

Flowline Closure Checklist

ECMC Rule 911.a.(4) Environmental Site Closure Assessment Field Form

Additional Attachments:		Tank Battery Closure		Wellhead Closure		Pit Closure		Partially Buried Vault Closure
Site Name & ECMC Facility Number: Sandau 34-11F		Date: 09/06/2023, 12/07/2023						Remediation Project #: 30750
Associated Wells:		Age of Site:						Number of Photos Attached: 9
Starting point: (GPS coordinates and descriptions) 40.267184, -104.772716								
End point: (GPS coordinates and descriptions) 40.266338, -104.766306								
USCS Soil Type: Well Graded Sand - SW					Estimated Depth to Groundwater: >4'			
Hydrocarbon Impacted Soils / Spills: (Note estimated size and if impact appears to be surficial or extends to an unknown depth) None observed								
Salt Crusted Soils or Impacted Vegetation: (Note estimated size and if impact appears to be surficial or extends to an unknown depth) None observed								
Flowlines								
Flowline type	Oil/Water/Gas							
Depth	4'							
Age								
Length	1819'							
Construction Material	Steel							
Were flowlines pulled?	Yes							
Visual Integrity of lines	Good condition							
Visual impacts if trenched	None observed							
PID Readings if trenched	0.0-0.1							
Sample taken? Location/Sample ID#	Yes, see below							
Photo Number(s)	1-9							
Other observations regarding on location flowlines: Grab confirmation soil samples were collected along the flowline path (FL01-C@4' - FL01-K@4'). Directional changes were observed at FL01-E@3', FL01-F@4', and FL01-G@4'. The flowline was sampled at the separator by Fremont Environmental during decommissioning of the associated facility (REM #25708).								
Summary								
Was impacted soil identified? No Yes - less than 10 cubic yards Yes - more than 10 cubic yards								
Total number of samples field screened: 9					Total number of samples collected: 3			
Highest PID Reading: 0.1					Total number of samples submitted to lab for analysis: 3			
If more than 10 cubic yards of impacted soil were observed:								
Vertical extent:					Estimated spill volume:			
Lateral extent:					Volume of soil removed:			
Is additional investigation required?								
Was groundwater encountered during the investigation? No Yes - not impacted or in contact with impacted soils Yes - groundwater impacted and/or in contact with impacted soils								
Measured depth to groundwater:					Was remedial groundwater removal conducted? Yes No			
Date Groundwater was encountered:					Commencement date of removal:			
Sheen on groundwater? Yes No					Volume of groundwater removed prior to sampling:			
Free product observed? Yes No					Volume of groundwater removed post sampling:			
Total number of samples collected:					Total Volume of groundwater removed:			
Total number of samples submitted to lab for analysis:								



Photographic Log

					
Equipment ID: FL01-C@4'		Equipment Type: Flowline		Equipment ID: FL01-D@4'	
Material: Steel	Volume:	Contents: Oil/Gas/Water	Material: Steel	Volume:	Contents: Oil/Gas/Water
Notes/Conditions: Facing West			Notes/Conditions: Facing West		





Photographic Log

					
Equipment ID: FL01-G@4'		Equipment Type:			
Material:	Volume:	Contents:		Equipment ID: FL01-E@3'	
				Equipment Type:	
Notes/Conditions: FACING SOUTH			Notes/Conditions: FACING EAST		

Photographic Log

											
Equipment ID: FL01-F@4'		Equipment Type:		Equipment ID: FL01-H@3'		Equipment Type:					
Material:		Volume:		Contents:		Material:					
Material:		Volume:		Contents:		Material:					
Notes/Conditions: FACING WEST						Notes/Conditions: FACING SOUTH					

Photographic Log

					
Equipment ID: FL01-I@4'		Equipment Type:			
Material:	Volume:	Contents:			
Notes/Conditions: FACING WEST					
					
Equipment ID: FL01-J@2'		Equipment Type:			
Material:	Volume:	Contents:			
Notes/Conditions: FACING WEST					

Photographic Log


					
Equipment ID: FL01-K@3'		Equipment Type:	Equipment ID:		Equipment Type:
Material:	Volume:	Contents:	Material:	Volume:	Contents:
Notes/Conditions: FACING WEST			Notes/Conditions:		

TABLE 1
SOIL SAMPLE LOCATIONS
NOBLE ENERGY, INC. - SANDAU 34-11F

Soil Sample ID	Date	PID (ppm)	Visual	Olfactory	Sample Type (Grab/Lab)	Latitude ¹	Longitude	PDOP
FL01-C@4'	09/06/23	0.0	No Staining	No Odor	Grab	40.266889	-104.771513	0.8
FL01-D@4'	09/06/23	0.0	No Staining	No Odor	Grab	40.266972	-104.771868	0.8
FL01-E@3'	12/07/24	0.0	No Staining	No Odor	Lab	40.266843	-104.770853	NC
FL01-F@4'	12/07/24	0.0	No Staining	No Odor	Lab	40.266827	-104.770419	NC
FL01-G@4	12/07/24	0.0	No Staining	No Odor	Lab	40.266757	-104.769898	0.9
FL01-H@3'	12/07/24	0.0	No Staining	No Odor	Grab	40.266689	-104.769294	1.2
FL01-I@4'	12/07/24	0.1	No Staining	No Odor	Grab	40.266553	-104.768195	NC
FL01-J@2'	12/07/24	0.1	No Staining	No Odor	Grab	40.266440	-104.767363	NC
FL01-K@3'	12/07/24	0.0	No Staining	No Odor	Grab	40.266356	-104.766794	NC

Notes:

PID = Photoionization detector

ppm = parts per million

PDOP = Position dilution of precision

HC = Hydrocarbon

NC = Not Collected

1.) Latitude and longitude coordinates will be provided in decimal degrees with an accuracy and precision of 5 decimals of a degree using the North American Datum ("NAD") of 1983

TABLE 2
SOIL ANALYTICAL DATA
NOBLE ENERGY, INC. SANDAU 34-11F

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 ^{1,2}		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 ^{1,2,3}		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
FL01-E@3'	12/07/23	<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
FL01-F@4'	12/07/23	<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
FL01-G@4'	12/07/23	<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

Soil Sample ID	Date	pH	SAR	EC (mmhos/cm)	Boron (mg/L)
SSR ^{1,2}		6 - 8.3	<6	<4mmhos/cm	2
FL01-E@3'	12/07/23	8.72	0.835	0.160	<2.00
FL01-F@4'	12/07/23	7.98	1.69	0.327	<2.00
FL01-G@4'	12/07/23	7.39	2.21	0.514	<2.00

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 ^{1,2}		0.68	15,000	71	0.3	3,100	400	1,500	390	390	23,000
Protection of Groundwater SSL ^{1,2,3}		0.29	82	0.38	0.00067	46	14	26	0.26	0.8	370
FL01-E@3'	12/07/23	0.723	61.7	<0.200	<0.30	1.25	3.85	1.44	<0.260	0.0264	5.43
FL01-F@4'	12/07/23	0.669	37.4	<0.200	<0.30	3.85	3.50	1.23	<0.260	0.0492	7.68
FL01-G@4'	12/07/23	0.508	63.1	<0.200	<0.30	1.29	3.54	1.27	<0.260	<0.0200	5.86

Notes:

1. Compounds referenced from 2 CCR 404-1, Table 915-1, effective January 15, 2021.

2. Soil Screening Levels (SSL) and Soil Suitability for Reclamation (SSR) standards referenced from EPA Regional Screening Levels (EPA RSLs) for Chemical Contaminants at Superfund Sites, effective November 2020.

3. SSLs are applicable if a pathway for communication with groundwater is present.

Definitions:

ECMC = Energy and Carbon Management 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 = 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 ECMC Table 915-1 standard

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

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

Benz(a) = Benzo(a)anthracene

Benzo(b) = Benzo(b)fluoranthene

Benzo(k) = Benzo(k)fluoranthene

Benzo(a) = Benzo(a)pyrene

A,H = Dibenzo(a,h)anthracene

1,2,3-CD = Indeno(1,2,3-cd)pyrene

1-M = 1-methylnaphthalene

2-M = 2-methylnaphthalene



Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

January 04, 2024

Jacob Whritenour

Tasman Geosciences

6855 W. 119th Ave.

Broomfield, CO 80020

RE: Noble - Sandau 34-11F

Work Order #2312147

Enclosed are the results of analyses for samples received by Summit Scientific on 12/07/23 17:53. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Jacob Wood". The signature is written in a cursive, flowing style.

Jacob Wood For Paul Shrewsbury

President



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

Project: Noble - Sandau 34-11F

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/04/24 12:23

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FL01-E@3'	2312147-01	Soil	12/07/23 09:58	12/07/23 17:53
FL01-F@4'	2312147-02	Soil	12/07/23 10:13	12/07/23 17:53
FL01-G@4'	2312147-03	Soil	12/07/23 09:35	12/07/23 17:53

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.

Lab ID	Page 1 of 1
2312147	

S₂

Sample Receipt Checklist

S2 Work Order# 2312147Client: Noble TomanClient Project ID: Sandau 34-11 FShipped Via: H.D./P.U./FedEx/UPS/USPS/Other ☐ Airbill #:

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	--------------------------	--------------------------

Matrix (Check all that apply)

Air

☐

Soil/Solid

☒

Water

☐

Other

☐

Temp (°C)

9.7

Thermometer #

1

	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"/>	
If custody seals are present, are they intact? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ANZEE
Are samples due within 48 hours present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
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 checked="" type="checkbox"/>	<input 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 checked="" type="checkbox"/>	<input 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 type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Missing sample #4
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.

AB

Custodian Printed Name

12/7/23

Date/Time



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

Project: Noble - Sandau 34-11F

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/04/24 12:23

FL01-E@3'
2312147-01 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/07/23 09:58**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	0.0020		mg/kg	1	BGL0494	12/13/23	12/14/23	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: **12/07/23 09:58**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4	0.0587	147 %		50-150		"	"	"	"	
Surrogate: Toluene-d8	0.0440	110 %		50-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	0.0437	109 %		50-150		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **12/07/23 09:58**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
C10-C28 (DRO)	ND	50		mg/kg	1	BGL0497	12/13/23	12/15/23	EPA 8015M	
C28-C36 (ORO)	ND	50		"	"	"	"	"	"	

Date Sampled: **12/07/23 09:58**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: o-Terphenyl	9.29	74.3 %		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 - Sandau 34-11F

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/04/24 12:23

FL01-E@3'
2312147-01 (Soil)

Summit Scientific

PAH by EPA Method 8270D SIM

Date Sampled: **12/07/23 09:58**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Acenaphthene	ND	0.00500	mg/kg	1	BGL0590	12/15/23	12/16/23	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: **12/07/23 09:58**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 2-Methylnaphthalene-d10	0.0160	48.1 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10	0.0136	40.7 %	40-150		"	"	"	"	

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **12/07/23 09:58**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Boron	ND	2.00	mg/L	1	BGL0531	12/14/23	12/26/23	EPA 6020B	

Total Metals by EPA 6020B

Date Sampled: **12/07/23 09:58**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							

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Tasman Geosciences
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Broomfield CO, 80020

Project: Noble - Sandau 34-11F

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/04/24 12:23

FL01-E@3'
2312147-01 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Arsenic	0.723	0.200	mg/kg dry	1	BGL0604	12/15/23	12/28/23	EPA 6020B
Barium	61.7	0.400	"	"	"	"	"	"
Cadmium	ND	0.200	"	"	"	"	"	"
Copper	1.25	0.400	"	"	"	"	"	"
Lead	3.85	0.200	"	"	"	"	"	"
Nickel	1.44	0.400	"	"	"	"	"	"
Silver	0.0264	0.0200	"	"	"	"	"	"
Zinc	5.43	0.400	"	"	"	"	"	"
Selenium	ND	0.260	"	"	"	"	"	"

Hexavalent Chromium by EPA Method 7196

Date Sampled: **12/07/23 09:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	0.30	mg/kg dry	1	BGL0498	12/13/23	12/13/23	EPA 7196A	

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction

Date Sampled: **12/07/23 09:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	38.0	0.0500	mg/L dry	1	BGL0935	12/27/23	01/03/24	EPA 6020B	
Magnesium	7.73	0.0500	"	"	"	"	"	"	
Sodium	21.6	0.0500	"	"	"	"	"	"	

Calculated Analysis

Date Sampled: **12/07/23 09:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.835	0.00100	units	1	BHA0101	01/03/24	01/03/24	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

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

Project: Noble - Sandau 34-11F

Project Number: [none]

Project Manager: Jacob Whritenour

Reported:

01/04/24 12:23

FL01-E@3'
2312147-01 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **12/07/23 09:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	95.4		%	1	BGL0639	12/18/23	12/18/23	Calculation	

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction

Date Sampled: **12/07/23 09:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.160	0.0100	mmhos/cm	1	BGL1062	12/29/23	12/29/23	EPA 120.1	

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction

Date Sampled: **12/07/23 09:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	8.72		pH Units	1	BGL1059	12/29/23	12/29/23	EPA 9045D	

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6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Sandau 34-11F

Project Number: [none]

Project Manager: Jacob Whritenour

Reported:

01/04/24 12:23

FL01-F@4'
2312147-02 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/07/23 10:13**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	BGL0494	12/13/23	12/14/23	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: **12/07/23 10:13**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4	0.0580	145 %	50-150		"	"	"	"	
Surrogate: Toluene-d8	0.0440	110 %	50-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	0.0449	112 %	50-150		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **12/07/23 10:13**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	BGL0497	12/13/23	12/15/23	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **12/07/23 10:13**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl	9.48	75.8 %	30-150		"	"	"	"	

PAH by EPA Method 8270D SIM

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

Project: Noble - Sandau 34-11F

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/04/24 12:23

FL01-F@4'
2312147-02 (Soil)

Summit Scientific

PAH by EPA Method 8270D SIM

Date Sampled: **12/07/23 10:13**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Acenaphthene	ND	0.00500	mg/kg	1	BGL0590	12/15/23	12/16/23	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: **12/07/23 10:13**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 2-Methylnaphthalene-d10	0.0160	47.9 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10	0.0183	54.8 %	40-150		"	"	"	"	

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **12/07/23 10:13**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Boron	ND	2.00	mg/L	1	BGL0531	12/14/23	12/26/23	EPA 6020B	

Total Metals by EPA 6020B

Date Sampled: **12/07/23 10:13**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							

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6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Sandau 34-11F

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/04/24 12:23

FL01-F@4'
2312147-02 (Soil)

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Total Metals by EPA 6020B

Arsenic	0.669	0.200	mg/kg dry	1	BGL0604	12/15/23	12/28/23	EPA 6020B
Barium	37.4	0.400	"	"	"	"	"	"
Cadmium	ND	0.200	"	"	"	"	"	"
Copper	1.23	0.400	"	"	"	"	"	"
Lead	3.85	0.200	"	"	"	"	"	"
Nickel	1.23	0.400	"	"	"	"	"	"
Silver	0.0492	0.0200	"	"	"	"	"	"
Zinc	7.68	0.400	"	"	"	"	"	"
Selenium	ND	0.260	"	"	"	"	"	"

Hexavalent Chromium by EPA Method 7196

Date Sampled: **12/07/23 10:13**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	0.30	mg/kg dry	1	BGL0498	12/13/23	12/13/23	EPA 7196A	

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction

Date Sampled: **12/07/23 10:13**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	26.2	0.0500	mg/L dry	1	BGL0935	12/27/23	01/03/24	EPA 6020B	
Magnesium	6.23	0.0500	"	"	"	"	"	"	
Sodium	37.0	0.0500	"	"	"	"	"	"	

Calculated Analysis

Date Sampled: **12/07/23 10:13**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	1.69	0.00100	units	1	BHA0101	01/03/24	01/03/24	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

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

Project: Noble - Sandau 34-11F

Project Number: [none]

Project Manager: Jacob Whritenour

Reported:

01/04/24 12:23

FL01-F@4'
2312147-02 (Soil)

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Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **12/07/23 10:13**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	94.4		%	1	BGL0639	12/18/23	12/18/23	Calculation	

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction

Date Sampled: **12/07/23 10:13**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.327	0.0100	mmhos/cm	1	BGL1062	12/29/23	12/29/23	EPA 120.1	

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction

Date Sampled: **12/07/23 10:13**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.98		pH Units	1	BGL1059	12/29/23	12/29/23	EPA 9045D	

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6855 W. 119th Ave.
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Project: Noble - Sandau 34-11F

Project Number: [none]

Project Manager: Jacob Whritenour

Reported:

01/04/24 12:23

FL01-G@4'
2312147-03 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/07/23 09:35**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	BGL0494	12/13/23	12/14/23	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: **12/07/23 09:35**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4	0.0525	131 %	50-150		"	"	"	"	
Surrogate: Toluene-d8	0.0434	109 %	50-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	0.0440	110 %	50-150		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **12/07/23 09:35**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	BGL0497	12/13/23	12/15/23	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **12/07/23 09:35**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl	7.52	60.2 %	30-150		"	"	"	"	

PAH by EPA Method 8270D SIM

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Tasman Geosciences
6855 W. 119th Ave.
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Project: Noble - Sandau 34-11F

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/04/24 12:23

FL01-G@4'
2312147-03 (Soil)

Summit Scientific

PAH by EPA Method 8270D SIM

Date Sampled: **12/07/23 09:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BGL0590	12/15/23	12/16/23	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: **12/07/23 09:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10	0.0163	48.8 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10	0.0140	42.0 %	40-150		"	"	"	"	

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **12/07/23 09:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	ND	2.00	mg/L	1	BGL0531	12/14/23	12/26/23	EPA 6020B	

Total Metals by EPA 6020B

Date Sampled: **12/07/23 09:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Sandau 34-11F

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/04/24 12:23

FL01-G@4'
2312147-03 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Arsenic	0.508	0.200	mg/kg dry	1	BGL0604	12/15/23	12/28/23	EPA 6020B
Barium	63.1	0.400	"	"	"	"	"	"
Cadmium	ND	0.200	"	"	"	"	"	"
Copper	1.29	0.400	"	"	"	"	"	"
Lead	3.54	0.200	"	"	"	"	"	"
Nickel	1.27	0.400	"	"	"	"	"	"
Silver	ND	0.0200	"	"	"	"	"	"
Zinc	5.86	0.400	"	"	"	"	"	"
Selenium	ND	0.260	"	"	"	"	"	"

Hexavalent Chromium by EPA Method 7196

Date Sampled: **12/07/23 09:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	0.30	mg/kg dry	1	BGL0498	12/13/23	12/13/23	EPA 7196A	

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction

Date Sampled: **12/07/23 09:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	33.4	0.0500	mg/L dry	1	BGL0935	12/27/23	01/03/24	EPA 6020B	
Magnesium	7.12	0.0500	"	"	"	"	"	"	
Sodium	53.8	0.0500	"	"	"	"	"	"	

Calculated Analysis

Date Sampled: **12/07/23 09:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	2.21	0.00100	units	1	BHA0101	01/03/24	01/03/24	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

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

Project: Noble - Sandau 34-11F

Project Number: [none]

Project Manager: Jacob Whritenour

Reported:
01/04/24 12:23

FL01-G@4'
2312147-03 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **12/07/23 09:35**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
% Solids	88.1			%	1	BGL0639	12/18/23	12/18/23	Calculation	

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction

Date Sampled: **12/07/23 09:35**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Specific Conductance (EC)	0.514	0.0100		mmhos/cm	1	BGL1062	12/29/23	12/29/23	EPA 120.1	

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction

Date Sampled: **12/07/23 09:35**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
pH	7.39			pH Units	1	BGL1059	12/29/23	12/29/23	EPA 9045D	

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

Project: Noble - Sandau 34-11F

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/04/24 12:23

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

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

Batch BGL0494 - EPA 5030 Soil MS

Blank (BGL0494-BLK1)

Prepared & Analyzed: 12/13/23

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	0.0519		"	0.0400		130	50-150			
Surrogate: Toluene-d8	0.0439		"	0.0400		110	50-150			
Surrogate: 4-Bromofluorobenzene	0.0426		"	0.0400		106	50-150			

LCS (BGL0494-BS1)

Prepared & Analyzed: 12/13/23

Benzene	0.115	0.0020	mg/kg	0.100		115	70-130			
Toluene	0.129	0.0050	"	0.100		129	70-130			
Ethylbenzene	0.124	0.0050	"	0.100		124	70-130			
m,p-Xylene	0.246	0.010	"	0.200		123	70-130			
o-Xylene	0.122	0.0050	"	0.100		122	70-130			
1,2,4-Trimethylbenzene	0.123	0.0050	"	0.100		123	70-130			
1,3,5-Trimethylbenzene	0.128	0.0050	"	0.100		128	70-130			
Naphthalene	0.0996	0.0038	"	0.100		99.6	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0551		"	0.0400		138	50-150			
Surrogate: Toluene-d8	0.0435		"	0.0400		109	50-150			
Surrogate: 4-Bromofluorobenzene	0.0423		"	0.0400		106	50-150			

Matrix Spike (BGL0494-MS1)

Source: 2312101-06

Prepared & Analyzed: 12/13/23

Benzene	0.120	0.0020	mg/kg	0.100	ND	120	70-130			
Toluene	0.132	0.0050	"	0.100	ND	132	70-130			QM-07
Ethylbenzene	0.123	0.0050	"	0.100	ND	123	70-130			
m,p-Xylene	0.248	0.010	"	0.200	ND	124	70-130			
o-Xylene	0.121	0.0050	"	0.100	ND	121	70-130			
1,2,4-Trimethylbenzene	0.123	0.0050	"	0.100	ND	123	70-130			
1,3,5-Trimethylbenzene	0.128	0.0050	"	0.100	ND	128	70-130			
Naphthalene	0.102	0.0038	"	0.100	0.00348	98.1	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0561		"	0.0400		140	50-150			
Surrogate: Toluene-d8	0.0436		"	0.0400		109	50-150			
Surrogate: 4-Bromofluorobenzene	0.0426		"	0.0400		106	50-150			

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6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Sandau 34-11F

Project Number: [none]

Project Manager: Jacob Whritenour

Reported:

01/04/24 12:23

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

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

Batch BGL0494 - EPA 5030 Soil MS

Matrix Spike Dup (BGL0494-MSD1)	Source: 2312101-06			Prepared & Analyzed: 12/13/23						
Benzene	0.114	0.0020	mg/kg	0.100	ND	114	70-130	5.45	30	
Toluene	0.127	0.0050	"	0.100	ND	127	70-130	3.53	30	
Ethylbenzene	0.123	0.0050	"	0.100	ND	123	70-130	0.366	30	
m,p-Xylene	0.244	0.010	"	0.200	ND	122	70-130	1.76	30	
o-Xylene	0.119	0.0050	"	0.100	ND	119	70-130	1.65	30	
1,2,4-Trimethylbenzene	0.120	0.0050	"	0.100	ND	120	70-130	2.89	30	
1,3,5-Trimethylbenzene	0.125	0.0050	"	0.100	ND	125	70-130	2.04	30	
Naphthalene	0.0988	0.0038	"	0.100	0.00348	95.4	70-130	2.69	30	
Surrogate: 1,2-Dichloroethane-d4	0.0535		"	0.0400		134	50-150			
Surrogate: Toluene-d8	0.0432		"	0.0400		108	50-150			
Surrogate: 4-Bromofluorobenzene	0.0421		"	0.0400		105	50-150			

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

Project: Noble - Sandau 34-11F

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/04/24 12:23

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch BGL0497 - EPA 3550A

Blank (BGL0497-BLK1)

Prepared: 12/13/23 Analyzed: 12/15/23

C10-C28 (DRO)	ND	50	mg/kg							
C28-C36 (ORO)	ND	50	"							
Surrogate: o-Terphenyl	12.0		"	12.5		95.9	30-150			

LCS (BGL0497-BS1)

Prepared: 12/13/23 Analyzed: 12/15/23

C10-C28 (DRO)	468	50	mg/kg	500		93.6	70-130			
Surrogate: o-Terphenyl	11.2		"	12.5		89.5	30-150			

Matrix Spike (BGL0497-MS1)

Source: 2312101-06

Prepared: 12/13/23 Analyzed: 12/15/23

C10-C28 (DRO)	455	50	mg/kg	500	45.0	81.9	70-130			
Surrogate: o-Terphenyl	9.09		"	12.5		72.7	30-150			

Matrix Spike Dup (BGL0497-MSD1)

Source: 2312101-06

Prepared: 12/13/23 Analyzed: 12/15/23

C10-C28 (DRO)	507	50	mg/kg	500	45.0	92.5	70-130	11.0	20	
Surrogate: o-Terphenyl	10.8		"	12.5		86.5	30-150			

Summit Scientific

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6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Sandau 34-11F

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/04/24 12:23

PAH by EPA Method 8270D SIM - Quality Control

Summit Scientific

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

Batch BGL0590 - EPA 5030 Soil MS

Blank (BGL0590-BLK1)

Prepared: 12/15/23 Analyzed: 12/16/23

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	"								
Surrogate: 2-Methylnaphthalene-d10	0.0212		"	0.0333		63.7		40-150			
Surrogate: Fluoranthene-d10	0.0297		"	0.0333		89.0		40-150			

LCS (BGL0590-BS1)

Prepared: 12/15/23 Analyzed: 12/16/23

Acenaphthene	0.0270	0.00500	mg/kg	0.0333		81.1		31-137			
Anthracene	0.0278	0.00500	"	0.0333		83.4		30-120			
Benzo (a) anthracene	0.0244	0.00500	"	0.0333		73.3		30-120			
Benzo (a) pyrene	0.0189	0.00500	"	0.0333		56.7		30-120			
Benzo (b) fluoranthene	0.0233	0.00500	"	0.0333		69.8		30-120			
Benzo (k) fluoranthene	0.0250	0.00500	"	0.0333		75.0		30-120			
Chrysene	0.0304	0.00500	"	0.0333		91.3		30-120			
Dibenz (a,h) anthracene	0.0291	0.00500	"	0.0333		87.4		30-120			
Fluoranthene	0.0270	0.00500	"	0.0333		81.0		30-120			
Fluorene	0.0238	0.00500	"	0.0333		71.4		30-120			
Indeno (1,2,3-cd) pyrene	0.0296	0.00500	"	0.0333		88.7		30-120			
Pyrene	0.0317	0.00500	"	0.0333		95.2		35-142			
1-Methylnaphthalene	0.0246	0.00500	"	0.0333		73.8		35-142			
2-Methylnaphthalene	0.0279	0.00500	"	0.0333		83.7		35-142			
Surrogate: 2-Methylnaphthalene-d10	0.0245		"	0.0333		73.4		40-150			
Surrogate: Fluoranthene-d10	0.0277		"	0.0333		83.1		40-150			

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6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Sandau 34-11F

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/04/24 12:23

PAH by EPA Method 8270D SIM - Quality Control

Summit Scientific

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

Batch BGL0590 - EPA 5030 Soil MS

Matrix Spike (BGL0590-MS1)

Source: 2312147-01

Prepared: 12/15/23 Analyzed: 12/16/23

Acenaphthene	0.0182	0.00500	mg/kg	0.0333	ND	54.6	31-137		
Anthracene	0.0193	0.00500	"	0.0333	ND	58.0	30-120		
Benzo (a) anthracene	0.0191	0.00500	"	0.0333	ND	57.2	30-120		
Benzo (a) pyrene	0.0137	0.00500	"	0.0333	ND	41.1	30-120		
Benzo (b) fluoranthene	0.0163	0.00500	"	0.0333	ND	49.0	30-120		
Benzo (k) fluoranthene	0.0173	0.00500	"	0.0333	ND	51.9	30-120		
Chrysene	0.0186	0.00500	"	0.0333	ND	55.7	30-120		
Dibenz (a,h) anthracene	0.0181	0.00500	"	0.0333	ND	54.3	30-120		
Fluoranthene	0.0186	0.00500	"	0.0333	ND	55.7	30-120		
Fluorene	0.0171	0.00500	"	0.0333	ND	51.2	30-120		
Indeno (1,2,3-cd) pyrene	0.0168	0.00500	"	0.0333	ND	50.5	30-120		
Pyrene	0.0203	0.00500	"	0.0333	ND	60.8	35-142		
1-Methylnaphthalene	0.0178	0.00500	"	0.0333	ND	53.4	15-130		
2-Methylnaphthalene	0.0184	0.00500	"	0.0333	ND	55.2	15-130		
Surrogate: 2-Methylnaphthalene-d10	0.0162		"	0.0333		48.6	40-150		
Surrogate: Fluoranthene-d10	0.0186		"	0.0333		55.9	40-150		

Matrix Spike Dup (BGL0590-MSD1)

Source: 2312147-01

Prepared: 12/15/23 Analyzed: 12/16/23

Acenaphthene	0.0146	0.00500	mg/kg	0.0333	ND	43.8	31-137	22.0	30
Anthracene	0.0159	0.00500	"	0.0333	ND	47.8	30-120	19.2	30
Benzo (a) anthracene	0.0156	0.00500	"	0.0333	ND	46.7	30-120	20.2	30
Benzo (a) pyrene	0.0159	0.00500	"	0.0333	ND	47.6	30-120	14.7	30
Benzo (b) fluoranthene	0.0145	0.00500	"	0.0333	ND	43.6	30-120	11.7	30
Benzo (k) fluoranthene	0.0154	0.00500	"	0.0333	ND	46.2	30-120	11.7	30
Chrysene	0.0151	0.00500	"	0.0333	ND	45.3	30-120	20.6	30
Dibenz (a,h) anthracene	0.0176	0.00500	"	0.0333	ND	52.9	30-120	2.61	30
Fluoranthene	0.0157	0.00500	"	0.0333	ND	47.0	30-120	16.9	30
Fluorene	0.0152	0.00500	"	0.0333	ND	45.7	30-120	11.3	30
Indeno (1,2,3-cd) pyrene	0.0168	0.00500	"	0.0333	ND	50.4	30-120	0.133	30
Pyrene	0.0172	0.00500	"	0.0333	ND	51.6	35-142	16.5	30
1-Methylnaphthalene	0.0146	0.00500	"	0.0333	ND	43.6	15-130	20.1	50
2-Methylnaphthalene	0.0165	0.00500	"	0.0333	ND	49.6	15-130	10.6	50
Surrogate: 2-Methylnaphthalene-d10	0.0143		"	0.0333		42.8	40-150		
Surrogate: Fluoranthene-d10	0.0154		"	0.0333		46.2	40-150		

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

Project: Noble - Sandau 34-11F

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/04/24 12:23

Total Metals by EPA 6020B Hot Water Soluble Extraction - Quality Control
Summit Scientific

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

Batch BGL0531 - EPA 3050B

Blank (BGL0531-BLK1)

Prepared: 12/14/23 Analyzed: 12/26/23

Boron ND 2.00 mg/L

LCS (BGL0531-BS1)

Prepared: 12/14/23 Analyzed: 12/26/23

Boron 5.06 2.00 mg/L 5.00 101 80-120

Duplicate (BGL0531-DUP1)

Source: 2311392-02

Prepared: 12/14/23 Analyzed: 12/26/23

Boron 0.170 2.00 mg/L 0.174 2.82 20

Matrix Spike (BGL0531-MS1)

Source: 2311392-02

Prepared: 12/14/23 Analyzed: 12/26/23

Boron 6.12 2.00 mg/L 5.00 0.174 119 75-125

Matrix Spike Dup (BGL0531-MSD1)

Source: 2311392-02

Prepared: 12/14/23 Analyzed: 12/26/23

Boron 6.13 2.00 mg/L 5.00 0.174 119 75-125 0.0336 25

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

Project: Noble - Sandau 34-11F

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/04/24 12:23

Total Metals by EPA 6020B - Quality Control

Summit Scientific

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

Batch BGL0604 - EPA 3050B

Blank (BGL0604-BLK1)

Prepared: 12/15/23 Analyzed: 12/28/23

Arsenic	ND	0.200	mg/kg wet
Barium	ND	0.400	"
Cadmium	ND	0.200	"
Copper	ND	0.400	"
Lead	ND	0.200	"
Nickel	ND	0.400	"
Silver	ND	0.0200	"
Zinc	ND	0.400	"
Selenium	ND	0.260	"

LCS (BGL0604-BS1)

Prepared: 12/15/23 Analyzed: 12/28/23

Arsenic	43.7	0.200	mg/kg wet	40.0	109	80-120
Barium	41.7	0.400	"	40.0	104	80-120
Cadmium	2.06	0.200	"	2.00	103	80-120
Copper	44.2	0.400	"	40.0	110	80-120
Lead	20.4	0.200	"	20.0	102	80-120
Nickel	43.2	0.400	"	40.0	108	80-120
Silver	2.09	0.0200	"	2.00	104	80-120
Zinc	43.7	0.400	"	40.0	109	80-120
Selenium	4.22	0.260	"	4.00	105	80-120

Duplicate (BGL0604-DUP1)

Source: 2312141-01

Prepared: 12/15/23 Analyzed: 12/28/23

Arsenic	0.730	0.200	mg/kg dry	0.681	7.00	20
Barium	238	0.400	"	260	8.94	20
Cadmium	0.166	0.200	"	0.185	10.5	20
Copper	1.42	0.400	"	1.19	17.5	20
Lead	8.88	0.200	"	8.93	0.575	20
Nickel	1.17	0.400	"	0.971	18.7	20
Silver	0.0193	0.0200	"	0.0189	2.35	20
Zinc	5.21	0.400	"	4.39	17.1	20
Selenium	ND	0.260	"	ND		20

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Project: Noble - Sandau 34-11F

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/04/24 12:23

Total Metals by EPA 6020B - Quality Control
Summit Scientific

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

Batch BGL0604 - EPA 3050B

Matrix Spike (BGL0604-MS1)		Source: 2312141-01			Prepared: 12/15/23 Analyzed: 12/28/23					
Arsenic	10.1	0.200	mg/kg dry	44.9	0.681	21.1	75-125			QM-05
Barium	297	0.400	"	44.9	260	82.9	75-125			
Cadmium	2.33	0.200	"	2.24	0.185	95.7	75-125			
Copper	10.8	0.400	"	44.9	1.19	21.4	75-125			QM-05
Lead	27.7	0.200	"	22.4	8.93	83.5	75-125			
Nickel	10.6	0.400	"	44.9	0.971	21.5	75-125			QM-05
Silver	2.11	0.0200	"	2.24	0.0189	93.1	75-125			
Zinc	15.1	0.400	"	44.9	4.39	23.9	75-125			QM-05
Selenium	4.17	0.260	"	4.49	ND	92.8	75-125			

Matrix Spike Dup (BGL0604-MSD1)		Source: 2312141-01			Prepared: 12/15/23 Analyzed: 12/28/23					
Arsenic	10.2	0.200	mg/kg dry	44.9	0.681	21.2	75-125	0.389	25	QM-05
Barium	302	0.400	"	44.9	260	94.1	75-125	1.68	25	
Cadmium	2.34	0.200	"	2.24	0.185	96.2	75-125	0.538	25	
Copper	10.8	0.400	"	44.9	1.19	21.4	75-125	0.183	25	QM-05
Lead	28.1	0.200	"	22.4	8.93	85.6	75-125	1.64	25	
Nickel	10.7	0.400	"	44.9	0.971	21.6	75-125	0.679	25	QM-05
Silver	2.12	0.0200	"	2.24	0.0189	93.7	75-125	0.552	25	
Zinc	15.3	0.400	"	44.9	4.39	24.3	75-125	1.25	25	QM-05
Selenium	4.28	0.260	"	4.49	ND	95.3	75-125	2.59	25	

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Broomfield CO, 80020

Project: Noble - Sandau 34-11F

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/04/24 12:23

Hexavalent Chromium by EPA Method 7196 - Quality Control
Summit Scientific

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

Batch BGL0498 - 3060A Mod

Blank (BGL0498-BLK1)

Prepared & Analyzed: 12/13/23

Chromium, Hexavalent ND 0.30 mg/kg wet

LCS (BGL0498-BS1)

Prepared & Analyzed: 12/13/23

Chromium, Hexavalent 26.1 0.30 mg/kg wet 25.0 104 80-120

Duplicate (BGL0498-DUP1)

Source: 2311392-02

Prepared & Analyzed: 12/13/23

Chromium, Hexavalent ND 0.30 mg/kg dry ND 20

Matrix Spike (BGL0498-MS1)

Source: 2311392-02

Prepared & Analyzed: 12/13/23

Chromium, Hexavalent 27.9 0.30 mg/kg dry 27.6 ND 101 75-125

Matrix Spike Dup (BGL0498-MSD1)

Source: 2311392-02

Prepared & Analyzed: 12/13/23

Chromium, Hexavalent 27.5 0.30 mg/kg dry 27.6 ND 99.6 75-125 1.40 20

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Broomfield CO, 80020

Project: Noble - Sandau 34-11F

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/04/24 12:23

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction - Quality Control

Summit Scientific

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

Batch BGL0935 - General Preparation

Blank (BGL0935-BLK1)

Prepared: 12/27/23 Analyzed: 01/03/24

Calcium	ND	0.0500	mg/L wet
Magnesium	ND	0.0500	"
Sodium	ND	0.0500	"

LCS (BGL0935-BS1)

Prepared: 12/27/23 Analyzed: 01/03/24

Calcium	6.03	0.0500	mg/L wet	5.00	121	70-130
Magnesium	5.17	0.0500	"	5.00	103	70-130
Sodium	5.90	0.0500	"	5.00	118	70-130

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Broomfield CO, 80020

Project: Noble - Sandau 34-11F

Project Number: [none]

Project Manager: Jacob Whritenour

Reported:
01/04/24 12:23

Physical Parameters by APHA/ASTM/EPA Methods - Quality Control

Summit Scientific

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

Batch BGL0639 - General Preparation

Duplicate (BGL0639-DUP1)

Source: 2311392-02

Prepared & Analyzed: 12/18/23

% Solids	90.6	%	90.6	0.0518	20
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Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Sandau 34-11F

Project Number: [none]

Project Manager: Jacob Whritenour

Reported:

01/04/24 12:23

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction - Quality Control

Summit Scientific

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

Batch BGL1062 - General Preparation

Blank (BGL1062-BLK1)

Prepared & Analyzed: 12/29/23

Specific Conductance (EC) ND 0.0100 mmhos/cm

LCS (BGL1062-BS1)

Prepared & Analyzed: 12/29/23

Specific Conductance (EC) 0.150 0.0100 mmhos/cm 0.150 100 95-105

Duplicate (BGL1062-DUP1)

Source: 2312147-01

Prepared & Analyzed: 12/29/23

Specific Conductance (EC) 0.160 0.0100 mmhos/cm 0.160 0.375 20

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

Project: Noble - Sandau 34-11F

Project Number: [none]

Project Manager: Jacob Whritenour

Reported:

01/04/24 12:23

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction - Quality Control

Summit Scientific

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

Batch BGL1059 - General Preparation

LCS (BGL1059-BS1)

Prepared & Analyzed: 12/29/23

pH	9.16	pH Units	9.18	99.8	95-105
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Duplicate (BGL1059-DUP1)

Source: 2312147-01

Prepared & Analyzed: 12/29/23

pH	8.78	pH Units	8.72	0.686	20
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Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Sandau 34-11F

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/04/24 12:23

Notes and Definitions

QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS/LCSD recovery.
QM-05	The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The associated LCS and/or LCSD were within acceptance limits, therefore the data are considered valid.
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