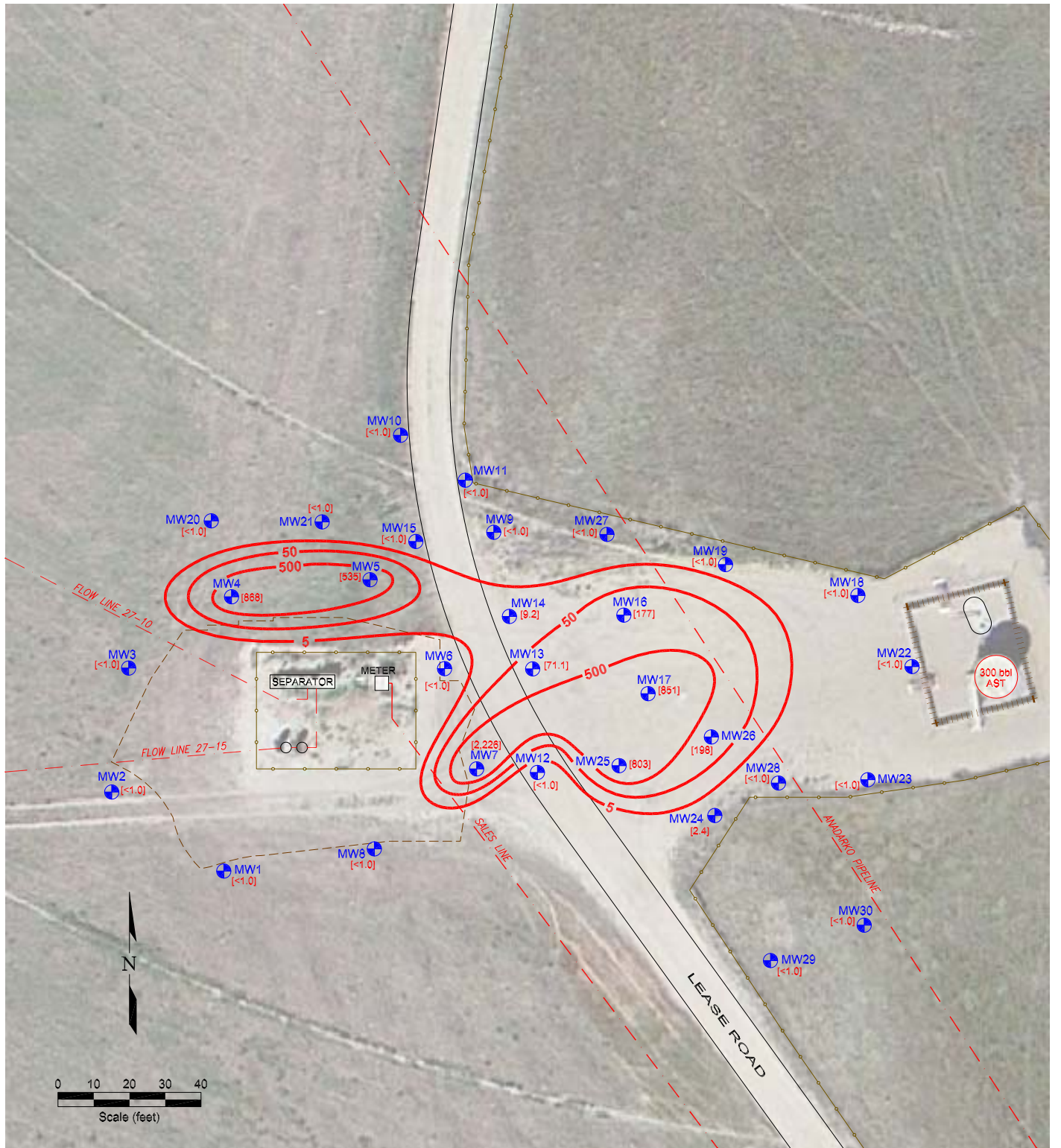
- MONITORING WELL
  - FENCE LINE
  - PIPELINE
  - CONTAINMENT BERM
  - ABOVE GROUND STORAGE TANK
- |                      |         |
|----------------------|---------|
| DATE SAMPLED         | 6/14/13 |
| BENZENE (ug/L)       | <1.0    |
| TOLUENE (ug/L)       | <1.0    |
| ETHYLBENZENE (ug/L)  | <1.0    |
| TOTAL XYLENES (ug/L) | <1.0    |

Figure 4  
**GROUND WATER CHEMISTRY MAP**

**Noble Libsack R G27-15**  
SW SE Section 27, T4N, R65W  
Weld County, Colorado

Project No. <b>C013-009</b>	Prepared by	Drawn by <b>JMA</b>
Date <b>7/25/13</b>	Reviewed by	Filename <b>13009R</b>





**LEGEND**

- MONITORING WELL
- FENCE LINE
- PIPELINE
- CONTAINMENT BERM
- ABOVE GROUND STORAGE TANK
- BENZENE CONCENTRATION (ug/L)  
MW1 - MW11 sampled 8/14/13  
MW12 - MW19 sampled 7/9/13  
MW20 - MW30 sampled 7/19/13
- BENZENE ISOCONCENTRATION (ug/L)  
Dashed where inferred

Figure 5  
**BENZENE ISOCONCENTRATION MAP**  
 JUNE 14 - JULY 19, 2013

**Noble Libsack R G27-15**  
 SW SE Section 27, T4N, R65W  
 Weld County, Colorado

Project No. <b>C013-009</b>	Prepared by	Drawn by <b>JMA</b>
Date <b>7/25/13</b>	Reviewed by	Filename <b>13009R</b>



APPENDIX A  
**BORING LOGS**

**APPENDIX B**

**SAMPLING PLAN**

## SAMPLING METHODS AND PROCEDURES

### Water Level Measurements

All ground water level measurements will be obtained using an electric measuring device, which indicates when a probe is in contact with ground water. Measurements will be obtained by lowering the device into the well until the water surface had been encountered, and by measuring the distance from the top of the inside riser pipe to the probe. All of the measurements will be recorded to the nearest 0.01 ft. To minimize cross-contamination, the water level indicator will be decontaminated with isopropyl alcohol and distilled water between each well.

### Monitoring Well Sampling

All monitoring wells were sampled from the “cleanest” to the “most contaminated” according to the protocols listed below.

#### Field Protocol

- Step 1            Measure water level in each well.
- Step 2            Purge each monitoring well by evacuating a minimum of three well bore volumes using a disposable polyethylene bailer.
- Step 3            Collect water samples using a disposable polyethylene bailer.
- Step 4            Cool samples to approximately 4°C for transportation.
- Step 5            Store water samples and transport to a specific laboratory, following all documentation and chain-of-custody procedures.

Upon completion of ground water sampling, a chain-of-custody log will be completed. Chain-of-custody records include the following information: project, project number, shipped by, shipped to, suspected hazard, sampling point, location, field identification number, date collected, sample type, number of containers, analysis required, and sampler's signature.

The chain-of-custody records will be shipped with the samples to the laboratory. Upon arrival at the laboratory the samples will be checked in and signed by the appropriate laboratory personnel. Laboratory identification numbers will be noted on the chain-of-custody record. Upon completion of the laboratory analysis, the completed chain-of-custody record will be returned to the project manager.

### **Analytical Methods**

The following list identifies the various chemical constituents and analytical methods which will be used for their quantification.

<u>Chemical Parameter</u>	<u>Method</u>
Benzene, Toluene, Ethylbenzene and Total Xylenes (BTEX)	EPA Method - 8260C

APPENDIX C

LABORATORY DOCUMENTATION

# Certificate of Analysis

## eANALYTICS LABORATORY

June 24, 2013

Client: Fremont Environmental  
PO Box 1289  
Wellington CO 80549

Project: Lipsack R G27-15

Lab ID: 061701

Date Received: 06/17/13

Number of Samples Received: 11

Sample Condition: Samples arrived intact and in appropriate sample containers

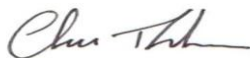
Sample Temperature: Within acceptable range of 2-6° C, or as specified in EPA Method

Analysis	EPA Method	Lab ID on COC
BTEX	8260C	1 - 11

All quality control analyses associated with the requested analyses were satisfactorily passed before the samples were run. If you have any questions please give us a call, we are happy to help.

Thank you for allowing eAnalytics Laboratory to provide laboratory services for you, we truly appreciate your business.

Sincerely,



Christopher Dieken  
Quality Assurance Manager  
eAnalytics Laboratory  
(970) 667-6975  
info@eAnalyticsLab.com



A2LA & Department of Defense (DoD) Certified

# Certificate of Analysis

Chain of Custody



June 24, 2013

<b>CLIENT:</b> <u>FEELMONT</u> <b>Project:</b> <u>MOBILE-LIBRARY R 627-15</u> <b>Project Manager:</b> <u>HEMETHAN</u> <b>Sampler:</b> <u>..</u> <b>Phone/Email:</b> <u>..</u> <b>Address:</b> <u>..</u>		<b>CHAIN OF CUSTODY</b> Doc# 09																																						
<b>Lab ID</b>	<b>Sample Name</b>	<b>Sampling Date/Time</b>	Matrix: (S) Soil (W) Water (V) Vapor (O) Other																																					
			Number of Containers																																					
01	MW-1	6/14/13 AM/PM	2W	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="10" style="text-align: center;">ANALYSIS</th> <th style="text-align: center;">Other Tests &amp; Sample Comments</th> </tr> <tr> <td>Fixed Gases</td> <td>BOD / COD</td> <td>Nitrate / Nitrite / Ammonia</td> <td>PCBs</td> <td>TRPH</td> <td>Oil &amp; Grease</td> <td>R / I / C &amp; Paint Filter</td> <td>Trace Metals Scan</td> <td>RCRA 8 Metals (Total/TCLP/Dissolved)</td> <td>pH / TSS</td> <td>DRO</td> <td>TO-14 / TO-15 / GRO</td> <td>SVOC 625 / 8270</td> <td>VOC 624 / 8260 (Total / TCLP)</td> <td>BTEX / MTBE / GRO</td> <td rowspan="11" style="vertical-align: top;">                 Noble - BTEX             </td> </tr> </table>										ANALYSIS										Other Tests & Sample Comments	Fixed Gases	BOD / COD	Nitrate / Nitrite / Ammonia	PCBs	TRPH	Oil & Grease	R / I / C & Paint Filter	Trace Metals Scan	RCRA 8 Metals (Total/TCLP/Dissolved)	pH / TSS	DRO	TO-14 / TO-15 / GRO	SVOC 625 / 8270	VOC 624 / 8260 (Total / TCLP)	BTEX / MTBE / GRO	Noble - BTEX
ANALYSIS														Other Tests & Sample Comments																										
Fixed Gases	BOD / COD	Nitrate / Nitrite / Ammonia	PCBs											TRPH	Oil & Grease	R / I / C & Paint Filter	Trace Metals Scan	RCRA 8 Metals (Total/TCLP/Dissolved)	pH / TSS	DRO	TO-14 / TO-15 / GRO	SVOC 625 / 8270	VOC 624 / 8260 (Total / TCLP)	BTEX / MTBE / GRO	Noble - BTEX															
02	MW-2	AM/PM																																						
03	MW-3	AM/PM																																						
04	MW-4	AM/PM																																						
05	MW-5	AM/PM																																						
06	MW-6	AM/PM																																						
07	MW-7	AM/PM																																						
08	MW-8	AM/PM																																						
09	MW-9	AM/PM																																						
10	MW-10	AM/PM																																						
11	MW-11	AM/PM																																						

**\* Turnaround Time (Business Days):**  
 Normal  
 03 Day (1.25x)  
 048 Hour (1.5x)  
 024 Hour (2x)  
 Same Day (3x)  
\* Begins when sample is received by Lab

**Rush analysis requires an extra charge. If possible please inform eAnalytics in advance for rush analysis.**

**Requisitioned by:** HEMETHAN  
**Company:** FEELMONT  
**Received by:** HEMETHAN  
**Company:** FEELMONT  
**Date:** 6/17/13  
**Time:** 11:16am

**Sample Preservative:**  None  Ice (4°C)  Oxid  Other

**Comments & Report Requests**

**Hold - Do Not Analyze - Hold**  
 The Marketplace at Centerra: 1767 Rocky Mountain Avenue Loveland CO 80538  
 P: (970) 667-6975 F: (970) 669-0941 E: info@eAnalyticslab.com www.eAnalyticslab.com  
**eANALYTICS LABORATORY**

**WO #** 061701

Page 1 of 1





# Certificate of Analysis

Quality Control  
Analysis



June 24, 2013

Client: Fremont Environmental  
PO Box 1289  
Wellington CO 80549

Project: Lipsack R G27-15

Lab ID: 061701

Matrix: WATER  
Batch ID: EA 06-19-13

EPA Method: 8260C     BTEX

Sample Name	Benzene	Toluene	Ethyl - Benzene	Total Xylenes	Date Analyzed	Lab ID
Laboratory Control Sample	101	98	93	99	06/19/13	L 06-19-13
(Acceptable 70-130%)	% Rec	% Rec	% Rec	% Rec		
Calibration Verification	95	97	90	97	06/19/13	C 06-19-13
(Acceptable 80-120%)	% Rec	% Rec	% Rec	% Rec		
Reagent Blank	< 1.0	< 1.0	< 1.0	< 1.0	06/19/13	RB 06-19-13
	ug/L	ug/L	ug/L	ug/L		

*Todd Rhea*

Laboratory Manager - eAnalytics Laboratory

# Certificate of Analysis

## eANALYTICS LABORATORY

July 15, 2013

Client: Fremont Environmental  
PO Box 1289  
Wellington CO 80549

Project: Lipsack 27-15

Lab ID: 071001

Date Received: 07/10/13

Number of Samples Received: 11

Sample Condition: Samples arrived intact and in appropriate sample containers

Sample Temperature: Within acceptable range of 2-6° C, or as specified in EPA Method

Analysis	EPA Method	Lab ID on COC
BTEX	8260C	1 - 11

All quality control analyses associated with the requested analyses were satisfactorily passed before the samples were run. If you have any questions please give us a call, we are happy to help.

Thank you for allowing eAnalytics Laboratory to provide laboratory services for you, we truly appreciate your business.

Sincerely,



Christopher Dieken  
Quality Assurance Manager  
eAnalytics Laboratory  
(970) 667-6975  
info@eAnalyticsLab.com



A2LA & Department of Defense (DoD) Certified

# Certificate of Analysis

Chain of Custody



July 15, 2013

Chain of Custody Form

 1767 Rocky Mountain Avenue Loveland CO 80538    Phone: (970) 667-6975    Fax: (970) 669-0941    www.eAnalyticsLab.com			<b>ANALYSIS INFORMATION</b> (Select analysis by checking box on corresponding sample line)																
<b>CLIENT INFORMATION</b> (*New Clients please fill out completely)			Number of Containers	Matrix: (S) Soil (W) Water (V) Vapor (O) Other	BTEX / MTBE / GRO (EPA 8260)	DRO (EPA 8015)	Vapor BTEX / TVPH (EPA TO-14)	Full VOC (EPA 8260)	Semi-Volatiles (Full List / PAHs)	TRPH / Oil & Grease	RCRA 8 Metals (Total / TCLP / Dissolved)	React. / Ignit. / Corrosivity / Paint Filter	pH / TSS / TDS	Metals (Specify)	PCBs / Pesticides / Herbicides	Anions (Specify)	Other Analysis		
Company: Fremont Environmental Inc. Project: <u>NOBLE-LIBSACK 27-15</u> Project Manager: Paul Henehan Sampler: <u>  </u> Phone/Email: 303-956-8714 PaulH@FremontEnv.com Address: 12061 Pennsylvania St., Suite B-101 Thornton, CO 80241																			
Lab ID	Sample Name	Sampling Date/Time																	
01	MW-4	7/9/13 AM/PM	2	W															
02	MW-5																		
03	MW-7																		
04	MW-12																		
05	MW-13																		
06	MW-14																		
07	MW-15																		
08	MW-16																		
09	MW-17																		
10	MW-18																		
11	MW-19																		
<b>Comments:</b>																			
<b>Turnaround Time (Business Days)</b> TAT begins when sample is received by eANALYTICS <input checked="" type="radio"/> Normal (5-10 Days) <input type="radio"/> 3 Day (1.25x) Rush analysis requires an extra charge. <input type="radio"/> 2 Day (1.5x) If possible please inform eANALYTICS in advance for rush analysis. <input type="radio"/> 1 Day (2x) <input type="radio"/> Same Day (3x)										<b>Record of Custody</b> Relinquished by: <u>[Signature]</u> Date: <u>7/10/13</u> Company: <u>[Signature]</u> Time: <u>0900</u> Received by: <u>Ronald M. Carter</u> Date: <u>7/10/13</u> Company: <u>Executive course</u> Time: <u>0900</u> Relinquished by: <u>Ronald M. Carter</u> Date: <u>7/10/13</u> Company: <u>[Signature]</u> Time: <u>1100</u> Received by: <u>[Signature]</u> Date: <u>7-10-13</u> Company: <u>eANALYTICS</u> Time: <u>1100</u>									
<b>Colorado OPS Project:</b> Yes / No																			
<b>For eANALYTICS Use</b>																			
<b>Samples Received Intact:</b> <input checked="" type="radio"/> Yes / <input type="radio"/> No																			
<b>Received Within Temperature Range (2-6°C):</b> <input checked="" type="radio"/> Yes / <input type="radio"/> No																			
<b>Sample Preservative:</b> <input checked="" type="radio"/> Ice / <input type="radio"/> None <input checked="" type="radio"/> Acid / <input type="radio"/> Other																			

WO # 071001

eANALYTICS: Environmental testing made Easy

Page 1 of 1





# Certificate of Analysis

**Quality Control  
Analysis**



**July 15, 2013**

Client: Fremont Environmental  
PO Box 1289  
Wellington CO 80549

Project: Lipsack 27-15

Lab ID: 071001

Matrix: WATER  
Batch ID: EA 07-12-13

EPA Method: 8260C     BTEX

Sample Name	Benzene	Toluene	Ethyl - Benzene	Total Xylenes	Date Analyzed	Lab ID
Laboratory Control Sample (Acceptable 70-130%)	95 % Rec	102 % Rec	90 % Rec	102 % Rec	07/12/13	L 07-12-13
Calibration Verification (Acceptable 80-120%)	91 % Rec	102 % Rec	90 % Rec	93 % Rec	07/12/13	C 07-12-13
Reagent Blank	< 1.0 ug/L	< 1.0 ug/L	< 1.0 ug/L	< 1.0 ug/L	07/12/13	RB 07-12-13

*Todd Rhea*

Laboratory Manager - eAnalytics Laboratory

# Certificate of Analysis

## eANALYTICS LABORATORY

July 23, 2013

Client: Fremont Environmental  
PO Box 1289  
Wellington CO 80549

Project: Libsack 27-15

Lab ID: 071906

Date Received: 07/19/13

Number of Samples Received: 11

Sample Condition: Samples arrived intact and in appropriate sample containers

Sample Temperature: Within acceptable range of 2-6° C, or as specified in EPA Method

Analysis	EPA Method	Lab ID on COC
BTEX	8260C	1 - 11

All quality control analyses associated with the requested analyses were satisfactorily passed before the samples were run. If you have any questions please give us a call, we are happy to help.

Thank you for allowing eAnalytics Laboratory to provide laboratory services for you, we truly appreciate your business.

Sincerely,



Christopher Dieken  
Quality Assurance Manager



Todd Rhea  
Laboratory Manager

eAnalytics Laboratory  
(970) 667-6975  
info@eAnalyticsLab.com



A2LA & Department of Defense (DoD) Certified

# Certificate of Analysis

Chain of Custody



July 23, 2013

Chain of Custody Form

**eANALYTICS LABORATORY**

1767 Rocky Mountain Avenue Loveland CO 80538 | Phone: (970) 667-6975 | Fax: (970) 669-0941 | www.eAnalyticsLab.com

**CLIENT INFORMATION** (\*New Clients please fill out completely) | **ANALYSIS INFORMATION** (Select analysis by checking box on corresponding sample line)

Company: FREMONT

Project: NOBLE LIBSACK 27-15

Project Manager: HENEHAN

Sampler: \_\_\_\_\_

Phone/Email: \_\_\_\_\_

Address: \_\_\_\_\_

Lab ID	Sample Name	Sampling Date/Time	Number of Containers	Matrix (S) Soil (W) Water (V) Vapor (O) Other	ANALYSIS INFORMATION											Other Analysis		
					BTEX / MTBE / TVPH (EPA 8260)	TEPH (EPA 8015)	Vapor BTEX / TVPH (EPA TO-14)	Full VOC (EPA 8260)	Semi-Volatiles (Full List / PAHs)	TRPH / Oil & Grease	RCRA & Metals (Total / TCLP / Dissolved)	React. / Ignit. / Corrosivity / Paint Filter	pH / TSS / TDS	Metals (Specify)	PCBs / Pesticides / Herbicides		Anions (Specify)	
01	MW-20	7/19/13	2	W														NOBLE BTEX
02	21																	
03	22																	
04	23																	
05	24																	
06	25																	
07	26																	
08	27																	
09	28																	
10	29																	
11	30																	

Comments: \_\_\_\_\_

<p><b>Turnaround Time (Business Days)</b>                  TAT begins when sample is received by eANALYTICS  <input checked="" type="radio"/> Normal (5-10 Days)  <input type="radio"/> 3 Day (25%)  <input type="radio"/> 2 Day (50%)  <input type="radio"/> 1 Day (100%)  <input type="radio"/> Same Day (300%)</p> <p>Rush analysis requires an extra charge.                  If possible please inform eANALYTICS in advance for rush analysis.</p> <p>Colorado OPS Project: Yes / No</p> <p>For eANALYTICS Use                  Samples Received Intact: <input checked="" type="radio"/> Yes / No                  Received Within Temperature Range (2-6°C): Yes / No                  Sample Preservative: Ice / Acid / None / Other</p>	<p><b>Record of Custody</b></p> <p>Relinquished by: <u>[Signature]</u> Date: <u>7/19/13</u>                  Company: <u>FR</u> Time: <u>4:40</u> PM</p> <p>Received by: _____ Date: _____                  Company: _____ Time: _____ AM/PM</p> <p>Relinquished by: _____ Date: _____                  Company: _____ Time: _____ AM/PM</p> <p>Received by: <u>Todd Drea</u> Date: <u>7-19-13</u>                  Company: <u>eANALYTICS</u> Time: <u>4:40</u> PM</p>
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# Certificate of Analysis

**Quality Control  
Analysis**



**July 23, 2013**

Client: Fremont Environmental  
PO Box 1289  
Wellington CO 80549

Project: Libsack 27-15

Lab ID: 071906

Matrix: WATER  
Batch ID: EA 07-22-13

EPA Method: 8260C     BTEX

Sample Name	Benzene	Toluene	Ethyl - Benzene	Total Xylenes	Date Analyzed	Lab ID
Laboratory Control Sample	95	98	92	94	07/22/13	L 07-22-13
(Acceptable 70-130%)	% Rec	% Rec	% Rec	% Rec		
Calibration Verification	96	96	93	95	07/22/13	C 07-22-13
(Acceptable 80-120%)	% Rec	% Rec	% Rec	% Rec		
Reagent Blank	< 1.0	< 1.0	< 1.0	< 1.0	07/22/13	RB 07-22-13
	ug/L	ug/L	ug/L	ug/L		

























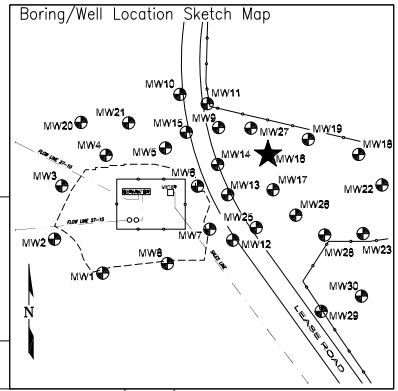








# BORING/WELL CONSTRUCTION LOG



Page 1 of 1

Boring/Well No. <b>MW-16</b>		Total Depth <b>11'</b>	Location <b>Noble Energy Libsack R G27-15 SW SE Section 27, T4N, R65 W Boulder County, Colorado</b>			
Project No./Name <b>C013-009/Noble Libsack</b>		Drilling Contractor/Driller <b>DrillPro/Terrence &amp; Randy</b>				
Geologist/Office <b>PVH</b>		Approved By				
Drilling Equipment/Method <b>Hurricane</b>		Size/Type of Bit <b>2.5" direct push</b>	Sampling Method <b>direct push</b>	Start/Finish Date <b>7/8/13</b>		
Well Installed? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Casing Mtrl./Dia. <b>PVC/1"</b>	Screen: Type <b>Slotted</b>   Mtrl. <b>PVC</b>   Length <b>10'</b>   Dia. <b>1"</b>   Slot Size <b>0.010"</b>			
Elevation of: (ft. above datum)	Ground Surface	Top of Well Casing	Top of Screen	Bottom of Screen	Ground Water Surface/Date Measured	
	.	<b>99.18</b>	<b>98.18</b>	<b>88.18</b>	.	

DEPTH (feet)	WELL CONSTRUCTION		LITHOLOGY		Penetration Rate (blows/6")	Recovery (%)	Sample Interval (feet)	PID Values (ppm)
			GRAPHIC LOG	VISUAL DESCRIPTION				
	Bentonite	1" Blank	GW	Road base				
5	#10-20 Silica Sand	1" Screen	SW	Sand, gray, moist, strong petroleum odor  brown, wet dark gray/black			3	370
10			CL	Clay, sandy, moist, no odor			7	275
15				TD 11'			9.5	14
20							11	0

















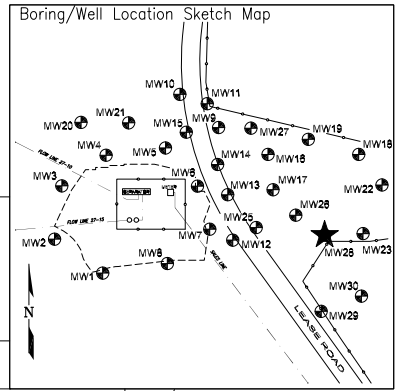








# BORING/WELL CONSTRUCTION LOG



Page 1 of 1

Boring/Well No. <b>MW-28</b>		Total Depth <b>11'</b>	Location <b>Noble Energy Libsack R G27-15 SW SE Section 27, T4N, R65 W Boulder County, Colorado</b>			
Project No./Name <b>C013-009/Noble Libsack</b>		Drilling Contractor/Driller <b>DrillPro/Terrence &amp; Randy</b>				
Geologist/Office <b>PVH</b>		Approved By				
Drilling Equipment/Method <b>Hurricane</b>		Size/Type of Bit <b>2.5" direct push</b>	Sampling Method <b>direct push</b>	Start/Finish Date <b>7/16/13</b>		
Well Installed? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Casing Mtrl./Dia. <b>PVC/1"</b>	Screen: Type <b>Slotted</b>   Mtrl. <b>PVC</b>   Length <b>10'</b>   Dia. <b>1"</b>   Slot Size <b>0.010"</b>			
Elevation of: (ft. above datum)		Ground Surface .	Top of Well Casing <b>98.64</b>	Top of Screen <b>97.64</b>	Bottom of Screen <b>87.64</b>	Ground Water Surface/Date Measured <b>97.50 (-1.14) 7/19/13</b>

DEPTH (feet)	WELL CONSTRUCTION		LITHOLOGY		Penetration Rate (blows/6")	Recovery (%)	Sample Interval (feet)	PID Values (ppm)
			GRAPHIC LOG	VISUAL DESCRIPTION				
	Bentonite	1" Blank		Topsoil				
				Silt, gray, very moist				
5				Sand, wet, dark gray staining, no odor (organic?) wet with black streaks, light odor		4	0	
	#10-20 Silica Sand	1" Screen		Sand, clayey, firmer		7	0	
				Sand, brown, wet, no odor				
10				Clay, brown				
				Clay, sandy, moist, no odor TD 11'		11	0	
15								
20								



