

# Summit Scientific

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4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

July 19, 2024

Jacob Whritenour

Tasman Geosciences

6855 W. 119th Ave.

Broomfield, CO 80020

RE: Noble - Brown 44-24 Flowline

Work Order #2407181

Enclosed are the results of analyses for samples received by Summit Scientific on 07/15/24 18:27. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

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

Natalie Tessier For Paul Shrewsbury

President



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

Project: Noble - Brown 44-24 Flowline

Project Number: UWRWE-A2785-ABN

Project Manager: Jacob Whritenour

**Reported:**  
07/19/24 07:10

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FL01R-W@2'	2407181-01	Soil	07/15/24 10:34	07/15/24 18:27
BKG01@2'	2407181-02	Soil	07/15/24 11:16	07/15/24 18:27

Summit Scientific

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S<sub>2</sub>

Sample Receipt Checklist

S2 Work Order# 2407181

Client: N. J. Tasman Client Project ID: Brown 44-24 Flowline

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

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

Temp (°C) 8.9 Thermometer # 1

	Yes	No	N/A	Comments (if any)
If samples require cooling, is the temperature < 6°C? <sup>(1)</sup> 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"/>	<u>on ice</u>
If custody seals are present, are they intact? <sup>(1)</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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? <sup>(1)</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client w/ date and time recorded? <sup>(1)</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all samples received intact? <sup>(1)</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided? <sup>(1)</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received? <sup>(1)</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC? <sup>(1)</sup>	<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)? <sup>(1)</sup> 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? <sup>(1)</sup> 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):

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

AS  
Custodian Printed Name

7/15/24  
Date/Time



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**Reported:**  
07/19/24 07:10

**FL01R-W@2'**  
**2407181-01 (Soil)**

**Summit Scientific**

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

Date Sampled: **07/15/24 10:34**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	0.0020		mg/kg	1	BHG0428	07/16/24	07/17/24	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: **07/15/24 10:34**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4	0.0448	112 %		50-150		"	"	"	"	
Surrogate: Toluene-d8	0.0402	100 %		50-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	0.0402	100 %		50-150		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **07/15/24 10:34**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
C10-C28 (DRO)	ND	50		mg/kg	1	BHG0430	07/16/24	07/18/24	EPA 8015M	
C28-C36 (ORO)	ND	50		"	"	"	"	"	"	

Date Sampled: **07/15/24 10:34**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: o-Terphenyl	6.57	52.6 %		30-150		"	"	"	"	

**PAH by EPA Method 8270D SIM**

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07/19/24 07:10

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**2407181-01 (Soil)**

**Summit Scientific**

**PAH by EPA Method 8270D SIM**

Date Sampled: **07/15/24 10:34**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BHG0412	07/16/24	07/16/24	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: **07/15/24 10:34**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10	0.0209	62.8 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10	0.0217	65.0 %	40-150		"	"	"	"	

**Total Metals by EPA 6020B Hot Water Soluble Extraction**

Date Sampled: **07/15/24 10:34**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	ND	2.00	mg/L	1	BHG0416	07/16/24	07/17/24	EPA 6020B	

**Total Metals by EPA 6020B**

Date Sampled: **07/15/24 10:34**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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**2407181-01 (Soil)**

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**Total Metals by EPA 6020B**

Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Arsenic	3.01	0.200	mg/kg dry	1	BHG0415	07/16/24	07/17/24	EPA 6020B
Barium	75.4	0.400	"	"	"	"	"	"
Cadmium	0.419	0.200	"	"	"	"	"	"
Copper	9.31	0.400	"	"	"	"	"	"
Lead	29.4	0.200	"	"	"	"	"	"
Nickel	4.02	0.400	"	"	"	"	"	"
Silver	0.141	0.0200	"	"	"	"	"	"
Zinc	57.3	0.400	"	"	"	"	"	"
Selenium	ND	0.260	"	"	"	"	"	"

**Hexavalent Chromium by EPA Method 7196**

Date Sampled: **07/15/24 10:34**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	0.30	mg/kg dry	1	BHG0419	07/16/24	07/16/24	EPA 7196A	

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

Date Sampled: **07/15/24 10:34**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	55.4	0.0500	mg/L dry	1	BHG0423	07/16/24	07/17/24	EPA 6020B	
Magnesium	2.95	0.0500	"	"	"	"	"	"	
Sodium	22.9	0.0500	"	"	"	"	"	"	

**Calculated Analysis**

Date Sampled: **07/15/24 10:34**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.812	0.00100	units	1	BHG0491	07/18/24	07/18/24	Calculation	

**Physical Parameters by APHA/ASTM/EPA Methods**

Date Sampled: **07/15/24 10:34**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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**FL01R-W@2'**  
**2407181-01 (Soil)**

**Summit Scientific**

**Physical Parameters by APHA/ASTM/EPA Methods**

% Solids	89.2	%	1	BHG0418	07/16/24	07/16/24	Calculation
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**Specific Conductance by EPA Method 120.1, Saturated Paste Extraction**

Date Sampled: **07/15/24 10:34**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.290	0.0100	mmhos/cm	1	BHG0433	07/16/24	07/17/24	EPA 120.1	

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

Date Sampled: **07/15/24 10:34**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	8.26		pH Units	1	BHG0432	07/16/24	07/17/24	EPA 9045D	

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**BKG01@2'**  
**2407181-02 (Soil)**

**Summit Scientific**

**Total Metals by EPA 6020B Hot Water Soluble Extraction**

Date Sampled: **07/15/24 11:16**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Boron	ND	2.00		mg/L	1	BHG0416	07/16/24	07/17/24	EPA 6020B	

**Total Metals by EPA 6020B**

Date Sampled: **07/15/24 11:16**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Arsenic	2.39	0.200		mg/kg dry	1	BHG0415	07/16/24	07/17/24	EPA 6020B	
Barium	64.8	0.400		"	"	"	"	"	"	
Cadmium	0.232	0.200		"	"	"	"	"	"	
Copper	6.48	0.400		"	"	"	"	"	"	
Lead	9.14	0.200		"	"	"	"	"	"	
Nickel	3.14	0.400		"	"	"	"	"	"	
Silver	0.0799	0.0200		"	"	"	"	"	"	
Zinc	20.8	0.400		"	"	"	"	"	"	
Selenium	ND	0.260		"	"	"	"	"	"	

**Hexavalent Chromium by EPA Method 7196**

Date Sampled: **07/15/24 11:16**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chromium, Hexavalent	ND	0.30		mg/kg dry	1	BHG0419	07/16/24	07/16/24	EPA 7196A	

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

Date Sampled: **07/15/24 11:16**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Calcium	83.5	0.0500		mg/L dry	1	BHG0423	07/16/24	07/17/24	EPA 6020B	
Magnesium	2.84	0.0500		"	"	"	"	"	"	
Sodium	57.8	0.0500		"	"	"	"	"	"	

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**Reported:**  
07/19/24 07:10

**BKG01@2'**  
**2407181-02 (Soil)**

**Summit Scientific**

**Calculated Analysis**

Date Sampled: **07/15/24 11:16**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	1.69	0.00100	units	1	BHG0491	07/18/24	07/18/24	Calculation	

**Physical Parameters by APHA/ASTM/EPA Methods**

Date Sampled: **07/15/24 11:16**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	95.8		%	1	BHG0418	07/16/24	07/16/24	Calculation	

**Specific Conductance by EPA Method 120.1, Saturated Paste Extraction**

Date Sampled: **07/15/24 11:16**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.396	0.0100	mmhos/cm	1	BHG0433	07/16/24	07/17/24	EPA 120.1	

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

Date Sampled: **07/15/24 11:16**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.69		pH Units	1	BHG0432	07/16/24	07/17/24	EPA 9045D	

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**Reported:**  
07/19/24 07:10

### 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 BHG0428 - EPA 5030 Soil MS

##### Blank (BHG0428-BLK1)

Prepared: 07/16/24 Analyzed: 07/17/24

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	0.0388		"	0.0400		96.9	50-150				
Surrogate: Toluene-d8	0.0405		"	0.0400		101	50-150				
Surrogate: 4-Bromofluorobenzene	0.0397		"	0.0400		99.2	50-150				

##### LCS (BHG0428-BS1)

Prepared: 07/16/24 Analyzed: 07/17/24

Benzene	0.149	0.0020	mg/kg	0.150		99.4	70-130				
Toluene	0.145	0.0050	"	0.150		96.9	70-130				
Ethylbenzene	0.150	0.0050	"	0.150		100	70-130				
m,p-Xylene	0.299	0.010	"	0.300		99.7	70-130				
o-Xylene	0.144	0.0050	"	0.150		95.8	70-130				
1,2,4-Trimethylbenzene	0.137	0.0050	"	0.150		91.3	70-130				
1,3,5-Trimethylbenzene	0.136	0.0050	"	0.150		90.7	70-130				
Naphthalene	0.136	0.0038	"	0.150		90.5	70-130				
Surrogate: 1,2-Dichloroethane-d4	0.0409		"	0.0400		102	50-150				
Surrogate: Toluene-d8	0.0412		"	0.0400		103	50-150				
Surrogate: 4-Bromofluorobenzene	0.0409		"	0.0400		102	50-150				

##### Matrix Spike (BHG0428-MS1)

Source: 2407133-01

Prepared: 07/16/24 Analyzed: 07/17/24

Benzene	0.111	0.0020	mg/kg	0.150	ND	74.0	70-130				
Toluene	0.0924	0.0050	"	0.150	ND	61.6	70-130				QM-05
Ethylbenzene	0.0603	0.0050	"	0.150	ND	40.2	70-130				QM-05
m,p-Xylene	0.119	0.010	"	0.300	ND	39.8	70-130				QM-05
o-Xylene	0.0953	0.0050	"	0.150	ND	63.5	70-130				QM-05
1,2,4-Trimethylbenzene	0.0273	0.0050	"	0.150	ND	18.2	70-130				QM-05
1,3,5-Trimethylbenzene	0.103	0.0050	"	0.150	ND	68.5	70-130				QM-05
Naphthalene	0.0397	0.0038	"	0.150	ND	26.5	70-130				QM-05
Surrogate: 1,2-Dichloroethane-d4	0.0396		"	0.0400		98.9	50-150				
Surrogate: Toluene-d8	0.0401		"	0.0400		100	50-150				
Surrogate: 4-Bromofluorobenzene	0.0417		"	0.0400		104	50-150				

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**Reported:**  
07/19/24 07:10

**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 BHG0428 - EPA 5030 Soil MS**

<b>Matrix Spike Dup (BHG0428-MSD1)</b>	<b>Source: 2407133-01</b>			<b>Prepared: 07/16/24 Analyzed: 07/17/24</b>						
Benzene	0.112	0.0020	mg/kg	0.150	ND	75.0	70-130	1.37	30	
Toluene	0.0974	0.0050	"	0.150	ND	64.9	70-130	5.22	30	QM-05
Ethylbenzene	0.0612	0.0050	"	0.150	ND	40.8	70-130	1.48	30	QM-05
m,p-Xylene	0.131	0.010	"	0.300	ND	43.7	70-130	9.31	30	QM-05
o-Xylene	0.0988	0.0050	"	0.150	ND	65.8	70-130	3.56	30	QM-05
1,2,4-Trimethylbenzene	0.0316	0.0050	"	0.150	ND	21.0	70-130	14.6	30	QM-05
1,3,5-Trimethylbenzene	0.0994	0.0050	"	0.150	ND	66.3	70-130	3.26	30	QM-05
Naphthalene	0.0373	0.0038	"	0.150	ND	24.8	70-130	6.39	30	QM-05
Surrogate: 1,2-Dichloroethane-d4	0.0376		"	0.0400		94.0	50-150			
Surrogate: Toluene-d8	0.0403		"	0.0400		101	50-150			
Surrogate: 4-Bromofluorobenzene	0.0413		"	0.0400		103	50-150			

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**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 BHG0430 - EPA 3550A**

**Blank (BHG0430-BLK1)**

Prepared & Analyzed: 07/16/24

C10-C28 (DRO)	ND	50	mg/kg								
C28-C36 (ORO)	ND	50	"								
Surrogate: <i>o</i> -Terphenyl	11.4		"	12.5		91.6	30-150				

**LCS (BHG0430-BS1)**

Prepared & Analyzed: 07/16/24

C10-C28 (DRO)	449	50	mg/kg	500		89.8	70-130				
Surrogate: <i>o</i> -Terphenyl	11.2		"	12.5		89.5	30-150				

**Matrix Spike (BHG0430-MS1)**

Source: 2407156-01

Prepared: 07/16/24 Analyzed: 07/17/24

C10-C28 (DRO)	1430	50	mg/kg	500	1140	56.8	70-130				QM-02
Surrogate: <i>o</i> -Terphenyl	10.2		"	12.5		81.3	30-150				

**Matrix Spike Dup (BHG0430-MSD1)**

Source: 2407156-01

Prepared: 07/16/24 Analyzed: 07/17/24

C10-C28 (DRO)	1190	50	mg/kg	500	1140	10.3	70-130	17.7	20		QM-02
Surrogate: <i>o</i> -Terphenyl	10.5		"	12.5		84.4	30-150				

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

Project: Noble - Brown 44-24 Flowline  
Project Number: UWRWE-A2785-ABN  
Project Manager: Jacob Whritenour

**Reported:**  
07/19/24 07:10

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

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

**Batch BHG0412 - EPA 5030 Soil MS**

**Blank (BHG0412-BLK1)**

Prepared & Analyzed: 07/16/24

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	0.0305		"	0.0333	91.5	40-150				
Surrogate: Fluoranthene-d10	0.0253		"	0.0333	75.8	40-150				

**LCS (BHG0412-BS1)**

Prepared & Analyzed: 07/16/24

Acenaphthene	0.0211	0.00500	mg/kg	0.0333	63.2	31-137				
Anthracene	0.0214	0.00500	"	0.0333	64.2	30-120				
Benzo (a) anthracene	0.0241	0.00500	"	0.0333	72.3	30-120				
Benzo (a) pyrene	0.0204	0.00500	"	0.0333	61.1	30-120				
Benzo (b) fluoranthene	0.0213	0.00500	"	0.0333	63.8	30-120				
Benzo (k) fluoranthene	0.0211	0.00500	"	0.0333	63.2	30-120				
Chrysene	0.0231	0.00500	"	0.0333	69.4	30-120				
Dibenz (a,h) anthracene	0.0190	0.00500	"	0.0333	57.1	30-120				
Fluoranthene	0.0224	0.00500	"	0.0333	67.1	30-120				
Fluorene	0.0224	0.00500	"	0.0333	67.3	30-120				
Indeno (1,2,3-cd) pyrene	0.0110	0.00500	"	0.0333	33.1	30-120				
Pyrene	0.0245	0.00500	"	0.0333	73.6	35-142				
1-Methylnaphthalene	0.0211	0.00500	"	0.0333	63.4	35-142				
2-Methylnaphthalene	0.0189	0.00500	"	0.0333	56.7	35-142				
Surrogate: 2-Methylnaphthalene-d10	0.0217		"	0.0333	65.0	40-150				
Surrogate: Fluoranthene-d10	0.0235		"	0.0333	70.4	40-150				

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Project: Noble - Brown 44-24 Flowline

Project Number: UWRWE-A2785-ABN  
Project Manager: Jacob Whritenour

**Reported:**  
07/19/24 07:10

**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 BHG0412 - EPA 5030 Soil MS**

<b>Matrix Spike (BHG0412-MS1)</b>	<b>Source: 2407165-01</b>			<b>Prepared &amp; Analyzed: 07/16/24</b>							
Acenaphthene	0.0225	0.00500	mg/kg	0.0333	ND	67.4	31-137				
Anthracene	0.0237	0.00500	"	0.0333	ND	71.0	30-120				
Benzo (a) anthracene	0.0252	0.00500	"	0.0333	ND	75.5	30-120				
Benzo (a) pyrene	0.0217	0.00500	"	0.0333	ND	65.2	30-120				
Benzo (b) fluoranthene	0.0224	0.00500	"	0.0333	ND	67.3	30-120				
Benzo (k) fluoranthene	0.0219	0.00500	"	0.0333	ND	65.7	30-120				
Chrysene	0.0238	0.00500	"	0.0333	ND	71.4	30-120				
Dibenz (a,h) anthracene	0.0200	0.00500	"	0.0333	ND	60.1	30-120				
Fluoranthene	0.0238	0.00500	"	0.0333	ND	71.5	30-120				
Fluorene	0.0232	0.00500	"	0.0333	ND	69.7	30-120				
Indeno (1,2,3-cd) pyrene	0.0214	0.00500	"	0.0333	ND	64.1	30-120				
Pyrene	0.0262	0.00500	"	0.0333	ND	78.7	35-142				
1-Methylnaphthalene	0.0242	0.00500	"	0.0333	ND	72.6	15-130				
2-Methylnaphthalene	0.0219	0.00500	"	0.0333	ND	65.7	15-130				
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0222</i>		<i>"</i>	<i>0.0333</i>		<i>66.5</i>	<i>40-150</i>				
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0250</i>		<i>"</i>	<i>0.0333</i>		<i>74.9</i>	<i>40-150</i>				

<b>Matrix Spike Dup (BHG0412-MSD1)</b>	<b>Source: 2407165-01</b>			<b>Prepared &amp; Analyzed: 07/16/24</b>							
Acenaphthene	0.0210	0.00500	mg/kg	0.0333	ND	63.0	31-137	6.82	30		
Anthracene	0.0211	0.00500	"	0.0333	ND	63.4	30-120	11.3	30		
Benzo (a) anthracene	0.0234	0.00500	"	0.0333	ND	70.2	30-120	7.31	30		
Benzo (a) pyrene	0.0198	0.00500	"	0.0333	ND	59.5	30-120	9.21	30		
Benzo (b) fluoranthene	0.0207	0.00500	"	0.0333	ND	62.0	30-120	8.19	30		
Benzo (k) fluoranthene	0.0197	0.00500	"	0.0333	ND	59.2	30-120	10.4	30		
Chrysene	0.0217	0.00500	"	0.0333	ND	65.0	30-120	9.50	30		
Dibenz (a,h) anthracene	0.0189	0.00500	"	0.0333	ND	56.6	30-120	6.03	30		
Fluoranthene	0.0215	0.00500	"	0.0333	ND	64.5	30-120	10.4	30		
Fluorene	0.0217	0.00500	"	0.0333	ND	65.0	30-120	7.04	30		
Indeno (1,2,3-cd) pyrene	0.0198	0.00500	"	0.0333	ND	59.3	30-120	7.87	30		
Pyrene	0.0243	0.00500	"	0.0333	ND	72.9	35-142	7.68	30		
1-Methylnaphthalene	0.0212	0.00500	"	0.0333	ND	63.6	15-130	13.3	50		
2-Methylnaphthalene	0.0183	0.00500	"	0.0333	ND	55.0	15-130	17.8	50		
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0197</i>		<i>"</i>	<i>0.0333</i>		<i>59.2</i>	<i>40-150</i>				
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0227</i>		<i>"</i>	<i>0.0333</i>		<i>68.0</i>	<i>40-150</i>				

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

Project: Noble - Brown 44-24 Flowline

Project Number: UWRWE-A2785-ABN  
Project Manager: Jacob Whritenour

**Reported:**  
07/19/24 07:10

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

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

**Batch BHG0416 - EPA 3050B**

<b>Blank (BHG0416-BLK1)</b>				Prepared: 07/16/24 Analyzed: 07/17/24							
Boron	ND	2.00	mg/L								
<b>LCS (BHG0416-BS1)</b>				Prepared: 07/16/24 Analyzed: 07/17/24							
Boron	4.89	2.00	mg/L	5.00		97.9	80-120				
<b>Duplicate (BHG0416-DUP1)</b>				<b>Source: 2407160-01</b>		Prepared: 07/16/24 Analyzed: 07/17/24					
Boron	0.170	2.00	mg/L		0.182			6.82	20		
<b>Matrix Spike (BHG0416-MS1)</b>				<b>Source: 2407160-01</b>		Prepared: 07/16/24 Analyzed: 07/17/24					
Boron	5.06	2.00	mg/L	5.04	0.182	96.9	75-125				
<b>Matrix Spike Dup (BHG0416-MSD1)</b>				<b>Source: 2407160-01</b>		Prepared: 07/16/24 Analyzed: 07/17/24					
Boron	5.77	2.00	mg/L	5.04	0.182	111	75-125	13.0	25		

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6855 W. 119th Ave.  
Broomfield CO, 80020

Project: Noble - Brown 44-24 Flowline  
Project Number: UWRWE-A2785-ABN  
Project Manager: Jacob Whritenour

**Reported:**  
07/19/24 07:10

**Total Metals by EPA 6020B - Quality Control**  
**Summit Scientific**

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

**Batch BHG0415 - EPA 3050B**

**Blank (BHG0415-BLK1)**

Prepared: 07/16/24 Analyzed: 07/17/24

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 (BHG0415-BS1)**

Prepared: 07/16/24 Analyzed: 07/17/24

Arsenic	39.3	0.200	mg/kg wet	40.0		98.2	80-120		
Barium	41.0	0.400	"	40.0		103	80-120		
Cadmium	1.97	0.200	"	2.00		98.3	80-120		
Copper	40.1	0.400	"	40.0		100	80-120		
Lead	19.9	0.200	"	20.0		99.5	80-120		
Nickel	40.1	0.400	"	40.0		100	80-120		
Silver	1.97	0.0200	"	2.00		98.5	80-120		
Zinc	39.7	0.400	"	40.0		99.2	80-120		
Selenium	3.60	0.260	"	4.00		90.1	80-120		

**Duplicate (BHG0415-DUP1)**

Source: 2407157-01

Prepared: 07/16/24 Analyzed: 07/17/24

Arsenic	2.18	0.200	mg/kg dry		2.25		3.12	20	
Barium	59.2	0.400	"		47.3		22.4	20	QR-03
Cadmium	0.158	0.200	"		0.158		0.487	20	
Copper	3.23	0.400	"		3.41		5.46	20	
Lead	7.26	0.200	"		5.27		31.8	20	QR-03
Nickel	3.09	0.400	"		3.00		2.96	20	
Silver	0.0156	0.0200	"		0.0170		8.54	20	
Zinc	12.5	0.400	"		13.4		7.36	20	
Selenium	ND	0.260	"		ND			20	

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6855 W. 119th Ave.  
Broomfield CO, 80020

Project: Noble - Brown 44-24 Flowline

Project Number: UWRWE-A2785-ABN  
Project Manager: Jacob Whritenour

**Reported:**  
07/19/24 07:10

**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 BHG0415 - EPA 3050B**

**Matrix Spike (BHG0415-MS1)**

Source: 2407157-01

Prepared: 07/16/24 Analyzed: 07/17/24

Arsenic	42.8	0.200	mg/kg dry	42.4	2.25	95.7	75-125			
Barium	92.7	0.400	"	42.4	47.3	107	75-125			
Cadmium	2.34	0.200	"	2.12	0.158	103	75-125			
Copper	31.5	0.400	"	42.4	3.41	66.2	75-125			QM-05
Lead	26.2	0.200	"	21.2	5.27	98.7	75-125			
Nickel	31.1	0.400	"	42.4	3.00	66.3	75-125			QM-07
Silver	2.09	0.0200	"	2.12	0.0170	97.8	75-125			
Zinc	42.0	0.400	"	42.4	13.4	67.3	75-125			QM-07
Selenium	3.24	0.260	"	4.24	ND	76.4	75-125			

**Matrix Spike Dup (BHG0415-MSD1)**

Source: 2407157-01

Prepared: 07/16/24 Analyzed: 07/17/24

Arsenic	41.0	0.200	mg/kg dry	40.5	2.25	95.5	75-125	4.45	25	
Barium	88.0	0.400	"	40.5	47.3	101	75-125	5.14	25	
Cadmium	2.23	0.200	"	2.03	0.158	102	75-125	4.93	25	
Copper	30.3	0.400	"	40.5	3.41	66.4	75-125	3.69	25	QM-05
Lead	25.5	0.200	"	20.3	5.27	99.7	75-125	2.81	25	
Nickel	30.4	0.400	"	40.5	3.00	67.5	75-125	2.41	25	QM-07
Silver	1.99	0.0200	"	2.03	0.0170	97.3	75-125	5.03	25	
Zinc	40.5	0.400	"	40.5	13.4	66.8	75-125	3.56	25	QM-07
Selenium	3.12	0.260	"	4.05	ND	76.9	75-125	3.89	25	

**Post Spike (BHG0415-PS1)**

Source: 2407157-01

Prepared: 07/16/24 Analyzed: 07/17/24

Arsenic	112		ug/l	100	5.15	107	75-125			
Barium	211		"	100	108	103	75-125			
Cadmium	5.70		"	5.00	0.360	107	75-125			
Copper	82.4		"	100	7.79	74.6	75-125			QM-01
Lead	63.6		"	50.0	12.0	103	75-125			
Nickel	82.1		"	100	6.85	75.3	75-125			
Silver	5.27		"	5.00	0.0388	105	75-125			
Zinc	108		"	100	30.7	77.2	75-125			
Selenium	9.23		"	10.0	0.159	90.7	75-125			

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Broomfield CO, 80020

Project: Noble - Brown 44-24 Flowline  
Project Number: UWRWE-A2785-ABN  
Project Manager: Jacob Whritenour

**Reported:**  
07/19/24 07:10

**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 BHG0419 - 3060A Mod**

**Blank (BHG0419-BLK1)**

Prepared & Analyzed: 07/16/24

Chromium, Hexavalent      ND      0.30 mg/kg wet

**LCS (BHG0419-BS1)**

Prepared & Analyzed: 07/16/24

Chromium, Hexavalent      25.0      0.30 mg/kg wet      25.0      100      80-120

**Duplicate (BHG0419-DUP1)**

**Source: 2407149-01**

Prepared & Analyzed: 07/16/24

Chromium, Hexavalent      ND      0.30 mg/kg dry      ND      20

**Matrix Spike (BHG0419-MS1)**

**Source: 2407149-01**

Prepared & Analyzed: 07/16/24

Chromium, Hexavalent      31.1      0.30 mg/kg dry      30.4      ND      102      75-125

**Matrix Spike Dup (BHG0419-MSD1)**

**Source: 2407149-01**

Prepared & Analyzed: 07/16/24

Chromium, Hexavalent      30.9      0.30 mg/kg dry      30.4      ND      102      75-125      0.392      20

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Broomfield CO, 80020

Project: Noble - Brown 44-24 Flowline

Project Number: UWRWE-A2785-ABN  
Project Manager: Jacob Whritenour

**Reported:**  
07/19/24 07:10

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

**Summit Scientific**

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

**Batch BHG0423 - General Preparation**

**Blank (BHG0423-BLK1)**

Prepared: 07/16/24 Analyzed: 07/17/24

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

**LCS (BHG0423-BS1)**

Prepared: 07/16/24 Analyzed: 07/17/24

Calcium	5.63	0.0500	mg/L wet	5.00	113	70-130
Magnesium	5.02	0.0500	"	5.00	100	70-130
Sodium	4.80	0.0500	"	5.00	95.9	70-130

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 6855 W. 119th Ave.  
 Broomfield CO, 80020

Project: Noble - Brown 44-24 Flowline

Project Number: UWRWE-A2785-ABN  
 Project Manager: Jacob Whritenour

**Reported:**  
 07/19/24 07:10

**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 BHG0418 - General Preparation**

**Duplicate (BHG0418-DUP1)**

Source: 2407176-01

Prepared & Analyzed: 07/16/24

% Solids	91.6		%		93.0			1.59	20	
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6855 W. 119th Ave.  
Broomfield CO, 80020

Project: Noble - Brown 44-24 Flowline

Project Number: UWRWE-A2785-ABN  
Project Manager: Jacob Whritenour

**Reported:**  
07/19/24 07:10

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

**Summit Scientific**

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

**Batch BHG0433 - General Preparation**

**Blank (BHG0433-BLK1)**

Prepared: 07/16/24 Analyzed: 07/17/24

Specific Conductance (EC) ND 0.0100 mmhos/cm

**LCS (BHG0433-BS1)**

Prepared: 07/16/24 Analyzed: 07/17/24

Specific Conductance (EC) 0.152 0.0100 mmhos/cm 0.150 102 95-105

**Duplicate (BHG0433-DUP1)**

Source: 2407179-01

Prepared: 07/16/24 Analyzed: 07/17/24

Specific Conductance (EC) 0.146 0.0100 mmhos/cm 0.148 0.680 20

Summit Scientific

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

Project: Noble - Brown 44-24 Flowline

Project Number: UWRWE-A2785-ABN  
Project Manager: Jacob Whritenour

**Reported:**  
07/19/24 07:10

**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 BHG0432 - General Preparation**

**LCS (BHG0432-BS1)**

Prepared: 07/16/24 Analyzed: 07/17/24

pH	9.15	pH Units	9.18	99.7	95-105
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**Duplicate (BHG0432-DUP1)**

Source: 2407179-01

Prepared: 07/16/24 Analyzed: 07/17/24

pH	8.92	pH Units	8.99	0.782	20
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Tasman Geosciences  
6855 W. 119th Ave.  
Broomfield CO, 80020

Project: Noble - Brown 44-24 Flowline

Project Number: UWRWE-A2785-ABN

Project Manager: Jacob Whritenour

**Reported:**  
07/19/24 07:10

### Notes and Definitions

- QR-03 The RPD value for the sample duplicate or MS/MSD was outside of QC acceptance limits due to matrix interference. QC batch accepted based on LCS and/or LCSD recovery and/or RPD values.
- 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.
- QM-02 The RPD and/or percent recovery for this QC sample cannot be accurately calculated due to the high concentration of analyte inherent in the sample.
- QM-01 The spike recovery for this QC sample is outside of established control limits due to sample matrix interference.
- 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