

# **FREMONT ENVIRONMENTAL INC.**

February 19, 2017

Mr. Jacob Evans  
Noble Energy Inc.  
2115 117<sup>th</sup> Ave,  
Greeley, CO 80634

Subject:     **Excavation Report**  
          Alm USX E 13-11  
          API # 05-123-23305  
          NWSW Sec 11, T6N, R65W  
          Weld County, Colorado  
          Fremont Project No. C017-022  
          Facility #305650 (Location)

Dear Mr. Evans:

Enclosed please find a copy of the above referenced Excavation Report for the Alm USX E13-11 release site in Weld County, Colorado. The enclosed report describes excavation actions to remove impacted soil from the site.

Since the excavation project has removed the subsurface petroleum impacts, Noble Energy Inc. should request that a No Further Action (NFA) determination be provided by the Colorado Oil and Gas Conservation Commission (COGCC) for this 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

**1759 REDWING LANE, BROOMFIELD, CO 80020**  
**(303) 956-8714 (DIRECT)**

**EXCAVATION REPORT**  
**NOBLE ENERGY INC.**  
**ALM USX E13-11**  
**WELD COUNTY, COLORADO**  
**FREMONT PROJECT NO. C017-022**  
**FACILITY #305650**

**Prepared by:**

**Fremont Environmental Inc.**  
**1759 Redwing Lane**  
**Broomfield, CO 80020**  
**(303) 956-8714**

**February 19, 2017**

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**EXCAVATION REPORT**  
**NOBLE ENERGY INC.**  
**ALM USX E13-11**  
**WELD COUNTY, COLORADO**  
**FREMONT PROJECT NO. C017-022**  
**FACILITY #305650**

**1.0 INTRODUCTION**

The purpose of this document is to present information collected during the excavation of petroleum-impacted soil at the Alm USX E13-11 release location in Weld County, Colorado. Impacted soil was identified at this site due to a historical release from the facility's separator bypass line. This one day excavation project was completed on February 14, 2017.

**2.0 BACKGROUND INFORMATION**

**2.1 Site Location**

The Alm USX E13-11 site is located approximately five miles northeast of Greeley, Colorado in Weld County as shown on Figure 1. The site is located in a rural area 0.25 miles northeast of the intersection of County Road 70 and County Road 45. The location is further described as the NW  $\frac{1}{4}$  of the SW  $\frac{1}{4}$  of Section 11, Township 6N, Range 65W.

**2.2 Site History**

The site consists of the former separator and bypass line for the Alm USX E13-11 natural gas well. The Alm USX E13-11 well was drilled in 2005 to a depth of approximately 7,321 feet. Soil impacts were identified beneath the former separator during abandonment of the facility. These soil impacts initiated this excavation effort.

### **3.0 FIELD ACTIVITIES**

Remediation efforts consisted of the excavation of petroleum-impacted soil at this site. The soil consisted of roadbase which was underlain by sandy clay to a depth of at least eight feet. Ground water was not encountered during the excavation work. The 15' x 25' excavated area is shown on Figure 3.

Excavation was initiated at the location of the former separator on February 14, 2017. Soil removal took place primarily in the area adjacent to and below the former separator bypass line to a depth of approximately eight feet. Excavation continued until all soil impacts were excavated later that same day. Four sidewall samples and one floor sample collected upon completion of the excavation work indicated that no petroleum impacts were present.

The sidewall samples were collected as grab samples near the lower portion of the excavation wall at a depth of four to five feet. One floor sample was collected at a depth of eight feet. The soil samples were analyzed by Summit Scientific Inc. of Golden, Colorado for benzene, toluene, ethylbenzene and xylenes (BTEX), naphthalene, Total Petroleum Hydrocarbons - Gasoline Range Organics (TPH-GRO) by EPA method 8260C, and TPH - Diesel Range Organics (TPH-DRO) by EPA method 8015. The laboratory report and chain-of-custody documentation are included in Appendix A.

A summarization of the laboratory data is included in Table 1, which presents the laboratory analyses for each soil sample. The laboratory analyses indicated that all five soil samples collected from the sidewalls and floor achieved the COGCC Table 910-1 limits.

A total of 150 cubic yards of petroleum impacted soil were removed by Gusher Oilfield Services Inc. from the location during the course of this project. The impacted soil was

disposed of at the Waste Management Inc. Northern Colorado landfill in Ault, Colorado as non-hazardous waste. The site was re-contoured to match the surrounding surface after backfilling was completed.

#### **4.0 DISCUSSION**

Site remediation of the Alm USX E13-11 location was completed on February 14, 2017 by excavation and disposal of impacted soil. Approximately 150 cubic yards of impacted soil were excavated and removed from this site.

As demonstrated by the soil sampling and analyses, the petroleum impacted soil has been removed from the site by excavation. This was confirmed by the analyses of the soil samples collected from the excavation floor and sidewalls which were below the COGCC Table 910-1 limits. Therefore, Noble should request a no further action (NFA) determination from the COGCC.

#### **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.**

 For MVA

2/19/17

Date \_\_\_\_\_

\_\_\_\_\_  
Mark Taylor

Construction Consultant

Reviewed by:



2/19/17

Date \_\_\_\_\_

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

Senior Consultant

## **TABLES**

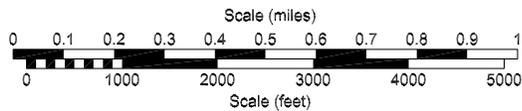
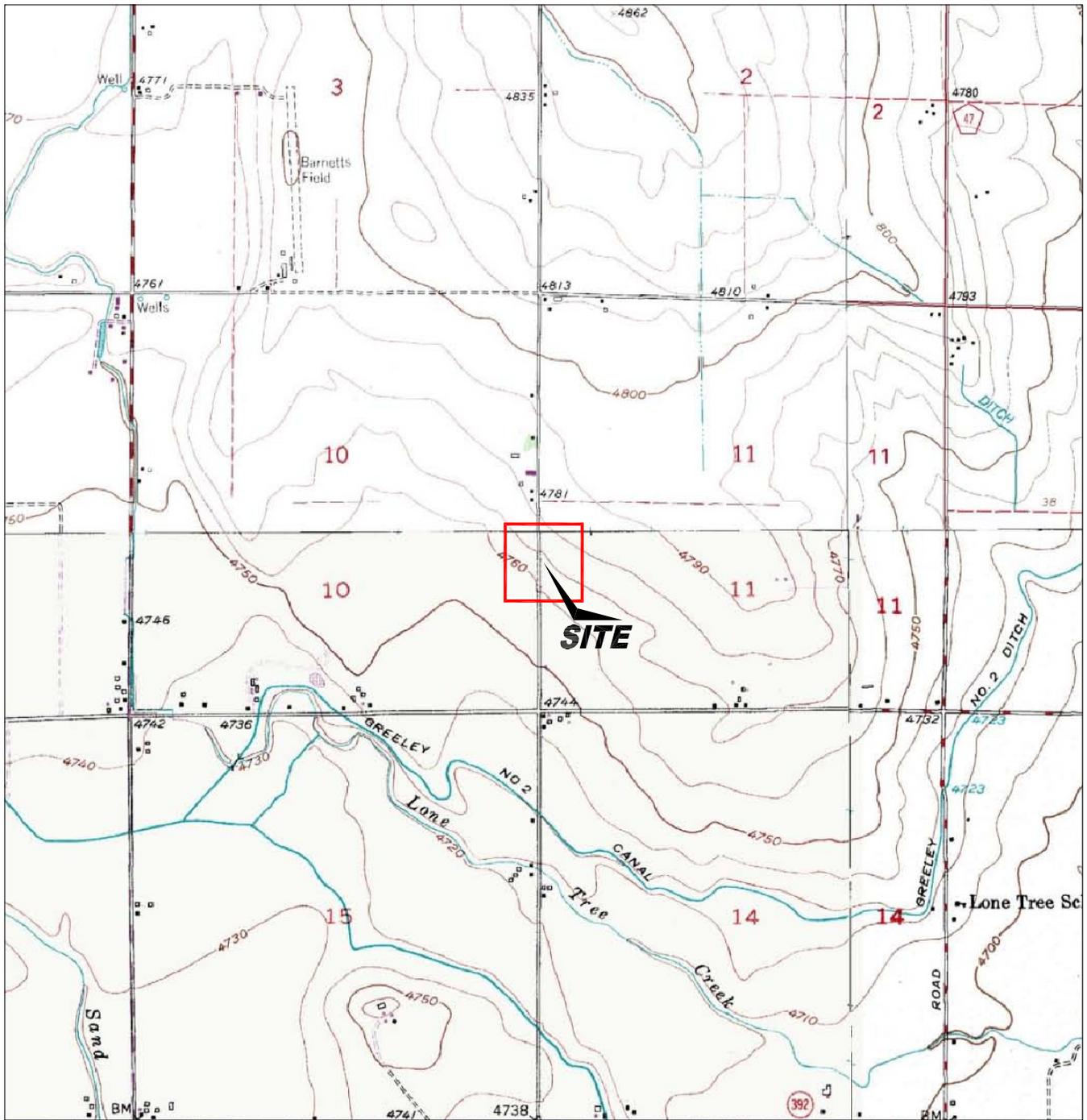
**TABLE 1**  
**SUMMARY OF SOIL CHEMISTRY DATA**  
**NOBLE ENERGY INC.**  
**ALM USX E 13-11, E11-11, WELD COUNTY, COLORADO**  
**FREMONT PROJECT NO. C017-022**

Sample	Depth (ft)	Date Sampled	Location	Pass or Fail	Benzene mg/kg	Toluene mg/kg	Ethyl-Benzene mg/kg	Xylenes mg/kg	Naphthalene mg/kg	TPH GRO mg/kg	TPH DRO mg/kg
<b>Separator</b>											
N. Wall 4 Ft	4	2/14/2017	Wall	Pass	<0.002	<0.005	<0.005	<0.010	<0.010	<50	<50
S. Wall 4 Ft	4	2/14/2017	Wall	Pass	<0.002	<0.005	<0.005	<0.010	<0.010	<50	<50
E. Wall 4 Ft	4	2/14/2017	Wall	Pass	<0.002	<0.005	<0.005	<0.010	<0.010	<50	<50
W. Wall 5 Ft	5	2/14/2017	Wall	Pass	<0.002	<0.005	<0.005	<0.010	<0.010	51	130
Floor 8 Ft	8	2/14/2017	Wall	Pass	<0.002	<0.005	<0.005	<0.010	<0.010	59	<50
<b>COGCC Table 910 Limits</b>					<b>0.17</b>	<b>85</b>	<b>100</b>	<b>175</b>	<b>23</b>	<b>500</b>	<b>500</b>

Bold faced values exceed the COGCC Table 910-1 concentrations

TPH summation (GRO + DRO) must be less than 500 mg/kg

## FIGURES



USGS 7.5 MINUTE SERIES (TOPOGRAPHIC)

Figure 1  
SITE LOCATION MAP

Noble Alm USX E 13-11, Alm USX E 11-11  
NW SW Section 11, T6N, R65W  
Weld County, Colorado

Project No. C017-022	Prepared by	Drawn by JMA
Date 2/15/17	Reviewed by	Filename 17022T





**LEGEND**

-  FENCE LINE
-  CONTAINMENT BERM
-  FORMER FACILITY
-  ABOVE GROUND STORAGE TANK

**Figure 2  
SITE MAP**

**Noble Alm USX E 13-11, Alm USX E 11-11**  
 NW SW Section 11, T6N, R65W  
 Weld County, Colorado

Project No. <b>C017-022</b>	Prepared by	Drawn by <b>JMA</b>
Date <b>2/15/17</b>	Reviewed by	Filename <b>17022Q</b>





**LEGEND**

- FENCE LINE
- CONTAINMENT BERM
- LIMITS OF EXCAVATION
- FORMER
- ABOVE GROUND STORAGE TANK
- FORMER FACILITY



SOIL SAMPLE LOCATION

2/14/17	
4' - Wall	
B	<0.002
T	<0.005
E	<0.005
X	<0.010
N	<0.010
G	<50
D	<50

NS

NOT SAMPLED

Figure 3  
**EXCAVATION SOIL CHEMISTRY**

**Noble Alm USX E 13-11, Alm USX E 11-11**  
NW SW Section 11, T6N, R65W  
Weld County, Colorado

Project No. <b>C017-022</b>	Prepared by	Drawn by <b>JMA</b>
Date <b>2/15/17</b>	Reviewed by	Filename <b>17022Q</b>



APPENDIX A

LABORATORY DOCUMENTATION

# Summit Scientific

---

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

February 15, 2017

Paul Henehan  
Fremont Environmental  
1759 Redwing Lane  
Broomfield, CO 80020

RE: Noble - Alm 13-11/Alm USX E11-11

Enclosed are the results of analyses for samples received by Summit Scientific on 02/14/17 17:50. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury  
President



Fremont Environmental  
1759 Redwing Lane  
Broomfield CO, 80020

Project: Noble - Alm 13-11/Alm USX E11-11

Project Number: [none]  
Project Manager: Paul Henehan

**Reported:**  
02/15/17 06:36

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
N. WALL 4 FT	1702103-01	Soil	02/14/17 00:00	02/14/17 17:50
S. WALL 4 FT	1702103-02	Soil	02/14/17 00:00	02/14/17 17:50
E. WALL 4 FT	1702103-03	Soil	02/14/17 00:00	02/14/17 17:50
W. WALL 5 FT	1702103-04	Soil	02/14/17 00:00	02/14/17 17:50
FLOOR 8 FT	1702103-05	Soil	02/14/17 00:00	02/14/17 17:50

Summit Scientific

*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.*



Fremont Environmental  
1759 Redwing Lane  
Broomfield CO, 80020

Project: Noble - Alm 13-11/Alm USX E11-11

Project Number: [none]  
Project Manager: Paul Henehan

Reported:  
02/15/17 06:36

# Summit Scientific 1702103

S2

741 Corporate Circle, Suite J • Golden, Colorado 80401  
303-277-9310 • 303-374-5933

Page 1 of 1

Client: Fremont Environmental Project Manager: Paul Henehan  
Address: P.O. Box 1289 E-Mail: paulh@fremontenv.com  
City/State/Zip: PO Box 1829 Wellington, CO 80549  
Phone: 303-956-8714 Fax: Project Name: Noble-Alm 13-11, Alm USX E11-11  
Sampler Name: HENEHAN Project Number:

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested						Special Instructions
					HCl	HNO3	None	Other (Specify)	Groundwater	Soil	Air-Canister #	Other (Specify)	BTEX	GRO/DRO	Naphthalene	SAR	EC	Ph	
1	N. WALL 4 FT	2/14/17		1			✓		✓				✓	✓	✓				
2	S. WALL 4 FT			1			✓		✓				✓	✓	✓				
3	E. WALL 4 FT			1			✓		✓				✓	✓	✓				
4	W. WALL 5 FT			1			✓		✓				✓	✓	✓				
5	FLOOR 8 FT			1			✓		✓				✓	✓	✓				
6																			
7																			
8																			
9																			
10																			

Relinquished by: <u>Paul Henehan</u>	Date/Time: <u>2/14/17 17:50</u>	Received by: <u>[Signature]</u>	Date/Time: <u>2-14-17 17:00</u>	<b>Turn Around Time (Check)</b> Same Day <input checked="" type="checkbox"/> 72 hours 24 hours <input type="checkbox"/> Standard 48 hours <input type="checkbox"/> <u>WED AM 12</u> <b>Sample Integrity:</b> Temperature Upon Receipt: <u>16.0</u> <input checked="" type="checkbox"/> Intact: <input checked="" type="radio"/> Yes <input type="radio"/> No	Notes:
Relinquished by: <u>[Signature]</u>	Date/Time: <u>2-14-17 17:50</u>	Received by: <u>[Signature]</u>	Date/Time: <u>2-14-17 17:50</u>		
Relinquished by:	Date/Time:	Received by:	Date/Time:		

www.s2scientific.com



Fremont Environmental  
1759 Redwing Lane  
Broomfield CO, 80020

Project: Noble - Alm 13-11/Alm USX E11-11

Project Number: [none]  
Project Manager: Paul Henehan

Reported:  
02/15/17 06:36

**Sample Receipt Checklist**

S2 Work Order: 1702103

Client: Fremont Client Project ID: Noble - ALM 13-11, ALM USX E 11-1

Shipped Via: H.D. onice Airbill #: \_\_\_\_\_  
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Matrix (check all that apply):  Air  Soil/Solid  Water  Other: \_\_\_\_\_  
(Describe)

Cooler ID				
Temp (°C)	<u>16.0</u>			

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature just above 0°C to ≤ 6°C <sup>(1)</sup> ? NOTE: If samples are delivered the same day of sampling, this requirement is waived provided that there is evidence that cooling has begun.	X			
Were all samples received intact <sup>(1)</sup> ?	X			
Was adequate sample volume provided <sup>(1)</sup> ?	X			
If custody seals are present, are they intact <sup>(1)</sup> ?			X	
Are short holding time analytes or samples with HTs due within 48 hours present?	X			
Is a chain-of-custody (COC) form present and filled out completely <sup>(1)</sup> ?	X			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	X			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	X			
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	X			
For volatiles in water – is there headspace present? <b>If yes, contact client and note in narrative.</b>			X	
Are samples preserved that require preservation (excluding cooling) <sup>(1)</sup> ? Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect			X	
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ? Record the pH in Comments.			X	
If dissolved metals are requested, were samples field filtered?			X	
Additional Comments (if any):				
<sup>(1)</sup> If NO, then contact the client before proceeding with analysis and note in case narrative.				

Murip.  
Custodian Printed Name

PA 2-14-17  
Signature or Initials of Custodian

17:50  
Date/Time



Fremont Environmental  
1759 Redwing Lane  
Broomfield CO, 80020

Project: Noble - Alm 13-11/Alm USX E11-11

Project Number: [none]  
Project Manager: Paul Henehan

**Reported:**  
02/15/17 06:36

**N. WALL 4 FT**  
**1702103-01 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **02/14/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1702149	02/14/17	02/14/17	8015M	

Date Sampled: **02/14/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		100 %	30-150		"	"	"	"	

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **02/14/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1702148	02/14/17	02/14/17	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **02/14/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		107 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.2 %	21-167		"	"	"	"	

Summit Scientific

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.



Fremont Environmental  
1759 Redwing Lane  
Broomfield CO, 80020

Project: Noble - Alm 13-11/Alm USX E11-11

Project Number: [none]  
Project Manager: Paul Henehan

**Reported:**  
02/15/17 06:36

**S. WALL 4 FT**  
**1702103-02 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **02/14/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1702149	02/14/17	02/14/17	8015M	

Date Sampled: **02/14/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		95.8 %	30-150		"	"	"	"	

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **02/14/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1702148	02/14/17	02/14/17	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **02/14/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		101 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		98.5 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		95.3 %	21-167		"	"	"	"	

Summit Scientific

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Fremont Environmental  
1759 Redwing Lane  
Broomfield CO, 80020

Project: Noble - Alm 13-11/Alm USX E11-11

Project Number: [none]  
Project Manager: Paul Henehan

**Reported:**  
02/15/17 06:36

**E. WALL 4 FT  
1702103-03 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **02/14/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1702149	02/14/17	02/14/17	8015M	

Date Sampled: **02/14/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		96.4 %	30-150		"	"	"	"	

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **02/14/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1702148	02/14/17	02/14/17	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **02/14/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		102 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.5 %	21-167		"	"	"	"	

Summit Scientific

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Fremont Environmental  
1759 Redwing Lane  
Broomfield CO, 80020

Project: Noble - Alm 13-11/Alm USX E11-11

Project Number: [none]  
Project Manager: Paul Henehan

**Reported:**  
02/15/17 06:36

**W. WALL 5 FT  
1702103-04 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **02/14/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (DRO)</b>	<b>130</b>	50	mg/kg	1	1702149	02/14/17	02/14/17	8015M	

Date Sampled: **02/14/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		102 %	30-150		"	"	"	"	

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **02/14/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1702148	02/14/17	02/14/17	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>51</b>	50	"	"	"	"	"	"	

Date Sampled: **02/14/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		105 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		101 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		110 %	21-167		"	"	"	"	

Summit Scientific

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Fremont Environmental  
1759 Redwing Lane  
Broomfield CO, 80020

Project: Noble - Alm 13-11/Alm USX E11-11

Project Number: [none]  
Project Manager: Paul Henehan

**Reported:**  
02/15/17 06:36

**FLOOR 8 FT**  
**1702103-05 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **02/14/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1702149	02/14/17	02/14/17	8015M	

Date Sampled: **02/14/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		95.6 %	30-150		"	"	"	"	

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **02/14/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1702148	02/14/17	02/14/17	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>59</b>	50	"	"	"	"	"	"	

Date Sampled: **02/14/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		107 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		111 %	21-167		"	"	"	"	

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Fremont Environmental  
1759 Redwing Lane  
Broomfield CO, 80020

Project: Noble - Alm 13-11/Alm USX E11-11

Project Number: [none]  
Project Manager: Paul Henehan

**Reported:**  
02/15/17 06:36

**Extractable Petroleum Hydrocarbons by 8015 - Quality Control**  
**Summit Scientific**

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

**Batch 1702149 - EPA 3550A**

**Blank (1702149-BLK1)**

Prepared & Analyzed: 02/14/17

C10-C28 (DRO)	ND	50	mg/kg								
<i>Surrogate: o-Terphenyl</i>	12.1		"	12.5		96.8	30-150				

**LCS (1702149-BS1)**

Prepared & Analyzed: 02/14/17

C10-C28 (DRO)	521	50	mg/kg	499		104	73-134				
<i>Surrogate: o-Terphenyl</i>	12.4		"	12.5		99.3	30-150				

**Matrix Spike (1702149-MS1)**

Source: 1702103-01

Prepared & Analyzed: 02/14/17

C10-C28 (DRO)	537	50	mg/kg	499	8.99	106	50-148				
<i>Surrogate: o-Terphenyl</i>	12.6		"	12.5		101	30-150				

**Matrix Spike Dup (1702149-MSD1)**

Source: 1702103-01

Prepared & Analyzed: 02/14/17

C10-C28 (DRO)	522	50	mg/kg	499	8.99	103	50-148	2.80		20	
<i>Surrogate: o-Terphenyl</i>	12.3		"	12.5		98.3	30-150				

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Project Number: [none]  
Project Manager: Paul Henehan

Reported:  
02/15/17 06:36

**Volatile Organic Compounds by EPA Method 8260B - Quality Control**  
**Summit Scientific**

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

**Batch 1702148 - EPA 5030 Soil MS**

**Blank (1702148-BLK1)**

Prepared & Analyzed: 02/14/17

Naphthalene	ND	0.010	mg/kg							
Benzene	ND	0.0020	"							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	50	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0373</i>		<i>"</i>	<i>0.0400</i>		<i>93.2</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0402</i>		<i>"</i>	<i>0.0400</i>		<i>100</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0379</i>		<i>"</i>	<i>0.0400</i>		<i>94.7</i>	<i>21-167</i>			

**LCS (1702148-BS1)**

Prepared & Analyzed: 02/14/17

Naphthalene	0.00978	0.010	mg/kg				66-138			
Benzene	0.0847	0.0020	"	0.100		84.7	58-130			
Toluene	0.0971	0.0050	"	0.100		97.1	61-134			
Ethylbenzene	0.114	0.0050	"	0.0992		115	74-139			
m,p-Xylene	0.213	0.010	"	0.200		107	73-137			
o-Xylene	0.102	0.0050	"	0.0980		104	73-141			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0386</i>		<i>"</i>	<i>0.0400</i>		<i>96.5</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0389</i>		<i>"</i>	<i>0.0400</i>		<i>97.2</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0382</i>		<i>"</i>	<i>0.0400</i>		<i>95.5</i>	<i>21-167</i>			

**Matrix Spike (1702148-MS1)**

Source: 1702103-01

Prepared & Analyzed: 02/14/17

Naphthalene	0.00960	0.010	mg/kg		ND		10-158			
Benzene	0.0844	0.0020	"	0.100	ND	84.4	30-131			
Toluene	0.0991	0.0050	"	0.100	ND	99.1	30-134			
Ethylbenzene	0.119	0.0050	"	0.0992	ND	120	22-153			
m,p-Xylene	0.219	0.010	"	0.200	ND	110	10-159			
o-Xylene	0.107	0.0050	"	0.0980	ND	109	31-151			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0419</i>		<i>"</i>	<i>0.0400</i>		<i>105</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0395</i>		<i>"</i>	<i>0.0400</i>		<i>98.7</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0391</i>		<i>"</i>	<i>0.0400</i>		<i>97.8</i>	<i>21-167</i>			

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Project: Noble - Alm 13-11/Alm USX E11-11

Project Number: [none]  
Project Manager: Paul Henehan

**Reported:**  
02/15/17 06:36

**Volatile Organic Compounds by EPA Method 8260B - Quality Control**  
**Summit Scientific**

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

**Batch 1702148 - EPA 5030 Soil MS**

<b>Matrix Spike Dup (1702148-MSD1)</b>	<b>Source: 1702103-01</b>			<b>Prepared &amp; Analyzed: 02/14/17</b>						
Naphthalene	0.00948	0.010	mg/kg	ND	ND	86.0	10-158	1.26	42	
Benzene	0.0860	0.0020	"	0.100	ND	86.0	30-131	1.87	34	
Toluene	0.100	0.0050	"	0.100	ND	100	30-134	1.23	30	
Ethylbenzene	0.116	0.0050	"	0.0992	ND	117	22-153	2.23	24	
m,p-Xylene	0.216	0.010	"	0.200	ND	108	10-159	1.53	68	
o-Xylene	0.104	0.0050	"	0.0980	ND	106	31-151	2.31	38	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0422</i>		<i>"</i>	<i>0.0400</i>		<i>106</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0395</i>		<i>"</i>	<i>0.0400</i>		<i>98.7</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0383</i>		<i>"</i>	<i>0.0400</i>		<i>95.8</i>	<i>21-167</i>			

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Project: Noble - Alm 13-11/Alm USX E11-11

Project Number: [none]  
Project Manager: Paul Henehan

**Reported:**  
02/15/17 06:36

### Notes and Definitions

DET Analyte DETECTED  
ND Analyte NOT DETECTED at or above the reporting limit  
NR Not Reported  
dry Sample results reported on a dry weight basis  
RPD Relative Percent Difference