

# **FREMONT ENVIRONMENTAL INC.**

April 7, 2017

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

Subject:       **Excavation Report**  
Brown 20-13, English 31-20  
API # 05-123-22068  
NWNE Sec 20, T6N, R66W  
Weld County, Colorado  
Fremont Project No. C017-038  
Facility #332272 (Location), Spill #449710

Dear Mr. Evans:

Enclosed please find a copy of the above referenced Excavation Report for the Brown 20-13, English 31-20 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. Henahan, P.E.  
Senior Consultant

Enclosure

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

**EXCAVATION REPORT**

**NOBLE ENERGY INC.**

**BROWN 20-13, ENGLISH 31-20**

**WELD COUNTY, COLORADO**

**FREMONT PROJECT NO. C017-038**

**FACILITY #332272, SPILL #449710**

**Prepared by:**

**Fremont Environmental Inc.**

**1759 Redwing Lane**

**Broomfield, CO 80020**

**(303) 956-8714**

**April 7, 2017**

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**EXCAVATION REPORT**  
**NOBLE ENERGY INC.**  
**BROWN 20-13, ENGLISH 31-20**  
**WELD COUNTY, COLORADO**  
**FREMONT PROJECT NO. C017-038**  
**FACILITY #332272, SPILL #449710**

**1.0 INTRODUCTION**

The purpose of this document is to present information collected during the excavation of petroleum-impacted soil at the Brown 20-13, English 31-20 release location in Weld County, Colorado. Impacted soil was identified at this site due to a historical release from the facility's water-side separator line. This three-day excavation project was completed on March 21, 2017.

**2.0 BACKGROUND INFORMATION**

**2.1 Site Location**

The Brown 20-13, English 31-20 site is located approximately three miles northwest of Greeley, Colorado in Weld County as shown on Figure 1. The site is located in a rural area 0.5 miles west of the intersection of County Road 29 and Highway 392. The location is further described as the NW  $\frac{1}{4}$  of the NE  $\frac{1}{4}$  of Section 20, Township 6N, Range 66W.

**2.2 Site History**

The site consists of the water-side separator piping for the Brown 20-13, English 31-20 natural gas wells. The Brown 20-13 well was drilled in 2004 to a depth of approximately 7,290 feet. Soil impacts were identified during routine maintenance 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 seven feet where ground water was encountered. As shown on the attached figures, the excavation was of an irregular shape with overall dimensions of approximately 35' x 60'.

Excavation was initiated at the location of the piping failure location on March 15, 2017. Soil removal took place primarily in the area adjacent to the water vault and followed the water-side separator line to the west at a depth of approximately seven feet. Excavation continued until all soil impacts were excavated on March 21, 2017. Eight sidewall soil samples and one ground water sample collected during and after the excavation work indicated that no residual 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 feet. The ground water sample was collected at a depth of seven 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 ground water sample was analyzed for BTEX by EPA method 8260C. The laboratory reports and chain-of-custody documentation are included in Appendix A.

Summaries of the laboratory data are included in Tables 1 and 2. Table 1 presents the laboratory analyses for each soil sample. In addition, a column stating whether the laboratory analyses passed or failed the COGCC limits is provided. The laboratory analyses indicated that all eight soil samples collected from the sidewalls achieved the COGCC Table 910-1 limits. Table 2 presents the ground water analytical data; the BTEX

concentrations in water sample (W1) were less than the COGCC Table 910-1 allowable limits.

A total of 200 cubic yards of petroleum impacted soil were removed by Saucedo 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**

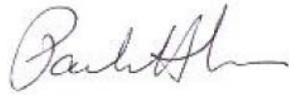
Site remediation of the Brown 20-13, English 31-20 location was completed on March 21, 2017 by excavation and disposal of impacted soil. Approximately 200 cubic yards of impacted soil were excavated and removed from this site.

As demonstrated by the soil and ground water sampling, petroleum impacts have been removed from the site by excavation. This was confirmed by the analyses of the soil samples collected from the excavation sidewalls and the ground water sample 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

4/7/17

Date \_\_\_\_\_

\_\_\_\_\_  
Mark Taylor  
Construction Consultant

Reviewed by:



4/7/17

Date \_\_\_\_\_

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

## **TABLES**

**TABLE 1**  
**SUMMARY OF SOIL CHEMISTRY DATA**  
**NOBLE ENERGY INC.**  
**BROWN 20-13, ENGLISH 31-20, WELD COUNTY, COLORADO**  
**FREMONT PROJECT NO. C017-038**

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
1-4'	4	3/16/2017	Wall	Pass	<0.002	<0.005	<0.005	<0.010	<0.010	<50	<50
2-4'	4	3/16/2017	Wall	Pass	<0.002	<0.005	<0.005	<0.010	<0.010	<50	<50
3-4'	4	3/16/2017	Wall	Pass	<0.002	<0.005	<0.005	<0.010	<0.010	<50	<50
4-4'	4	3/20/2017	Wall	Pass	<0.002	<0.005	<0.005	<0.010	<0.010	<50	<50
5-4'	4	3/20/2017	Wall	Pass	<0.002	<0.005	<0.005	<0.010	<0.010	<50	<50
6-4'	4	3/20/2017	Wall	Pass	<0.002	<0.005	<0.005	<0.010	<0.010	<50	<50
7-4'	4	3/20/2017	Wall	Pass	<0.002	<0.005	<0.005	<0.010	<0.010	<50	<50
8-4'	4	3/21/2017	Wall	Pass	<0.002	<0.005	<0.005	<0.010	<0.010	<50	<50
COGCC Table 910 Limits					0.17	85	100	175	23	500	500

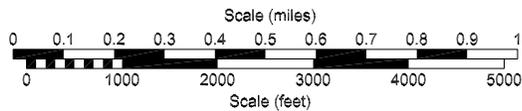
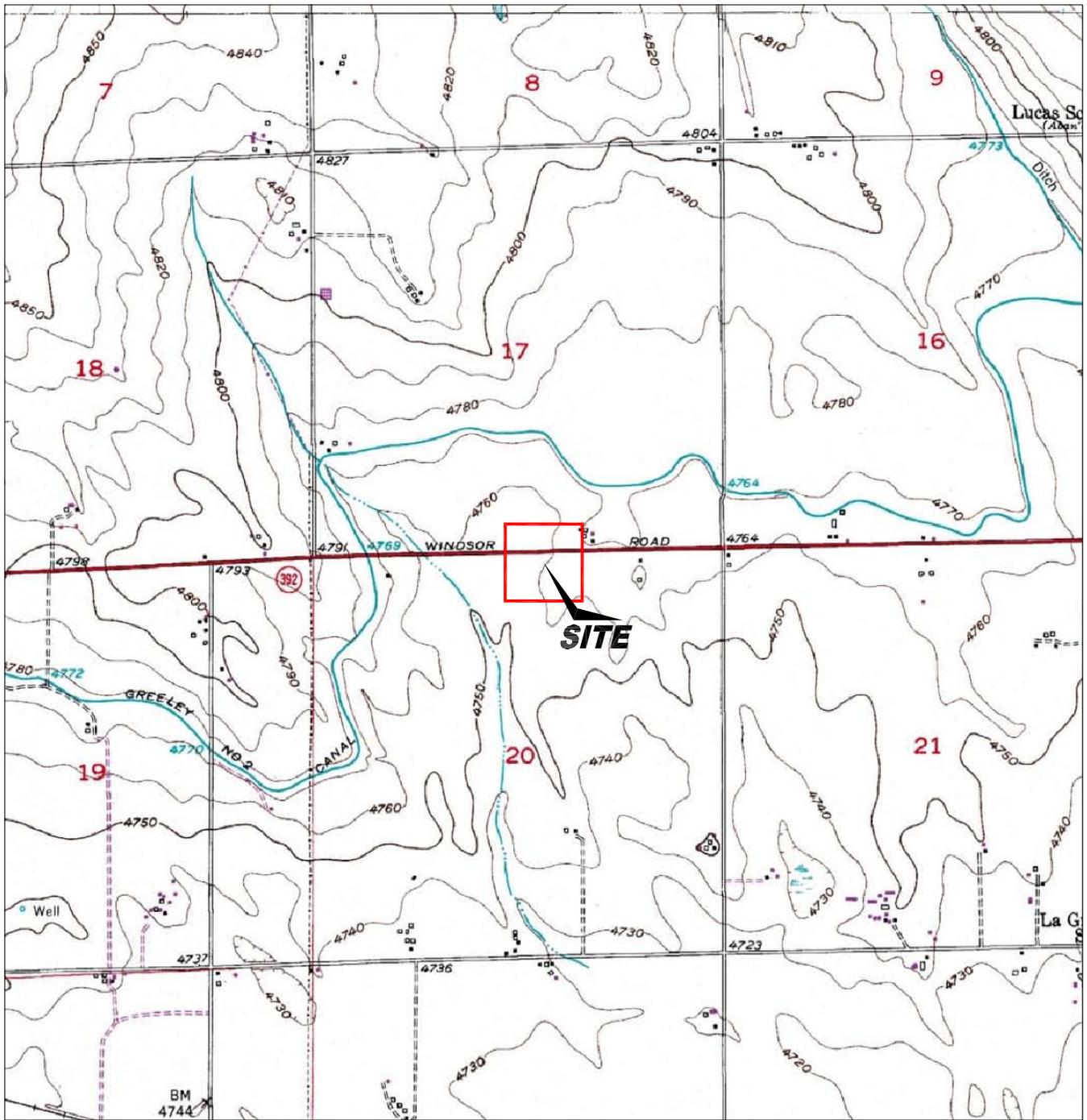
Bold faced values exceed the COGCC Table 910-1 concentrations

**TABLE 2**  
**SUMMARY OF GROUND WATER CHEMISTRY DATA**  
**NOBLE ENERGY INC.**  
**BROWN 20-13, ENGLISH 31-20**  
**FREMONT PROJECT NO. C017-038**

<b>SAMPLE LOCATION</b>	<b>DATE</b>	<b>BENZENE (µg/L)</b>	<b>TOLUENE (µg/L)</b>	<b>ETHYL BENZENE (µg/L)</b>	<b>TOTAL XYLENES (µg/L)</b>
W1	03/27/17	<1.0	<1.0	1.5	<1.0
Table 910-1 Limits		5	560	700	1,400

Bold face values exceed the COGCC limits

## FIGURES



USGS 7.5 MINUTE SERIES (TOPOGRAPHIC)

Figure 1  
SITE LOCATION MAP

**Noble Brown 20-13, English 31-20**  
NW NE Section 20, T6N, R66W  
Weld County, Colorado

Project No. C017-038	Prepared by	Drawn by JMA
Date 4/3/17	Reviewed by	Filename 17038T





**LEGEND**

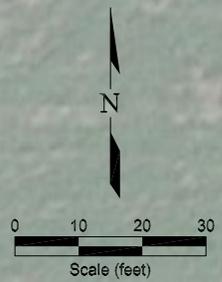
-  FENCE LINE
-  CONTAINMENT BERM
-  CONTAINMENT WALL
-  ABOVE GROUND STORAGE TANK
-  FORMER FACILITY

**Figure 2  
SITE MAP**

**Noble Brown 20-13, English 31-20**  
 NW NE Section 20, T6N, R66W  
 Weld County, Colorado

Project No. <b>C017-038</b>	Prepared by	Drawn by <b>JMA</b>
Date <b>4/3/17</b>	Reviewed by	Filename <b>17038Q</b>





**LEGEND**

	FENCE LINE		ABOVE GROUND STORAGE TANK
	CONTAINMENT BERM		FORMER FACILITY
	CONTAINMENT WALL		
	LIMITS OF EXCAVATION		
	SOIL SAMPLE LOCATION		WATER SAMPLE LOCATION

<table border="1"> <tr><th colspan="2">3/20/17</th></tr> <tr><th colspan="2">4' - Wall</th></tr> <tr><td>B</td><td>&lt;0.002</td></tr> <tr><td>T</td><td>&lt;0.005</td></tr> <tr><td>E</td><td>&lt;0.005</td></tr> <tr><td>X</td><td>&lt;0.010</td></tr> <tr><td>N</td><td>&lt;0.010</td></tr> <tr><td>G</td><td>&lt;60</td></tr> <tr><td>D</td><td>&lt;60</td></tr> </table>	3/20/17		4' - Wall		B	<0.002	T	<0.005	E	<0.005	X	<0.010	N	<0.010	G	<60	D	<60	DATE SAMPLED DEPTH (ft) and LOCATION BENZENE (mg/kg) TOLUENE (mg/kg) ETHYLBENZENE (mg/kg) TOTAL XYLENES (mg/kg) NAPHTHALENE (mg/kg) TPH-GRO (mg/kg) TPH-DRO (mg/kg)	<table border="1"> <tr><th colspan="2">3/16/17</th></tr> <tr><td>B</td><td>&lt;1.0</td></tr> <tr><td>T</td><td>&lt;1.0</td></tr> <tr><td>E</td><td>1.5</td></tr> <tr><td>X</td><td>&lt;1.0</td></tr> </table>	3/16/17		B	<1.0	T	<1.0	E	1.5	X	<1.0	DATE SAMPLED BENZENE (ug/L) TOLUENE (ug/L) ETHYLBENZENE (ug/L) TOTAL XYLENES (ug/L)
3/20/17																															
4' - Wall																															
B	<0.002																														
T	<0.005																														
E	<0.005																														
X	<0.010																														
N	<0.010																														
G	<60																														
D	<60																														
3/16/17																															
B	<1.0																														
T	<1.0																														
E	1.5																														
X	<1.0																														
NS	NOT SAMPLED																														

**Figure 3  
EXCAVATION SOIL CHEMISTRY**

**Noble Brown 20-13, English 31-20  
NW NE Section 20, T6N, R66W  
Weld County, Colorado**

Project No. <b>C017-038</b>	Prepared by	Drawn by <b>JMA</b>	
Date <b>4/3/17</b>	Reviewed by	Filename <b>17038Q</b>	

APPENDIX A

LABORATORY DOCUMENTATION

# Summit Scientific

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741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

March 17, 2017

Paul Henehan  
Fremont Environmental  
1759 Redwing Lane  
Broomfield, CO 80020

RE: Noble - Brown 20-13, English 31-20

Enclosed are the results of analyses for samples received by Summit Scientific on 03/16/17 16:28. 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 - Brown 20-13, English 31-20

Project Number: C014-007  
Project Manager: Paul Henehan

**Reported:**  
03/17/17 06:43

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
1-4'	1703132-01	Soil	03/16/17 00:00	03/16/17 16:28
2-4'	1703132-02	Soil	03/16/17 00:00	03/16/17 16:28
3-4'	1703132-03	Soil	03/16/17 00:00	03/16/17 16:28
W1	1703132-04	Water	03/16/17 00:00	03/16/17 16:28

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 - Brown 20-13, English 31-20

Project Number: C014-007  
Project Manager: Paul Henehan

Reported:  
03/17/17 06:43

1703132

# Summit Scientific

S<sub>2</sub>

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 - BROWN 20-13, ENGLISH 31-20  
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	Napthalene	SAR	EC		PH
1	1-4'	3/16/17		1															
2	2-4'	"		1			✓		✓				✓	✓	✓				
3	<del>2-4'</del> 3-4'	"		1			✓		✓				✓	✓	✓				
4	WI	"		2			✓		✓				✓						
5																			
6																			
7																			
8																			
9																			
10																			

Relinquished by: <u>PAUL HENEHAN</u> Date/Time: <u>3/16/17 15:20</u>	Received by: <u>PAUL HENEHAN</u> Date/Time: <u>3-16-17 15:20</u>	Turn Around Time (Check) <input checked="" type="checkbox"/> Same Day <input type="checkbox"/> 24 hours <input type="checkbox"/> 48 hours <input type="checkbox"/> 72 hours <input type="checkbox"/> Standard Sample Integrity: Temperature Upon Receipt: Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Notes:
Relinquished by: <u>PAUL HENEHAN</u> Date/Time: <u>3-16-17 17:10</u>	Received by:		
Relinquished by:	Received by:		

www.s2scientific.com

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 - Brown 20-13, English 31-20

Project Number: C014-007  
Project Manager: Paul Henehan

Reported:  
03/17/17 06:43

1703132

Sample Receipt Checklist

S2 Work Order: \_\_\_\_\_

Client: Fremont

Client Project ID: Noble - Brown 20-13, English 31-20

Shipped Via: H.D.

(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Airbill #: \_\_\_\_\_

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

Cooler ID					
Temp (°C)	<u>20.1</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.	<input checked="" type="checkbox"/>			
Were all samples received intact <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
If custody seals are present, are they intact <sup>(1)</sup> ?			<input checked="" type="checkbox"/>	
Are short holding time analytes or samples with HTs due within 48 hours present?	<input checked="" type="checkbox"/>			
Is a chain-of-custody (COC) form present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace present? <b>If yes, contact client and note in narrative.</b>		<input checked="" type="checkbox"/>		
Are samples preserved that require preservation (excluding cooling) <sup>(1)</sup> ?			<input checked="" type="checkbox"/>	
Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect				
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ? Record the pH in Comments.			<input checked="" type="checkbox"/>	
If dissolved metals are requested, were samples field filtered?			<input checked="" type="checkbox"/>	
Additional Comments (if any):				
_____				

<sup>(1)</sup> If NO, then contact the client before proceeding with analysis and note in case narrative.

Muri P.  
Custodian Printed Name

M 3-16-17  
Signature or initials of Custodian

15:30  
Date/Time



Fremont Environmental  
1759 Redwing Lane  
Broomfield CO, 80020

Project: Noble - Brown 20-13, English 31-20

Project Number: C014-007  
Project Manager: Paul Henehan

**Reported:**  
03/17/17 06:43

**1-4'**  
**1703132-01 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **03/16/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1703180	03/16/17	03/16/17	8015M	

Date Sampled: **03/16/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		104 %	30-150		"	"	"	"	

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

Date Sampled: **03/16/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1703179	03/16/17	03/16/17	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: **03/16/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		101 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.4 %	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 - Brown 20-13, English 31-20

Project Number: C014-007  
Project Manager: Paul Henehan

**Reported:**  
03/17/17 06:43

**2-4'**  
**1703132-02 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **03/16/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1703180	03/16/17	03/16/17	8015M	

Date Sampled: **03/16/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		98.0 %	30-150		"	"	"	"	

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

Date Sampled: **03/16/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1703179	03/16/17	03/16/17	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: **03/16/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		105 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		104 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.4 %	21-167		"	"	"	"	

Summit Scientific

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Fremont Environmental  
1759 Redwing Lane  
Broomfield CO, 80020

Project: Noble - Brown 20-13, English 31-20

Project Number: C014-007  
Project Manager: Paul Henehan

**Reported:**  
03/17/17 06:43

**3-4'**  
**1703132-03 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **03/16/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1703180	03/16/17	03/16/17	8015M	

Date Sampled: **03/16/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		99.7 %	30-150		"	"	"	"	

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

Date Sampled: **03/16/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1703179	03/16/17	03/16/17	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: **03/16/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		107 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		102 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		95.9 %	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 - Brown 20-13, English 31-20

Project Number: C014-007  
Project Manager: Paul Henehan

**Reported:**  
03/17/17 06:43

**W1**  
**1703132-04 (Water)**

**Summit Scientific**

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

Date Sampled: **03/16/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1703144	03/16/17	03/16/17	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>1.5</b>	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **03/16/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		113 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		98.0 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		92.9 %	45-146		"	"	"	"	

Summit Scientific

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Fremont Environmental  
1759 Redwing Lane  
Broomfield CO, 80020

Project: Noble - Brown 20-13, English 31-20

Project Number: C014-007  
Project Manager: Paul Henehan

**Reported:**  
03/17/17 06:43

**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 1703180 - EPA 3550A**

**Blank (1703180-BLK1)**

Prepared & Analyzed: 03/16/17

C10-C28 (DRO)	ND	50	mg/kg								
<i>Surrogate: o-Terphenyl</i>	12.7		"	12.5		102	30-150				

**LCS (1703180-BS1)**

Prepared & Analyzed: 03/16/17

C10-C28 (DRO)	668	50	mg/kg	499		134	73-134				
<i>Surrogate: o-Terphenyl</i>	12.7		"	12.5		101	30-150				

**Matrix Spike (1703180-MS1)**

Source: 1703132-01

Prepared & Analyzed: 03/16/17

C10-C28 (DRO)	579	50	mg/kg	499	21.8	112	50-148				
<i>Surrogate: o-Terphenyl</i>	12.1		"	12.5		97.1	30-150				

**Matrix Spike Dup (1703180-MSD1)**

Source: 1703132-01

Prepared & Analyzed: 03/16/17

C10-C28 (DRO)	612	50	mg/kg	499	21.8	118	50-148	5.48	20		
<i>Surrogate: o-Terphenyl</i>	12.9		"	12.5		103	30-150				

Summit Scientific

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Fremont Environmental  
1759 Redwing Lane  
Broomfield CO, 80020

Project: Noble - Brown 20-13, English 31-20

Project Number: C014-007  
Project Manager: Paul Henehan

Reported:  
03/17/17 06:43

**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 1703144 - EPA 5030 Water MS**

**Blank (1703144-BLK1)**

Prepared & Analyzed: 03/16/17

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	1.0	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>14.4</i>		<i>"</i>	<i>13.3</i>		<i>108</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.3</i>		<i>"</i>	<i>13.3</i>		<i>100</i>	<i>45-149</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>17.6</i>		<i>"</i>	<i>13.3</i>		<i>132</i>	<i>45-146</i>			

**LCS (1703144-BS1)**

Prepared & Analyzed: 03/16/17

Benzene	38.9	1.0	ug/l	33.3		117	51-132			
Toluene	38.2	1.0	"	33.3		114	51-138			
Ethylbenzene	41.4	1.0	"	33.1		125	58-146			
m,p-Xylene	77.3	2.0	"	66.5		116	57-144			
o-Xylene	38.8	1.0	"	32.7		119	53-146			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>15.1</i>		<i>"</i>	<i>13.3</i>		<i>114</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.4</i>		<i>"</i>	<i>13.3</i>		<i>101</i>	<i>45-149</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>12.5</i>		<i>"</i>	<i>13.3</i>		<i>93.9</i>	<i>45-146</i>			

**Matrix Spike (1703144-MS1)**

Source: 1703113-01

Prepared & Analyzed: 03/16/17

Benzene	39.9	1.0	ug/l	33.3	ND	120	34-141			
Toluene	39.6	1.0	"	33.3	ND	119	27-151			
Ethylbenzene	43.8	1.0	"	33.1	ND	132	29-160			
m,p-Xylene	85.7	2.0	"	66.5	ND	129	20-166			
o-Xylene	41.8	1.0	"	32.7	ND	128	33-159			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>15.2</i>		<i>"</i>	<i>13.3</i>		<i>114</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.4</i>		<i>"</i>	<i>13.3</i>		<i>101</i>	<i>45-149</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>12.9</i>		<i>"</i>	<i>13.3</i>		<i>97.0</i>	<i>45-146</i>			

Summit Scientific

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Fremont Environmental  
1759 Redwing Lane  
Broomfield CO, 80020

Project: Noble - Brown 20-13, English 31-20

Project Number: C014-007  
Project Manager: Paul Henehan

Reported:  
03/17/17 06:43

**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 1703144 - EPA 5030 Water MS**

Matrix Spike Dup (1703144-MSD1)	Source: 1703113-01			Prepared & Analyzed: 03/16/17						
Benzene	39.9	1.0	ug/l	33.3	ND	120	34-141	0.100	32	
Toluene	36.3	1.0	"	33.3	ND	109	27-151	8.83	25	
Ethylbenzene	45.3	1.0	"	33.1	ND	137	29-160	3.41	50	
m,p-Xylene	86.8	2.0	"	66.5	ND	131	20-166	1.36	36	
o-Xylene	43.4	1.0	"	32.7	ND	133	33-159	3.59	26	
Surrogate: 1,2-Dichloroethane-d4	15.5		"	13.3		116	37-154			
Surrogate: Toluene-d8	12.6		"	13.3		94.2	45-149			
Surrogate: 4-Bromofluorobenzene	12.8		"	13.3		96.4	45-146			

**Batch 1703179 - EPA 5030 Soil MS**

Blank (1703179-BLK1)	Prepared & Analyzed: 03/16/17									
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	"							
Surrogate: 1,2-Dichloroethane-d4	0.0412		"	0.0400		103	23-173			
Surrogate: Toluene-d8	0.0418		"	0.0400		104	20-170			
Surrogate: 4-Bromofluorobenzene	0.0386		"	0.0400		96.6	21-167			

LCS (1703179-BS1)	Prepared & Analyzed: 03/16/17									
Naphthalene	ND	0.010	mg/kg							
Benzene	0.0808	0.0020	"	0.100		80.8	58-130			
Toluene	0.0978	0.0050	"	0.100		97.8	61-134			
Ethylbenzene	0.116	0.0050	"	0.0992		117	74-139			
m,p-Xylene	0.242	0.010	"	0.200		121	73-137			
o-Xylene	0.110	0.0050	"	0.0980		112	73-141			
Surrogate: 1,2-Dichloroethane-d4	0.0419		"	0.0400		105	23-173			
Surrogate: Toluene-d8	0.0395		"	0.0400		98.8	20-170			
Surrogate: 4-Bromofluorobenzene	0.0400		"	0.0400		100	21-167			

Summit Scientific

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Fremont Environmental  
1759 Redwing Lane  
Broomfield CO, 80020

Project: Noble - Brown 20-13, English 31-20

Project Number: C014-007  
Project Manager: Paul Henehan

**Reported:**  
03/17/17 06:43

**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 1703179 - EPA 5030 Soil MS**

**Matrix Spike (1703179-MS1)**

**Source: 1703132-01**

Prepared & Analyzed: 03/16/17

Naphthalene	ND	0.010	mg/kg		ND		10-158			
Benzene	0.0808	0.0020	"	0.100	ND	80.8	30-131			
Toluene	0.0978	0.0050	"	0.100	ND	97.8	30-134			
Ethylbenzene	0.113	0.0050	"	0.0992	ND	114	22-153			
m,p-Xylene	0.238	0.010	"	0.200	ND	119	10-159			
o-Xylene	0.109	0.0050	"	0.0980	ND	111	31-151			
Surrogate: 1,2-Dichloroethane-d4	0.0417		"	0.0400		104	23-173			
Surrogate: Toluene-d8	0.0395		"	0.0400		98.8	20-170			
Surrogate: 4-Bromofluorobenzene	0.0383		"	0.0400		95.8	21-167			

**Matrix Spike Dup (1703179-MSD1)**

**Source: 1703132-01**

Prepared & Analyzed: 03/16/17

Naphthalene	ND	0.010	mg/kg		ND		10-158		42	
Benzene	0.0821	0.0020	"	0.100	ND	82.1	30-131	1.66	34	
Toluene	0.101	0.0050	"	0.100	ND	101	30-134	3.14	30	
Ethylbenzene	0.112	0.0050	"	0.0992	ND	113	22-153	0.935	24	
m,p-Xylene	0.233	0.010	"	0.200	ND	117	10-159	2.14	68	
o-Xylene	0.107	0.0050	"	0.0980	ND	109	31-151	1.81	38	
Surrogate: 1,2-Dichloroethane-d4	0.0441		"	0.0400		110	23-173			
Surrogate: Toluene-d8	0.0398		"	0.0400		99.6	20-170			
Surrogate: 4-Bromofluorobenzene	0.0371		"	0.0400		92.8	21-167			

Summit Scientific

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Fremont Environmental  
1759 Redwing Lane  
Broomfield CO, 80020

Project: Noble - Brown 20-13, English 31-20

Project Number: C014-007  
Project Manager: Paul Henehan

**Reported:**  
03/17/17 06:43

### 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

# Summit Scientific

---

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

March 21, 2017

Paul Henehan  
Fremont Environmental  
1759 Redwing Lane  
Broomfield, CO 80020

RE: Noble - Brown 20-13, English 31-20

Enclosed are the results of analyses for samples received by Summit Scientific on 03/20/17 17:30. 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 - Brown 20-13, English 31-20

Project Number: C014-038  
Project Manager: Paul Henehan

**Reported:**  
03/21/17 06:45

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
4-4'	1703168-01	Soil	03/20/17 00:00	03/20/17 17:30
5-4'	1703168-02	Soil	03/20/17 00:00	03/20/17 17:30
6-4'	1703168-03	Soil	03/20/17 00:00	03/20/17 17:30
7-4'	1703168-04	Soil	03/20/17 00:00	03/20/17 17:30
8-4'	1703168-05	Soil	03/20/17 00:00	03/20/17 17:30

Summit Scientific

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Fremont Environmental  
1759 Redwing Lane  
Broomfield CO, 80020

Project: Noble - Brown 20-13, English 31-20

Project Number: C014-038  
Project Manager: Paul Henehan

Reported:  
03/21/17 06:45

# Summit Scientific 1763168

S<sub>2</sub>

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

Page 1 of 1

Client: Fremont Environmental (Noble) 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 - Brown 20-13, English 31-20  
Sampler Name: Mark T Project Number: C017-038

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	4-4'	3/20/17		1			✓						✓	✓					
2	5-4'																		
3	6-4'																		
4	7-4'																		
5	8-4'																		
6																			
7																			
8																			
9																			
10																			
Relinquished by:		Date/Time: 3/20/17 14:30	Received by:		Date/Time: 3-20-17 14:30		Turn Around Time (Check)			Notes: Tues AM 1/2									
Relinquished by:		Date/Time: 3-20-17 18:00	Received by:		Date/Time:		Same Day <input checked="" type="checkbox"/> 72 hours												
Relinquished by:		Date/Time:	Received by:		Date/Time:		24 hours <input type="checkbox"/> Standard												
Relinquished by:		Date/Time:	Received by:		Date/Time:		48 hours <input type="checkbox"/>												
Relinquished by:		Date/Time:	Received by:		Date/Time:		Sample Integrity: Temperature Upon Receipt: 13.0												
Relinquished by:		Date/Time:	Received by:		Date/Time:		Intact: <input checked="" type="radio"/> Yes <input type="radio"/> No												

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Fremont Environmental  
1759 Redwing Lane  
Broomfield CO, 80020

Project: Noble - Brown 20-13, English 31-20

Project Number: C014-038  
Project Manager: Paul Henehan

Reported:  
03/21/17 06:45

**Sample Receipt Checklist**

S2 Work Order: 1703168

Client: Fremont/Noble Client Project ID: Noble - Brown 20-13, English 31-20

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

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

Cooler ID					
Temp (°C)	<u>13.0</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):				
<b><sup>(1)</sup> If NO, then contact the client before proceeding with analysis and note in case narrative.</b>				

Nuri P.  
Custodian Printed Name

PH 3-20-17  
Signature or Initials of Custodian

14:40  
Date/Time



Fremont Environmental  
1759 Redwing Lane  
Broomfield CO, 80020

Project: Noble - Brown 20-13, English 31-20

Project Number: C014-038  
Project Manager: Paul Henehan

**Reported:**  
03/21/17 06:45

**4-4'**  
**1703168-01 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **03/20/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1703216	03/20/17	03/20/17	8015M	

Date Sampled: **03/20/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		111 %	30-150		"	"	"	"	

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

Date Sampled: **03/20/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1703215	03/20/17	03/20/17	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: **03/20/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		135 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %	21-167		"	"	"	"	

Summit Scientific

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Fremont Environmental  
1759 Redwing Lane  
Broomfield CO, 80020

Project: Noble - Brown 20-13, English 31-20

Project Number: C014-038  
Project Manager: Paul Henehan

**Reported:**  
03/21/17 06:45

**5-4'**  
**1703168-02 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **03/20/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1703216	03/20/17	03/20/17	8015M	

Date Sampled: **03/20/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		114 %	30-150		"	"	"	"	

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

Date Sampled: **03/20/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1703215	03/20/17	03/20/17	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: **03/20/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		103 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		97.4 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		91.5 %	21-167		"	"	"	"	

Summit Scientific

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Fremont Environmental  
1759 Redwing Lane  
Broomfield CO, 80020

Project: Noble - Brown 20-13, English 31-20

Project Number: C014-038  
Project Manager: Paul Henehan

**Reported:**  
03/21/17 06:45

**6-4'**  
**1703168-03 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **03/20/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1703216	03/20/17	03/20/17	8015M	

Date Sampled: **03/20/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		110 %	30-150		"	"	"	"	

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

Date Sampled: **03/20/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1703215	03/20/17	03/20/17	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: **03/20/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		99.5 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		96.3 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		89.5 %	21-167		"	"	"	"	

Summit Scientific

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Fremont Environmental  
1759 Redwing Lane  
Broomfield CO, 80020

Project: Noble - Brown 20-13, English 31-20

Project Number: C014-038  
Project Manager: Paul Henehan

**Reported:**  
03/21/17 06:45

**7-4'**  
**1703168-04 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **03/20/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1703216	03/20/17	03/20/17	8015M	

Date Sampled: **03/20/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		105 %	30-150		"	"	"	"	

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

Date Sampled: **03/20/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1703215	03/20/17	03/20/17	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: **03/20/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		102 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		98.6 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		89.7 %	21-167		"	"	"	"	

Summit Scientific

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Fremont Environmental  
1759 Redwing Lane  
Broomfield CO, 80020

Project: Noble - Brown 20-13, English 31-20

Project Number: C014-038  
Project Manager: Paul Henehan

**Reported:**  
03/21/17 06:45

**8-4'**  
**1703168-05 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **03/20/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1703216	03/20/17	03/20/17	8015M	

Date Sampled: **03/20/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		117 %	30-150		"	"	"	"	

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

Date Sampled: **03/20/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1703215	03/20/17	03/20/17	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: **03/20/17 00:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		93.4 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		87.9 %	21-167		"	"	"	"	

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Fremont Environmental  
1759 Redwing Lane  
Broomfield CO, 80020

Project: Noble - Brown 20-13, English 31-20

Project Number: C014-038  
Project Manager: Paul Henehan

**Reported:**  
03/21/17 06:45

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

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

**Batch 1703216 - EPA 3550A**

**Blank (1703216-BLK1)**

Prepared & Analyzed: 03/20/17

C10-C28 (DRO)	ND	50	mg/kg							
<i>Surrogate: o-Terphenyl</i>	12.1		"	12.5		96.7	30-150			

**LCS (1703216-BS1)**

Prepared & Analyzed: 03/20/17

C10-C28 (DRO)	578	50	mg/kg	499		116	73-134			
<i>Surrogate: o-Terphenyl</i>	12.1		"	12.5		97.2	30-150			

**Matrix Spike (1703216-MS1)**

Source: 1703168-01

Prepared & Analyzed: 03/20/17

C10-C28 (DRO)	517	50	mg/kg	499	39.6	95.6	50-148			
<i>Surrogate: o-Terphenyl</i>	11.1		"	12.5		88.9	30-150			

**Matrix Spike Dup (1703216-MSD1)**

Source: 1703168-01

Prepared & Analyzed: 03/20/17

C10-C28 (DRO)	508	50	mg/kg	499	39.6	93.9	50-148	1.67	20	
<i>Surrogate: o-Terphenyl</i>	10.9		"	12.5		87.5	30-150			

Summit Scientific

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1759 Redwing Lane  
Broomfield CO, 80020

Project: Noble - Brown 20-13, English 31-20

Project Number: C014-038  
Project Manager: Paul Henehan

Reported:  
03/21/17 06:45

**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 1703215 - EPA 5030 Soil MS**

**Blank (1703215-BLK1)**

Prepared & Analyzed: 03/20/17

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>0.0403</i>		<i>"</i>	<i>0.0400</i>		<i>101</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0430</i>		<i>"</i>	<i>0.0400</i>		<i>107</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0415</i>		<i>"</i>	<i>0.0400</i>		<i>104</i>	<i>21-167</i>			

**LCS (1703215-BS1)**

Prepared & Analyzed: 03/20/17

Naphthalene	ND	0.010	mg/kg				66-138			
Benzene	0.0835	0.0020	"	0.100		83.5	58-130			
Toluene	0.100	0.0050	"	0.100		100	61-134			
Ethylbenzene	0.115	0.0050	"	0.0992		116	74-139			
m,p-Xylene	0.235	0.010	"	0.200		118	73-137			
o-Xylene	0.108	0.0050	"	0.0980		110	73-141			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0439</i>		<i>"</i>	<i>0.0400</i>		<i>110</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0404</i>		<i>"</i>	<i>0.0400</i>		<i>101</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0398</i>		<i>"</i>	<i>0.0400</i>		<i>99.6</i>	<i>21-167</i>			

**Matrix Spike (1703215-MS1)**

Source: 1703169-01

Prepared & Analyzed: 03/20/17

Naphthalene	0.0181	0.010	mg/kg		0.0177		10-158			
Benzene	0.0862	0.0020	"	0.100	ND	86.2	30-131			
Toluene	0.114	0.0050	"	0.100	0.0116	102	30-134			
Ethylbenzene	0.118	0.0050	"	0.0992	ND	119	22-153			
m,p-Xylene	0.283	0.010	"	0.200	0.0244	130	10-159			
o-Xylene	0.123	0.0050	"	0.0980	0.00756	118	31-151			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0434</i>		<i>"</i>	<i>0.0400</i>		<i>109</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0410</i>		<i>"</i>	<i>0.0400</i>		<i>102</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0399</i>		<i>"</i>	<i>0.0400</i>		<i>99.8</i>	<i>21-167</i>			

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Project: Noble - Brown 20-13, English 31-20

Project Number: C014-038  
Project Manager: Paul Henehan

**Reported:**  
03/21/17 06:45

**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 1703215 - EPA 5030 Soil MS**

<b>Matrix Spike Dup (1703215-MSD1)</b>	<b>Source: 1703169-01</b>			<b>Prepared &amp; Analyzed: 03/20/17</b>						
Naphthalene	0.0178	0.010	mg/kg		0.0177		10-158	1.67	42	
Benzene	0.0895	0.0020	"	0.100	ND	89.5	30-131	3.76	34	
Toluene	0.116	0.0050	"	0.100	0.0116	105	30-134	2.19	30	
Ethylbenzene	0.120	0.0050	"	0.0992	ND	121	22-153	1.73	24	
m,p-Xylene	0.273	0.010	"	0.200	0.0244	124	10-159	3.79	68	
o-Xylene	0.120	0.0050	"	0.0980	0.00756	115	31-151	2.46	38	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0457</i>		<i>"</i>	<i>0.0400</i>		<i>114</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0419</i>		<i>"</i>	<i>0.0400</i>		<i>105</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0386</i>		<i>"</i>	<i>0.0400</i>		<i>96.4</i>	<i>21-167</i>			

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1759 Redwing Lane  
Broomfield CO, 80020

Project: Noble - Brown 20-13, English 31-20

Project Number: C014-038  
Project Manager: Paul Henehan

**Reported:**  
03/21/17 06:45

### 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