

# Summit Scientific

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4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

June 28, 2024

Jacob Whritenour

Tasman Geosciences

6855 W. 119th Ave.

Broomfield, CO 80020

RE: Noble - Erickson A4-12 Flowline

Work Order #2406302

Enclosed are the results of analyses for samples received by Summit Scientific on 06/20/24 17:55. 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 - Erickson A4-12 Flowline

Project Number: UWRWE-A4034-ABN

Project Manager: Jacob Whritenour

**Reported:**  
06/28/24 11:01

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FL01R-W@4'	2406302-01	Soil	06/20/24 09:46	06/20/24 17:55
BKG01@3'	2406302-02	Soil	06/20/24 10:15	06/20/24 17:55

Summit Scientific

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

Lab ID	Page 1 of 1
* 2406302	

Client: Noble/Tasman		Project Manager: Jake Whritenour		Company: Chevron	
Address: 6855 W 119th Ave		E-Mail: Jwhritenour@tasman-geo.com		Project Name/Location: Erickson A4-12 Flowline	
City/State/Zip: Broomfield / CO / 80020				AFE#: UIWRWE - A4034-ABN	
Phone: 970-214-7901		Project Name: Erickson A4-12 Flowline		PO/Billing Codes:	
Sampler Name: Lillian Buck		Project Number:		Contact: <del>Dan Peterson</del> Mike Montoya	

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix			Analysis Requested							Special Instructions			
					HCl	HNO3	None	Other	Water	Soil	Air-Canister #	Other	VOC - 915	TPH - 915	PAH - 915	pH, EC, SAR	Boron - HWS	Metals - 915		HOLD		
1	FL01R-W e 4'	6/20/24	0946	3			X			X			X	X	X	X	X	X	X		pH, EC, SAR by saturated paste	
2	BKG01 e 3'	↓	1015	2			X			X					X	X	X					
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						
13																						
14																						
15																						

Relinquished by: <i>[Signature]</i>	Date/Time: 6/20/24 1450	Received by: Tasman Lochbox	Date/Time: 6/20/24 1450	TAT Business Days	Field DO	Notes:
Relinquished by: Tasman Lochbox	Date/Time: 6/20/24 1755	Received by: <i>[Signature]</i>	Date/Time: 6/20/24 1755	Same Day	Field EC	
Relinquished by:	Date/Time:	Received by:	Date/Time:	1 Day	Field ORP	
Relinquished by:	Date/Time:	Received by:	Date/Time:	2 Days	Field pH	
Relinquished by:	Date/Time:	Received by:	Date/Time:	3 Days	Field Temp.	
Temperature Upon Receipt: 9.0	Corrected Temperature: e	IR gun #: 1	HNO3 lot #:	Standard	X Field Turb.	

S<sub>2</sub>

Sample Receipt Checklist

S2 Work Order# 2406302

Client: Nadjet Casman Client Project ID: Erickson A4-12 Flowline

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

-

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

Temp (°C)

Thermometer #

	Yes	No	N/A	Comments (if any)
If samples require cooling, is the temperature < 6°C? <sup>(1)</sup> <b>NOTE:</b> 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? <b>If yes, contact client and note in narrative.</b>	<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

6/20/24  
Date/Time



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

Project: Noble - Erickson A4-12 Flowline

Project Number: UWRWE-A4034-ABN  
Project Manager: Jacob Whritenour

**Reported:**  
06/28/24 11:01

**FL01R-W@4'**  
**2406302-01 (Soil)**

**Summit Scientific**

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

Date Sampled: **06/20/24 09:46**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	0.0020		mg/kg	1	BHF0700	06/23/24	06/24/24	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: **06/20/24 09:46**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4	0.0517	129 %		50-150		"	"	"	"	
Surrogate: Toluene-d8	0.0386	96.6 %		50-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	0.0416	104 %		50-150		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **06/20/24 09:46**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
C10-C28 (DRO)	ND	50		mg/kg	1	BHF0706	06/23/24	06/23/24	EPA 8015M	
C28-C36 (ORO)	ND	50		"	"	"	"	"	"	

Date Sampled: **06/20/24 09:46**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: o-Terphenyl	12.0	96.2 %		30-150		"	"	"	"	

**PAH by EPA Method 8270D SIM**

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Project Manager: Jacob Whritenour

**Reported:**  
06/28/24 11:01

**FL01R-W@4'**  
**2406302-01 (Soil)**

**Summit Scientific**

**PAH by EPA Method 8270D SIM**

Date Sampled: **06/20/24 09:46**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BHF0652	06/21/24	06/22/24	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: **06/20/24 09:46**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10	0.0253	75.9 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10	0.0242	72.6 %	40-150		"	"	"	"	

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

Date Sampled: **06/20/24 09:46**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	ND	2.00	mg/L	1	BHF0668	06/21/24	06/25/24	EPA 6020B	

**Total Metals by EPA 6020B**

Date Sampled: **06/20/24 09:46**

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

Project: Noble - Erickson A4-12 Flowline

Project Number: UWRWE-A4034-ABN  
Project Manager: Jacob Whritenour

**Reported:**  
06/28/24 11:01

**FL01R-W@4'**  
**2406302-01 (Soil)**

**Summit Scientific**

**Total Metals by EPA 6020B**

Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	2.37	0.200	mg/kg dry	1	BHF0670	06/21/24	06/25/24	EPA 6020B	
Barium	87.3	0.400	"	"	"	"	"	"	
Cadmium	0.340	0.200	"	"	"	"	"	"	
Copper	7.95	0.400	"	"	"	"	"	"	
Lead	11.6	0.200	"	"	"	"	"	"	
Nickel	5.83	0.400	"	"	"	"	"	"	
Silver	0.0312	0.0200	"	"	"	"	"	"	
Zinc	28.2	0.400	"	"	"	"	"	"	
Selenium	0.303	0.260	"	"	"	"	"	"	

**Hexavalent Chromium by EPA Method 7196**

Date Sampled: **06/20/24 09:46**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	0.30	mg/kg dry	1	BHF0730	06/24/24	06/25/24	EPA 7196A	

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

Date Sampled: **06/20/24 09:46**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	60.5	0.0500	mg/L dry	1	BHF0801	06/25/24	06/27/24	EPA 6020B	
Magnesium	4.90	0.0500	"	"	"	"	"	"	
Sodium	14.5	0.0500	"	"	"	"	"	"	

**Calculated Analysis**

Date Sampled: **06/20/24 09:46**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.482	0.00100	units	1	BHF0946	06/28/24	06/28/24	Calculation	

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

Date Sampled: **06/20/24 09:46**

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

Project: Noble - Erickson A4-12 Flowline  
Project Number: UWRWE-A4034-ABN  
Project Manager: Jacob Whritenour

**Reported:**  
06/28/24 11:01

**FL01R-W@4'**  
**2406302-01 (Soil)**

**Summit Scientific**

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

% Solids	84.4	%	1	BHF0654	06/21/24	06/24/24	Calculation
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**Specific Conductance by EPA Method 120.1, Saturated Paste Extraction**

Date Sampled: **06/20/24 09:46**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.268	0.0100	mmhos/cm	1	BHF0811	06/25/24	06/26/24	EPA 120.1	

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

Date Sampled: **06/20/24 09:46**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	8.58		pH Units	1	BHF0810	06/25/24	06/26/24	EPA 9045D	

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Project Number: UWRWE-A4034-ABN  
Project Manager: Jacob Whritenour

**Reported:**  
06/28/24 11:01

**BKG01@3'**  
**2406302-02 (Soil)**

**Summit Scientific**

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

Date Sampled: **06/20/24 10:15**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Boron	ND	2.00	mg/L	1	BHF0668	06/21/24	06/25/24	EPA 6020B	

**Total Metals by EPA 6020B**

Date Sampled: **06/20/24 10:15**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Arsenic	2.24	0.200	mg/kg dry	1	BHF0670	06/21/24	06/25/24	EPA 6020B	
Barium	162	0.400	"	"	"	"	"	"	
Cadmium	0.588	0.200	"	"	"	"	"	"	
Copper	6.30	0.400	"	"	"	"	"	"	
Lead	18.4	0.200	"	"	"	"	"	"	
Nickel	8.04	0.400	"	"	"	"	"	"	
Silver	0.0371	0.0200	"	"	"	"	"	"	
Zinc	27.5	0.400	"	"	"	"	"	"	
Selenium	ND	0.260	"	"	"	"	"	"	

**Hexavalent Chromium by EPA Method 7196**

Date Sampled: **06/20/24 10:15**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Chromium, Hexavalent	ND	0.30	mg/kg dry	1	BHF0730	06/24/24	06/25/24	EPA 7196A	

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

Date Sampled: **06/20/24 10:15**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Calcium	51.3	0.0500	mg/L dry	1	BHF0801	06/25/24	06/27/24	EPA 6020B	
Magnesium	17.1	0.0500	"	"	"	"	"	"	
Sodium	71.0	0.0500	"	"	"	"	"	"	

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Project: Noble - Erickson A4-12 Flowline  
Project Number: UWRWE-A4034-ABN  
Project Manager: Jacob Whritenour

**Reported:**  
06/28/24 11:01

**BKG01@3'**  
**2406302-02 (Soil)**

**Summit Scientific**

**Calculated Analysis**

Date Sampled: **06/20/24 10:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	2.19	0.00100	units	1	BHF0946	06/28/24	06/28/24	Calculation	

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

Date Sampled: **06/20/24 10:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	87.4		%	1	BHF0654	06/21/24	06/24/24	Calculation	

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

Date Sampled: **06/20/24 10:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.719	0.0100	mmhos/cm	1	BHF0811	06/25/24	06/26/24	EPA 120.1	

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

Date Sampled: **06/20/24 10:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	8.36		pH Units	1	BHF0810	06/25/24	06/26/24	EPA 9045D	

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Project: Noble - Erickson A4-12 Flowline

Project Number: UWRWE-A4034-ABN  
Project Manager: Jacob Whritenour

**Reported:**  
06/28/24 11:01

### 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 BHF0700 - EPA 5030 Soil MS

##### Blank (BHF0700-BLK1)

Prepared: 06/23/24 Analyzed: 06/24/24

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	"								
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0495</i>		<i>"</i>	<i>0.0400</i>		<i>124</i>	<i>50-150</i>				
<i>Surrogate: Toluene-d8</i>	<i>0.0387</i>		<i>"</i>	<i>0.0400</i>		<i>96.8</i>	<i>50-150</i>				
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0407</i>		<i>"</i>	<i>0.0400</i>		<i>102</i>	<i>50-150</i>				

##### LCS (BHF0700-BS1)

Prepared: 06/23/24 Analyzed: 06/24/24

Benzene	0.104	0.0020	mg/kg	0.100		104	70-130				
Toluene	0.107	0.0050	"	0.100		107	70-130				
Ethylbenzene	0.105	0.0050	"	0.100		105	70-130				
m,p-Xylene	0.206	0.010	"	0.200		103	70-130				
o-Xylene	0.102	0.0050	"	0.100		102	70-130				
1,2,4-Trimethylbenzene	0.101	0.0050	"	0.100		101	70-130				
1,3,5-Trimethylbenzene	0.100	0.0050	"	0.100		100	70-130				
Naphthalene	0.0977	0.0038	"	0.100		97.7	70-130				
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0525</i>		<i>"</i>	<i>0.0400</i>		<i>131</i>	<i>50-150</i>				
<i>Surrogate: Toluene-d8</i>	<i>0.0418</i>		<i>"</i>	<i>0.0400</i>		<i>104</i>	<i>50-150</i>				
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0416</i>		<i>"</i>	<i>0.0400</i>		<i>104</i>	<i>50-150</i>				

##### Matrix Spike (BHF0700-MS1)

Source: 2406287-01

Prepared: 06/23/24 Analyzed: 06/24/24

Benzene	0.0652	0.0020	mg/kg	0.100	ND	65.2	70-130				QM-07
Toluene	0.0729	0.0050	"	0.100	ND	72.9	70-130				
Ethylbenzene	0.0944	0.0050	"	0.100	ND	94.4	70-130				
m,p-Xylene	0.193	0.010	"	0.200	ND	96.7	70-130				
o-Xylene	0.0873	0.0050	"	0.100	ND	87.3	70-130				
1,2,4-Trimethylbenzene	0.0919	0.0050	"	0.100	ND	91.9	70-130				
1,3,5-Trimethylbenzene	0.0946	0.0050	"	0.100	ND	94.6	70-130				
Naphthalene	0.0794	0.0038	"	0.100	ND	79.4	70-130				
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0514</i>		<i>"</i>	<i>0.0400</i>		<i>129</i>	<i>50-150</i>				
<i>Surrogate: Toluene-d8</i>	<i>0.0396</i>		<i>"</i>	<i>0.0400</i>		<i>99.0</i>	<i>50-150</i>				
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0419</i>		<i>"</i>	<i>0.0400</i>		<i>105</i>	<i>50-150</i>				

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

Project: Noble - Erickson A4-12 Flowline

Project Number: UWRWE-A4034-ABN  
Project Manager: Jacob Whritenour

**Reported:**  
06/28/24 11:01

**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		

**Batch BHF0700 - EPA 5030 Soil MS**

Matrix Spike Dup (BHF0700-MSD1)	Source: 2406287-01			Prepared: 06/23/24 Analyzed: 06/24/24						
Benzene	0.0594	0.0020	mg/kg	0.100	ND	59.4	70-130	9.39	30	QM-07
Toluene	0.0694	0.0050	"	0.100	ND	69.4	70-130	4.98	30	QM-07
Ethylbenzene	0.0931	0.0050	"	0.100	ND	93.1	70-130	1.38	30	
m,p-Xylene	0.190	0.010	"	0.200	ND	94.9	70-130	1.96	30	
o-Xylene	0.0840	0.0050	"	0.100	ND	84.0	70-130	3.92	30	
1,2,4-Trimethylbenzene	0.0921	0.0050	"	0.100	ND	92.1	70-130	0.261	30	
1,3,5-Trimethylbenzene	0.0948	0.0050	"	0.100	ND	94.8	70-130	0.285	30	
Naphthalene	0.0743	0.0038	"	0.100	ND	74.3	70-130	6.56	30	
Surrogate: 1,2-Dichloroethane-d4	0.0537		"	0.0400		134	50-150			
Surrogate: Toluene-d8	0.0399		"	0.0400		99.8	50-150			
Surrogate: 4-Bromofluorobenzene	0.0422		"	0.0400		105	50-150			

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Broomfield CO, 80020

Project: Noble - Erickson A4-12 Flowline  
Project Number: UWRWE-A4034-ABN  
Project Manager: Jacob Whritenour

**Reported:**  
06/28/24 11:01

**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 BHF0706 - EPA 3550A**

**Blank (BHF0706-BLK1)**

Prepared & Analyzed: 06/23/24

C10-C28 (DRO)	ND	50	mg/kg								
C28-C36 (ORO)	ND	50	"								
Surrogate: <i>o</i> -Terphenyl	14.8		"	12.5		119		30-150			

**LCS (BHF0706-BS1)**

Prepared & Analyzed: 06/23/24

C10-C28 (DRO)	534	50	mg/kg	500		107		70-130			
Surrogate: <i>o</i> -Terphenyl	14.7		"	12.5		118		30-150			

**Matrix Spike (BHF0706-MS1)**

Source: 2406287-01

Prepared & Analyzed: 06/23/24

C10-C28 (DRO)	510	50	mg/kg	500	18.9	98.2		70-130			
Surrogate: <i>o</i> -Terphenyl	17.4		"	12.5		139		30-150			

**Matrix Spike Dup (BHF0706-MSD1)**

Source: 2406287-01

Prepared & Analyzed: 06/23/24

C10-C28 (DRO)	455	50	mg/kg	500	18.9	87.2		70-130	11.4	20	
Surrogate: <i>o</i> -Terphenyl	9.68		"	12.5		77.4		30-150			

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

Project: Noble - Erickson A4-12 Flowline  
Project Number: UWRWE-A4034-ABN  
Project Manager: Jacob Whritenour

**Reported:**  
06/28/24 11:01

**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 BHF0652 - EPA 5030 Soil MS**

**Blank (BHF0652-BLK1)**

Prepared & Analyzed: 06/21/24

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	"							
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0201</i>		<i>"</i>	<i>0.0333</i>		<i>60.3</i>	<i>40-150</i>			
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0196</i>		<i>"</i>	<i>0.0333</i>		<i>58.7</i>	<i>40-150</i>			

**LCS (BHF0652-BS1)**

Prepared & Analyzed: 06/21/24

Acenaphthene	0.0233	0.00500	mg/kg	0.0333		70.0	31-137			
Anthracene	0.0232	0.00500	"	0.0333		69.5	30-120			
Benzo (a) anthracene	0.0237	0.00500	"	0.0333		71.2	30-120			
Benzo (a) pyrene	0.0239	0.00500	"	0.0333		71.6	30-120			
Benzo (b) fluoranthene	0.0257	0.00500	"	0.0333		77.2	30-120			
Benzo (k) fluoranthene	0.0259	0.00500	"	0.0333		77.6	30-120			
Chrysene	0.0243	0.00500	"	0.0333		72.9	30-120			
Dibenz (a,h) anthracene	0.0202	0.00500	"	0.0333		60.6	30-120			
Fluoranthene	0.0252	0.00500	"	0.0333		75.7	30-120			
Fluorene	0.0229	0.00500	"	0.0333		68.6	30-120			
Indeno (1,2,3-cd) pyrene	0.0196	0.00500	"	0.0333		58.8	30-120			
Pyrene	0.0201	0.00500	"	0.0333		60.2	35-142			
1-Methylnaphthalene	0.0207	0.00500	"	0.0333		62.1	35-142			
2-Methylnaphthalene	0.0206	0.00500	"	0.0333		61.7	35-142			
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0207</i>		<i>"</i>	<i>0.0333</i>		<i>62.1</i>	<i>40-150</i>			
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0256</i>		<i>"</i>	<i>0.0333</i>		<i>76.9</i>	<i>40-150</i>			

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

Project: Noble - Erickson A4-12 Flowline

Project Number: UWRWE-A4034-ABN  
Project Manager: Jacob Whritenour

**Reported:**  
06/28/24 11:01

**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 BHF0652 - EPA 5030 Soil MS**

<b>Matrix Spike (BHF0652-MS1)</b>	<b>Source: 2406288-01</b>			<b>Prepared &amp; Analyzed: 06/21/24</b>								
Acenaphthene	0.0231	0.00500	mg/kg	0.0333	ND	69.4	31-137					
Anthracene	0.0226	0.00500	"	0.0333	ND	67.7	30-120					
Benzo (a) anthracene	0.0310	0.00500	"	0.0333	0.00682	72.7	30-120					
Benzo (a) pyrene	0.0301	0.00500	"	0.0333	0.0103	59.4	30-120					
Benzo (b) fluoranthene	0.0303	0.00500	"	0.0333	0.0140	48.9	30-120					
Benzo (k) fluoranthene	0.0261	0.00500	"	0.0333	0.00808	54.1	30-120					
Chrysene	0.0342	0.00500	"	0.0333	0.00945	74.2	30-120					
Dibenz (a,h) anthracene	0.0190	0.00500	"	0.0333	ND	57.0	30-120					
Fluoranthene	0.0355	0.00500	"	0.0333	0.00905	79.4	30-120					
Fluorene	0.0226	0.00500	"	0.0333	ND	67.7	30-120					
Indeno (1,2,3-cd) pyrene	0.0264	0.00500	"	0.0333	ND	79.1	30-120					
Pyrene	0.0437	0.00500	"	0.0333	0.0111	98.0	35-142					
1-Methylnaphthalene	0.0223	0.00500	"	0.0333	ND	66.8	15-130					
2-Methylnaphthalene	0.0220	0.00500	"	0.0333	ND	66.1	15-130					
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0225</i>		<i>"</i>	<i>0.0333</i>		<i>67.4</i>	<i>40-150</i>					
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0211</i>		<i>"</i>	<i>0.0333</i>		<i>63.3</i>	<i>40-150</i>					

<b>Matrix Spike Dup (BHF0652-MSD1)</b>	<b>Source: 2406288-01</b>			<b>Prepared &amp; Analyzed: 06/21/24</b>								
Acenaphthene	0.0233	0.00500	mg/kg	0.0333	ND	69.9	31-137	0.642	30			
Anthracene	0.0216	0.00500	"	0.0333	ND	64.7	30-120	4.43	30			
Benzo (a) anthracene	0.0307	0.00500	"	0.0333	0.00682	71.6	30-120	1.22	30			
Benzo (a) pyrene	0.0321	0.00500	"	0.0333	0.0103	65.3	30-120	6.36	30			
Benzo (b) fluoranthene	0.0327	0.00500	"	0.0333	0.0140	56.0	30-120	7.56	30			
Benzo (k) fluoranthene	0.0284	0.00500	"	0.0333	0.00808	60.9	30-120	8.30	30			
Chrysene	0.0341	0.00500	"	0.0333	0.00945	73.9	30-120	0.269	30			
Dibenz (a,h) anthracene	0.0202	0.00500	"	0.0333	ND	60.5	30-120	5.94	30			
Fluoranthene	0.0327	0.00500	"	0.0333	0.00905	71.0	30-120	8.17	30			
Fluorene	0.0221	0.00500	"	0.0333	ND	66.4	30-120	2.04	30			
Indeno (1,2,3-cd) pyrene	0.0257	0.00500	"	0.0333	ND	77.2	30-120	2.40	30			
Pyrene	0.0396	0.00500	"	0.0333	0.0111	85.6	35-142	9.89	30			
1-Methylnaphthalene	0.0223	0.00500	"	0.0333	ND	66.9	15-130	0.200	50			
2-Methylnaphthalene	0.0221	0.00500	"	0.0333	ND	66.4	15-130	0.430	50			
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0226</i>		<i>"</i>	<i>0.0333</i>		<i>67.9</i>	<i>40-150</i>					
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0219</i>		<i>"</i>	<i>0.0333</i>		<i>65.8</i>	<i>40-150</i>					

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

Project: Noble - Erickson A4-12 Flowline

Project Number: UWRWE-A4034-ABN  
Project Manager: Jacob Whritenour

**Reported:**  
06/28/24 11:01

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

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

**Batch BHF0668 - EPA 3050B**

**Blank (BHF0668-BLK1)**

Prepared: 06/21/24 Analyzed: 06/25/24

Boron ND 2.00 mg/L

**LCS (BHF0668-BS1)**

Prepared: 06/21/24 Analyzed: 06/25/24

Boron 5.63 2.00 mg/L 5.00 113 80-120

**Duplicate (BHF0668-DUP1)**

Source: 2405004-01RE1

Prepared: 06/21/24 Analyzed: 06/25/24

Boron 5.81 2.00 mg/L 5.03 14.3 20

**Matrix Spike (BHF0668-MS1)**

Source: 2405004-01RE1

Prepared: 06/21/24 Analyzed: 06/25/24

Boron 11.6 2.00 mg/L 4.98 5.03 131 75-125 QM-01

**Matrix Spike Dup (BHF0668-MSD1)**

Source: 2405004-01RE1

Prepared: 06/21/24 Analyzed: 06/25/24

Boron 12.6 2.00 mg/L 4.98 5.03 153 75-125 8.96 25 QM-01

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6855 W. 119th Ave.  
Broomfield CO, 80020

Project: Noble - Erickson A4-12 Flowline

Project Number: UWRWE-A4034-ABN  
Project Manager: Jacob Whritenour

**Reported:**  
06/28/24 11:01

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

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

**Batch BHF0670 - EPA 3050B**

**Blank (BHF0670-BLK1)**

Prepared: 06/21/24 Analyzed: 06/25/24

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 (BHF0670-BS1)**

Prepared: 06/21/24 Analyzed: 06/25/24

Arsenic	42.6	0.200	mg/kg wet	40.0	106	80-120
Barium	40.6	0.400	"	40.0	101	80-120
Cadmium	1.98	0.200	"	2.00	98.9	80-120
Copper	42.7	0.400	"	40.0	107	80-120
Lead	20.3	0.200	"	20.0	101	80-120
Nickel	42.5	0.400	"	40.0	106	80-120
Silver	1.99	0.0200	"	2.00	99.6	80-120
Zinc	42.4	0.400	"	40.0	106	80-120
Selenium	4.57	0.260	"	4.00	114	80-120

**Duplicate (BHF0670-DUP1)**

Source: 2406290-10

Prepared: 06/21/24 Analyzed: 06/25/24

Arsenic	3.21	0.200	mg/kg dry	2.23	35.8	20	QR-04
Barium	105	0.400	"	108	3.27	20	
Cadmium	0.349	0.200	"	0.192	58.0	20	QR-01
Copper	4.54	0.400	"	3.38	29.4	20	QR-04
Lead	10.7	0.200	"	7.04	41.3	20	QR-04
Nickel	4.87	0.400	"	3.62	29.5	20	QR-04
Silver	0.0606	0.0200	"	0.0404	40.0	20	QR-01
Zinc	20.1	0.400	"	15.8	24.0	20	QR-04
Selenium	0.303	0.260	"	0.222	30.9	20	QR-01

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6855 W. 119th Ave.  
Broomfield CO, 80020

Project: Noble - Erickson A4-12 Flowline

Project Number: UWRWE-A4034-ABN  
Project Manager: Jacob Whritenour

**Reported:**  
06/28/24 11:01

**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 BHF0670 - EPA 3050B**

<b>Matrix Spike (BHF0670-MS1)</b>	<b>Source: 2406290-10</b>			<b>Prepared: 06/21/24 Analyzed: 06/25/24</b>								
Arsenic	32.2	0.200	mg/kg dry	43.9	2.23	68.4	75-125					QM-07
Barium	153	0.400	"	43.9	108	102	75-125					
Cadmium	2.51	0.200	"	2.19	0.192	106	75-125					
Copper	32.1	0.400	"	43.9	3.38	65.6	75-125					QM-07
Lead	30.2	0.200	"	21.9	7.04	106	75-125					
Nickel	32.8	0.400	"	43.9	3.62	66.6	75-125					QM-07
Silver	2.30	0.0200	"	2.19	0.0404	103	75-125					
Zinc	47.4	0.400	"	43.9	15.8	71.9	75-125					QM-07
Selenium	5.81	0.260	"	4.39	0.222	127	75-125					QM-07

<b>Matrix Spike Dup (BHF0670-MSD1)</b>	<b>Source: 2406290-10</b>			<b>Prepared: 06/21/24 Analyzed: 06/25/24</b>								
Arsenic	31.7	0.200	mg/kg dry	45.2	2.23	65.1	75-125	1.82	25			QM-07
Barium	162	0.400	"	45.2	108	119	75-125	5.62	25			
Cadmium	2.56	0.200	"	2.26	0.192	105	75-125	1.78	25			
Copper	32.5	0.400	"	45.2	3.38	64.5	75-125	1.22	25			QM-07
Lead	29.2	0.200	"	22.6	7.04	97.9	75-125	3.58	25			
Nickel	33.3	0.400	"	45.2	3.62	65.7	75-125	1.53	25			QM-07
Silver	2.37	0.0200	"	2.26	0.0404	103	75-125	3.09	25			
Zinc	47.0	0.400	"	45.2	15.8	69.0	75-125	0.730	25			QM-07
Selenium	5.66	0.260	"	4.52	0.222	120	75-125	2.63	25			

<b>Post Spike (BHF0670-PS1)</b>	<b>Source: 2406290-10</b>			<b>Prepared: 06/21/24 Analyzed: 06/25/24</b>								
Arsenic	84.4		ug/l	100	4.98	79.4	75-125					
Barium	339		"	100	242	97.9	75-125					
Cadmium	5.75		"	5.00	0.428	106	75-125					
Copper	85.4		"	100	7.54	77.9	75-125					
Lead	67.1		"	50.0	15.7	103	75-125					
Nickel	86.7		"	100	8.06	78.6	75-125					
Silver	5.37		"	5.00	0.0900	106	75-125					
Zinc	116		"	100	35.2	80.4	75-125					
Selenium	13.0		"	10.0	0.494	125	75-125					

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

Project: Noble - Erickson A4-12 Flowline  
Project Number: UWRWE-A4034-ABN  
Project Manager: Jacob Whritenour

**Reported:**  
06/28/24 11:01

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

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

**Batch BHF0730 - 3060A Mod**

**Blank (BHF0730-BLK1)**

Prepared: 06/24/24 Analyzed: 06/25/24

Chromium, Hexavalent ND 0.30 mg/kg wet

**LCS (BHF0730-BS1)**

Prepared: 06/24/24 Analyzed: 06/25/24

Chromium, Hexavalent 25.2 0.30 mg/kg wet 25.0 101 80-120

**Duplicate (BHF0730-DUP1)**

**Source: 2406285-01**

Prepared: 06/24/24 Analyzed: 06/25/24

Chromium, Hexavalent ND 0.30 mg/kg dry ND 20

**Matrix Spike (BHF0730-MS1)**

**Source: 2406285-01**

Prepared: 06/24/24 Analyzed: 06/25/24

Chromium, Hexavalent 28.7 0.30 mg/kg dry 29.2 ND 98.4 75-125

**Matrix Spike Dup (BHF0730-MSD1)**

**Source: 2406285-01**

Prepared: 06/24/24 Analyzed: 06/25/24

Chromium, Hexavalent 28.8 0.30 mg/kg dry 29.2 ND 98.6 75-125 0.203 20

Summit Scientific

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

Project: Noble - Erickson A4-12 Flowline

Project Number: UWRWE-A4034-ABN  
Project Manager: Jacob Whritenour

**Reported:**  
06/28/24 11:01

**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 BHF0801 - General Preparation**

**Blank (BHF0801-BLK1)**

Prepared: 06/25/24 Analyzed: 06/27/24

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

**LCS (BHF0801-BS1)**

Prepared: 06/25/24 Analyzed: 06/27/24

Calcium	5.57	0.0500	mg/L wet	5.00	111	70-130
Magnesium	4.89	0.0500	"	5.00	97.8	70-130
Sodium	4.43	0.0500	"	5.00	88.6	70-130

Summit Scientific

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

Project: Noble - Erickson A4-12 Flowline

Project Number: UWRWE-A4034-ABN  
 Project Manager: Jacob Whritenour

**Reported:**  
 06/28/24 11:01

**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 BHF0654 - General Preparation**

Duplicate (BHF0654-DUP1)	Source: 2406290-01		Prepared: 06/21/24 Analyzed: 06/24/24	
% Solids	78.1	%	92.3	16.6 20

Summit Scientific

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Project: Noble - Erickson A4-12 Flowline

Project Number: UWRWE-A4034-ABN  
Project Manager: Jacob Whritenour

**Reported:**  
06/28/24 11:01

**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 BHF0811 - General Preparation**

**Blank (BHF0811-BLK1)**

Prepared: 06/25/24 Analyzed: 06/26/24

Specific Conductance (EC) ND 0.0100 mmhos/cm

**LCS (BHF0811-BS1)**

Prepared: 06/25/24 Analyzed: 06/26/24

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

**Duplicate (BHF0811-DUP1)**

Source: 2406301-01

Prepared: 06/25/24 Analyzed: 06/26/24

Specific Conductance (EC) 0.0520 0.0100 mmhos/cm 0.0519 0.154 20

Summit Scientific

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Broomfield CO, 80020

Project: Noble - Erickson A4-12 Flowline

Project Number: UWRWE-A4034-ABN  
Project Manager: Jacob Whritenour

**Reported:**  
06/28/24 11:01

**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 BHF0810 - General Preparation**

**LCS (BHF0810-BS1)**

Prepared: 06/25/24 Analyzed: 06/26/24

pH	9.15	pH Units	9.18	99.7	95-105
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**Duplicate (BHF0810-DUP1)**

Source: 2406301-01

Prepared: 06/25/24 Analyzed: 06/26/24

pH	7.04	pH Units	7.14	1.41	20
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Summit Scientific

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

Project: Noble - Erickson A4-12 Flowline

Project Number: UWRWE-A4034-ABN  
Project Manager: Jacob Whritenour

**Reported:**  
06/28/24 11:01

### Notes and Definitions

- QR-04 The RPD value for the sample duplicate or MS/MSD was outside of QC acceptance. QC batch accepted based on LCS and/or LCSD recovery and/or RPD values.
- QR-01 Analyses are not controlled on RPD values from sample concentrations less than 10 times the reporting limit. QC batch accepted based on LCS and/or LCSD QC results.
- 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-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