

**REMEDIAL EXCAVATION REPORT
O'CONNELL C31-18 WELLHEAD**

**COGCC SPILL TRACKING #483067
COGCC REMEDIATION #24272**



2115 117th Avenue
Greeley, CO 80631

Prepared by:



6855 W. 119th Ave
Broomfield, CO 80020

March 23, 2023

Mr. Dan Peterson
Environmental Specialist
Noble Energy Inc.
2115 117th Avenue
Greeley, CO 80631

Subject: **Remedial Excavation Report**
 O’Connell C31-18 Wellhead
 API #: 05-123-13782
 Spill/Release Point ID #: 483067
 Remediation Project #: 24272
 SWNE S31 T4N R64W
 Weld County, Colorado

Dear Mr. Peterson:

Below please find a copy of the above referenced Remedial Excavation Report (Report) for the O’Connell C31-18 Wellhead (Site) in Weld County, Colorado. The text below describes the environmental assessment and associated soil sampling conducted at the Site between October 4, 2022 (Decommissioning) and March 6, 2023 (Excavation) by Tasman, Inc. (Tasman), on behalf of Noble Energy, Inc. (Noble).

Introduction

The purpose of this document is to describe the results of the remedial excavation and associated sampling activities. The activities described below were performed in response to the discovery of suspected impacted material adjacent to the O’Connell C31-18 Wellhead during decommissioning activities and confirmed on October 13, 2022.

Facility Background

The Site is located approximately eight miles southwest of the town of Kersey in Weld County, Colorado, as shown on Figure 1. The Site is surrounded by rangeland, and the legal description is the southwest quarter of the northeast quarter of Section 31, Township 4 North, Range 64 West, 6th Principal Meridian. The Site is located on terrain that is gradually flat. The Site is approximately 0.55 miles southeast of the intersection of County Road 49 and County Road 40 and has coordinates of 40.272175°, -104.593004°. The Site location map is included as Figure 1.

Tasman was retained by Noble on October 4, 2022, to complete soil sampling and documentation during decommissioning and abandonment activities at the former O’Connell C31-18 wellhead. During decommissioning and abandonment activities at the Site historic impacts were discovered adjacent to the wellhead and confirmed on October 13, 2022. A Form 19 was submitted to the Colorado Oil and Gas Conservation Commission (COGCC) on October 13, 2022. The COGCC subsequently issued Spill/Release Point ID Number 483067 for this event and the Site was plugged

and abandoned. The COGCC issued Remediation Number 24272 for this project. The Initial Site investigation was reported in the *Supplemental Form 27* (COGCC Document # 403274199) that was submitted to the COGCC on December 29, 2022.

Field Activities- Remedial Excavation

Remedial excavation activities were conducted on March 6, 2023, to remove impacted soil in the area of the former wellhead location. The excavation was guided in the field using a PID and standard headspace sampling techniques. A total of four soil samples (SS01@4' through SS04@4') were collected from the final perimeter of the excavation along with one excavation base sample (FS01@5'). All soil samples were submitted to Summit for laboratory analysis of COGCC Table 915-1 list of organics in soil using USEPA Method 8260B and USEPA Method 8270D, and TPH using USEPA Methods 8260B and 8015 per the approved amended sampling plan (COGCC Document # 403274199). Groundwater was not encountered during the excavation. Excavation soil analytical data is summarized in Table 2 and the remedial excavation extent and sample locations are illustrated on Figure 2. The laboratory analytical report is included as Attachment A.

A total of approximately 12 cubic yards of impacted material were removed for off-Site disposal at the Waste Management Buffalo Ridge Landfill under signed Noble waste manifests. A total of approximately 12 cubic yards of imported clean fill was used to backfill the excavation. The final remedial excavation extent measured approximately 8 ft. by 8 ft. by 5 ft. bgs.

Results

Laboratory analytical results for the remedial excavation soil samples collected along the final excavation extent and the one floor sample indicate all samples were below applicable COGCC Table 915-1 soil standards.

Conclusions and No Further Action Request

Based upon field and laboratory data collected during remedial excavation activities, impacted soil in the area of the release has been successfully removed. A No Further Action (NFA) designation is being requested from the COGCC for this project.

Remarks

The discussion and conclusions contained in this report represent the professional opinions of Tasman Geosciences, Inc. These opinions are based on currently available information and are arrived at in accordance with currently accepted geologic and engineering practices.

Please contact me at (720) 616-8383 or at jwhritenour@tasman-geo.com if you require additional information.

Sincerely,
Tasman Geosciences, Inc.



Jake Whritenour, Program Manager

Attachments:

Table 1 – Decommissioning and Site Assessment Soil Analytical Data

Table 2 – Excavation Soil Analytical Data

Figure 1 – Site Location Map

Figure 2 – Excavation Analytical Results Map (03/06/2023)

Attachment A – Laboratory Analytical Report

TABLES

TABLE 1
DECOMMISSIONING AND SITE ASSESSMENT SOIL ANALYTICAL DATA
NOBLE ENERGY, INC. - O'CONNELL C31-18



Soil Sample ID	Date	¹ Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	1,2,4 - TMB (mg/kg)	1,3,5 - TMB (mg/kg)	Naphthalene (mg/kg)	TPH-GRO (mg/kg)	TPH-DRO (mg/kg)	TPH-ORO (mg/kg)	Acenaphthene (mg/kg)	Anthracene (mg/kg)	Benz(a) (mg/kg)	Benzo(a) (mg/kg)	Benzo(b) (mg/kg)	Benzo(k) (mg/kg)	Chrysene (mg/kg)	A,H (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	1,2,3-CD (mg/kg)	Pyrene (mg/kg)	1-M (mg/kg)	2-M (mg/kg)
Residential SSL ²		1.2	490	5.8	58	30	27	2	500			360	1,800	1.1	0.11	1.1	11	110	0.11	240	240	1.1	180	18	24
Protection of Groundwater SSL ^{2,3}		0.0026	0.69	0.78	9.9	0.0081	0.0087	0.0038	500			0.55	6	0.011	0.24	0.3	2.9	9	0.096	8.9	0.54	0.98	1.3	0.006	0.019
FS01@6'	10/04/22	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00335	<0.200	<25.0	<100	<0.00335	<0.00335	<0.00335	<0.00335	<0.00335	<0.00335	<0.00335	<0.00335	<0.00335	<0.00335	<0.00335	<0.00335	<0.00335	<0.00335
FL01-A@4'	10/04/22	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	0.0069	<0.200	<25.0	<100	0.0269	0.0572	0.125	0.11	0.104	0.0782	0.121	0.0218	0.308	0.0316	0.0715	0.242	0.00249	0.00291
BH01@6'	10/27/22	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<0.50	<50	<50	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
BH01@10'	10/27/22	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<0.50	<50	<50	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500

Soil Sample ID	Date	pH	SAR	EC (mmhos/cm)	Boron (mg/L)
Residential SSL ²		6 - 8.3	<6	<4mmhos/cm	2
FS01@6'	10/04/22	8.19	0.247	0.421	0.157
FL01-A@4'	10/04/22	8.07	0.109	0.268	<0.0992
BH01@6'	10/27/22	8.03	0.0938	0.221	0.0647
BH01@10'	10/27/22	7.89	0.100	0.153	0.0532

Soil Sample ID	Date	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Chromium (VI) (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Zinc (mg/kg)
Residential SSL ²		0.68	15,000	71	0.3	3,100	400	1,500	390	390	23,000
Protection of Groundwater SSL ^{2,3}		0.29	82	0.38	0.00067	46	14	26	0.26	0.8	370
FL01-A@4'	10/04/22	1.55	41.3	<0.0973	<2.53	<9.73	<9.73	<9.73	<0.0973	<0.0973	<97.3
BH01@6'	10/27/22	0.559	21.9	<0.211	<0.30	2.49	3.08	2.01	<0.274	<0.0211	9.89
BH01@10'	10/27/22	0.632	31.9	<0.212	<0.30	2.67	2.71	2.96	<0.275	<0.0212	12.3
BG01@4'	10/27/22	0.709	27.3	<0.205	<0.30	2.53	2.74	2.65	<0.267	0.0205	10.9
BG01@8'	10/27/22	0.678	28.3	<0.206	<0.30	2.31	2.45	2.63	<0.268	0.0218	10.0
BG02@4'	10/27/22	0.628	28.9	<0.205	<0.30	2.24	2.40	2.37	<0.267	<0.0205	10.2
BG02@8'	10/27/22	0.567	28.0	<0.206	<0.30	2.12	2.38	2.42	<0.267	<0.0206	10.1
BG03@4'	10/27/22	0.665	32.2	<0.206	<0.30	2.30	2.45	2.41	<0.267	<0.0206	10.4
BG03@8'	10/27/22	0.609	28.6	<0.206	<0.30	2.42	2.34	2.52	<0.268	<0.0206	10.7
BG04@4'	10/27/22	0.566	30.2	<0.205	<0.30	2.20	2.20	2.24	<0.266	<0.0205	10.3
BG04@8'	10/27/22	0.571	27.3	<0.206	<0.30	2.09	2.35	2.30	<0.267	<0.0206	9.44
BG05@4'	10/27/22	0.633	30.6	<0.205	<0.30	2.19	2.41	2.39	<0.267	<0.0205	10.3
BG05@8'	10/27/22	0.644	35.0	<0.207	<0.30	2.28	2.51	2.51	<0.269	<0.0207	10.8

Notes:

- Compounds referenced from 2 CCR 404-1, Table 915-1, effective January 15, 2021.
- Soil Screening Levels (SSL) referenced from EPA Regional Screening Levels (EPA RSLs) for Chemical Contaminants at Superfund Sites, effective November 2020.
- SSLs are applicable if a pathway for communication with groundwater is present.

Definitions:

COGCC = Colorado Oil and Gas Conservation Commission
 TPH-GRO = Total petroleum hydrocarbons - gasoline range organics
 TPH-DRO = Total petroleum hydrocarbons - diesel range organics
 TPH-ORO = Total petroleum hydrocarbons - oil range organics
 mg/kg = Milligrams per kilogram
 SAR = Sodium Adsorption Ratio
 EC = Electrical Conductivity
 mmhos/cm = Millimhos per centimeter
 mg/L = Milligrams per liter
 < = Analytical result is less than the indicated laboratory reporting limit

1,2,4 - TMB = 1,2,4 Trimethylbenzene
 1,3,5 - TMB = 1,3,5 Trimethylbenzene
 Benz(a) = Benzantracene
 Benzo(b) = Benzofluoranthene
 Benzo(k) = Benzofluoranthene
 Benzo(a) = Benzopyrene
 A,H = Dibenzoanthracene
 1,2,3-CD = Indenopyrene
 1-M = 1-methylnaphthalene
 2-M = 2-methylnaphthalene

Highlighted results are equal to or exceed the COGCC Table 915-1 standard

TABLE 2
EXCAVATION SOIL ANALYTICAL DATA
NOBLE ENERGY, INC. - O'CONNELL C31-18



Soil Sample ID	Date	¹ Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	1,2,4 - TMB (mg/kg)	1,3,5 - TMB (mg/kg)	Naphthalene (mg/kg)	TPH-GRO (mg/kg)	TPH-DRO (mg/kg)	TPH-ORO (mg/kg)	Acenaphthene (mg/kg)	Anthracene (mg/kg)	Benz(a) (mg/kg)	Benzo(a) (mg/kg)	Benzo(b) (mg/kg)	Benzo(k) (mg/kg)	Chrysene (mg/kg)	A,H (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	1,2,3-CD (mg/kg)	Pyrene (mg/kg)	1-M (mg/kg)	2-M (mg/kg)
Residential SSL ²		1.2	490	5.8	58	30	27	2	500			360	1,800	1.1	0.11	1.1	11	110	0.11	240	240	1.1	180	18	24
Protection of Groundwater SSL ^{2,3}		0.0026	0.69	0.78	9.9	0.0081	0.0087	0.0038	500			0.55	6	0.011	0.24	0.3	2.9	9	0.096	8.9	0.54	0.98	1.3	0.006	0.019
SS01@4'	03/06/23	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<0.50	<50	<50	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
SS02@4'	03/06/23	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<0.50	<50	<50	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
SS03@4'	03/06/23	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<0.50	<50	<50	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
SS04@4'	03/06/23	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<0.50	<50	<50	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	0.00708	<0.00500	<0.00500	0.00760	<0.00500	<0.00500
FS01@5'	03/06/23	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<0.50	<50	<50	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500

Notes:

- Compounds referenced from 2 CCR 404-1, Table 915-1, effective January 15, 2021.
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mg/kg = Milligrams per kilogram

SAR = Sodium Adsorption Ratio

EC = Electrical Conductivity

mmhos/cm = Millmhos per centimeter

mg/L = Milligrams per liter

< = Analytical result is less than the indicated laboratory reporting limit

Highlighted results are equal to or exceed the COGCC Table 915-1 standard

1,2,4 - TMB = 1,2,4 Trimethylbenzene

1,3,5 - TMB = 1,3,5 Trimethylbenzene

Benz(a) = Benzantracene

Benzo(b) = Benzo(a)fluoranthene

Benzo(k) = Benzo(a)fluoranthene

Benzo(a) = Benzopyrene

A,H = Dibenzoanthracene

1,2,3-CD = Indenopyrene

1-M = 1-methylnaphthalene

2-M = 2-methylnaphthalene

FIGURES

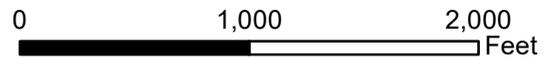
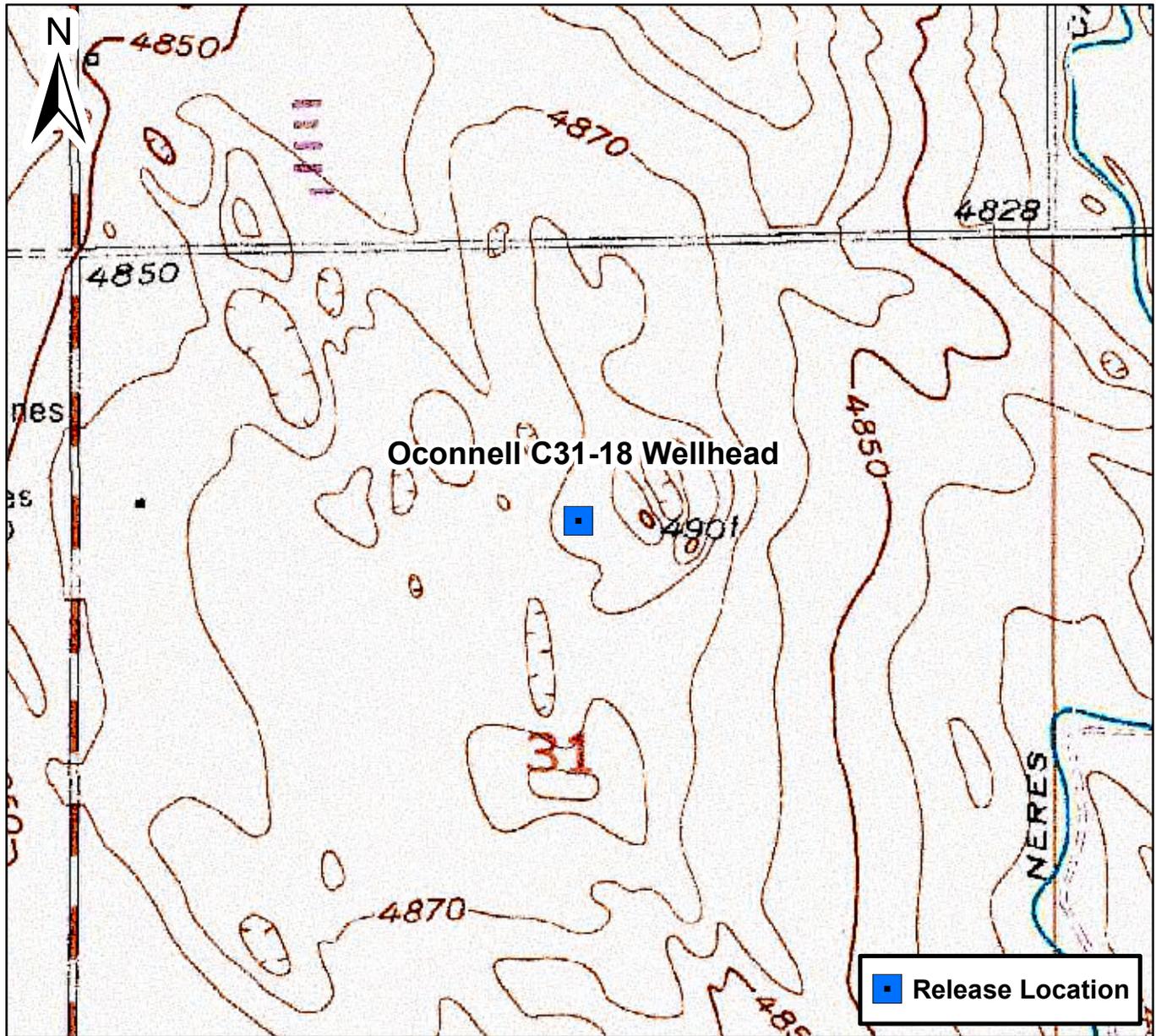
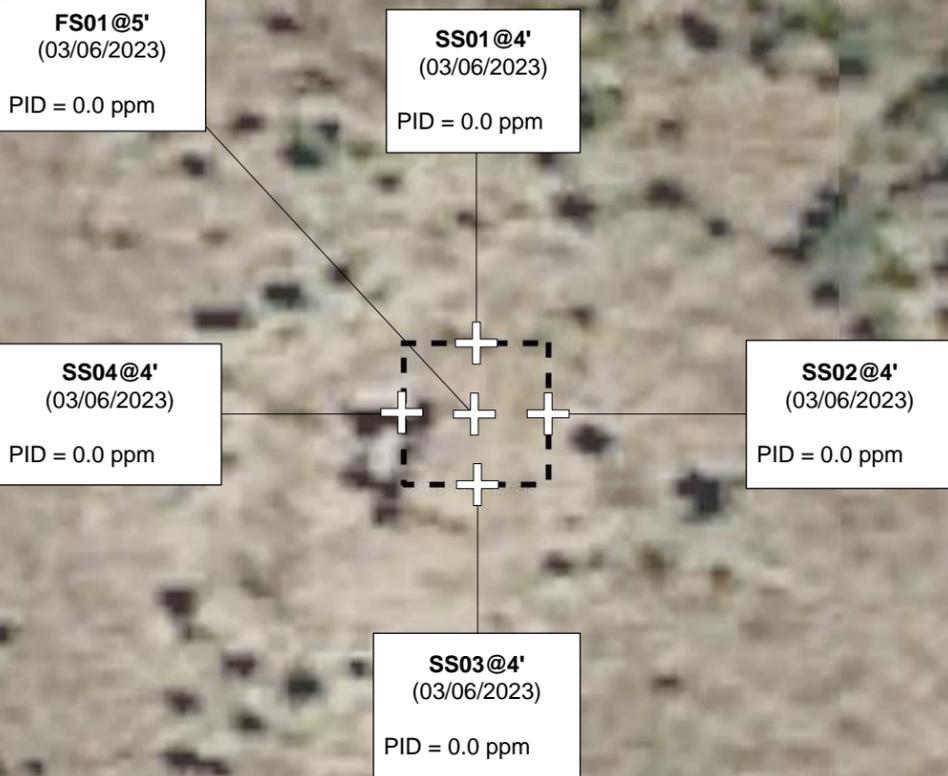


Figure 1

Site Location Map
 O'Connell C31-18 Wellhead
 SWNE S31 T4N R64W
 Weld County, Colorado





Legend

- Excavation Extent
- ⊕ Soil Sample Location – Lab Analyzed

Notes

- 1) All locations are approximate unless otherwise noted.
- 2) Buried infrastructure has been spatially projected.
- 3) Analytical results below laboratory detection limits or within compliance of COGCC Table 915-1 not shown.
- 4) Concentration in exceedance of COGCC table 915-1 soil standards indicated in **RED**.

GPS – Global Positioning System
 mg/kg – Milligrams per kilogram

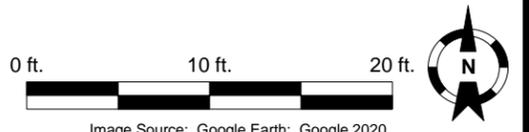


Image Source: Google Earth; Google 2020

DATE:	03/07/2023
DESIGNED BY:	JW
DRAWN BY:	AE



TASMAN Tasman Geosciences, Inc.
 6855 W 119th Avenue
 Broomfield, CO 80020

Noble Energy, Inc. – DJ Basin
O’Connell C31-18
 SWNE, Section 31, Township 4 North, Range 64 West
 Weld County, Colorado

Excavation Soil Analytical
 Results Map
 (03/06/2023)

Figure 2

ATTACHMENT A

LABORATORY ANALYTICAL DATA REPORT

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

March 14, 2023

Jacob Whritenour

Tasman Geosciences

6855 W. 119th Ave.

Broomfield, CO 80020

RE: Noble - O'Connell C31-18

Work Order #2303128

Enclosed are the results of analyses for samples received by Summit Scientific on 03/06/23 16:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Mikayla Axtell For Paul Shrewsbury

President



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - O'Connell C31-18

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
03/14/23 11:57

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FS01@5'	2303128-01	Soil	03/06/23 11:48	03/06/23 16:30
SS01@4'	2303128-02	Soil	03/06/23 11:53	03/06/23 16:30
SS02@4'	2303128-03	Soil	03/06/23 11:56	03/06/23 16:30
SS03@4'	2303128-04	Soil	03/06/23 11:58	03/06/23 16:30
SS04@4'	2303128-05	Soil	03/06/23 12:00	03/06/23 16:30

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.

SUMMIT SCIENTIFIC

4653 Table Mountain Drive
Golden, CO 80403
303-277-9310

Lab ID	Page 1 of 1
2303128	

Client: <u>Noble / Tasman</u>	Project Manager: <u>JAKE WRITENOUR</u>	Send Invoice To:
Address: <u>6855 W 119th Ave</u>	E-Mail: <u>jwritenour@tasmangeo.com</u>	Company:
City/State/Zip: <u>Broomfield, CO 80020</u>	Project Name: <u>O'Connell C3121</u>	Project Name/Location:
Phone: <u>248 410 9812</u>	Project Number: <u>-</u>	AFE#:
Sampler Name: <u>SARAH QUATTROCHI</u>		PO/Billing Codes:
		Contact:

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix		Analysis Requested						Special Instructions		
					HCl	HNO3	None	Other	Water	Soil	Air-Canister #	Other	NOC - 915	TPH - 915	PAH - 915	Boron		EC, SAR, pH	Metals-915
1	F501 @ 5'	3/6/23	1148	2			X			X			X	X	X	X	X	X	
2	S501 @ 4'	↓	1153	↓			↓			↓			↓	↓	↓	↓	↓	↓	
3	S502 @ 4'	↓	1156	↓			↓			↓			↓	↓	↓	↓	↓	↓	
4	S503 @ 4'	↓	1158	↓			↓			↓			↓	↓	↓	↓	↓	↓	
5	S504 @ 4'	↓	1200	↓			↓			↓			↓	↓	↓	↓	↓	↓	
6																			
7																			
8																			
9																			
10																			
11																			
12																			
13																			
14																			
15																			

Relinquished by: <u>[Signature]</u>	Date/Time: <u>3/6/23</u>	Received by: <u>SZ</u>	Date/Time: <u>3/6/23</u>	TAT Business Days	Field DO	Notes:
				Same Day <input checked="" type="checkbox"/>	Field EC	
Relinquished by: <u>SZ</u>	Date/Time: <u>3/6/23</u>	Received by: <u>[Signature]</u>	Date/Time: <u>3/6/23</u>	1 Day <input type="checkbox"/>	Field ORP	
	Date/Time: <u>1/6/30</u>		Date/Time: <u>1/6/30</u>	2 Days <input type="checkbox"/>	Field pH	
Relinquished by:	Date/Time:	Received by:	Date/Time:	3 Days <input type="checkbox"/>	Field Temp.	
Temperature Upon Receipt: <u>84</u>	Corrected Temperature: <u>[Signature]</u>	IR gun #: <u>1</u>	HNO3 lot #: <u></u>	Standard <input type="checkbox"/>	Field Turb.	

S₂

Sample Receipt Checklist

S2 Work Order# 2303128

Client: Noble Kasman Client Project ID: O'Connell C31-21

Shipped Via: H.D./P.U./FedEx/UPS/USPS/Other Airbill #: _____

-

Matrix (Check all that apply) Air Soil/Solid Water Other

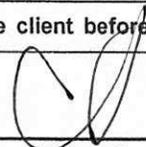
Temp (°C)

Thermometer #

	Yes	No	N/A	Comments (if any)
If samples require cooling, is the temperature < 6°C? ⁽¹⁾ NOTE: If samples are delivered the same day of sampling, this requirement is met if there is evidence that cooling has begun.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	on ICE
If custody seals are present, are they intact? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are samples due within 48 hours present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sameday
Are water samples with short hold times present? Note the short hold analysis in the comments column - pH, Nitrate/Nitrite, Ferrous Iron (Fe ²⁺), Hexavalent Chromium (Cr ⁶⁺ , Cr VI), COD/BOD, Total Coliform, E. Coli, Total Residual Chlorine (TRC), Dissolved Oxygen	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Is a chain-of-custody (COC) form present and filled out Completely? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client w/ date and time recorded? ⁽¹⁾	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were all samples received intact? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling)? ⁽¹⁾ Note the type of preservative in the comments column – HCl, H ₂ SO ₄ , NaOH, HNO ₃ , etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If samples are acid preserved for metals, is the pH ≤ 2? ⁽¹⁾ Record the pH in Comments.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If dissolved metals are requested, were samples field filtered?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Additional Comments (if any):

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


Custodian Printed Name

3-6-22
Date/Time



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - O'Connell C31-18

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
03/14/23 11:57

FS01@5'
2303128-01 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/06/23 11:48**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	0.0020		mg/kg	1	BGC0163	03/06/23	03/06/23	EPA 8260B	
Toluene	ND	0.0050		"	"	"	"	"	"	
Ethylbenzene	ND	0.0050		"	"	"	"	"	"	
Xylenes (total)	ND	0.010		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050		"	"	"	"	"	"	
Naphthalene	ND	0.0038		"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50		"	"	"	"	"	"	

Date Sampled: **03/06/23 11:48**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4	0.0512	128 %		50-150		"	"	"	"	
Surrogate: Toluene-d8	0.0400	100 %		50-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	0.0428	107 %		50-150		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **03/06/23 11:48**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
C10-C28 (DRO)	ND	50		mg/kg	1	BGC0164	03/06/23	03/06/23	EPA 8015M	
C28-C36 (ORO)	ND	50		"	"	"	"	"	"	

Date Sampled: **03/06/23 11:48**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: o-Terphenyl	14.3	114 %		30-150		"	"	"	"	

PAH by EPA Method 8270D SIM

Summit Scientific

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Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - O'Connell C31-18

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
03/14/23 11:57

FS01@5'
2303128-01 (Soil)

Summit Scientific

PAH by EPA Method 8270D SIM

Date Sampled: **03/06/23 11:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BGC0170	03/07/23	03/08/23	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Chrysene	ND	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	ND	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Pyrene	ND	0.00500	"	"	"	"	"	"	
1-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **03/06/23 11:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10	0.0291	87.2 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10	0.0214	64.3 %	40-150		"	"	"	"	

Summit Scientific

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Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - O'Connell C31-18

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
03/14/23 11:57

SS01@4'
2303128-02 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/06/23 11:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	BGC0163	03/06/23	03/06/23	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
Naphthalene	ND	0.0038	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **03/06/23 11:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	0.0422	105 %	50-150		"	"	"	"	
Surrogate: Toluene-d8	0.0392	97.9 %	50-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	0.0402	101 %	50-150		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **03/06/23 11:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	BGC0164	03/06/23	03/06/23	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **03/06/23 11:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl	10.2	81.5 %	30-150		"	"	"	"	

PAH by EPA Method 8270D SIM

Summit Scientific

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Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - O'Connell C31-18

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
03/14/23 11:57

SS01@4'
2303128-02 (Soil)

Summit Scientific

PAH by EPA Method 8270D SIM

Date Sampled: **03/06/23 11:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BGC0170	03/07/23	03/08/23	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Chrysene	ND	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	ND	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Pyrene	ND	0.00500	"	"	"	"	"	"	
1-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **03/06/23 11:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10	0.0329	98.6 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10	0.0229	68.8 %	40-150		"	"	"	"	

Summit Scientific

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Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - O'Connell C31-18

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
03/14/23 11:57

SS02@4'
2303128-03 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/06/23 11:56**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	BGC0163	03/06/23	03/06/23	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
Naphthalene	ND	0.0038	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **03/06/23 11:56**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	0.0524	131 %	50-150		"	"	"	"	
Surrogate: Toluene-d8	0.0407	102 %	50-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	0.0418	104 %	50-150		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **03/06/23 11:56**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	BGC0164	03/06/23	03/06/23	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **03/06/23 11:56**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl	9.95	79.6 %	30-150		"	"	"	"	

PAH by EPA Method 8270D SIM

Summit Scientific

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Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - O'Connell C31-18

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
03/14/23 11:57

SS02@4'
2303128-03 (Soil)

Summit Scientific

PAH by EPA Method 8270D SIM

Date Sampled: **03/06/23 11:56**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BGC0170	03/07/23	03/08/23	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Chrysene	ND	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	ND	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Pyrene	ND	0.00500	"	"	"	"	"	"	
1-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **03/06/23 11:56**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10	0.0310	92.9 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10	0.0236	70.8 %	40-150		"	"	"	"	

Summit Scientific

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Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - O'Connell C31-18

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
03/14/23 11:57

SS03@4'
2303128-04 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/06/23 11:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	BGC0163	03/06/23	03/07/23	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
Naphthalene	ND	0.0038	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **03/06/23 11:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	0.0464	116 %	50-150		"	"	"	"	
Surrogate: Toluene-d8	0.0393	98.3 %	50-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	0.0413	103 %	50-150		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **03/06/23 11:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	BGC0164	03/06/23	03/06/23	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **03/06/23 11:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl	10.7	85.7 %	30-150		"	"	"	"	

PAH by EPA Method 8270D SIM

Summit Scientific

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Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - O'Connell C31-18

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
03/14/23 11:57

SS03@4'
2303128-04 (Soil)

Summit Scientific

PAH by EPA Method 8270D SIM

Date Sampled: **03/06/23 11:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BGC0170	03/07/23	03/08/23	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Chrysene	ND	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	ND	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Pyrene	ND	0.00500	"	"	"	"	"	"	
1-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **03/06/23 11:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10	0.0309	92.7 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10	0.0227	68.2 %	40-150		"	"	"	"	

Summit Scientific

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Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - O'Connell C31-18

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
03/14/23 11:57

SS04@4'
2303128-05 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/06/23 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	BGC0163	03/06/23	03/07/23	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
Naphthalene	ND	0.0038	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **03/06/23 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	0.0516	129 %	50-150		"	"	"	"	
Surrogate: Toluene-d8	0.0397	99.2 %	50-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	0.0426	106 %	50-150		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **03/06/23 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	BGC0164	03/06/23	03/06/23	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **03/06/23 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl	9.90	79.2 %	30-150		"	"	"	"	

PAH by EPA Method 8270D SIM

Summit Scientific

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Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - O'Connell C31-18

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
03/14/23 11:57

SS04@4'
2303128-05 (Soil)

Summit Scientific

PAH by EPA Method 8270D SIM

Date Sampled: **03/06/23 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BGC0170	03/07/23	03/08/23	EPA 8270D SIM	
Anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.00500	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500	"	"	"	"	"	"	
Chrysene	ND	0.00500	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500	"	"	"	"	"	"	
Fluoranthene	0.00708	0.00500	"	"	"	"	"	"	
Fluorene	ND	0.00500	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500	"	"	"	"	"	"	
Pyrene	0.00760	0.00500	"	"	"	"	"	"	
1-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.00500	"	"	"	"	"	"	

Date Sampled: **03/06/23 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10	0.0352	106 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10	0.0254	76.1 %	40-150		"	"	"	"	

Summit Scientific

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Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - O'Connell C31-18

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
03/14/23 11:57

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 BGC0163 - EPA 5030 Soil MS

Blank (BGC0163-BLK1)

Prepared: 03/06/23 Analyzed: 03/07/23

Benzene	ND	0.0020	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
1,2,4-Trimethylbenzene	ND	0.0050	"							
1,3,5-Trimethylbenzene	ND	0.0050	"							
Naphthalene	ND	0.0038	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0472		"	0.0400		118	50-150			
Surrogate: Toluene-d8	0.0397		"	0.0400		99.2	50-150			
Surrogate: 4-Bromofluorobenzene	0.0412		"	0.0400		103	50-150			

LCS (BGC0163-BS1)

Prepared: 03/06/23 Analyzed: 03/07/23

Benzene	0.0892	0.0020	mg/kg	0.100		89.2	70-130			
Toluene	0.0779	0.0050	"	0.100		77.9	70-130			
Ethylbenzene	0.0935	0.0050	"	0.100		93.5	70-130			
m,p-Xylene	0.184	0.010	"	0.200		92.2	70-130			
o-Xylene	0.0872	0.0050	"	0.100		87.2	70-130			
1,2,4-Trimethylbenzene	0.0846	0.0050	"	0.100		84.6	70-130			
1,3,5-Trimethylbenzene	0.0859	0.0050	"	0.100		85.9	70-130			
Naphthalene	0.0733	0.0038	"	0.100		73.3	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0423		"	0.0400		106	50-150			
Surrogate: Toluene-d8	0.0378		"	0.0400		94.4	50-150			
Surrogate: 4-Bromofluorobenzene	0.0410		"	0.0400		102	50-150			

Matrix Spike (BGC0163-MS1)

Source: 2303123-01

Prepared: 03/06/23 Analyzed: 03/07/23

Benzene	0.0866	0.0020	mg/kg	0.100	ND	86.6	70-130			
Toluene	0.0767	0.0050	"	0.100	ND	76.7	70-130			
Ethylbenzene	0.0891	0.0050	"	0.100	ND	89.1	70-130			
m,p-Xylene	0.178	0.010	"	0.200	ND	89.2	70-130			
o-Xylene	0.0847	0.0050	"	0.100	ND	84.7	70-130			
1,2,4-Trimethylbenzene	0.0832	0.0050	"	0.100	ND	83.2	70-130			
1,3,5-Trimethylbenzene	0.0836	0.0050	"	0.100	ND	83.6	70-130			
Naphthalene	0.0748	0.0038	"	0.100	ND	74.8	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0435		"	0.0400		109	50-150			
Surrogate: Toluene-d8	0.0390		"	0.0400		97.6	50-150			
Surrogate: 4-Bromofluorobenzene	0.0404		"	0.0400		101	50-150			

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6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - O'Connell C31-18

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
03/14/23 11:57

Volatile Organic Compounds by EPA Method 8260B - Quality Control

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

Batch BGC0163 - EPA 5030 Soil MS

Matrix Spike Dup (BGC0163-MSD1)	Source: 2303123-01			Prepared: 03/06/23 Analyzed: 03/07/23						
Benzene	0.0849	0.0020	mg/kg	0.100	ND	84.9	70-130	1.89	30	
Toluene	0.0764	0.0050	"	0.100	ND	76.4	70-130	0.392	30	
Ethylbenzene	0.0902	0.0050	"	0.100	ND	90.2	70-130	1.27	30	
m,p-Xylene	0.180	0.010	"	0.200	ND	89.8	70-130	0.738	30	
o-Xylene	0.0837	0.0050	"	0.100	ND	83.7	70-130	1.18	30	
1,2,4-Trimethylbenzene	0.0821	0.0050	"	0.100	ND	82.1	70-130	1.38	30	
1,3,5-Trimethylbenzene	0.0853	0.0050	"	0.100	ND	85.3	70-130	1.92	30	
Naphthalene	0.0728	0.0038	"	0.100	ND	72.8	70-130	2.68	30	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0422</i>		<i>"</i>	<i>0.0400</i>		<i>105</i>	<i>50-150</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0393</i>		<i>"</i>	<i>0.0400</i>		<i>98.2</i>	<i>50-150</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0408</i>		<i>"</i>	<i>0.0400</i>		<i>102</i>	<i>50-150</i>			

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Project: Noble - O'Connell C31-18

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
03/14/23 11:57

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 BGC0164 - EPA 3550A

Blank (BGC0164-BLK1)

Prepared: 03/06/23 Analyzed: 03/07/23

C10-C28 (DRO)	ND	50	mg/kg								
C28-C36 (ORO)	ND	50	"								
Surrogate: <i>o</i> -Terphenyl	15.3		"	12.5		122	30-150				

LCS (BGC0164-BS1)

Prepared: 03/06/23 Analyzed: 03/07/23

C10-C28 (DRO)	495	50	mg/kg	500		98.9	70-130				
Surrogate: <i>o</i> -Terphenyl	15.7		"	12.5		125	30-150				

Matrix Spike (BGC0164-MS1)

Source: 2303123-01

Prepared: 03/06/23 Analyzed: 03/07/23

C10-C28 (DRO)	472	50	mg/kg	500	15.3	91.4	70-130				
Surrogate: <i>o</i> -Terphenyl	11.3		"	12.5		90.3	30-150				

Matrix Spike Dup (BGC0164-MSD1)

Source: 2303123-01

Prepared: 03/06/23 Analyzed: 03/07/23

C10-C28 (DRO)	459	50	mg/kg	500	15.3	88.8	70-130	2.81	20		
Surrogate: <i>o</i> -Terphenyl	15.5		"	12.5		124	30-150				

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Project: Noble - O'Connell C31-18

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
03/14/23 11:57

PAH by EPA Method 8270D SIM - Quality Control

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

Batch BGC0170 - EPA 5030 Soil MS

Blank (BGC0170-BLK1)

Prepared & Analyzed: 03/07/23

Acenaphthene	ND	0.00500	mg/kg							
Anthracene	ND	0.00500	"							
Benzo (a) anthracene	ND	0.00500	"							
Benzo (a) pyrene	ND	0.00500	"							
Benzo (b) fluoranthene	ND	0.00500	"							
Benzo (k) fluoranthene	ND	0.00500	"							
Chrysene	ND	0.00500	"							
Dibenz (a,h) anthracene	ND	0.00500	"							
Fluoranthene	ND	0.00500	"							
Fluorene	ND	0.00500	"							
Indeno (1,2,3-cd) pyrene	ND	0.00500	"							
Pyrene	ND	0.00500	"							
1-Methylnaphthalene	ND	0.00500	"							
2-Methylnaphthalene	ND	0.00500	"							
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0340</i>		"	<i>0.0333</i>		<i>102</i>		<i>40-150</i>		
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0366</i>		"	<i>0.0333</i>		<i>110</i>		<i>40-150</i>		

LCS (BGC0170-BS1)

Prepared & Analyzed: 03/07/23

Acenaphthene	0.0353	0.00500	mg/kg	0.0333	106	31-137
Anthracene	0.0347	0.00500	"	0.0333	104	30-120
Benzo (a) anthracene	0.0341	0.00500	"	0.0333	102	30-120
Benzo (a) pyrene	0.0334	0.00500	"	0.0333	100	30-120
Benzo (b) fluoranthene	0.0346	0.00500	"	0.0333	104	30-120
Benzo (k) fluoranthene	0.0350	0.00500	"	0.0333	105	30-120
Chrysene	0.0282	0.00500	"	0.0333	84.7	30-120
Dibenz (a,h) anthracene	0.0287	0.00500	"	0.0333	86.0	30-120
Fluoranthene	0.0338	0.00500	"	0.0333	101	30-120
Fluorene	0.0350	0.00500	"	0.0333	105	30-120
Indeno (1,2,3-cd) pyrene	0.0324	0.00500	"	0.0333	97.3	30-120
Pyrene	0.0353	0.00500	"	0.0333	106	35-142
1-Methylnaphthalene	0.0378	0.00500	"	0.0333	113	35-142
2-Methylnaphthalene	0.0357	0.00500	"	0.0333	107	35-142
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0357</i>		"	<i>0.0333</i>	<i>107</i>	<i>40-150</i>
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0375</i>		"	<i>0.0333</i>	<i>113</i>	<i>40-150</i>

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Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
03/14/23 11:57

PAH by EPA Method 8270D SIM - Quality Control

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

Batch BGC0170 - EPA 5030 Soil MS

Matrix Spike (BGC0170-MS1)	Source: 2303125-01			Prepared & Analyzed: 03/07/23						
Acenaphthene	0.0213	0.00500	mg/kg	0.0333	ND	63.8	31-137			
Anthracene	0.0201	0.00500	"	0.0333	ND	60.2	30-120			
Benzo (a) anthracene	0.0203	0.00500	"	0.0333	ND	61.0	30-120			
Benzo (a) pyrene	0.0191	0.00500	"	0.0333	ND	57.4	30-120			
Benzo (b) fluoranthene	0.0198	0.00500	"	0.0333	ND	59.3	30-120			
Benzo (k) fluoranthene	0.0207	0.00500	"	0.0333	ND	62.0	30-120			
Chrysene	0.0171	0.00500	"	0.0333	ND	51.2	30-120			
Dibenz (a,h) anthracene	0.0163	0.00500	"	0.0333	ND	49.0	30-120			
Fluoranthene	0.0199	0.00500	"	0.0333	ND	59.8	30-120			
Fluorene	0.0209	0.00500	"	0.0333	ND	62.7	30-120			
Indeno (1,2,3-cd) pyrene	0.0177	0.00500	"	0.0333	ND	53.0	30-120			
Pyrene	0.0215	0.00500	"	0.0333	ND	64.5	35-142			
1-Methylnaphthalene	0.0312	0.00500	"	0.0333	ND	93.6	15-130			
2-Methylnaphthalene	0.0238	0.00500	"	0.0333	ND	71.4	15-130			
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0339</i>		<i>"</i>	<i>0.0333</i>		<i>102</i>	<i>40-150</i>			
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0226</i>		<i>"</i>	<i>0.0333</i>		<i>67.8</i>	<i>40-150</i>			

Matrix Spike Dup (BGC0170-MSD1)	Source: 2303125-01			Prepared & Analyzed: 03/07/23						
Acenaphthene	0.0235	0.00500	mg/kg	0.0333	ND	70.4	31-137	9.91	30	
Anthracene	0.0224	0.00500	"	0.0333	ND	67.1	30-120	10.8	30	
Benzo (a) anthracene	0.0231	0.00500	"	0.0333	ND	69.3	30-120	12.6	30	
Benzo (a) pyrene	0.0222	0.00500	"	0.0333	ND	66.6	30-120	14.8	30	
Benzo (b) fluoranthene	0.0227	0.00500	"	0.0333	ND	68.1	30-120	13.8	30	
Benzo (k) fluoranthene	0.0228	0.00500	"	0.0333	ND	68.5	30-120	10.0	30	
Chrysene	0.0192	0.00500	"	0.0333	ND	57.7	30-120	12.0	30	
Dibenz (a,h) anthracene	0.0199	0.00500	"	0.0333	ND	59.7	30-120	19.7	30	
Fluoranthene	0.0226	0.00500	"	0.0333	ND	67.7	30-120	12.4	30	
Fluorene	0.0230	0.00500	"	0.0333	ND	69.0	30-120	9.52	30	
Indeno (1,2,3-cd) pyrene	0.0210	0.00500	"	0.0333	ND	62.9	30-120	17.1	30	
Pyrene	0.0241	0.00500	"	0.0333	ND	72.3	35-142	11.4	30	
1-Methylnaphthalene	0.0319	0.00500	"	0.0333	ND	95.6	15-130	2.09	50	
2-Methylnaphthalene	0.0280	0.00500	"	0.0333	ND	83.9	15-130	16.2	50	
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0338</i>		<i>"</i>	<i>0.0333</i>		<i>101</i>	<i>40-150</i>			
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0256</i>		<i>"</i>	<i>0.0333</i>		<i>76.7</i>	<i>40-150</i>			

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Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
03/14/23 11:57

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