

# Flowline Closure Checklist

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

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

Photographic Log



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

Photographic Log



<b>Equipment ID:</b> FL01-G@4'		<b>Equipment Type:</b>	
<b>Material:</b>	<b>Volume:</b>	<b>Contents:</b>	
<b>Notes/Conditions:</b> FACING SOUTH			

<b>Equipment ID:</b> FL01-E@3'		<b>Equipment Type:</b>	
<b>Material:</b>	<b>Volume:</b>	<b>Contents:</b>	
<b>Notes/Conditions:</b> FACING EAST			

Photographic Log

					
<b>Material:</b>	<b>Volume:</b>	<b>Contents:</b>	<b>Material:</b>	<b>Volume:</b>	<b>Contents:</b>
<b>Notes/Conditions:</b> FACING WEST			<b>Notes/Conditions:</b> FACING SOUTH		

## Photographic Log



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

Photographic Log



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

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

Soil Sample ID	Date	PID (ppm)	Visual	Olfactory	Sample Type (Grab/Lab)	Latitude <sup>1</sup>	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	<sup>1</sup> 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 <sup>1,2</sup>		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 <sup>1,2,3</sup>		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 <sup>1,2</sup>		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 <sup>1,2</sup>		0.68	15,000	71	0.3	3,100	400	1,500	390	390	23,000
Protection of Groundwater SSL <sup>1,2,3</sup>		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:

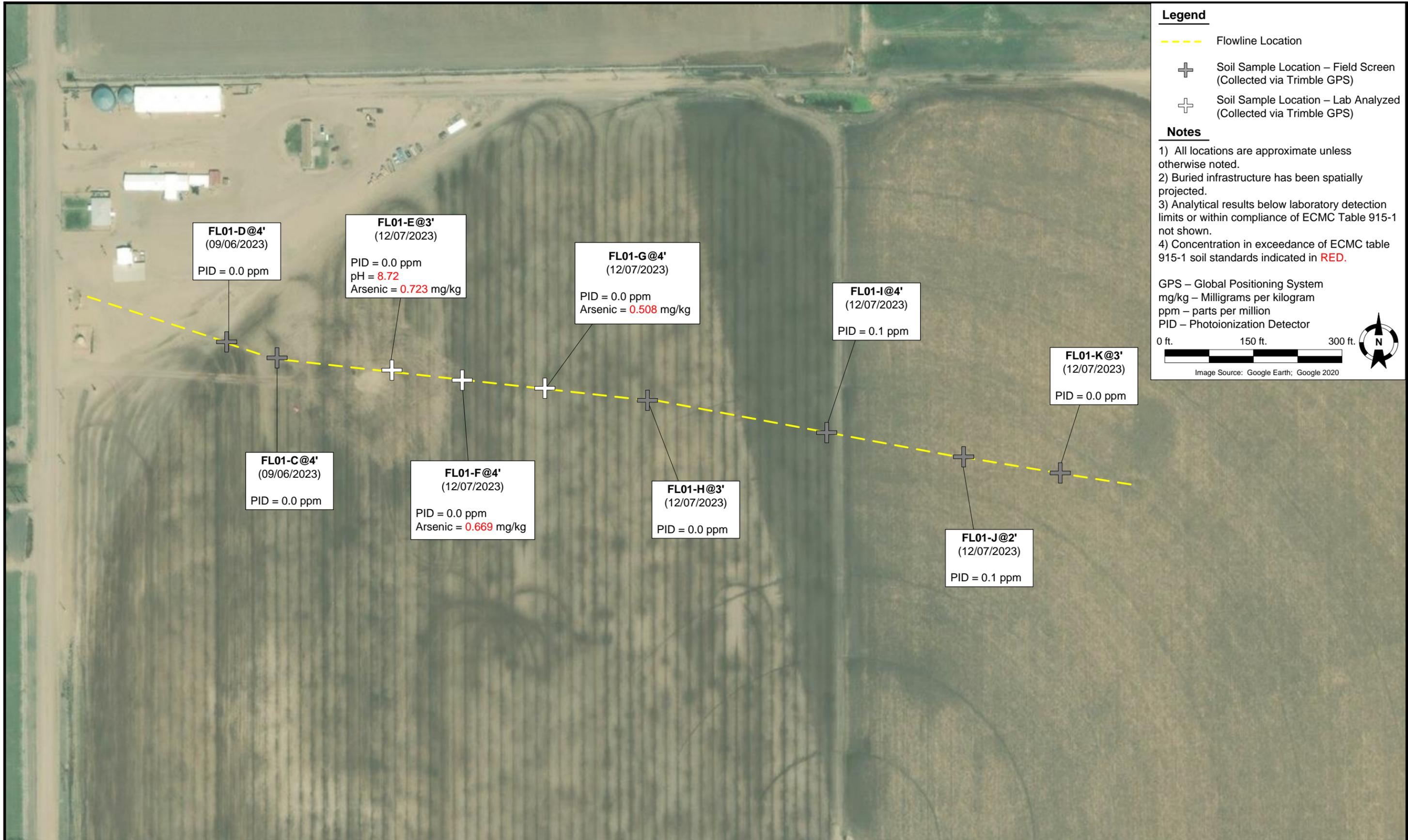
- Compounds referenced from 2 CCR 404-1, Table 915-1, effective January 15, 2021.
- Soil Screening Levels (SSL) and Soil Suitability for Reclamation (SSR) standards referenced from EPA Regional Screening Levels (EPA RSLs) for Chemical Contaminants at Superfund Sites, effective November 2020.
- SSLs are 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 = 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) = 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

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



DATE: 02/29/2024

DESIGNED BY: JW

DRAWN BY: MP



**Tasman Inc.**  
 6855 W 119<sup>th</sup> Avenue  
 Broomfield, CO 80020

**Noble Energy, Inc. – DJ Basin**  
**Sandau 34-11F**  
 NESE, Section 34, Township 4 North, Range 66 West  
 Weld County, Colorado

Flowline Closure & Soil  
 Analytical Results Map  
 (09/06/23, 12/07/2023)

**FIGURE**  
 1

# Summit Scientific

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4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

January 04, 2024

Jacob Whritenour

Tasman Geosciences

6855 W. 119th Ave.

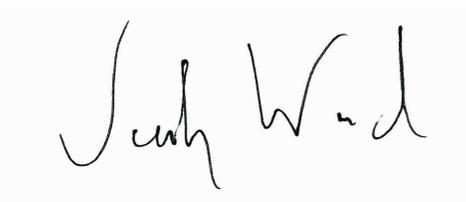
Broomfield, CO 80020

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 that reads "Jacob Wood". The signature is written in a cursive style with a large initial "J" and a long, sweeping underline.

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.*



S<sub>2</sub>

Sample Receipt Checklist

S2 Work Order# 2312147

Client: Noble Gasman Client Project ID: Sandau 3411F

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

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"/>	<u>ANZEE</u>
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 <sup>2+</sup> ), Hexavalent Chromium (Cr <sup>6+</sup> , 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"/>	<u>Missing sample #</u>
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 <sub>2</sub> SO <sub>4</sub> , NaOH, HNO <sub>3</sub> , 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

330 33



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 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 09:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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 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 09:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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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**

**Total Metals by EPA 6020B**

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

Summit Scientific

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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-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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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 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 10:13**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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 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 10:13**

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

**Summit Scientific**

**Total Metals by EPA 6020B**

Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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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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**

**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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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**

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

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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 Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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 Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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 Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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.  
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**

**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**

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

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

### 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 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	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	0.0519		"	0.0400		130	50-150			
<i>Surrogate: Toluene-d8</i>	0.0439		"	0.0400		110	50-150			
<i>Surrogate: 4-Bromofluorobenzene</i>	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			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	0.0551		"	0.0400		138	50-150			
<i>Surrogate: Toluene-d8</i>	0.0435		"	0.0400		109	50-150			
<i>Surrogate: 4-Bromofluorobenzene</i>	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			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	0.0561		"	0.0400		140	50-150			
<i>Surrogate: Toluene-d8</i>	0.0436		"	0.0400		109	50-150			
<i>Surrogate: 4-Bromofluorobenzene</i>	0.0426		"	0.0400		106	50-150			

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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

**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 BGL0494 - EPA 5030 Soil MS**

<b>Matrix Spike Dup (BGL0494-MSD1)</b>	<b>Source: 2312101-06</b>			<b>Prepared &amp; Analyzed: 12/13/23</b>						
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	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0535</i>		<i>"</i>	<i>0.0400</i>		<i>134</i>	<i>50-150</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0432</i>		<i>"</i>	<i>0.0400</i>		<i>108</i>	<i>50-150</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0421</i>		<i>"</i>	<i>0.0400</i>		<i>105</i>	<i>50-150</i>			

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

**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 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: <i>o</i> -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: <i>o</i> -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: <i>o</i> -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: <i>o</i> -Terphenyl	10.8		"	12.5		86.5	30-150				

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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

**PAH by EPA Method 8270D SIM - Quality Control**

**Summit Scientific**

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

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

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

**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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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		Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit		

**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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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

**Hexavalent Chromium by EPA Method 7196 - Quality Control**  
**Summit Scientific**

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

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

**Batch BGL0935 - General Preparation**

**Blank (BGL0935-BLK1)**

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

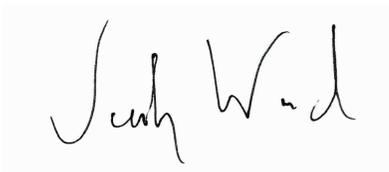
Calcium	ND	0.0500	mg/L wet							
Magnesium	ND	0.0500	"							
Sodium	ND	0.0500	"							

**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			

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

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

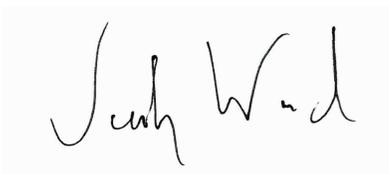
**Summit Scientific**

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

**Batch BGL0639 - General Preparation**

Duplicate (BGL0639-DUP1)	Source: 2311392-02	Prepared & Analyzed: 12/18/23		
% Solids	90.6	% 90.6	0.0518	20

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

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

**Summit Scientific**

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

**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

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

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

**Summit Scientific**

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

**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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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.*



Tasman Geosciences  
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### 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