

FREMONT ENVIRONMENTAL INC.

January 21, 2015

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

Subject: **Site Investigation Report**
 Greenhead 18-11,12
 API # 05-123-17337, 17338
 NESW Sec 7, T4N, R66W
 Weld County, Colorado
 Fremont Project No. C014-078
 Facility #311394 (Location), Spill #400738091

Dear Mr. Evans:

Enclosed please find a copy of the above referenced Site Investigation Report for the Greenhead 18-11, 12 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.

A handwritten signature in blue ink, appearing to read "Paul V. Henahan".

Paul V. Henahan, P.E.
Senior Consultant

Enclosure

SITE INVESTIGATION REPORT

NOBLE ENERGY INC.

GREENHEAD 18-11, 12

WELD COUNTY, COLORADO

FREMONT PROJECT NO. C014-078

FACILITY #311394 (LOCATION), SPILL#400738091

Prepared by:

Fremont Environmental Inc.

**1759 Redwing Lane
Broomfield, CO 80020
(303) 956-8714**

January 21, 2015

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	4
5.0 REMARKS.....	5

Tables

Table 1:	Summary of Soil Chemistry
Table 2:	Summary of Ground Water Chemistry and Elevation Data

Figures

Figure 1:	Site Location Map
Figure 2:	Site Map
Figure 3:	Excavation Chemistry Map
Figure 4:	Cross Sections
Figure 5:	Soil Chemistry Map
Figure 6:	Inferred Ground Water Contour Map
Figure 7:	Ground Water Chemistry Map

Appendices

Appendix A:	Boring Logs
Appendix B:	Sampling Plan
Appendix C:	Laboratory Documentation

SITE INVESTIGATION REPORT
NOBLE ENERGY INC.
GREENHEAD 18-11, 12
WELD COUNTY, COLORADO
FREMONT PROJECT NO. C014-078
FACILITY #311394 (LOCATION), SPILL#400738091

1.0 INTRODUCTION

The purpose of this document is to present soil and ground water quality data collected during a site investigation at the Greenhead 18-11,12 site in Weld County, Colorado. Impacted soil and ground water were identified at this location due to a release from the facility's water vault. Five monitoring wells were installed at this site on January 5, 2015 to delineate the magnitude and extent of subsurface impacts.

2.0 BACKGROUND INFORMATION

2.1 Site Location

The Greenhead 18-11,12 site is located approximately two miles east of Milliken, Colorado in Weld County as shown on Figure 1. The site is located in a rural and agricultural area one mile northwest of the intersection of County Road 46 and Highway 60. The location is further described as the NE ¼ of the SW ¼ of Section 7, Township 4N, Range 66W.

2.2 Site History

The site consists of the water vault for the Greenhead 18-11,12 natural gas wells. The Greenhead 18-11 well was drilled in 1993 to a depth of approximately 7,555 feet. Soil and ground water impacts were recently identified at the facility after the water vault failed an integrity test. Those observations initiated the site investigation at this location to determine the extent of subsurface impacts.

An excavation to remediate the source impacts was undertaken in November 2014 by Fremont Environmental Inc. (Fremont). Approximately 10 cubic yards of impacted soil were excavated and removed from the water vault area. One ground water sample was collected from the excavation and analyzed for petroleum constituents. The laboratory analysis of the water sample indicated that the sample exhibited dissolved petroleum constituent concentrations of benzene (128 ug/L) that were greater than the Colorado Oil and Gas Conservation Commission's (COGCC's) Table 910-1 limits. As a result, a site investigation to determine the extent of ground water impacts was required.

Agricultural grade gypsum was placed at the water table during backfilling to promote anaerobic biodegradation of residual petroleum in the soil and ground water. The site was re-contoured to match the surrounding surface after backfilling was completed.

3.0 SITE INVESTIGATION ACTIVITIES

3.1 Soil Borings/Monitoring Wells

A site investigation was conducted at the facility on January 5, 2015. A total of five soil borings were advanced utilizing a Geoprobe rig. All of these borings were completed as flush-mounted, 1-inch diameter monitoring wells. These monitoring wells were used to delineate the extent of soil and ground water impacts at the site. The locations of the monitoring wells are illustrated on the attached figures.

Generally, the subsurface consists of roadbase or topsoil which is then underlain by sand and gravel that extends to a depth of at least 12 feet. The maximum depth of the borings was 12 feet. Ground water is present across the site at a depth of approximately seven to eight feet. Geologic cross sections are presented on Figure 4.

The 1-inch diameter monitoring wells were constructed with 10 feet sections of well screen that were placed at a total depth of approximately 12 feet and completed at the ground surface with flush-mounted vaults. Soil samples from each of the borings were evaluated in the field using a photoionization detector (PID). Logs of the monitoring wells are presented in Appendix A.

Soil samples were collected from each of the borings and sent to eAnalytics Laboratory, Inc. in Loveland, Colorado for the analyses of benzene, toluene, ethylbenzene and xylenes (BTEX), naphthalene, total petroleum hydrocarbons-gasoline range organics (TPH-GRO), and TPH-diesel range organics (TPH-DRO).

Soil impacts were not observed in any of the five borings above the COGCC's Table 910-1 limits for BTEX, naphthalene, TPH-GRO and TPH-DRO. The soil chemistry is presented on Figure 5 and summarized on Table 1. The laboratory's report is provided in Appendix C.

3.2 Ground Water Monitoring

Ground water levels were measured in the five monitoring wells on January 5, 2015 in accordance with the Sampling Plan included in Appendix B. The data are summarized in Table 2.

Water table contours inferred from the January 2015 data are illustrated on Figure 6. Based on these data, ground water is inferred to flow to the east southeast. The water table gradient was calculated at approximately 0.004 feet per foot (ft/ft) for the January 2015 data.

3.3 Ground Water Sampling and Analysis

Ground water samples were collected from the five monitoring wells January 5, 2015. All ground water samples were submitted to eAnalytics Laboratory, Inc. for analyses of benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8260C.

The ground water chemistry for all five monitoring wells were below their respective COGCC Table 910-1 values. The ground water chemistry is shown on Figure 7. The ground water analytical data are summarized in Table 2. A copy of the laboratory's report is presented in Appendix C.

4.0 DISCUSSION

A site investigation was conducted at the Greenhead 18-11,12 location on January 5, 2015 as a result of a release from the facility's water vault. Five monitoring wells were installed at the site to delineate the magnitude and extent of soil and ground water impacts.

Soil impacts above the COGCC Table 910-1 limits were not observed in any of the five monitoring wells. This is likely due to the excavation project that was conducted in November 2014 to remove impacted soil from this location. Approximately 10 cubic yards of impacted soil were excavated and removed from the site. Gypsum was placed in the excavation to enhance anaerobic biodegradation of residual soil and ground water impacts.

The data collected from the monitoring wells indicates that the ground water flow direction is to the east southeast. The BTEX concentrations in the five monitoring wells were less than the COGCC Table 910-1 limits. These data are illustrated on Figure 7.

Noble will sample the ground water at this site on a quarterly basis to evaluate the BTEX concentrations relative (COGCC's) Table 910-1 requirements. 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

Reviewed by:



Michael R. Gerstner

Senior Geologist

1/21/15

Date_____

1/21/15

Date_____

TABLES

TABLE 1
SUMMARY OF SOIL CHEMISTRY DATA
NOBLE ENERGY INC.
GREENHEAD 18-11, 12, WELD COUNTY, COLORADO
FREMONT PROJECT NO. C014-078

SAMPLE LOCATION	DATE SAMPLED	DEPTH ft	BENZENE mg/kg	TOLUENE mg/kg	ETHYL BENZENE mg/kg	TOTAL XYLENES mg/kg	NAPHTH-ALENE mg/kg	TPH-GRO mg/kg	TPH-DRO mg/kg
MW-1	01/05/15	4	<0.01	<0.01	<0.01	<0.01	<0.01	<50	<50
MW-2	01/05/15	4	<0.01	<0.01	<0.01	<0.01	<0.01	<50	<50
MW-3	01/05/15	4	<0.01	<0.01	<0.01	<0.01	<0.01	<50	<50
MW-4	01/05/15	4	<0.01	<0.01	<0.01	<0.01	<0.01	<50	<50
MW-5	01/05/15	4	<0.01	<0.01	<0.01	<0.01	<0.01	<50	<50
COGCC Table 910-1 Concentrations			0.17	85	100	175	23	500*	500*

The TPH-GRO and TPH-DRO concentrations are added together; if the sum of the two is >500 mg/kg, this exceeds the COGCC Table 910-1 limit

Bold face values exceed the COGCC limits

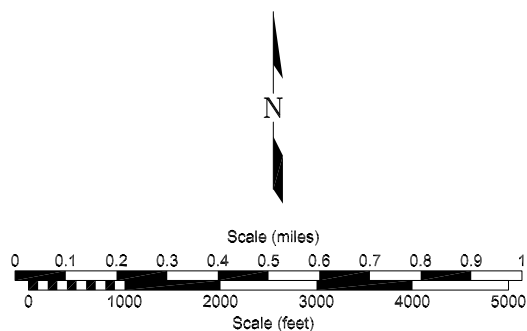
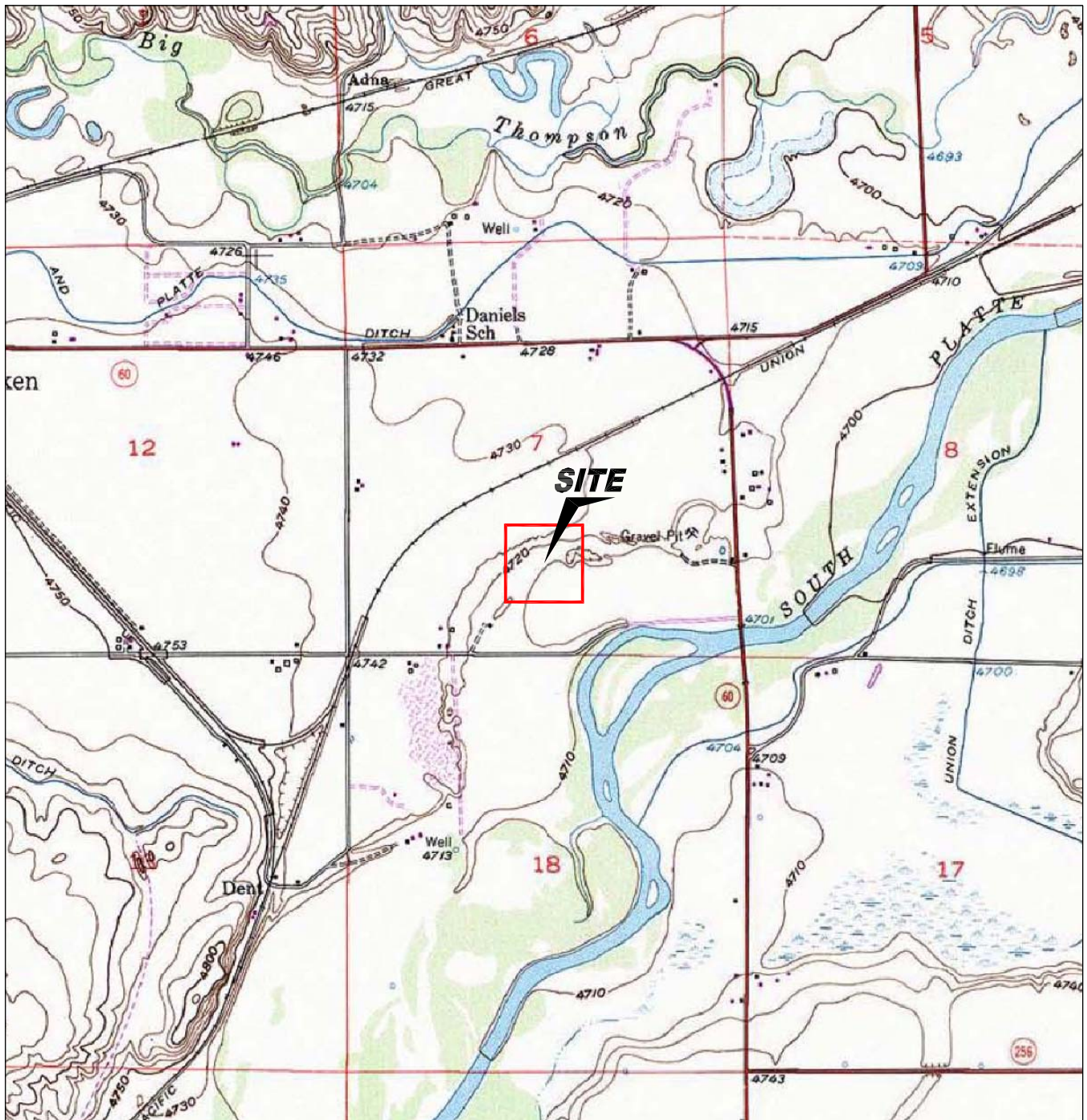
TABLE 2
SUMMARY OF GROUND WATER ELEVATION DATA AND CHEMISTRY DATA
NOBLE ENERGY INC.
GREENHEAD 18-11, 12, WELD COUNTY, COLORADO
FREMONT PROJECT NO. C014-078

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	01/05/15	<1.0	<1.0	<1.0	<1.0	100.00	7.84	92.16	NP
MW-2	01/05/15	<1.0	<1.0	<1.0	<1.0	99.56	7.45	92.11	NP
MW-3	01/05/15	<1.0	<1.0	<1.0	<1.0	99.38	7.37	92.01	NP
MW-4	01/05/15	<1.0	<1.0	<1.0	<1.0	99.66	7.61	92.05	NP
MW-5	01/05/15	<1.0	<1.0	<1.0	<1.0	99.81	7.80	92.01	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 Greenhead 18-11 & 18-12
SW SE Section 7, T4N, R66W
Weld County, Colorado

Project No. C014-078	Prepared by	Drawn by JMA
Date 11/21/14	Reviewed by	Filename 14078T





LEGEND

- MONITORING WELL
- CONTAINMENT BERM
- ABOVE GROUND STORAGE TANK

Figure 2
SITE MAP

Noble Greenhead 18-11 & 18-12
SW SE Section 7, T4N, R66W
Weld County, Colorado

Project No.
C014-078

Prepared by

Drawn by
JMA

Date
1/15/15

Reviewed by

Filename
14078Q





LEGEND

CONTAINMENT BERM
 ABOVE GROUND STORAGE TANK



SOIL SAMPLE LOCATION



WATER SAMPLE LOCATION

11/14/14	4
B	<0.01
T	<0.01
E	<0.01
X	<0.01
G	<50
D	<50

DATE SAMPLED
 SAMPLE DEPTH (ft)
 BENZENE (mg/kg)
 TOLUENE (mg/kg)
 ETHYLBENZENE (mg/kg)
 TOTAL XYLENES (mg/kg)
 TPH-GRO (mg/kg)
 TPH-DRO (mg/kg)

11/14/14	4
B	128
T	369
E	69.4
X	932

DATE SAMPLED
 BENZENE (ug/L)
 TOLUENE (ug/L)
 ETHYLBENZENE (ug/L)
 TOTAL XYLENES (ug/L)

Figure 3 EXCAVATION SOIL & WATER CHEMISTRY

Noble Greenhead 18-11 & 18-12
 SW SE Section 7, T4N, R66W
 Weld County, Colorado

Project No.
C014-078

Prepared by

Drawn by

JMA

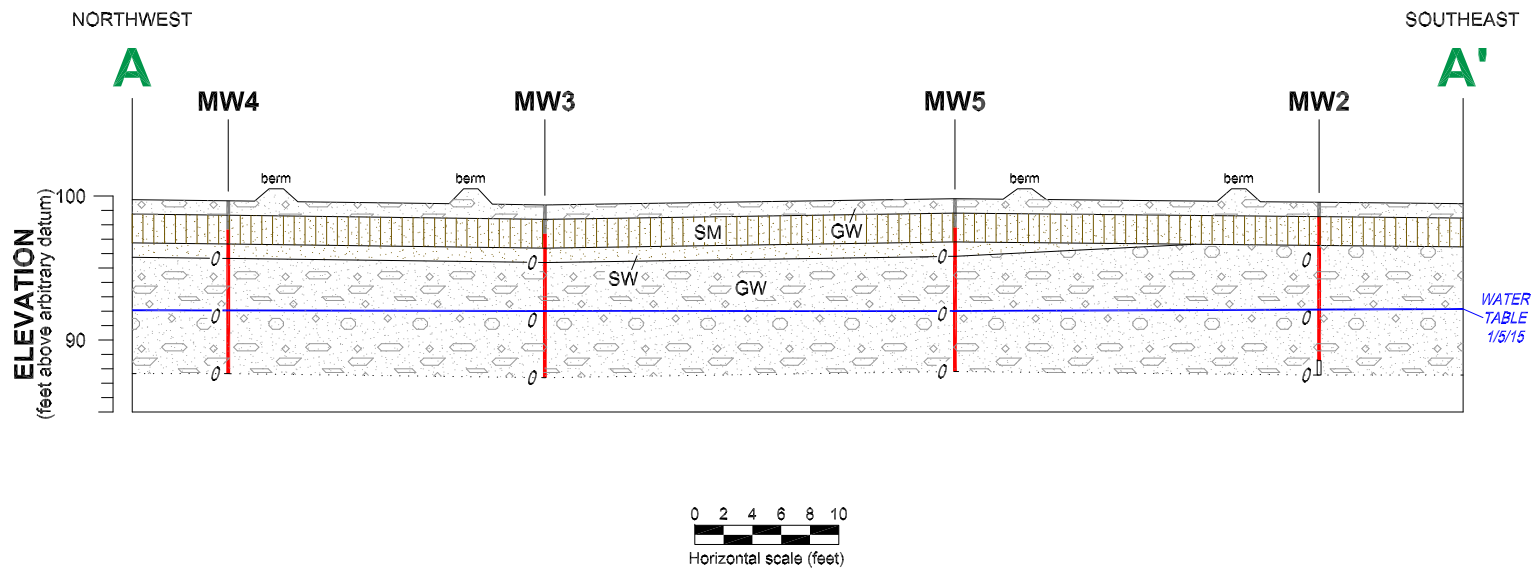
Date
1/15/15

Reviewed by

Filename

14078Q





LEGEND

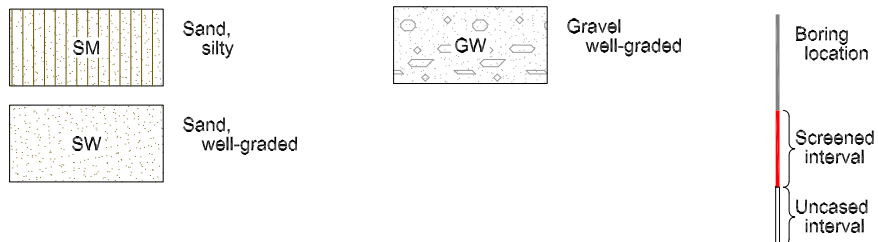

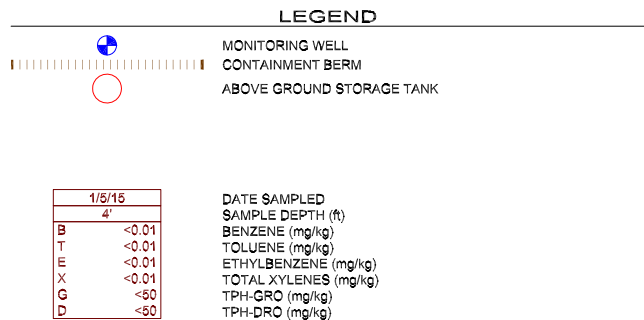


Figure 4


CROSS-SECTION A-A'

Noble Greenhead 18-11 & 18-12
SW SE Section 7, T4N, R66W
Weld County, Colorado

Project No. C014-078	Prepared by	Drawn by JMA	
Date 1/15/15	Reviewed by	Filename 14078Q	



Noble Greenhead 18-11 & 18-12
SW SE Section 7, T4N, R66W
Weld County, Colorado

Project No. C014-078	Prepared by	Drawn by JMA	
Date 1/15/15	Reviewed by	Filename 14078Q	



LEGEND







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

Figure 6
INFERRED GROUNDWATER CONTOUR
JANUARY 5, 2015

Noble Greenhead 18-11 & 18-12
 SW SE Section 7, T4N, R66W
 Weld County, Colorado

Project No.
C014-078

Prepared by

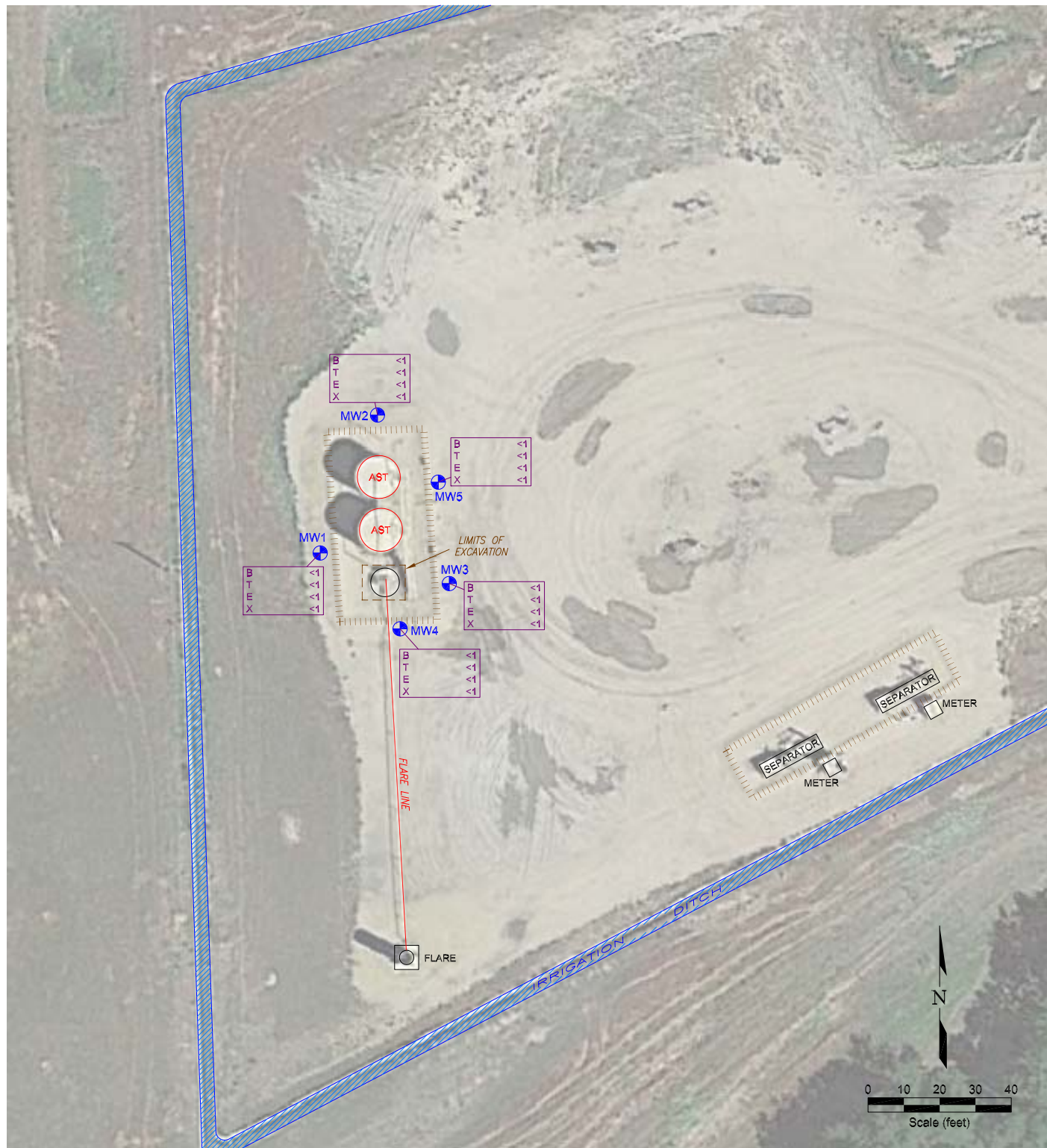
Drawn by
JMA

Date
1/15/15

Reviewed by

Filename
14078Q





LEGEND

 MONITORING WELL
 CONTAINMENT BERM
 ABOVE GROUND STORAGE TANK

B <1
 T <1
 E <1
 X <1

BENZENE (ug/L)
 TOLUENE (ug/L)
 ETHYLBENZENE (ug/L)
 TOTAL XYLENES (ug/L)

Figure 7
GROUND WATER CHEMISTRY MAP
JANUARY 5, 2015

Noble Greenhead 18-11 & 18-12
 SW SE Section 7, T4N, R66W
 Weld County, Colorado

Project No.
C014-078

Prepared by

Drawn by
JMA

Date
1/15/15

Reviewed by

Filename
14078Q



APPENDIX A

BORING LOGS

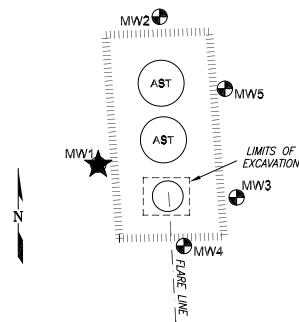


BORING/WELL CONSTRUCTION LOG

Page 1 of 1

Boring/Well No. MW1	Total Depth 12'	Location Noble Energy Greenhead 18-11 & 18-12 SW SE Section 7, T4N, R66W Weld County, Colorado			
Project No./Name C014-078/Noble Greenhead 18-11 & 18-12		Approved By			
Drilling Contractor/Driller DrillPro		Geologist/Office PVH			
Drilling Equipment/Method Hurricane		Size/Type of Bit 2.5" direct push	Sampling Method direct push	Start/Finish Date 1/5/15	
Well Installed? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Casing Mtrl./Dia. PVC/1"	Screen: Type Slotted Mtrl. PVC Length 10' Dia. 1" Slot Size 0.010"			
Elevation of: (ft. above datum)	Ground Surface .	Top of Well Casing 100.00	Top of Screen 99.00	Bottom of Screen 89.00	Ground Water Surface/Date Measured 92.16 1/5/15

Boring/Well Location Sketch Map



DEPTH (feet)	WELL CONSTRUCTION		LITHOLOGY		Penetration Rate (blows/ft)	Sample Interval (feet)	PID Values (ppm)
			GRAPHIC LOG	VISUAL DESCRIPTION			
	Bentonite	1" Blank	GW	Roadbase			
			SM	Sand, silty			
5				Sand and gravel, no stain, no odor		4	0
	#10-20 Silica Sand	1" Screen	GW	Water level 7.84' wet		8	0
10							
						12	0
15							
20							

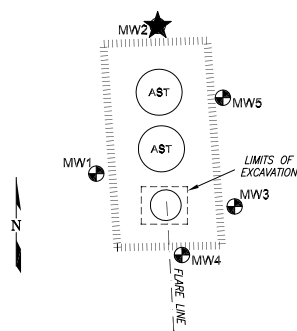


BORING/WELL CONSTRUCTION LOG

Page 1 of 1

Boring/Well No. MW2	Total Depth 12'	Location Noble Energy Greenhead 18-11 & 18-12 SW SE Section 7, T4N, R66W Weld County, Colorado			
Project No./Name C014-078/Noble Greenhead 18-11 & 18-12		Approved By			
Drilling Contractor/Driller DrillPro		Geologist/Office PVH			
Drilling Equipment/Method Hurricane		Size/Type of Bit 2.5" direct push	Sampling Method direct push	Start/Finish Date 1/5/15	
Well Installed? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Casing Mtrl./Dia. PVC/1"	Screen: Type Slotted Mtrl. PVC Length 10' Dia. 1" Slot Size 0.010"			
Elevation of: (ft. above datum)	Ground Surface .	Top of Well Casing 99.56	Top of Screen 98.56	Bottom of Screen 88.56	Ground Water Surface/Date Measured 92.11 1/5/15

Boring/Well Location Sketch Map



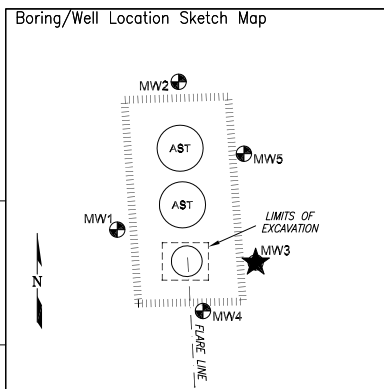
DEPTH (feet)	WELL CONSTRUCTION		LITHOLOGY		Penetration Rate (blows/ft)	Sample Interval (feet)	PID Values (ppm)
			GRAPHIC LOG	VISUAL DESCRIPTION			
	Bentonite	1" Blank	GW	Roadbase			
			SM	Sand, silty, stiff			
				Sand and gravel, no stain, no odor		4	0
5							
	#10-20 Silica Sand	1" Screen	GW	Water level 7.45'		8	0
				wet			
10							
				TD 12'		12	0
15							
20							



BORING/WELL CONSTRUCTION LOG

Page 1 of 1

Boring/Well No. MW3		Total Depth 12'	Location Noble Energy Greenhead 18-11 & 18-12 SW SE Section 7, T4N, R66W Weld County, Colorado		
Project No./Name C014-078/Noble Greenhead 18-11 & 18-12			Drilling Contractor/Driller DrillPro		
Geologist/Office PVH			Approved By		
Drilling Equipment/Method Hurricane			Size/Type of Bit 2.5" direct push	Sampling Method direct push	Start/Finish Date 1/5/15
Well Installed? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Casing Mtrl./Dia. PVC/1"	Screen: Type Slotted Mtrl. PVC Length 10' Dia. 1" Slot Size 0.010"		
Elevation of: (ft. above datum)	Ground Surface .	Top of Well Casing 99.38	Top of Screen 97.38	Bottom of Screen 87.38	Ground Water Surface/Date Measured 92.01 1/5/15



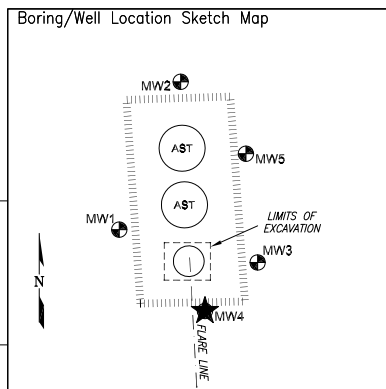
DEPTH (feet)	WELL CONSTRUCTION		LITHOLOGY		Penetration Rate (blows/ft)	Sample Interval (feet)	PID Values (ppm)
			GRAPHIC LOG	VISUAL DESCRIPTION			
	Bentonite	1" Blank	GW	Roadbase			
			SM	Sand, silty			
			SW	Sand, coarse, no stain, no odor			
5				Sand and gravel, brown, no stain, no odor		4	0
			GW	wet			
				Water level 7.37'			
10	#10-20 Silica Sand	1" Screen				8	0
15						12	0
20							



BORING/WELL CONSTRUCTION LOG

Page 1 of 1

Boring/Well No. MW4	Total Depth 12'	Location Noble Energy Greenhead 18-11 & 18-12 SW SE Section 7, T4N, R66W Weld County, Colorado		
Project No./Name C014-078/Noble Greenhead 18-11 & 18-12		Drilling Contractor/Driller DrillPro		
Geologist/Office PVH		Approved By		
Drilling Equipment/Method Hurricane		Size/Type of Bit 2.5" direct push	Sampling Method direct push	Start/Finish Date 1/5/15
Well Installed? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Casing Mtrl./Dia. PVC/1"	Screen: Type Slotted Mtrl. PVC Length 10' Dia. 1" Slot Size 0.010"		
Elevation of: (ft. above datum)	Ground Surface .	Top of Well Casing 99.66	Top of Screen 97.66	Bottom of Screen 87.66
		Ground Water Surface/Date Measured 92.05 1/5/15		



DEPTH (feet)	WELL CONSTRUCTION		LITHOLOGY		Penetration Rate (blows/ft)	Sample Interval (feet)	PID Values (ppm)
			GRAPHIC LOG	VISUAL DESCRIPTION			
	Bentonite	1" Blank	GW	Roadbase			
			SM	Sand, silty			
			SW	Sand, coarse, no stain, no odor			
5				Sand and gravel, brown, no stain, no odor		4	0
			GW	wet			
	#10-20 Silica Sand	1" Screen		Water level 7.61'		8	0
10							
						12	0
15							
20							

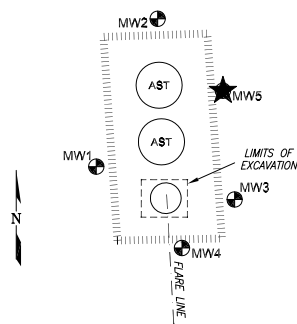


BORING/WELL CONSTRUCTION LOG

Page 1 of 1

Boring/Well No. MW5	Total Depth 12'	Location Noble Energy Greenhead 18-11 & 18-12 SW SE Section 7, T4N, R66W Weld County, Colorado		
Project No./Name C014-078/Noble Greenhead 18-11 & 18-12		Drilling Contractor/Driller DrillPro		
Geologist/Office PVH		Approved By		
Drilling Equipment/Method Hurricane		Size/Type of Bit 2.5" direct push	Sampling Method direct push	Start/Finish Date 1/5/15
Well Installed? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Casing Mtrl./Dia. PVC/1"	Screen: Type Slotted Mtrl. PVC Length 10' Dia. 1" Slot Size 0.010"		
Elevation of: (ft. above datum)	Ground Surface .	Top of Well Casing 99.81	Top of Screen 97.81	Bottom of Screen 87.81
		Ground Water Surface/Date Measured 92.01 1/5/15		

Boring/Well Location Sketch Map



DEPTH (feet)	WELL CONSTRUCTION		LITHOLOGY		Penetration Rate (blows/ft)	Sample Interval (feet)	PID Values (ppm)
			GRAPHIC LOG	VISUAL DESCRIPTION			
	Bentonite	1" Blank	GW	Roadbase			
			SM	Sand, silty			
			SW	Sand, coarse, no stain, no odor			
5				Sand and gravel, brown, no stain, no odor		4	0
			GW				
				Water level 7.80'			
	#10-20 Silica Sand	1" Screen		wet		8	0
10							
				TD 12'		12	0
15							
20							

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

Test Report



January 6, 2015

Client: Fremont Environmental / Noble Energy

Project: Greenhead 18-11, 12

Lab ID: 2728

Date Samples Received: 1/5/2015

Number of Samples: 10

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

The quality control procedures associated with the requested analyses were satisfactorily passed before the samples were run.

Thank you for allowing eAnalytics Laboratory to provide laboratory services for you.

Sincerely,

A handwritten signature in black ink, appearing to read "Chris Dieken".

Christopher Dieken
Quality Assurance Manager

A handwritten signature in black ink, appearing to read "Todd Rhea".

Todd Rhea
Laboratory Manager

eAnalytics Laboratory

1767 Rocky Mountain Avenue Loveland CO 80538

Chain of Custody

eANALYTICS
LABORATORY

<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="font-size: 2em; font-weight: bold; letter-spacing: 5px;">eANALYTICS</div> <div style="font-size: 1.5em; font-weight: bold; letter-spacing: 5px;">LABORATORY</div> </div> <div style="display: flex; justify-content: space-between; font-size: 0.8em; margin-top: 5px;"> 1767 Rocky Mountain Avenue Loveland CO 80538 Phone: (970) 667-6975 Fax: (970) 669-0941 www.eAnalyticsLab.com </div>									
CLIENT INFORMATION <small>(*New Clients please fill out completely)</small>				ANALYSIS INFORMATION <small>(Select analysis by checking box on corresponding sample line)</small>					
Company: Fremont Environmental				<div style="display: flex; justify-content: space-around; font-size: 0.7em;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Number of Containers</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Matrix (S) Soil (W) Water (V) Vapor (O) Other</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">BTX (EPA 8260)</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">BTX Naphthalene (EPA 8260)</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">TPH - GRO/DRO (EPA 8260/8015)</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">SAR (US Dept of Ag Method 20B)</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">EC (US Dept of Ag Method 3)</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">pH (EPA 9045D)</div> </div>					
Project: NOBLE - GREENHEAD 18-11, 12									
Project Manager: Paul Henehan									
Sampler: --									
Phone/Email: 303-956-8714									
Address: P.O. Box 1289 Wellington CO 80549				Other Analysis					
Lab ID	Sample Name	Sampling Date/Time	AM / PM	2 W	✓	✓	✓	✓	✓
1	MW-1	1/5/15	AM / PM	2 W	✓				
2	MW-2	}	AM / PM						
3	MW-3		AM / PM						
4	MW-4		AM / PM						
5	MW-5		AM / PM	2 W	✓				
6	MW-1 4 FT		AM / PM	1 S		✓	✓		
7	MW-2 4 FT		AM / PM						
8	MW-3 4 FT		AM / PM						
9	MW-4 4 FT		AM / PM						
10	MW-5 4 FT		AM / PM	1 S		✓	✓		
				AM / PM					
			AM / PM						
			AM / PM						
			AM / PM						
			AM / PM						
Comments:									
Turnaround Time (Business Days) <small>TAT begins when sample is received by eANALYTICS</small> <input checked="" type="radio"/> Normal (5-10 Days) <input type="radio"/> 3 Day (1.25x) <input type="radio"/> 2 Day (1.5x) <input type="radio"/> 1 Day (2x) <input type="radio"/> Next Bus Morning (Noble Pricing)				Record of Custody Relinquished by: <u>BUTLER</u> Date: <u>1/5/15</u> Company: FREMONT ENVIRONMENTAL Received by: _____ Date: _____ AM / PM Company: _____ Time: _____ AM / PM Relinquished by: _____ Date: _____ AM / PM Company: _____ Time: _____ AM / PM Received by: <u>Aty Taylor</u> Date: <u>1/5/15</u> Company: eANALYTICS Time: <u>2:45</u> AM / PM					
For eANALYTICS Use Samples Received Intact <input checked="" type="radio"/> Yes <input type="radio"/> No Received Within Temperature Range (2-6°C) <input checked="" type="radio"/> Yes <input type="radio"/> No Sample Preservative Ice <input type="radio"/> None <input type="radio"/> Acid <input type="radio"/> Other									

WO # 2728
eANALYTICS: Environmental testing made Easy
Page of

eANALYTICS

L A B O R A T O R Y

Client: Fremont Environmental / Noble Energy Lab ID: 2728

Project: Greenhead 18-11, 12

Analysis: Volatile Organics Method: EPA8260
TPH EPA8260/8015

Sample Name	Benzene	Toluene	Ethyl- benzene	Total Xylenes	Naph- thalene	TPH GRO C6-C10	TPH DRO C10-C28	Date Sampled	Date Analyzed	Lab ID	
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg				
MW-1 4FT	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 50	< 50	01/05/15	01/06/15	2728	6
MW-2 4FT	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 50	< 50	01/05/15	01/06/15	2728	7
MW-3 4FT	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 50	< 50	01/05/15	01/06/15	2728	8
MW-4 4FT	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 50	< 50	01/05/15	01/06/15	2728	9
MW-5 4FT	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 50	< 50	01/05/15	01/06/15	2728	10

eAnalytics Laboratory

1767 Rocky Mountain Avenue Loveland CO 80538

eANALYTICS
LABORATORY

Client: Fremont Environmental / Noble Energy Lab ID: 2728

Project: Greenhead 18-11, 12

Analysis: Volatile Organics Method: EPA8260

Sample Name	Benzene ug/L	Toluene ug/L	Ethyl- benzene ug/L	Total Xylenes ug/L	Date Sampled	Date Analyzed	Lab ID
MW-1	< 1.0	< 1.0	< 1.0	< 1.0	01/05/15	01/06/15	2728 1
MW-2	< 1.0	< 1.0	< 1.0	< 1.0	01/05/15	01/06/15	2728 2
MW-3	< 1.0	< 1.0	< 1.0	< 1.0	01/05/15	01/06/15	2728 3
MW-4	< 1.0	< 1.0	< 1.0	< 1.0	01/05/15	01/06/15	2728 4
MW-5	< 1.0	< 1.0	< 1.0	< 1.0	01/05/15	01/06/15	2728 5

eAnalytics Laboratory

1767 Rocky Mountain Avenue Loveland CO 80538

eANALYTICS
L A B O R A T O R Y

Client: Fremont Environmental / Noble Energy

Lab ID: 2728

Project: Greenhead 18-11, 12

Method: EPA8260

Sample Name	Dibromo- fluoromethane % Recovery	1,2 Dichloro- ethane-D4 % Recovery	Toluene-D8 % Recovery	Bromo- fluorobenzene % Recovery	Date Sampled	Date Analyzed	Lab ID
MW-1 4FT	89	97	86	103	01/05/15	01/06/15	2728 6
MW-2 4FT	111	88	100	93	01/05/15	01/06/15	2728 7
MW-3 4FT	111	96	109	108	01/05/15	01/06/15	2728 8
MW-4 4FT	87	95	103	87	01/05/15	01/06/15	2728 9
MW-5 4FT	103	86	103	87	01/05/15	01/06/15	2728 10

eAnalytics Laboratory

1767 Rocky Mountain Avenue Loveland CO 80538

eANALYTICS
LABORATORY

Client: Fremont Environmental / Noble Energy

Lab ID: 2728

Project: Greenhead 18-11, 12

Method: EPA8260

Sample Name	Dibromo- fluoromethane % Recovery	1,2 Dichloro- ethane-D4 % Recovery	Toluene-D8 % Recovery	Bromo- fluorobenzene % Recovery	Date Sampled	Date Analyzed	Lab ID
MW-1	98	88	96	87	01/05/15	01/06/15	2728 1
MW-2	102	94	98	96	01/05/15	01/06/15	2728 2
MW-3	104	97	106	88	01/05/15	01/06/15	2728 3
MW-4	109	96	91	107	01/05/15	01/06/15	2728 4
MW-5	101	103	102	87	01/05/15	01/06/15	2728 5

eAnalytics Laboratory

1767 Rocky Mountain Avenue Loveland CO 80538

eANALYTICS

LABORATORY

Client: Fremont Environmental / Noble Energy Lab ID: 2728

Project: Greenhead 18-11, 12

Analysis: Volatile Organics Method: EPA8260
TPH EPA8260/8015

Sample Name	Benzene % Rec	Toluene % Rec	Ethyl- benzene % Rec	Total Xylenes % Rec	Naph- thalene % Rec	TPH GRO C6-C10 % Rec	TPH DRO C10-C28 % Rec	Date Analyzed	Lab ID	
Laboratory Control Sample	97	90	91	96	97	100	99	01/06/15	LCS	2728 1
(70-130%)										
Method Blank	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 50	< 50	01/06/15	MB	2728 1
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg			

eAnalytics Laboratory

1767 Rocky Mountain Avenue Loveland CO 80538

eANALYTICS
LABORATORY

Client: Fremont Environmental / Noble Energy Lab ID: 2728

Project: Greenhead 18-11, 12

Analysis: Volatile Organics Method: EPA8260

Sample Name	Benzene	Toluene	Ethyl- benzene	Total Xylenes	Date Analyzed	Lab ID		
	% Rec	% Rec	% Rec	% Rec				
Laboratory Control Sample	101	98	93	90	01/06/15	LCS	2728	1
(70-130%)								
Method Blank	< 1.0	< 1.0	< 1.0	< 1.0	01/06/15	MB	2728	1
	ug/L	ug/L	ug/L	ug/L				

eAnalytics Laboratory

1767 Rocky Mountain Avenue Loveland CO 80538